KELLOGG

USE—is the Test

KELLOGG GENERAL CATALOG NUMBER 6, 1923

Contains the entire Kellogg product line available in 1923, telephones, switching equipment, telephone piece parts, construction supplies, wire and cable, poles, tools etc.

Produced in bound hard cover book form, 8 ½ X 11 inches, 30# coated stock printed by lithography in black and white.

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REVISED 8 FEBURARY 2009

KELLOGG
APPARATUS AND SUPPLIES

CATALOG NO.
6

Use is the Test



KELLOGG SWITCHBOARD AND SUPPLY CO.
Chicago, Ill.

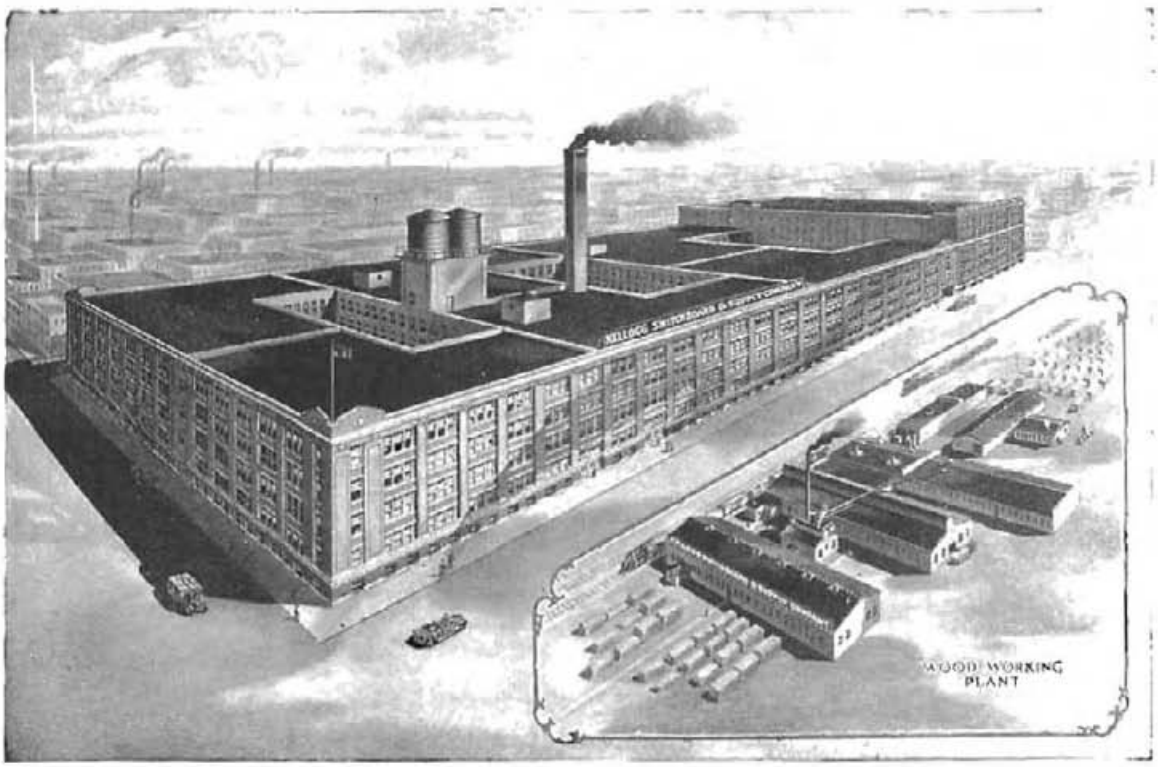
Columbus, O. **Kansas City, Mo.** **San Francisco, Cal.**

Use is the Test

A complete listing and illustrating of

Telephone and Switchboard Equipment

Manufactured by



The Kellogg Factory and Woodworking Plant

KELLOGG SWITCHBOARD & SUPPLY CO.

General Offices and Factory
ADAMS AND ABERDEEN STREETS
CHICAGO

Branch Offices and Warehouses

111 North Front Street
Columbus, Ohio

407 Broadway
Kansas City, Mo.

86 Third Street
San Francisco, Calif.

374 East Oak Street
Portland, Ore.

Sweelinckstraat, No. 8
The Hague, Holland

The best line supplies carried in stock — hardware, tools, wire.

62 Kiangse Road,
Shanghai, China

USE THE INDEX

All articles in this catalogue are listed in the index, pages 345 to 353. Catalogue pages are arranged alphabetically as far as practicable.

Each piece of apparatus is listed in the index under all names or phrases that it is commonly known by. For instance: Magneto Desk Set Boxes, will be found under: M, D and B.

Telephones, switchboards and apparatus are listed first alphabetically in this catalogue. These are followed by piece part plates. The last half of the catalogue covers line supply equipment.

Index — Pages 345 to 353.

This catologue is a complete listing of Kellogg products and supplies. Descriptions are necessarily condensed; for more detailed information, write us.



Columbus, Ohio



Rear View Columbus Warehouse
Showing Trackage Facilities



Portland, Oregon

Views of

Kellogg Switchboard & Supply Company Branch Offices and Warehouses.

Prompt, efficient sales service is our constant aim.

Comprehensive lines carried in stock at all times.



San Francisco, Calif.
Offices 12th Floor



Kansas City, Mo.



Rear View Kansas City Warehouse, Showing Trackage Facilities

TO THE PURCHASER

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. Purchasers unknown to us should have satisfactory bank or commercial references accompany their first order when it is desired to have same shipped on open account, and 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 number to save delay. Also please mention catalogue number.

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

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.

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 our consent.

Long experience has shown that proper understanding of each case saves transportation expense, delays and misunderstanding 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 Co. 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.

ADVERTISING

The ultimate aim of the practical telephone man is to operate an exchange for a fair profit, the carrying on of an interesting business of incalculable benefit to his town and the world.

One of the important things about this business is to secure contracts for telephone service.

We carry in stock a large assortment of printing plates, lantern slides and posters to aid you in this work. The printing plates and lantern slides contain a space for the insertion of your name.

Kellogg lantern slides are constantly used by a large number of Independent companies with fine results and our stock includes practically every subject.

Kellogg printing plates can be furnished in whatever width desired. These printing plates are invaluable for use in directories, newspaper advertising and circularizing.

Illustrations used in making up our printing plates and lantern slides have been drawn by some of the foremost artists of this country and are in a class by themselves. Our booklet No. 204 illustrates and describes our lantern slide and printing plate service. A copy will be sent upon request.

For the convenience of telephone companies, we can furnish combination cable boxes and terminal pole records, cable records, classification of the various major sub-divisions of exchange work, wiring diagrams of magneto telephones, etc. Many of these forms are found very useful by wire chiefs.

Copies are free for the asking.

Let us help with your publicity problems.



Printing Plate or Lantern Slide



This Set is Very Popular



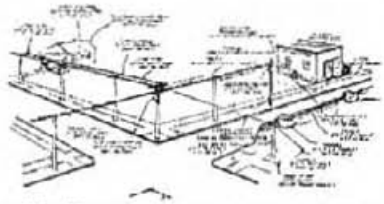
Human Interest Illustrations Increase Directory Value
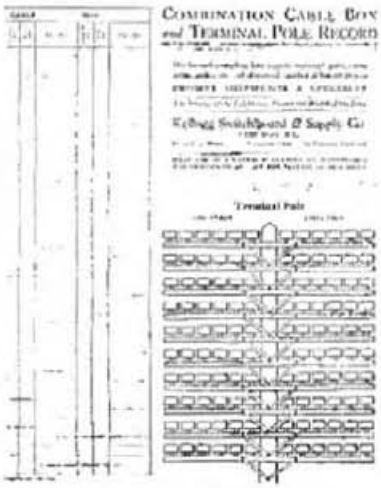


Arrangement of Lantern Slides



Good Illustration for Directories

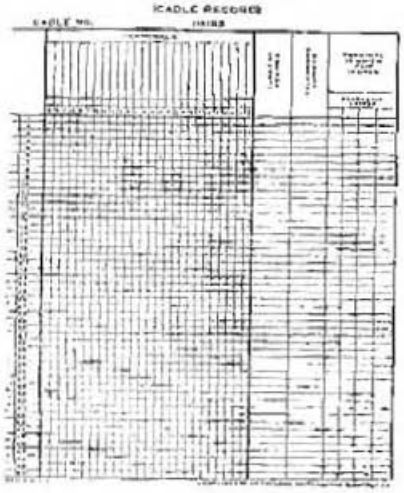


Classification of the various Major Subdivisions of Accounts of the Interstate Commerce Commission



These Cards are 8x10 Inches





Size 8x10 Inches

ARMS—TRANSMITTER

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

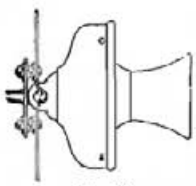
No. 42—This pressed steel arm is used on Magneto and short back board type, and common battery sets; 4¾" long; adjustable to 18 degrees above and 12 degrees below horizontal: concealed cord; replaces all former types; net weight 8 ounces.

No. 39—The transmitter back of this arm is of punched brass, nickel plated, the balance punched steel. This arm is used on steel residence sets; ¾" long; adjustable to 15 degrees above and 15 degrees below horizontal; concealed cord.



Code No. 41
Transmitter Arm

No. 41—The transmitter back of this arm is of punched brass, nickel plated, 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" opening in woodwork to mount; concealed cord; net weight, 5 ounces.



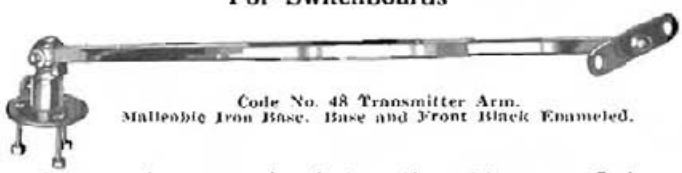
No. 39
Transmitter Arm

No. 50. This arm consists of the base of No. 42 and the transmitter mounting of the No. 41 Arm. Used for mounting transmitter on automatic wood telephones.



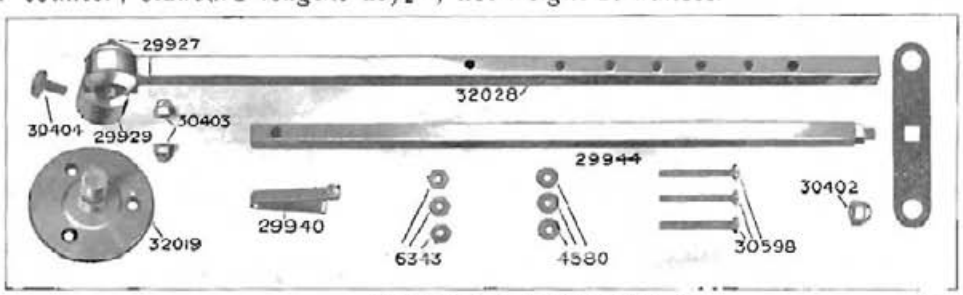
Code No. 50
Transmitter Arm

For Switchboards



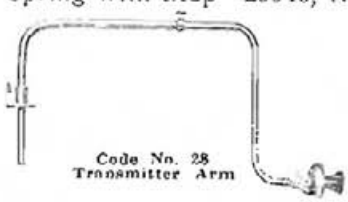
Code No. 48 Transmitter Arm.
Malleable Iron Base. Base and Front Black Enameled.

No. 48—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"; net weight 25 ounces.



Piece Parts No. 48 Transmitter Arm

	Mountings
Base—32019, Support—29929, Stud—29927, Nut	30403
Tube Assembled (Outside)	32028
Tube Assembled (Inside)	2944
Spring with Stop—29940, Nut—30402, Screw, 30404, Screw—30598, Washer—6343, Nut 4580	



Code No. 28
Transmitter Arm

No. 28—Switchboard arm is used on desk and small boards. It is made of brass tubing, heavily nickel plated; cords are concealed. Minimum length 16¼", maximum, 22¾". This arm is equipped with swivel joint, enabling it to be swung either to the right or left.

ARRESTERS

Telephone

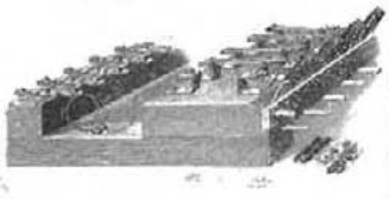


No. 3

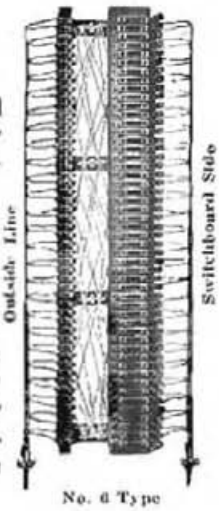
No. 3. This neat carbon disk type arrester is mounted on all standard Kellogg magneto wall sets and is easily cleaned. It is 1⅛" in diameter and arranged for mounting on ⅜" wood. Used on standard telephones.

Central Office Protectors

Arrester and Cross Connecting Equipment



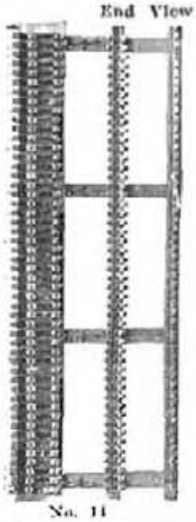
No. 6. Combination lightning arrester, fuse and cross connecting rack. The No. 6 type ranges from 5 to 25 metallic lines or 10 to 50 grounded lines and is so arranged that any line can be cross connected to any switchboard drop. These arresters are equipped with No. 11 fuses and carbon arresters.



No. 6 Type

End View No. 6

Code No.	Type	Mounting Centers	Carbons	Description	No. of Pairs	Length
6	Swbd.	⅝"	1¼"x⅜"x¼"	Fuse Arr. & Cross Conn. Rack	25	32½"
8	Swbd.	⅜"	1¼"x⅜"x¼"	Fuse Arr. & Cross Conn. Rack	5	7¼"
9	Swbd.	⅝"	1¼"x⅜"x¼"	Fuse Arr. & Cross Conn. Rack	10	13¾"
15	Swbd.	⅜"	1¼"x⅜"x¼"	Fuse Arr. & Cross Conn. Rack	20	26¼"

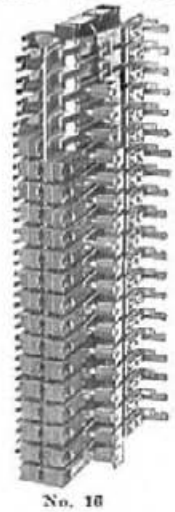


No. 11

The No. 11 type is similar to the No. 6 type but is provided with brass connecting strip for grounding one side of lines in switchboard cable without soldering connections.

Code No.	Type	Mtg. Center	Carbons	Kind	No. of Pairs	Length
14	Swbd.	⅝"	1¼"x⅜"x¼"	Fuse Arr. & Cross Conn. Rack	25	32½"

(Similar to Type No. 6, but with ground strip added.) Caring for 50 Ground Lines. Grounded lines are not recommended but when used switchboards should be wired metallic and grounded outside the arresters.



No. 16

No. 16. High potential and weak current protector mounted on iron bars arranged for mounting on distributing frame. Length of bars as specified but standard length is for 20 pairs. This arrester is equipped with No. 2 heat coils, carbon blocks and mica dialectrics.

Code No.	Type	Mounting Centers	Carbons	Description	No. of Pairs	Length
16	Swbd.	½"	1¼"x⅜"x¼"	Arrester & S. C. P.	1 to 20	Specify

Bars—Distributing, Bus (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 washers. They are divided into two types, the No. 3 and 5, No. 3 type measuring ¼"x¾" and No. 5 type ¼"x⅜". Code numbers and lengths are listed below.



No. 3



No. 5

Code No.	No. of Points	Centers Spaced	Length	Stock
		No. 3 Type		
3	1	.....	1¼"	¼"x¾"
4	3	½"	2½"	¼"x1⅝"
		No. 5 Type		
5	4	½"	2 1/16"	¼"x¾"
10	5	½"	3 1/16"	¼"x⅜"
12	6	½"	3 1/16"	¼"x⅜"
13	8	½"	4 1/16"	¼"x⅜"
18	10	½"	5 1/16"	¼"x⅜"
19	12	½"	6 1/16"	¼"x⅜"
23	15	½"	8 1/16"	¼"x⅜"

ARRESTERS

Switchboard Protection 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 at all 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 up and the pairs numbered to correspond to the connected drops. In a like manner the line cables should be permanently formed up 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.



Type L-6 Main Distributing Frame

MAIN DISTRIBUTING FRAMES

(COOK)

Type L-6 Main Distributing Frame

This frame is designed to carry the H25 fuse and carbon protectors only.

The H-25 consists of No. A-7 wood fuses and standard carbons, mounted on maple panels, fuse clips being set in hard rubber.

Standard terminal blocks and distributing rings are furnished.

This frame is similar to Type L, except that the spacing between verticals is 12 inches instead of 7½ inches.

H-25 protectors are made in 50 pair sections and will be suitable for mounting on L-6 main distributing frame.

Special mounting bar is necessary when heat coil protectors are to be mounted on this type of frame.

Mfrs. No.	Description.
1030	L-6 main frame ironwork only.
1002	Terminal blocks only (2 clip).
1190	H-25 switchboard protector with A-7 wood fuse, 50 pair bank.

Shipping weights—Frame knocked down, per 100 pairs, 50 pounds; frame ready to set up, per 100 pairs, 70 pounds.

Type L-3—Wall Frame

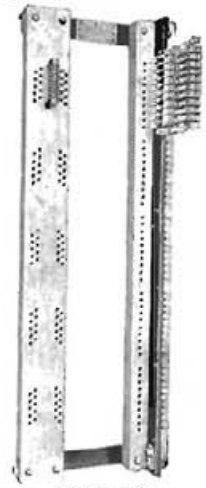
For small installations of 100 lines or less, a special distributing board (Type L-3) is furnished. This board can be made up for either 50 or 100 pairs ultimate capacity, and supplied with either No. H-36, 10, 10-W, 50 or 60 Cook type protectors as hereafter described. Unless 500 volt direct current (Street Ry. Current) is to be protected against, we recommend the use of H-36 Cook Protectors with magnesia fuses and carbons.

The protectors and line cable terminals are mounted in sectional banks of 10 pairs each. An initial capacity of only 10 pairs can thus be secured, and the capacity may be increased at any time by additions of 10 pair banks of protectors or terminals.

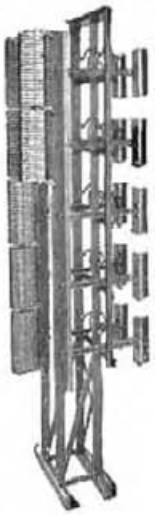
This board combines all the desirable features of the large distributing frame (Type L), but it is intended to be fastened to the wall.

Mfrs. No.	Description.
1020	Type L-3 wall frame only.
1021	Terminal blocks only (2 clip, 10 pairs per strip).

Shipping weights—50 pairs, 35 pounds; 100 pairs, 70 pounds.



Type L-3 Wall Frame



Type L Main Distributing Frame Standard Construction

MAIN DISTRIBUTING FRAMES (Cook)

Type L Main Distributing Frame

A combined sectional distributing and protector frame consisting of an angle iron frame built in vertical sections of 100 to 200 pairs. New vertical frame sections can be added at any time. The protectors can be readily attached to the frame as needed.

At the back end of the horizontal bar, directly opposite the protectors, are the cable terminal blocks, mounted vertically in strips of twenty-five pairs each. This gives an excess of 25% more "street cable" pairs than equipped switchboard lines. If the 25% excess is not sufficient continuous 200 pair strips may be used giving an excess of 100% reserve cable capacity.

For distributing the cross connecting wires, a small insulating ring is placed directly back of each cable block and larger ones are secured to the vertical angle irons. Verticals are spaced 7½ inches centers but if there be any probability of the exchange being changed to common battery a 9½ inches spacing is recommended to make the frame grow uniformly with the relay rack and to afford more working room.

Mfrs. No.	Description
1001	Type L main frame, single floor angle, ironwork only.
1002	Terminal blocks only (2 clips).
1003	Terminal blocks only (7 clips).
1004	Terminal blocks only (14 clips).

Shipping weights—Frame knocked down, per 100 pairs, 50 pounds; frame packed ready to set up, per 100 pairs, 70 pounds.



No. 1002 Cook Terminal Block—Used on All Cook Distributing Frames

Type L-2 Intermediate Distributing Frame

In a multiple switchboard the answering jacks and line signals generally branch off from the main line circuits, which include the multiple jacks. By using an intermediate frame these branches to the answering jacks and line signals may be interchanged between the lines, so that any line may be answered at any position on the switchboard. In this manner the total number of very busy lines may be distributed between the various operators so as to divide the work equally between them.

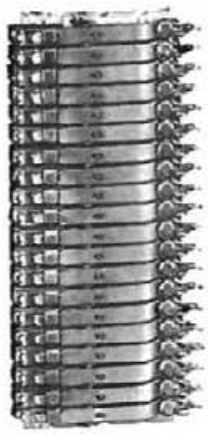
The intermediate distributing frame is made in the unit type of construction, so additional sections can be added without disturbing existing equipment. It has distributing blocks on both sides which permits cross connections from one side of the frame to the other.

In ordering Type L-2 intermediate distributing frame specify the ultimate capacity in lines of multiple which the frame may be called upon to serve. The reason for this is that it is necessary for us to provide space for the required ultimate number of jumper wires, making the width of the frame shelves sufficient to accommodate them. The intermediate distributing frames are made in three standard widths from front to back, each width suitable for one ultimate capacity.

Mfrs. No.	Description
1010	Type L-2 intermediate frame, ironwork only.
1002	Terminal blocks only (2 clips).
1003	Terminal blocks only (7 clips).
1004	Terminal blocks only (14 clips).
1014	Fanning strip for multiple side.
1015	Maple fanning strips only, for terminal blocks.

Shipping weights—Frame knocked down, per 100 pairs, 55 pounds; frame ready to set up, per 100 pairs, 75 pounds.

NO. 10. CENTRAL OFFICE PROTECTOR



Type 10

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

The resistance of the heat coil to an abnormal current generates sufficient heat to soften the low-melting point solder and releases the spring. To reset the protector after operation, contact springs must be resoldered to the heat coils for which purpose an electric re-soldering plug can be conveniently used.

This protector is equipped with either composition or wire-wound heat coils of 7½ ohms resistance.

Each lightning arrester consists of one grooved and one flat carbon, and a U-shaped celluloid dielectric .005 thick.

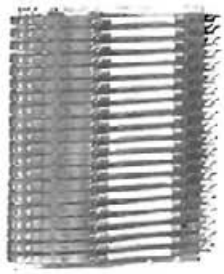
The resoldering plug can be operated from dry cell or other battery connection, and when used automatically tests the circuit through the heat coil in the resoldering process.

A test plug permits the testing of the circuit in, thru, or around the heat coil.

Mfrs. No.	Description
1100	No. 10—10 pair bank switchboard protector, composition coils.
1101	No. 10—20 pair bank switchboard protector, composition coils.
1100	No. 10—10 pair bank switchboard protector, wire wound coils.
1101	No. 10—20 pair bank switchboard protector, wire wound coils.
1102	No. 10 composition heat coils.
1103	No. 10 wire-wound heat coils.
1104	Test switch, 10 point.
1105	Test cord for above.
1106	Test plug for No. 10 switchboard protector.
1107	Resoldering tool for No. 10 switchboard protector.

Shipping weight—100 pairs protectors, 23 pounds.

CENTRAL OFFICE PROTECTORS (Cook) Frame Type



Type 10-W

Type 10-W

Same as No. 10 Protector on a deeper mounting plate, which also carries a composition tubular fuse. Designed to meet the demand of customers seeking the highest protection, as well as all the requirements of the National Board of Fire Underwriters. No. 10-W has all the advantages of the No. 10 Protector, with the additional advantage of the composition fuse.

This protector is especially recommended for use with Municipal Fire Alarm and Police Telephone and Telegraph Circuits. Can also be used for central office protection where there is no fuse protection for lines as they enter the exchange or cable leading to the exchange.

1110 No. 10W—10 Pr. Bank switchboard protector, composition coils.
1111 No. 10W—20 Pr. Bank switchboard protector, composition coils.
1110 No. 10W—10 Pr. Bank switchboard protector, wire wound coils.
1111 No. 10W—20 Pr. Bank switchboard protector, wire wound coils.
1102 No. 10 composition heat coils.
1103 No. 10 wire wound heat coils.
1114 No. 22A fuses.
1104 Test switch, 10 point.
1105 Test cord for above.
1106 Test plug for No. 10-W switchboard protector.
1107 Resoldering tool for No. 10W switchboard protector.

Shipping Weight—100 pairs complete, 60 pounds.

Types 50 and 60



Types 50 and 60

These are Cook's newest types of protectors. They are simple and efficient, cheap and durable. The self-soldering coil can be obtained in low resistance, and will operate within satisfactory limits. This coil never requires new or additional solder, is self-soldering, and the operated protector only requires pushing in the spring to be reset. The No. 60 is exactly like the No. 50, with the addition of an alarm spring.

The mounting plate provides unusual spacing of carbons, making removal easy.

Except when otherwise specified, furnished with composition heat coils of 7 ohms resistance. Under ½ ampere load, these coils will operate in approximately thirty seconds and will carry 3/10 of an ampere indefinitely.

1122 No. 60—10 Pr. Bank switchboard protector, composition coils.
1122 No. 60—10 Pr. Bank switchboard protector, wire wound coils.
1123 No. 60—20 Pr. Bank switchboard protector, composition coils.
1123 No. 60—20 Pr. Bank switchboard protector, wire wound coils.
1124 No. 50—60 composition heat coils.
1125 No. 50—60 wire wound heat coils.
1104 Test switch, 10 point.
1105 Test cord for above.
1128 Test plug for No. 50 or No. 60 switchboard protector.

Shipping weight—100 pairs protectors, 35 pounds.



Type H-25

Type H-25

WOOD MOUNTING PANEL

Type H-25 is a fuse and carbon protector made for use where no protection is required against sneak currents. It is generally sold for use on L-6 main distributing frame, but may be mounted on L-3 frame. Fuses are held securely and with good contact by patented clips. Clips are well insulated by being set in hard rubber, mounted on hard maple panels.

