KELLOGG

GENERAL CATALOG NO. 9, 1932

A general catalog of material manufactured by Kellogg Switchboard and Supply of switchboards, telephones, apparatus and supplies.

Although this catalog is not dated the year 1932 is a best guess based on the type of telephones listed and the last pole dating nail listed is 1932.

A bound book 8 X 11 inches, saddle stitched with hard cover, printed by lithography on coated stock.

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KELLOGG

SWITCHBOARDS
TELEPHONES
APPARATUS
SUPPLIES

CATALOG NUMBER 9

KELLOGG Switchboard & Supply COMPANY
GENERAL OFFICES AND FACTORY
1066 West Adams Street
CHICAGO

Customer Information

Guarantee

We guarantee our goods to the extent that we replace within one year from date of invoice those that prove defective when used for the purpose manufactured, but no goods can be credited unless our consent has been obtained before they are returned.

Terms

Our terms are 30 days net from date of invoice with the exception of a few items of construction material which carry a discount for cash within ten days from date of invoice. The terms are clearly noted on acknowledgment of order. Purchasers unknown to us should have satisfactory bank or commercial references accompany their first order when it is desired to have shipment made on open account. A remittance with first order will avoid the delay incident to the necessary credit investigation. Goods may be forwarded by freight with sight draft attached to bill of lading or by express collect on delivery, if a remittance, sufficient to pay express charges both ways, accompanies the order.

Orders

Orders should be written on order blanks, or on separate sheets, to avoid delay to both order and reply.

Changes and Cancellations

Owing to the special stock conditions, etc., changes and cancellations of orders once entered cannot be made without our consent and on terms that will make good all loss and expenses incurred in preparing the order for shipment.

Shipments

Shipments are made according to directions received with orders. In their absence we will use our best judgment in making selections of routes. State whether we shall ship by freight, express or parcel post. It is our endeavor to ship standard goods immediately upon receipt of orders, and customers will greatly assist us in making prompt shipments if they will order by catalog number to save delay. Also please mention number of the catalog.

Claims for Breakage and Non-Delivery

Our goods are carefully packed by experienced packers, and each article is checked three times before reaching the packing case.

Receipts from the transportation company clearly specify that shipments were received in good condition and we, therefore, do not hold ourselves responsible for any loss or damage sustained in transit.

Claims for non-delivery, etc., should be made promptly against the transportation company.

If we are notified of such claims, we will gladly lend our assistance to secure a satisfactory adjustment for the customer.

On parcel post shipments claims are to be made to us as we insure the material and make adjustments.

Claims

Claims for shortage should be made promptly upon receipt of goods and should be accompanied by the packer's ticket which is placed in each case, or freight receipt with agent's notation covering shortage. No claims will be entertained five days after receipt of shipment.

Claims for clerical errors should be accompanied by a reference to our invoice number.

Returning Goods

No goods should be returned for credit or exchange without receiving a written authorization from us.

Long experience has shown that proper understanding of each case saves transportation expense, delays and misunderstandings and avoids returning satisfactory goods because of mistaken impression, etc.

Name and address of shipper should be marked plainly on all packages returned for credit, exchange or repairs, and a proper notice of shipment should be sent to the Kellogg Company. We stand ready at all times to rectify mistakes we make, and without cost to our customers, but under no circumstances should goods be returned without first consulting us for shipping instructions.

No credit for labor expense involved in the repair of defective or damaged goods will be allowed. If goods are defective, the measure of damage is the price of the defective goods only.

Marine and Parcel Post Insurance

Unless otherwise directed, we reserve the right to insure against non-delivery all shipments made by steamer or parcel post, for which a nominal charge will be made to cover cost of this service.

CONTENTS

SINCE 1897, the Kellogg organization has sponsored the cause of independent telephony—supplying practically all its needs and constantly pioneering new developments for the advancement of the industry. It is Kellogg's policy and constant desire to co-operate closely with each and every telephone company, so that any one, or all, may have the full advantage of Kellogg's tremendous research facilities, extensive equipment, and wealth of engineering skill and experience.

It is an accepted fact that chiefly through Kellogg aid the industry has developed and progressed to its present state. That the telephone business is profitable, is also largely due to Kellogg's work in designing and building the proper equipment for "low cost, good profit" operation. Today as in the past, Kellogg is continuing to keep faith with the industry, by unceasing research, perfection of new equipment, and in numerous ways helping the industry reduce costs and improve telephone service.

Magneto Switchboards

Applications

In the early days, local battery or magneto systems were the only type known, and even at the present stage of communication progress, magneto is the only type of service that actually fills the requirements of the small exchange serving widely scattered subscribers.

This is so because: (1) Magneto is the simplest form of telephony; (2) local battery transmission, at its best, is the best transmission so far devised by telephone engineers; (3) magneto equipment will overcome obstacles of distance, and outside plant, before which any other apparatus would fail.

The magneto office equipment must be such that it will give satisfactory service to its patrons. The maintenance expense must be extremely low. Replacements must be negligible. The apparatus itself must be so simple that it can be handled perfectly by persons of very limited training and experience.

Kellogg magneto switchboards meet these requirements. How well this is fulfilled is proven by the thousands of Kellogg magneto switchboards in service in all the civilized countries of the world. These boards are performing faithfully in the service of departments of the United States Government, foreign governments, railroads, oil and gas companies, besides the majority of all magneto exchanges in the U. S. independent telephone industry.

The underlying quality in material, design, and workmanship is responsible for the service records established by Kellogg owners everywhere.

Selection

The selection of the proper magneto switchboard depends upon the number of patrons to be served, the type of line construction, the length of the lines, the number of telephones on each line, and the probability of growth. These few facts, when known, make it easy to select the proper size switchboard with sufficient drop, jack, and cord circuit capacity, to adequately care for the needs of the community.

The fact that a magneto switchboard may serve an exchange area from fifteen to twenty or more years, makes it necessary to select the equipment on a basis of performance as well as long service life.

The design and quality of materials used in the manufacture of Kellogg magneto switchboards are responsible for keeping voice and ringing losses at an absolute minimum. This results in sure ringing and sharp, crisp transmission and reception which gives "telephone satisfaction" to the users.

The complete line of Kellogg magneto switchboards includes a board for every need, from a 10-line wall switchboard to a 400-line floor type board. The line and cord equipment of each type of switchboard depends upon the conditions to be met in each individual exchange. A number of service features are available to meet these various conditions, and the proper selection of the features means a great deal in subscriber satisfaction and operator efficiency. They should not be overlooked. The features themselves, however, merely add to the performance of the basic Kellogg circuits and equipment.

MAGNETO SWITCHBOARDS

Supervision

Probably the most talked of, and least understood factor in the performance of a magneto switchboard is supervision. Kellogg offers two types—drop and lamp.

Drop Supervision

The drop supervision switchboards are provided with either one or two drops bridged across the cord circuit to give the operator a visual signal that the connected parties have "rung off" and the cords must be taken down. These signals, called "clearing out drops" are located in the face of the board in line with their respective cord circuits and numbered to correspond. In the single supervision type of cord, the drop is wired directly across the talking conductors of the cord circuit and will respond to ringing current from the generator of either of the two subscribers' telephones which are connected by the cords. Double supervision provides two drops, one associated with the answering and the other with the calling cord. In such a cord circuit, condensers or a repeating coil of the non-ring through type are inserted between the answering and calling cords. This arrangement assures that each drop will be operated only by the ringing current from the telephone connected on that particular hall of the cord pair. Being much more satisfactory than single drops, double drop supervision is the type in more common use today.

Lamp Supervision

Far superior to the older method of drop supervision is lamp supervision—a feature originated by Kellogg engineers. It is well known that nothing so attracts and compels an operator's attention as the brilliant glow of a lighted lamp on the keyshelf and unobstructed by the cords.

Lamps are the only correct form of keyshelf supervision because there are no moving parts on the keyshelf. The relays which light the lamps are located in the back of the cabinet where they are protected from dust and injury. A relay is connected across each answering and calling cord and is operated by the current from the telephone of the calling or the called subscriber in "ringing off". When the relay operates, the corresponding supervisory lamp is lighted and remains burning until it is extinguished by an operation of the listening key.

Another advantage of lamp supervision is the fact that the storage battery used for lighting the lamps is also used for the operator's transmitter. All complaints of poor transmission due to run-down dry cells in the operator's circuit are eliminated by the use of the small storage battery which gives an even flow of current all the time. It is necessary, when lamp supervision is used, that a source of commercial lighting current be available, and a trickle charger be used to keep the storage battery charged. Therefore no exchange without electric lighting should install lamp supervision. Wall type magneto switchboards, discussed completely on page 11, are not wired for lamp supervision because they have no keyshelves, and the No. 50, because of its small size, is wired for drop supervision only.

Equipment

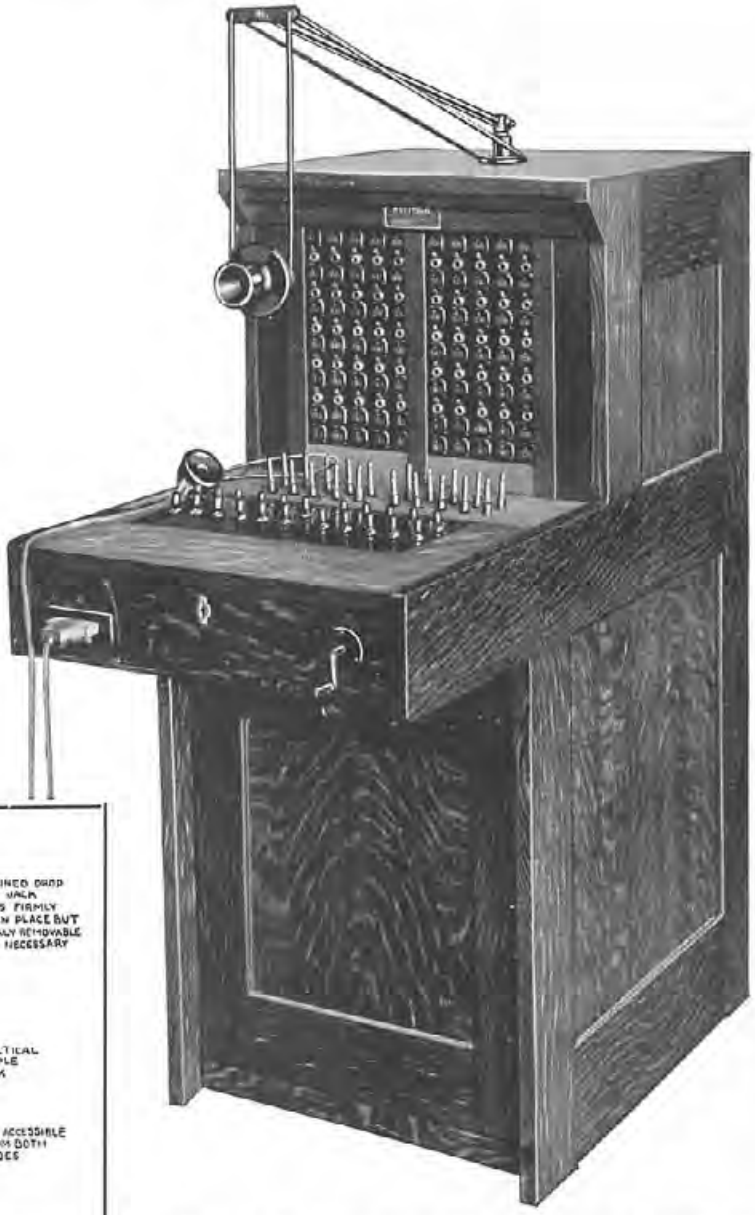
The cabinets, line signals, keys, repeating coils, and other parts of Kellogg magneto switchboards are designed and built to give long service, free from trouble. Only the finest materials are used and only the most skillful workmanship is employed in manufacturing. Each part is deserving of a description much larger than it is possible to give here. Therefore bulletin No. 121 has been prepared which explains and describes the complete story in detail. Copies will be sent on request.

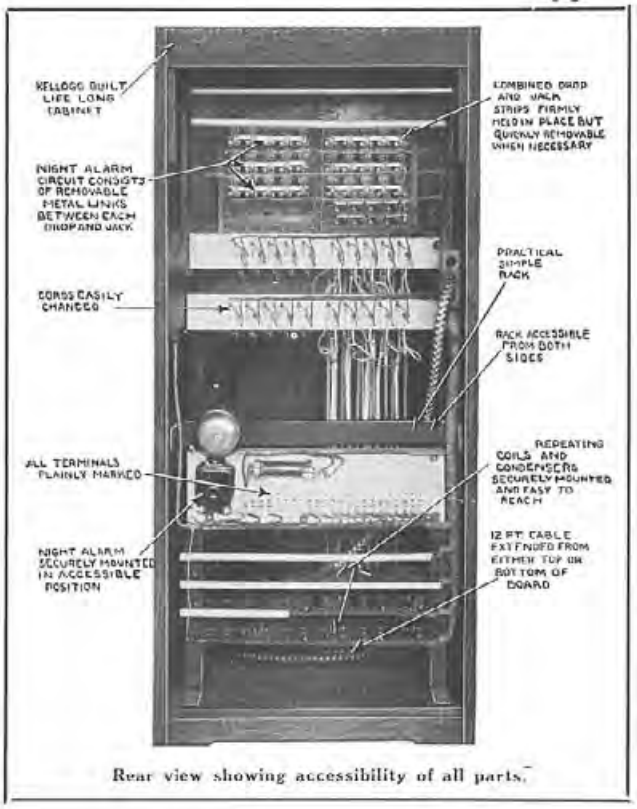
Floor type magneto switchboards are shipped complete with twelve feet of line cable attached, an operator's set with either suspended or breastplate transmitter, a powerful hand generator wired through a switching key, a night alarm with bell and key (an additional alarm with buzzer and key is furnished when line drops are equipped with armature contacts for indicating code rings or party lines), a small set of tools, a complete set of blue prints and specifications describing all circuit apparatus and code numbers, and, in the case of drop supervision boards, two dry cells for night alarm and three for operator's transmitter. Storage batteries and chargers for lamp supervision are not included and must be ordered separately. See Power Equipment on pages 48 to 52 inclusive.

Magneto switchboards are packed in wax paper lined wooden cases, securely braced to prevent damage in transit. The Kellogg guarantee of free replacement of all defective parts accompanies each order and assures the purchaser of satisfaction in service.

The following pages illustrate and describe the available types of Kellogg magneto switchboards. More detailed information on all Kellogg magneto switchboards is contained in Bulletin 121 which will be sent on request.

THE 50 TYPE SWITCHBOARD



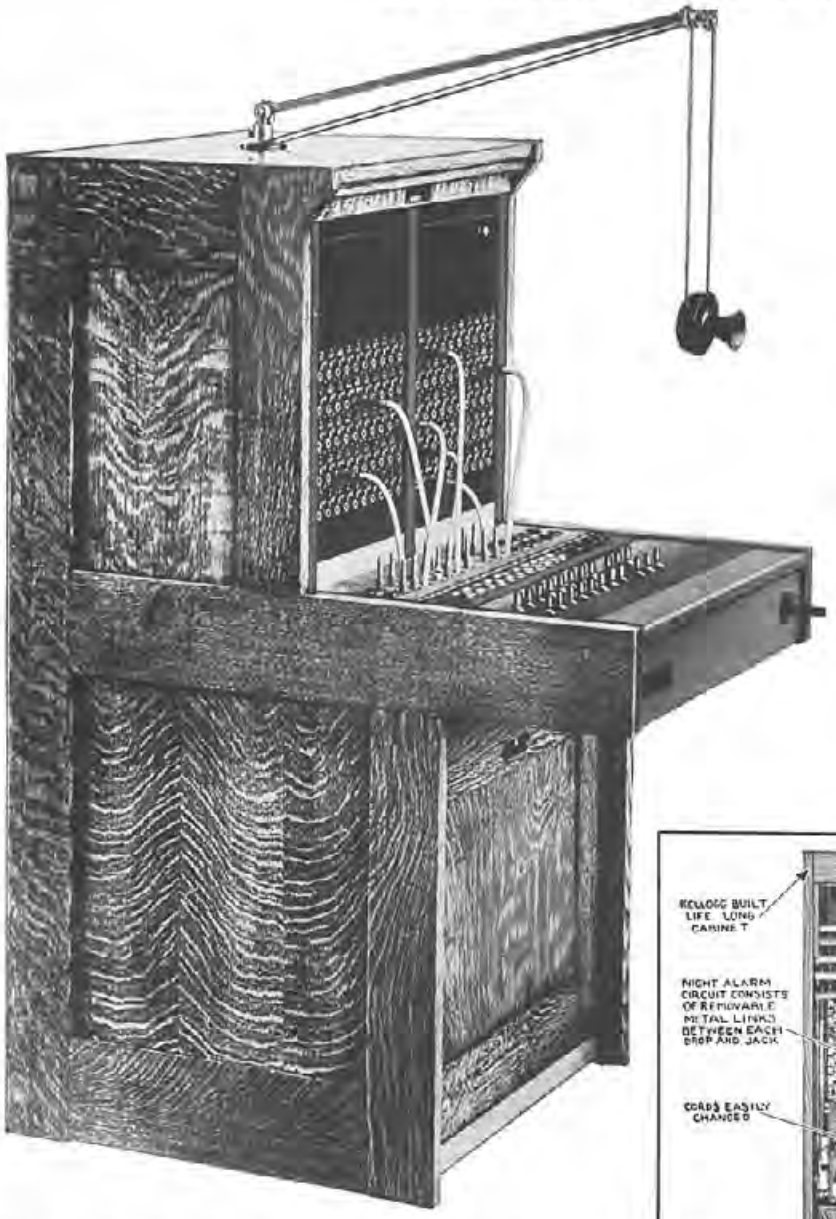


Rear view showing accessibility of all parts.

View of the 50 type switchboard equipped with 50 lines and 10 double lamp supervisory cord circuits (ultimate capacity). The Kellogg 50 line switchboard is the smallest of the Kellogg floor types. It is ideally suited for exchanges where the growth is not expected to require more than 50 lines. This switchboard presents no problem to operate and is inexpensive to maintain. It gives the finest type of magneto service.

The solid oak cabinet has a medium golden oak finish. The height of its keyshelf permits the operator to use an ordinary chair.

Complete specifications and ordering information for this switchboard are given on page 10.

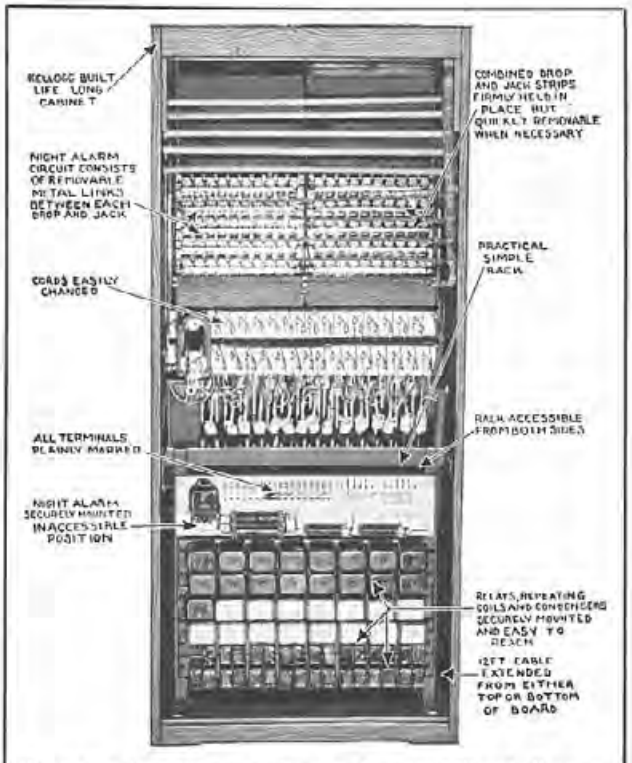


THE 150 TYPE SWITCHBOARD

View of the 150 type switchboard equipped with 100 lines and double lamp supervisory cord circuits. The Kellogg 150 line switchboard is a very popular size—one that is found in most average magneto exchanges. It presents no problem to operate and is inexpensive to maintain. Like the Kellogg 50 line switchboard, it gives the finest type of magneto switching service.

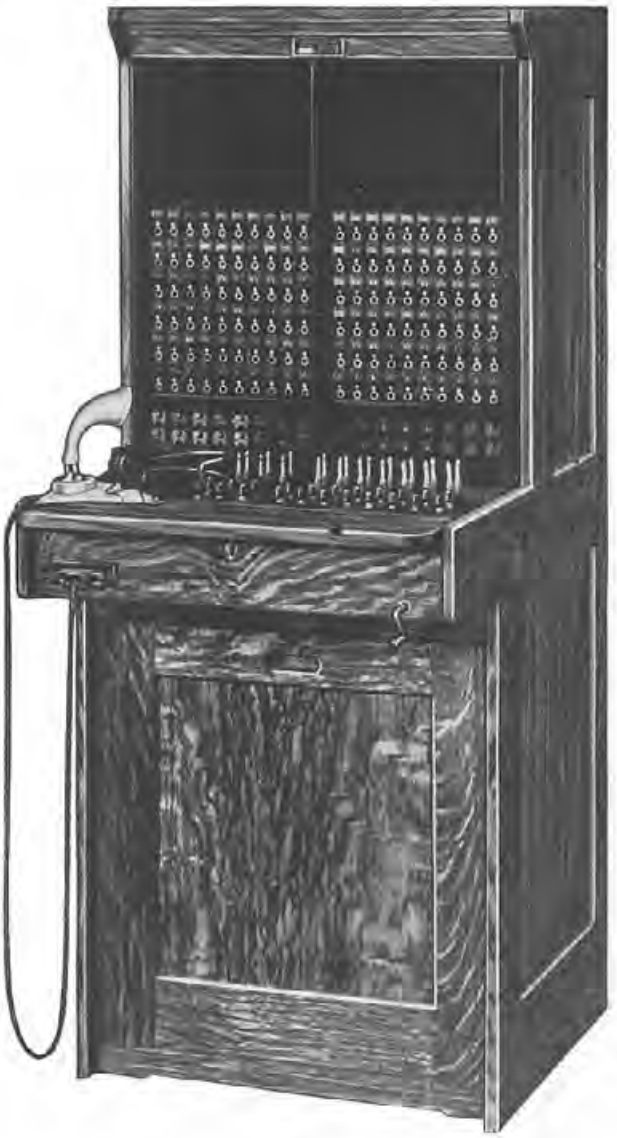
The solid oak cabinet has a medium golden oak finish. The height of the keyshelf permits the operator to use an ordinary chair. This switchboard is wired for 100 or 150 lines, 15 double drop or double lamp supervisory cord circuit, and either breastplate or suspended type transmitter. Line and cord equipment will be furnished as desired up to the ultimate capacity.

Complete specifications and ordering information for this switchboard are given on page 10.



Rear view showing compactness and accessibility of all parts.

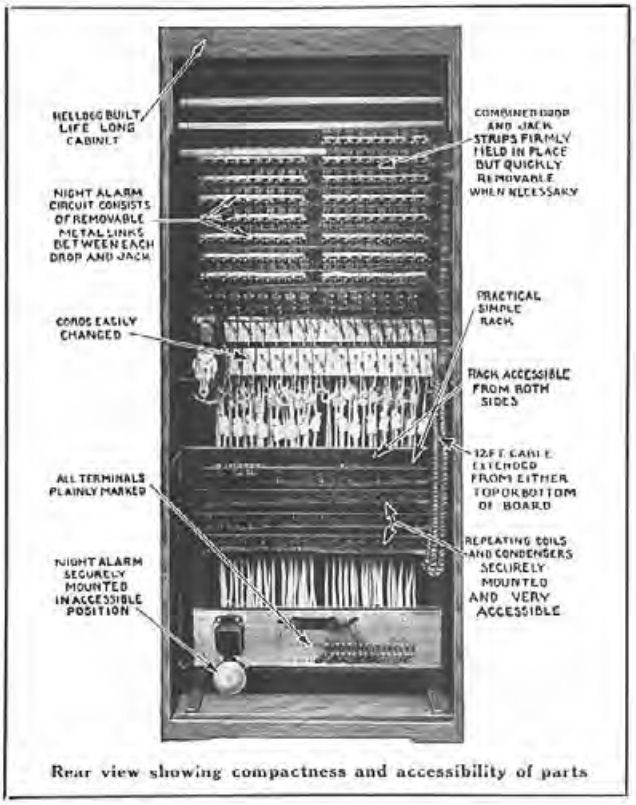
THE 200 TYPE SWITCHBOARD



View of the 200 type switchboard equipped with 120 lines and 10 double drop supervisory cord circuits. The Kellogg 200 line magneto switchboard is the largest single position magneto board of the Kellogg line. This single position cabinet is especially adapted to meet the needs of an exchange where future growth may require additional positions. It is usually found impractical for one operator to handle over 200 lines.

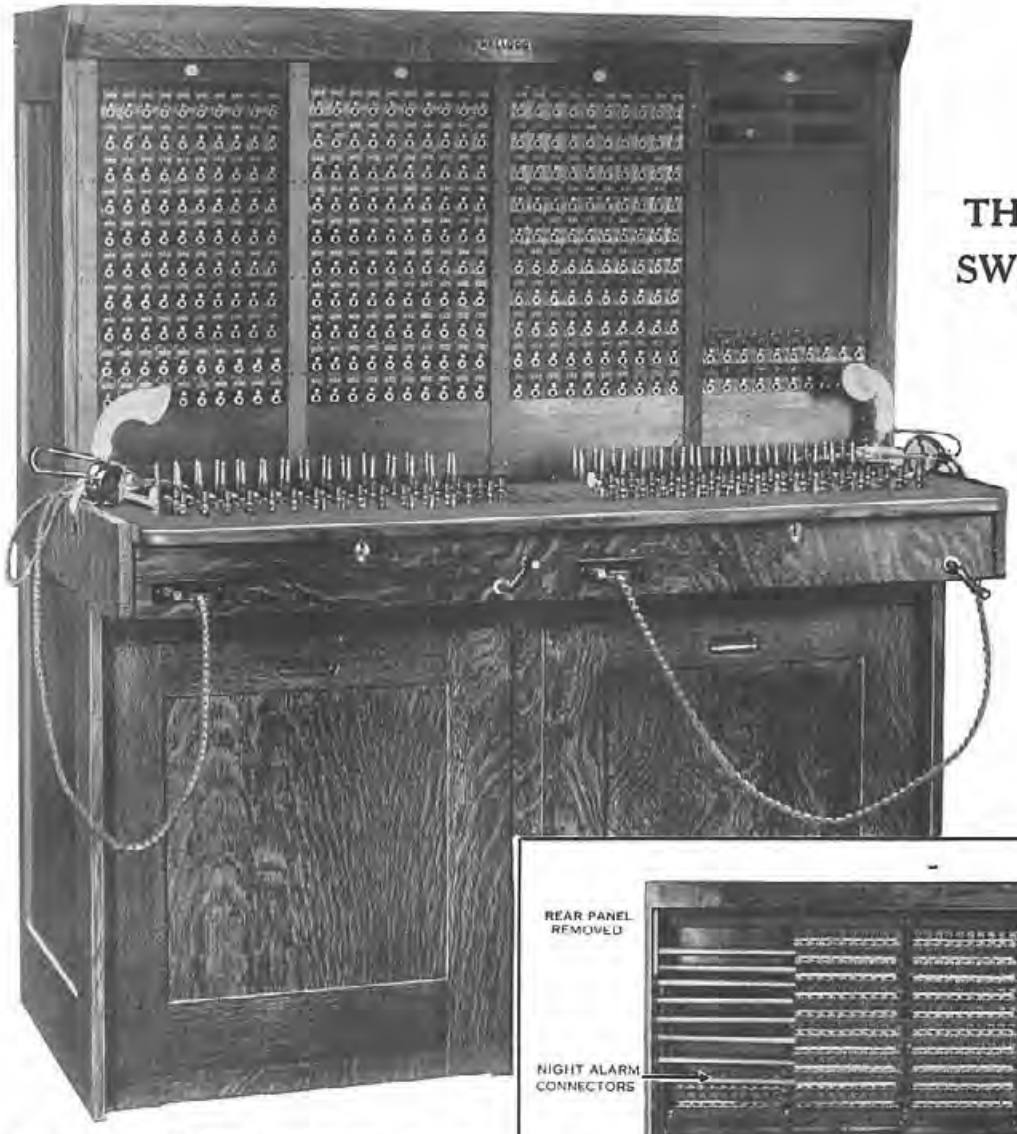
This switchboard is provided with a low keyshelf. The cords are of sufficient length to give the maximum reach when two positions are placed together. This board can be wired for 100, 150 or 200 lines, 15 double drop or double lamp supervisory cord circuits, and either breastplate or suspended type transmitter. Line and cord equipment can easily be added as desired up to the ultimate capacity.

The complete specifications and ordering information for this switchboard are given on page 10.



Rear view showing compactness and accessibility of parts

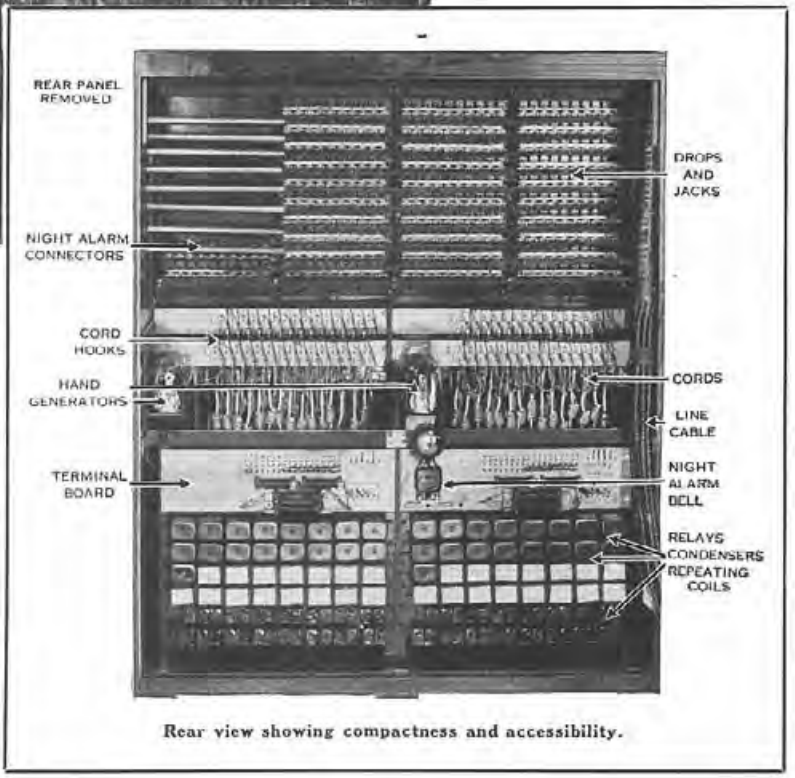
THE 400 TYPE SWITCHBOARD



View of the 400 type switchboard equipped with 320 lines and 30 double lamp supervisory cord circuits. It is the largest of the standard Kellogg floor types, and can be furnished wired for either 300 or 400 lines, 30 double drop or double lamp supervisory cord circuits. Line and cord equipment can easily be added as desired up to the ultimate capacity.

Lamp supervision allows more calls to be handled with greater care and ease. In addition to the supervisory lamps associated with each cord pair, a large red pilot lamp is used which remains lighted until the operator has given proper attention to all disconnect and recall signals. Improvement of line and supervisory pilots, lamp signal keyshelf supervision, and the distribution of rural lines in front of the local positions, speeds operator's handling time.

Complete specifications and ordering information for this switchboard are given on page 10.

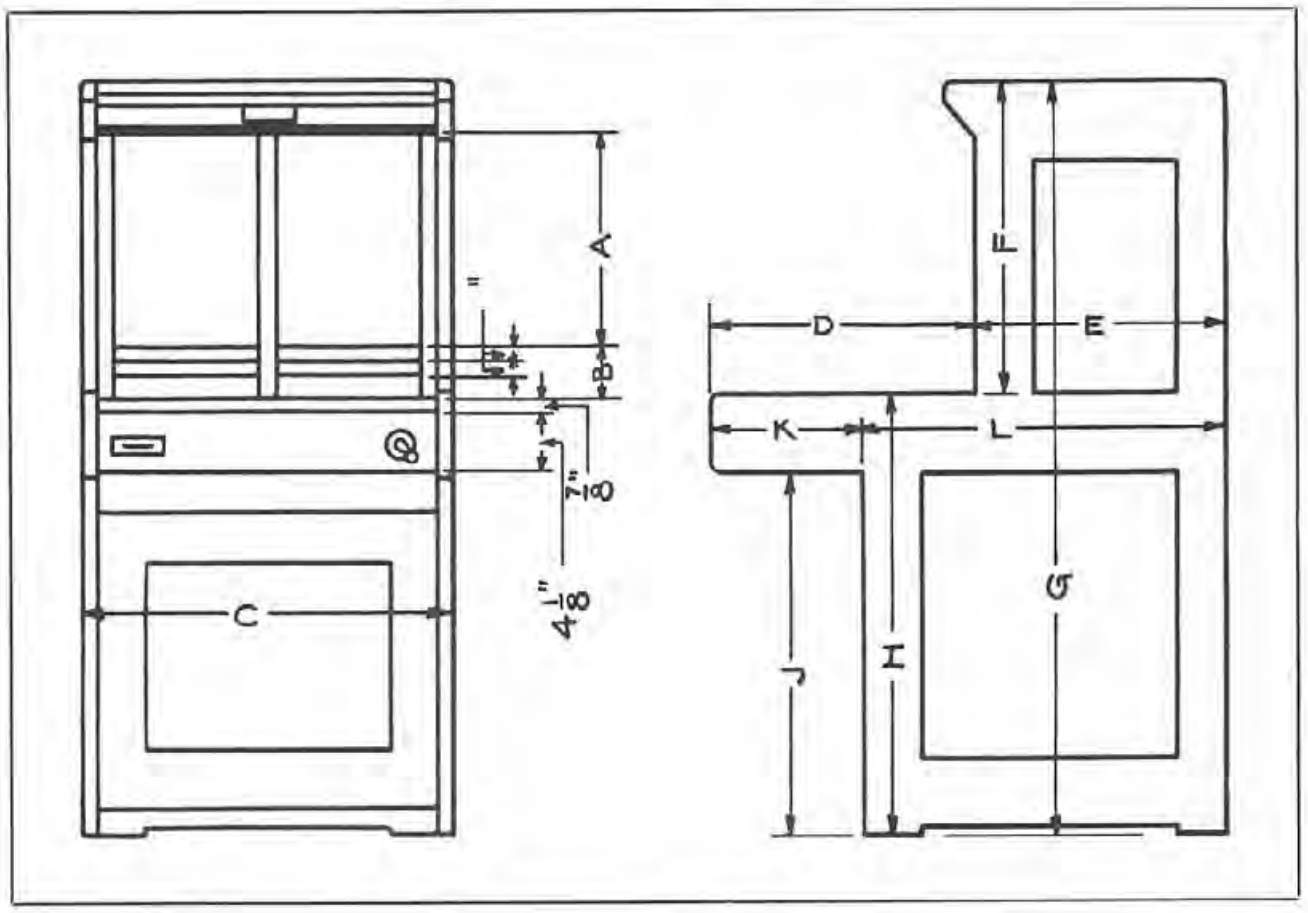


Rear view showing compactness and accessibility.

MAGNETO SWITCHBOARDS

All Kellogg magneto switchboards may be furnished with either suspended or breastplate type transmitter. Line drops are usually wound to 500 ohms. Other resistances can be furnished if desired. All boards are wired as indicated in the table below, and drops and cords can be equipped as desired up to the ultimate capacity.

In placing orders, specify the number of lines and cord circuits to be equipped and also whether the 12 feet of line cable should be extended from the top or bottom of switchboard cabinet.



Code No.	Lines Wired	Cords Wired	Supervision	DIMENSIONS IN INCHES											Shipping Weight Pounds
				A	B	C	D	E	F	G	H	J	K	L	
50	50	10	Double Drop	8¾	3	20	18	17	15⅛	45¼	30⅛	24⅞	10⅛	24¾	300
150 AL	100	15	Double Lamp	11	3	25	18	17	21⅛	51¼	30⅛	24⅞	10¼	24¾	500
150-BL	150	15	Double Lamp	11	3	25	18	17	21⅛	51¼	30⅛	24⅞	10¼	24¾	600
150-A	100	15	Double Drop	11	3	25	18	17	21⅛	51¼	30⅛	24⅞	10¼	24¾	400
150-B	150	15	Double Drop	11	3	25	18	17	21⅛	51¼	30⅛	24⅞	10¼	24¾	500
200-AL	100	15	Double Lamp	18	4	24	17⅛	17¼	25	58	33	28	10⅛	24	500
200-BL	150	15	Double Lamp	18	4	24	17⅛	17¼	25	58	33	28	10¼	24	550
200-CL	200	15	Double Lamp	18	4	24	17⅛	17¼	25	58	33	28	10¼	24	600
200-A	100	15	Double Drop	18	4	24	17⅛	17¼	25	58	33	28	10¼	24	425
200-B	150	15	Double Drop	18	4	24	17⅛	17¼	25	58	33	28	10¼	24	500
200-C	200	15	Double Drop	18	4	24	17⅛	17¼	25	58	33	28	10¼	24	600
400-AL	300	30	Double Lamp	18	4	47⅛	17⅛	17¼	25	58	33	28	10¼	24	850
400-BL	400	30	Double Lamp	18	4	47⅛	17⅛	17¼	25	58	33	28	10¼	24	1100
400-A	300	30	Double Drop	18	4	47⅛	17⅛	17¼	25	58	33	28	10¼	24	750
400-B	400	30	Double Drop	18	4	47⅛	17⅛	17¼	25	58	33	28	10¼	24	1000

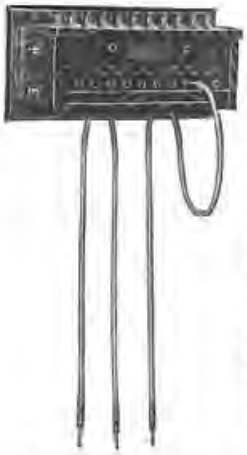
Kellogg

MAGNETO SWITCHBOARDS

Wall Type Magneto Switchboards

To meet the demands of exchanges too small to justify the expense of the floor type cabinet, the Kellogg Company has designed a complete line of wall type switchboards.

Type 9-B Switchboard



The 9-B is the smallest of the Kellogg wall type switchboards. Its operation is just as positive and just as dependable as the largest magneto board. Its capacity is limited, however, to ten drops and jacks with night alarm, two cord circuits and two supervisory or listening-in jacks. Code night alarm contacts, causing the night alarm bell to give a signal to correspond to the code rings on the bell, may be had if desired.

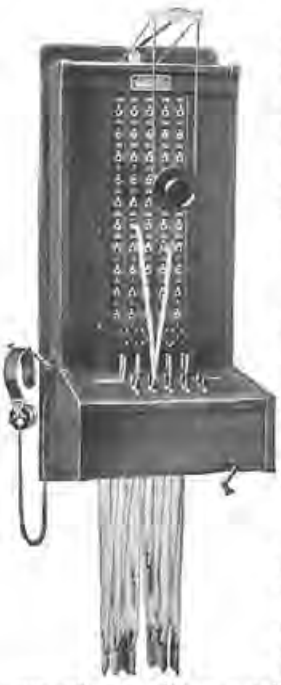
This switchboard is recommended where the requirements will not exceed ten lines. Gas, power, railway, and mining companies find this switchboard indispensable for inter-communicating purposes. Once installed, it operates for many years with but little attention.

The line wiring terminates on binding posts on the top of the cabinet to which the outside lines are fastened. Through special design, the line binding posts include air gap lightning arresters.

The operator's set, which is furnished only when specified, and which may consist of any standard magneto telephone with hand generator and bell box, is connected to the two binding posts on the side of the switchboard cabinet.

Shipping weight approximately twenty-five pounds.

Type 7-A Switchboard



When a 50 line magneto switchboard is required and lack of available space will not permit a floor type cabinet to be used, the Kellogg 7-A wall magneto switchboard is the popular choice because of its compactness and fine performance. The cabinet, mounted on the wall, swings outward from the back panel. Connections and inspection can be made with ease.

Standard drops and jacks are used and mounted five per strip. The 7-A switchboard is wired for fifty drops and jacks, regular or code night alarm, five single drop supervisory cord circuits, hand generator and twelve feet of cable. Equipment may be installed as required up to the ultimate capacity.

The lines are brought out of the cabinet in a fifty pair, braid covered, wax core cable. The operator's equipment consists of a standard suspended type transmitter with either the hand or the headband type receiver. All circuits are arranged for connecting to either metallic or grounded lines.

Shipping weight approximately two hundred fifty pounds.

Type 17-B Switchboard

The 17-B switchboard has a greater capacity than the 9-B. It is wired for 34 lines, 6 single drop supervisory cord circuits, night or code alarm, and provided with an 8-foot cable extending from the top of the cabinet. The switchboard may be partially equipped for present traffic requirements, and for future growth, equipment can be added up to its total capacity.

The drops and jacks are mounted ten per strip. They are of standard design, and can be interchanged with those of any Kellogg floor type magneto switchboard.

Managers of small exchanges prefer this board because of its dependability and easy operation.

The cabinet is hinged on one side so that the face equipment may be swung away from the wall, permitting adjustments and connections to be made with ease. All parts are standard and may be replaced on order.

The 17-B is not furnished with operator's equipment unless specified. Two binding posts are located inside the cabinet to which any standard magneto telephone can be connected.

Shipping weight approximately fifty five pounds.

Type 17-C Switchboard

The Kellogg 17-C wall switchboard is the same as the 17-B except that it is equipped with a suspended type operator's set with a hand generator mounted in a separate cabinet. Shipping weight approximately sixty five pounds.

Type 29-B Switchboard

Kellogg engineers designed this switchboard to meet the specific requirements of rural exchanges and switching centers where an audible line signal is desired. It differs from other Kellogg magneto wall switchboards by not requiring the operator to be in immediate attendance at all times.

A bell is wired across each line and operates similar to that of a telephone bell. This enables the operator to tell, without being at the switchboard, whether a party line subscriber is signaling her or another party on the same line.

The capacity of this board is limited to 15 lines, 5 connecting cord circuits, and night alarm. It may be equipped with as many cord circuits as desired up to its total capacity. The line equipment is in units of three each, permitting the switchboard to be equipped with 3, 6, 9, 12 or 15 lines.

An 8-foot cable extends from the top of the board. The cabinet is hinged at the side, permitting it to swing outward from the back panel. The operator's instrument cord may be connected to any standard magneto telephone. Night alarm equipment is furnished which consists of a buzzer and switch, and may be located wherever desired, near or apart from the switchboard. The buzzer will operate when any of the switchboard drops fall, providing the night alarm switch is closed.

Shipping weight approximately fifty-five pounds, fully equipped.

Masterbuilt
SWITCHBOARDS

(PAT. APPLIED FOR)

TRUE to past traditions Kellogg is again opening a new era in telephone history. Without doubt the Kellogg Service Switchboard has done more to reduce central office operating costs than any other development since the first common battery telephone. Since the appearance of the feature cord, all development has centered on the imitation, modification, and expansion of the original Kellogg idea.

Lowers Central Office Investment

It has remained for Kellogg to point the way to lower central office investments. The Masterbuilt Line is a development equally as far reaching as the feature cord. The demand for a flexible, interchangeable, and demountable section has existed for years. Other manufacturers have attempted to produce equipment of that type but have failed because they lacked the vision or the boldness to adopt a "knock-down" construction.

With over a third of a century of successful manufacturing experience and a full and sympathetic understanding of operating problems, Kellogg is the logical source of these strides that continue to make telephone history. Only Kellogg could conceive a Masterbuilt Switchboard.

Masterbuilt Stands Alone

Today, the Masterbuilt Line stands alone — an equipment without a peer — an offering without competition. There is only one Masterbuilt!

Think of everything that a switchboard should be. Think of all the adjectives and all the attributes — Masterbuilt has them all. Beauty, space, simplicity, rigidity, strength, efficiency, flexibility, economy, durability, accessibility and compactness are some of the first impressions. Complete investigation proves this latest Kellogg achievement to be the answer to every wish.

Solid Steel Framework

A framework of solid steel is the foundation of every Masterbuilt switchboard. This is not a row of individual frames bolted together, but one fabricated unit complete and interlocking from end to end. Angle irons and channels are used without stint, and deep gussets assure rigidity that will outlast even the Kellogg equipment that it mounts.

A Complete Masterbuilt Line

Three sections of graceful lines and convenient sizes are constructed in this way and constitute the Masterbuilt Line. There is the 800 line board for the town of limited future. In the 1600 line job the telephone executive will find his ideal for those up-and-coming centers headed towards civic prominence. The 4200 line switchboard is the ultimate hope of every exchange.

Conserves Investment

The telephone company of today is careful of its investment dollars, each of which incurs its expense in depreciation, taxes, interest and other charges. Masterbuilt Switchboards do not demand excessive investments in surplus, idle equipment. All future needs are problematical —they may be greater or less or they may not materialize at all. Masterbuilt crosses the bridges as they are reached. Only a Masterbuilt position can be converted from local to toll overnight. The multiple is in no way disturbed, daytime service is uninterrupted. Rearrangement costs are figured in dollars instead of thousands.

Masterbuilt Is Easy to Install

Masterbuilt is conserving of those installing dollars, too. "Knock-down" shipment means smaller parcels, easier and cheaper handling and no hoists or special openings in telephone offices. Ironwork is shipped at ironwork freight rates; not as electrical equipment. The transportation company collects no premium on account of the great space consumed.

Masterbuilt ironwork goes together as easily as a child's toy. Sections are not sprung out of square in shipment. The complete switchboard is built, as a steel building is built, on the spot where it is to stand. The installer handles one piece at a time and secures each member, square and level, as he goes. Bolts and machine screws do the trick; there is no riveting on the job.

(PAT. APPLIED FOR)

Rigid Steel Frame ...Continuous and Interlocking

The cord equipment for each position is shipped completely wired, assembled, adjusted, and tested. It only remains for the installer to slide the key shelf, connecting rack and cord rack into place, hang the gate and "that's that." Connect the power, hang the cords and wire to the operator's jack and the cords are ready for business. How different than the old tedious process of assembling and wiring relay gates on the job! Telephone companies certainly save big money here.

(PAT. APPLIED FOR)

Positional Units... Factory Wired Complete and Interchangeable

All the equipment is, of course, Kellogg standard. The circuit arrangements are those that have made Kellogg famous. Telephone men will find in the Masterbuilt Line all the operating economies that they have associated with Kellogg equipment. The same high grade of service to subscribers, the same low traffic costs, the negligible maintenance expense and year-on-year dependability are built into all Masterbuilt Switchboards to an even greater degree.

(PAT. APPLIED FOR)

Assembly... Convenient and Accessible

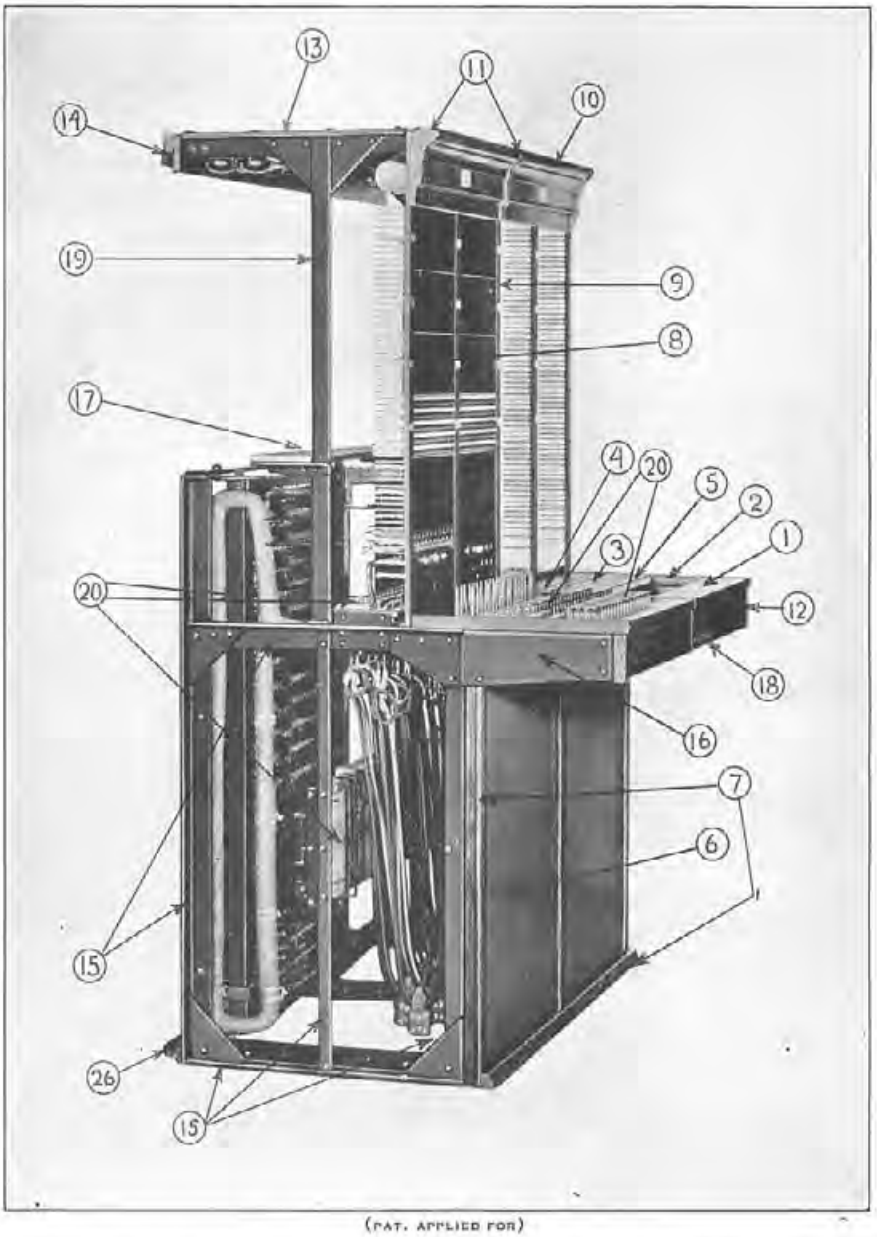
The woodwork is the same that our artisans have been turning out for years. Of course, it's only trimming, the steel frame supports the weight, but the dull rubbed quarter-sawed oak makes a beautiful contrast with black phenol fibre panels and key shelves, adding that final distinctive touch.

(PAT. APPLIED FOR)

Complete Masterbuilt Board... Low Cost, Minimum Installation ...Flexibility

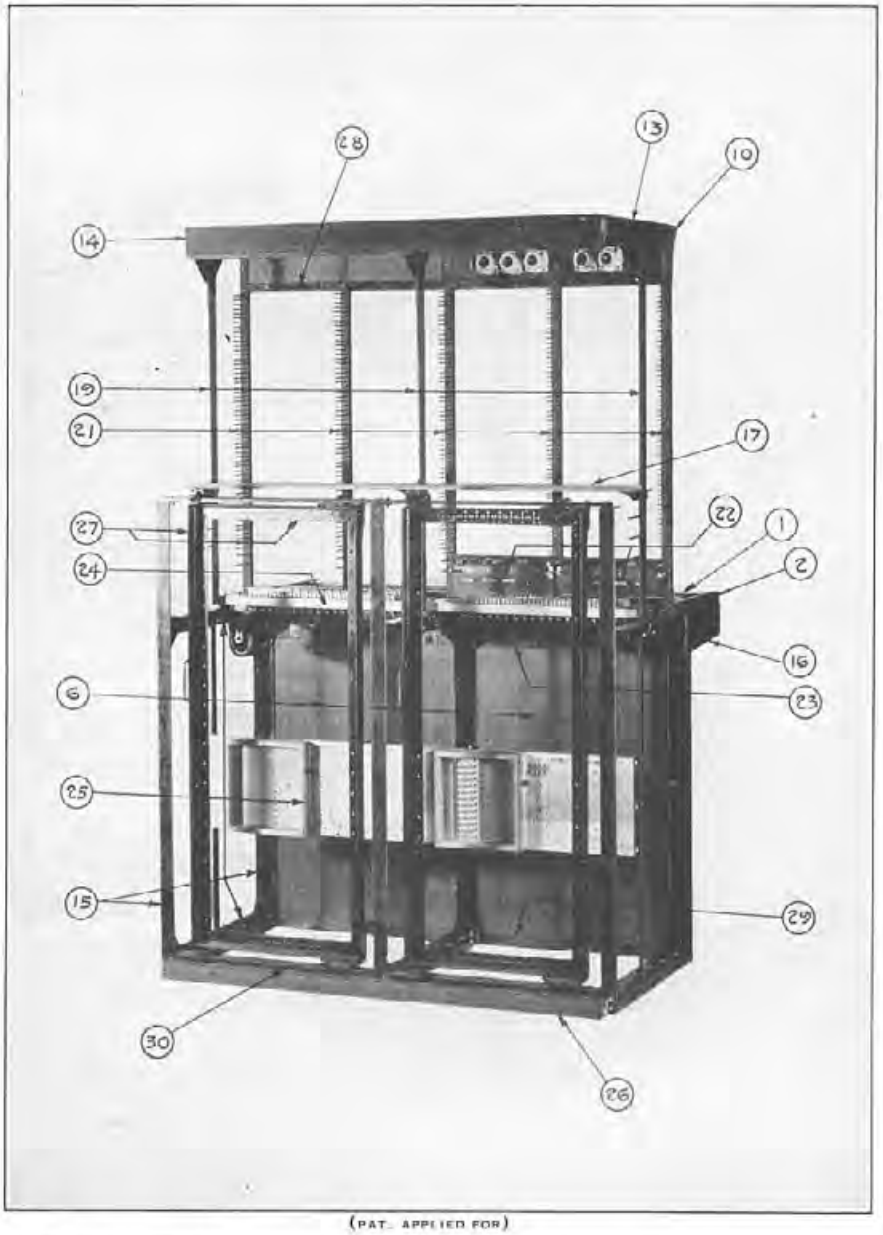
As wonderful as the Masterbuilt is, you may not be surprised. Maybe it's only what you expected Kellogg would do. It does look simple but so do all big developments. The outstanding success of the Masterbuilt Line is due solely to careful design and standardization, with which has been achieved the lowest price ever enjoyed by Kellogg customers. Those investment dollars will certainly go a long way now.

Masterbuilt SWITCHBOARDS



(PAT. APPLIED FOR)

1. Key shelf, phenol fibre faced.
2. Pilasters, phenol fibre faced, between adjacent positions.
3. Full length piano hinge.
4. Plug shelf, black leather faced.
5. Lamp shelf, phenol fibre faced.
6. Door panels, linoleum covered.
7. Floor moulding and panel strips, wood finish.
8. Multiple spring and lamp jack blank panels, phenol fibre faced.
9. Finishing stile strips, phenol fibre faced.
10. Frieze boards.
11. Wood pilasters for separators between frieze boards.
12. Wood pilasters for separators between front rail.
13. Roof, sheet metal.
14. Upper rear door moulding, wood finish.
15. One piece leg assembly.
16. Key shelf supporting bracket, steel.
17. Multiple cable shelf—wood.
18. Front rail (wood), with operator's jacks.
19. Roof support attached to leg assembly with bolts.
20. Positional equipment consisting of relays, coils and condensers on relay gate, completely adjusted, and connected by means of key cable to lamp rail, key shelf, cord rack and connecting rack.
26. Lower rear door moulding, wood finish.



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1. Shelf assembly.
2. Pilasters, phenol fibre faced, between adjacent positions.
6. Door panels, linoleum faced.
10. Frieze board, wood finish.
13. Roof, sheet metal.
14. Upper rear door moulding, wood finish.
15. Leg assembly.
16. Key shelf supporting bracket, steel.
17. Multiple cable shelf, wood.
19. Roof support attached to leg assembly with bolts.
21. Steel stile strips with brass pins to fasten jack strips.
22. Piling blank panels, phenol fibre faced.
23. Rear dust pan.
24. Cord connecting rack, shipped connected to gate assembly.
25. Miscellaneous connecting rack for fuse cabinet, night alarm, operator's coils, etc., connected to gate assembly.
26. Lower rear door moulding, wood finish.
27. Relay gate — removable.
28. Cross members, steel.
29. Cross members, steel.
30. Floor angle, steel.

The Masterbuilt switchboard has been designed in the belief that the future of independent telephony lies in the attainment of a maximum return from a minimum capital operated at a minimum expense.

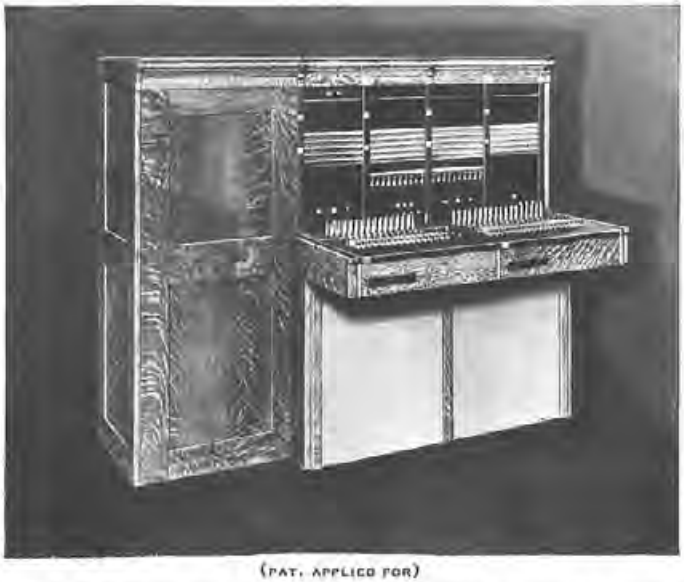
No equipment can cost so little to install as manual equipment. It has been proven repeatedly that no other service is so satisfying to subscribers as modern manual service; and for this reason alone, it commands rates equal to those necessary for the maintenance of more complicated equipment.

The purpose of the Masterbuilt switchboard, therefore, is to make an economical equipment more economical and to make a modern service more modern. There are three sizes of Masterbuilt switchboards, each having a local line capacity of 800 lines, 1600 lines, and 4200 lines respectively.

Masterbuilt Operation

the 6-800

THE smallest member of the Masterbuilt family is the "6-800," a full multiple, common battery switchboard for the exchange in which the expected ultimate growth is 800 lines or less. This class of exchanges includes the town wavering between magneto and common battery. It includes the resort town with little local traffic but a large toll business. New industrial centers and new residential communities also come under the same heading.



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To fit such a number of requirements, provision has been made for a variety of service features which may be installed in the "6-800." The local line equipment may be either full common battery, or it may be of the universal type. The universal equipment permits one line at a time to be changed from magneto to common battery to suit conditions or convenience.

Ample space is allowed for rural and toll lines with either drop or lamp signals. Drops are usually preferred for rural lines because the clattering of the drop is an audible indication of code rings originating on the line. Lamp signals on either rural or toll lines are designed so that the lamp flashes as the subscriber turns his hand generator. When the ringing has stopped, the lamp burns steadily. If rural lines are to be changed to common battery at some future time, they may be terminated on lamp signal universal circuits, which makes it unnecessary to replace any switchboard equipment when the rural telephones are converted.

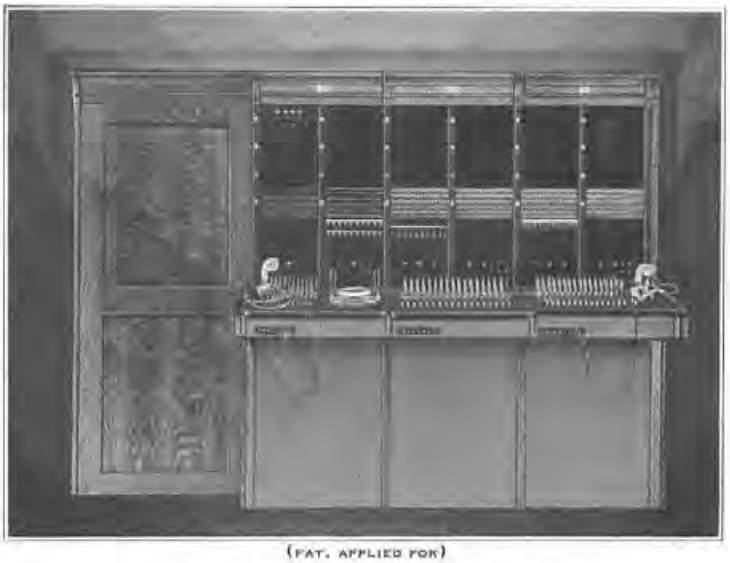
Universal cords permit any operator to handle local, rural, and toll calls without confusion or undue transmission loss. Common battery subscribers' bells may be rung automatically, speeding up service and relieving the operator of the necessity of supervising and reringing on such calls. Full selective, harmonic party line ringing makes party lines more popular because of increased privacy.

If the number of magneto rural lines is small, it is desirable to use full common battery cord circuits, with the many additional features possible in this type. Automatic listening, instantaneous disconnect and recall, automatic peg count, secret service, and positive protection against intrusion on busy connections are some of the features offered in the 6-800 Masterbuilt. Wherever a low type board of 800 lines capacity is required, a 6-800 Masterbuilt will do the job best.

Masterbuilt Operation

the 1600

FOR towns of larger size, and for rapidly growing communities, the 1600 Masterbuilt is recommended. In this switchboard a local line capacity of 1600 lines is possible with the equipment multipled on a four-panel basis. Multipled on a three-panel basis, the maximum capacity is naturally 1200 lines. Ample space for rural and toll lines, using either drop or lamp signal, is provided below the local multiple. Space is also available for recording trunks, pay station lines, local to rural trunks, and other miscellaneous apparatus. The cord equipment may be extremely varied, providing for the most efficient handling of traffic.



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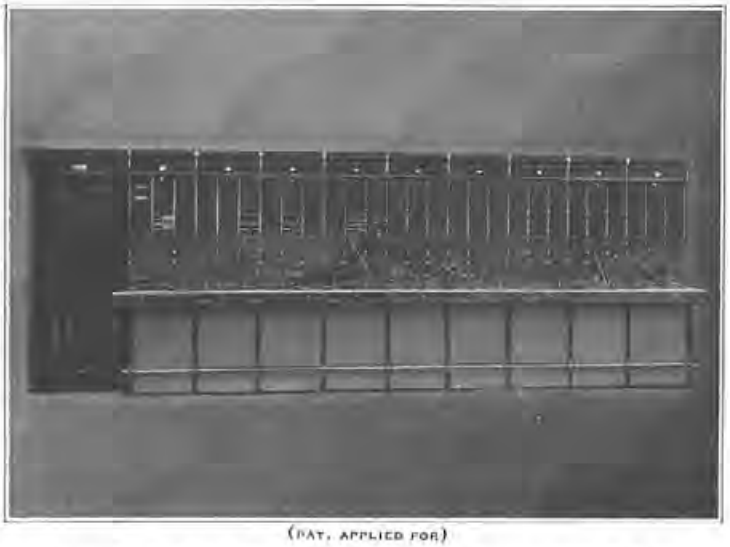
The requirements in various towns, of course, differ to a large extent, and they determine the number of toll, rural, and local positions, and the exact type of equipment to be placed in each. Toll may be handled on a straight toll basis, using recording trunks and toll cord circuits, or it may be spread among combination operators who handle toll and rural service and help out with local connections when required.

The rapidly increasing popularity of A-B toll service has caused concern to many telephone men whose switchboards are not equipped to establish this type of connection. Masterbuilt switchboards may be equipped with full universal cords in all positions, giving a high grade toll service with a maximum transmission loss of 1.0 d.b. In cases where A-B toll service is desired, together with a very rapid and high grade local service, a special A-B toll cord is recommended which has been developed to meet this requirement. This cord circuit contains practically the same local service features as the straight common battery cord, but, in addition, enables any operator to establish, supervise, and time A-B toll connections; and it also provides flashing recall on such connections. On local to local connections instantaneous disconnect with line lamp recall is provided. There is practically no limit to the possibilities of the 1600 Masterbuilt, except the line capacity.

the 4200

FOR exchanges over 1600 lines the 4200 Masterbuilt is the answer. This is a single-position, three-panel, high-type, section having all of the Masterbuilt features of flexibility for additions and re-arrangements. The local line capacity is 4200 lines on a seven-panel multiple basis. In this section all of the Service Switchboard features have been included, as well as a number of recent developments to care for present-day traffic and plant requirements. These include special circuits for the handling of toll and local traffic on a more economical basis than has been possible in the past. The Masterbuilt cabinet design is closely followed permitting the addition of an individual operator's position, as desired and the ready removal and installation of the relay gate and other positional equipment when changes become necessary.



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In the past, many companies have hesitated to put toll positions in the same line-up with their local, because toll additions necessitated expensive removal of local equipment to make room for additional toll apparatus. By the installation of separate toll boards with local multiple or toll switching trunks and a toll switching position on the local board, a great deal of operating efficiency has been lost. Wherever it is necessary for two operators to handle a call, the operating expense naturally goes up rapidly. With the Masterbuilt design and the low cost of making re-arrangements, it is possible to take advantage of the straight line form of local and toll installation and to profit by the obvious traffic saving.

No telephone service can be satisfactory unless it provides: (1) A quick answer, (2) A speedy connection, (3) A satisfactory conversation, (4) An instantaneous disconnect, and (5) A prompt recall. In the design of Masterbuilt Service Switchboards, these fundamental elements have been provided in such a way that marked traffic savings have been made possible. The Kellogg service features described in the following paragraphs may be built into the various types of Masterbuilt switchboards where the size of the exchange makes the features advisable and economical.

Masterbuilt Service Features

Multiple Line Lamp Call Distribution

consists of the association of a line lamp with each multiple appearance of the line. In this way every call is made available to every operator so that it is unnecessary for the subscriber to wait on one or two particular operators to answer his signal because every call is within reach of every operator. Switchboard operation is placed on a competitive basis as between operators, and their performance may be graded in the terms of actual calls handled. This feature not only tends towards a very rapid answering time, but it very materially reduces traffic expense. Multiple line lamp makes each operator's position a complete unit in itself which is ideal for night, Sunday, and holiday operation.

Keyless Listening

is that feature which automatically connects the operator to the calling party upon the insertion of the answering cord and without the necessity of operating a manual listening key. This feature is a great time-saver both for the operator, who is spared the manual work of key operation, and for the subscriber whose call is answered that much sooner.

After the operator has answered a call, she can only free her telephone circuit of that call by inserting the calling plug and starting the machine ringing. Therefore, it is impossible for her to accidentally abandon a calling subscriber without completing the desired connection.

A Typical Kellogg 6-800 Masterbuilt Installation

This feature also prevents the so-called "overlapping" which consists of an operator inserting two or more answering plugs at one time and answering the call on the second plug as soon as she completes the first connection. This abuse results in delaying the second call unnecessarily when it might have been completed by another operator who was idle. Most well-informed traffic authorities seek to prevent overlapping through discipline, but the Kellogg feature cord makes it impossible.

Non-Interference

is that feature which prevents two operators from answering the same call. In large exchanges such an arrangement is very desirable since it would be confusing for two operators to answer simultaneously the same subscriber. The cases of attempted double answering are rather remote in exchanges where the traffic is carefully watched by the chief operator or supervisor to see that no more than the required number of operators is on the board. However, non-interference is recommended on large exchanges to prevent even this remote possibility.

Automatic Answered-Call Peg Count

is that feature which automatically registers every call that the operator answers. This provides the chief operator or supervisor with an accurate measure of the traffic handled by hours, days, or months and furnishes the most satisfactory information on which schedules and payrolls may be computed. As mentioned above, it forms an accurate rating for operative performance.

Secret Service

is that feature, associated with automatic listening, which prevents the operator from listening on a completed connection. As soon as the calling cord is inserted and the machine ringing is started, the operator is automatically excluded from the circuit. Machine ringing and dark keyshelf definitely take care of all supervision, and the operator has no further duty except to take down the cords at the completion of the conversation.

Audible Multiple Busy Test

is that feature which provides an audible indication to the operator that the line to which she wishes to complete a connection is busy. This test consists of a slight click in the operator's receiver as soon as the tip of the calling plug touches the thimble of a busy jack. With instantaneous disconnect features, however, the operator, as well as the calling party, is automatically excluded from the busy line even though the operator may actually insert the calling plug.

Masterbuilt Service Features

Machine Ringing

is that feature which provides an intermittent automatic ringing of the called subscriber's bell. This ringing continues until the called subscriber answers or the calling party abandons the call and hangs up his receiver. If the switchboard is arranged for individual lines only, the automatic ringing may be keyless, so that it is only necessary for the operator to insert the calling plug into the line of the party called for, whereupon the ringing starts immediately. With party line systems, however, it is necessary for the operator to start the ringing, after the calling plug has been inserted, by depressing the ringing button which selects the code, or frequency, to be rung and automatically sets the machine ringing mechanism in motion.

Machine ringing will reduce the cord holding time in any exchange now equipped with manual ringing. Subscribers soon learn that the telephone must be answered promptly to stop the incessant ringing of the bell. The reduction in cord holding time means that fewer cords and fewer operators' positions are necessary and by reducing the holding time on the calling and called subscribers' circuits, it materially reduces the number of busy reports and unavoidable second calls.

Reverting ringing tone is that feature which provides to the calling party a tone each time that the bell of the called party is rung. This tone indicates to the calling party that the operator has performed every possible function in connection with the call and that desired conversation is then dependent only on the answering of the telephone by the party called. This feature entirely does away with reports that the operator refuses to ring, and of course, relieves the operator of all necessity for re-ringing on established connections.

A Typical Kellogg 4200 Masterbuilt Installation

Dark Keyshelf

is that feature which consists of all keyshelf supervisory lamps remaining in an unlighted condition after the ringing has been started and until one or the other of the parties hangs up his receiver. The answering supervisory lamp is lighted only when the calling party desires to disconnect or recall. The calling supervisory lamp is lighted when the calling plug is first inserted and serves as a guard lamp until the automatic ringing has been started. As soon as the ringing is started, the calling supervisory lamp is extinguished and does not light again until the called subscriber restores his receiver to the switch-hook or, if the called subscriber fails to answer, the calling subscriber abandons the call. With this method of supervision any lighted supervisory lamp means that attention is required—either ring or disconnect. There are no flashing signals to irritate the operator nor is perfect supervision dependent upon the operator's understanding and differentiation between the full or partial illumination of the lamps.

Instantaneous Disconnect

is that feature which entirely disassociates the cord circuit from the subscriber's line circuit the instant that he restores his receiver to the switch-hook. This disconnection applies not only to the talking conductors of the cord, but also to the busy test so that after the completion of a call or the abandonment of an uncompleted call the line of either party or both parties is immediately available for either an outgoing or an incoming call.

This feature materially reduces the cord holding time since the cord may immediately be used for another connection. The disconnect indication on the supervisory lamps is complete and unmistakable; however, in the event that the operator has other idle cords, it is not necessary for her to take down a disconnected cord pair immediately because the cords, if left in the subscriber's line jack, can in no way interfere with the subscribers' service. This feature results in a saving of operator's time and a decreased answering time for the subscriber on both original and subsequent calls. The number of busy tests is reduced by making both subscribers' lines immediately available for incoming service.

Instantaneous disconnect may be furnished on both cords or on the answering cord only. Traffic studies show that the majority of recalls come from the party who originates the first call rather than the party who was called on the first call. For this reason some traffic authorities believe that disconnect on the answering cord is sufficient. However, in some cases it has been proven that the saving in the number of busy tests and consequent second calls was more than enough to justify the installation of instantaneous disconnect on the calling cord as well.

Line Lamp Recall

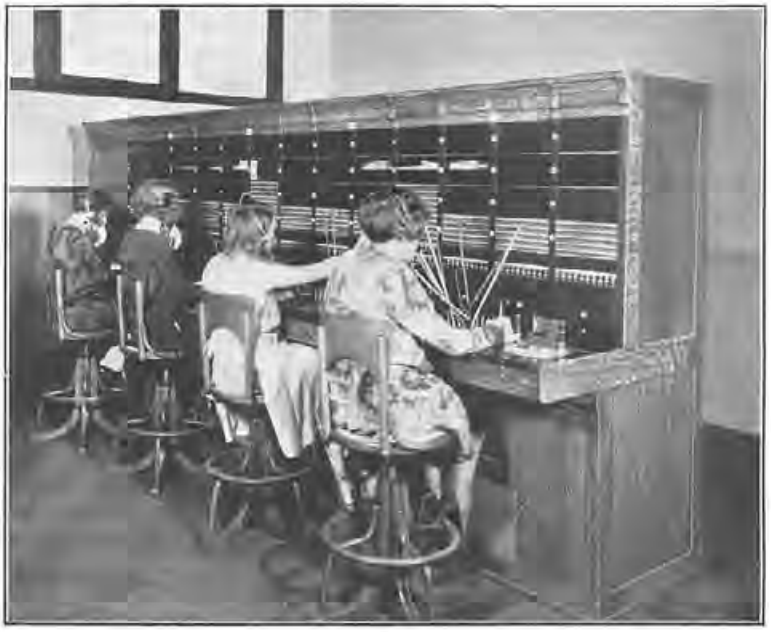
is that feature associated with instantaneous disconnect which permits a subscriber's recall to appear in the line lamp instead of on the cord supervisory lamp as would be the case without instantaneous disconnect in the cord circuits. The recall appearing in the line lamps is just as available to every operator as was the original call, and the subscriber receives the same prompt answer on all classes of calls.

Busy Line Lock-Out

is that feature which positively prevents a second call from being completed to a busy line so long as ringing or a conversation is in progress. With this feature, the operator gets the audible multiple busy test on a busy line, but even though she may plug into the jack, the cord is held open and the operator cannot start the machine ringing nor release her telephone set from the calling party until she withdraws the incorrectly inserted plug and reports the line as "busy." Under this condition the calling supervisory lamp remains burning as a visible indication of her error until rectified.

This feature may be considered as the last step in perfecting secret service. "Busy line lock-out" prevents a third party from being connected into an established connection and prevents a second operator from listening in on any multiple appearance of a busy line. This feature also prevents careless operators from ringing on established connection in case a busy test is disregarded.

SPECIAL SWITCHBOARDS



TOLL SWITCHBOARDS

Kellogg apparatus is particularly suitable for long distance telephony in which field extreme sensitivity and low transmission loss is imperative. Present day practice leans towards the incorporation of toll positions in the local switchboard. However, where the size of the office and the traffic conditions make such an arrangement infeasible, a Kellogg toll board provides the maximum transmission and operating advantages.

Kellogg's broad engineering experience furnishes a source of reliable advice on all matters pertaining to toll traffic and trunking. This experience includes full knowledge of all the latest developments in the long distance field. Many practices which have become standard today, are of Kellogg origin. The value of such an engineering service cannot be over estimated in the design of toll offices, since in most cases the equipment must be built to special requirements, and must always be dependable.

Kellogg toll boards, designed and manufactured entirely within the Kellogg factory are serving many large offices of both the manual and machine switching types. These switchboards have established an enviable reputation for furnishing high grade service with low maintenance and low operating costs. Kellogg engineers will offer advice and make recommendations regarding any toll problem, and will gladly suggest the proper equipment to assure the best results.

SPECIAL P. B. X. SWITCHBOARDS

For many years Kellogg engineers have successfully designed, engineered, and manufactured special communication apparatus for unusual and very exacting assignments.

The complete telephone system for the world's largest Zeppelin, is an example of Kellogg specialized engineering and manufacture. Wherever safety of property or life is dependent on instant and continuous communication, Kellogg equipment should be specified.

Special Kellogg switchboards for train dispatching are designed with the purpose of providing extreme safety and ease of operation. Millions of kilowatts of electricity are dispatched over Kellogg switchboards. Vast quantities of oil and gas flow and stop in response to messages transmitted by Kellogg equipment. These services are far too important to be trusted to any but the most dependable equipment, and it is for that reason that Kellogg apparatus predominates in these exacting industries.

Space does not permit adequate description of the various types of Kellogg equipment used in rendering these important services. Kellogg engineers will be glad to investigate any communication problem, regardless of the complications, and furnish detailed information, specifications, and prices on the correct equipment for the job.

SPECIAL SWITCHBOARDS

MUNICIPAL SERVICE

One of the largest fire alarm switchboards recently installed, was engineered and manufactured in the Kellogg factory. In the purchase of such important civic equipment as switchboards for fire and police service, dependability is naturally the first consideration. That is the reason why more and more Kellogg equipment is being used by public safety departments of cities, counties, and states.

In some instances these switchboards require little more than ordinary P.B.X. equipment; in others, such as that illustrated on this page, which was built for one of the largest cities in the United States, many special features are incorporated for services entirely foreign to usual telephone practice. The equipment may vary in size from a twenty-line cordless turret, to a board with hundreds of lines and several operators' positions.

The furnishing and maintenance of fire and police communication is a very natural function of the telephone company. The telephone plant is the logical distribution medium for the police and fire alarm signal system, and the maintenance of even a large net work is not a heavy burden on the trained personnel of the telephone company. The operating company, looking for additional revenue, can very profitably investigate this field and feel sure of the full cooperation of the Kellogg company in laying out and filling the requirements of the city engineers.

ANNUNCIATOR UNITS

Annunciator equipment for power house use must be dependable above all things. For this reason, Kellogg is a recognized source of such equipment. The accompanying illustrations are typical Kellogg annunciator units furnished for large generating stations.

These units are generally assembled in steel cabinets of a type to match other existing panels in the station. They may be either self contained, as illustrated, or smaller units may be designed to fit into the existing gauge or control boards. Complete accessibility is secured by full-width doors, and every precaution is taken to make each unit as nearly fireproof and dustproof as the nature of the materials and conditions of use will permit.

The Kellogg Company, thru an intensive study of the applications of annunciator equipment, is in a position to make recommendations based on the practices adopted by leaders in the power industry. Many variations of circuit operation are available to meet practically any operating condition. Provisions for operation on either continuous or momentary alarm contacts are obtainable with manual, automatic, or remote lamp-reset features. Audible alarms of any size or voltage may be had with any of the reset features. Alarm fusing, ground indication, and instantaneous lamp check, make it practically impossible for the system to fail without giving immediate warning. Holding lamps and operation counters add to the simplicity of operation. Each circuit is clearly marked with a name plate, engraved to designate the machine or apparatus with which that circuit is associated.

Kellogg engineers also furnish annunciator panels in more compact turret form when desired, and will gladly provide estimates on any type or size of equipment.

TESTING EQUIPMENT

The Junior Test Cabinet

Every telephone exchange, large or small, magneto or common battery, should be equipped with good testing apparatus so that line, instrument, or exchange troubles may be quickly and easily located. The Kellogg Junior Test Cabinet saves time and expense, and eliminates service interruptions. It is a small, compact unit suitable for mounting on or near the switchboard in small exchanges, or on the Wire Chief's desk in larger offices.

The oak turret is arranged with voltmeter and control keys on the front panel, and with a removable rear panel for wiring and inspection. The cabinet measures 13½ inches high, by 10 inches wide, by 6 inches deep. It is finished in standard No. 9 medium dark, dull-rubbed oak.

The testing circuit includes a special Weston 267 type voltmeter with two scales reading 0 to 30 volts and 0 to 3 volts. The low scale is calibrated for direct reading in ohms. A single scale voltmeter reading 0 to 30 volts only, may be supplied when desired. Tests may be made for short circuits, grounds on either side of line, crosses, or resistance measurements on lines or apparatus. These tests are made through trunks, three of which are wired, one for the main frame test shoe, one for the switchboard, and one for a pair of testing clips. Any or all of these trunks may be equipped as required. Suitable cords, plugs, weights, and other apparatus being furnished to fit standard protectors and switchboard line jacks.

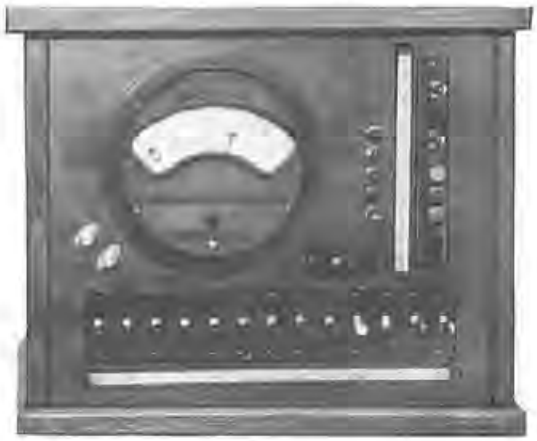
A set of terminals is provided for an operator's telephone. No instrument is furnished with the Kellogg Junior Test Cabinet unless requested, as it is not always necessary to talk directly to the subscriber through the testing circuit. A standard magneto wall or desk telephone may be used when the cabinet is designed for a magneto exchange. A common battery circuit is furnished in the cabinet for common battery exchanges, and any standard common battery telephone may be used as an operator's set. An order wire key may also be furnished when desired. A single frequency ringing key is furnished on all sets, but a four- or five-frequency master key may be included for ringing on party lines.

Requests for prices should include information on:

1. Make and type of switchboard (for Swbd. Trunk).
2. Make and type of main frame protection (for MDF Trunk).
3. Type of ringing system (for Master Key).

Describe voltmeter scale desired, if order wire key should be furnished, and if operator's telephone is wanted.

The Senior Test Cabinet



The Kellogg Senior Test Cabinet is designed as an aid to the Wire Chief in the average common battery exchange where proper maintenance of lines and equipment is of first importance. It is larger and more flexible than the Junior, being housed in a turret 18⅛ inches wide, 13⅞ inches deep, and 14⅝ inches high. It is equipped with a Weston type 24, two-scale voltmeter, reading 0 to 30 and 0 to 150 volts, with resistances of 10,000 and 50,000 ohms. The voltmeter is controlled with a key and shunt, battery and reversing keys, and a grounding key. Other keys in the test circuit are arranged for testing in or out from the main frame, connecting test trunks to switchboard, order wire, connecting howler or bridge, flash key, key for reading voltage of test battery, ringing key for any ringing system, and a listening key.

Standard equipment includes an operator's telephone of the desk stand type with head band receiver, an alarm buzzer, a two-way trunk to local switchboard with audible alarm, two test trunks to switchboard, one trunk to main frame test shoe, binding posts for Wheatstone bridge or howler, and two order wires. No bridge, howler, test shoe, or cords and plugs for local board are included, but may be added when desired. Complete information on make and type of switchboard, main frame protector, and ringing system is necessary when ordering.

Kellogg engineers will gladly recommend a suitable bridge for use with the Senior Test Cabinet. Suggestions on special desks for mounting the turret will also be made, though any standard office desk is suitable. No drilling is necessary in the desk top, as the Senior turret is self-contained except for the extension alarm bell, batteries bridge, and howler, which may be mounted in any convenient location.

Telephone dry cells or radio "B" batteries are required to furnish the testing voltages of 30 and 150. Current for operating the operator's telephone is obtained from the exchange storage battery.

Detailed specifications will be sent on request.

TESTING EQUIPMENT

The Major Type Cabinet

The Major Type testing cabinet is especially designed for use in large central offices. It incorporates all the features of the Senior type, plus additional cabinet space, line facilities, and other refinements.

The cabinet is of the turret type, suitable for mounting on a flat top desk or table. It measures 38 inches long, by 15¾ inches high, and 15⅝ inches deep. It may be furnished in any wood or finish to match the switchboard, woodwork or furniture. The interior of the cabinet provides ample space to enclose all relays, condensers, coils and terminal strips. A fuse panel is also located in the back of the cabinet for the protection of all circuits.

The face panel is of the same material and finish as the other exposed woodwork. About two thirds of its area is occupied by the testing equipment and the lamps and keys associated with the in and out lines and trunks. Pigeon holes and book stalls are provided at the right.

The operator's telephone equipment may be either a desk stand or a standard operator's set with head receiver and suspended or breastplate transmitter. With this equipment, the wire chief may talk on any of the desk lines, in and out trunks, or test trunks.

Two incoming lines from the local switchboard can be installed. These lines terminate with a line lamp, listening key, holding key and guard lamp in the wire chief's desk and may be used for trouble reports.

Wiring is provided for four order wires, two common battery test trunks, two magneto test trunks and one testing circuit, one generator circuit, one wire chief's telephone, one howler circuit and one M.D.F. test trunk.

Space and drilling for ten combined test and hospital trunks terminating at supervisory lamps, a guard lamp, and a combined testing and reversing key are provided.

Standard models of wheatstone bridge type testing equipment can be supplied to work in conjunction with this test circuit.

Desks

Standard flat top desks are suitable for mounting the Junior, Senior or Major type test cabinets. For general practice, a single tier Gunn No. 342-S desk is recommended. This desk is of oak with a 5-ply 1½-inch wood top, and contains a row of three drawers at the right. A convenient fourth drawer is located just beneath the top, and above the knee space. A writing board or shelf slides outward from beneath the top and over the tier of drawers.

These desks are very suitable for average use, measuring 32 x 42 inches across the top and standing 30½ inches high. For larger installations, requiring two operator's positions, or more desk space, a No. 360-S flat top desk is used. This desk is similar in construction to the 342-S type. It measures 60x34 inches across the top by 30½ inches high, and has a sliding writing shelf with a tier of three drawers at each end. A large spacious drawer is located above the knee space in the center.

Information and Chief Operator's Equipment

View of 2-position information and chief operator's turret, mounted on a 360-S Gunn Type desk.

The chief operator and information clerk are important factors in the operation of any efficient central office. They must be provided with adequate facilities for carrying on their work. It is customary to engineer and build chief operator and information desks to suit the particular installation. For general use, however, the following arrangement proves very popular:

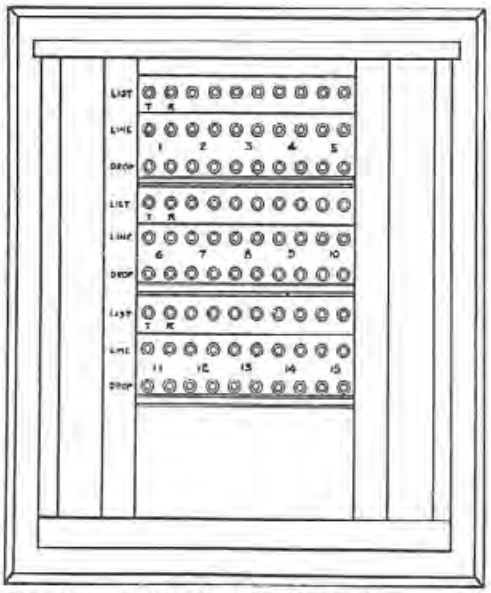
A flat top desk with a tier of three drawers and a sliding writing shelf at the right, supports a turret type cabinet measuring 38 inches long, 15¾ inches high and 15⅝ inches deep. This turret may be furnished in any wood or finish to match the switchboard, woodwork or furniture. The face panel is of the same material and finish as the other exposed woodwork. About two-thirds of its area is occupied by the testing apparatus. Pigeon holes and book stalls are provided.

All turrets have wiring, drillings, punchings, etc., for one operator's set, generator master key, night alarm, magneto through trunk to local switchboard, two-way line to wire chief's desk, two-way line to toll switchboard, and a two-way line to the local switchboard. They are wired for 2-service observation lines, 3 incoming desk lines, 10 peg count meters, and 16 listening and monitoring circuits. All circuits are operated with keys which are mounted in the face of the turret.

Further information, prices, and detailed specifications will be gladly furnished upon request.

TOLL TEST PANELS

Since the use of toll service is becoming increasingly popular, and it has proved to be a profitable source of revenue to the operating company, it is essential that good toll testing equipment be used to maintain the efficiency of the circuits. Reliable service is important in attracting greater toll use. It is necessary, therefore, to keep a constant check on the physical condition of toll lines by making a daily survey of the toll network. This daily survey is easily and quickly accomplished with a Kellogg Toll Test Panel.



Face Drawing of Single Panel 15 Line Capacity Toll Test Cabinet

The Toll Test Panel, in connection with the wire chief's testing equipment, will permit these daily tests and assist materially in locating line troubles when they occur. The toll test panel is primarily a series of spring jacks, arranged in groups of 4, 6, 8, 10, 12 and sometimes more, for testing, patching, talking and ringing on the toll lines. These jacks also form a rapid and convenient means of opening, shorting and grounding the lines for test as well as for cutting in or out repeating coils, composite repeaters, or other toll line apparatus.


Single Panel 30 Line Capacity Toll Test Cabinet. (This cabinet has capacity of 60 lines if arranged on two panel basis.)

The usual minimum is six jacks a line, each jack having a single conductor, and the group being arranged with two jacks for bridged listening, two for testing the line (out), and two for testing the drop (in).

Greater facility for patching and testing is accomplished by an increased number of jacks in each line. For the more complex toll circuits with simplex and composite equipment, more than six jacks per line is imperative. However, simple circuits with a less number of jacks permit more line capacity in the test panel by reason of requiring less space in the face of the board.

Fifteen lines, with six jacks a line, require 90 jacks. These may be mounted on hard rubber strips, or on a solid phenol fiber or rubber panel in a small wall cabinet similar to the No. 17-C magneto switchboard. (See page 11). Capacities of 30 and 60 lines with six or more jacks a line are available in a larger wall cabinet, such as illustrated on this page. In addition, the larger wall cabinet has space for patching cords and cord circuits, a hand generator, and an operator's telephone.

Because of the invariably special nature of toll testing equipment, inquiries should include information on the ultimate line capacity desired, number of lines to be equipped, number of phantom circuits, number of jacks for each line, number of patching cords or cord circuits, and type of operator's set.

A drawing or description of the toll network would also be a material aid to Kellogg engineers in writing specifications. Recommendations on toll test equipment will be furnished without obligation.


Two-position floor type Toll Test Cabinet

P. B. X. Switchboards

Applications

The first step in the selection of a P.B.X. should be a careful study of the requirements of the subscriber. Most important is the consideration of the possible ultimate growth.

In an industrial plant the growth can be fairly estimated by taking into consideration the number of executives requiring individual instruments, and the number of major departments in the plant and offices. It is well to overlook the opinions of the executives on this growth, for it has been proven that the need for instruments in all of these departments usually exists within the first year after installation of the P.B.X. Almost invariably this is caused by the speeding up effect in the plant.

In a commercial institution, the growth after the initial installation is apt to be small, and consists mainly of trunks and extensions.

In hospitals, hotels, schools, real estate offices, laundries and steamships, there is but little growth under ordinary circumstances, but it is well in the case of all but the steamships, to take into consideration the plans of the Boards of Directors over a reasonable period.

The next important consideration is that of cord circuits and trunking facilities. In the industrial plant, especially in the smaller city, the calling is mostly inter-departmental. This, of course, requires a larger number of cords than is necessary for a hotel where intercommunication is at a minimum. The number of trunks is usually determined at the beginning by the number of direct lines in use.

In a commercial institution the condition is slightly different. While there is considerable intercommunication, there is also a large amount of outside calling.

In hotels there is very little intercommunication, but there is a large amount of outside calling, requiring an adequate number of trunks, but fewer cords.

In steamships, intercommunication requirements are small, being mostly between officers. However, adequate cords to handle emergencies should be provided.

In hospitals, intercommunication is chiefly between departments and floors, and the amount of calling is usually very small. It is essential, however, that a careful study be made of the trunk requirements.

In schools, neither intercommunication nor trunking is a serious matter under ordinary routine. However, adequate facilities to take care of emergencies should be taken into consideration.

To adequately care for the needs of railroads, special study is generally required, but Kellogg P.B.X.'s can be made to fit unusual conditions.

Kellogg Private Branch Exchanges are made in a variety of sizes and equipped to fill almost any condition encountered. Like Masterbuilt switchboards and Magneto boards, Kellogg P.B.X. equipment is built to fit actual conditions rather than theoretical ideas.

General

A private branch exchange switchboard is quite similar to a central office exchange, in both principle and operation. It enables connections to be established between various telephone stations, within its jurisdiction, and also trunk connections to the main exchange. Calls are answered and connections completed to other stations or to trunks in the usual manner.

The major circuits incorporated in a private branch exchange switchboard are the line, cord, trunk, and operator's telephone circuits. The secondary circuits are the ringing, battery switching, pilot and night alarm circuits. The narrative of operation of each of these circuits is described in the following paragraphs.

Kellogg P.B.X. switchboards are supplied with either plug ended or jack ended trunk circuits. Both types are in general use. Local conditions and preferences largely determine the type to be used.

The line circuits furnished with Kellogg P.B.X. switchboards, are of the lamp signal type (with or without line relays as desired.)

It is sometimes necessary to furnish trunk service to P.B.X. extensions when no operator is in attendance at the switchboard, such as at night, on Sundays, and holidays. This can be accomplished on all jack and plug ended trunks, except the J.M. (Magneto), by the use of night trunk jacks and patching cords. With the plug ended trunks PCB and PMR type, only one P.B.X. line can be connected to a trunk.

Telephones connected to a machine switching main exchange through the P.A. trunk must be equipped with a signalling device for through service. Patching or "spider" cords are not regularly furnished with P.B.X. switchboards, but when desired, it is necessary to specify the number of stations to be connected to each trunk.

Each private branch switchboard is equipped with a generator switching circuit. This enables the power generator, supplied from the main exchange or locally installed ringing machine, to be switched to the hand generator which is furnished in each switchboard.

The battery supply required for the operation of a private branch exchange is usually supplied from a small power plant installed near the switchboard. When the private exchange is located within a reasonably short distance of the main exchange, the battery supply may be furnished over sufficient cable conductors to maintain the proper voltage.

Trunk Circuits

The selection of the proper trunk circuit to connect P.B.X. subscribers through the main exchange to subscribers in town or for toll calls, is very important. The following paragraphs contain description of trunk circuits of both the jack ended and plug ended type.

Generally speaking, plug ended trunks are more desirable when the number of trunk connections to be put up, is greater than the number of station connections. Jack ended trunks are preferable when there is a greater proportion of intercommunication than outside calling. Hotels, hospitals, real estate offices, and laundries, usually prefer plug ended trunks because there is little conversation between departments and much incoming or outgoing trunk traffic. In commercial offices and factories, jack ended trunks are preferable, because generally there is considerable intercommunication.

Technically, there is but little difference between the circuits. The selection should be made entirely on a basis of local conditions. If no decision can be reached, Kellogg engineers will gladly make recommendations. Two trunks for connection with a common battery main exchange are the most popular—the P.C.B.R. and the J.C.B.R. Each is recommended highly and both are considered the standard for general use.

P.B.X. SWITCHBOARDS

Plug Ended Trunks

Code P.C.B. for Common Battery Main Exchange

The P.C.B. plug ended trunk circuit is recommended for commercial institutions and other establishments, where no charge is made for trunk calls. It is of the two way, plug ended, ringdown type, arranged for completing connections between a P.B.X. switchboard and a common battery main exchange. This circuit furnishes "through" supervision to the main exchange when the P.B.X. party hangs up the receiver. However, it is not provided with the re-ring feature, therefore, the main exchange operator cannot signal the P.B.X. party when making a re-call over the same trunk. The P.B.X. party can re-call the main exchange operator direct, allowing only the flashing of the disconnect lamp at the P.B.X. to indicate the re-call to the P.B.X. operator.

Battery current for talking is supplied from the cord or trunk circuit at the main exchange. This provides transmission which is practically the same as if the P.B.X. party was connected direct to the main exchange. Where the toll cords at the main exchange are of the 48 volt type, it provides the P.B.X. party with the same added transmission efficiency received by main exchange subscribers.

Code P.C.B.R. for Common Battery Main Exchange

The P.C.B.R. plug ended trunk circuit is recommended for hotels, resorts and other establishments where an additional charge is made for each trunk call. It is of the two way, plug ended, ringdown type, arranged for completing connections between a P.B.X. switchboard and a common battery main exchange. This circuit furnishes "through" supervision to the main exchange, when the P.B.X. party hangs up the receiver. It is impossible for the P.B.X. party to re-call the main exchange without the knowledge of the P.B.X. operator. This circuit is arranged for the re-ring feature, making it possible for the main exchange operator to re-call the P.B.X. party providing the connection has not been cleared by the P.B.X. operator.

The battery current for talking is supplied from the cord or trunk circuit at the main exchange. This provides transmission which is practically the same as if the P.B.X. party was connected direct to the main exchange. Where the toll cords of the main exchange are of the 48 volt type, this circuit will provide the P.B.X. party the same added transmission efficiency received by the main exchange subscriber.

Code P.A. for Two-Wire Common Battery Machine Switching Exchange

The P.A. plug ended trunk circuit permits the supervision of all trunk calls by the P.B.X. operator. It is of the two way, plug ended, ringdown type arranged to complete connections between a P.B.X. switchboard and a two-wire machine switching main exchange. This is accomplished by operating the trunk dialing key which is common with the signaling device. Only the P.B.X. operator can dial into the machine switching exchange, therefore, it is necessary for the P.B.X. party to signal the operator to make additional calls. This circuit is arranged for the re-ring feature. It is possible for the main exchange to re-call the P.B.X. operator even though the trunk connection has not been cleared. In that case the P.B.X. party will not be signaled.

The P.A. circuit is arranged to provide the P.B.X. party with battery supply from the main exchange. It will provide the P.B.X. party the same transmission efficiency received by the main exchange subscribers. Where the toll cords are of the 48 volt type, it provides the P.B.X. party with the same added transmission efficiency received as if the P.B.X. party was connected direct to the main exchange.

Code P.M.R. for Magneto Main Exchange Service

The P.M.R. plug ended trunk circuit permits the supervision of all trunk calls by the P.B.X. operator. It is of the two way, plug ended, ringdown type arranged to complete connections between a P.B.X. switchboard and a magneto main exchange. This circuit is arranged to furnish "through" supervision to the magneto exchange. Only the P.B.X. operator can signal the main exchange on new calls or re-calls. It is arranged with the re-ring feature, which makes it possible for the main exchange operator to re-call the P.B.X. operator over a trunk which has not been cleared, without signalling the P.B.X. party.

By placing a supply of battery on the main exchange end of the trunk circuit momentarily, the clearing out drop associated with the cord circuit at the main exchange is operated. This is accomplished by connecting batteries to the main exchange end of the trunk. The P.M.R. circuit is of the repeating coil type arranged for battery feed to the P.B.X. subscriber by a balanced relay connected to the center windings of the coil.

Jack Ended Trunks

Code J.B.C.R. for Common Battery Main Exchange

The J.B.C.R. jack ended trunk circuit permits the P.B.X. operator to supervise all trunk calls. It is of the two way, jack ended, ringdown type arranged for completing connections between a common battery main exchange and a P.B.X. switchboard. This circuit is equipped with the re-ring feature, permitting the main exchange to re-call over a trunk which has not been cleared from a previous connection at the P.B.X. Re-ringing over the trunk will not signal the P.B.X. subscriber, even though connected to the trunk at the P.B.X. Recalls of this type will light the trunk line lamp the same as a new call.

Code J.A. for Two-Wire Machine Switching Exchange

The J.A. jack ended trunk circuit permits the supervision of all calls by the P.B.X. operator. It is of the two way, jack ended, ringdown type arranged for completing connections between a two-wire machine switching main exchange and a P.B.X. switchboard. This circuit is equipped with the re-ring feature making it possible for

a main exchange subscriber to call the P.B.X. switchboard over a trunk which has not been cleared from a previous connection. Re-ringing over this trunk on a re-call will not signal a P.B.X. party even though connected to the trunk circuit. Calls of this nature will light the trunk line lamp in the same manner as if the plug at the P.B.X. were removed from the trunk spring jack.

On trunk calls originating at the P.B.X., it is necessary that the P.B.X. party signal the operator in order to make additional calls, as only the P.B.X. operator can dial into the main exchange. This is accomplished by operating the trunk dialing key which is common with the dial.

Code J.M. for Magneto Main Exchange

The J.M. jack ended trunk circuit is of the two way, jack ended, ringdown type. It is arranged for completing connections between a magneto main exchange and a P.B.X. switchboard.

On calls originating at the main exchange, the operator ringing over the trunk trips the line relay at the P.B.X., lighting the line lamp. The P.B.X. operator, in answering this call, inserts the calling plug into the trunk jack, operating the restoring relay which extinguishes the line lamp. For calls originating at the P.B.X., the operator inserts the calling cord into the trunk spring jack and rings, which energizes the line drop at the main exchange. This circuit provides single disconnect only at each end and is not designed for "through" night service.

Code J.M.R. for Magneto Main Exchange

The J.M.R. jack ended trunk circuit is of the two way, jack ended, ringdown type arranged for completing connections between a magneto main exchange and a P.B.X. switchboard. This circuit, arranged for the re-ring feature, makes it possible for a main exchange subscriber to re-call the P.B.X. over a trunk which has not been cleared from a previous connection. Re-ringing over this trunk on a re-call will not signal the P.B.X. party even though connected to the trunk circuit. Calls of this nature will light the trunk line lamp the same as if the plug at the P.B.X. were removed from the trunk jack.

Line Circuits

The line circuit furnished with all Kellogg P.B.X.'s, with the exception of code 1210-P and 1210-J, is wired but not equipped with line relays.

The 1210-P and 1210-J switchboards are wired for 200 lines, 100 being wired for line relays. The cabinet capacity allows equipment for only 100 line relays.

Where the loop resistance of any P.B.X. line exceeds 30 ohms (not including telephone instrument), line relays should be installed. This resistance, figured in feet, is equal to a 1,000 foot loop using 22-gauge wire, or 2,000 feet of 19-gauge wire, or about 2,300 feet when a metallic line of No. 12 iron wire is used.

22-gauge cable may be used from the connecting rack on the switchboard to the central distributing point, and from there to the telephone No. 19 gauge interior twisted pair wire should be used.

It is very seldom that all lines are required to be equipped with line relays. Usually the majority of telephones connected to a P.B.X. are used in the same building with the switchboard.

When any of the telephones are located outside of the building or at more distant points, No. 22 gauge cable or open wire (No. 12 iron) is usually used. Each line will operate satisfactorily without a line relay up to the distances given above.

Cord Circuit

The P.B.X. cord circuit is of the common battery condenser type, arranged for double supervision and equipped with ringing and listening keys. When specified, a ring-back key for ringing on the answering cord can be furnished. They are only required when the P.B.X. party desires the operator to complete a connection and re-call when the connection is established.

Operator's Telephone Circuit

This circuit is of the anti-side tone induction coil type arranged for breast plate or suspended type transmitters. When specially requested, this circuit can be equipped to operate with a desk type telephone.

Battery Switching Circuit

The purpose of this circuit is to disconnect the battery supply from circuits which do not require current for night connection or unattended service.

Generator Circuit

This circuit is arranged for both power generator and hand generator. A switching key is provided to change from one to the other.

Night Alarm

Each switchboard has an audible signal wired common to all line and supervisory lamps through a control key. The bell or buzzer operates from the same battery supply used for the balance of the apparatus.

Cabinet Finish

The standard cabinet finish of Kellogg P.B.X.'s is a medium dark, quarter sawed oak. Light oak, birch, mahogany, walnut, and other finishes can be had on special request. Special finishes are subject to additional cost and sometimes require longer time in which to make delivery.

Power Equipment

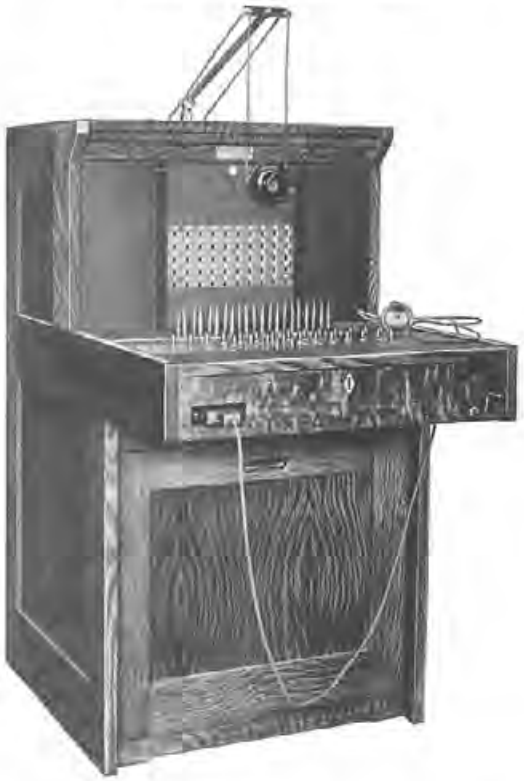
All P.B.X. switchboards are equipped to operate on 24-volts D.C. unless otherwise ordered.

For information on power equipment, see pages 48 to 52.

Bulletin No. 8X gives complete information, circuit diagrams, on Kellogg P.B.X. switchboards. A copy of this bulletin will be sent on request.

P. B. X. SWITCHBOARDS

The 1055 P. B. X. Switchboard



The Kellogg type 1055 P.B.X. switchboard is the smallest of the floor types. It can be furnished with plug or jack ended trunks and is wired and equipped with:

1 Operator's Telephone Set
1 Generator Circuit
1 Pilot Circuit
1 Night Alarm
1 Battery Cut-Off Key

The Kellogg 1055-P private branch exchange switchboard is arranged for plug ended trunks to the main exchange. It may be arranged to operate with common battery, machine switching or magneto main exchange equipment, as required. This switchboard has a capacity for:

50 Lines
5 Plug Ended Trunks
8 Cord Circuits

All of the lines are wired for line relays.

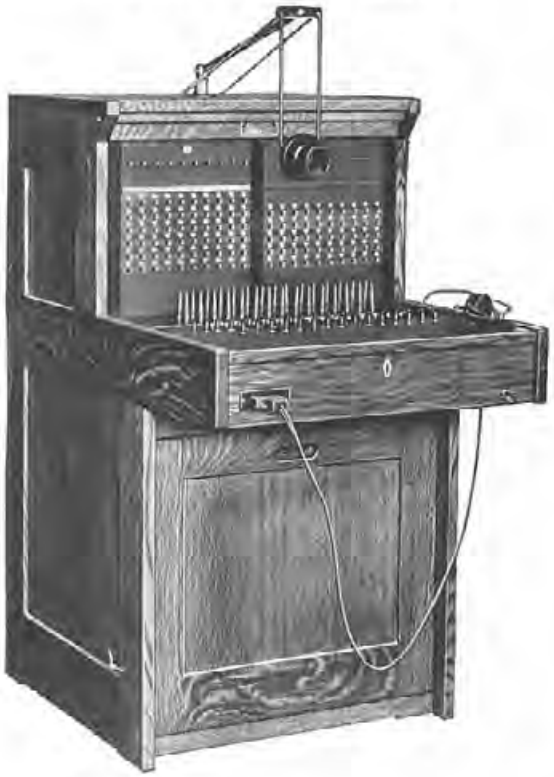
The Kellogg 1055-J private branch exchange switchboard is arranged for jack ended trunks to the main exchange. It may be arranged to operate with common battery, machine switching or magneto main exchange equipment, as required. This switchboard has a capacity for:

50 Lines
5 Jack Ended Trunks
10 Cord Circuits

All of the lines are wired for line relays.

Specifications and ordering information on page 30.

The 1110 P. B. X. Switchboard



The Kellogg type 1110 P.B.X. is a medium size standard floor type switchboard and can be furnished with plug or jack ended trunks. It is wired and equipped with:

1 Operator's Telephone Set
1 Generator Circuit
1 Pilot Circuit
1 Night Alarm
1 Battery Cut-Off Key

The Kellogg 1110-P private branch exchange switchboard is arranged for plug ended trunks to the main exchange and may be arranged to operate with common battery, machine switching or magneto main exchange equipment, as required. This switchboard has a capacity for:

100 Lines
8 Plug Ended Trunks
10 Cord Circuits

All of the lines are wired for line relays.

The Kellogg 1110-J private branch exchange switchboard is arranged for jack ended trunks to the main exchange and may be arranged to operate with common battery, machine switching or magneto main exchange equipment, as required. This switchboard has a capacity for:

100 Lines
8 Jack Ended Trunks
15 Cord Circuits

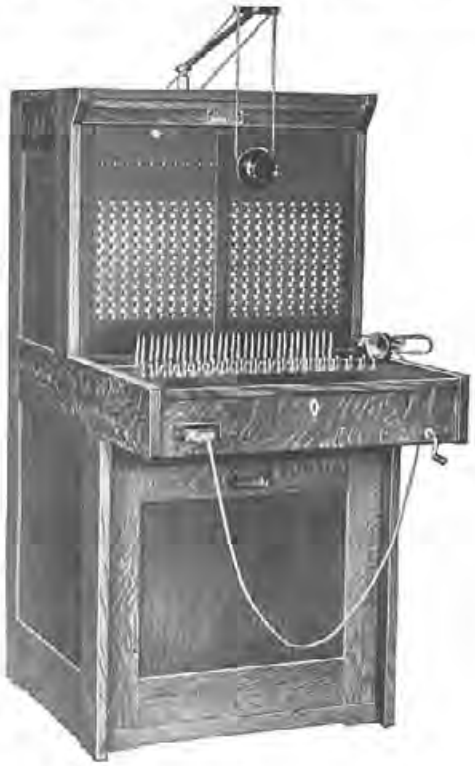
All of the lines are wired for line relays.

When code J.M.R. trunks are used the trunk capacity is reduced to 7 trunks.

Specifications and ordering information on page 30.

P. B. X. SWITCHBOARDS

The 1210 Type P. B. X. Switchboard



The Kellogg type 1210 P.B.X. switchboard is the largest of the standard floor types. It is furnished with either plug or jack ended trunks and wired and equipped with:

1 Operator's Telephone Set
1 Generator Circuit
1 Pilot Circuit
1 Night Alarm
1 Battery Cut-Off Key

The Kellogg 1210-P private branch exchange switchboard is arranged for plug ended trunks to the main exchange and may be arranged to operate with common battery, machine switching, or magneto main exchange equipment as required. This switchboard has a capacity for:

200 Lines
10 Plug ended trunks
12 Cord Circuits

One hundred (100) of the lines are wired for line relays.

The Kellogg 1210-J private branch exchange switchboard is arranged for jack ended trunks to the main exchange and may be arranged to operate with common battery, machine switching, or magneto main exchange equipment, as required. This switchboard has a capacity for:

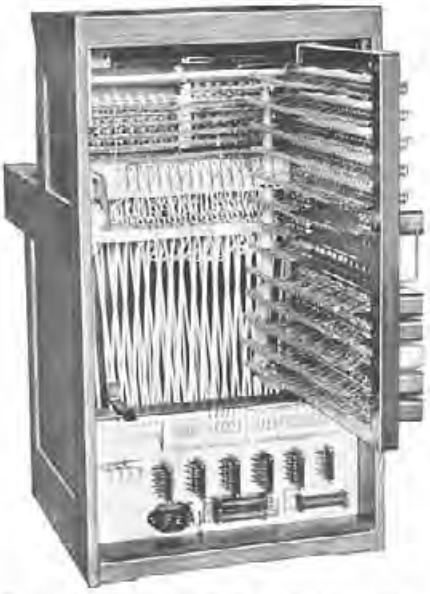
200 Lines
10 Jack Ended Trunks (10-per strip)
15 Cord Circuits

One hundred (100) of the lines are wired for line relays.

When code J.M.R. trunks are used the trunk capacity is reduced to 8 trunks.

Specifications and ordering information on page 30.

Typical Rear Views of Kellogg P. B. X.



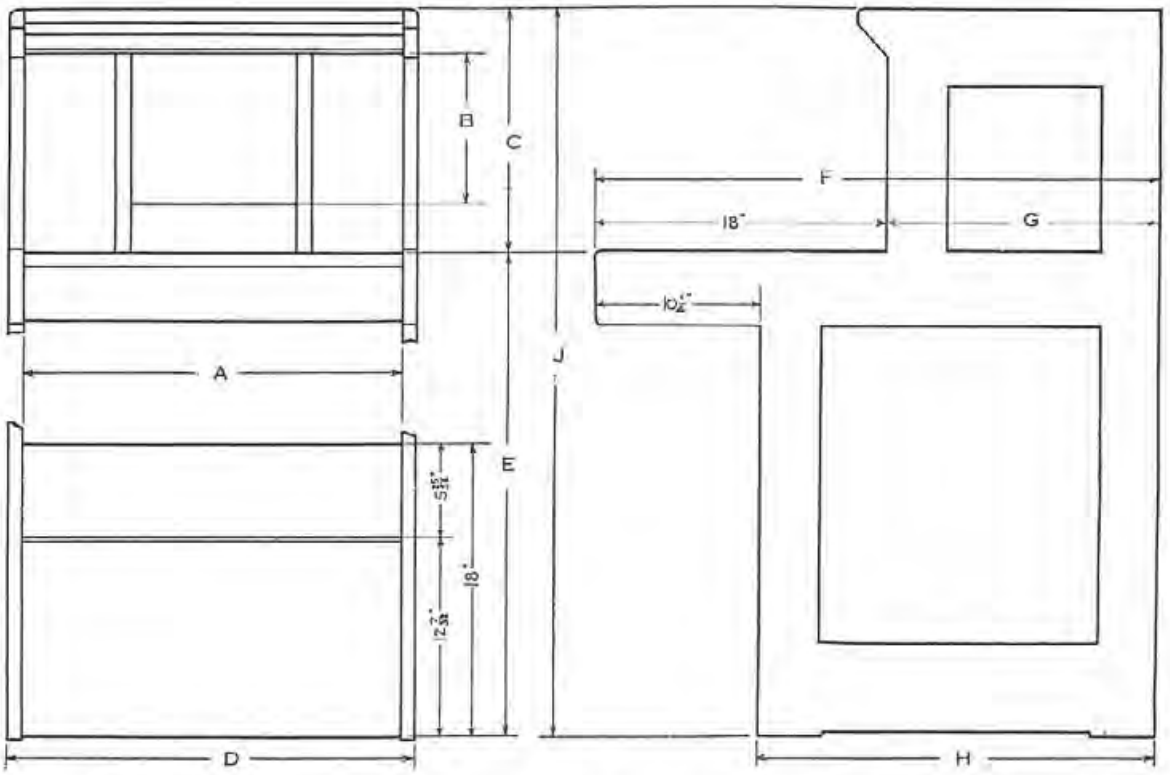
All Kellogg floor type P.B.X. switchboards are similar in general construction. Apparatus is Kellogg standard, conveniently located for quick inspection and adjustment. Only best cabinet materials are used, and generally finished in No. 9 golden oak.

The above view shows the relay gate opened. This allows the maintenance man to thoroughly inspect all cord and wire connections with ease. Line and cord equipment can be added, as required, up to the total capacity.

The above view shows the general arrangement of apparatus, with relay gate closed. Ample space is provided for inspection and adjustment of the relays. Fuses are always visible and can be easily replaced.

P. B. X. SWITCHBOARDS

Dimensions



Code No.	Dimensions								
	A	B	C	D	E	F	G	H	J
1045	18¼"	7 9/32"	13⅛"	20"	2'-6"	2'- 7¼"	13¼"	21"	3'-7⅛"
1055	23 5/16"	9 9/32"	15⅛"	25⅛"	2'-6⅛"	2'-11"	17"	24¾"	3'-9¼"
1110	23 5/16"	9 9/32"	15⅛"	25⅛"	2'-6⅛"	2'-11"	17"	24¾"	3'-9¼"
1210	23 5/16"	15 1/16"	21⅛"	25⅛"	2'-6⅛"	2'-11"	17"	24¾"	4'-3¼"

Shipping Weights

Code No.	Lines		Cords		Trunks			Approx. Wt. Packed Pounds
	Wired	Equipped	Wired	Equipped	Type	Wired	Equipped	
1055-P	50	10	8	4	Plug	5	2	350
1055-P	50	30	8	5	Plug	5	3	375
1055-P	50	50	8	8	Plug	5	4	400
1110-P	100	60	10	8	Plug	8	4	455
1110-P	100	80	10	10	Plug	8	4	480
1110-P	100	100	10	10	Plug	8	5	505
1210-P	200	120	12	10	Plug	10	5	565
1210-P	200	160	12	12	Plug	10	5	585
1210-P	200	200	12	12	Plug	10	10	610
1055-J	50	10	10	6	Jack	5	2	350
1055-J	50	30	10	8	Jack	5	3	375
1055-J	50	50	10	10	Jack	5	4	400
1110-J	100	60	15	12	Jack	8	4	455
1110-J	100	80	15	14	Jack	8	4	480
1110-J	100	100	15	15	Jack	8	5	505
1210-J	200	120	15	15	Jack	10	5	565
1210-J	200	160	15	15	Jack	10	5	585
1210-J	200	200	15	15	Jack	10	10	610

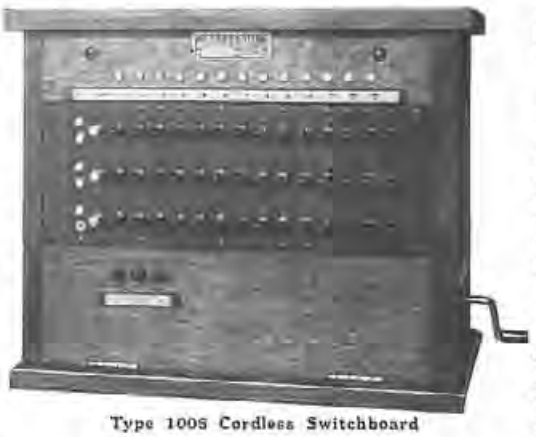
CORDLESS P.B.X. SWITCHBOARDS

One of the most profitable sources of revenue to a telephone company is the installation of P.B.X. equipment in business offices, hospitals, banks, stores, police and fire departments, and other institutions where two or more lines are used. When the number of lines required does not exceed twenty, a cordless P.B.X. is preferred. Its small size permits installation on top of an ordinary desk convenient to a filing clerk, typist, or other person who can devote part time to the operation of the P.B.X. switchboard.

Low cost and minimum maintenance make Kellogg cordless P.B.X.s a good investment for the telephone company. The flexible, fast, and dependable service provided by Kellogg P.B.X. switchboards, offers many advantages to the subscribers. It is easy to operate, and influences greater use of the telephone service. Increased toll traffic often results from P.B.X. installations.

The Kellogg 1005 type cordless P.B.X. is a standard board, having a capacity of ten lines, five connecting circuits, and three trunks. Equipment may be had for lines and trunks up to the total capacity.

The 1006-AA Cordless P.B.X. switchboard is held in stock for immediate shipment, equipped with ten lines, five connecting circuits, and two trunk circuits for operation with a common battery manual main exchange. The stock switchboard is not equipped with line relays, but such relays are held in stock and may be shipped with the P.B.X. An extra, complete trunk circuit is also held in stock, packed ready for shipment, in case three trunks are wanted. This extra trunk is not installed in the cabinet at the factory.

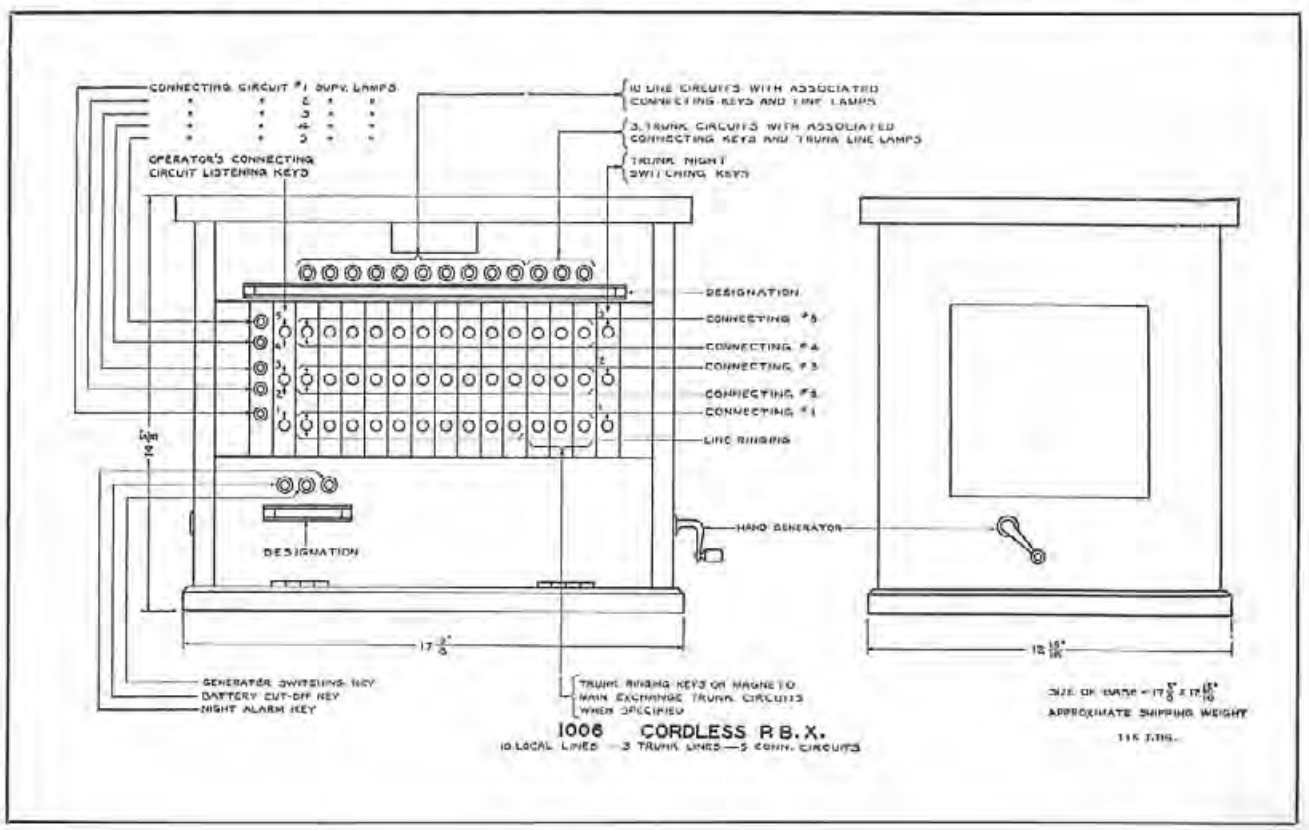


Type 1005 Cordless Switchboard

The 1006-A and 1006-AA are identical except for the number of connecting circuits. The single A denotes three connecting circuits, and the double A (AA) denotes five connecting circuits.

THE CABINET is constructed of wood with panelled sides and an extended bevelled base. The standard finish is a medium dark oak which harmonizes with most office furniture. Mahogany and walnut finishes are also available upon request. Special lacquer finishes may be had, and cabinets may be finished to match any woodwork.

The rear door opens sideways to expose the line and other terminals, and the armature side of all relays, while the face panel is hinged on the bottom allowing it to drop forward to expose the wiring of the keys. These doors allow full accessibility to all apparatus without sacrifice of cabinet strength, and without destroying the unity of cabinet and relay framework.



CORDLESS P.B.X. SWITCHBOARDS

LINE CIRCUITS are of the common battery type with line lamps operating in series, or actuated by line relays. A line relay is required on all lines having a loop resistance of more than 30 ohms. This is equal to about 500 feet distance from switchboard to telephone using 22 B & S copper wire.

TRUNK CIRCUITS may be arranged to connect with any type of main exchange whether magneto, common battery, or machine switching. Two different types of trunks are available for common battery manual exchanges. One type of trunk feeds battery current to the talking party from the P.B.X. storage battery, and the other feeds main exchange battery current direct to the P.B.X. extension. Night trunk keys are provided for unattended or night service.

VOLTAGE. All standard cordless P.B.X. switchboards are arranged for 24 volt operation, but can be furnished for 48 volt operation if required. A battery cut-off key is provided for switching off all current to the P.B.X. switchboard.

CONNECTING CIRCUITS are all arranged with lamp supervision to indicate the end of conversation on a connection. The supervisory lamps are also connected to an alarm buzzer in common with line and trunk signals, so that an audible alarm may, at the discretion of the operator, be given on any lighted lamp in the switchboard. Battery current for each connecting circuit is fed through an individual battery feed coil.

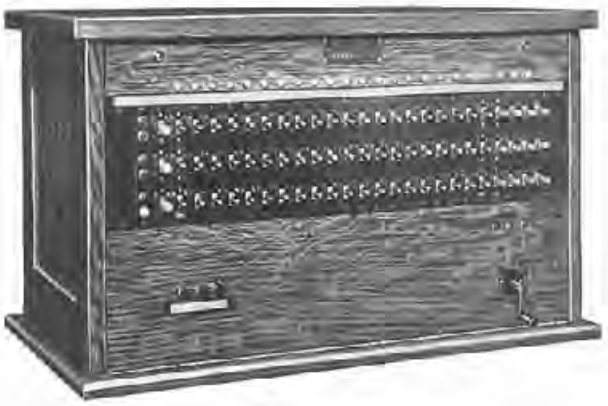
RINGING CURRENT can be supplied by a hand generator or power ringing machine. A switching key is provided so that either source of ringing current may be used. A hand generator is furnished as standard equipment. Being of Kellogg heavy duty construction, it produces ample power for ringing extensions in regular service.

Rear View of Type 1003 Cordless Switchboard

WIRING consists of hand made cable of 22 B & S gauge tinned copper conductors, insulated with silk and cotton wrappings. Enamel insulated wire may be had at small additional cost, if climatic conditions require extra moisture-proofing. Each P.B.X. is complete with an Operator's Set of the desk stand type, and listening keys (with white handles) associated with each connecting circuit. The hook switch contacts are arranged to shut off the alarm buzzer when the receiver is lifted. A Masterphone desk set may be had at slight additional cost. The telephone also mounts a dial when automatic trunks are specified. The dial itself is not regularly furnished and must be ordered separately.

	Lines		Trunks		Connecting Ckts.	
Code No.	Wired	Equipped	Wired	Equipped	Wired	Equipped
1006-A	10	As	3	As	3	As
1006-AA	10	Specified	3	Specified	5	Specified

Type 2006 Cordless Switchboards



Type 2006 Cordless Switchboard

In certain locations where space is not available for a floor type P.B.X. and the number of lines required exceeds ten, the Kellogg 2006 type cordless P.B.X. will be found the ideal equipment. It is constructed and arranged exactly the same as the 1006 type, except that the cabinet is wider, allowing a capacity of 20 lines, five connecting circuits, and three trunks. Four or five trunks may be wired if the number of lines is correspondingly reduced to nineteen or eighteen.

All lines are wired for line relays because the increased number of telephones spread over a larger area generally results in lines that exceed the 30 ohm limit for series operation. Trunk circuits may be provided to connect with any type of main exchange whether magneto, common battery, or machine switching. Common battery manual trunks are more widely used in this switchboard. Night keys for night or unattended service are provided as in the 1006 type.

The operator's telephone is either a desk stand or a Masterphone desk set, depending on the preference indicated.

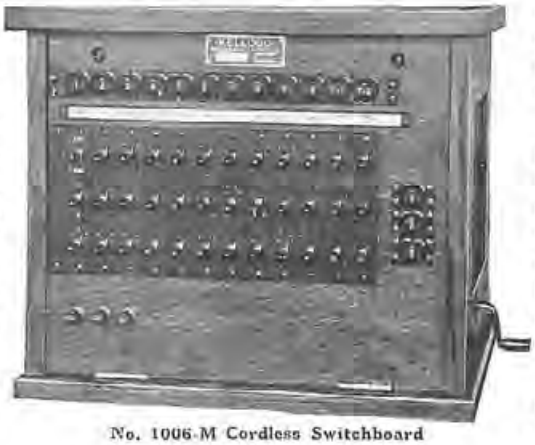
Designations are provided for all lines, trunks, connecting circuits, and miscellaneous keys. Blue prints are included with each shipment for maintenance purposes. In addition, a photostat circuit print is mounted inside the rear door of each switchboard for easy reference by the trouble man. Maintenance tools are not included, but may be furnished at slight additional cost.

The cabinet dimensions are: height, 16⅞ inches; depth, 14½ inches; width, 26¼ inches. The shipping weight is approximately 185 pounds, fully equipped.

This switchboard may be modified to meet the needs of practically any condition. The standard cabinet finish is No. 9 oak, but any kind of wood and cabinet finish can be had, as well as special materials and finishes for the face panel. Prices will be furnished on request for equipment of other than regular design, such as applicable for police and fire service, and power company communication or dispatching, where a large cordless switchboard is more desirable than any other type of switching equipment. The Kellogg 2006 type cordless P.B.X. requires but little maintenance. The long wearing qualities of Kellogg cam keys, which are thoroughly insulated, makes this cordless P.B.X. an assembly of unusually long life, and capable of providing dependable service in any location.

MAGNETO CORDLESS P.B.X. SWITCHBOARDS

When a P.B.X. is required for switching a small number of magneto lines, the Kellogg 1006-M Magneto Cordless is the correct equipment to use. Its small size permits it to be placed on a desk or table out of the way. Its simple circuits make it easy to operate and maintain in good working order. Because it has no cords to wear out there is practically no part that needs replacement under ordinary conditions. This P.B.X. is a favorite among pipe line, oil, electric companies, railroads, and fire departments where continuous, reliable service is most important.



No. 1006-M Cordless Switchboard

The cabinet is constructed of kiln-dried, quarter-sawed oak, with a medium dark finish. The face panel is arranged with twelve line drops on a mounting, across the top. Each line drop has associated connecting keys immediately under it. Each of the connecting circuits has a supervisory drop located at the side.

Ten of twelve lines are numbered from 1 to 10, the remaining two being marked "T1" and "T2" and designated as trunk circuits. All of the drops and keys are alike in lines and trunks. Since the 1006-M cordless P.B.X. is designed for magneto service, all circuits operate from dry cells.

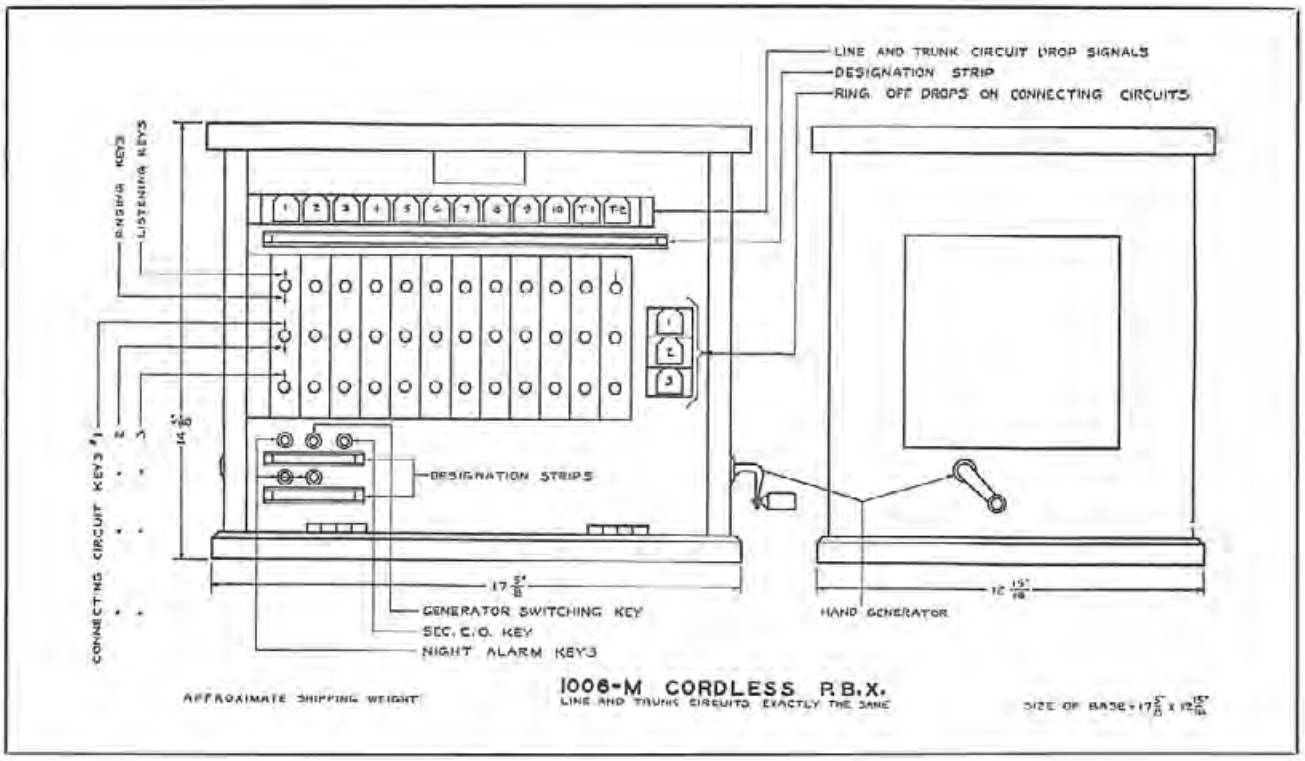
The drops are of the manual restoring shutter type with coils wound to 500, 1000, 2500 ohms. Unless otherwise specified, 500 ohms coils are furnished. Alarm contacts on the drop shutters actuate a regular night alarm buzzer.

Extra contacts may also be placed on the drop armatures for code ringing in case the lines have more than one telephone each. Code ringing is furnished at a slight additional cost. The Kellogg hand generator is wired through a switching key, so that power ringing may be used.

Terminals for connecting lines, trunks, and dry cells, are located on a maple connecting rack in the rear of the cabinet which opens with a full size side-swinging door. The terminal side of all keys, and the armature side of all drops are exposed by the hinged front panel which opens forward by loosening two cabinet locking screws.

All wiring consists of hand made cable of thoroughly insulated 22 B & S gauge copper wire. Standard wiring provides for ten lines, two trunks, and three connecting circuits. As many lines as desired may be equipped up to capacity. Although three connecting circuits are standard, four may be provided at slight additional cost.

An operator's telephone of the desk stand type with long case receiver is furnished with each switchboard. A Masterphone desk set can be had at an increase in price.



Kellogg Telephones

Kellogg telephones have attained an enviable reputation for having the finest transmission and reception. This dominant advantage, and the superiority it gives Kellogg telephones is, in a measure responsible for the fact that thousands of companies throughout the world have standardized on them. This leadership has not been attained by mere chance. Kellogg has successfully held this prominent position of leadership in the industry for more than a third of a century by persistent effort. The Kellogg organization has given innumerable products to further telephony's progress.

Kellogg telephones have always played an important part in this advancement. They are today, the recognized standard for transmission and reception. They are dependable and trouble-free. Kellogg telephones are simple in design and ruggedly constructed. They are manufactured with care and precision. They require practically no maintenance attention and insure satisfactory service for years and years.

Wherever Kellogg telephones are given the opportunity to perform, they prove to be the finest instruments that money can buy.

Kellogg Transmitters

Kellogg transmitters are specially designed to give the best results in long distance as well as local service. The diaphragm is made from hard drawn aluminum. The highest grade carbon, correctly sized, insures minimum battery consumption and freedom from packing. The small number of parts, accurately made from the best materials, insure long life with practically no chance for trouble.

Kellogg Receivers

The design of Kellogg receivers secure a uniform clearness of tone and accurate articulation. The diaphragm, made of perfectly flat ferrotype metal of proper thickness, is always held in the correct position to respond freely and accurately to the voice currents. The permanent magnets are made from the best grade of magnet steel, and hold their magnetism indefinitely.

Kellogg Induction Coils

The windings of Kellogg induction coils are of the proper resistance and balance. This permits sufficient current to carry over long distance lines without distortion, and yet not reduce the strength of the incoming voice currents.

Kellogg Ringers

Kellogg ringers are extremely sensitive and efficient. Even under adverse conditions when available ringing current is at a minimum, Kellogg ringers respond where others fail. The gongs are manufactured from the best materials obtainable. They are rich in tone and will not crack or become "dead" through regular service.

Kellogg Condensers

Kellogg condensers are manufactured by the most modern processes and with the best materials. They are made to meet the maximum voltage that may be required in the class of work for which they are designed.

Kellogg Generators

The unusually strong output of Kellogg generators is primarily due to the special design and special materials used in the permanent magnets, and in the revolving armature. Kellogg generators are reliable and insure long life in all types of magneto service. Only a minimum number of parts are used in their construction.

Kellogg Hookswitches

The simple, sturdy design of Kellogg hookswitches make them highly efficient. They are of the short, compact type with removable hook. The nickel silver contact springs are of the correct length for proper tension, and are equipped with special contacts. Kellite is used exclusively for insulation purposes.

Kellogg Cabinets

Kellogg magneto telephones generally have standard quarter-sawed oak cabinets. The cabinets are regularly constructed from carefully selected lumber of the finest grade, and beautifully finished in natural golden oak.

Kellogg common battery telephones have cabinets of pressed steel. They are durable and lasting, and have a protective finish of heavy black enamel.

Kellogg Circuits

Kellogg talking circuits are designed in connection with the Kellogg transmitter and receiver and induction coil, for maximum transmission and reception. These circuits are simple and efficient. The ringing circuits are also designed for the greatest efficiency.

The KELLOGG Masterphone

More than twenty-five years ago, the first Kellogg handset was introduced to the telephone industry. Since that time, handset telephones have become increasingly popular with telephone men and subscribers.

The Masterphone is the latest development of this type of phone. It is generally accepted by telephone men as the finest and most beautiful instrument of its kind. Many improvements and exclusive features are incorporated in the Masterphone, which are lacking in other handsets. Its modern, streamline design is rugged and beautiful. Its simple, durable construction, practically eliminates all maintenance attention. Its ease of operation, and perfect transmission and reception, satisfies those who demand utmost efficiency.

The same outstanding characteristics which made the desk Masterphone so universally popular are also incorporated in Masterphone wall sets and compact wall extension sets, for every type of service.

Further information on the Masterphone line will be found on pages 35, 36, 38 and 41.

COMMON BATTERY TELEPHONES

710 Masterphone

The Kellogg 710 Desk Masterphone, for common battery service is designed for use with new balanced TRIAD circuit. With the Kellogg 610 desk set box, this Masterphone combines the use of latest type non-positional transmitter, and the TRIAD circuit to give perfect articulation, transmission with volume, and natural tone qualities. Extraneous noises or side tone, and foreign induced sounds, are eliminated by this circuit arrangement.

The 710 Masterphone, designed with extreme simplicity, consists of a molded Kellite handset and cradle base of modern beauty.

The transmitter and receiver are compact, self-contained units. No cord connections to these units. They can be quickly and easily removed for inspection or replacement, without tools. Heavy bronze contact clips on each unit firmly grip ends of bar conductors, assuring perfect contacts. Guide slots in housings and locating lugs on units and mouthpiece assure correct positions. Two heavy brass bars, molded into the solid Kellite handle, are the conductors to transmitter and receiver. These bars act as reinforcements, reduce breakage, and eliminate nuisance of threading cord ends through handle.

Only three cord connections to the handset. A special grommet, braided into the moisture-proof lead-in cord, eliminates tie-cords and relieves all strain from terminals.

Ample space provided for plunger switch assembly in base. No connecting racks and no cabling. All connections made direct to switch assembly. Two steel protector plates guard switch assembly from cord interference. Only two screws hold complete assembly in position. No special tools required. Sufficient clearance between all terminals eliminate danger of short-circuited connections.

Roomy base affords easy access to the long resilient contact springs. The springs are actuated by two durable rollers fastened to plunger. The rollers assure easy, positive operation of contacts, and less wear on parts. Plunger switch is operated by a flexible coil spring when handset is removed. This switch operates regardless of position or angle of handset on cradle. The three conductor handset cord is 42" long. Four conductor desk set cord is 72" long.

Information on Kellogg 610 type desk set box with the TRIAD circuit, for use with 710 Masterphone for common battery service, is given below.

700 Masterphone

The Kellogg 700 Desk Masterphone can be used for common battery or magneto service with any standard bell box arranged for the conventional three-conductor booster circuit. It is identical in construction to the 710 Masterphone, except provided with a three-conductor, 72" desk set cord.

Information on Kellogg 602 desk set box, recommended for use with 700 Masterphone for common battery service, is given on page 37.

610 Desk Set Box

The Kellogg 610 desk set box employs the new TRIAD circuit. When used with the 710 Masterphone, it gives the finest type of telephone service known to telephony. The complete absence of side tone results in clear, concise transmission and complete subscriber satisfaction. All natural tones are preserved, together with perfect articulation and volume. The new TRIAD balanced circuit used in this desk set box is wired by the Kellogg simplified system. All connections are made direct to connecting rack.

The Kellogg 610 enclosed gong, four conductor desk set box contains a ringer, condenser, induction coil and connecting rack in a standard wall box. The heavy, drawn steel cover is finished in durable black enamel. Special hinges allow the cover to be completely dropped off the box when installing or making adjustments. The ringer is Kellogg standard, and guaranteed to give many years of service without trouble. The condenser contains two windings with flexible leads which connect direct to the connecting rack. The three winding induction coil, and nine point connecting rack are combined to eliminate unnecessary wiring.

The connecting rack, induction coil, condenser, and ringer are easily accessible, and can be quickly removed with a screw driver. All connections are made directly to the connecting rack without the use of a soldering iron. Markings on the connecting rack are clearly stamped.

The entire unit occupies a wall space of 7 inches wide and 9½ inches high. The over-all depth is 3½ inches. Net weight 5½ pounds.

A complete desk set, employing the TRIAD circuit, consists of a 710 Masterphone and one of the following desk set boxes.

Code No.	Ringer	Ringer Frequencies
610-SA	1000 Ohm	Straight Line
610-BA	1000 Ohm	Biased Ringer
610-HB	Harmonic	30, 42, 54, 66
610-HA	Harmonic	16⅔, 33⅓, 50, 66⅔

COMMON BATTERY TELEPHONES

This compact set requires a wall mounting space 7 inches wide and 9½ inches high. Depth of cabinet, 3⅛ inches. Net weight 6½ pounds.

F9810 Masterphone

The Kellogg F9810 Wall Masterphone is for common battery service. It combines the use of the latest type non-positional transmitter, and the new TRIAD circuit. This arrangement gives the finest transmission known to telephony. The complete absence of side tone results in clear concise transmission and complete subscriber satisfaction. All natural tones are preserved, together with perfect articulation and volume. The new TRIAD circuit is wired by the Kellogg simplified system.

The transmitter and receiver are self-contained, compact units, and can be quickly and easily removed for inspection and replacement without tools.

The 27-C handset is the same as that of the 700 and 710 Masterphones, and suspended on a specially designed hook.

This Masterphone is of the enclosed gong type and contains a ringer, condenser, induction coil, connecting rack and hookswitch in a standard wall box. The heavy drawn steel cover is finished in durable black enamel.

The ringer is Kellogg standard, and guaranteed to give many years of service without trouble. The condenser contains two windings with flexible leads which connect direct to the connecting rack. Markings on the connecting rack are clearly stamped.

The three winding induction coil and connecting rack are combined to eliminate unnecessary wiring. The hookswitch contact springs are provided with screw type terminals for ease in connecting. All parts are easily accessible for inspection or adjustment. A screw driver is the only tool needed in replacing any of them. All connections are made without the use of a soldering iron.

Code No.	Ringer	Ringer Frequencies
F9810-SA	1000 Ohm	Straight Line
F9810-BA	1000 Ohm	Biased Ringer
F9810-HB	Harmonic	30, 42, 54, 66
F9810-HA	Harmonic	16⅔, 33⅓, 50, 66⅔

The 9710 Masterphone

The Kellogg compact wall extension 9710 Masterphone is an ideal, two-wire common battery unit without ringer. It combines the use of the latest compact type non-positional, self-contained transmitter and the new TRIAD balanced circuit to give transmission with volume, perfect articulation, and natural tone qualities. Extraneous noises or side tone are eliminated. The 27-C handset is the same as that of the 700 and 710 Masterphones.

The small drawn steel box is finished in a durable black enamel. It contains special Masterphone hookswitch, two winding condenser, and three winding induction coil and connecting rack unit.

Mounting space of only 4x5½ inches is required for this compact wall extension Masterphone. Net weight, with handset, 3¼ lbs.

439 Extension Desk Set Box

The Kellogg 439 extension desk set box, when used with the 710 manual or 730 dial-type Masterphone, provides a complete desk set without ringer, employing the new TRIAD balanced circuit. It gives the finest type of transmission known to telephony. The complete absence of side tone results in clear, concise transmission and complete subscriber satisfaction. All the natural tones are preserved with perfect articulation and volume. The TRIAD circuit is wired by the Kellogg simplified system. All connections are made direct to the connecting rack.

The connecting rack, three winding induction coil, and the two winding condenser are easily accessible and can be quickly removed with a screw driver. Markings on the connecting rack are clearly stamped.

The 439 desk set box is small and compact, occupying a wall space of only 4¾ inches by 6⅜ inches. The over-all depth including the black enameled steel cover is 2⅜ inches. Net weight, 2 pounds.

COMMON BATTERY TELEPHONES

Enclosed Gong Wall Telephone

F801 Wall Telephone

The Kellogg F801 wall set is of the enclosed gong type. It is wired with the Kellogg booster induction coil circuit which is designed in connection with the Kellogg transmitter and receiver to give maximum transmission and reception.

The F801 consists of an induction coil, ringer, condenser, hookswitch and connecting rack, mounted in a cabinet, and the transmitter and receiver. The cabinet is made of heavy drawn steel, finished in a durable black enamel.

All parts are easily accessible and can be removed with an ordinary screw driver. They are of Kellogg standard design and construction, and are interchangeable with those used on older Kellogg sets. The transmitter is sturdily constructed, yet extremely sensitive. It will give unequalled transmission over either long or short lines. The design and construction of the transmitter arm provides a permanent transmitter adjustment that will not loosen up in service. The receiver is of the same high quality and efficiency as the transmitter.

The connecting rack is conveniently located. It's identification markings are clearly stamped and filled with white lead so as to be readily distinguishable.

The mounting space required for this telephone is 7 inches wide and 9½ inches high. The depth of the cabinet is 3½ inches. The net weight is 7 pounds.

Code No.	Ringer	Ringer Frequencies
F801-SA	1000 Ohm	Straight Line
F801-BA	1000 Ohm	Biased Ringer
F801-HB	Harmonic	30, 42, 54, 66
F801-HA	Harmonic	16⅔, 33⅓, 50, 66⅔

Harmonic Rural Telephones

The Kellogg F802 telephone is recommended for common battery rural lines having divided ringing. This set is similar to the F801 type in appearance, design, and construction except provided with an extra condenser in the ringing circuit.

All Kellogg enclosed gong, wall or desk, common battery telephones are arranged so that they may be easily converted to this rural type by the addition of a 1 M.F. condenser.

Interior F801 Telephone

Code No.	Ringer	Condenser	Ringer Frequencies
F802-HB	Harmonic	2—1 M.F.	30, 42, 54, 66
F802-HA	Harmonic	2—1 M.F.	16⅔, 33⅓, 50, 66⅔

Desk Stand

F118 Desk Stand with F602 Desk Set Box

The Kellogg F118 desk stand is still the standard of comparison for good transmission, reception and low maintenance cost. It can be used for either common battery or magneto service, with any standard bell box arranged for the conventional three conductor circuit.

The rugged Kellogg desk stand is practically unbreakable. It is sturdily constructed. It has a permanent transmitter adjustment that will not loosen up in service. The trouble-free hookswitch and universal connecting rack are located in the roomy base, and are readily accessible for inspection. The steel base plate is equipped with a heavy felt rim which protects furniture and absorbs shocks.

The steel upright is covered with a tube of Kellite, which will not chip, mar, or discolor. All other parts, with the exception of Kellite receiver and mouthpiece, is finished in durable black enamel.

For a complete common battery desk set, order F118 desk stand and one of the F602 desk set boxes listed below. Net weight of desk stand, 3½ pounds.

Enclosed Gong Desk Set Box

The F602 desk set box is of the enclosed gong type with Kellogg simplified wiring. It may be used with the Kellogg F118 desk stand or other telephones using the conventional three conductor circuit. Ringer, condenser, induction coil and connecting rack are mounted in the heavy drawn steel cabinet. Cabinet finished in durable black enamel. Special hinges allow cover to be completely removed. All parts easily accessible and quickly removable with ordinary screw driver.

Interior View

Induction coil and connecting rack are combined to eliminate unnecessary wiring. Flexible wires lead from condenser to rack. All connections easily made direct to rack without use of soldering iron.

Mounting space of 7 inches wide, 9½ inches high required. Over-all depth, 3½ inches. Net weight, 5½ pounds. Complete desk set consists of F118 desk stand and one of the following desk set boxes:

Code No.	Ringer	Ringer Frequencies
F602-SA	1000 Ohm	Straight Line
F602-BA	1000 Ohm	Biased Ringer
F602-HB	Harmonic	30, 42, 54, 66
F602-HA	Harmonic	16⅔, 33⅓, 50, 66⅔

730 Dial Type KELLOGG Masterphone

The Kellogg 730 Masterphone utilizes the new balanced TRIAD circuit. With the Kellogg 610 desk set box, this Masterphone combines the use of latest type non-positional transmitter, and the TRIAD circuit to give perfect articulation, transmission with volume, and natural tone qualities. Extraneous noises or side tone and foreign induced sounds are eliminated.

The 730 Masterphone, designed with extreme simplicity, consists of a beautiful Kellite handset and an attractive circular base. The 27-C handset is the same as that of the 710 Masterphone.

The transmitter and receiver are self-contained, compact units. No cord connections to these units. They can be easily removed for inspection.

The base has ample room for plunger switch assembly. No connecting racks and no cabling. All connections made direct to switch assembly. Two steel protector plates guard switch assembly from cord interference. Only two screws hold complete assembly in position. No special tools are required. Sufficient clearance between all terminals eliminate danger of short-circuited connections. Roomy base affords easy access to the long resilient contact springs. The springs are actuated by two durable rollers fastened to plunger. The rollers assure easy, positive operation of contacts, and less wear on parts. Plunger switch is operated by a flexible coil spring when the handset is removed. This switch operates regardless of position or angle of handset on cradle. The three conductor handset cord is 48 inches long. Four conductor desk set cord is 72 inches long.

The 730 Masterphone also makes an ideal extension set by wiring to the main station with quadruplex wire. Where a two-conductor set is desired, the 439 desk set box (page 36) may be used. Net weight, less dial, 3 pounds.

Information on Kellogg 610 desk set box given below.

725 Dial Type KELLOGG Masterphone

The Kellogg 725 Masterphone can be used with any standard bell box arranged for the conventional three conductor circuit. It is identical in construction to the Kellogg 730 Masterphone, except provided with a three conductor, 72-inch desk set cord. Information on Kellogg 602 desk set box, recommended for use with 725 Masterphone for machine switching service, is given on page 39.

9817 Dial Type KELLOGG Masterphone

Code No.	Ringer	Ringer Frequencies
F9817-BA	1000 Ohm	Biased Ringer
F9817-HB	Harmonic	30, 42, 54, 66
F9817-HA	Harmonic	16⅔, 33⅓, 50, 66⅔

The Kellogg 9817 wall Masterphone combines the use of latest type non-positional transmitter and the new balanced TRIAD circuit. This arrangement preserves all natural tone qualities together with perfect articulation and volume. Complete absence of side tone results in clear, concise transmission and complete subscriber satisfaction. The TRIAD circuit is wired by the Kellogg simplified system.

The transmitter and receiver are self-contained, compact units, and can be quickly and easily removed for inspection or replacement, without tools. The 27-C handset is the same as that of the 730 and 725 Masterphone.

This Masterphone is similar to the Kellogg 9810 Masterphone, except provided with a suitable dial adapter that will mount any standard dial. A connecting rack, near the dial mounting, is convenient for dial connections.

610 Desk Set Box

The Kellogg 610 desk set box with 730 Masterphone, gives the finest type of telephone service known to telephony. Complete absence of side tone results in clear, concise transmission and complete subscriber satisfaction. All natural tones are preserved, together with perfect articulation and volume.

New TRIAD circuit by Kellogg simplified wiring connects ringer, two-winding condenser, three-winding induction coil, and nine-point connecting rack. All parts easily accessible. Cabinet finished in durable black enamel. Special hinges allow cover to be completely dropped off. Over all size 7 inches wide, 9½ inches high, 3½ inches deep. Net weight 5½ pounds. Complete desk set consists of 730 Masterphone and one of the following boxes.

Code No.	Ringer Frequencies
610-SA	Straight Line
610-BA	Biased Ringer
610-HB	30, 42, 54, 66
610-HA	16⅔, 33⅓, 50, 66⅔

COMMON BATTERY TELEPHONES

F803 Dial Type Wall Telephone

F803 Wall Telephone

The Kellogg F803 dial type wall set is of the enclosed gong type. It is wired with the Kellogg booster induction coil circuit which is designed, in connection with the Kellogg transmitter and receiver, to give maximum transmission and reception.

The F803 consists of a transmitter, receiver, induction coil, ringer, condenser, hookswitch and two connecting racks (one for the dial connections) mounted in a cabinet. The cabinet is made of heavy drawn steel, finished in a durable black enamel. It is provided with a suitable dial adapter which will mount any standard dial.

All parts are easily accessible and can be removed with an ordinary screw driver. They are of Kellogg standard design and construction, and are interchangeable with those used on older Kellogg sets. The transmitter is sturdily constructed, yet extremely sensitive. It will give unequalled transmission over either long or short lines. The design and construction of the transmitter arm provides a permanent transmitter adjustment that will not loosen up in service. The receiver is of the same high quality and efficiency as the transmitter.

Interior F803 Dial Telephone

Both connecting racks are conveniently located. They are provided with universal type terminals. All markings are clearly stamped and filled with white lead so as to be readily distinguishable.

The mounting space required for the F803 is 7 inches wide and 9½ inches high. The depth of the cabinet is 3½ inches. The net weight less dial is 7 pounds.

The F803 dial type wall set is not furnished with dial unless specified. When dials are not furnished, the dial opening is covered with a black enameled apparatus blank.

Code No.	Ringer	Ringer Frequencies
F803-BA	1000 Ohm	Biased Ringer
F803-HB	Harmonic	30, 42, 54, 66
F803-HA	Harmonic	16⅔, 33⅓, 50, 66⅔

Dial Type Desk Stand

F301 Desk Stand with F602 Desk Set Box

The Kellogg F301 desk stand is the standard for good transmission, reception and low maintenance cost.

The rugged Kellogg desk stand is practically unbreakable. It is sturdily constructed. It has a permanent transmitter adjustment that will not loosen up in service. The troublefree hookswitch and universal connecting rack are located in the roomy base, and readily accessible for inspection. The steel base plate is equipped with a heavy felt rim which protects furniture and absorbs shocks.

The steel upright is covered with a tube of Kellite which will not chip, mar, or discolor. All other parts, with exception of Kellite receiver and mouthpiece, are finished in durable black enamel.

The F301 desk stand is not furnished with dial unless specified. Without dial, a black enameled apparatus blank covers opening. For a complete dial type desk set, order F301 desk stand and one of the F602 desk set boxes listed below. Net weight of stand, less dial, 4½ pounds.

Enclosed Gong Desk Set Box

The F602 desk set box is of the enclosed gong type with Kellogg simplified wiring. It may be used with the Kellogg F301 desk stand or other telephones using the conventional three conductor circuit. Ringer, condenser, induction coil and connecting rack are mounted in the heavy drawn steel cabinet. Cabinet finished in durable black enamel. Special hinges allow cover to be completely removed. All parts easily accessible and quickly removable with ordinary screw driver.

Interior View

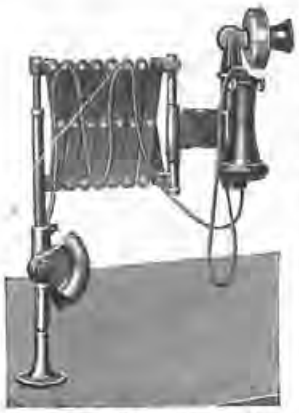
Induction coil and connecting rack are combined to eliminate wiring. Flexible wires lead from condenser to rack. Connections easily made direct to rack without soldering.

Mounting space of 7 inches wide, 9½ inches high required. Over-all depth, 3½ inches. Net weight 5½ pounds. Complete desk set consists of F301 desk stand and one of the following desk set boxes:

Code No.	Ringer	Ringer Frequencies
F602-SA	1000 Ohm	Straight Line
F602-BA	1000 Ohm	Biased Ringer
F602-HB	Harmonic	30, 42, 54, 66
F602-HA	Harmonic	16⅔, 33⅓, 50, 66⅔

COMMON BATTERY TELEPHONES

Bracket Telephone



Standard Bracket Telephone with Universal Attachment No. 2 Mounting

The Kellogg F618 Bracket Telephone is recommended in place of a standard desk stand when it is more convenient to have the phone off the desk and out of the way. This set is especially suitable for those who make constant use of the telephone. For the telephone company, this instrument secures a desk stand rate with practically no maintenance. It is less subject to breakage.

When it is desired to give the bracket a vertical movement as well as a horizontal, a Universal attachment may be obtained for a small additional cost, which transforms any standard bracket into a Universal type.

A complete bracket telephone consists of a Kellogg F618 Bracket Telephone and one of the F602 common battery desk set boxes described and illustrated on page 37. Shipping weight 9 lbs.

Mountings for Bracket Telephone

No. 1 | No. 2 | No. 5 | Universal Attachmen

No. 1 Mounting to be attached to the side of a flat top desk, a roll top desk, or table.

No. 2 Mounting is used on a flat top table or desk.

No. 5 Mounting is also used on the side of a flat top desk, a roll top desk, or table.

The No. 2 Mounting is standard, and is regularly furnished when either the Standard or Universal type arm is ordered, unless otherwise specified.

F429 Extension Desk Set Box

Interior View No. 429 Desk Set Box

The Kellogg F429 extension desk set box, when used with the 700 or 725 Masterphone, the F118 or F301 desk stands, provides a complete desk set without ringer. It may be used with any other standard three conductor desk telephone. It eliminates the necessity of stocking telephones with the induction coil and condenser in the base.

The F429 desk set box is small and compact, occupying a wall space of only 4¾ inches by 6⅜ inches. The over all depth including the black enameled steel cover, is 2⅜ inches. Net weight 2 lbs.

Two Conductor Desk Stand

No. 97 Desk Stand

The Kellogg F97 two conductor desk stand is similar to the standard F118 stand except for the addition of an induction coil and talking circuit condenser in the base. A two conductor cord is supplied for connection to the desk set box.

The simple, sturdy construction of the Kellogg F97 desk stand makes it practically unbreakable under ordinary conditions. It provides a permanent transmitter adjustment that will not loosen up in service. The trouble-free hookswitch, the universal connecting rack, the induction coil, and the talking circuit condenser are in the base. They are readily accessible for inspection. The steel base plate is equipped with a heavy felt rim. This felt rim protects the furniture and absorbs the jar, when the telephone is set down.

To assure a lasting finish that will not chip, mar, or discolor, the steel upright is covered with a tube of Kellite. The balance of the stand, with the exception of the Kellite receiver and mouthpiece, is finished in durable black enamel.

For a complete two conductor common battery desk set, order the F97 desk stand and one of the F605 desk set boxes listed below. Net weight of stand only 3½ pounds.

Two Conductor Desk Set Box—Extension Bell

No. F605 Desk Set Box

The Kellogg F605 common battery, two conductor desk set box and extension bell, consists of a ringer, condenser, and connecting rack mounted in a steel cabinet. This cabinet is similar in construction and appearance to the F602 enclosed gong desk set box described on page 37. It is made of heavy drawn steel finished in durable black enamel. Special hinges are used which allow the cover to be completely removed when installing or making adjustments. The ringer, condenser and connecting rack are easily accessible for inspection and adjustment. The connecting rack is clearly marked for convenience. Universal type terminals are used.

The F605 extension bell when used with the two conductor desk stand F97, which has a condenser and connecting rack in its base, forms a complete desk set.

Provision is made in the F605 cabinet so that a 99A induction coil may be easily added when desired. The addition of the 99A induction coil makes it identical to the F602 standard common battery desk set box.

The mounting space required is 7 inches wide and 9½ inches high. The over-all depth is 3½ inches. The net weight is 4 pounds.

Code No.	Ringer	Ringer Frequencies
F605-SA	1000 Ohm	Straight Line
F605-BA	1000 Ohm	Biased Ringer
F605-HB	Harmonic	30, 42, 54, 66
F605-HA	Harmonic	16⅔, 33⅓, 50, 66⅔

MAGNETO TELEPHONES

700 Desk KELLOGG Masterphone

The Kellogg 700 desk set is the most popular of Masterphone type instruments. It can be used for magneto or common battery service, with any standard bell box arranged for the conventional three-conductor circuit.

This Masterphone consists of a moulded Kellite handset and cradle base. It contains many exclusive Kellogg features such as the self-contained, compact receiver and non-positional transmitter units; simplified cord connections; plunger switch assembly with easy, positive operating plunger switch; the long resilient contact springs; and the solid Kellite handle moulded with two heavy brass bar conductors through the center. These features are fully explained on page 35.

Page 43 contains complete information on standard magneto desk set boxes, recommended for use with the 700 Masterphone. Net weight of 700 Masterphone, 2¾ pounds.

3809M Wall KELLOGG Masterphone

Code No.	Generator	Ringer	Remarks
3809M	3-bar	1000 ohm	
3812M	5-bar	1600 ohm	
3816M	5-bar	1600 ohm	condenser
3820M	5-bar	1600 ohm	condenser, secret calling button
3824M	5-bar	1600 ohm	condenser and grounding key

The Kellogg 3809-M Wall Masterphone consists of a standard Kellogg oak cabinet and a moulded Kellite handset suspended on a special Masterphone hookswitch. The F27-C handset is the same as that used with the 700 Masterphone.

The ringer is the Kellogg non-adjustable, non-sticking type. Permanent magnets are of high quality steel, and carefully wound high impedance coils with cores of soft annealed iron.

Kellogg generators are ruggedly constructed to withstand hard usage, and will give many years of service without attention. The 3-bar generator is designed for local lines having one or more telephones, or for lightly loaded rural lines. The 5-bar generator supplies ample current for long and heavily loaded rural lines. Mounting space required for Wall Masterphone is 7½ by 10 inches. Net weight: 3-bar wall set, 13½ pounds; 5-bar, 16½ pounds.

Battery-saver is not supplied with 3809M Masterphone unless specified.

F9827 KELLOGG Masterphone

The Kellogg F9827 compact wall Extension Masterphone is an ideal two-wire magneto unit without ringer. It consists of a small steel box and a moulded Kellite handset. The F27-C handset is the same as that used with the 700 Masterphone, and is suspended from a specially designed hookswitch.

The box is made of drawn steel, finished in a durable black enamel. It contains the hookswitch, induction coil, and connecting rack. The entire unit is small, neat, durable, and convenient, giving perfect transmission and reception. Its modern design is attractive. Its small size permits installation almost anywhere.

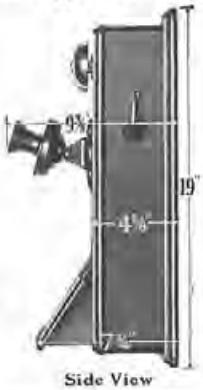
A mounting space of only 4 inches wide and 5½ inches high is required for this compact Masterphone. Net weight including handset is 3¼ pounds.

MAGNETO TELEPHONES

Compact Type Wall Telephone

Closed View

Shipping Weight
1 telephone to a box
3-Bar Gen. Type, 26 lbs.,
5-Bar Gen. Type, 29 lbs.



Side View

Shipping Weight
2 telephones to a box
3-Bar Gen. Type, 46 lbs.
5-Bar Gen. Type, 53 lbs.

Open View

Code F-2809 3-Bar Set 1000 OHM Ringer

This telephone is designed especially for local lines having one or more telephones, and for lightly loaded farm lines. It is equipped with the same long distance transmitter and sensitive Kellite shell receiver used on all Kellogg telephones. The ringer is the famous Kellogg non-adjustable, non-sticking type. The powerful 3-bar generator furnishes current output large enough for all service requirements except long and heavily loaded farm lines. This type of telephone can also be furnished with higher resistance ringers and with condenser, if required. No battery saver is furnished unless specified.

4-Bar Generator Sets

Four-bar generator sets are available in any of the following telephones, but the saving over the cost of the 5-bar is so small that the larger generator with its extra power is recommended.

Code F-2812 Heavy Duty 5-Bar Set 1600 OHM Ringer

This instrument is equipped with a powerful 5-bar generator capable of delivering the necessary voltage and current for the longest and most heavily loaded farm lines. The ringer is of the famous Kellogg 1600 ohm sensitive non-sticking type. Transmitter, receiver and induction coil are the same high standard used in all Kellogg telephones and give equally efficient transmission on long distance as well as local connections. A battery saver is furnished without extra charge.

Code F-2859 Heavy Duty 5-Bar Set 2500 OHM Ringer

Same as F-2812 except equipped with a 2500 ohm ringer for lines already equipped with this resistance.

Code F-2816 Heavy Duty 5-Bar Set 1600 OHM Ringer With Condenser

This telephone is the same as the F-2812 described above with the addition of ½ MF condenser in the receiving circuit. The duty of this condenser is to keep ringing current from passing through the receiver when the receiver happens to be off the hook. On long farm lines equipped with a number of telephones, it is possible to "ring through" even though a number of receivers are down, providing they are equipped with these condensers. A battery saver is furnished without extra charge.

Code F-2880 Heavy Duty 5-Bar Set 2500 OHM Ringer With Condenser

Same as F-2816 except equipped with a 2500 ohm ringer.

Code F-2820 Heavy Duty 5-Bar Set 1600 OHM Ringer With Condenser and Secret Calling Button

This instrument has the same equipment as F2816 but is furnished with a push button and a special generator capable of delivering two kinds of ringing current, pulsating and alternating. When the button is not pressed, the generator delivers alternating current to the line which rings all of the bells and throws the drop at Central.

By holding the button down while turning the crank, pulsating current is delivered which throws the drop at Central, but does not ring the other bells on the line. A battery saver is furnished without extra charge. No change in wiring is required at central office. This telephone can be used on either a grounded or metallic line, having various types of telephones on the line.

Code F-2860 Heavy Duty 5-Bar Set 2500 OHM Ringer With Condenser and Secret Calling Button

Same as F-2820 except equipped with a 2500 ohm ringer.

Code F-2824 Heavy Duty 5-Bar Set 1600 OHM Ringer With Condenser and Grounding Key

This telephone is arranged for calling Central secretly by ringing over one side of the line and through the drop to ground. It can only be used on two wire metallic lines which have all telephones equipped with push buttons and with the drop disconnected from one side of the line and wired to ground. This telephone is recommended only for lines already equipped with instruments of the same type.

Residence Type Wall Telephone

Backboard Dimensions
7½ inches by 10 inches
Shipping Weight, 20 lbs.

Code F-1809 3-Bar Set 1000 OHM Ringer

This instrument is same as F-2809 except for the cabinet and is equipped with a 3-bar generator and 1000 ohm ringer. Battery savers are not furnished with this instrument unless specified.

This is an excellent set where batteries can be located in the basement or other out of the way place and where minimum wall space is available.

Heavy Duty 5-Bar Set

This type can be furnished in other combinations of ringer resistance and generators on special order. For rural telephones, however, the compact sets containing a battery compartment are usually preferred.

MAGNETO TELEPHONES

Magneto Desk Stand

No. F118 Desk Stand

The Kellogg F118 desk stand is universally recognized as the standard of comparison for good transmission, reception and low maintenance cost. It can be used for either magneto or common battery service, with any bell box arranged for the conventional three conductor circuit.

The simple, sturdy construction of the Kellogg desk stand makes it practically unbreakable under ordinary conditions. A permanent transmitter adjustment is provided that will not loosen up in service. The trouble-free hookswitch and the universal connecting rack are located in the roomy base. They are readily accessible for inspection. The steel base plate is equipped with a heavy felt rim.

To assure a lasting finish that will not chip, mar, or discolor, the steel upright is covered with a tube of Kellite. The balance of the stand, except the Kellite receiver and mouthpiece, is finished in a durable black enamel.

For a complete magneto desk set, order the Kellogg F118 desk stand and one of the standard magneto desk set boxes listed on the right. Net weight 3½ pounds.

Bracket Telephone

Standard Bracket Telephone with Universal Attachment No. 2 Mounting

The Kellogg F-618 Bracket Telephone is recommended in place of a standard desk stand, when it is more convenient to have the phone off the desk and out of the way. This set is especially suitable for those who make constant use of the telephone. For the telephone company, this instrument secures a desk stand rate with practically no maintenance. It is less subject to breakage.

When it is desired to give the Bracket a vertical movement as well as a horizontal, a Universal attachment may be obtained for a small additional cost. A Universal attachment transforms any standard bracket into a Universal type.

A complete telephone consists of an F-618 Bracket Telephone and one of the standard magneto desk set boxes described on the right. Shipping weight 9 lbs.

Mountings for Bracket Telephone

No. 1

No. 2

No. 5

Universal Attachment

No. 1 Mounting is to be attached to the side of a flat top desk, a roll top desk or table.

No. 2 Mounting is used on a flat top table or desk.

No. 5 Mounting is also used on the side of a flat top desk, a roll top desk or table.

The No. 2 Mounting is standard, and is regularly furnished when either the Standard or Universal type arm is ordered, unless otherwise specified.

Magneto Desk Set Boxes

Kellogg magneto desk set boxes are compact and built to stand many years of hard usage.

They are used with the Kellogg 700 Masterphone, the F118 desk stand, or other desk stands wired for the conventional three conductor circuit, and can be easily converted to common battery. The mounting space required is 10¼ inches high and 8 inches wide. The over all depth of the cabinet is 6 inches.

No. F2309 Desk Set Box

Code F-2328 1000 OHM Ringer 3-Bar Generator

This standard Kellogg desk set box is recommended for business and residence service except for heavily loaded rural lines. It can be furnished with biased ringer for 4-party negative and positive pulsating ringing when desired. Shipping weight 14 lbs.

Code F-2361 Heavy Duty 5-Bar 1600 OHM Ringer

The powerful Kellogg 5-bar generator insures "ringing through" even on heavily loaded rural lines. This box can be furnished with 2500 ohm ringer. Shipping weight 17 lbs.

Code F-2370 Heavy Duty 5-Bar 1600 OHM Ringer With Condenser

This Kellogg desk set box is equipped with a ½ M.F. condenser in the receiver circuit. The condenser keeps ringing current from passing through the receiver when the receiver is off the hook. On long farm lines, equipped with a number of telephones, it is possible to "ring through" even though a number of receivers are down, providing they are equipped with condensers. If desired, a 2500 ohm ringer can be furnished. Shipping weight 17 lbs.

Code F2374 Heavy Duty 5-Bar 1600 OHM Ringer With Condenser and Secret Calling Button

This Kellogg desk set box is the same as the F-2370, with the exception of the secret calling feature which consists of a push button and a special generator, capable of delivering two kinds of ringing current, pulsating and alternating. When the button is normal, the generator delivers alternating current to the line which rings all of the bells and throws the drop at Central. By holding the button down while turning the crank, pulsating current is delivered which throws the drop at Central, but does not ring other bells on the line. No change in wiring is required at the central office. This desk set box can be used on either a grounded or metallic line having various types of telephones or desk set boxes on the line. If desired, a 2500 ohm ringer can be furnished. Shipping weight 17 lbs.

Code F-2376 Heavy Duty 5-Bar 1600 OHM Ringer With Condenser and Grounding Key

This Kellogg desk set box is arranged for calling Central secretly, by ringing over one side of the line and through the drop to ground. It can only be used on two-wire metallic lines which have all the telephones or desk set boxes equipped with push buttons and with the drop at central disconnected from one side of the line and wired to ground. If desired, a 2500 ohm ringer can be furnished. Wt. 17 lbs.

EXTENSION TELEPHONE ACCESSORIES, TEST SETS

Extension Key Boxes

No. 8

Kellogg key boxes are used for switching a telephone to one of several different lines or vice versa. They are extensively used in systems having several trunk lines and a separate intercommunication circuit. The sturdy cabinets are manufactured from select wood and finished in black ebony. The dimensions of the cabinet are: 5½ inches high, 3⅜ inches wide and 1⅜ inches deep. The net weight is 12 ounces.

Code No.	Switches One Telephone	Key-Locks In
8	to either of 2 lines	2 positions
9	to either of 3 lines	3 positions

Induction Coil

No. 100A Induction Coil

The Kellogg 100A induction coil, when used with the 700 Masterphone or the F118 desk stand makes an ideal, two wire, magneto extension set less ringer and generator. It consists of a suitably marked universal connecting rack mounted and wired to the standard magneto induction coil. Dimensions: 4¼ inches long, 1⅝ inches high, 1⅜ inches wide. Net weight 7 ounces.

Magneto Extension Bells

No. 37 Extension Bell

The Kellogg 37 type magneto extension bell consists of a small, neat, quarter-sawed oak cabinet with ringer and two binding posts. The ringer is extremely efficient. It responds to even the weakest current, yet will not freeze or stick. Coils accurately wound with highest grade copper wire. The brass bells are finished in heavy black enamel. Dimensions 5½ inches high, 6⅜ inches wide and 4¾ inches high. Net weight 3 lbs.

Code No.	Resistance	Remarks
37SA	1000 ohms	Straight Line
37SD	1600 ohms	Straight Line
37SG	2500 ohms	Straight Line
37BA	1000 ohms	Biased Ringer
37HB	Harmonic	30, 42, 54, 66 cycles.

Weatherproof Loudringing Bell

The Kellogg Loudringing Weatherproof Extension Bell is especially designed for outdoor installations. It is also used extensively, however, for indoor purposes where a good loud ringing bell is required. The bells are furnished with either straight line or harmonic ringers. They operate perfectly under all climatic conditions. They are efficient and trouble-free.

The 6-inch steel gongs are cadmium plated. The housing consists of a heavy cast iron base with removable cast iron cover held by two screws. It has a weatherproof finish of heavy durable gray zinc paint.

Dimensions including gongs: width 13 inches, length 12¼ inches, depth 4¼ inches. Net weight 13½ lbs.

Code No.	Ringer	Remarks
65-SA	1000 ohm	Straight Line
65-SD	1600 ohm	Straight Line
65-SG	2500 ohm	Straight Line
*65-HB	Harmonic	30, 42, 54, 66 cycles
*65-HA	Harmonic	33⅓, 50, 66⅔, 16⅔ cycles.

*Equipped with No. 12 condenser 1 M.F. capacity.

Linemen's Test Set

The Kellogg 1025 compact, easy-to-carry linemen's testing and talking set is designed for use on common battery lines. It is a very desirable accessory to the linemen's repair kit. When used as a talking set, Central can be reached by simply "clipping" in at the main frame, the terminal rack, or out on the line.

The set consists of a Kellogg No. 19 handset arranged for two single conductor cords, sixty-two inches long, equipped with two No. 13 Universal test clips. The handset is made entirely of metal, black enameled with exception of the hard rubber ear cap.

Test Set

The Kellogg 1015 test set is a complete portable telephone, sturdily constructed, and will talk and ring over the longest and most heavily loaded lines. It is equipped with a powerful Kellogg 4-bar generator, 1600 ohm ringer, long distance transmitter, head receiver, induction coil, hookswitch and 2 No. 4 dry cells. The oak cabinet is strongly reinforced with metal corners. Net weight with dry cells, 15 lbs. Height, 8 inches. Width, 7 inches. Depth, 8⅜ inches.

Transmission Measuring Set

Receiver Unit

Oscillator Unit

This Transmission Measuring Set is compact, easy to use, commercially accurate, and reasonably priced. In addition to measuring transmission losses of lines, apparatus, and circuits, it measures capacity of condensers, inductance of coils, exact efficiency of transmitters and receivers, and tests all "wound" apparatus (relays, repeating coils, etc.) for balance, short circuits, and connections.

A receiver and oscillator unit comprise the Transmission Measuring Set. Each unit is contained in a compact, hand finished wood cabinet. The same receiver unit is used with either Model A or Model B.

Direct readings up to 15 decibels are made from the calibrated dial without calculation. Model A oscillator uses a mechanical vibrator that delivers a constant frequency of 1000 cycles. It is recommended where a rugged portable set is required. Model B, containing tube oscillator, is recommended where excessive vibrations interfere with the mechanical type.

MISCELLANEOUS TELEPHONES

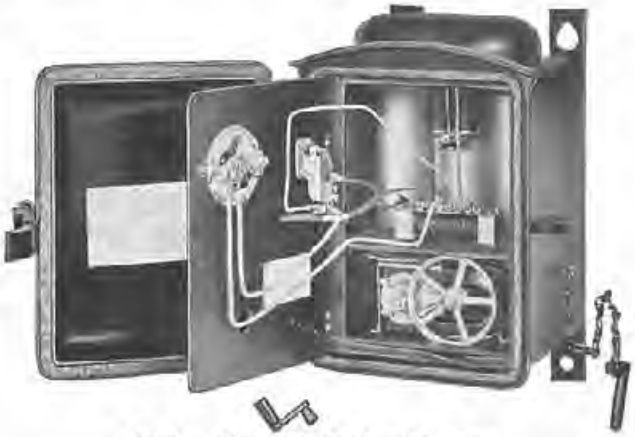
Kellogg Outdoor Telephone

The Kellogg Outdoor Telephone, type 4883, is one of the latest developments in the telephone field. It is the finest unit of its kind. This outdoor telephone is the result of a long study of the needs of the many diversified industries who use outdoor telephones.

No. 4883 Outdoor Telephone

This new Kellogg Outdoor Telephone contains all the desirable features necessary to meet every communication requirement. It is weatherproof, adaptable to any combination of common battery or magneto equipment, reasonable in weight, designed with simplicity, and all parts are accessible. As outdoor telephones are often used on long, heavily loaded lines where transmission and ringing efficiency are all important, provisions have been made to permit any circuit arrangement necessary to assure the highest quality transmission and reception, and efficient ringing.

The cast iron housing is weatherproof, but ventilated to prevent condensation of moisture or "sweating." It has a cast-in shelf upon which three dry batteries may be placed. Ample space is provided for either the standard Kellogg five-bar or six-bar generator. The generator is mounted on a sliding bakelite shelf and can easily be removed for inspection. The induction coil is mounted on another sliding bakelite shelf upon which space is also available for a condenser when specified. The connecting rack is mounted on the induction coil. Simplified wiring, with rubber insulated wire, is used throughout. No cabling required.



Interior of No. 4883 Outdoor Telephone

The door of the iron housing is securely fastened by a locking pin which is attached to the box by a chain. The door swings to the left permitting free use of the right hand for the operation of the generator crank and other functions.

Slotted screw holes in the mounting lugs permit the setting of the upper lag screws before the housing is hung in place. The entire telephone may be handled and installed by one man.

The Kellogg 4883 type outdoor telephone is equipped with a 32-L low-resistance, local battery type transmitter for operation with either two or three standard No. 6 dry cells. The receiver is the Kellogg 81-A high efficiency watch-case type, with cobalt steel magnets. This receiver, though small and compact, is an ideal unit because its size does not sacrifice the quality of reception. The Kellogg 100-A induction coil, with silicon steel core, is balanced for transmission and reception. It is combined with a bakelite connecting rack. The 159 hookswitch is provided with screw terminals. The Kellogg 55-EG ringer is equipped with three inch gongs of the non-adjustable armature type, with adjustable gong posts. It is the most efficient bell ever furnished on an outdoor telephone. The Kellogg 81 type five-bar generator is regularly furnished. When a six-bar generator is required, the 75 type is used.

Face View of No. 4883 Outdoor Telephone

The black weather-proof finish housing has an over all height (not including mounting lugs) of 14⅛ inches, width over clasps and hinges 11⅝ inches, over all depth 10¼ inches. Horizontal mounting centers 7⅞ inches; vertical mounting centers 14¼ inches.

Weight complete less dry batteries, with five-bar generator, 69 lbs., with six-bar generator, 72 lbs.

Kellogg Iron Housing

The Kellogg No. 1 iron telephone housing is of sturdy weatherproof construction. It is made of cast iron and finished with one dip coat of black asphaltum paint over which is applied one durable coat of aluminum paint. The self-closing door is provided with a Corbin lock. The top is provided with a three-quarter inch tapped hole for the line wires.

The spacious interior of this housing provides ample room for standard types of telephones. The interior dimensions are 15 inches high at the side, 17 inches high at the center, 13½ inches wide, and 7¾ inches deep. The over all exterior dimensions are: 17½ inches high, 13½ inches wide, and 9½ inches deep. The net weight of the housing only, is 105 pounds.

MISCELLANEOUS TELEPHONES

Oil Field Telephones

No. 2884 Wall Telephone

Kellogg heavy duty Oil Field Telephones are especially designed for the Petroleum Industry. They are ruggedly built to meet all conditions in the field. Efficient ringing on long, heavily loaded lines, and superior transmission and reception are largely responsible for the popularity of Kellogg phones in pipe line and oil field work.

The Kellogg 2884 telephone is similar in construction, except for its larger size to the standard compact magneto telephone. It is wired with a separate primary and secondary circuit. Dimensions 23 inches high, 9¼ inches wide, and 5¼ inches deep. Net weight 26 lbs.

Code No. 2884 6-Bar Generator 2500 OHM Ringer

No. 90A Desk Stand with 2415 Desk Set Box

The Kellogg desk type Oil Field Telephone consists of a standard Kellogg 90A desk stand and a 2415 desk set box. The desk set box is equipped with a six-bar generator and 2500 ohm ringer. It gives the same service as the 2884 wall set, described above. The desk stand is durably finished in black enamel, and equipped with Kellite receiver shell and mouthpiece, providing an almost indestructible unit. Dimensions of desk stand 11 inches high, desk set box 10¼ inches high, 8¾ inches wide and 6¼ inches deep. Net weight of stand 3¾ lbs., box 17¾ lbs.

Insulated Telephone

The Kellogg insulated wall telephone is for use on lines in the vicinity of high-tension currents. It safeguards the telephone circuit, and protects the user from shock. It is of the compact type, having concealed binding posts. No exposed metal parts are connected to the circuits. The hookswitch is insulated as well as the generator crank. Dimensions 25 inches high, 8¼ inches wide, and 5¼ inches deep. Net weight 24¾ lbs.

Code No.	Generator	Ringer
2744	5-Bar	1600 OHM

Railroad Telephones

Kellogg Railroad Telephones are specially designed for utmost efficiency and lowest transmission loss. Apparatus and circuit designs are simple. In actual operation, Kellogg Railroad Telephones show the smallest loss and the highest efficiency of any similar telephone.

F2945 Wall Telephone

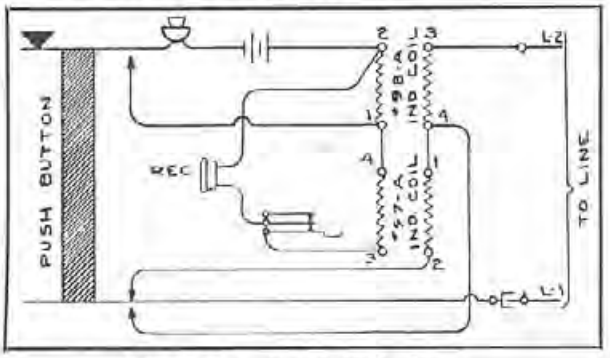
No. F2945 Telephone

The Kellogg F2945 telephone is of the compact wall type, equipped with an insulated generator, and a low wound watch-case type receiver with leather covered head band. It has sufficient space for three dry cells.

The circuit is designed to insulate the operator from any high potential line currents. This is accomplished by the transformer being wired across the line ahead of the operator. Such arrangement permits a great number of telephones to be permanently bridged across the line, any or all of which may have their receiver off the hook without materially affecting the transmission efficiency of the line.

The Kellogg F2945 telephone is more widely used at sidings, along right of ways, or similar places for the purpose of permitting conductors and trainmen to get into quick communication with the dispatchers.

This telephone is drilled and wired for, but not equipped with ringers. Ample space is allowed for ringers when desired. Dimensions 23 inches high, 9¼ inches wide and 5¼ inches deep. Net weight 25¼ lbs.



F1983 Insulated Telephone

No. F1983 Telephone

The Kellogg F1983 wall telephone is provided with the Kellogg standard magneto telephone circuit.

All coil windings are vacuum impregnated for protection against moisture. The wiring is of braided rubber covered wire. All metal parts are insulated for protection against voltages up to 1000 volts alternating current. This telephone is used at sidings, in yards, along right of ways, or similar places where a standard telephone of the insulated type is applicable. Dimensions 10¾ inches high, 8½ inches wide, and 6¼ inches deep. Net weight 18 lbs.

MISCELLANEOUS TELEPHONES

The F601 Bracket Telephone

F601 Bracket Telephone with No. 15 Wall Mounting

The Kellogg F601 Bracket Telephone is particularly designed for railroad use. The extension arm is strong and durable, and generally outlast others.

A low wound watch-case type receiver with leather covered head-band, the same as used with the F-2945 wall telephone, is generally furnished. When specified, a standard switchboard operator's receiver can be substituted.

The removal of one screw at the base of the instrument permits the barrel, or sleeve, to slide down. This allows easy access to the terminals and hookswitch assembly. All parts are specially insulated. Universal type terminals are provided. Either pin or spade tipped cords can be used. Standard spade tipped receiver and desk stand cords are furnished, unless pin tips are specified.

A special mounting bracket is furnished with each bracket telephone. When ordering, specify which of the mountings listed is desired. If a vertical movement of the bracket telephone is needed in addition to the horizontal, a universal attachment can easily be added. Net weight of bracket telephone including mounting, 9 pounds.

No. 1

No. 2

No. 5

Universal Attachment

No. 1 Mounting is used on the side of a flat top desk or table.

No. 2 Mounting is used on a flat top desk or table.

No. 5 Mounting is used on the back of a flat top desk or table.

No. 15 Mounting is used for flat surfaced walls.

No F4421 Generator Box

The Kellogg F4421 Generator box consists of a standard heavy duty five-bar generator mounted in oak cabinet similar in construction to Kellogg standard magneto desk set boxes. The generator leads are wired to suitable binding posts for convenience in connecting the line wires. The dimensions are: 10¼ inches high, 8 inches wide, and 6 inches deep. The net weight is 13½ pounds.

The F4421 is usually used in connection with either the F2413 or F2414 desk set box, and the F601 Bracket telephone for signalling purposes when the dispatcher is not always on the line.

No. F2413 Desk Set Box

The Kellogg F-2413 desk set box incorporates the same high efficiency circuit used in the F-2945 telephone.

This unit is equipped with a push button on the side of the box. It is arranged to operate with the F-601 bracket telephone which has a special receiver and transmitter, or with similar instruments of high efficiency.

All coil windings are vacuum impregnated as a protection against moisture. The induction coils have a break down of 1000 volts alternating current between windings.

When this desk set box is used at a way station, where the dispatcher is not always on the line, the F-4421 Generator Box should be installed for signalling purposes.

Dimensions of desk set box are: 7 inches high, 6 inches wide, and 3 inches deep. The net weight is 3 pounds.

No. F2414 Desk Set Box

The Kellogg F2414 desk box is similar to the F2413 except that it is not provided with push button, and requires the use of the No. 1 type foot switch.

This unit incorporates the same high efficiency circuit used with the F2945 wall telephone. It is arranged for use with the F-601 bracket telephone, or similar instruments.

When this desk set box is used at a way station where the dispatcher is not always on the line, the F4421 generator box should be installed for signalling purposes.

No. 1 Type Foot Switch

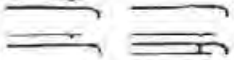
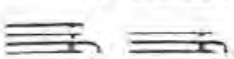
The Kellogg No. 1 type foot switch is a sturdy, reliable unit consisting of a housing formed from 16 BWG sheet steel, finished in durable, black baked enamel. The cover, of the same material and finish, fits snugly over the entire assembly, and is held in position with one screw. Four mounting screw holes are provided in the back and four in the base for rigid mounting.

A new type compression joint Unilet is provided for easy connection of conduit. No threads are required on the conduit with this type of Unilet. The foot pedal is a malleable iron casting, mounted in brackets welded to the back of the housing, and pivots on a ⅜" bearing pin.

A sturdy coil spring raises pedal to non-operating position when foot pressure is released. The coil spring is of non-rusting stainless steel, specially designed for maximum tension with minimum stretch. This construction reduces spring breakage and maintenance to a minimum.

The long resilient contact springs are of heavy gauge German silver. They are reinforced with special steel buffer springs, providing the required tension without danger of crystallization. Contact springs and terminals are insulated from the housing and foot pedal with bakelite and micarta. Terminals are provided for either screw or soldered joint connections. Spring assemblies are mounted on the back of the housing, safe from water, snow and mud, which might find entrance through the pedal slot.

The over all height of housing is 6½ inches, 3 inches wide, and 2⅝ inches deep. The over all depth including pedal is 5⅛ inches. The net weight is 3 pounds.

Code No.	Spring Combination	
1-A		One make contact
1-B		One make and one make and break contact
1-C		One break, two make and one make and break contact

Power Apparatus

All telephone switchboards require a source of current for ringing and talking purposes. Magneto switchboards are provided with hand generators for ringing, and dry cell batteries for the operator's transmitter. Power ringing may be used for magneto service when the operator must handle a large number of calls. All common battery boards require storage batteries both for ringing and talking.

The type of ringing equipment best suited for an individual exchange varies with each installation. Kellogg engineers will, upon request, and without obligation, recommend the most reliable and economical type.

Pole Changers

The pole changer is a machine designed to convert direct current into alternating current for telephone ringing purposes. It operates on the same principle as the ordinary door bell, with a weighted pendulum to regulate its frequency of vibration. Ordinarily, the telephone exchange storage battery of twenty-four volts is used to operate the vibrator, although dry cells or other sources of direct current of correct amperage and voltage are satisfactory.

Pole changers are supplied with a single vibrating unit for straight line service or with four or five vibrating units of different frequencies for party line service.

It is recommended that a five frequency harmonic pole changer be installed when changing over to selective service because four frequencies are then available for selective four-party ringing exclusively. The fifth frequency is then used for all straight line ringing, including toll. This fifth frequency adds but a trifle to the cost of the equipment, but does not increase the cost of operation.

Kellogg pole changers require very little attention. They hold their adjustment over a long period of time. There are only three vibrating springs; one is used to operate the pendulum, the other two, together with the swinging pendulum, produce the desired frequency of ringing current.

To protect the pole changer contacts, a 15-watt 100-volt mazda lamp should be installed in the line side of the ringing leads in each position of the switchboard.

Five Frequency Harmonic Pole Changer

The Kellogg 19 pole changer is designed especially for selective ringing service. It consists of five vibrating units identical with each other except for the vibrator reeds and weights. These simple vibrators change the direct current supplied by a 24-volt storage battery to frequencies of 16, 30, 42, 54 and 66 cycles alternating current. This current is then stepped up to the proper ringing voltage by the 18-A transformer set which is designed for use with this pole changer.

All of the equipment in the pole changer is mounted on a slate backboard and wired to suitable terminals. A hinged, glass door is provided to protect the apparatus and permits the maintenance man to make an occasional inspection without opening the pole changer cabinet. All parts are easily accessible for adjustment or cleaning.

Dimensions: 29⅛ inches long, 9⅜ inches wide, 6⅛ inches deep. Net weight, 58 pounds.

Code No.	Used With Transformer Set	Frequencies
19	18-A	16, 30, 42, 54, 66

Four Frequency Harmonic Pole Changer

Kellogg four frequency harmonic pole changers are similar in construction and appearance to the No. 19, except equipped with only four units. Dimensions: 21 inches long, 6¾ inches wide, 5⅛ inches deep. Net weight, 50 pounds.

Code No.	Used With Transformer Set	Frequencies
17	19-A	30, 42, 54, 66
6	21-A	16⅔, 33⅓, 50, 66⅔

Five Frequency Transformer Set

The Kellogg 18-A transformer set is used in conjunction with the 19-A five frequency pole changer. It contains five efficient heavy-duty ringing transformers that are accurately wound with heavy gauge wire, thoroughly insulated, and provided with a sufficient number of iron laminations to prevent undue heating under ordinary ringing loads.

These transformers are mounted in an oak cabinet having a solid oak hinged door. All the wiring is brought to the base and soldered to suitable terminals. Provision is made for fusing each individual transformer. The cabinet dimensions are: 37⅞ inches long, 10¾ inches wide, and 5¼ inches deep. The net weight is 125 pounds.

Code No.	Used With Pole Changer	Ringing Voltage	Frequencies
18-A	19-A	100	16, 30, 42, 54, 66

Four Frequency Transformer Sets

Kellogg four frequency harmonic transformer sets are similar in construction and appearance to the 18-A, except equipped with only four transformers. The cabinet dimensions are: 37⅞ inches long, 10¾ inches wide, 5¼ inches deep. The net weight is 105 pounds.

Code No.	Used With Pole Changer	Ringing Voltage	Frequencies
19-A	17	100	30, 42, 54, 66
21-A	6	100 to 145	16⅔, 33⅓, 50, 66⅔

Pole Changer Test Set

The Kellogg No. 5 pole changer test set provides a quick and easy method of checking harmonic pole changer frequencies.

It consists of a set of five harmonic ringers and the necessary condensers mounted in a compact quarter-sawed oak cabinet. The over all dimensions of this wall mounting cabinet are: 23¾ inches high, 8 inches wide, and 6¼ inches deep.

The frequencies of the ringers used in the No. 5 test set are 30, 42, 54, 66 and 16⅔ cycles. Other frequency combinations can be furnished on request. Net weight 17 pounds.

EKKO Frequency Meter

The Ekko frequency meter enables the maintenance man to check and accurately adjust pole changer frequencies.

It is a stroboscope type of meter, operated by a synchronous motor. The reading is accurate and direct; no computations nor stop watches are necessary. The pole changer to be regulated is connected to the meter and adjustments made until the desired frequency is shown.

The Ekko meter is portable, rugged, and inexpensive. It is housed in a neat wooden box approximately 10 inches square and 6 inches high. Net weight 10 pounds.

The Model A meter is arranged to check any of the following frequencies: 16⅔, 20, 25, 30, 33⅓, 42, 50, 54, 60 66 and 66⅔ cycles, and operates direct from 110-115 volt 60 cycle current supply.

POWER APPARATUS

Single Frequency Pole Changer

No. 36-A
Pole Changer

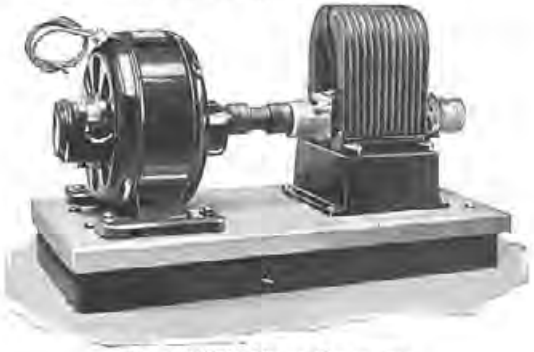
The Kellogg 36 type single frequency pole changer operates direct from the exchange storage battery, and produces 100 volt 20 cycle ringing current. This ringing current can be used for straight line, code, and party line (divided tip and sleeve) ringing.

The simple vibrator is of Kellogg standard design, and requires but occasional inspection and adjustment to keep it in perfect operating condition. The ringing transformer is accurately wound with heavy gauge wire, thoroughly insulated, and provided with a sufficient number of iron laminations to prevent undue heating under ordinary ringing loads.

The cabinet is of high grade oak, designed to mount vertically upon the wall. All of the equipment is securely fastened to the heavy oak backboard, and wired to convenient terminal. The hinged glass door protects the apparatus from dust and other foreign substances. It is easily opened, permitting free access for inspection and adjustment. The over all dimensions are: 25 inches long, 9½ inches wide, and 5½ inches deep. The net weight is 38 pounds.

Code No.	Operates From	Remarks
36-A	24 Volt D.C.	Standard Exchange Batteries
36-B	32 Volt D.C.	Home Lighting Batteries

Motor Generator Sets



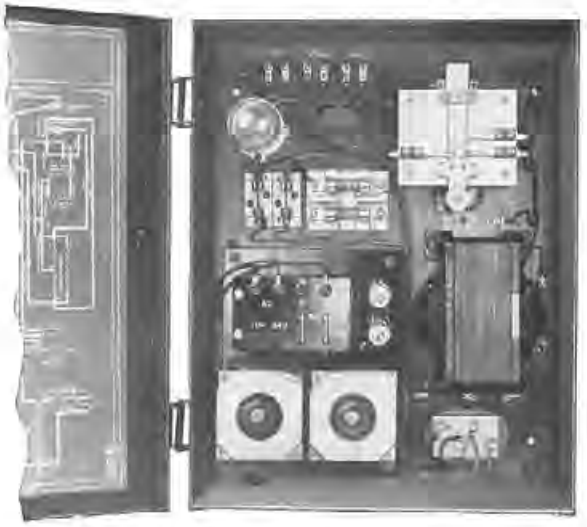
Type MSW3 Motor Generator

Exchanges having electric light service available will find the motor-driven magneto ringer an economical addition to their equipment. It can be attached to an electric light socket, and will ring with uniformity under a 10% rise or fall in service voltage. This equipment will handle exchanges up to 1,500 subscribers, delivering 80-volt, 19-cycle ringing current. A motor generator set requires minimum attention and costs no more to operate than a 100-watt electric light bulb.

Only standard sets are listed, but special motors can be supplied to operate from 25, 30, 40 or 50-cycle circuits. Where only two or three-phase circuits are available, the A.C. sets will operate from any one phase of these circuits. An attachment can be supplied to furnish pulsating current.

Cat. No.	Generator	Current Required for Motor
310081	MSW3	115-volt direct
310082	MSW3	230-volt direct
310087	MSW3	110-volt, 60-cycle alternating
310088	MSW3	220-volt, 60-cycle alternating

No. 1-A Power Unit



The Kellogg 1-A Power Unit, with a twenty-four volt storage battery, forms a complete power installation for P.B.X., magneto or small common battery switchboards handling any number of calls up to 3,000 a day. It supplies adequate ringing current of 100 volts, 20 cycle, and does not interfere with radio reception.

This compact unit combines in one cabinet, all the necessary fuses, switches, condensers, pole changer, transformer, dry charger, and filter equipment. All of the equipment is mounted on a wood backboard inside the black enameled steel cabinet. Dimensions of wall mounting cabinet: 20 inches high, 16 inches wide, 8 inches deep. Two conduit knockout holes are provided at top, one for entrance of commercial current and ringing leads to switchboard; the other for direct current leads to storage battery.

The direct current charging rate of the Westinghouse Rectox (dry) charger, is variable from approximately 100 milliamperes to 1 ampere by means of slide band resistors.

Code No.	Operating Current Cycle	Operating Current Voltage	Ringing Current Cycle	Ringing Current Voltage	Net Weight
1-A	60	110-115	20	100	100 lbs.

Telering Model EX-3

No. EX-3 Telering

The TELERING is a simple, economical and dependable ringing machine for converting commercial 60 cycle alternating current to 20-cycle telephone ringing current. It can also be furnished for 50 cycle commercial current. The manufacturer states that Telering absolutely will not interfere with radio reception.

The TELERING has only one vibrator and a single contact, with the result that the machine requires practically no attention. The output ringing current is maintained at a constant voltage. Only one model is used for any sized load. It is capable of ringing any exchange from a large central office down to a small P.B.X. The standard machine is equipped with a 50-watt lamp. The current consumption is only a few watts. Dimensions: 9 inches wide, 12 inches high, and 5 inches deep. Net weight 14 pounds.

POWER APPARATUS

Charging

Then tendency today, is to charge storage batteries by the trickle, or the automatic control method.

The trickle method consists of charging the batteries continuously over a twenty-four hour period at a constant rate sufficient to compensate for drain and battery losses.

The automatic control method allows charging equipment to automatically operate when battery discharge reaches predetermined point. Charger automatically disconnects when battery becomes fully charged.

Automatic control of the charging equipment eliminates the possibility of overcharging. The control unit may be either an ampere hour meter or voltmeter relay. Kellogg recommends the ampere hour meter because the operator can tell at a glance the number of ampere hours of reserve battery current on hand. The operation of the voltmeter is controlled by the high and low voltage of the battery.

An automatic starting rectifier must be used with the automatic charging control circuit.

The Fansteel or Tungar rectifiers listed on this page are of the automatic starting type, and suitable for use with an automatic charging control circuit.

Tungar Rectifier

The full wave Tungar rectifier is designed for telephone exchanges using either 24 or 48-volt batteries. It operates from either 105 to 125 or 210 to 250 volts 60 cycle single phase alternating current. Charging rate may be varied 1 to 3 amperes on any number of cells from 9 to 24.

No. 3049455 Tungar Rectifier

This Tungar is equipped with an insulating transformer, an internal direct current reactance coil, a 6 point switch to control the direct current charging rate and an ammeter. With the 6 point switch the operator may adjust the charging rate to meet the requirements of the battery.

Due to the efficient internal direct current reactance coil, it is perfectly quiet. This permits charging of the batteries while in service. It is admirably adapted for trickle charging on account of the variable charging rate which makes it possible to trickle charge any type of battery from a 3 to a 7.5 ampere size. It is a small compact set of the following over all dimension, 12⅛ inches wide, 13¼ inches deep and 15 inches high. Shipping weight 78 pounds.

The Tungar is mounted on 2 angle irons 17½ inches long. These angle irons are drilled for mounting the rectifier on the wall. The A.C. leads are brought out at the top of the rectifier, and the D.C. leads at the bottom. It is furnished completely equipped with 2 bulbs. It is a simple matter to connect the A.C. leads to the commercial current and the D.C. leads to the battery.

Cat. No.	Description
3049455	1 to 3 ampere Tungar rectifier with 2 bulbs.
12X825	Replacement bulb for above Tungar rectifier

Fansteel Rectifier

Fansteel CB-1-F Rectifier

This Fansteel Rectifier was developed for charging 24-volt storage batteries by the trickle-charge method. It differs from other chargers in that it does not depend on bulbs or vibrators, but upon the chemical characteristic of the elementary metal—tantalum. This metal when placed in an acid electrolyte with another metal such as lead, becomes a one-way conductor, allowing current to flow from lead to the tantalum, but not back.

The rectifying electrodes are the tantalum and the lead. The electrolyte in the rectifying cell is sulphuric acid of 1.200 gravity, the same grade used in telephone storage batteries except that a special salt of iron and cobalt has been added to stabilize the cell and diminish sediment in the jars. A coat of oil on top of the electrolyte prevents rapid evaporation of water, acid spray, and fumes. A built-in filter circuit eliminates all trace of A.C. hum.

Charger Type	Max. Charge	Dimensions, Inches Height	Width	Depth	Shipping Weight
CB-1-F	1 Amp.	12	12	8½	68 lbs.
CM-11-F	3 Amp.	16	22	8½	100 lbs.
CR-1-F	6 Amp.	21	24	10½	285 lbs.

Fansteel CAB-4 Operator's Power Unit

Fansteel CAB-4 Power Unit

The CAB-4 power unit consists of a small Fansteel charger and a sealed type, 4-volt Exide battery, operating from 110-volt, 60-cycle A.C. current. It provides a constant battery supply for the operator's telephone circuit and night alarm, year after year without interruption. The only attention required is the addition of water to the battery and rectifying cell, 2 to 3 times a year. This is a popular unit with those who do not want to rely on dry cells or primary batteries.

With this unit, supplying a continuous, uniform current flow to the operator's set, transmission of the highest quality is assured at all times. The charger has a direct current output of from 25 to 250 milliamperes. The 2-cell, 4-volt battery has a capacity of 14 ampere hours.

The CAB-4 power unit is large enough to furnish current for 2 or 3 operators' transmitters. It has sufficient battery reserve for approximately 4 days, should the commercial current fail. This unit is enclosed in an attractive steel case, 9⅓ inches deep, 8½ inches wide, and 8½ inches high. Shipping weight with battery, 55 pounds.

BATTERIES

Since the storage battery is the heart of the central office, it must be selected for reliability, and its capacity must be determined accurately. There are two general types of battery plates, the Planté and the Faure. The Planté plate, is formed from pure lead with the active material electrochemically deposited on ribbons or serrations inside. The Faure (pasted) plate is formed by the mechanical pasting of the active material in the open spaces of the grid-shaped lead-antimony sheet. Either type of battery will give good service in telephone installations. Longer life is generally conceded to the Planté type, while the Faure type is generally considered as having lower unit capacity cost.

The capacity of a storage battery for a given installation should be figured by multiplying the number of calls per day by the ampere drain for each call at an average holding time, plus at least a 10% safety factor. The average drain for a call of 1½ minutes duration on a Kellogg P.B.X., Universal, or toll cord circuit is .008 ampere, and the drain of an automatic ringing universal or feature cord is about .013 amperes. On this basis, 1,000 calls at .008 amperes requires a minimum battery capacity of 8 ampere hours, and 1,000 calls at .013 amperes requires a capacity of at least 13 ampere hours. The 10% safety factor should then be added to determine the correct battery capacity.

The following table shows the correct size and type of battery for small exchanges with various traffic loads and types of cord circuits. For battery capacity, greater than 60 ampere hours, consult a Kellogg representative or submit detailed information to the Kellogg factory.

Sealed type glass jar storage batteries are shipped complete, with electrolyte, inter-cell connectors, and other necessary parts to insure quick and satisfactory installation. Cells are charged, ready for immediate service.

TABLE OF RECOMMENDED BATTERY SIZES

Class of Service	No. of Calls in 24 Hours at 90 Seconds Holding Time	Approximate Ampere Hours Required		CAT. NO OF RECOMMENDED BATTERY				Charger
				EXIDE		PHILCO DIAMOND GRID		
		Manual	Automatic Ring	M'nch'st'r Pos. Box Negatives (Plante Type)	Pasted Plate (Faure Type)	Steel Glass (Faure Type)	Blown Glass (Faure Type)	
P.B.X. or Lamp Supv. Magneto	1000 or less	12	.....	CTMH	BTE-5	522UX	.....	
Main Exchange	1000-2000	16	.....	PTMH	BTE-7	922UX	.....	Fansteel CR-1-F
Main Exchange	2000-3000	24	.....	PTMH	BTE-7	922UX	.....	
Main Exchange	1000-2000	.....	26	ETMH	KXO-5	.....	5KB	
Main Exchange	3000-4000	32	.....	ETMH	KXO-5	.....	5KB	
Main Exchange	2000-3000	.....	39	DMGO-5	KXF-7	5DPG	7KB	3 Amp. Tungar or Fansteel CM-11-F
Main Exchange	4000-5000	40	.....	DMGO-5	KXF-7	5DPG	7KB	
Main Exchange	5000-6000	48	.....	DMGO-7	KXF-9	7DPG	9KB	
Main Exchange	3000-4000	.....	52	DMGO-7	KXF-9	7DPG	9KB	
Main Exchange	6000-7000	56	.....	DMGO-7	KXF-9	7DPG	9KB	

EXIDE BATTERIES

DMGO-5 Cell

Exide storage batteries are available in a variety of sizes and types to meet telephone requirements. For most applications, a sealed glass jar assembly is recommended. Composition covers are sealed to the top of the jars and provided with spray-proof vents. The elements are suspended from the cover by locked terminal posts, and braced by hard rubber pins passing under staggered lugs on the plates. In the larger sizes, two types are offered, the Planté, or "Chloride Accumulator," and the Faure, or "flat pasted plate."

The Chloride Accumulator is probably the most durable battery available because of its rugged plate construction. The Manchester Positive plate is of lead-antimony alloy perforated with openings into which buttons of active material are forced. The Box Negative plate has a grid formed of square pockets with perforated sides holding the sponge lead in permanent position. Cells of this type are available in capacities from 6 to 640 ampere hours at the 8-hour rate.

The pasted plate type will furnish greater capacity in a given space than the chloride type. The initial cost is lower. The active material is deposited on both sides of the plate framework in vertical strips between horizontal bars, which are staggered for greater strength. The jars, covers, and post construction, are the same as the chloride type. Capacities from 6 to 1064 ampere hours at the 8-hour rate are available. Where space is limited, and cost is a consideration, and service requirements are light, and operating conditions satisfactory, the results obtained from the pasted plate type may justify its selection.

For P.B.X. service, Exide batteries of the BTE, CTMH, and PTMH are furnished in painted wooden crates with carrying handles. Each crate assembly contains a pilot cell with charge indicating balls. The cells are connected with lead plated straps ready for service. Batteries are shipped charged and filled with electrolyte.


11 BTE Cells in Crate

Exide Batteries

Type	Ampere Hour Capacity 8-hr. Rate of Disch'rg	No. of Cells	Overall Dimensions in Inches			Net Weight Complete with Electrolyte Unpacked
			Length	Width	Height	
BTMH	6	11	26 5/16	4 11/16	9 7/8	56 lb.
CTMH	12	11	29 1/16	7 1/2	11 7/8	124 lb.
PTMH	24	11	33 3/4	8	16 5/8	206 lb.
ETMH	36	11	20 7/16	20 1/2	16 5/8	317 lb.
DMGO-5	40	1	4 11/16	8 1/16	14 13/16	29 lb.
DMGO-7	60	1	5 13/16	8 1/16	14 13/16	38 lb.
BTE-5	14.4	11	21 7/16	12	9 3/8	117 lb.
BTE-7	21.6	11	21 7/16	12	9 7/8	127 lb.
KXO-5	36	11	21 5/16	16 1/8	12 3/8	178 lb.

BATTERIES, POWER BOARDS

PHILCO BATTERIES

No. 9 EPG Cell

Philco sealed-type, spray-proof telephone batteries are available in capacities ranging from 12 to 1120 ampere hours. Composition covers, with spray-proof vents, are sealed to the top of pressed glass jars. The elements are supported on glass ribs moulded in the bottom and four sides of jar.

The Philco plates are of Diamond Grid construction with the active material firmly pressed into the plate and locked in place by virtue of crossing grid members on opposite plate surfaces. Each positive plate surface is further protected by a perforated, thin sheet rubber retainer.

The quarter-sawed hardwood separators placed between the positive and negative plates afford maximum strength and porosity. The special construction of the larger type glass jars, together with the tapered hard rubber wedges which fit tightly over the outside negative plate corners, hold the entire plate, separator, and retainer assembly in place. This reduces excessive sediment, and prevents buckling of plates or shifting from their original positions. This construction adds many years to the life of the battery.

The 12 and 24 ampere hour capacity batteries, known as the UX type, are generally used for P.B.X., magneto or small common battery exchanges where it is desirable to have the battery near the switchboard. For that reason they are housed in seasoned wood cabinets finished in oak or mahogany.

No. 922 UXA Battery

Protecting covers are provided with slots through which the built-in charge indicators can be seen. Sturdy UXB type cabinets without covers, can be furnished where finely finished cabinets are not required. They are finished with two coats of acid-proof asphaltum paint.

Where low initial cost is the deciding factor, the KB type of battery is often used. The cells are built with heavy Diamond Grid plates and quarter-sawed hardwood separators, suspended from composition molded covers, sealed to blown glass jars. Spray-proof funnel vents, double lug supports at the element top, and hard rubber tie-in rod beneath, complete a rugged unit. Slotted rubber separators may be had in these batteries by adding the initial R after KB, when ordering.

Philco Batteries

Type	Ampere Hour Capacity 8-Hr. Rate of Discharge	No. of Cells	Overall Length	Dimensions in Inches Width	Height	Net Wt. Including Electrolyte
522UXA	12	11	19 1/16	9	9 3/4	82 lb.
522UXB	12	11	19 1/16	9	8 1/8	82 lb.
922UXA	24	11	23 5/8	10 5/8	9 3/4	123 lb.
922UXB	24	11	23 5/8	10 5/8	8 1/8	123 lb.
5-DPG	46	1	4 15/16	8 15/16	13 1/4	27 lb.
7-DPG	69	1	5 15/16	8 15/16	13 1/4	33 lb.
5-KB	37	1	4 1/2	8 5/16	12 7/16	23 lb.
7-KB	55.5	1	4 1/2	8 5/16	12 7/16	26 lb.

POWER SWITCHBOARDS

The present day tendency is toward smaller sized power control panels. In most telephone exchanges, a wall type power board, requiring minimum space, is sufficient.

This is due to the greatly simplified types of power equipment now in general use, such as sealed type batteries, trickle charging, and automatic switching circuits. Kellogg engineers design power panels with full knowledge and understanding of the application of the latest developments in telephone power apparatus.

No. 37300

Asbestos ebony is used instead of slate because it does not buckle or warp, and is practically unaffected by chemicals. It is free from metallic or other substances detrimental to the performance of power switchboards.

In addition to the types illustrated, the Kellogg Company will gladly furnish designs, suggestions, and cost estimates on power panels of correct style and type for specific purposes.

No. 37300 Power Board

The Kellogg 37300 power board contains sufficient switches for controlling a rectifier and a five frequency pole changer. The asbestos ebony panel is 30 inches long, 9 3/8 inches wide, and 1 inch thick with a 1/8-inch bevel on the face side. It mounts on the wall with iron brackets extended eight inches from the wall. The meters are of the small type Weston Model 301.

No. 3-B Power Board

The Kellogg 3-B Power board is designed to switch two sets of five frequency pole changers, and two interrupter machines for automatic ringing.

It measures 31 3/4 inches long, 20 inches wide and 1 inch thick and contains 15 switches and the necessary fuses, meters and circuit breaker for a complete installation.

No. 4-B

No. 3-B

No. 4-B Power Board

The Kellogg 4-B power board contains 12 switches and the necessary fuses, meters and circuit breaker required in a small power plant installation.

It is supported by an iron pipe frame five feet six inches in height. The ebony asbestos panel measures 31 3/4 inches high, 17 1/8 inches wide and 1 inch thick.

ARRESTER AND CROSS CONNECTING EQUIPMENT

Every switchboard should be protected from lightning by some form of carbon lightning arrester for each incoming line. Where there is danger from electric light and power circuits, best practice calls for the use of a fuse or heat coil sneak current protector in addition to the carbon arrester, which is intended as a protection against lightning.

Every exchange of any size requires some means of cross-connecting in order that subscribers moving from one part of town to another can do so without changing their old number.

Switchboard cables should be permanently formed and the pairs numbered to correspond to the connected drops. In a like manner the line cables should be permanently formed and the pairs numbered to correspond with cable box numbers.

Then there should be a flexible link between switchboard and line cables, making it possible to connect any switchboard drop on to any outside line. These flexible links are called cross-connecting wires or "jumper" wires, and the terminals to which they attach are termed cross-connecting strips.

For convenience the protection and cross-connecting strips are usually mounted together and the whole combination is called a protector and main distributing frame or rack.

These are put up in two forms: wall mounting equipments for small exchanges and self-supporting upright racks of angle iron construction for large exchanges.

"L" Main Distributing Frame

The type "L" Main Distributing Frame on which the outside cable is terminated and the Central Office Protectors are mounted, is designed for maximum strength, rigidity and accessibility.

It is made in sectional form so that the additions may be made to the right or left without disturbing the existing equipment.

It is built entirely of steel in vertical sections one or two hundred pairs each. Cook Central Office Switchboard Protectors and standard line terminals can easily be attached as required.

Methods of construction and standard dimensions are shown in illustration. Angle iron is used for all verticals and for top and bottom of frame, while channel iron is used for all horizontal arms and cross-connecting ties.

A numbered maple fanning strip is mounted directly behind the steel protector mounting bar.

To facilitate distribution and tracing of cross-connecting wires, two rings with enameled insulation are provided for each cross arm. One, an open ring, is mounted on each vertical near each cross iron; and the other, a closed ring, is a part of the bracket which holds the line terminal blocks on type "L" frames in place.

When frames are equipped with line terminal blocks, and continuous maple distributing strips, as shown in Figure 3, only one large jumper ring is used, that being the ring on the vertical upright.

A ground lug is attached to the lower end of each protector mounting bar. A good ground connection is essential for all frames.

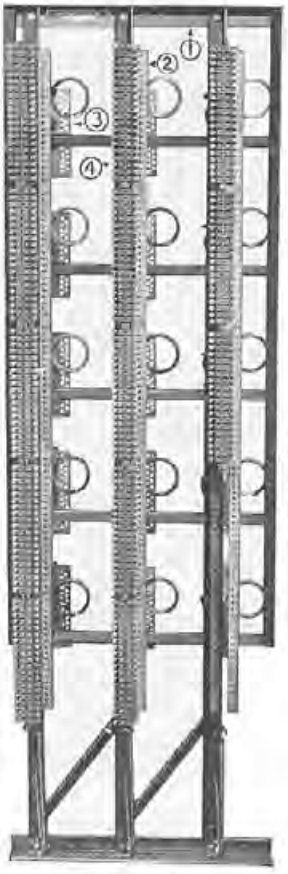


Fig. 1
"L" Main Distributing Frame Protector Side

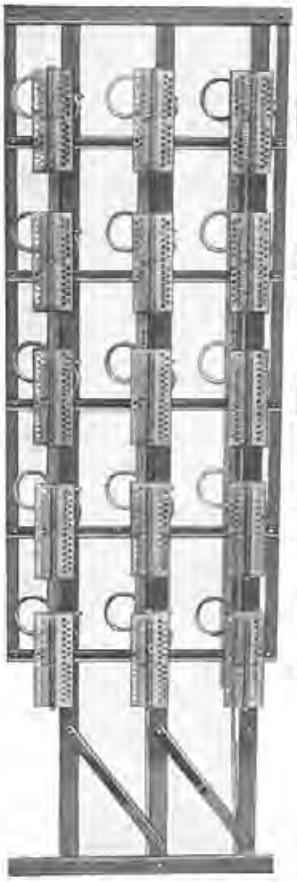


Fig. 2
"L" Main Distributing Frame Individual Line Terminal Blocks

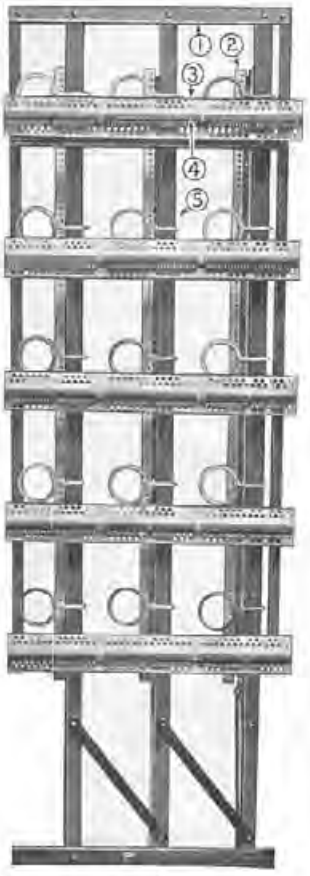


Fig. 3
"L" Main Distributing Frame Continuous Horizontal Maple Distributing Strip

Type "L" frame is manufactured in either single or double floor angle construction. The uprights of a standard 100 pair capacity are 6 feet in height from the floor line, but can be made to attach to the ceiling of terminal room.

All Cook frames are given three coats of black asphaltum paint unless otherwise ordered. They are assembled at the factory to insure perfect fitting of all parts and then knocked down for shipment.

Vertical Frame

There are four parts to a type "L" Main Distributing Frame as shown in Fig. 1:

1st. Framework consisting of all necessary steel parts, large jumper rings, bolts, nuts and ground lugs.

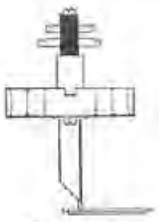
2nd. Vertical protector fanning strip, one fanning strip consists of two pieces of maple the capacity of the mounting bar. It is mounted directly behind the protectors on the right and left side of the mounting bar.

3rd. Line terminals consisting of nickel-silver punchings set in hard rubber, mounted on kiln dried individual maple distributing strip. Standard blocks are 20 or 26 pairs each, from 2 clips to 6 clips high. Blocks may be added as required.

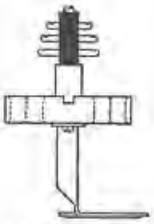
4th. Protectors in sections of 20 pairs each. These may be added as required.

ARRESTER AND CROSS CONNECTING EQUIPMENT

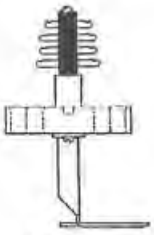
"L" Main Distributing Frame



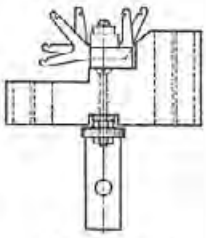
Cat. No. 1002



Cat. No. 1003

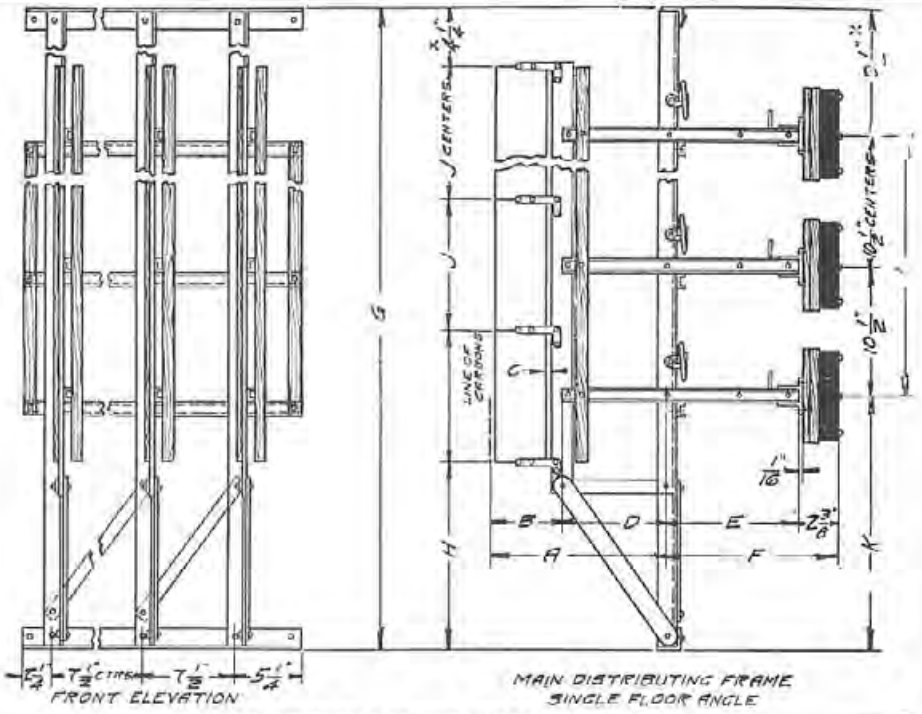


Cat. No. 1004



Cat. No. 4000

Line Terminal Blocks



PROTECTOR AND TERMINAL DIMENSIONS

TYPE OF PROTECTOR	SIZE OF FRAME	A	B	C	D	E	F 2 Clip
No. 100	SMALL 100-400 PR.	10 1/2"	4 1/2"	1/2"	6"	6 1/2"	8 3/4"
	MEDIUM—400-1000 PR.	12 5/8"	4 1/2"	1/2"	8 3/4"	10 5/8"	13"
	LARGE 1000 PR.-UP.	14 7/8"	4 1/2"	1/2"	10 1/4"	18 1/2"	20 7/8"
No. 105	SMALL—100-400 PR.	14 3/8"	8 3/8"	1"	6"	6 1/2"	8 3/4"
	MEDIUM—400-1000 PR.	17"	8 3/8"	1"	8 3/4"	10 5/8"	13"
	LARGE—1000 PR.-UP.	18 7/8"	8 3/8"	1"	10 1/4"	18 1/2"	20 7/8"
No. H-30	SMALL—100-400 PR.	12"	6"	5/8"	6"	6 1/2"	8 3/4"
	MEDIUM—400-1000 PR.	14 3/8"	6"	5/8"	8 3/4"	10 5/8"	13"
	LARGE—1000 PR.-UP.	16 1/4"	6"	5/8"	10 1/4"	18 1/2"	20 7/8

NUMBER OF PAIRS OF PROTECTORS PER VERTICAL	FRAME DIMENSIONS					
	Gx	H	J	K	L	X
100 (STANDARD)	6'-0"	1'-3 3/8"	10 3/8"	1'-8 1/2"	3'-6"	NOTE: X Dim's. variable with height of ceiling, standard dims. shown.
110	6'-10 1/2"	1'-8 1/4"	5 1/2" & 10 1/2"	1'-8 1/2"	4'-4 1/2"	
150	8'-7 1/2"	1'-8 1/4"	5 1/2" & 10 1/2"	1'-8 1/2"	6'-1 1/2"	
160	8'-7 1/2"	1'-3 1/4"	10 1/2"	1'-8 1/2"	6'-1 1/2"	
200	10'-0"	10 3/4"	10 1/2"	1'-4"	7'-10 1/4"	

Table of Dimensions of Cook Main Frame

Horizontal Frame

Line terminals may be mounted on continuous maple distributing strips either horizontally or vertically as shown in Fig. 3. When figuring on such construction there are five items to a Main Distributing Frame.

1st. Main Frame, iron work only.

2nd. Protector Fanning Strips.

3rd. Continuous maple distributing strips, horizontally or vertically.

4th. Line terminals in sections of 20 or 26 pairs, 2 to 6 clips high less maple distributing blocks.

5th. Protectors in 20 pair sections.

Cat. No.	Description	Net Wt., Lbs. per 100 Pair
1001	"L" Main Distributing Frame	35
1014	Vertical protector fanning strip	4
1002	Line terminal blocks complete with maple distributing strips	8
1015	Maple distributing strips only	5
4000	Three-way line terminal block complete	12
4001	Three-way line terminal block less maple distributing strip	4
4002	Maple distributing strip only for three-way line terminal block	8

NUMBERING: Line Terminals are numbered on the face of rubber blocks and fanning strips are numbered to the right of the mounting bar. These are numbered as ordered.

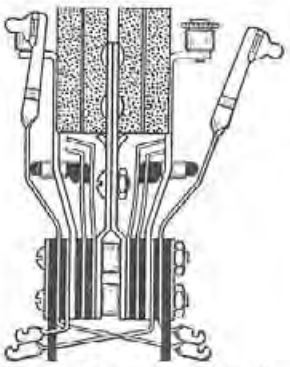
ARRESTER AND CROSS CONNECTING EQUIPMENT

No. 100 Central Office Protector

No. 100 Protector
Width, 2 in., Depth, 3½ in.

This Central Office Protector is the newest design. It is equipped with wire wound, self-soldering heat coils that operate accurately, and with carbon block arresters treated with Cook anti-dust process and spaced with celluloid dielectrics. The heat coils are mounted in a horizontal position and are very easily removed or replaced.

When operated, this protector opens the circuit, grounds the line and operates an alarm signal. All that is necessary to reset the protector is simply push the switchboard spring back over the heat coil. No coil to change, turn or resolder.



The diagrammatic drawing shows the simplicity of the assembly, with the switchboard solder lugs on one side, the line on the other. Carbon and heat coil holding spring is unusually heavy and insures a positive permanent tension between the lightning arrester carbons and ground plate. To permit "toothpicking," a special grooved carbon is used, toothpicks run into this groove, keep the ground and alarm spring open when the heat coil operating spring is released.

The terminal solder lugs of this protector are very securely held and designed to give ample strength. The terminal ends are formed and arranged to provide the easiest method for switchboard wiring.

Of the many attractive features of this protector, the testing facilities must not be overlooked. By simply slipping the test plug over the protector, testing is permitted through or around the heat coils. When test plug is withdrawn, the protector is reset.

This protector is furnished with wire wound heat coils not exceeding 4 ohms. These coils operate in less than 210 seconds on .5 ampere and will carry .35 ampere for 3 hours when tested at a temperature of 68° F. Heat coils with different operating characteristics may be furnished on special order.

Cat. No.	Description	Length Inches	Net Wt., Lbs. per 100 Pairs
1230	Protectors in 10 pr. Sections	5½	22
1231	Protectors in 20 pr. Sections	10½	21
1232	No. 100 Heat Coils	...	...
1234	No. 100 Test Plugs	...	...

No. 105 Central Office Protector

No. 105. Width, 3 inches; Depth, 7 inches

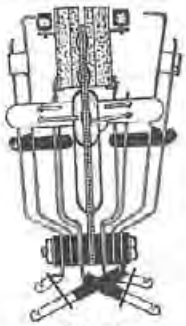
This is a combination of Cook No. 100 Protector with line fuses mounted in a compact and convenient way. The design and insulation afford excellent protection between the line and switchboard circuits.

The switchboard circuits are returned from the protector between the ground plates. The switchboard and line terminals are separated, and insulated on opposite sides of protector.

Fuses are of composition type: No. A-22, 4¾ in. long and are furnished in 3 ampere capacity unless otherwise specified.

Other details of this Protector are the same as No. 100.

Cat. No.	Description	Length Inches	Net Wt., Lbs. per 100 Pairs
1237	Protectors in 10 pair sections	5½	45
1238	Protectors in 20 pair sections	10½	47
1232	No. 100 Wire Wound heat coils	...	...
1234	Test Plug	...	...



No. 10
Width, 2 inches
Depth, 4¾ inches

No. 10 Central Office Protector

The operation of its heat coils opens the circuit, grounds the line, and operates an alarm signal.

The position of the springs, both before and after operation, is shown in the diagrammatic drawing. The resistance of the heat coil to an abnormal current generates sufficient heat to soften the low-melting point solder and release the spring. To reset the protector after operation, contact springs must be resoldered to the heat coils.

Heat coils are wire wound, not exceeding 4 ohms. They operate in less than 210 seconds on .5 ampere and carry .35 ampere for three hours at 68° F.

Cat. No.	Description	Length Inches	Net Wt., Lbs. per 100 Pairs
1100	Protectors in 10 pair sections	5½	23
1101	Protectors in 20 pair sections	10½	25
1103	No. 10 Wire Wound heat coils	...	...
1106	Test plug	...	...
2802	Heat coil solder	...	...
2803	Heat coil flux	...	...