Made in 50-pair sections, and is always furnished with standard A-7 wooden tubular fuse of 1 ampere capacity, unless otherwise ordered. Carbons and dielectrics are standard.

Units with mountings of 10 pairs or more will be furnished when desired at an extra charge for unequipped pairs. These will be set on standard maple panels with ground strip for 50 pairs.

Cat. No.	Description	Weight
1190	H-25 protector, 50 pair bank	35 lbs.



Type H-36

Type H-36

STEEL MOUNTING PANEL

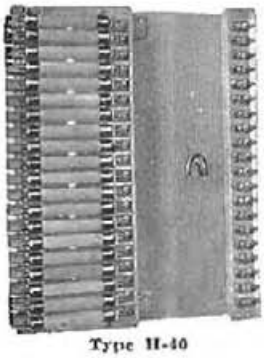
Protector is furnished with wood or composition fuses, the latter being necessary where it is desired to meet the Underwriters' requirements. Unless otherwise ordered furnished with A-45 fuse of 1-ampere capacity. Fuses are held securely and with good contact by patented clips, which are well insulated by hard rubber. Carbons and dielectrics furnished are standard.

Cat. No.	Article
1200	H-36 protector with A-46 wood fuse, 10-pair bank.
1201	H-36 protector with A-46 wood fuse, 20-pair bank.
1202	H-36 protector with A-45 composition fuse, 10-pair bank.
1203	H-36 protector with A-45 composition fuse, 20-pair bank.

Shipping weight—100-pair bank, 38 pounds.

CENTRAL OFFICE PROTECTORS

(Cook) Frame Type



Type H-40

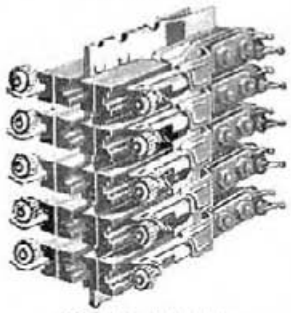
Type H-40

WALL TYPE

Type H-40 is a fuse and carbon protector with distributing rack, for use in small exchanges where something simple and inexpensive is required. Furnished with a common ground, where grounded circuits are used. Screw and washer connections are furnished for jumper circuits; wooden tubular fuses, Type A-44, are secured by patented clips; lightning arrester carbons and dielectrics are of standard type.

Mfrs. No.	Description
1210	H-40 protector, any size, 5 to 50 pairs.

Shipping weights—10 pair bank, 10 pounds; 16 pounds; 50 pair bank, 30 pounds.



No. 100 Protector

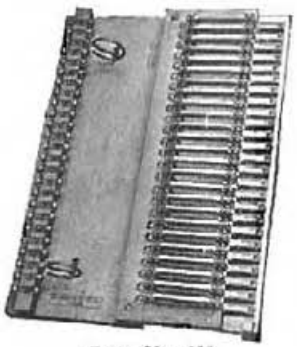
No. 100 Protector

This protector is equipped with self-soldering heat coils mounted in a horizontal position and very easily removed or replaced.

The circuit opening spring has a boss and lip formed on its contact end, which insures positive contact with heat coil at a definite place, resulting in perfect alignment of contact springs.

When operated, this protector opens the circuit, grounds the line, and operates a signal. Its clearances are greater than any protector we have made, and its insulation is superior. This protector has the advantage of simplicity of assembly. The protector parts of each half pair are held in perfect position by two bolts which serve one side of plate only. Carbon holding spring is unusually heavy, and insures positive, permanent tension between the carbons and ground plate

Standard grooved carbons may be used, but where "tooth-picking" of the arrester is desired, carbons with a special tooth-pick groove should be used on the outside. These are furnished with standard equipment. All carbons have faces treated by our patented process. Standard U-shaped dielectrics are celluloid, .005 thick.



Type No. 132

No. 132 Switchboard Protector and Distributing Board

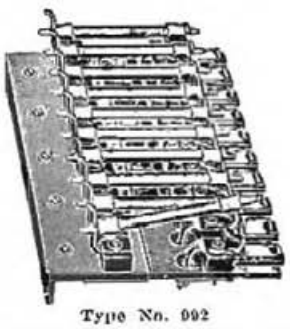
(Reliable)

(Flat Wood Fuse)

A switchboard protector and distributing board arranged for mounting on the wall and hinged so that all wiring is accessible. To be used for protection against lightning, high potential and sneak currents.

Consists of: No. 44 Blow-Rite flat wood fuses, 1 ampere, 3½ inches tip to tip, held in place by phosphor bronze contact springs which grip the flat tips of the fuses. Jumper wire rings and screw terminals are provided for making cross connections.

No. 132 Sizes	Dimensions	Net Wt.
12½ pair	17 x12x2⅜ in.	6¼ lbs.
25 pair	32⅝x12x2⅜ in.	13½ lbs.



Type No. 992

No. 992 Protector

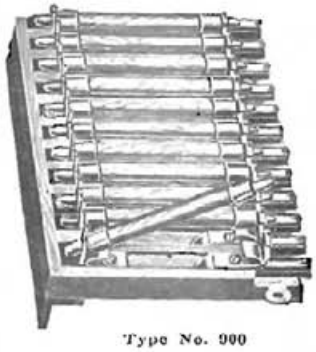
The No. 992 Protector is mounted on an oxidized steel panel ⅛ inch thick and all parts are insulated with heavy rubber blocks. The solder terminals pass through the holes in the mounting plate with wide clearance between terminals and plate. A heavy fibre strip riveted to the mounting plate holds the terminals in position. The fuse clips and tension springs are very heavy.

The No. 992 Protector is the standard of many large telephone companies for protecting long important lines in cable boxes and terminal rooms. Equipped with either No. 26 Fibre or No. 4 Wood Fuse.

Size	Length	Width	Weight
5 pr	13½ in.	7 in.	7½ lbs.
10 pr	25 in.	7 in.	15 lbs.
15 pr	37½ in.	7 in.	22½ lbs.
20 pr	50 in.	7 in.	30 lbs.
25 pr	62½ in.	7 in.	37½ lbs.

CENTRAL OFFICE PROTECTORS

(RELIABLE)



Type No. 900

No. 900 Protector

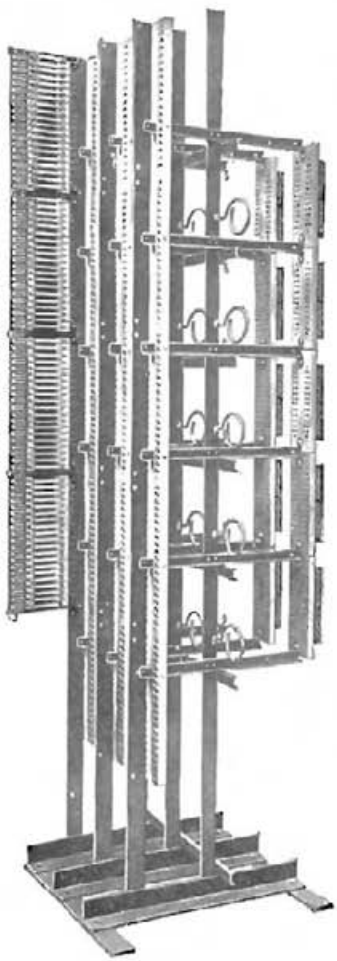
The No. 900 Protector is mounted on a treated maple panel and is provided with an angle iron for mounting in cable box or on the wall with both sides accessible for wiring and testing. The fuse clips are substantial and the No. 4 wood fuses are 4 inches from shoulder to shoulder.

Size	Length	Width	Weight
12½ pair	19 in.	6½ in.	3¼ lbs.
25 pair	39 in.	6½ in.	6½ lbs.

MAIN DISTRIBUTING FRAMES

(RELIABLE)

No. 101 Main Distributing Frame



The No. 101 Main Distributing Frame is designed for use in large and small telephone exchanges where a substantial floor type frame is required. Mild steel angles, channels and bars of ample strength are used, and all uprights are bolted to the floor angles to give the frame proper footing. The jumper rings are of generous size and well insulated. The cable fanning strips and jumper wire facilities permit a neat cable layout with plenty of space and convenient terminals for running jumper wires.

The switchboard protectors are designed to protect the central office plant from lightning, from sneak currents and from crosses with electric light and power wires. The flat fuses are lined with Blow-Rite fuse wire of one-half ampere carrying capacity, which blows with uniform accuracy, and the fuses have the advantage over ordinary switchboard protection of leaving a wide air gap between the trouble and the switchboard apparatus. The fuses are made so that opens can be detected at a glance and the old fuse wire easily removed. When new Blow-Rite fuse wire is inserted the refilled fuse is as accurate as a new one.

The protectors are mounted in banks of twenty pairs on mild steel mounting plates with rigid supports for attaching to the frame. The mounting plates are covered with sheet micarta to prevent the possibility of contact between mounting plates and wiring. Heavy phosphor-bronze fuse clips hold the fuse terminals in a firm grip and the wire terminals and fuse clip are riveted together to insure permanent electrical contact. The screws which hold the insulating strips on the mounting plate are threaded into miniature strain insulators, and this substantial construction has made it possible to do away with all insulating bushings and washers, which are an ever-present source of trouble in many types of switchboard protectors.



The cable terminals are made with soldering terminals, embedded in hard rubber mounted on maple blocks. Twenty pair blocks are standard. Single rows, pairs, triples or quads can be supplied in sets of twenty or twenty-five per terminal block.

The test plugs slip into the fuse clips as easily as a fuse.

Standard Frames are built with verticals on 9-inch centers unless otherwise specified. All frames are made for growth in either direction.

Uses No. 44 Flat Fuse.

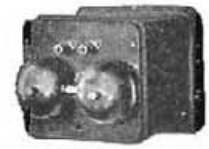
BELLS—EXTENSION



No. 15



No. 47



No. 37

These extension bells are for auxiliary use with wall or desk telephones and are used where conditions make the regular telephone bells inaudible, such as in factories, warehouses, garages, machine shops, etc.

Ringers are mounted in wood or steel boxes with two line terminals or binding posts, gongs are finished in black enamel.

When ordering specify same ringer resistance or frequency as telephone with which it is to be used.

Harmonic four and eight party frequencies	30	42	54	66
Corresponding ringer resistance	All 1000 ohm resistance.			
Harmonic four party frequencies	33⅓	50	66⅔	16⅔
Corresponding ringer resistance	500	500	500	2500
Harmonic two party frequencies			20	60
Corresponding ringer resistance			2500	500

For Common Battery Telephone Service

With Condensers

2½-inch Gongs

Code No.	Type	Resistance	Condenser	Use
15SA	Flat Steel	1000 ohms	2 M. F.	Straight line service.
15BA	Flat Steel	1000 ohms	2 M. F.	Biased line service.
15HA	Flat Steel	16⅔, 33⅓, 50, 66⅔ cycles	2 M. F.	Harmonic line service.
15HB	Flat Steel	30, 42, 54, 66 cycles	2 M. F.	Harmonic line service.
63SA	Flat Steel	1000 ohms	1 M. F.	Straight line service.
63SC	Flat Steel	500 ohms	1 M. F.	Straight line service.
63BA	Flat Steel	1000 ohms	1 M. F.	Biased line service.
63BC	Flat Steel	500 ohms	1 M. F.	Biased line service.
63HA	Flat Steel	16⅔, 33⅓, 50, 66⅔ cycles	1 M. F.	4 party line service.
63HB	Flat Steel	30, 42, 54, 66 cycles	1 M. F.	4 party line service.
63HC	Flat Steel	20, 60 cycles	1 M. F.	2 party line service.

6-inch Gongs

47SA	Wood	1000 ohms	1 M. F.	Straight line service.
47BA	Wood	1000 ohms	1 M. F.	Biased line service.
47HA	Wood	16⅔, 33⅓, 50, 66⅔ cycles	1 M. F.	Harmonic line service.
47HB	Wood	30, 42, 54, 66 cycles	1 M. F.	Harmonic line service.

4-inch Gongs

48SA	Wood	1000 ohms	1 M. F.	Straight line service.
48BA	Wood	1000 ohms	1 M. F.	Biased line service.
48HA	Wood	16⅔, 33⅓, 50, 66⅔ cycles	1 M. F.	Harmonic line service.
48HB	Wood	30, 42, 54, 66 cycles	1 M. F.	Harmonic line service

Without Condensers

6-inch Gongs

147SA	Wood	1000 ohms	Straight line service.
147SD	Wood	1600 ohms	Straight line service.

2½-inch Gongs

163SA	Flat Steel	1000 ohms	Straight line service.
163SC	Flat Steel	500 ohms	Straight line service.
163BA	Flat Steel	1000 ohms	Biased line service.
163BC	Flat Steel	500 ohms	Biased line service.
163HA	Flat Steel	16⅔, 33⅓, 50, 66⅔ cycles	4 party line service.
163HB	Flat Steel	30, 42, 54, 66 cycles	4 party line service.
163HC	Flat Steel	20, 60 cycles	2 party line service.

For Magneto Telephone Service

2½-inch Gongs

37SA	Wood	1000 ohms	Straight line service.
37SD	Wood	1600 ohms	Straight line service.
37SG	Wood	2500 ohms	Straight line service.
37BA	Wood	1000 ohms	Biased line service.
37HA	Wood	16⅔, 33⅓, 50, 66⅔ cycles	Harmonic line service.
37HB	Wood	30, 42, 54, 66 cycles	Harmonic line service.

BOXES—DESK SET

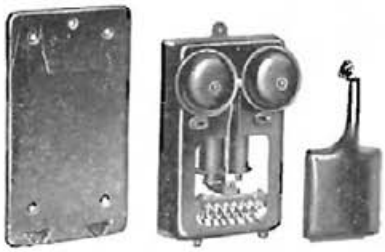
Common Battery



No. 404 Type

Kellogg Desk Stand Boxes are extra compact, requiring small mounting space. The steel boxes are of pressed steel, heavily enameled, and present a very fine appearance. The wood boxes are made of the same heavy quartered oak used in making Kellogg telephones, with the same high grade finish. All apparatus is arranged in the most practical and accessible manner. The gongs are heavily black enameled.

The 404 type Desk Stand Box is of pressed steel, heavily black enameled, and is especially desirable where the mounting space is limited. The loosening of one screw releases the cover, exposing the binding posts, ringer and cord connecting rack. The loosening of another screw permits the removal of the box from the mounting plate, which is attached to the wall, giving access to all apparatus contained in the box.



Open View No. 404 Type

The following codes of this type desk set box are used with No. 97 and No. 39 Desk Stands and 111 Grabaphone set. They contain a 1 M. F. condenser and ringer.

Code	Ringer	
F-75SA	86-A	1000 Ohm Straight Line.
F-75BA	85-B	1000 Ohm Biased.
F-75HB	88-A	Four Party Harmonic 30, 42, 54, 66 Cycles.
F-75HA	87-A	Four Party Harmonic 16⅔, 33⅓, 50, 66⅔ Cycles
F-75PSA	86-A	Same as F-75SA except brown finish.

The following codes are used with our No. 118 Desk Stand and No. 115 Grabaphone Set. These boxes contain a No. 79 induction coil, a 2 M. F. condenser and ringer.

Code	Ringer	
F-404SA	86-A	1000 Ohm Straight Line.
F-404BA	85-B	1000 Ohm Biased.
F-404HB	88-A	Four Party Harmonic 30, 42, 54, 66 Cycles.



No. 259 Type

The 259 type Desk Stand Box is of pressed steel, and very popular, although somewhat larger than the 404 type, it is compact and pleasing in appearance. The cover is attached with hinges, which are located at the bottom. The release of the spring catch which also forms the tapper guard, permits the swinging down of the cover, exposing all apparatus.

The following codes are used with the No. 97 and No. 39 Desk Stands and No. 111 Grabaphone Set. They contain a 1 M. F. condenser and ringer.

Code	Ringer	
F-259SA	84-A	1000 Ohm Straight Line.
F-259BA	79-A	1000 Ohm Biased.
F-259HR	73-A	Four Party Harmonic, 30, 42, 54, 66 Cycles.



Open View No. 259 Type

The following codes are used with No. 118 Desk Stand and 115 Grabaphone Set. They contain a No. 79-A induction coil and a 2 M. F. condenser and ringer.

Code	Ringer	
F-257SA	84-A	1000 Ohm Straight Line.
F-257BA	79-A	1000 Ohm Biased.
F-257HB	73-A	Four Party Harmonic 30, 42, 54, 66 Cycles.
F-413	79-L	1000 Ohms No. 30 Resistance Coil.
F-413A	79-L	1000 Ohms No. 1-N Resistance Coil.
F-412	72-A	Four party, 16⅔, 33⅓, 50, 66⅔ No. 118 Condenser

BOXES—DESK SET

Common Battery

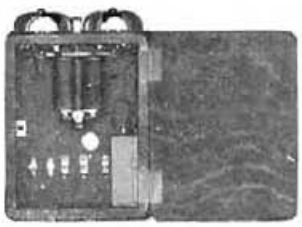


No. 408 Type

The No. 408 Type Desk Set box is of quartered oak, with Kellogg high grade finish. It is light in weight, compact, handsome in appearance, and is a popular box, where the wood type is desired.

The following codes are used with the No. 97 and No. 39 Desk Stands, and No. 111 Grabaphone Sets. They contain a 1 M. F Condenser and Ringer.

Code	Ringer
F-408-SA	84-A 1000 ohm straight line.
F-408-SC	84-C 500 ohm straight line.
F-408-BA	79-A 1000 ohm biased.
F-408-BC	79-C 500 ohm biased.
F-408-HA	72-A 4 party Harmonic, 16⅔, 33⅓, 50, 66⅔ cycles.
F-408-HB	73-A 4 party Harmonic, 30, 42, 54, 66 cycles.
F-408-HC	74-A 2 party Harmonic, 20, 60 cycles.



Open View
No. 408 Type

The following codes are used with the No. 118 Desk Stand and No. 115 Grabaphone Set. They contain a No. 79-A Induction Coil and 2 M. F. Condenser and Ringer.

Code	Ringer
F-407-SA	84-A 1000 ohm straight line.
F-407-SC	84-C 500 ohm straight line.
F-407-BA	79-A 1000 ohm biased.
F-407-BC	79-C 500 ohm biased.
F-407-HA	72-A 4 party Harmonic, 16⅔, 33⅓, 50, 66⅔ cycles.
F-407-HB	73-A 4 party Harmonic, 30, 42, 54, 66 cycles.
F-407-HC	74-A 2 party Harmonic, 20, 60 cycles.

Magneto



No. 2328

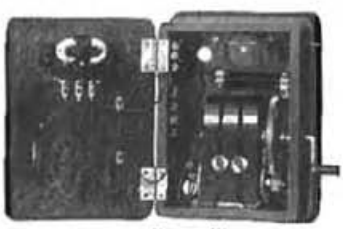
Kellogg Magneto Desk Set Boxes are extra compact, and convertible to common battery. The cabinet is made of heavy quartered oak, with our standard golden oak finish. All apparatus is securely mounted in the most practical manner. The exposed parts are heavily black enameled. All Magneto Desk Stand Boxes are equipped with our No. 3 Lightning Arrester and standard connecting rack.

The following code boxes are equipped with condenser, induction coil, generator, and ringer, as specified below.

These boxes are used with our No. 84 desk set and No. 115 Grabaphone.

Straight Line Ringer

Code No.	Ringer	Generator
F-2409	No. 78-A 1000 ohm	No. 15 3-Bar Alternating
STRAIGHT LINE RINGER WITH NO. 28-C INDUCTION COIL—		
F-2328	No. 78-A 1000 ohm	No. 15 3-Bar Alternating
F-2361	No. 78-D 1600 ohm	No. 53 5-Bar Alternating
F-2362	No. 78-G 2500 ohm	No. 53 5-Bar Alternating
WITH NO. 28, ½ M. F. CONDENSER IN RECEIVER CIRCUIT— NO. 28 INDUCTION COIL		
F-2363	No. 78-A 1000 ohm	No. 15 3-Bar Alternating
F-2364	No. 78-D 1600 ohm	No. 15 3-Bar Alternating
F-2365	No. 78-G 2500 ohm	No. 15 3-Bar Alternating
F-2366	No. 78-A 1000 ohm	No. 22 4-Bar Alternating
F-2367	No. 78-D 1600 ohm	No. 22 4-Bar Alternating



Open View
No. 2328

BOXES—DESK SET

Magneto With No. 28, ½ M. F. Condenser—No. 28C Induction Coil

Code	Ringer	Generator
F-2368	No. 78-G 2500 ohm	No. 22 4-Bar Alternating.
F-2369	No. 78-A 1000 ohm	No. 53 5-Bar Alternating.
F-2370	No. 78-D 1600 ohm	No. 53 5-Bar Alternating.
F-2371	No. 78-G 2500 ohm	No. 53 5-Bar Alternating.
F-2388	No. 78-A 1000 ohm	No. 19 3-Bar Pulsating.
F-2379	No. 78-D 1600 ohm	No. 19 3-Bar Pulsating.
F-2378	No. 78-A 1000 ohm	No. 23 4-Bar Pulsating.
F-2389	No. 78-D 1600 ohm	No. 23 4-Bar Pulsating.
F-2390	No. 78-D 1600 ohm	No. 55 5-Bar Pulsating.

Biased Ringer—No. 28C Induction Coil

F-2327	No. 79-A 1000 ohm	No. 15 3-Bar Alternating.
F-2372	No. 79-G 2500 ohm	No. 15 3-Bar Alternating.

Harmonic Selective Ringer

F-2410	No. 73-A 4-Party	No. 15 3-Bar Alternating (no Ind. Coil)

Harmonic Selective Ringer—No. 28C Induction Coil

F-2326	No. 73-A 4-Party	No. 15 3-Bar Alternating.

Harmonic Selective Ringer—With No. 10 and No. 28, ½ M. F. Condensers—No. 28C Induction Coil

F-2394	No. 72-A 4-Party	No. 66 3-Bar Pulsating.

Straight Line Ringer—Condenser and Push Button for Grounded Signalling—No. 28C Induction Coil

F-2376	No. 78-D 1600 ohm	No. 53 5-Bar Alternating.
F-2386	No. 78-A 1000 ohm	No. 15 3-Bar Alternating.
F-2411	No. 78-G 2500 ohm	No. 53 5-Bar Alternating.

Straight Line Ringer—Condenser and Push Button for Secret Signalling—No. 28C Induction Coil

F-2374	No. 78-D 1600 ohm	No. 59 5-Bar Pulsating and Alternating.

Desk Set Boxes for Railway Dispatching Service

These boxes are of the same construction as our standard Magneto Desk Stand Boxes. They are equipped with binding post for attaching an additional push button or key if required.

Code	Generators	Retard or Resistance Coil	Condenser	Induction Coil	Push Button	Ringer
F-2416	No. 53 5-Bar	30-F, 30-G	12	28-C	26	
F-2417	No. 15 3-Bar	30-F, 30-G	12	28-C	26	
F-2418	No. 53 5-Bar	4-L Resis. Coil	25	28-C	14	
F-2419			25	28-C		
F-2402		30-G	25–28	66-A	14	
F-2422	No. 74 3-Bar	4-L Resis. Coil	25	28-C	14	78-G 2500 ohm

Heavy Duty Desk Set Boxes for Oil Field Service With Special Heavy High Power Generator

Code	Generator	Induction Coil	Ringer
2415	No. 75 6-bar	28-C	78-G

Generator Boxes

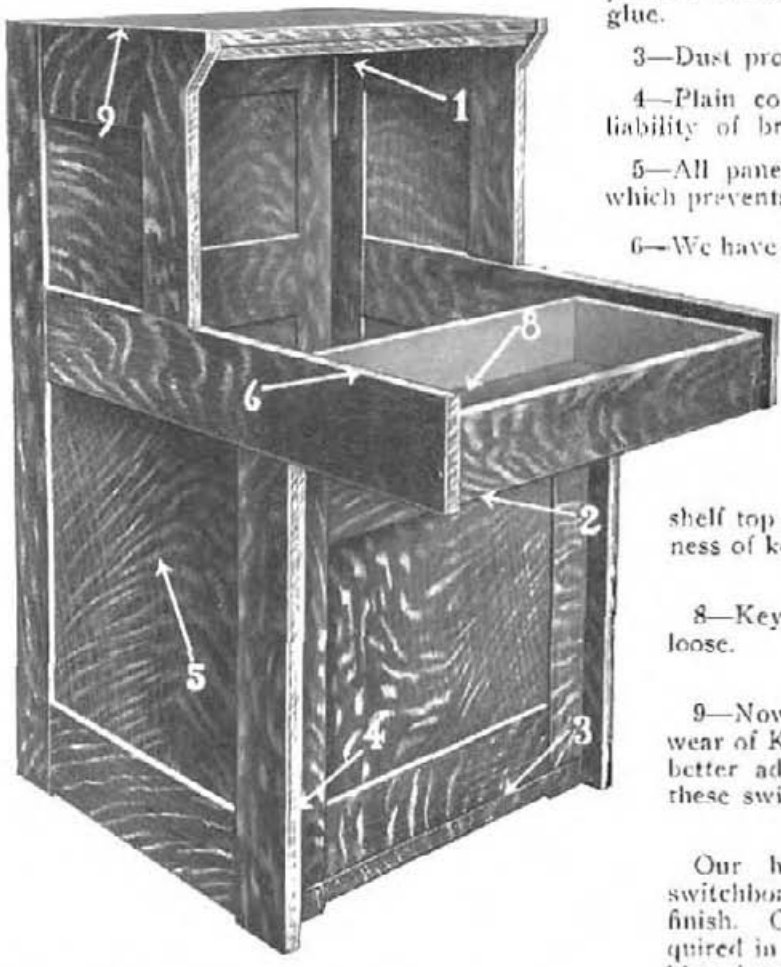
Code	Generator
F-2420	No. 22 4-bar
F-2421	No. 53 5-bar

CABINETS—Switchboard, Construction

Kellogg Cabinets are built by us in our own plant. Cabinets bought on the open market did not come up to the Kellogg standard, so in order to house our switchboard apparatus properly, we have our own complete wood working plant.