No. 10-W Central Office Protector

This is a combination of Cook No. 10 Protector with fuses. Width, 3½ inches, depth, 9 inches. It is neat, compact and accessible. Cook special type of fuse-holding springs are used. They hold the fuses under constant and permanent tension and permit fuses to be easily installed and removed.

Fuses are type A-22, 4¾ inches long, composition type of 3 ampere capacity.

Cat. No.	Description	Length Inches	Net Wt., Lbs. per 100 Pairs
1110	Protectors in 10 pair sections	5½	42
1111	Protectors in 20 pair sections	10½	44
1103	No. 10 Wire Wound Heat Coils	...	...
1106	Test Plug	...	...
1112	Resoldering Clamp	...	...

ARRESTER AND CROSS CONNECTING EQUIPMENT

"B" Main Distributing Frame

This main frame is designed for mounting Cook No. 3800 protectors 3/8" centers which require no frame bar.

Like the "L" main frame, it is made up of vertical sections, each having capacity of 202, 303 or 404 pairs of protectors. Additions may be made to the right or left.

Vertical uprights, floor, top pieces and guard rail are of angle iron—shelf and cross channels are of channel iron. This frame is light, yet strong and rigid.

Frame is painted aluminum unless otherwise specified.

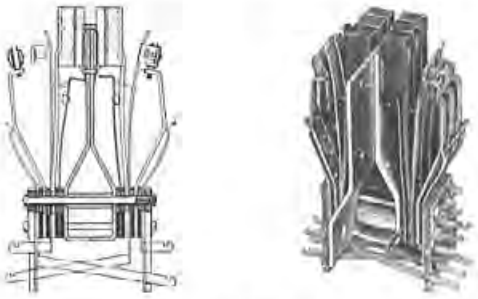
To facilitate the running of jumpers, large open rubber covered rings are furnished for attaching to the vertical upright at each shelf channel.

Dimensions of this frame are shown. These may be varied to suit conditions.

Line terminals are mounted on continuous maple distributing strips.

This main frame weighs approximately 24 pounds per hundred pairs.

No. 3800 Central Office Protector



No. 3800 Protector
Width 3 inches, Depth 4¾ inches, Length 39 inches

This protector is of latest design, embodying all of the best features of other protectors of earlier design including the ratchet type self-soldering heat coil. It is particularly adaptable for "B" type frames.

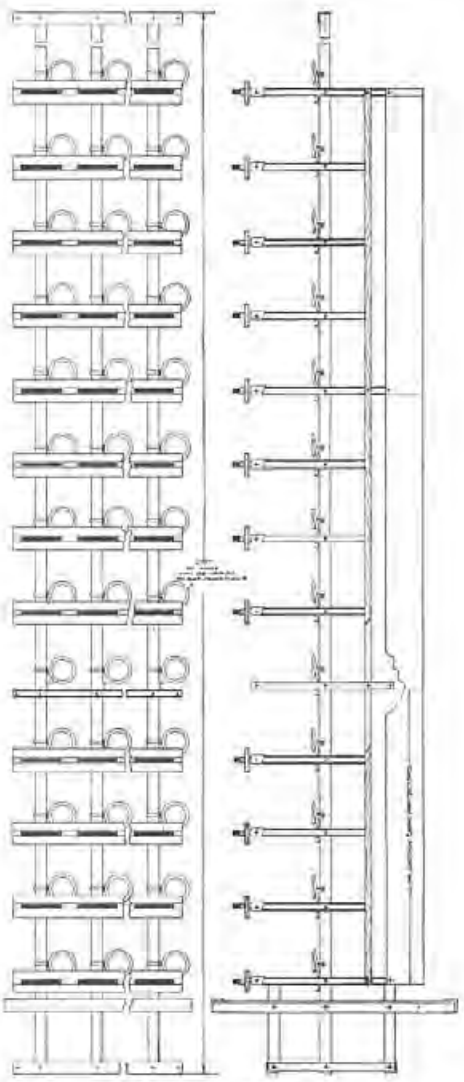
The protector is built in sections of 101 pairs, the pairs being spaced, on 3/8" centers. This gives great economy of head room as 101 pairs are mounted on 39" centers.

The mounting plate is made of cadmium-plated steel so formed as to secure great strength and rigidity. All the springs are of nickel silver of ample size to give positive operation for an indefinite period. The springs are mounted by two bolts passing through the mounting plate, the terminals being held in Bakelite clamping pieces. Insulation is of hard rubber throughout.

Heavy carbon springs insure positive permanent tension between lightning arrester units and ground plate. The spring in which the heat coil is set is of heavy material. The switchboard spring makes contact with this heat coil spring. This provides a means of opening the circuit without grounding the line or closing the alarm circuit.

When operated, this protector opens the circuit, grounds the line and operates an alarm signal. All that is necessary to reset the protector is to simply relatch the operating heat coil spring with the heat coil.

Testing is accomplished by means of a test plug. The circuit may be tested through or around the heat coils without disturbing the protector.



Dimensional Drawing

Heat coils are wire wound, less than 3 ohms in resistance. These coils operate in less than 210 seconds on .5 ampere and will carry .35 ampere for three hours when tested at a room temperature of 68° F.

Lightning arresters furnished are unit dischargers, consisting of two extremely hard, specially grooved carbons and celluloid dielectric, sealed together. These units will uniformly break down within a few volts of their predetermined rating. They are easy to test and replace.

This protector does not mount on a frame bar, but is attached directly to the shelf channels of the main frame as shown above.

Cat. No.	Description	Net Wt., Lbs. per 101 Pairs
1235	Protectors in 101 pair sections	22
1236	Test Plug for 3800 Protector	--
1240	No. 3800 Heat Coil	--
2614	Unit Dischargers	--

ARRESTER AND CROSS CONNECTING EQUIPMENT

No. H-36 Central Office Protector

No. H-36 Width 1 ½ In. Depth 5 in.

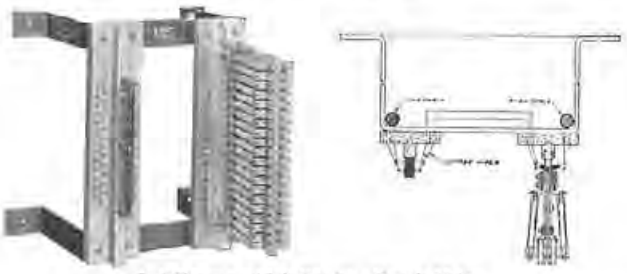
This is designed to protect circuits where heat coils are not required. The fuses and lightning arrester carbons are mounted on metal plates of the same length as those used for Cook Central Office Heat Coil Protectors and may be mounted on Main Frames which are also carrying heat coil protectors.

Fuses are held securely and with positive contact by Cook patented nickel silver clips. Standard carbons, one plain and one grooved, and "U" shape celluloids .005 inch thick are provided.

This protector is furnished with wood or composition fuses the latter being necessary where it is desired to meet the Underwriters' requirements. Unless otherwise ordered, composition fuses of 1 ampere capacity will be furnished.

Cat. No.		Length Inches	Net Wt., Lbs. 100 Pairs
1200	Protectors in 10-pair sections with A-46 wood fuses	5½	20
1201	Protectors in 20-pair sections with A-46 wood fuses	10½	20
1202	Protectors in 10-pair sections with A-45 composition fuses	5½	21
1203	Protectors in 20-pair sections with A-45 composition fuses	10½	21

L-9 Wall Frame



L-9 Frame width 9½ in. Depth 15 in.

This is a small distributing frame designed to carry any of Cook Central Office Protectors and 2-clip 26-pair line terminals.

It is arranged as follows:

Cable Side 26 pairs—Protector Side 20 pairs.

Cable Side 52 pairs—Protector Side 40 pairs.

Cable Side 78 pairs—Protector Side 60 pairs.

Distributing strips of hard maple are mounted on two heavy steel brackets with sufficient room to make it accessible.

The drawing shows the H-36 Protector mounted, also method of construction and wiring.

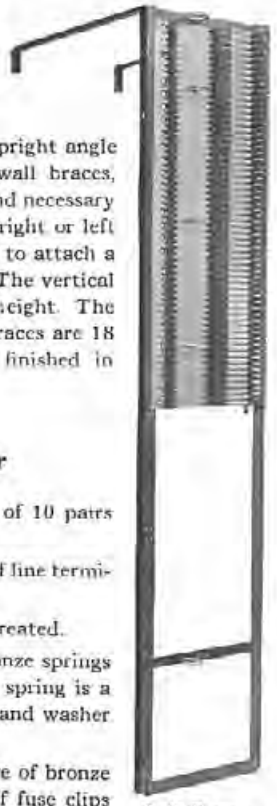
Cat. No.	Description	Length Inches	Net Wt., Lbs.
1050	20-pair size without protectors but including line terminals	12	10
1052	40-pair size without protectors but including line terminals	27	18
1054	60-pair size without protectors but including line terminals	42	32

L-10 Main Distributing Frame

This is a floor type of frame to be used in mounting H-51 Central Office Protector.

It is designed to replace the old wooden fire hazard wall frames.

Frame consists of two vertical upright angle iron supports with cross pieces, wall braces, jumper rings for top and bottom, and necessary bolts. Additions may be made to right or left side. The top cross piece is drilled to attach a cable bracket to the switchboard. The vertical uprights are six feet nine inches in height. The frame is sixteen inches wide and braces are 18 inches long. All steel parts are finished in aluminum.



L-10 Frame with No. H-51 Protector

No. H-51 Protector

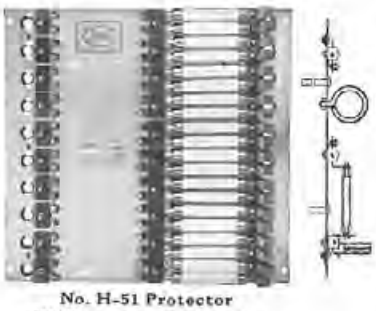
The H-51 Protector, in sections of 10 pairs each are installed as required.

H-51 Protector is a combination of line terminals and central office protector.

The base is of metal, aluminum treated.

Line terminal side consists of bronze springs set in hard rubber, one side of the spring is a solder connection, the other, screw and washer and solder contact.

Fuse springs and carbon block are of bronze set in hard rubber. Jumper side of fuse clips contain screw and washer and solder contact, switchboard cable clips are solder contact.



No. H-51 Protector
Width 12 in., Depth 16 in.

An extra solder clip is provided to make a common ground.

Carbons ground on a copper ground strip that runs the length of the mounting plate, with provisions to make the ground continuous.

Fuses are composition type A-12 of 1 ampere capacity. Standard grooved carbons and "U" shape dielectrics are furnished as standard equipment.

Where wires run through the metal base, fibre insulation is furnished for protection. Enameled jumper rings are mounted on top of each plate for cross connecting and covered metal pins on the back for tying up cable.

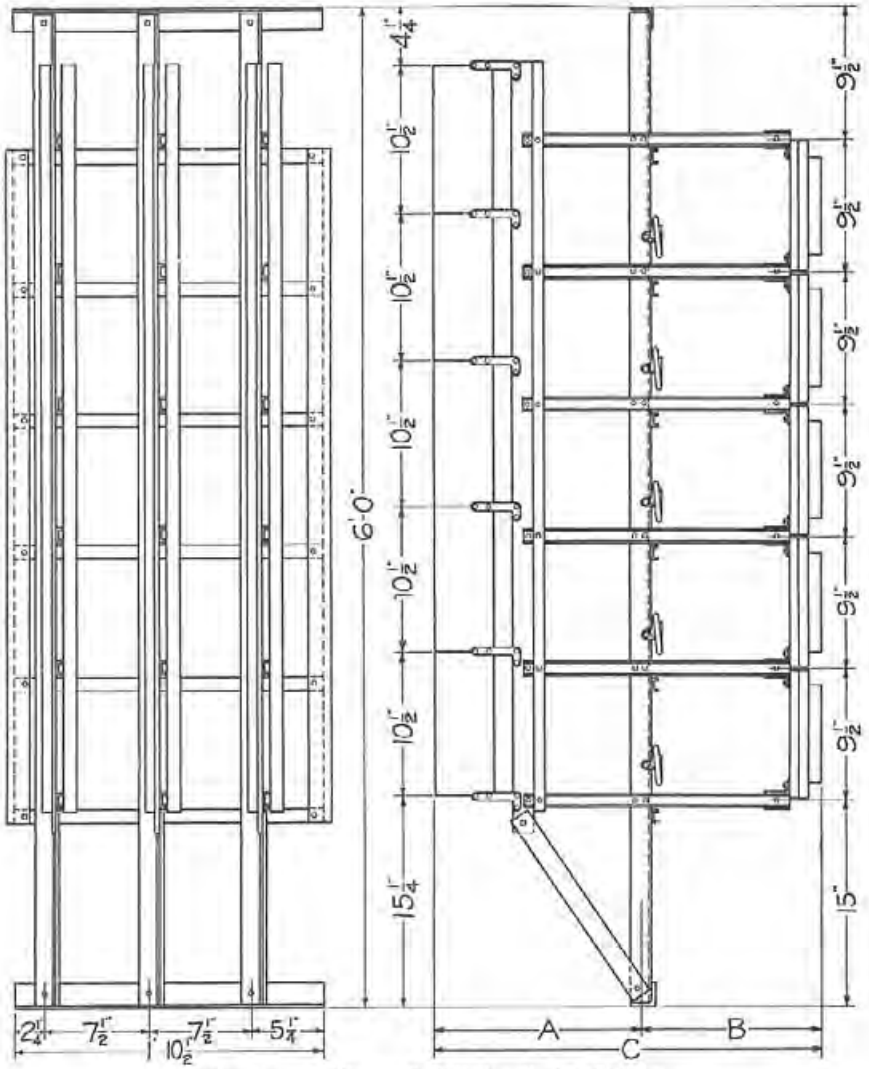
The frame and protector is strong, rigid, convenient and fireproof.

Cat. No.	Description	Length Inches	Net Wt., Lbs.
1260	L-10 Frame 50-pair	81	16
1040	H-51 Protector 10-pair sections	12	45

ARRESTER AND CROSS CONNECTING EQUIPMENT

No. 303 Main Distributing Frame

200 pairs No. 303 M.D.F. equipped with 80 pairs No. 303H Protectors and 250 pairs No. 102H Line Cable Terminals



Dimensions A=14⅞ in. B=13$\frac{1}{16}$ in. C=2 ft. 3$\frac{15}{16}$ in.

Floor type frame for use with No. 303F and No. 303H Switchboard Protectors. Arranged for growth in either direction. Terminal Blocks may be attached in either horizontal or vertical rows as ordered. Vertical rows of terminals are recommended for frames up to 600 lines. Larger frames are more convenient to work on when terminals are arranged in horizontal rows.

Cat. No.	Description		Wt., Lbs.
303	Frame work only	100 pair units	100
102H	Line Cable Terminals	25 pair blocks	1
303H	Protectors—Heat Coils	20 pair banks	4½
303F	Protectors—Fibre Fuses	20 pair banks	4½

No. 303 Switchboard Protector

No. 303H Protector

The No. 303H is a heat coil and air-gap Central Office Protector to be used for protection against sneak currents, lightning and direct crosses with supply circuits. The heat coil, which may be reset repeatedly is of the quick wide opening type which will protect against crosses with supply circuits as efficiently as a standard telephone fuse. The wire wound heat coil is made to operate in accordance with the standard specifications for the protection of the various types of Central Office equipment. The indicating feature protrudes more than an inch from the end of the cartridge, and can be seen from a distance.

To reset, the repair man presses on the indicating rod while a current of one ampere is applied to the coil. When the solder melts, he feels the rod give, cuts off the current and holds the rod a moment more to give the solder time to set.

There has always been some difference of opinion among engineers as to the best method of connecting Central Office Protectors in the entering circuits. The No. 303H Switchboard Protector may be connected with heat coil either inside or outside the carbons by simply turning the protector bank end for end. Each protector consists of two No. 107 Heat Coils, two P495 Sawtooth Discharge Blocks and two No. 663 Carbons.

The No. 303F is a fuse and carbon Central Office Protector for use in protecting Central Office equipments where the additional expense of the heat coil feature is not easily justified.

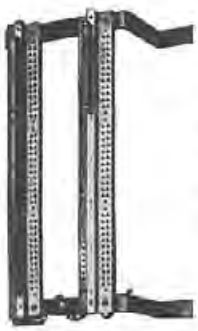
No. 107 Heat Coil (Full Size)

No. 106 Fuse (Full Size)

Each protector consists of two No. 106 Fuses, two P495 Sawtooth Discharge Blocks and two No. 663 Carbons.

Cat. No.	Description	Wt., Lbs.
No. 303H	20 pair banks—No. 107 Heat Coil	4½
No. 303F	20 pair banks—No. 106 Fibre Fuse	4¼

No. 103 Wall Type Distributing Frame

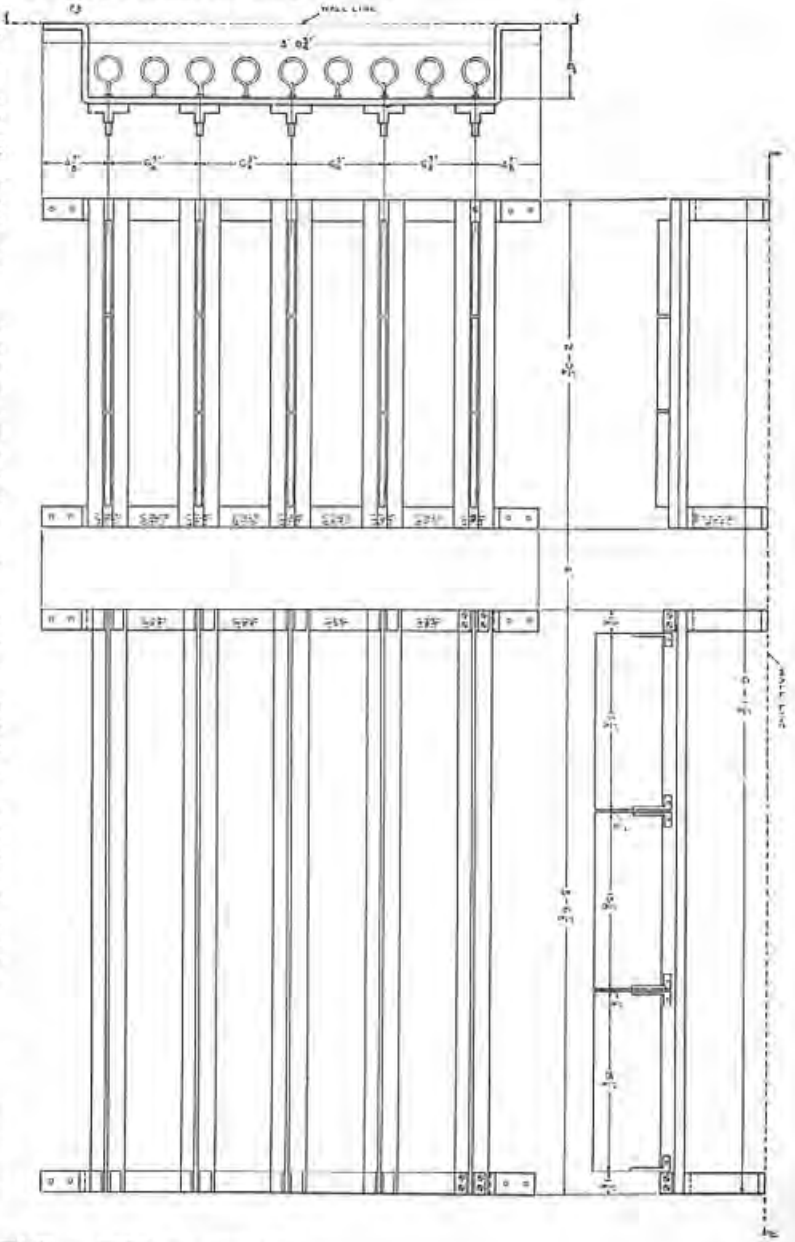


120 pairs No. 103 M.D.F. equipped with 80 pairs No. 303H Protectors and 100 pairs No. 104H Line Terminals

A Wall Type Main Distributing Frame designed for use in small telephone central offices where the size of the office or the available space does not permit of the installation of a floor type frame, but where an equally substantial and accessible Main Distributing Frame is needed.

The steel frame work supports the protectors and line terminals well out from the wall. All line terminals are grouped at the top and all protectors at the bottom or vice versa, with plenty of space and jumper rings between the upper and lower groups for making cross connections.

Each vertical section of the frame has a capacity of 60 pairs of No. 303H Switchboard Protectors mounted in banks of 20 pairs each and 75 pairs of No. 104H Line Cable Terminals in blocks of 25 pairs each. Each frame is shipped complete with fanning strips, jumper rings when ordered. Protectors and fanning strips are numbered beginning with one from the top down and from left to right unless otherwise specified.

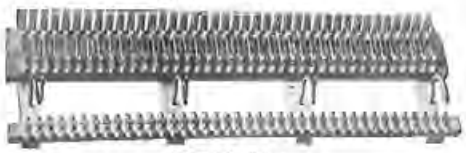


Cat. No.	Description	Ship. Wt., Lbs.
103	Frame work only—60 pair units	5
104H	Line Cable Terminals—25 pair blocks	1¼
303H	Protectors—107 Heat Coil—20 pr. banks	4½
303F	Protectors—fibre fuses—20 pair banks	4¼
303	Test Plug with Cord	½
111	Heat Coil reset panel	1½

ARRESTER AND CROSS CONNECTING EQUIPMENT

No. 6 Type Arrester

Switchboard Side



Outside Line

No. 6. Combination lightning arrester, fuse and cross connecting rack. The capacity of the No. 6 type is 25 metallic lines or 50 grounded lines and is so arranged that any line can be cross connected to any switchboard drop.

It is equipped with No. 11 fuses and carbon arresters with mounting centers spaced $\frac{5}{8}$ of an inch. The carbons used are $1\frac{1}{4}$ inches long, $\frac{3}{8}$ inch wide and $\frac{1}{4}$ inch thick.

Code No.	Description	No. of Pairs	Length Inches
6	Fuse Arr. and Cross Conn. Rack.....	25	$32\frac{1}{2}$

Telephone Arrester

Code No. 5

This neat carbon desk type arrester is suitable for any standard wood telephone and is easily cleaned. It is $1\frac{1}{8}$ inches in diameter and arranged for mounting on $\frac{1}{2}$ inch wood. It can be very easily installed by drilling three holes through the wood, two of which are for the connectors and the other for the center mounting bolt which holds the entire arrester assembly.

Heat Coils

Code No. 2

Heat coil is carefully made and will blow at the amperage specified. The resistance varies between 3.8 to 4 ohms. This heat coil will operate on .5 ampere in less than 210 seconds and will carry .35 ampere for 10 minutes at 68° Fahrenheit. Fits the Kellogg No. 16 Arrester.

Code No. 6

Heat coil is used on Kellogg No. 1 Arrester. The resistance is $3\frac{1}{2}$ ohms. This heat coil will operate on .5 ampere in less than 210 seconds and will carry 3.5 amperes indefinitely at 68° Fahrenheit.

Distributing Bus Bars (Fuse Posts)

Distributing bars are used on switchboards for battery commons, ground strips and fuse terminals. They are finished in rolled brass and furnished with round head brass machine screws with washer.

No. 3 Type

Code No.	Number of Terminal Screws	Length Inches	Stock Inches
3	2	$1\frac{3}{8}$	$\frac{1}{4}$x$\frac{1}{4}$

Distributing Bus Bars (Fuse Posts)

No. 5 Type

No. 5 Type $\frac{1}{4}$ in. by $\frac{1}{4}$ in.

Code No.	Number of Terminal Screws	Centers Spaced Inch	Length Inches	Stock Inches
5	5	$\frac{1}{2}$	$2\frac{9}{16}$	$\frac{1}{4}$x$\frac{3}{8}$
10	6	$\frac{1}{2}$	$3\frac{1}{16}$	$\frac{1}{4}$x$\frac{3}{8}$
12	7	$\frac{1}{2}$	$3\frac{9}{16}$	$\frac{1}{4}$x$\frac{3}{8}$
15	9	$\frac{1}{2}$	$4\frac{9}{16}$	$\frac{1}{4}$x$\frac{3}{8}$
18	11	$\frac{1}{2}$	$5\frac{9}{16}$	$\frac{1}{4}$x$\frac{3}{8}$
19	13	$\frac{1}{2}$	$6\frac{9}{16}$	$\frac{1}{4}$x$\frac{3}{8}$
23	16	$\frac{1}{2}$	$8\frac{1}{16}$	$\frac{1}{4}$x$\frac{3}{8}$

No. 52 Type

Code No.	Number of Terminal Screws	Length Inches	Stock Inches
52	2	$1\frac{3}{8}$	$\frac{1}{4}$x$\frac{1}{4}$

Terminal Strips

Code No. 10 Terminal Strip

A very convenient type of connecting rack having screw connections. These connectors are made of steel, hot tin plated and mounted on a hard maple wood base finished with shellac.

Code No.	No. of Lines	No. of Connectors	Length of Face, Inches
41	5	10	$7\frac{1}{2}$
42	10	20	$13\frac{3}{4}$
43	25	50	$32\frac{1}{2}$

Code No. 31 Terminal Strip

A cable terminal having soldered connections. Clips mounted in black stained hard maple blocks.

Code No.	Total No. Connectors	Connectors Per Row	Connectors in Height Inches	Overall Length Inches
34	10	5	2	$3\frac{3}{8}$
32	20	10	2	$6\frac{1}{8}$
31	30	10	3	$6\frac{1}{8}$
49	40	10	4	$6\frac{1}{8}$

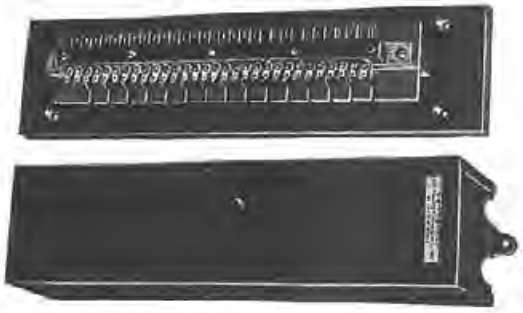
CONNECTING RACKS, BINDING POSTS

No. 23 Connecting Rack

The No. 23 is a neat appearing and serviceable type of connecting rack recommended for universal use. The base is made of maple, the cover of metal handsomely finished in black enamel. The binding posts will take either spade or spike tips. Dimensions 3 inches diameter, 1¼ inches high. Furnished in 3 sizes as follows:

Code No.	Remarks
23-C	2 connectors
23-B	3 connectors
23-A	4 connectors

Junction Box



The 2500 type junction block is arranged for both solder and screw connections. On each clip there is provided one screw and two soldered connections. A fibre fanning strip is provided and so arranged that it is not necessary to form and lace the cables, which may enter the box from either end. This is a most flexible high-grade terminal for all work where junction boxes and branch terminals are required. The cover is of metal thoroughly enameled and attached to the block with two screws. Overall width 2⅛ inches and overall height 3⅛ inches.

Code No.	Length Overall, Inches	No. of Pairs
2513-B	9 1/16	13
2521-B	14⅜	21

Binding Posts

Code No. 2

Code No. 2 binding post is made of brass heavily nickel plated. A hole that will take wire as large as No. 8 B. & S. gauge is drilled at an angle of 60° to a line drawn between the two base screws. Two piece number 3849 wood screws are furnished. The base of this binding post is approximately ⅜" x ¾" overall. The tin plated terminal is ⅝" in length.

Code No. 7

Code No. 7 binding post is identical in construction with Code No. 2 except that the terminal is cut off flush with the base. Two piece 3849 screws are furnished.

Binding Posts

Code No. 22

Code No. 22 has a hole drilled at an angle of 45° to a line drawn through the two base screws that will take wire as large as No. 11 B. & S. gauge. This post is made of brass heavily nickel plated. Two piece No. 3437 wood screws are furnished. The tin plated terminal is ⅝ inch in length and the base approximately 7/16 inch by 1 inch overall.

Code No. 44

Code No. 44 binding post is identical in construction with Code No. 22 except that the terminal is cut off flush with the base. Two piece No. 3437 wood screws are furnished.

Code No. 21

Code No. 21 binding post has the upper portion constructed similar to Code No. 22 binding post. It is made of brass heavily nickel plated. The terminal is tin plated for ease in soldering wires to it. The hole that will take wire as large as No. 11 B. & S. gauge is drilled in line with the length of the base. One piece No. 4482 wood screw is furnished. The base has an approximate overall dimension of 1⅛ inches in length and ½ inch in width.

Code No. 11

Code No. 11 binding post has recently become very popular because of its small size and adaptability for many out of the way connections. It is made of brass tin plated. One piece No. 4482 wood screw is furnished for mounting. Overall base dimensions 5/16 inch by 1 inch.

Code No. 76

Code No. 76 binding post is identically the same as the code No. 11 except that it is provided with a clip to take spike or pin tips. The clip makes this binding post more desirable for universal use.

One piece No. 4482 wood mounting screw is furnished.

Code No. 59

Code No. 59 is of the same general construction as the code No. 11 binding post except that the connection is made at right angles to the base. One piece No. 11033 wood mounting screw is furnished. Overall dimensions of base are approximately 5/16 inch by ¾ inch.

Code No. 63

Code No. 63 is identical with code No. 59 except that it is provided with a clip to take spike or pin tips. A very satisfactory binding post for universal use. One piece No. 11033 mounting screw furnished.

SWITCHBOARD AND POWER CABLE

For Paper Insulated Cable See Supply Section

Switchboard Cable

Kellogg Switchboard cables are manufactured from the best grades of selected raw materials by specially designed machinery, and are furnished in several styles and sizes.

The wires are tinned, thoroughly annealed, and are of not less than 98 per cent pure copper, evenly coated with tin. Only the best grade of silk and cotton wrappings are used for insulation. After the insulation is applied the twisted pairs are formed into a cable and covered with several wraps of heavy manila paper and then thoroughly saturated with beeswax. This cable is regularly furnished with wrappings of single silk and cotton over tinned or enameled wire and double silk and cotton insulation over tinned wire. The standard overall covering is of braided cotton, saturated with a lead colored fire-proof paint.

A standard color code is used so that each pair of wires can be identified. Cable up to 26 pairs can be shipped in boxes up to 500-foot lengths. Above 500 feet, reels are required. Large sizes, such as 41, 51 and 102 pairs can be shipped in boxes up to 250-foot lengths. Above 250 feet, reels are required. When cable reels are furnished they will be charged for. Full credit will be allowed for their return in good condition, prepaid to the Kellogg factory.

Round Type—22 B. & S. Gauge, Wax Core

Two Silk and One Cotton-Tinned

Code No.	No. of Pairs	No. of Singles	Diameter Inches	Approximate Net Wt., Lbs. per 1000 Feet
56-A	7	..	5/16	63
65-A	11	..	25/64	86
99-A	11	11	25/64	120
127-A	16	..	13/32	116
42-A	21	..	15/32	145
41-A	21	21	17/32	206
112-A	26	..	15/32	173
125-A	41	..	5/8	252
63-A	51	..	5/8	312
62-A	102	..	19/16	622

Round Type—22 B. & S. Gauge, Wax Core

One Silk and One Cotton-Tinned Enameled

Code No.	No. of Pairs	No. of Singles	Diameter Inches	Approximate Net Wt., Lbs. per 1000 Feet
114-AX	11	..	23/64	83
137-AX	11	11	25/64	119
100-AX	16	..	13/32	116
107-AX	21	..	15/32	132
22-AX	21	21	17/32	163
33-AX	26	..	15/32	164
109-AX	41	..	5/8	246
29-AX	51	..	5/8	304
53-AX	102	..	19/16	623

Flat Type—22 B. & S. Gauge, Wax Core

One Silk and One Cotton-Enamel

Code No.	No. of Pairs	Dimensions Inches	Approximate Net Wt., Lbs. per 1000 Feet
104-AX	41	7/16 x 3/4	256

The above cable is most popular, other sizes can be furnished on special request.

Flat Type—22 B. & S. Gauge, Wax Core

Two Silk and One Cotton-Tinned

Code No.	No. of Pairs	No. of Singles	Dimensions Inches	Approximate Net Wt., Lbs. per 1000 Feet
135-A	21	21	5/16 x 1	242
119-A	41	..	7/16 x 3/4	266

Round Type—19 B. & S. Gauge, Wax Core

Two Silk and One Cotton-Tinned

Code No.	No. of Pairs	Diameter Inches	Approximate Net Wt., Lbs. per 1000 Feet
81-A	16	15/32	181
85-A	21	35/64	234

Lead Covered—22 B. & S. Gauge, Wax Core

Two Silk and One Cotton-Tinned

Code No.	No. of Pairs	Thickness of Sheath Inches	Diameter Inches	Approximate Net Wt., Lbs. per 1000 Feet
120-L	11	1/16	29/64	390
148-L	13	1/16	15/32	442
144-L	16	1/16	17/32	544
121-L	21	1/16	33/64	670
147-L	26	1/16	19/32	730
146-L	51	5/64	3/4	1080
145-L	102	3/32	1 5/16	1790

Power Cable

For carrying ringing circuits through key cables. Consists of No. 22 B & S gauge single wires twisted into a cable having no overall braid. Each wire is insulated with enamel and two reverse silk and one cotton wrappings.

Code No.	No. of Conductors	Diameter Inches	Approximate Net Wt., Lbs. per 1000 Feet
71-X	5	7/64	15
72-X	9	5/32	26

7 Wire Twist 20 Gauge 2 Silk—2 Cotton Braided

For carrying power circuits from ringing equipment leads to key cables. Consists of No. 20 B & S gauge single wires twisted into a cable having no overall braid. Each wire is insulated with enamel and two reverse silk and one cotton wrappings.

Code No.	No. of Conductors	Diameter Inches	Approximate Net Wt., Lbs. per 1000 Feet
101-X	5	15/64	29
102-X	7	1/4	40
103-X	9	21/64	51

POWER CABLE, SWITCHBOARD AND JUMPER WIRE

For Other Wire See Supply Section

Power Cable

For leads from ringing equipment to switchboard. Consists of No. 18 B.& S. gauge single wires twisted into a cable having no overall braid. Each wire is insulated with rubber and a cotton overall braid.

Code No.	No. of Conductors	Diameter
59	5	$^{37}/_{64}$ in.
105	7	$^{15}/_{32}$ in.
59-L	Same as 59 with lead sheath overall	
105-L	Same as 105 with lead sheath overall	

For leads from power board to ringing apparatus. Consists of one No. 14 B.& S. gauge and eleven No. 18 B.& S. gauge single wires twisted into a cable having no overall braid. Each wire is insulated with rubber and a cotton overall braid.

Code No.	No. of Conductors	Diameter
122	12	$^{3}/_{8}$ in.
122-L	Same as 122 with lead sheath overall	

Flame Proof Jumper Wire

Kellogg flame proof jumper wire is made in two, three or four conductor No. 22 B.& S. gauge tinned enamel with the very highest flame proof qualities and is particularly desirable in localities subject to extreme moisture or for plants operating on high voltage. It has the advantage also of having a smaller diameter than rubber covered jumper wire.

The single conductor of this wire consists of a No. 22 B.& S. gauge soft tinned copper conductor, insulated with enamel and 3 wrappings of silk saturated with a moisture proofing compound and covered with flame proof cotton outer braid.

The flame proofing is such that a horizontal length of one foot of single wire can be heated with a flame for a length of one inch for one minute and when the flame is withdrawn the fire will be extinguished before it has burned more than one-half inch in either direction from portion heated.

Kellogg jumper wire is stocked in one piece lengths ranging in size from 250 to 1000 feet. No splices permitted.

Code No.	Colors	Description	Wt., Lbs. per 1000 ft.
1002-E	Red, White	Duplex tinned enamel	6.450
1003-E	Red, White, Blue	Triplex tinned enamel	9.732
1004-E	Red, White, Blue, Slate	Quadruple tinned enamel	12.900

For those preferring jumper wire without enamel Kellogg can supply the following having the same insulation and flame proofing as that listed above, but with conductors tinned only.

Code No.	Colors	Description	Wt., Lbs. per 1000 ft.
1002	Red, White	Duplex tinned	6.450
1003	Red, White, Blue	Triplex tinned	9.732
1004	Red, White, Blue, Slate	Quadruple tinned	12.900

Telephone Cable Wire

Cable wire used for wiring telephones can be furnished in a variety of colors made in single conductor only. The conductor is of 20 B.& S. gauge tinned copper wire insulated with one wrapping of silk and one of cotton applied in reverse direction and a cotton outer braid applied very tightly so as to cause the insulation to adhere closely to the wire. The wire is saturated in wax making it moistureproof.

Code No. Waxed	Color
F-661	Red
F-663	Brown
F-665	Orange
F-667	Green
F-669	Black
F-844	White
F-846	Slate
F-848	Blue
F-851	White and Green
F-853	White and Black
F-855	White and Red
F-857	White and Orange
F-859	White and Blue
F-863	White and Brown

There are approximately 180 feet to the pound.

This wire can also be furnished with the conductor having an additional coating of enamel when specified. Where wire with an extra high insulation is required, most of the above colors can be furnished in 20 B.& S. gauge generator wire which has an additional silk insulation.

Only 16 B.& S. gauge generator wire is listed below but complete information will be furnished on the 20 B.& S. gauge on application. There are approximately 100 feet to the pound.

Code No. Waxed	Not Waxed	B. & S. Gauge	Color
F-442	F-441	16 tinned	Red
F-444	F-443	16 tinned	Black

Duplex Generator Wire

Duplex generator wire is made only in 20 B.& S. gauge and in the following colors: There are approximately 92 feet to the pound.

Code No.	B. & S. Gauge	Color
F-925	20 tinned	Red and Black
F-927	20 tinned	Brown and Brown White
F-928	20 tinned	Orange Green and Orange Black

Switchboard Wire

Switchboard wire is the tinned copper wire used in Kellogg switchboard cable. The insulation consists of one or two wrappings of silk next to the wire followed with a cotton wrapping and then saturated in wax. This wire can be furnished with tinned or tinned enameled conductors, as specified, in all standard cable colors. No. 22 B.& S. gauge is standard but can also be furnished in 19 and 24 B.& S. gauge. No. 19 B.& S. gauge contains 210 feet per pound, No. 22 B.& S. gauge, 400 feet per pound and No. 24 B. & S. gauge, 550 feet per pound.

Duplex Switchboard Wire

Can be supplied in all standard color combinations as used in standard cables in 22 B.& S. gauge. There are 195 feet to the pound.

Lacing Twine

Commonly called lock stitch and possesses unusual strength. Used for lacing wires in special keyboard and switchboard cable. Put up in one-pound balls.

No. 6 (waxed) light weight
No. 9 (waxed) medium weight
No. 11 (waxed) heavy weight

INDUCTION COILS

Magneto Telephones

Code No. 28-C

The No. 28-C induction coil is a most efficient universal local battery coil for use in any magneto telephone. The windings are so proportioned to give the maximum out-put in transmission with a minimum loss on receiving. Terminals are provided for either solder or screw connections. Burned out coils should be replaced with new ones as it is cheaper to order new ones than to have the old ones torn down and repaired. The primary winding has a resistance of 1.6 ohms, the secondary 22 ohms. Overall length, 4¼ inches, spool heads, 1 inch square. Net weight, 4½ ounces.

Code No. 100-A

The No. 100-A magneto induction coil when used with either a No. 700 Masterphone or a No. 118 desk stand, makes an ideal extension set where no ringer is required.

The coil and connecting rack are combined for compactness and simplicity. All wires terminate at the connecting rack. Terminals are clearly marked.

The primary winding has a resistance of 1.3 ohms and the secondary a resistance of 11.1 ohms. Occupies a space only 4¼x1⅜ inches, 1⅜ inches deep. Net weight 7 ounces.

Common Battery Telephones

Code No. 51-A

The No. 51-A induction coil is for use in the base of Kellogg code No. 97 desk stand. The primary winding has a resistance of 33 ohms and the secondary of 17.5 ohms. One side of the primary winding is soldered to one of the universal terminals, the other primary lead as well as the secondary leads are brought out to a length of about 4 inches. Overall length of coil, 4¼ inches, large spool head, 1 inch wide and 1½-inch high. Net weight, 5 ounces.

Code No. 79-A

The No. 97-A induction coil is standard for common battery or central energy telephones. The primary winding has a resistance of 33 ohms, the secondary of 17.5 ohms. The coil is impregnated making it impervious to moisture. The windings are wired to binding posts suitable for solder or screw connections. Overall length, 4⅝ inches, spool heads, 1 inch square. Net weight, 6 ounces.

Code No. 99-A

The No. 99-A is a combined common battery induction coil and connecting rack for use with telephones and desk set boxes using simplified wiring. The primary winding of the coil has a resistance of 25.4 ohms and the secondary a resistance of 7.8 ohms. The coil is suitably impregnated to make it moistureproof. The coil winding leads are soldered to the connecting rack terminals which are clearly engraved for easy identification. Occupies a space of only 4¼x1⅜ inches, 1⅜ inches deep. Net weight 7 ounces.

Code No. 103-A

The No. 103-A induction coil is of the same dimensions and mounting centers as the No. 99-A induction coil. It is provided with three windings for use with the Kellogg Triad circuit. These windings are suitably impregnated to make them moistureproof. The leads are soldered to the connecting rack terminals which are clearly engraved for easy identification. Net weight 8 ounces.

Magneto Switchboards

Code No. 28-C

The No. 28-C is a universal local battery coil for use in magneto telephones as well as magneto switchboards using dry cells or primary batteries for operator's sets. The primary winding has a resistance of 1.6 ohms, the secondary, 22 ohms. Terminals are provided for either solder or screw connections. Replaces Nos. 14-A and 14-C. Overall length, 4¼ inches, spool heads, 1 inch square. Net weight, 4½ ounces.

Code No. 81-A

The No. 81-A induction coil is similar in construction to the No. 28-C coil but used with battery feed coils where operator's sets on magneto switchboards are supplied from storage battery. The primary winding has a resistance of 4 ohms and the secondary 37½ ohms. Suitable terminals are provided for either screw or solder connection. Length overall, 4¼ inches, spool heads, 1 inch square. Net weight, 4½ ounces.

Common Battery Switchboards

Code No. 7-A

The No. 7-A induction coil is used in common battery switch boards where a third or tertiary winding is desired for monitoring in connection with the operators circuit. The primary winding has a resistance of 65 ohms, the secondary, 90 ohms and the tertiary, 435 ohms. Mounted on a maple base and wired to suitable terminals for solder connection. Base is 2⅛ inches wide and 6 inches long. Approximate height, 2⅛ inches. Net weight, 13 ounces.

Code No. 17-A

The No. 17-A induction coil is used in common battery switchboards where in addition to the third winding for monitoring a fourth winding is used for a busy test or some such other feature. The primary winding has a resistance of 28.5 ohms, the secondary, 62 ohms, the tertiary, 410 ohms and the fourth, 474 ohms. The coil is mounted on a maple base and wired to suitable terminals for solder connection. Width of base, 2 inches, length, 6 inches. Approximate overall height, 1⅞ inches. Net weight, approximately 16 ounces.

Code No. 72-A

The No. 72-A induction coil is used as the side tone reducing coil for use in large common battery multiple switchboards and P.B.X. Consists of two coils mounted on a 2½-inch by 6-inch maple base and wired to 5 terminals suitable for solder connection. The first winding of coil No. 1 has a resistance of 13 ohms, the second of 82 ohms. The first winding of coil No. 2 has a resistance of 13 ohms, the second, 432 ohms. Approximate net weight, 16 ounces.

INDUCTION, REPEATING COILS

Common Battery Switchboards

Code No. 32-A

The No. 32-A induction coil is used as a "Balanced" busy test coil in connection with the No. 72-A induction coil on large common battery switchboards. Has four windings, the two secondaries of which are wound parallel forming a split secondary. The primary winding has a resistance of 28½ ohms, 1st secondary 45 ohms, 2nd secondary 45 ohms and the tertiary 410 ohms. Mounted on a maple base and wired to suitable terminals for solder connection, Width 2 inches; length 6 inches. Approximate overall height 1⅞ inches. Net weight approximately 16 ounces.

Code No. 32-B

The No. 32-B induction coil is similar to No. 32-A in appearance and in uses except resistance. The primary winding has a resistance of 28½ ohms, 1st secondary 135 ohms, 2nd secondary 135 ohms, tertiary 425 ohms.

Code No. 78-A

The No. 78-A induction coil is similar to No. 72-A in construction and appearance but with an additional resistance winding for high efficiency toll operator's circuit. On coil No. 1 the first winding has resistance of 12 ohms, the second of 82 ohms and the third of 100 ohms. On the second coil the first winding has a resistance of 12 ohms the second of 432 ohms. Net weight approximately 16 ounces.

Miscellaneous

Code No. 35-A

The No. 35-A induction coil is for use with Kellogg No. 2 howler. The primary winding has a resistance of 1½ ohms, the secondary 51½ ohms. Combined with an adjustable interrupter assembly to change direct current into high frequency alternating current to operate the No. 2 howler. Length 4¾ inches; width 2 inches; height over all 3½ inches. Approximate net weight 24 ounces.

Code No. 66-A

The No. 66-A induction coil is a combined interrupter and induction coil for railroad telegraphone sets. The primary has a resistance of .8 ohms, the secondary 51½ ohms. Length 3 inches; width 1 inch; height 2 inches. Approximate net weight 12 ounces.

Operators' Feed Coil

These coils are used in magneto switchboards with No. 81-A induction coils to supply operators' transmitters with current from storage battery. One No. 81-A induction coil and one battery feed coil is used in each position. These coils each consist of a 2 M.F. condenser in combination with two retardation coils, one in each side of the circuit. They are wound to secure the proper impedance to feed the right amount of current to the transmitter and prevent cross talk between positions. Base is of maple being 3¾ inches wide and 6 inches long. Net weight 1½ lbs.

Code No.	For Use with
3-A	24-volt battery

Repeating Coils

Every engineering and manufacturing precaution is taken to insure a superior coil, that will meet the most exacting demands in both ringing and talking efficiency. The cores are made of Silicon steel and the windings are completely enclosed in heavy cross talk proof cases. The transmission losses are considerably less than one half mile of standard cable.

Switchboard—Talk through Only

Code No. 20-A

The No. 20-A repeating coil meets the demand for an efficient "Talk through only" coil that can be mounted on standard relay mountings. Having four concentric windings of 12.1, 13.7, 15.2 and 16.6 ohms respectively wound about a large iron core, it is unexcelled for use in a magneto or other types of cord circuits to connect dissimilar lines together for communication purposes.

Eight terminals are provided and so arranged that the coil will mount in the same space occupied by two 1000 type relays. Also mounts on individual mountings listed below. Height 1¹³⁄₁₆ inches; width 2⅛ inches; length 4⅛ inches. Net weight, less mounting, 2¼ pounds.

Code No. 16-A

The No. 16-A repeating coil possesses the same electrical characteristics and uses as the No. 20-A but is designed to mount on wood. Made of two concentric wound coils, each coil being placed upon one leg of a horseshoe lamination. Resistance of windings are 20, 16, 20, 16 ohms respectively. Height 3¾ inches; width 3²⁵⁄₃₂ inches; length 2⅝ inches. Net weight 3 pounds.

Switchboard—Ring and Talk Through

Code No. 19-A

The No. 19-A repeating coil is similar in construction to the No. 20-A except the laminations are of the closed core type making a very efficient "Ring and talk through" coil. Ideal for use in magneto cord circuits or whenever a "Ring Through" coil is desired. Four concentric windings having resistances of 15.3, 17.1, 18.8 and 20.9 ohms respectively connect to eight terminals. Mounts same as No. 20-A. Length 4⅛ inches; height 1¹³⁄₁₆ inches; width 2⅜ inches. Net weight less mounting 2¼ pounds.

21A

85°

Mountings

No. 1014

No. 1012

No. 1013

Code No.	Mounts on	Net Wt. Oz.
1012	Right side	6
1013	Left side	6
1014	Roof	6

REPEATING, RESISTANCE COILS

Phantom and Drainage Coils

For proper protection for these coils see "Arresters" on pages 138, 139, 140 and 141 of the Supply Section.

Balanced Coils for Metallic Phantoms

Code No. 18-A

The No. 18-A repeating coil being balanced electrically as to capacity, resistance and impedance is principally used for "Phantom Work." Can be introduced at the center of two physical circuits in order to produce a split phantom which can be operated in either direction without interference to the physical circuits. Adaptable to any circuit requirement such as simplex and composite circuits where a well balanced coil is required. Because of the great amount of iron and the heavy wire with which the coil is wound the ringing and talking efficiency is very high, the actual transmission loss being considerably less than one half mile standard cable. On account of its sturdy construction this coil will be found very serviceable and will stand hard usage. The four parallel windings of 5.7, 5.7, 7.5 and 7.5 ohms respectively are wired to eight terminals. Mounted on wood base 10¾ inches long and 4 inches wide and arranged to mount on standard coil racks. Overall height 5⅛ inches. Net weight 12 pounds.

Coils for Grounded Phantoms

Code No. 18-B

The No. 18-B repeating coil is constructed similarly to the No. 18-A except that it has two windings in tandem and two in parallel. For this reason it is more adaptable for use on rural phantoms particularly grounded phantoms, as the windings being separated are less subject to lightning damage. Talk and ring through efficiency practically the same as the No. 18-A. Transmission loss considerably less than one half mile. Resistance of windings, size of coil and base, weight, etc. same as No. 18-A repeating coil.

Phantom Coil Housing

(Hot Galvanized)

The Phantom Coil Housing is ideal for housing Kellogg No. 18 type repeating coils. It is weatherproof and insures protection to the coils from climatic conditions, thereby improving phantom telephone service.

The construction of this housing is similar to that of cable terminals. The housing proper is made of black sheet steel, dipped in molten zinc which gives it a continuous unbroken zinc coating and adds many years of service. A treated maple board is provided for mounting the repeating coils. This mounting board is equipped with Sawtooth Lightning arresters which should be wired to the coils for protection. The heavy steel mounting bracket is so formed as to fit the pole without gaining. Diameter of housing 8½ inches.

Capacity	Inches Overall Height	Weight Shipping
One repeating coil...	16¾	60 lbs.
Two repeating coils..	21½	72 lbs.

Code No. 17-F

The No. 17-F repeating coil possesses the same electrical characteristics as the No. 18-B. On account of the smaller wire and less iron in the core this coil is slightly less efficient as a ring thru coil than the No. 18-B. Transmission loss less than one half mile. Two parallel and two tandem windings. Resistances 21.5, 21.5, 29.5 and 29.5 ohms. Length 3¾ inches, width 3 inches, height 3⅞ inches. Mounting centers length 2⅞ inches, width 2⅛ inches. Net weight 3 pounds.

Insulating Transformer

Code No. 19-B

The No. 19-B insulating transformer is well balanced and withstands a breakdown test of 7500 volts. Can be used either as an insulating transformer or drainage coil on telephone lines paralleling high tension electric light lines. The three single windings of 29, 29 and 58 ohms are brought out with six heavy rubber covered leads. It is furnished without cover or base and can be mounted as desired. Length 7 inches, width 4⅝ inches, height 4⅜ inches. Net weight 17 pounds.

Resistance Coils

Also See Non-Inductive Relay Coils

Kellogg resistance coils are wound with enamel and silk insulated special resistance wire which has proven under test and in practice to be especially adapted to this service. These coils are made in suitable forms so that they can be mounted where it is found most convenient. Resistance coils can be furnished in the types illustrated below in any resistance if quantities warrant.

No. 1 Type

Consists of a small wood spool upon which the wire is wound and then soldered to two terminals. Spool heads 1 inch square. Spool length 1¾ inches. Overall length including terminals 2 inches.

Code No.	Resistance, Ohms	Code No.	Resistance, Ohms
1-A	1000	1-M	2000
1-B	500	1-N	10000
1-C	100	1-P	5000
1-D	700	1-Q	250
1-E	30	1-S	300
1-F	200	1-U	6000
1-K	50	1-Y	240

No. 4 Type

Similar to No. 1 type except length. Spool heads 1 inch square. Length 2⅞ inches. Overall length including terminals 3⅛ inches.

Code No.	Resistance, Ohms	Code No.	Resistance, Ohms
4-B	400	4-J	5000
4-E	100	4-L	250
4-F	200		

No. 5 Type

Consists of a small wood spool upon which the wire is wound and then soldered to two terminals. Spool heads 1 inch square. Spool length 1¾ inches. Overall length including terminals, 2 inches.

Code No.	Resistance, Ohms
5-A	10,000

RETARDATION COILS

Retardation Coils

See Relay Coils

The function of retardation or impedance coils in the telephone field is to feed battery and to isolate or limit fluctuating or alternating currents to some particular circuits. All conditions under which these coils are to be used, must be considered carefully and a proper coil selected to meet those conditions.

Kellogg retardation coils are made over a core of soft iron wire or on coils having laminated cores of silicon steel. The size of the enamel wire, the number of turns, the amount of iron in the coil, all are predetermined in Kellogg laboratories in order to make coils of the highest grade and efficiency.

Switchboard Type

No. 8 Type

The No. 8 type Kellogg retardation coil is used in operator' scircuit.

The coil is mounted on a wood base and connected to two terminals suitable for soldering. Overall length of base, 6 inches width, 2 inches.

Code No.	Resistance, Ohms
8-A	100
8-B	200
8-C	350

No. 9 Type

The No. 9 type retardation coil is used in operator's circuits for battery feed coils. No. 9-A is used in the wall telephone of Kellogg inter-communicating systems using retardation coil circuit. Overall length including terminals 3 5/16 inches. Spool heads 1 inch square.

Code No.	Resistance Ohms	Net Weight Ozs.
9-A	25	6
9-B	150	7
9-C	200	7
9-D	85	6
9-E	100	6

Switchboard Type Retardation Coils

No. 21 Type

The No. 21 type coil is mounted in a cross talkproof individual shell as illustrated. The No. 62-A has the shell milled to permit mounting in pairs on 2000 type relay mountings. The other codes also mount on the 2000 type mountings listed under Relays, but not in pairs. Length of shell 3 1/8 inches, diameter 1 5/16 inches.

Code No.	Resistance, Ohms		Winding	No. Terms.
21-B	100		Single	2
21-D	2000		Single	2
21-E	500		Single	2
21-J	300		Single	2
21-L	200		Single	2
22-B	100	100	Tandem	4
25-A	1000	1000	Parallel	4
25-B	2000	2000	Parallel	4
25-C	50	50	Parallel	4
20062-A	400		Single	2

Switchboard Type—Continued

No. 56 Type

The No. 56 type is placed in a standard relay shell cover. It mounts on standard 2000 type relay mountings listed under relays on page 101. Dimensions of can are 4 inches high, 2 29/32 inch wide and 1 13/16 inches deep.

Code No.	No. of Term.	Resistance Ohms	Winding
56-A	4	57 57	Tandem
63-A	2	500	Single

Power Type Retardation Coils

Code No. 23-A

The No. 23-A retardation coil is used with harmonic pole changers when noise killer battery is used. The resistance of the single wound coil is .125 ohms. Size of base 11 1/2 inches long, 6 3/4 inches wide. Height 5 inches.

Code No. 41-A

The No. 41-A retardation coil is used with single frequency pole changers also on harmonic pole changers when noise killer battery is not used. Resistance .08 ohms. Base 3 inches wide, 7 inches long. Height 3 3/4 inches.

Miscellaneous Retardation Coils

No. 40 Type

Similar in construction to Kellogg repeating coils. The No. 40-A has two balanced parallel windings for phantom work. The No. 44-A has two tandem windings for grounded phantoms. Base 3 3/4 inches by 2 7/8 inches. Height 3 7/8 inches.

Code No.	Resistance 1st Winding	Resistance 2nd Winding	Winding
40-A	45 ohms	45 ohms	Parallel
44-A	54 ohms	54 ohms	Tandem

Code No. 55-A

Used as a composite balancing coil. It has four windings of 39 ohms each, balanced electrically as to capacity, resistance and impedance. Mounted on base and enclosed in an iron cover. Size of base 11 inches by 9 3/4 inches. Overall height 7 inches.

Code No. 65-A

Designed to reduce the interference caused to radio sets by telephone ringing equipment. It is wound on a wood core. Inductance value 3 milihenry. Resistance 2.75 ohms. Diameter 2 3/8 in., height 1 7/16 in.

RETARDATION COILS, CONDENSERS

Telephone Type

No. 16 Type

The No. 16 type consists of a steel core upon which is wound the single coil winding of copper wire. Dimensions 1 inch in diameter and ⅞ inch high. The No. 16-A is used in common battery desk stands of the retardation coil type. The No. 16 C is used in the No. 2869 composite telephone.

Code No.	Resistance Ohms	Net Weight Ozs.
16-A	33	2
16-C	4.5	2½

No. 30 Type

The No. 30 type is principally used for Railway and Dispatchers Telephones. Adjustable core. Windings connect to two terminals provided for either solder or screw connection. Overall length including terminals, 3⅞ inches. Spool heads, 1 inch square.

Code No.	Resistance Ohms	Net Weight Ozs.
30-F	3.5	6
30-G	150	7

No. 58 Type

The No. 58 type is the standard coil used in all common battery retardation coil circuit telephones. Overall length including terminals, 4¼ inches. Spool head, 1 inch square.

Code No.	Resistance Ohms	Net Weight Ozs.
58-A	25	7½

Battery Feed Coils for Intercommunicating Systems

This type of relay coil is used for battery feed coils in intercommunicating telephone circuits. It has two concentric windings. Length not including terminals 2⅛ inches, diameter 1 inch. Mounts in the iron mounting strips shown below. Replaces No. 14 type retardation coils.

Code No.	Resistance Ohms		Net Weight Ozs.
CMB	100	100	5
CMF	50	50	5

Mounting for C. M. B. and C. M. R. Battery Feed Coils

These cast iron mountings are oxidized to prevent rusting. The length overall is 9 5/16 inches, mounting centers being 8¾ inches. Width of strip, 15/16 inch, coil centers spaced 13/16 inch.

Code No.	No. per Strip
163	10
319	1

Condensers

For Telephones, Switchboards, General Use

Kellogg condensers are manufactured by the most modern processes and with the best materials obtainable. The foil and paper are the finest the market affords. The impregnating compound is a special formula developed after years of laboratory research. To insure long life a special sealing compound is used. This compound will not crack at 0 degrees nor flow at 150 degrees Fahrenheit.

Kellogg condensers are made to meet the maximum voltage that may be required in the class of work for which they are designed.

These working voltages are given below. In addition each condenser receives a fifteen second flash test of double the rated working voltage.

Code No. 28 — **½ M. F.**

The No. 28 condenser is standard for receiver circuits of magneto telephones. Dimensions of can 2½ inches long, 1¼ inches wide, ¾ inch thick. Working voltage 200 volts direct current. Mounting ear provided at base.

Code No. 10 — **½ M. F.**

The No. 10 condenser is similar in construction and appearance to the No. 28 but without mounting ear. Dimensions of can 2⅜ inches long, 1¼ inches wide and ¾ inch thick. Working voltage 200 volts direct current.

Code No. 184 — **½ M. F.**

The No. 184 condenser is of the same construction as the No. 28 except it is provided with 7 inch flexible leads to which spade tip terminals are soldered. Dimensions of can 2½ inches long, 1¼ inches wide and ¾ inches thick. Working voltage 200 volts direct current.

Code No. 20 — **.2 to .3 M. F.**

The No. 20 condenser is similar to No. 28 except no mounting ears are provided. Dimensions of can 2⅜ inches long, 1¼ inches wide, ¾ inch long. Working voltage 400 volts, direct current.

Code No. 12 — **1 M. F.**

The No. 12 condenser is used in many types of telephones and desk set boxes. Dimensions of can 4⅜ inches long, 2 inches wide and 45/64 inch thick. Working voltage 400 volts, direct current.

Code No. 177 — **1 M. F.**

The No. 177 condenser is of the same construction as the No. 12 except it is provided with 6-inch flexible leads to which spade tip terminals are soldered. Dimensions of can 4⅛ inches long, 2 inches wide and 23/32 inches thick. Working voltage 200 volts direct current.

Code No. 146 — **1 M. F.**

The No. 146 condenser is used in the 800 type common battery telephones. Dimensions, of can 4⅜ inches long, 2 5/16 inches wide and 1⅛ inches thick. Working voltage 400 volts direct current.

Code No. 16 — **2 M. F.**

The No. 16 condenser is used in many types of telephones and desk set boxes. Same dimensions as No. 146. Working voltage 200 volts direct current.

CONDENSERS

Code No. 185 **1 M. F.—2 M. F.**

The No. 185 condenser contains one 1 M.F. and one 2 M.F. condenser in one can. It is for use with the Kellogg Triad circuit. Length of can, 4⅜ inches, width 2⅛ inches, thickness 1⅜ inches. Working voltage 200 volts direct current.

Code No. 174 **2 M. F.**

The No. 174 condenser is principally for use in magneto telephones where height of the condenser can is a determining factor. Length of can 2¼ inches, width 1¾ inches, thickness 1⅝ inches. Working voltage 200 volts direct current.

Code No. 68 **½ M. F.**

The No. 68 condenser is for use in older type magneto switchboard cord circuits. Dimensions of can 3⅜ inches long, 1½ inches wide and 1½ inches thick. Working voltage 400 volts direct current.

Code No. 78 **1 M. F.**

The No. 78 condenser is similar in appearance to the No. 68 except no mounting ears are provided. Used in common battery wood telephones and desk set boxes. Dimensions same as No. 68. Working voltage 200 volts direct current.

Code No. 67 **1 M. F.**

The No. 67 condenser is the same as No. 68 except capacity. Used in magneto cord circuits. Working voltage 200 volts direct current.

Code No. 66 **2 M. F.**

The No. 66 condenser is the same as No. 68 except capacity and rated working voltage which is 160 volts direct current.

Code No. 62 **2 M. F.**

The No. 62 condenser is similar in appearance to the No. 68 except no mounting ears provided. Used in No. 722 extension telephone. Dimensions same as No. 68. Working voltage 160 volts direct current.

Code No. 53 **2 M. F.**

The No. 53 condenser is similar to No. 68 but is provided with 2 mounting ears, 1 on base and 1 on side for mounting condenser in corner of box. Used in No. 97 desk stand. Same dimensions as No. 62. Working voltage 160 volts direct current.

Code No. 132 **1 M. F.**

The No. 132 condenser is arranged to mount on steel mounting strips. Dimensions of can, 3¼ inches long, 1½ inches wide and 1⅛ inches thick. Working voltage 200 volts direct current.

Code No. 64 **2 M. F.**

The No. 64 condenser mounts on steel mounting strip. Dimensions are the same as No. 132. Working voltage 160 volts direct current.

Code No. 103 **1 M. F.**

The No. 103 condenser has mounting ears on the side. Dimensions of can 3 inches long, 1½ inches wide and 1⅛ inches thick. Working voltage 200 volts direct current.

Code No. 172 **1 M. F.**

The No. 172 condenser is of the same construction as the No. 103 except it is provided with flexible wire leads to which spade tip terminals are soldered. Dimensions of can 3 inches long, 1½ inches wide, and 1⅛ inches thick. Working voltage 200 volts direct current.

Code No. 34 **2 M. F.**

The No. 34 condenser is of the same appearance as No. 103 except slightly larger in dimensions of the can being 4⅜ inches long, 2 1/16 inches wide and 1⅛ inches thick. Working voltage 200 volts direct current.

Code No. 36 **2 .M. F**

The No. 36 condenser is designed to mount on an iron plate. Dimensions of can 4⅜ inches long, 2 1/16 inches wide, 1⅛ inches thick. Working voltage 200 volts direct current.

Mountings for No. 36 Condenser

This type of enameled steel mounting furnished as follows:

Code No.	Cond. per strip	Width Inches	Mtg. Centers Inches	Length Overall Inches
272	11	2	13½	13⅞
289	18	2	25¼	26
335	16	2	20⅜	21⅛
356	10	2	13 1/10	13 9/16

Code No. 153 **1 M. F.**

The No. 153 condenser mounts on standard relay strips. It is provided with a lug so that a standard relay shell can be placed over it. Dimensions of can 3¼ inches long, 1 17/32 inches wide, and 1½ inches thick. Working voltage 200 volts direct current.

Code No. 65 **2 M. F.**

The No. 65 condenser uses the same can as No. 153. Working voltage 160 volts direct current.

Code No. 128 **4 M. F.**

The No. 128 consists of twin 2 M. F. condensers placed in a regular relay shell. Provision is made to mount on regular relay mounting strips. Dimensions of shell, 4 inches long, 1⅞ inches wide, 2¼ inches thick. Working voltage 200 volts direct current.

CONDENSERS, DESK STAND CORDS

Code No. 24 — **½ M. F.**

The No. 24 is used on various types of pole changers, requiring a high breakdown condenser. Overall, 2⅞ inches long, 2 1/16 inches in diameter. Working voltage 700 volts direct current.

Code No. 25 — **1 M. F.**

The No. 25 condenser is the same as No. 24 except capacity. Working voltage 400 volts direct current.

Code No. 141 — **⅛ to ½ M. F.**

The No. 141 condenser is equipped with four terminals providing one common and three taps of ⅛, ¼, or ½ M.F. Dimensions of can 4⅜ inches long, 1¾ inches wide and 1⅝ inches thick. Working voltage 700 volts direct current.

Code No. 143 — **¼ M. F.**

The No. 143 condenser uses the same size can as the No. 141. Working voltage 700 volts direct current.

Code No. 140-C — **1 M. F.**

The No. 140 condenser uses the same size can as the No. 141 and is provided with a cover. Working voltage 700 volts direct current.

Code No. 171-C — **¼ M. F.**

The No. 171-C condenser is provided with two mounting lugs and a cover. Dimensions of can 4⅜ inches long, 2 inches wide and ¾ inches in width. Working voltage 700 volts direct current.

Code No. 108 — **4.2 M. F.**

The No. 108 condenser consists of two balanced units mounted on a maple block. Dimensions, 10¾ inches long over all, 1⅞ inches wide and 2⅞ inches high. Working voltage 700 volts direct current.

Condenser Mounting Brackets

Piece No.	Thickness of Condenser, Inches
5771	¾
5772	1 1/32
27928	1½
4854	2 1/16

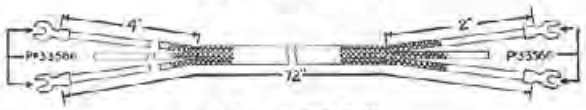
Kellogg Desk Stand Cords

Over a third of a century of successful cord manufacturing is the outstanding reason for the long life, high conductivity, and resistance to moisture of Kellogg desk stand cords. These years of experience, coupled with modern cord making machines supervised by qualified operators, and complete facilities for testing both raw material and finished product, insures Kellogg quality.

The conductors of Kellogg desk stand cords are made of eighteen strands of the highest quality copper tinsel. The tinsel is scientifically braided to give maximum strength. Kellogg cords withstand the constant twisting, jerking, and bending that present-day speedy service subjects them to. The tinsel is absolutely sealed against moisture and oxidation by a special insulation. The insulated wire is then protected by a closely woven cotton inner braid, and followed by the application of a heavy brown mercerized cotton outer braid. Terminals are firmly soldered and tie cords provided to take the strain off the conductors while in use.

Only standard Kellogg cords that can be shipped from stock are listed. However, cords requiring different trim and terminals can be quickly furnished to meet special requirements.

Two Conductor

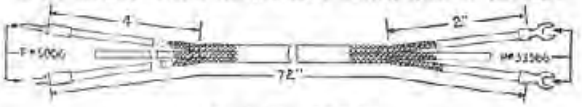


Code No. F665-D

Tracer colors solid and black. Fits Kellogg Nos. F-39, F-75, F-97, F-111 and other stands provided with terminals for flat type tips. Replaces Kellogg F100-D, S.C. D-2-C Cord.

Code No. 665-D

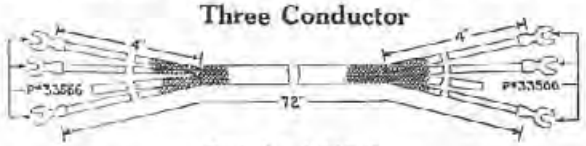
Same as Code No. F665-D except having spike or pin tips.



Code No. 667-D

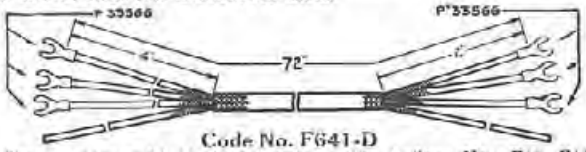
Tracer colors solid and black. Replaces Kellogg No. 186-D cord.

Three Conductor



Code No. F640-D

Tracer colors green, red, yellow. Fits Kellogg Nos. F115-A, F118, F118-B, F135, F138 and F301 stands. Replaces Kellogg F452-D, S.C. No. D-3-C, A.E. No. D-541844-A cords.

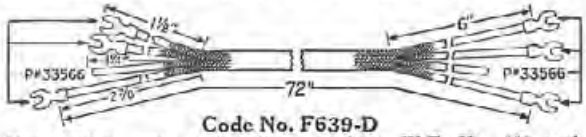


Code No. F641-D

Tracer colors solid, black and yellow. Fits Kellogg Nos. F84, F110, F115 and other stands provided with terminals for flat tips. Replaces Kellogg No. F150-D.

Code No. 641-D

Same as above except having spike or pin tips.

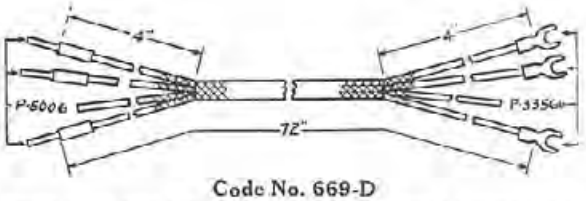


Code No. F639-D

Tracer colors green, red, yellow. Replaces W.E. No. 550 cord.

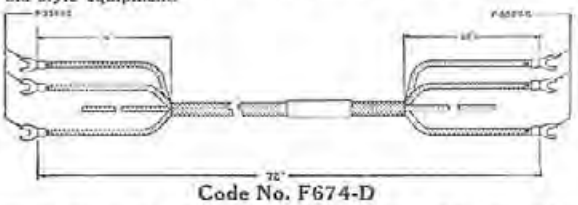
Kellogg

DESK STAND, HANDSET CORDS



Code No. 669-D

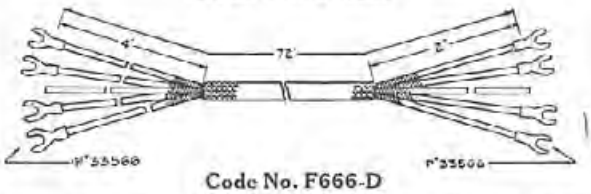
Tracer colors solid red, yellow. A general purpose replacement cord for old style equipment.



Code No. F674-D

Tracer colors red, yellow, green. Fits Kellogg Nos. 700 and 725 Masterphone stands.

Four Conductor

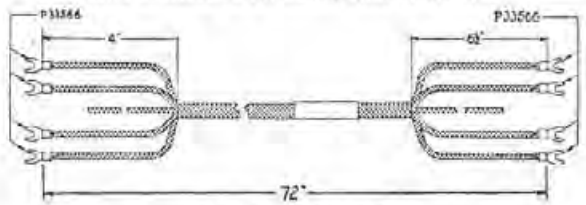


Code No. F666-D

Tracer colors solid, black, red, yellow. For 4 conductor magneto stands and desk set boxes provided with terminals for flat type tips. Replaces Kellogg F-102-D, or S.C. F-4-C cord.

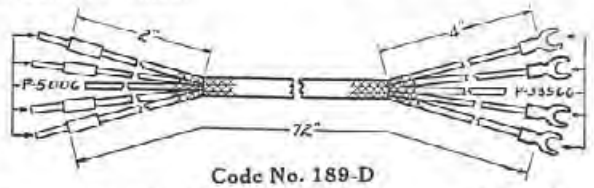
Code No. 666-D

Same as above except having spike or pin tips.



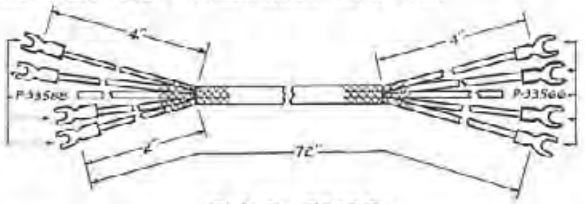
Code No. F685-D

Tracer colors solid red, yellow, green. Fits Kellogg Nos. 710 and 730 Masterphone stands.



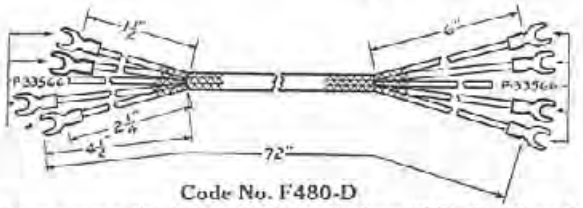
Code No. 189-D

Tracer colors solid, black, red, yellow. Fits most four-conductor stands where a spike or spade terminal can be used.



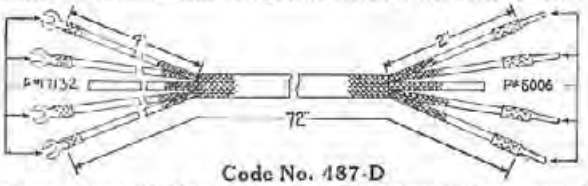
Code No. F246-D

Tracer colors solid, black, red, yellow. Fits Kellogg F-97-B Stand.



Code No. F480-D

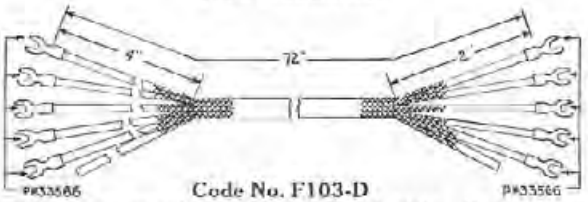
Tracer colors solid, black, red, yellow. Replaces W.E. No. 231 cord.



Code No. 487-D

Tracer colors solid, black, red, yellow. Fits Monarch Magneto stands.

Five Conductor

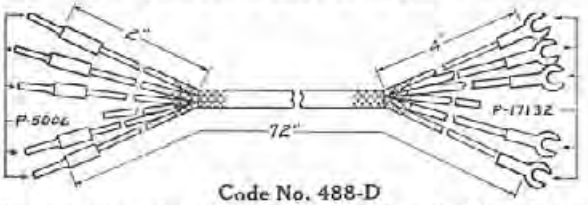


Code No. F103-D

Tracer colors solid black, red, yellow and white. Principally used with inter-communicating systems.

Code No. 103-D

Same as Code No. F103-D except having spike or pin tips.

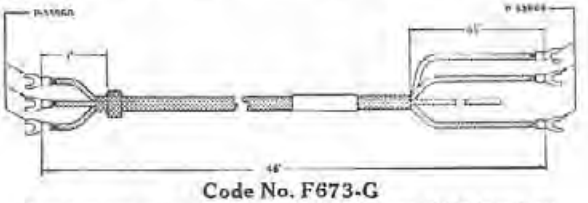


Code No. 488-D

Tracer colors solid, black, red, yellow, white. Fits Monarch stand.

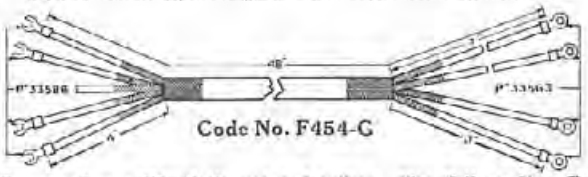
Handset Cords

Kellogg handset cords are of the same sturdy construction as Kellogg desk stand cords. This insures long life, high conductivity and resistance to moisture. Only standard Kellogg handset cords are listed. However, handset cords to meet other requirements can be quickly furnished to order.



Code No. F673-G

Tracer colors red, yellow, green. Fits Kellogg F27-C hand set.



Code No. F454-G

Tracer colors solid, black, red and yellow. Fits Kellogg Nos. F11 and F12 Grahaphones.

RECEIVER, OPERATOR CORDS

Receiver Cords

Kellogg receiver cords, like Kellogg desk stand cords are purchased for their long life, high conductivity and resistance to moisture qualities. They are of the same construction as the desk stand cords.

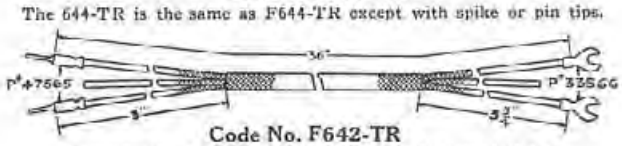
Only standard cords that can be shipped from stock are listed. However, cords requiring different trim and terminals can be quickly furnished to meet special requirements.

Code No. F644-TR

Tracer colors solid and black. Replaces Kellogg F98TR, W.E. R-2-G, S.C. R-2-G, A.E. D-541846-A Cords. Fits Kellogg F41A receiver.

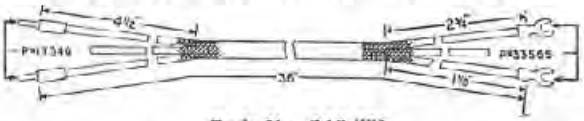
Code No. 644-TR

The 644-TR is the same as F644-TR except with spike or pin tips.



Code No. F642-TR

Tracer colors solid and black. Replaces S.C. cord R-2-1.



Code No. 646-TR

Tracer colors white and green replaces W.E. No. 549. Standard for W.E. desk stand.

Operators' Cords

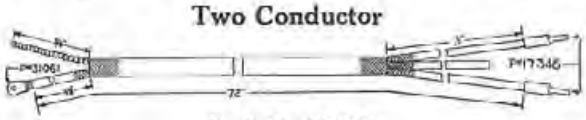
Kellogg operators' cords are of the same construction as Kellogg desk stand cords. They are purchased for their long life, high conductivity and resistance to moisture qualities.

The conductors are made of eighteen strands of the highest quality copper tinsel. The tinsel is scientifically braided to give maximum strength. Kellogg cords withstand the twisting, jerking, and bending which operators' cords are constantly subjected to. The tinsel conductor is absolutely sealed against moisture and oxidation by the use of special insulation. The insulated wire is then protected by a closely woven cotton inner braid, and followed by the application of a heavy brown mercerized cotton outer braid. Terminals are firmly soldered, and tie cords provided to take the strain off the conductors while in use.

Only standard Kellogg operators' cords are listed below. However, cords requiring different trim and terminals can be quickly furnished to meet special requirements.

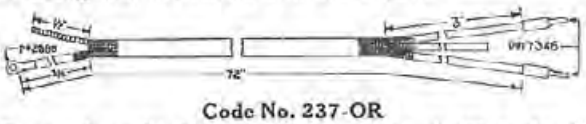
For Suspended Transmitter Type Operator's Set

Two Conductor



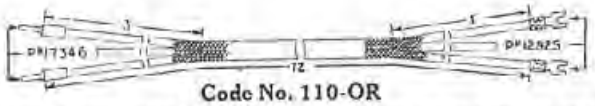
Code No. 26-OR

Tracer colors solid, black. Diameter at plug end .292 to .312 inches for ⅞" 18 Whit. Tap. Formerly standard on Kellogg switchboards. Fits Kellogg Nos. 107, 168 and W.E. No. 47 plugs.



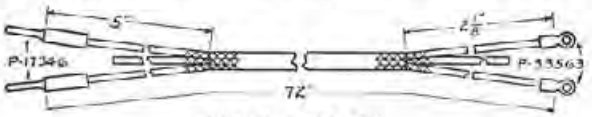
Code No. 237-OR

Tracer colors solid, black. Diameter at plug end .196 to .216 (for 12-24 Whit. Tap). Fits Kellogg No. 75 plug.



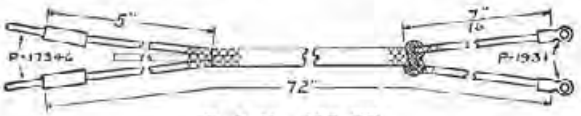
Code No. 110-OR

Tracer colors solid and black. Standard on Kellogg boards using suspended type transmitter. Fits Kellogg Nos. 145 and 146 plugs.



Code No. 466-OR

Tracer colors solid, black. Fits Kellogg No. 139 plugs. Replaces W.E. cord No. 254.

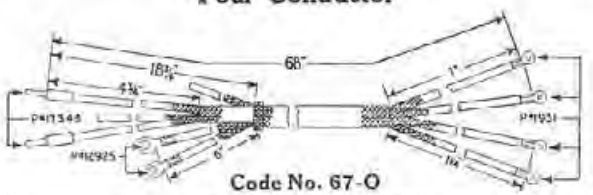


Code No. 468-OR

Tracer colors solid, black. Knotted at plug end. Replaces W.E. No. 30 cord.

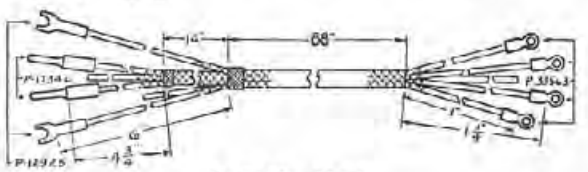
For Breastplate Transmitter Type Operator's Sets

Four Conductor



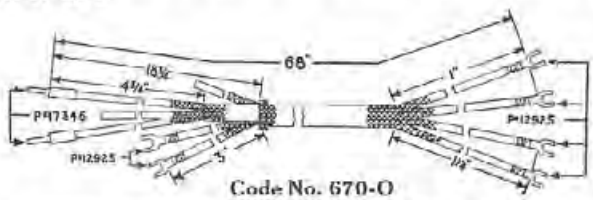
Code No. 67-O

Transmitter tracer colors solid, black; receiver red, yellow. Fits Kellogg No. 25 plug.



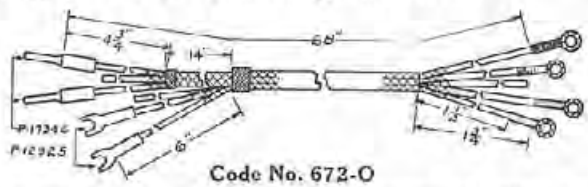
Code No. 199-O

Transmitter tracer colors solid, blue; receiver red, yellow. Fits Kellogg No. 139, W.E. Nos. 103, 112 and 137 plugs. Replaces W.E. No. 87 Cord.



Code No. 670-O

Transmitter tracer colors black, green; receiver red, yellow. Fits Kellogg No. 145 plug. Replaces Kellogg No. 111-O cord.



Code No. 672-O

Transmitter tracer colors black, green; receiver red, yellow. Fits Kellogg No. 182 plug. Replaces Kellogg No. 439-O cord.

SWITCHBOARD CORDS

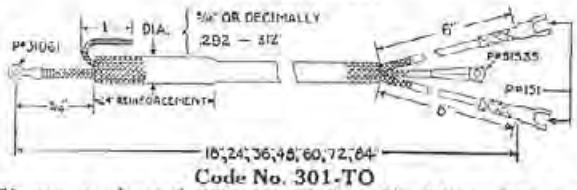
Tinsel Switchboard Cords

The use of Kellogg all tinsel switchboard cords is a real economy in switchboard maintenance. They combine low resistance, extreme flexibility and long life. Recommended for Kellogg Service switchboards and other equipment where traffic is heavy and operators work at high speed.

The conductors are made of eighteen strands of the highest quality copper tinsel. A durable, moisture-proof covering of the finest insulating material obtainable is applied to the conductors. The individual conductors are twisted together with sufficient rope filler to make a smooth round cord. A cotton inner braid, and then a tough outer braid of the longest wearing material available is woven over the insulated conductors. For reinforcement and to give longer wear to the cord, the outer braid is doubled for a distance of twenty-four inches from the plug end.

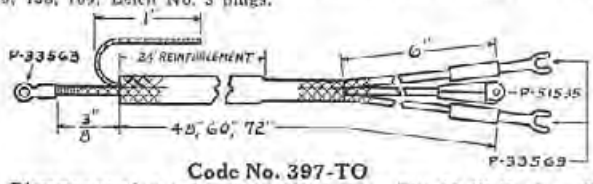
The standard color of the outer braid is white. Red, white, or green can be furnished on order. When desired, cords will be furnished complete with switchboard plugs attached. In such cases, specify code number of the plugs.

Two Conductor



Code No. 301-TO

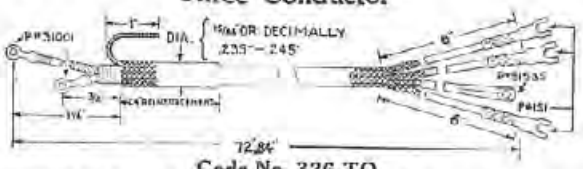
Diameter at plug end .292 to .312 inches. Fits Kellogg Nos. 3, 42, 70, 138, 109, Leich No. 3 plugs.



Code No. 397-TO

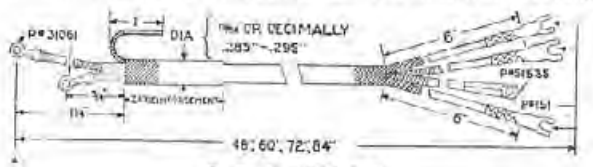
Diameter at plug end .310 to .328 inches. Fits 47 W.E. plug. Replaces W.E. No. 493, S-2-A cords.

Three Conductor



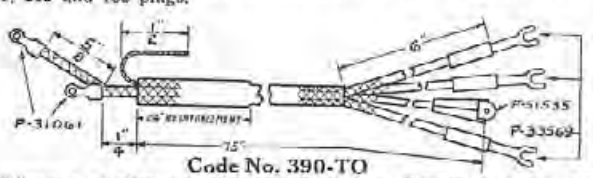
Code No. 326-TO

Diameter of plug end .250 to .270 inches. Fits Kellogg No. 201 plugs.



Code No. 309-TO

Diameter of plug end .285 to .295 inches. Fits Kellogg Nos. 12, 13, 106, 202 and 152 plugs.



Code No. 390-TO

Diameter of plug end .261 to .281 inches. Fits Kellogg No. 185, W.E. No. 109 plug. Replaces W.E. No. 447 cord.

Code No. 391-TO

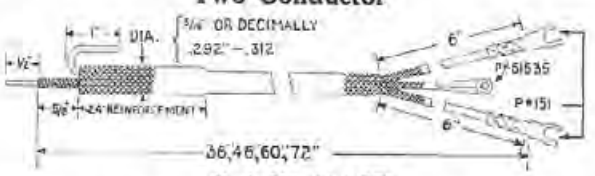
Same as No. 390-TO except diameter of plug end .292 to .312 inches. Fits Kellogg No. 191, W.E. No. 110 plug. Replaces W.E. 448 cord.

Steel and Tinsel Cords

Kellogg steel and tinsel cords are known for their durability and ease with which they may be cut back. They consist of spiral piano steel conductors wrapped over the finest quality of braided tinsel. The round steel conductors give the cord long life, while the tinsel lowers the resistance. This construction assures a most satisfactory cord from a transmission standpoint.

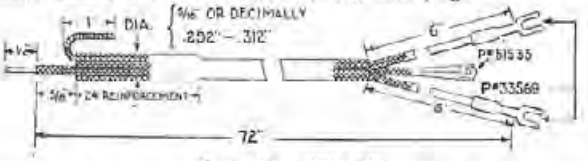
When it is desired to have switchboard plugs attached to the cords at the Kellogg factory, the code number of the plugs must be specified.

Two Conductor



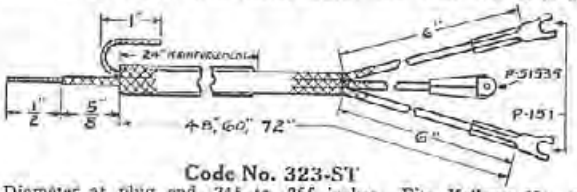
Code No. 304-ST

Kellogg standard diameter at plug end .292 to .312 inches. Fits Kellogg Nos. 3, 42, 70, 130, 187, A.E. No. 1188 plugs.



Code No. 353-ST

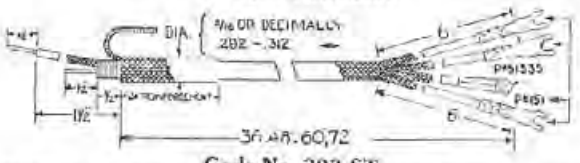
Diameter at plug end .292 to .312 inches. Fits W.E. No. 47 plug.



Code No. 323-ST

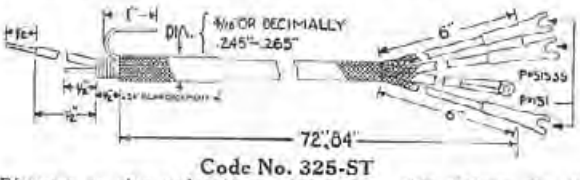
Diameter at plug end .245 to .265 inches. Fits Kellogg No. 211, S.C. Nos. 56 and 67 plugs.

Three Conductor



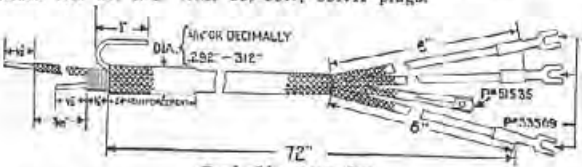
Code No. 303-ST

Diameter at plug end .292 to .312 inches. Fits Kellogg Nos. 12, 13, 74, 106, 152, 202 and Leich plugs.



Code No. 325-ST

Diameter at plug end .245 to .265 inches. Fits Kellogg No. 201 Garford No. 54, S.C. Nos. 55, 55N, 55NX plugs.



Code No. 358-ST

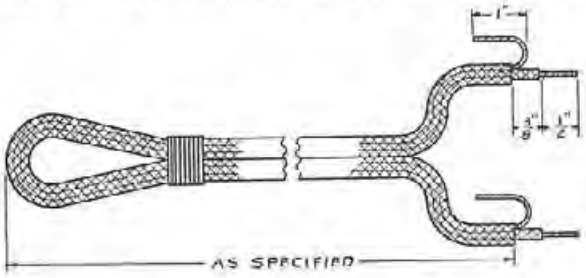
Diameter at plug end .292 to .312 inches. Fits Kellogg No. 191 W.E. No. 110 plugs.

PATCHING, TRANSMITTER CORDS AND ACCESSORIES

Switchboard Patching Cords

Switchboard patching cords are made in a variety of types to meet the requirements of different telephone exchanges.

Switchboard patching cords must of necessity, generally be made up special. Each telephone exchange has its own peculiar condition to meet. Kellogg switchboard patching cords are made from one, two, or three conductor switchboard cordage of either all tinsel, or steel and tinsel construction. When requesting information on Kellogg switchboard patching cords, include a rough sketch and the code number of the switchboard plug they are to be used with.



Code No. 308-ST

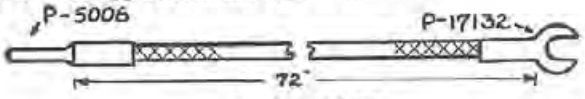
Mounts plug at each end. Tied at center. Diameter of plug ends .292 to .312 inches. Fits Kellogg Nos. 3, 42 and 70 plugs.

Switchboard Transmitter Cords

Kellogg switchboard transmitter cords are of the same construction as Kellogg desk stand cords. They can be relied upon for long life, high conductivity, and resistance to moisture.

Code No. 499-T

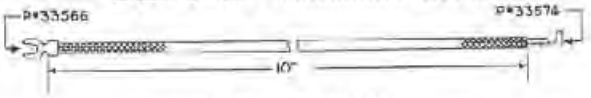
For Kellogg suspended type transmitter.



Code No. 465-ST

Replaces W. E. No. 437.

Desk Stand Transmitter Cords



Code No. 505-T

Code No. 505 transmitter cord replaces W. E. No. 548. It is of the same construction as Kellogg eighteen strand desk stand cords except with green silk over all braid.

Transmitter Cordage

Transmitter cordage as used in Kellogg desk and wall telephones consists of 15 strands of bare copper wire of finest quality, over which is placed one cotton wrapping followed by a blue and red cotton over all braid. The cordage is then impregnated with glue.

Code No.	Color	Approximate Feet per Pound
F137	Blue and Red	165

Cordage

Kellogg one, two and three conductor cordage can be furnished in any length. The conductors are made up of eighteen strands of the highest quality copper tinsel. The tinsel is scientifically braided to give maximum strength. Kellogg cordage withstands the constant twisting, jerking and bending that present-day speedy service subjects it to. The tinsel is absolutely sealed against moisture and oxidation by a special insulation. The insulated wire is then protected by a closely woven cotton inner braid, and followed by the application of a heavy brown mercerized cotton outer braid.

Cord Fasteners


No. 4

No. 4 cord fastener, brass dull nickeled.

No. 5 cord fastener, steel hot tin plated.


No. 5

Cord Hooks


No. 2

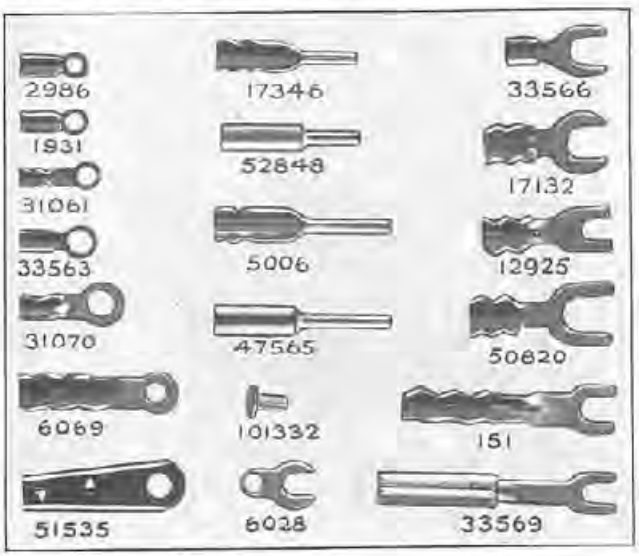
No. 2 brass cord hook made from No. 11 B & S gauge brass. Bent to form loop to prevent cord from slipping off.

Cord Weight

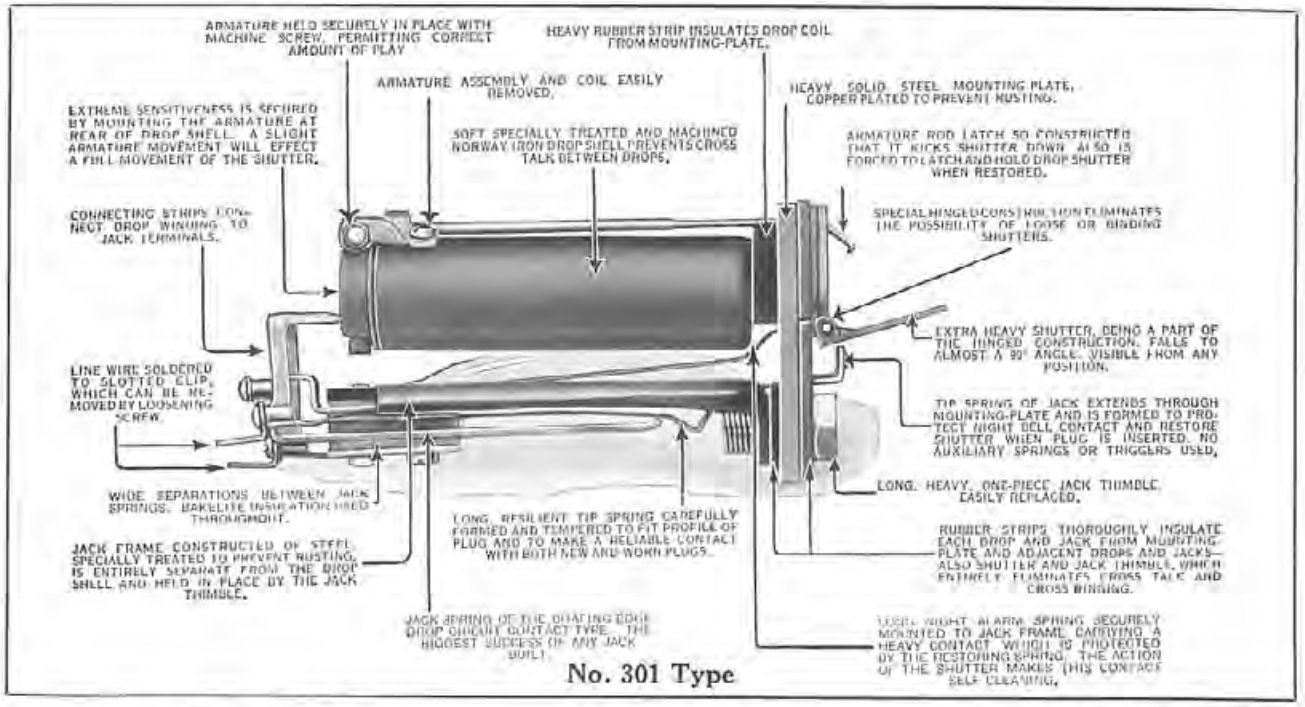
Code No. 9 cord weight is the standard weight for promptly restoring switchboard cords to their proper position after use. Having a weight of from 9 to 11 ounces, this cord weight will perform its task quickly yet not damage the cord by being too heavy. Dimensions, 4 inches long, $1\frac{23}{32}$ inches wide and ½ inch thick. The steel casing is given a rust-proof treatment before being filled with lead to add weight.

Cord Tips

The following list includes the standard cord tips used on Kellogg cords. The photographs are actual size. These tips are made of brass, hot tin plated.



DROPS AND JACKS—COMBINED



No. 301 Type

PC39454 Shutter Brass Black Enameled

PC39458 Shutter Support Brass Nickel Plated

PC39459 Insulation Bakelite

Combined Drops and Jacks

The Kellogg combined drop and jack is extremely sensitive. It operates with a minimum current, and gives a good clear rattle. The mechanism is designed so the drop shutter will always restore even if the plug is badly worn. Kellogg drops and jacks are practically free from trouble and burn-outs.

The outstanding feature is the extreme simplicity of construction and freedom from trouble. The long combined, tip and restoring spring of heavy, even tempered German Silver is the only spring making contact with the plug. The action of this spring places all jack wear on the inexpensive and easily replaced jack thimble. A positive electrical contact is always insured.

The break contact spring which cuts one side of the drop off from the line when the plug is inserted, is also constructed of heavy German Silver being so formed that the chafing knife edge always makes a good electrical contact.

The Kellogg armature assembly is simplicity itself. The long lever principle again provides maximum action at the shutter with a minimum air gap at the armature. With small air space between armature and coil, sensitive and positive armature operation is insured with a minimum current flow.

The drop shutter is of the punched hinged type construction and falls to an angle of 65 degrees when released. The shutter is plainly visible from any angle.

The Kellogg night alarm has been proven by fifteen years of service. Here again the principle of a long, flexible spring having a non-corrosive contact insures maximum operation.

The code ringing night alarm often times called the armature contact is separate from the regular night alarm. It is easily adjusted from the face of the switchboard.

Heavy insulators separate the springs and thick blocks of hard rubber insulate drops and jacks from the frame, insuring maximum protection against lightning and other foreign current. Coils are easily removable but the liberal insulators make such removal rarely necessary.

Kellogg drops with mountings can be used in boards of other manufacture. In ordering give board number if Kellogg, if otherwise name of manufacturer and dimensions of mounting

Standard Drop and Jack

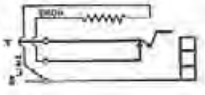
2 Conductor—Single Cut Off

Code No. 300 drop and jack is provided with code ringing night alarm. An adjustment screw protrudes through the mounting strip, allowing easy and positive adjustment.

Code No. 301 drop and jack is standard where the code ringing feature is not desired. Will mount on the same type mounting as the Code No. 300 type.

The letter after the code number indicates the resistance of the coil winding. For example Code No. 301-DJE drop and jack has a coil whose resistance is 500 ohms. If the drops and jacks are to be mounted specify the code number of the mounting.

Code No.	Resistance 500 Ohms	Resistance 1000 Ohms	Plug Used
300	DJE	DJC	42
301	DJE	DJC	42



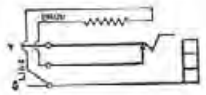
DROPS AND JACKS—COMBINED

Drop and Jack to Fit W.E. 47 Plug

2-Conductor—Single Cut Off

Code No. 303 drop and jack fits the W.E. No. 47 plug. It is identical with the 301 except for the different jack thimble.

Code No.	Resistance 500 Ohms	1000 Ohms
303	DJE	DJC

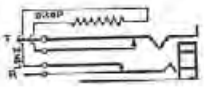


Drop and Jack for Toll Lines

2-Conductor—Double Cut Off

Code No. 103 drop and jack is similar in construction to the Code No. 301 type except that the jack is provided with double cut off springs to cut the drop coil completely out of the circuit when plug is inserted.

Code No.	500 Ohms	1000 Ohms	Plugs Used
103	DJE	DJC	42

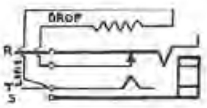


Rural Lines
Common Battery Switchboards

2-Conductor—Single Cut Off

Code No. 105 drop and jack is similar in construction to the Code No. 103 but fits 3 conductor plug.

Code No.	500 Ohms	1000 Ohms	Plugs Used
105	DJE	DJC	106

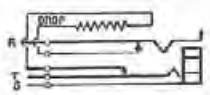


Rural Toll Lines
Common Battery Switchboards

3-Conductor—Double Cut Off

Code No. 107 drop and jack is similar to Code No. 105 except provided with double cut off so that drop coil is cut from the line completely when plug is inserted.

Code No.	500 Ohms	1000 Ohms	Plugs Used
107	DJE	DJC	106



Drop and Jack Mountings

The standard Kellogg mounting strips for the above drops and jacks are made in five and ten per strip. The strip proper is made of steel, copper plated. Heavy blocks of insulation are used to insulate the drop and the jack from the mounting. The shutters which are furnished are fastened to the mounting. Net weight, five per strip complete, 2½ lbs., ten per strip, 4 lbs.

Drop and Jack Mountings—Continued

FIVE PER STRIP

No. 257, Mtg. Complete with Drops and Jacks

Code No. 257

The No. 257 mounting strip is the standard five per strip. It will mount the Nos. 29, 101 and 301 type drop and jacks. The mounting centers are 6¼ inches. Length face, 5$^{55}/_{64}$ inches, overall length, 6$^{11}/_{16}$ inches. Width of strip, 1¾ inches. Net weight, 10 ounces.

Code No. 333

The No. 333 mounting strip is similar to No. 257 but is drilled for code-ringing night alarm. Mounts Nos. 59, 100 and 300 type. Net weight, 10 ounces.

Code No. 395

The No. 395 is identical to the No. 257 except that 2-piece No. 28421 adapters are provided to cover the end spacing. This permits flush type mounting. Net weight, 10 ounces.

TEN PER STRIP

No. 329, Mtg. Complete with Drops and Jacks

Code No. 329

The No. 329 is the standard ten per strip mounting that mounts the Nos. 29, 101 and 301 drop and jack. Mounting centers are 10$^{21}/_{32}$ inches, length of face, 10¼ inches, length overall, 11¼ inches. Width strip, 1¾ inches. Net weight, 1 lb.

Code No. 426

The No. 426 is the standard ten per strip mounting that mounts the Nos. 59, 100 and 300 type drop and jack. Similar to the No. 329 except drilled for adjustable code ringing night alarm. Net weight, 1 lb.

Code No. 258

The No. 258 mounting is of the lug mounted type. Width of strip, 1⅞ inches, overall length, 10¾ inches. Length of face, 10¼ inches. Mounting centers, 11$^{5}/_{32}$ inches. Net wt., 1 lb.

DROPS—COMBINED RINGER, DROP AND JACK

Clear Out Drops

The Kellogg No. 51 ring off drop or clear out drop is similar in design and embodies all the points of excellence found in the Kellogg line drop. This drop being very sensitive, the shutter is forced to fall with even the weakest ringing current. Drops are of the rust-proof construction and are fitted with contacts for night alarm or pilot lamp signals, the same as drops used for the line circuit. Carried in stock in the following resistances:

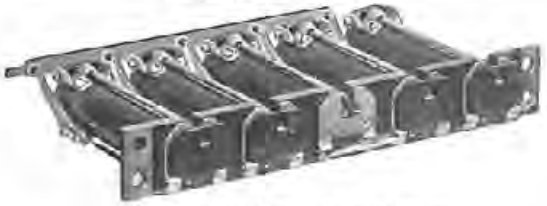
Code No.	Resistance, Ohms
51-DC	1000
51-DE	500

Other resistances can be furnished on special order.

Clear Out Mountings

While a mounting can be furnished to meet practically any requirement, Kellogg recommend using the following standards which are carried n stock for prompt shipment. Net weight complete with drops, five per strip, 2½ lbs., eight per strip, 2¾ lbs., ten per strip, 3 lbs.

FIVE PER STRIP



No. 259, Mtg. Complete with Drops

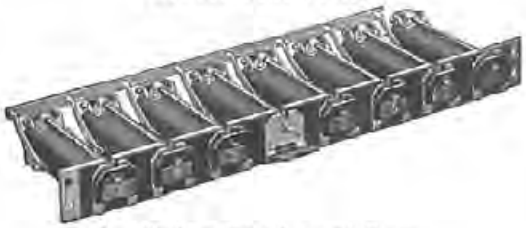
Code No. 259

The No. 259 drop mounting is standard for mounting five Code No. 51 drops. In general construction it is similar to the drop and jack mounting strip. The mounting screw centers are 6¼ inches, length of face, 5$^{27}/_{32}$ inches, width, 1 inch. The drop mounting centers are 1$^{3}/_{16}$ inches. Net weight, 4 ounces.

Code No. 449

The No. 449 is identical with the No. 259 except it has a width of 1$^{3}/_{16}$ inches. The face is of the flush type. Fits Dean switchboards. Net weight, 6 ounces.

EIGHT PER STRIP



No. 433, Mtg. Complete with Drops

Code No. 433

The No. 433 is the standard for mounting eight No. 51 type drops or No. 22 type. Overall length, 10$^{21}/_{32}$ inches, length of face, 10¼ inches, width, 1 inch mounting centers, 10$^{21}/_{32}$ inches. Drop mounting centers, 1$^{5}/_{32}$ inches Net weight, 10 ounces.

Drop Mountings—Continued

TEN PER STRIP

Code No. 427

The No. 427 drop mounting is similar to the No. 433 except 10 per strip. Overall length, 10$^{31}/_{32}$ inches, mounting centers, 10$^{31}/_{32}$ inches, length of face, 10¼ inches, width, 1 inch. Drop mounting centers, 1 inch. Net weight, 12 ounces.

No. 260, Mtg. Complete with Drops

Code No. 260

The No. 260 drop mounting is standard for mounting 10 Code No. 51 drops. Similar in construction to the drop and jack mounting strip of the lug mounted type. The mounting screw centers are 11$^{5}/_{32}$ inches, length of face, 10¼ inches, width of strip, 1 inch, length overall, 10¾ inches. The drop mounting centers are 1 inch. Net weight, 12 ounces.

Other types of mounting strips can be furnished on special order by sending in a sample and giving code number and make of switchboard.

Combined Ringer, Drop and Jack

The No. 3 type combined ringer, drop and jack is used where a bell signal is required instead of a drop. The gongs are made of brass nickel plated, the diameter being 1$^{13}/_{32}$ inches. The nickel plated shutter is operated by the armature clapper, however, it must be restored manually. The jack is of the same standard construction as those used for combined drops and jacks.

They can be furnished in different resistances as follows:

Code No.	Resistance, Ohms
3A	1000
3D	1600
3E	2500

Mountings

Code No. 455

Code No. 455 mounting mounts in the same space as the standard 10 per strip combined drop and jack mounting. Screw mounting centers, 10$^{21}/_{32}$ inches, length of face, 11$^{3}/_{32}$ inches, width, 1¾ inches. Mounts 3 Code No. 3 type combined ringers and drops.

DESIGNATION STRIPS, HOWLERS, GENERATORS

Designation Strips

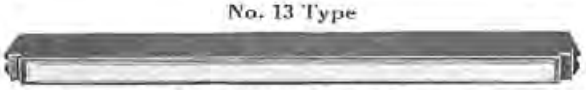
The holders of Kellogg designation strips are made from drawn brass heavily black enameled. White paper inserts are used under the clear celluloid cover. These strips of paper are easily removed for lettering or replacement.

The following strips are all 17/32 inch in width and can be furnished in the various lengths listed. Piece No. 5964 wood mounting screws are furnished only when specified.

No. 7 Type

Code No.	Overall Length in Inches	No. of Mtg. Screws Required
22	1 7/16	2
17	5 1/2	2
28	8 9/16	3
16	9 1/2	3
15	10	3
10	10 1/4	3
33	11 1/2	5
19	13 1/16	4
26	15 1/2	5
30	17	4
7	19 1/2	5
9	20 9/16	5
8	21 11/16	5

No. 13 Type



The No. 13 type is similar to the No. 7 type in general construction. The designation strip is mounted on a black enameled blank jack panel to harmonize in finish.

Code No.	Mtg. Centers Inches	Width of Blank, Inches	Dimensions Designation Strips Inches
31	8 1/4	1/2	7/16 x 7 9/16
23	8 1/4	3/8	3/16 x 7 9/16
13	11 5/32	1/2	7/16 x 10
20	11 5/32	7/16	7/16 x 10

Howlers

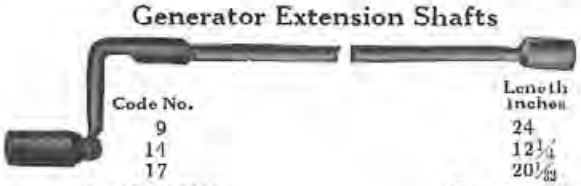
NOTE: See industrial signals also loud ringing bells.

Code No. 5A

The No. 5A howler is used for railroad dispatching service and industrial signals. It consists of a heavy adjustable unit wound to 1700 ohms and mounted in a compact oak cabinet. Dimensions of base, 5 1/8 inches by 6 inches. Overall height, including horn, 9 inches.

Being adjustable this unit can be accurately tuned to the high frequency current from which it is to operate insuring the most efficient operation and producing greatest volume.

Generator Extension Shafts



Code No.	Length Inches
9	24
14	12 1/4
17	20 1/32

Pc. No. 15911 — Generator Cranks

Generators

The secret of the Kellogg generator's extraordinary strength lies not only in its permanent magnet, but in the superior design of its revolving electro-magnet or armature, upon which the wire is wound. It is just as important that this revolving magnet be massive in size as it is to have a large and powerful magnet, for it is absolutely useless to have the permanent magnet furnish more magnetism than the electro-magnet has capacity to use. Most important of all, however, is the necessity for a liberal amount of winding space to accommodate a large coil of magnet wire in which the ringing circuit is generated.

The Kellogg armature is of the shaftless type, allowing plenty of winding space and the maximum amount of iron in the core.

All generator parts are well protected from rust and corrosion. Magnets are given a heavy coating of special blue paint. The gear, pinion, shaft field and screws are all nickel plated, dull finish.

Telephone Generators

No. 53

No. 16

Alternating Current

Code No.	No. Bars	Use
15	3	Lines in town
22	4	Farm lines
53	5	Farm lines
75	6	Requires extra large telephone cabinet

Pulsating and Alternating Current

Code No.	No. Bars	Description
59	5	Farm lines

NOTE: Pulsating current generators can be furnished on request.

Switchboard Generators

No. 72

No. 63

Alternating Current

Code No.	No. Bars	Remarks
72	5	Mounts from bottom
63	5	No. 72 inverted

NOTE: For generator parts see Generator Piece Part Plates, page 119.

JACKS—SPRING

Spring Jacks

Kellogg spring jacks are designed to withstand severe use with a minimum of wear on the springs and on the plugs that are used with them.

The frame work of these jacks is of heavy and rigid brass construction with phenol fibre insulation. The mounting strips are made of the finest grade of hard rubber. The German silver springs are properly tempered to withstand the hard usage to which they are subjected and to give maximum life.

For convenience the jacks are arranged according to the plug types they fit. If in doubt or if the jacks listed do not meet the requirements please communicate with Kellog giving complete specifications and their engineering department will promptly submit recommendations.

Operators' Jacks Listed Under Operators' Plugs

Two Conductor

For Plugs of the No. 42 187 137 Types Plug Diameter. 2495 Inches

Twenty per Strip

The face strip dimensions are 10¼ inches long and 7/16 inch high. Strip mounting centers 11 5/32 inches. Jacks on ½-inch centers.

Code No.	Spring Combination	Remarks
116	2 Conductor	
211	2 Conductor	Same as No. 116 except drilled for party line indicators.

Ten per Strip

Same dimensions as twenty per strip except jacks on 1-inch centers.

Code No.	Spring Combination	Remarks
163	2 Conductor	
195	2 Conductor	Same as No. 163 but slotted for No. 3 number plates.

Same dimensions as above except face strip ½-inch high.

Code No.	Spring Combination	Remarks
129	2 Conductor contacts	
132	1 Make and break	
283	1 Make	
186	2 Conductor contacts	5 jacks same as No. 129.
	1 Make and break	5 jacks same as No. 132.

Five per Strip

The face strip dimensions are 5 27/32 inches long and ½-inch high. Strip mounting centers, 6¾ inches. Jacks on 1 3/16-inch centers.

Code No.	Spring Combination	Remarks
215	2 Conductor	Transfer jack with removable sleeve.

Individual

Overall dimensions, 3 inches. Mount on ⅝-inch centers.

Code No.	Spring Combination	Remarks
85	2 Conductor	Mounts on ½-inch panel.
277	1 Make and break	Mounts on ½-inch panel

Overall dimensions, 3¾ inches. Mount on 1-inch centers.

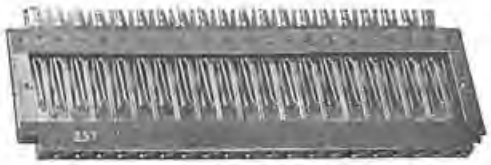
Code No.	Spring Combination	Remarks
319	1 Conductor contacts	Mounts on 3/32-inch panel.
315	2 Conductor contacts	Mounts on 3/32-inch panel.

JACKS—SPRING

Three Conductor

For Plugs of the No. 201 Type

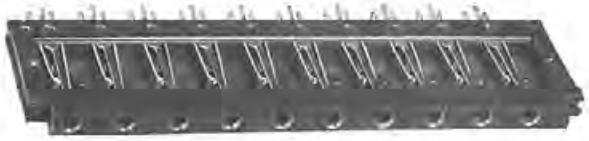
Twenty per Strip



The face strip dimensions are $7\frac{21}{32}$ inches long and $\frac{3}{8}$ inch high. Strip mounting centers $8\frac{9}{32}$ inches. Jacks on $\frac{3}{8}$-inch centers.

Code No.	Spring Combination	Remarks
239	3 Conductor	
257	3 Conductor	Same as No. 239 except drilled for party line indicators.

Ten per Strip



Same dimensions as twenty per strip except jacks on $\frac{3}{4}$-inch centers.