The raw materials, drying, cutting, planing, veneering, varnishing and polishing, are according to Kellogg specifications insuring the buyer a cabinet of unusual strength, practical dimensions and fine appearance.

1—Panel groove. Kellogg heavy quartered oak panels have no metal handles to break, discolor or become loose. Finger grips cut into wood. Kellogg panels in position set in deep grooves, are dust and rattle proof.



2—Kellogg switchboard frame of extra heavy stock. The taper wedged dove tail joint is so strong it would hold without glue.

3—Dust proof panel recess.

4—Plain corners avoid dust ledges and liability of breakage.

5—All panels are three-ply construction which prevents warping.

6—We have yet to hear of Kellogg switchboard sides or shelves warping. Kellogg key shelf top (not shown in illustration) most durable ever built. Plated piano hinge. Heavy leather surface covering plug shelf. Kellogg method of attaching keys assures smooth shelf top and long wear without looseness of key escutcheons.

8—Key shelf bottom cannot work loose.

9—Nowhere does the extraordinary wear of Kellogg wood finishes show to better advantage than on the top of these switchboards.

Our heavy, quarter-sawed oak switchboards have a rich golden oak finish. Over two weeks' time is required in applying, drying in and rubbing down, the several coats of shellac and varnish. With such a finish, the cabinet retains its rich and attractive appearance through years of continuous and hard usage which most switchboards receive.

The switchboard cabinet is constructed with removable front and rear doors, of the "lift out" type, from carefully selected and kiln dried quarter-sawed oak, tongued and grooved and joined in a substantial manner.

The steel frame and angle iron work throughout the cabinet is provided for a rigid apparatus mounting. This frame is treated to prevent rust and corrosion.

CABINET CODES

Code No.	Jack Space Width	Jack Space Height	Height	Total Depth	Width	Positions	Description
133	9 "	12½"	13½"	6 "	10 "	1	Testing cabinet.
114	15⅜"	12⅞"	14⅝"	12⅜"	16⅞"	1	1-panel Cordless P. B. X.
114B	15⅜"	12⅞"	14⅝"	12⅜"	16⅞"	1	1-panel Cordless P. B. X.
134	23½"	15⅛"	16⅞"	14½"	26¼"	1	2-panel turret for cordless.
4	34½"	12⅝"	15¾"	15⅝"	38⅜"	1	3-panel turret, generally used on Gunn desks.
104A	23⅝"	12⅜"	15¾"	15⅝"	38⅜"	1	2-panel with pigeonholes and book stalls, wood front.
104B	23⅝"	12⅝"	15¾"	15⅝"	38⅜"	1	No. 104A less wood front with 2-panel jack frame.
151	3' 5⅛"	8½"	9¾"	15½"	4' 5⅛"	1	3-panel turret with pigeonholes, no front board.
135	3' 8⅞"	10¼"	12 "	15½"	5' 11½"	1	3-panel turret with pigeonholes and front board.
137	4' 4¾"	8½"	9¾"	15½"	5' 4¾"	2	4-panel, 2-position turret, low, no front board or dividing panel.
136	2' 5⅛"	13¼"	19¼"	15½"	6' 3¾"	2	4-panel, 2-position turret, high, with pigeonholes and front board with dividing rail between positions.

Gunn Type Desks—Flat Top

141	31"	24"	36"	Gunn desk.
142	31"	34"	50"	Gunn desk.
143	31"	38"	96"	96" long Gunn desk.

Turrets and Desks

Code No.	Jack Space Width	Jack Space Height	Height of Key Shelf	Height	Total Depth	Width	Positions	Description
139	21⅜"	15 "	2' 5½"	3' 10⅜"	2' 10"	3' 5¼"	1	Cord type turret and desk.
140				2' 6 "	31⅛"	14¾"	1	Drawer desk only to be used with 112 cabinet.

Unit Type Cabinets With Removable End Panels

107	9⅝"	21⅛"	2' 8 "	4' 8 "	3' 4"	11½"	1	1-panel calculagraph cabinet.
107E	9⅝"	21⅛"	2' 8 "	4' 8 "	3' 4"	11½"	1	For No. 1 toll board cabinet.
108	20⅛"	21⅛"	2' 8 "	4' 8 "	3' 4"	22⅛"	1	2-panel, 1 position toll cabinet.
108E	20⅛"	21⅛"	2' 8 "	4' 8 "	3' 4"	22⅛"	1	For No. 1 toll board cabinet.
146		2' 7 "	2' 7½"	6' ⅛"	3' 1⅛"	22⅛"	1	1 position multiple cabinet.
147	5' 5⅞"	2' 7 "	2' 7½"	6' ⅛"	3' 1⅛"	5' 6⅛"	3	3 position multiple cabinet.

Low Type Universal

Code No.	Jack Space Width	Jack Space Height	Height of Key Shelf	Height	Total Depth	Width	Positions	Description
112	18¼"	10⅞"	30⅛"	43⅛"	31¼"	20 "	2	30 line switchboard.
112B	18¼"	10⅞"	30⅛"	43⅛"	31¼"	20 "	2	No. 112 cabinet, designed for No. 4-B., P. B. X.
112BA	18¼"	10⅞"	30⅛"	43⅛"	31¼"	20 "	2	40 line switchboard.
122	23⅜"	12⅞"	30⅛"	45¼"	35 "	25⅛"	1	100 line switchboard.
122B	23⅜"	12⅞"	30⅛"	45¼"	35 "	25⅛"	1	No. 122 framed for No. 2, P. B. X.
123	30 "	18⅛"	30⅛"	51¼"	35 "	31½"	1	200 line, P. B. X.—150 line Magneto.
124	45⅝"	18⅞"	30⅛"	51¼"	35 "	47⅜"	2	320 line Magneto.
152	23⅛"	18⅞"	30⅛"	51¼"	35 "	25⅛"	1	Standard 150 magneto switchboard.

High Type Magneto and Common Battery Cabinets

111	21⅛"	22"	3'	5' 1⅞"	2' ⅛"	22⅞"	1	1 position, 150 line cab. for addition
129	3' 9¾"	26"	3'	5' 6⅛"	2' 9½"	3' 11½"	2	2 position multiple, wood cabinet
130	5' 8⅞"	26"	3'	5' 6⅛"	2' 9½"	5' 9⅛"	3	3 position multiple, wood cabinet

Wall Type With Plug Shelf Cabinets

149	2½"	27⅞"		3' 8⅜"	14⅞"	15 "	1	1 panel, toll test cabinet
131	3½"	19½"		3' 2½"	14⅛"	15 "	1	2 panel, toll test cabinet
132	3½"	19½"		3' 2½"	14⅛"	20½"	1	3 panel, toll test cabinet

Wall Type Without Plug Shelf Cabinets

116	11	1¾"		6⅞"	6⅛"	14½"	1	10 line magneto switchboard
117	11⅛"	13⅞"		16¾"	10 "	14¼"	1	34 line magneto switchboard.
117A	11⅛"	13⅞"		16¾"	10 "	14¼"	1	34 line magneto switchboard.
148			2' 2¾"	4' 3½"	35 "	3' 2⅜"	1	
150				3' 1⅞"	5⅞"	10¾"	1	

CABLE—SWITCHBOARD

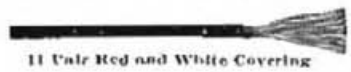
Kellogg Switchboard cables are manufactured from the best grades of selected raw materials by our own specially designed machinery, and are furnished in several styles and sizes.

The wires are tinned, thoroughly annealed, and are of not less than 98 per cent pure copper, evenly coated with tin and cleansed of all acid and other foreign matter and enameled. 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 single silk and cotton and double silk and cotton insulation. Two types of over all covering are furnished—red and white, and lead colored fireproof paint.

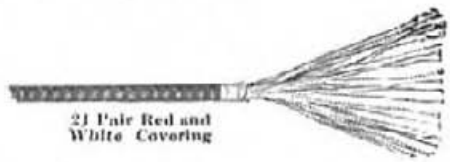
A standard color code is used so that each pair of wires can be identified. Small sizes, such as 11, 21 and 26 pairs can be shipped in boxes up to 500 foot lengths. Above 500 feet, reels are required. Large sizes, such as 41, 51 and 102 pairs can be shipped in boxes up to 250-foot lengths. Above 250 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 our factory.



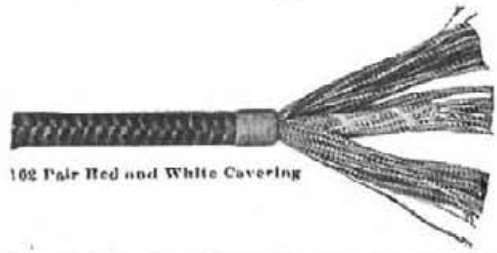
Flat Cable Soldered to Spring Jack.



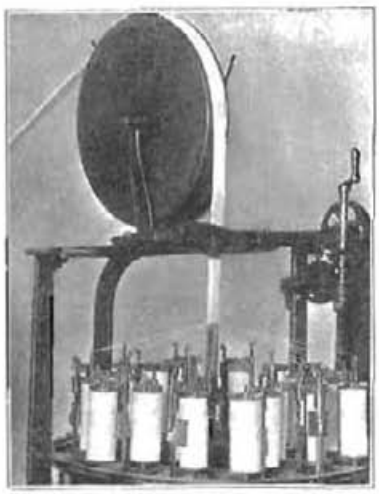
11 Pair Red and White Covering



21 Pair Red and White Covering



102 Pair Red and White Covering



Flat Cable Braiding Machine

CABLE—SWITCHBOARD

Two Silk and One Cotton—Enameled 22 B. & S. Gauge—Flat Type

Code	No. of Twisted Pairs	No. of Sgl. Conds.	Color Code	Dimensions	Weight per 1000 ft. (lbs.)	Use
49AX	21	....	D	$\frac{3}{8}$x$\frac{33}{64}$"	144	Common Battery Mult. Swbds.
104AX	41	....	J	$\frac{7}{16}$x$\frac{9}{32}$"	265	Common Battery Mult. Swbds.
117AX	21	21	K	$\frac{13}{32}$x$\frac{3}{4}$"	206	Common Battery Mult. Swbds.
138AX	21	21	K	$\frac{13}{32}$x$\frac{3}{4}$"	206	Common Battery Mult. Swbds.
139AX	21	21	K	$\frac{7}{16}$x 1"	247	Common Battery Mult. Swbds.
140AX	21	21	K	$\frac{13}{32}$x1$\frac{1}{8}$"	.....	Common Battery Mult. Swbds.

One Silk and One Cotton—Enameled 22 B. & S. Gauge—Round Type

114AX	11	....	A	23x64"	86	Common Battery Swbds.
107AX	21	....	D	15x32"	140	Common Battery Swbds.
109AX	41	....	J	5x8 "	248	Trunk Cable.
29AX	51	....	L	5x8 "	301	Asst. Lamp Mult.
53AX	102	....	V	15x16"	622	Magneto Swbds. & Gen'l Use.
137AX	11	11	E	25x64"	116	Common Battery Swbds.
22AX	21	21	K	17x32"	197	Common Battery Swbds.

Two Silk and One Cotton—19 B. & S. Gauge Saturated—Round Type

Code Outside Braid Red and White	Lead	Paint	No. of Twisted Pairs	No. of Sgl. Conds.	Color Code	Dia. Over all	Weight Per 1000 ft.	Use
81	.....		16	....	C	$\frac{15}{32}$"	193	Toll trunks.
85	.....		21	....	D	$\frac{33}{64}$"	239	Toll boards.
.....	134A		26	....	F	$\frac{5}{8}$"	296	Toll boards.
.....	136A		41	?	A No. 3	$\frac{25}{32}$"	.....	Toll boards.

Cable for Kellogg Interior Systems

Over all covering painted with lead colored fire proof paint.



Cable With Lead Sheath

Where dampness or conditions of exposure or service require, order cable with lead sheath as follows:

Code No.	No. of Twisted Pairs	Color Scheme	Remarks
8209AX	1 No. 16, 9 No. 22	G No. 2	Lead colored fire proof paint.
8213AX	1 No. 16, 13 No. 22	R No. 2	
8217AX	1 No. 16, 17 No. 22	S No. 2	
8221AX	1 No. 16, 21 No. 22	T No. 2	
8225AX	1 No. 16, 25 No. 22	U No. 2	
8209L	1 No. 16, 9 No. 22	G No. 2	$\frac{1}{16}$" Lead Sheath
8213L	1 No. 16, 13 No. 22	R No. 2	$\frac{1}{16}$" Lead Sheath
8217L	1 No. 16, 17 No. 22	S No. 2	$\frac{1}{16}$" Lead Sheath
8221L	1 No. 16, 21 No. 22	T No. 2	$\frac{1}{16}$" Lead Sheath
8225L	1 No. 16, 25 No. 22	U No. 2	$\frac{1}{16}$" Lead Sheath

CABLE—POWER

One Silk and One Cotton—Enameled 22 B. & S. Gauge—Round Type

Code	No. of Twisted Pairs	No. of Sgl. Conds.	Color Code	Dia. Over all	Use
141	....	5	C No. 2	$\frac{3}{4}$"	For ringing leads.
142	....	9	B No. 2	$\frac{5}{8}$"	For ringing leads.

Two Silk and One Cotton— 20 B. & S. Gauge—Round Type

101	....	5	Y	$\frac{13}{32}$"	For ringing leads.
102	....	7	M No. 2	$\frac{7}{16}$"	For ringing leads.
103	....	9	B No. 2	$\frac{31}{64}$"	For ringing leads.

Rubber and Braid Insulation—18 B. & S. Gauge—Round Type

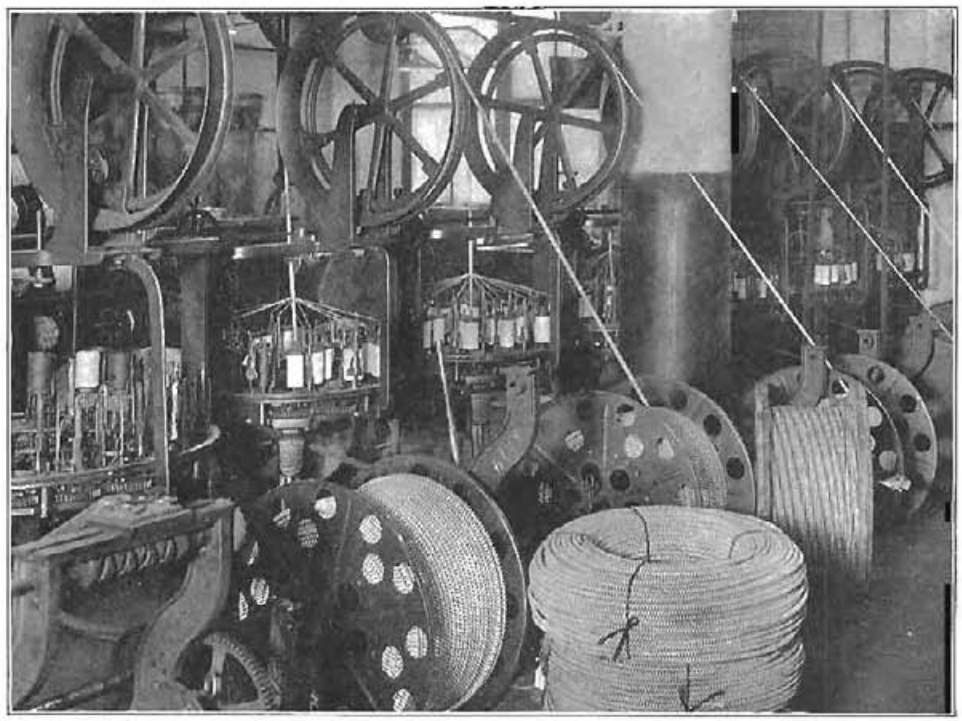
59	....	5	Y	$\frac{27}{64}$"	For ringing leads.
66	....	9	B No. 2	$\frac{35}{64}$"	For ringing leads.
105	....	7	M No. 2	$\frac{19}{32}$"	For ringing leads.

Rubber and Braid Insulated —14-18 Gauges—Round Type

122	....	12	D No. 3	$\frac{5}{8}$"	For use between power board and ringing apparatus.

No. 22-22-16 Gauges

130	41	21 & 4	P No. 2	$\frac{33}{32}$"	Enameled wire.



A Few Cable Braiding Machines

CHAIRS — OPERATORS

Chairs shown here are for use with both the high and low keyshelf type of switchboard as well as for wire chief and chief operator's desk.

They are regularly furnished in Golden Oak or imitation Dull Mahogany. Specify which finish is wanted.

The first measurement indicates the distance of the seat from the floor when the chair is in its lowest position, while the second indicates the highest.



Low Keyshelf Type

Code

1110 Range, 18-22 and 21-25 in. Cane seat.

1110PL Perforated leather over cane.



Low Keyshelf Type

Code

1160W Range, 18-22 in. For use with low keyshelf type swbds. Wood seat.

1100 Cane seat.

1100PL Perforated leather over cane.



High Keyshelf Type

Code

1112 Range 31-35 in. Ring 14½ in. from floor. Cane seat.

1112PL Perforated leather over cane.



High Keyshelf Type

Code

1101 Range 24-28 in. For use with swbds. having 36-in. key shelf. Our standard for high keyshelf boards. Cane seat.

1101PL Perforated leather seat over cane.

1103 Range 28-32 in. Cane Seat.

1103PL Perforated leather over cane.



High Keyshelf Type

Code

1111 Range, 27-31 in. Ring 9½ in. from floor. Cane seat.

1111PL Perforated leather over cane.

1114 Range, 27-31 in. Ring, 14½ in. from floor. Cane seat.

1111PL Perforated leather over cane.



High Keyshelf Type

Code

1120W Range, 27-31 in. Ring, 9½ in. from floor. Wood seat.

1120PL Perforated leather over cane.

CAPS—LAMP


No. 24


No. 25


No. 55


No. 62


No. 76


No. 154

Code No.	Type	Lens: Material	Lens: Color	Lens: Shape	Where Used—Lamp Jacks	Markings	Remarks
				No. 24 Type			
24	Line	Mica, Paper and Celld.	White	Disc. (Flat)	Nos. 1, 3, 4, 5, 8, 9, 12, 20, 23		Has 2 piece frame with wide shoulder. Cap screws on.
				No. 25 Type			
25	Line	White Glass Mica, Paper and Red Celld.	White	Disc	Same as No. 24		Shorter shoulder than No. 24.
27	Line	Mica, Paper and Celld.	White	Disc			
				No. 55 Type			
55	Line	Mica, Paper and Celld.	White	Disc	Same as No. 24		Shoulder on holder.
				No. 62 Type			
62	Line	Opalt. Glass	White				
62A	Line	Opalt. Glass Mica and Red Celld.	White				
62B	Line	Opalt. Glass Mica and Green Celld.	White				
62C	Line	Opalt. Glass Mica and Green Celld.	White		.....	⊕	
62D	Line	Opalt. Glass Mica and Red Celld.	White		.....	⊕	
62E	Line	Opalt. Glass	White	Convex	35, 36, 41	⊕	Stem ½" in length.
62F	Line	Opalt. Glass	White				
62G	Line	Clear Glass	Green				
62H	Line	Opalt. Glass	White		.....	◉	
62J	Line	Clear Glass	Green		.....	⊕	
62K	Line	Clear Glass	Green		.....	◉	
				No. 76 Type			
76	Super.	Glass, Mica, Paper and Celld.	White	Disc	1, 3, 4, 5, 8, 9, 12, 30, 23		Similar to 25, but with groove in top to receive extractor.
				No. 154 Type			
154	Line	Opalt. Glass	White				
154A	Line	Clear Glass	Red				
154B	Line	Clear Glass	Green				
154C	Line	Clear Glass	Not colored				
154D	Line	Opalt. Glass	White		.....	⊕	
154E	Line	Opalt. Glass	White				
154F	Line	Clear Glass 2 pcs. Mica and Spring	Not colored				
154G	Line	Opalt. Glass	White		.....	◐	Flat Opalt.
154H	Line	Opalt. Glass	White		.....	◐	
154J	Line	Opalt. Glass	White		.....	◉	
154K	Line	Opalt. Glass	White	Convex	10, 11, 15, 18, 19, 21, 22, 24, 25, 26, 27, 28, 31, 32, 33, 34, 37, 40, 42, 43, 44	◉	One-piece brass frame with ring to receive extractor. Fits all individual and strip lamp jacks having ⅝" opening.
154L	Line	Opalt. Glass	White			◎	
154M	Line	Opalt. Glass	White		.....	◐	
154N	Line	Clear Glass	Blue				
154P	Line	Clear Glass	Red Sand Blasted				
154Q	Line	Clear Glass	Green Sand Blasted				
154R	Line	Opalt. Glass	White				Lens coated with green lacquer.
154U	Line	Clear Glass	Red				
154V	Line	Clear Glass	Green				
154W	Line	Clear Glass	Green Sand Blasted				

CAPS — LAMP



No. 4



No. 9

Code No	Type	Lens Material	Lens Color	Lens Shape	Where Used Lamp Jacks	Marking	Remarks
				No. 4 Type			
4	Pilot	Clear Glass	Red	Diamond	No. 6 Lamp Jack or 1.425" hole	.....	
7	Pilot	Opalt. Glass	White	Diamond	.....	.....	
				No. 9 Type			
9	Pilot	Opalt. Glass	White	Diamond	⅞" hole	.....	Frame made of brass, nickel plated. No protector. Fits ⅞" hole.
9A	Pilot	Clear Glass	Red	Diamond	.....	.....	
9B	Pilot	Clear Glass	Green	Diamond	.....	.....	
9C	Pilot	Clear Glass	Not colored	Diamond	.....	.....	
9D	Pilot	Clear Glass	Amber	Diamond	.....	.....	

COILS—INDUCTION

Magneto Telephone



No. 28C



No. 85C

Code	Length Overall	Width Overall	Height Overall	No. of Term.	No. of Windings	Res. Primary Winding	Res. 1st Sec. Winding	Res. 2nd Sec. Winding	Res. Tertiary Winding	Use
28C	4¼"	1"	1"	4	2	.8	51.5	....	.....	Magneto Swbds. and telephones.
41B	3⅝"	⅞"	⅝"	4 (Wire)	2	5	100	....	.....	Base of 105 desk stand. Similar to No. 28, except spool heads.
41C	.....	.....	.....	4	2	8	51.5	....	.....	
85C	6"	2¼"	2"	4	2	8	51.5	....	.....	Magneto Ext. Service. Mtd. on base.
86C	4¼"	1"	1"	4	2	8	51.5	....	.....	Similar to No. 28, except spool heads.

Magneto Switchboard



No. 32

Code	Length Overall	Width Overall	Height Overall	No. of Term.	No. of Windings	Res. Primary Winding	Res. 1st Sec. Winding	Res. 2nd Sec. Winding	Res. Tertiary Winding	Use
14C	6"	2"	1⅞"	4	2	4	103	....	.....	Similar to No. 32, but with 2 term. Magneto Swbds.
32D	6"	2"	1¾"	8	4	4	75	75	440	For operator circuit of magneto Swbds. using storage battery.
33A	6"	2"	3½"	6	3	1.25	60	60	.....	Similar to No. 32.

Common Battery Telephone



No. 51A

Code	Length Overall	Width Overall	Height Overall	No. of Term.	No. of Windings	Res. Primary Winding	Res. 1st Sec. Winding	Res. 2nd Sec. Winding	Res. Tertiary Winding	Use
51A	4¼"	1"	1½"	2	2	33	17.5	....	.....	Base No. 97 desk stand.
F-51A	4¼"	1 "	1½"	2	2	33	17.5	....	.....	Base No. 118 desk stand.
53A	4 7/16"	1 3/16"	1 5/8"	3	3	33	17.5	....	.....	Similar to No. 51, except spool heads.
79A	4⅝"	1"	1"	4	2	33	17.5	....	.....	C. B. telephones and bell boxes. Spool assembly terms. on both ends.
82A	4⅝"	1 3/16"	1⅛"	4	2	33	17.5	....	.....	Similar to No. 79 with Micarta heads.
89A	6"	2 5/16"	1 15/16"	4	2	33	17.5	....	.....	No. 79 mounted on wood base.



No. 79A

COILS—INDUCTION

Common Battery Switchboard

Code No.	Length Overall	Width Overall	Height Overall	No. of Terminals	No. of Windings	Res. primary Winding	Res. 1st Sec. Winding	Res. 2nd Sec. Winding	Res. Tertiary Winding	Use
5A	5⅜"	1 7/16"	1¼"	4	2	64	68			Coil and terminals mounted on oak base.
7A	6 "	2 1/16"	2 1/16"	6	3	65	90		435	Maple base holding terminals used on C. B. swbds.
7B						1.25	90		435	
7C						1.25	90		2000	
7D						4	90		435	
32A	6 "	2 "	1¾"	8	4	28.5	45	45	410	(A) 24 volt C. B. Mult. swbds. Side Tone Reducer (B) same as (A) but for 48 volt system.
32B	6 "	2 "	1¾"	8	4	28.5	135	135	435	
17A	6 "	2 "	1¾"	8	4	28.5	62	410	474	Similar to No. 32 on extension to existing C. B. Mult. Swbds. 4 concentric coils.
17B	6 "	2 "	1¾"	8	4	28.5	62	1475	474	
72A	1st coil 6 "	2⅛"	1½"	5	4	33	16			
	2nd coil 6 "					33	16 & 350	G. S. Series		24 and 48 volt C. B. Mult. Swbds. Side tone reducer.
78A	1st coil 6 "	2⅛"	1½"	6	5	33	16	100 G. S.		Similar to No. 72 arranged for special busy test.
	2nd coil 6 "					33	16 and 350	G. S. Series		
99A	4 "	3 "	2½"	8	4	33	17.5			Common battery insert unit.