Code No.	Spring Combination	Remarks
274	3 Conductor	
253	3 Conductor	Slotted for No. 2 number plates.

Individual

Overall dimensions 3 inches. Mount $\frac{5}{8}$-inch centers.

Code No.	Spring Combination	Remarks
254	3 Conductor	Mounts $\frac{3}{8}$-inch panel.

Three Conductor

For Plugs of the No. 106 Type

Twenty per Strip

The face strip dimensions are $10\frac{1}{4}$ inches long by $\frac{3}{16}$ inch high. Strip mounting centers $11\frac{3}{32}$ inches. Jacks on $\frac{3}{8}$-inch centers.

Twenty per Strip

Code No.	Spring Combination	Remarks
261	3 Conductor	
258	3 Conductor	Same as No. 261 except drilled for party line indicators.
268	2 Conductor contacts	
270	1 Make contact	
272	1 Break contact	

Ten per Strip

Same dimensions as twenty per strip except jacks on $\frac{3}{4}$-inch centers.

Code No.	Spring Combination	Remarks
273	3 Conductor	
355	3 Conductor	Same as No. 273 except drilled for party line indicators.
259	3 Conductor	Slotted for No. 3 number plate.
267	2 Conductor contacts	
354	2 Conductor contacts	Same as No. 267 except drilled for party line indicators.
271	1 Break contact	
269	1 Make contact	

JACKS — SPRINGS

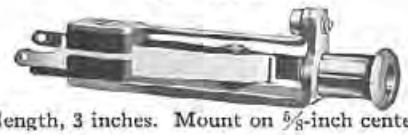
Three Conductor
For Plugs of the No. 106 Type

Five per Strip

Same dimensions as twenty per strip except jacks on 2-inch centers.

Code No.	Spring Combination	Remarks
297	3 Conductor	
296	2 Conductor contacts	
318	1 Make contact	

Individual



Overall length, 3 inches. Mount on 5/8-inch center.

Code No.	Spring Combination	Remarks
260	3 Conductor	Mounts on 3/16-inch panel.
286	1 Make and break	
356	1 Break	

Overall length, 3 3/4 inches. Mount on 1-inch centers. Similar in appearance to No. 316.

Three Conductor
For Plugs of the No. 152 Type

Twenty per Strip

The face strip dimensions are 10 1/4 inches long and 1/2-inch high. Strip mounting centers 11 5/32 inches. Jacks on 1/2-inch centers.

Code No.	Spring Combination	Remarks
146	3 Conductor	
250	3 Conductor	Same as No. 146 except drilled for party line indications.
134	2 Conductor contacts	
159	1 Make contact	

Three Conductor
For Plugs of the No. 152 Type

Ten per Strip

Same dimensions as twenty per strip except jacks on 1-inch centers.

Code No.	Spring Combination	Remarks
141	3 Conductor	
147	2 Conductor contacts	
149	1 Break contact	
191	1 Make contact	
218	1 Make and break contact	Transfer jack.

Individual

Overall dimensions, 3 inches. Mount on 5/8-inch centers.

Code No.	Spring Combination	Remarks
94	3 Conductor	Mounts 1/2-in. panel.
100	2 Conductor contacts	Mounts 1/4-in. panel.

Two Conductor

Overall dimensions, 3 inches. Mount on 5/8-inch centers.

Code No.	Spring Combination	Remarks
357	2 Conductor	Mounts on 9/16-inch panel.
358	2 Conductor contacts	Mounts on 3/16-inch panel.

Overall dimensions, 3 3/4 inches. Mounts on 1-inch centers.

Code No.	Spring Combination	Remarks
298	2 Conductor contacts	Mounts on 9/32-inch panel.

The No. 434 jack mounting mounts 10 No. 315 individual jacks. It is made of steel. Strip 1 inch wide, 10 1/4 inches long. Mounting centers 10 21/32 inches. Jack centers 1-inch.

JACK ACCESSORIES, KEYS

Jack Mounting Pin, Lug and Clips

Piece No.	Length, Inches	Remarks
28489	3	Standard for split style lug mounting
29735	3 7/32	For use with jack blanks

Piece No. 29027 Levin Lug has an overall length of 2 3/8 inches.

Piece No. 29026 Levin Lug has an overall length of 1 7/8 inches.

Piece No. 1872 Levin Lug has an overall length of 2 1/4 inches.

Piece No. 2169 retaining clip for holding two strips of jacks.
Piece No. 2800 retaining clip for holding one strip of jacks.
Piece No. 989 nut for mounting fastening jacks.
Piece No. 3988 washer used in connection with above piece numbers.

Indicator Pins—Party Line

These indicator pins are used on multiple jacks and indicate the equipped stations on a party line. They fit the drillings in the face of the spring jack as shown in the cut.

Concave Head

This type of indicator pin is made from iron wire properly treated to prevent rust. The head is concave and filled with colored Pyrolin Lacquer. Furnished in four colors.

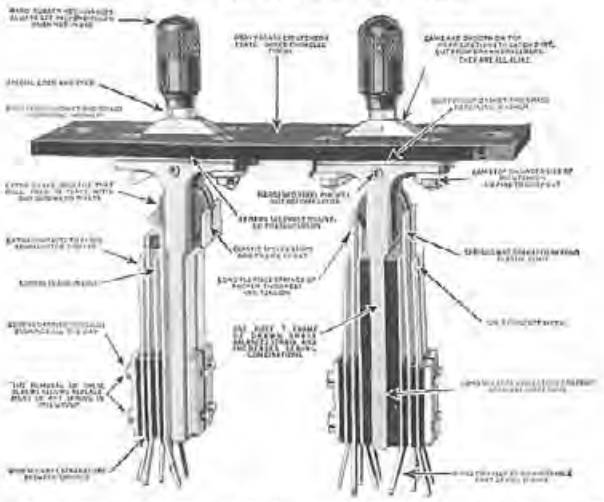
Code No.	Color	Code No.	Color
5	Red	7	Red
6	White	8	Blue

Celluloid Head

This style of indicator pin is also made of iron wire properly treated to prevent rust. The head is made of solid celluloid. Furnished in five colors:

Code No.	Color	Code No.	Color
10	Red	13	Blue
11	White	14	Yellow
12	Green		

No. 1000 Type Cam Keys



Kellogg cam keys are built on a perfect center line or T frame, making it possible to assemble any number of spring combinations of either the locking, restoring or both locking and restoring types, which are always interchangeable with each other.

All bushings, insulations and rollers are made from Kellite, which will not carbonize or break down under high voltage and which will stand up under the most rigid and persistent usage.

The T frame, typical of Kellogg cam keys, and the assembling screws are made of brass. The springs are made of German silver with special contacts, eliminating the possibility of corrosion and giving perfect talking and ringing connections in every operation.

The scientific basis on which Kellogg keys are constructed, with proper distribution of wear, insures long life and positive contacts.

Keys mounted on escutcheons should be ordered so that the first key mentioned on the order will be the key nearest the operator when installed, and so that all locking keys are farthest from the operator. Net weight, 3 1/2 ounces.

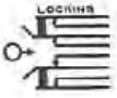
Single Locking

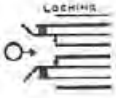
Code No. 1001

Two sets of make contacts.

Code No. 1003

Four sets of break contacts.



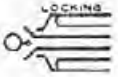


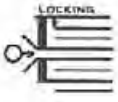
Code No. 1004

Two sets of break contacts and two sets of make contacts.

Code No. 1014

Two sets of make before break contacts.





Code No. 1017

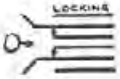
One set of break contacts and three sets of make contacts.

KEYS

No. 1000 Type Cam Keys
Single Locking

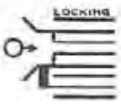
Code No. 1025
Two sets of make before break contacts and two sets of make contacts.

Code No. 1028
Two sets of make and break contacts.



Code No. 1034
Four sets of make and break contacts.

Code No. 1035
One make contact and two sets of make and break contacts.

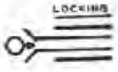


Code No. 1042
Three sets of make contacts.

Code No. 1069
One make contact, one break contact and two sets of make and break contacts.

Code No. 1070
Two break contacts and four make contacts.

Code No. 1072
Four sets of make contacts.



Code No. 1077
One make contact and one set having two make contacts.

Code No. 1083
Two sets of make and break contacts, and one set of break contacts.

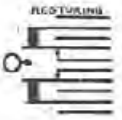
Code No. 1102
Three sets of make and break contacts.

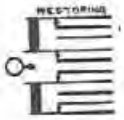
Code No. 1115
One set of break contacts and two sets of make before two break contacts.

No. 1000 Type Cam Keys
Single Restoring

Code No. 1068
Four sets of make and break contacts.

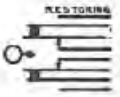
Code No. 1007
Two sets of make and break contacts and two make contacts.

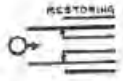




Code No. 1008
Two sets of make and break contacts and two break contacts.

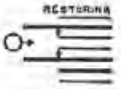
Code No. 1009
Two sets of break contacts and two sets of make contacts.





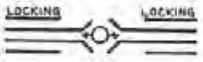
Code No. 1033
Two sets of make and break contacts.

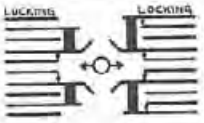
Code No. 1022
One set make and break contacts and one set having two make and one break contacts.



Double Locking

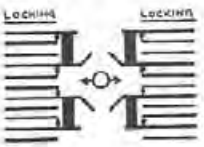
Code No. 1002
Two sets of make contacts on each side.



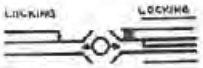


Code No. 1010
Two sets of make and break contacts and two make contacts on one side, two sets of make and break contacts and two break contacts on other.

Code No. 1011
Four sets of make contacts on each side.

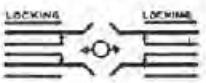


Code No. 1013
Four sets of make and break contacts on each side.



Code No. 1018
One break contact on one side and two make contacts and one break contact on other.

Code No. 1030
Two sets make and break contacts on each side.



KEYS

No. 1000 Type Cam Keys

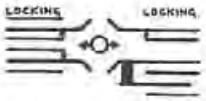
Double Locking

Code No. 1036

Two sets of make and break contacts and one make contact on one side, two sets of make and break contacts on other.

Code No. 1037

Two sets of make and break contacts on one side, two make contacts and one break contact on other.

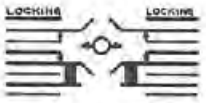


Code No. 1039

Two sets of make before break contacts on each side.

Code No. 1049

Two sets of make and break contacts and one make contact on each side.

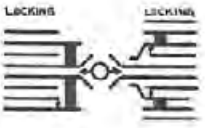


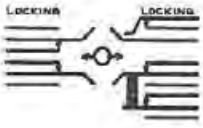
Code No. 1051

Three sets of make contacts and one break contact on each side.

Code No. 1052

Three make contacts and one break on one side, two sets of make before break contacts and two make contacts on other.



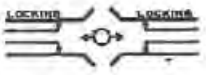


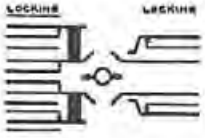
Code No. 1055

Two sets of make and break contacts on one side, two sets of make and break contacts and one make before break contact on other.

Code No. 1059

Two sets of break contacts on each side.



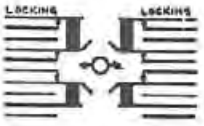


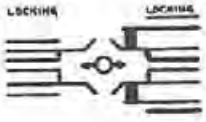
Code No. 1065

Four sets of make and break contacts on one side, two sets of make before break contacts on other.

Code No. 1067

Two sets of make and break contacts, one make contact and one break contact, on each side.



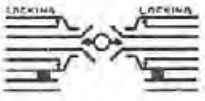


Code No. 1073

Two sets of make and break contacts on one side. Two make contacts and two break contacts on other.

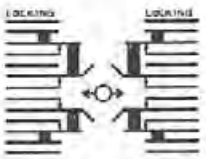
Code No. 1074

Two sets of make before break contacts and one make contact on each side.



No. 1000 Type Cam Keys

Double Locking

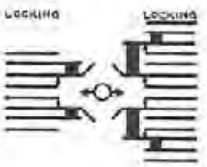


Code No. 1079

Two sets of make and break contacts, two make contacts and two break contacts on each side.

Code No. 1082

Two make contacts and two break contacts on one side, two sets of make and break contacts, two make contacts and two break contacts on other.

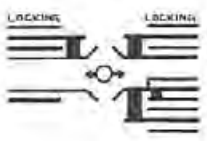


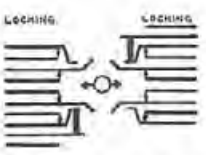
Code No. 1085

Three break contacts and one make contact on each side.

Code No. 1086

Three make contacts on one side, four make contacts and one break contact on other.



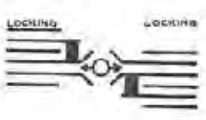


Code No. 1091

Two sets of make before two break contacts and one make contact on each side.

Code No. 1097

Two make contacts on one side, three make contacts on the other.

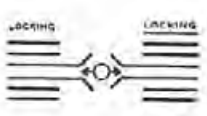


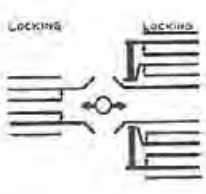
Code No. 1098

Three make contacts on each side.

Code No. 1103

Two sets each having two make contacts on one side. One set having two make contacts and one set having three make contacts on other.



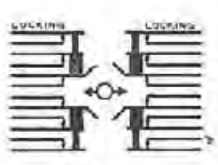


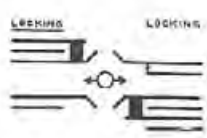
Code No. 1105

Two sets of make and break contacts on one side, two sets of make before break contacts and two sets make and break contacts on other.

Code No. 1108

Six sets of break contacts on each side.



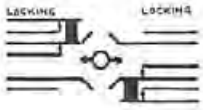


Code No. 1113

Three sets of make contacts on one side, two sets of make contacts and one break contact on other.

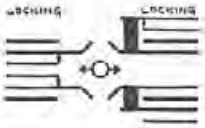
KEYS

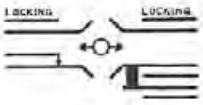
No. 1000 Type Cam Keys
Double Locking



Code No. 1114
Two sets of break contacts and one make contact on each side.

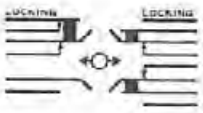
Code No. 1116
Two sets of make and break contacts on one side, three sets of make contacts and one break contact on other.



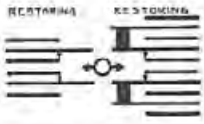


Code No. 1117
One make contact and one break contact on one side, three sets of make contacts on other.

Code No. 1119
Two break contacts and one make contact on one side, two sets of make contacts and two sets of break contacts on other.

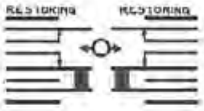


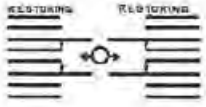
Double Restoring



Code No. 1056
Two sets of make and break contacts on one side, two sets of make and break contacts and two make contacts on other.

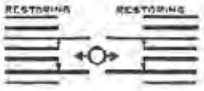
Code No. 1050
Two sets of make and break contacts and one make contact on each side.

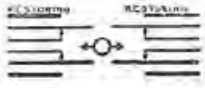




Code No. 1071
Two sets of two make and one break on each side.

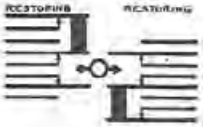
Code No. 1012
One set make and break contacts and one set two makes and one break contact on each side.



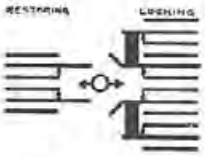


Code No. 1031
Two sets of make and break contacts on each side.

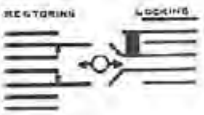
Code No. 1075
Two sets of make and break contacts and one break contact on each side.



No. 1000 Type Cam Keys
Locking and Restoring

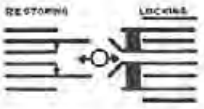


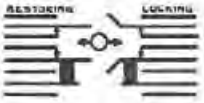
Code No. 1016
Two sets of make and break contacts restoring side, four sets of make and break contacts on locking side.



Code No. 1021
One set of make and break contacts, one set of two makes and one break contact on restoring side. Three make contacts on locking side.

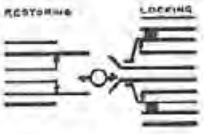
Code No. 1023
Two sets of make and break contacts on restoring side, four sets of make contacts on locking side.

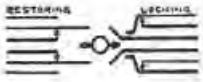




Code No. 1024
Two sets of make and break contacts and one make contact on each side.

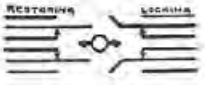
Code No. 1026
Two sets of make and break contacts on restoring side, two sets of make before break contacts, two make contacts on locking side.

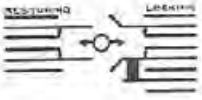




Code No. 1027
Two sets of make and break contacts on restoring side, two sets of make before break contacts on locking side.

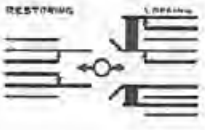
Code No. 1029
Two sets of make and break contacts on each side.

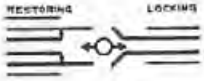




Code No. 1032
Two sets of make and break contacts on restoring side, two sets of make and break contacts, one make contact on locking side.

Code No. 1040
Two sets of make and break contacts on restoring side, two sets of make contacts, one break contact and one make and break contact on locking side.



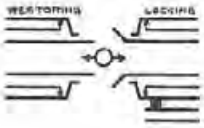


Code No. 1041
Two sets of make and break contacts on restoring side, two sets of make contacts on locking side.

KEYS

No. 1000 Type Cam Keys

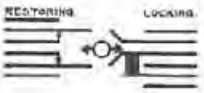
Locking and Restoring



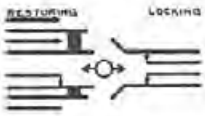
Code No. 1058

Two sets make before break contacts on restoring side, two sets of make before break contacts and one make contact on locking side.

Code No. 1043



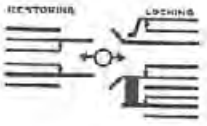
Two sets of make and break contacts on restoring side, three sets of make contacts on locking side.



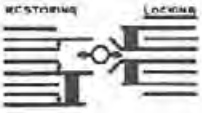
Code No. 1048

Three sets of make contacts and one break contact on restoring side, two sets of break contacts on locking side.

Code No. 1054



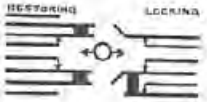
Two sets of make and break contacts on restoring side, two sets of make and break contacts, one set make before break contacts on locking side.



Code No. 1057

Two sets of make and break contacts and one break contact on restoring side, four sets of make contacts on locking side.

Code No. 1066



Two sets of make contacts and two break contacts on restoring side. Three sets of break contacts on locking side.

Meteor Metal Contacts

Of same construction as the 1000 type key except equipped with heavy meteor metal contacts.

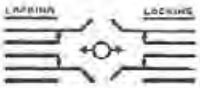
Single Locking

Code No. 1005

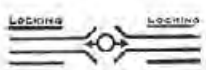
Two sets of make contacts.

Double Locking

Code No. 1019



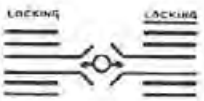
Two sets of make and break contacts on each side.



Code No. 1020

Two sets of make contacts on each side.

Code No. 1106

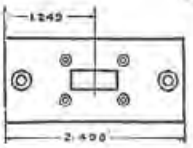


Two sets of two make contacts on one side, one set of two make contacts and one set of make contacts on other.

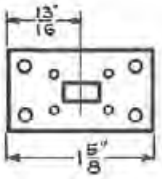
Escutcheons for Cam Keys

The following standard escutcheons for the 1000 type cam keys are made of brass heavily black enamel, giving a rich finished appearance to the key. For those desiring blank key escutcheons Kellogg carries a large variety in stock and will gladly quote on your requirements. Mounting screws not furnished unless specified then charged for extra.

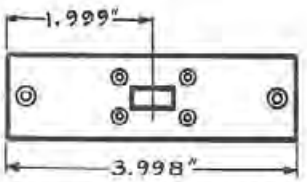
Single Type Escutcheon



Code No.	Length Overall, Inches	Width Overall, Inches
1053	$2\frac{1}{2}$	$\frac{3}{4}$
1054	$2\frac{1}{2}$	$\frac{13}{16}$
1055	$2\frac{1}{2}$	$\frac{7}{8}$
1021	$2\frac{1}{2}$	1

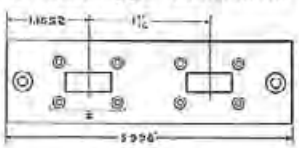


Code No.	Length Overall, Inches	Width Overall, Inches
1022	$1\frac{5}{8}$	$\frac{15}{16}$



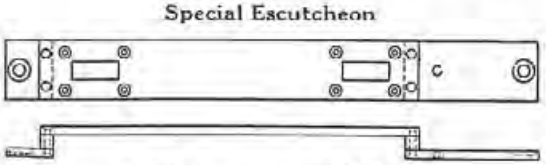
Code No.	Length Overall, Inches	Width Overall, Inches	Remarks
1069	4	$\frac{3}{4}$	

Double Type Escutcheon



Code No.	Length Overall, Inches	Width Overall, Inches	Remarks
1070	4	$\frac{3}{4}$	
1015	4	$\frac{13}{16}$	
1016	4	$\frac{13}{16}$	Less hole Z
1013	4	1	
1011	4	1	Less hole Z
1085	4	$1\frac{1}{8}$	
1012	4	$1\frac{3}{16}$	
1010	4	$1\frac{3}{16}$	Less hole Z
1026	4	$1\frac{29}{32}$	
1029	4	$1\frac{1}{2}$	Keys $\frac{5}{32}$ off center use with No. 1012

Special Escutcheon



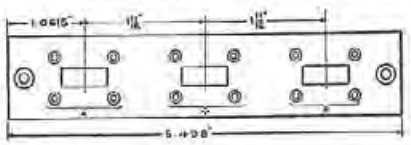
Code No.	Length Overall, Inches	Width Overall, Inches	Remarks
1049	$7\frac{21}{64}$	$\frac{27}{32}$	

Kellogg

KEYS

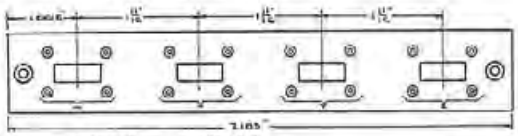
Escutcheons for Cam Keys

Triple Type Escutcheon



Code No.	Length Overall, In.	Width Overall, In.	Remarks
1040	5 1/2	3/4	Less hole Y
1076	5 1/2	3/4	Less hole Z
1078	5 1/2	3/4	Less holes Y and Z
1014	5 1/2	13/16	
1057	5 1/2	13/16	Less hole Y
1074	5 1/2	1	
1041	5 1/2	1	Less hole Y
1077	5 1/2	1	Less hole Z
1075	5 1/2	1	Less holes Y and Z
1080	5 1/2	1 1/16	Less holes Y and Z
1000	5 1/2	1 1/8	
1002	5 1/2	1 1/8	Less hole Y
1004	5 1/2	1 1/8	Less hole Z
1001	5 1/2	1 1/8	Less holes Y and Z
1003	5 1/2	1 1/8	Less holes X and Z
1071	5 1/2	1 3/16	
1043	5 1/2	1 3/16	Less hole Z
1030	5 1/2	1 3/32	
1031	5 1/2	1 3/32	Less hole Y
1065	5 1/2	1 3/32	Less hole Z

Quadruple Type Escutcheon



Code No.	Length Overall, In.	Width Overall, In.	Remarks
1051	7 3/16	13/16	
1036	7 3/16	1	Less hole W
1032	7 3/16	1	Less holes X and W
1037	7 3/16	1	Less holes X, Y and W
1007	7 3/16	1 1/8	

Vertical Type Escutcheon

Five Per Strip

Code No.	Width Inches	Length Inches	Key Centers Inches	Mtg. Centers Inches
405	1 3/4	5 1/8	1 9/64	6 3/4
454	1 1/4	10 1/4	2	11 5/32

Six Per Strip

Code No.	Width Inches	Length Inches	Key Centers Inches	Mtg. Centers Inches
435	1 3/4	11 3/32	1	10 21/32 screw mounted from front

Ten Per Strip

Code No.	Width Inches	Length Inches	Key Centers Inches	Mtg. Centers Inches
400	1 1/8	10 1/4	1	11 5/32
453	1 1/4	10 1/4	1	11 5/32

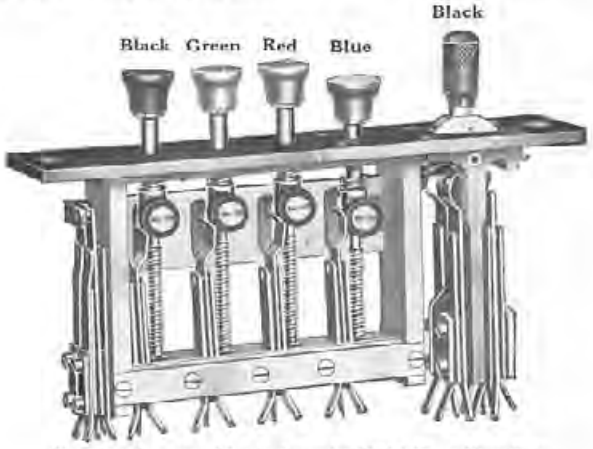
Four Party Keys

Kellogg Four Party Ringing Keys are of the same superior construction as the 1000 type cam keys. They are known for their long life, freedom from trouble and ease of operation. The key buttons are of tough hard composition mounted on heavy brass rods, retained in position with tempered steel spiral springs. The frame is of great strength and cannot warp or bind the keys. The springs are of German Silver with non-corrosive contact metal. Kellite insulation is used throughout. The sliding bar is of steel actuated by bronze pins. Buttons furnished in standard colors of black, green, red and blue.

With Kellogg type of construction it is impossible to ring more than one party on a line at a time.

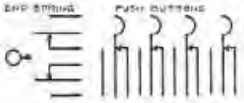
Locking Type with Cam Key

The push buttons remain in operating position until restored by the cam key or by operation of one of the other buttons.



No. 265A Arranged for Release by 1000A Type Cam Key

The following keys are arranged to be released by any of the new style cam keys listed on page 88. In ordering, kindly specify code number of four party key, cam key and the escutcheon they are to be mounted on.



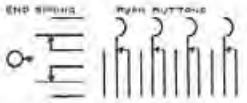
Code No. 265-A

Code No. 267-A

Code No. 355-A

Restoring Type with Cam Key

The push buttons do not remain in operating position but automatically return to an indicating position from which they are restored by operation of the cam key or one of the other buttons.



Code No. 264-A

KEYS

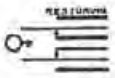
1000 Type Cam Keys
For Four Party Cam Release Keys
Double Restoring Type

Code No. 1060-A

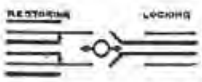
Two sets of make and break contacts, two sets of make contacts.

Code No. 1061-A

Two sets of make and break contacts.



Locking and Restoring

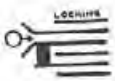


Code No. 1044-A

Two make and break contacts on restoring side, two make contacts on locking side.

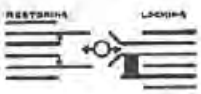
Code No. 1045-A

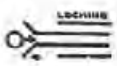
Three make contacts on locking side.



Code No. 1046-A

Two make and break contacts on restoring side, three make contacts on locking side.





Code No. 1047-A

Two make contacts on locking side.

Code No. 1053-A

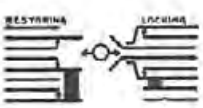
Two sets of make contacts and two sets of break contacts on locking side.

Code No. 1062-A

Two make and break contacts and two make contacts on locking side.

Code No. 1063-A

One set make before break contact and three make contacts on locking side.



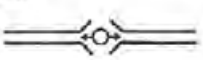
Code No. 1118

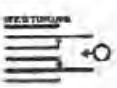
Two sets of make and break contacts, one break contact on restoring side, two sets of make before break contacts and one make contact on locking side.

Single Restoring Type

Code No. 1000-A

Dummy release key.



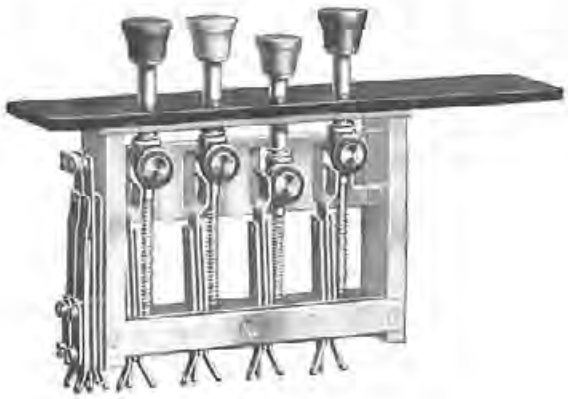


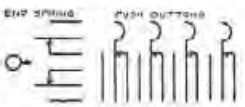
Code No. 1015-A

Two make and break contacts on restoring side.

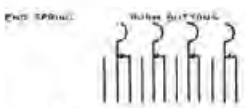
Four Party Keys
Locking Type Less Cam Key Release

The push button remains in operating position until restored by operation of one of the other buttons.





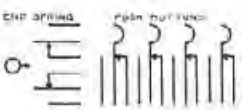
Code No. 266



Code No. 310

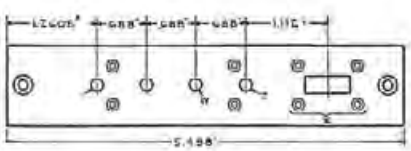
Restoring Type Less Cam Key Release

The push buttons do not remain in operating position but automatically return to an indicating position from which they are restored by operation of one of the other push buttons.



Code No. 323

Escutcheons for Four Party Keys
With and Without Cam Release Key

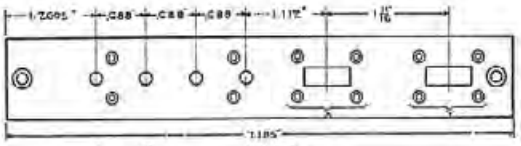


Code No.	Length Overall Inches	Width Overall Inches	Remarks
1027	$5\frac{1}{16}$	$\frac{3}{4}$	
1028	$5\frac{1}{16}$	$\frac{3}{4}$	Less hole X
1039	$5\frac{1}{16}$	1	
1038	$5\frac{1}{16}$	$1\frac{1}{16}$	
1005	$5\frac{1}{16}$	$1\frac{1}{8}$	
1006	$5\frac{1}{16}$	$1\frac{1}{8}$	Less Hole X

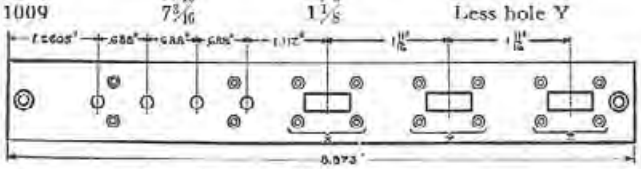
KEYS

Escutcheons for Four Party Keys

With or Without Cam Release Key



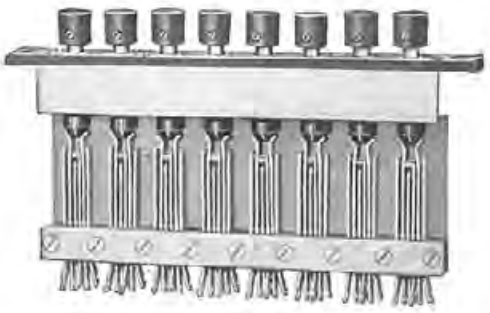
Code No.	Length Overall Inches	Width Overall Inches	Remarks
1033	7 3/16	1	
1008	7 3/16	1 1/8	
1009	7 3/16	1 1/8	Less hole Y



Code No.	Length Overall Inches	Width Overall Inches	Remarks
1017	8 7/8	1 1/8	

Keys Push Button Type

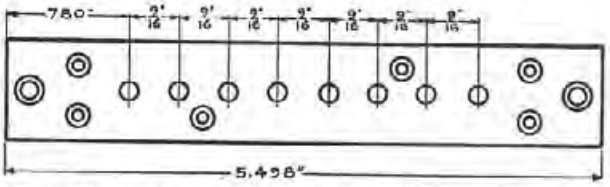
These keys are of the same sturdy construction as the four party keys. The frames are of heavy brass nickel plated. The buttons are made of hard black rubber.



Eight per Strip

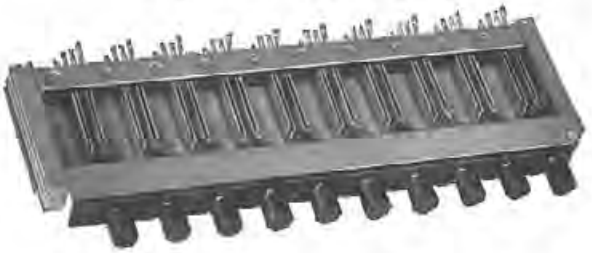
Code No.	Spring Combination	Length Inches	Width Inches
301		5 1/2	1/2
318		5 1/2	1/2

Escutcheon for Nos. 301 and 318 Keys



Code No. 1023 escutcheon is made of hard drawn brass handsomely finished in black enamel.

Keys Push Button Type

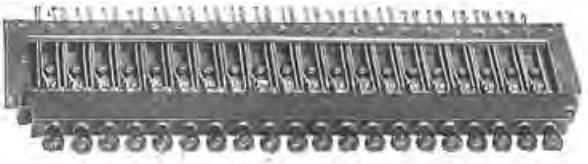


Ten per Strip

Code No.	Spring Combination	Mounting Centers Inches	Size Inches	Remarks
312		11 5/32	10 1/4 x 1/2	Pin Mounted

Twenty per Strip

Code No.	Spring Combination	Mounting Centers Inches	Size Inches	Remarks
366		11 5/32	10 1/4 x 1/2	Pin Mounted



Similar to spring jacks in construction except equipped with plugs. Mounting centers 11 5/32 inches. Face of strip, 10 1/4 inches by 7/16 inches.

Code No.	Spring Combination	Number per Strip	Remarks
314		10	Similar to No. 273 Spring Jack
313		20	Similar to No. 261 Spring Jack

12-24 TA

KEYS

Individual Order Wire Key

In keeping with Kellog standards the frames of these individual order wire keys are of heavy brass, nickel plated, buttons of hard black rubber, springs of German silver with non-corrosive contacts. Length, 2¾ inches, not including button.

Locking Type

Code No.	Spring Combination	Thickness of Mounting Inches	Remarks
255		¾	
303		⅞	
167		⅞	
269		⅞	
300		⅞	Meteor metal contacts

Restoring Type

254		¾	
302		⅞	

Restoring Type

Code No.	Spring Combination	Thickness of Mounting Inches	Remarks
5		⅞	
66		⅞	
296		⅞	

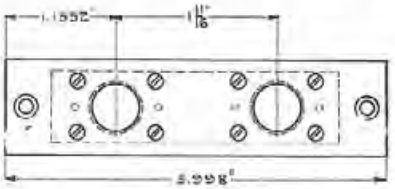
Individual Order Wire Key—Continued

Restoring Type

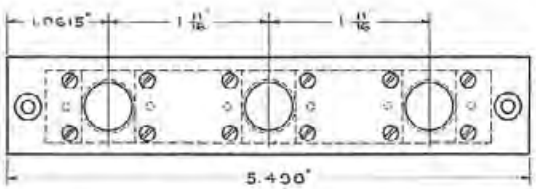
Code No.	Spring Combination	Remarks
172		Metal escutcheon 1¼-inch diameter

Order Wire Key Mountings

Made of brass heavily black enameled. Holes, ½ inch in diameter.



Code No.	Width, Inches	Remarks
1024	1	Mounts 2 keys



Code No.	Width, Inches	Remarks
1042	13/16	Mounts 3 keys
1083	1	Mounts 3 keys

Key Escutcheon Clamps

The standard clamp is made of steel copper plated.

Piece No.	Description
27783	Clamp for 1000 type escutcheon
15044	⅝-inch machine bolt, black enamel head

Key Blanks

Key blanks are made of cold rolled steel handsomely finished in black enamel. Mounting screws are furnished extra when specified.

Code No.	Description
142	Dummy Plug for 1000 type key
28870	Machine screw for above dummy plug

LAMPS, LAMP CAPS

Switchboard Lamps

The Kellogg Switchboard Lamp is the result of over thirty years of constant research and endeavor for improvement. Being manufactured by workmen specialized in their respective arts, Kellogg lamps of uniform current consumption, voltage brilliancy and size are assured.

Extreme care is used to make sure that the glass of uniform thickness and texture is shaped without a tip so as to concentrate the light at the proper point. The brass contact terminals give strength and protection to the lamp as well as perfect contact when placed in the jack. The phenol fibre separator, the glass support for the filament, the specially prepared carbon filament, the almost perfect vacuum produced by the mercury air exhausting pumps, and many other features insure a switchboard lamp of long life and superior to any other lamp now on the market. Kellogg lamps will fit all standard lamp jacks.

Users of Kellogg switchboard lamps are assured of getting a uniform reliable product and lower cost per year of service.

Carried in stock in the following voltages. Overall length 1 11/16 inch, diameter overall 5/16 inch:

Code No.	Voltage	Current Consumption Min. Amperes	Max. Amperes
3-A	3	200	260
4-A	4	.170	.210
6-A	6	.120	.160
6-B	6	.300	.380
6-C	6	.170	.210
8-A	8	.085	.115
10-A	10	.085	.115
12-A	12	.085	.115
12-C	12	.025	.035
14-A	14	.085	.115
16-A	16	.085	.115
18-A	14 to 26*	.035	.045
20-A	20	.085	.115
24-A	24	.075	.115
24-C	24	.025	.035
27-A	27	.085	.115
30-A	30	.080	.115
32-A	27 to 36**	.025	.035
36-A	36	.060	.080
40-A	40	.045	.060
40-B	35 to 47***	.025	.0375
44-A	44	.045	.060
48-A	48	.045	.060
55-A	55	.045	.060

*Current limits shown are with 18 volts on lamp.
**Current limits shown are with 32 volts on lamp.
***Current limits shown are with 40 volts on lamp.

Standard Mazda Lamp

Code No. 110-A 110 Volts 15 Watt Edison Base
Used in ringing circuits

Lamp Caps

No. 25 Type

Fits 11/32 inch hole. Length 5/16 inch.

The No. 25 type Lamp Cap is used with the No. 23 Lamp Jack and other jacks with hard rubber face strips. Cap screws on holding lens provided with blank paper discs for numbering. Kindly specify numbering desired.

Code No.	Marking	Color	Remarks
25	②	Red Celluloid	Specify numbering
27	②	White Celluloid	Specify numbering

Lamp Caps—Continued

No. 154 Type

Fits 11/32 inch hole. Length of shank 9/32 inch.

The No. 154 Type Lamp Cap is used with Nos. 10, 25, 31, 32, 33, 34, 37, 43 and 44 types of Lamp Jacks.


No. 154


No. 154D


No. 154F


No. 154G


No. 154U

Code No.	Marking	Color	Remarks
154	○	White Opalescent	
154F	②	Clear Glass	Semi Convex lens. Specify numbering desired on paper disc.
154G	○	White Opalescent	154 but flat lens
154D	⊕	White Opalescent	
154H	◐	White Opalescent	
154J	◉	White Opalescent	
154K	◍	White Opalescent	
154L	◎	White Opalescent	
154M	◐	White Opalescent	
154U	○	Clear Red Glass	Lens Semi Convex
154V	○	Clear Green Glass	Lens Semi Convex
154W	○	Green	Top of lens sand-blasted

No. 79 Type

Fits 5/16 inch hole. Length of shank 1/2 inch. The No. 79 Type Lamp Cap is used with Nos. 35, 36, 41 types of Lamp Jacks.

Code No.	Marking	Color	Remarks
79	○	White Opalescent	Red Celluloid behind white lens.
79-A	○	Red Opalescent	
79E	○	White Opalescent	
79F	◐	White Opalescent	
79G	○	Clear Green Glass	
79K	◉	Green	
79L	◐	White Opalescent	
79M	◐	Clear Red Glass	

No. 9 Type

Fits 3/8 inch hole. Length of shank 7/16 inch. The No. 9 Type Lamp Cap is used generally for Pilot and Signal work.

Code No.	Color
9	White Opalescent
9-A	Clear Red Glass
9-B	Clear Green Glass
9-C	Clear Glass
9-D	Clear Amber Glass

No. 74 and 75 Type

Fits 13/16 inch hole. Length of shank 7/32 inch. The No. 74 and 75 Type Lamp Cap fits Dean Pilot Jacks and is also used for Signal Work.

Code No.	Color
74	White Opalescent
75	Clear Red Glass

LAMP JACKS, METERS

Lamp Jacks

All Kellogg lamp jacks are designed so that the standard switchboard lamp is securely held in the proper position, furnishing maximum light to the caps.

The lamp jack strip has a heavy brass frame finished in a dull nickel. The springs are of German Silver, the insulators of phenol fibre dilecto insuring lasting electrical qualities. The face of the strip is of heavy brass finished with a durable coating of black enamel that will not chip under ordinary usage.

Each lamp is partitioned by a brass strip preventing leakage of light to the adjoining lamp caps.

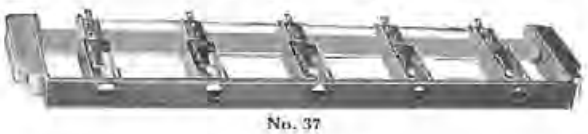
Individual

No. 39

Code No. 39

Code No. 39 is an individual lamp jack the frame of which is made of steel and given a rust proof coating. The contact springs are made of German Silver which insures a good electrical contact. To give the standard switchboard lamp the proper brilliancy this jack must be mounted on a $\frac{7}{8}$ inch panel. Can be mounted on $\frac{5}{8}$ inch centers. Length of jack overall including springs, $1\frac{1}{16}$ inches.

Five Per Strip



No. 37

Code No. 37

Code No. 37 is a 5 per strip lamp jack with standard pin centers of $11\frac{1}{32}$ inches. The jacks are spaced 2 inches apart and the face of the strip is $10\frac{1}{4}$ inches long, $\frac{1}{2}$ inch wide. This jack is drilled for Kellogg standard No. 154 type of lamp cap.

Ten Per Strip

No. 34

Code No. 34

Code No. 34 is the standard 10 per strip lamp jack having mounting pin centers of $11\frac{1}{32}$ inches. The face of the strip is $10\frac{1}{4}$ inches long and $\frac{1}{2}$ inch wide. The jacks are spaced 1 inch apart. Drilled for Kellogg standard No. 154 type lamp cap.

Code No. 31

Code No. 31 is a ten per strip lamp jack having mounting pin centers of $8\frac{1}{32}$ inches. The jacks are spaced $\frac{5}{8}$ inches apart and the face of the strip is $7\frac{1}{32}$ inches long by $\frac{1}{2}$ inch wide. Drilled to take Kellogg standard No. 154 type lamp cap.

Lamp Jacks

Twenty per Strip

No. 25

Code No. 25

Code No. 25 is the standard 20 per strip lamp jack having mounting pin centers of $11\frac{1}{32}$ inches. The face of the strip is $10\frac{1}{4}$ inches long by $\frac{1}{2}$ inch wide. The jacks are spaced $\frac{1}{2}$ inch apart. Drilled to mount Kellogg standard No. 154 type lamp cap.

Code No. 41

Code No. 41 is a 20 per strip lamp jack having mounting pin centers of $8\frac{1}{32}$ inches. The jacks are spaced $\frac{3}{8}$ inch apart and the face of the strip is $7\frac{1}{32}$ inches long and $\frac{7}{16}$ inch wide. Drilled to mount Kellogg No. 79 type cap.

Meters

Kellogg Message Meters are electrically operated and are unusually accurate.

The relays are Kellogg standard with a special armature which insures ample movement to properly operate the counter. The core is of finest grade soft Norway iron, pot annealed. The cover is of pressed steel heavily black enameled.

These meters are standard equipment on Kellogg Master-built Service Switchboards and have many special uses and applications where consecutive numbering records are required.

Can be mounted individually or in strips. Overall dimensions $1\frac{1}{2}$ inches wide, $1\frac{3}{8}$ inches high and $5\frac{1}{16}$ inches in depth.

Code No.	Resistance Ohms	Operates on Volts
1A	300	24
1B	500	48

Individual Mounting

Code No. 380

The Code No. 380 mounts on wood and is furnished with two mounting screws. Made of steel handsomely finished with black enamel.

Strip Mountings

Code No. 446

Mounts 5 meters. Strip mounting centers $9\frac{1}{2}$ inches, overall length 10 inches, width $1\frac{3}{16}$ inches, depth $\frac{7}{16}$ inch. Steel black enameled.

Code No. 1023

Mounts 15 meters. Strip mounting centers $25\frac{1}{4}$ inches, overall length 26 inches, width 2 inches. Will mount on relay gate. Steel black enameled.

NUMBER PLATES, PLUGS

Number Plates

Spring Jack Style

Code No. 2

Code No. 2 number plate is used for designation purposes on the code No. 201 spring jack. It is made of brass heavily black enameled. Inscription as specified is filled with white lead making a clean cut designation. Dimensions $\frac{3}{8}$-inch by $\frac{1}{4}$-inch.

Code No. 3

Code No. 3 number plate is identical to code No. 2 except in size. Fits code No. 195 spring jack. Dimensions $\frac{5}{16}$ inch by $\frac{7}{16}$ inch.

Plug Shelf Style

Code No. 4

Code No. 4 number plate is used for numbering the different panels of each position or section of a switchboard. It is made of polished white ivory $\frac{1}{8}$-inch thick, $\frac{3}{4}$ of an inch in diameter. The inscription is engraved as specified and filled with black paint.

Code No. 5

Code No. 5 number plate is used for numbering each cord circuit. It is $\frac{3}{4}$ of an inch in diameter, $\frac{1}{8}$ of an inch thick and made of white polished ivory. The numerals are engraved as specified and filled with black paint.

Drop and Jack Style

Code No. 10

Code No. 10 number plate is standard for numbering drop and jacks. Carried in stock numbered from 0 to 999. Made of German Silver having a black lacquered finish. The numerals are polished bright so that they are very readable. Dimensions of number plate, $\frac{5}{8}$ inch by $\frac{5}{16}$ inch.

Stile Strip Style

Code No. 46

Code No. 46 number plate is used for numbering the different positions of a switchboard. Made of white polished ivory having the numerals as specified engraved and filled with black paint. Overall dimensions, $1\frac{3}{4}$ inches by $1\frac{1}{4}$ inches.

Code No. 57

Code No. 57 number plate is the standard stile strip number plate. Made of white polished ivory having the numerals as specified engraved and filled with black paint. Overall dimensions, $1\frac{1}{16}$ inches square. Use 2 piece No. 5959 screws for stiles $\frac{1}{8}$ inch thick, for stile strips of No. 14 B. & S. gauge use 2 piece 26226 screws. Screws are furnished only when specified.

Code No. 116

Code No. 116 number plate is identical to code No. 57 except it is made of red opaque polished celluloid. Same mounting screws are used as listed with code No. 57.

Transmitter Style

Code No. 88

Code No. 88 number plate is held in place by two of the transmitter back screws. It is made of steel heavily black enameled. Clear transparent celluloid is used to protect the white card which is furnished blank. Mounting holes are at a 90° angle. Mounts on most standard makes of transmitters.

Number Plates

Transmitter Style—Continued

Code No. 87

Code No. 87 number plate is held in place on the transmitter by the ferrule on the mouthpiece. The frame is of brass heavily nickel plated. Clear transparent celluloid is used for protecting the white card on any desired inscription is written or printed. Radius $1\frac{17}{32}$ inches, approximate width $2\frac{3}{16}$ inches. Fits over all standard makes of transmitters.

Plugs

Kellogg switchboard plugs are made to give maximum service. The heavy brass tips are made to resist wear. The hard rubber insulation will not break down, even after years of severe usage. No weak parts—eliminating plug breakages. Every part carefully made and of the proper size. Connections protected by fibre sleeve held securely in place. Note— Whit, is the abbreviation for Whitworth tap having rounded top threads which prevent cutting cords.

Two Conductor Plugs

For Jacks of Kellogg Make

Code No. 42

Standard two conductor plug used on practically all self restoring type drops and jacks. Fits cord Nos. 301-TO and 304-ST. Used with 300 and 301 type Drop and Jacks.

Code No. 187

Tip conductor specially arranged so as to fit spring jack with tip springs varying in location. For old type two wire multiple jacks. Fits cord Nos. 301-TO and 304-ST.

Code No. 109

A two conductor plug that will operate three conductor jacks of the Plug Group No. 152. Fits cord Nos. 301-TO and 304-ST.

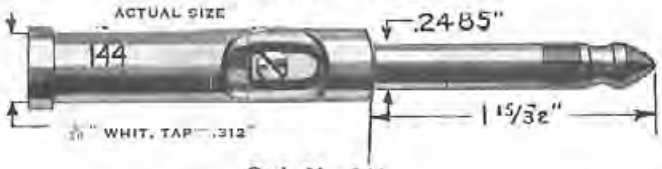
For Jacks of Other Makes

Code No. 168

Replaces W. E. No. 47. Fits Cord Nos. 301-TO and 304-ST.

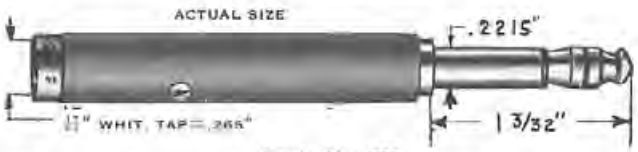
PLUGS, PLUG SEATS, DUMMY PLUGS

Two Conductor Plugs
For Jacks of Other Makes



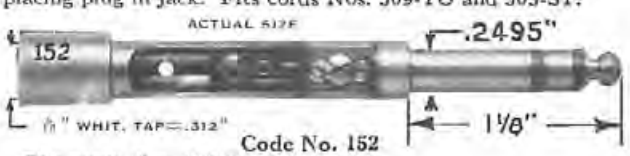
Code No. 144
Replaces Swedish American Plug. Fits cord No. 331-ST.

Three Conductor Plugs
For Jacks of Kellogg Make



Code No. 201
Standard three conductor plug for small diameter jacks. Fits cords Nos. 326-TO and 325-ST.

Code No. 106
Used on common battery and magneto multiple and non-multiple boards. Has provision for non-short circuiting when placing plug in jack. Fits cords Nos. 309-TO and 303-ST.

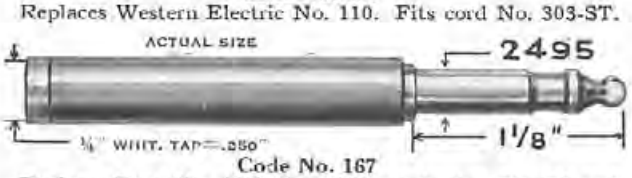


Code No. 152
Fits cords Nos. 309-TO and 303-ST.

Code No. 137
A three conductor plug that will fit two conductor jacks of the plug group No. 152. Fits cords Nos. 309-TO and 303-ST.

Three Conductor Plugs
For Jacks of Other Makes

Code No. 191
Replaces Western Electric No. 110. Fits cord No. 303-ST.



Code No. 167
Replaces Dean No. 4815 plug. Fits cords Nos. 326-TO and 325-ST.

Plug Seats

Plug seats in strips cannot be accurately drilled unless they are fitted to the plug shelf and drillings made with the old plug holes as a guide. Strips are shipped undrilled and if desired, necessary tools for drilling can be furnished.

Code No. 9

Code No. 9 individual plug seat consists of two parts, a leather washer and a red fibre seat fastened to the plug shelf by 2 wood screws which are furnished. The leather washer is 1/32 of an inch thick and has an outside diameter of 11/16 inch. The dimensions of the 1/8-inch red fibre strip are 1 by 3/4 inch. The cord hole is .368 inch in diameter.

Code No. 10


No. 10

Code No. 10 individual plug seat is similar to Code No. 9, except having a red fibre washer and a brass seat fastened to the plug shelf by two wood screws which are furnished. The 1/8-inch red fibre washer has an outside diameter of 11/16 inch. The brass strip is 1 by 3/4 inch. The cord hole is .368 inch in diameter.

Trouble Sleeves

Trouble sleeves are made of fibre tubing and used for designating defective cord and plugs. Tubing split to allow for variation in plugs. Furnished in two sizes as follows:

Code No.	Remarks
163	For plugs of .2495 inch diameter.
223	For plugs of .2215 inch diameter.

Plug Hole Blanks
Code No. 134-B


No. 134-B

Code No. 134-B dummy plug is made of maple with black ebony finished top. It is used with the Kellogg standard plug bushing Pc. 19222. Diameter of plug .484 inches, length 1 3/8 inches.

Plug blanks can be furnished in other sizes and finished for special purposes upon request.

Lamp Hole Blank
Code No. 133-B

Same as 134-B except diameter of plug .333 inch, total length, 1 1/4 inches.

Dummy Plugs


No. 83

For designating lines in trouble, service discontinued, etc. Made of brass and finished with enamel in the following colors:

Code No.	Diameter of Plug	Color
83	.2495	White
84	.2495	Black
85	.2495	Red
86	.2495	Blue
87	.2495	Yellow
88	.2495	Green
101	.2187	White


No. 24

Code No. 24

Made of hard rubber polished. Length of plug 1 1/8 inches. Diameter, .2495 inch.

OPERATORS' PLUGS AND JACKS

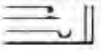
Two Conductor

No. 107 Plug
No. 75 Plug

No. 24 Jack

No. 97 Jack

Jacks

Code No.	Spring Combination	Fits Plug	Remarks
24		75 107	Brass nickel plated. Mounts from rear with machine screws
97		75 107	Brass nickel plated. Mounts from front with wood screws. Extension telephone jack.

Plugs

Code No. 107

Construction similar to that of a standard switchboard plug. Used with No. 97 Jack. Will fit code No. 26-OR Operators' Cord.

Code No. 75

Identical to Code No. 107 except provided with bushing Pc. 13034 to take smaller diameter cord. Used with No. 97 jack. Will fit Code No. 237-OR Operators' Cord.

Four Conductor

No. 182 Plug

No. 325-A Jack

Jack

Code No.	Spring Combination	Fits Plug	Remarks
325-A		182	Metal escutcheon and hard rubber frame.

Plug

Code No. 182

Standard operators' plug used in Kellog switchboards equipped with breastplate Type Operators' Set. Used with No. 325-A Jack. Will fit Code No. 439-O Operators' Cord.

Test Plugs

Code No. 16

Two single conductor plugs mounted under one shell. Used with two No. 34 Spring Jacks in pairs for Test Panel.

Four Conductor

No. 145 Plug

No. 43 Jack

Jack

Code No.	Spring Combination	Fits Plug	Remarks
43		145	Hard rubber frame.

Plug

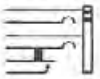
Code No. 145

The prongs are mounted in a hard fibre strip which is provided with terminal screws, conductor separators and an adjustable strip to grip the cord and prevent any strain on the terminal connections. Used with No. 43 Jack. Will fit Code No. 111-O Operators' Cord.

No. 25 Plug

No. 57 Jack

Jack

Code No.	Spring Combination	Fits Plug	Remarks
57		25 136	Brass nickeled. Mounts from rear with machine screws.
224		25 136	Similar to 57 except spring combination.

Plug

Code No. 25

Two plugs under one cover. Used with No. 57 Jack. Will fit Code No. 67-O Operators' Cord.

Code No. 136

Identical to Code No. 25 except provided with bushing Pc. 28818 to take smaller diameter cord. Used with No. 57 Jack. Will fit Code No. 239-O Operators' Cord.

No. 139 Plug

No. 310 Jack

Jack

Code No.	Spring Combination	Fits Plug	Remarks
310		139	Two individual jacks mounted on hard rubber.

Plug

Code No. 139

Two No. 130 Plugs under one cover. Used with No. 310 Jack. Will fit No. 199-O Operators' Cord.

RECEIVERS, PUSH BUTTONS

Subscribers' Receivers

Code No. F41-A

Standard telephone receivers have long magnets of the bi-polar type, heavy brass retaining cup, 36-inch moisture-proof receiver cord with heavy tinsel conductors and high grade insulation.

The Kellite shell is highly polished and the cord hole in the end of the case is rounded out, which prevents excessive wear on the cord. The ear cap securely holds the diaphragm and receiver in the shell and is shaped to perfectly fit the orifice of the ear and has no objectionable lettering around the edge.

The shell and cap are of a standard size so that many other makes of receivers will fit the shell perfectly.

The cord terminals are so designed that either spade or spike tip cord terminals can be used. The cord is regularly supplied with spade tips on both ends.

Code No.	Resistances	Remarks
F-41-A	62 Ohms	Standard
F-66-A	85 Ohms	Similar to F41-A except for direct current. Replaces F-36.
27944		Kellite shell only
32307		Kellite cap only

Pc. No. 55919 Masterphone

The illustration shows the rear view of Pc. No. 55919 Masterphone receiver. Designed as a unit with no cord connection, it is easily installed without the use of tools. The two different sized locating lugs correspond to guide slots in the walls of the housing and insure installing the receiver unit in its correct position. The heavy bronze clips make positive electrical contact by gripping the bar conductors, in the receiver housing, firmly on both sides.

Operator's Receivers

Code No. 65-A

No. 65-A Receiver With No. 12 Band

The No. 65-A type operator's receiver, combining real efficiency and permanent, satisfying service, with feather-like weight, is an equipment that will be appreciated by the operator and manager alike. The total weight of receiver and band is but 3.9 ounces, enabling operator to wear it continuously for the entire period without the least discomfort or fatigue. The total width is 2⅜ inches and the depth or thickness ⅞ inch. Terminals are entirely enclosed within the shell; solid horseshoe permanent magnet, and electro-magnets of high grade wire wound on cores of special magnet iron. The head band is arranged to permit the receiver to be adjusted in any position that is most comfortable to the wearer. Standard for all switchboards.

Code No.	Resistance	Shipping Weight
65-A	100 Ohms	8 Oz.

No. 46-A

Code No. 46-A

Formerly used on all switchboards. Replaced by No. 65-A. The shell and cap are of black Kellite. Specify head band desired. Resistance 140 ohms. Shipping weight, 12 ounces.

Code No. 14-A

Similar to No. 46-A except hard rubber shell and cap. Used only on 1016 Test Set with special hook switch.

Railroad Dispatching Receivers

Code No. 80 Type

The No. 80 receiver is of the small watch case type having a weighted brass shell. It is provided with high efficiency magnets similar to the No. 65 type. To be used with No. 2 headband.

Code No.	Resistance
80-A	60 Ohms
80-B	400 Ohms

Code No. 81 Type

The No. 81 receiver is the same as the No. 80 type except provided with a ring for hanging on hook.

Code No.	Resistance
81-A	60 Ohms

No. F41-B

Same as standard F41-A receiver except resistance.

Code No.	Resistance
F41-B	650 Ohms

Code No. 46-B

The same as the standard F46-A receiver except resistance.

Code No.	Resistance
F46-B	650 Ohms

Head Bands

Code No. 12

New type wire head band. For No. 65-A receiver only. Wt. 2 oz.

Consists of flat spring steel, black enameled, with leather cover. For No. 46 Type receiver.

Code No. 2

Code No. 3

Same as No. 2 except mounts two receivers.

Push Button—Receiver

The German silver springs are mounted on a steel frame. Insulation is of Kellite. The bushing and push button are of brass nickel plated making a very neat appearing yet serviceable push button. Overall dimensions, 1⅛ inches by 1⅜ inches by 1⅜ inches in height.

Code No.	Spring Combination	Remarks
3		Mounts ⅜-inch panel
4		Mounts ½-inch panel

This style of push button requires special drilling to mount. Insulation is of Kellite, springs of German silver with special non-corrosive contact. Overall dimensions, 3⅛ inches long, 1⅛ inches high, 1 inch wide.

Code No.	Spring Combination	Remarks
5		Mounts ⅜-inch panel
8		Mounts ½-inch panel
14		Mounts ½-inch panel

RELAYS

A Strip of 16 Pairs of 2000 Type Relays on a 1006 Mounting Strip Showing Relays with and without Shell Covers

A Strip of 20 Pairs of 2000 Type Relays on a 1008 Mounting Strip. Single Can Cover Shown Below.

Relays

Kellogg relays are of simple design and sturdy construction. The angle type armature and simple adjustment insure reliable operation under the severe conditions which relays must meet in telephone service. Because of the importance of positive unfailing relay operation, Kellogg relays are built to the most exacting specifications.

The iron used in cores and frame is not only selected with extreme care, but each lot is tested and retested by every means known to the modern laboratory before it is passed to the manufacturing departments.

Cores and frames are carefully annealed in sealed pots to prevent the possibility of residual magnetism. The long resilient springs are constructed from the finest grade of German silver. Contact points are of special metal.

Coils contain liberal winding space allowing the maximum number of turns and insuring a wide margin of operation.

Heavy mounting plate and cover, with adequate knurled and slotted nut secured to permanently riveted cover rod, insures absolute stability to both relay and cover, obviating any possible interference with relay action.

2000 Type Relays

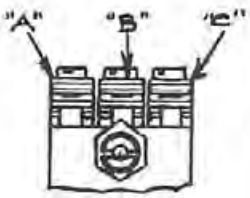
The 2000 type relays are Kellogg standard and are used on practically all new work. They can be furnished in a large variety of spring combinations and coil resistances.

These relays can be mounted in pairs and each pair provided with a drawn cover. When 2000 type relays are ordered singly the double mounting plate is furnished and one space is left vacant. A variety of mounting strips may be had, including angle mountings for mounting single pairs.

2000 Type Relay Less Cover and Mounting

Only a partial listing of Kellogg relays and relay coils are given. If a suitable relay cannot be found, please submit complete specifications, and Kellogg Engineers will promptly give recommendations. Send wiring diagram of circuit so as to facilitate selecting proper type relay.

2000 TYPE RELAYS



End view of Relay, showing position of spring combinations and slotted nut for holding armature in correct position.

The following code numbers cover the relay spring combinations only. To specify a complete relay the code number of the relay should be given followed by the letters designating the coil wanted. Mountings are specified separately.

Make Before Break

Code No.	Spring Combination A	B	C	Remarks
2006				One set make before break contacts.
2007				Two sets make before break contacts.
2008				Three sets make before break contacts.
2009				Four sets make before break contacts.

Mixed Spring Combinations

Code No.	Spring Combination A	B	C	Remarks
2001				One set make and break contacts.
2002				Two sets make and break contacts.
2003				Three sets make and break contacts.
2004				Four sets make and break contacts.
2005				Two sets of break contacts and two sets make and break contacts.
2019				Two sets of make and break contacts and one set make before break contacts.
2020				One set of make and break contacts and two sets make before break contacts.
2021				Two sets of make and break contacts and two sets make before break contacts.
2022				One set make and break contacts. Two relays yoked at armatures. No springs on left hand relay.
2023				Five sets of make contacts.
2025				One set make and break contacts and one set make before break contacts.
2027				One set make contacts and four sets make and break contacts.
2028				Two sets make contacts, two sets break contacts and one set make before break contacts.

Mixed Spring Combinations—Continued

Code No.	Spring Combination A	B	C	Remarks
2029				One set make contacts. For Pilot relays.
2030				One set break contacts. For Supervisory relays.
2031				Two sets make contacts and three sets make and break contacts.
2034				One set break contacts and one set make and break contacts. Interrupter relay. Special tension spring.
2036				One set make contacts and one set make before break contacts.
2037				Two sets make contacts.
2039				Three sets make and break contacts with screw armature adjustment.
2048				Two sets break contacts.
2059				Three sets break contacts.
2063				Two sets make and break contacts and three sets make before break contacts.
2065				Two sets make contacts, and one set make before break contacts.
2075				One set break contacts, two sets make contacts and one set make and break contacts.
2077				Four sets of make contacts.
2078				One set make contacts and one set break contacts.
2079				One set make contacts, one set break contacts and two sets make and break contacts.
2080				Three sets make contacts and one set make and break contacts.
2081				Two sets make contacts and one set make and break contacts.
2089				One set make and break and one set make before break contacts.

RELAYS

Make and Break Springs with Light Armatures

Use standard 2000 type relay coils.

Code No.	Spring Combination	Remarks
2043		One set make contacts. For pilot relays.
2044		One set make and break contacts.
2045		One set break contacts. One extra insulated terminal.
2049		One set break contacts.
2056		Two sets make contacts.

Buzzer Springs

Uses ratchet type coil only.

Code No.	Spring Combination	Remarks
2042		Trouble tone buzzer.

Coils for Buzzer Relays

Code No.	Resistance, Ohms	Remarks
S-DZ	300	Ratchet type armature
S-FL	500	Ratchet type armature

Alternating Current Relays

Alternating current relays use only coils listed below:

Code No.	Spring Combination	Remarks
2017		One set make contacts.
2018		One set break contacts.
2052		One set make and one set break contacts.
2057		One make contact. Extra adjusting spring.
2085		Two sets make contacts. Tension adjusting spring.

Relay Coils for A.C. Type Relays

Code No.	Resistance, Ohms
S-BW	50
S-BX	1000
S-BY	1600
S-BZ	500
S-FJ	2500
S-GC	120

Trip and Restoring Relays

Restoring Relays on Right Side Facing Armature

Restoring relays on right side facing armature. Restoring relays use standard 2000 type relay coils.

Code No.	Spring Combination A	Spring Combination B	Spring Combination C	Remarks
2060				Four sets make and break contacts.
2064				Two sets make and break contacts.
2066				No contact springs.
2067				One set make and break contacts.
2068				Three sets make and break contacts.
2082				Two sets make before break contacts.

Trip Relays on Left Side Facing Armature

Trip relays use only coils listed below. The contacts shown in Position A make contact only momentarily, those in Position C make permanently.

Code No.	Spring Combination A	Spring Combination B	Spring Combination C	Remarks
2061				One set break contacts and one set of make contacts.
2062				One set make contacts.
2083				One set make contacts and one set make and break contacts.
2086				Two sets make contacts.

Coils for Trip Relays

Code No.	Resistance, Ohms
S-FS	500
S-FU	1000
S-GM	50
S-GN	100

2000 TYPE RELAY COILS

Relay Coils for 2000 Type Relays

Relay coils are wound with copper wire unless the letters "GS," which indicate German silver, follow the resistance value. Enamel insulation is standard. German silver wire is insulated with enamel and one wrapping of green silk and wound non-inductive unless otherwise specified.

Single Wound

Code No.	Resistance Ohms		Remarks
S-EQ	1.5		Pilot Relays—24 volt
S-EB	3.5		Pilot Relays—48 volt
S-D	10		
S-E	20		
S-F	30		
S-G	40		
S-H	50		
S-BL	70		
S-K	80		
S-L	100		
S-M	125		
S-N	150		
S-P	200		
S-Q	250		
S-R	300		Used in cut-off relays
S-S	350		
S-U	400		
S-V	500		
S-W	1000		
S-AH	1000	450C—550GS	Live relay coil
S-X	1500		
S-Y	2000		
S-Z	3000		
S-BG	4000		
S-AE	5000	3900C—1100GS	
S-DL	6000	4000C—2000GS	

Single Wound—With Copper Sleeves

The following single wound coils are used where a sluggish release is desired:

Code No.	Resistance Ohms		Remarks
S-AB	10000	3300C—6700GS	Inductive
S-AJ		50	1/16 inch copper sleeve
S-AK		100	1/16 inch copper sleeve
S-AL		200	1/16 inch copper sleeve
S-AN		300	1/16 inch copper sleeve
S-AP		500	1/16 inch copper sleeve
S-AQ		1000	1/16 inch copper sleeve
S-AR		125	1/8 inch copper sleeve
S-BM		500	1/8 inch copper sleeve
S-BU		1000	1/8 inch copper sleeve

Concentric Wound

Code No.	Resistance Ohms		Remarks
C-DQ	11		Pilot line relay
	1		
C-M	50		
	50		
C-J	100		
	100		
C-K	100		
	500		
C-N	300		
	300		
C-Z	500		
	500GS		1/16 inch copper sleeve
C-P	1000	525C	525C and 475GS.
		475GS	Connected in series
	1000		to terminals 1 and 2
C-DG	300		
	17000		No. 4 terminal dead

Relay Coils for 2000 Type Relays

Parallel Windings

Code No.	Resistance Ohms	Remarks
P-D	75	
	75	
P-C	100	
	100	
P-L	2000	1230C and 770GS for each winding
	2000	

Tandem Windings

Code No.	Resistance Ohms	Remarks
T-T	10	24-volt cord circuit
	10	
T-R	20	
	20	
T-J	50	
	50	
T-Z	75	
	75	
T-C	100	48-volt cord circuit
	100	
T-BY	125	1/4-inch core
	125	
T-U	150	
	150	
T-G	200	
	200	
T-K	250	
	250	
T-M	300	
	300	
T-F	500	
	500	
T-Y	1000	
	1000	
T-CD	1500	
	1500	
T-AX	2000	
	2000	

2000 Type Relay Coils Wound Non-Inductive Used for Resistance Coils

Single Wound

These coils are wound throughout with German silver wire insulated with enamel and one wrapping of silk.

Code No.	Resistance Ohms	Code No.	Resistance Ohms
S-CW	20	S-CD	1000
S-CA	25	S-CF	1100
S-CX	40	S-CR	1200
S-CE	100	S-CL	1400
S-CY	125	S-CZ	1500
S-CT	200	S-CJ	2000
S-CQ	250	S-CG	2500
S-CC	300	S-CM	3000
S-CV	400	S-CN	4000
S-CB	500	S-CU	7000
S-CP	600	S-CH	10,000
S-CS	750	S-CK	11,000

Tandem Wound

Code No.	Resistance Ohms	Code No.	Resistance Ohms
T-BM	20	T-CE	750
	20		750
T-CB	40	T-BU	1500
	40		1500
T-AV	50	T-CN	2000
	50		2000
T-AT	200	T-CJ	3000
	200		3000

RELAYS

Mounting Strips for 2000 Type Relays

Single Row Type

Single Row Type

Code No.	No. of Pairs Per Strip	Length Overall, Inches	Mtg. Centers Inches	Width Inches
1000	5	13 13/16	13 1/16	2
1011	6	16 1/4	15 1/2	2
1001	7	18 11/16	17 15/16	2
1021	7	20 1/2	19 3/4	2
1002	8	21 1/8	20 3/8	2
1003	10	26	25 1/4	2

Double Row Type

Similar to Single Row Type in construction but mounts two rows of relays.

Code No.	No. of Pairs Per Strip	Length Overall, Inches	Mtg. Centers Inches	Width Inches
1005	14	8 15/16	17 15/16	4
1004	10	13 13/16	13 1/16	4
1006	16	21 1/8	20 3/8	4
1007	20	26	25 1/4	4

No. 1012

No. 1013

Code No.	Face High Inches	Face Wide Inches	Remarks
1012	1 7/8	2 5/8	Mounts on right side of cabinet.
1013	1 7/8	2 5/8	Mounts on left side of cabinet.

No. 1014

No. 1024

Code No.	Face High Inches	Face Wide Inches	Remarks
1014	2 1/8	2 1/2	Mounts on roof of cabinet.
1024	2 1/8	2 1/2	Mounts on floor of cabinet.

No. 10 Type Relays

Mounting Centers 13/16 Inch

The No. 10 Type is somewhat similar to the 2000 type relay in general construction except that its overall dimensions are smaller. In ordering the number indicates the spring combination and the letter indicates the resistance.

Code No.	Spring Combination	Resistance in Ohms A	B	C	D	E	F	G	H	J	K
10	One set make contacts and two sets make and break contacts.	250	30	500							
21	Two sets of break contacts.	250	300								
25	One set make and break contact.	250									
26*	One set make contacts.	250	90	600	500	100	250	6	500	1000	1000
561	One set two make contacts and three dead terminals.	500	300								
569-A	One set make contacts and two dead terminals.	500									
567‡	Two sets break contacts and three dead terminals.	300 1640									

*The 26-F has 500 ohms copper shunted by 500 ohms German silver. 26H has 1000 ohms copper shunted by 500 ohms German silver. 26-K has 500 ohms copper in series with 500 ohms German silver.

‡The 567 is double wound. Terminals 1 and 2, three hundred ohms. Terminals 2 and 3, sixteen hundred forty ohms.

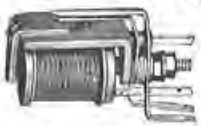
RELAYS

Mounting Strips for No. 10 Type Relays

Code No.	No. per Strip	Length Overall, Inches	Mtg. Centers Inches	Width Inches
375	15	13 13/16	13 1/16	3/4

Code No.	No. per Strip	Length Overall, Inches	Mtg. Centers Inches	Width Inches
376	20	18 11/16	17 15/16	3/4
377	30	26	25 1/4	3/4

No. 600 Type—Line Relays



Mounting Centers 5/8 Inches

A highly efficient relay of the miniature type. Order in the same manner as No. 2000 type relays.

Code No.	Spring Combination
600	One set make contacts. Regular line circuit.
601	Two sets make contacts. Universal line circuit.
602	Two break contacts. Reg. and Universal Cutoff.

Coils for 600 Type Relays

Code No.	Resistance, Ohms	Relays
C-CB	1000 1000	Concentric wound
S-DM	1000	Single
S-DN	200	Single
S-DP	300	Single

Mountings for 600 Type Relays

Code No.	No. per Strip	Mtg. Centers Inches	Length Overall, Inches	Width Inches
439	15	13 1/16	13 15/16	1 3/8
440	20	17 15/16	18 1/16	1 3/8
441	30	25 1/4	26	1 3/8
432	40	20 3/4	21 1/2	3 1/4

Polarized Relay

For Railway Composite Ringer Circuit

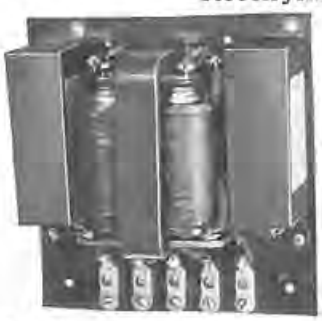
Relay

Cover

Single wound coils. Mounted on wood base.

Code No.	Spring Combination	Resistance, Ohms
564	One set make and break contact	175

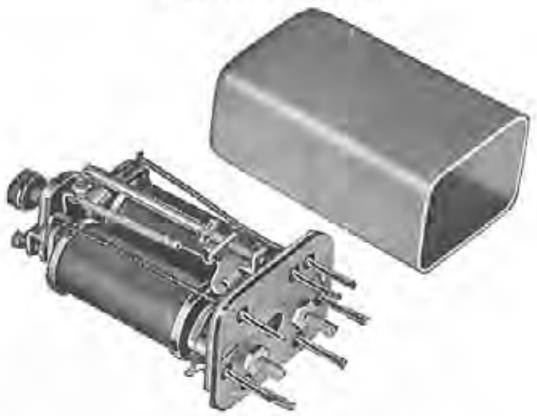
Rectifying Relay



Consists of 2 concentric wound coils and 2 Code No. 107 condensers mounted as a unit. Adjustable set of make and break contacts. The rectifier relay coils have additional resistance windings which are connected in series with the two condensers to prevent sparking of the adjustable relay contacts. No overall shell cover. Used on Nos. 6 and 7 converters.

Code No.	Resistance, Ohms	
555-A	300 G-S	30 C

Polarized Relays



No. 546

The No. 546 type polarized relay consists of two coils, a permanent magnet and an armature, similar to those used in a standard polarized telephone ringer. The relay has a make and break contact. These contacts have platinum points mounted on adjusting screws. The armature is controlled by a biasing spring with micrometer screw adjustment. These fine adjustments permit a very close setting, making it possible to operate the relay continuously on closed circuit work with dry battery current.

It can be so adjusted that the current flow which holds the contact open will not re-operate the relay in case the circuit is broken and again restored. This feature is especially desirable in alarm circuits as after the circuit is broken a reconnection will not shut off the alarm.

A relay of this type has a wide variety of uses where low current consumption and extreme sensitiveness is required.

Code No.	Contacts	Resistance in Ohms A	B	C	D	Remarks
546		40	200	1600	2500	Single wound coils
		40	200	1600	2500	

Alternating Current Relay

Regular A. C. Relay mounted on wood block 4 inches by 4 inches. Overall length of relay, 4 1/2 inches. Wired to binding post.

Code No.	Contacts	Resistances
355		500 ohms

RINGERS

Kellogg ringers are constructed throughout of the best materials and are so designed that they will not magnetize and stick. They can be furnished in either the adjustable or non-adjustable type and are fitted with high-grade brass gongs which are sand blasted and heavily black enameled. The long type, high impedance coils have cores of soft annealed Norway Iron. The spools are carefully insulated and wound with highest grade copper wire. Connectors are attached to spools eliminating breakage of coil wires. The permanent magnet is of high quality magnet steel. The armature has a thin strip of special metal attached to it which prevents sticking. The tapper rod is of proper length to give sure, instant signaling. Adjustable gong posts keep the center type gongs in the correct position.

Magneto—Non-Adjustable

The Kellogg No. 78 type Ringer has a non-adjustable armature and is standard for Magneto Telephones. This ringer is built for maximum efficiency and the armature adjustment cannot be changed. The greatest care is maintained in securing this adjustment so that the ringer will respond to the weakest currents yet will not freeze or stick. Can mount on wood of any thickness up to ¾ inch without effecting gong adjustment.

Code No.	Resistance Ohms	Size of Gongs, Inches	Remarks
78-A	1000	2½	Straight line bridging.
78-B	80	2½	Straight line bridging.
78-D	1600	2½	Straight line bridging.
78-G	2500	2½	Straight line bridging.

Common Battery—Adjustable

The Kellogg No. 84 Type Ringer being of the adjustable type is standard for Common Battery service. This ringer is of the same general construction as the No. 78 type except for the adjustable iron core. Can be mounted on wood of any thickness up to ¾ inch.

Code No.	Resistance Ohms	Size of Gongs, Inches	Remarks
84-A	1000	2½	Standard.
85-B	1000	2½	Biased for flat steel desk set box.
86-A	1000	2½	Regular for flat steel desk set box.
18-C	1600	1¾	No. 1016 Test Set.
66-B	80	None	No. 84 less clapper, gongs and gong posts.

The Kellogg No. 79 Type Ringer is similar to the No. 84 type except equipped with spiral biasing spring.

Code No.	Resistance Ohms	Size of Gongs, Inches	Remarks
79-A	1000	2½	Biased Ringing
79-D	1600	2½	Biased Ringing
79-G	2500	2½	Biased Ringing

Harmonic Ringers

No. 73 Harmonic Ringer

Kellogg Harmonic Ringers—that most important item in party line telephone service—are in a class by themselves, tried and tested in the severest kinds of party line telephone service.

They are equipped with a positive gong adjustment. Once set, the adjustment remains so indefinitely. The adjustment is made at the base of the gong-post with the aid of a screw driver and a special wrench furnished with the ringer. Gongs, 2½ inches in diameter. In ordering please specify the party desired.

Code No.	Resistance Ohms	Frequencies 1	2	3	4	Remarks
72-A	500	33⅓	50	66⅔		
72-A	2500				16⅔	
73-A	1000	30	42	54	66	Standard
74-A	2500	20				
74-A	500	60				
101-A	2500	25				
97-A	500	33⅓	50	66⅔	16⅔	For 75 and 404 flat steel boxes.
98-A	2500	20	60			For flat steel desk set boxes.

SWITCH HOOKS, MECHANICAL SIGNALS

Hookswitches

Kellogg Hookswitches are mounted on a black enameled steel frame. The springs are of heavy German Silver and assembled with a steel reinforcing spring, insuring positive contact. Kellite insulations are used. The hook is easily removed by simply pushing the springs forward. Kellogg Hookswitches are simple in construction yet reliable in operation.

Code No. 103

The No. 103 hookswitch is standard for use in all wood type telephones. When it is advisable to replace hook in old style telephone, Kellogg strongly recommend the purchase of this hookswitch, which can be easily installed.

Code No.	Spring Combination
103	

Code No. 113

The No. 113 hookswitch is standard for all common battery steel sets not using the new simplified wiring.

Code No	Spring Combination
113	

Code No. 153

The No. 153 hookswitch is for use with the Masterphone handset and is provided with screw terminals for telephones with simplified wiring.

Code No.	Spring Combination
153	

Code No. 150

Similar to the No. 153, but takes standard receiver hook.

Code No.	Spring Combination
150	

Code No. 151

Similar to the No. 150 except spring combination.

Code No.	Spring Combination
151	

Code No. 154

The No. 154 hookswitch is for use with the Masterphone handset and is provided with screw terminals for telephones with simplified wiring.

Code No.	Spring Combination
154	

Code No. 155

The No. 155 hookswitch is the same as No. 154 except mounted on a black enameled steel escutcheon.

Code No.	Spring Combination
155	

Code No. 156

The No. 156 hookswitch is similar to the No. 155 except spring combination.

Code No.	Spring Combination
156	

Dummy Hookswitches

No. 100

Code No. 100

Dummy Hook made of brass and heavily nickel plated. Furnished with two wood screws for mounting.

Battery Saver

No. 1

The principle of the Kellogg No. 1 battery saver is extremely simple. It stops the receiver hook after it has closed the receiver contact, but before the battery contact has been closed, thus permitting reception without the use of batteries. Pressing the stop lever releases the receiver hook which closes the battery contacts permitting complete conversation. Net weight 3 ounces.

Mechanical Signals

Kellogg Mechanical Signals are similar to and of the same superior construction as Kellogg Drops. Other resistances can be furnished on special orders.

Code No. 7—Mech. Signal

Code No.	Mtg. Centers Inches	Resistance Ohms	Remarks
7-B	1	100	Equipped with Night Alarm

No. 12 Mech. Signal

Code No.	Mtg. Centers Inches	Resistance Ohms	Remarks
12-A	1½	160	Busy test on toll boards
12-D	1½	215	Busy test on toll boards

Mountings

For No. 7 Type

Code No.	No. per Strip	Width Inches	Mtg. Centers Inches
145	2	1¼	2⅜
139	10	1¼	11⅝

For No. 12 Type

Code No.	No. per Strip	Width Inches	Mtg. Centers Inches
465	10	1	11⅝
200	20	1	11⅝

SWITCHBOARD TOOLS

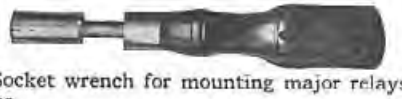
No. 8—Flat wrench for adjusting drop armatures.

No. 9—Flat wrench for adjusting ringers.

No. 10—Flat wrench for adjusting ringers.

No. 11—Socket wrench for relay arm. nuts, also for arrester nuts.

No. 12—Socket wrench for sleeve of comb. D. & J. and removing No. 72 type relay shell with hexagonal nut.



No. 13—Socket wrench for mounting major relays on mounting strips.

No. 14—Socket wrench for fastening jacks in Swbd. with Pc. No. 989 nuts.

No. 15—Spanner wrench for nuts for mounting drop and comb, drop and jack mountings.

No. 16—Socket wrench for stop nuts on No. 1000-type cam keys.

No. 17—Socket wrench with adjustable feature for Pc. No. 989 nuts.

No. 18—Socket wrench for nuts on relay gates.

No. 19—Wrench for removing No. 22-type major relay shells.

No. 20—Screwdriver wrench for removing No. 72-type major relay shell with round nut.

No. 21—Small Board screwdriver.

No. 22—Screwdriver for hollow screws on plugs.

No. 24—Supervisory lamp cap extractor.

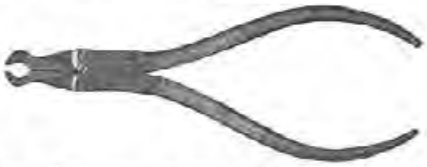
No. 25—Steel lamp extractor for 7/16 in. jacks.

No. 27—Fibre lamp extractor.

No. 28—Adjuster for contact springs on Mech. signals.

No. 29—Adjuster for tip springs on No. 116-type jacks.

No. 30—Wrench for removable sleeve of jacks, small size sleeve.
No. 31—Wrench for removable sleeve of jacks, regular size sleeve.
No. 37—Wrench for inserting and removing sleeve of No. 88 spring jack; similar to Code No. 30.



No. 32—Pliers for removing heat coils.

No. 33—Pliers for removing 4-party key buttons.

No. 35—Long handle diagonal Swedish cutters.

No. 36—Long handle, long nose chain pliers.

SWITCHBOARD TOOLS, TRANSFORMERS

No. 38 Line lamp cap extractor.

No. 39 Pliers for placing terminals on tinsel cords.

No. 40 Plug gauge for gauging worn No. 106, 137 and 156 plugs.
No. 41 Plug gauge for gauging worn No. 201 plugs.
No. 45 Plug gauge for gauging worn No. 166 plugs.
No. 46 Plug gauge for gauging worn No. 152 plugs.
No. 47 Plug gauge for gauging worn No. 112 and 187 plugs.
No. 50 Plug gauge for gauging worn No. 42 plugs.
No. 53 Plug gauge for gauging worn No. 128 plugs.
No. 54 Plug gauge for gauging worn No. 26 plugs.

NOTE: All plug gauges furnished with strong leather case.

No. 42 Tool for skinning switchboard cable.

No. 43 Relay spring adjuster, right hand bend.

No. 44 Relay spring adjuster, left hand bend.

No. 48 Jack gauge for gauging worn No. 239 type jacks.
No. 49 Jack gauge for gauging worn No. 258 type jacks.
No. 51 Jack gauge for gauging worn jacks taking the No. 42 plug or plugs of similar size.
No. 55 Jack gauge for gauging worn jacks taking the No. 26 plug or plugs of similar size.

No. 52 Desk set spring adjuster.

No. 56 For bending and adjusting springs in spring jack.

No. 57 For adjusting No. 555 relay on Nos. 6 and 7 converters.

No. 59 For adjusting ringers on No. 742 type telephones.

No. 60 Relay spring adjuster special construction to adjust center or B spring assembly.

No. 61 Key Spring Adjuster.

No. 71. Used for removing the Masterphone transmitter ring and receiver cap. Also valuable aid in removing caps from other types of receivers.

Transformers

Insulating Transformers Described on Page 66

No. 5

Kellogg transformers are made in various types to operate in connection with 24 or 32 volt ringing equipment installations. They are mounted on suitable bases and can readily be installed in the standard transformer set cabinets. These coils are accurately wound to the proper number of turns most suitable for the purpose intended, thoroughly insulated, and wound with wire of heavy gauge; also provided with sufficient number of iron laminations to prevent undue heating under ordinary ringing loads.

Code No.	No. Term.	Voltage Cycles	Primary	Secondary	Apparatus Used with
1-C	4	16–25	24	100	18-A, 21-A, 22-A, Transformer set
7-A	4	20–42	24	100	18-A, 19-A, 36-A, Transformer set
9-A	4	54–66	24	100	18-A, 19-A, Transformer set
2-A	4	33	24	135	21-A, 24-A, Transformer set
3-A	4	50–66	24	135	21-A, 24-A, Transformer set
5-D	4	20	32	110	36-B Pole changer
17-A	7	.....	..	...	6 and 7 Converter
18-A	8	.....	..	...	9 Auxiliary apparatus panel

TRANSMITTERS

Transmitter

Front Diaphragm Bridge

The reverse type Kellogg Transmitter requires little description—"It talks for itself." Designed over a third of a century ago, it still leads in talking qualities. That this transmitter was designed and built according to correct principles is proven by years of service with practically no change in the original design and scientific method of manufacture.

The exposed faces of the electrodes are made from a special grade of dense carbon, accurately finished and highly polished without filling, thus making the surface permanent and lasting. The hard drawn aluminum diaphragm with carbon retaining cup is subjected to extreme pressure in accurately shaped dies, to give it the required resilience to respond without lag to any form of audible sound waves.

The granular carbon is exceedingly hard and uniform in size and free from dust, retaining these qualities indefinitely. The carbon retaining cup is sealed by means of carefully gauged mica held in place by an aluminum washer riveted permanently to the diaphragm. A gasket or cushion is provided from special quality soft rubber to allow the diaphragm to respond perfectly to all sound waves.

To protect the diaphragm the transmitter front is made of extra heavy brass and the bridge from a straight piece of cold drawn ribbon steel. This rigid construction is one of the reasons for the fine clear cut articulation of the Kellogg Transmitter.

Machine screws and washers for attaching the transmitter to arm will be furnished only when specified.

Special markings on transmitter fronts, such as the name of the telephone company, require special tools and cause delayed shipment. Customers desiring special markings should make use of the No. 88 name plate or card holder, which attaches to any Kellogg Transmitter by means of the screws which hold the transmitter front in place.

The standard No. 22 type transmitter is handsomely finished in black enamel. It is furnished complete with black enameled transmitter back and Kellite mouthpiece. Net weight, 11½ ounces.

Code No.	Description
22-C	Common battery
22-LC	Universal
22-L	Local battery

No. 114 CH

The No. 114 CH Transmitter is of the same general construction as the standard No. 22C, but it is equipped with high resistance carbon. It is used on long loops where the available current is less than 100 milliamperes, at the transmitter. It is especially desirable for rural common battery lines. The carbon chamber front is lacquered red to prevent confusion with standard diaphragms.

Telephone Transmitters

No. 64 Type

Same as No. 22 type except transmitter back is not furnished. Net weight, 8½ ounces.

Code No.	Description
64-C	Common battery
64-LC	Universal
64-L	Local battery

No. 112 Type

Full floating diaphragm of the same construction as used by Kellogg in manufacturing test sets for the World War. Will stand rough usage, yet give perfect transmission. Frame and casing nickel plated, mouthpiece of brass black enameled. Used on Kellogg Grabaphones.

Code No.	Description
112-C	Common battery
112-LC	Universal
112-L	Local battery

Masterphone Transmitter

No. 57340

This transmitter provides the Masterphone with the finest type of transmission available in handset telephones. Illustration shows rear view of Pc. No. 57340 Masterphone transmitter. It is a self-contained unit of non-positional, compact type. Designed as a unit with no cord connections, it is easily installed without the use of tools. Two different sized locating lugs correspond to guide slots in wall of housing which insures the transmitter of always being in correct position. The heavy bronze clips make positive electrical contact by gripping bar conductors firmly on both sides.

Switchboard Transmitters

The world renowned talking qualities of Kellogg transmitters are not lacking in Kellogg operators' transmitters, which is very important, as patrons and neighboring exchanges judge the character of service of any plant very largely by how well they hear the operator.

Suspended Type

The No. 55-C suspended type transmitter is standard for all types of switchboards using this style of transmitter. Furnished in black enamel finish and with two 72-inch transmitter cords. Net weight, 18 ounces.

No. 1076

Breastplate Type

The No. 1076-C transmitter is standard for all types of switchboards using the breastplate style of transmitter. The breastplate is constructed of aluminum, white celluloid veneered; the mouthpiece is of hard rubber, heavily white enameled. Transmitter shell is aluminum. Net weight, 10 ounces.

The No. 76-C is similar to No. 1076-C but breastplate is of polished aluminum and mouthpiece of black hard rubber.

TRANSMITTER PARTS

Transmitter Backs

Pc. 10259

Pc. 46279 Transmitter Back

Kellogg standard transmitter back furnished on No. 22 type transmitter unless otherwise ordered. Handsomely finished in black enamel. Will attach to any make telephone arm requiring two screws for mounting transmitter.

Pc. 10259 Transmitter Back

Same as Pc16279 except nickel plated.


Pc. 34155

Pc. 34155 Transmitter Back

Mounts Kellogg No. 64 Type Transmitter and will fit all types of Western Electric telephone arms with concealed cords. Made of brass heavily nickeled.

Pc. 50764 Transmitter Back

Same as Pc. No. 34155 Transmitter Back except black enameled.


Pc. 29748

Pc. 29748 Transmitter Back

Mounts Kellogg No. 64 Type Transmitter and will fit all types of Western Electric telephone arms with exposed cords. Made of punched brass handsomely nickeled.


Pc. 5755

Pc. 5755 Transmitter Back

Mounts Kellogg No. 64 Type Transmitter and will fit old style American Electric telephone arm with exposed cords. Punched brass heavily nickeled.


Pc. 27505

Pc. 27505 Transmitter Back

Mounts Kellogg No. 64 Type transmitter and will fit Sterling Electric Telephone arm with concealed cords. Brass heavily nickeled.

Transmitter Adapters

While many types of adapters are listed for attaching the Kellogg transmitter to other makes of special telephone arms, their general use is not recommended, as experience has proven that it is more satisfactory to use the Kellogg transmitter with the No. 42 or 41 arm attached than it is to use an adapter for attaching transmitter to an old arm. This provides a more modern and rigid apparatus and at the same time conforms with the present standards.

Note: In ordering specify transmitter code number, together with piece part number of adapter required.


Pc. 8274

Pc. 8274 Adapter

Adapter for attaching Kellogg No. 22 type transmitter to Ericsson Telephone arm with concealed cord. Cast Brass nickeled.


Pc. 8545

Pc. 8545 Adapter

Adapter for attaching Kellogg No. 22 type transmitter to old style American Electric Telephone arm with concealed cord. Cast brass nickeled.

Transmitter Adapters


Pc. 39823

Pc. 39823 Adapter

This adapter is used with Pc. 34155 transmitter back for attaching the Kellogg transmitter to Western Electric desk or wall sets. Cast brass nickel plated finish.

Pc. 50762 Adapter

Same as Pc. 39823 except finished in black enamel. Used with Pc. 50764 transmitter back.


Pc. 5742

Pc. 5742 Adapter

Adapter for attaching standard Kellogg transmitters to old style Stromberg Carlson telephone arms with concealed cords. Cast brass heavily nickeled.


Pc. 6689

Pc. 6689 Adapter

Adapter for attaching Kellogg standard transmitters to North Electric telephone arm with concealed cord. Cast brass nickeled.

Transmitter Arms

For Telephones

Kellogg Adjustable Transmitter Arms are of pressed brass and steel construction, and are free from heavy or brittle castings. They adjust readily, and easily, and are so designed as to keep their adjustment. They are attractively finished in black enamel, and all wiring is concealed.


Code No. 42 Transmitter Arm

Code No. 42

This pressed steel arm is used on deep shelf magneto and short back board type, and common battery sets; 4¾ inches long; adjustable to 18 degrees above and 12 degrees below horizontal; concealed cord; replaces all former types; net weight 8 ounces.


Code No. 50 Transmitter Arm

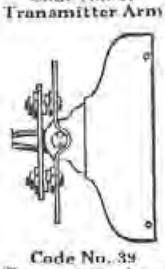
Code No. 50

This arm consists of the base of No. 42 and the transmitter mounting of the No. 41 Arm. This is the standard arm for magneto telephones and all other wood cabinet instruments. Depth from transmitter to back 2⅝ in.


Code No. 41 Transmitter Arm

Code No. 41

The transmitter back of this arm is of punched brass, black enameled, and balance of the arm is of pressed steel, black enameled, adjustable to 15 degrees above and 15 degrees below horizontal. This arm is used on residence type sets, and requires a 2-inch opening in woodwork to mount; concealed cord; net weight, 5 ounces.


Code No. 39 Transmitter Arm

Code No. 39

The transmitter back of this arm is of punched brass, black enameled, the balance punched steel. This arm is used on steel residence sets; ¾ inch long; adjustable to 15 degrees above and 15 degrees below horizontal; concealed cord.

TRANSMITTER ARMS, MOUTHPIECES

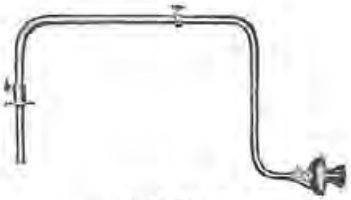
Transmitter Arms—Switchboard

Code No. 48

Code No. 48 Transmitter Arm
Malleable Iron Base. Base and Front Black Enameled

Switchboard transmitter arm is of the adjustable type. It is made of heavy brass with a durable nickel finish. It can be used on all types of small switchboards, and is a marked improvement over other styles. This arm eliminates the usual cord weight. It is equipped with horizontal and vertical swivel joints, making it possible to place in any position, and making it possible to hold the transmitter conveniently for use, whether in a standing or sitting position. This arm is especially valuable with P. B. X.'s or Magneto Switchboards, where the operator or attendant has other work to do, and uses an adjoining desk or counter; standard lengths, 15½ inches; net weight, 25 ounces.

Code No. 28



Code No. 28
Transmitter Arm

Switchboard arm is used on desk and small boards. It is made of brass tubing, heavily nickel plated; cords are concealed. Minimum length, 16¼ inches, maximum, 22¾ inches. This arm is equipped with swivel joint, enabling it to be swung either to the right or left.

Kellogg Switchboard Mouthpieces

Pc. No. 29776

Pc. No. 29776 switchboard mouthpiece is constructed of black hard rubber and will fit all Kellogg operators transmitter.

Pc. No. 39354 switchboard mouthpiece same as Pc. No. 29776 except white enameled for No. 1076 Operators' Set.

Kellite Products

Kellite Products are practically unbreakable and have a beautiful finish that is lasting. After years of hard service they still retain their "newness." Some Kellite advantages:

1st—Unbreakable; tensile strength, 3,600 to 3,900 lbs. per square inch—as "strong as iron."

2nd—A perfect dielectric; dielectric strength of 300 to 350 volts per mil many times as much as rubber.

3rd—Shape retaining; will not warp or discolor, coefficient of expansion only .000034 inches for each degree centigrade, just enough elasticity to keep from being brittle.

4th—Oil, water, moisture and color proof; impervious to most of the organic acids excepting nitric acid and concentrated sulphuric acid.

5th—Odorless; absolutely no obnoxious smell.

6th—Non-inflammable; positively will not burn; resists temperature up to 350° F., and somewhat higher for short periods. At higher temperature Kellite only chars.

7th—Light weight; specific gravity of only 1.33 weighs only as much as an equal volume of hard rubber.

Kellite Telephone Mouthpieces

Pc. No. 29779

Pc. No. 29779 telephone mouthpieces are made of Kellite which is unbreakable in ordinary service. These mouthpieces retain their glossy finish and are not affected by heat, chemical, moisture, etc.

Pc. No. 34419 telephone mouthpiece special for Stromberg-Carlson telephones, Monarch, American, Electric, etc.

Kellogg can furnish composition mouthpieces for those desiring them. Also Kellite mouthpieces to fit other makes of telephones.

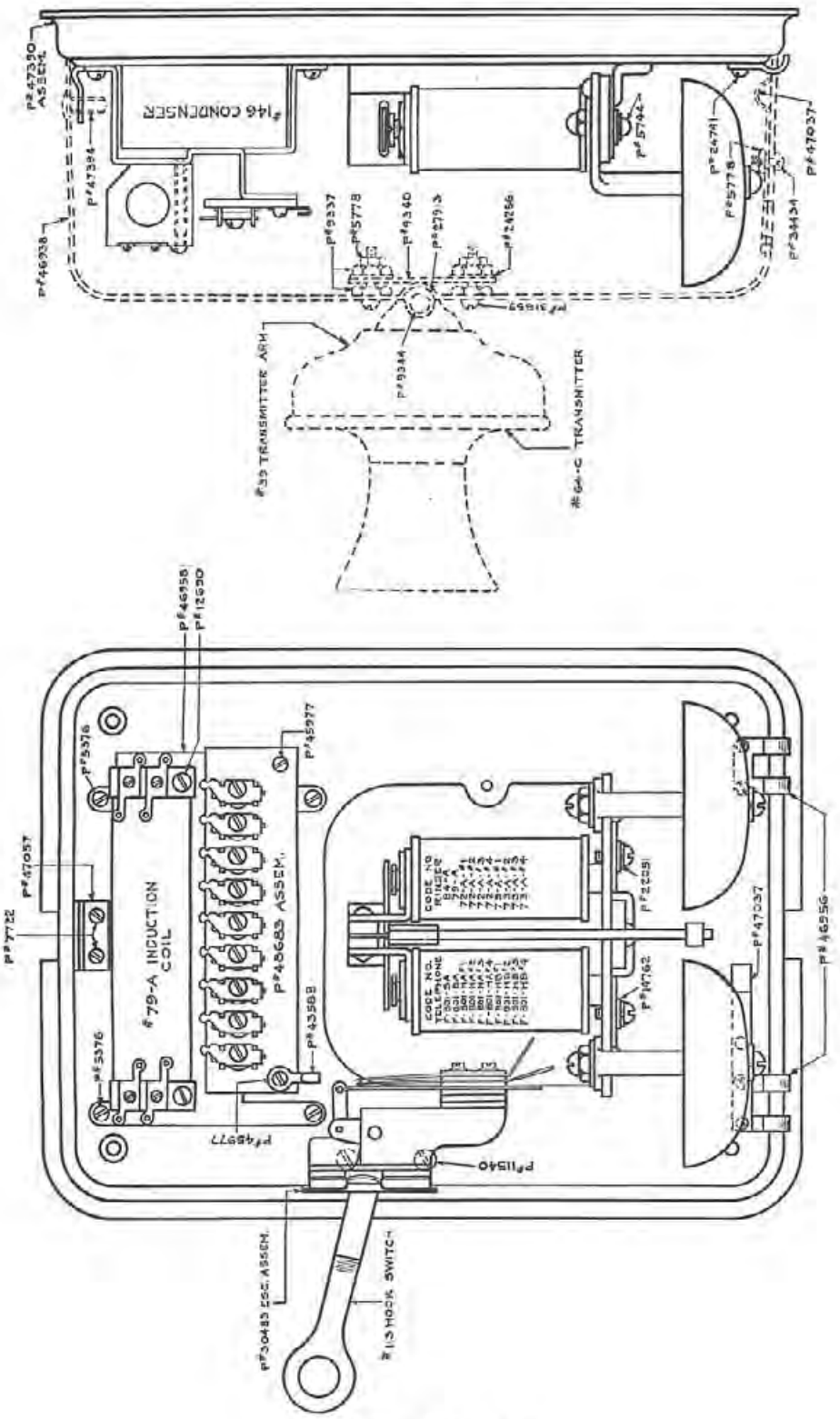
Pc. No. 38191

Pc. 43963

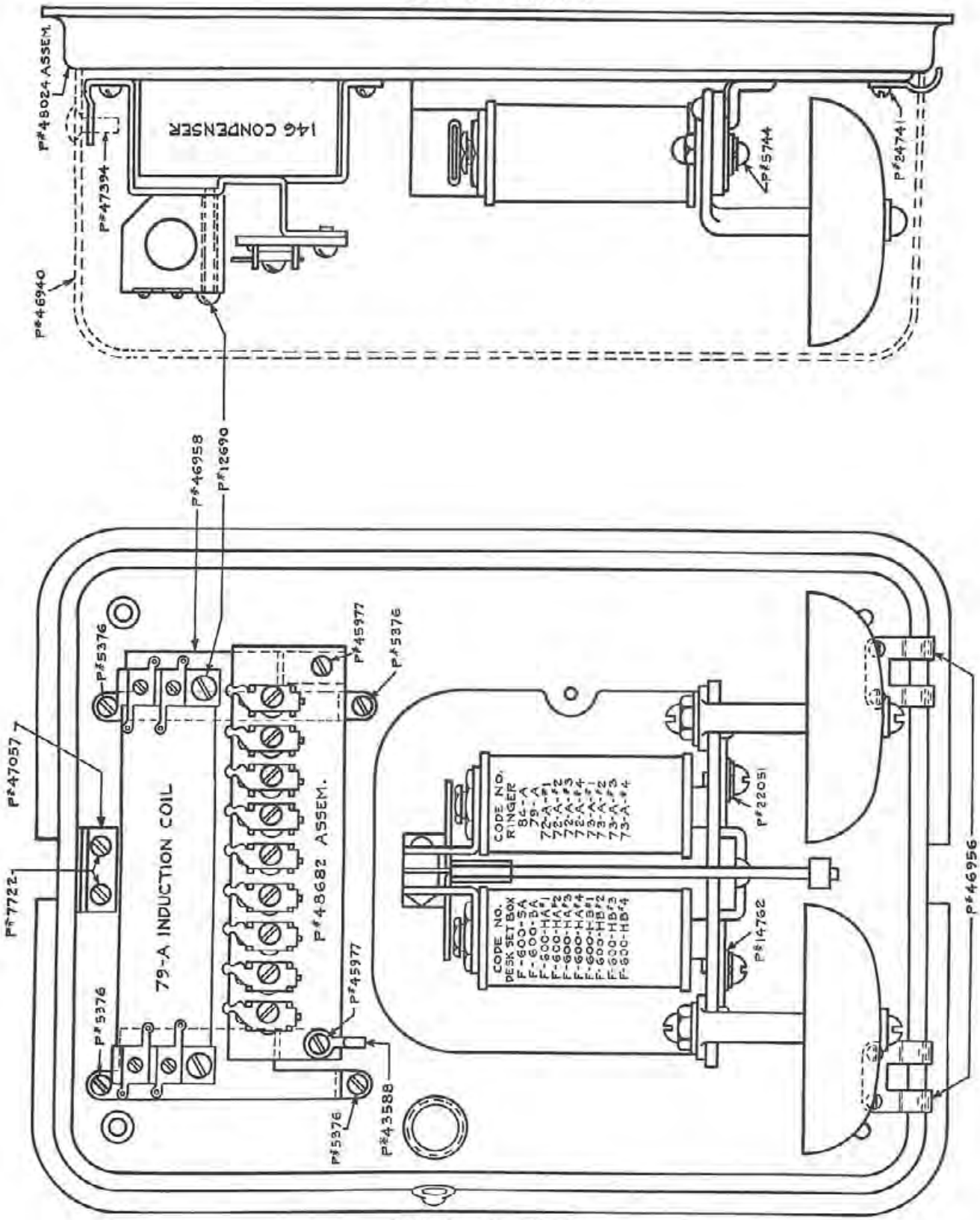
Pc. No. 38191—Hard rubber mouthpiece for old style grabaphones of Kellogg make.

Pc. No. 43963—Brass mouthpieces. Black enameled for new style Kellogg grabaphones.

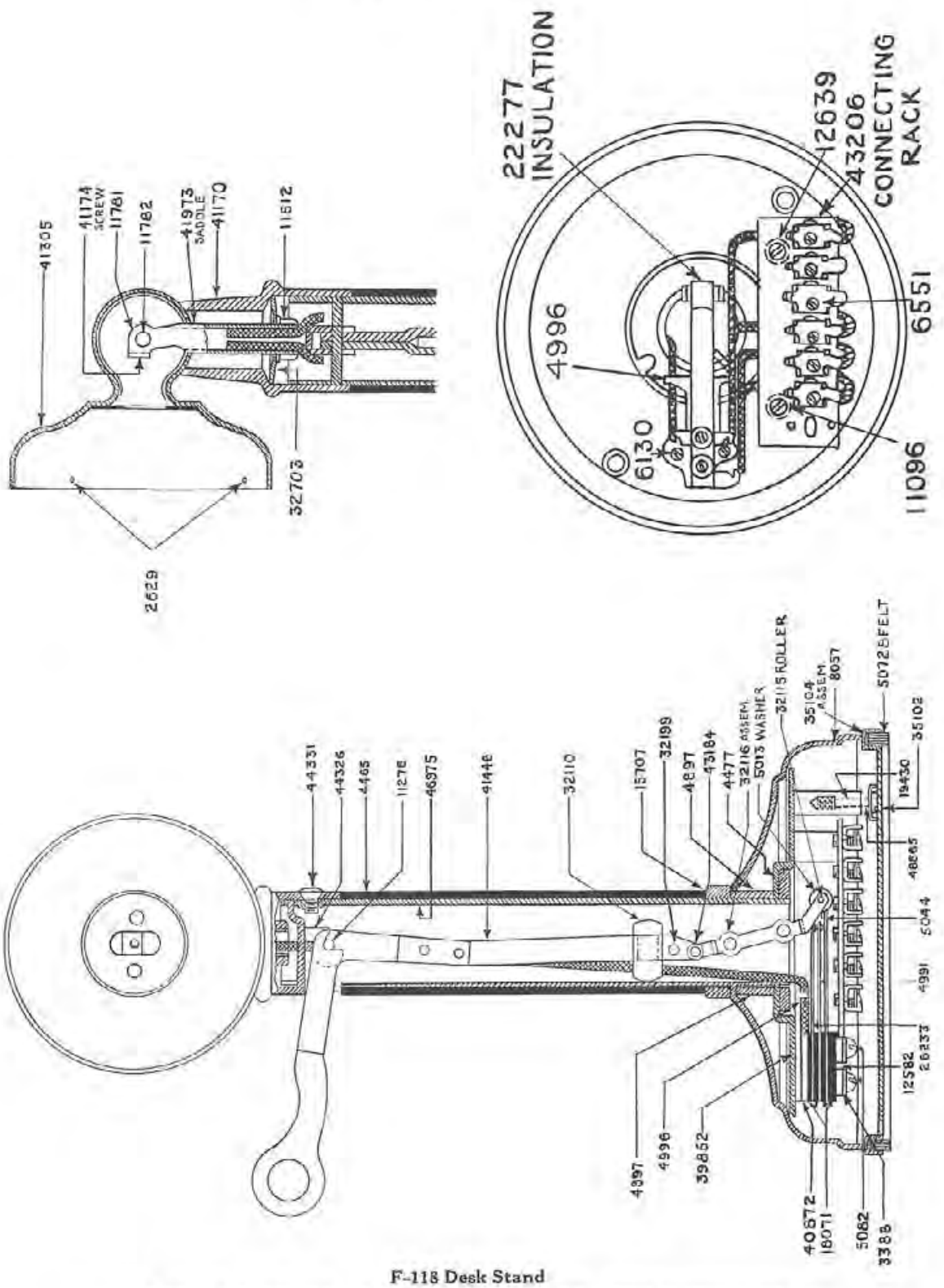
PIECE PARTS



F-801 Type Telephone

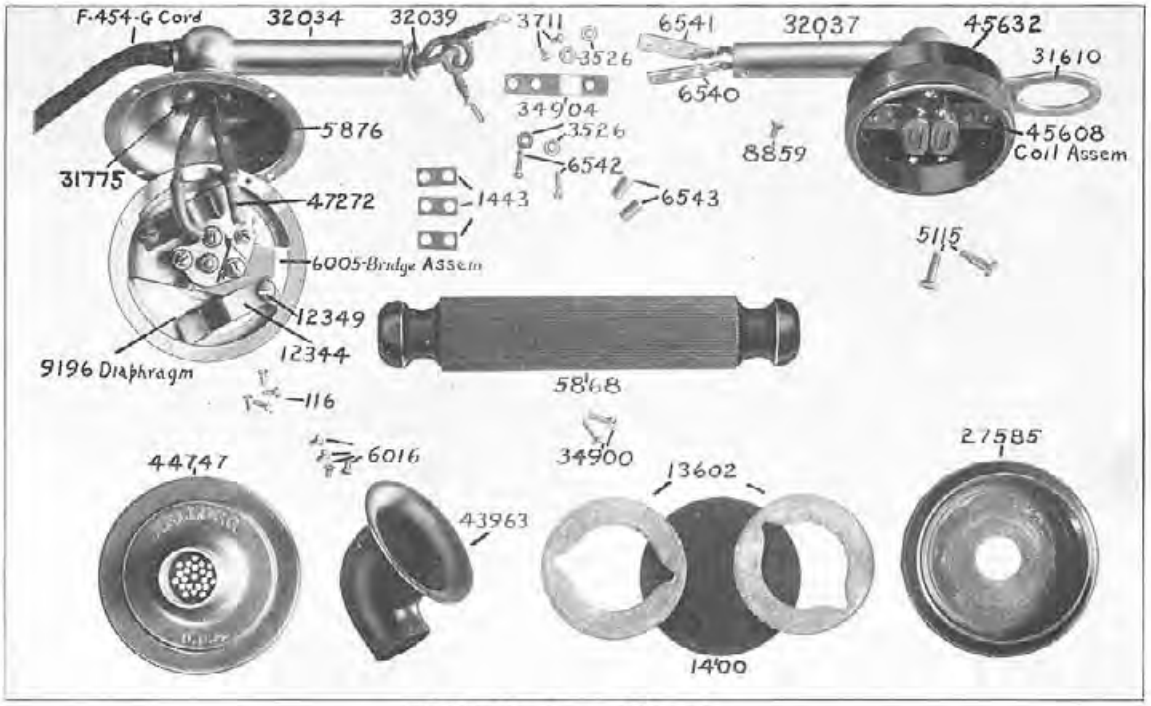


F-600 Type Desk Set Box

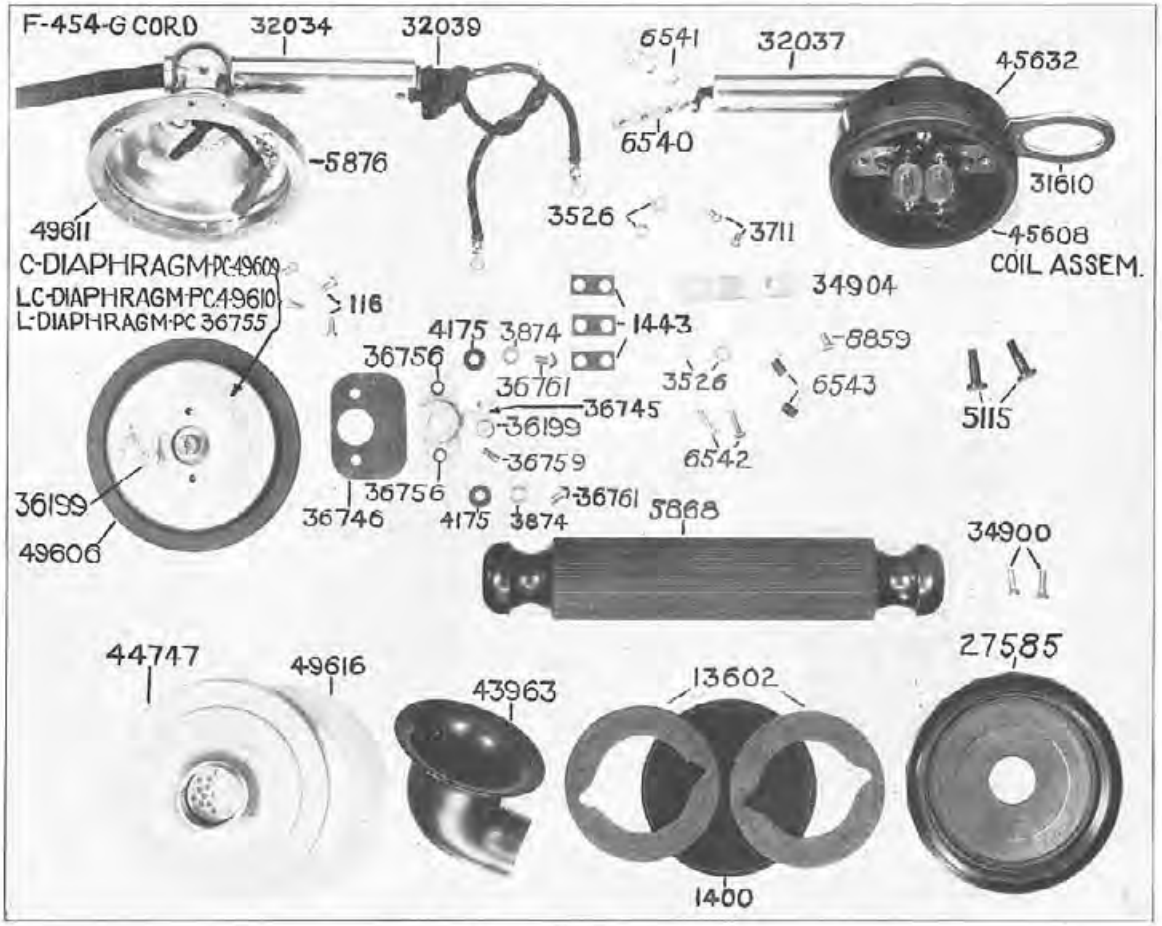


F-118 Desk Stand

F-84 Desk Stand same as F-118 desk stand except 1-Pc. 50364 Connecting rack assembly Piece Number 35104 base assembly includes Pc. No. 35102 and Pc. No. 50728 Pelt



F-12 Grabaphone—Old Style
F-11 Grabaphone same as F-12 except not equipped with piece 31610 hook



F-12 Grabaphone—New Style
F-11 Grabaphone same as F-12 except not equipped with Pc. 31610 hook

PIECE PARTS

KELLOGG Masterphone

Pc. 57340 Transmitter

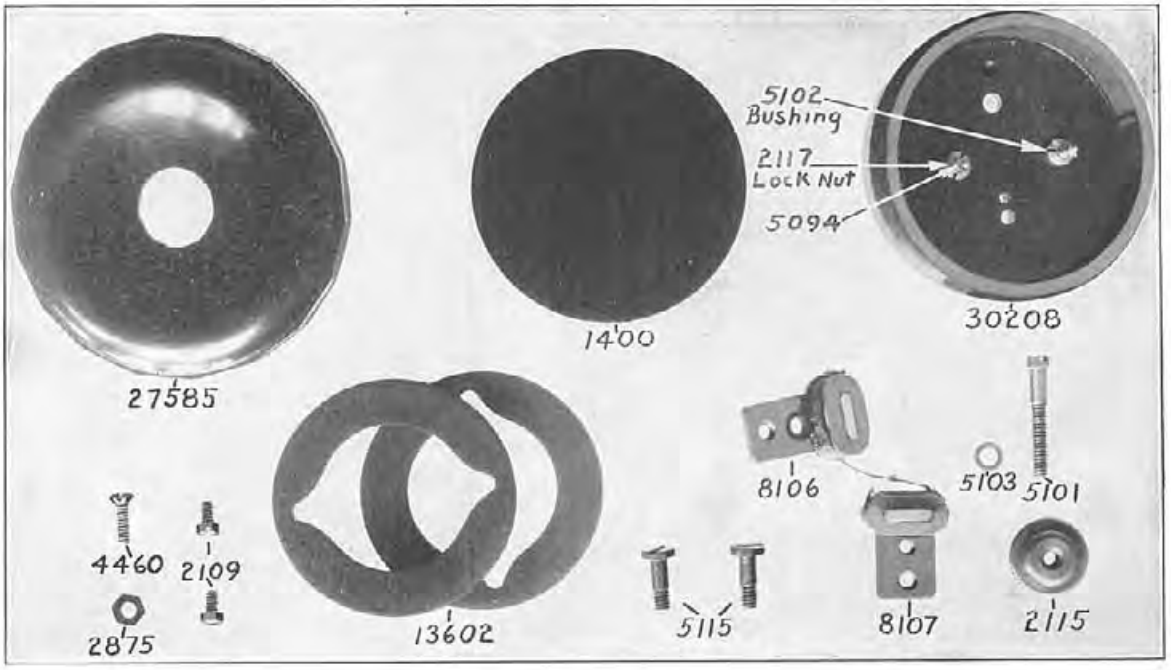
Pc. 55368
Transmitter
Mouthpiece

Pc. 55369
Transmitter
Mouthpiece Ring

Pc. 55919 Receiver

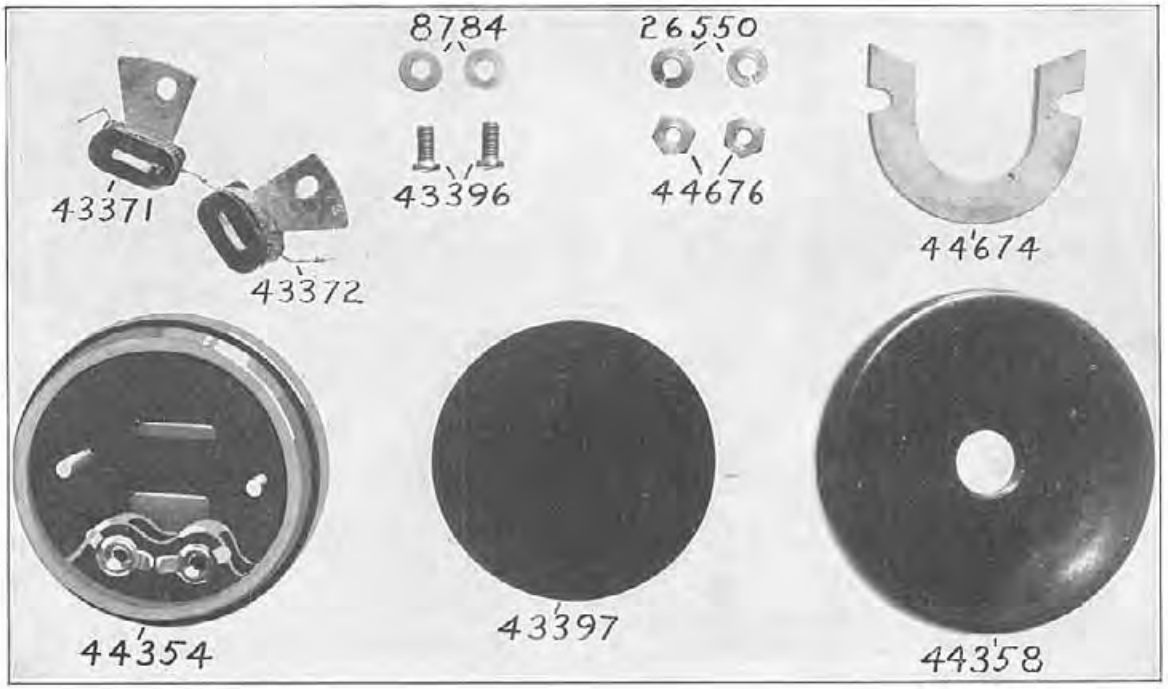
Pc. No. 55398 Moulded Kellite Shell Base only

PIECE PARTS



No. 46 A Receiver

Parts are interchangeable with No. 14 A receivers except when used on No. 1016 test set, in which case use Pc. No. 5086 cap and Pc. No. 5085 shell to fit special hook switch on test set.