Miscellaneous

9A	1½"	1¾"	1¼"		2	6.15	135		Subs. signal.
11A	9 "	2 7/16"	2¼"	4	2	630	0.12		Busy back signal.
11B						150	0.12		
13A	6 "	2 "	1¾"	6	3	.85	47	36	Similar to 32 but 3 terminals for combined Tel. & Tel. sets.
16A	5 "	3 "	3 "	4	2	12.6	9		Howler.
35A	5¾"	2 "	3½"	5	2	1.5	51.5		Composite set.
37A	6⅝"	1 7/16"	1¼"	4	2	0.3	16		Similar to No. 28 except length.
44A	6 "	2 "	1⅜"	6	2	53/52	1850		Split primary.
66A	3 "	1 "	2 "	3	2	8	51.5		Combined interrupter and induction coil for railroad telegraphone sets.
81A	4⅛"	1 "	1 "	4	2	4	37½		Similar to No. 28 Delco light system.
83A	4 "	1¼"	1¼"	4	2	24.7	96.3		No. 1 composite Ringing Interrupter.
84A	4⅜"	1⅜"	2 "	4	2	1.3	160		Buzzer set.


No. 5A


No. 7


No. 72A


No. 35A


No. 66A


No. 81A


No. 83A

COILS—RELAY
For 2,000 Type Relays

These coils are made up from the best of materials. The windings are of copper and German Silver wire. The copper wire is either enameled or single silk covered as indicated and the German Silver wire is enameled and single silk covered.

Note: The first letter of the code indicates the type of winding as "C" for concentric and "S" for single, etc., and the last letters indicate the resistance.

Concentric Wound

Code No.	Insulation	Resistance	Remarks
C-A	Silk	1000 150-gs	⅛" Copper sleeve.
C-B	Silk	500 1000-gs	
C-D	Silk or Enamel	100 500-gs	
C-F	Silk	500 500	
C-G	Silk	100 40-gs	
C-I	Silk	100 100	
C-K	Silk	100 500	
C-M	Silk	50 50	
C-N	Silk	300 300	
C-P	Silk	525 1000 { 475-gs } 1000-gs	Connected in series. Inductive wound.
C-Q	Silk	100 20-gs	
C-T	Silk or Enamel	200 40-gs	
C-U	Silk	1000 250-gs	
C-V	Silk	3000 250-gs	
C-Y	Silk	950 950-gs	Wound inductive.
C-Z	Silk	500 500gs	⅛" Copper sleeve.
C-AA	Silk	1000 200-gs	
C-AB	Silk or Enamel	500 500-gs	
C-AC	Silk	500 100-gs	¼" Copper sleeve.
C-AD	Silk	1000 100-gs	⅛" Copper sleeve.
C-AE	Silk or Enamel	500 300-gs	
C-AF	Silk	200 400-gs	
C-AG	Silk or Enamel	100 70-gs	
C-AH	Silk or Enamel	500 100-gs	
C-AJ	Silk or Enamel	1000 500-gs	
C-AK	Silk	800 70-gs	
C-AL	Silk	700 80-gs	
C-AM	Silk or Enamel	300 300-gs	
C-AN	Silk	100 100-gs	Wound Ind.
C-AQ	Silk	50 300-gs	
C-AR	Silk	500 500-gs	Wound Ind.
C-AS	Silk	500 10-gs	
C-AT	Silk	200 300-gs	
C-AW	Silk	500 20-gs	
C-AX	Silk	1000 10-gs	⅛" Copper sleeve.
C-AY	Silk	500 10-gs	⅛" Copper sleeve.
C-BA	Silk	100 300-gs	
C-BB	Silk	100 15-gs	Wound Ind.
C-BD	Silk	500 1500-gs	
C-BE	Silk	1000 20-gs	
C-BF	Silk	200 200-gs	
C-BG	Silk	200 100-gs	
C-BH	Silk	1000 50-gs	
C-BJ	Silk or Enamel	300 3700-gs	

COILS—RELAY

Concentric Wound

Code No.	Insulation	Resistance	Remarks
C-DM	Enamel	323 200-gs	1 & 2 rough wound. 1 & 3 wound induc. No. 4 dead.
C-DN	Enamel	800 100-gs	Rough wound.
C-DP	Silk	1000 1000-gs	
C-DQ	Enamel	11 1	¼" core.
C-DR	Enamel	1025 450-gs	Rough wound. ¼" core.
C-DS	Enamel	1000 1500-gs	
C-DT	Enamel	500 300-gs	
C-DU	Enamel	300 1200	

Parallel Wound

P-A	Silk	30 30	
P-B	Silk	500 500	
P-C	Silk	100 100	
P-D	Silk	75 75	
P-E	Silk	1000 1000	
P-F	Enamel	300 300	
P-G	Enamel	500 500	Spec. spool for trip type relay, No. 2,000 type.
P-H	Silk	500 500	For trip type. 2,000 type relay.
P-J	Silk	50 50	Similar to P-A but winding twisted in pairs.
P-K	Silk	100 100	For trip type. 2,000 type relay.
P-L	Silk	2000 2000	

Single Wound

Code No.	Insulation	Resistance		Remarks
S-A	Silk	1.75		
S-B	Silk or Enamel	3		
S-C	Silk	6		
S-D	Silk or Enamel	10		
S-E	Silk or Enamel	20		
S-F	Silk	30		
S-G	Silk	40		
S-H	Silk or Enamel	50		
S-J	Silk	65		
S-K	Silk	80		
S-L	Silk or Enamel	100		
S-M	Silk	125		
S-N	Silk	150		
S-P	Silk or Enamel	200		
S-Q	Silk or Enamel	250		
S-R	Silk	300		
S-S	Silk	350		
S-T	Silk	375		
S-U	Silk	400		
S-V	Silk or Enamel	500		
S-W	Silk	1000		
S-X	Silk	1500		
S-Y	Silk or Enamel	2000		
S-Z	Silk	3000		
S-AA	Silk	67	100 200-gs	Conn. in mult.
S-AB	Silk	10,000	3300 6700-gs	Conn. in series.
S-AC	Silk	500	100 400-gs	Conn. in series.
S-AD	Silk	1,000	200 800-gs	Conn. in series.
S-AE	Silk	5,000	3900 1100-gs	Conn. in series.
S-AF	Silk	17	20 100-gs	Conn. in mult.
S-AG	Silk	200	1000 250-gs	Conn. in mult.
S-AH	Silk or Enamel	1000	450 550-gs	Conn. in series
S-AJ	Silk		50	⅛" cop. sleeve
S-AK	Silk		100	⅛" cop. sleeve
S-AL	Silk		200	⅛" cop. sleeve
S-AM	Silk		250	⅛" cop. sleeve
S-AN	Silk		300	⅛" cop. sleeve
S-AP	Silk		500	⅛" cop. sleeve
S-AQ	Silk		1000	⅛" cop. sleeve
S-AR	Silk		125	⅛" cop. sleeve
S-AS	Silk		235	

COILS—RELAY

Single Wound

Code No.	Insulation		Resistance	Remarks
S-EF	Silk		10,000-gs	Micarta heads.
S-EG	Silk		100	Micarta heads.
S-EH	Silk		600	Micarta heads.
S-EJ	Silk		1100-gs	Micarta heads.
S-EK	Enamel		7250	Same spool assem. as S-EA.
S-EL	Silk		700	
S-EM	Enamel	11.8	16 / 45-gs	Same spool assembly as S-EA. Conn. in mult.
S-EN	Enamel	1000	450 / 550-gs	4-term. with 3 & 4 dead. Conn. in series to 1 & 2.
S-EP	Enamel		3800	Same spool assembly as S-EA.
S-EQ	Enamel		1.52	Same spool assembly as S-EA.
S-ER	Silk		63	Used with 532-A relay.
S-ES	Silk		63	Same as S-ER but core tapped at arm. end.
S-ET	Enamel		140	Same spool assembly as S-EA. Spools not filled.
S-EU	Silk		1000	For trip type relay.
S-EV	Silk		500	For trip type relay.
S-EW	Enamel	200	50 / 150-gs	Conn. in series.

Code No.	Insulation		Resistance	Remarks
S-EX	Enamel		34	Rated resist. 32.3 to 35.7.
S-EY	Enamel	206	500 / 350-gs	Conn. in mult. Wound inductive.
S-EZ	Enamel		40	⅛" cop. sleeve over core.
S-FA	Enamel		1175	¼" core.
S-FB	Enamel		34	
S-FC	Enamel		540	Terms. 3 & 4. Consist of No. 35 cond. plate.
S-FD	Enamel		50	A. C. relay, No. 22 type.
S-FE	Enamel	72.4	78 / 1000-gs	G. S. wound ind. & conn. in mult.
S-FF	Enamel		13½	¼" core.
S-FG	Enamel		800	Rough wound.
S-FH	Enamel		100	Trip type relay.
S-FJ	Enamel		2500	Rough wound. A. C. relay.
S-FK	Silk	26.7	32 / 150-gs	Conn. in mult. A. C. relay.
S-FL	Enamel		500	Ratchet arm. adj't
S-FM	Enamel		1000	Solid copper arm. head.
S-FN	Silk		43	Solid copper arm. head.

Tandem Wound

T-A	Silk	500 50	⅛" cop. sleeve.
T-B	S & E	500 500	⅛" cop. sleeve.
T-C	S & E	100 100	
T-D	Silk	1000 100	
T-E	S & E	500 100	
T-F	S & E	500 500	
T-G	Silk	200 200	
T-H	Silk	500 250	
T-J	S & E	50 50	
T-K	Silk	250 250	
T-L	Silk	500 50	
T-M	Silk	300 300	
T-N	S & E	500 200	
T-P	Silk	100 500	
T-Q	Silk	225 225	
T-R	Silk	20 20	
T-S	Silk	200	
T-T	Silk	500 10	
T-U	Silk	10 150	
T-V	Silk	150 1000	
T-W	Silk	200 20	
T-X	Silk	1500 1000	
T-Y	S & E	500 1000	
T-Z	Silk	1000 75	
T-AA	Silk	75 150 75 150-gs 150 75 150-gs	Both wound concentric.

COILS—REPEATING

The repeating coils listed below replace all former types and represent our latest development in coils and are superior to any now on the market for both ringing and transmission efficiency.

The cores are made of Silicon steel laminated, and the windings are completely enclosed in heavy cross-talk proof cases.



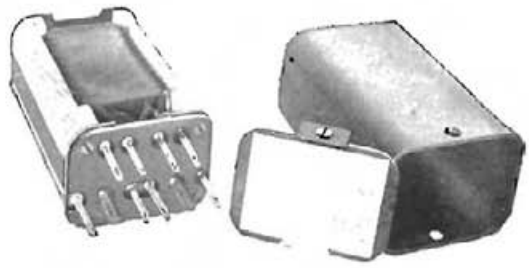
No. 16

Height 3¾ in. Width, 3½ in. Depth 2½ in.



No. 17

Height 3¾ in. Width 3⅜ in. Depth 2⅞ in.



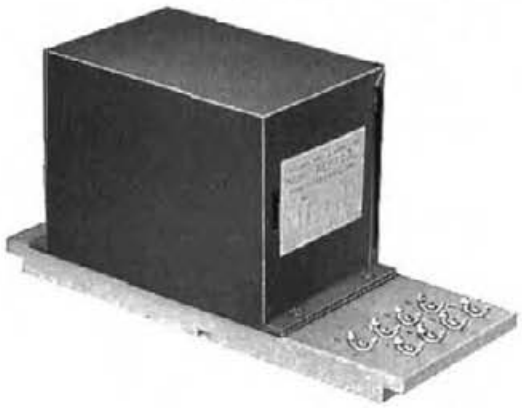
No. 20

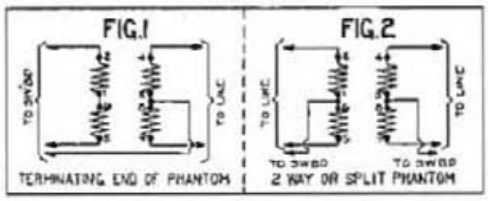
Height 1⅞ in. Width 2⅜ in. Length 4⅛ in.

Code	Description	Use
17A	4 parallel windings, 26-ohms each. Net weight, 5 lbs. 3 oz.	This coil is of the ring-through type and should be used in all single supervisory cord circuits that are to be equipped with coils. Can also be used for phantom work.
17-F	Similar to No. 17-A except has two windings in tandem and two in parallel.	Especially designed for phantom work and particularly adaptable to grounded phantoms, since the windings are separated there is less possibility of the coil being subjected to the effects of lightning. Talk and ring through efficiency practically same as No. 17-A.
18-B	Similar to No. 17-A except has two windings in tandem and two in parallel.	Especially designed for rural phantom work and particularly adaptable to grounded phantoms, since the windings are separated there is less possibility of the coil being subjected to the effects of lightning. Talk and ring through efficiency practically same as No. 17-A.
16-A	2 concentric windings, 16- and 20-ohms. Net weight, 3 lbs. 3 oz.	Common battery cord and trunk circuits, non-ring through type. Formerly used in magneto double supervisory cord circuits.
16-B	Same as No. 16-A except connections.	Double supervisory, positive non-ring through magneto cord circuits.
19-A	4 concentric windings, 15.3, 17.1, 18.8, 20.9-ohms.	For magneto cord circuits where a ring and talk through coil is required.
20-A	4 concentric windings, 12.1, 13.7, 15.2, 16.6-ohms.	Talk through only. Magneto cord circuits and local trunk ckts. Mounts on relay strips.

For Transformers, see Page 202-3.

COILS — PHANTOM AND SIMPLEX





Connections No. 18A.
Over all Dimensions
10¾"x4"x5¾"

The No. 18-A phantom coil was designed to meet the urgent need of a coil which could be introduced at the center of a physical circuit to obtain an intermediate phantom or telegraph circuit.

Heretofore, when service of this kind was required, it was necessary to introduce two repeating coils in each physical circuit making a total of four additional coils which decreased the transmission and ringing efficiency. The old arrangement was necessary due to the fact that previous coils were not perfectly balanced in each half.

The No. 18-A coil is arranged to mount on standard coil racks and has a resistance on ½ of the transformer circuit of 11.4 ohms, which is made up of two windings of 5.7 ohms each. The other half of the transformer circuit has a total resistance of 15 ohms, which is made up of two windings of 7.5 ohms each. The coil is perfectly balanced on either half. This means that if necessary to bridge on a phantom, the No. 18-A coil may be introduced at the center of two physical circuits and the phantom may be split and operated in either direction without interference on the physical circuits.

The transmission loss to telephone values is less than one-half mile, No. 19 gauge cable having a mutual capacity of .054 M. F. per mile. It has greater ringing efficiency than any other coil on the market.

The No. 18-A repeating coil, when used to obtain an intermediate telegraph station on a simplex telephone circuit, eliminates the thump which is usually present when unbalanced coils are used.

This coil has been placed in service on lines where other repeating coils, including the No. 46-A, have been used and a material increase in efficiency has been noticed.

COILS — RESISTANCE

Kellogg resistance coils have a sufficiently large carrying capacity and radiating surface to prevent them from overheating. They are wound with enamel insulated special resistance wire, which is enameled in our own wire enameling plant, and which has proven under test and in practice to be superior to any other enamel wire made. These coils are made in suitable forms so that they can be mounted where it is found most convenient. We are prepared to furnish resistance coils in the type illustrated below in any resistance.



No. 1 Type

Code	Resistance	Size of Spec. Res. Wire	Code	Resistance	Size of Spec. Res. Wire
1A	1,000 ohms	No. 36	1K	50 ohms	No. 29
1B	500 ohms	No. 36	1L	1 ohm	No. 22
1C	100 ohms	No. 29	1M	2,000 ohms	No. 36
1D	700 ohms	No. 36	1N	10,000 ohms	No. 40
1E	30 ohms	No. 29	1P	500 ohms	No. 36
1F	260 ohms	No. 29	1Q	250 ohms	No. 30
1G	3,000 ohms	No. 36	1R	10,000 ohms	No. 40
1H	10 ohms	No. 26	1S	300 ohms	No. 31
1J	120 ohms	No. 29	1T	450 ohms	No. 34
			1U	6,000 ohms	No. 38

COILS—RESISTANCE



No. 4 Type

Code	Resistance	Size of Spec. Res. Wire	Code	Resistance	Size of Spec. Res. Wire
4A	500 ohms	No. 28	4G	1,500 ohms	No. 32
4B	400 ohms	No. 28	4H	160 ohms	No. 28
4C	300 ohms	No. 28	4J	5,000 ohms	No. 34
4D	50 ohms	No. 25	4K	5 ohms	No. 29 Copper
4E	100 ohms	No. 28	4L	250 ohms	No. 28
4F	200 ohms	No. 28	4M	1,000 ohms	No. 30



No. 5A

5A	10,000 ohms	No. 38	4N	2,400 ohms	No. 34
29	Variable	No. 18			
30A	48,000 ohms				
31A	300 ohms	No. 35			
32A	16 ohms	No. 35			

Also see non-inductive relay coils which can be used as resistance coils.

COILS—RETARDATION

See Relay Coils Pages 22-27

Kellogg retardation coils are made over a core of soft iron wire or on coils having laminated cores of silicon steel. They are wound with the proper size enamel wire, and number of turns, and have the proper amount of iron. The coils are thoroughly tested for resistance and inductance. The function of retardation coils 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 the proper coil selected to meet these conditions.



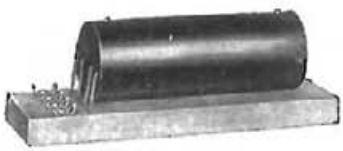
No. 8
Base 2x6 in. Coil 4½x1⅜ in.



No. 9
3⅜x1¼x1 in.



No. 10
2¼x1 in. Diam.



No. 11
Base 9x2⅜ in.
Coil Diam. 2¾ in.: Length 6 in.

Code No.	Type	Term	Resist	Size of Wire	Winding
8A	Open	2	100	29	Single
8B	Open	2	200	30	Single
8C	Open	2	350	32	Single
8D	Open	2	30	26	Single
8E	Open	2	500	32	Single
8F	Open	2	400	32	Single
8G	Open	2	200c/800GS	31&32	Single
8H	Open	2			
9A	Open	2	25	27	Single
9B	Open	2	150	32	Single
9C	Open	2	200	....	Single
10A	Cast Iron Encased	2	500	37	Single
10B	Cast Iron Encased	2	100	32	Single
10C	Cast Iron Encased	2	200	34	Single
10D	Cast Iron Encased	2	1000	39	Single
10E	Cast Iron Encased	2	300	35	Single
10F	Cast Iron Encased	2	800c/700GS	40&38	Single
10G	Cast Iron Encased	2	30	30	Single
10H	Cast Iron Encased	2	40	30	Single
10J	Cast Iron Encased	2	1800c/200GS	40&38	Single
10K	Cast Iron Encased	2	50	31	Single
10L	Cast Iron Encased	2	70	32	Single
10M	Cast Iron Encased	2	150	33	Single
10N	Cast Iron Encased	2	250	35	Single
10P	Cast Iron Encased	2	175	34	Single
11A	Closed	4	60/60	26	2 parallel on one spool

COILS—RETARDATION



No. 14
2¼x1¼ in. Diam.



No. 16
⅞x1 ft. Diam.



No. 18
2½x1½ in. Diam.



No. 21
Shell Over All
3⅝x1⅞ in. Diam.



No. 22
Shell Over All
3⅛x1½ in. Diam.



No. 23A
11½x6¾ in.



No. 24
3½ in. x 1 in.



No. 25
Shell Over All
3⅛x1½ in.

Code No.	Type	Term.	Res.	Size of Wire	Winding
12A	Closed	4	15/15	19	2 on 2 spools
12B	Closed	4	25/25	30	2 on 2 spools
14A	Cast Iron Encased	4	250/250	37&37	2 coils concent.
14B	"	4	100/100	35&35	" " "
14C	"	4	25/25	32&32	" " "
14D	"	4	10/10	29&29	" " "
14E	"	4	500/500	39&39	" " "
14F	"	4	50/50	33&33	" " "
14G	"	4	150/150	36&36	" " "
16A	Open	....	33	31	Single
16B	Open	....	100	34	"
18A	Open	2	25	28	"
21A	Closed	2	350	33	Ind. non Ind.
21B	Closed	2	100	30	" " "
21C	Closed	2	30	28	" " "
21D	Closed	2	2000	39	" " "
21E	Closed	2	500	34	" " "
21F	Closed	2	32	18	" " "
21G	Closed	2	50	29	" " "
21H	Closed	2	1000	36	" " "
21J	Closed	2	300	33	" " "
21K	Closed	2	1500	37	" " "
21L	Closed	2	200	32	" " "
22A	Closed	4	75/75	32	2 Tandem
22B	Closed	4	100/100	32	"
22C	Closed	4	150/150	34	"
22D	Closed	4	250/250	35	"
22E	Closed	4	200/200	34	"
23A	Closed	2	125	12	Single
23B	Closed	2	33	12	"
25A	Closed	4	1000/1000	39	Parallel
25B	Closed	4	2000/2000	39	"
25C	Closed	4	50/50	32	"
28A	Closed	2	1500	38	Single
28B	Closed	2	1000	31	"
29A	Closed	4	8.8/8.8	20	Tandem
29B	Closed	4	27/27	23	"
29C	Closed	4	500/500	30	Parallel
29D	Closed	4	.34/.34	12	Tandem



No. 28
Base 8½x2⅞ in.



No. 29
Base 11½x6¾ in.

COILS — RETARDATION



No. 30
Adjustable Core Over All 3⅞x1 in.

No. 31 similar to No. 11

No. 34 same as No. 21, but with rubber heads



No. 35A
Base 10¾x6¾ in.

No. 36 similar to No. 29

No. 39 similar to No. 29



No. 40
3¾x2⅞ in.



No. 55

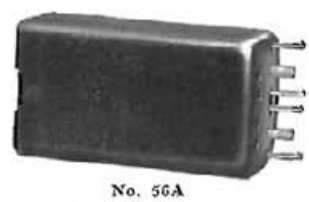


No. 41
Base 7x3 in.

Code	Type	Term.	Resist.	Size of Wire	Winding
30A	Open	2	1.9	21	Single
30B	Open	2	50	29	"
30C	Open	2	100	31	"
30D	Open	2	7.5	24	"
30E	Open	2	25	27	"
30F	Open	2	3.5	23	"
30G	Open	2	150	31	"
31A	Closed	4	1500/1500	31	Tandem
34A	Closed	2	2000	39	Single
35A	Closed	2	.125	12	"
36A	Closed	4	500/500	30	Parallel
36B	Closed	4	50/50	25	"
39A	Closed	8	44/44 44/44	26	4 Wires Parallel
40A	Closed	4	44/44	28	Parallel
40B	Closed	4	500/500	34	"
41A	Closed	2	.08	14	Single
42A	Open	2	25	27	"
43A	Open		165/165	34	Parallel
44A	Closed	4	54/54	27	Tandem
44B	Closed	4	200/200	31	"
45A	Closed	4	80/80		Single
55A	Closed		39/39 39/39	39	"
56A	Closed	4	57/57	29	Tandem
58A	Closed	2	25		Single



No. 42
4⅛x1⅛x1 in. Diam.



No. 56A

CONDENSERS

For Telephones, Switchboards and General Use

Kellogg Condensers are manufactured by the most modern process and are of the best materials obtainable. Special tin foil and paraffin paper are used in the construction of all our condensers, rather than the metallized paper process, which is not satisfactory for general use.

The tin foil type of construction is more expensive, but is thoroughly reliable and free from trouble and is the only condenser that will withstand high frequency currents, such as auto ignition and radio work. It is well known that where an ordinary condenser fails the installation of a Kellogg will prevent further trouble.

We are prepared to furnish condensers for special work providing the quantity is large. All standard condensers, except Nos. 37 and 67, are provided with metal covers.

For Telephones



No. 28



No. 12



No. 16



No. 8



No. 62

Code	M. F. Cap.	Height	Width	Thickness	Use
28*	½	2⅞"	1¼"	1 1/16"	Receiver circuit Magneto Telephones.
10	½	2¾"	1¼"	¾"	Base of No. 89 Stand No. 111 Cradle set.
20	.2	2¾"	1¼"	¾"	Special three layers of paper and one layer of tin foil.
77*	½	3 1/16"	1¼"	¾"	Similar to No. 28, except mounting ear is bent flat and is parallel with side of case.
12	1	4¼"	2 "	1⅜"	Telephones and bell boxes.
16	2	4¼"	2 1/16"	1⅜"	Telephones and bell boxes, also common battery cord circuits.
8	1	4⅜"	2 1/16"	⅞"	Same as No. 12 except terminals.
15	½	4⅜"	2 1/16"	⅞"	Same as No. 12 except terminals.
41	1.5	4¼"	2 1/16"	⅞"	Special. Similar to No. 16.
90	1	4¼"	2 1/16"	1⅜"	Two ½ M. F. condensers in same case. Similar to No. 16.
110	2	4¼"	2 1/16"	1 3/16"	Same as No. 16, except terminal head is specially treated for export use.
78	1	3⅜"	1½"	1 3/16"	Common battery wood telephones and bell boxes. Similar to No. 62.
62	2	3⅜"	1½"	1 3/16"	Common battery wood telephones and bell boxes.
103*	1	4⅛"	1⅝"	1 1/16"	Same as No. 78, except mounting ear is on side.
53*	2	3⅜"	1⅝"	1 1/16"	In base of No. 97 desk stand. Similar to No. 103.
96*	2	4⅛"	1⅝"	1 1/16"	No. 110 Grabaphone unit set. Similar to No. 103.
105	½	4⅛"	2 "	⅜"	Similar to No. 12, but ½ M. F. to stand 1000 volts direct current, break down test.
99*	½	3⅜"	2¼"	1 3/16"	4 papers 1000 volts D. C. Break-down test used in No. 2866 telephones. Similar to 103, but mounts on base.
23	1	2⅛"	3 "	1 "	For 4 party sub. sets. Similar to No. 12.
13	1	3 1/32"	4 7/16"	5/8"	Special.
30	1	4⅛"	2 "	⅜"	Similar to No. 12, but with 3 terminals ½ M. F. from center terminals to either outside ones.
19	2	3⅛"	4 7/16"	5/8"	Similar to No. 13, but 1 strawboard is used in place of space strip.
58	2	11 5/16"	2 1/16"	1 1/16"	Flexible terminals 7½" long, two 1 M. F. condensers in one case.