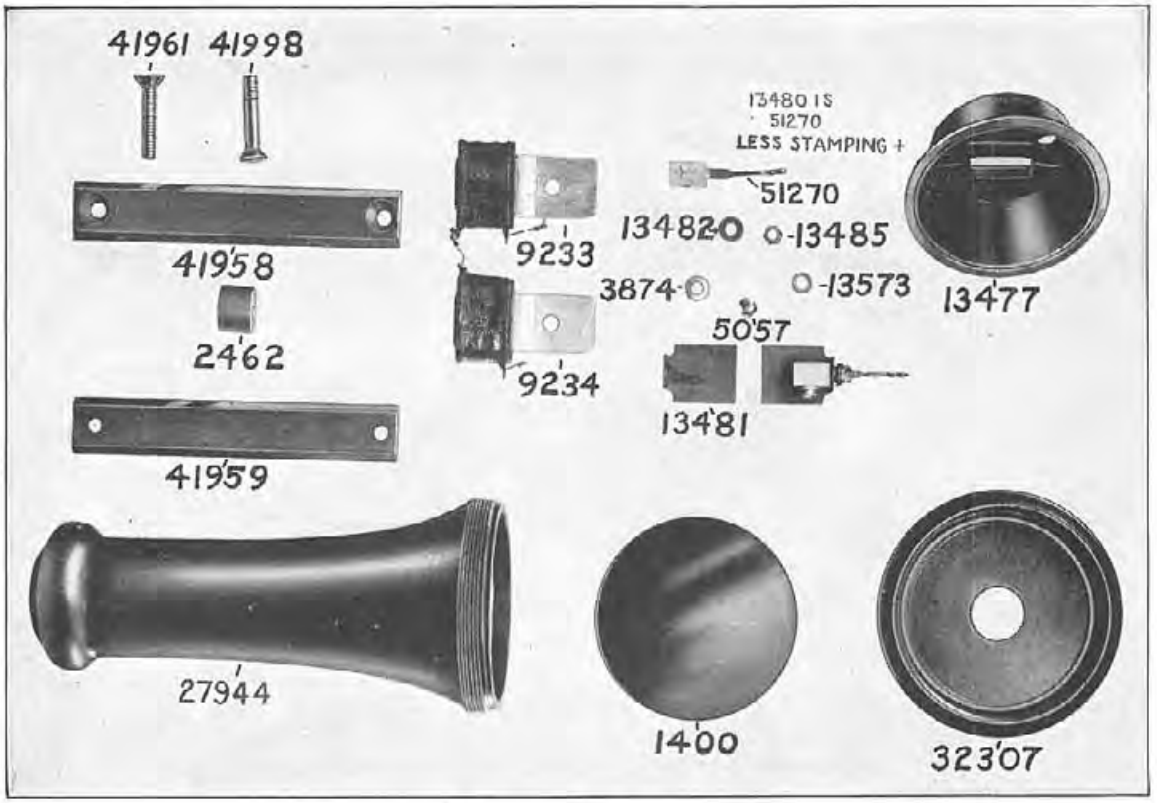


No. 65 A Receiver

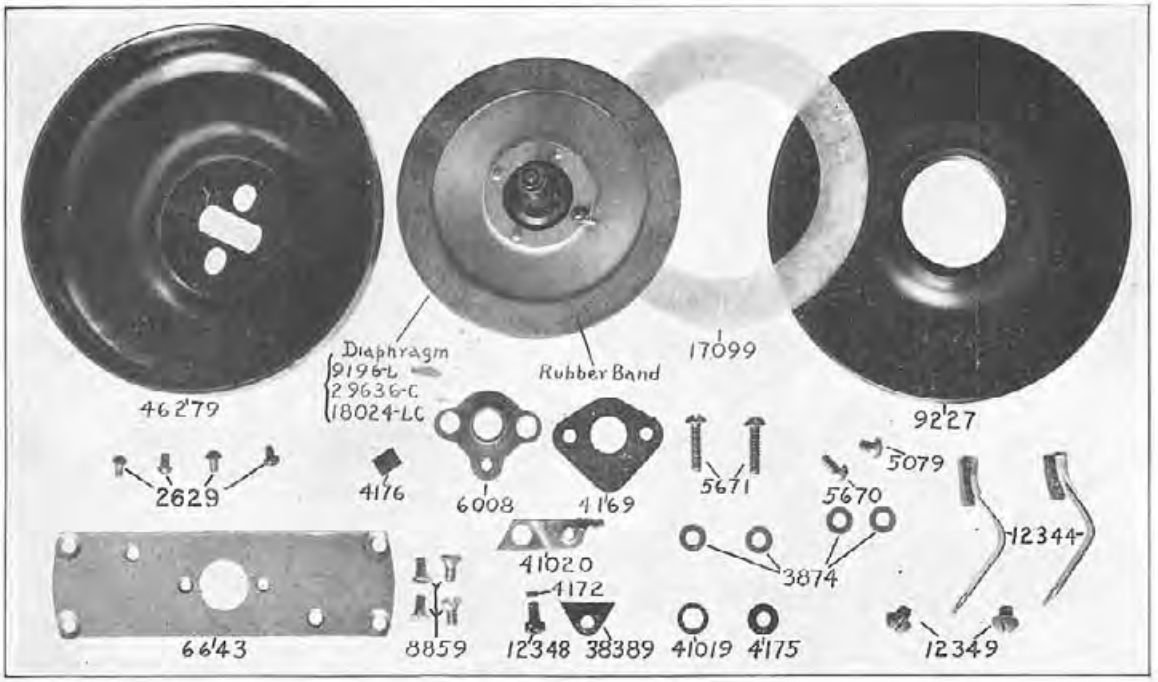
On Pcs. Nos. 43371 and 43372 the resistance of 50 ohms per coil must be specified.

Magnets, coils, diaphragm, screws, washers and nuts interchangeable with No. 54 A receivers. Cap for 54 A receiver is Pc. 43360. If new body is desired order Pc. 44354 and Pc. 49358 together with yoke No. 45171 which will make the 54 A receiver into a No. 65 A.

PIECE PARTS

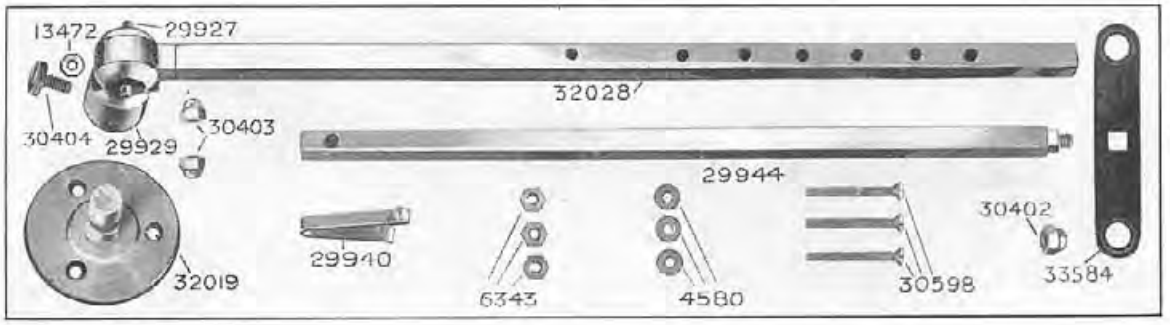


F-41-A Kellite Shell Receivers
Parts are interchangeable with 26-A and 32-A receivers



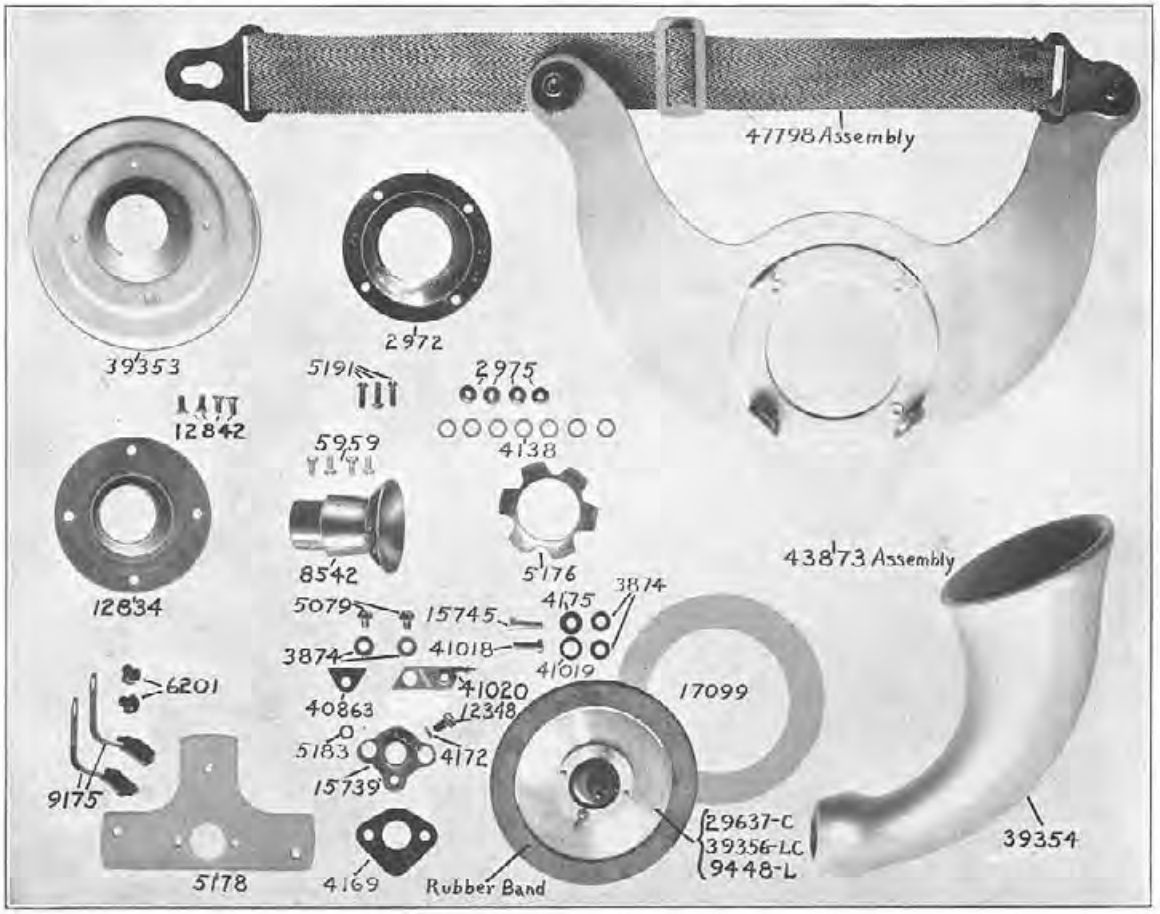
No. 22 Type Transmitter
Pc. 12341 bridge assembly will mount on old and new type transmitter
If nickel plated transmitter is desired order Pc. 10259 back and Pc. 9164 front, otherwise same as above

PIECE PARTS



No. 48 Transmitter Arm
Pc. 954 Eyelet (not shown) is used for cord escutcheon

NOTE: Pc. 33584 has been changed to Pc. 33854

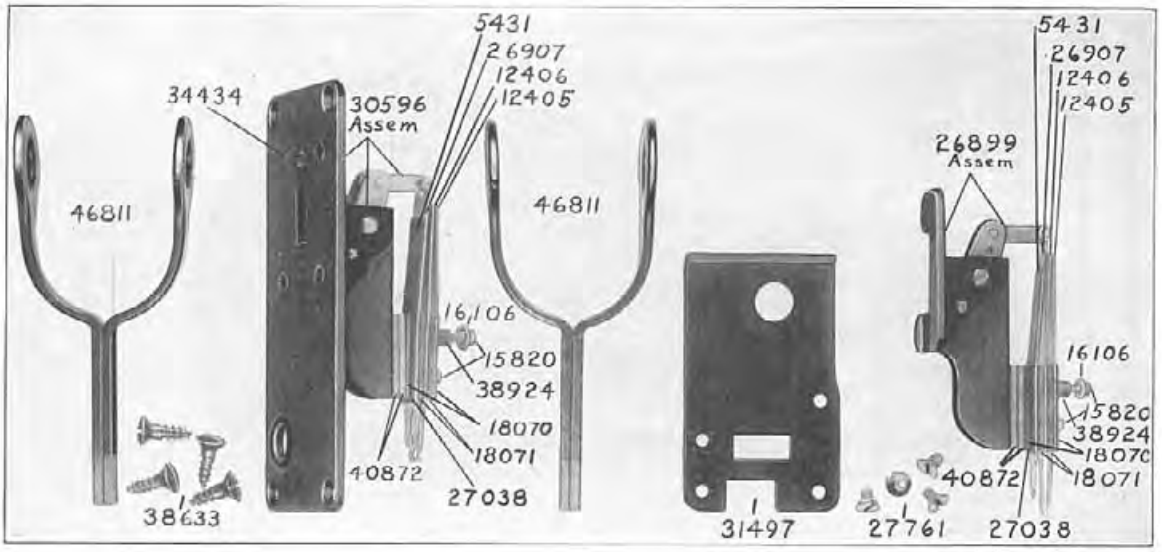


No. 1076 Transmitter

Pc. 43674 breastplate assembly includes Pc. 43873 and 47798. No. 76 transmitter parts are interchangeable, except use Pc. 29776 mouthpiece, Pc. 32549 transmitter front, Pc. 5175 assembly including Pc. 2979 band, 2980 clasp and 2982 buckle.

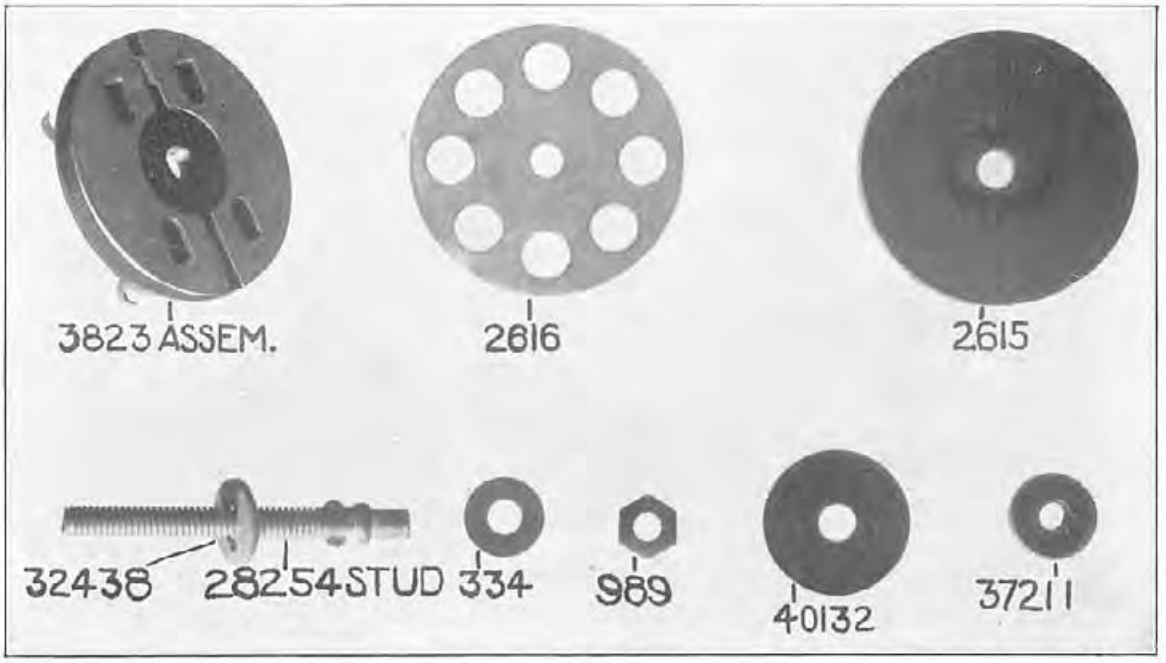
NOTE: Pc. 9175 has been changed to Pc. 12344; Pc. 39353 to Pc. 53532.

PIECE PARTS

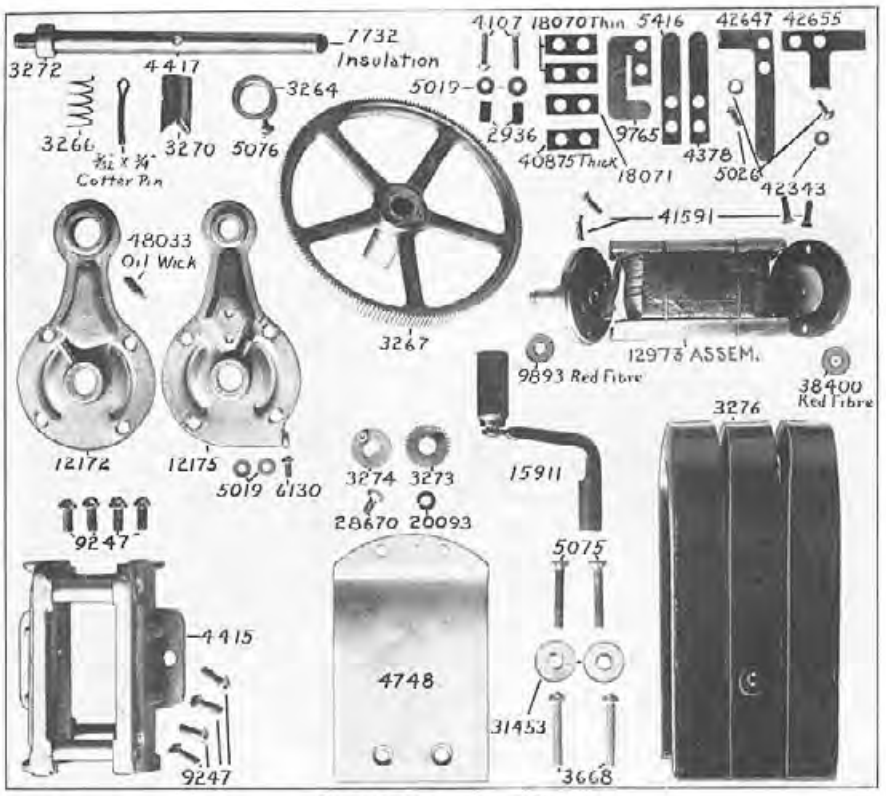


No. 103 Hook Switch
Used with wood sets.

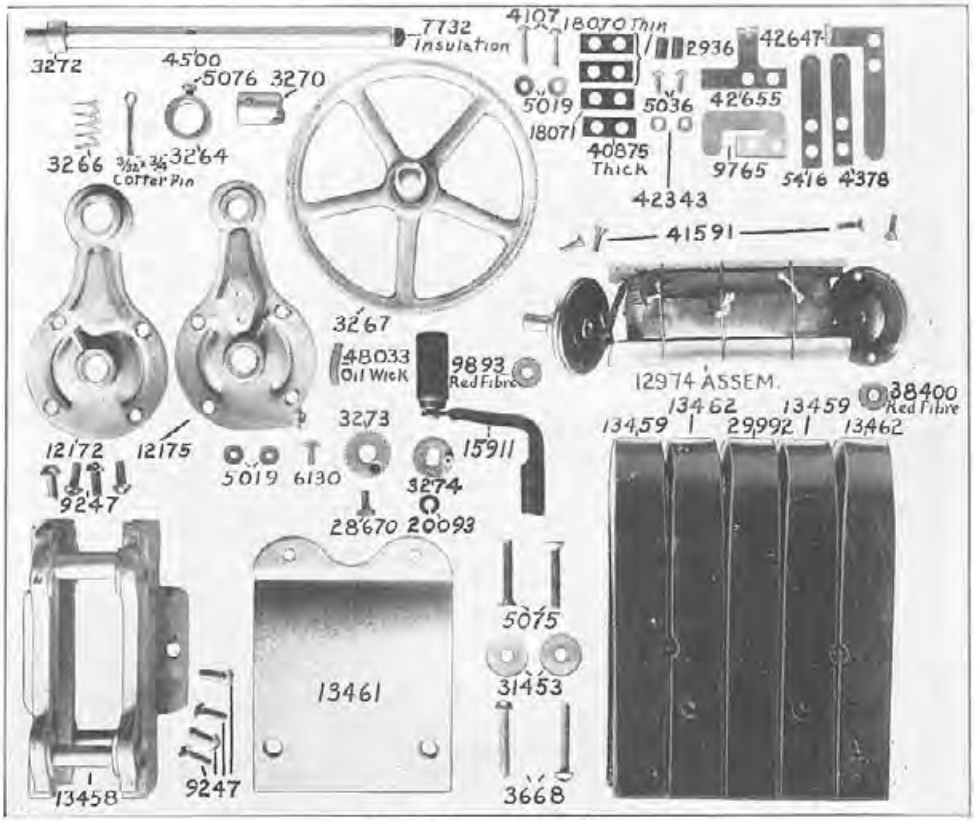
No. 113 Hook Switch
Used with steel sets.



No. 3 Arrester

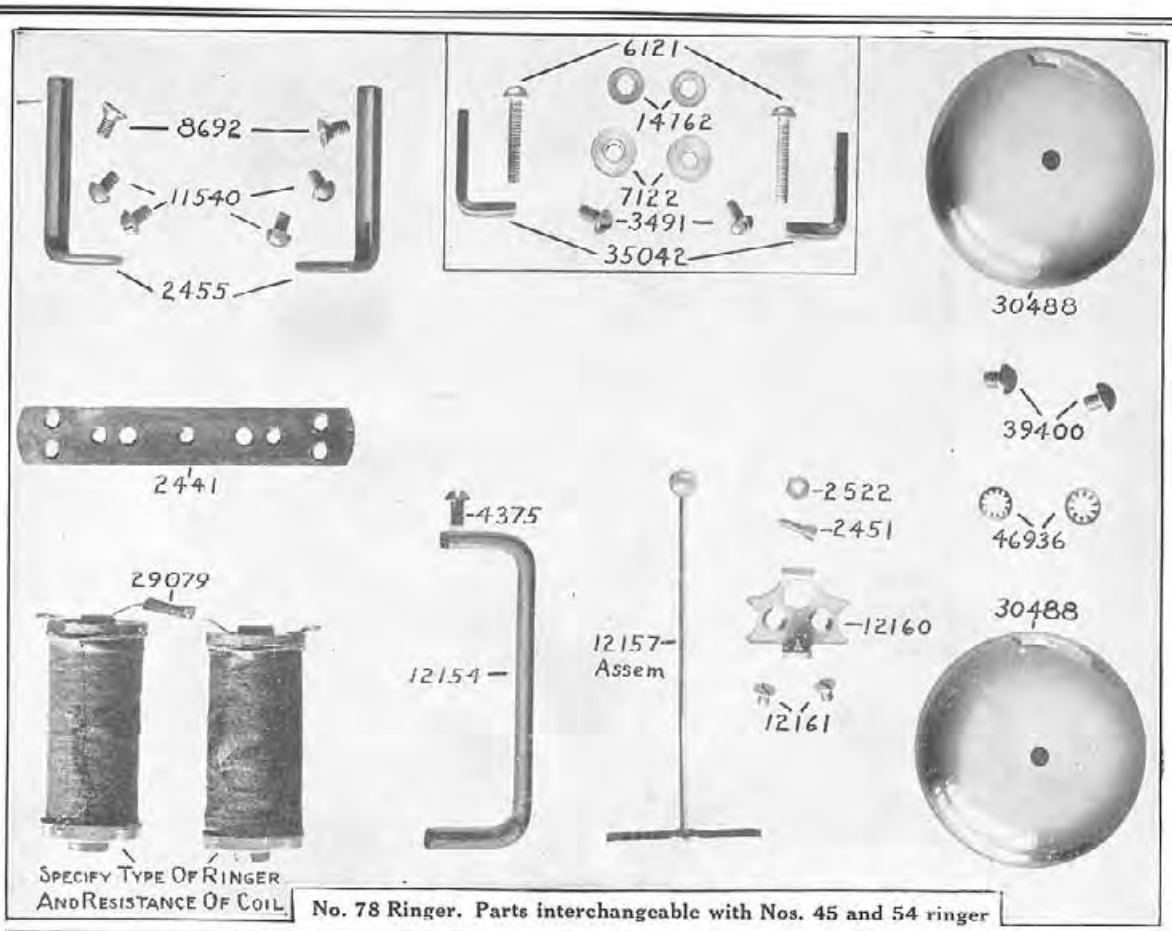


No. 15 Generator 3 Bar

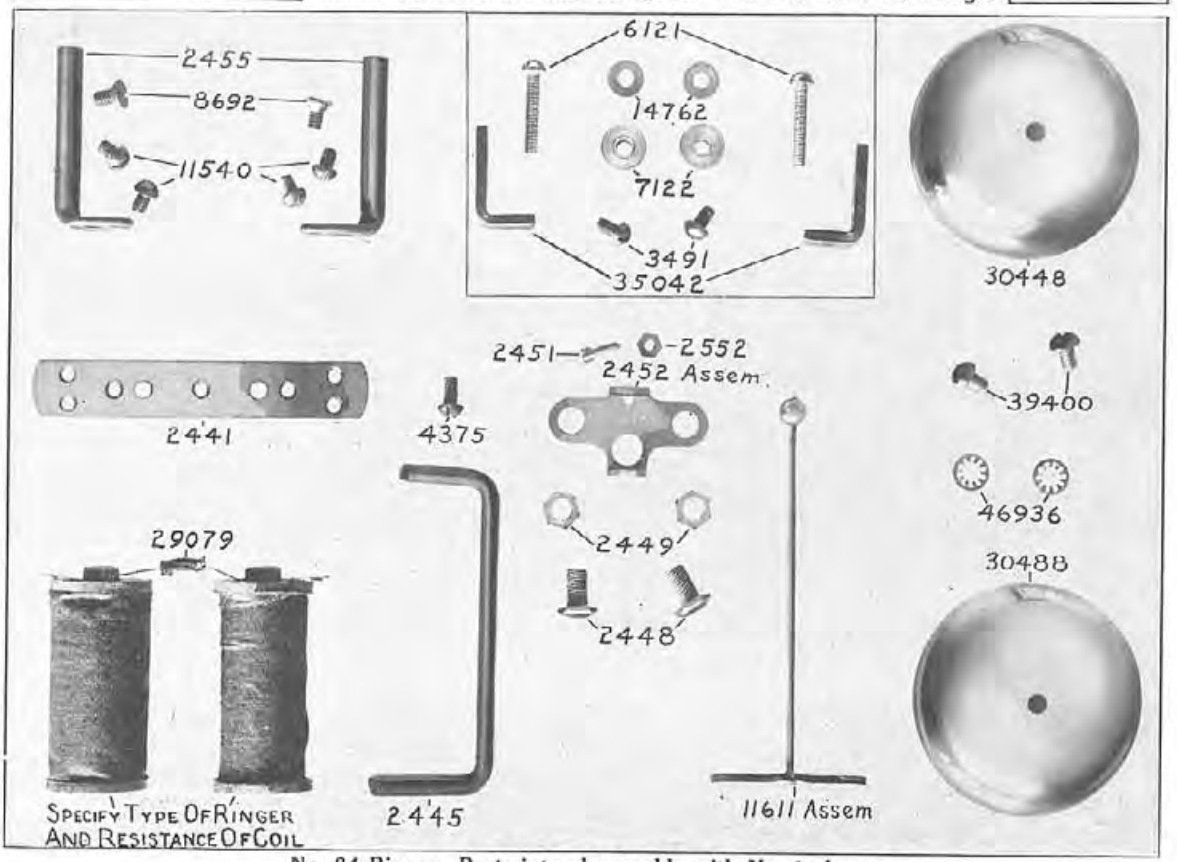


No. 53 Generator 5 Bar

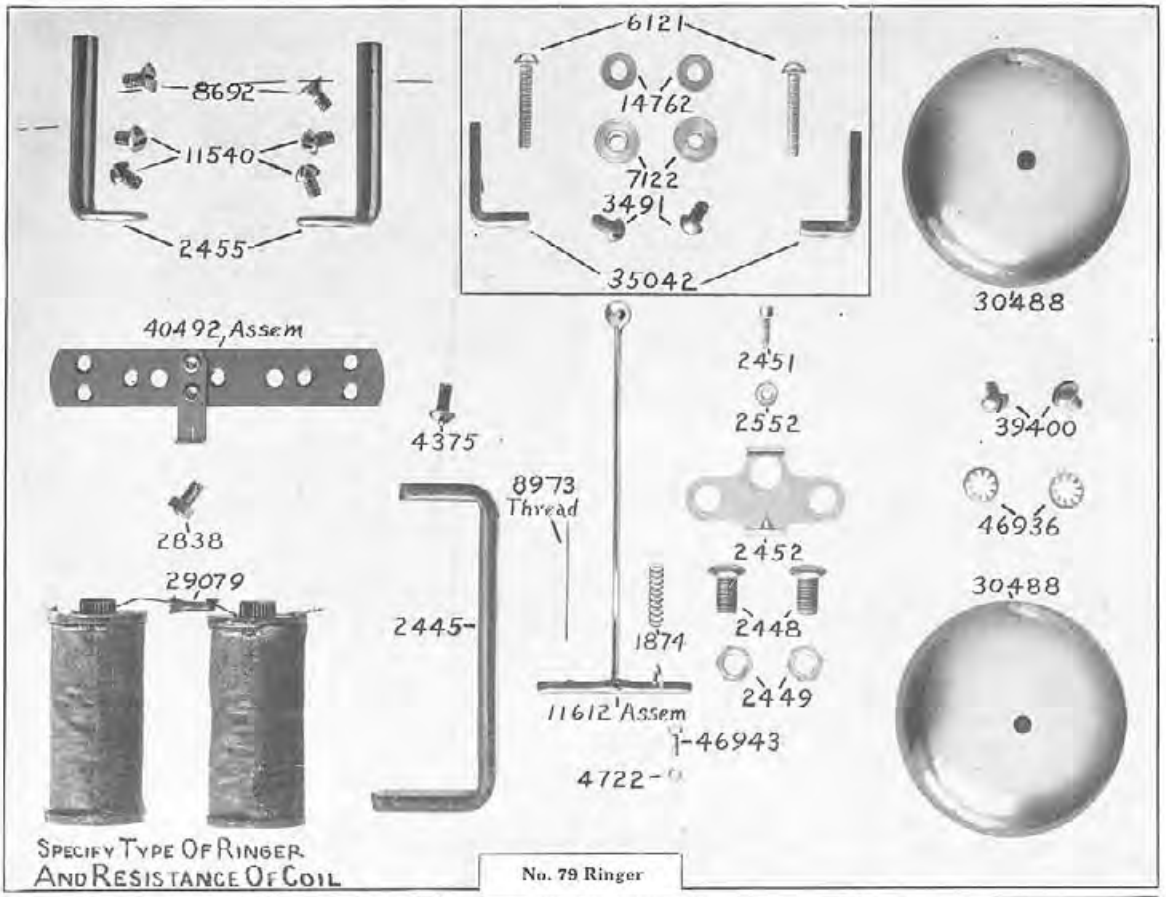
No. 22 Generator 4 Bar uses same parts as No. 53 except Pc. 3281 pole piece instead Pc. 13458 and 4 Pc. 3276 magnets in place those shown



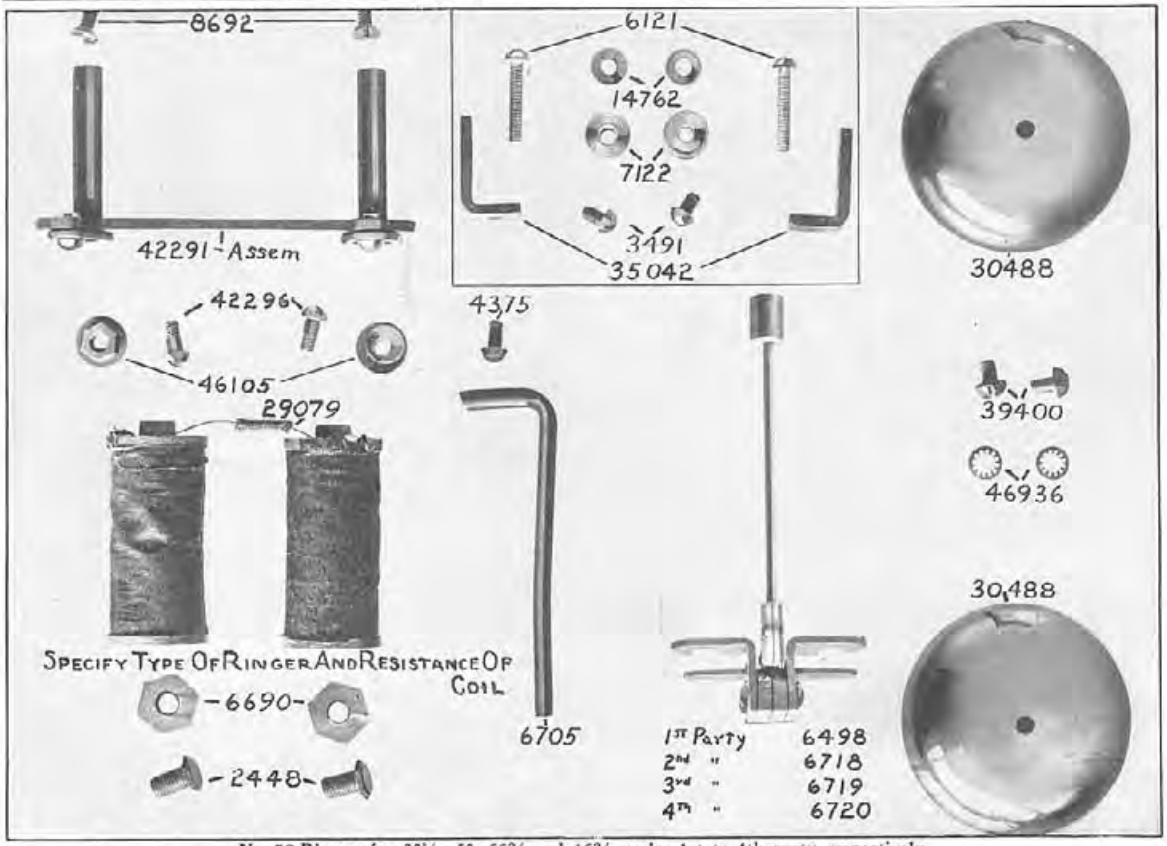
No. 78 Ringer. Parts interchangeable with Nos. 45 and 54 ringer



No. 84 Ringer. Parts interchangeable with No. 1 ringer

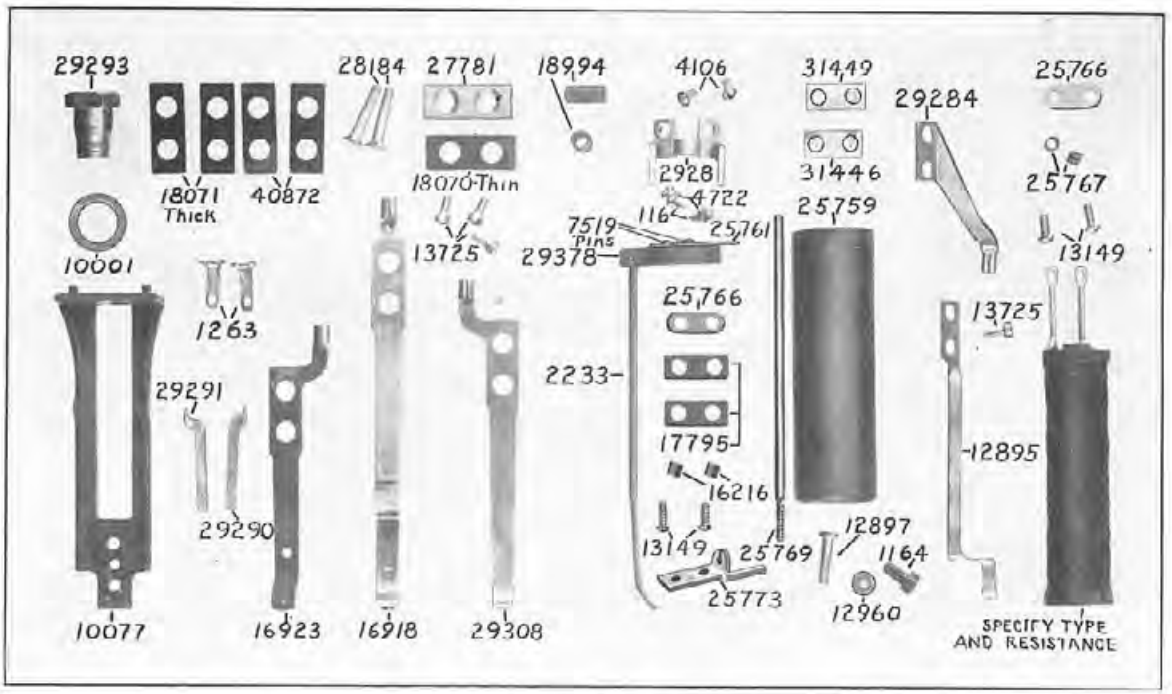


No. 79 Ringer



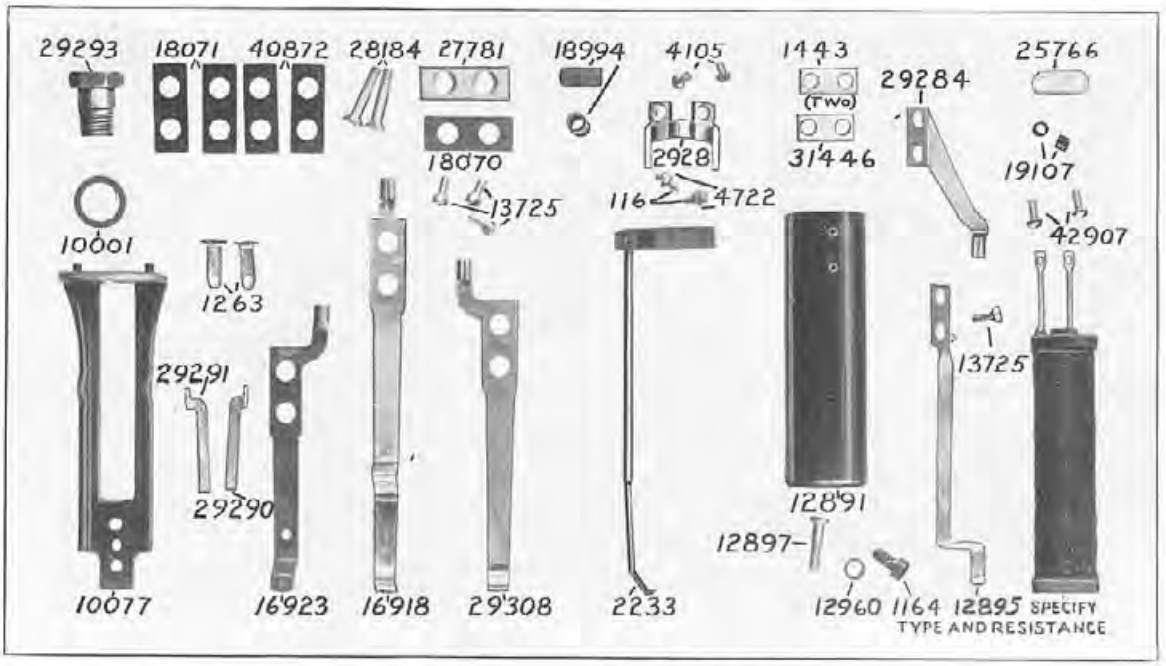
No. 72 Ringer for 33⅓, 50, 66⅔ and 162⅔ cycles 1st to 4th party respectively.
No. 73 Ringer for 30, 42, 54 and 66 cycles. Vibrator assemblies Pc. 15193, Pc. 15194, Pc. 15195, Pc. 15196, 1st to 4th party respectively.

PIECE PARTS



No. 100 Combined Drop and Jack

For mounting parts, see pages 131 and 132, Coils for Nos. 100, 101, 300 and 301 Combined Drop and Jack.



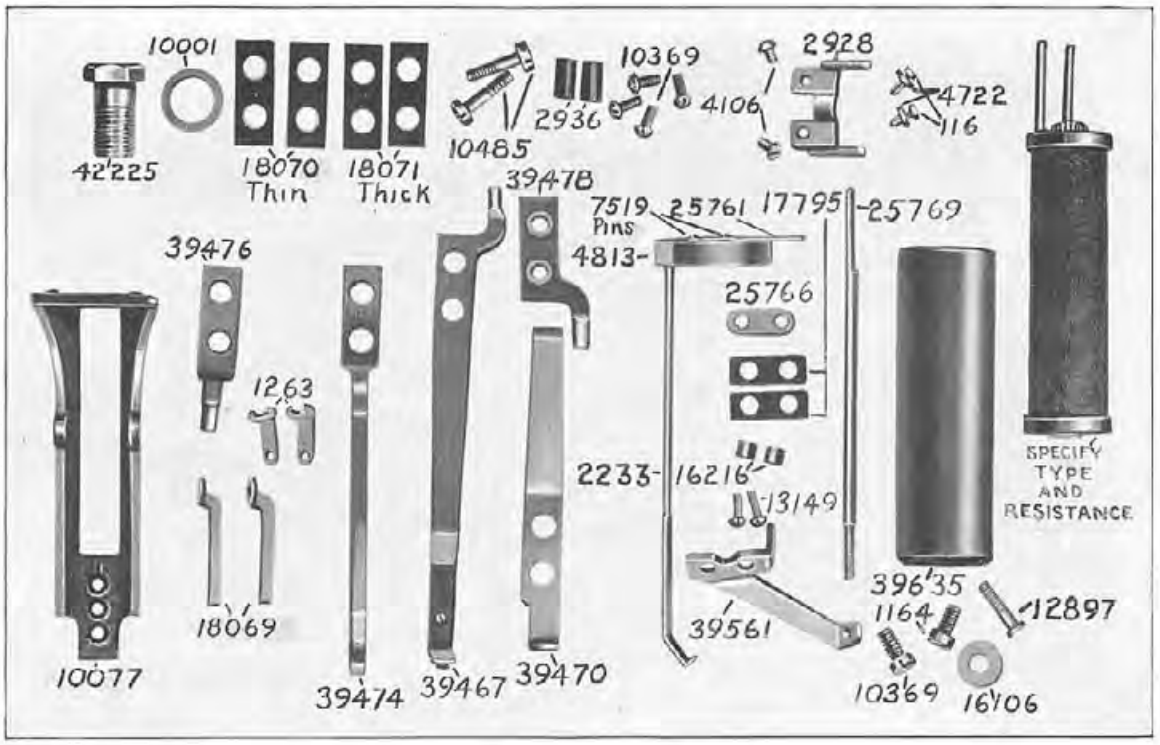
No. 101 Combined Drop and Jack

Parts for drop shown above are same as used on No. 51 clearing out drop. For mounting parts, see pages 124 and 125.

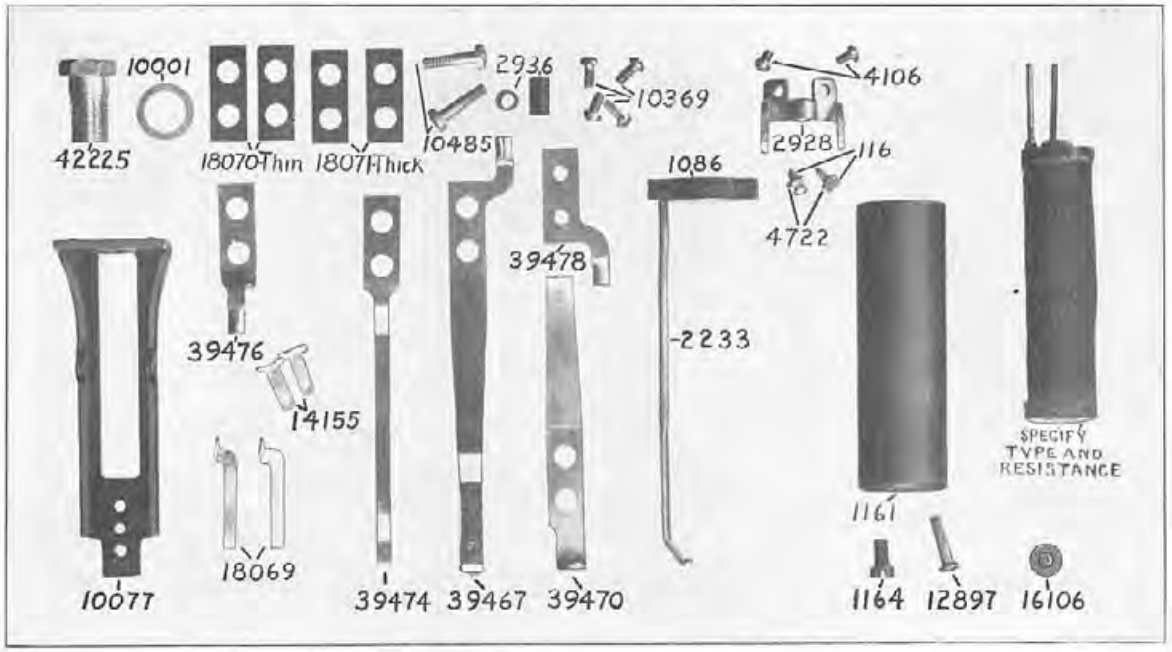
Resistance	Code No. Coils for 100, 101, 300 and 301 C. D. & J.	Code No. Coils for 50 and 51 Drop
100 Ohms	DJA	DA
500 Ohms	DJE	DE
1000 Ohms	DJC	DC

Coils for Combined Drop and Jack and Drops

PIECE PARTS



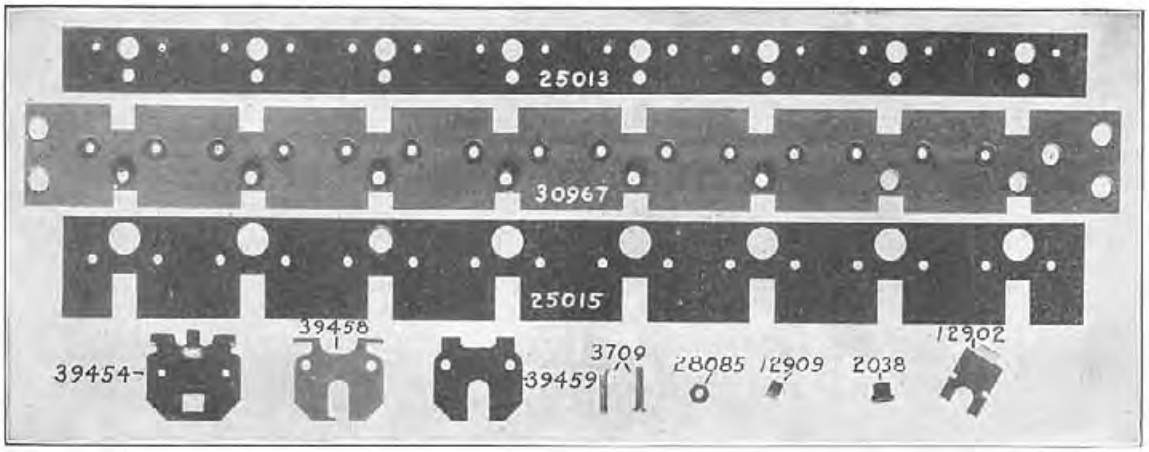
No. 300 Combined Drop and Jack



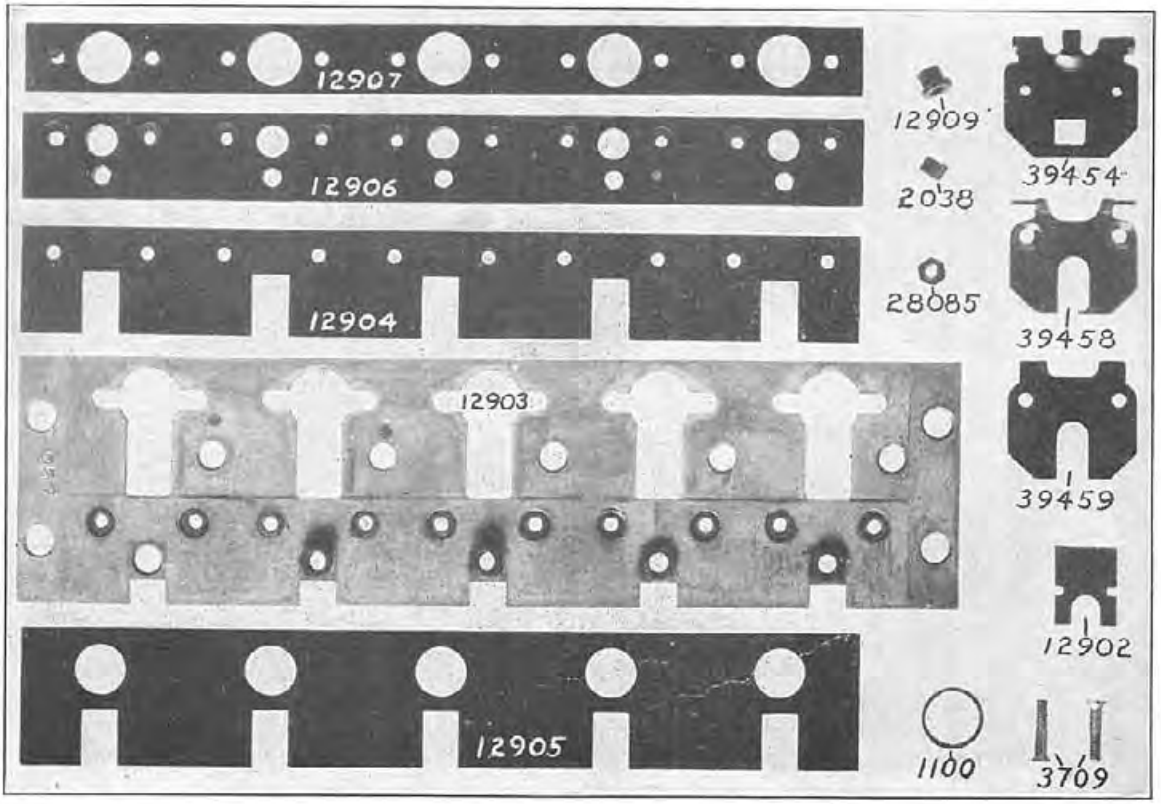
No. 301 Combined Drop and Jack
For drop and jack mounting parts, see pages 124 and 125

Pc. 30336 Connector for use with Nos. 100, 101, 300 and 301 Combined Drop and Jack.

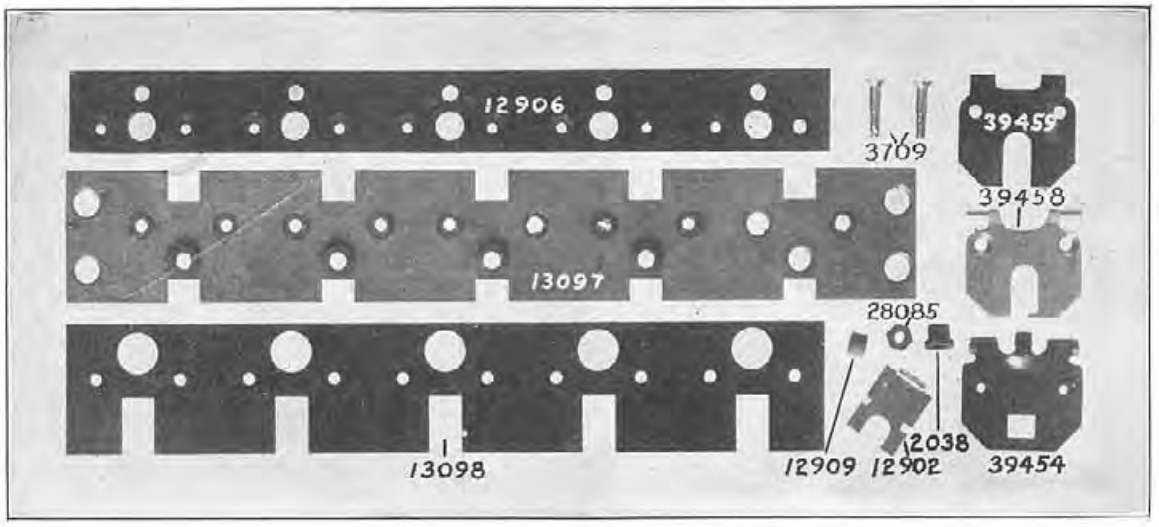
PIECE PARTS



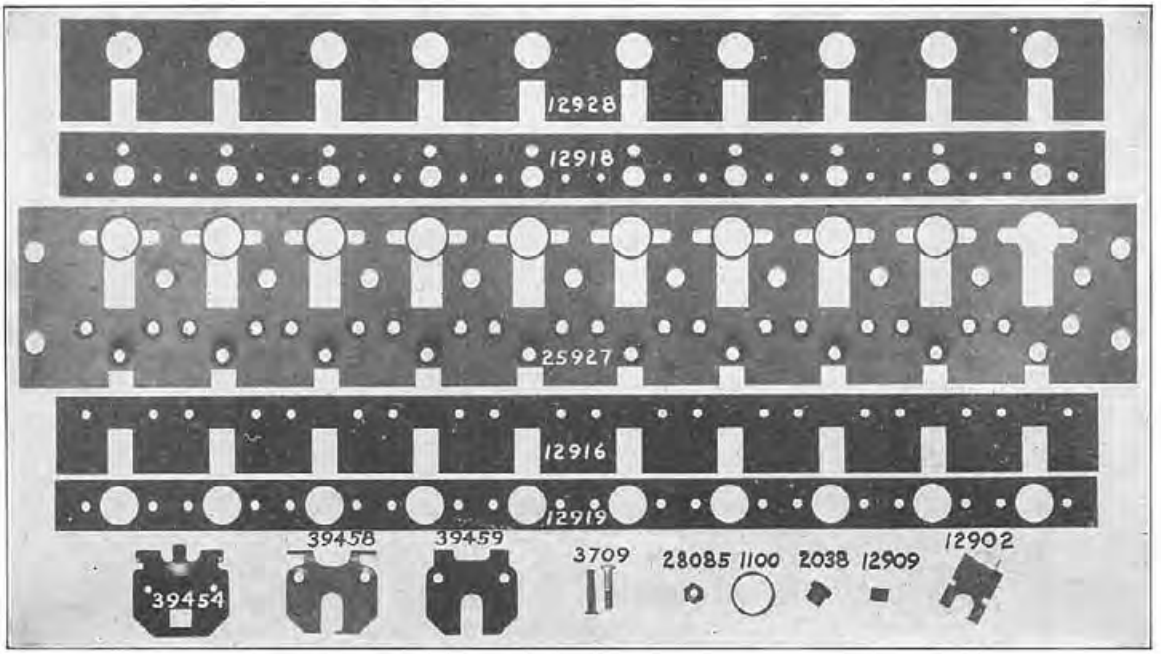
No. 433 Drop Mounting
Mounts Nos. 22 and 51 type drops.



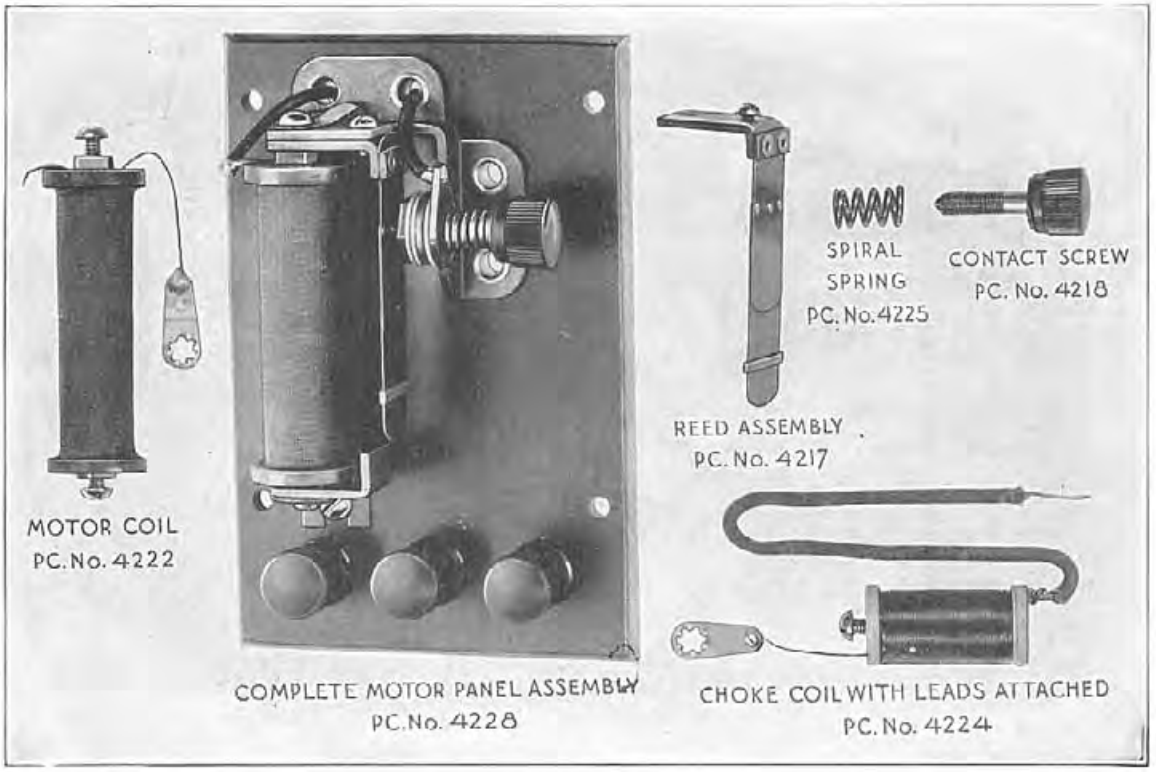
No. 257 drop and jack mounting mounts Nos. 29, 101 and 301 drops and jacks.
No. 333 drop and jack mounting uses same parts as the above except Pc. 25858 insulation instead 1295. Mounts Nos. 59, 100 and 300 drops and jacks with code ringing night alarm.



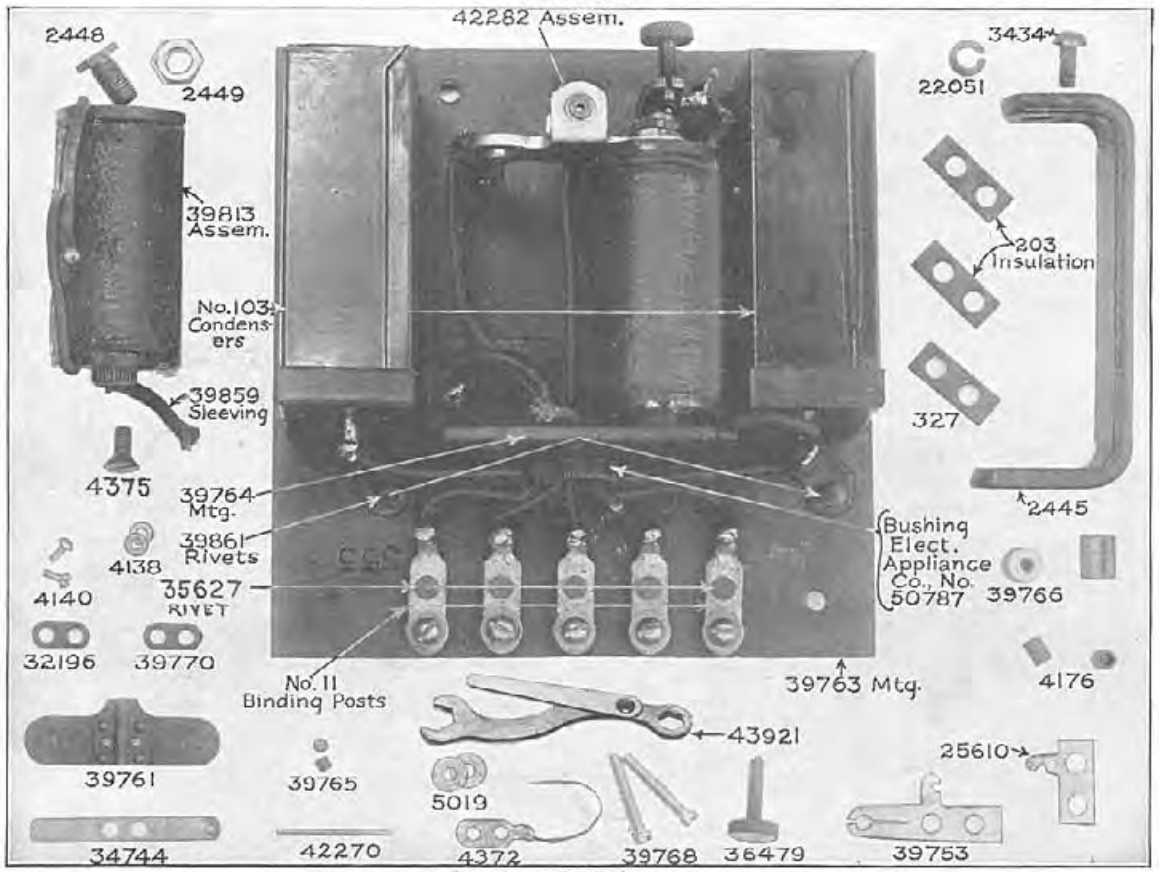
No. 259 Drop Mounting
Mounts Nos. 22 and 51 type drops



No. 329 drop and jack mounting mounts Nos. 29, 101, and 301 drop and jacks.
No. 426 drop and jack mounting uses same parts as the above except Pc. 29350 insulation instead Pc. 12928. Mounts Nos. 59, 100, and 300 drop and jacks with code ringing night alarm.



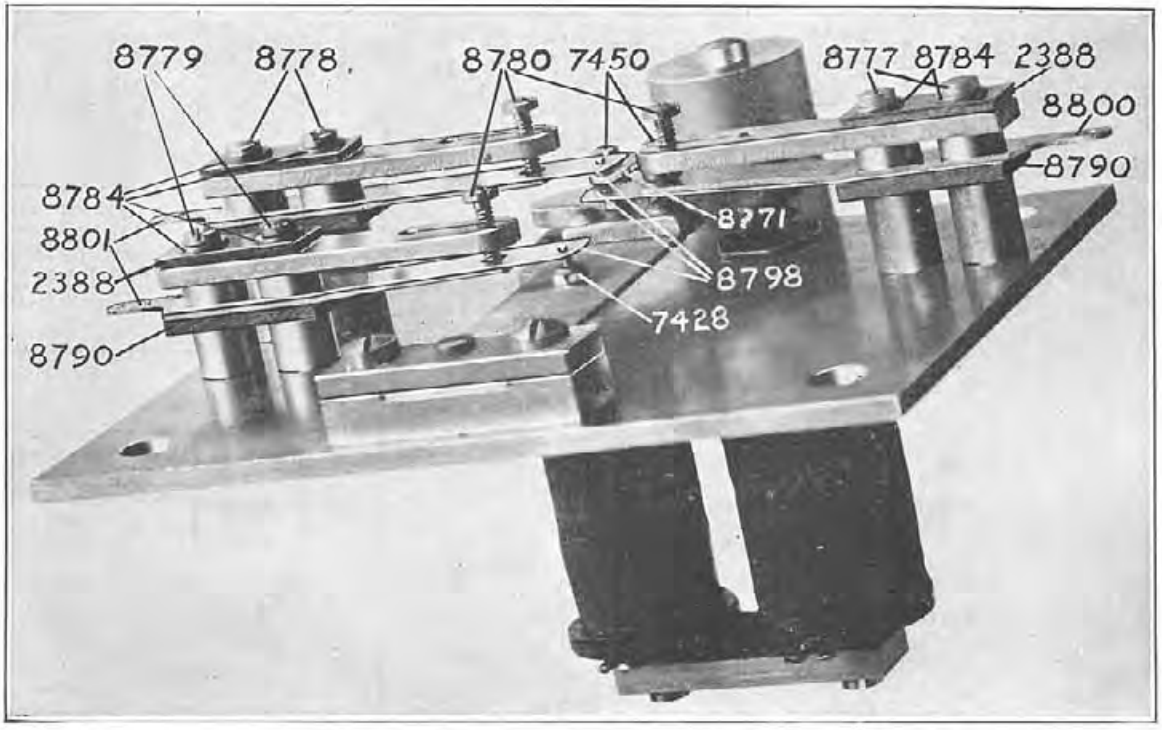
TELERING

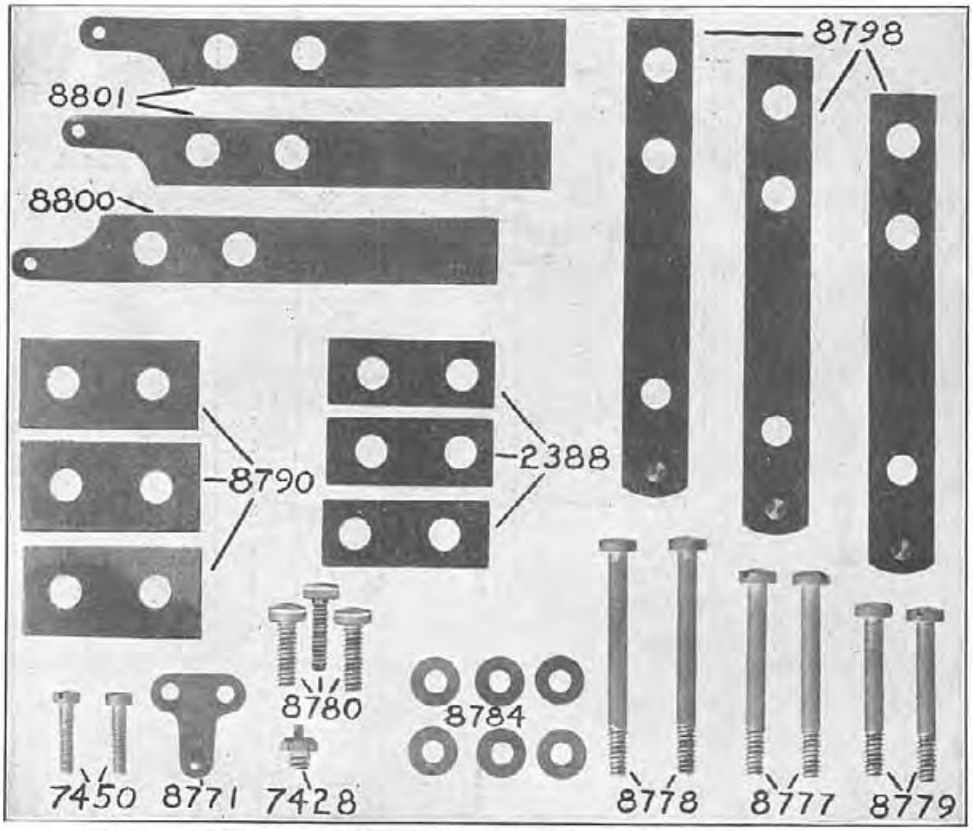


No. 555 Relay

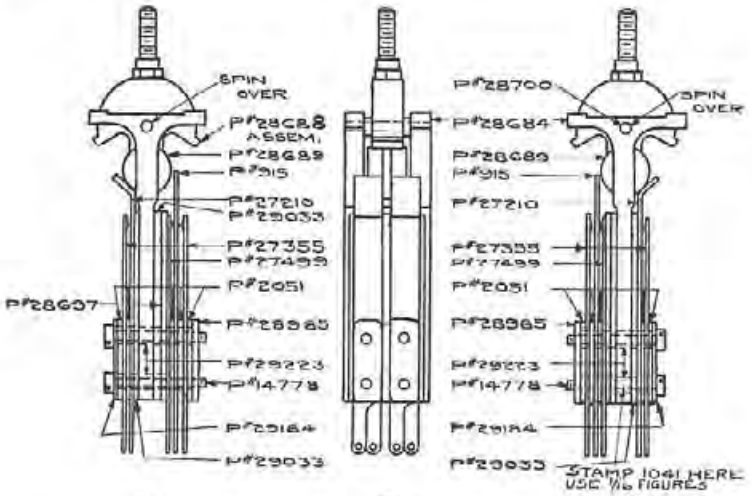
NOTE: Pc. 387 has been changed to Pc. 18071; Pc. 203 to Pc. 18070X; Pc. 43921 to No. 57 tool.

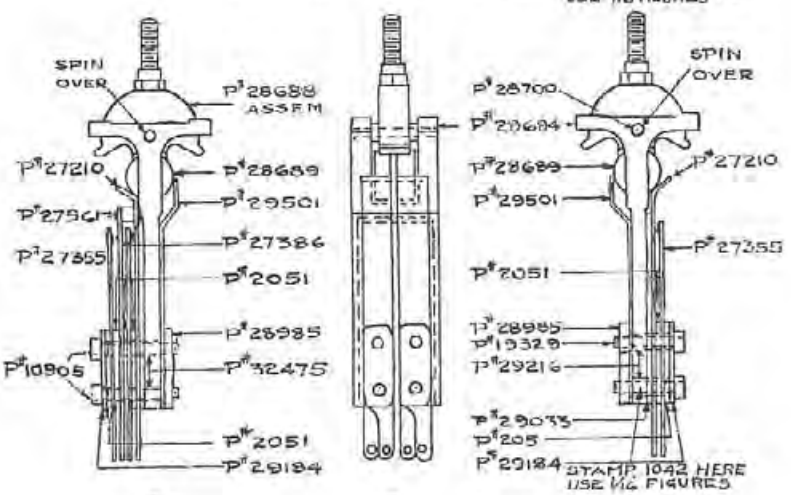
PIECE PARTS

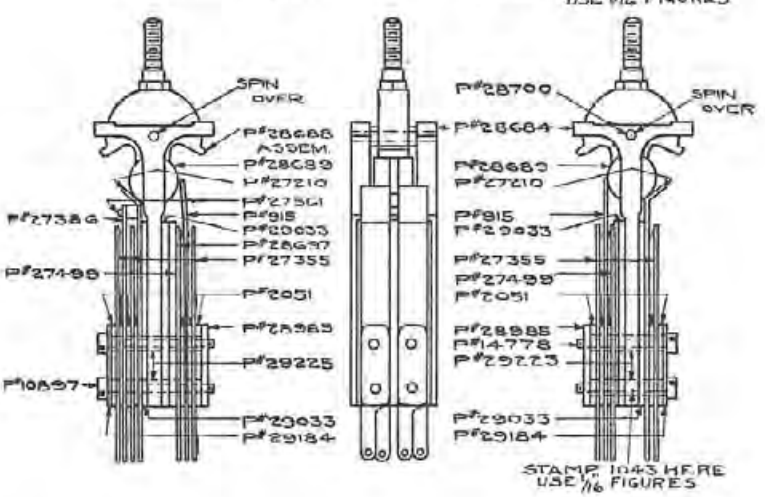




Vibrator assembly used on Nos. 13, 29, 36 A, 36 B and all harmonic pole changers







No. 1041 Key

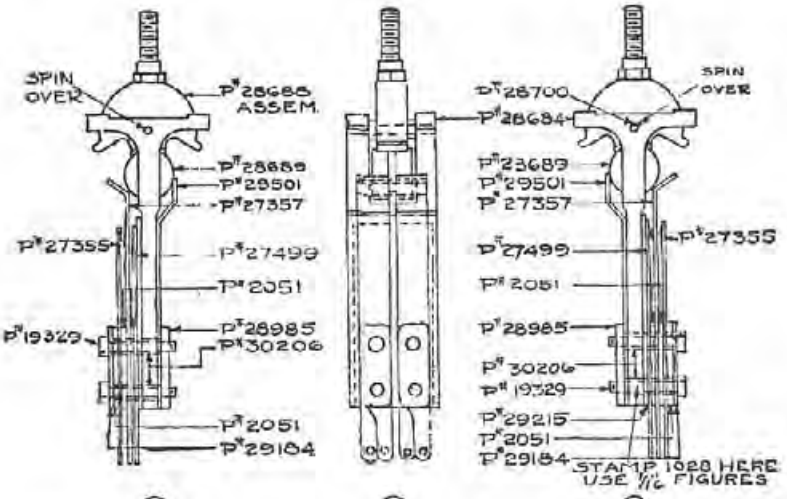
No. Pcs.	Pc. No.	Description
1	28684	Frame
1	28688	Cam assem.
2	28689	Roller
1	28700	Pin
2	29033	Ins.
1	28697	Ins.
10	2051	Ins.
2	915	Spg. with cont.
2	27210	Spg. with cont.
4	27355	Spg. with cont.
2	27499	Spg. with cont.
2	29184	Washer
4	29223	Bushing
2	28985	Nut
4	14778	Spec. screw

No. 1042 Key

No. Pcs.	Pc. No.	Description
1	28684	Frame
1	28688	Cam assem.
2	28689	Roller
6	2051	Ins.
1	29033	Ins.
2	27210	Spg. with cont.
1	27386	Spg. with cont.
3	27355	Spg. with cont.
2	29184	Washer
2	32475	Bushing
1	28700	Pin
1	27561	Separator
2	28985	Nut
2	29501	Spring
2	29216	Bushing
2	10905	Spec. screw
2	19329	Spec. screw

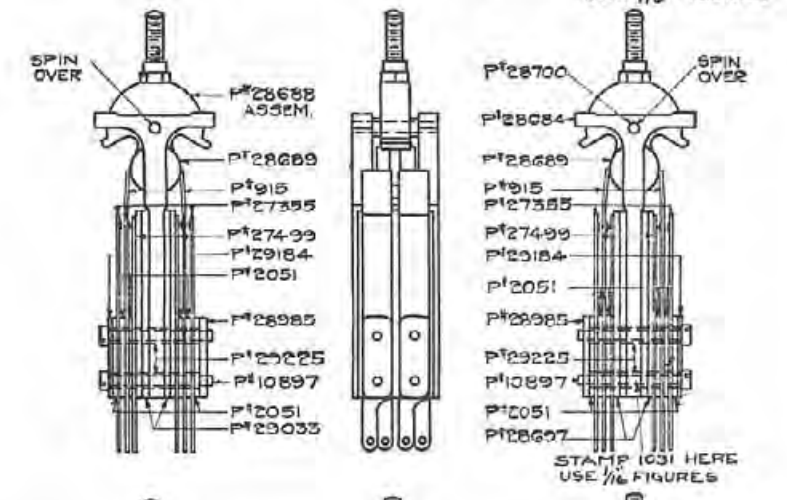
No. 1043 Key

No. Pcs.	Pc. No.	Description
1	28684	Frame
1	28688	Cam assem.
2	28689	Roller
1	28700	Pin
2	29033	Ins.
1	28697	Ins.
12	2051	Ins.
2	27210	Spg. with cont.
2	915	Spg. with cont.
5	27355	Spg. with cont.
1	27386	Spg. with cont.
2	27499	Spg. with cont.
1	27561	Separator
2	29184	Washer
2	29225	Bushing
2	29223	Bushing
2	28985	Nut
2	14478	Spec. screw
2	10897	Spec. screw



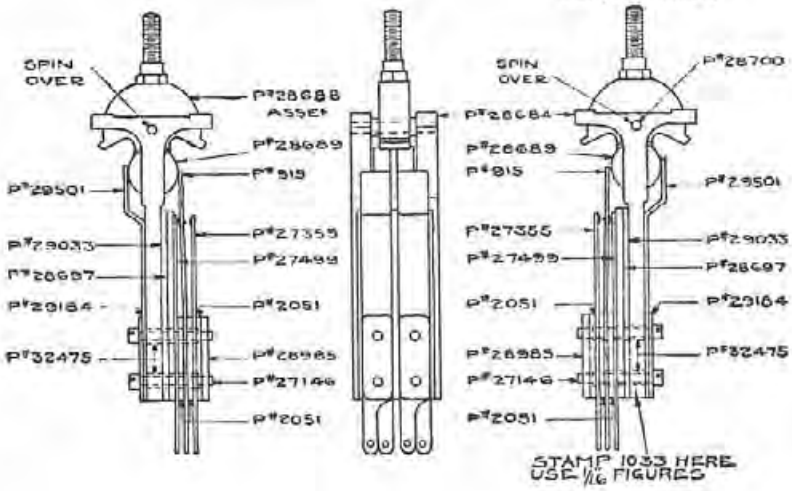
No. 1028 Key

No. Pcs.	Pc. No.	Description
1	28684	Frame
1	28688	Cam assem.
2	28689	Roller
6	2051	Ins.
1	29215	Ins.
2	27357	Spg. with cont.
2	27355	Spg. with cont.
2	27499	Spg. with cont.
2	29184	Washer
1	28700	Pin
2	28985	Nut
2	29501	Springs
4	30206	Bushing
4	19329	Spec. screw



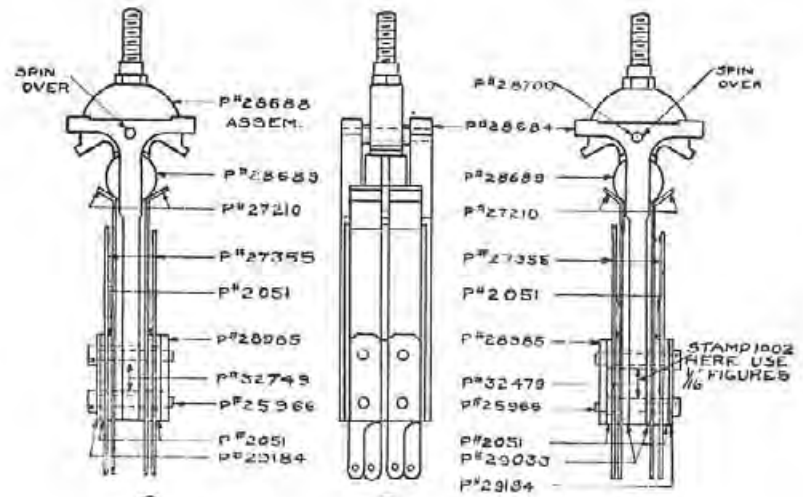
No. 1031 Key

No. Pcs.	Pc. No.	Description
1	28684	Frame
1	28688	Cam assem.
2	28689	Roller
1	28700	Pin
12	2051	Ins.
2	28697	Ins.
2	29033	Ins.
4	915	Spg. with cont.
4	27499	Spg. with cont.
4	27355	Spg. with cont.
2	28985	Nut
4	29225	Bushing
2	29184	Washer
4	10897	Spec. screw



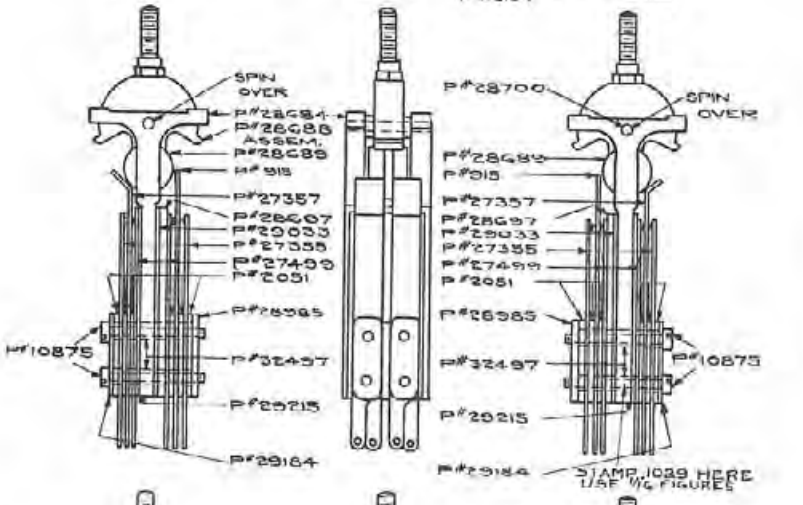
No. 1033 Key

No. Pcs.	Pc. No.	Description
1	28684	Frame
1	28688	Cam assem.
2	28689	Roller
1	28700	Pin
1	28697	Ins.
1	29033	Ins.
6	2051	Ins.
2	915	Spg. with cont.
2	27355	Spg. with cont.
2	27499	Spg. with cont.
2	29184	Washer
2	32475	Bushing
2	28985	Nut
2	29501	Springs
4	27146	Spec. screw



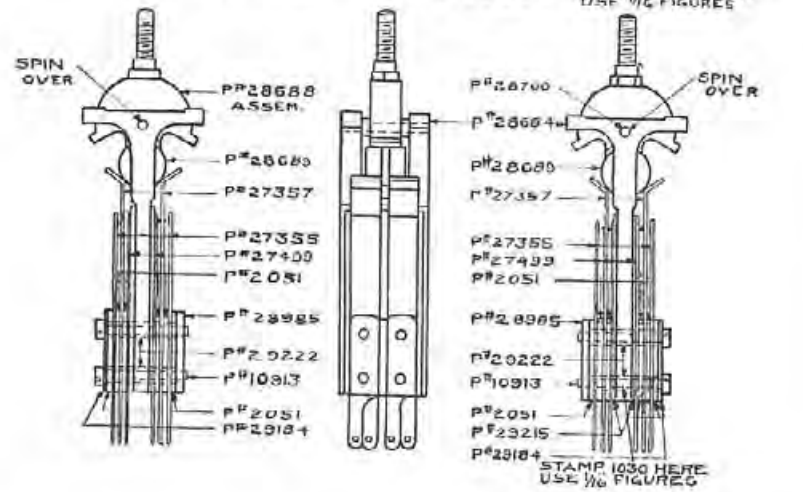
No. 1002 Key

No. Pcs.	Pc. No.	Description
1	28684	Frame
1	28688	Cam assem.
2	28689	Roller
1	28700	Pin
8	2051	Insulation
2	29033	Insulation
4	27210	Spg. with cont.
4	27355	Spg. with cont.
2	28985	Nut
4	32479	Bushing
2	29184	Washer
4	25966	Spec. screw



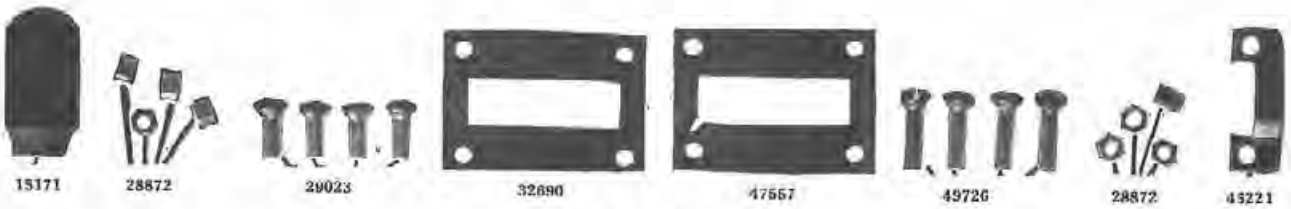
No. 1029 Key

No. Pcs.	Pc. No.	Description
1	28684	Frame
1	28688	Cam assem.
2	28689	Roller
1	28700	Pin
1	28697	Insulation
1	29033	Insulation
1	29215	Insulation
12	2051	Insulation
2	915	Spg. with cont.
4	27355	Spg. with cont.
2	27357	Spg. with cont.
4	27499	Spg. with cont.
2	29184	Washer
4	32497	Bushing
2	28985	Nut
4	10875	Spec. screw



No. 1030 Key

No. Pcs.	Pc. No.	Description
1	28684	Frame
1	28688	Cam assem.
2	28689	Roller
1	28700	Pin
12	2051	Insulation
2	29215	Insulation
4	27357	Spg. with cont.
4	27355	Spg. with cont.
4	27499	Spg. with cont.
2	28985	Nut
4	29222	Bushing
2	29184	Washer
4	10913	Spec. screw



Kellogg

KELLOGG LINE SUPPLIES

ANCHORS

Never-Creep Anchors

Never-Creep is an appropriate name for these anchors, as they will not creep or move if properly installed. They bolt through solid earth, and it is not necessary to fill the hole to secure the holding power. The plate is manufactured from malleable iron and the rods are furnished with a drop forged thimble-eye. The thimble-eye is an exclusive feature of Never-Creep Anchors and eliminates the use of guy thimbles.

To install, bore a hole for the plate at right angle to the line of pull, then drive the rod and hang on plate. In ordering specify the catalog number of plate and size and length of Never-Creep rods desired. By using the Never-Creep Twineye rods, the anchor plates can be used for double guying.

Never-Creep Plates Only

Cat. No.	Size Plate Inches	Takes Rod Diam. Inches	Wt. Lbs. Per 100	Cat. No.	Size Plate Inches	Takes Rod Diam. Inches	Wt. Lbs. Per 100
C-510	5x10	½	380	C- 825	8x25	¾	2008
C-615	6x15	½-⅝	788	C- 835	8x35	¾-1	3215
C-620	6x20	⅝	932	C-1040	10x40	1	4880
C-820	8x20	¾	1350				

Never-Creep Thimble Eye Rods Only

Cat. No.	Size Rod Inches	Maximum Size Strand Inches	Wt. Lbs. Per 100	Cat. No.	Size Rod Inches	Maximum Size Strand Inches	Wt. Lbs. Per 100
C-25	½x5	⅜	390	C-37	¾x7	⅝	1120
C-26	½x6	⅜	450	C-38	¾x8	⅝	1245
C-56	⅝x6	½	680	C-17	1x7	¾	2150
C-57	⅝x7	½	755	C-18	1x8	¾	2300
C-36	¾x6	⅝	960				

Never-Creep Twineye Rods Only

C-360	¾x6	2½	970	C-170	1x7	2⅝	2160
C-370	¾x7	2½	1130	C-180	1x8	2⅝	2310
C-380	¾x8	2½	1255				

Never-Creep Installing Tools

Maul

Bar

The Heavy Auger is equipped with a quick action dumping mechanism and telescoping handle. The Installing Bar is used for placing the plate in position and the opposite end is made for tamping.

The Maul is made especially for driving Never-Creep Rods. It has two lead and two iron faces, or two wood and two iron faces. Wood faces are furnished unless otherwise specified.

Cat. No.	Description	Wt., Lbs. Each
C-15	10 ft. Installing and Tamping Bar	9
C-16	Wood or Lead Faced Maul	12
	Extra Wood Inserts for Maul	1
C-610	Telegraph Auger, 6-in. to 10-in	26
C-812	Heavy Telegraph Auger, 8-in. to 12-in	28
C-177	Quick Catch Telescoping Auger Handle	17

Everstick Expanding Anchors

Two Way

Three Way

Everstick Anchors are made of high grade malleable iron. The expanded plates provide a large anchoring surface against undisturbed earth. These anchors can be used with standard guy rods. Installation is very simple, an earth auger and the Everstick Tamping Bar is all that is needed. After boring hole place the anchor allowing tamping bar to slide down over rod, then tamp anchor until plates are fully spread. For best results place a quantity of broken stone on anchor and fill in balance of hole with well tamped earth. Furnished less rods. If rods are desired give length and size (see Rods Catalogue, page 177).

Cat. No.	Description		Takes Rod Diam. Inch	Area Expanded	Strain Lbs.	Wt. Lbs. Each
833	Three-Way	8-inch	⅝	75 sq. in.	3,000	5½
834	Three-Way	8-inch	⅝	87 sq. in.	4,000	7¼
836	Three-Way	8-inch	¾	112 sq. in.	6,000	9½
8310	Three-Way	8-inch	¾	128 sq. in.	10,000	12
8312	Three-Way	8-inch	1	132 sq. in.	12,000	12½
10316	Three-Way	10-inch	1	204 sq. in.	16,000	22½
52	Two-Way	5-inch	⅝	42 sq. in.	2,000	4
62	Two-Way	6-inch	⅝	57 sq. in.	2,200	7½
82	Two-Way	8-inch	¾	103 sq. in.	6,000	13½
64	Four-Way	6-inch	¾	71 sq. in.	6,000	10½
84	Four-Way	8-inch	1	130 sq. in.	10,000	18½
104	Four-Way	10-inch	1	200 sq. in.	16,000	31
124	Four-Way	12-inch	1¼	320 sq. in.	32,000	65

Everstick Installing Tools

Auger Blades

Auger Handle

Tamping Bar

Blackburn Telescoping Auger Handle equipped with Iwan Auger blades greatly assist in boring holes. This handle telescopes to four feet, and as the depth increases the handle lengthens by a slight pressure on the finger lever. Auger blades and handles are furnished separately, when desired complete specify catalogue number of blade and length of handle.

The Everstick Tamping Bar is equipped with an iron shoe having a slot to fit over rod. With this arrangement it cannot bounce from the rod.

Cat. No.	Description	Wt., Lbs. Each
No. 5	Iwan Auger Blades bore 5-inch holes	4
No. 6	Iwan Auger Blades bore 6-inch holes	6
No. 8	Iwan Auger Blades bore 8-inch holes	7
No. 10	Iwan Auger Blades bore 10-inch holes	8
No. 12	Iwan Auger Blades bore 12-inch holes	13
No. 8	Telescopic Handle, 8-ft.	17
No. 10	Telescopic Handle 10 ft.	20
9-Foot	Everstick Tamping Bar	20

ANCHORS

Chance Cone Anchor

Chance Cone Anchors are made of Semi-Steel which gives great strength and assurance against breaking under severe loads. The flat opposing faces present more effective operation of the wedging portions and the flared bottom provides them with a final grip, thus greatly increasing the holding power. For installing use an earth auger slightly larger than the size anchor, bore a hole to the depth desired. Attach rod and place anchor, then tamp a quantity of broken stone around the anchor and fill hole with well tamped earth. Furnished less rods. If rods are desired (see Rods Catalog, page 177).

Cat. No.	Size of Anchor	Size Rod	Wt., Lbs. Each
C- 6	6"	5/8" and smaller	3½
C- 8	8"	5/8" and smaller	5½
C-10	10"	3/4" and smaller	10
C-12	12"	1" and smaller	17½

Drive and Twist Anchors

Drive and Twist Anchors are made of steel throughout. The shaft eye and point are all one solid piece dipped in asphaltum. The Bearing for the strong heavy blade is made of Black Diamond Tool Steel and has a breaking strength of over 10,000 lbs. The point acts as a pilot when driving through roots, gravel and rocky soil. For installing just drive anchor down with a sledge then insert a bar in the eye and twist four revolutions to the right.

Cat. No.	Span Blades	Diameter Rod	Wt., Lbs. Each
1	8 in.	½ x 4 ft.	8
2	12 in.	⅝ x 5 ft.	17
3	12 in.	¾ x 6 ft.	15

Harpoon Anchors

Harpoon Anchors are manufactured from drop forged steel. The sharp spear point makes driving easy and assures quick penetration of hard soil, gravel, roots and other obstacles. The eye is thick and heavy and will withstand the severest sledging. It has a smooth well rounded hole which gives a perfect bearing surface for the Guy Wire. For installing, drive anchor into earth with a sledge, blades are opened by lifting it up about 4 inches. Positive holding power in undisturbed earth is assured because blades open automatically when strain is applied.

Cat. No.	Length Rod	Diameter Rod	Wt., Lbs. Each
5	5 ft.	1 inch square	20

Matthews Scrulix Anchors

Matthews Scrulix Anchors are manufactured of high carbon steel and are screwed into solid earth. No moving parts to adjust, nothing to assemble, shipped ready to be installed. For ordinary installation No. 567 Wrench is used. When screwing down close to walls, fences and other projections use the No. 865 Ratchet Handle.

Cat. No.	Diameter	Size Rod	Wt., Lbs. Each
612-R	6 inch	⅝ x 6 ft.	7½
698-R	6 inch	⅝ x 6 ft.	9½
758-R	7 inch	⅝ x 6 ft.	11
858-R	8 inch	⅝ x 6 ft.	13
567	Anchor Wrench		30
865	Anchor Ratchet Handle		16

Kearney Screw Anchors

Kearney Screw Anchors are made of pre-heated certified malleable iron hot galvanized and painted. The pitch of the helix blade gives great holding power. For installing use Kearney Anchor Wrench and simply screw the anchor into the earth. The Installing Wrench fits into a socket on the helix and there can be no Wrench breakage or splitting.

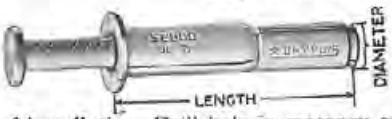
Cat. No.	Diameter Helix	Size Rod	Wt., Lbs. Each
61	6 inch	⅝ x 6 ft.	8½
65	6 inch	¾ x 6 ft.	10½
75	7 inch	¾ x 6 ft.	11½
Kearney Anchor Wrench			27

Lead Screw Anchors

A new design anchor which gives greater holding power, yet requires a smaller installation hole for the corresponding size screw. Ribbed sides and bell shaped tops fill in irregular bore at top of the Masonry hole. This locks the anchor and prevents it from turning when tightening up the screw. It takes more sizes of screws grouped in a more convenient series, eliminating the necessity of stocking many sizes. Order by screw size and length of anchor.

Length Anchor	Size Screw	Fractional Screw Size	Drill Required	Std. Pkg.	Wt., Lbs. Per 100
¾"	6– 8–10	1/8"–3/16"	1/4"	100	2
1½"	6– 8–10	1/8"–3/16"	1/4"	100	2¼
1"	10–12–14	3/16"–1/4"	5/16"	100	2½
1½"	10–12–14	3/16"–1/4"	5/16"	100	3½
1"	16–18	5/16"	3/8"	100	4
1½"	16–18	5/16"	3/8"	50	5

Dryvin Anchors



An expansion shield which uses nails as an expansion and locking pin; employing an entirely new principle of installation. Drill hole in masonry and pass shield through mounting hole of object attached. Be sure top flange remains above fixture. Load tension—shocks—jars and vibration are not applied directly to the nail, but to top of shield where they are absorbed. The shield—not the nail—carries the load. This feature gives Dryvin extraordinary holding power.

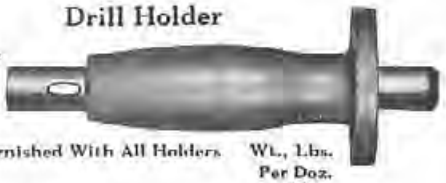
Anchor Diam. Inches	Length Inches	Size Drill Inches	Std. Pkg.	Wt., Lbs. Per 100
3/16	7/8	3/16	100	1.2
3/16	1¼	3/16	100	1.6
1/4	1	3/16	100	2
1/4	1¼	3/16	100	2¾
5/16	1¼	5/16	100	4
5/16	2¼	5/16	100	6½
3/8	2	3/8	100	9
1/2	2¼	1/2	50	15½

Masonry Hamrtwist Drill Points

These drill points are furnished with either large or small shanks. Large shanks furnished unless otherwise specified.

Diameter	Standard Package	Wt., Lbs. Per Doz.	Diameter	Standard Package	Wt., Lbs. Per Doz.
3/16"	12	½ lb.	3/8"	12	2 lbs.
1/4"	12	¾ lb.	7/16"	12	2 lbs.
5/16"	12	1 lb.	1/2"	12	2¼ lbs.

Drill Holder



Type	Knock-Out Pin Furnished With All Holders	Wt., Lbs. Per Doz.
Rubber Grip		12

CROSS ARM SPECIFICATIONS

Scope

This specification covers cross arms made of Douglas fir and long leaf yellow pine.

General

The specification and drawings are intended to include all instructions necessary for the manufacturer to guide him in his work. They are intended to supplement each other and any details indicated in one and not in the other shall be executed the same as if indicated in both.

Dimensions

Cross arms shall be of the style and dimensions shown and allowable variations must not be exceeded. Figures on the drawings shall be followed in preference to scale measurements.

Seasoning

Cross arms shall be made of thoroughly air-dried or kiln-dried timber.

Material

Finished cross arms shall not contain any of the defects listed below, and, where any of these defects are present, they shall be cause for rejection.

Annular Rings. Annular rings counted radially less than 8 per inch.

Checks. Checks exceeding 12 inches in length, $\frac{3}{4}$ inch in depth, or $\frac{1}{16}$ inch in width.

Grain. Grain, as shown by the medullary rays of the wood, which departs from parallelism with the axis of the cross arm by an amount greater than 1 inch in 1 foot of length (approximately 5 degrees).

Knots. Loose or unsound knots. Knots exceeding $\frac{1}{4}$ inch in diameter in any 3-inch longitudinal section having pin or bolt hole as its center. Single knots or a plurality of knots in any 6-inch longitudinal section having a total diameter in excess of $\frac{3}{4}$ inch. The least diameter of a knot shall be considered its diameter for the purpose of this specification.

Loose Heart.

Pitch Pockets. Pitch pockets exceeding 8 inches in length or $\frac{1}{4}$ inch in width. Pitch pockets exceeding 4 inches in length or $\frac{1}{4}$ inch in width which enter a pin or bolt hole on the top of the arm. Single pitch pockets which extend through the arm appearing on more than one surface.

Rot. Rot, dote or red heart.

Sapwood. Sapwood in excess of 25% in Douglas fir or Sapwood in excess of specifications in long leaf yellow pine in any cross section taken in a plane perpendicular to the axis of the cross arm.

Shakes. Cracks or splits concentric to the annular rings of the wood.

Wane. Bark or reduction of cross section due to removal of bark.

Warp. Warp exceeding $\frac{1}{2}$ inch for cross arms 6 feet or less in length, $\frac{3}{4}$ inch for cross arms 8 feet or less in length, and 1 inch for cross arms 10 feet or less in length. The warp shall be determined by measuring the offset between the cross arm and a straight-edge laid lengthwise on the concave face of the cross arm.

Worm Holes.

Pin and bolt holes shall be tested with steel gauges, as follows:

1–17/32-inch pin holes shall admit the 1½-inch gauge without forcing, but shall not admit the 1–9/16-inch gauge.

11/16-inch bolt holes shall admit the $\frac{5}{8}$-inch gauge without forcing.

9/16-inch bolt holes shall admit the $\frac{1}{2}$-inch gauge without forcing.

7/16 inch holes shall admit the $\frac{3}{8}$-inch gauge without forcing.

The pin and bolt holes shall be smooth and free from excessive splintering where the bit has been broken through.

Cross arms not conforming with this specification shall be rejected and the manufacturer shall either replace such rejected arms with arms complying with this specification at his own expense or shall allow credit for such rejected arms.

Storage

Cross arms held for storage shall be stacked in cross piles on skids in such a manner as to insure good ventilation. The stacks shall be roofed to prevent the penetration of rain or the direct action of the sun.

STANDARD CROSS ARMS

The following table gives specifications for cross arms which are generally recognized as standard. When ordering cross arms that vary from those shown in the table, plainly mark your order accordingly.

NOTE—All arms are bored with 3/8-inch brace bolt holes unless otherwise specified.

STOCK NUMBER		Size Arm	PIN HOLES				Center Bolt Hole	Brace Bolt Spacing	Use Length Brace	WEIGHT PER 100	
			Spacings			Size					
Fir	Pine		Center	Sides	Ends					Fir	Pine
		3¼x4¼	**Electric Light Arms**								
5800	5860	3 ft., 2 pin	28	....	4	1 17/32	5/8	25	20	1020	1320
5801	5861	4 ft., 4 pin	16	12	4	1 17/32	5/8	28	22	1360	1760
5802	5862	5 ft., 4 pin	18	17	4	1 17/32	5/8	28	22	1700	2200
5803	5863	6 ft., 4 pin	22	21	4	1 17/32	5/8	32	24, 26	2040	2640
5804	5864	6 ft., 6 pin	16	12	4	1 17/32	5/8	32	24, 26	2040	2640
5805	5865	8 ft., 6 pin	18	17½	4	1 17/32	5/8	32	24, 26	2720	3520
5806	5866	8 ft., 8 pin	16	12	4	1 17/32	5/8	32	24, 26	2720	3520
5807	5867	8½ ft., 10 pin	16	9¾	4	1 17/32	5/8	32	24, 26	2890	3740
5808	5868	10 ft., 8 pin	17½	15¾	4	1 17/32	5/8	42	30, 32	3400	4400
5809	5869	10 ft., 10 pin	16	12	4	1 17/32	5/8	42	30, 32	3400	4400
5810	5870	10 ft., 12 pin	16	9 5/8	3 7/8	1 17/32	5/8	42	30, 32	3400	4400
		2¾x3¾	**Pony Telephone Arms**								
5819	5879	24 in., 2 pin	17	....	3½	1 9/32	5/8	..	.....	500	650
5820	5880	30 in., 2 pin	23	....	3½	1 9/32	5/8	..	.....	625	812
5821	5881	36 in., 2 pin	29	....	3½	1 9/32	5/8	25	20	750	975
5822	5882	42 in., 4 pin	16	9½	3½	1 9/32	5/8	28	22	875	1137
5823	5883	62 in., 6 pin	16	9¾	3½	1 9/32	5/8	28	22	1300	1680
5824	5884	82 in., 8 pin	16	9¾	3¾	1 9/32	5/8	28	22	1700	2220
5825	5885	102 in., 10 pin	16	9¾	4	1 9/32	5/8	28	22	2125	2762
5826	5886	120 in., 12 pin	16	9 5/8	3 7/8	1 9/32	5/8	28	22	2500	3250
		3x4¼	**Western-Union Arms**								
5920	5924	6 ft., 6 pin	20	11½	3	9/16	21/32	..	.....	1920	2460
5921	5925	8 ft., 8 pin	21	11½	3	9/16	21/32	..	.....	2560	3280
5922	5926	10 ft., 10 pin	22	11½	3	9/16	21/32	..	.....	3200	4100
		3½x4½	**N. E. L. A. Arms**								
5828	5888	3 ft. 2 in., 2 pin	30	....	4	1 17/32	11/16	28	22	1267	1583
5829	5889	5 ft. 7 in., 4 pin	30	14½	4	1 17/32	11/16	38	28	2234	2792
5830	5890	8 ft., 6 pin	30	14½	4	1 17/32	11/16	38	28	3200	4000
5831	5891	9 ft. 2 in., 8 pin	30	12	4	1 17/32	11/16	38	28	3667	4583
		3¼x4¼	**N. E. L. A. (Light) Arms**								
5833	5893	3 ft. 2 in., 2 pin	30	....	4	1 17/32	11/16	28	22	1077	1393
5834	5894	5 ft. 7 in., 4 pin	30	14½	4	1 17/32	11/16	38	28	1898	2457
5835	5895	8 ft., 6 pin	30	14½	4	1 17/32	11/16	38	28	2720	3520
5836	5896	9 ft. 2 in., 8 pin	30	12	4	1 17/32	11/16	38	28	3117	4034
		3¼x4¼	**New England Arms**								
5838	5898	3 ft., 2 pin	30	....	3	1 17/32	11/16	33	26	1020	1320
5839	5899	5 ft. 6 in., 4 pin	30	13½	4½	1 17/32	11/16	36	28	1870	2420
5840	5900	7 ft. 9 in., 6 pin	30	13½	4½	1 17/32	11/16	36	28	2635	3410
5841	5901	10 ft., 8 pin	30	13½	4½	1 17/32	11/16	36	28	3400	4400

Minimum Carload Weights: Fir from Pacific Coast Mills, 38,000 lbs. Small cars are scarce and weight of at least 50,000 lbs. should be figured on. Cars to contain as high as 90,000 lbs. can be had. Smaller cars are available in the Southern Yellow Pine Regions—minimum weight 34,000 lbs.

WOOD BRACKETS, POLE STEPS, PINS

Side or Pole Brackets

Manufactured from oak thoroughly seasoned and dried, which eliminates shrinkage after the brackets are installed. The top or threaded portion is accurately turned to size and the threads are cleanly cut. Provided with two 7/16 inch diameter holes for mounting with spikes.

The Kellogg Special and Giant Brackets are very much stronger due to their short shank feature. Recommended wherever Nos. 9 or 12 insulators are used. Furnished only by Kellogg.

All Brackets are furnished painted or unpainted except the Kellogg and Western Union sizes which are furnished unpainted only. Wired in bundles of 25 each except the No. 2554-2, 2555 W.U. and 2557 new. W.U. types which are 20 to a bundle.

Cat. No.	Size, Inches	Wt., Lbs. per 1000
2550-4	1 1/2 x 2 x 10	500
2551-1	1 1/2 x 2 x 12	600
2552-3	1 1/2 x 2 1/2 x 12	700
2553-L.D.	1 3/4 x 2 x 12	700
2554-2	2 x 2 1/4 x 12	800
2555 W. U.	2 x 2 3/4 x 12	850
2557-New W. U.	2 x 2 3/4 x 12	1250
2560 Kellog Special	1 1/2 x 2 x 10	500
2561 Kellogg Giant	2 x 2 3/4 x 12	850

Wood Pole Steps

Furnished in plain, painted and creosoted oak. On orders not specifying, painted pole steps are furnished. For iron pole steps see catalog page 175.

Cat. No.	Size	Std. Pkg. Quantity	Wt., Lbs. per 1000
2586	1 1/2 x 2 x 7	25	500
2662	1 3/4 x 2 5/8 x 7	25	700

Locust Pins

The Locust wood pin is most popular because the hard, close grained wood is impenetrable by moisture and practically impervious to decay. Because of its great strength and uniform quality, it is well suited for making wood insulator pins where accurate turning and freedom from shrinking or warping are primary considerations.

Cat. No.	Size	Description	Std. Pkg.	Wt., Lbs. per 1000
1760	1 1/2 x 8 in.	No. 1 Grade Locust	250	325
1761	1 1/2 x 9 in.	No. 1 Grade Locust	250	450

Corner Pins

Corner pins are used principally on corners and strain points. They are reinforced with a 3/8 inch galvanized bolt which extends through the entire length of the pin. An extra large washer 2 inches in diameter is provided so that the nut may be tightened and the pin securely fastened in place.

Cat. No.	Size	Material	Std. Pkg. Quantity	Wt., Lbs. per 1000
1784	1 1/2 x 8 in.	Locust	250	590
1785	1 1/2 x 9 in.	Locust	200	750

Western Union Steel Pins

With Wood Tops

The cobs of the Western Union Steel pin are made of the best grade of air-dried oak, and are boiled in paraffin to exclude all moisture. The pins are forged from stiff, high carbon, open hearth steel, and are roll threaded on the top to receive the cobs, which are assembled on the pins by a specially designed machine which locates any tops that may be defective.

The long shank pin is equipped with one square nut and a round washer clipped on one side to permit locking the nut by driving a nail into the arm. For use with standard insulators having 1-inch pin holes.

Short shank pins are furnished with nut only and are designed for use on transposition brackets, steel crossarms, ridge irons, etc. The No. 1194 and 1196 have a cob with an extra long thread for use with transposition insulators. Extra cobs can be furnished.

Cat. No.	Diam. Shank Inches	Length, Inches Above Shoulder	Length, Inches Below Shoulder	Std. Pkg. Quantity	Wt., Lbs per 100
1190	1/2	4 1/2	5	300	74
1191	1/2	4 1/2	5	225	106
1193	1/2	4 1/2	1	500	53
1194	1/2	5	1	400	59
1195	5/8	4 1/2	1	325	74
1196	5/8	5	1	300	76

All Wood Tops

With Galvanized Bolt

The tops are made of the highest grade locust wood. They require no treating to prolong their life. Each pin is equipped with a button head bolt with fins to prevent the bolt from turning within the wood top. These pins are made for wood or steel arms and for insulators with a 1 inch or 1 3/8 inch pin hole. The 1 inch top sizes can only be furnished with a 1/2 inch bolt and the 1 3/8 inch top sizes are furnished with a 5/8 inch bolt. Bolts are threaded 1 1/2 inch minimum.

Cat. No. Locust Tops	Size Bolt Inches	Std. Pkg. Quantity	Wt., Lbs. per 100
910	1/2 x 5 1/2	300	56
911	1/2 x 9 1/2	200	68
930-J	5/8 x 9	150	116
940	5/8 x 10 1/2	100	132
950	5/8 x 10 1/2	100	134
960	5/8 x 12 1/2	100	156

Transposition Pins

Extreme care is taken in selecting these Transposition pins which have an extra long thread for use with transposition insulators.

Cat. No.	Size	Description	Std. Pkg. Quantity	Wt., Lbs. per 1000
1782	1 1/4 x 9 in.	Standard Locust	250	400
1790	1 1/4 x 9 in.	Painted Oak	250	350

Duplex Insulator Pins

Duplex pins are threaded on both ends and are also used for transposition insulators.

Cat. No.	Size	Std. Pkg. Quantity	Wt., Lbs. per 1000
1786	1 1/4 x 11 1/2 in.	200	500
1787	1 1/2 x 12 in.	200	650

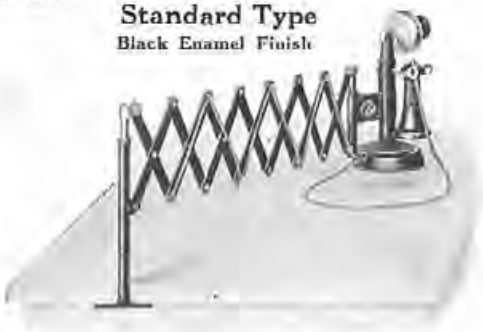
EXTENSION ARMS

Sperry Telephone Extension Arm

The Sperry Arm adds much to office efficiency. It holds the phone—cord and all—off the desk where it cannot overturn inkwells and other desk fixtures or get tangled up with papers. It is simple, strong and durable, and will last a lifetime. Furnished in two types, Standard and Universal, complete with Minute Clamp, Dummy Hook, Cord Holders and screws, in one package.

Standard Type

Black Enamel Finish



The Standard Type Sperry Arm operates out and in horizontally. When ordering be sure to specify catalog number of mounting desired. On orders that do not specify particular mountings, the No. 2 mounting will be furnished.

Cat. No.	Length Extended	Wt., Lbs. Each
8—Standard	26 inches	5½
10—Standard	30 inches	6
12—Standard	34 inches	6¼
14—Standard	38 inches	6½
16—Standard	42 inches	7

Minute Clamp

Minute Clamp

The Minute Clamp fits around the barrel of the telephone and is furnished with all Standard and Universal Telephone Arms, unless otherwise specified. It requires no tools or screws to attach and is quick and simple in operation.

No. 20

No. 20 Clamp

The No. 20 Clamp fits all telephones with cylindrical barrels and is only furnished on orders when specified.

No. 21

No. 21 Clamp

The No. 21 Clamp is used for the old automatic telephone with the convex barrel, and is only furnished on orders when specified.

No. 22

No. 22 Clamp

The No. 22 Clamp is for the French or cradle type telephone.

Universal Attachment

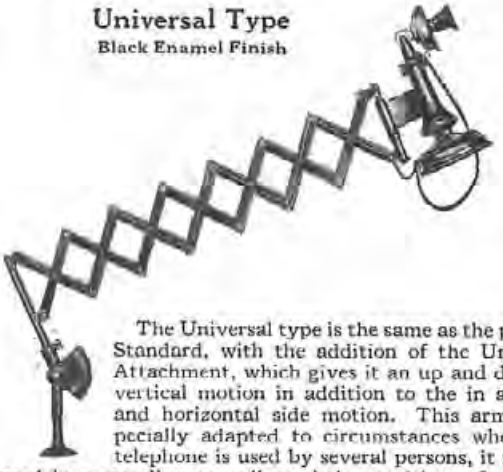
Universal Attachment

Black Enamel Finish

The Universal Attachment fits any Sperry Standard Arm. It is inserted between the arm and the mounting and serves to give the arm the up and down motion as well as the horizontal movement. The feature of this attachment is it can be furnished separately which means any Standard Type Arm can be made into a Universal Type by simply adding this attachment.

Universal Type

Black Enamel Finish

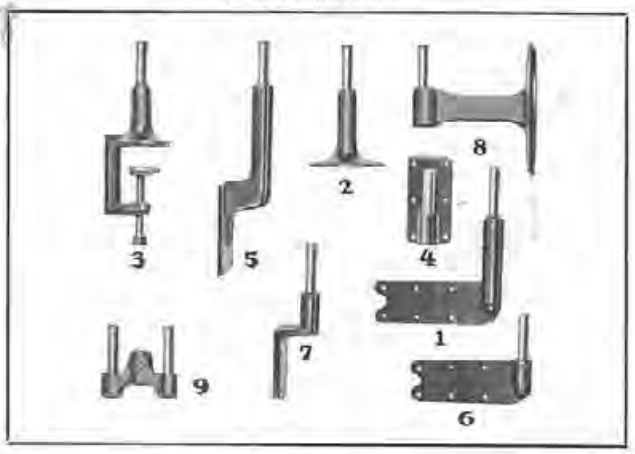


The Universal type is the same as the popular Standard, with the addition of the Universal Attachment, which gives it an up and down or vertical motion in addition to the in and out and horizontal side motion. This arm is especially adapted to circumstances where one telephone is used by several persons, it may be also used in a standing as well as sitting position. It may be adjusted to any position and automatically stays put.

Cat. No.	Length Extended	Wt., Lbs. Each
8—Universal	26 inches	8
10—Universal	30 inches	8⅛
12—Universal	34 inches	8¾
14—Universal	38 inches	9
16—Universal	42 inches	9½

Sperry Arm Mountings

Black Enamel Finish



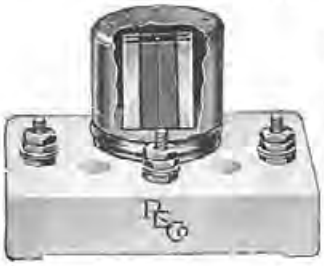
The mountings illustrated above have been especially designed so that Sperry Arms can be installed in the most convenient place or position. Any of these mountings may be used with either the Standard or Universal type brackets.

Cat. No.	Description
1	Used on side of roll-top desk.
2	Used on the top of the desk.
3	Clamps to edge of a flat-top desk.
4	Used on a wall or partition.
5	Used on side of a flat-top desk.
6	Used on side of roll-top desk.
7	Used on side of a flat-top desk.
8	Fastens to the wall or partition.
9	Fits any mounting and holds two brackets.
11	Fastens to under side of desk or table top with screws.
13	Fastens under table or desk at corner.

NOTE: Mountings No. 6 and No. 8 designed especially for the Universal Arms.

ARRESTERS

Cat. No. 977-AA

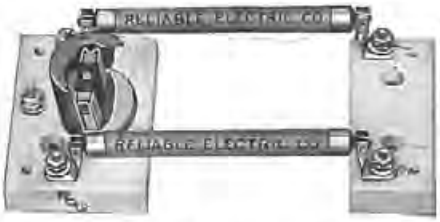


A self-cleaning, saw-tooth air gap protector used for protection against lightning where crosses with electric circuits are not likely to occur. Discharge blocks enclosed by a brass screw cover. Consists of two P-197 carbon blocks and two P-495 saw-tooth discharge blocks. Size, 3½ x 2½ x 2¼ inches. Std. pkg. 100. Weight, 1 lb. each.

Cat. No. 977-A

Same as No. 977-AA except equipped with four P-197 carbon blocks and two P-312 dielectrics.

Cat. No. 977-DD



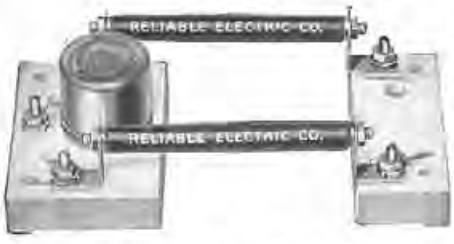
A metal saw-tooth air gap discharge protector used for protection against lightning and crosses with electric current. Discharge blocks are enclosed by a brass cap.

Consists of two No. 77, 7-ampere Blow-Rite tubular fibre fuses, two P-197 carbon blocks, and two P-495 metal saw-tooth discharge blocks. Size 7 ½ x 3 ½ x 2 ¼ inches. Std. pkg. 100. Weight 2 lbs.

Cat. No. 977-D

Same as No. 977-DD except equipped with four P-197 carbon blocks and two P-312 mica dielectrics.

Cat. No. 977-HH



A self-cleaning saw-tooth air gap protector used for protection against lightning and crosses with electric circuits. Discharge blocks are enclosed by a brass screw cover.

Consists of two No. 55, 7-ampere Blow-Rite tubular fibre fuses with lock nut tips, two P-197 carbon blocks and two P-495 saw tooth discharge blocks. Size 7 x 3 ½ x 2 ¼ inches. Std. pkg. 100. Weight 2 lbs.

Cat. No. 977-H

The same protector except with four P-197 carbon blocks, and two P-312 mica dielectrics.

Cat. No. 997-B

A self-cleaning saw-tooth air gap lightning arrester adapted for outside use and mounted in a perfectly weatherproof housing. Consists of two No. 95, 3-ampere Blow-Rite tubular wood fuses, held in place by nickeled phosphor-bronze contact springs with four projections which bite into the fuse tips, and two adjustable saw-tooth metal discharge plates normally placed .005 inch from the carbon ground. Size 8¾ x 4⅛ x 2¾ inches. Std. pkg. 100. Weight, 5 lbs. each.

Cat. No. 2

A durable, compact and efficient arrester for protection against lightning and where crosses with electric circuits are not likely to occur. The solid piece of glazed porcelain is fitted with brass binding posts, nuts, washers and nickel-silver springs. Consists of two 2080 plain carbons and two 2081 grooved carbons separated by two 2094 U-shaped celluloid dielectrics, placed in a recess and covered with an insulated and ventilated brass cap. Size, 2¾ x 2 x 3 inches. Std. pkg. 100. Weight, 1 lb. each.

Cat. No. B-13

This protector is designed to carry either a long or short fuse. It consists of two pieces of porcelain, one carrying fuse clips for the line and the other carrying fuse clips for the instrument end. Equipped with two 2080 plain carbons and two 2081 grooved carbons separated by two 2094 U-shaped mica dielectrics or two 4500 true gap dischargers and two 2080 plain carbon placed in a recess and covered with an insulated metal cap.

Regularly furnished with A-9, 3-ampere porcelain fuses.

Cat. No.	Description	Length Inches	Depth Inches	Width Inches	Wt., Lbs. Each
1560	Protector Complete	7	2	3	2
1561	Porcelain mounts for line end only	¾	2	3	½
1562	Instrument end complete	3	2	3	1

Cat. No. B-7

A heavy, glazed porcelain base equipped with two 2080 plain carbons and two 2081 grooved carbons separated by two 2094 U-shaped mica dielectrics or two 2080 plain carbons and two 4500 true gap dischargers, set in a well in the porcelain and covered by an insulated brass cap.

This protector is equipped with two A-9, 3-ampere tubular porcelain fuses. Size, 6¾ x 3 x 2 inches. Std. pkg. 100. Weight 2 lbs.

Cat. No. B-9

A weatherproof and fireproof arrester adapted for outside use, especially where drops run under power wires, or on rural lines where it may be installed under a porch.

The heavy porcelain box provides holes for wire connections so placed that by drawing insulated wire into them they can be made tight. The drawn aluminum metal cover is lined with cork insole to secure a good gasket-tight joint.

Equipped with A-9, 3-ampere porcelain tubular fuses, two 2080 plain carbons, two 2081 grooved carbons separated by two 2094 U-shaped celluloid dielectrics. Size 7 ½ x 3 x 4 ⅛ inches. Std. pkg. 100. Weight 4 lbs.

ARRESTERS

Cat. No. 1000

A new weatherproof self-cleaning saw-tooth air gap protector for outside mounting. Rigid zinc slide cover which cannot tilt and contact with fuse clips. Staggered fuses simplify installation wiring. Suitable for party line protection. Bracket will accommodate procelain tie knob and the cover can be secured to the bracket when lowered. Furnished with two No. 55 Fuses, two P-495 Saw-tooth Discharge Blocks, two P-197 Carbons. Std. Pkg. 50. Shipping weight, 2 pounds.

Connecting Blocks

Two and three point blocks for terminating outside and inside wire. Porcelain base with brass lugs, nuts and washers.

Shipping weight, 2 point, ⅜ lb.
Shipping weight, 3 point, ½ lb.

Cat. No. 975-B

A self-cleaning, saw-tooth air gap protector for protection against lightning, particularly at rural and other isolated stations where it is desirable to be free from annoyances of cleaning carbon and where crosses with electric circuits are not likely to occur. Consists of two adjustable saw-tooth metal discharge plates normally placed .005 inch from the carbon ground. Can be supplied with or without "all over" metal cover. On orders not specifying, arresters less cover will be shipped. Size 5 x 2 x 1½ inches. Std. pkg. 100. Weight, 1½ lbs.

Cat. No. 975

Same as above except furnished with two No. 18, 3-ampere Blow-Rite tubular fibre fuses. Size 5 x 2 x 2 in.

Cat. No. 998

A self-cleaning, saw-tooth air gap protector used for protection against lightning and crosses with electric circuits. Can be supplied with or without "All Over" metal cover which encloses fuses as well as lightning arrester.

Consists of two No. 6, 3-ampere Blow-Rite tubular wood fuses held in place by goose neck contacts with phosphor bronze tension springs; and two adjustable saw-tooth metal discharge plates normally placed .005 inch from the carbon ground. Size 7⅜ x 3¾ x 1⅝ inches. Std. pkg. 100. Shipping weight 3 pounds each.

No. 75 tubular fibre or No. 35 porcelain fuses supplied when specified.

Cat. No. 998-C

Same as above except equipped with two No. 77 Blow-Rite tubular fibre fuses. No. 27 tubular wood or No. 28 porcelain fuses supplied when specified. Weight 2½ lbs.

"O" Type Sub-Station Arrester

A completely enclosed sub-station protector, that offers perfect protection for outdoor use.

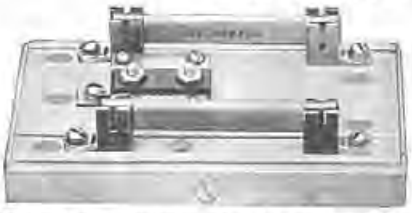
Base and back is a single piece of heavy white glazed porcelain, the galvanized bracket acts as a stop. The hood is of pure zinc. It is grounded through a guide at the top of the arrester.

Fuse clips are of phosphor bronze and are securely fastened to the porcelain by oval head brass screws. The Type O Protector is made for various lengths of fuses, as listed below. Fuses are 5 ampere capacity unless otherwise ordered.

Lightning Arresters ground on a copper ground strip. Two 2080 carbons, two 2081 carbons and two 2094 dielectrics, or two 4500 True Gap Dischargers and two 2080 carbons that will not permanently ground the line are furnished. Line and instrument wires are connected on opposite sides of the porcelain which provides wide separation and increased protection. Line wires are drawn through holes in the porcelain base and terminate on the face of the porcelain under hexagon nuts. Instrument and ground wires enter through holes in the base and are taken up the back of the porcelain to binding posts. This is a small, neat, compact protector, of sturdy construction and high quality.

Cat. No.	Equipped With	Dimensions in Inches Length	Width	Depth	Wt. Lbs. Each
O-7	A7 Wood Fuse	6¼	2¼	1¾	2½
O-9	A9 Composition Fuse	6¼	2¼	1¾	2½
O-12	A12 Composition Fuse	4½	2¼	1¾	2
O-16	A16 Wood Fuse	6¼	2¼	1¾	2½
O-44	A44 Wood Fuse	4½	2¼	1¾	2
O-52	A52 Fibre Fuse	6¼	2¼	1¾	2

Cat. No. 976-C



A self-cleaning, saw-tooth air gap protector for protection against lightning and crosses with electric circuits. Supplied with or without "all over" metal cover which encloses fuses and arrester. Consists of two No. 14, 3-ampere, Blow-Rite fibre flat wood fuses and two adjustable saw-tooth metal discharge plates normally placed .005 inch from carbon ground. Size, 5⅛ x 3 x 2 inches. Std. pkg. 100. Weight, 2½ lbs.

Cat. No. 976

Same as above except equipped with two No. 52, 3-ampere Blow-Rite fibre fuses.

Cat. No. 400

Considered standard for farm line and toll line protection, against lightning. Strongly built with heavy porcelain base, substantial brass mountings and large thumb nuts. Equipped with two P-56, one P-55 carbons and four P-57 varnished cambric dielectrics. The arrester carbons are sufficiently large to carry an exceptionally heavy discharge of lightning. Size 3⅜ x 2 x 2 inches. Std. pkg. 100. Weight 85 lbs. per 100.

ARRESTERS AND PARTS

Cat. No. 222
(Reliable)

The No. 222 Ten Point Protector is designed to drain static discharges from open wire leads. It is weatherproof, very sturdy, easy to install and instantaneous in operation. Furnished with ten P495 Self-Cleaning Sawtooth Lightning Discharge Blocks and ten P197 Carbons. Standard package 25. Shipping weight, 3½ lbs.

Cat. No. 202

A self-cleaning saw-tooth air gap lightning arrester, with capacity for ten wires, to be used out-of doors and for draining lines of lightning at the cross arm, without grounding the lines. All five pairs of lightning arresters can be connected to one pair of wires, if desired. The lightning arresters are mounted in a cast-iron housing to protect them from the weather and from sharp-shooters and rock throwers. The arresters should be mounted on the crossarm out of the lineman's way. Consists of ten saw-tooth metal discharge plates normally placed .010 inch from the carbon ground. Spring washers are provided on all bolts and screws to keep arrester parts and screw connections from working loose. Size 7 x 2⅝ x 5¼ inches. Std. pkg. 25. Weight 6½ lbs.

Cat. No. 402-S

Weatherproof, self cleaning, saw-tooth air gap arrester for outdoor mounting. For protection against lightning at telephone stations and for draining it from open wire toll and rural lines.

Consists of two P-495 saw-tooth discharge blocks and two P-197 carbons mounted on porcelain base with galvanized bracket and cover. Length, 8½ inches over bracket. Std. pkg. 100. Weight 2 lbs.

Cat. No. 7
(Cook)

For protection against lightning entering cable from subscribers' drops or open leads.

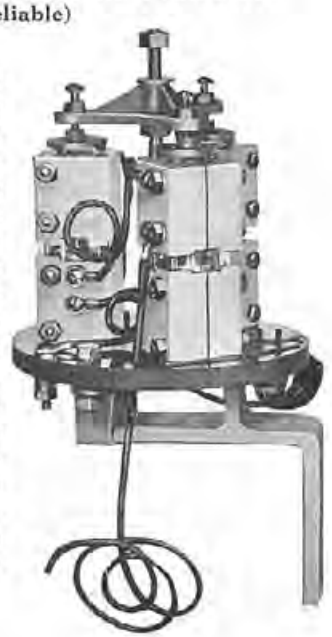
This arrester has a capacity of 10 wires. Consists of a metal back and bracket, bakelite base, phosphor bronze springs, True Gap Dischargers. Back and base is of a single piece of heavy steel, hot galvanized. Insulation and fanning strip is of a single piece of moulded bakelite. The contact springs are of phosphor bronze. These fit in slots in the bakelite. Binding posts are of brass with square heads and cannot be turned.

Equipped with two 4500 True Gap Dischargers and two 2080 carbons, that will not ground the line, but other types of dischargers may be used. The dischargers ground on a nickel silver strip, permanently fastened to the base which forms the bracket. The ground binding post is attached to this bracket.

The heavy zinc hood is furnished either hinged at the base, or a slip on hood with a chain.

Bakelite fanning strip has the jumper holes closed with a very thin film of bakelite. This is easily removed when jumpers are looped through. Size, 7x2x5". Weight, 4 lbs.

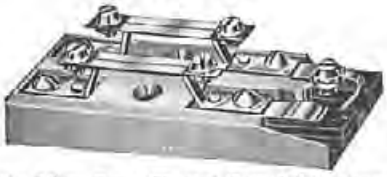
The Serjdetour Telephone Protector
(Reliable)



For all communication circuits exposed to power line induction or possible contact. A weatherproof air gap protector, no moving parts or auxiliary relays. Will carry discharge of 25 amperes for ten minutes without becoming short-circuited, and hence may be mounted in connection with 25 ampere fuses. Serjdetour will sustain voltages of 66 KV or more without blowing up and without allowing any of the high voltage to get past to damage the station telephone equipment. Shipping weight, 25 lbs.

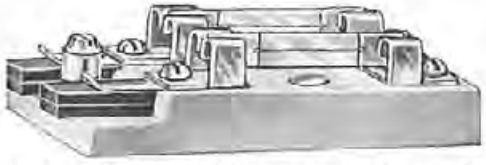
ARRESTERS AND PARTS

Cat. No. 89



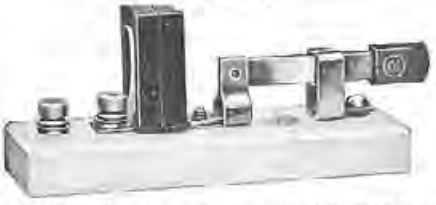
Double Pole Mica Fuse (Postal Type) Telephone Protectors with carbon block air gap, for protection against lightning, and crosses with electric circuits. Uses No. 11 Mica Fuses. Equipped with four P-22 carbons and two P-23 Mica Dielectrics. Size 4½ x 1⅜ x 1¼ inches. Std. pkg. 100. Weight 70 lbs. per 100.

Cat. No. 86



Double Pole Mica Fuse (Western Union Type) Telephone Protector with carbon block air gap, for protection against lightning and crosses with electric circuits. Uses No. 8 Mica Fuses. Equipped with four P-22 carbons and two P-23 Mica Dielectrics. Size 4½ x 1¾ x 1⅛ inches. Std. pkg. 100. Weight 70 lbs. per 100.

Cat. No. 511

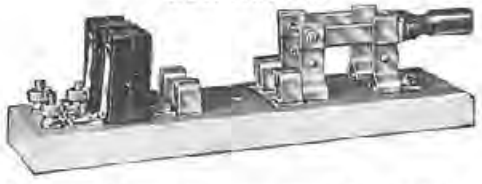


A carbon block lightning arrester provided with a single pole, single throw knife switch to disconnect the telephone. Equipped with two P-52 carbons and one P-53 Mica Dielectric. Size 6¼ x 1½ x 2¼ inches. Std. pkg. 50. Weight 104 lbs. per 100.

Cat. No. 512

Same as Cat. No. 511 except double pole. Equipped with double pole, single throw knife switch, four P-52 carbons and two P-53 Mica Dielectrics. Size 8 x 3 x 2¼ inches. Std. pkg. 50. Weight 220 lbs. per 100.

Cat. No. 500



A carbon block lightning arrester provided with a double pole, double throw knife switch for cutting off the telephone. Built for use with Western Union type No. 19 fuses for protection against crosses with electric circuits and lightning. Equipped with four P-52 carbons and two P-53 Mica Dielectrics. Size 8 x 3 x 2¼ inches. Std. pkg. 50. Weight 220 lbs. per 100.

Cat. No. 501

Same as Cat. No. 500 except of the single pole type. Provided with single pole, single throw knife switch, equipped with two P-52 carbons and one P-53 Mica Dielectric. Uses No. 19 Western Union fuses. Size 8 x 1½ x 2¼ inches. Std. pkg. 50. Weight 116 lbs. per 100.

Cat. No. 495 Discharge Block

Cat. No. 495

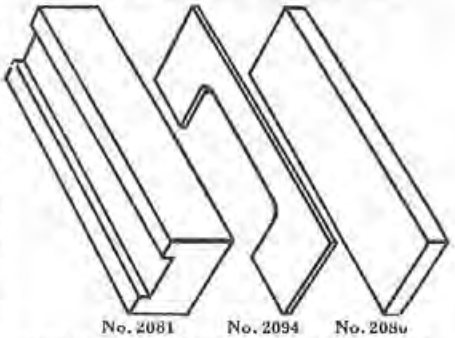
A self-cleaning saw-tooth discharge block designed to replace the line carbon and mica separator of existing and new lightning arresters and cable terminals.

Cut shows self-cleaning discharge block with carbon ground block ready for insertion in a lightning arrester. Carbon ground blocks of various shapes and thicknesses adapt the discharge block to fit any lightning arrester or cable terminal which used ¾ x 1½-inch carbon or copper blocks.

Cat. No. 4500 True Gap Discharger

The True Gap discharger is designed to relieve telephone circuits from high potential without permanently grounding the line. It is of rugged construction, accurately made, and free from maintenance expense. The discharger is used with a carbon block. A heavy brass discharger is moulded into a bakelite block the size of an ordinary carbon. On the top of this bakelite block is a metal cap anchored to the discharger blade. The discharge surfaces are completely inclosed so no dust can accumulate. The True Gap is recommended for use in pole cable terminals, sub-station protectors, and farm line arresters.

Carbon Block and Celluloid Dielectrics



No. 2081 No. 2094 No. 2080

The Nos. 2080 and 2081 carbon arrester blocks are specially treated under their patented process, which eliminates carbon dust and makes them self-cleaning under ordinary conditions. A greatly reduced percentage of carbon troubles, will follow the use of these self-cleaning carbons.

The No. 2094 celluloid dielectrics are widely known and favored because of their uniform thickness and high insulating qualities. Long experience has proved them to be the best form of dielectrics for use between carbon blocks. Mica dielectrics can be furnished when required, but they are not recommended because of the frequent metallic strata which mica contains, causing arcing and consequent short circuiting. Also it is almost impossible to secure mica in uniform thicknesses, all of which detracts from the accuracy of the device on which mica is used.

Brach Vacuum Arrester

The Type 440 Arrester is equipped with a triple path cartridge, and thus by bringing the two-line wires into the same vacuum chamber as the ground connection, the maximum degree of protection is secured; and, due to the fact that both sides of the line are in the same vacuum chamber, there is a decided shunting or balancing effect which equalizes both sides of the line whenever they become unbalanced due to static disturbances.

In addition, this arrangement of the three electrodes in one tube relieves either side of the line when subjected to abnormal conditions and immediately carries all such disturbances to ground.

In addition to the vacuum cartridge, this arrester is equipped with regulation telephone type fuses.

BATTERIES, BELLS

Dry Batteries

Columbia and French Dry batteries are furnished with Fahnestock or Screw connections. Specify type when ordering.

No. 6 Columbia Gray Label Batteries

This is a medium low current, long life battery made for telephone service, door bells, and any other low current drain service. Initial amperage, 18 to 22 amperes, 1½ volts. Size 2½ x 6 inches. Standard package 50. Weight 222 lbs. per 100.

Columbia Ignition Battery

Made especially for ignition and heavy duty work. Initial amperage is 28 to 32 amperes, 1½ volts. Size 2½ x 6 inches. Standard package 50. Weight 216 lbs. per 100.

No. 6 French Telephone Battery

Made with internal protective coating which reduces shelf deterioration. This feature makes this battery especially serviceable in telephone work. Initial amperage 18 to 22 amperes, 1½ volts. Practically no action when battery is idle. Its life is exceedingly long. Size 2½ x 6 inches. Standard package 50. Weight 222 lbs. per 100.

French Ignitor Battery

It is high in amperage and is made for ignition and other heavy duty work. It is also used for pole changers. Initial 28-32 amperage, 1½ volts. Size 2½ x 6 inches. Standard package 50. Shipping weight 222 lbs. per 100.

French No. 44 Round Test Set Battery

French No. 44 dry cells are intermediate in capacity between a No. 6 dry cell and the larger types of flashlight cells. No. 44 cells are recommended for any service regularly performed by a No. 6 dry cell where weight is an important consideration. Frequently used on linemen's test sets.

The weight per cell, 10 oz. Voltage, per cell, 1½ volts. Size, 1⅛ x 4⅛ inches over all height.

No. 777 Field Set Battery

No. 777 battery is for use with government field set. 3 volts.

Columbia .04 Oval Battery

This small oval battery is designed for use with Kellogg No. 1016 test set. Initial amperage 10 to 12 amperes, 1½ volts. Size 1⅛ x 4 inches. Weight 11¼ ounces.

No. 531—703 Battery

For use with Kellogg No. 1020 test set. 4½ volts.

Battery Boxes

No. 2

To be used with desk or hotel type of magneto or local battery telephones, electric bell installations or wherever dry cells are used. Inexpensive, saves batteries, and stores them neatly and conveniently where they can be readily inspected.

Neat and attractive in appearance and does not have to be hid in the basement or a dark corner. Hang it on a hook or nail on the wall.

Made of heavy pressed steel, finished in bright black japan, and lined throughout with heavy insulating fibre, which insulates the sides of the box and edges of the holes. A tight fitting cover is attached to the box by a nickel-plated chain. Holes are provided in the top and bottom for leading in wires.

Code	Capacity	Weight
No. 2	2 No. 6 Cells	1 lb. each
No. 3	3 No. 6 Cells	1 lb. each

Gravity

Gravity Type Battery

They should be sold for no other purpose in telephone exchanges but to supply operators transmitter battery where storage battery is unattainable. They are designed for closed circuit work of small consumption and should not be recommended for telephone use. Furnished in two sizes, Cat. No. 57, 5 x 7 inches and Cat. No. 68, 6 x 8 inches. Battery consists of jar, zinc, copper and sufficient blue vitriol.

Edison Primary Battery

The Edison primary battery is used extensively for telephone work. It is adaptable to railway signal work, train dispatchers, talking and ringing circuits and fire alarms.

The No. S403 battery is considered standard. It is of the round jar type with overall dimensions of 7⅞ by 10⅝ inches. It has a capacity of 400 ampere hours.

The S502 battery is of the rectangular jar type with a capacity of 500 ampere hours. Overall dimensions are 5¾ by 6¾ by 12½ inches.

The type "RR" battery is obsolete but may be converted into the S403 battery by ordering a 403 cover with nuts and a complete S403 renewal which includes the zinc-oxide plate, caustic soda and special oil.

Edison Primary

Push Buttons

These push buttons are furnished in copper finished metal.

Cat. No.	Description
200	Copper finished

Faraday Vibrating Bells

Enclosed type. Faraday signal gongs are superior to the ordinary bell. It is nickel plated and operates on 2 dry bells. Recommended for installations exposed to dust, dampness, or mechanical injury.

Cat. No.	Size Gong, Inches	Wt., Lbs. Each
A-3	3	2½
A-4	4	3½

Bells and Buzzers

These iron box bells and buzzers differ from others because they have a plunger hammer. They operate from two dry cells or from the 6-volt secondary circuit of a bell ringing transformer. Free action of the armature eliminates mechanical adjustment. The bell operates perfectly on one, two, or three dry batteries. The mechanism is copperized—therefore rustproof. Cases are dust and bugproof. The durability and faultless operation of the iron box bells is coupled with attractive appearance.

PRXXX, Buzzer

Cat. No.	Type	Size of Gong, Inches	Resistance, Ohms	Wt. Lbs.
222-3½	Marlo Bell	3	3½	1
212-300	PRXXX Bell	3	300	1
212-500	PRXXX Bell	3	500	1
220 3½	Marlo Buzzer	..	3½	½
210-50	PRXXX Buzzer	..	50	½
210-300	PRXXX Buzzer	..	300	½
210-500	PRXXX Buzzer	..	500	½

Thimble Eye Bolts
(Hot Galvanized)

Thimble eye bolts and angle bolts are used for guying to a pole. They eliminate the use of strain plates and the extra strand necessary for wrapping around the pole. When heavy loads are to be carried on the Thimble eye bolt, use a No. 7891 guy plate.

Thimble Eye Bolts

Cat. No.	Size Inches	Wt. Lbs. per 100	Cat. No.	Size Inches	Wt. Lbs. per 100
8050	5/8 x 8	120	8060	3/4 x 8	160
8051	5/8 x10	140	8061	3/4 x10	200
8052	5/8 x12	160	8062	3/4 x12	240
8053	5/8 x14	180	8063	3/4 x14	280
8054	5/8 x16	200	8064	3/4 x16	320
8055	5/8 x18	220	8065	3/4 x18	360

Thimble Eye Angle Bolts

8150	5/8 x 8	120	8160	3/4 x 8	160
8151	5/8 x10	140	8161	3/4 x10	200
8152	5/8 x12	160	8162	3/4 x12	240
8153	5/8 x14	180	8163	3/4 x14	280
8154	5/8 x16	200	8164	3/4 x16	320
8155	5/8 x18	220	8165	3/4 x18	360

Guy Plates
(Hot Galvanized)

Guy Plates are used with all sizes of Thimble Eye and Angle Bolts.

Cat. No.	Size Inches	Wt., Lbs. per 100
7891	7x2 1/2x 9/16	142

Eye Bolts
(Hot Galvanized)

The length is measured from center of the eye to the end of the bolt. Bolts up to 12 inches in length are threaded 4 inches, exceeding this length, threaded 6 inches.

Cat. No.	Size, Inches	Std. Pkg. Quan.	Wt., Lbs. per 100
8936	1/2 x 6	100	55
8938	1/2 x 8	100	65
8940	1/2 x 10	100	75
8942	1/2 x 12	100	85
8944	1/2 x 14	100	95
8958	5/8 x 8	50	100
8960	5/8 x 10	50	116
8962	5/8 x 12	50	132
8964	5/8 x 14	50	149

Expansion Shield

Expansion Bolts are commonly used for attaching fixtures, cables, etc. to surface of masonry. It is a split combination of one-piece malleable shield, which expands when lag screw is screwed into it. Furnished less screw. For lag screws to be used with these bolts, see Cat. page No. 144.

Diameter of Screw Inches	Length Shield Inches	Std. Pkg. Quan.	Wt., Lbs. per 100
1/4	1 1/2	100	5
5/16	1 3/4	100	6
3/8	2 3/4	100	11
7/16	2 3/4	100	17
1/2	3 1/2	100	19
5/8	3 1/2	100	25

Springin Toggle Bolts

Springin Toggle Bolts are made of tempered spring steel with a cam action against the saddle which throws them to open position. The wings are the springs and are very powerful so that the toggle will carry a much greater load than is ever required of a fastening of this type.

Bolts have diameters of 1/8, 3/16, 1/4 and 5/16 inches, are furnished in lengths, of 2, 3, 4, and 6 inches. Furnished with round or flat head bolts. When ordering specify size, type and style of bolt desired.

Reversible Toggle Bolts

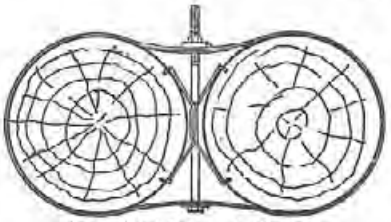
Diamond reversible toggle bolts are for attaching to hollow brick, tile or used lath walls. Furnished with round or flat head stove bolts also with loose head or nuts. Bolts have diameters of 1/8, 3/16, 1/4 and 5/16 inches, are furnished in lengths of 3, 3 1/2, 4, 5 and 6 inches. When ordering specify size, type and style bolt desired.

Pole Stubbing Clamp
(Hot Galvanized)

Samson pole stubbing clamps are easily installed. They make the pole and stub just as strong and rigid as a one piece pole.

General practice calls for the use of two clamps. One clamp is located at the ground line and the other near the top of the stub.

Two sizes, the Giant and the Junior, take care of all diameters of pole from seven to eighteen inches. The complete clamp consists of a heavy clamping band, two saddle plates and a special staple for fastening the loose end of the band to the pole or stub. The Giant band is 2 1/2 inches in width and 8 feet in length. The junior is 2 1/4 inches in width and 5 feet 10 inches in length. Both sizes are provided with 11/16 inch diameter holes to permit the use of 1/2 or 5/8 inch diameter bolts. Bolts and square washers must be ordered extra. The length of bolt should be slightly longer than the diameter of the pole.



Assembled Clamp in Service

Cat. No.	Description	For Size Pole Diameter Inches	Wt., Lbs. per 100
J6850	Giant No. 1	13 to 18	950
J6851	Junior No. 2	7 to 12	625

BOLTS, FLAT BRACES, LAG SCREWS

Machine or Cross-Arm Thru-Bolts
(Hot Galvanized)

Principally used for attaching cross arms to the poles. To determine the correct length allow ¾ inches for nut and washer, add the thickness of the cross-arm to the pole diameter less depth of gain. Length is measured from inside of head to tip of bolt.

All bolts furnished with rolled threads. Bolts 6 inches and smaller threaded 1½ inches, 8 to 12-inch threaded 4 inches, 14 inches and longer threaded 6 inches.

Cat. No.	Size Inches	Std. Pkg. Quan.	Wt., Lbs. per 100
8603	⅜ x 3	1000	13
8603½	⅜ x 3½	1000	15
8604	⅜ x 4	1000	16
8604½	⅜ x 4½	900	18
8605	⅜ x 5	800	19
8605½	⅜ x 5½	750	20
8606	⅜ x 6	650	22
8704½	½ x 4½	550	34
8705	½ x 5	500	36
8706	½ x 6	400	41
8708	½ x 8	350	52
8710	½ x 10	150	62
8712	½ x 12	150	72
8808	⅝ x 8	100	82
8810	⅝ x 10	100	98
8812	⅝ x 12	100	114
8814	⅝ x 14	100	130

Carriage or Brace Bolts
(Hot Galvanized)

Used for attaching braces to the cross arm. For correct length, order bolts ¾ inch longer than the thickness of cross arm. Threaded for 1½ inches.

Cat. No.	Size Inches	Std. Pkg. Quan.	Wt., Lbs. per 100
8633	⅜ x 3	1000	13
8633½	⅜ x 3½	1000	14
8634	⅜ x 4	1000	16
8634½	⅜ x 4½	900	17
8635	⅜ x 5	800	19
8635½	⅜ x 5½	750	20
8644½	½ x 4½	500	32
8645	½ x 5	450	35
8646	½ x 6	350	40

Lag Screws or Heel Bolts
(Hot Galvanized)

Fetter Drive

Gimlet Point

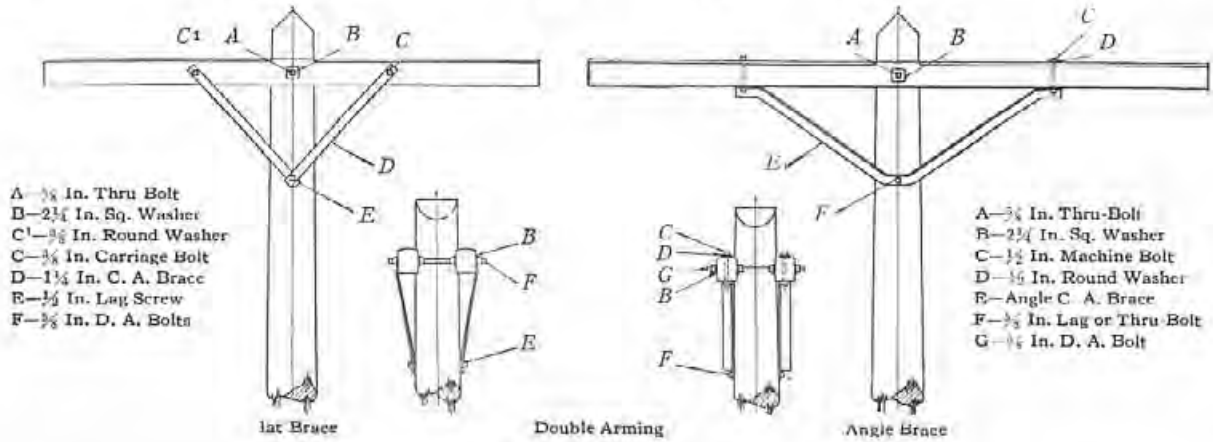
Used principally to fasten cross arm braces to the pole. The fetter drive type is more popular as it may be driven into the wood without tearing the fibres. By adding a few turns it is securely seated.

Cat. No.	Size Inches	Std. Pkg. Quan.	Wt., Lbs. per 100
8722	¼ x 2	6000	3
8722½	¼ x 2½	5000	3
8732½	5/16 x 2½	3000	6
8733	5/16 x 3	2500	7
8742¼	⅜ x 2¼	2500	8
8742½	⅜ x 2½	2500	9
8743	⅜ x 3	2000	10
8743½	⅜ x 3½	1500	11
8744	⅜ x 4	1250	12
8744½	⅜ x 4½	1000	14
8753	½ x 3	1000	19
8753½	½ x 3½	1000	21
8754	½ x 4	800	24
8754½	½ x 4½	700	26

Flat Cross-Arm Braces
(Hot Galvanized)

Braces are punched at one end with a 7/16-inch hole for ⅜ inch carriage bolt, and on the other end with a 9/16-inch hole for ½-inch lag screw. Standard bundle comprises 20 pieces.

Cat. No.	Length Inches	Wt., Lbs. per 100
7020	17/32 x 7/32 x 20	142
7022	17/32 x 7/32 x 22	156
7024	17/32 x 7/32 x 24	170
7026	17/32 x 7/32 x 26	184
7028	17/32 x 7/32 x 28	198
7122	1¼ x ¼ x 22	184
7124	1¼ x ¼ x 24	200
7126	1¼ x ¼ x 26	217
7128	1¼ x ¼ x 28	234
7130	1¼ x ¼ x 30	250



Flat Brace — Double Arming — Angle Brace

BOLTS, BRACES, WASHERS

Angle Iron Alley Arm Braces
(Hot Galvanized)

Alley or side arm braces made from open hearth angle steel with forged ends and steps used extensively on distributing lines in alleys. They are punched with 9/16-inch holes for 1/2-inch bolts. Use one 1/2-inch machine or carriage bolt for attaching to cross arms, and two 1/2-inch Lag Screws for attaching to the street side of the pole.

Cat. No.	Size	Std. Pkg. Quan.	Wt., Lbs. per 100
1521	1 1/2 x 1 1/2 x 3/16 x 5	5	1100
1523	1 1/2 x 1 1/2 x 3/16 x 6	5	1300
1525	1 3/4 x 1 3/4 x 3/16 x 7	5	1760
1526	2 x 2 x 1/4 x 10	5	3800

Angle Iron Vertical Braces
(Hot Galvanized)

Where it is necessary to clear buildings or trees by extending the load to one side of the pole, the angle iron vertical brace is used between cross arms in connection with angle iron alley arm brace. They are designed to take care of a lead of 2, 3 or 4 arms and additional ones may be accommodated by the use of additional braces. Punched with 9/16 inch holes to take 1/2-inch machine bolts.

Cat. No.	Size Stock Inches	No. of Arms	Spacing Arms	Std. Pkg. Quan.	Wt., Lbs. per 100
1533	1 1/2 x 1 1/2 x 3/16	2	18	5	300
1534	1 1/2 x 1 1/2 x 3/16	3	18	5	570
1535	1 1/2 x 1 1/2 x 3/16	4	18	5	846
1536	1 1/2 x 1 1/2 x 3/16	2	24	5	390
1537	1 1/2 x 1 1/2 x 3/16	3	24	5	750
1538	1 1/2 x 1 1/2 x 3/16	4	24	5	1110

Cross Arm Back Braces
(Hot Galvanized)

Used for bracing cross arms at corners and terminal poles or any place subjected to heavy strain. Made of flat and angle open hearth steel, punched with 11/16-inch holes to take 5/8-inch machine bolts at center and punched with 9/16-inch holes to take 1/2-inch carriage bolts at the ends. Can often be used to eliminate double arming.

Cat. No.	Size	Description of Material	Std. Pkg. Quan.	Wt. Lbs. Per 100
381	1 1/2 x 1 1/2 x 3/16 x 5 ft.	Angle	5	750
382	1 1/2 x 1 1/2 x 3/16 x 6 ft.	Angle	5	1000
383	1 3/4 x 1 3/4 x 3/16 x 9 ft. 2 in.	Angle	5	1755

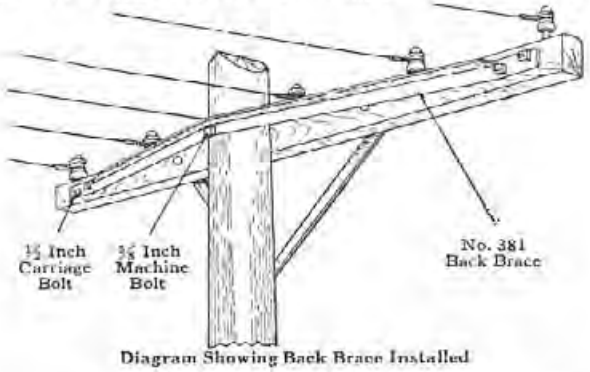


Diagram Showing Back Brace Installed

Double Arming or Spacing Bolts
(Hot Galvanized)

Furnished with four nuts. Rolled threads used exclusively. Bolts up to 12-inch are threaded 4 inches, longer bolts 6 inches on each end.

For correct length allow 1 1/4 to 1 1/2 inches for washers and nuts, add twice the thickness of the cross arm plus the diameter of pole less depth of gain.

Cat. No.	Size Inches	Std. Pkg. Quan.	Wt., Lbs. per 100
8842	1/2 x 12	50	76
8844	1/2 x 14	50	85
8846	1/2 x 16	50	93
8862	5/8 x 12	50	128
8864	5/8 x 14	50	143
8866	5/8 x 16	50	158

Square

Square Washers
(Hot Galvanized)

Square washers are used on machine bolts, double arming bolts, and guy rods.

Cat. No.	Size Washer Inches	Diam. Hole Inches	Size Bolt Inches	Std. Pkg. Quan.	Wt., Lbs. per 100
1074	2 x 2 x 1/8	11/16	1/2, 5/8	500	15
1075	2 1/4 x 2 1/4 x 3/16	11/16	5/8	500	24
1076	2 1/4 x 2 1/4 x 3/16	13/16	3/4	500	24
1078	3 x 3 x 3/16	7/8	5/8, 3/4	250	44
1079	3 x 3 x 1/4	7/8	5/8, 3/4	250	59
1080	4 x 4 x 3/16	7/8	5/8, 3/4	100	83
1081	4 x 4 x 1/2	1 1/16	1	50	215

Round

Round Washers
(Hot Galvanized)

Round washers are used for Carriage Bolts and Lag Screws.

Cat. No.	Outside Diam. Inches	Diam. Hole Inches	Size Bolt Machine Inches	Size Bolt Carriage Inches	Thick. Gauge	Std. Pkg. Quan.	Wt. Lbs. per 100
1085	1 1/4	1/2	..	3/8	14	2500	3
1086	1 3/8	9/16	1/2	1/2	12	2500	4
1088	1 3/4	11/16	5/8	1/2	10	1000	8
1089	2	13/16	3/4	..	9	1000	11

Stubbing Washer
(Hot Galvanized)

For reinforcing poles, which are rotted off at the butt, to new stubs. Size washer, 3 1/4 x 3 1/4 x 1/4 inches.

Cat. No.	Diam. Hole Inches	Size Bolt Inches	Std. Pkg. Quan.	Wt. Lbs. per 100
133	13/16	5/8 or 3/4	100	75

BRACKETS

House Bracket
(Hot Galvanized)

No. 1200-9200

The No. 1200-9200 bracket is made of 3/16x1 3/4 inch stock, hot galvanized, having three 9/32 inch mounting holes, illustration shows manner in which brackets are usually assembled. Bolts and knobs are extra and should be ordered separately. Three 1 1/2x16 inch galvanized R. H. wood screws are recommended for mounting the bracket to wood frame buildings; three 1/4x1 inch Dryvin lead anchors for brick or masonry walls. Standard package 200. Weight 50 lbs. per 100.

Pole Bracket
(Hot Galvanized)

No. 1202-9202

The No. 1202-9202 bracket is made of 1/4x2 inch stock, hot galvanized, having three 7/16 inch mounting holes. Illustration shows manner in which brackets are usually assembled. Bolts and knobs are not included with the bracket. Three 3/8x4 lag screws are recommended for mounting bracket to pole. Standard package 125. Weight 100 lbs. per 100.

Size Bolts for Mounting Knobs to House or Pole Bracket		
No. Knobs	Size Knob	Size Bolt
1	2 groove	5/16x2 inch
2	2 groove	5/16x3 1/2 inch
1	4 groove	5/16x3 inch
2	4 groove	5/16x5 1/2 inch

Pearl Drop Wire Bracket
(Hot Galvanized)

No. 200

These brackets are furnished complete with knob ready to install. The unbreakable wire screw hook and malleable castings are hot galvanized, insuring long life. To install screw in hook, hang on two piece yoke assembled into insulator.

No. 100 Single Groove for Electric and Radio Wires. Size yoke 3/8 inch.

No. 200 Double Groove for Duplex Telephone Wires. Size yoke 3/8 inch.

No. 202 Double Groove for Duplex Telephone Wires. Size yoke 5/16 inch.

Packed in cartons of 25.

Corner Bracket
(Hot Galvanized)

No. 2584

The No. 2584 corner bracket is made of 1/4 x 1 1/4-inch stock, hot galvanized, and is eight inches in length, having two 7/16-inch mounting holes. For mounting to wood buildings; use two 3/8 x 2 1/4-inch galvanized lag screws, for brick or masonry; use two 3/8 x 2 Dryvin lead anchors. See table under pole brackets for bolts necessary to mount knobs. Standard package 25. Weight 65 lbs. per 100.

Wire Holder

No. 1622-1980

This type of telephone bracket has been designed so that no metal is exposed after installation. The insulator is made from the highest grade dry process porcelain and is safe for 1000-lb. strains.

It is equipped with No. 22x2 inch galvanized wood screw and the size of the wire hole is 9/16 x 3/4 inch. Standard package, 50 pieces. Weight 60 lbs. per 100.

Span Bracket
(Hot Galvanized)

The span bracket fastens to the strand and is used to take off house service connections.

Each bracket comes equipped with one No. 8901-1095 suspension clamp and one 1/2x1 5/8 inch bolt for clamping on the strand. The porcelain knobs and bolts for mounting should be ordered separately.

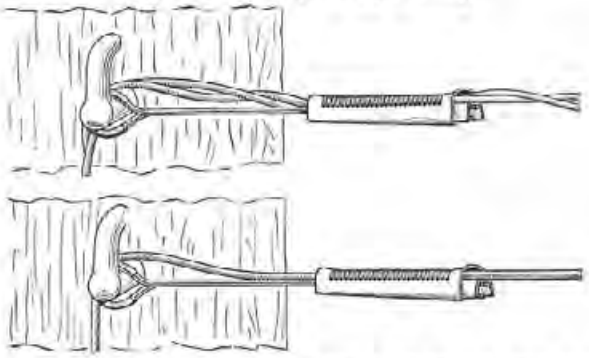
Cat. No.	Standard Pkg. Quan.	Wt., Lbs. per 100
7910	100	138

Terminal Bracket
(Hot Galvanized)

No. C-14

The No. C-14 terminal brackets are for all kinds of dead-ending and terminal use. Furnished complete with bolt and two groove porcelain knob. Shipping weight 100 lbs. per 100.

Type "P" Drop Wire Clamp



An ideal clamp for attaching parallel or twisted pair drop wire to poles and buildings.

The use of these clamps prolongs the life of the wire, permits free swinging at dead ends, and places all wear on the hardware. They are very quickly and easily installed and two of them can be used in making an angular turn.

Type "P" clamps are wedge shaped, furnished with a copper wire loop at the end for hooking over screw hooks, drive hooks, masonry hook anchors or porcelain knobs. When mounting to poles and wood buildings, use screw hooks, drive hooks or porcelain knobs. For brick or stone buildings, use masonry hook anchors or porcelain knobs. When used for twisted pair, it is essential to parallel the wires through the wedge.

Cat. No.	Packed Carton	Std. Pkg. Quan.	Wt., Lbs. Per 100
"P" Drop Wire Clamp	25	1000	18

BRACKETS

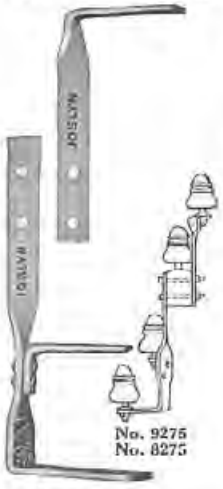
Single Point Bracket
(Hot Galvanized)

Nos. 450 and 451 Brackets are made of 1¼x5/16 inch steel and are provided with a ⅜ inch round hole for a 2 inch No. 14 galvanized wood screw used to prevent the bracket from pulling to one side on the arm. The bracket is clamped on the arm by a carriage bolt and all brackets have holes for Cat. No. 1193 ½ inch Western Union Steel Insulator Pins. Furnished less pins, screws, insulators and bolts. (For pins and bolts see catalog pages 136-144.)

Cat. No.	Size of Arm	Carriage Bolt	Std. Pkg. Quan.	Wt. Lbs. per 100
450	3¼x4¼	⅜x4½	10	242
451	2¾x3¾	⅜x4	10	235

Four Point Transposition Bracket
(Hot Galvanized)

The Nos. 9275-8275 are made of 1½x⅜ inch steel and is used for 4-wire transpositions. Fastened to the arm by two ½x5 inch machine bolts, spaced 2⅜ inches apart, and has holes for Cat. No. 1193 — ½ inch Western Union Steel Pins. Furnished in two parts as shown less pins, insulators and bolts. (For pins and bolts catalog pages 136-144.)



Cat. No.	Size of Arm	Std. Pkg. Quan.	Wt., Lbs. per 100
9275-8275	3¼x4¼	5	693

Wall Bracket
(Hot Galvanized)

Made of ¾ inch channel steel and furnished with one inch pressed steel threads, 5/16 inch mounting holes.

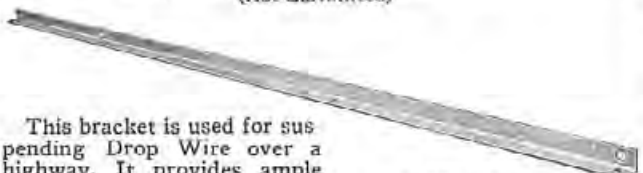
Cat. No.	Std. Pkg. Quan.	Wt., Lbs. per 100
145-5	25	52

Corner Bracket
(Hot Galvanized)

Made of ¾ inch channel steel and furnished with one inch pressed steel threads, 5/16 inch mounting holes and 5/16 by 11/16 inch mounting slots.

Cat. No.	Std. Pkg. Quan.	Wt., Lbs. per 100
150-6	25	68

Highway Cross-Over Bracket
(Hot Galvanized)



This bracket is used for suspending Drop Wire over a highway. It provides ample clearance when a short pole is used. Manufactured from 1½x1½x¼x90 inch Angle Iron. Furnished with six ⅜ inch holes for mounting two or four groove knobs with machine or stove bolts, also four ⅝ inch holes for mounting to pole. Shipping weight 1750 lbs. per 100.

Single Point Bracket
(Hot Galvanized)

The No. 110-18 is most popular for light work, the No. 111-19 for heavy duty. In ordering state size crossarm to be mounted on. Furnished with ⅜ inch "U" bolts bent for 3¼x4¼ inch crossarms unless otherwise specified.

Cat. No.	Size Channel	Mtg. Holes	Std. Pkg. Quan.	Wt. Lbs. per 100
110-18	¾ inch	⅜ inch	25	112
111-19	1 inch	7/16 inch	25	160

Two Point Bracket
(Hot Galvanized)

The Nos. 227-22 and 237-20 are made of ¾ inch channel steel. In ordering state size crossarm to be mounted on. Furnished with ⅜ inch "U" bolts bent for 3¼x4¼ inch crossarms unless otherwise specified.

Cat. No.	Spacing Inches	Std. Pkg. Quan.	Wt., Lbs. per 100
237-20	10	20	181
227-22	8	10	210

Four Point Transposition Bracket
(Hot Galvanized)

This type of transposition bracket with the "U" bolt mounting easily withstands the heavy strains placed on it by long spans of swinging wires. Used principally for transposing four wires of two toll circuits on which a phantom circuit is connected. The "U" bolts furnished are for 3¼x4¼ inch arms. However, they can be furnished to fit any standard crossarm. Brackets are of ¾ inch channel steel, doubled galvanized by the hot-dip process.

Cat. No.	Spacing Inches	Std. Pkg. Quan.	Wt., Lbs. per 100
437-21	6½ and 10	10	410

Distributing Bracket
(Hot Galvanized)

These brackets are used for distributing twisted pair telephone wires. A six knob bracket only is illustrated. The four and eight knob brackets are of the same construction except length is arranged according to number knobs. The bases are made of 1¾x5/8 inch channel. The knobs are held in place by a ⅜ inch bolt. A 3/16 inch hole is provided in each end for ½ inch screws. Furnished with knobs as shown.

Cat. No.	No. Knobs	Overall Length	Wt., Lbs. per 100
2900-73	4	10	250
2901-74	6	13	356
2902-75	8	16	443

BOOTHS

Folding Door Booth
For Group Installation

This folding door booth is for group installation only and is furnished with unfinished sides; separators are used between the units of group installations and finished panels are used at each end of the group only. It is particularly desirable for use in narrow places, as the door requires a space of only 3 inches in front for opening and closing. No guide slot is required.

It is strong in construction and beautiful in appearance, being made of solid mahogany or quartered oak. The inside is lined with sheet metal, the floor and baseboard covered with linoleum, and threshold provided with safety tread.

Height	Width	Depth
88¼ in.	29 in.	30½ in.

No.	Wood	Back
1-C	Golden Oak	Hardwood (exposed Back) glass in door
1-D	Golden Oak	Softwood (unexposed Back) glass in door
1-A	Light Mah.	Hardwood (exposed Back) glass in door
1-B	Light Mah.	Softwood (unexposed Back) glass in door
1-E	Dark Mah.	Hardwood (exposed Back) glass in door
1-F	Dark Mah.	Softwood (unexposed Back) glass in door

NOTE: When desired, these booths can be furnished with seats and door switch equipment to operate both an electric light and electric ventilator.

Folding Door Booth
For Unit Installation

Similar in construction to the folding door booth used for group installations except that it is built as a single unit and is finished on all sides. Several can be placed in a group with glass panels at the front only.

In economy of space ventilation, ease of maintenance and appearance this booth is second to none. In dimensions it is the same as the booth for group installation, but is furnished in different materials as follows.

Height	Width	Depth
88¼ in.	29 in.	30½ in.

No.	Material	Finish	Glass in Panels
2-A	Plain Oak	Medium Oak	2 in door, 2 in left side, 1 in right side
2-B	Birch	Dark Mahogany	2 in door, 2 in left side, 1 in right side
2-C	Birch	Light Mahogany	2 in door, 2 in left side, 1 in right side
2-G	Plain Oak	Medium Oak	2 in door only
2-H	Birch	Dark Mahogany	2 in door only
2-J	Birch	Light Mahogany	2 in door only

NOTE: When desired, these booths can be furnished with seats and door switch equipment to operate both an electric light and electric ventilator.

Receding Door Booth

Built as a single unit.

The door, when swung open, slides back along the right wall. It opens easily and smoothly, with no grooved slot required. Only 6 inches in front of the booth is required for the opening and closing of the door.

This booth has a reinforced back panel for mounting a wall telephone or coin collector. Also furnished with a writing shelf which can be used for a desk telephone if desired.

Height	Width	Depth
83½ in.	28½ in.	29¼ in.

No.	Material	Finish	Glass in Panels
3-A	Plain Oak	Medium Oak	1 in door, 1 in right side
3-B	Birch	Dark Mahogany	1 in door, 1 in right side
3-C	Birch	Light Mahogany	1 in door, 1 in right side
3-D	Plain Oak	Medium Oak	1 in door, 1 in right side, 1 in left side.
3-E	Birch	Dark Mahogany	1 in door, 1 in right side, 1 in left side
3-F	Birch	Light Mahogany	1 in door, 1 in right side, 1 in left side.
3-G	Plain Oak	Medium Oak	1 in door only.
3-H	Birch	Dark Mahogany	1 in door only.
3-J	Birch	Light Mahogany	1 in door only.

NOTE: The above booths can be furnished with seat, electric light and door switch equipment at an additional charge.

Swinging Door Booth

Made throughout of kiln-dried plain white oak or birch—all sides are framed and paneled 5-ply. The right and left sides are interchangeable.

Has a reinforced back for mounting either a wall telephone or coin box. A writing shelf is furnished which affords means of mounting a desk set.

The floor is oiled and the whole booth is finished, inside and out, by staining, filling, shellacking, and varnishing.

Height	Width	Depth
83½ in.	28½ in.	29¼ in.

No.	Material	Finish	Glass in Panels
4-A	Plain Oak	Medium Oak	1 in door, 1 in right side
4-B	Birch	Dark Mahogany	1 in door, 1 in right side
4-C	Birch	Light Mahogany	1 in door, 1 in right side
4-D	Plain Oak	Medium Oak	1 in door, 1 in right side, 1 in left side
4-E	Birch	Dark Mahogany	1 in door, 1 in right side, 1 in left side
4-F	Birch	Light Mahogany	1 in door, 1 in right side, 1 in left side
4-G	Plain Oak	Medium Oak	1 in door only
4-H	Birch	Dark Mahogany	1 in door only
4-J	Birch	Light Mahogany	1 in door only

NOTE: The above booths can be furnished with seat, electric light and door switch at an additional charge.

Booths shipped *knocked down* unless order specifies to be shipped *set up*.

CABLE

Lead Encased Telephone Cable

This cable is regularly furnished with various Electrostatic Capacities, and with conductors of Nos. 19, 22 and 24 B & S Gauge.

Each wire is insulated with either one or two wraps of manila paper, wound loosely in helical form on the wire, although for mechanical reasons Kellogg recommends the use of double paper wrap in preference to a single paper wrap.

Dry paper is used on account of its low specific inductive capacity, which is further reduced by the air space produced by the loose wrapping.

After each wire is wrapped, the insulated conductors so formed are twisted together in pairs, each wire of a pair being wrapped with paper of different color for tracing purposes. The length of lay of the wires varies from three to five and one-half inches.

The pairs thus formed are cabled together in layers, each layer being one pair thick. Succeeding layers are wound in reverse direction and the final layer is taped over with paper.

The cable is then treated under vacuum at a constant temperature carefully regulated to extract the moisture from the cable without causing deterioration of the paper insulation.

The cable is then sheathed with either pure lead or 99% lead with 1% antimony. Kellogg recommends the 1% antimony for all aerial construction as a pure lead sheath is liable to be crushed or buckled with consequent injury to the cable. It is also liable to crystallize under continuous vibration.

After the cable is sheathed it is immersed in water for a specified period to detect any imperfection in the sheath. It is then tested for electrostatic capacity and insulation resistance.

Efficiency of transmission depends upon the resistance of the conductors, the electrostatic capacity and to a limited extent on the insulation resistance.

Conductor Resistance

Except for the purpose of long distance transmission, where a lower conductor resistance may be necessary, cables are usually built of Nos. 19, 22 or 24 B & S Gauge, the resistance of these wires being sufficiently low for all general purposes

The resistance of those wires—42.5 ohms, 85 ohms and 135.6 ohms per mile respectively at 20 degrees Centigrade,—are considerably increased, both through twisting into pairs and through cabling the pairs, but as the increase is not constant for all wires in the cable, it is usual to specify the maximum conductor resistance for any wire in the cable.

Mutual Capacity

is the capacity relation which one wire of a pair bears to its mate, the capacity measurement being made while the balance of wires in the cable and lead sheath are grounded.

Grounded Capacity

is the capacity relation which one wire bears to the balance of wires in cable, the capacity measurement being made while all other wires and lead sheath are grounded.

Electrostatic Capacity

When two or more pairs of wires in a cable are in service at the same time, there is generated, or set in motion, various electrical currents which act, in a greater or lesser degree, as a disturbing element to adjacent pairs or conductors. In cables where the conductors are brought very closely together this disturbing element is somewhat more noticeable and the capacity greater than in a cable whose conductors are more widely separated. As an illustration, a cable made of 100 pairs No. 22 gauge wire and compressed into a space of $1\frac{5}{16}$ inch diameter; this gives a capacity of .08 microfarads per mile. Compress the same number of pairs into a space of $1\frac{3}{32}$-inch diameter; this gives a capacity of .10 microfarads per mile. Again, compress the same number of pairs into a space of $1\frac{1}{16}$-inch diameter; this gives a capacity of .12 microfarads per mile. By compressing the cable the capacity is higher each time, due to the fact that as the conductors are brought nearer to each other the disturbing element mentioned above is more active. This influence existing between any two or more wires is termed "Electrostatic Capacity" and is expressed in microfarads per mile of cable.

The lower the capacity the greater the separation of conductors and diameter of cable. As cables increase in diameter, requiring a greater weight of lead sheath per foot, the expense of manufacturing accordingly increases; therefore the lower capacity cables are of higher cost.

As the Electrostatic Capacity of a cable will increase with a rise in temperature it is customary to state at what temperature a given capacity is desired.

The Electrostatic Capacity is specified in microfarads per mile at a given temperature, and is expressed either as "Mutual Capacity" or "Grounded Capacity" and the two must not be confused.

The following table showing the equivalent of Grounded Capacity to Mutual Capacity indicates how important it is to state whether Grounded or Mutual Capacity is wanted.

.08 Grounded Capacity is equal to .054 Mutual Capacity
.10 Grounded Capacity is equal to .066 Mutual Capacity
.105 Grounded Capacity is equal to .07 Mutual Capacity
.111 Grounded Capacity is equal to .074 Mutual Capacity
.114 Grounded Capacity is equal to .076 Mutual Capacity
.12 Grounded Capacity is equal to .080 Mutual Capacity
.14 Grounded Capacity is equal to .093 Mutual Capacity
.16 Grounded Capacity is equal to .107 Mutual Capacity
.18 Grounded Capacity is equal to .12 Mutual Capacity

To change Mutual Capacity to Grounded Capacity multiply by 1.5.

To change Grounded Capacity to Mutual Capacity multiply by .666

Insulation Resistance

The effect of insulation resistance under actual working conditions is not definitely known, owing to the high frequencies employed, but as a decrease in insulation resistance causes an increase in electrostatic capacity, it is advisable that the insulation resistance should be fairly high.

The usual practice is to specify a minimum of 500 megohms per mile, which is considered sufficiently high to prevent any appreciable leakage. Actual tests, however, generally exceed 1000 megohms per mile.

Insulation resistance is decreased by a rise in temperature, therefore the temperature at which a certain resistance is desired should be specified.

CABLE

General Specifications Covering Paper Insulated, Dry Core, Lead Encased Telephone Cable

Conductors

Conductors shall consist of pure annealed solid copper wire, uniformly round, smooth, free from all imperfections not consistent with the best commercial practice and shall have resistivity of not more than .15635 ohms per meter gram.

For the purpose of calculating weights, cross section, etc., the specific gravity shall be taken at 8.89 at 20 degrees C (68 degrees F).

When necessary either twist or sleeve joints shall be made in the individual conductors and shall be made as nearly as possible electrically and mechanically equal to the solid conductors.

The size of conductors shall be expressed in the Brown & Sharpe Gauge.

Insulation

Each conductor shall be insulated with a wrap or wrappings of pure manila paper spirally applied each turn overlapping the preceding. In double paper the wrappings shall be applied in reverse layers.

The individual conductors shall be twisted in pairs each conductor a distinctive color from its mate and shall be twisted with a lay of three inches (3 inches) to five and one-half inches (5½ inches) depending on size of the conductor.

The twisted pairs shall be laid spirally together in cylindrical form, the core or center surrounded by reversed spiral layers. Each cable shall have a distinctive tracer pair in the outside layer. The layers shall be bound together with an open wind of cotton yarn.

The completed core shall have a belt of pure manila paper applied spirally.

In addition to the number of pairs called for on individual orders extra pairs shall be furnished as shown in the following table:

Number of Pairs In Cable	Extra Pairs Supplied
5 to 125	1
150 to 225	2
250 to 325	3
350 to 425	4
450 to 525	5
550 to 600	6

Sheath

The completed core shall be enclosed in a round sheath of uniform thickness, free from cracks, holes or other defects. The thickness and composition of the sheath shall be in accordance with the requirements of individual orders.

Specifications continued on following page.

No. 22 B. & S. GAUGE TELEPHONE CABLE

Double Reverse Paper Wrapped

.12 grounded capacity—.080 mutual capacity.
1% antimony in lead sheath.

Pairs	Outside Diameter Inches	Lead Thickness Inches	Full Reel Length Feet	Approx. Full Reel Shpg. Wt. per 1000 Ft.
5	3/8	1/16	2640	395
10	15/32	5/64	2640	590
15	9/16	3/64	2640	820
25	5/8	5/64	2640	940
50	27/32	3/64	2000	1560
75	1 1/32	3/32	2000	2190
100	1 1/8	3/32	1500	2640
125	1 1/4	3/32	1200	2940
150	1 3/8	7/64	1200	3650
200	1 9/16	7/64	1000	4300
250	1 3/4	1/8	800	5810
300	1 29/32	1/8	800	6360
400	2 5/32	1/8	700	7600
500	2 3/8	1/8	500	8770
600	2 9/16	1/8	500	9620
800	2.875	1/8	500	11755
900	3	1/8	500	12500
1000	3.188	1/8	500	13680

Single Paper Wrapped

.135 grounded capacity—.090 mutual capacity.
1% antimony in lead sheath.

Pairs	Outside Diameter Inches	Lead Thickness Inches	Full Reel Length Feet	Approx. Full Reel Shpg. Wt. per 1000 Ft.
5	.343	.070	3500	390
10	.406	.070	3500	480
15	.499	.070	3500	635
25	.562	.070	3500	805
50	.734	.070	3000	1205
75	.884	.075	2500	1625
100	1.004	.080	2500	2010
125	1.098	.080	2000	2330
150	1.192	.080	1600	2625
200	1.373	.085	1600	3320
250	1.508	.090	1500	3885
300	1.659	.095	1400	4540
400	1.898	.105	1200	5355
500	2.101	.105	1000	6850
600	2.273	.105	900	7725
800	2.605	.115	500	10240
900	2.730	.115	500	11240
1000	2.875	.125	500	12380
1200	3.156	.125	500	14160

CABLE

Insulation Resistance

The insulation resistance of each conductor shall be not less than five hundred (500) megohms per mile of cable for each length at 20 degrees C. (68 Degrees F.) each conductor being measured against all the rest and the sheath. The insulation resistance is tested with at least one hundred (100) volts after an electrification of one minute.

Electrostatic Capacity

Telephone cables can be furnished with average grounded electrostatic capacity of .08, .10, .12 microfarads per mile with high wires of .085, .105, .125 microfarads per mile respectively, the measurement being made at 20 degrees C. (68 degrees F.) while all the conductors and sheath are connected together.

Dielectric Strength

The insulation of each conductor measured against the rest and the sheath shall be capable of withstanding an electrification of five hundred (500) volts one (1) minute without rupture.

Inspection

The above tests shall be made at the works of the manufacturer by the manufacturer or the purchaser or his representative who will be afforded all reasonable means to assure himself that the material, workmanship, mechanical and electrical properties are as heretofore described.

Shipments

The cables shall be filled eighteen (18) inches on each end with a moisture repelling compound and sealed with solder making them air and moistureproof.

The cable will be shipped in standard lengths, or in length as specified on individual orders, on substantial wooden reels, slated to prevent injury to the cable.

No. 24 B. & S. GAUGE TELEPHONE CABLE

Double Reverse Paper Wrapped

12 Grounded Capacity-.080 Mutual Capacity
1% Antimony in Lead Sheath

Pairs	Outside Diameter Inches	Lead Thickness Inches	Full Reel Length Feet	Approx. Full Reel Shipping Wt., per 1000 Ft.
10	7/16	5/64	2640	550
15	17/32	5/64	2640	760
25	19/32	7/64	2640	870
50	23/32	5/64	2000	1420
75	31/32	9/64	2000	1990
100	1 1/16	3/32	1500	2210
125	1 3/16	3/32	1200	2670
150	1 5/16	7/64	1200	3210
200	1 15/32	1/16	1000	3770
250	1 5/8	1/8	800	5070
300	1 3/4	1/8	800	5630
350	1 7/8	1/8	700	6060
400	2	1/8	700	6570
500	2 1/4	1/8	500	7570
600	2 7/16	1/8	500	8540
800	2.730	1/8	500	10310
900	2.875	1/8	500	10910
1000	3	1/8	500	11505
1200	3.250	1/8	333	14105

Single Paper Wrapped

13 Grounded Capacity-.085 Mutual Capacity
1% Antimony in Lead Sheath

Pairs	Outside Diameter Inches	Lead Thickness Inches	Full Reel Length Feet	Approx. Full Reel Shipping Wt. per 1000 Ft.
10	.390	.070	3500	435
15	.453	.070	3500	595
25	.499	.070	3500	675
50	.656	.070	3000	970
75	.791	.075	2500	1360
100	.869	.075	2500	1530
125	.947	.080	2500	1850
150	1.035	.080	2500	2035
200	1.192	.080	1800	2510
250	1.326	.085	1800	2950
300	1.451	.085	1600	3390
350	1.524	.090	1600	3740
400	1.618	.090	1400	4120
500	1.815	.095	1100	5030
600	1.960	.105	1100	5950
800	2.273	.105	500	7910
900	2.366	.105	500	8650
1000	2.543	.115	500	9475
1200	2.730	.125	500	11425

No. 19 B. & S. GAUGE TELEPHONE CABLE

Double Reverse Paper Wrapped

12 Grounded Capacity-.080 Mutual Capacity
1% Antimony in Lead Sheath

5	15/32	5/64	2500	550
10	9/16	5/64	2500	840
15	21/32	5/64	2500	990
25	25/32	7/64	2000	1470
50	1 1/16	3/32	1500	2520
75	1 9/32	3/32	1200	3130
100	1 15/32	7/64	1000	3980
200	2	1/8	800	6985

Single Paper Wrapped

135 Grounded Capacity-.090 Mutual Capacity
1% Antimony in Lead Sheath

5	.453	.070	3500	600
10	.546	.070	3500	770
15	.609	.070	3500	880
25	.718	.070	3000	1180
50	.947	.075	2500	1820
75	1.176	.080	1800	2575
100	1.311	.085	1600	3120
200	1.784	.095	1200	5210

CABLE COMPOUND, CHAIRS

Cable Compound

Ever-Protect is a very high class material for underground cable construction without the use of conduit. Coated on and around cable, it prevents corrosion and deterioration of the cable sheath by chemical action and dampness from defective cable sheath.

Very easily melted and applied. A trench is dug and a wooden or metal trough, preferably the latter, is placed below the cable. A strip of tarred felt or fibre paper is laid in the trough. Apply a coat of Ever-Protect on this paper. After the compound is cooled the cable is laid and hot Ever-Protect poured in as shown in above illustration. The tarred felt or fibre paper is then wrapped about the cable and as the compound cools it sets and holds the paper firmly in place. As soon as the compound cools the cable is laid in the trench and the earth filled in.

One hundred pounds of Ever-Protect Cable compound will coat:

325 feet of 25 pair cable.
300 feet of 50 pair cable.
200 feet of 75 pair cable.
165 feet of 100 pair cable.
150 feet of 125 pair cable.
125 feet of 150 pair cable.
100 feet of 200 pair cable.

Packed in 50 pound cans, also open top iron drums of 350 to 400 pounds each. Heavy tarred felt paper can be furnished in rolls of 5, 6, 7, and 8 inches wide. Liquid compound for protecting checked and crystallized cable messenger, roofs and pole gains can be furnished in 1 to 5 gallon cans.

Wood Operator's Chairs

No. 1104-C
No. 1114-C

These first quality, straight-grained wood operator's chairs are finished in standard No. 9 Golden Oak. The Nos. 1110-C and 1104 chairs with cane seats are carried in stock. Shipping weight, crated, approximately 55 lbs. each. The first range measurement is the distance from the seat to the floor when the chair is in its lowest position, the second indicates the highest.

No. 1110 C

Cat. No.	Range	Outside Diam. of Foot Ring	Ring Height from Floor
1110-C	18"-22"	16"	2¾"
1104-C	24"-31"	17"	11⅝"
1114-C	28"-35"	17"	15½"

Do/More Metal Chairs

New in design — new in construction — the Do/More Telephone Operator Chair incorporates the many Do/More features that banish fatigue and promote health. There is but one way to sit in this chair — the *correct* way. The easily adjustable back — the form fitting seat and the swivel height adjustment are special Do/More features. Furnished in three ranges — 18" to 22", 24" to 28", 28" to 32". Choice of three types of seats as follows: Type RC — a round cane seat. Type RGL — a rectangular leather seat. Type RWC — a saddle wood frame cane seat.

Standard finish: Black or Olive Green enameled, Seat No. 9 Golden Oak.

Standard finish furnished unless otherwise specified.

No. 2832-RGL No. 2428-RWC No. 1822-RC

Cat. No.	Range	Seat	Diam. of Foot Ring	Ring Height from Floor	Shipping Weight Each
1822-RC	18-22"	Round Cane	17¼"	6½"	29 lbs.
2428-RC	24-28"	" "	"	8¾"	31 lbs.
2832-RC	28-32"	" "	"	12½"	32 lbs.
1822-RGL	18-22"	Rectangular Leather	"	6½"	29 lbs.
2428-RGL	24-28"	" "	"	8¾"	31 lbs.
2832-RGL	28-32"	" "	"	12½"	32 lbs.
1822-RWC	18-22"	Comb. Saddle Cane Seat	"	6½"	29 lbs.
2428-RWC	24-28"	" " " "	"	8¾"	31 lbs.
2832-RWC	28-32"	" " " "	"	12½"	32 lbs.

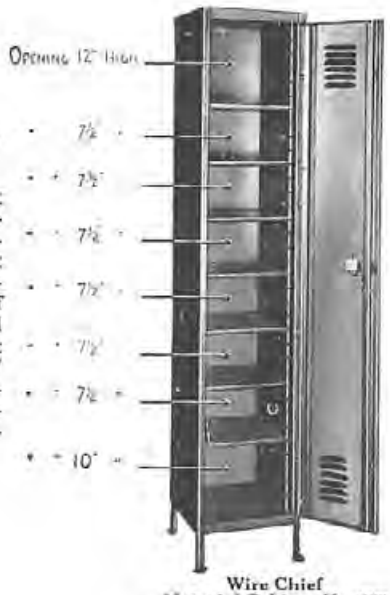
CABINETS

Lyon cabinets are specially built to meet the telephone company's needs. Each style is designed to fulfill a definite requirement as efficiently and economically as possible. Well constructed and made of metal throughout, they will give many years of good service, even though subjected to more than ordinary abuse. All the cabinets listed here are shipped set up completely as shown. They are finished in green baked enamel and fitted with a flat key lock, that is master-keyed. Three keys are furnished.

When ordering additional Lyon cabinets, state master key series.

Material Cabinet No. 883

A material cabinet adapted to a wide variety of uses. It provides a neat, compact storage cabinet for almost any kind of equipment. Equipped with seven shelves that are adjustable on 2" centers. All the openings are easily accessible. Overall dimensions 15"x15"x78".



Wire Chief
Material Cabinet No. 883

Compartment Cabinets

When a number of equal bins are required for storing small parts, these cabinets are recommended. The compartments are 6⅜ inches high, 7 inches wide, 8¾ inches deep. Specify numbering on top left hand compartment on each unit ordered. The standard plan of numbering is to begin with 0 for the top left hand compartment and count from top to bottom; e.g., the top compartment numbers will be 0, 10, 20 for the 850B cabinet, and 0, 10, 20, 30, 40 for the 850A cabinet.

The 30 compartment cabinet is same as the 50 compartment cabinet, except that it is three openings wide. The 15 compartment cabinet is same as the 30 compartment cabinet except that it is five openings high and has no base.

Overall Dimensions

Width	Depth	Height of Base	Height of Cabinet & Base
50 Compartment Cabinet No. 850A			
35¼"	8¾"	11"	74¾"
30 Compartment Cabinet No. 850B			
21¼"	8¾"	11"	74¾"
15 Compartment Cabinet No. 850C			
21¼"	8¾	0"	36"

Cord Cabinet No. 848

This cabinet is equipped with seven 6-in. cord hooks, and two clips on each side for holding wedge blocks. Like the other cabinets listed it has louvers for ventilation. Overall dimensions are 15" x 15" x 78".

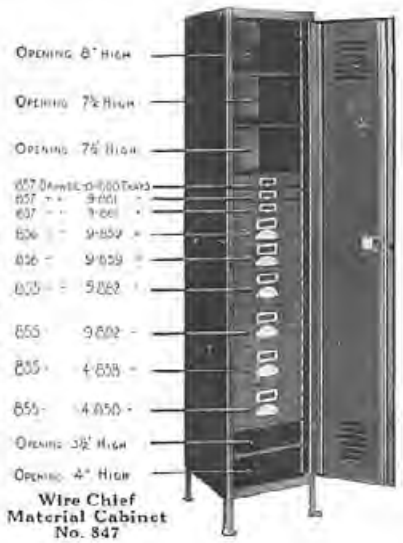
Tool Cabinet No. 884

This cabinet is equipped with one No. 891 tool panel insert fitted with 35 pegs adjustable on 1" centers. It has five shelves and two drawers, one No. 856 drawer containing nine trays and one No. 855 drawer. Overall dimensions are 15" x15"x78".

Wire Chief
Tool Cabinet
No. 884

Material Cabinet No. 847

For storing a variety of small pieces that must be kept separate, yet easily accessible, this cabinet is ideal. It has nine drawers and five shelf spaces to accommodate different materials. Shelves are adjustable on a 2" center. Overall dimensions 15"x15"x78".



Wire Chief
Material Cabinet
No. 847

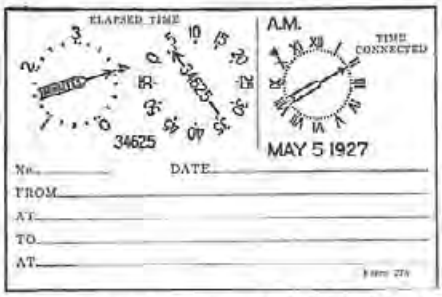
CALCULAGRAPHS

Calculagraphs

An elapsed time recorder that definitely and permanently establishes the time a toll circuit is in use. The measure of time elapsed secures an absolute record by which the toll fee can be accurately arrived at, avoiding disputes and preventing losses in the collection of revenues. Equipped with two levers; by operating one when a connection is established and the other when the conversation is finished, a true record is obtained similar to the one shown below. Two models are made: the No. 6 calculates and prints the elapsed time in minutes and quarter minutes and records the time of day. The No. 6X, in addition, prints the day, month and year. (See facsimile record below.)

Both models are furnished in two styles: Style C for sinking in the existing key-shelf to fit flush with the top, or Style A mounted on a pedestal that may be adjusted to any height from 26 to 40 inches and placed wherever desired.

Model 6	Style A—Pedestal type
Model 6X, with dater	Style A—Pedestal type
Model 6	Style C—Flush type
Model 6X, with dater	Style C—Flush type



Above is a record of Calculagraph Model 6X showing the time of day, that the connection was made 10:10 A. M., and the exact elapsed time the circuit was in use, four minutes. The number indicates the serial number of the Calculagraph to identify it. The record may be made on the standard toll ticket or tickets of any size.

Hand Counter

A Hand Tally Counter, useful for counting poles, calls, traffic work, etc. Quickly set back to zero by one turn of the knob. Can be operated with either hand. Has rounded corners so as not to irritate the hand of the user, or wear the pocket when carrying it.

Chronoscope

An instrument for timing telephone calls. This instrument is the newest and most reliable device made for checking the time of toll messages.

The method of using same is very simple. The Chronoscope is provided with two levers. A single downward pressure on the side lever will wind the clock, set it going and start the hand.

To stop the hand when through using the telephone, if interrupted, or line gets out of order, turn the top lever upward and the clock will stop. When telephone or line is in order again, press the upward lever downward and the instrument will record again the exact time the telephone has been used.

To set the hand back to the starting point, press the large lever on the side of instrument and the hand will fly back to the starting point, so that the instrument is always ready for use.

Metal Oxidized case 2½ inches. Diameter of dial, 2 inches. Six minute time. Bell on three and six minutes and stopper at any period.

Straight Counter

No. 8 Straight Counter

This counter is used in practically every telephone exchange throughout the country for making accurate traffic records.

The socket plate is intended to go flush into the keyboard slightly to the right of the operator and to remain there permanently. The counter can be then inserted and removed at will. At such periods as it is decided to make a count, counter is placed in the socket plate in front of each operator and upon receipt of each call the operator presses the lever. This counter registers up to 100,000.

Set Back Ratchet Counter

No. Z8T

No. Z8 T. This counter is suitable where a hand operated set back counter is desired, and can be furnished with the drive shaft projecting either on right or left hand side. Furnished with 3, 4 or 5 figure wheels.

CLAMPS, CLIPS

Guy Clamps
(Hot Galvanized)


No. 1033

The great holding power of No-Slip Guy Clamps is acquired by means of the diagonal ridges in the grooves which fit the lay of the strand and provide a much larger bearing surface than the smooth groove. The ends of the grooves are rounded to prevent injury to the strand by pinching, and the edges of the diagonal ridges are rounded to facilitate meshing when the clamp is tightened and each individual strand is automatically forced into position.

These clamps are furnished with high carbon, heat-treated track bolts with low pitch threads, which give the greatest possible leverage. The bolts have oval necks (in case of Nos. 1030, 1031, 1033 and 930) and square necks (in the case of Nos. 1032, 931, 932, 933), which fit into similarly shaped holes in the clamp plates and prevent the bolts from turning when the nuts are being tightened. Nos. 1033 and 930 are generally considered standard.

Cat. No.	Description	Size Bolt Inches	Std. Pkg. Quan.	Wt. Lbs. per 100
1030	2 Bolt 3 inch Smooth Groove...	½	100	135
1031	3 Bolt 4 inch, "No-Slip" Groove	⅝	50	155
1033	Standard 3 Bolt 6 inch, "No-Slip" Groove	⅝	50	216
930	Standard 3 Bolt 6 inch, Smooth Groove	⅝	50	216
1032	Heavy Type, 3 Bolt 6 inch, "No-Slip" Groove	⅝	50	263
931	Heavy Type, 3 Bolt 6 inch, Smooth Groove	⅝	50	263
932	4 Bolt, Heavy Type 8 inch, "No-Slip" Groove	⅝	25	328
933	4 Bolt, Heavy Type, 8 inch Smooth Groove	⅝	25	328

Malleable Iron Guy Clamps
(Hot Galvanized)

Cook's Universal malleable iron guy clamps are used for light construction and for the same purpose as the smaller no slip clamps are, but for service Kellogg recommend the rolled steel clamp, thereby making all construction standard and eliminating so far as possible all special material.

Cat. No.	Size	Std. Pkg. Quan.	Wt., Lbs. per 100
1029	3 bolt 5 inch	125	160

Cable Suspension Clamps
(Hot Galvanized)


No. 1096


No. 1095

Cable Suspension Clamps shaped so as to securely grip the messenger strand. The one-bolt clamp is furnished less bolts.

In attaching to pole, a nut and square washer are placed between the clamp and pole to provide clearance for the cable. Where cables are to be mounted on both sides of the pole, a ⅝-inch double arming bolt is usually used instead of a machine bolt.

Cat. No.	Description	Length Inches	Std. Pkg. Quan.	Wt., Lbs. Per 100
1095	One bolt	2½	100	75
1096	Three bolt	6	50	220

Cross Over Clamps
(Hot Galvanized)


No. 7930

Cross over clamps are used for joining two cable messengers when they cross each other at right angles, or where cables turn corners, or branch cables leave the main points some distance away from the supporting pole. Their use is to assure alignment of the main line messenger or branches.

Cat. No.	Description	Size of Sides, Inches	Std. Pkg. Quan.	Wt., Lbs. per 100
7930	Drop Forged	1½x3½x½	125	160


No. 8986

Grade Clamps
(Hot Galvanized)

Kellogg recommend this type clamp for securing lead cable to messenger strand on steep inclines. Drop Forged Grade Clamps are ⅜" thick and are furnished with four ½" clamp bolts which have elliptical shoulders to prevent turning while the nuts are being tightened.

Cat. No.	Size Clamp	Size Cable	Wt., Lbs. per 100
8986	5¼" x 4"	1⅜"	200
8987	6¼" x 4"	2 1/16"	245
8988	7" x 4"	2⅛"	266
8989	7⅞" x 4"	2⅞"	284

Drop Forged Wire Rope Clips

Genuine Crosby Clips are designed to exert maximum grip without injury to the strand. The base of saddle is drop forged from steel of special analysis and the U bolts are cold bent from selected screw stock steel. After being thoroughly smoothed off on the emery wheels and in tumbling barrels, they are galvanized and given a final rigid inspection.

They are easily applied and taken off, requiring no special skill. The U bolt should bear on the short end of the strand so that the flat base of the clip rests on the tension side of the strand, otherwise the strand is liable to be injured by putting a crimp into the tension side. No fewer than two clips should be used and preferably four to six, particularly where any unusual strains are likely to develop.

Cat. No.	Size Inches	Wt., Lbs. per 100	Cat. No.	Size Inches	Wt., Lbs. per 100
1038	¼	31	1043	⅝	106
1039	5/16	33	1044	¾	164
1040	⅜	35	1045	⅞	253
1042	½	75	1046	1	294

Strand Connector

Diamond Galvanized Strand Connectors will connect dead ends of messenger strands when they occur between pole, and result in great economy in pole line construction. It is customary where a messenger strand ends between poles to wrap the surplus wire around the last pole passed, resulting in a considerable loss of strand. Width of groove, 1 inch; diam., ⅜ inch; weight, 1 lb. each.

Width of groove, 1 inch; diam., ⅝ inch; weight, 1 lb. each.

CLAMPS, CLEATS, CLEANERS

Combination Cable Clamp

This new Combination Cable Clamp and Bridle Ring provides a more economical and more quickly applied fastening for attaching lead covered cables and parallel runs of bridle wire to walls. It has resulted in economies in cost of material and labor and has eliminated certain objectionable features in clamps previously used for this purpose.

The rings are snapped into place by hand and may easily be opened, as shown in illustration for the addition or removal of bridle wires. They may be attached to the clamps at any time subsequent to their installation. Only one size of ring is used interchangeably with all sizes of clamps. Furnished less Bridle Rings unless otherwise specified.

Cat. No.	Size, Cable Out. Dia. Inches	Size, Inches Wood Screw	Size, Inches Lead Anchor	Wt., Lbs. per 100
0-A	9/16	No. 14x1 1/4	1/4x1	4
0	11/16	No. 14x1 1/4	1/4x1	4
1	13/16	No. 14x1 1/4	1/4x1	5
2-A	1	No. 14x1 1/4	1/4x1	6
2	1 1/16	No. 14x1 1/4	1/4x1 1/4	6
3-A	1 3/8	No. 14x1 3/4	1/4x1 1/4	17
3	1 9/16	No. 14x1 3/4	1/4x1 1/4	17
4-A	1 7/8	No. 14x1 3/4	1/4x1 1/4	20
4	2 3/16	No. 14x1 3/4	1/4x1 1/4	20
5	2 5/8	No. 14x1 3/4	1/4x1 1/4	31

One size of Ring fits all Sizes of Clamps. Diameter of eye, 1 inch. Weight, 4 lbs. per 100.

Screw Anchors for Combination Clamps

Description	Wt., Lbs. per 100
1/4x1 in. for Clamp No. 0/A to No. 2	5
1/4x1 1/2 in. for Clamp No. 3/A to No. 5	6

Small Cable Clamp Less Bridle Ring Attachment

Cat. No.	Size, Cable Out. Dia. Inches	Size, Inches Wood Screw	Size, Inches Lead Anchor	Wt., Lbs. per 100
0/G	3/16	1x8	3/16x7/8	1
5/0	3/8	1x8	3/16x7/8	1
4/0	1/16	1x8	3/16x7/8	1 1/2
3/0	1/2	1x8	3/16x7/8	1 1/2
2/0	5/8	1x8	3/16x7/8	2

Fibre Cleats

Style No. 1 Style No. 2 Style No. 2-A

Fibre cleats are furnished in three styles—as per cut. These cleats furnish a neat and substantial method of permanently retaining interior wire in place, especially on lath and plaster walls where it is not desirable to fasten with nails or staples.

Eureka Portable Cleaner

The Eureka Portable Cleaner is very easy to use. It is supported by a strap over the operator's shoulder and the weight with cleaning tools is only 8 1/2 pounds. It develops powerful suction from an air-cooled motor and is sold under a written guarantee. Many of the largest telephone companies in the country are using this cleaner.

As shown in illustration, this cleaner is supported at the operator's side and out of the way of all equipment. The operator may stoop, climb a ladder with it, or get into other inaccessible places, due to its compact construction and to the unique method of its use. This cleaner has been tested in a number of exchanges and has been found to be practically indispensable for cleaning switchboards, cable runways, relay racks, distributing frames and for general cleaning of telephone equipment and apparatus. It is also a handy instrument for cleaning upholstery of automobiles, etc.

For cleaning telephone equipment by suction, use the end of the fibre hose, and the bristle brush tool. When you desire to use the Eureka Portable Cleaner as a blower, simply remove the bag, attach the blower coupling, put on the hose and you then have a powerful blower for cleaning surfaces inaccessible to the suction tools. Will not cause injury or disturb adjustment of relays.

Kling Ground Clamps

A galvanized steel clamp for connecting ground wires to 1/2-inch and 5/8-inch ground rods equipped with cup pointed set screw which insures a good contact, even on a rusty rod. Adapted for either iron or copper ground wires. Made in two sizes, 1/2 inch for 1/2-inch rods and 5/8 inch for 5/8-inch rods. Clamps should be attached before rod is driven. Shipping weight 1/2-inch, 15 lbs. per 100; 5/8-inch, 17 lbs. per 100.

Adjustable Ground Clamps

The most approved method of permanently making ground connections at subscribers' stations where water pipes are available and where it is inconvenient to solder ground wires onto ground rods.

Cat. No.	What They Fit	Ship. Wt. per 1000
0	5/8 & 1/2-inch ground rods	30 lbs.
1	3/8, 1/2, 3/4, 1 & 1 1/4-inch pipe	55 lbs.

CLEANERS, CLIPS

Eureka De Luxe Cleaner

The Eureka DeLuxe brings you greater convenience, ease of operation, cleaning effectiveness and beauty unusual in an electric cleaner—at the lowest price possible for such quality.

The new "full-floating" brush is a sensational innovation. By spring pressure it "rides" on the floor covering, and provides the positive brush action so necessary for quick removal of lint, hair, threads and other surface litter. At the same time the "floating" action allows for the natural wear of the bristles—not possible in any other type of permanently fixed brush. It is equipped with a full 1/5 H. P. motor, air cooled, steel fan, bonalite castings.

This super-powered Eureka De Luxe cleans deeply, swiftly and thoroughly—removing all deeply embedded, stubborn dirt by "High Vacuum"—the identical cleaning principle of all costly installed systems built into large buildings and hotels.


Head Attachments

The beautiful new red bag—with patented steel-spring opening for easy emptying — is made of a special finely woven fabric, which definitely improves dust screening action.

The 20-foot extension cord, by attaching to the regular cord, gives a 40-foot cleaning radius. Also used when cleaner is connected with automobile cleaner.

The convenient radiator tool permits cleaning in otherwise unreachable places, and is also most useful in renovating pillows, cushions, etc.

The upholstery nozzle with brush is scientifically adapted to the thorough cleaning of upholstered furniture, drapes, stair-carpets, mattresses and pillows.

A 30-inch extension tube permits the easy and effective cleaning of mouldings, baseboards, drapes and other hard-to-get-at places.

The improved floor polisher gives floors a beautiful, lustrous finish at a great saving of time and labor.

Eureka Sanitor and sanitizing compound sanitizes, deodorizes and assists in moth control.

Switchboard Jack Cleaners

These brushes are recommended for cleaning switchboard jacks when used with carbon Tetra Chloride liquid being revolved on a flexible shaft or wheel drill. This is an ideal way to clean switchboard jacks and is non-injurious. Brushes are furnished in two sizes—No. 32 diameter .249 fits all Jacks approximately ¼-inch in diameter; No. 22 diameter .221 fits all Jacks using No. 201 Kellogg plugs. Carbon Tetra Chloride liquid is also an excellent cleaner for Switchboard plugs. Furnished in either 4 oz. or 8 oz. bottles.

Cylinder Bellows

No. 1 Universal Duster

Made entirely of wood. No chance for short circuits. Ideal for dusting out switchboard relay racks and places where cloths or brushes are liable to cause injury to contacts or disturb adjustment of relays.

Cat. No. 1 Length, 20 inches Wt., each, 10½ ounces.

Fahnestock Clips

These clips are made of special copper bronze spring metal for different sizes of wire and for connecting an iron to iron wire, a copper to a copper wire, or an iron to a copper wire. In every case the metal used is the same, but when the connector is meant to be used on an iron wire it is coated with pure block tin by dipping it in the melted metal. Always specify whether clips are to be used on iron wire, copper wire, or on iron to a copper wire; also mention the size of wire and gauge when ordering.

Plain

No. 3

Cat. No.	Size Wire B & S Gauge	Size Inches	Size Screw
2	No. 10	1 x 3/8	No. 8
3	No. 10	1 1/16 x 3/8	No. 8
3C	No. 12	7/8 x 3/8	No. 6
4	No. 10	1 x 5/8	Threaded 8-32
10	No. 14	3/4 x 5/16	No. 6

With Lug

No. 5

Lug is provided for soldering wire. Length shown does not include the lug.

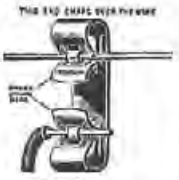
Cat. No.	Size Wire B&S Gauge	Size Inches	Size Screw
5	No. 10	1 1/16 x 3/8	No. 8
5-C	No. 12	7/8 x 3/8	No. 6
8	No. 10	1 3/8 x 3/8	No. 8
8-C	No. 12	1 1/16 x 3/8	No. 8
15	No. 16	1/2 x 7/32	No. 4

Plain Type

No. 9

Cat. No.	Size Wire B&S Gauge	Size Inches	Size Screw
9	No. 10	2 1/16 x 3/8	No. 8
9-C	No. 10	1 3/4 x 3/8	No. 8

Snap Over Type


No. 34

One end snaps over the line. Other end does not snap over wire but will take any size wire up to No. 7 B&S gauge. Made in one size only.

Cat. No.	Size Wire B&S Gauge	Size Inches
34	Up to No. 7	2 3/4 x 5/8

Double Type


No. 30

The No. 30 clip is made by riveting two large clips together. Both ends snap over the line wire and are used for test poles or party line work.

No. 31 consists of one large and small clip riveted together. The small clip does not snap over and will take up to and including a No. 10 B&S gauge wire. Used for attaching drop or jumper wires to line on junction poles or party line.


No. 31

Both made for any sizes of wire.

Cat. No.	Size Wire	Size, Inches
30	As ordered	1 5/16 x 5/8
31	As ordered	1 5/16 x 5/8

CONNECTORS

Connecting Block

Detroit

This connector consists of two No. 9C binding posts mounted on a molded composition base in imitation of hard rubber. This connector will take No. 10 B.&S. gauge wire.

Length Over All Inches	Width Inches	Thickness of Base Inch
2½	1⅜	⅜

Murdock Connector Block

No. 1

Terminal connection units extensively used in telephone and telegraph practice, and suitable for any installation requiring the distribution of many low voltage wires. Adaptable to any installation. May increase or decrease the number of pair connectors at pleasure. The interlocking feature makes them readily installed as strips. Made of moulded composition of the highest insulating properties. Unit size 1½ x 1⅜ x 3/16 inches.

Cat. No.	Description	Wt., Lbs. per 100
1	Fitted with 4 binding head screws with one washer under each; detachable links.....	8
3	Fitted with 2 binding head and 2 round head screws, the latter with check nuts.....	9

Two holes in side for entering wires or cord tips. Links are attached.

Test Clips

No. 27

No. 21-A

No. 2

These clips take a good firm hold and are constructed with a thin nose for tight quarters. The Nos. 27 and 28 are furnished with side jaws for bare wire testing. By using these clips in connection with a pocket knife a contact can be made without skinning the insulation from wire.

The insulated connectors can be attached to the wire without the lineman coming in metallic contact with it. No. 28, same as No. 27, only insulated; No. 25 same as 24, only insulated, Nos. 27 and 28 recommended for telephone work; Nos. 24 and 25 for electric light; No. 21-A for storage battery.

The No. 2 Testing Clips are used for piercing insulated wires. They are made of heavy nickel silver with hard sharp spikes.

Cat. No.	Stock	Insulated or bare	Spread of Jaws Inches	Amperage	Wt., Lbs. per 100
27	Copper	Bare	9/16	10	4
28	Copper	Insulated	9/16	10	5½
24	Copper	Bare	¾	20	5
25	Copper	Insulated	¾	20	6
21-A	Lead P Steel	Bare	1½	35	15
2	Nickel Silver	Bare	⅝	10	4

Test Connectors

These connectors are made from Copper bar, very easily installed and insure good permanent contact.

Cat. No.	Finish	Used to Connect	Wt., Lbs. per 100
1	N.P. Brass	No. 17 or 18 B & S Copper Wire	2
2	Plain Brass	No. 12 B & S or 14 N.B.S. Copper Wire	2½
2-T	Tinned Brass	No. 14 B.W.G. iron wire or smaller	2½
3	Plain Brass	No. 10 B & S or 12 N.B.S. copper wire	5
3-T	Tinned Brass	No. 12 B.W.G. Iron Wire	5
4	Galv. Iron	No. 12 B.W.G. Iron Wire	5½
6	Steel and Brass	Copper Drop to No. 12 B.W.G. Iron Wire	11
7-A	Plain	No. 16-17 B & S Copper Wire	6¼
260	Plain	No. 10-17 B & S Copper Wire	10
155	Plain	No. 6 Telephone Batteries	2½
86	Plain	No. 10 B & S Copper Wire and Smaller	2½
2451	Plated	No. 12 BWG iron wire and smaller	2½
1600	Aluminum	No. 12 BWG iron wire and smaller	2
1612	Plated	No. 12 BWG iron wire and smaller to No. 10 B&S Copper wire	2

GROUND CONES, CONDUIT

Ground Cones

The subject of adequate dependable grounding of the exchange equipment and of the cable terminals is of vital importance to every telephone company. The danger of high tension wires breaking and falling across telephone lines is always present and is as much of a problem as the lightning hazard. The fused lightning arrester may operate perfectly but if the ground is rusted away or is inadequate in discharge area to instantly carry off the charge, serious damage will result.

In addition to protective advantages a good ground is very essential for eliminating inductive interference or cross talk. Majority of cross talk, it has been found, to be due to insufficient ground connection. Good ground connection drains the telephone circuits of all surplus and static currents. For a good ground Kellogg recommends the use of Paragon Ground Cones.

Paragon Ground Cones are made of heavy continuous copper with all joints spot welded. There is nothing to rust or corrode, no soldered connections to come apart by galvanic or electrolytic action. Pure granular charcoal is used as a filler and aids in attracting and holding moisture about the ground.

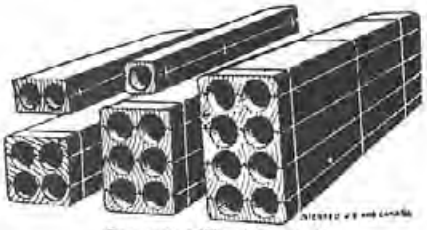
They are easily and quickly installed with an ordinary post hole auger—no large excavations are required. They provide a large surface discharge area all concentrated in permanently moist earth.

These cones are inexpensive in first cost—easy and cheap to install and are permanent and sure acting in operation. They represent a big actual saving over a long period of time and provide definitely dependable protection.

Furnished in two types; one, the cylinder type with solid walls, the other the cone type with perforated walls. Each cone is furnished with five feet of No. 4 soft copper lead in wire welded to the cone.

Cat. No.	Type	Length Feet	Diam. Inches	Discharge Area	Wt., Lbs. Each
1	Cylinder—Solid	1	4	340 Sq. In.	4
2	Cylinder—Solid	2	4	678 Sq. In.	6
3	Cone Perforated	1	4	340 Sq. In.	4
4	Cone Perforated	2	4	678 Sq. In.	6

Creosoted Wood Conduit



Creosoted Wood Conduit

These "Mereduc" conduits are made of selected Southern Pine and are treated with the best creosote, 15 lbs. to the cubic foot. A few reasons why you should consider these conduits are:

1. Their average life is fifty years and there are seldom any replacements necessary.
2. They weigh less than clay conduit, which lessens transportation charges and makes them easy to handle.
3. They are unbreakable.
4. They can be opened up to allow the cable to be repaired and then closed up without any special tools or skilled labor.
5. The creosote process used keeps them in good condition and prevents insects, especially the Borer, from getting in to the cable and causing trouble.
6. The installation of the cable in this conduit is economical. The bore is smooth, which allows the cable to slip through the ducts without the use of lubricants.
7. "Mereduc" conduits are sold in single ducts or in multiples of two to twelve. The single ducts have mortised and tenoned joints and multiples are finished with smooth joints and wrapped with burlap and coated with pitch to give a finished installation.

Lengths

Single duct.....1.5 feet to 12 feet
Special requirements up to 20-foot lengths

Multiple ducts.....1.4 feet to 6 feet
Special requirements up to 20-foot lengths

Weights

2-in. single interlock duct.....2 lbs. per duct ft.
2½-in. single interlock duct.....3 lbs. per duct ft.
3-in. single interlock duct.....4 lbs. per duct ft.
3-in. multiple duct.....3 lbs. av. duct ft.

Bore

Single, 1½-inch, 2-inch, 2½-inch, 3-inch Bore.
Multiple: 3-inch Bore.

CONDUIT, CLAY

A Permanent Protection for Telephone Cables Now Tried and Proven for Over 40 Years

Natco Clay Conduit is manufactured from special high-grade clays, ground and moulded into form, then vitrified into a flint-like rock by over 2,000 degrees of heat, and salt glazed to provide permanently smooth glass-like duct surfaces. It constitutes a safe barrier between the cables and the ever present agencies of destruction, collapse and disintegration.

Permanence

Permanent in character and in form, economical in first cost and upkeep, Natco Conduit will not soften, swell, deform or disintegrate on exposure to heat, moisture, frost, steam or chemical attack. Proof against chemical attack from without, Natco Conduit is in itself absolutely free from caustic alkalies, acids or organic compounds that would harmfully affect the cable sheath.

Strength and Rigidity

Of high compressive strength, Natco Clay Conduit will safely carry all normal street loads, and stand up under severe traffic vibration. It permits immediate back-filling of trenches. Natco Clay Conduit may be readily incorporated into the walls or floors of telephone exchange buildings, repeater stations and other structures, as these structures are built and at a little cost, thus providing permanent cable protection against moisture, fire, corrosion. As Natco never swells on exposure to moisture, it will never strain, crack or damage the masonry which surrounds it.

Flexibility and Low Cost

Natco Multiple Duct units are quickly and economically installed. New shapes are available for constructing curves; for turning branches; for transposing duct lines and cables in crossing bridges of viaducts, or circumventing street obstructions; for splaying duct lines in approaching manholes or cable vaults; for constructing laterals; and for other special applications. The Natco comprehensive line assures extreme flexibility in construction, fewer manholes, less splicing and bending of cables, and lower installation costs. Natco's glass like surfaces never soften, swell or peel. The coefficient of friction is low; cable pulling hence is safe and easy.

Maintenance and Depreciation

Repairs to cables, if any, may be made quickly and the duct line restored to its original condition by the use of Natco Split Conduit. Salvage or replacement of valuable cables can be carried out at any time, with no damage and little expense. There is no depreciation, little maintenance; service is continuous and dependable.

Quality and Service

Rigorous inspection, carried on at every stage of manufacture, and designed to exclusively serve the interests of the user of Natco Clay Conduit, assures the highest quality—a quality guaranteed by the name "Natco" stamped on every piece. Full stocks, large manufacturing facilities, and skilful labor assure prompt shipments; scientific shipping methods assure the arrival of the conduit on the job in good condition.

Types of Natco Conduit

Two general types of Natco Underground clay conduit are manufactured: single duct and multiple duct.

Natco Single Duct Conduit. This is adapted to laterals, and is made both in round bore, and square bore with rounded corners. It is scarified lengthwise on four sides to provide anchorage for joint mortar.

Natco Multiple Duct Conduit. This provides longer lengths, and a multiplicity of duct holes. In all shapes, through dowel holes permit positive alignment. Economical and quick to install, and especially adapted to all telephone work. Scarifications around the outside at a short distance from each end provide anchorage for joint mortar. The bore of the duct holes is square in cross section with rounded corners.

Natco conduit is made in two sizes of bores—3¼ inch, which is standard in most telephone work, and 3½ inch.

Natco conduit is made in standard lengths, also in short lengths for breaking joints and filling out at manholes. See table.

Dimensions are uniform to meet exacting requirements. Liberal thickness of walls and webs insure strength and reduce chipping and breakage in transit and handling.

Natco Split Conduit

Made in all single and multiple duct-forms. See table for lengths. These split sections make it easy to replace or repair conduit lines, and they may be also used to enclose cable joints or splices, in place of building manholes.

Dowel Pins

Steel dowel pins $\frac{3}{16}$ x 3 inches with washer at the center can be furnished. It requires only two pins for each piece of conduit regardless of the number of dowel holes in the latter. **When ordering specify if you wish dowel pins furnished.**

Bends

Natco Single Duct Bends can be furnished in all standard bores in either 45 degree or 90 degree angles and in 12, 18, 24, 30 or 36-inch radius. The radius is measured from the center line of the duct hole. It takes four 90 degree bends or eight 45 degree bends to form a complete circle of 360 degrees. These curves can be furnished knifed for splitting apart or can be furnished solid without the knifing.

CONDUIT, CLAY

Single Duct, Square Bore 18 Inches Long.

Single Duct, Round Bore 18 Inches Long

Two Duct, Square Bore 24 Inches Long

Mitered Conduit 3'-10' Foot Radius (for Curve Construction). Approximate Length, 6 x 6¾ Inches; 2, 3, and 6-way, Edge or Flat Position; 4 and 9-way.

Three Duct, Square Bore 24 Inches Long

Branch Conduit (for Dividing Conduit Lines) 24 Inches Long. 2, 3, 4 and 9-way for 2 Branches; 3 and 6-way for 3 Branches; 6-way for 2 Branches (2 or 3-way).

Four Duct, Square Bore 36 Inches Long

Split Conduit (for Quick Repairs), 18 Inches Long; 1, 2, 3, 4, 6 and 9-way.

Six Duct, Square Bore 36 Inches Long

Transposition Conduit (for Transposing Ducts and Cables) 24 Inches Long. 2, 3 and 6-way, 22½° R, H. or L. H.

Nine Duct, Square Bore 36 Inches Long

Socket Joint Single Duct (for Laterials), 18 Inches Long.

Natco Underground Clay Conduit

Standard Shapes and Sizes

Type	Nominal Bore Inches	Actual Bore Inches	Approx. Outside Dimensions Inches	No. of Dowel Holes	Standard Length Inches	Duct, Feet per Pc.	Lengths of Short Pieces Inches	Wt., Lbs. per Duct Foot	Approx. No. Duct Feet in Carload
Single Duct	3¼ Rd.	3⅜	4⅛x 4⅛	0	18	1½	2 to 15	8	7500
Single Duct	3½ Rd.	3⅝	4¾x 4¾	0	18	1½	2 to 15	10	6600
Single Duct	3½ Sq.	3⅝	5 x 5	0	18	1½	2 to 15	11	6000
Multiple Duct									
2-duct	3¼ Sq.	3⅜	4¾x 8⅛	2	24	4	6, 8, and 12	8	7500
3-duct	3¼ Sq.	3⅜	4⅞x12⅜	4	24	6	6, 8, and 12	8	7500
4-duct	3¼ Sq.	3⅜	8¾x 8⅛	5	36	12	6, 9, 12 & 18	7	8500
6-duct	3¼ Sq.	3⅜	8¾x12¾	2	36	18	6, 9, 12 & 18	7	9000
9-duct	3¼ Sq.	3⅜	13 x13	4	36	27	6, 9, 12 & 18	7	9000
2-duct	3½ Sq.	3⅝	5⅛x 9⅜	2	24	4	6, 8 & 12	9	6500
3-duct	3½ Sq.	3⅝	5⅛x13⅜	4	24	6	6, 8 & 12	9	7000
4-duct	3½ Sq.	3⅝	9⅜x 9⅜	5	36	12	6, 9, 12 & 18	8	7500
6-duct	3½ Sq.	3⅝	9⅜x13⅜	2	36	18	6, 9, 12 & 18	8	7500
Splits									
Single duct	3¼ Rd., 3½ Rd. or 3½ sq. bore				18		6–9–12		
2 and 3 duct	3¼ or 3½ sq. bore				24		6 9 12		
4 and 6 duct	3¼ or 3½ sq. bore				18		6–9–12		
9-duct	3¼ sq. bore				18		6 9 12		

Minimum Car (60,000 lbs.)
Maximum Car (approx. 75,000 lbs.)

CONDUIT, FIBRE

Fibre Conduit

Fibre Conduit is made of fibrous pulp, thoroughly impregnated with a preservative and waterproofing compound. It is light in weight and is made in lengths which experience has shown may be more conveniently and economically laid than either longer or shorter lengths. It affords maximum protection to cables, both in the process of drawing and afterward. May readily be cut with lathe tools or saw.

Furnished in two types—Harrington Joint Type (Tapered Sleeve) and Socket Joint Type.

Socket Joint

The Socket Joint is cut to a slight taper, uniform in size and reamed so that there is no appreciable offset on the inside of the pipe at the joints. Since these joints are machine-cut, they form a connection that is perfect in fit and alignment.

Approx. Inside Diameter Inches	Standard Crate Contains Feet	Approximate Gross Weight Standard Crate, Pounds	Approximate No. of Feet Minimum Carload 30,000 Lbs.
2	200	275	32300
2½	200	320	27000
3	150	290	22000
3½	125	310	18000
4	100	280	16000
4½	80	280	13200
5	60	280	10000

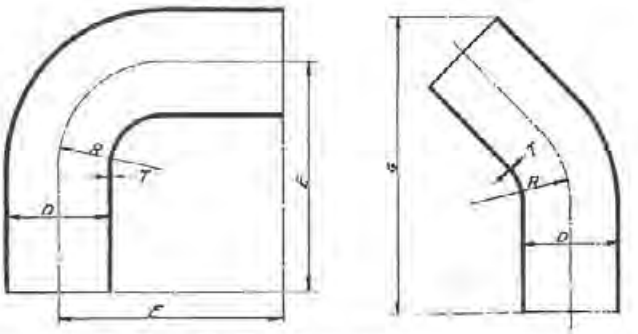
Harrington Drive Joint
(Tapered Coupling)

The Harrington Joint is usually specified for installations where concrete protection is not provided. Some of the advantages obtained by its use are:

(1) Tighter joints, more easily made.
(2) Greater flexibility, making it possible to pass minor obstructions by slight deviations from perfectly straight runs.
(3) Less waste, as a new taper can easily be formed on the ends of broken pieces.