For Switchboards



No. 37

					board cord circuits.
37*	1	3 "	3 3/16"	1 "	Formerly used in magneto switch-
68*	½	3⅜"	2¼"	1 3/16"	Magneto cord circuits.
67*	1	3½"	2¼"	1 3/16"	Magneto cord circuits.
66*	2	3½"	2¼"	1 1/16"	P. B. X. cord circuits.
64	2	2⅞"	1⅝"	1 3/16"	Same as No. 62, arranged to mount on steel mounting strip like relays.
32*	½	3 "	3 3/16"	1⅝"	Mounting ears on narrow side.
34*	2	5¼"	2 7/16"	1⅛"	Mounting ears on narrow side.

*Denotes condensers with ears for mounting.

CONDENSERS

For Switchboards



No. 68

Code No.	M. F. Cap.	Height	Width	Thickness	Use
36	2	5¼"	2½"	1⅛"	Common battery cord circuits. Same as No. 16, except arranged to mount on steel mounting strip like relays.



No. 64

54	½	5¼"	2½"	1⅛"	Similar to No. 36.
57	1	5¼"	2½"	1⅛"	Same as No. 36, except capacity.
101*	½	3⅞"	1⅜"	1½"	Similar to No. 64.
65*	2	4⅛"	1½"	1⅝"	Similar to No. 64 with lugs on rear for holding can.



No. 34

Miscellaneous

24	½	2¾"	2⅛"	Round	Pole changers.
25	1	2¾"	2⅛"	Round	Pole changers.
79	.2	2⅝"	1⅜"	⅞"	Two 1. M. F. condensers under one case, special for telegraph service.



No. 30

17	.3	4⅛"	2⅛"	⅞"	4 layers of paper to 1 layer of tin foil. Similar to No. 8.
31	.05 to .1	5¾"	¾"	Round	3 layers of paper to 1 of tin foil.
118	.75 to .80 to 1	4⅛"	2⅛"	1⅛"	Two units in one cover used with 412 desk set box.
11	4	8⅜"	4⅝"	1⅛"	Two 2 M. F. condensers connected in multiple, one case overall. Similar No. 8.



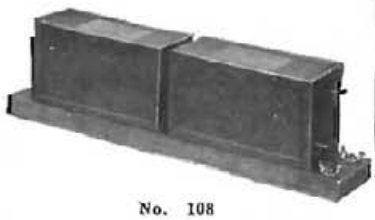
No. 25

102	2.10	4⅛"	1⅛"	2⅜"	Balanced condenser.
108	4.20	10¾"	1⅞"	2⅞"	2 No. 102 condensers (paired) mounted on wood base.
128	4	4 "	1⅛"	2⅝"	Twin condensers in case for No. 56 set coil.

*Denotes condenser with ears for mounting.



No. 118



No. 108



No. 128

Condenser Mounting Brackets

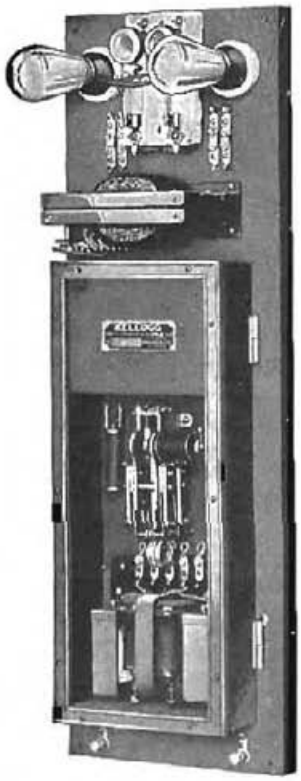


	Width Inches	Thickness Inches	Use
Pc. 1288	2⅛	1⅛	No. 16 and No. 90 condenser.
Pc. 4854	2⅛	Any	With all condensers 2⅛ wide.
Pc. 27928	1½	Any	With all condensers 1½ wide.
Pc. 8261	Any	1½	With all condensers 1½ thick.
Pc. 5771	Any	¾	With all condensers ¾ in. thick.
Pc. 10638	1⅛	¾	With No. 10 and No. 20 condenser.
Pc. 3982	2⅛	1⅛	With No. 16 condenser.

CONVERTERS—ELECTRIC LIGHT CURRENT

No. 6 Converter

The No. 6 alternating current converter operates directly from 110 volt, 50 to 60 cycle commercial current lighting mains and converts the 110 volt alternating current to a form of direct current, which is in turn converted to obtain alternating current of approximately 20 cycles per second for ringing polarized telephone bells.



No. 6

No. 7 Converter

The No. 7 converter operates directly from 110 volt, 60 cycle current and is the same as the No. 6, but delivers both alternating and positive and negative pulsating current for ringing both polarized and biased telephone bells.

The No. 6 and 7 converters are identical in construction with the exception that the vibrating unit of the No. 7 converter has two additional springs for negative and positive pulsating impulses which are wired to two additional binding posts at the bottom of the back board panel; otherwise the construction, maintenance, adjustment and operation of the No. 7 converter is the same as that of the No. 6.

Cabinets

All of the operating equipment included in the converter is mounted on an asbestos wood panel which insures against the possibility of damage by fire. The use of this material has the approval of the National Board of Fire Underwriters.

A hinged glass cover is mounted on this back board to cover the condensers, the pole changing vibrator and the rectifier relay. This cover is provided with hinges that permit it to be removed from the back board when opened.

Operation with A. C. Current

These converters consist of three principal details, which are the transformer, rectifier relay and the pole changing vibrator unit. The operation of these three principal details is as follows:

The 110 volt, 60 cycle alternating current lighting circuit is connected to the switch and protection fuses at top of back board panel and is taken in on the primary side of the transformer, which serves as an effective insulator for the telephone ringing equipment, and also adjusts the current to a voltage suitable for ringing.

The current is then taken from the secondary of the insulating transformer through 32 volt, 25 watt tungsten lamps to the rectifier relay, which is bridged across the secondary of the transformer. The function of this relay is to convert the alternating current into a form of uni-directional or direct current. The lamps limit the current supply to the relay contacts with which they are directly associated.

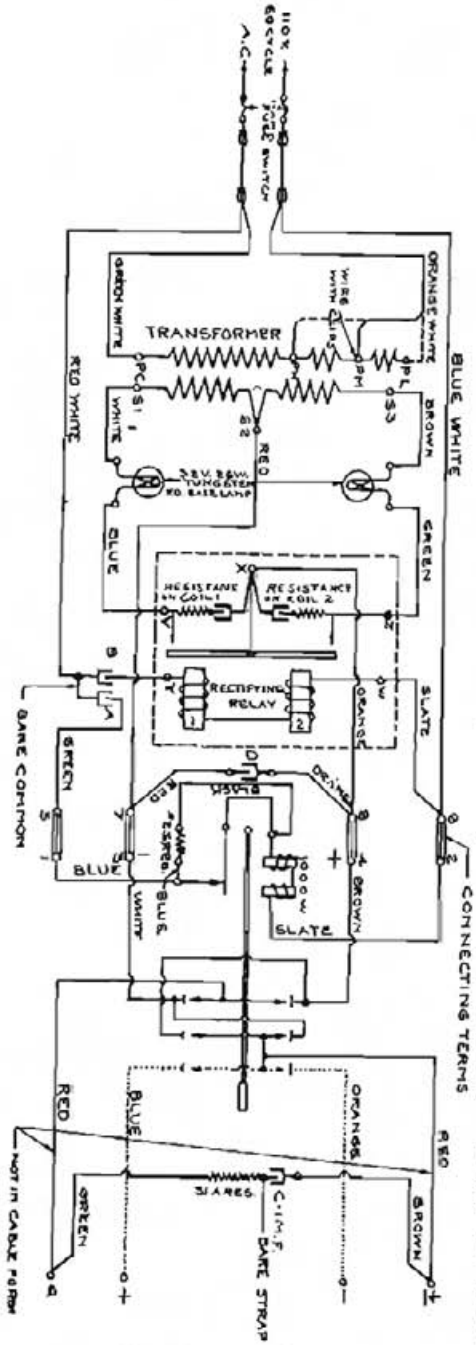
The uni-directional current is taken from binding post "X" on the rectifier relay to the pole changing vibrator unit, which is also connected to the middle tap of the transformer secondary with a condenser bridged across the leads to reduce generator noise on telephone lines. This unit reconverts the uni-directional current into an alternating current, having a frequency of approximately 20 cycles per second, which is suitable for ringing standard polarized telephone bells. A high wound resistance coil is bridged across the vibrator contacts to prevent sparking and consequent injury to these contacts.

The generator or ringing leads are bridged with a 1 MF condenser and a non-inductive resistance to take up the reaction of the ringers and eliminate inductive disturbances when ringing out on the line.



No. 7

CONVERTERS—ELECTRIC LIGHT CURRENT



Circuit of No. 7 Converter

No. 6 Converter Circuit same as No. 7, Omitting Springs and Wiring to Binding Posts "+" and "—"

Our arrester, catalog No. 1518809, can be used with the No. 6 or No. 7 converter where the Electric Light Company have insufficient arrester protection on their electric light wire.

A separate circuit direct from the 110 volt leads is provided to operate the rectifier relay and pole changer vibrator, condensers being wired in series with both of these units.

The rectifying relay coils have additional resistance windings which are connected in series with two condensers to prevent sparking of the relay contacts.

Operation With D C Current

Either the No. 6 or No. 7 converters can be used, in case of the failure of the local commercial lighting current with which your instrument is operated, by the use of dry cells. First remove the four straps near the top of the panel which connect the binding posts numbered from 1 to 8. Then connect 16 dry cells in series across binding post Nos. 1 and 2 for the purpose of operating the vibrators. Next connect 60 dry cells in series across binding posts Nos. 3 and 4, taking care to connect the negative side of your battery to the binding post marked No. 3, and the positive to the No. 4, with lamps in the circuit as shown in the illustration on the next page.

This figure at top page 37, is a wiring diagram, showing the dry cells connected through two switches which can be used to switch from the dry cell battery to the commercial current as desired. It also shows the connections mentioned above. No other changes in the adjustment of the converter are necessary for operation in this manner when the above instructions have been followed. It is, of course, necessary to open the switch at the top of the panel before making these changes.

Adjustments

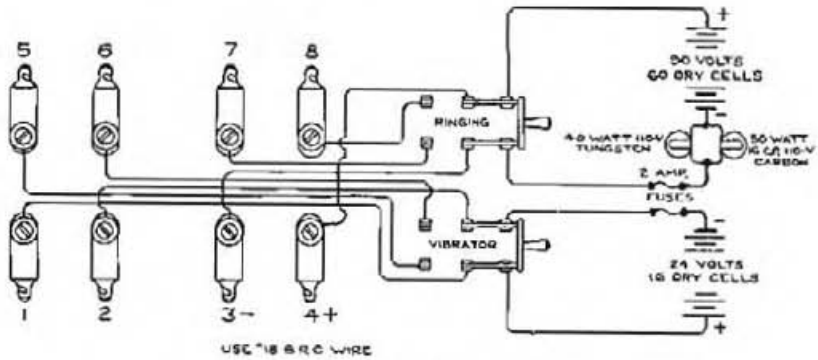
All converters leaving the factory are carefully inspected and adjusted and should not require adjustments of any kind when they are put into service, except possibly a regulation of the voltage of the outgoing ringing current. Provision has been made for this regulation on the primary side of the transformer, which is located immediately beneath the line switch, near the top of the panel.

One of the wires terminating on the small connector strip underneath the transformer is provided with a clip, so that it can be moved to any of the binding posts marked "PH," "PM" and "PL." When this wire is connected to the binding post marked "PH" you will obtain a ringing current of approximately 110 volts, which should be used only in case of necessity on long and heavily loaded lines. When connected to binding post marked "PM" a medium ringing current of approximately 100 volts, will be had, and when connected to the binding post marked "PL" a ringing current of approximately 90 volts will be had. Line conditions will determine where this connection should be made.

Our advice is that you do not use a higher voltage than is necessary to satisfactorily ring the bells on all of your lines.

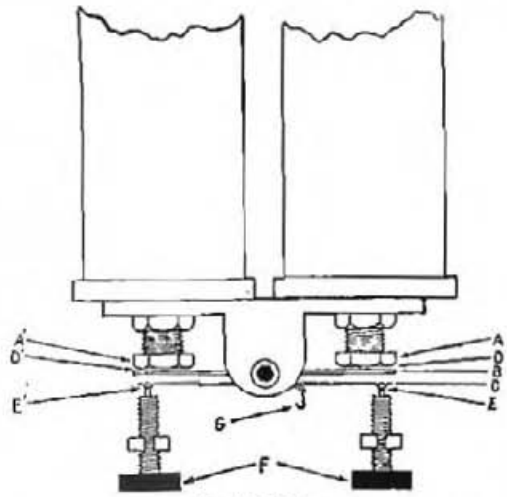
There should be no necessity for changing any of the other wires terminating on this connecting strip, and these should always remain as they are when the converter is received.

CONVERTERS—ELECTRIC LIGHT CURRENT



Wiring for Emergency Circuit

Rectifier Relay



No. 555 Relay

"A" Pc. 10004 "B" Pc. 35781 "C" Pc. 34744
"F" Pc. 30470 "G" Pc. 1852

Before attempting to make adjustments, open A. C. line switch at top of back board panel.

Remove the permanent steel magnet by extracting the screw at upper end which will make the various parts more accessible.

Refer to the drawing and make certain that the armature "B" moves freely and does not bind in the bearings.

Contact spring "C" and armature "B" should be parallel.

Pole pieces "A" and A' should be run out equally until the clearance at gaps "D" and D' between the armature "B" and pole pieces "A" and A' is .010 of an inch on each side or .020 of an inch if measured on one side with the other end of armature touching the pole piece, using the thickness of gauge furnished. Lock the pole pieces in this position with the lock nuts.

Turn in the contact screws "F" until they just make with the contacts on spring "C", the gaps "D" and D' being kept equal (.010 of an inch).

Turn screws "F" away (to left) about 1-8 turn from contacts on spring "C" to give a clearance of .002 of an inch at gaps "E" and E'. Use Pc. No. 42921 combination wrench and gauge for the above adjustments.

Green stranded wide "G" must be kept from touching any part of the relay and should be looped so as not to hamper the armature in its movement.

The permanent magnet is of sufficient strength if it can lift its own weight and, in replacing same on the relay, care should be taken to prevent disturbing parts already adjusted.

Contacts must be bright and free from pits. Contact screws should center on spring contacts.

Carefully examine the armature and pole pieces to see that no iron filings or chips adhere to them as they might arrange themselves in a manner to prevent the armature from vibrating.

By observing these instructions when making adjustments, the relay will operate quietly and with minimum wear at the bearings, delivering a steady uni-directional current of approximately 95 volts with transformer lead on "PM". This voltage can be measured across terminals 7 and 8 near top of converter with a D. C. voltmeter. See circuit of converter, page 36.

If any trouble is experienced with this relay which cannot be remedied by this simple adjustment, we suggest that you remove the entire unit from the converter by first taking off the five wires at the top of the rectifying unit and then removing the four retaining screws, after which the entire unit can be removed and sent to the Kellogg company for attention. However, this unit is very simply constructed and there is very little to get out of order so that such procedure should rarely be necessary except as a direct result of careless handling or improper adjustment and consequent injury to the unit.

CONVERTERS—ELECTRIC LIGHT CURRENT

Pole Changing Vibrator

Contact springs should have a moderate tension and clear the adjusting screws in the arms.

Contacts on springs and intermediate studs must be free from pits and centered on each other with a gap of approximately 1/32 of an inch between contacts.

Pole pieces should be run out toward the armature but not near enough to touch same when armature vibrates. The closer the pole pieces are run to the armature, the wider the swing of the armature will be but the armature should not swing so far as to cause the contact springs to be pushed against the arms that hold the adjusting screws. When proper position of pole pieces has been found they should be locked in place by the lock nuts.

To test for correct adjustment of pole changing vibrator, connect a D. C. voltmeter to the binding posts marked "G" and "±". When the adjustment is correct, the needle will vibrate at zero An uneven ringing current is indicated by violent fluctuations from zero and can be corrected by a slight adjustment of the adjusting screws.

For the No. 7 converter the D. C. voltmeter may be used in the same manner across binding posts "G" and "+" and "G" and "—" to read the pulsating current voltages. The alternate springs nearest to the back board are the pulsating current contacts and should be adjusted to give the highest voltage which is approximately 40 volts.

If a D. C. voltmeter is not available a suitable means of determining when the converter is properly adjusted is to short circuit terminals No. 7 and No. 8 with the converter in operation. The lamps should glow with full brilliancy without flickering; if one of the lamps fails to light it is probably burned out or the relay contacts do not make properly; flickering of the lamps indicates pitted or dirty contacts. By short circuiting the ringing binding post marked "G" and the binding post "±" the lamps should glow with about one-half brilliancy, flickering at the same rate as the pole changing vibrator armature oscillates. On the No. 7 converter, in addition to the above, by short circuiting the terminals "G" and "+" the lamps should glow with slightly less brilliancy than when the terminals "G" and "±" are short circuited, also flickering will be very marked and half as rapid. Proceed as above with binding posts "G" and "—".

Note: The leads running to the supply mains must be made at a place where there is no other common resistance in the circuit.

Installation

UNPACKING. These converters should be carefully unpacked and all packing material removed, except the anchor block on the vibrator unit which should remain in place until the converter is mounted.

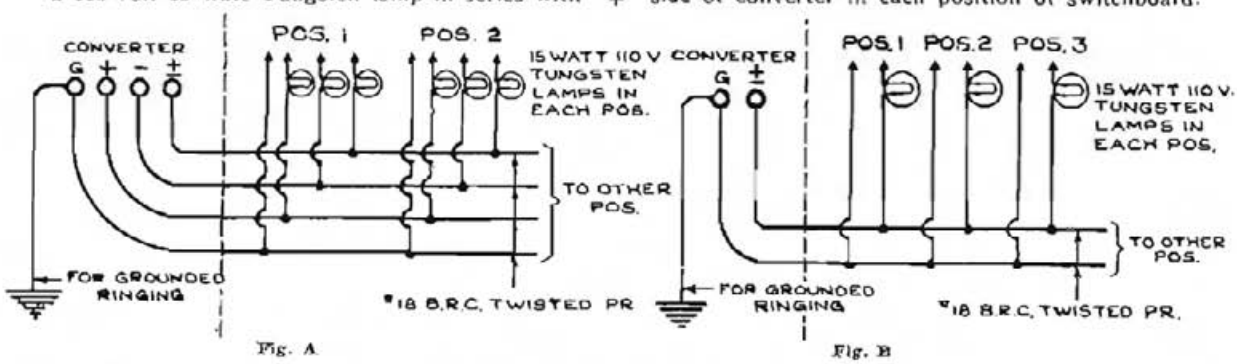
MOUNTING. To obtain the best results, mount firmly on a solid wall, which is free from vibration using a plumb-line or spirit-level to adjust the converter in an upright position. Then remove the anchor block from the vibrator unit.

CONNECTING OPERATING CURRENT. Open fuse switch at top of and in the center of back board panel, then bring the two leads from the local lighting circuit, carrying a 110 volt, 60 cycle single phase alternating current and connect to the two terminals at top of switch.

The A. C. supply voltage must not exceed 125 volts and no attempt should be made to operate the converter in series with a resistance for the purpose of reducing the line voltage.

CONNECTING GENERATOR LEADS TO CONVERTER. Generator leads should be of No. 18 gauge rubber covered twisted pair wire. Bring these leads from the telephone switchboard and attach them to the binding posts, at bottom of back board panel, which are marked "G" and "∓" on the No. 6 converter and "G" "∓" "—" and "+" on the No. 7 converter. If the No. 7 is used for alternating current only, connect as instructed for the No. 6.

CONNECTING GENERATOR LEADS TO SWITCHBOARD. For straight line ringing run one pair of wires as shown in Fig. B, being careful that they do not come in proximity to the transmitter battery and order wires so as to avoid the possibility of generator noise in the operator's circuit. Place a 110 volt 15 watt Tungsten lamp in series with "∓" side of converter in each position of switchboard.



When the No. 7 converter is used for both the positive and negative pulsating party line ringing and straight line ringing, a second pair of wires is required, as shown in Fig. A, and two additional 110 volt 15 watt Tungsten lamps connected in series with the leads to each position of switchboard.

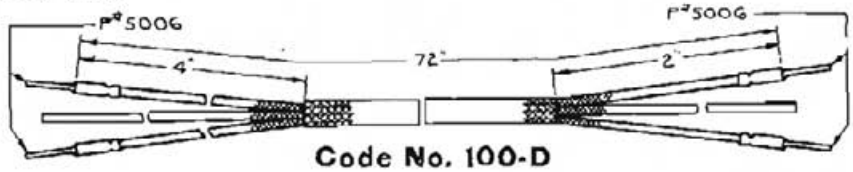
CORDS—DESK STAND

Kellogg desk stand cords are made up of the finest tinsel, covered with a double insulation of the best quality silk and cotton. The conductors are twisted together with a filler of jute and a brown mercerized braid over all. This construction gives a smooth and flexible cord as well as great durability.

The conductors consist of 12 strands of tinsel twisted together in three ropes, each consisting of 4 strands of tinsel and 2 of cotton. Over this is a wrapping of white cotton impregnated with a moisture-proof compound. This is covered with a plain brown cotton braid, over which is placed the brown mercerized outer braid.

The green silk deskstand cords are of the same construction as the brown mercerized, except that the cotton braid is green and the outer covering is of green silk.

The black and maroon desk stand cord conductors are of 18 strands of tinsel twisted together into 3 ropes of 6 strands each, over which is placed 2 wraps of silk, impregnated with a moisture-proof compound. This is covered with a black mercerized cotton braid over which is placed a black and maroon mercerized cotton braid.



Code No. 100-D

Two Conductor—Brown Mercerized

Green Silk Furnished When Specified.

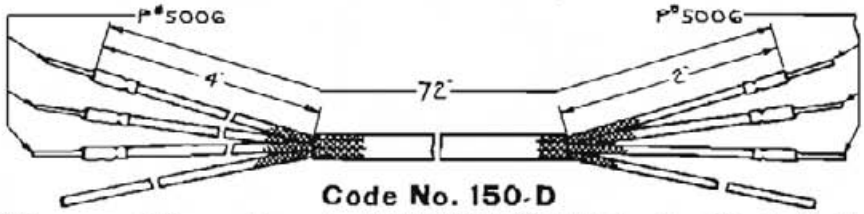
Code No.	Tips and Conn. Stand End	Tips and Conn. Box End	Length of Conds. Stand End, In.	Length of Conds. Box End, In.	Tracer Colors	Length Overall Inches	Remarks
100-D	5006	5006	2	4	Brown, Black	72	For No. 97, 39, 78, 75 and 111 desk stands.
F100-D	33566	33566	2	4	Brown, Black	72	For No. F97, F39, F78, F75 and F111 desk stands.
516-D	5006	5006	2	4	Brown, Black	120	For 2 conductor stands.
511-D	Loops	17132	2	4	Brown, Black	72	
581-D	33566	5006	2	4	Brown, Black	72	

2 Conductor—Black and Maroon

538-RD	5006	5006	2	4	Brown, Black	72	For 2 conductor stands.

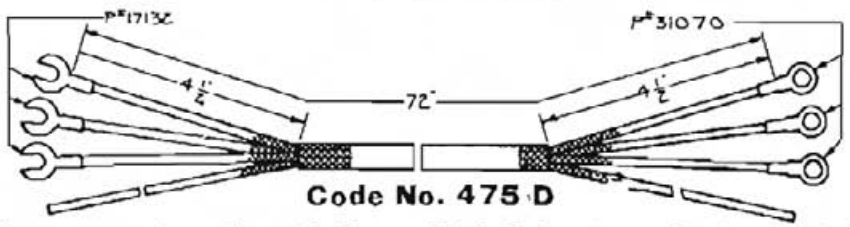
3 Conductor—Brown Mercerized

Green Silk Furnished When Specified.



Code No. 150-D

150-D	5006	5006	2	4	Brown, Black, Orange	72	For No. 84, 68, 82, 115, 110 and 120 stands.
F150-D	33566	33566	2	4	Brown, Black, Orange	72	For No. F84, F68, F82, F115, F110 and F120 stands.
452-D	5006	33566	2	2	Brown, Red, Orange	72	
F452-D	33566	33566	2	2	Brown, Red, Orange	72	



Code No. 475-D

475-D	31070	17132	4½	4½	Brown, Black, Red	72	Replaces S. C. No. D3A and No. 13.

CORDS—DESK STAND

4 Conductor—Brown Mercerized

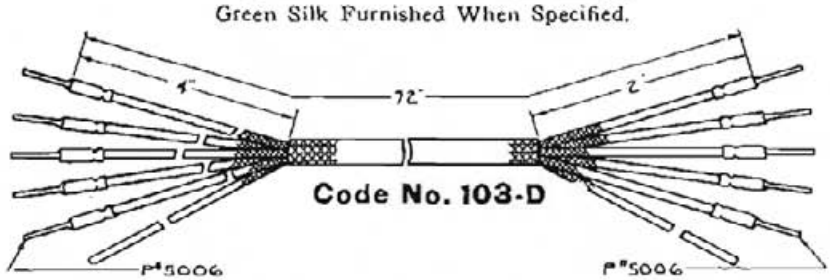
Code No.	Tips and Conns. Stand End	Box End	Length of Conds. Stand End, In.	Box End, In.	Tracer Colors	Length Over all Inches	Remarks
169-D	Bare / Tinsel	12129	4	4	Brown, Red, Orange, Blue	72	For auto. desk stand.
127-D	6028	5006	Min. 1¼ / Max. 2	7	Brown, Black, Red, Orange	72	For flexiphone.

4 Conductor—Black and Maroon

241-RD	5006	5006	2	4	Green, Black, Red, Orange	72	For 4 cond. stands and boxes.
F241-RD	33566	33566	2	4	Green, Black, Red, Orange	72	For 4 cond. stands and boxes with flat terminals.
F501-RD	33566	33566	Min. 1¼ / Max. 4	6	Green, Red, Orange, Blue	72	Replaces W. E. Co. No. 416.
402-RD	31070	33584	3	4	Green, Black, Red, Orange	72	For S. C. desk stands.