Approx. Inside Diameter Inches	Standard Crate Contains Feet	Approximate Gross Weight Standard Crate, Pounds	Approximate No. of Feet Minimum Carload 30,000 Lbs.
2	200	295	31300
2½	200	355	24700
3	150	330	20500
3½	125	335	17000
4	100	320	14850
4½	80	320	12100
5	60	292	9200

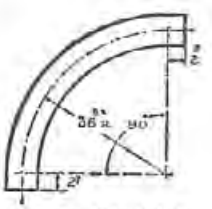
Fibre Conduit Elbows



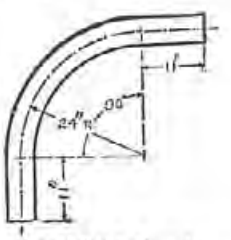
Dimensions below are in inches, and approximate only

D	2	2½	3	3½	4	4½	5
R	2½	2½	3	3	3½	4½	5
E	6	6½	6½	7	7½	8	11
G	8½	9	9	9½	10½	12	16
T	¼	¼	¼	¼	3/32	5/16	3/8

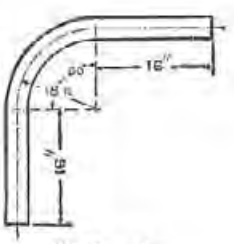
Fibre Conduit Bends



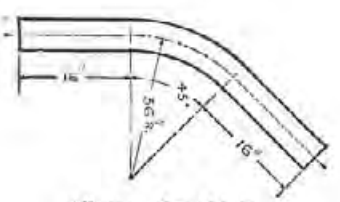
All sizes, 2" to 5" I. D



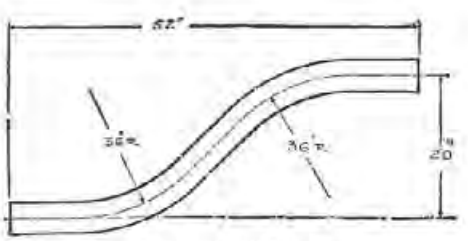
2" and 2½" I. D. only



2" I. D. only



All sizes, 2" to 5" I. D.



Standard "S" Bend—
All sizes, 2" to 4½" I. D., 36" Rad.
5" size, 18" Rad.

EXTINGUISHERS

PYRENE FIRE EXTINGUISHER
Wall Bracket Type

Pyrene

Pyrene Fire Extinguishers are ideal for telephone companies. They stop the fire before it can spread—thereby helping to maintain continuous telephone service. Pyrene Extinguishers are approved by the Underwriters Laboratories and are the most effective type for smothering any class of fire in its incipient stage; fires, inflammable liquids or electrical equipment. The liquid is non-conductive of electricity and will not injure electrical apparatus. Ideal for protecting switchboards, rheostats, controller boxes, oil transformers or any other electrical device. Pyrene should be used in fighting fires that start in oil, paint, gasoline, shellac, or any other highly inflammable substance.

The double-acting pump with patented rotating pick-up will discharge a steady, continuous stream 25 to 30 feet, regardless of what position the extinguisher is held in.

It is recommended to use only Pyrene Fire Extinguishing Liquid in refilling extinguishers, as any other liquid may cause corrosion or make use of the extinguisher on electrical equipment dangerous. Pyrene liquid will not freeze at 50°F below zero.

Pyrene Extinguishers are made in a standard brass finish. They can be furnished in nickel plated or colored Duco finishes to match interior decorative schemes. When ordering Duco finish, specify color and furnish sample.

Cat. No.	Description
C11	1 pint Polished Brass, Wall Bracket.
C21	1 quart Polished Brass, Wall Bracket.
C31	1½ quarts Polished Brass, Wall Bracket.
CR1	1 pint can Refill Pyrene Fire Extinguishing Liquid.
CR2	1 quart can Refill Pyrene Fire Extinguishing Liquid.
CR3	1½ quart can Refill Pyrene Fire Extinguishing Liquid.
CR4	1 gallon can Refill Pyrene Fire Extinguishing Liquid.

GUARDENE FIRE EXTINGUISHERS

Guardene

The 2½-gallon Guardene Soda and Acid (Chemical) Extinguisher will extinguish incipient fires in free-burning materials—such as wood, rubbish and textiles—where the cooling and quenching effect of water is of first importance. This extinguisher ejects a stream 40 feet in any direction. It should be protected against frost.

The three container units—shell, dome and bottom—are made of finest quality cold-rolled copper. All seams are thoroughly sweated and heavily backed with solder. The side seam is riveted in addition to soldering.

As a further safeguard against corrosion, the interior is completely coated with a lead-alloy. Each extinguisher is tested to withstand a pressure of 350 pounds complying with Underwriters Laboratories requirements.

To operate, tip the Guardene up-side-down. To stop the flow, turn it right-side-up. It must be recharged immediately after use.

Insurance authorities require annual inspection and recharging of Soda and Acid Extinguishers. Guardene Charges contain the highest grade Sulphuric Acid and Soda Bicarbonate packed in air tight containers, acid bottles sealed with safety closure.

Cat. No.	Description	Height	Capacity	Wt., Lbs.
S13	Copper, Polished.	24 in.	2½ gal.	40
S12	Copper, Nickel Plated.	24 in.	2½ gal.	40
S14	Copper, Chromium Plated.	24 in.	2½ gal.	40
SR1	Soda and Acid Recharge.			

Pyrene Fire Extinguisher—Pressure Type

Pyrene

This extinguisher consists of a top stamping and bottom casting made of high-pressure brass to which is fastened an inner and outer shell of heavy gauge, seamless drawn tubing forming two chambers. The inner chamber contains air pressure and the outer chamber contains Pyrene Fire Extinguishing Liquid. These two chambers are sealed tightly against each other. When the operating valve wheel is turned, air pressure enters the liquid chamber, thus expelling a continuous stream of liquid through a flexible metal hose, rubber insulated.

An efficient pump is built into this extinguisher to renew air pressure. For convenience, in addition, an air valve permits a service air line to be used where available.

The open face pressure gauge at the top indicates the correct air pressure in the chamber at all times. An inspection glass is also provided so that the liquid level may be observed. The normal level is the center of this glass.

To recharge, unscrew the filler cap, pour in one gallon of Pyrene Fire Extinguishing Liquid, replace the filler cap, open the small disc valve and pump to 100 lbs. pressure, close the small disc valve and the extinguisher is ready for use.

To operate the extinguisher, grasp the hose in right hand and with left hand operate valve wheel which completely controls the flow of air and liquid at a quarter turn. The stream ranges from 30 to 40 feet.

The one-gallon pressure type Pyrene Fire Extinguisher is inspected and labeled by the Underwriters Laboratories and approved by the Associated Factory Mutual Laboratories.

Cat. No.	Description	Height	Diam.	Shipping Wt., Lbs.
C41	1 gallon, Polished Brass	24 in.	6 in.	37
C42	1 gallon, Buffed Nickel	24 in.	6 in.	37
C44	1 gallon, Chromium Plated	24 in.	6 in.	37

PHOMENE FIRE EXTINGUISHERS

Phomene

Although similar in size and appearance to the 2½ gallon Soda and Acid Extinguisher the character of the stream and its method of fire attack are entirely different. While the 2½ Gallon Soda and Acid discharges only 2½ gallons of solution, the 2½ gallon Phomene releases 22 gallons of tough fire-killing foam.

The foam spreads over the burning surface—liquid or solid—cuts off the supply of oxygen, and forms a tough, air-tight, and fireproof blanket. Once extinguished, the fire cannot reignite because the foam blanket is still there—a very important feature in extinguishing highly flammable liquid fires such as oil, gasoline, naphtha, tar, wax, grease, shellac, and other flammable solvents.

The Foam Type Extinguisher differs from the Soda and Acid type only in that it has a removable inner container of seamless drawn copper, coated with a corrosion-resisting lead alloy. Complete charging directions and instructions for use are on the name plate of each extinguisher. Inspected and labelled by the Underwriters Laboratories.

Cat. No.	Description	Ht.	Capacity In. Gal.	Wt. Lbs.
P13	Copper, Polished	24	2½	38
P12	Copper, Nickel Plated	24	2½	38
P14	Copper, Chromium Plated	24	2½	38
PR1	Extra Foam Recharge			

Recharge

FUSES, FUSE WIRE

Blow-Rite Terminal and Protector Fuses

Sizes and types for every kind of telephone protector.

When ordering fuses specify the code number of the protector to insure selection of correct fuse.

Blow-Rite fuse wire has great tensile strength and accurate fusing characteristics, so that you are sure to receive perfect fuses when Blow-Rite is specified.

When ordering fuses specify amperage; also number of arrester or terminal. This will insure selection of correct fuse.

Cat. No.	Material	Length Over All Inches	Wt., Lbs. per 1000
6	Wood	4 3/8	60
35	Porcelain	4 3/8	90
27	Wood	5 1/4	63
75	Fibre	4 3/8	62
29	Wood	3 1/2	46
28	Porcelain	5 1/4	100
48	Fibre	3 1/2	48
77	Fibre	5 1/4	65
95	Wood	4 11/16	45
A- 7	Wood	5 1/4	70
A-16	Wood	5	25
A-46	Wood	3 1/2	30
A- 9	Composition	5 1/4	90
A-12	Composition	3 1/2	60
A-22	Composition	4 3/8	80
A-45	Composition	3 1/2	50
106	Fibre	3 9/16	22 1/2

Cat. No.	Material	Length Over All Inches	Wt., Lbs. per 1000
55	Fibre	4 5/8	80

Cat. No.	Material	Length Over All Inches	Wt., Lbs. per 1000
56	Fibre	4 1/8	83
A-60	Wood	4 1/2	90

Cat. No.	Material	Length Over All Inches	Wt., Lbs. per 1000
52	Fibre	3 3/8	68

Cat. No.	Material	Length Over All Inches	Wt., Lbs. per 1000
44	Wood	3 1/2	43

Combination Heat Coil Fuse

Cat. No.	Material	Length Over All Inches	Wt., Lbs. per 1000
107	Fibre	3 11/16	29 1/2

Mica Fuses

Standard mica fuses are provided with copper terminals. Special mica and fibre fuses of every description can be furnished promptly. They are inspected thoroughly before shipment is made.

When ordering specify code number and amperage. Send samples of special fuses with order. Fuses packed 50 in a box.

Note. The enclosed type of fuse is recommended and all orders not specifying will be filled with that type. All of the styles are carried in stock in the enclosed type in both 1/4 and 1/2 amperage.

Western Union Type

Cat. No.	Length	Width	Cat. No.	Length	Width
19	2 Inches	3/8 Inch	22	2 1/2 Inches	1/2 Inch
8	2 1/8 Inches	3/8 Inch			

Postal Type

Cat. No.	Length	Width	Cat. No.	Length	Width
137	1 7/8 In. or 2 Inches	1/4 Inch	11	2 1/8 Inches	3/8 Inch
21	2 Inches	3/8 Inch	25	2 1/2 Inches	1/2 Inch

Blow-Rite Fuse Wire

Blow-Rite Fuse Wire is a copper alloy made especially for lining telephone fuses. It has great tensile strength and can be soldered without burning the wire. It is rated at its exact blowing point and does not corrode or crystallize as ordinary fuse wire does.

Blow-Rite Fuse Wire is put up on 300-foot spools and is made in 1, 2, 3, 4, 5, 7 and 10 amperes blowing point.

Lead Fuse Wire

Persons using Fuse Wire should take into consideration the length of wire between binding posts, since this length has an important bearing on the fusing point. The most advisable length for each particular size of wire will be found in the following table. If wire is used in shorter pieces than there given, its carrying capacity will be raised.

Put up on Wooden Spools and Packed in Tin Boxes.

Safe Carrying Capacity Amperes	Best Lengths for Use and Fusing Currents for Such Lengths In.	Amperes	Length Feet per Pound	Diameter Millimeters	One Package Contains
1/8	1	1/2	40,725	2 1/2	250 feet
1/4	1	3/4	12,550	4 1/2	250 feet
1/2	1	1 1/2	2,550	10	4 4-oz. spools
3/4	1	2 1/4	1,516	13	2 8-oz. spools
1	1 1/4	3	993	16	2 8-oz. spools
2	1 1/2	5	407	25	2 8-oz. spools
3	1 1/2	7	265	31	2 8-oz. spools
4	1 3/4	9	207	35	1 1-lb. spool
5	1 3/4	10	167	39	1 1-lb. spool
6	2	12	144	42	1 1-lb. spool
7	2	13	120	46	1 1-lb. spool
8	2	15	106	49	1 1-lb. spool
9	2	16	94	52	1 1-lb. spool
10	2 1/4	17	84	55	1 1-lb. spool
12	2 1/4	20	68	61	1 1-lb. spool
14	2 1/4	23	58	66	1 1-lb. spool
15	2 1/4	24	55	68	1 1-lb. spool

FIRST AID KITS, GUY WIRE PROTECTOR

Davis First Aid Kits

Since the Davis system of Emergency Equipment has been made available to the telephone industry you no longer have to buy equipment you will never use—equipment that tries to cover every kind of an accident for every kind of industry. No longer need you throw away left over remnants of first aid dressings, or use material that has been handled previously and hence is unsanitary. No longer must you fumble around among the disordered contents of a tin box, searching for first aid material that is probably missing.

Now you can get a first aid kit that gives you equipment you will actually need and use. Each of the dressings and treatments in the Kit is individual, and hence surgically clean when used. There is never anything left over to put back or throw away; therefore there is no waste or any danger of infection. The entire Kit contents are instantly accessible and completely visible at all times.

The Kits are sturdily constructed of 20 gauge steel with spot welded corners and are finished in green duco.

No. 1 Phone-Kit—Assortment G

Specially adapted for the use of troublemen, installers, inspectors and linemen. Size 4⅛x2⅞x1¼ inches.

No. 10 Phone-Kit—Assortment S

For the use of the small gang, two to four men, this kit is ideal for cable splicers, drop wire installers and heavy construction gangs. Size 7¾x4⅝x2⅜ inches.

No. 16 Phone-Kit Assortment F

This kit is well adapted to medium size groups, 4 to 6 men, in construction and distribution departments. Size 9x6½x2⅜ inches.

No. 24 Phone-Kit Assortment P

Designed for the use of large construction gangs such as pole line construction, subway construction, cable construction. Size 9x9x2⅝ inches.

No. 60 Phone-Kit Assortment G

For exchange and station use. Size of heavy aluminum case 22⅛x9½x3 inches.

Guy Wire Protector

(Hot Galvanized)

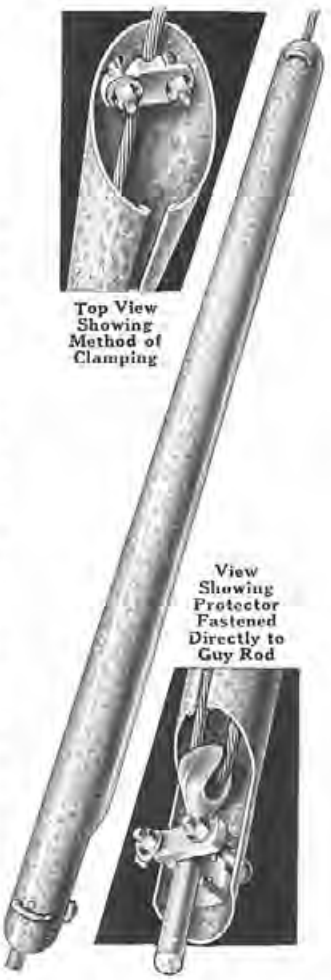
The Cylindrical Guy Wire Protector is used largely in densely populated districts for greater protection to pedestrians and children than many other types. It is a good will builder in another way, too, as it improves the appearance of the guy wire materially.

The protector completely covers and conceals the anchor and clamp. It is applied after the guy is installed, by slipping it over the strand—then down past the clamp and over the eye of a ¾-inch or smaller rod.

The new clamping device, one at top and bottom, illustrated at the right, clamps directly on the guy rod and makes a stronger assembly than the method of lamping on the strand. The spacer block is made of steel and is electrically welded to the inside of the cylinder. All parts are hot galvanized.

Cat. No.	Length	Wt. Lbs.
1605	8 Ft.	16½

Top View Showing Method of Clamping



View Showing Protector Fastened Directly to Guy Rod

U-Cable Guards and Straps

(Hot Galvanized)

"U" cable guards are made from 14 gauge sheet steel formed into U shape for protecting telephone cables. The U-shape affords additional strength necessary against collision, and the rounded surface protects the pedestrian.

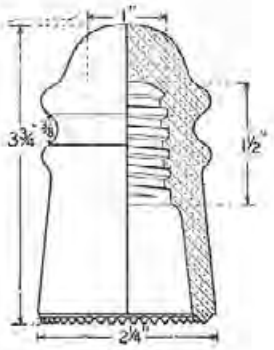
Cat. No.	Size In.	Size Ft.	Std. Pkg. Quan.	Wt., Lbs. per 100
985	1⅜	x 6	5	450
986	2⅜₆	x 5	5	750
987	2⅜₆	x 8	5	1225
988	3⅜₆	x 5	5	1100
989	3⅜₆	x 8	5	1750

Mounting Straps

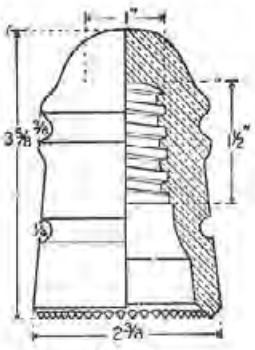
Cat. No.	Size Steel Inches	Used with Cable Guard	Std. Pkg.	Wt. Lbs. per 100
995	¾x1⅛	985	150	13
996	¾x1⅛	986-7	150	21
997	1x⅜₆	988-9	150	55

INSULATORS

Screw Thread Glass Insulators



No. 9



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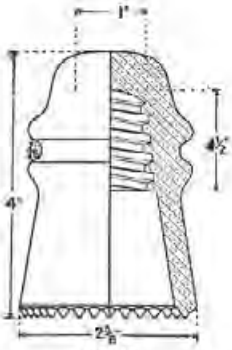

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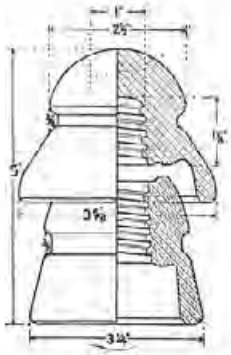

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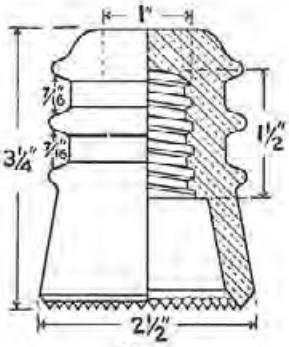

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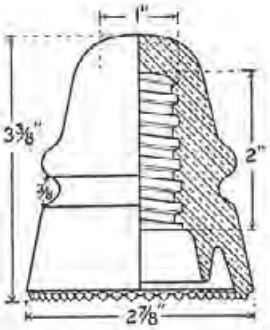
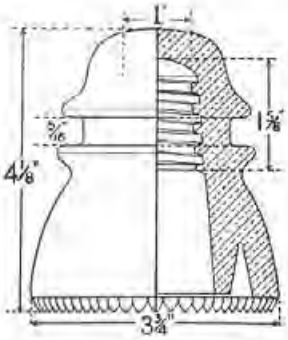
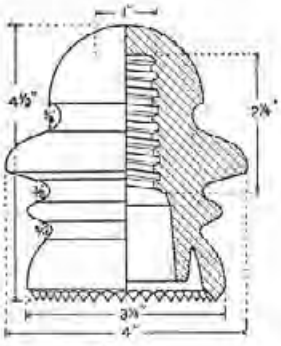


No. 14



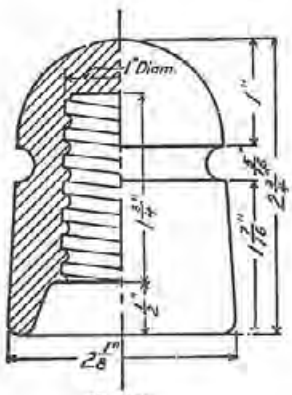
No. 42



No. 53

Cat. No.	Description	Std. Pkg. Quantity per Box	Wt., Lbs. per 1000 Pkd. in Boxes
9	Single Groove Pony	250	632
10	Exchange Line	250	692
12	Double Groove Pony	250	688
14	D. G. D. P. Pony	200	865
16	Long Distance New Style	175	1075
42	D. P. 24-ounce	100	1700
50	Two-Piece Transposition	75	1768
53	One-Piece Transposition	50	2080

Screw Thread Porcelain Insulators



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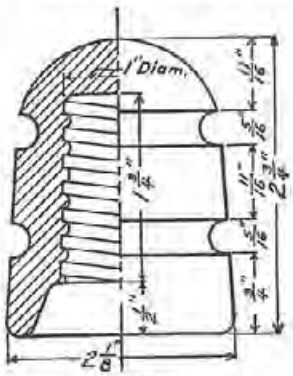

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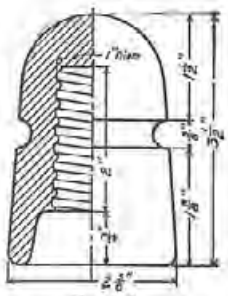

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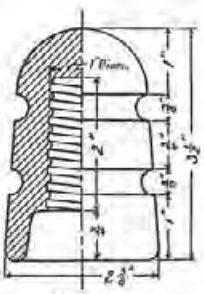


No. 112

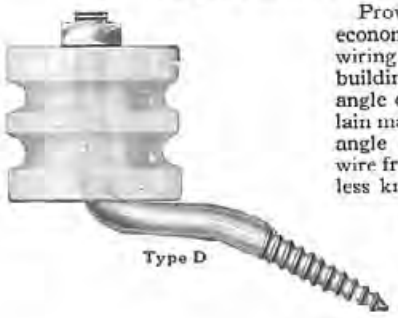
Cat. No.	Description	Number per Barrel	Wt., Lbs. per 1000
107	Single Groove	700	500
108	Double Groove	700	490
109	Single Groove	500	800
112	Double Groove	500	750

INSULATORS, KNOBS

Unglazed Porcelain Tubes

Length Under Head	Inside Diam. Inches	Outside Diameter Inches	No. per Bbl.	Wt., Lbs. per 1000
3	5/16	9/16	4500	65
4	5/16	9/16	3600	80
6	5/16	9/16	2000	120
6	3/8	11/16	1400	200
8	3/8	11/16	1200	210
10	3/8	11/16	1000	265

Angle Screw Insulation



Provides a convenient and economical fastening for drop wiring on frame or brick buildings. By inclining the angle of the screw the porcelain may be set at any desired angle to receive the bridle wire from the pole. Furnished less knobs in following sizes:

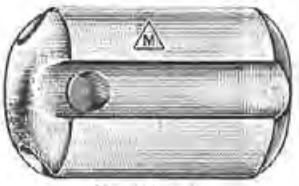
5/16 x 2 1/4 x 2 1/4".
3/8 x 2 x 3 1/2".

Split Insulated Screw Eye

Illustration is a full size cut of Insulated Screw Eye. The porcelain ring has a diagonal opening which allows the easy insertion of wires and when pulled taut they cannot become released from the ring. The porcelain is glazed on the interior surface of the ring and on the surfaces of the slot. The steel Screw Eye is galvanized by the Hot Dip Process. Put up in containers of 100 and 250.

Strain Insulators

No. 500 is used for dead-ending No. 12 and No. 14 wire or bracket lines. No. 502 is used for No. 10 wire and larger. No. 500 and No. 502 are the same general type except in size and weight.



No. 500, 502

Cat. No.	Diameter Inches	Height Inches	Size of Hole Inches	Number per Bbl.	Wt., Lbs. per 1000
500	1 1/2	2 1/4	5/16	1600	255
502	2 1/2	3	3/8	500	900

Insulated Screw Eye

Insulated Screw Eye. Diameter 1 inch. Hole 5/8 inch. Weight per 1000, 80 lbs.

CB Knobs

CB Knob Double

CB Knob Double. Weight per 1000 knobs, 250 lbs.

Self-Tying Knobs

Self Tying Knobs

Self-Tying Knobs require only one screw to install. The drop can be led in from any angle and pulls directly against the screw. Weight per 1000 knobs, 490 lbs.

Porcelain Knobs

No. 22-37 Split

No. 4

No. 4-2Gr

6061-2Gr Tel

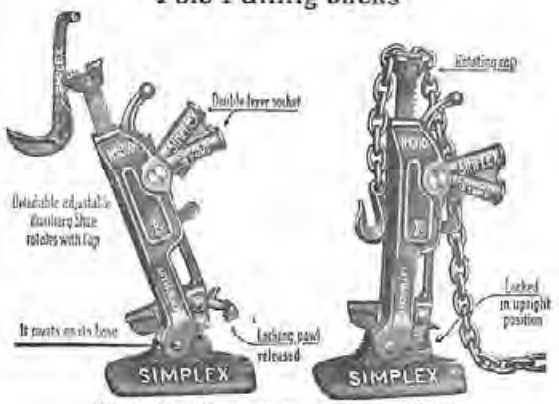
6062-4G Tel

Nail Knob

Cat. No.		Height Inches	Diameter Inches	Hole Inches	Groove Inches	Number per Bbl.	Wt., Lbs. per 1000
6061	2 Groove Telephone	1 1/2	1 5/8	3/8	5/16	2000	210
6062	4 Groove Telephone	2 1/4	1 3/4	7/16	5/16	1000	395
4	Single Groove	1 11/16	1 1/2	3/8	3/8	2000	230
4	Double Groove	1 11/16	1 1/2	3/8	7/16	2000	225
22	Split Knob	1 5/8	2 1/8	1	5/16	1250	332
37	Split Knob	1 1/2	1 3/4	1/2	1/2	1800	250
	Nail Knob	1 3/4	1 3/16	1/4	1/4	2700	160

JACKS

Pole Pulling Jacks

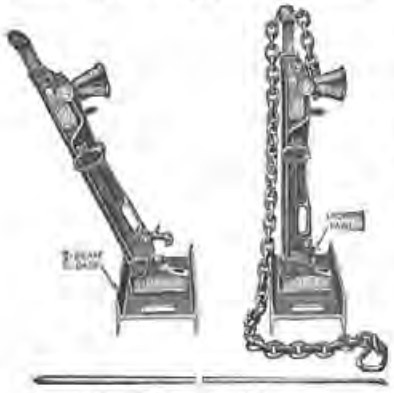


No. 310 Simplex Emergency Jack 15 ton

Made especially for pulling, straightening and lowering telephone, telegraph, electric light, power and railroad poles. Handles every phase of pole work with unequalled efficiency, dispatch and economy.

These jacks pivot on their base to any angle within 60° of vertical, permitting them to operate at full capacity at an angle as well as vertically.

They are strong, powerful and safe. All working parts are of drop steel forging, the standard of malleable iron, the chain and lever of bar steel. Both lifting and lowering operations are positively automatic and absolutely controlled, making accident to operator, pole or equipment impossible.



No. 329 Simplex, 15 tons

The No. 310 Jack was especially designed for small and rural telephone companies having smaller size pole equipment. It is furnished with 5-foot steel chain, steel auxiliary shoe and 5-foot steel pinch bar.

The No. 329 Jack is of heavier construction and will handle the larger size of poles efficiently. Furnished with 8-foot steel chain, 5-foot steel lever or pinch bar and 2 feet of 10-inch 25-lb. I beam with punched hand hole.

Cat. No.	Capacity	Lift Inches	Height Inches	Total Weight, Each
310	15 ton	12½	20½	105 lbs.
329	15 ton	24	38	195 lbs.

Cable Reel Jack

A pair of these jacks will safely handle cable reels from 36 to 84 inches in diameter. Side foot on base prevents jack tipping over and endangering workman or cable.

These jacks are of the same superior construction as the pole pulling jacks. Capacity, 10 tons.

Cat. No.	Hght. In.	Lift In.	Wt. Each
322	34½	13	98 lbs.

Pipe Pushing Jack

No. 334 Jack showing tapered jaws

These jacks are designed for pushing pipe through the most unfavorable soil conditions, without crushing or distorting the pipes. They can be operated by two or four men, depending upon soil conditions. When solid cribbing or blocking is difficult to obtain, it is possible to hold the jack against the back pressure with one lever, while the other lever is being operated. These duplex levers or sockets can be operated singly, alternately or together, depending upon the size of pipe, soil conditions and cribbing.

Each size of pipe requires a set of tapered jaws so that a perfect grip is made in order not to crush the pipe and to utilize the great pushing power of these jacks. Both jacks have a 27-inch travel, necessitating resetting of the jaws to make another 27 inch push.

Furnished complete with lever bars, extension pipes for extending lever bars and one set of tapered jaws. In ordering specify size of jaws required.

Cat. No.	For Pipe Sizes, inclu.	Weight lbs. Complete
332	¾" to 2"	195
334	2" to 4"	298

It is necessary that a steel pilot of proper size be placed on the end of the pipe before starting it through the earth.

Steel Pilot Cat. No.	Weight	Cat. No.	Weight
1 -inch Pilot	1 lb.	2½-inch Pilot	5 lbs.
1½-inch Pilot	1¼ lbs.	3 -inch Pilot	7½ lbs.
2 -inch Pilot	3 lbs.	4 inch Pilot	11½ lbs.

Handyman Pole Puller

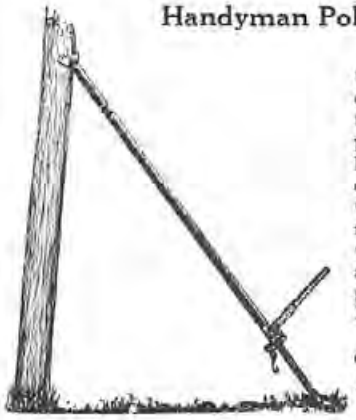
The Handyman Rapid Pole Puller has been in use a number of years successfully pulling 25 and 35-foot poles under all conditions. Its many advantages and features make it indispensable where the great majority of poles run 35 feet or less in length. Can be used as a cable reel jack and on every job where there is heavy lifting and pulling. It can also be equipped with a metal pike pole for straightening poles.

The pole clamp keeps the jack from rubbing against the pole. Pulls a pole 3 feet without stopping to take a new hitch. Lifts on the down stroke.

Comes complete with I-Beam base 6 x 24 inches, one hardwood handle, and malleable iron pole clamp with 5-ft. steel chain.

Cat. No.	Description	Weight
H-1	Handyman Pole Puller	91 lbs.
H-P	6-foot Metal Pike Pole	16 lbs.

Handyman Pole Pusher



Straightens leaning poles, takes slack out of wires on corners, moves pole through trench on resetting, holds pole straight while pulling, high enough for one man to carry and operate. Furnished with 8-foot metal pike pole made of hollow steel tubing, which telescopes the standard and rests on the running gear of the tool. Also 24-inch I-Beam 6 inches wide.

Cat. No.	Description	Weight
H-2	Pole Pusher	76 lbs.

Handyman Guy Stretcher

Used for taking up slack, pulling underground cable, etc. Same as the Handyman Pole Pusher but less the pike pole and I-Beam. Furnished with 2 swivel hooks.

Cat. No.	Description	Weight
H-3	Guy Stretcher	23 lbs.

Combination Pole Pusher and Guy Stretcher

A combination of the Handyman Pole Pusher and the Handyman Guy Stretcher. Very popular with linemen. Can also be used for pulling small poles. Handles a 20 foot pole very nicely. Furnished with 48 inch Handyman Jack, 2 swivel hooks, I-Beam Base, 8-ft. metal pike pole.

Cat. No.	Description	Weight
H-4	Combination Pole Pusher and Guy Stretcher	81 lbs.

Oshkosh Safety Extension Ladder

Here, is a light weight, SAFETY Extension Ladder designed expressly for Public Utilities. It is a great improvement over anything in this line of equipment which the Utility field has ever been offered. It is, in every sense of the word, a SAFETY Ladder.

One of the outstanding features is the automatic safety lock. Never before has such a fool-proof safe guard been provided on an extension ladder. The ladder is extended by merely pulling the rope. The instant the operator lets go of the rope, the locking device drops into place and the top section is firmly locked. To lower, the operator gives a slight pull on the rope then lets the top section slowly descend. It cannot accidently drop.

The side rails are made from straight grained, properly seasoned aeroplane Spruce. Selection standards are most rigid, requiring that the grain must not depart from parallelism more than one inch throughout the entire length of the ladder.

The rungs are made from tough Mountain Hickory and they, too, are absolutely straight grained. Each rung has a shouldered tenon joint which is pressed tightly into the side rails assuring a safe, tight fit. The side rails of each section are connected at top, middle and bottom with steel tie-rods. This combination makes a most rugged, durable construction. Either section can be used separately as an individual ladder.

Other exclusive safety features are —the rubber faced tips . . . the transparent safety finish . . . the safety pole grippers . . . and the rubber guarded safety pikes. No other ladder on the market offers these important safety advantages. Average weight 2 lbs. per foot.

Total Length	Extended Length	Total Length	Extended Length
20′	18′	34′	31′
22′	20′	36′	33′
24′	22′	38′	35′
26′	24′	40′	37′
28′	26′	42′	39′
30′	28′	44′	41′
32′	30′		

Utility Step-Extension Ladder

Used as an Extension Ladder

Used as a Step Ladder

The Utility Step-Extension Ladder is the handiest, most convenient to use, light in weight, just right for a multitude of uses. Clear, select NORWAY is used in all risers, steps and tops, while rungs are of genuine, straight grained, second-growth hickory. The special ¾ inch steel band truss (patented) has five points of support and two bolts for each step. No other ladder of this type can be as rigid without the use of this special feature. Castings used are made of malleable iron (no breakage) and metal parts are finished in aluminum.

The UTILITY Ladder is a perfect trestle, as the rungs in the back legs are spaced between the steps, making a scaffold support every six inches, an ideal ladder for the painter. The machine work is of highest grade, and workmanship in assembly produces a ladder of distinction. Furnished in lengths of five, six, seven, eight, ten and twelve feet.

MANHOLE EQUIPMENT

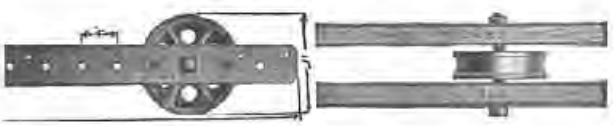
No. 9111 Ladder

Manhole Ladders

These ladders are manufactured from 1½ x 5/16 x 3/16-inch galvanized channel and rungs of ⅝-inch round open-hearth steel spaced 15 inches apart. Width 12 inches.

Cat. No.	No. of Rungs	Length Feet	Wt. Lbs. Each
9110	4	6	23
9111	5	6½	24
9112	6	8	30
9113	7	10	38
9114	8	11	42
9115	9	12	46
9116	10	13	49
9117	11	14	53

Skids and Sheaves



For leading the pulling line from the mouth of the duct out through the manhole to the capstan or winch. Standard length is 9 feet, width of sheave 2 inches. Other lengths and widths can be made to order. Weight 180 lbs. per set.

Cable Racks

For manhole and interior cable work. The sections are made in two lengths which can be combined into any length desired. These sections are made from 1½ x ⅝ x 3/16-inch galvanized open-hearth channel steel, amply strong to support the heaviest cables. They should be fastened to manhole walls with ½ x 4-inch expansion bolts.

The hooks are cut from open-hearth galvanized steel "T" section and have a smooth, well rounded top surface 1½ inches wide which will not injure the sheath of cables. See following tables:

Cat. No.	No. of Holes	Hook Hole Spacing Inches	Length Over All Inches	Bolt Hole Spacing Inches	Wt. Lbs. per 100
2124	8	1½	15	13⅝	120
2125	14	1½	24	22½	260
2126	18	1½	30	28½	310

Cable Hooks

Cat. No.	Extension from Face of Rack	Size of Steel Inches	Wt., Lbs. per 100
2131	4	1½ x 1 1/16 x 5/16	52
2132	7½	1½ x 1 1/16 x 5/16	104
2133	10	1½ x 1 1/16 x 5/16	126

Square Manhole Frames and Covers

Square

Cat. No.	Size Opening Inches	Size Over All Inches	Height Inches	Wt., Lbs. Complete
271	18 x 30	26 x 38	5	375

Round Manhole Frames and Covers

Round

These manhole frames and covers, with one exception, are all of the same outside dimensions, the only variation being in the weight, which depends on where they are to be used. Diameter of cover 22½ inches. Diameter of base 36 inches.

Cat. No.	Height Inches	Wt., Lbs. Complete
202	9	540
204	9	450
206	9	400
208	7	350
211	6	315

Manhole Cover Hooks

This is a very useful tool for the subway construction force. It is designed easily to raise a heavy manhole cover by prying the wedged point end of the hook under the groove provided in the cover for the purpose. It is made of an excellent quality of electric tool steel suitably hardened at and adjacent to the hook to prevent its bending, and at the same time sufficiently tough to prevent breaking off.

Manhole Guards

Manhole Guards

These guards are necessary when manholes are open. Made of ¾-inch pipe. They can be folded, as shown in illustration, so as to take up a minimum space when not in use.

Dimensions	Wt., Lbs. Each
Open 50 x 50 x 42 inches	50
Closed 3½ x 50 x 42 inches	50

MANHOLE EQUIPMENT

Pulling-In Irons

(Hot Galvanized)

9120-8120

These irons are set into the concrete or brick walls of street vaults opposite all duct entrances to provide a convenient and strong attachment for the pulling-in iron blocks for installing or removing cables. Made of ⅜-inch steel and extend 8 inches from the wall.

Conduit Straps

(Hot Galvanized)

8925-7925

Used for attaching 2 or 3-inch conduit. They are made of ¼x1-inch steel, and have holes for ½ inch lag screws. Hot galvanized after forming. Order by piece.

Cat. No.	Size Inches	Wt., Lbs. per 100
8925-7925	2	78
8926-7926	3	100

Cable Duct Shields

(Hot Galvanized)

9140-8140

Protects cable sheaths at entrance to ducts. Made of galvanized steel and furnished as follows:

Cat. No.	Size of Gauge Sheet Steel	Diameter Inches	Length Inches	Wt., Lbs. per 100
9140-8140	20	3	6	61
9142-8142	12	2⅝	9	170

Steel Cable Reel Wheels

Complete outfit consists of two wheels, a reel bar with guides and collars and a tongue. The reel bar is made of rolled steel shafting 2½ inches in diameter and 6 feet long. Designed to carry a maximum load of 6000 lbs., which is sufficient for ordinary purposes. Wheels requiring a greater load will be made up special. Specify size when ordering.

Sizes Diameter	Wt., Lbs. Each
4 Feet	825
5 Feet	940
6 Feet	1044
6½ Feet	1157
7 Feet	1270
8 Feet	1384

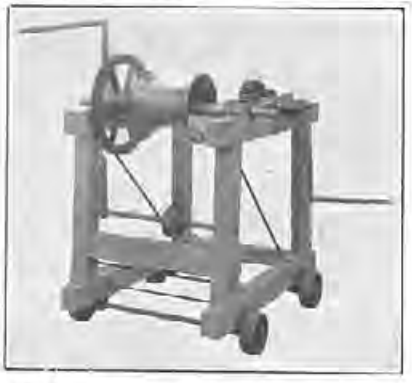
Coupling Rods

These coupling rods are flexible enough to adjust themselves to the variations in the line, avoiding the possibility of the rods binding to the side or becoming clogged or uncoupled in the duct.

They are made of a best grade second growth young hickory straight grained and put through an oil process of toughening which insures long life of the rod. The castings are of the best grade Malleable Iron, well annealed and machined to make a snug fit, there is no lost motion and they will not come uncoupled in the duct.

Size	Description	Wt., Lbs. Each
2-Ft. Rod	Straight Stick	1¾
3-Ft. Rod	Straight Stick	2
4-Ft. Rod	Straight Stick	2¼
3-Ft. Rod	Swell Center Stick	2¼
4-Ft. Rod	Swell Center Stick	2½

Cope Cable Pulling Winch



Size, 28x42x36 inches high. Has 3 speed adjustments, rope guide and 2 handles. Diameter of drum in center, 6 inches. Length of drum in center, 11 inches.

Frame of Oak.

Little Giant Cable Bender

Made of forged tool steel, with steel tube extension handle. Six adjustments taking in all size cables up to 2¾ inches. Weight, 12 lbs.

MISCELLANEOUS SUPPLIES

Kellogg Wiping Solder

Kellogg Special wiping solder is made to Kellogg's rigid specifications and because of its quality is recommended for all cable splicing.

Ordinary bar solder "Half and Half" also for cable splicing.

Plain Wire Solder

Used for general line work in connection with some kind of flux. Same as "Half and Half" only in wire form.

Kester Rosin Core Solder

Just the thing for soldering delicate electrical connections such as switchboards, instrument repairs and installations. It has two items in one—solder and flux. Solder is a hollow wire filled with resin flux; as solder melts flux flows out on the job insuring a perfect bond. Put up in 1, 5 and 10-pound spools.

Allen Soldering Stick

A convenient form of soldering flux of the same quality as Allen's paste.

Allen Soldering Paste

Will not corrode or injure surface to which it is applied. Ideal for soldering with torch or soldering copper.

Cat. No.	Size Cans
039538	2 oz.
039565	4 oz.
039539	8 oz.
039540	1 lb.

Allen Soldering Salts

A combination of several of the most efficient soldering agents in a convenient soluble form. Gives off no obnoxious gases. Very superior to the old time acid.

Cat. No.	Size Bottle
039547	½ lb.
039548	1 lb.

Solderall

This material will join all metals except aluminum. Strength and durability equal to regular solder Contains pure pulverized solder combined with non-corrosive flux, ready for instant use.

Marlin

Made from the best grade of long line Three-Ply American hemp selected material and thoroughly tarred. Furnished in 1 pound balls.

Kellogg Black Friction Tape

An excellent tape with good adhesive qualities and made to Kellogg specifications. Put up in ½-lb. rolls. Standard width, ¾ in.

Manson Friction Tape

Put up in ½-lb. tins, width ¾ in.

Okonite Tape

A rubber tape put up in ½-lb. packages, ¾ in. wide and suitable for all telephone or electrical purposes.

Cotton Splicing Tape

This tape is used for wrapping cable splices. Furnished in rolls 4 inches wide and 10 yards long. Cut from unbleached muslin having a 50/60 weave. Weight approximately 16 lbs. per 100 rolls.

Lead Sleeves

For making splices at cable junctions furnished with a ⅛-inch wall. The following table is given for convenience in determining the proper number of pounds to specify for each sleeve based on straight splices using No. 22 and 24 B. & S. gauge conductors. These estimates are approximate only. Length of sleeve is of course optional, according to splices. Cut to any length.

No. 22 Gauge Cable

No. Pairs	Inside Diam. Inches	Length Inches	Approx.Wt. Lbs. Each
10, 15, 25	1½	16	4¼
50, 75	2	18	6¼
100, 150	2½	20	8½
200	3	20	10¼
300, 400	3½	22	13
600	4	22	15

No. 24 Gauge Cable

No Pairs	Inside Diam Inches	Length Inches	Approx.Wt Lbs. Each
10, 15, 25	1⅛	16	4
50, 75	1½	18	5
100, 150	2	20	7
300, 400	3	22	8½
300, 400	3	22	11¼
600	3½	22	13

Cotton Sleeving

Cat. No.	Size, Inches	Yards per Lb.	Remarks
1	1/8	280	Furnished in 1 and 5 lb. spools
3	5/32	230	

Waxed Cotton Sleeves

Cat. No.	Size Inches	Approx. Length Inches	Carton Contains
4	5/32	3½	Appr. 350 pcs.
5	⅛	3¼	Appr. 700 pcs.

MISCELLANEOUS SUPPLIES

Paper Sleeves

Used to insulate bare joints of cable construction where splices have been made. One sleeve used on each wire of each pair at junction makes a compact and reliable insulation.

Diameter	Used for Straight Splices	Std. Pkg. Quan.	Wt., Lbs. per 1000
1/8x3	22 Ga.	175	1
1/8x2 3/4	22 Ga.	175	1
3/16x3	19 Ga.	110	1

Cable Pasters

Small strips of white paper gummed on one side are provided for use in indicating the length of a wiped joint and giving it a neat and finished appearance. These strips are 2 x 11 inches. Also furnished in rolls of 600 feet.

Metal Rim Tags

No. 32

For tagging cable or wires as a means of designation after they have been tested out and assembled in groups. Made of thin tough cardboard and bound with metal. Can be used over and over for the same purpose. One inch in diameter.

Insulating Cable Compound

For insulating and sealing potheads and cable terminals or where insulation and protection from moisture of wires or current-carrying parts is desired. It is normally hard forming into the mold or container, but when heated can readily be poured. Furnished in one-gal. cans only. Will not run in temperature less than 190 degrees. Approx. wt., 10 lbs.

Paraffine

Kellogg furnishes commercially refined, white paraffine to be used for "boiling out" paper insulated cables before splicing. Furnished in any quantity desired.

Beeswax

Faultless A-1 Beeswax is ideal for impregnating or boiling out cable forms' cores of wool or silk and cotton cables to render them moisture resisting and prevent the insulation from fraying. Furnished in one pound cakes.

Plumbers' Candles

(Stearine)

Used to apply to lead sheath before pouring on hot lead in making; also used by installers for illumination while working in dark places.

Cat. No.	Length Inches	Diameter Inches	Wt. Each
3	7 1/2	1 1/4	4.5 oz.
5	5 1/2	1 1/4	3.3 oz.

Pole Dating Nails

(Hot Galvanized)

Used for indicating the year in which pole was set.

Cat. No.	Number	Wt., Lbs. per 1000
1928	28	4.4
1929	29	4.4
1930	30	4.4
1931	31	4.4
1932	32	4.4

Aluminum Letters and Figures

Aluminum letters and figures are made of 99% pure aluminum rolled especially for this purpose. They will neither rust, tarnish nor corrode. Being perfectly smooth they do not catch or hold dirt.

Furnished in 6", 4", 3", 2", 1 1/2", 1", 3/4" and 1/2" sizes. Standard package contains 100 pieces. Special sizes and designs for special purchases.

Milonite or Perfection Nails

For use in installing interior telephone wire where a neat and workmanlike job is desired on woodwork around baseboards, casings and mouldings. Furnished in boxes of 1000 each. Weight, 2 lbs. per 1000.

Cat. No.	Color	Diam. Head Inches	Length Inches
1887 1/2	Green	7/16	1/2
1887 5/8	Green	7/16	5/8
1887 7/8	Green	7/16	7/8

Insulated Staples

For retaining interior telephone or bell wire on wood surface. Furnished in boxes of 100. Weight, 2 1/2 lbs. per 1000.

Cat. No.	Description	Length Inches
1	For hardwood	1/2
3	For general use	3/4
5	For hardwood	5/8
6	For general use	3/4

Eureka Insulated Nails

These nails consist of an oval head wire nail, reinforced by a top fibre disc and a flexible rubber bushing.

Cat. No.	Size Inches	Color	Std. Pkg. Quan.	Wt., Lbs. per 1000
31	5/8	Gray	500	1 1/2
32	3/4	Gray	500	1 1/2

Cat. No. 31

Eureka Fibre Insulators

No. 101

Consists of a round head nail, reinforcing a top fibre disc, a flexible rubber bushing and a lower fibre disc. The twisted wire loop is placed between the disc and the nail driven, whereby the rubber bulges, giving a thick insulation and the wires are clamped between the discs.

Cat. No.	Size, Inches	Color	Std. Pkg. Quan.	Wt., Lbs. per 1000
101-Oxidized	3/4	Gray	250	2 1/2

PAY STATIONS

No. 14 Pay Station

The No. 14 is designed for general portable business. Made to fit any make desk telephone. In ordering state type and make of desk stand to be used and fittings will be furnished accordingly. Has nickel, dime and quarter slots. Weight each, 16 lbs.

No. 11 Pay Station

The No. 11 will fit any regular wall telephone in present use. Connected to the telephone by means of a mounting plate furnished with the pay station. Has nickel, dime and quarter slots. Furnished without receiver and transmitter. Weight each, 17 lbs.

No. 11-A same as above with extra large money drawer.

No. 7 Pay Station

The No. 7 is one of the most popular type of stations made. Made with three slots for nickels, dimes and quarters. They mount on the front of regular wall telephones and are drilled to accommodate any specific transmitter arm. In ordering specify arm to be used or order arm with station. Nickel, dime and quarter slots. Furnished without receiver and transmitter. Weight, each, 11 lbs.

No. 8-A Pay Station

The No. 8-A station is designed for local calls only with nickel slot and large coin capacity. No electrical connections, springs or levers. Affords rapid operation, service and low maintenance cost. Attached on back board by offsetting the transmitter arm, or by mounting plate. The latter method recommended. Weight each, 6 lbs.

No. 23-D Pay Station

The No. 23-D station is very compact and includes all connections and switchhook. Upper compartment is hinged allowing inspections without entering the money drawer or disconnecting any wiring, the repair man and inspector being confined to this section while the collector has the lower. Used with desk stand box; transmitter and receiver of regular set. Furnished without receiver and transmitter. Has nickel, dime and quarter slots. Weight each, 20 lbs.

No. 50-K Postpay Stations

Equipped with 50-C Apparatus Blank

These stations are arranged for the collection of toll charges after the line has been built up. (Call central in the usual way. Do not deposit money until told to do so by operator). They can be used on either common battery or magneto systems, and require no special central office equipment to operate them. They are furnished with either the open type or self locking coin receptacle. These stations contain the cable, transmitter, receiver, terminal block and all the usual connections requiring but the bell box, for a complete installation. They are convertible by changing the direction card and adding the electro magnetic coin relay to prepay station, either manual or machine switchhook, and afford large possibilities to those companies who now operate postpay but eventually will change over to prepayment service.

Non-Breakable Messenger Hanger

(Hot Galvanized)

Is made with the back curved to fit the pole. By using this with a double arming bolt, the nut helps to keep the cable well away from the pole and another cable may be installed on the other side without disturbing the original installation. Furnished less bolts. For bolts see cat. page No. 144.

Cat. No.	Size Inches	Std. Pkg. Quan.	Wt., Lbs. per 100
1045	5/16 strand or smaller	125	150
1046	3/8 strand and larger	125	150

Universal Messenger Hanger

(Hot Galvanized)

The Universal Hangers are forged from open hearth steel with a specially curved groove which allows them to be used on corners as well as on straight runs. Two 1/2 inch high carbon steel track bolts clamp the strand. Mounting holes 9/16 and 11/16 inches in diameter for 1/2-inch lag and 5/8-inch through bolt. Cat. No. 1070-1 is made for 3/8-inch strand and larger and No. 1071-2 is for 5/16-inch strand and smaller.

Cat. No.	Stock Size Inches	Std. Pkg. Quan.	Wt., Lbs. per 100
1070-1	1/2x2	50	300
1071-2	3/8x1 3/4	75	240

PLATES, SHIMS, POLE STEPS AND SEATS

Guy Hook Strain Plate

(Hot Galvanized)

Serves the double function of preventing the Guy strand from slipping down the pole and from biting into the pole. The guy hook is firmly welded to the plate. Size, 4 x 8 x No. 14 Gauge.

Cat. No.	Std. Pkg. Quan.	Wt.,Lbs. per 100
6577	100	124

Strain Plate

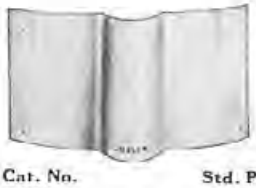
(Hot Galvanized)

Used for the same purpose as Guy Shims but gives better protection to the pole, costs less, and is cheaper to install than shims. From two to four plates are required per pole, depending on its diameter. Size, 4 x 8 x No. 14 Ga.

Cat. No.	Std. Pkg. Quan.	Wt., Lbs. per 100
1034	100	75

Moulding Strain Plate

(Hot Galvanized)



Used to prevent the guy strand from cutting or crushing the ground wire moulding. This plate is formed to fit over standard one inch ground wire moulding. Size, 4 x 8 x No. 14 Ga.

Cat. No.	Std. Pkg. Quan.	Wt., Lbs. per 100
6576	100	75

Butt Plates or Hub Guards

(Hot Galvanized)

Hub Guards are used on corner poles to protect them from the hubs of wagons and trucks. The dimensions given are those of the flat plates before bending, the 16-inch guards being bent to a 7½-inch radius. All holes are 9/16 inch diameter for ½ inch lag screws, there being three holes on each side.

Cat. No.	Size	Wt., Lbs. per 100
1037	16 x 18 x ⅛	1200

Pole Shims

Pole shims (or strain plates) should always be used underneath guy wires to protect the wood. They are punched with ¼ inch nail hole ⅜ inch from each end.

Cat. No.	Size	Std. Pkg. Quan.	Wt., Lbs. per 100
1036	1¾ x 3/16 x 8 in.	200	64

Iron Pole Steps

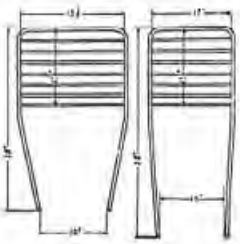
No. 1116

Used for stepping large expensive poles where companies prefer to furnish them in place of using climbers, as climbers cut into and spoil the surface. Especially used where poles are to be painted and where terminal is located.

Cat. No.	Size	Description	Std. Pkg. Quan.	Wt., Lbs. per 100
1116	5/16 x 9 in.	Hook Head	100	70
1117	⅜ x 9 in.	Hook Head	100	87
1118	⅜ x 10 in.	Hook Head	100	95
6126	⅜ x 10 in	Long Hook Head	175	115
1119	⅜ x 9 in.	Button Head	200	91
6129	⅜ x 10 in.	Button Head	175	105

Pole Seats

(Hot Galvanized)



Although light in weight, this type of seat is very rigid and strong. The frame and braces are made of 1 x ½-inch channel iron and the cross bars on the seat are of ⅜-inch square bars with the edge up, which provides a rough surface and prevents slipping. Sufficient space between the cross bars prevent ice and snow from collecting. Each brace is secured to the pole by means of two ½-inch lag screws and the frame by means of two ⅝-inch lag screws. They are designed to fit a 10-inch diameter pole but may be fitted to 8 or 12-inch diameter poles.

Cat. No.	Description	Wt., Lbs. Each
755–285	16½-inch Wide Steel Frame Seat	14
757–287	13 -inch Wide Steel Frame Seat	13

RINGS, HANGERS

National Cable Rings

These rings grip the messenger with two prongs. With both prongs in place on the messenger the ring forms a tension that holds the grip of the prongs on the messenger so tight they positively cannot slip. The harder the pull the tighter the grip. Wide opening between the two prongs makes National rings especially desirable for reclipping. They are made of high carbon wire galvanized to stand the Standard Four Immersion Test. These rings can be furnished in the following sizes.

In ordering specify size of strand on which rings are to be used.

Size Inches	Size Strand Inches	Size Cable Pairs	Std. Pkg. Quan.	Wt., Lbs. per 1000
1½	5/16, 3/8	5–50	2000	55
2 light	5/16, 3/8	50–150	1000	62
2 heavy	5/16, 3/8, 7/16	50–150	1000	80
2½	3/8, 7/16, 1/2	150–300	1000	98
3	7/16, 1/2	300–500	500	120
3½	7/16	500 and over	500	135

Never-Slip Type Cable Rings

Four Bearing

Never-Slip Cable Rings are applied by hand, no tools being required. Rings fit ¼- to ½-inch strand. Never-Slip rings can be installed over or removed from an existing cable without injury to ring or strand. They can be salvaged if desired to use in another place, and require fewer rings per mile. It costs less to use Never-Slip rings.

1½-, 2- and 2½ inch rings are usually spaced 24 inches on centers while 3-inch and larger are spaced 20 inches apart. When ordering, specify size strand rings are to be used on.

Packed 500 to sack.

Cat. No.	Size Inches	Size Cable Pairs	Wt., Lbs. per 1000
1½	1½	5–50	114
2-L	2	50–150	122
2-H	2	50–150	166
2½	2½	150–300	186
3	3	300–500	200
3½	3½	500 and over	224

Duplex Cable Ring

Two Bearing

The V bottom of the Duplex cable rings prevents lateral movement of the cable independent of ring, and the additional surface aids in supporting the cable more securely. Both suspension hooks grip the messenger type. They are very easily clipped around an existing cable. The cable can be pulled from any direction. Smooth, galvanized finish. Specify size strand rings are to be used on.

Size Inches	Std. Pkg. Quan.	Wt., Lbs. Per 1000
1½	1000	76½
2	1000	88½
2½	1000	127½
3	500	139
3½	500	150

Bridle Rings

Galvanized and enameled bridle rings are both used for retaining wire in place without forming into hand made cables or fastening with nails or staples. They have a capacity for future growth as more wires may be added as desired. Each ring has a ¼-inch opening which eliminates threading wire through the eye, thereby preventing kinks and breakage of wire. The smooth surface of an enameled bridle ring, together with its insulating qualities, makes it more desirable than the cheaper galvanized ring.

Cat. No.	Size Eye Inches	Length of Shank, Inches	Wt., Lbs. per 1000
A-1⅜	1⅜	1¼	160
C-1¼	1¼	1¼	140
E- ⅝	⅝	⅞	48
F-3	3	1¾	540

Drive Rings

These Drive Rings are designed to accomplish the same purpose as the Screw Bridle Ring, with the added advantage of their use in stucco exterior walls and plaster interior walls over wood where it is difficult to secure a wood screw bridle ring. They are easy to attach. Simply drive them in with a hammer and they will hold securely. They are made of hard nail wire galvanized by the hot process.

Diam. of Eye Inches	Wire Gauge	Overall Length Inches
1⅜	No. 11	2
1¼	No. 9	3

Marline Cable Hanger

The 3-ply Houseline used in the manufacture of these hangers is of the very best grade. The hooks are made from No. 9 wire regalvanized after forming.

Cat. No.	Size Cable in Pairs	Size of Loop Inches	Wt., Lbs. per 1000
1721	25	9	35
1722	50	11	37
1723	75	12	38
1724	100	14	40
1725	150	15	42
1726	200	16	45

Davidson Cable Hanger

This hanger is made of pure zinc without other metal parts, does not rot, rust, or corrode. It holds the cable close to the messenger and overcomes most of the vibration to which a loosely hung cable is subjected. By a double tie around messenger and cable, the sheath is electrically bonded to the messenger at each hanger, so that punctures, due to insufficient bonding do not occur. On account of the large surface supporting the cable at each hanger, the covering of the wires is not injured at points of contact.

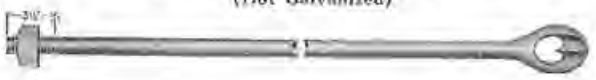
Cat. No.	Length Inches	Strand Inches	Cable	Wt., Lbs. per 1000
1	7⅞	5/16	5–25 pr.	50
2	11	3/8	30–150 pr.	65
3	14	3/8	175–300 pr.	105
4	16	3/8	Spec. for R. R. work	135

RODS

Thimbleye Anchor Rods
(Hot Galvanized)

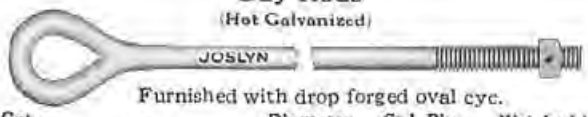
Cat. No.	Size	Diameter of Eye	Std. Pkg. Quantity	Wt., Lbs. per 100
J-7405	1/2 x 5	3/16	10	335
J-7406	1/2 x 6	3/16	10	400
J-7416	5/8 x 6	11/16	10	680
J-7417	5/8 x 7	11/16	10	755
J-7418	5/8 x 8	11/16	10	830
J-7426	3/4 x 6	13/16	5	960
J-7427	3/4 x 7	13/16	5	1120
J-7428	3/4 x 8	13/16	5	1245
J-7429	3/4 x 9	13/16	5	1350
J-7438	1 x 8	1 1/8	3	2300
J-7440	1 x 10	1 1/8	3	2600

Twineye Anchor Rods
(Hot Galvanized)



Cat. No.	Size	Diameter of Eye	Std. Pkg. Quantity	Wt., Lbs. per 100
J-7526	3/4 x 6	1	5	970
J-7528	3/4 x 8	1	5	1255
J-7529	3/4 x 9	1	5	1460
J-7538	1 x 8	1 5/16	3	2310
J-7540	1 x 10	1 5/16	3	2895

Guy Rods
(Hot Galvanized)



Furnished with drop forged oval eye.

Cat. No.	Size	Diameter of Eye	Std. Pkg. Quantity	Weight Lbs. per 100
1000	1/2 x 5	3/4 in.	10	335
1002	1/2 x 6	3/4 in.	10	400
1005	5/8 x 5	1 1/2 in.	10	540
1006	5/8 x 6	1 1/2 in.	10	640
1007	5/8 x 7	1 1/2 in.	10	740
1010	3/4 x 6	1 1/2 in.	5	910
1011	3/4 x 7	1 1/2 in.	5	1060
1012	3/4 x 8	1 1/2 in.	5	1210
1014	1 x 8	2 in.	5	2165
1015	1 x 10	2 in.	5	2700

Guy or Jay Hooks
(Hot Galvanized)

Guy Hooks should always be used with guys to keep them from slipping down. The one-bolt is recommended in preference to the two-bolt as the one-bolt can adjust itself to the angle of the messenger whereas the two-bolt cannot and is inclined to tear the lag screws out of the pole. It is better to use a 1/2-inch or 5/8-inch through bolt in preference to a lag screw as they hold better and are not apt to tear the wood.

Cat. No.	Description	Std. Pkg. Quantity	Wt., Lbs. per 100
1016	1 1/4 x 1/4 x 3 in., 1 bolt	450	30
1017	1 1/2 x 3/8 x 3 1/2 in., 1 bolt	300	75
1018	1 1/2 x 3/8 x 6 in., 2 bolt	200	90
1019	1 3/4 x 3/8 x 4 in., 1 bolt	200	90

Ground Rods
(Hot Galvanized)

Furnished with or without wire. The wired type has five turns of No. 12 B. & S. gauge copper wire (free end 5 inches long) soldered to the upper end of the rod, insuring a perfect electrical connection. The unwired type is equipped with a hole for inserting the ground wire, which also facilitates soldering. No. 1101 uses No. 6 wire, free ends, 6 inches long.

Plain Ground Rods

Cat. No.	Size Inches	Std.Pkg. Quan.	Wt.,Lbs. per 100	Cat. No.	Size Inches	Std.Pkg. Quan.	Wt.,Lbs. per 100
1102	3/8 x 5	20	185	1107	5/8 x 6	10	600
1103	3/8 x 6	20	223	1108	5/8 x 7	10	700
1104	1/2 x 5	20	315	1109	5/8 x 8	10	800
1105	1/2 x 6	20	375				

Wired Ground Rods

1098	1/2 x 5	10	320	1100	5/8 x 6	10	595
1099	1/2 x 6	10	395				

Copper-Steel Core Rods

Copper-Steel Core ground rods do not rust. They assure a permanent low resistance ground connection. Rods are pointed, ready for driving. Ground wire is very easily soldered to copper surface of rod.

Cat. No.	Size Inches	Std.Pkg. Quan.	Wt.,Lbs. Per 100	Cat. No.	Size Inches	Std.Pkg. Quan.	Wt.,Lbs. Per 100
8315	3/8 x 5	10	200	8337	5/8 x 7	10	760
8316	3/8 x 6	10	240	8338	5/8 x 8	10	870
8325	1/2 x 5	10	350	8339	5/8 x 9	10	980
8326	1/2 x 6	10	420	8348	3/4 x 8	10	1250
8327	1/2 x 7	10	490	8349	3/4 x 9	10	1400
8336	5/8 x 6	10	650				

Mechanical Ground Rod Clamp

The Mechanical Ground Rod Clamp has been designed for attaching grounding wires to Ground Rods by a mechanical method and it makes a permanent and secure bond between the rod and wire.

The clamp and safety screw are made of high grade corrosion resisting and fatigue resisting non-ferreous metal.

Great pressure may be exerted on the wire or strand by means of the safety screw and wrench without stretching or bursting the clamp. When properly tightened, a pull of approximately one ton is necessary to cause wire or strand slippage.

Stock No.	Size Rod Inches	Size of Wire	Std. Package	Approx. Shipping Wt.,Lbs. 100 Pcs.
9490	3/8	6-12 B&S	10	25
9491	1/2	4-10 B&S solid	10	30
9492	5/8	5/16 in. Strand to 8 B&S solid	10	55
9493	3/4	3/8 in. Strand to 8 B&S solid	10	75
9495	1	4/0 Strand to 4 B&S solid	5	90

Kellogg Guy Thimble Holder

The use of a guy thimble in the eye of a standard anchor rod makes a larger and more uniform bend in the messenger or guy wire than can be obtained with the so-called patented eye rods. The Kellogg holder eliminates the difficulty and danger incident to holding the thimble in place; with this device the guy can be pulled by fastening the fall rope of the blocks to a truck. After the guy is pulled the tool is easily removed by hand and the guy clamp bolted in place. Enables a crew of linemen to place anchor guys in one-half the time. Manufactured from heavy cast iron and covered with a heavy coating of black enamel. Shipping weight, 3 lbs.

SIGNALS, RELAYS

Benjamin Single Stroke Bells and Chimes

National Electrical Code Standard

The Benjamin Single Stroke Bells and Chimes are simple in design and positive in operation. The mechanism is of the solenoid type with only one moving part—the plunger which responds instantly when the coil is energized. This type of construction practically eliminates maintenance costs and assures operation with a minimum current consumption.

Adjustable Tone Volume.—The tone volume of both bells and chimes is adjustable. Soft, medium or loud tones may be obtained by adjusting the set screw at the bottom of the casing which regulates the plunger stroke.

Easy Installation.—Installation is simplified by a special mounting plate which provides a means of direct attachment to Gem Type Outlet Boxes or to any switch or outlet box cover having mounting holes spaced on 3⅜-inch centers.

Construction.—The plunger is of magnetic iron, with a bakelite striker that moves freely in a bakelite tube. The magnet coil is layer wound, impregnated and not affected by moisture. The chimes are identical in construction to the bells except that a metal chime bar with a wood resonating chamber is provided in place of a gong. All housings are of cast iron; housings, bells and resonating chamber of chimes are finished in black.

3 Inch Diam. Bell

Designed for locations where the amount of noise to be overcome is not great enough for the more penetrating tone of a larger bell. Construction and mechanism operation is the same for all sizes of bells and the chime.

Cat. No.	Description	*Voltage
8110	3-in. Bell	110 Volts, 60 Cyc., A.C.
8111	3-in. Bell	110 Volts, D.C.

Cat. 8110

6 and 8 Inch Diam. Bells

For use in locations where excessive noise makes the use of the larger, more penetrating tone bells necessary. All bells and chimes have the feature of adjustable tone volume.

Cat. No.	Description	*Voltage
8115	6-in. Bell	110 V., 60 Cy., A.C.
8116	6-in. Bell	110 V., D.C.
8117	8 in. Bell	110 V., 60 Cy., A.C.
8118	8-in. Bell	110 V., D.C.

Cat. 8115

Chime

For use in locations where a pleasant yet audible signal is desired, such as public buildings, large residences, libraries, banks, department stores, professional offices, etc. Easy installation and wiring are additional features of Benjamin Single Stroke Bells and Chimes.

Cat. No.	Description	*Voltage
8120	Chime	110 V., 60 Cyc., A.C.
8121	Chime	110 V., D.C.

Cat. 8120

*Voltage.—Standard voltages are listed above. Special A.C. voltages from 6 to 250 volts and any frequency from 25 to 60 cycles may be specified at an additional charge. Special D. C. voltages from 6 to 250 volts may be specified at an additional charge. Special voltages and frequencies must be specified when ordering.

Benjamin Motor Driven Signal

National Electrical Code Standard

Cat. 8175

A weatherproof signal of remarkable carrying and penetrating power. For use in such locations as steel mills, railroad shops, foundries, cotton mills, etc., where a signal must compete for attention with excessively loud manufacturing noises. Suitable for either indoor or outdoor installation and designed to operate with a minimum of attention or adjustment. This signal is particularly efficient on code calling systems, responding accurately and distinctly in sounding the combinations of long and short calls. This is due to the motor attaining its full speed almost instantly when contact is made and not coasting after current is cut off.

Construction.—Sturdily and durably constructed of heavy cast metal with a steel angle mounting bracket. Projector, housing and cap are thoroughly gasketed to make the signal weatherproof. Signal is finished in baked black enamel and furnished completely assembled and tested. Wired with 14-in. wire leads for easy installation. Tapped for ½-in. conduit.

Cat. No.	Description	*Voltage
8175	Single Projector	110 Volts, 60 Cycles, A.C.
8176	Single Projector	110 Volts, D.C.
8180	Double Projector	110 Volts, 60 Cycles, A.C.
8181	Double Projector	110 Volts, D.C.

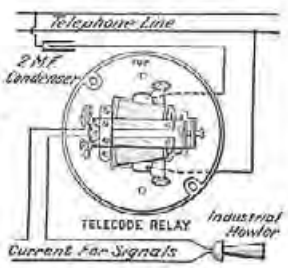
*Special voltages can be furnished when specified at an additional charge.

Benjamin Telecode Relay

Cat. 8315

In factories, mines, quarries, foundries, machine shops and locations where there is a great volume of noise, the ordinary telephone bell can seldom be heard. The Telecode Relay utilizes Benjamin Industrial Signals on any type of telephone system without affecting the ringing or talking efficiency of the telephone. Can be supplied for operation on telephone circuits using either A. C. or D. C. as their ringing energy. For standard telephone circuits the relay is wound to the same resistance as the bells of the circuit. Specify the resistance of the telephone bells on the same line when ordering. If used in intercommunicating telephone systems having A. C. or D. C. for ringing energy, specify the voltage. Construction.—Relay mechanism is mounted on porcelain base 4½ inches in diameter. Contact capacity is .8 ampere, 110 volts, or equivalent to five Benjamin signals. Mounting screw spacings are 3½ inches on centers.

Cat. No.	Description
8313	For mounting on a panel—back connections with cover.
8314	With weatherproof conduit fitting mounting tapped ½-in.
8315	With 6 x 6-in. pressed steel box with ½-in. knockouts for indoor use.



Standard winding is 1,000 ohms. An additional charge is made for all special resistance wiring.

Relay is connected to telephone line at any point. When phone rings, relay closes the circuit which operates signal. Common battery systems use a 2 M.F. condenser in series with a relay coil. Condenser is not necessary on private or magneto systems.

SIGNALS

Benjamin National Electrical Code Standard

Signals—Industrial

These signals have a peculiar pitch and penetrating tone, which makes them effective and satisfactory.

For any industrial or public service, the imperative need for reliable signals necessitates equipment that will perform perfectly day after day under the difficult conditions of modern industry. Benjamin Industrial signals are made for just that sort of duty, because they are so ruggedly made and perfectly assembled that infallible daily performance can be expected for years. Finish—Baked Black Enamel.

Direct Current Signals

These Signals are for Multiple operation on direct current only and may be employed successfully on circuits as high as 250 volts. When six or eight D.C. Signals are to be used on one circuit not less than 24 volts should be used.

Standard voltage is 110 volts D.C. Signals for special voltage, up to and including 250 volts, D.C., will be furnished at an additional price. **Specify voltage when ordering.**

Heavy Duty Weatherproof—D. C.

No. 8326-H

Construction—The cast iron body with two mounting lugs is tapped for ½-inch pipe connection. Pressed steel front cover is rigidly attached to either a one-piece drawn brass bell type sound projector or a special 14-inch conical projector. A gasket between cover and body makes the signal weather proof.

Cat. No.	Connection	Type of Projector
8326-H	½-inch Conduit	Brass Bell
8358-A	½-inch Conduit	14-inch Conical

Heavy Duty Non-Weatherproof—D. C.

No. 8326-A

Construction—This signal has pressed steel body with approved insulated side entrance for open wiring. One-piece drawn brass bell type sound projector is rigidly attached to pressed steel cover which also carries the mounting bracket. Wire connections easily accessible by loosening two screws and removing back.

Cat. No.	Connection	Type of Projector
8326-A	Open Wiring	Brass Bell

Alternating Current Signals

These signals may be operated on either multiple or series circuits and will work well even in connection with vibrator or single stroke gongs and other electrical signal equipment.

When used in series with other electrical devices special windings are furnished, which allow passage of sufficient current to operate the other devices on the same line. A 10 per cent variation in voltage will in no wise affect the satisfactory working of the signal.

Standard voltage is 110 volts A.C. Signals for special voltage up to and including 250 volts, A.C., will be furnished at an additional price. **Specify voltage when ordering.**

Factory Non-Weatherproof—A. C.

No. 8152-L

Construction—This signal has pressed steel body with approved insulated side entrance for open wiring. One-piece drawn brass, bell type sound projector or 9-inch conical projector is attached to heavy pressed steel cover which also carries the mounting bracket. Wire connections easily accessible by loosening two screws and removing back.

Cat. No.	Connection	Type of Projector
8355-A	Open Wiring	Brass Bell
8152-L	Open Wiring	9-inch Conical

Heavy Duty Weatherproof—A. C.

No. 8346-H

Construction—The cast iron body with two mounting lugs is tapped for ½-inch pipe connection. Pressed steel front cover is rigidly attached to either a one-piece drawn brass bell type projector or a special 14-inch conical projector. A gasket between cover and body makes the signal weatherproof.

Cat. No.	Connection	Type of Projector
8346-H	½-inch Conduit	Brass Bell
8357-A	½-inch Conduit	14-inch Conical

Mine Type Weatherproof—A. C.

No. 8152-S

Construction—This signal has pressed steel body and front cover, with mounting bracket attached to front cover, and a one-piece, drawn brass, bell type sound projector. Electrical connections are made to insulated wire leads entering front cover. Signal made weatherproof by gasket and by sealing wire entrance.

Cat. No.	Connection	Type of Projector
8152-S	Open Wiring	Brass Bell

SIGNS, SLEEVES, SCREWS AND SWITCHES

Pay Station Signs

No. 1—3 Colors

No. 2—3 Colors

No. 4—2 Colors

Every telephone company should have a number of these signs placed in conspicuous parts of their city to indicate public telephone pay stations.

These signs are attractively made of porcelain enamel on 18 gauge steel plate and are guaranteed never to fade or tarnish from the effects of the weather. They will last a business lifetime.

Made up in these color combinations—No. 1 and No. 2, three colors—blue, white, red; No. 4, two colors blue and white.

Cat. No.	Size, Inches	Wt., Lbs. Each
1	17x18	6
2	8x18	3
4	8x18	3

Double Tube Splicing Sleeves
Copper and Tinned Copper

The use of double tube sleeves are recommended for making all connections in straight line splices. Use copper sleeves for copper wire. Use tinned copper or tinned steel for iron wire. They are made accurately and very close to the size of wire for which they are intended. When twisted they draw snugly around the wire forming an absolutely solid joint which air and moisture cannot penetrate. When ordering copper sleeves use B. & S. gauge in specifying. When ordering tinned copper sleeves for iron wire use B. W. G. gauge.

B. & S.	B. W. G.	N. B. S.	Full Lgth., In.	Half Lgth., In.	Full Length Ship. Wt. per 1000 Lbs.
6	8	..	6¾	3⅜	118
8	10	..	5½	2¾	68
9	11	..	5¼	2⅝	60
10	12	12	4¾	2⅜	35
12	14	14	4½	2¼	29
14	16	..	4	2	20
16	18	..	4	2	20
17	19	..	4	2	17

Tinned Steel Sleeves

B. W. G.	Full Length Inches	Half Length Inches	Full Length Ship. Wt. per 1000
8	6¾	3⅜	85
9	5¼	2⅝	68
10	5½	2¾	53
12	4¾	2⅜	38
14	4½	2¼	30
16	4	2	17

Combination sleeves can also be furnished in standard sizes. To avoid errors when ordering specify kind and size of wire sleeves are intended for. When ordering steel sleeves use B. W. G. gauge.

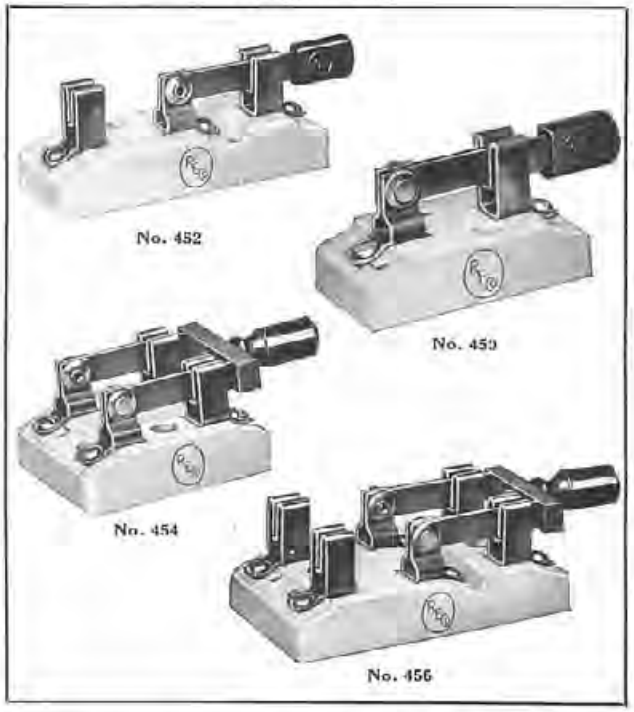
Wood Screws

Flat Head

Common Wood Screws (for use in wood) are regularly made in both iron and brass with three styles of head, flat, round, and oval.

All standard sizes from ¼ to 6 inches are carried in stock. Furnished in blued, bright or nickel finish. The following are carried in galvanized, 1½x14 and 1½x16-inch round head. 2½x16-inch flat head, 3x16-inch flat head, 3½x16-inch flat head, 3½x18-inch flat head and 4x18-inch flat head.

Baby Knife Switches
Porcelain Base



Cat. No.	Style	Dimensions Inches	Std. Pkg. Quan.	Wt., Lbs. per 100
450	S.P.S.T.	2 7/16x1¼	100	37
452	S.P.D.T.	3⅝x1¼	100	61
454	D.P.S.T.	2 7/16x2	100	63
456	D.P.D.T.	3⅝x2	100	105

Acme Switch

The round pattern battery switches have removable nickel silver handles.

Cat. No.	Description	Std. Pkg. Quan.	Wt. Lbs. per 100
1	Two point	100	15

PROTECTOR STRIPS

No. 132 Switchboard Protector

A switchboard protector and distributing board for mounting on the wall and hanging on the wall and hinged so that all wiring is accessible. To be used for protection against lightning, crosses with electric circuits and sneak currents. Each pair consists of two P662 carbons, two P495 metal sawtooth discharge blocks and two No. 44 Blow-Rite flat wood fuses, 1 ampere, 3½ inches tip to tip, held in place by nickeled phosphor bronze contact springs which grip the flat tips of the fuses. Jumper wire rings and screw terminals provided for making cross connections.

Capacity	Length Inches	Width Inches	Wt. Each Complete, Lbs.
12½ Pair	17	12	27
25 Pair	32⅝	12	33½

No. 727 Protector Strip

A protector strip with single row of fuses for mounting in junction boxes between aerial and underground cable for protection against crosses with electric circuits. Strips are designed for vertical mounting in 25 pair pole houses 13¼ inches wide by 3 feet 5 inches high and in 50 pair pole houses 20¼ inches wide by 3 feet 5 inches high. Each pair consists of two No. 27 fuses, 7 amperes, 4¾ inches shoulder to shoulder.

The nickeled phosphor bronze fuse clips have contact points which bite into the fuse ends insuring good contact even if the fuse ends are corroded.

Capacity	Length Inches	Width Inches	Wt. Each Complete, Lbs.
26 Pair	29¹³⁄₁₆	7¼	10

No. 927 Protector Strip

A protector strip for mounting in pole houses. To be used for protection against lightning and crosses with electric circuits. Each pair consists of two No. 197 carbon blocks, two P495 metal sawtooth discharge blocks and two No. 27 tubular wood fuses, 5 amperes, 4¾" shoulder to shoulder.

The nickeled phosphor bronze fuse clips have contact points which bite into the fuse ends insuring good contact even if the fuse ends are corroded.

Capacity	Length Inches	Width Inches	Wt. Each Complete, Lbs.
13 Pair	15½	5¹⁵⁄₁₆	11
26 Pair	30⅛	5¹⁵⁄₁₆	26

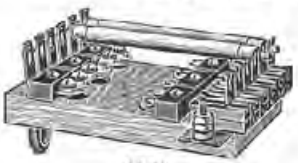
No. 944 Protector Strip

A protector strip for mounting in pole houses and for protecting toll and rural lines in central offices. To be used for protection against lightning, crosses with electric circuits and sneak currents if desired. Each pair consists of two P197 and two P367 carbon blocks, two P312 U-shaped mica dielectrics and two No. 44 flat wood fuses, 5 amperes, 3½ inches over all. All spring posts are of nickeled phosphor bronze. No. 52 tubular fibre fuses supplied when specified.

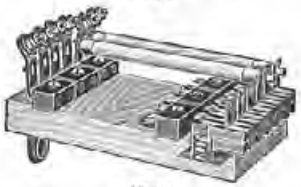
Capacity	Length Inches	Width Inches	Wt. Each Complete, Lbs.
12½ Pair	19	6½	12
25 Pair	38	6½	27

Terminal Strips

Pole House Strips H-14 and H-19



H-14



H-19

Except for the drop connections the H-14 and H-19 Pole House Strips are similar. Panel is of maple, springs of phosphor bronze, insulation of rubber, A-7 wooden fuses and grooved carbons or True Gap Dischargers. Made in units of 5 to 50 pairs.

Cat. No.	Description	Height per Pair	Depth Inches	Width Inches	Wt., Lbs. 100 Pairs
2000	H-14 complete	1¼	6	3	40
2010	H-19	1¼	6	3	40

GG-4 Connecting and Distributing Strip

This is a connecting and distributing strip made up in pairs, with screw and washer connection provided on one side. Clips are of nickel silver, very securely mounted in hard rubber blocks.

Made up in any length or number of pairs.

Cat. No.	Description	Height per Pair	Width Inches	Depth Inches	Wt., Lbs. 100 Pairs
2070	GG-4 Strip	1⅛	1½	2½	8

TERMINALS

Protected Type A-27
(Reliable)

A protected cable terminal with air-tight cable compartment to be used without pothead for open wire distribution from lead covered aerial or underground cable. Arranged for mounting on pole and provided with hot galvanized steel cover and bracket. Fits pole without gaining.

The treated maple protector mounting panels open wide to facilitate soldering. When specified these terminals are equipped with a No. 22 B. & S. gauge six-foot cable stub.

Each pair of protectors consists of two No. 27 tubular wood fuses, lined with five ampere Blow-Rite fuse wire, two P-197 carbon blocks and two P-495 metal saw-tooth self-cleaning discharge blocks. The fuse posts and carbon springs are phosphor bronze with contact points which bite into end pieces of the fuse.

Capacity Pair	Height Inches	Wt., Lbs., Each — Less Stub	With Stub
11	13	33	37
16	16	35	37
26	23	35	68
50	38	71	105

Type AS-27

Same as the type A-27 except it has an all steel case box.

Protected Type A-56
(Reliable)

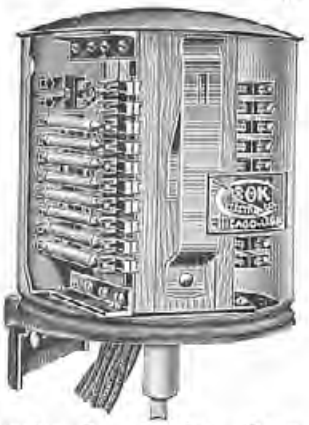
A protected cable terminal with air-tight cable compartment to be used without pot-head for open wire distribution from lead covered aerial or underground cable. Arranged for mounting on pole and provided with hot galvanized steel cover and bracket. Fits pole without gaining.

The treated ample protector mounting panels open wide to facilitate soldering. When specified these terminals are equipped with a No. 22 B. & S. gauge cable stub.

Each pair of protectors consists of two No. 56 Standard, tubular fibre fuses lined with five ampere Blow-Rite fuse wire, two P-197 carbon blocks and two P-495 metal saw-tooth discharge blocks. The fuse posts and carbon springs are phosphor bronze.

Capacity Pair	Height Inches	Wt., Lbs., Each — Less Stub	With Stub
11	14	38	42
16	17½	42	44
26	25	46	79

Protected Type S-6
(Cook)



Strength, light weight, rigidity, and perfect insulation are combined in this terminal. The bracket, base, cable box (except zinc front) cover spring, mounting panels, as well as the hood, are all formed from Toncan Iron, a metal highly resistant to corrosion. All parts fit perfectly and are thoroughly galvanized. Hollow studs for the cable wires, springs for holding fuses, lightning arresters, and connecting jumpers, are all set in hard rubber, providing perfect insulation.

Steel Core Box. This, with the self soldering nozzle, eliminates the necessity of an external pothead, simplifies the method of installation, and greatly reduces its cost, at the same time securing satisfactory results. Nozzles are made of formed seamless steel tubing thoroughly galvanized and rigidly fastened in the base of the cable box. The terminals are shipped with sheet solder and flux in place inside the nozzles.

The S-6 terminal is equipped with Cook standard tubular A-7—5 amp. wood fuse, 4¾ inches between shoulders. The lightning arresters are grooved, treated carbons separated by celluloid dielectrics, U shaped, .007 of an inch thick. True Gap Dischargers that will not ground the line can be furnished when desired at no extra cost. On the zinc face-plate of the cable box is stamped a number for each cable pair. Jumper connections of screw and washer or solder can be readily made. Any circuit can be tested by removing a fuse and testing through the fuse holders. This terminal will be furnished with 22 B & S gauge cable stub attached when so ordered.

Capacity Pair	Description	Height Inches	Diam. Inches	Wt., Lbs., Each — Less Stub	With Stub
11	S-6 Complete	14	9	15	20
16	S-6 Complete	17½	9	18	26
26	S-6 Complete	26½	9	26	32
51	S-6 Complete	39½	9	45	57
102	S-6 Complete (Twin 51 prs.)	39½	9	100	133

Protected Type S-7-A
(Cook)

This terminal is made for an A-60 fuse which is fastened with a screw and nut connection. In all other details this terminal is identical to the type S-6.

The A-60 fuse has a wooden dowel with brass ends; the jumper end screws into a brass lug in the fuse holding spring; the cable end fastens with a heavy hexagonal brass nut.

Shipped less stub unless otherwise specified.

Capacity Pair	Description	Height Inches	Diam. Inches	Wt. Lbs. Each — Less Stub	With Stub
10	S-7-A Complete	14	9	15	21
16	S-7-A Complete	17½	9	16	24
26	S-7-A Complete	26½	9	26	30
51	S-7-A Complete	39½	9	46	60
..	A-60 Fuse			9 per C.	

TERMINALS

Protected Type A-G
(Reliable)

A protected cable terminal to be used without pot-head for open wire distribution from lead covered aerial or underground cable. Arranged for mounting on a pole and provided with cover, hot galvanized all over; bracket fits pole without gaining.

The treated maple protected mounting panels open wide to facilitate soldering and the cable compartment requires only a small amount of cable compound. When specified these terminals are equipped with a number 22 B. & S. gauge 6 foot stub.

Each pair of protectors consists of two No. 44 renewable wood fuses, lined with 5-ampere Blow-Rite fuse wire, two P-662 carbon blocks and two P-495 metal saw-tooth, self-cleaning discharge blocks.

Capacity Pair	Height Inches	Wt., Lbs., Each Less Stub	Wt., Lbs., Each With Stub
11	12	32	36
16	15	34	36
26	21¼	35	66
50	36¼	68	91

Unprotected Type R. U.
(Reliable)

The R. U. Terminal is used for mounting on poles or buildings. It has a reversible sliding type weatherproof cover, which surrounds the jumper wires back of the fanning plate. The cover is made of heavy zinc — ribbed and rigid — no sharp edges or corners. Gravity catches hold cover in raised position and out of the way. Bronze chain is used so cover cannot be dropped.

Cover grips the edges of the fanning plate eliminating any danger of contact with binding posts. Highest grade bakelite face plates with bosses for greater surface distance between lugs. Long, heavy binding posts are spun over, so nuts cannot come off and are proof against season cracking. Wire slides into position on binding posts when pressed against beveled edges of washers. Guide rings for jumpers,—easily re-located when terminals are reversed. All steel parts are hot galvanized.

One size detachable bracket used for all R. U. terminals. Simplified mounting—no danger of striking terminal or cable when driving lags. The cast iron cable chamber will outlast the cable, it is sand-blasted to assure adherence of a heavy galvanized coating to casting. The new Reliable moisture-proof, non-cracking compound is used in potheads. 6 ft. 22 gauge double paper wrapped cable in all stubs. Shipped less stub unless otherwise specified:

Capacity Pair	Height Inches	Wt., Lbs., Each Less Stub	Wt., Lbs., Each With Stub
11	11	11	15
16	12	13	17½
26	16	17	22

Protected Type S-16-D
(Cook)

Unit protector mounts, to be installed as needed, are the features which make this steel terminal differ from the type S-6. This terminal is designed to permit the permanent soldering of all cable connections at the time of installation, each conductor being brought through insulated hollow brass studs in the side of the cable box.

The H-29-D unit protector mounts are sold separately from the terminal. The mount provides for both solder and screw and washer connection at the jumper end. A-7 Fuses, 5 ampere capacity, and standard grooved carbons with dielectrics .007 inch thick are furnished unless otherwise ordered. Shipped less stub unless otherwise specified.

Capacity Pair	Description	Height Inches	Diam. Inches	Wt., Lbs., Each Less Stub	Wt., Lbs., Each With Stub
10	S-16-D without mounts	14	9	13	20
16	S-16-D without mounts	17½	9	15	25
26	S-16-D without mounts	26½	9	22	28
51	S-16-D without mounts	39½	9	37	55
H-29-D Unit Mounts complete		....	.	16 per C.	

Unprotected Type XB
(Cook)

The XB is light weight, durable, easy to mount and practically unbreakable. The terminal cable box and bracket are made of separate pieces of heavy Toncan Iron, riveted together and thoroughly hot galvanized. The heavy sheet zinc hood fits snugly to the box. A strong, galvanized steel chain is attached to the hood. The terminal may be mounted with cable stub carried out of either top or bottom, as the hood is reversible. The cable enters through a well in the steel box and in which solder is puddled so that a strong and tight connection is made. A metal strap holds the cable and prevents vibration at the joint between the cable and terminal.

The face plate and fanning strip are made of a single piece of moulded bakelite. Moulded bakelite has very high electrical resistance under all conditions. It is impervious to moisture. It is a poor conductor of heat. It is of great strength and very neat in appearance. The 12/24 studs have square heads set in the bakelite face plate and cannot turn. Bosses moulded on the face of the bakelite greatly increases the surface distance between studs and raise the live parts $\frac{3}{16}$" above the face of the terminal. Numbers for each pair made in the bakelite face plate are optional. Ample room is provided on both sides of the bakelite face plates for jumper wires which are taken through openings at the bottom of the terminal. Also manufactured of Everdur for localities where severe alkaline or sulphur conditions exist. Shipped with 6½ feet, 22 gauge cable stub unless otherwise specified.

Capacity Pair	Height Inches	Width Inches	Depth Inches	Wt., Lbs., Each Less Stub	Wt., Lbs., Each With Stub
11	12½	7	3⅜	8	15
16	12½	7	3½	9	16
26	15¼	7⅞	3½	11	25

TERMINALS, METERS, TEST SETS

Steel Terminal Boxes

A neatly finished steel box containing terminal strips to be used for distributing telephone wires in buildings where several sub-stations are to be located. Each box is provided with Knock-outs at top and bottom. Boxes can also be furnished for flush mounting at slightly higher prices. The type L boxes are the same as type E but are equipped with type L strips.

Type E Steel Terminal Boxes

Capacity	Dimensions Inches	Wt., Lbs. Each
11 pair	5½ x 10 x 4	7
16 pair	5½ x 12½ x 4	9
22 pair	11 x 9¾ x 4	10
26 pair	11 x 13¾ x 4	12
32 pair	11 x 13¾ x 4	13
52 pair	11 x 19¾ x 4	16
104 pair	11 x 40 x 4	105
208 pair	24 x 40 x 4	165

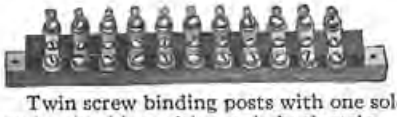
Type L Steel Terminal Boxes

Capacity	Dimensions Inches	Wt., Lbs. Each
11 pair	11 x 9¾ x 4	10
16 pair	11 x 13¾ x 4	12
26 pair	11 x 19¾ x 4	16

Type E Terminal Strip

Screw binding posts with soldering terminals embedded in hard maple mounted on maple back strip.

Capacity	Length Inches	Wt., Lbs. Each
11 pair	9 5/16	1
13 pair	10 5/16	1
16 pair	11 13/16	1
22 pair	17 1/8	1
26 pair	19 5/8	1
32 pair	22 1/8	2
52 pair	37¾	2½



Type L Terminal Strip

Twin screw binding posts with one soldering washer mounted on hard rubber with maple back strip.

Capacity	Length Inches	Wt., Lbs. Each
5½ pair	9½	1
8 pair	12 5/8	1
11 pair	17	1
13 pair	18 7/8	2
16 pair	23¼	2½
26 pair	35¾	3

Type T Terminal Strip

Soldering terminals embedded in hard rubber mounted on maple back strip.

Made with 1, 2, 3 or 4 rows of terminals of 20 or 26 terminals per row.

Kellogg Volt-Ohm-Meter

Kellogg No. 279

Kellogg No. 280

A practical and accurate meter for testing armatures, dry cells, drop coils, fuses, heat coils, switchboard coils, transmitters and for countless other tests in and around the central office.

These volt-ohm-meters enable one to make tests that would ordinarily require the use of a voltmeter, an ammeter, a Wheatstone bridge and a technical man familiar with their proper usage.

The low cost of these meters is quickly absorbed in the Magneto Exchange by the saving in dry batteries effected by elimination of high resistance transmitters. In addition there is the time saved in easily locating trouble.

The No. 279 volt-ohm-meter has a scale of 0 to 150 milliamperes, 0 to 3 volts and 0 to 1000 ohms.

The No. 280 volt-ohm-meter has a range of 0 to 3 volts and 0 to 30 volts, 0 to 10,000 ohms and 0 to 100,000 ohms.

Pocket Ammeters and Voltmeters

Valuable for indicating the strength and condition of telephone and radio batteries, also locating ignition and starting troubles and particularly useful because they show polarity, thus indicating the direction of the current.

Cat. No.	Reading
24	Ammeter—0-35 amperes, 1 ampere division
34C	Voltmeter—0-50 volts, 1 volt division
44	Voltammeter—0-35 amperes, 0-10 volts, 1 ampere and ½ volt divisions

Stewart Direct Reading Test Cabinet

Reads resistance to trouble direct in ohms. Operates on 30-volts of battery. Can be changed to operate on 24-volts so as to work on 24-volt storage battery, if so ordered.

Any telephone man can install it in one hour's time and anyone can use it. Push button marked short, and it reads resistance to short. Button marked Ground L-1, reads resistance to ground on one side, and button marked Ground L-2 reads resistance to ground on other side.

Card furnished with each instrument gives distance for each reading on the different sizes of wire.

The meter can be used as a 15-volt voltmeter or it can be equipped for 150-volts. Shipping weight, 12 pounds.

TEST SETS

Stewart Test Set

This Test Set tells which way and how far trouble is from the tester without opening the line. It is a complete portable telephone, having transmitter, receiver, generator, battery, etc., and talks up as efficiently as a telephone. Comes complete with all cords and clips, detector coil, full length shoulder strap, and leather top cover. When ordering batteries for this Test Set Specify No. 03.

Cat. No.	Type Service	Size Inches	Wt., Lbs.
Midget	Light	3½, 5¾x6¾	7
Heavy Duty	Heavy Duty	4½, 6¾x8	10

West Test Set

This Test Set is used in the location of the various forms of trouble, such as: "shorts," "grounds," "crosses," "opens," "swinging trouble," "leaky arrestor carbons," faulty ground rods," "defective windings," etc.

The carrying case consists of vulcanized fiber over a laminated wood body finished with three coats of Duco olive-drab color, and equipped with a long adjustable shoulder strap. The size over all is 8 x 8 x ¾ inches and weighs 10 lbs. each.

Telefault-Matthews

The type L Telefault will find wet trouble of high or low resistance, grounds, crosses, split pairs and dead shorts. It will not "noise up" other working pairs. It sends only four volts out on a line. It has a tone test circuit which is more efficient than any other. The exploring coil and receiver will tell whether power circuits are alive before touching them. Operates on one dry cell. Weight, 8 pounds.

The Teleohm

A practical and inexpensive portable testing instrument for telephone troublemen, switchboard repairmen, linemen and shopmen. Indispensable for testing and locating all kinds of line circuit, telephone and switchboard trouble, shorts, grounds, high resistance, and open circuits in coils of all kinds, also partially shorted coils, high resistance transmitters, cut-outs in receiver, desk stand and switchboard cords, hook switch contacts, etc. Uses two standard flashlight cells for battery. Equipped with a Weston 0-3 Volt Direct Reading Ohmmeter 0-10,000 Ohm Scale, with Glass Protector, mounted in a solid black walnut case size 1⅝ in. x 3½ in. x 6 in. Complete with battery, "On and Off" Battery Switch, cords and Test Clips. Weight complete 1¼ pounds.

The Portis Test Meter

This instrument has been steadily gaining in popularity since its first introduction in 1927. The meter has a direct reading ohm scale and is made by one of the leading and best known instrument manufacturers. The dial is calibrated to indicate resistances from 0 to 10,000 ohms. Assembled in a neat wood case complete with two cells of flashlight battery, test cords, and neck tape. It is of convenient pocket size and indispensable to the trouble man.

The Portis Splice Tester

This splice tester is designed for testing open wire joints from the ground without having to climb any poles or disturb the wire in the least. The 12 inch blades with roughened edges are brought down across the wire with a scraping action which effectively removes rust or scale and insures a clean contact for the hooks without injury to the wire when making the test. It is used in connection with the Portis Test Meter. No extension pole is furnished as one can be purchased locally. A strip of 1 x 2 will serve the purpose.

Stewart Pocket Phone

A combination transmitter and receiver in the same case, to be used as a common battery test set. It talks up as efficiently as a telephone, and when used as a receiver, it is a perfect receiver. It can be carried in the vest pocket and costs less than a combination set, is not nearly so heavy and cumbersome, and is not susceptible to breakage. Comes complete with cords and clips ready for use. Weight, 4 oz.

Stewart Detecto-Meter

The Stewart Detecto-Meter is the most successful instrument made for locating bad joints, locating low resistance ringers, checking transmitters, receivers, induction coils, etc.

Reads resistance direct in ohms, the same as a voltmeter reads volts. Operates on one dry battery.

The instrument is also a 150-volt voltmeter and a battery tester. Weight, 40 lbs.

L & N Type T Portable Test Set

The Type T Test Set incorporates every feature which long experience has proved desirable in such an instrument. It has the necessary circuit connections for resistance measurements in a Wheatstone bridge range, for measurement of insulation resistance, and for location of faults by Murray and Varley loop and other methods. Connections for either circuit are made by setting a three-way lever key to the corresponding position. With a simple buzzer and telephone receiver the set is also used for locating opens.

The rheostat has a total resistance of 10, 110 ohms adjustable in steps of one ohm. It includes four dial switch decades of ten coils each of 1, 10 and 100 ohms, and nine coils of 1000 ohms, all accurate to 0.1 percent. The fourth dial has an infinity point for testing for open circuit. The rheostat has an extra binding post which permits its use independent of the bridge. The switch has extremely low contact resistance.

The ratio arms are controlled by a single dial switch giving seven decimal multipliers from 0.001 to 1000 and 3 M values for Murray loop tests. Ratio resistances are accurate to 0.05 percent. There is no contact resistance in the ratio circuit. In resistance measurements the operator automatically selects the ratio which gives maximum sensitivity. Measured resistance is equal to the rheostat setting multiplied by the ratio setting.

The galvanometer has a suspended coil system which cannot stick or give false indications. It is designed to withstand hard usage, and has a clamp to hold it when not in use. In case of damage, the system can be easily replaced without affecting the sensitivity of the instrument. The sensitivity is one megohm; i.e. a current of one microampere causes a deflection of one galvanometer scale division. A three-position Ayrton shunt is connected in the galvanometer circuit and is conveniently and rapidly operated by means of three push buttons.

The inclosed battery is an ordinary commercial type. Provision is made for using an external battery and external galvanometer for greater sensitivity when necessary. Protective resistances in both internal and external battery circuits guard against overheating the bridge coils.

Though exceedingly compact, this test set has ample room for manipulation, and is extremely simple in operation. It is approximately 8⅞ x 7⅜ x 4" in size and weighs 8½ pounds.

Cat. No.	Description
5410	Type T Portable Testing Set.
5301	Leather Carrying Case for above.
5308	Extra Battery.
5412	Buzzer for use with above set.
9872	Telephone Receiver, with head band.
2325-c	Spare Galvanometer System for 5410 Testing Set.

L & N Artificial Cables

Artificial lines can be supplied in portable form and arranged so that resistance and capacity representing standard equivalents of cable lengths can be placed in circuit by means of small knife switches. The resistances and condensers are adjusted to a high degree of accuracy, and are mounted so as to prevent derangement during transportation. Artificial cables can be supplied to meet the most exacting specifications and correspondence is solicited in order to quote upon cables of specified constants.

L & N Type S Portable Test Set

This set comprises a compact Wheatstone bridge convenient for electrical resistance measurements in laboratory, shop or field, with provision for Murray and Varley loop tests in location of faults in telephone and telegraph lines and cables. With a buzzer and telephone receiver it can be used to locate opens.

The rheostat comprises four dial switch decades giving a total resistance of 9,999 ohms adjustable in steps of one ohm, accurate to 0.1 percent. The ratio arms are governed by a single switch affording seven decimal multipliers from 0.1 to 1000 and 3 M values for Murray loop tests. The ratio resistances are accurate to 0.05 percent. All switch contacts are inclosed but easily accessible. The rheostat switches have very low contact resistance. There is no contact resistance in the ratio circuit.

The galvanometer has a strong, suspended coil system with a clamp for protection when not in use. In case of damage it can be easily replaced without affecting the sensitivity or accuracy of the bridge. The sensitivity is one megohm.

The battery included in the bridge is an ordinary commercial type. External battery and galvanometer can be used. It is approximately 8⅞ x 7⅜ x 4" in size and weighs 8½ pounds.

Cat. No.	Description
5300	Type S Portable Testing Set.
5301	Leather Carrying Case for above.
5308	Extra Battery.
5412	Buzzer for use with above set.
9872	Telephone Receiver, with head band.
2325-c	Spare Galvanometer System for 5300 Testing Set.

Stewart Cable Tester

Locates shorts, crosses, grounds, and wet spots to an inch. Operates on dry batteries. As the Exploring Coil is neutral to the tone on the armor, the Cable Tester is a success for locating water trouble. This patented feature is found in no other set. Shipping weight, 18 pounds.

TOOLS

Sheath Splitting Knife

No. 1515-1

A very sturdy tool, knife edge tempered and ground to a keen edge.

Cat. No.	Wt., Lb. Each
1515-1	1

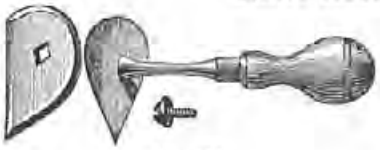
Cable Stripper Knife

No. 1560-2

For stripping heavy insulated wire and cable. Has hard wood handle, which fits the hand comfortably. Blade securely riveted in handle, but rivet is deeply countersunk, eliminating the chance of shock.

Cat. No.	Length Over All, In.	Length Blade, In.	Wt., Lbs. per Doz.
1560-2	8½	3½	2¼

Shave Hook

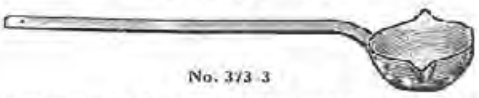


No. 304

Used for scraping lead sleeves, pipe, cable ends, pot heads, etc. The blade is fastened in place with a nut, so that it can be replaced when required.

Cat. No.	Pattern	Wt., Lbs. per Doz.
304	Half Oval	2½

Pouring Ladle



No. 373-3

This is the standard type of ladle used for general construction where soldering by means of the pouring method is required.

Cat. No.	Diameter Bowl	Wt., Lb. Each
373-3	3	1

Unique Balanced Ladles

These ladles enable the user to pour the metal more accurately and easily. The close to the bowl grip relieves the user of considerable strain and the wood handle is always cool because of the air space around the shank. A fibre washer between ferrule and wood handle protects the user from burns. To attach or remove handle, only a screwdriver is required. Ladles are furnished in 2½", 3", 3½", and 4" bowl diameters.

Melting Pot

This pot is made of heavy cast iron to retain the heat as long as possible and is provided with steel handle.

Cat. No.	Diameter Top of Pot
398-6	6 inches
398-7	7 inches

Turn Pins—Drift Plugs

Turn Pins and Drift Plugs are used for expanding ends and smoothing out lead sleeves. Turn Pins furnished 1-2-3 inches. Drift Plugs furnished 1-2-3-4-5-6 inches.

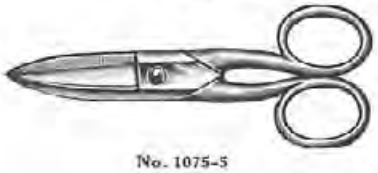
Hardwood Dressers

No. 295

Made of hardwood for shaping and dressing lead sleeving, pipe, potheads, etc.

Cat. No.	Wt., per Doz.
296	15 lbs.

Electrician's Scissors

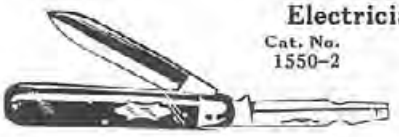


No. 1075-5

A scissors designed for the electrician and mechanic. Will stand continued hard service. Made of high-grade steel properly tempered. Has a screw hinge, allowing adjustment. Nickel-plated finish.

Cat. No.	Size	Weight, per Doz.
1075-5	5-inch	2 lbs.

Electrician's Knife



Cat. No.	Description
1550-2	Electrician's Knife, Double Blade

Wiping Cloth

No. 371

Made in two styles; one of moleskin and the other of ticking, used especially for wiping off lead joints.

Cat. No.	Size, Inches	Style
371-3	3x3	Moleskin
371-4	4x4	Moleskin
371-5	5x5	Moleskin
371-6	6x6	Moleskin
371-7	7x8	Moleskin
372-3	3x3	Ticking
372-4	4x4	Ticking
372-5	5x5	Ticking
372-6	6x6	Ticking
372-7	7x8	Ticking

Fibre Test Boards

Numbers that you can read. Numbers that will not wash off. Standard numbering.

Cat. No.	Numbering	Cat. No.	Numbering
810	1- 51	822	607- 657
811	51-101	823	657- 707
812	102-152	824	708- 758
813	152-202	825	758- 808
814	203-253	826	809- 859
815	253-303	827	859- 909
816	304-354	828	910- 960
817	354-404	829	960-1010
818	405-455	830	1011-1061
819	455-505	831	1061-1111
820	506-556	832	1112-1162
821	556-606	833	1162-1212

TOOLS

Cableman's Saw

This saw is arranged particularly for use on cable work. One of these saws should be in every tool kit. Will also cut wood.

Cat. No.	Length of Blade	Weight, Each
24–14	14 inches	1 lb.

Docking Saw

A useful saw for rough, fast sawing around docks, ship yards, car shops, lumber yards, farms and for bridge, mine, railroad and contractors' work. Full breasted blade, 18 gauge on toothed edge, taper ground to 20 gauge for clearance, bevel filed teeth, 4½ points to inch, peg shape. Handle, easy grip pattern, malleable iron, tinned and riveted. High-grade special steel. Each saw sharpened and set ready for use.

Cat. No.	Length
590	30 in.

Forester Pruner

The blade is of Silver Steel and is 26 inches long, 1¼ inches wide at point, 3½ inches at butt. Being narrow, the blade cannot bind, and the wider butt adds stiffness. Three points to the inch gives large teeth that cut large or small limbs readily. Teeth are filed and set. The handle is of fine beech, varnished edges, extra large grip for use with gloves, if desired. Fastened to blade with three brass screws.

Cat. No.	Length
17	25 in.

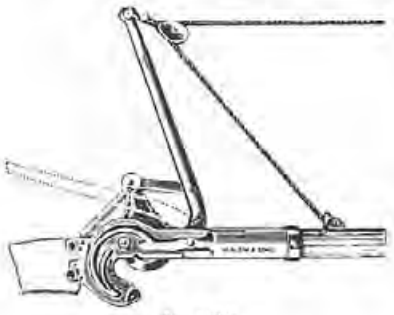
One-Man Saw

For those desiring an unusually high-grade One-Man Saw, in Silver Steel. The use of this high-grade material in connection with the scientific construction throughout insures One-Man Saws vastly superior to any other.

Kellogg recommends anyone desiring a strictly high-grade One-Man Saw which will receive an unusually keen, sharp cutting edge and hold it for the longest time to purchase the Silver Steel quality.

Cat. No.	Lengths
No. 390.	3, 3½, 4, 4½, 5, 5½, 6 feet.

Klein Tree Trimmer



No. 3628

The entire head of the Klein Tree Trimmer Comprising hook and socket into which handle it fits, is sturdily constructed of pressed steel. The knife, made of tempered tool steel, is round in shape and arranged to rotate slightly with each cut, thus providing the entire circumference of the blade for cutting and giving an edge more than three times the length of that on the ordinary blade.

The leverage makes the trimmer cut easily limbs up to 1¼ inch, both green and dry. So arranged that knife may be readily removed for sharpening or renewal.

Two threaded holes are provided for attaching saw.

Cat. No.	Size	Wt. Lbs. Each
3628	12½ 112	3½

Klein Tree Trimmer Saws

No. 913-12

No. 913-15

These saws can be readily attached to the No. 3628 Tree Trimmer. The curved blade saw is particularly efficient and easy cutting even for large limbs. The teeth on both saws are set to cut on up and down stroke.

Cat. No.	Size	Wt. Lbs. Per Doz.
913-12	12 inches	4½
913-15	15 inches	6

Klein Saw Handle

This handle makes an efficient hand saw for cutting heavy branches from either of the above tree trimmer saws. Either of the saws can be set in this handle in a few seconds and securely fastened with the thumb screw.

Cat. No.	Description	Wt. Lbs. Per Lb.
913-G	Saw Handle	6

Tree Trimmer Handles

Klein Tree Trimmer Handles are made from select Washington Fir. They are furnished in 18 foot lengths made up of two or three sections held securely by brass ferrules. The diameter is 1⅝ inches.

Cat. . .	Description	Length	Wt. Lbs. per Doz.
3601-6	3—six foot sections	18 ft.	10½
3601-9	2-nine foot sections	18 ft.	9¾

No. 1-W Pulley Type Tree Trimmer

The No. 1-W Bartlett Tree Trimmer is one of the most powerful and light weight cutting tools produced. This tree trimmer will sever with the slightest effort, any branch up to 1¼ inch diameter. It has a double leverage due to the pulley which is attached to the curved lever in addition to the compound lever on the blade itself. The swivel pulley allows the operator to pull the rope from any angle, and efficiently work the knife without changing the position of the hand when cutting.

The No. 1-W Tree Trimmer is furnished with 1¼ inch by 1⅛ inch one piece rectangular poles in lengths from 6 to 16 feet, or if jointed poles are wanted extra sections can be furnished in 4, 6 or 8 feet to be joined to any length of top section selected by means of the Bartlett No. 156 Rectangular Brass Sleeve.

Weight of Head complete 1¾ pounds. Weight of 12 foot tree trimmer, one piece pole 5 pounds 7 ounces. In ordering specify length of handle desired.

No. 1-T Bartlett Tree Trimmer

This tree trimmer has the same cutting head as the No. 1-W but is operated by a rope fastened to a lever on the side of the pole and does not have a pulley.

No. 156 Brass Sleeve

The No. 156 Quick-Change Brass Sleeve was designed for fastening together the jointed handle sections of the Nos. 1-W and 1-T Tree Trimmers and the No. 44 Pole Saw. When the pole is inserted into the sleeve, a pin automatically drops into place preventing the two sections from pulling apart. The sections are then as rigid as if a one piece pole. Furnished complete less wood poles, or mounted on sections as preferred.

No. 44 Bartlett Pole Saw

The No. 44 Bartlett Pole Saw is for use on limbs larger than the capacity of the No. 1 Type Trimmer. It has a sixteen inch blade with seven teeth to the inch. The blade is adjustable to three angles, and cuts on both the up and down stroke. Furnished complete with poles in 6, 8, 10, 12, 14 and 16 foot lengths.

No. 777 Bartlett Two Hand Pruner

The blade and the hook of the No. 777 Bartlett Two Hand Pruner are made of hardened drop forged crucible tool steel. It is furnished with twenty-six inch white ash handles riveted and double ferruled for absolute security. This tool, on account of its draw cut, is easily operated on large branches.

Seymour Smith Tree Pruner

The strong, rugged Seymour Smith Tree Pruner is built to stand the hard use that linemen give their tools in clearing the right of way for telephone and power lines.

The operating and cutting mechanism of this type pruner is incorporated in the head and is very simple. There are only two moving parts. The spring and the blade are easily renewed. The operator is insulated from any high tension wire by the wooden pole and hemp rope. There is no danger of this tool short-circuiting line wires and causing damage to electrical equipment.

The head and lever are made of the best grade malleable iron. The blade is of high quality tool steel, properly hardened and tempered. The spring is of Vanadium spring steel, carefully hardened and tempered. The poles are made from selected airplane Sitka Spruce. They come in sections, joined with a simple and positive hard brass locking joints. The No. 1 poles are made from 1¼ inch and the No. 2 from 1¾ inch octagon stock.

No. 1-18

For general use the No. 1-18 Trimmer is recommended. It will cut with ease branches up to one inch in diameter. For heavy duty work the 2-18 trimmer is recommended. It easily cuts branches up to one and one-half inches in diameter.

Cat. No.	Description
1-18	Complete trimmer including Pruner head and rope, six foot handle head section, and 2 six foot handle extensions.

REPLACEMENT PARTS

Cat. No.	Description
1	Pruner Head with rope guide
1	Six foot handle head section
1	Six foot handle extension section
1	Eight foot handle head section
1	Eight foot handle extension section
2-18	Complete heavy duty trimmer including pruner head, six-foot handle head section and 2 six-foot handle sections.

REPLACEMENT PARTS

Cat. No.	Description
2-18	Heavy Duty Pruner Head with rope guide
2	Six foot handle head sections
2	Six handle extension sections
2	Eight foot handle head sections
2	Eight foot handle extension sections

TOOLS

Bell Face Nail Hammer
Polished Two-Tone Hickory Handles

No.	Weight Ozs.	Length Inches	Wt., Lbs. per Doz.
10	24	14	25
11	20	14	21 1/2
11 1/2	16	13	18 1/2
12	13	13	14 1/2
12 1/2	10	12 1/2	12
13	7	12	9 1/2
14	5	11	6

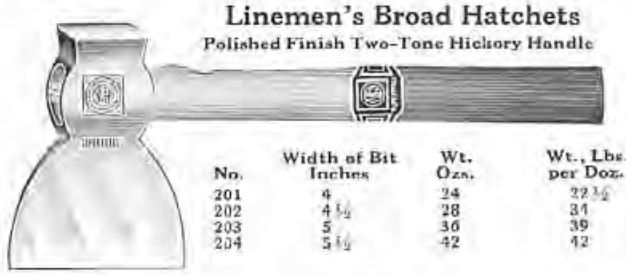
Ball Pein Hammer
Polished Two-Tone Hickory Handles

No.	Weight Ozs.	Length Inches	Wt., Lbs. per Doz.
7/0	2	10 1/4	3 1/4
5/0	4	11	5 1/2
4/0	6	12	7 1/2
3/0	8	13	10 1/2
2/0	12	14	14
0	16	14	19
1	20	15	21
2	24	16	24
3	28	17	28
4	32	17	30
6	40	17 1/2	36
8	48	17 1/2	43 1/2

Chipping Hammer
Polished White Hickory Handles

No.	Weight Ozs.	Length Inches	Wt., Lbs. per Doz.
1	24	15	22
2	32	16	31
3	40	16	34

Linemen's Broad Hatchets
Polished Finish Two-Tone Hickory Handle



No.	Width of Bit Inches	Wt. Ozs.	Wt., Lbs. per Doz.
201	4	24	22 1/2
202	4 1/2	28	31
203	5	36	39
204	5 1/2	42	42

Linemen's Broad Hatchets

Short, strong blade with special blunt edge. Heavy, hardened head. Gun metal finish. Length of handle, 16 inches.