5 Conductor—Brown Mercerized

Green Silk Furnished When Specified.



Code No. 103-D

103-D	5006	5006	2	4	Brown, Black, Red, Orange White	72	For 5 conductor stands.
F103-D	33566	33566	2	4	Brown, Black, Red, Orange White	72	
488-D	5006	17132	2	4	Brown, Black, Red, Orange White	72	Fits Monarch Telephones.

5 Conductor—Black and Maroon

437-RD	5006	5006	2	4	Green, Black, Red, Orange White	72	No. 85-C desk stand.
F437-RD	33566	33566	2	4	Green, Black, Red, Orange White	72	

6 Conductor—Brown Mercerized

104-D	5006	5006	2	4	Brown, Black, Red, Orange White, Blue	72	For No. 98 stand.

7 Conductor—Brown Mercerized

429-D	11192	33566	Max. 2¼ Min. ⅞	Max. 6⅛ Min. 2¼	Black, Red, Orange, Brown Blue, White, Green	80	Pc. No. 11192 numbered.

CORDS—GRABAPHONE

Kellogg Grabaphone Cords are of the same construction as our Desk Stand Cords.

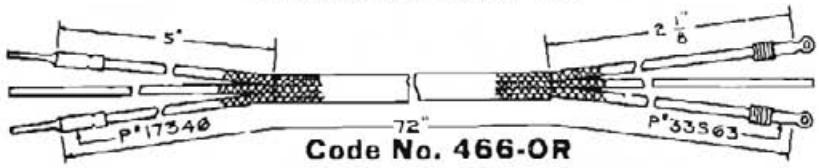
3 Conductor—Brown Mercerized

Green Silk furnished when specified

Code No.	Tips and Conns. Stand End	Box End	Length of Conds. Stand End, In.	Box End, In.	Tracer Colors	Length Over all Inches	Remarks
455-G	5006	6028 / Bare	4	Min. 2⅛ / Max. 2⅜	Green, Black, Orange	48	For Nos. 13 and 14 Grabaphone.
F455-G	33566	6028 / Bare	4	Min. 2⅛ / Max. 2⅜	Green, Black, Orange	48	

CORDS — OPERATORS'

2 Conductor—Green Silk

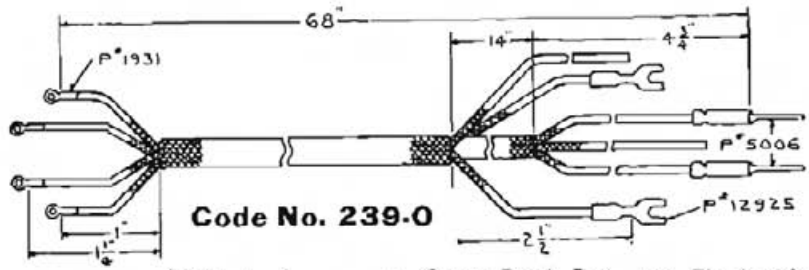


Code No. 466-OR

Code No.	Tips and Conns. Plug End	Tips and Conns. Receiver End	Length of Conds. Plug End, In.	Length of Conds. Receiver End, In.	Tracer Colors	Length Over all Inches	Remarks
466-OR	33563	17346	2⅛	5	Green, Black	72	W. E. Co. Code No. 254. Reinforcing at plug end.
492-OR	33563	17346	Min. ¼ / Max. ⅜	5	Red, Green	72	W. E. Co. Code No. 369. For No. 139 plug.
482-OR	Bare	Bare	2	3½	Green, Black	72	Fits Monarch Switchboard.

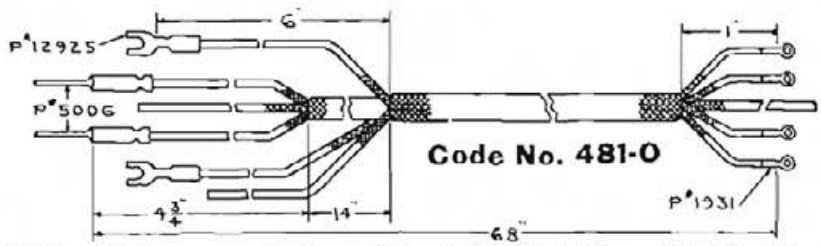
4 Conductor—Green Silk

Code No.	Tips and Conns. Plug End	Tips and Conns. Transmitter End	Tips and Conns. Receiver End	Length of Conds., Inches Plug End	Length of Conds., Inches Transmitter End	Length of Conds., Inches Receiver End	Tracer Colors	Length Over all Inches	Remarks
67-O	1931	12925	5006	Min. 1 / Max. 1¼	6	4¾	Green, Black, Red, Orange	68	Transmitter on tip of plug. Fits No. 25 plug



Code No. 239-O

239-O	1931	12925	5006	Min. 1 / Max. 1¼	2½	4¾	Green, Black, Red, Orange	68	Fits bushing Pe No. 28818. 3/32 drill. Transmitter on tip. No. 136 plug.
240-O	1931	12925	5006	Min. 1 / Max. 1¼	2½	4¾	Green, Black, Red Orange	68	Fits bushing Pe No. 28818. 3/32 drill. Receiver on tip No. 136 plug.



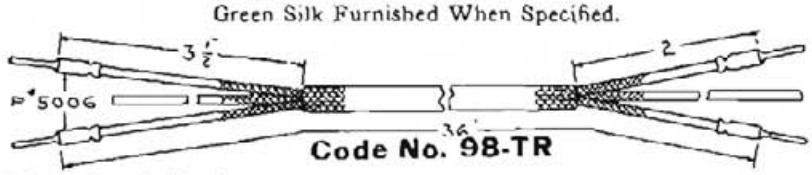
Code No. 481-O

481-O	1931	12925	5006	1	6	4¾	Green, Black, Red, Orange	68	Fits Dean Operator Plug. Fits bushing Pe No. 28818.
498-O	1931	31061	31061	Min. 1 / Max. 1¼	2½	3	Green, Black, Red, Orange	68	Fits American Electric Co. No. 51 plug.
493-O	1931	Bare	5006	Min. 2½ / Max. 3	4½	2	Green, Black, Red, Orange	68	Fits Leich Electric Co. operator's plug.
140-O	33563	33563	17346	Min. 2 / Max. 2 7/16	4	3¾	Green, Black, Red, Orange	96	W. E. Co. breast plate transmitter, W. E. Co. plug No. 103.
228-O	33563	33563	17346	Min. 2 / Max. 2 7/16	4	3¾	Green, Black, Red, Orange	72	Fits W. E. Co. plug No. 103.
199-O	33563	12925	5006	Min. 2 / Max. 3¾	6	4¾	Green, Black, Red, Orange	68	Fits W. E. Co. plug No. 103.
464-O	33563	12925	5006	Min. 2 / Max. 2 7/16	2½	4¾	Green, Black, Red, Orange	68	Fits No. 153 plug and W. E. Co. plug and jack.

CORDS — RECEIVER

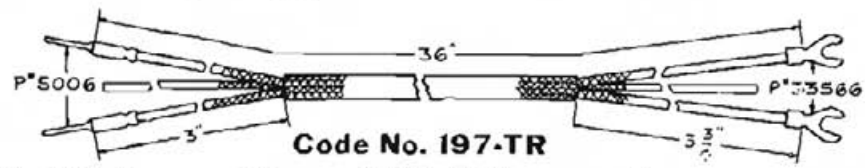
2 Conductor—Brown Mercerized

Green Silk Furnished When Specified.



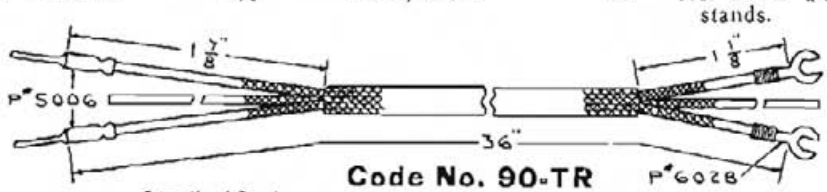
Code No. 98-TR

Code No.	Tip and Conns. Receiver End	Stand End	Length of Conds Receiver End, In.	Stand End, In.	Tracer Colors	Length Over all Inches	Remarks
98-TR	5006	5006	3½	2	Brown, Black	36	For all receivers with solid terminals.
F98-TR	5006	33566	3½	2	Brown, Black	36	For all receivers with flat terminals.
508-TR	5006	5006	3½	2	Brown, Black	30	
512-TR	5006	12925	3	3¼	Brown, Black	30	
207-TR	5006	17132	3½	Min. 1⅛ Max. 2¾	Brown, Black	36	W. E. Code No. 178.



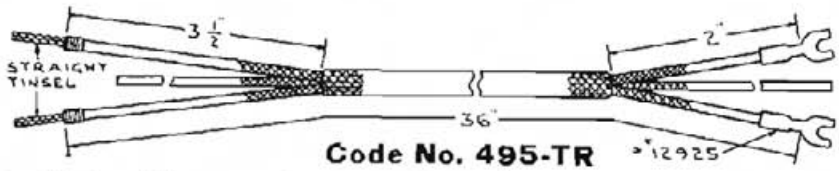
Code No. 197-TR

197-TR	5006	33566	3	3¼	Brown, Black	36	
27-TR	5006	Bare	4½	1¼	Brown, Black	36	
196-TR	5006	Loops	3	3⅛	Green, Black	36	No. 197-B and F197-B desk stands.



Code No. 90-TR

Code No.	Tips and Conns. Receiver End	Stand End	Length of Conds. Receiver End, In.	Stand End, In.	Tracer Colors	Length Over all Inches	
90-TR	5006	6028	1⅞	1⅛	Brown, Black	36	Flexiphones.
170-TR	5006	6028	3½	Min. 1¼ Max. 2¾	Brown, Red	36	W. E. Co.'s Code No. 178.



Code No. 495-TR

495-TR	12925	Bare	3½	2	Brown, Black	36
500-TR	Loops	17132	3⅛	3	Brown, Black	36
510-TR	Loops	33586	3½	2	Brown, Black	36
198-TR	Loops	Loops	3	3⅛	Brown, Black	36
255-TR	Bare	Loops	3½	2	Brown, Black	36

2 Conductor—Black and Maroon

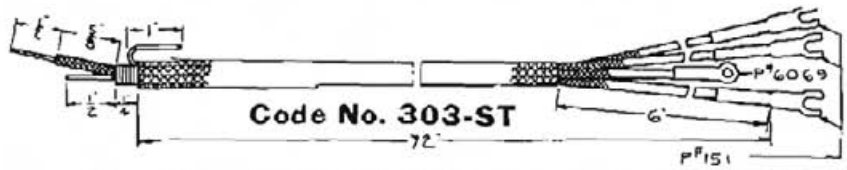
515-RTR	5006	6028	3½	Min. 1¼ Max. 2¾	Green, Black	36	Flexiphone and telephone arm.
497-RTR	5006	6028	3½	Min. 1¼ Max. 2¾	Green, Black	42	Flexiphone and telephone arm.
248-RTR	39663	17132	3½	Min. 1½ Max. 2	Black, Red	36	No. 9 blocking cord.

CORDS—SWITCHBOARD

3 Conductor—Steel and Tinsel Conductors

Standard Lengths—36", 48", 72", 84".

Code No.	Tips and Conns. Plug End	Tips and Conns. Swng. End	Length Plug End, In.	Diam. at Plug End	Tracer Colors	Fits Tap Inches	Remarks
325-ST	.....	151	½–1	.235–.245	White, Blue, Red	¼–32	Fits Nos. 129, 143, 154, 188, 164, 176 and 177 plugs.
339-ST	.....	33586	⅜–⅞	.245–.255	White, Blue, Red	.....	Fits Dean plugs and S. C. Nos. 22, 37, 37D plugs.
359-ST	.....	151	⅜–¾	.250–.260	White, Blue, Red	.....	
342-ST	.....	151	⅜–¾	.265–.275	White, Blue, Red	8–24	Fits Nos. 71, 77, 185, 91 plugs and Dean No. 77 plugs.



303-ST	.....	151	½–1	.285–.295	White, Blue, Red	⅛–18	Fits Nos. 106, 74, 137, 152, 34, 108, 111, 156, 29, 191, 115, 116, 118, 194, 18, 38, 165 plugs.
366-ST	.....	151	½–1	.285–.295	White, Blue, Red	.....	Arranged for plug at each end.
358-ST	.....	33569	½–⅞	.285–.295	White, Blue, Red	.....	Fits W. E. No. 110 plug.
364-ST	.....	151	¼–¾	.300–.305	White, Blue, Red	.....	Fits No. 35A Sterling plug.
340-ST	.....	151	¼–¾	.335–.345	White, Blue, Red	.....	Fits No. 5 Sterling plug.
335-ST	.....	151	⅞–1⅛	.360–.370	White, Blue, Red	⅜–24	Fits No. 202 plug.

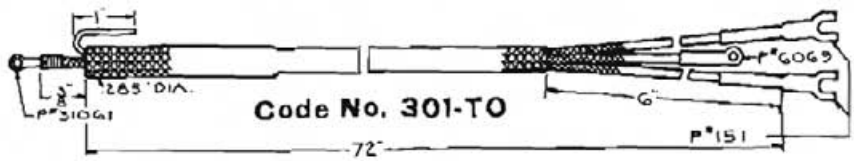
1 Conductor—Tinsel Conductors

313-TO	.....	31061	⅜	.285–.295	White	⅛–18	Fits No. 44 plug.
318-TO	.....	31061	1¼	.285–.295	White	⅛–18	Arranged for plug at each end.

2 Conductor—Tinsel Conductors

Standard Lengths—36", 48", 60", 72".

324-TO	31061	151	½	.235–.245	White, Blue	¼–32	Fits No. 128 plug.
332-TO	31061	2749	½	.235–.245	White, Blue	14–20	Fits No. 11 S. C. plugs.



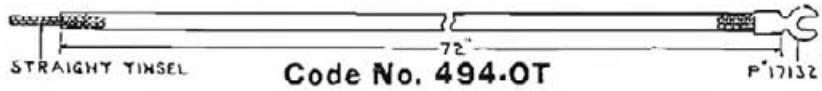
301-TO	31061	151	¾	.285–.295	White, Blue	⅛–18	Fits Nos. 3, 15, 17, 42 and 70 plugs.
306-TO	31061	.....	¾–¾	.285–.295	White, Blue	⅛–18	Arranged for plug at each end. Tips reversed.
327-TO	31061	.....	¾–¾	.285–.295	White, Blue	⅛–18	Arranged for plug at each end. Red overall braid. Fits Nos. 106 and 112 plugs.
314-TO	31061	151	1⅛	.285–.295	White, Blue	⅛–18	Tip and frame of No. 74 plug.
316-TO	31061	151	1⅛	.285–.295	White, Blue	.....	Fits tip of No. 81 plug.
328-TO	31061	5006	¾	.285–.295	White, Blue	.....	Fits sleeve ring of No. 106 plug. Red overall.
363-TO	31061	151	⅜	.265–.275	White, Blue	.....	Fits No. 155 plug.

3 Conductor—Tinsel Conductors

326-TO	31061	151	¾–1¼	.235–.245	White, Blue, Red	.....	Fits Nos. 154 and 129 plugs.
338-TO	31061	33569	½–1	.235–.245	White, Blue, Red	.....	Fits Nos. 143 and 188 plugs. Red over all braid.
329-TO	31061	151	¾–1¼	.265–.275	White, Blue, Red	.....	Fits No. 77 plug.
349-TO	31061	Bare Tinsel Sold'd	¾–1⅛	.275–.280	White, Blue, Red	.....	Fits Nos. 176 and 177 plugs. Also fits Garford Nos. 4630 and 4635 plugs.

CORDS—TRANSMITTER

1 Conductor—Green Silk



Code No. 494-OT

Code No.	Tips and Conns. Transmitter End	Tips and Conns. Conn. Rack End	Tracer Colors	Length Over all Inches	Remarks
494-OT	Bare	17132	Green	72	No stay cord.
199-OT	Bare	5006	Green	72	No stay cord.

1 Conductor—Black and Maroon

418-RT	17344	33566	Red	9¾	W. E. Co. No. 423
484-RT	17344	33566	Red	12	W. E. Co. No. 423
416-RT	33692	33566	Red	12	W. E .Co. No. 426
417-RT	33574	33566	Red	13	W. E. Co. No. 330

2 Conductors—Green Silk

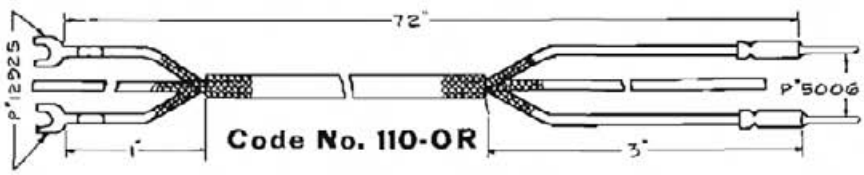
166-T	12925	5006	Green, Black	12	

CORDS FOR MISCELLANEOUS EQUIPMENT

CORDS — DESK STAND

Kellogg standard desk stand cords listed on pages 40 to 42 will fit American Electric Company's desk stands.

CORDS — OPERATORS'

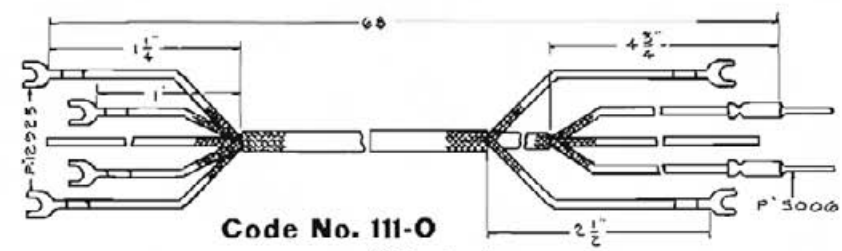


Code No. 110-OR

2 Conductor—Green Silk

Code No.	Plug End	Tips and Conns. Transmitter End	Tips and Conns. Receiver End	Length of Conds. Plug End, In.	Length of Conds. Transmitter End, In.	Length of Conds. Receiver End, In.	Length Over all Inches	Fits A. E. Co.'s Plug No.
110-OR	12925	.....	5006	1	.....	3	72	103

4 Conductor—Green Silk

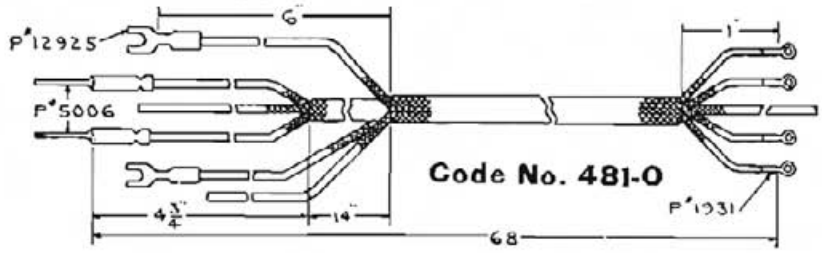


Code No. 111-O

111-O	12925	12925	5006	Min. 1 Max. 1¼	3	4¼	68	103
498-O	1931	31061	31061	Min. 1 Max. 1¼	2½	3	68	51

CORDS FOR MISCELLANEOUS EQUIPMENT

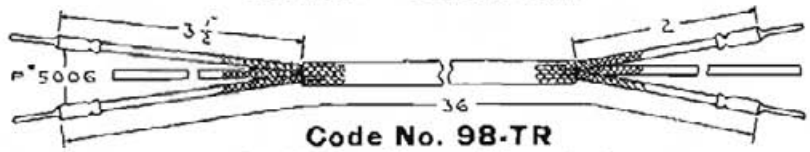
CORDS — OPERATORS'



4 Conductor—Green Silk

Code No.	Tips and Conns. Plug End	Transmitter End	Receiver End	Lengths of Conds. Plug End, In.	Transmitter End, In.	Receiver End, In.	Length Over all Inches	Remarks
481-O	1931	12925	5006	1	6	4¾	68	Fits Dean's talking set and 4 cond. operator's plug.

CORDS — RECEIVER



2 Conductor—Brown Mercerized

Code No.	Tips and Conns. Rec. End	Stand End	Length of Conds. Receiver End, In.	Stand End, In.	Length Over all Inches	Remarks
98-TR	5006	5006	3½	2	36	Fits all Dean and Garford receivers.

CORDS — SWITCHBOARD

2 Conductor—Steel and Tinsel

Code No.	Tips Switchboard End	Length at Plug End, In.	Diam. at Plug End	Fits Plugs	Remarks
360-ST	151	⅛	{.265 / .275}	All 2 conductor	For magneto, small C. B., Dean and Garford boards.

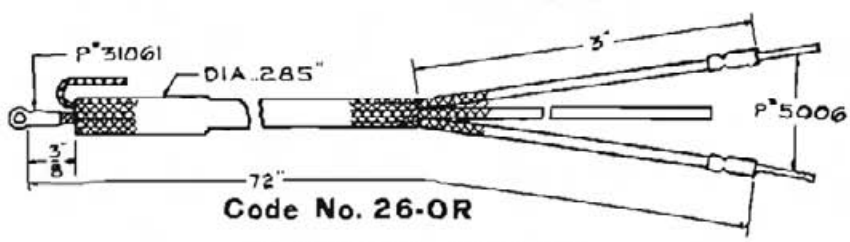
3 Conductor—Steel and Tinsel

342-ST	151	⅜—¼	{.265 / .275}	All 3 conductor	For multiple, P. B. X., Dean and Garford swbds.

CORDS — DESK STAND

Kellogg standard desk stand cords listed on pages 40 to 42, will fit Leich desk stands.

CORDS — OPERATORS'



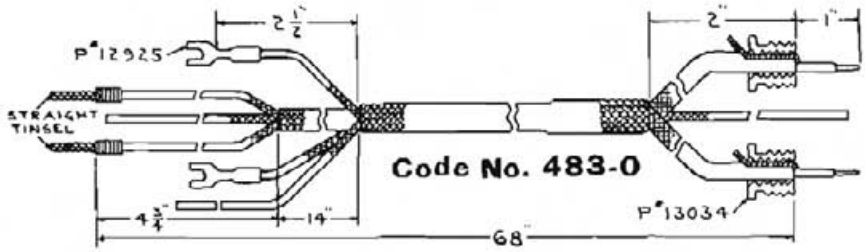
2 Conductor—Green Silk

26-OR	{31061 / Bare}	.....	5006	⅜	.....	3	72	Fits Leich receivers and plug No. 3.

CORDS FOR MISCELLANEOUS EQUIPMENT

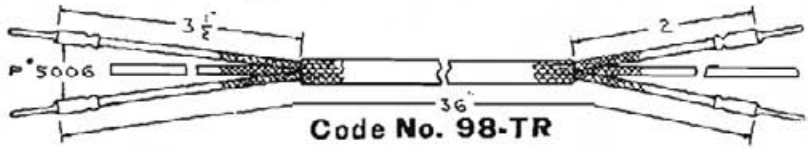
CORDS — OPERATORS'

Code No.	Conds.	Plug End	Tips and Conns. Transmitter End	Receiver End	Length of Conds. Plug End, In.	Transmitter End, In.	Receiver End, In.	Length
482-OR	2	Bare	.....	Bare	2	.....	3½	72



483-O	4	Bare	12925	Bare	⅛	2½	4¾	68

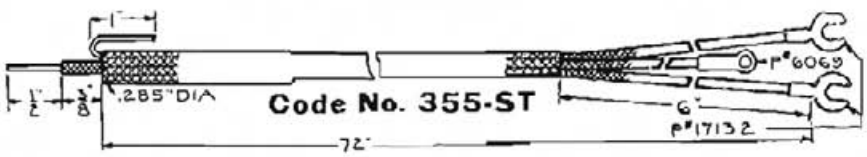
CORDS — RECEIVER



2 Conductor—Brown Mercerized

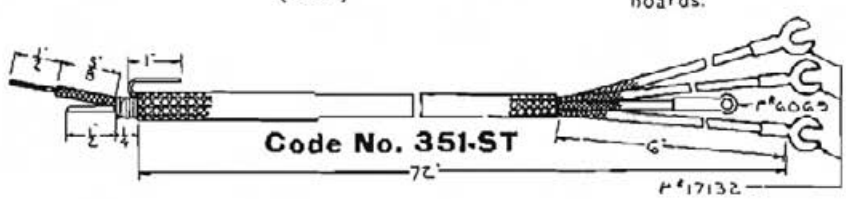
Code No.	Tips and Conns. Receiver End	Stand End	Length of Conds. Receiver End, In.	Stand End, In.	Length	Remarks
98-TR	5006	5006	3½	2	36	Fits all Monarch receivers.

CORDS — SWITCHBOARD



2 Conductor—Steel and Tinsel

Code No.	Tips Swbd. End	Length of Conds. Plug End, In.	Switchboard End	Fits Monarch Plugs	Remarks
355-ST	17132	⅛	{.285 / .295}	All 2 conductor	For Monarch magneto switchboards.



3 Conductor—Steel and Tinsel

351-ST	17132	½–1	{.285 / .295}	All 3 conductor	For Monarch magneto mult. C. B. and P. B. X. switchboards.

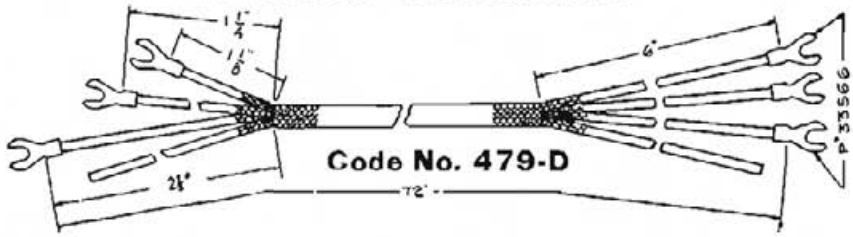
CORDS — TRANSMITTER

Code No.	Conds.	Tips and Conns. Transmitter End	Conn. Rack	Length Inches	Remarks
485-OT	1	31070	31070	72	For Monarch suspended type transmitters.