No.	Width of Bit Inches	Wt. Lbs.	Wt., Lbs. per Doz.
58	4 3/4	4	48

Wrecking Bars
Light Gooseneck Pattern

A substantial Bar at a popular price. Painted black.

No.	Length Inches	Diam. of Oct. Steel, Inches	Wt., Lbs. per Doz.
12	12	1/2	9
18	18	5/8	22

Cold Chisels

No. 45. Extra Refined Octagon Steel. Polished and Gun Metaled Head and Taper. Natural finish body. This chisel is the standard pattern, first quality.

Diam. of Steel, Ins.	Size of Cut	Length Inches	Wt., Lbs. per Doz.
1/4	5/16	5	1
5/16	3/8	5 1/2	1 1/2
3/8	7/16	5 1/2	2 1/2
7/16	1/2	6	3 1/2
1/2	5/8	6	4
5/8	3/4	7	7
5/8	7/8	7 1/2	11
3/4	1	8	15
1	1 1/8	8 1/2	20

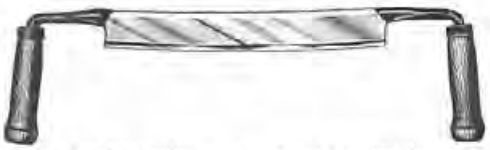
Socket Framing Chisels

These Socket Framing Chisels have beveled edges and long hardwood handles fitted with nickeled pressed steel rings. The blades, sockets and handles are fully polished.

The blades, measuring 8 inches long, are of extra heavy cross section, made of solid steel, and the sockets are of heavier gauge, proportionately longer than the firmer chisels. The overall length ranges from 16 inches on the smallest to 17 1/2 inches on the largest sizes.

No.	Width, Inches	No.	Width, Inches
261—3/8-inch	3/8	261—1 -inch	1
261—1/2-inch	1/2	261—1 1/4-inch	1 1/4
261—5/8-inch	5/8	261—1 1/2-inch	1 1/2
261—3/4-inch	3/4	261—1 3/4-inch	1 3/4
261—7/8-inch	7/8	261—2 -inch	2

Draw Knife



For use in shaving poles preparatory to painting or treating with preservatives. Consists of a heavy blade 2 1/2 inches wide and 14 inches long. Length overall, 24 inches. The blades are full polished and shanks are enameled black.

The handles are hardwood finished natural and are large and full formed with an enlarged end providing the best grip. They are fitted with heavy steel ferrules, but with this form of handle no cap is required.

This knife is recommend for the user whose requirements are unusually severe. It offers real economy where maximum wear is desired.

Cat. No.	Weight, Lbs. Each
625X	3 1/2

Standard Blade Screw Driver

A superior quality driver. Blades of extra fine, special grade steel; every point given two severe turning tests before shipment. Selected hardwood handles finished in dead black, grooved and shaped for grip and comfort. Fastening of blades in handles by unique method, without pins; cannot loosen in use or even the usual abuse. Blades and ferrules finely polished. An extra strong, durable, well balanced tool.

Cat. No.	Length Blade Inches	Length Over All Inches	Wt., Lbs. per Doz.
90– 3	3	6¾	1½
90 4	4	9¼	2¾
90– 5	5	10½	4
90– 6	6	11¾	4¼
90 7	7	13	6
90– 8	8	14	6¼
90– 9	9	15	6¾
90 10	10	16½	9½

Cabinet Screw Driver

Same as standard style except light, slim blades. All lengths have about same size points. Blade same width all way back and slightly tempered entire length. Six in a box.

Cat. No.	Length Blade Inches	Length Over All Inches	Wt., Lbs. per Doz.
95– 4½	4½	8¼	1½
95– 5½	5½	9½	1¾
95– 6½	6½	10¼	1¾
95– 7½	7½	12	2½
95– 8½	8½	13	2½
95– 9½	9½	14	2¾
95–10½	10½	15	3
95–12½	12½	17	3¼

Ratchet Screw Driver

Save time and labor. No tiresome grip and let-go movement necessary. Right hand Ratchet, Left-hand Ratchet and Rigid adjustments. Quickly changed by sliding shifter. Every blade given two severe twisting tests. Polished hardwood handles. Polished blades and nickeled ratchet case.

No.	Length Blade Inches	Wt., Lbs. per Doz.
10–3	3	3
10–4	4	3¼
10 6	6	4⅝

Assembler Screw Driver

Cat. No.	Length of Blade Inches	Diameter Inches	Wt., Oz. per Doz.
611–8	4½	⅛	12

Spiral Screw Drivers

These drive or draw screws by pushing on the handle or by a ratchet movement, or they can be made rigid as an ordinary screw driver. The movement is changed instantly by a simple shifter. Spindle can be locked closed. Three bits of different sizes furnished with each driver; of extra high quality steel and thoroughly tested. Metal parts nickel plated; hardwood handle polished.

No. 35 for small screws only; much lighter and more sensitive than No. 30-A. Used on electrical and similar work. Bits have straight sides to follow screws into deep holes in insulators, etc. Pocket size. Set of extra long bits can be supplied for this tool.

Quick Return Style—Same as drivers above, but a spring added in the handle. Spring pressure keeps blade in screw slot and pushes handle back after each stroke. So driver can be used with one hand, if other is holding work or cannot reach. Quicker, handier and easier to use than other style. Bits and attachments same for both.

Cat. No.	Length with Bit, Closed, Inches	Wt., Lbs. per Doz.
30A	13	12
31A	16¾	18¾
35	9⅛	7½
130 A (Quick Return)	14⅜	12¾
131-A (Quick Return)	19¼	20¼
135 (Quick Return)	10	7½

Attachments

For Spiral Screw Drivers

Chuck and Drill Points

Countersink

Screw Holder Bit

Socket Bit

In ordering attachments be careful to give size and style of Spiral Driver in use. The shanks are same diameter as regular bits where they fit in chuck of driver. All attachments dozen in a box.

No. Attachment	Diam. Shank, Inches	Fits Drivers Nos.
30	9/32	30-A, 130-A, 20–2
31	9/16	31-A, 131-A, 20–3
35	7/32	35, 135, 20–1

Chuck and Drill Points used in place of bit, make Spiral Driver into an automatic drill for wood. Set of points and a chuck in wood box.

No.	No. Points with Chuck	Range of Sizes in Set, Inches	Wt., Lbs. per Doz.	
30	8	1/16 to 11/64	1⅛	..
31	8	1/16 to 11/64	1¼	.....
35	3	1/16 to 3/32	½	.....

Countersinks and Screw Holder Bits. Sizes 30, 31, 35.

Socket Bits—Two Styles; for both square and hex nuts as shown, or for hex only. Give style, width of nuts across flats and No. of driver.

No. 30—1/4, 5/16, 11/32, 3/8, 7/16, 1/2 in. across flats.
No. 31—11/32, 3/8, 7/16, 1/2, 9/16, 5/8 in. across flats.
No. 35—3/16 Hex. only, 1/4, 5/16.

TOOLS

Automatic Drills

For rapidly boring holes in wood by pushing down on the handle, which is forced back by a spring. The drill point revolves backward on up stroke of handle, clearing the chips and freeing the point. Points are held in chuck so they cannot be pulled out.

Drill made of brass and steel, the outside nickel plated and polished. The handle is a magazine for holding the drill points. It is quickly closed and locked and when unlocked the drill points are forced up into plain sight. Eight drill points are included with each drill: 1/16, 5/64, 3/32, 7/64, 1/8, 9/64, 5/32, 11/64-inch diameter. Extra points in wood boxes, either sets of eight, or dozen of one size.

No. 41 Capacity, holes 1/16 to 11/64-inch diameter. Length including drill point 11 3/8 inches. Weight, per dozen, 8 pounds.

Single Speed Hand Drills

Single-speed plain Hand Drills with 3-jaw chuck for round shank tools only. Nickel plated steel frame and chuck. Solid grip-handle of polished hardwood. Two steel pinion gears support main driving gears.

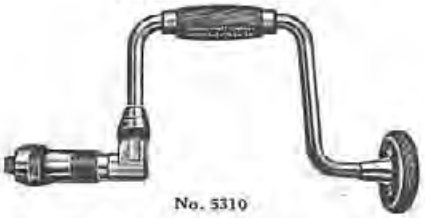
Cat. No.	Capacity of Chuck Inches	Length Over All Inches	Wt., Lbs. Each
1431	3/32	9 1/2	1 1/2

Double Speed Breast Drill

Double-speed plain Breast Drills. Capacity up to 1/2 inch. With 2-jaw chuck for square shank tools, or 3-jaw chuck for round shank tools. Malleable iron frame; adjustable breast plate; screw driver bit on side handle. Handy sliding shifter instantly changes the speed or locks spindle for opening chuck. Steel spindle with adjustable ball bearing.

Cat. No.	Style Chuck	Length Over All Inches	Wt., Lbs. Each
1455	3-jaw	16 1/2	5 1/2

Ratchet Braces

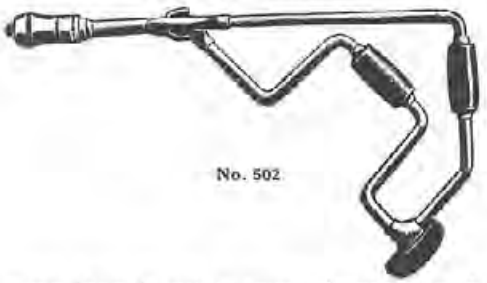


No. 5310

This Ratchet Brace is especially adapted for telephone work. The 10-inch sweep brace is most commonly used.

Cat. No.	Sweep Inches
5308	8
5310	10

Corner Braces



No. 502

This corner brace is easy to operate because there is ample space between swivel and steadying handle to allow free use of the handle. Can be furnished in 8 and 10-inch sweep. The 10-inch sweep brace is recommended on account of the additional leverage secured.

Cat. No.	Sweep Inches	Length Inches
502	10	17
503	8	17

Cross Arm and Pole Bit

A valuable addition to telephone companies' service car equipment. This single cutter tool having one outlining spur with one chip lifter has a very wide channel insuring proper elevation and clearance of chips. This style of head will bore very easily, smoothly and quickly through cross arms and poles. Twist, 12 inches long. Overall length, approximately 17 inches.

Cat. No.	Size Inches	Cat. No.	Size Inches
56-G-6	3/8	56-G-10	5/8
56-G-7	7/16	56-G-11	11/16
56-G-8	1/2	56-G-12	3/4
56-G-9	9/16	56-G-14	7/8

Woodboring Brace Drill

The body of metal in the twist is sufficiently heavy to give strength but yet does not interfere with chip clearance. Length of twist varies from 2 1/4 to 4 inches and overall length from 4 1/2 to 8 inches.

Cat. No.	Size Inches	Cat. No.	Size Inches
46- 8	1/4	46-16	1/2
46-10	5/16	46-18	9/16
46-12	3/8	46-20	5/8
46-14	7/16	46-22	11/16

Bell Hanger Drill

This quality Bell Hanger Drill is made with 4 1/2-inch twist and can be furnished in 12, 18, 24 or 30-inch lengths.

Cat. No.	Size Inches	Cat. No.	Size Inches
48- 6	3/16	48-16	1/2
48- 8	1/4	48-18	9/16
48-10	5/16	48-20	5/8
48-12	3/8	48-22	11/16
48-14	7/16	48-24	3/4

Klein's Side-Cutting Pliers

No. 201 Pattern

The Lineman's Special Side-Cutting Plier is one of the most popular pliers in use today. Its handles are shaped to the curvature of the hand, a much desired feature. Powerful leverage and keen reinforced cutting knives make this plier adaptable for heavy cutting in telephone and telegraph work.

Cat. No.	Size, Inches	Wt., Lbs. per Dozen
201 6	6	5
201–7	7	7½
201–8	8	12
201–9	9	12½

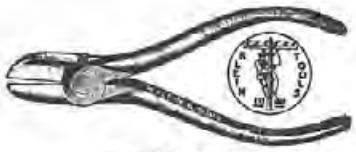
Klein's Side-Cutting Pliers
With Sleeve Twister

No. 212 Pattern

This plier is same as No. 201 series, with the addition of chambers for twisting double sleeve joints.

Cat. No.	Wt., Lbs., per Doz.	Size Sleeve Twister
212–6	5	17 B.& S.
212–7	7½	17 B.& S.
212–8	12	10 B.& S.

Oblique Cutting Pliers
For Close Cutting



No. 202 Pattern

Electricians, telephone men and switchboard builders will find this particular oblique cutting plier one of the most useful tools in their kits. Cuts close, the narrow head permitting its use in confined places. The knives are perfectly fitted, so that they meet accurately at all points. This plier is of the lap joint type, and this superior feature makes it an advance over the old box joint method.

Cat. No.	Size in Inches	Wt., Lbs., per Doz.
202–5 Kleins	5	4
202–6 Kleins	6	4¼
15–5 Swedish	5	4

Klein's Long Oval Nose Pliers
With or Without Cutters

No. 301 Pattern

Style 301–6 plier has been perfected to meet a long-felt want of the electrician and general mechanic. A special feature is its adaptability to stripping the ends of insulated wire. This tool is properly tempered and hardened, so that the jaw will not spring when pressure is applied.

No. 203–6 has the same features as the No. 301–6 series with the addition of the cutting knives. The knives are carefully fitted and the body of the plier is tempered and hardened, assuring true cutting.

Cat. No.		Size in Inches	Wt., Lbs., per Doz.
301–5	(without cutter)	5	2¾
301–6	(without cutter)	6	3
203–5	(with cutter)	5	2¾
203–6	(with cutter)	6	3

Klein's Long Needle Nose Plier

No. 303 Pattern

This tool has all the features of No. 301 series, with the exception that the points of the nose are more of the needle point pattern, which some mechanics prefer. The thin points make these pliers more useful for the general class of work done in Central offices.

Cat. No.	Size, Inches	Wt., Lbs., per Doz.
303 6	6	3

Klein's Long Curved Nose Plier

No. 302 Pattern

A handy plier for working around switchboards, terminals and telephones, due to the nose being curved. The angle is arranged to give full clearance and prevent skinning of knuckles. Users will find this tool adaptable to a great variety of uses. The jaws will not lose their shape or set due to pressure applied, owing to the quality of steel used, its hardening and tempering.

Cat. No.	Size, Inches	Wt., Lbs., per Doz.
302–6	6	2¾

Klein's Long Flat Nose Plier

No. 305 Pattern

Extra long wide flat nose makes this an especially useful plier. This plier is especially hardened and tempered, so that the jaw will not spring when pressure is applied. This tool is adaptable to switchboard work, telephone and telegraph work, armature winding, etc. A very handy tool for spring adjusting. This plier can be supplied with inside of jaws left smooth if desired.

Cat. No.	Size, Inches	Wt., Lbs., per Doz.
305–6	6	3½

Klein's Long Flat Nose, Side-Cutting Plier

No. 206 Pattern

This plier is similar in its usefulness to our No. 305 series shown above with the added advantage of cutting knives.

Cat. No.	Size, Inches	Wt., Lbs., per Doz.
206–6	6	3½

Klein's Slip Joint Plier

No. 406 Pattern

Made of tempered tool steel (like all Klein Pliers) this tool will give service that cannot be expected from the ordinary plier of similar pattern. Has a wire cutter and a screwdriver handle.

Cat. No.	Size, Inches	Wt., Lbs., per Doz.
406–6½	6½	7

Klein's Bent Nose Slip Joint Plier

No. 408 Pattern

A plier of the bent nose type. Specially designed for use in difficult places. An excellent general purpose tool that should be included in every mechanic's kit. Made of tempered tool steel and can be relied on for maximum service.

Cat. No.	Size, Inches	Wt., Lbs., per Doz.
408–8	8	8

Wire Splicing Clamps

Forged from a select grade of tool steel properly hardened and tempered. Handles will not buckle when closed. Have polished heads and black handles.

No. 102-1—Baby Pattern

No. 102-1

A handy vest pocket size adapted for telephone troublemen. Has five round holes, accommodating all sizes of copper wire from 8 to 16 B. & S. gauge, and all sizes of iron wire from 10 to 18 B. W. G.

Cat. No.	Size In Length	Wt. per Doz.
102-1	8 in.	4½ lbs.

No. 102-3—Standard Size

No. 102-3

Used in telephone and telegraph line work, covering wide range of wires. Large hole can also be used in serving guy wire or messenger strand. Has six round holes accommodating all sizes of copper wire from 2 to 12 B. & S. gauge and all sizes of iron wire from 4 to 14 B. W. G.

Cat. No.	Size in Length	Wt. per Doz.
102-3	10¾ in.	15 lbs.

Combination Wire and Sleeve Clamps

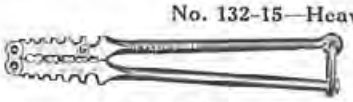
No. 132-12—Light Weight

No. 132-12

Standard telephone clamp for general line and trouble work. Has four round holes, accommodating all sizes of copper wire from 6 to 12 B. & S. gauge, and all sizes of iron wire Nos. 8 to 14 B. W. G. The reverse side has four sets of chambers adapted for twisting double tube copper sleeve joints Nos. 8 to 17 B. & S. gauge, and iron sleeve joints Nos. 10 to 19 B. W. G.

Cat. No.	Size in Length	Wt. per Doz.
132-12	9 in.	10¼ lbs.

No. 132-15—Heavy Weight

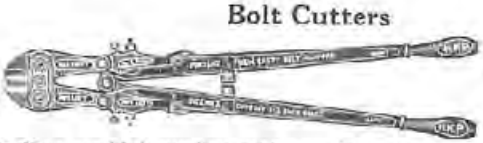


No. 132-15

Covers the range of bare wires telephone and telegraph linemen usually handle. The large hole also can be used in serving guy wire, or messenger strand. Has five round holes which will accommodate all sizes of copper wire Nos. 4 to 12 B. & S. gauge, and all sizes of iron wire Nos. 6 to 14 B. W. G. gauge. The reverse side has five sets of chambers adapted for twisting double tube copper sleeve joints Nos. 6 to 17 B. & S. gauge, and iron sleeve joints Nos. 8 to 19 B. W. G.

Cat. No.	Size in Length	Wt. per Doz.
132-15	11¼ in.	15½ lbs.

Bolt Cutters



The handles are japanned malleable iron, tough and strong; buffers are high quality rubber springs; the jaws specially tempered high-grade special tool steel for cutting annealed bolts and rivets. Jaws tempered for cutting harder material when specified. Made in 4 sizes—Nos. 0, 1, 2, 3.

Cat. No.	Cuts Bolts Up to, Inch	Length Inches	Wt., Lbs. Each
0	5/16	18	3
1	3/8	24½	5¾
2	1/2	30	9
3	5/8	36	13

Combination Steel Wrench—For Lag Screws

No. 3109-20

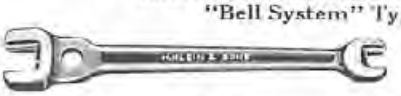
These wrenches are forged from select bar steel. The slot is formed in a cross shape, and will fit machine bolts, nuts or lag screws, from 3/8 inch to 5/8 inch. The small end of the wrench is arranged for 5/16 inch medium bolts or lag screws. The round hole allows the end of a bolt to come through as the nut is run on.

The jaw is wider at its upper end and when this wrench is put on a nut or bolt the tendency is to draw the bolt-head or nut into the wrench and prevent slipping off.

Cat. No.	Size In Length	Wt. per Doz.
3109-20	13½ in.	20 lbs.

Klein's Lineman's Wrench

"Bell System" Type



No. 3146

This wrench is forged of select bar steel and is of the open end type with two openings of different size at each end.

At the larger end the openings are 1 1/16-inch and 15/16-inch, the smaller end 13/16-inch and 7/8-inch. There is a hole provided at the larger end so that the wrench may be used for turning in standard pole steps.

This wrench is particularly adapted for use on the heavier 3-bolt guy clamps on which the clearance for a wrench is limited.

Cat. No.	Size in Length	Wt., Each
3146	13 in.	2 lbs.

Lineman's Socket Wrench

C-154

This Lineman's Socket Wrench fits all of the standard nuts and lags used in pole line construction.

It takes the place of a hammer, or hand axe in driving lags, pins, bolts, steps, etc., and is far superior to any other kind of wrench for pole line construction use.

Only wrench made that nuts on two and three bolt messenger clamps can be tightened without removing wrench from nuts.

Cat. No.	Nut Sizes	Weight, Each
C-234	¾" and smaller	3¼ lbs.
C-154	⅝" and smaller	2½ lbs.

Vises

Two styles, with and without Swivel Base. Work gripped extra firmly at bench, with free swivel action and rigid lever lock. Just loosen one set screw, lift vise off the base without disturbing the work and use on machine or surface plate; then it can be returned to bench again.

Body and sliding jaw of cast iron with hardened steel faces. Can be set on either side, end or bottom, as all are accurately machined to square.

Without Swivel Base

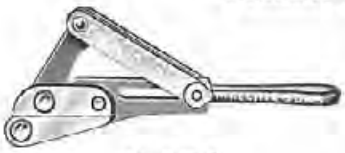
Cat. No.	Jaws, In. Open	Jaws, In. Depth	Size, Inches Width	Size, Inches Height	Size, Inches Length	Wt., Lbs. Each
991	1 1/16	7/8	1½	1½	4⅝	1½
992	1 3/16	1¼	2	2 1/16	6	3½
993	3 1/16	1⅞	2¾	3	8¾	10½
994	4	2 1/16	4	4⅛	12¼	32

With Swivel Base

1991	1½	⅞	1½	3⅛	4⅝	2½
1992	1 3/16	1¼	2	4⅛	6	5½
1993	3 1/16	1⅞	2¾	5¾	8¾	15½
1994	4	2⅛	4	7⅝	12¼	45

Klein's Chicago Grips

Without Pulleys



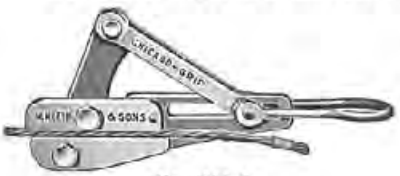
No. 1613-30

Main body piece and lever are forged steel. Draw parts are of wrought steel. Gripping jaws are machined smooth. Rivets are machine turned and workmanship throughout is first class.

Once this grip seizes the wire it holds on with the tenacity of a bull dog. The harder the pull, the tighter the hold. It pulls straight without leaving kinks in the wire. It is handy to put on and holds itself in place by means of a spring acting on the compressing lever. A noteworthy feature is the arrangement of the draw link so that it does not hang down at right angles, and is therefore not in the way of the line when the grip is put on.

Cat. No.	Size of Wire Smaller Than	Without Pulleys	Wt., Lbs. Each
1613-30	No. 6	Without	1½
1613-40	No. 0	Without	2⅝
1613-50	No. 0000	Without	7½

For Messenger Strand and Heavy Cables



No. 1628-6

These grips are similarly constructed to No. 1613 series, but are heavier. They frequently can be modified on special order to accommodate strand and cable of larger diameters.

Cat. No.	
1628-6	For 6,000-lb. Messenger Strand.
1628-16	For 16,000-lb. Messenger Strand.

Buffalo Grips

No. 420-1

For bare and insulated wire with and without pulleys.

These Grips will receive wire in open position without manipulating any part of the tensioning tackle. It is efficient, reliable and simple; is made entirely of steel and will not slip or injure the most delicate insulation.

Cat. No.	Size of Wire Smaller Than	With or Without Pulley
420-1	No. 6	Without
420A-1	No. 6	With

Haven's Steel Grip

No. 1604-10

A popular grip for all around work. Forged from crucible tool steel. The eccentric or dog is hand cut, hardened and tempered. All rivets are steel, machine turned. Almost automatic in action. The handle and the eccentric allows instantaneous hold. A shake of the rope on the tackle disengages or releases the grip. It will not slip, heavy strain only making it grip the tighter.

Cat. No.	Can Be Used on Wire Size	Wt., Lbs. per Dozen
1604-10	No. 4 and smaller	12
1604-20	½ in. wire and smaller	30
1625-20	No. 6 to ¾ wire	69

Klein's Self-Locking Block Tackle

No. 1802-30

Designed for use with Chicago and Haven's grips. Consists of light steel shell block galvanized, fitted with a snubbing hack to lock load in any position. This is a great time saver for the man on the pole. Also in handling a vertical load. To lock the load, simply pull the luff rope under the hook. To release pull the rope. The blocks are arranged with spring guard snap hooks. When pulling up wire to make a splice, it may be used with two grips attached to the snaps, or with the drop forged hook to anchor to an insulator pin or any other convenient anchorage. Furnished with 25-foot ⅜-inch Manila rope and detachable hook. 2½ lbs.

Capstan

Best Known Appliance for Tightening Back Guys

A rope pulley block with which one man can exert a direct pull or lift of from 1000 to 4000 pounds.

Numbers 2 and 4 include 33 feet of rope.

Cat. No.	Capacity	Rope Size
C 2	2000	½
C 4	4000	⅝

Detachable capstan to be used with ordinary blocks

Cat. No.	Weight
C 3	Light
C 5	Heavy

Eastern Climbers

No. 1901
Punched Loop

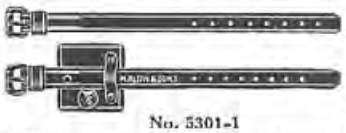
No. 1900
Riveted Loop

In considering the manufacture of linemen's pole climbers, several points present themselves, and the most prominent to guide in output are safety, comfort, and longevity. They are produced from the very best grade of spring steel hardened and tempered under expert supervision, making them absolutely trustworthy. They are designed to fit the foot and limb, giving the linemen the greatest freedom of action and comfort. The stock from which they are produced insures long life and service. Furnished less strap, unless otherwise specified.

Cat. No.	Style of Loop	Weight, Lbs. per Pair
1901—Kleins	Punched	3⅝
1900—Kleins	Riveted	3½
1903—Kleins	Riveted	2¾

Sizes 15½ to 17 inches carried in stock. Lengths from 15 to 18 inches from the instep to the end of shank, by ½-inch variations, can be furnished. When ordering, specify length.

Straps for Eastern Climbers



No. 5301-1

The set consists of two upper straps with 4 x 4 plain leather pads and two lower straps as shown in cut, made of select first quality harness leather, extra heavy "drop forged" roller buckles. Heel straps (over all), 22 inches long by 1¼ inches wide; calf strap (over all), 22 inches long by 1¼ inches wide.

Cat. No.	Description	Wt., Lbs. per Doz. Sets
5301–1	One set complete with plain pads	15 lbs.
5301–2	Same as above, with sheep lined pads	16 lbs.
5301–3	Same as above, with felt lined pads	16 lbs.
5301–4	Straight strap without pad (2 straps)	6 lbs.
5301–5	Strap with plain pad (2 straps)	9 lbs.

Inspectors' Pocket Tool Kit

This kit is a solid black leather folding case strongly stitched, reinforced back. A very handy assortment to fit the pocket. Fitted with one each of the following: 201 6" Side Cutting Pliers; 301 5" Long Nose Pliers; 1550 2" "Xela" Electrician Knife; 1 Pair Electrican Tweezers; 1 Special File; 1 Special Screwdriver.

Cat. No.	Weight, Lbs. Each
1305-2	1½

Inspectors' Tool Bag—Harness Leather

No. 5108 Pattern

This bag is a combination of all the good features of the various common leather bags. It is made of harness leather and will stand rough and hard usage and still always look well. It has a shoulder strap combined with a pad and hand strap; also a saw and bit holder. The bottom is three-ply and is studded with steel studs. Retaining straps pass clear around the bag so that it may be loaded to the limit of its capacity and be securely held intact. All seams are sewed with hot waxed linen thread, lock stitched. The leather used does not absorb moisture.

Cat. No.	Size, Inches	Weight, Lbs. Each
5108–18	18 x 8	4½
5108–20	20 x 8	5⅛

Lineman's Tool Bag
Canvas With Leather Bottom

No. 5102 Pattern

This bag is made of one piece white duck reinforced all around the bottom, 3¼ inches up, with heavy bag leather. The bottom is made of heavy leather outside and duck inside, lock stitched all around. This lock stitch forms an independent knot in each stitch, making it impossible to rip. The bottom is studded with strong steel studs. Bottoms and sides are joined together with lock-stitched leather welt seams. Mouth of the bag is formed by a 12-gauge steel frame; the canvas is clinched between this frame and an inside secondary steel frame. Has harness leather handles and two retaining straps with buckles.

Cat. No.	Size, Inches	Weight, Lbs. Each
5102–18	18	3¾
5102–20	20	3⅞
5102–24	24	4½

"Hank's" Dee Rings and Snaps

"Hank's" Dee rings and snaps are Klein drop forgings individually tested to 1500 lbs. Once a "Hank's" snap is engaged in the Dee ring, it cannot be released accidentally, yet when desired a slight forward push will release it automatically and instantly. No fumbling at a spring latch. No button or tag. A boon to linemen at all times, especially in cold weather and when wearing gloves. In using a "Hank's" belt, it is necessary to use a "Hank's" safety strap. The "Hank's" fittings are not interchangeable with standard hardware.

Klein Tool Belts

DROP FORGED DEE RINGS AND BUCKLE
No. 5202

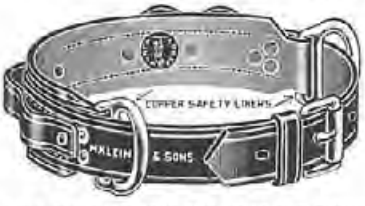
Made of select first quality harness leather. The cushion 2¼ in. wide carries the "D" rings. The outer or loop layer is 1½ in. wide formed into tool loops by riveting to the cushion. It also passes through the "D" rings and is furnished with a strong drop forged buckle tested to 1500 lbs.

The "D" rings are solid steel drop forgings of improved design, tested to 1500 lbs. Surfaces taking the wear of the "D" rings are protected with copper safety liners riveted through the full thickness of belt. All rivets are solid copper set with burrs and sewing is with hot waxed linen thread, lock stitched. "D" rings and buckle galvanized finish.

Made in lengths 36, 38, 40, 42, 44, 46 and 48 inches. Specify length required measuring from end of buckle to middle hole at the other end of belt.

Cat. No.	Type "D" Ring	Width Inches	Wt., Lbs. per Doz.
5202	Standard	2¼	30
H-5202	"Hank's"	2¼	30
5204	Standard	3½	32
H-5204	"Hank's"	3½	32

Klein Tool Belts



DROP FORGED TESTED DEE RINGS AND BUCKLE
No. 5211

First quality harness leather throughout. The inner or cushion layer, 3 inches wide, is narrowed at each end to carry the "D" rings. The body strap, 2 inches wide, is riveted and stitched to the cushion and also passes through the "D" rings. Two tool straps are provided and formed into two tool loops at each side of the belt by riveting through the two layers of belt proper. "D" rings and buckle are solid steel drop forgings of improved design, each tested to 1500 lbs. All rivets are solid copper, hand set with burrs. Sewing is with linen thread, hot waxed and lock stitched. Each belt packed in individual container.

Cat. No.	Type "D" Rings		Width Inches	Wt., Lbs. per Dozen
5211	Standard	N.E.L.A. type	3	36
H-5211	"Hank's"	.....	3	36

Klein Safety Straps

No. 5250

These straps are cut from first quality harness leather, back or center stock only. All rivets solid copper set with burrs. Drop forged roller snaps and buckles tested individually to 1500 pounds, galvanized finish. Straps may be lengthened or shortened by adjusting buckle. Reinforced both ends with copper safety clips riveted through double thickness of the leather. Each strap packed in individual container.

Cat. No.	Description	Size	Wt., Lbs. per Doz.
5250	Drop Forged Snap	1¾ in. x 5 ft. 8 in.	30
H-5250	"Hank's"	1¾ in. x 5 ft. 8 in.	30
5253	Roller Snap	2 in. x 5 ft. 8 in.	39

Klein Safety Straps

No. 5251

These straps are cut from first quality harness leather, back or center stock only. All rivets are of solid copper set with burrs. Drop forged roller snaps and buckles tested individually to 1500 pounds, galvanized finish. Straps may be lengthened or shortened by adjusting buckle. Each strap packed in an individual container.

Cat. No.	Description	Size	Wt., Lbs. per Doz.
5251	Drop Forge Snap	1¾ in. x 5 ft. 8 in.	30
H-5251	"Hank's"	1¾ in. x 5 ft. 8 in.	30

Klein Safety Straps

No. 5257 S and L

This strap—a heavy duty type—is similar to the No. 5253 but has a double tongue buckle to conform to "Bell System" (A. T. & T. Co.) specifications. First quality harness leather. Securely sewed with linen thread, hot waxed, lock stitched. Solid copper rivets and burrs set by hand. Snaps and buckle are solid steel drop forgings individually tested to 1500 lbs. One end reinforced with copper safety clip. The single end is returned through roller of snap and securely sewed and riveted. Made to fill the requirements of those who desire to use the "Bell System" standard.

Cat. No.	Size	Wt., Lbs. per Doz.
5257-S	2 in. x 5 ft. 1½ in. A. T. & T. Co. (Bell System) type	38
5257-L	2 in. x 5 ft. 10 in. A. T. & T. Co. (Bell System) type	40

Klein Safety Straps

No. 5258

This strap is a heavy duty type following the N.E.L.A. specifications. Made of first quality harness leather throughout. Sewed with linen thread, hot waxed, lock stitched. Solid copper rivets with burrs hand set. Snaps and buckle are solid steel drop forgings tested to 1500 lbs. Reinforced at buckle end with safety copper clip, at the fixed snap the strap is returned and secured by sewing and riveting.

Cat. No.	Size	Wt., Lbs. per Dozen
5258	2 in. x 5 ft. 6 in. N.E.L.A. Specifications	39

Malleable Iron Pulley Blocks


No. 369

These malleable iron pulley blocks have a shell length of 2¼ inches and a shell diameter of 1½ inches. The sheave has a thickness of ½ inch and takes a ⅜ inch rope.

Cat. No.	Style
368	Single Sheave Single Eye
369	Double Sheave Single Eye
370	Single Sheave Double Eye
371	Double Sheave Double Eye

Please order by number.

Steel Pulley Blocks


No. 261

These Blocks are much lighter than the wood Blocks and are equally as strong. There is no danger of the shells splitting and are more durable and the nicely rounded edges help to protect the rope. Can be furnished with single, double or triple sheave. **Please be sure and specify catalog number, size of shell and number of sheaves when ordering.**

Cat. No.	Shell Length Inches	Size Rope Inches	Diam. Sheave Inches
261 Single	4	½	2¼
261 Single	5	⅝	3
261 Single	6	¾	3½
262 Double	4	½	2¼
262 Double	5	⅝	3
262 Double	6	¾	3½
263 Triple	4	½	2¼
263 Triple	5	⅝	3
263 Triple	6	¾	3½

Wood Pulley Blocks


No. 26

These are regular Inside Iron strapped Blocks. Beckets are furnished in all single, one-half double and one-third triple blocks without charge. If a greater number is wanted an extra charge will be made. Furnished with single, double or triple sheave. **Please be sure and specify catalog number size of shell and number of sheaves when ordering.**

Cat. No.	Shell Length Inches	Size Rope Inches	Diam. Sheave Inches
26 Single	6	¾	3½
26 Single	8	1	4¾
27 Double	6	¾	3½
27 Double	8	1	4¾
28 Triple	6	¾	3½
28 Triple	8	1	4¾

RELIABLE CABLE GRIPS

Single Eye—Hard Wire

For Conduit Construction

Duplex hard tough wire grip for attaching pulling line to the end of a cable. Resists wear in rough, sandy conduits. Large sizes used on aerial cable.

For Cable Diam. Inches	Cat. No.	Size Inches	Cat. No.	Size Inches
¾ to ⅞	802	¾ x 22	812	¾ x 30
1 to 1⅜	803	1 x 22	813	1 x 30
1½ to 1⅞	804	1½ x 22	814	1½ x 30
2 to 2⅜	805	2 x 22	815	2 x 30
2½ to 2⅞	806	2½ x 30	816	2½ x 45
3 to 3⅜	807	3 x 30	817	3 x 45
3½ to 3⅞	808	3½ x 30	818	3½ x 45

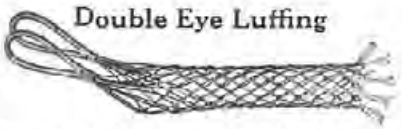
Single Eye—Soft Wire

For Aerial Construction

To be used only for drawing aerial cable through rings. The eyes are soft and do not wear well. They save trouble by feeding through aerial rings without displacing the rings.

For Cable Diam. Inches	Cat. No.	Size Inches	Cat. No.	Size Inches
¾ to ⅞	822	¾ x 24	832	¾ x 36
1 to 1⅜	823	1 x 24	833	1 x 36
1½ to 1⅞	824	1½ x 24	834	1½ x 36
2 to 2⅜	825	2 x 24	835	2 x 36
2½ to 2⅞	826	2½ x 24	836	2½ x 36

Double Eye Luffing



Used for pulling slack or removing old cable. Shortest body permits longest pull in cramped manhole.

For Cable Diam. Inches	Cat. No.	Size Inches	Cat. No.	Size Inches
¾ to ⅞	842	¾ x 18	852	¾ x 24
1 to 1⅜	843	1 x 18	853	1 x 24
1½ to 1⅞	844	1½ x 18	854	1½ x 24
2 to 2⅜	845	2 x 18	855	2 x 24
2½ to 2⅞	846	2½ x 18	856	2½ x 24
3 to 3⅜	847	3 x 18	857	3 x 24
3½ to 3⅞	848	3½ x 18	858	3½ x 24

Double Eye Split

Used for pulling slack in working cables. Can be attached and removed without cutting cables.

For Cable Diam. Inches	Cat. No.	Size Inches	Cat. No.	Size Inches
¾ to ⅞	862	¾ x 18	872	¾ x 24
1 to 1⅜	863	1 x 18	873	1 x 24
1½ to 1⅞	864	1½ x 18	874	1½ x 24
2 to 2⅜	865	2 x 18	875	2 x 24
2½ to 2⅞	866	2½ x 18	876	2½ x 24
3 to 3⅜	867	3 x 18	877	3 x 24
3½ to 3⅞	868	3½ x 18	878	3½ x 24

PREST-O-LITE EQUIPMENT

The use of Prest-O-Lite Gas as a fuel saves delays and interruptions. It furnishes an intense heat in a concentrated, easily controlled flame. No preheating, pumping up or generating required. Just turn on the gas and light the torch. This, together with the lightness and balance of the torches, makes possible neater and stronger connections that are solid through and through. Experienced linemen require no special training to use Prest-O-Lite equipment.

No. O-6119 Lineman's Outfit

The Prest-O-Lite No. O-6119 Lineman's Outfit was developed especially for telephone use. It will take care of the general soldering, brazing and heating work of the average exchange. The torch handle has two interchangeable heads so that two distinct torches may be assembled—one an open-flame torch, the other a soldering iron. The flame of the soldering iron is completely concealed within the head, eliminating possibility of burning insulation or other inflammable material. The Prest-O-Lite O-6119 Lineman's Outfit consists of the following, any of which may be ordered separately.

Quantity	Cat. No.	Description
1	O-2343	MC Tank with gas and key
1	A-6108	Soldering Iron
1	A-6085	Torch Stem and Mixer Assembly
1	A-3321	MC Handle Assembly
1	A-2345	MC Union
2	A-963	Hose Bands
6 ft.	Z-54	Fabric Hose
	A-3710	Friction lighter furnished at additional cost

No. O-6120 Lineman's Outfit

The Prest-O-Lite No. O-6120 Lineman's Outfit includes the same handle and open-flame torch as the O-6119 outfit. It is for use where open flame work only will be encountered. Particularly suitable for wire splicing. In addition it may also be used for light brazing. The Prest-O-Lite O-6120 Lineman's Outfit consists of the following, any of which may be ordered separately:

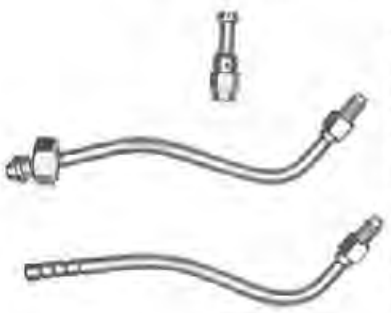
Quantity	Cat. No.	Description
1	O-2343	MC Tank with gas and key
1	A-6103	Torch
1	A-3321	MC Handle Assembly
1	A-2345	MC Union
2	A-963	Hose Bands
6 ft.	Z-54	Fabric Hose
	A-3710	Friction lighter furnished at additional cost

No. O-6109 5-In-1 Outfit

The Presto-O-Lite 5-in-1 Outfit includes four interchangeable torches and one soldering iron so that five distinct torches may be assembled. This wide assortment enables the user to apply the proper flame and the right temperature to obtain the best results for each job. Used for a large variety of soldering, brazing, sweating, melting, tempering and other heating operations. Comes packed in a neat, durable metal box with snap lock. The Prest-O-Lite O-6109 5-in-1 Outfit consists of the following, any of which may be ordered separately:

Quantity	Cat. No.	Description
1	A-6058	Handle
1	A-6084	Straight Stem and Mixer
1	A-6086	Short Curved Stem and Mixer
1	A-6083	Medium Curved Stem and Mixer
1	A-6089	Long Curved Stem and Mixer
1	A-6088	Soldering Iron Stem, sleeve, Mixer, and Copper Tip
1	A-3879	Union for B Tank
1	A-6081	Wrench
1	A-6299	Box
6 ft.	Z-54	Hose
2	A-963	Hose Bands,
		Replacement Parts for Soldering Iron
1	L-6078	Copper Tip Only

No. A-6102 Torch Set



The Prest-O-Lite A-6102 Torch Set has two stems,—one for connecting to a Prest-O-Lite Gas Tank with rubber hose, and the other with MC Union for attaching direct to Prest-O-Lite MC Tank. Convenient and efficient for light brazing and soldering. Produces a volume of heat sufficient for brazing steel rods up to 3/8 in. in diameter. Easy to operate. The Prest-O-Lite No. A-6102 Torch Set consists of the following, any of which may be ordered separately:

Cat. No.	Description
L-6014	Torch Head
A-6015	Stem for use with hose
A-6016	Stem with MC Union
	Rubber hose and Union for A, B, or E Tank furnished at extra cost.
A-3710	Friction lighter furnished at additional cost.

TORCHES

Clayton Lambert Blowtorches

No. 308 Blowtorch

No. 308

No. 308 Torch performs perfectly either indoors or outdoors under severest weather conditions. To guarantee quick starting, the burner is equipped with a patented preheater, which directs an intense preheating flame (1800 degrees) against the vaporizing veins of the back burner. A new type windshield of exclusive design provides positive protection in cold and windy weather. A powerful blue blast, which can be regulated to a small concentrated flame, can always be secured with the No. 308. Heat-resistant covers on control valve wheels afford protection for the hand. Non-enlargeable and self-cleaning gas jets never get out of order. Greatly improved vein construction gives unusually long burning life before requiring cleaning. The Torch is ruggedly constructed throughout—there are no loose parts or delicate adjustments to cause trouble.

Cat. No.	Gasoline Capacity	Wt., Lbs. Each
308	1 quart	5½

No. 32A Blowtorch

No. 32A

No. 32A Torch is identically the same in size and design as No. 308, with the exception that the patented preheating blast device is not attached to the burner. For the mechanic to whom the quick starting device is not essential, this tool will give remarkable satisfaction and out-perform any other torch he has ever owned. Has self-cleaning, non-enlargeable gas orifice. By changing the burner jet, kerosene may be burned successfully.

Cat. No.	Gasoline Capacity	Wt., Lbs. Each
32A	1 quart	5⅛
38	1 pint	3½

No. 208 Blowtorch

No. 208

Very economical in operation and is recommended for the general use of all mechanics. The tank is made of heavy gauge seamless drawn brass reinforced, with automatic brass pump fitted with New Double-Needle Burner, producing a steady pure blue flame of intense heat, using very little fuel. It is guaranteed to work perfectly in the wind and in weather far below zero. Burner has rigid hook and support for holding soldering copper. It is impossible to enlarge the burner orifice, a very great improvement.

Cat. No.	Gasoline Capacity	Wt., Lbs. Each
208	1 quart	5⅛
210	1 pint	4

Turner Blowtorches

No. 39-A Blowtorch

No. 39-A

Superblowtorch for professional users. Operates perfectly in any weather. Sturdy construction gives life-time service. Impossible to jam orifice by hard usage. Cleaning needle and orifice block easily replaced after long wear. Cool composition valve handles. Drip cup conveniently filled through lower priming valve. Highly polished seamless brass tank with trouble-free pump. Substantial and comfortable handle grip.

Cat. No.	Gasoline Capacity	Wt., Lbs. Each
39-A	1 quart	5

No. 45-A Blowtorch

No. 45-A

Super - design professional blowtorch having finest performance and most modern improvements. Extremely powerful blast functions perfectly in most severe weather. Orifice positively cannot be enlarged by rough usage. Easily removable cleaning needle and orifice block. Cool composition valve handles. Convenient drip cup priming through lower valve. Highly polished seamless brass tank with safety valve and air release.

Turner Kerosene Furnace

The Turner No. 76-B Kerosene Furnace is recommended for telephone and other public utility companies. It will quickly melt lead, tin, zinc, rosin, paraffin and other materials, and keep them molten for hours at a time with a minimum amount of fuel. It eliminates coil replacements, costly repairs or job tie-ups.

The patented copper bronze burner will last a lifetime. It gives accurate and efficient control of the flame at all times. The gas orifice is automatically cleared when the shut off valve is closed. The furnace is provided with cool composition valve handle, effective quick-acting trouble-free pump, heavy lead coated welded steel tank.

Cat. No.	Capacity, Quarts	Wt., Lbs. Each
76-B	4	13

TORCHES

Unique Blow Torches

The torch for use in cold blasts and zero weather. It is simple of design and of sturdy construction. The long horizontal generating veins are placed parallel with and directly under the flame. This insures the complete and thorough vaporizing of the fuel, producing an even, forceful blue flame of intense heat, which can be throttled down fine.

The orifice is kept clear of dirt and foreign particles by means of a steel needle which works in and out of it as the flame regulating valve is opened and closed. This eliminates the necessity of poking with pin or wire at the orifice and the resulting damage to the most delicate part of the torch.

The orifice is located $\frac{5}{8}$" forward of fuel control valve seat—a separate threaded block which is easily replaced. All channels and generating veins are fitted with removable plugs and are easily accessible for cleaning and repairing.

The tanks are of 18 gauge steel with brazed fittings and bottom welded.

No.	Size	Fuel	Flame Size	Weight
2	1 pint	Gasoline	6" x $\frac{3}{4}$"	3$\frac{1}{2}$ lbs.
3	1 quart	Gasoline	9" x 1 "	4$\frac{1}{4}$ lbs.
5	1 quart	Kerosene	8" x 1 "	4$\frac{1}{4}$ lbs.
7	2 quarts	Gasoline	9" x 1 "	5$\frac{1}{2}$ lbs.

Clayton Lambert Gasoline Furnace

No. 22A Coil Firepot is easy to start and very simple to operate and is guaranteed to burn low gravity gasoline perfectly in any kind of weather. Its terrific heat and large volume of flame make it especially efficient and gives unusual satisfaction when used in inaccessible corners for melting joints. Its speed in melting solder and babbitt in metal pot has never been equaled. It has broad base, sturdy uprights and sets low and is designed to handle a full six inch metal pot without being top heavy; a powerful pump produces air pressure quickly.

The improved quick detachable coil unit and hinged door coil cup makes it easy to clean and make repairs and saves time. The entire coil unit can be replaced in 45 seconds. Simply unscrew the coupling nut just above the shut-off valve and the coil unit can then be lifted out through the open door of the coil cup. The firepot is ready for use.

The No. 12A Coil Fire Pot is exactly like the No. 22A, except that it is fitted with air valve and bulb.

Cat. No.	Gasoline Capacity, Gal.	Wt., Lbs. Each
22A	1	9$\frac{3}{4}$
12A	1	9$\frac{3}{4}$

Unique Furnaces

The Unique Furnace will melt 50 pounds of solder in 10 minutes—but more important is the length of time it will function without attention.

Generator—The patented figure "8" seamless steel tubing generator is responsible for the intense heat which actually consumes the carbon.

Regulating Valve and Orifice Scraper—Perfect control of the flame—regulated as easily as a gas stove burner. As the control valve is opened and closed, the orifice—hole through which the gas blows—is automatically scraped and cleared of dirt particles.

Upper Structure—The generator, control valve and orifice scraper are removable for cleaning and repairing by simply loosening union and coil cup. All vital parts are replaceable without removing the top plate or disturbing uprights.

Tank—A drawn shell of 16 gauge steel with welded fittings and bottom. A steel **protecting** ring is welded into the bottom of the finished tank.

No.	Capacity	Top Plate	Weight	Dimensions	Fuel
63	1 gallon	*7-inch	12$\frac{1}{2}$ lbs.	8 x 12$\frac{1}{2}$"	Gasoline
65	1 gallon	7-inch	12$\frac{1}{2}$ lbs.	8 x 12$\frac{1}{2}$"	Kerosene

*Accommodates 8" solder pot.

The Unique Safety Folding Wind-Shield

The Unique Folding Windshields are made of 22 gauge steel, reinforced by double folding the edges. All three types fold flat for convenience in carrying.

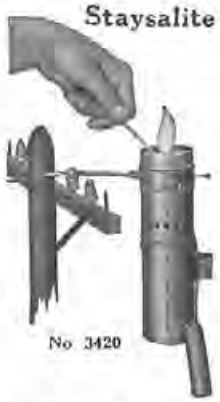
The No. 50 is fitted with a welded grate of $\frac{3}{8}$" material for supporting paraffin pots, kettles, etc.

The No. 50A is identical with the above described shield, without the grate.

The No. 50C is a three sided shield without a grate.

No.	Dimensions	Weight	Shape
50	23" x 19 " x 19 "	29 lbs.	4 sides
50A	23" x 19 " x 19 "	25 lbs.	4 sides
50C	22" x 17$\frac{1}{2}$" x 17$\frac{1}{2}$"	18 lbs.	3 sides

Staysalite Lineman's Alcohol Torch



No 3420

The Staysalite torch is the invention of a practical experienced telephone man. It stays lighted in the wind; it can be lighted and extinguished in a moment; it burns alcohol without odor or noise; it has no adjusting parts; therefore cannot get out of order; it can be carried on lineman's belt.

Cat. No.	Wt., Lbs. Each
3420	1$\frac{1}{4}$

TOOLS

Kellogg Soldering Iron

Kellogg Iron With Pointed Tip

A good, sturdy soldering iron built to give continuous, uninterrupted service under the hardest usage. The Kellogg factory as well as installing department have standardized on this iron because they can use it eight or more hours a day continuously without the slightest danger of burning it out.

The heating element is designed and insulated to furnish the correct amount of heat at the tip and yet keep the handle cool at all times. These irons can be furnished in two degrees of heat, "Medium Hot" or "Hot." The "Medium Heat" is for general use, being suitable for light work such as radio sets, telephone and switchboard wiring, etc. The "Hot Heat" is for heavier work and is more suitable for working with enameled wire. The heating element can be easily replaced when burned out.

The pointed tip furnished is most practical for general all around use. A heavier flat tip can be furnished in addition, at a small cost, by specifying 1 extra piece No. 47794 flat tip.

Designed to operate from either 110 volt alternating current or 115 volt direct current. Furnished with 6 foot heater cord and separable plug. Overall length less cord 14 inches. Net weight with cord and plug 28 ounces.

Code No.	Heat	Watts	Style of Tip
1-A	Medium	105	Pointed
2-A	Hot	150	Pointed

Repair Parts for Kellogg Irons

47796 Pointed Tip only.
47794 Flat Tip only.
47777 Medium Heat Element only.
47778 Hot Heat Element only.

Unique Solder Copper Handles

This handle was specially designed for use around Telephone Main Frames. The piano wires expand and contract as the steel shank does, thus maintaining a tight grip on the shank at all times. Since the only point of contact between the shank and the wood is at the extreme point of the shank the charring customary with most handles is eliminated. No tools required to attach this handle—just insert point of shank in square formed by the wires and force down until point is slightly imbedded in the wood.

No. 1 Handle for shanks $\frac{1}{16}$ to $\frac{3}{8}$". No. 2 Handle for shanks $\frac{5}{8}$ to $\frac{9}{16}$".

Vulcan Electric Soldering Iron

The Vulcan Electric Soldering Tool is correctly designed for the steady production and constant delivery of ample heat, and operates from either direct or alternating current. It is equipped with a perfectly "tinned" hand forged tip of purest copper, attached by an accurate, valve-fitting, metal-to-metal connection to the heater, and has a hermetically sealed winding chamber which (by protecting its heating wire from the oxidation and corrosion that would otherwise steadily eat it away) gives the Vulcan High Powered Heating Element a prolonged life of unimpaired heat production.

The Vulcan construction is unique in the simplicity of its maintenance requirements, consisting of 5 complete, replaceable parts,—a tip, a Hermetically Sealed Heating Head, a Handle, a Cord and a Plug.

The No. 30 is recommended for Radio and Home Use, fuses, instruments, inspector's or linemen's tool kits.

The No. 50 is for heavier work and suited for fast telephone work.

The No. 300 is of larger size and adapted for medium tinware, general manufacturing, metal patterns, etc.

Cat No.	Watts	Length	Net Wt. Oz.
30	60	Adjustable	12
50	120	Adjustable	18
300	250	$14\frac{3}{8}$"	35

Manual Soldering Irons

No. 1. Manual Type

These are carried in stock and are furnished without handles.

Cat. No.	Wt., Each
1	$\frac{1}{2}$ lb.
2	1 lb.
6	3 lb.

Pony Soldering Irons

No. 680-4. Pony Type

Designed especially for telephone and switchboard assemblers and adjusters. Forged and drawn out to the proper point for accurate work. Furnished with black ebonized handles.

Cat. No.	Length, Inches	Wt., Ounces
680-1	$11\frac{1}{2}$	$1\frac{1}{4}$
680-2	11	$1\frac{1}{2}$
680-3	9	$1\frac{3}{4}$
680-4	$8\frac{1}{2}$	2
680-5	8	3

TOOLS, TURNBUCKLES

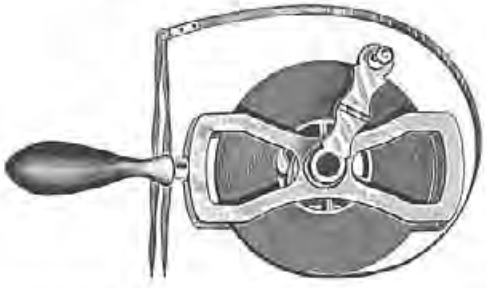
Sterling Linen Tapes

A strictly high grade tape especially popular with telephone and telegraph companies for ordinary work.

The tape is ⅜ inches wide with clear markings and prominent figures showing feet and inches. Reinforced leather ends. Case of genuine russet leather, metal lined, with folding flush handle and nickel plated trimmings.

Cat. No.	Length, Feet	Wt., Oz. Each
403	50	12
406	100	24

Surveyors' Chain Tape



A chain tape that will stand up to telephone, railroad, and other rough work. This line is of heavy and extra tough steel, coated with white metal to resist rust. The foot markings are on one side only and a pair of rawhide thongs is furnished with each tape.

Has sturdy metal reel of improved pattern, heavily nickel plated, with polished hardwood handle and long folding winding handle. Line is detachable from reel.

Cat. No.	Length, Feet	Wt., Lbs. Each
3100	100	3¼
3150	150	5

Challenge Steel Tapes

Particularly recommended for all kinds of general measuring. Line of highest grade tape steel with distinct feet, inches and eighth inches markings on one side only. Case of genuine russet leather, hand stitched and with substantial plated steel liner. Folding flush steel handle is opened by pressing pin on opposite side. Measurements guaranteed accurate.

Cat. No.	Length, Feet	Wt., Oz. Each
263	50	11
266	100	21

Acid Cured Lineman's Gloves

No. 70

Pure gum rubber gloves have been adopted as a "safety first" glove by many leading telephone companies. The Catalog No. 70 series is an ideal glove for linemen working on voltages up to 20,000. The fingers are straight. The overall glove length is 14 inches. All gloves are guaranteed by the factory. Can be supplied in sizes from 9 to 12.

Cat. No.	Guarantee Voltage
70–5000	5000
70–10000	10000
70–12000	12000
70–15000	15000
70–20000	20000

No. 281 and 188

Wire Gauges

A gauge made from the best of steel, tempered, adjusted and warranted accurate.

No. 281 American Standard 0 to 26 B.&S.

No. 188 English Standard 1 to 36 B.W.G.

Turnbuckles

(Hot Galvanized)

These turnbuckles are furnished with either two eyes or one eye and one hook. Please be sure to specify type when ordering.

Cat. No.	Size Inches	Type	Wt., Lbs. per C
1021	½x 6	Hook and Eye	136
1022	½x 9	Hook and Eye	167
1023	½x12	Hook and Eye	199
1231	⅝x 9	Eye and Eye	284
1232	⅝x12	Eye and Eye	352
1234	¾x12	Eye and Eye	507

Galvanized Wire Rope Thimbles

(Hot Galvanized)

Wire rope thimbles should be used on all guy anchor rods to give the guy wire the reinforcement at rod eye and eliminate short kinks in bending.

Cat. No.	Size Inches	Size Strand	Wt. Lbs. per C
1057	⅜	¼—5/16	10
1058	½	⅜—7/16	21
1059	⅝	½	40

Lineman's Safety Chair
Rigid Type

Blackburn's Rigid Cable Chairs are made very strong and rigid. The design and construction of these chairs assures long continued service.

The chair frame is made of cold rolled steel and steel channels braced with steel straps.

The seat is made of Western White Pine, reinforced with strap steel imbedded in wood to prevent bolts from pulling out of wood ends.

Holes are provided in open side of chair frame for snapping on safety belt. All chairs are equipped with hand brake to hold Chair stationary when desired. Blackburn's rubber tread wheels are made with the very best quality of automobile tire tread and will therefore give long service without any apparent wear of rubber. If necessary chairs can be re-tired in a few minutes. Chairs are furnished with or without wheel guards. If wheel guards are desired, they should be applied at the factory, at an additional cost.

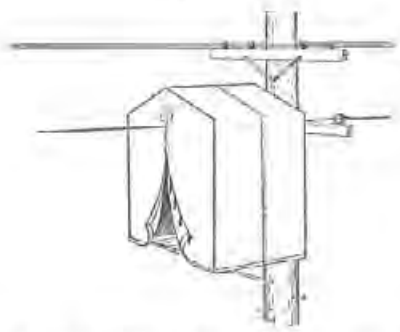
Cat. No.	Height	Width	Weight Crated
20	25½ in.	21 in.	28 lbs.

Lineman's Safety Chair
Flexible Type

Blackburn's Flexible Cable Chair can be collapsed, strapped or tied for convenient transportation aboard a train, bus or automobile. It is adjustable, up or down, by snaps and chain. The chain is made of steel, electric welded on sides of links to guard against weld opening. Snaps used are lineman's snaps of drop forged steel and galvanized. Flexible chairs can be furnished with No. 7 Seat or No. 8 Seat. The No. 7 Seat is made of high grade fir lumber, reinforced with strap steel imbedded in wood. No. 8 Seat is made with belting of the best canvas, riveted at ends with copper rivets around electric welded iron hangers. Holes are provided in open side of chair frame for snapping on safety chains. All chairs are equipped with hand brake to hold chair stationary when desired. The rubber tread wheels will give long service without any apparent wear of rubber as they are made with the highest quality of automobile tire tread. Chairs can be re-tired in a few minutes if necessary. Chairs are furnished with or without wheel guards. If desired they should be applied at the factory at an additional cost.

Cat. No.	Height	Width	Weight Crated	Seat Number
21	Adjustable	21 in.	33 lbs.	No. 7
22	Adjustable	21 in.	33 lbs.	No. 8

Cable Splicer Tent



For use of aerial cable splicers during cold and stormy weather. Made of 10 oz. Army cotton duck. The roof is spread and supported by means of a collapsible three-ribbed galvanized metal frame work which fastens to the cable suspension strand. On each of two opposite sides of the tent there is an opening which can be laced from the inside after the tent is erected.

Furnished in two sizes: Type "S" 3 ft. 2 in. long, 4 ft. 6½ in. wide and 8 ft. 8 in. high, is intended for general splicing uses. Type "L" 4 ft. 6 in. long, 4 ft. 6½ in. wide and 8 ft. 8 in. high for splicers engaged in splicing aerial toll cables and other splicing work where more room is required. Specify type when ordering.

"Matlock" Cable Roller

No. 501

By use of the "Matlock" Cable Roller, the work of running Aerial Cable is greatly expedited. A suitable number of "Matlock" rollers are attached to the messenger wire, in the simple manner shown in the cut, fastened in place by the T handle screws. The cable is then placed on the rollers and carried on to any required distance. A great many feet of cable can thus be run with ease and in a short time. The roller has a metal bushing extending beyond each end. This prevents wear on the roller and keeps it in the center of the frame. The frame is forged of mild steel.

Cat. No.		Wt., Each
501	With Wooden Roller	4½ lbs.
502	With Iron Roller	8 lbs.

TOOLS

Pay-Out Reel

This reel is of hardwood, reinforced and braced throughout with metal strips. The pins are adjustable for 12, 18, 21 and 24-inch coils. Wood painted delft blue, metal parts black.

Cat No.	Description	Wt., Lbs. Each
10-510-902	Pay-out	40

Barrow Reels

Made of hardwood and is of strong, durable construction, well able to withstand heavy work. The large metal discs on the reel and barrow form a common bearing surface around the center pin. Reel pins are adjustable for 12, 18, 21 and 24-inch coils. Wood painted delft blue, metal parts black.

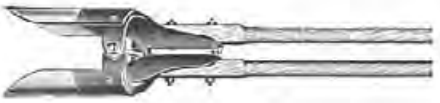
Cat. No.	Description	Wt., Lbs. Each
10-520-900	Barrow Reel	80
10-521-901	Extra guard pins	1½

Folding Take-Up Reel

This reel is the collapsible type, composed of two parts—the wooden stand and the metal reel. The stand is of hardwood mortised and tenoned and reinforced with steel. Reel is malleable iron and steel. Wood painted delft blue, reel and metal parts black.

Cat. No.	Size of Coil, Inches	Wt., Lbs. Each
10-501-897	21	42

Hercules Digger



A two-handled digger that has enjoyed universal popularity. Blades 5 x 9 inches. Castings are bolted together from the outside, with bolt passing through the center, making a stronger and more rigid tool.

Cat. No.	Size Handle, Feet	Wt., Lbs. Each
1924	4	9
1927	7	11

Iwan Augers

Very slight pressure is necessary to operate this handy post hole auger. Two sharp cutting edges are formed to both cut and hold the earth, leaving a round, clean cut hole.

Size, Inches	Size, Feet	Wt., Lbs. Each
4	4	7
5	4	7½
6	4	8½
7	4	9
8	4	9½
9	4	10

Eureka Diggers

Split hardwood handles, polished steel blades, malleable iron castings. Iron work and upper half of blades painted black. Length overall, 5 ft.

Cat. No.	Size Handle, Feet	Wt., Lbs. Each
10-435	4	9
10-436	7	11

Packed 12 in a bundle

Eureka Digger Handles

Cat. No.	Size, Feet	Wt., Lbs. Each
10-437	4	2
10-438	7	3½

Packed 12 in a bundle

TOOLS

Plain Round Digging Bars

Double beveled cutting blade at one end.

Cat. No.	Size	Wt., Lbs. Each
10-413-1085	1⅛ in. x 8 ft.	28

Packed 2 in a bundle.

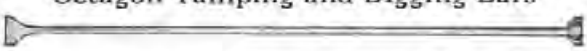
Octagon Crow and Digging Bars

Double beveled cutting blade at one end; pointed at the other.

Cat. No.	Size	Wt., Lbs. Each
10-401	1 in. x 7 ft.	20
10-402	1 in. x 8 ft.	25
10-404	1⅛ in. x 7 ft.	25
10-405	1⅛ in. x 8 ft.	28
10-406	1¼ in. x 8 ft.	33

Packed 2 in a bundle.

Octagon Tamping and Digging Bars



Double beveled cutting blade at one end; fitted with heavy tamping shoe at the other end.

Cat. No.	Size	Wt., Lbs. Each
10-408-1071	1 in. x 7 ft.	20
10-409-1072	1 in. x 8 ft.	25
10-411-1074	1⅛ in. x 7 ft.	25
10-412-1075	1⅛ in. x 8 ft.	30

Packed 2 in a bundle.

Electric Digging Spud and Tamper

Steel tubing with iron tamping shoe and forged crucible steel blade. This tool is well balanced and the broad blade makes digging easy. A very serviceable tool for general use.

Cat. No.	Length Feet	Wt., Lbs. Each
10-415-852	9	20

Packed 2 in a bundle.

Electric Tamping Bars

Steel tubing with iron tamping shoes. Painted black.

Cat. No.	Length Feet	Wt., Lbs. Each
10-416	7½	18
1044	8	15

Packed 2 in a bundle.

Light Shoe Tamping Bars

Select maple handle, 2 inches in diameter, tapered at lower end, fitted with steel shoe 1¾ x ¼ inch securely riveted to handles. Tamping end dipped in creosote to prevent decay, then painted delft blue. Handles smoothly sand finished.

Cat. No.	Length Feet	Wt., Lbs. Each
10-417-854	7	10
10-418-855	8	11

Packed 2 in a bundle.

Heavy Shoe Tamping Bars

Select maple handle, 1⅝ inches in diameter, tapered at lower end. Fitted with heavy steel shoe ½ x 1¼ inches. Securely riveted to handle. Tamping end dipped in creosote to prevent decay, then painted delft blue. Handles smoothly sand finished.

Cat. No.	Length Feet	Wt., Lbs. Each
10-419-1054	7	11
10-420-1055	8	12

Packed 2 in a bundle.

Slick or Loy Digging Tools

Select maple handles, 2 inches in diameter, tapered at lower end; fitted with extra heavy tool steel blades 4 inches by ½ inch with sharp cutting edge, held securely in place by two extra large head rivets. Blade end dipped in creosote to prevent decay. Handles smoothly sand finished.

Cat. No.	Length Feet	Wt., Lbs. Each
10 423	7	16
10-424-853	8	17

Packed 2 in a bundle.

A. T. & T. Pattern Tamping Bars

Select maple handles, 1⅝ inches in diameter, tapered at lower end; fitted with extra heavy one-piece shoe, made of 1¼-inch square steel. Rivets passing through the handle and shoe with heads countersunk, hold the shoe firmly in place. An extremely high-grade tamper. Tamping end dipped in creosote to prevent decay, then painted delft blue. Handles smoothly sand finished.

Cat. No.	Length Feet	Wt., Lbs. Each
10-421	7	12
10-422	8	13

Packed 2 in a bundle.

Tamping Bar Handles Only

Cat. No.	Handle	Wt., Lbs. Each
10-425-1002	7 ft. for No. 417 Tamper	7
10-426-1003	8 ft. for No. 418 Tamper	8
10 427 2002	7 ft. for No. 419 Tamper	6
10-428-2003	8 ft. for No. 420 Tamper	7
10-429	7 ft. for No. 421 Tamper	6
10-430	8 ft. for No. 422 Tamper	7
10-431	7 ft. for No. 423 Slick	7
10-432-1001	8 ft. for No. 424 Slick	8

Packed 6 in a bundle.

TOOLS

Pike Poles

Light Type

Poles of Douglas Fir with pikes of 3/8-inch crucible steel projecting 3 inches. Metal parts painted delft blue. Poles are 2 inches in diameter—not tapered.

Cat. No.	Size	Wt., Lbs. Each
10-204-805	2 in. x 10 ft.	8
10-205-806	2 in. x 12 ft.	9
10-206-807	2 in. x 14 ft.	11
10-207-808	2 in. x 16 ft.	13
10-208	2 in. x 18 ft.	15
10-209	2 in. x 20 ft.	17

Packed 6 in a bundle.

A. T. & T. Pattern Pike Pole

Diameter at center 2½ inches, tapering to 2 inches at ends. This gives extra strength at center where needed with very little increase in weight. Pikes project 4 inches. Metal parts painted delft blue.

Cat. No.	Size	Wt., Lbs. Each
10-219	2½ in. x 12 ft.	12
10-220	2½ in. x 14 ft.	14
10-221	2½ in. x 16 ft.	16
10-222	2½ in. x 18 ft.	18
10-223	2½ in. x 20 ft.	20

Pike Pole Handles Only

Selected Douglas Fir. Smoothly sand finished.

Cat. No.	Size	Wt., Lbs. Each
10-240-970	2 in. x 10 ft.	7
10-241-971	2 in. x 12 ft.	8
10-242-972	2 in. x 14 ft.	10
10-243-973	2 in. x 16 ft.	12
10-244	2 in. x 18 ft.	14
10-245	2 in. x 20 ft.	16
10-248-982	2½ in. x 12 ft.	11
10-249-983	2½ in. x 14 ft.	13
10-250-984	2½ in. x 16 ft.	15
10-251-985	2½ in. x 18 ft.	17
10-252-986	2½ in. x 20 ft.	19

Packed 6 in a bundle.

Standard Deadman

Made of 2 x 4 White Oak with wrought steel fork and spike; fitted with steel bands at each end to prevent splitting. Fork is securely fastened by rivet through the band. This support is adapted for the heaviest kind of work. Wood varnished, metal painted black.

Cat. No.	Length, Feet	Wt., Lbs. Each
10-306-848	8	30

Guarded Pike Poles

Made of selected Douglas Fir with malleable iron ferrule and fork on one piece driven onto pole and secured by a rivet. Handles are furnished in two sizes—the 2-inch are parallel, and the 2½-inch are tapered to 2 inches at the ends. Metal parts painted delft blue.

Cat. No.	Size	Wt., Lbs. Each
10-226-832	2 in. x 10 ft.	9
10-227-833	2 in. x 12 ft.	11
10-228-834	2 in. x 14 ft.	13
10-229-835	2½ in. x 16 ft.	17
10-230-836	2½ in. x 18 ft.	19
10-231-837	2½ in. x 20 ft.	21

Packed 6 in a bundle.

Mule Supports

Made of 4-inch selected hardwood, octagon shape, reinforced with strong steel bands at each end. Heavy crucible steel fork and spikes. Wood painted delft blue, metal black.

Cat. No.	Length, Feet	Wt., Lbs. Each
10-303-845	6	38
10-304-846	7	42
10-305-847	8	46

Jenney Supports

The best selected hardwood is used in this support. The fork is of crucible steel; heavy braces and bolts make it very serviceable. Spikes are bolted to each leg to avoid slipping. This support is shipped knocked down. Wood painted blue, the metal black.

Cat. No.	Length, Feet	Wt., Lbs. Each
10-300-842	6	52
10-301-843	7	57
10-302-844	8	62

Shovels, Wood Handles

The blade of the straight type shovel is in direct line with the handle, making this shovel especially adapted to digging and lining up. Crucible steel blades, with 9- or 22-inch polished straps; selected second growth hickory, ash or maple handle; 1¾-inch diameter at swell; smoothly finished.

Straight Shovels

Hickory or Ash Handles

Cat. No.	Size Handle Feet	Strap Inches	Wt., Lbs. Each
10-015	6	22	7
10-016-1032	7	22	8
10-017-1033	8	22	9
10-018-1034	9	22	10
10-019-1035	10	22	11
10-020	12	22	13

Packed 6 in a bundle

Straight Shovels

Maple Handles

Cat. No.	Size Handle Feet	Strap Inches	Wt., Lbs. Each
10-042	6	22	7
10-043-867	7	22	8
10-044-868	8	22	9
10-044-A-869	9	22	10

Crooked Shovels

Hickory or Ash Handles

Cat. No.	Size Handle Feet	Strap Inches	Wt., Lbs. Each
10-005	6	22	7
10-006-1040	7	22	8
10-007-1041	8	22	9
10-008-1042	9	22	10
10-009-1043	10	22	11
10-010	12	22	13

Packed 6 in a bundle

Crooked Shovels

Maple Handles

Cat. No.	Size Handle Feet	Strap Inches	Wt., Lbs. Each
10-036	6	22	7
10-037-874	7	22	8
10-038-875	8	22	9
10-038-A	9	22	10

Packed 6 in a bundle

Short Handled Shovels

Square points—plain back—polished blades and straps. Handles of the finest selected Northern White Ash—wax finished.

Cat. No.	Size Handle, Feet	Wt., Lbs. Each
10-080	4½	5

Round points—plain back—polished blades and straps. Handles of the finest selected Northern White ash—wax finished.

Cat. No.	Size Handle, Feet	Wt., Lbs. Each
10-081-1090	4½	5

Packed 6 in a bundle

Shovel Handles Only

Hickory or Ash

Cat. No.	Length, Feet	Wt., Lbs. Each
10-021	6, Crooked	3
10-022-1014	7, Crooked	4
10-023-1015	8, Crooked	5
10-024-1016	9, Crooked	6
10-025-1017	10, Crooked	7
10-026	12, Crooked	8
10-027	6, Straight	3
10-028-1005	7, Straight	4
10-029-1006	8, Straight	5
10-030-1007	9, Straight	6
10-031-1008	10, Straight	7
10-032	12, Straight	8

Packed 6 in a bundle

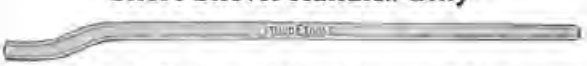
Shovel Handles Only

Maple

Cat. No.	Length, Feet	Wt., Lbs. Each
10-074-993	7, Straight	4
10-074-A-994	8, Straight	5
10-074-B-995	9, Straight	6
10-074-C-1000-B	7, Crooked	4
10-074-D-1000	8, Crooked	5
10-074-E	9, Crooked	6

Packed 6 in a bundle

Short Shovel Handles Only



Finest selected Northern White Ash—wax finished—heavy double bend For round and square point shovels.

Cat. No.	Length, Feet	Grade	Wt., Lbs. Each
10-082	4½	XX	2½
10-083	4½	X	2½
10-084	4½	No. 1	2½

Packed 12 in a bundle

Spoons

Western Union Pattern

Maple Handles

Cat No.	Size Handle Feet	Strap Inches	Wt., Lbs. Each
10-062-859	7	22	8
10-063-860	8	22	9
10-064-861	9	22	10

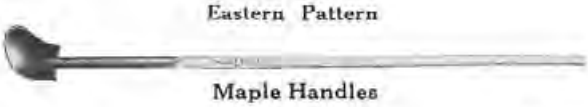
Hickory or Ash Handles

Cat. No.	Size Handle Feet	Strap Inches	Wt., Lbs. Each
10-049	6	22	7
10-050-1023	7	22	8
10-051-1024	8	22	9
10-052-1025	9	22	10
10-053-1026	10	22	11
10-054-1027	12	22	13

Packed 6 in a bundle.

Spoons

Eastern Pattern



Maple Handles

Cat. No.	Size Handle Feet	Strap Inches	Wt., Lbs. Each
10-064-A-859-E	7	22	8
10-064-B-860-E	8	22	9
10-064-C-861-E	9	22	10

Hickory or Ash Handles

Cat. No.	Size Handle Feet	Strap Inches	Wt., Lbs. Each
10-055-1023-E	7	22	8
10-056-1024-E	8	22	9
10-057-1025-E	9	22	10
10-058-1026-E	10	22	11

Packed 6 in a bundle.

Spoon Handles Only

Maple

Cat. No.	Length Feet	Wt., Lbs. Each
10-071-993	7	5
10-072-994	8	6
10-073-995	9	7

Spoon Handles Only

Hickory or Ash

Cat. No.	Length Feet	Wt., Lbs. Each
10-065	6	4
10-066-1005	7	5
10-067-1006	8	6
10-068-1007	9	7
10-069-1008	10	8
10-070	12	9

Packed 6 in a bundle.

Shovels

Steel D Handles

No other handle compares with the steel handle for strength and durability. The design of this handle is unusually attractive, smooth continuous curves that have no rough edges at any point. The stale and grip are both shouldered so that the metal and wood are flush, presenting a smooth surface along the entire length of the handle. The rivet through the grip is put in off center so the grip cannot turn and is rigid with the metal arms.

Square point—plain back—polished blades and straps. Handles of finest selected Northern White Ash—wax finished.

Cat. No.	Size Handle Inches	Wt., Lbs. Each
10-078	30	5

Round point—plain back—polished blades and straps. Handles of finest selected Northern White Ash—wax finished.

Cat. No.	Size Handle Inches	Wt., Lbs. Each
10-079	30	5

Packed 6 in a bundle.

Steel Handles Only

For Track Shovels

Heavy double bend. For round and square point shovels.

Cat. No.	Length Inches	Grade	Wt., Lbs. Each
10-075	30	XX	2
10-076	30	X	2
10-077	30	No. 1	2

Packed 6 in a bundle.

For Shovels or Scoops

Chisholm bend. For hollow back shovels or scoops. Specify whether for shovels or scoops.

Cat. No.	Length Inches	Grade	Wt., Lbs. Each
10-075-A	28	XX	2
10-076-A	28	X	2
10-077-A	28	No. 1	2

Packed 6 in a bundle.

For Tamping Shovels

Heavy double bend. For track work.

Cat. No.	Length Inches	Wt., Lbs. Each
10-075-B	30	2¼
10-076-B	30	2¼
10-077-B	30	2¼

Packed 6 in a bundle.

TOOLS

Carrying or Lug Hooks

Standard Type

For handling poles, ties and heavy timbers. Handles of selected, air-seasoned hickory and hard maple with hand turned knobs, smoothly sand finished. Hooks are crucible steel with duck bill points, hung in heavy malleable iron clasp and swivel. Metal parts painted delft blue.

Cat. No.	Size	Wt., Lbs. Each
10–100–295	2½ in. x 4 ft. Maple	7
10–101–296	2½ in. x 4½ ft. Maple	8
10–102–297	2½ in. x 5 ft. Maple	9
10–103	2½ in. x 4 ft. Hickory	7
10–104	2½ in. x 4½ ft. Hickory	8
10–105	2½ in. x 5 ft. Hickory	9

Packed 6 in a crate.

Western Union Type

For handling extra large heavy poles and timbers. Handles of selected air-seasoned hard maple with hand-turned knobs, smoothly sand finished. Metal parts painted delft blue. Handle 3 inches square at center. Extra large, heavy hooks of crucible steel, hung in heavy malleable iron clasp and steel swivel bolt through handle.

Cat. No.	Size	Wt., Lbs. Each
10–112–298	3 in. x 5 ft.	12
10–113–299	3 in. x 6 ft.	13
10–114–300	3 in. x 7 ft.	14

Packed 4 in a crate.

Carrying or Lug Hook Handles Only

Cat. No.	Size	Wt., Lbs. Each
10–106–593	2½ in. x 4 ft. Maple	3
10–107–594	2½ in. x 4½ ft. Maple	4
10–108–595	2½ in. x 5 ft. Maple	5
10–109	2½ in. x 4 ft. Hickory	3
10–110	2½ in. x 4½ ft. Hickory	4
10–111	2½ in. x 5 ft. Hickory	5

Packed 6 in a bundle.

Western Union Type Handles Only

Cat. No.	Size	Wt., Lbs. Each
10–115–963	3 in. x 5 ft. Maple	5
10–116–964	3 in. x 6 ft. Maple	6
10–117–965	3 in. x 7 ft. Maple	7

Packed 6 in a bundle.

Peavies

Handles of selected air-seasoned hickory or hard maple, with hand-turned knobs, smoothly sand finished. Malleable iron sockets and crucible steel hooks with duck bill points. Pikes are of crucible steel securely driven in. Metal parts are painted delft blue.

Cat. No.	Size	Wt., Lbs. Each
10–124	2½ in. x 4 ft. Hickory	8
10–125	2½ in. x 4½ ft. Hickory	9
10–126	2½ in. x 5 ft. Hickory	10
10–127	2½ in. x 4 ft. Maple	8
10–128	2½ in. x 4½ ft. Maple	9
10–129	2½ in. x 5 ft. Maple	10

Packed 6 in a crate.

Cant Hooks

Handles of selected hickory or hard maple, with hand-turned knobs, smoothly sand finished. Hooks are crucible steel with duck bill points, hung in heavy malleable iron clasps. Metal parts painted delft blue.

Cat. No.	Size	Wt., Lbs. Each
10–118–199	2½ in. x 4 ft. Hickory	7½
10–119–200	2½ in. x 4½ ft. Hickory	8
10–120	2½ in. x 5 ft. Hickory	8½
10–121–188	2½ in. x 4 ft. Maple	7½
10–122–189	2½ in. x 4½ ft. Maple	8
10–123	2½ in. x 5 ft. Maple	8½

Packed 6 in a crate.

Cant Hook and Peavie Handles Only

These handles are of the same high quality used in the above tools — selected, air-seasoned hickory or hard maple, with handturned knobs, smoothly finished.

Cat. No.	Size	Wt., Lbs. Each
10–130–575	2½ in. x 4 ft. Hickory	3½
10–131–576	2½ in. x 4½ ft. Hickory	4
10–132	2½ in. x 5 ft. Hickory	4½
10–133–544	2½ in. x 4 ft. Maple	3½
10–134–545	2½ in. x 4½ ft. Maple	4
10–135	2½ in. x 5 ft. Maple	4½

Packed 6 in a crate.

IRON WIRE AND STRAND

Galvanized Iron Telephone Wire

(Indiana Crapo Galvanized)

This wire is drawn from the highest grade material of special analysis, galvanized under the Crapo Patents, insuring a wire with a maximum resistance to corrosion due to the superior adhesion of the pure zinc. This special galvanizing process permits wrapping the wire around its own diameter without cracking or peeling of the galvanized coat, a feature that eliminates rust and corrosion setting in at the splices and ties. Furnished in three grades, BB, Extra BB and Steel.

"BB" is slightly higher in resistance than EBB but combines conductivity with tensile strength, having a maximum electrical resistance of 5,600 mile ohms.

"Extra BB" is highest in electrical conductivity, having a range of electrical resistance of 4,700 to 5,000 mile ohms.

"Steel." This grade is designed for short-line service where electrical conductivity can be sacrificed for tensile strength. Maximum resistance 6,500 mile ohms.

BB Grade

Size B. W. G.	Diameter Inches	Weight per Mile	Standard Coil	Breaking Strength in Lbs.
4	.238	811	¼ mile	2,271
6	.203	590	¼ mile	1,652
8	.165	390	½ mile	1,092
9	.148	314	½ mile	879
10	.134	258	½ mile	722
11	.120	206	½ mile	577
12	.109	170	½ mile	476
14	.083	99	½ mile	277

Extra BB Grade

4	.238	811	¼ mile	2,028
6	.203	590	¼ mile	1,475
8	.165	390	½ mile	975
9	.148	314	½ mile	785
10	.134	258	½ mile	645
11	.120	206	½ mile	515
12	.109	170	½ mile	425
14	.083	99	½ mile	247

Steel Grade

4	.238	811	¼ mile	2,433
6	.203	590	¼ mile	1,770
8	.165	390	½ mile	1,170
9	.148	314	½ mile	942
10	.134	258	½ mile	774
11	.120	206	½ mile	618
12	.109	170	½ mile	510
14	.083	99	½ mile	297

Crapo Process Old Process

Galvanized Steel Strand

(Indiana Crapo Galvanized)

Used in telephone work for guying poles and supporting aerial telephone cables. Furnished in five grades or strengths, viz., Standard, Siemens Martin, High Strength, Extra High Strength and A. T. & T. Spec. The standard grade can be furnished with either single or double galvanizing, all other grades furnished with double galvanizing only.

Kellogg recommend the double galvanized strand for all construction work. Single galvanized strand should only be used in country line construction where there is no possibility of deterioration from smoke conditions. All grades are formed by twisting seven single wires into a single strand. Put up in coils of 250 ft., 500 ft., 1000 ft. or reels of any length specify when ordering.

Standard

Diameter Inches	Size of Wires	Wt., Lbs. per 1000 Feet	Strength in Lbs.
3/16	16	73	1,150
¼	14	121	1,900
5/16	12	205	3,200
3/8	11	296	4,250
7/16	9½	399	5,700
½	8	517	7,400

Siemens Martin

3/16	16	73	1,900
¼	14	121	3,150
5/16	12	205	5,350
3/8	11	296	6,950
7/16	9½	399	9,350
½	8	517	12,100

High Strength

3/16	16	73	2,850
¼	14	121	4,750
5/16	12	205	8,000
3/8	11	296	10,800
7/16	9½	399	14,500
½	8	517	18,800

Extra High Strength

3/16	16	73	3,990
¼	14	121	6,650
5/16	12	205	11,200
3/8	11	296	15,400
7/16	9½	399	20,800
½	8	517	26,900

A. T. & T. Specification

5/32	13	190	4,000
5/16	12	205	6,000
3/8	11	206	10,000
7/16	10	399	16,000

KELLOGG BRONZE DROP WIRE

This tag on Kellogg Super-Bronze is printed in RED for easy identification.

Telephone engineers agree that it is real economy to purchase good drop wire, and that bronze is the best conductor for this purpose. It is the only conductor that meets every service requirement. It has conductivity and tensile strength. It is non-rusting and non-corrosive. All danger of high resistance joints, due to electrolytic action between different basic metals is eliminated, because copper and bronze have a natural tendency to unite.

It is common knowledge that life of drop wire depends directly on the quality and life of the insulation. Kellogg specification insulation is the finest ever used on drop wire. Actual "Life Tests" performed by unbiased experts on this insulation and that of four other known makes of drop wire, in the laboratories of a prominent midwestern university, conclusively proved that Kellogg insulation has at least 50% longer life than the others. It has a tensile strength of 1,500 pounds per square inch, and a 30% pure rubber content, compounded with special anti-oxidants (an exclusive Kellogg formula). Due to volume production and vast buying power, Kellogg bronzes are moderately priced. This affords a real saving to telephone men in first cost, maintenance cost, and in the reclaim value.

Kellogg SUPER-Bronze is an 18 B. & S. gauge conductor, having 200 pounds tensile strength. It is the strongest Bronze drop wire conductor made. Its small diameter and great strength reduces snow, sleet, and wind hazards to a new low point. It is priced exceptionally low, and recommended for all new installations, and replacement work.

Kellogg Special Bronze is a 17 B. & S. gauge conductor, having a tensile strength of 170 pounds. Its resistance of 32 ohms per mile is extremely low. It has a conductivity value of 85% of pure copper.

This tag printed in GREEN is attached to every coil of Kellogg Special Bronze.

Kellogg SUPER-Bronze—Specification 2018-B

Conductor

Newly developed Kellogg SUPER-Bronze of 18 B. & S. gauge, 200 pounds tensile strength per conductor. Drawn of one solid metal—uniform throughout. Will not rust or corrode. Will not deteriorate under any climatic condition. Conductivity of bronze is more than sufficient to meet maximum requirements for good commercial transmission. Smaller diameter and lighter weight. Reduces sleet and wind hazard. Tests show minimum sag. Will not break in less than 5 right angle bends over a $\frac{1}{16}$ inch radius. Free from scales, inequalities, flaws, splints, or other imperfections which would affect efficiency.

Insulation

Kellogg Specification insulation contains a minimum of 30% pure rubber, compounded by an exclusive Kellogg formula, with special anti-oxidants. Minimum tensile strength of 1,500 pounds per square inch. Applied by special tubing process, without seams, and vulcanized by latest approved methods. Wall thickness 3½% greater than generally recognized as sufficient for drop wire purposes. This insulation meets rigid physical tests for adhesion, wrapping, and penetration. With braid removed, insulated wire is capable of being twisted 3 times about its own diameter, left 16 to 24 hours, then untwisted and twisted again in reverse direction without showing signs of rupture. 2 inch piece stretches to 10 inches without rupture. 100 megohm breakdown test shows a table of unusually high dielectric values at all temperatures.

Braiding, Saturating, Lay, Coiling, Wrapping

The braiding, saturating, lay, coiling and wrapping of Kellogg 2018-B SUPER-Bronze is same as Kellogg 2017-B Special Bronze, and fully described on this page.

Cat. No.	Size B. & S.	Style	Rubber Diameter	Weight M Feet
2018-A	18	Single	.105"	17 lbs.
2018-B	18	Twisted Pair	.105"	33 lbs.
2018-P	18	Parallel	.105"	29 lbs.

Kellogg Special-Bronze—Specification 2017-B

Conductor

Special bronze of 17 B. & S. gauge, 170 pounds tensile strength per conductor. Conductivity of 85% I.A.C.S. at 20 degrees centigrade. Resistance, 32 ohms per mile. Otherwise same as 2018-B.

Insulation

Insulation same as that used for 2018-B.

Braiding and Saturating

Each insulated conductor is covered with a smooth, tough, close-woven braid of unbleached, two-end cotton. Braided conductor thoroughly saturated and smoothly covered with permanent weather-proofing compound, which adheres firmly to the braid. Does not act injuriously upon braid or insulation. Heat of 125° Fahrenheit does not melt the saturating compound, nor will it crack at 10° below zero.

Lay of Wires

The braid of one insulated conductor of the twisted pair has a raised thread throughout its entire length, to easily distinguish one conductor from the other. The two insulated and braided conductors are twisted together with an approved right hand lay that is regular and uniform.

Coiling and Wrapping

Kellogg Bronze Drop Wire is delivered in coils of one continuous length. The length averages 1,000 feet per coil. Diameter of eye of each coil is approximately 15 inches. Both ends of coil are accessible. Coils are securely bound with tape or twine, and wrapped with burlap or strong paper to prevent mechcanical injury in transportation. The gauge and length of wire is designated by two tags attached to each coil.

Cat. No.	Size B. & S.	Style	Rubber Diameter	Weight M Feet
2017-A	17	Single	$\frac{3}{64}$	18 lbs.
2017-B	17	Twisted Pair	$\frac{7}{64}$	35 lbs.
2017-P	17	Parallel	$\frac{3}{64}$	31 lbs.

WIRE

Ironite Drop Wire
(Crapo)

A special conductor of pure BB iron, accurately annealed by a special process to provide great tensile strength, high conductivity and great flexibility. Highly rust-resisting due to purity and density of metal and thoroughly protected by a heavy uniform coating of pure zinc applied by the Crapo process of galvanizing.

Specification 1019, 1018, 1016 and 1014 insulated with live new code rubber, highly elastic, tough and wear resisting. Specifications 3019 and 3018 insulated with a special 30% pure Para compound to provide extra long life and toughness. Braided with strictly two-ply long fibre cotton and thoroughly saturated with raised weatherproofing and wax. A small cord tracer is woven into one of the conductors of the pair for tracing.

Shipped in standard 1,000 ft. coils with large 15-inch eye for standard reels. USE BWG GAUGE WHEN ORDERING.

Cat. No.	Size BWG	Diam. Inches Over Rubber	No. of Conductors	Wt., Lbs. per 1000 Ft.
1019-B	19	7/64	Duplex	27
1018-B	18	1/32	Duplex	39
3019-B	19	7/64	Duplex	27
3018-B	18	1/32	Duplex	39
1016-B	16	5/32	Duplex	65
1014-B	14	11/64	Duplex	80

Hard Drawn Copper Drop Wire

Insulated with a special rubber—containing a pure rubber content equal to Code Requirements — highly elastic, tough and wear resisting. Braided with strictly two-ply long fibre cotton, and thoroughly saturated with weatherproofing and wax. A small raised cord marker is woven into the braid of one of the conductors of the pair for tracing. Shipped in standard 1000-ft. coils with large 15-inch eye to fit standard reels. USE B&S GAUGE WHEN ORDERING.

Cat. No.	Size B. & S.	Diam., Inches over Rubber	No. of Conductors	Wt., Lbs. per 1000 Ft.
1216-B	16	1/32	Duplex	45
1214-B	14	5/32	Duplex	62

Bridle or Spider Wire

Rubber covered, black saturated weatherproof braid soft drawn tinned copper conductor wire, used for connecting open lines to cable terminals. Single conductor No. 18 for installing grounds at subscribers stations. Duplex wire is furnished with a small raised cord marker in the braid of one of the conductors for tracing. Put up in coils of approximately 500-feet. USE B&S GAUGE WHEN ORDERING.

Cat. No.	Size B. & S. Gauge	Diam., Inches Over Rubber	No. of Conductors	Wt., Lbs. per 1000 Ft.
1519-A	19	3/32	Single	13
1519-B	19	3/32	Duplex	25
1518-A	18	1/16	Single	15
1518-B	18	1/16	Duplex	31
1516-A	16	5/32	Single	22
1514-A	14	5/32	Single	30
1520-A	20	3/32	Single	00
1520-B	20	3/32	Duplex	00
1522-A	22	3/32	Single	00
1522-B	22	3/32	Duplex	00

Kellogg Bronze Interior Wire

This new interior wire is fast superseding #19 B.& S. copper with leading telephone companies. Big savings in first cost are effected in addition to providing a vastly superior wire from a service standpoint.

Drawn from the same bronze used in making Kellogg drop wire its conductivity is equal to 85% of pure copper. It possesses the flexibility of #19 B.& S. copper yet its tensile strength (47 lbs. per conductor) is 40% greater.

The 5/64" special rubber insulation has a pure rubber content equal to Code requirements. The glazed olive green braid is specially shrunk to prevent raveling. Standard tracer threads are used for identification of conductors.

Put up in 500 foot coils. USE B&S GAUGE WHEN ORDERING.

Cat. No.	Size B.& S. Gauge	Diam. Over Rubber, Ins.	No. of Conductors	Wt., Lbs. per 1000 Feet
2022-A	22	3/32	Single	8
2022-B	22	3/32	Duplex	15
2022-C	22	3/32	Triplex	23

Copper Interior Telephone Wire

This wire is used for interior telephone wiring, furnished in single, duplex and triple conductors. Conductors are of tinned soft copper covered with a rubber insulating compound. Braid consists of closely woven hard glazed two-ply, two-end cotton thread. Color, olive green. When furnished in duplex and triplex, each conductor has a colored thread in the braid for tracing purposes. Put up in coils of approximately 500 ft. USE B&S GAUGE WHEN ORDERING.

Cat. No.	Size B. & S. Gauge	Diam. Over Rubber	No. of Conductors	Weight Lbs. per 1000 Ft.
1619-A	19	3/32-in.	Single	10
1619-B	19	3/32-in.	Duplex	20
1619-C	19	3/32-in.	Triplex	30
1618-A	18	7/64-in.	Single	12
1618-B	18	7/64-in.	Duplex	24
1618-C	18	7/64-in.	Triplex	35
1622-A	22	3/32-in.	Single	8
1622-B	22	3/32-in.	Duplex	15
1622-C	22	3/32-in.	Triplex	23

Flameproof Jumper Wire

Used on main distributing and intermediate distributing frames, distributing boxes and cross connecting racks. This wire consists of a soft tinned copper conductor insulated with a high grade rubber and covered with a flame-proof braid that does not fray out. Put up in coils of approximately 500 ft. USE B&S GAUGE WHEN ORDERING.

Cat. No.	Size B. & S. Gauge	Diam. Over Rubber	No. of Conductors	Color of Conductors	Weight Lbs. per 1000 Ft.
1320-A	20	1/16-in.	Single	Red	6
1320-B	20	1/16-in.	Duplex	Red and White	12
1320-C	20	1/16-in.	Triplex	Red, White; White with Red Tracer	18
1322-A	22	1/16-in.	Single	White	5
1322-B	22	1/16-in.	Duplex	Red and White	10
1322-C	22	1/16-in.	Triplex	Red, White; White with Red Tracer	15

WIRE

Pot Head Wire

Used to terminate a paper insulated cable for distribution in cable terminals and cable boxes to prevent moisture entering the cable. Consists of soft tinned copper conductor, rubber covered with no braid. Can be furnished in single or duplex. When furnished in duplex the insulation on the two wires is of different color for tracing purposes. Put up in coils of approximately 500 feet. USE B&S GAUGE WHEN ORDERING.

Cat. No.	Size B. & S. Gauge	Diam. Over Rubber	No. of Conductors	Weight Lbs. per 1000 Ft.
1419-B	19	5/64-in.	Duplex	17
1420-B	20	9/32-in.	Duplex	15
1422-B	22	9/32-in.	Duplex	15

Weatherproof Iron Tree Wire

This wire is used where wires run through trees and keeps them free from grounds during damp weather. Consists of BB double galvanized iron conductor, insulated with double or triple close cotton braid impregnated with moisture proofing and weatherprofing compound. Put up in ½-mile burlap coils. Always sold by weight. USE BWG WHEN ORDERING, and specify whether double or triple braid is desired.

Cat. No.	Insulation	Size B. W. G.	Weight per Mile
910-AA	Double Braid	10	350
910-AAA	Triple Braid	10	400
912-AA	Double Braid	12	225
912-AAA	Triple Braid	12	260
914-AA	Double Braid	14	145
914-AAA	Triple Braid	14	175
916-AA	Double Braid	16	90
916-AAA	Triple Braid	16	120

Kellogg Special Tree Wire

Rubber Insulated, Weatherproof Braid

Kellogg tree wire was designed to replace the ordinary two and three braid weatherproof iron tree wire. It is low in cost and has triple the life of ordinary weatherproofed wire.

The conductor consists of No. 14 or 16 BWG "Crapo" double galvanized ironite wire. This is insulated with a 1/32" wall of 30% rubber to seal the conductor against moisture and to prevent the braid from slipping. The rubber is covered with a tough two-ply cotton braid thoroughly impregnated. This is followed by a special hard service Seine twine cable cord which is also heavily saturated. This Seine cord twine is the toughest cord obtainable, and is the same material used in the manufacture of mine cables.

Put up in 1000-foot coils. USE BWG GAUGE WHEN ORDERING.

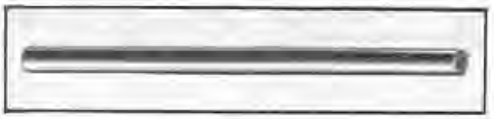
Cat. No.	Size BWG	Tensile Strength	No. of Conductors	Weight per Mile
714-A	14	400 lbs.	1	175
716-A	16	250 lbs.	1	120

Electric Light or Power Wires

This wire is used for electrical and power work, also radio aerials and ground wire. Consists of a soft drawn tinned copper conductor, insulated with new code rubber saturated braid over all. Furnished in 500-ft. coils. USE B&S GAUGE WHEN ORDERING.

Cat. No.	Size B. & S. Gauge	Conductor	Braid	Weight, Lbs. per 1,000 Ft.
804-AA	4	Stranded	Double	230
806-AA	6	Stranded	Double	158
808-A	8	Stranded	Single	80
810-A	10	Solid	Single	55
812-A	12	Solid	Single	40
814-A	14	Solid	Single	30

Bare Copper Wire



Supplied in soft, medium hard or hard drawn grades. Standard for toll line construction is hard drawn grade and unless otherwise specified, this grade will be furnished on all orders. The following table gives information on the hard drawn grade:

Size	Diam. Inches	Weight per 1000 Ft.	Weight per Mile	Approx. Weight per Coil
6 B&S	.1620	79	420	220
8 B&S	.1285	50	265	220
9 B&S	.1144	40	210	220
10 B&S	.102	31	165	220
12 N.B.S.	.104	33	174	228
12 B&S	.0808	20	105	125
14 B&S	.0641	13	65	125

Weatherproof Copper Wire

Weatherproof copper wire is especially adaptable to telephone, telegraph and railway signal work, combining high conductivity with great tensile strength. Consists of hard drawn copper conductor with either double or triple close cotton braid, impregnated with moisture proofing and weather proofing compound. USE B&S GAUGE WHEN ORDERING. Also specify whether double or triple braid is desired. Always sold by weight.

Size B. & S. Gauge	Approx. Weight Lbs. per 1000 Ft. Double Braid	Approx. Weight Lbs. per 1000 Ft. Triple Braid	Approx. Weight Lbs. per Mile Double Braid	Approx. Weight Lbs. per Mile Triple Braid
6	100	112	529	590
8	66	75	349	395
10	46	53	241	280
12	30	35	158	185
14	25	25	107	130
16	20	20	83	105

Nos. 6 and 8 put up in standard coils of 150 or 300 lbs. Nos. 10, 12, 14 and 16 put up in standard coils of 100 to 125 lbs. and can also be furnished in 25-lb. coils.

COMPARISON OF WIRE GAUGES

No.	Diameter in Millimeters B. & S.	Diameter in Inches B. & S.	B. W. G.	W. & M.	O. E. G.	N. B. S.
0000	11.684	.4600	.454	.393	.454	.400
000	10.404	.4066	.425	.362	.425	.372
00	9.266	.3648	.380	.331	.380	.348
0	8.252	.3249	.340	.307	.340	.324
1	7.341	.2893	.300	.283	.300	.300
2	6.553	.2576	.284	.263	.284	.276
3	5.826	.2294	.259	.244	.259	.252
4	5.19	.2043	.238	.225	.238	.232
5	4.619	.1819	.220	.207	.220	.212
6	4.115	.1620	.203	.192	.203	.192
7	3.665	.1443	.180	.177	.180	.176
8	3.264	.1285	.165	.162	.165	.160
9	2.906	.1144	.148	.148	.148	.144
10	2.588	.1019	.134	.135	.134	.128
11	2.304	.0907	.120	.120	.120	.116
12	2.052	.0808	.109	.105	.109	.104
13	1.83	.0720	.095	.092	.095	.092
14	1.628	.0641	.083	.080	.083	.080
15	1.45	.6571	.072	.072	.072	.072
16	1.29	.0508	.065	.063	.065	.064
17	1.149	.0453	.058	.054	.058	.056
18	1.0236	.0403	.049	.047	.049	.048
19	.9115	.0359	.042	.041	.040	.040
20	.81	.0320	.035	.035	.035	.036
21	.7239	.0285	.032	.032	.0315	.032
22	.6434	.0254	.028	.028	.0295	.028
23	.574	.0226	.025	.025	.027	.024
24	.5105	.0201	.022	.023	.025	.022
25	.4547	.0179	.020	.020	.023	.020
26	.4039	.0159	.018	.018	.0205	.018
27	.3607	.0142	.016	.017	.0188	.0164
28	.32	.0126	.014	.016	.0165	.0148
29	.287	.0113	.013	.015	.0155	.0136
30	.254	.0100	.012	.014	.0138	.0124
31	.2261	.0089	.010	.0135	.0123	.0116
32	.2032	.0080	.009	.013	.0113	.0108
33	.1803	.0071	.008	.011	.0103	.0100
34	.16	.0063	.007	.01	.0095	.0092
35	.1422	.0056	.005	.0095	.009	.0084
36	.127	.0050	.004	.009	.0075	.0076
37	.113	.0045	....	.0085	.0065	.0068
38	.1007	.0040	....	.008	.0058	.0060
39	.0897	.0035	....	.0075	.005	.0052
40	.0799	.0031	....	.007	.0045	.0048

Always use B. & S. gauge when ordering copper or Bronze wire. Use B. W. G. when ordering iron wire. Orders not specifying the gauge will be filled according to this method.

POLES

Northern White Cedar—Western Red—Creosoted Yellow Pine

Figure 1, Showing Carload of Northern White Cedar Poles Ready for Unloading.

Kellogg's facilities for furnishing Northern White Cedar, Western Red Cedar, and Creosoted Yellow Pine poles are unsurpassed. Well equipped concentrating yards, strategically located for quick delivery, permit the stocking of all sizes and lengths of poles, allow the timber to be held for a sufficient period of time to be properly air seasoned, and insure the prompt and efficient handling of all orders, including such work as framing or shaving poles to any specifications.

Northern White Cedar Poles are best for general telephone line construction. They are of proper size and shape to provide the necessary strength, durability, and neat appearance. The soft wood texture insures the linemen's safety when using climbers.

Pole Preservation

The average life of poles will vary considerably for different classes of timber and various soil conditions. In general, service tests have proven the average life of a Northern White or Western Red Cedar, butt treated, to be from twenty-five to thirty years.

Decay or butt rot, modern science has proven, is a form of decomposition due to lower plant life or fungi. Cedar poles have a natural resistance to the growth of fungi, and because of their great durability, require preservative treatment only in the section extending a short distance above and below the ground line. Pine poles, lacking natural preservative oils, need be treated their entire length.

Treatment of Cedar Poles

Cedar is composed of heartwood in the center, and sapwood on the outside. The cell structure of heartwood is such that preservative oils cannot penetrate it. The sapwood readily absorbs the preservative and completely protects the entire pole from rot. Treatment by the Perforation Process is recommended. It guarantees a definite depth of preservative penetration and gives the pole the largest volumetric absorption of oil possible. This results in poles of great permanence, eliminates their destruction by ordinary grass fires, and prevents any checking in the treated layers. The ⅜-inch penetration is recommended for Northern White Cedar as the sapwood only averages about $\frac{7}{16}$-inch in thickness. The ½-inch penetration is recommended for Western Red Cedar as the thickness of the sapwood averages about $\frac{9}{16}$-inch.

In both the Perforation Process and Specification "B" process, the poles are immersed to the proper depth in heated preservative oils for a minimum of four hours and cold oil for a period of two hours.

Poles treated by the Specification AA treatment are submerged to the proper depth in heated creosote for a minimum of fifteen minutes. As this process is purely superficial and no appreciable penetration of the preservative can be secured, treatment by the Specification "B" or the Perforation Process is recommended.

Specifications

There are numerous specifications by which cedar poles are graded. They should be very carefully considered before purchasing. For general telephone construction Kellogg recommend and supply poles graded by the Northern White Cedar Association, American Standard Association, American Telephone and Telegraph Company, and the National Electric Light Association.

The N.W.C.A. specification poles are the most popular. They are graded only by the top circumference and are referred to by five-inch, six-inch, seven-inch tops.

The A.S.A. specifications are rapidly becoming the standard for class poles. They are gradually replacing the A. T. & T. Co., and the N.E.L.A. specifications which are practically the same except for slight variations in measurements. These poles are referred to by letters of the alphabet. They guarantee a minimum circumference at the top, ground line and butt of the pole.

Orders

All orders should clearly specify the size of poles desired and the specifications under which they are to be inspected. In order to keep the shipping cost of each pole at a minimum, it is advisable to order a sufficient quantity of poles to make a carload shipment. If it is impossible to do this, Northern White Cedar posts can be included to provide the proper weight for the best rates. Upon arrival of the car at destination, the freight is to be paid by the customer direct to the railroad company. Freight charges may be deducted from gross amount of invoice. Shortage claims should be reported to the Kellogg Company within ten days from receipt of shipment and supported with original freight bill with agent's notation as to shortage.

UNLOADING POLES, SETTING BUTT TREATED POLES

Counting and Unloading Poles

Figure 2

Before poles are unloaded from a car, they should be carefully counted in order to check the number with the invoice. This count should be made by chalking or daubing with paint, the butt end of each pole, as it is counted. If a discrepancy occurs in the count and invoice, and a recheck discloses the same error, a railroad representative should be called upon to check and verify the count.

Many poles are broken by careless handling and unloading, and the following rules, if observed closely, will prevent injury to the poles as well as the workmen.

The safest way to unload poles from a car, whether it be a flat car or gondola, is to cut the top wires between the stakes, leaving the stakes intact, and lift the poles off the load with a crane or derrick. A sling around the poles of either cable or chain is used to better advantage than a grab hook, as a hook might slip off the pole, especially a large heavy pole, and tear out a portion of the wood.

If a crane or derrick is not available, cutting the car stakes and allowing the poles to roll off the car, usually results in a bad tangle of poles, and some breakage. To get the load off, with as much order and with little danger of breaking any poles, the following rules should be closely observed.

Refer to figure 1, page 216 and figure 2 above.

Figure 3

First, lean and support skid-ways (A) against the side of the car for the poles to roll over, and to prevent the load dropping to the ground.

Second, securely fasten cables or heavy ropes (B) to the stake pockets or trucks of car, and pass the free ends over the load to the opposite side, wrapping around truss bars or pockets and carrying around the end of the car to wrap twice around the draw bars. Have workmen (C) hold the free ends of the rope or cable to play it off as the load falls.

Third, examine all stakes to see that they are sound and not broken. Cut center wires.

Fourth, remove all intermediate stakes (D) on the near side of the load, leaving the two end stakes (E) intact.

Fifth, making certain that the cables or ropes are properly secured, cut off the two end stakes at stake pockets simultaneously, on near side, having the two workmen (F) both face the load as they work, so that they can more easily watch the load as it gives way. The load will then drop into the cable or rope sling, as shown in Figure 3 and the ropes or cables can then be played off the drawbars to allow the load to drop gradually to the skid-ways.

Strict adherence to these simple rules will prevent injury to the workmen, will keep the poles in orderly fashion, and prevent breakage.

Handling and Setting Treated Poles

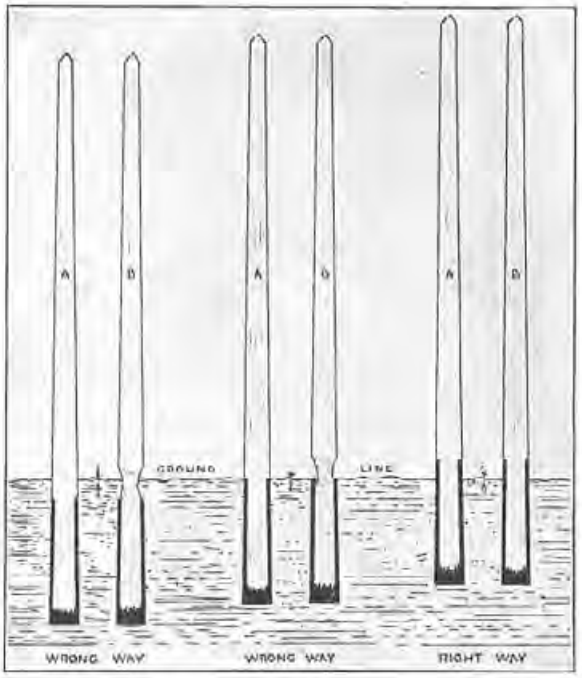


Figure 4

The life of a treated pole in service depends largely on proper handling after it leaves the treating plant. The poles should not be dragged along the ground and cant hooks, peavies or pike poles should never be used on the treated butt. Such treatment is very apt to break through the treated layer and expose untreated wood to decay.

When poles are to be stored for any length of time before setting, they should be placed on skids which are free from rot, and high enough above the ground to allow a free circulation of air around the pile, keeping the poles free from any surrounding weeds or vegetation.

Treated poles should always be set to their proper depth and never be cut off at the butt. Figure 4 shows the right and wrong way to set butt treated poles. The dark portions of the poles indicate the creosoted section which should extend at least one foot above the ground. It is in this ground line area that decay sets in.

In figure 4, pole "A" of each group shows the pole at the time of setting while pole "B" of each group shows the same pole after being set a few years. Note the presence of decay on both poles set the wrong way.

MEASURING POLES

Correct Way to Measure Sweep

Correct Way to Measure Diameter

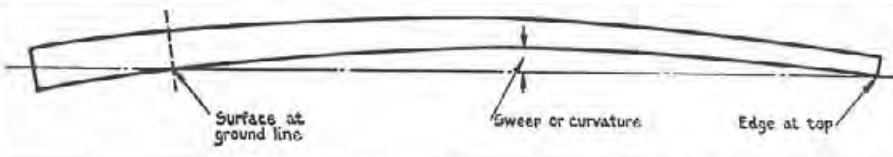
The correct way to measure the sweep of a pole is to stretch a tape tightly from the top to a point six feet from the butt end. A rule can then be used to determine the amount of sweep at the greatest distance between the pole and the tape. See the illustration above.

The terms 5 inch top—20 foot; 7 inch top—30 foot; are used to designate the top diameter and length of poles respectively. Because the tops and butts of poles are not perfect circles, the diameter cannot be measured direct. It is necessary to measure the circumference and divide it by 3.1416. This will give the diameter. The following table lists top sizes of poles and the required circumference.

Designated Top Size	Circumference Necessary	Designated Top Size	Circumference Necessary
4"	12"	7"	22"
5"	15"	8"	24"
5½"	17¼"	9"	27"
6"	18½"	10"	31"

Stretch a tape measure parallel to the axis of the pole and then use a rule to determine the sweep between the pole and the measure.

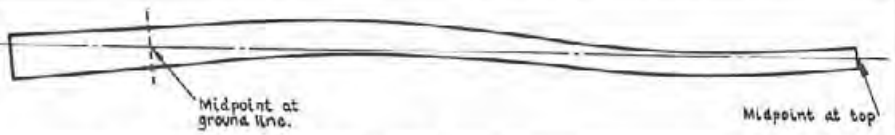
Measurement of Sweep Below Ground Line



Stretch a tape measure from the top to a point 6 feet from the butt end. Use a rule to determine the maximum sweep between the pole and tape.

Measurement of Sweep in One Plane

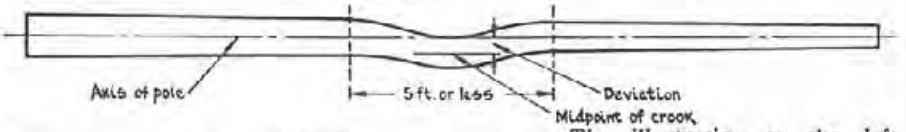
Stretch a tape measure from the mid-point of the top to the mid-point at the ground line. Use a rule to determine the maximum sweep of each side between the pole and tape.



Measurement of Sweep in Two Planes (Double Sweep)

The illustration to the left shows how measurements are made when the reference axes are approximately parallel.

The illustration to the right indicates how measurements are made when the axes of sections above and below the crook coincide or are practically coincident.



The illustration to the left shows how measurements are made when the axis of section above the short crook is not parallel or coincident with axis below the crook.

Measurement of Short Crooks

INDEX

A

B

C

INDEX—Continued

INDEX—Continued

INDEX—Continued

INDEX—Continued

INDEX—Continued

KELLOGG · No. 9

KELLOGG

SWITCHBOARDS
TELEPHONES
SUPPLIES
GEN. CATALOG No. 9

CHICAGO
U : S : A