CORDS FOR MISCELLANEOUS EQUIPMENT

CORDS — DESK STAND

3 Conductor—Brown Mercerized



Code No.	Tips and Conns. Stand End	Tips and Conns. Box End	Length of Conds. Stand End, In.	Length of Conds. Box End, In.	Length In.	Replaces W. E. Cord	Remarks
479-D	33566	33566	Min. 1⅛ Max. 2⅜	6	72	550	W. E. desk stands, Nos. 1020AL, AP, BC, MC, MP and SC. W. E. arms, Nos. 1048AA, AB and AC.

3 Conductor—Black and Maroon

410-RD	33566	33566	Min. 1¼ Max. 2¼	6	72	409	
502-RD	33566	33566	Min. 1½ Max. 2¼	6	81	409	

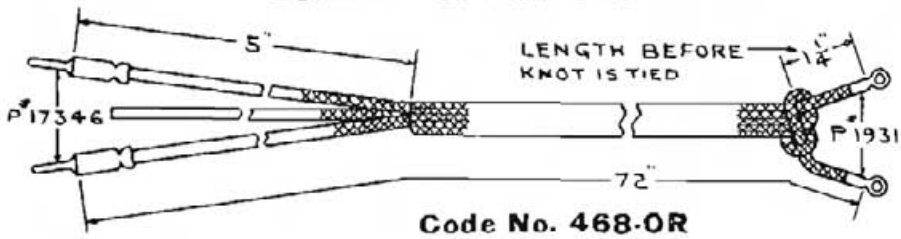
4 Conductor—Brown Mercerized

480-D	33566	33566	Min. 1½ Max. 4½	6	72	231	W. E. desk stand, Nos. 1020 C, F, AD, No. 1120 T, BE and No. 1320CN.

4 Conductor—Black and Maroon

501-RD	33566	33566	Min. 1¼ Max. 4	6	72	416	

CORDS — OPERATORS'



2 Conductor—Green Silk

Code No.	Tips and Conns. Plug End	Tips and Conns. Receiver End	Length of Conds., Inches Plug End	Receiver End	Length Inches	Remarks
468-OR	1931	17346	⅞	5	72	Replaces W. E. No. 30. Fits W. E. plugs, Nos. 83, 47 and 110.
466-OR	33563	17346	2⅛	5	72	Replaces W. E. No. 254. Fits W. E. plugs, Nos. 148 and 137.
492-OR	33563	17346	Min. ⅝ Max. ¼	5	72	Replaces W. E. No. 369. Fits W. E. plugs, No. 136.

CORDS — OPERATORS'

4 Conductor—Green Silk

Code No.	Tips and Conns. Plug End	Tips and Conns. Transmitter End	Tips and Conns. Receiver End	Length of Conds. Plug End, In.	Length of Conds. Transmitter End, In.	Receiver End In.	Length Inches	Remarks
140-O	33563	33563	17346	Min. 2 Max. 2⅞	4	3¼	96	For W. E. breast plate transmitters. Fits W. E. plug No. 103.
228-O	33563	33563	17346	Min. 2 Max. 2⅞	4	3¼	72	Fits W. E. plug No. 103.

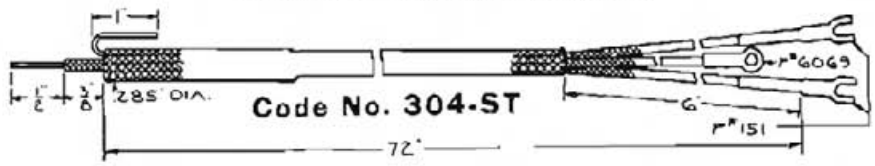
CORDS FOR MISCELLANEOUS EQUIPMENT

CORDS — RECEIVER

2 Conductor—Black and Maroon

Code No.	Tips and Conns. Receiver End	Tips and Conns. Stand End	Length of Conds. Receiver End, In.	Length of Conds. Stand End, In.	Length Inches	Remarks
414-RTR	17346	33566	3½	Min. 1¼ / Max. 2¾	54	Replaces W. E. No. 408.
415-RTR	17346	33566	3½	Min. 1¼ / Max. 2¾	42	Replaces W. E. No. 408.
427-RTR	17346	33566	3½	5	30	Replaces W. E. Nos. 446 and 546.

CORDS — SWITCHBOARD



2 Conductor—Steel and Tinsel

Code No.	Tips Switchboard End	Length of Plug End, In.	Diam. at Plug End	Fits W. E. Plug No.	Remarks
304-ST	151	⅝	.285 / .295	47 & 145	For magneto switchboards. Replaces W. E. cord No. 493.

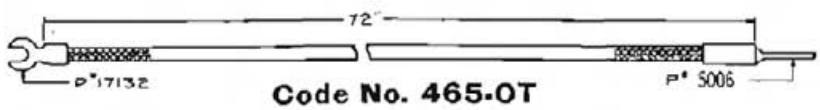
3 Conductor—Steel and Tinsel

Code No.	Tips Switchboard End	Length of Plug End, In.	Diam. at Plug End	Fits W. E. Plug No.	Remarks
303-ST	151	½–1	.285 / .295	110	For CB and PBX swbds. Replaces W. E. cord No. 448.
343-ST	151	⅜–¼	.265 / .273	109	For large CB mult. swbds. Replaces W. E. cord No. 447.

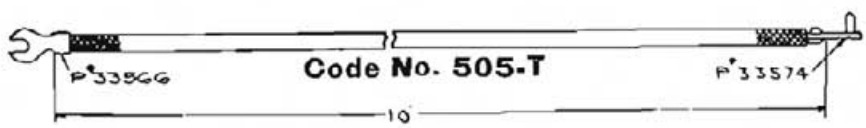
CORDS — TRANSMITTER

1 Conductor—Green Silk

Code No.	Tips and Conns. Transmitter End	Conn. Rack	Length Inches	Remarks
261-OT	5006	5006	72	For W. E. Co. test sets.



465-OT	5006	17132	72	Replaces W. E. Co. cord No. 437
143-T	17344	33566	10	Replaces W. E. Co. cord No. 390.

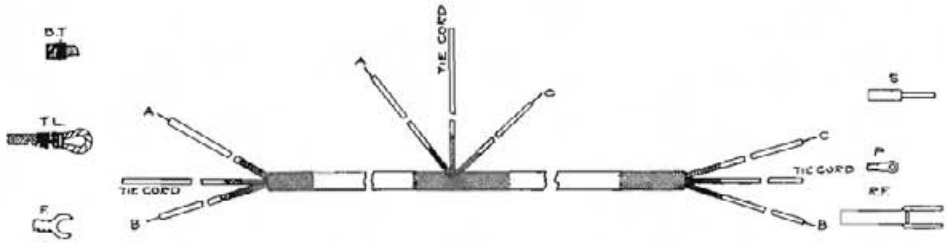


505-T	33574	33566	10	Replace W. E. cord No. 548.
418-RT	17344	33566	9¾	Replace W. E. cord No. 423.
484-RT	17344	33566	12	Replace W. E. cord No. 423.
416-RT	33602	33566	12	Replace W. E. cord No. 426.
417-RT	33574	33566	12	Replace W. E. cord No. 330.

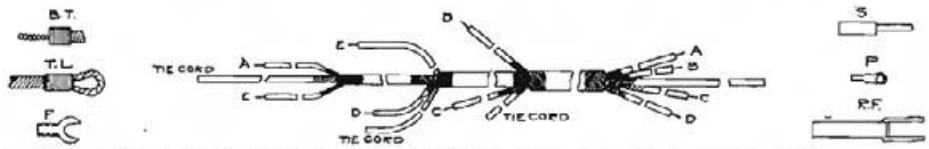
OPERATOR

F.—Flat Fork—Similar to 33566
Fork—Similar to 4081 R. F.—Round
S.—Spike—Similar to 5006
B. T.—Bare Tinsel
T. L.—Tinsel Loop
T. R.—Trans. and Rec.
S. B.—Switch Board.

Code.	Length Overall.	Cond.	A: T. R. End. Length.	Tip.	A: Color.	A: S. B. End Length.	Tip.	B: T. R. End. Length.	Tip.	B: Color.	B: S. B. End Length.	Tip.	C: T. R. End. Length.	Tip.	C: Color.	C: S. B. End Length.	Tip.	C: T. R. End. Length.	Tip.	D: Color.	D: S. B. End Length.	Tip.
Cord Group No. 26 for																						
26-OR	72"	2	¾"	S	Green	3 "	P	⅜"	S	Black	3 "	P										
237-OR	72"	2	½"	S	Green	3 "	P	⅜"	S	Black	3 "	P										
Cord Group No. 440 for																						
463-OR	68"	2	4¾"	S	Red	1½"	P	4¾"	S	Orange	1½"	P										
464-O	68"	4	4¾"	S	Green	2 "	P	2½"	S	Black	2 1/16"	P	4¾"	S	Red	2 "	P	2½"	S	Orange	2 1/16"	P
Cord Group No. 67 for																						
67-O	68"	4	6 "	F	Green	1 "	P	6 "	F	Black	1 "	P	18¾"	S	Red	1¼"	P	4¾"	S	Orange	1¼"	P
239-O	68"	4	2½"	F	Green	1 "	P	2½"	F	Black	1 "	P	18¾"	S	Red	1¼"	P	4¾"	S	Orange	1¼"	P
240-O	68"	4	2½"	F	Green	1¼"	P	2½"	F	Black	1¼"	P	18¾"	S	Red	1 "	P	4¾"	S	Orange	1 "	P
243-RO	68"	4	2¼"	F	Green	1 "	P	2½"	F	Black	1 "	P	18¾"	S	Red	1¼"	P	4¾"	S	Orange	1¼"	P
433-O	68"	4	2½"	F	Green	1 "	P	2½"	F	Black	1 "	P	18¾"	S	Red	1¼"	P	4¾"	S	Orange	1¼"	P
498-O	68"	4	2½"	F	Green	1 "	P	2½"	F	Black	1 "	P	17 "	S	Red	1¼"	P	3 "	S	Orange	1¼"	P
Cord Group No. 110 for																						
110-OR	72"	2	3 "	S	Green	1 "	F	3 "	S	Black	1 "	F										
111-O	68"	4	3 "	F	Green	1 "	P	3 "	F	Black	1 "	P	4¾"	S	Red	1¼"	P	4¾"	S	Orange	1¼"	P
Cords, Operators'																						
466-OR	72"	2	5 "	S	Green	2⅛"	P	5 "	S	Black	2⅛"	P										
492-OR	72"	2	5 "	S	Red	⅝"	F	5 "	S	Green	¼"	F										
468-OR	72"	2	5 "	S	Black	1/16"	P	5 "	S	Green	1/16"	P										
140-O	96"	4	3¾"	S	Green	2 "	F	4 "	P	Black	2 1/16"	F	3¾"	S	Red	2 "	F	4 "	P	Orange	2 1/16"	F
228-O	72"	4	3¾"	S	Green	2 "	F	4 "	P	Black	2 1/16"	F	3¾"	S	Red	2 "	F	4 "	P	Orange	2 1/16"	F
504-RO	98"	4	4 "	S	Green	2 "	F	4½"	P	Blue	2 1/16"	F	4 "	S	Red	2 "	F	4½"	P	Orange	2 1/16"	F
199-O	68"	4	6 "	F	Green	2 1/16"	P	6 "	F	Black	2 1/16"	P	18¾"	S	Red	2 "	P	4¾"	S	Orange	2 "	P
467-RO	82"	4	5 "	TL	Green	2 1/16"	TL	5 "	TL	Blue	2 1/16"	TL	20⅜"	TL	Red	2 "	TL	1⅜"	TL	Orange	2 "	TL
422-OR	72"	2	3 "	S	Green	⅞"	P	3 "	S	Black	⅞"	P										
481-O	68"	4	6 "	F	Green	1 "	P	6 "	F	Black	1 "	P	18¾"	S	Red	1 "	P	4¾"	S	Orange	1 "	P
482-OR	72"	2	3½"	BT	Green	2 "	TL	3½"	BT	Black	2 "	TL										
483-O	68"	4	2½"	F	Green	⅝"	BT	2½"	F	Black	⅝"	BT	4¾"	BT	Red	⅝"	BT	4¾"	BT	Orange	⅝"	BT
493-O	68"	4	4½"	BT	Green	3 "	P	4½"	BT	Black	3 "	P	2 "	S	Red	2½"	P	2 "	S	Orange	2½"	P
419-O	68"	4	6 "	F	Green	1¼"	P	6 "	F	Black	1¼"	P	4¾"	S	Red	4¾"	P	4¾"	S	Orange	4¾"	P



162-OR 83" 2 3 " S Green 3 " S 3 " S Black 2 " S 3 " S Green 2 " RF
F162-OR 83" 2 3 " F Green 3 " F 3 " F Black 2 " F 3 " F Green 2 " F



503-RO 116" 2 4 " S Red 2 " P 4¾" P Blue 2½" P 4¾" P Orange 2 1/16" P 4 " S Green 2 "
E=white; S—at both ends; both ends=4" long.

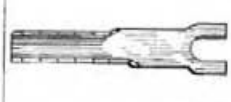
CORD TIPS

The following list includes all of our standard cord tips and a part of those furnished in the past to meet special conditions.

Our Standard tips regularly furnished on cords should meet all conditions, but in special cases we are prepared to furnish cords with any of the following tips attached.

In ordering cords with special tips, specify code number of cords with piece part number of tip attached.

Cuts exact size.	Pc. Part Number	Use	For use with screw No.	Replaces W. E. Co.'s No.	Replaces S. C. Co.'s No.
		TIPS FOR USE WITH PLUG END OF OPERATORS' & SWBD. CORDS, ETC.			
	1931		2		14
	33563		4	38	
	2986		2		
	1813		2		
	31061		2		
	31070		6		
	33692		4	67	
		SPADE TIPS			
	12925		4		
	33566	W. E. std.	6	62	4
	17132		8	62	4
	33584		8		17
	33588		4		35
	33586		6		19
	11196	Auto. El. Co.	4		
	12129	Auto. El. Co.	8		
	11192	Auto. El. Co.	8		
	14846		8		

Cuts exact size.	Pc. Part Number	Use	For use with screw No.	Replaces W. E. Co.'s No.	Replaces S. C. Co.'s No.
		FOR SWITCHBOARD CORDS			
	151		4		2
	2749	Special	4		
	33569	W. E. std.	4	8	17
	3477	Special	4		
	34603				1
	6069	Stay cord		45	20
		SPIKE TIPS			
	5006				18
	17346			29	
	17344			61	
	33574	W. E. trans. cord.		55	
	7625	Swbd. trans. cord.			
		MISCELLANEOUS			
	2734	Tel. trans. cord.	6		
	4928		4		
	6028		4		

Code No. 39 pliers for attaching Pc. 31061 terminal, page 202.

DROPS AND JACKS—COMBINED

The Kellogg Combined Drop and Jack is extremely sensitive and will fall reliably with a minimum of current; will give a good clean rattle and its mechanism is designed so drop will restore reliably, no matter how badly plug may be worn.

The Jack springs catch the plug firmly and are so tempered as to give fine service on the busiest toll and rural lines. All iron work is permanently protected against rust and scaling.



See pages 152 and 153 for mounting strip size.

10 Per Strip — 5 Per Strip

No. 101 Combined Drops and Jacks

A drop and jack that will cause you no trouble. Practically no burn-outs—the record is one in each five hundred and forty years of drop service.

Mounting strips are included without extra charge, where at least three Drops and Jacks are ordered on a five per strip mounting, and at least six on a ten per strip mounting.

In ordering give board number if Kellogg, otherwise name of manufacturer and dimensions of present mountings.

No. 5 Type

Code No.	Drop			Jack				
					Local Contacts			
	Term.	Mtg. Centers	Winding	Conds.	Break	Make	Break and Make	Plug Used
5	2	1"	S	2	1	....	....	42

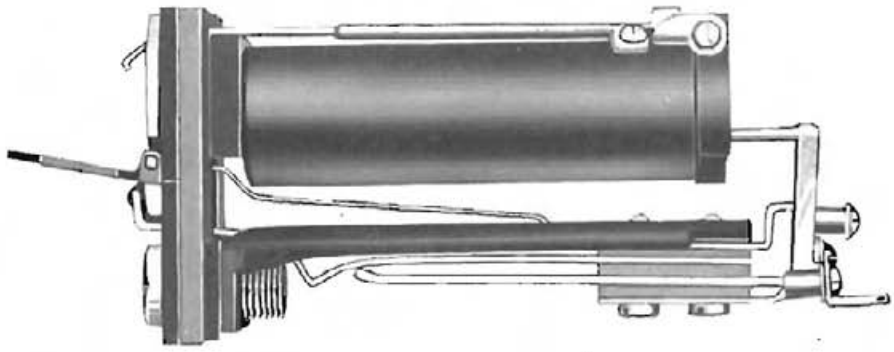
Code No.		Drop			Jack	Local Contacts				
With Armature Contacts	Without Armature Contacts	Term.	Mtg. Centers	Winding	Conds.	Break	Make	Break and Make	Plug Used	Remarks
100	101	2	1	S	2	1	....	....	42	
102	103	2	1	S	2	2	....	....	42	Nos. 100 and 101 except double cut off.
104	105	2	1	S	3	1	....	....	106	Nos. 100 and 101 except three conductor.
106	107	2	1	S	3	2	....	....	106	Nos. 104 and 105 except double cut off.
108	109	2	1	S	2	1	....	....	109	No. 100 but sleeve. Jack adjusted to restore shutter with No. 76 plug.
110	111	2	1	S	2	1	....	....	130	Same as Nos. 100 and 101 with sleeve of No. 66.
112	.....	2	1	S	2	....	1	....	130	Similar to No. 110 less conductor contact and with added local make, for Mtg. on 448. To fit W. E. Co. boards.
.....	113	2	1	S	2	2	1	....	42	
.....	114	2	1	S	3	1	1	....	106 & 112	
.....	115	2	1	S	3	2	....	....	77	
.....	116	2	1	S	3	1	....	....	106 & 112	
117	118	4	1	P	2	2	....	....	42	
.....	119	2	1	S	3	2	....	1	106	
300	301	2	1¼	S	2	1	....	....	42	For regular and code ring, night alarm.

Resistances for Combined Drops and Jacks

	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
Single	100	800	1000	500 G. S. 1100 C.	500	1200	350	480	200	150	300	80	250	750	120	600
Parallel					500 500											

DROPS AND JACKS—COMBINED

No. 301 Type



In accordance with requests from many of our old customers using our No. 3 combined drop and jack, for a drop and jack having the same spring jack construction as the No. 3 and with the improved relay contacts as furnished with the No. 100; we have developed and are now filling orders with the new No. 300 type drop and jack. The No. 300 has both code and regular night alarm, while the No. 301 has only the regular.

This new drop and jack has the following improved features:

No. 1—Jack.

The jack is of the single line spring construction with a chafing knife edge drop circuit contact. This type of cut-off contact has proven the greatest success of any jack ever built. Many of the first built No. 3 drops and jacks (put into service over twenty years ago) are still giving the best of service.

This simple construction makes possible the use of an extra strong constructed combined tip and restoring spring.

The jack is extremely simple, having only the tip and cut-off contact spring in addition to the regular night alarm spring. Locating the night alarm spring on the jack simplifies assembly, also maintenance.

The sleeve line conductor uses the frame of the jack and the sleeve thimble provides a long surface contact. This sleeve thimble is of the removable type permitting easy replacement when the thimble has become too badly worn for proper operation.

The frame of the jack is of the punched metal construction which permits uniform and rigid assembly. The terminals on the jack are of the screw type, the same as used on the No. 100 type.

No. 2—Night Alarm.

The night alarm has the same general arrangement as now furnished on the No. 100 and No. 101. Code alarm has been improved, so that the contact for the regular alarm does not have to close to give the code alarm. This latter simplifies the night alarm wiring and provides a more efficient code alarm.

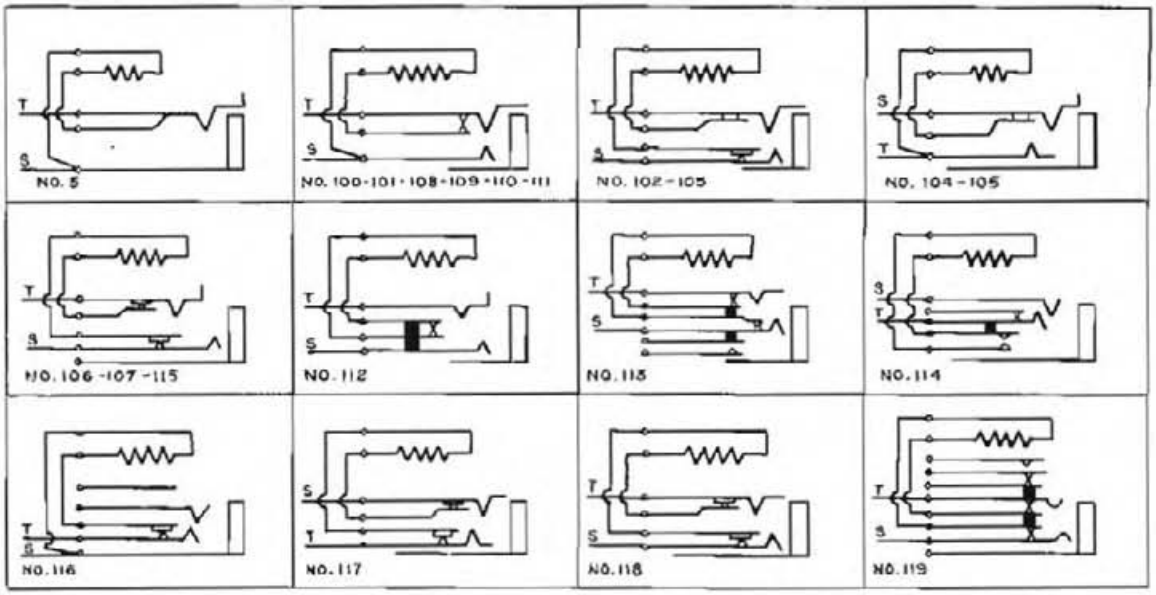
No. 3—Drop.

The drop has the same general appearance as the present No. 101. The drop shutter has been changed to punched hinge construction, using a stationary hinge pin which is a part of the shutter. There is no loose pin to work out. When the new shutter is released, it falls to almost a 90° angle instead of 50° or 60° angle, as on the present No. 100 type. The new hinge construction provides a more durable adjustment of the drop.

No. 4—Mounting.

The mounting strip is practically unchanged. The new drops with mountings can be placed in any board.

SPRING COMBINATIONS OF COMBINED DROPS & JACKS



DROPS—RING OFF

For Magneto Switchboard Cord Circuits

The Kellogg ring-off drops or "clearing-out drops" as they are sometimes called, are similar in design and embody all points of excellence found in the Kellogg line drops. They are sensitive. Shutters are forced to fall. Drops are of rust-proof construction and are fitted with contacts for night alarm or pilot lamp signals, the same as are the drops used in the line circuits.

See page 128 for mounting strip size.



5 Per Strip — 8 Per Strip

No. 51 Ring Off Drops.

Mounting strips are included without extra charge where at least three Drops and Jacks are ordered on a five per strip mounting, and at least six on a ten per strip mounting.

In ordering give board number if Kellogg, otherwise name of manufacturer and dimensions of present mountings.

Code No.		Terms	Mtg. Centers	Winding
With Armature Contact	Without Armature Contact			
50	51	2	1-inch	S

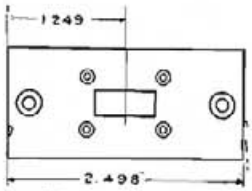
Resistances for Above Drops

A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q
			500GS											
100	800	1000	1100C	500	1200	350	480	200	150	300	30	250	750	120

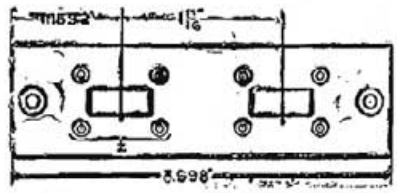
ESCUTCHEONS

For No. 1000 Type Cam Keys

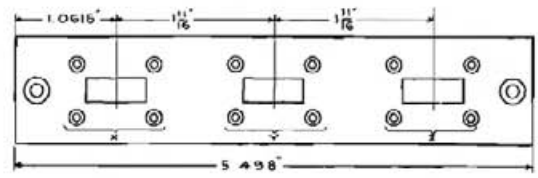
The following standard escutcheons are furnished with the 1000 type keys without charge. Charges made for special escutcheons only. Made of cold rolled steel and finished per specification Black enamel is standard finish and will be so furnished unless otherwise specified.



Code No.	Width
1053	¾"
1054	13/16"
1055	⅞"
1021	1"
Length 4"	
1069	¾"

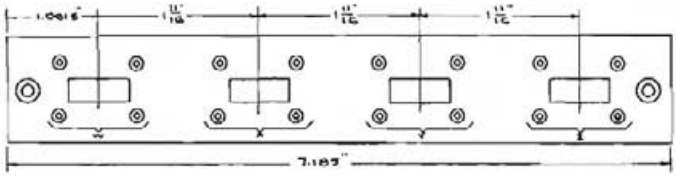


Code No.	Width	Remarks
1015	13/16"	
1016	13/16"	Less Hole Z.
1013	1"	
1011	1"	Less Hole Z.
1012	1 3/16"	
1010	1 3/16"	Less Hole Z.
1026	1 3/32"	
1029	1 3/32"	Keys off Center. Use with No. 1012.
1070	¾"	

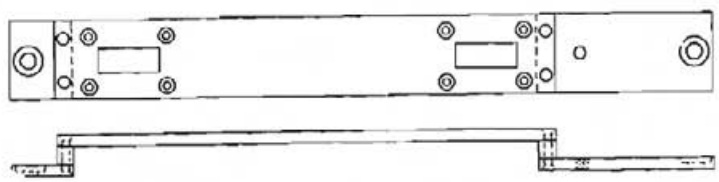


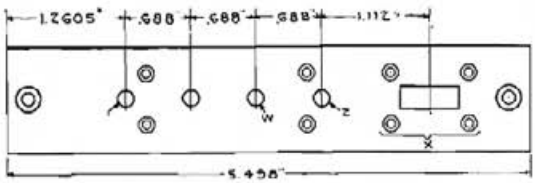
Code No.	Width	Remarks
1040	¾"	Less Hole Y.
1014	13/16"	
1057	13/16"	Less Hole Y.
1041	1"	Less Hole Y.
1059	1 1/16"	Less Hole Z.
1000	1⅛"	
1002	1⅛"	Less Hole Y.
1004	1⅛"	Less Hole Z.
1001	1⅛"	Less Hole Y and Z.
1003	1⅛"	Less Hole X and Z
1030	1 3/32"	
1031	1 3/32"	Less Hole Y.
1043	1 7/32"	Less Hole Z.
1065	1 3/32"	Less Hole Z.
1071	1 1/16"	

The No. 1049 escutcheon is used for mounting Kellogg keys on Western Electric Boards.



Code No.	Width	Remarks
1051	13/16"	
1036	1"	Less Hole W.
1032	1"	Less Holes W & X.
1037	1"	Less Holes W & X.
1007	1⅛"	





Length overall 7 3/64". Length of short end 7/16". Key mounting centers 3¾".

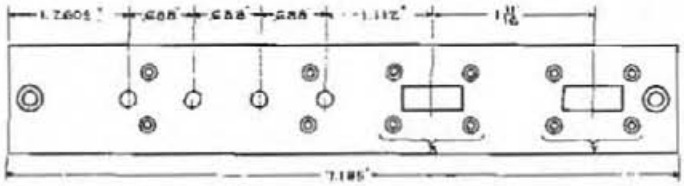
Code No.	Width	Remarks
1049	.839	Used on Western Electric Boards.

For No. 1000 Type 4 Party and Cam Keys

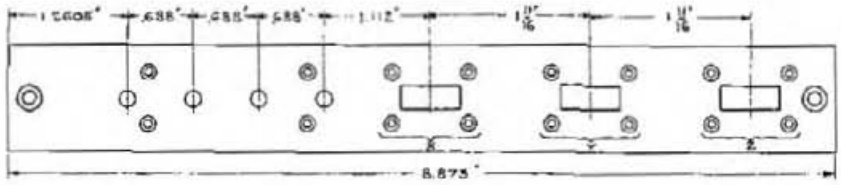
Code No.	Width	Remarks
1052	5/8"	Less Hole X.
1047	5/8"	Less Holes X, Z and W.
1027	¾"	
1028	¾"	Less Hole X.
1050	⅞"	Less Holes Z and W.
1039	1"	
1038	1 1/16"	
1005	1⅛"	
1006	1⅛"	Less Hole X.
1046	1⅛"	Less Holes Z and Y.
1072	1¼"	

ESCUTCHEONS

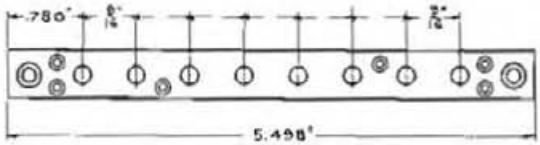
For No. 1000 Type 4 Party and Cam Keys



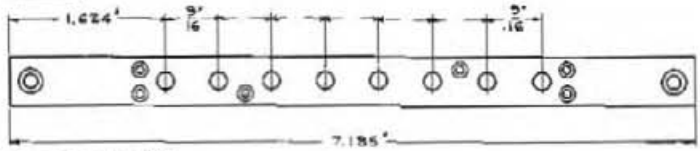
Code No.	Width	Remarks
1033	1 "	
1034	1 "	Less hole X.
1035	1 "	Less holes X & Y.
1008	1⅛"	
1009	1⅛"	Less hole Y.



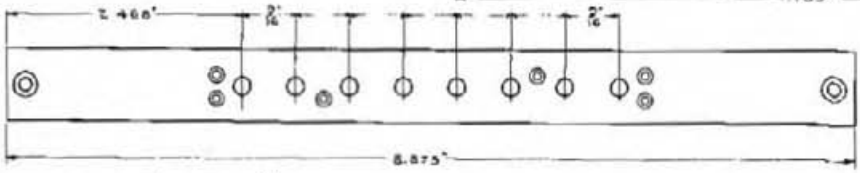
Code No.	Width	Remarks
1017	1⅛"	
1018	1⅛"	Less Hole Z



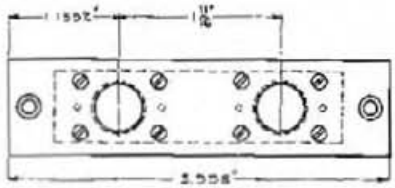
Code No. 1023 — Width ½"

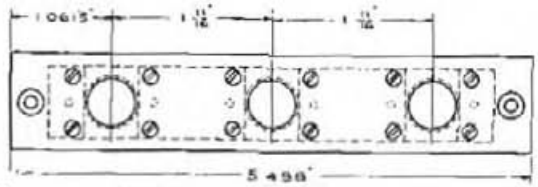


Code No. 1020 — Width ⅛"



Code No. 1019 — Width ¼"





Code No.	Width
1056	¼"
1025	⅜"
1024	1"

Code No.	Width
1042	⅛"

Blanks

Code No.	Length	Width
260	2½"	⅛"
254	2½"	1 "
245	4 "	¼"
252	4 "	⅜"
257	4 "	½"
224	4 "	1 "
225	4 "	1⅛"
227	4 "	1⅜"
256	4 "	1½"
243	4 "	1⅞"
226	4 "	1⅝"
251	4 "	1⅞"
270	4 "	⅛"
264	5½"	½"
309	5½"	⅝"
258	5½"	¾"
250	5½"	⅞"
268	5½"	1 "
241	5½"	1⅛"
269	5½"	1⅜"
261	5½"	1½"
263	7¼"	½"
262	7¼"	1 "
255	7¼"	1⅛"
253	8⅞"	1⅛"



No. 4

FASTENERS—CORD

No. 4. Cord Fasteners. Brass, dull nickeled.

No. 5. Cord Fasteners. Steel, hot tin plated.



No. 5

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-magneto 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, which permits the use of the correct amount of iron and wire to secure the most powerful results.

Repeated laboratory and exchange tests of the most severe character prove time and again the uniformly superior service of Kellogg generators.

The Kellogg Company overcomes all danger from rust and from short circuits caused by small pieces of loose nickel scale by giving their generator magnets a heavy plating of pure copper. This is afterward oxidized or burnt to a dead black finish that cannot rust or scale and will last forever.



Code No. 15 Generator

Telephone Type

Code No.	Bars	Description	Term.	Contacts
15	3	Alternating current	3	Make and break.
53	5	Alternating current	3	Make and break.
68	4	Pulsating and alternating	6	Break and dbl. make.
71	3	Pulsating and alternating	5	Make and break.
70	5	Pulsating and alternating	5	Make and break.
75	6	Alternating	3	Make and break.



Alternating Current Generator Terminals



Code No. 53 Generator

Switchboard Type

64	3	Alternating, Inverted gear wheels	2	No contacts.
61	4	Alternating, Inverted gear wheels	2	No contacts.
63	5	Alternating, Inverted gear wheels	2	No contacts.
72	5	Alternating	2	No contacts.
73	5	Alternating	2	No contacts.
78	6	Alternating	2	No contacts with Mtg. Brackets.



Pulsating & Alternating Current Generator Terminals



No. 62

Generator Parts

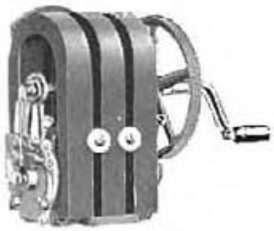
We furnish the following Generator Parts: Armatures for all 3-bar generators; armatures for all 4-bar generators; armatures for all 5-bar generators; large gear wheels for all generators; small gear wheels for all generators; right or left end bearing plate for generators; complete shunt spring assemblies for all generators.

In ordering parts give code number of generator or code number of telephone with which parts are to be used.

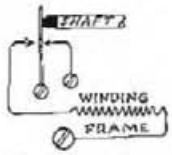
GENERATOR SPRING COMBINATIONS

Table of Spring Combinations

Code Numbers of Kellogg Generators. See description at top of several columns and find proper code numbers for three, four and five bar generators below the several descriptions.

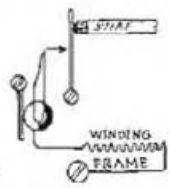


Column "A"



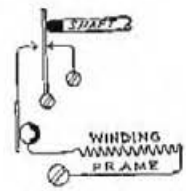
Shunt spring assembly No. 5420. Standard A. C. generator for bridging and series telephones having code numbers above 2000. Also interchanges with A. C. generators in telephones with codes below 1000.

Column "B"



Shunt spring assembly No. 17313. Standard P. & A. generator for telephones having push button to call central secretly with pulsating current.

Column "C"

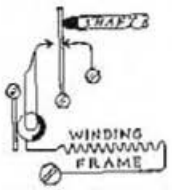


Shunt spring assembly No. 5614. Standard pulsating generator always interchangeable with standard A. C. generators listed in column A.

3 Bar.	No. 15	No. 32	No. 10
4 Bar. Mounts interchangeably with 5 bar generator.	No. 22	No. 33	No. 23
5 Bar Compact Type. Mounts interchangeably with 4 bar generator.	No. 53	No. 54	No. 55
5 Bar Old Style, Bars Spaced Out.	No. 20	No. 34	No. 45

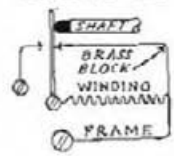


Column "D"



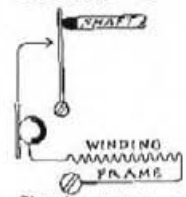
Shunt spring assembly No. 7842. Special P. & A. generator with ringer cut-off contact, otherwise same as generators listed in Column B.

Column "E"



Shunt spring assembly No. 5117. Obsolete A. C. generator formerly used in all Kellogg bridging sets. (Except two party selective.) Having code Nos. between 1000 and 2000.

Column "F"

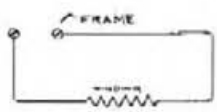


Shunt spring assembly No. 5421. Pulsating current generator without ringer cut off contact, otherwise same as generators listed in Column C.

3 Bar.	No. 31	No. 4	No. 8
4 Bar. Mounts interchangeably with 5 bar generator.	No. 26	No. 2	No. 6
5 Bar Compact Type. Mounts interchangeably with 4 bar generator.	No. 59	No. 53 Special with No. 5117. Shunt spring assembly.	No. 55 Special with No. 5421. Shunt spring assembly.
5 Bar Old Style, Bars Spaced Out.	No. 30	No. 5	No. 9

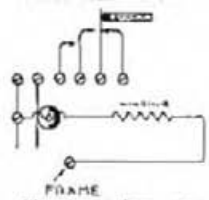


Column "G"



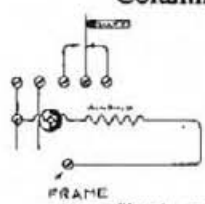
Shunt spring assembly No. 20032. Alternating Current Generator for Switchboards.

Column "H"



Shunt spring assembly No. 33835. Pulsating and alternating current Generator ringing both sides of line to ground.

Column "J"



Shunt spring assembly No. 37244. Pulsating and alternating current generator.

3 Bar	64		71
4 Bar	61	68	
5 Bar	63 72 73		70

HEAT COILS



No. 2

Kellogg Heat Coils are carefully made and will blow at the amperage specified. Only fuse wire of the highest grade is used.



No. 6

Code No.	Resistance	Remarks	Used on
2	3.45-3.70	Will not blow on .4-amp. for 5-min. Will blow on .5-amp. for 2-min.	No. 16 Arresters.
5	7.5	Will not blow on .3-amp. indefinitely. Will blow on .5 amp. in less than 30 seconds.	No. 1 Arresters

See page No. 201 for Heat Coil Pliers



No. 1 Cord Hook

HOOKS—CORD

Individual Type

No. 1—Brass Cord Hook. Made from No. 11 B. & S. gauge brass. One bend to hold cord threaded one end.

No. 2—Brass Cord Hook. Same as No. 1, but bent to form loop to prevent cord from slipping off.



No. 2 Cord Hook

Strip Type



No. 3B



No. 3A

No. 3 Type Cord Hook

Code No.	No. of Hooks	Hook Centers	Dimensions	Material
3	20	1 "	21 x¾"	Aero metal, 1/8" thick
3A	21	1¼"	26¼x¾"	Aero metal, 1/8" thick
3B	34	13/16"	19 7/16x¾"	Aero metal, 1/8" thick

HOWLERS

Kellogg howlers are made in two types. The No. 1 is for railway dispatching service and the No. 2 for exchange purposes to signal subscribers who have left the receivers off the hook.



No. 1 Howler

No. 1A—1,000 ohm Howler with 3x5½" Black Enamel Horn.



No. 2 Howler

No. 2—Howler consists of one No. 35A Ind. Coil and one No. 24 Condenser, mounted on 9 7/16x10⅜" wood base. Wired to four binding posts.

INDICATORS—PARTY LINE

These indicators are used on multiple jacks and key escutcheons to indicate the equipped stations on party lines. In ordering specify the color wanted, as they are made up in four colors: red, white, green and blue. The ringing key indicators are made to fit the thread in key escutcheons and the spring jack indicators fit the drillings in face of spring jack.



For Spring Jacks

No. 5 Red Party Line Indicator.
No. 6 White Party Line Indicator.
No. 7 Green Party Line Indicator.
No. 8 Blue Party Line Indicator.

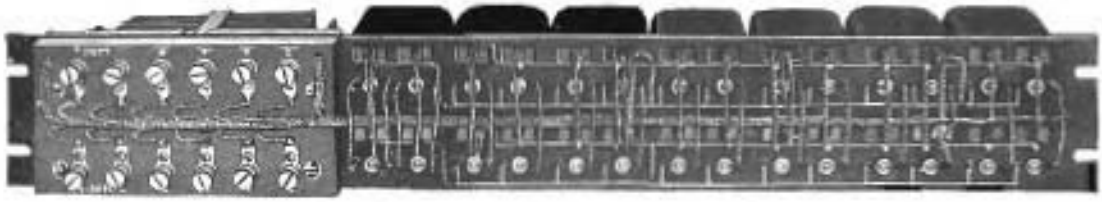
For Ringing Key Escutcheons



No. 1 Red Party Line Indicator.
No. 2 Black Party Line Indicator.
No. 3 Green Party Line Indicator.
No. 4 Blue Party Line Indicator.
No. 9 White Party Line Indicator.

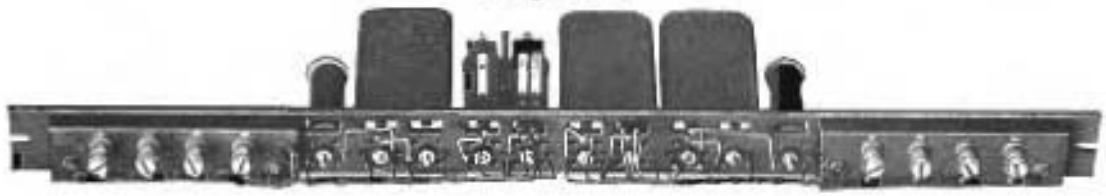
INTERRUPTERS—RELAY

Automatic Ringing



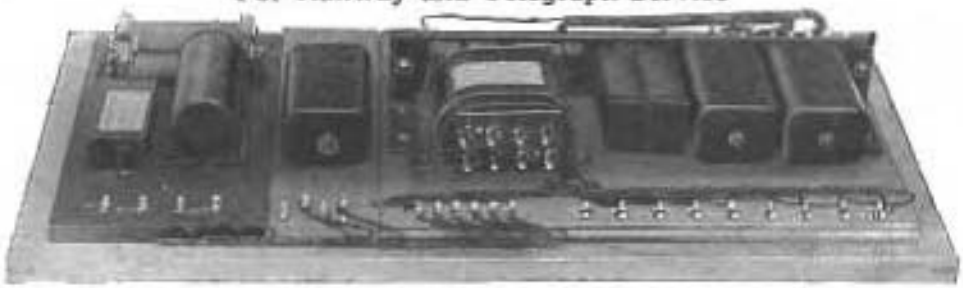
Code No.	Voltage	No. of Leads	No. of Seconds Silent	No. of Seconds Ringing	Remarks
2	40 to 48	4	4	1	Double Set
6	24	4	6	1	No. 1 but mounting
7	24	4	4	1	Double Set
8	24	3	6	1	Single Set direct contact
9	24	4	4	1	Single Set direct contact, mounted on No. 1016 mount

Busy Back



Code No.	Voltage	No. of Leads	Remarks
4	24 or 48	1	Double set vibrators, operate on storage battery.
5	24 or 48	1	Double set vibrators, operate on dry cells.

Composite Ringing
For Railway and Telegraph Service



Code No.	Ind. Coil	Retard Coil	Relay	Condenser	Remarks
1	83-A	43-A	547-A	53	Mounted on wood base.
2			541-A		No. 1 Composite Ringing Interrupter No. 3 Ann. apparatus panel.

INTERCOMMUNICATING SYSTEM



Twenty-Three Station Wall Type.

WITH the ever increasing demand on the business manager for system and reduction of waste, the telephone is coming into even greater favor. Today all progressive business houses are equipping their plants with private exchanges for interconnecting the various departments.

Such equipment gives an almost instantaneous means of directing the whole business force and provides a certain way of getting immediate answers to any of the questions that may arise between departments on a busy day.

This effectiveness of the telephone, so greatly appreciated in a business house, is attracting attention in other lines, and with the improvements made by the Kellogg company in a system especially designed for intercommunication, it is considered good economy to equip hospitals, schools, libraries, apartments and residences with telephones in the different rooms, or between floors or departments. The amount of time this saves and the satisfaction derived is best appreciated by those who have installed the Kellogg system.

Where the number of calls per day is so great as to justify an operator, a private switchboard is commonly used, but in many cases the need of an operator would prohibit the use of a private telephone plant, and it is for the purpose of getting the best communication between different stations in a building without an operator that the Kellogg Intercommunicating System has been designed.

In brief, the Intercommunicating System requires the following elements: a telephone set for each station, provided with a key or jack for every other station to be communicated with; battery to supply talking and ringing current; and wires to connect stations.

The Kellogg system is manufactured in two standard styles—Wall Set and Desk Set. Each of these can be furnished in two sizes containing twelve and twenty-four keys, respectively. The twelve-key size can be used for any number of stations to an ultimate of eleven, and the twenty-four key size for an ultimate of twenty-three stations; one of the keys having a green button for ringing the bell of the desired station.

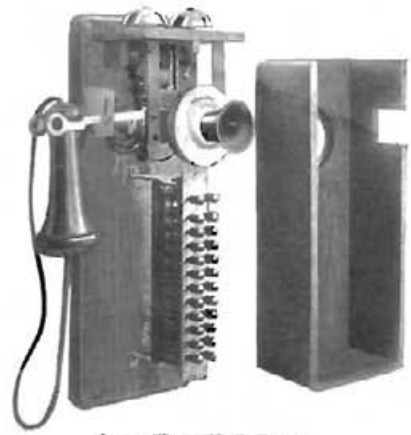
Fig. 2401 shows the external appearance of the wall set, which is neat, compact and very accessible. A card holder or designation strip is placed at each key. Into this strip a card may be inserted, giving the name of the party who will be called by depressing this button. By removing the cover in front, every piece of apparatus is in plain sight and easily accessible.

The Desk Set uses the standard Kellogg desk stand or grabaphone with a key box; and because of its convenience and appearance is preferred in many cases. This key box with cover removed is just as accessible as the wall set.

The same key unit is used in both styles. In the desk sets a buzzer is provided in place of the bell of the wall set, mounted on a neat oak base equipped with the proper binding posts.

Both the wall and desk sets have been designed for hard service and the usual careful work has entered into their construction. The talking circuit is exactly the same as that of our telephones used in the largest exchanges and is alike for both styles of sets; wall sets can be used indiscriminately with the desk sets in the same system.

Talking battery is fed through retardation coils and one coil is provided for each pair of wires running to the first station from the battery. These coils prevent inductive interference or cross-talk between lines.



Open View Wall Type.

INTERCOMMUNICATING SYSTEM

Sometimes it is desirable to be able to talk direct from the Intercommunicating System to any city subscriber. This is easily arranged. Provision has been made in all the sets, so that two of the keys in the twelve-key and four in the twenty-four-key size can be used for trunk service.

In case trunks to a city office are used, one of the stations designated "The Attendant's Station" answers incoming calls for parties in the Intercommunicating System. An extension bell at the Attendant's Station is necessary for each trunk. For the proper supervision of calls an Attendant's Station Box is required.



Eleven Station Desk Set Key Box showing arrangement of Key Buttons and Station Name Slips.

Operation

Operation of the Kellogg Key Type Intercommunicating System is simple and direct; press the button corresponding to the desired station, then push the green button, which rings the bell of the desired station. In answering a call at any station all that is necessary is to press the red button and remove the receiver from the hook in the regular manner. The same simplicity holds in case of calls over the trunk line to the city exchange.

When the extension bell rings at the Attendant's Station, the person at that station presses the trunk button and learns from the calling city subscriber the name of the desired party. The called station is rung in the usual way as described above. If the party cannot be obtained the Attendant's Station replies to that effect, hangs up the receiver and presses the disconnect push button in the Attendant's Station. The mechanical signal indicates when the called station has answered the city subscriber.

Description of Apparatus

It is a recognized fact that in order to get the same reliable and efficient service from an Intercommunicating System, as from the best city exchanges, the apparatus employed must be of the same standard of excellence. The Kellogg company has in the design of this system made constant effort to employ as much of its standard apparatus as possible, the excellence of which is undenied. Where special parts are necessary they are of the same high grade.

The telephone boxes are simple in outline, present a neat and handsome appearance, are compact and of few parts; very durable and substantial. The apparatus is mounted in a convenient and accessible manner so that when the box is opened all the working parts are exposed for inspection or connection of additional stations.



Open View Key Box—very accessible.

The woodwork used is taken from extra selected stock, thoroughly seasoned. All oak employed is quarter-sawed and the hand-rubbed varnish finish is of such character that it will not show ordinary wear.

The transmitter, which is the vital part of any telephone, is the regular Kellogg long distance transmitter, the recognized standard since 1901. Years of hard service under most trying conditions give it a reputation which is unapproached for reliability and long life.

The receiver is the standard Kellogg, used in the largest Independent exchanges in the country.

The hook switch is our latest type. The springs are of the best grade of German silver, with platinum contacts. It is strong and positive in its operation, and the particular design of the platinum points gives dust proof contact.

The retardation coils are standard coils used in large numbers and are thoroughly efficient.



The condensers are carefully designed and tested; they are a standard Kellogg product.

The vibrating bell used in the wall set is thoroughly dependable and will operate with small battery consumption.

The keys are assembled into a key unit, making the construction self-contained and rigid with no possibility of the individual parts getting out of adjustment. The same unit is used in both wall and desk sets.

INTERCOMMUNICATING SYSTEM

The individual keys are of the same grade of material and workmanship as our standard switchboard keys. The first two keys at the top in the 12 size and the first four in the 24 size unit, have extra springs so that one or all may be used for trunk service if desired. These keys have the letters X and Y stamped opposite the extra springs.

All keys except the one used for answering (home station key) and the ringing key are provided with black buttons. The button of this home station key is red and that of the ringing key, green.

The connecting keys are automatically locking, i. e., when any button is depressed the key remains in that position. Only the pressing of another connecting button can release it. The pressing of the ringing button does not restore other keys and it is non-locking.

Only one key, that with the green button, can ring other stations, and this prevents the unpleasant annoyance of false ringing, as may be the case where every key is also a ringing key, there being some temptation for those who pass by to press the buttons to "see how they work.". The separate ringing key also simplifies the construction and witing of the individual keys.

The Desk Stand is our standard type Kellogg "Indestructible," which we are furnishing to the regular telephone trade, and is unsurpassed in strength, neatness, reliability and durability.

The Desk Set Box which is used with the Desk Stand consists of a finely finished oak base, with buzzer and our standard nickel plated binding posts.

The key box is attractive and of the same finish as the wall set. The special design makes it possible to quickly get at the keys for inspection or repairs. The key unit is identically the same as used in the wall set. This key box can be operated in either a vertical or horizontal position or changed as desired as it need not be permanently attached to a desk or table.

The extension bell used for receiving trunk calls is the same as used on our regular common battery telephone lines. It contains the usual ringer and condenser, and corresponds in finish with the remainder of the equipment.

The Attendant's Station box consists of a neat small oak cabinet of standard finish. It is large enough to contain the supervisory equipment for two trunk lines which consist of one mechanical signal, one relay, one condenser and a push button per trunk.

The individual parts of the Kellogg Intercommunicating System are made to work one with the other; are carefully and neatly assembled and thoroughly tested before shipping.

Installation

The wall sets after being mounted in their respective places are complete after connecting the receiver cord terminals to the binding posts. The desk set is complete after connecting the receiver cord to the posts in base of desk stand and connecting the four conductor cord to the desk set box containing the buzzer.

Where an Attendant's Station is required, the Attendant's Station box should be placed so that the signal can be readily seen and the push button easily reached. The extension bell may be located at any convenient place.

The wiring between stations is done by means of cables consisting of twisted pair wires, preferably No. 22 B. & S. gauge, but in case the distance between the first and last station is short, No. 24 B. & S. gauge may be used. Where the places wired are at all damp, moisture proof cable must be used, otherwise standard switchboard cable is sufficient.

Besides the pair of wires for each station and one extra for emergency, two pairs should be provided to carry the ringing current, the two similar wires of a pair being connected in multiple for this purpose. The wires having solid colors are connected to the tip side of the keys; those with a white tracer to the sleeve.

The number of dry cells required is given in the following table:

	No. of dry cells for talking	For Ringing	Total
5 to 11 Stations, with 1,000 ft. cable	3	6	9
5 to 11 Stations, with 2,000 ft. cable	4	7	11
12 to 23 Stations, with 1,000 ft. cable	6	6	12
12 to 23 Stations, with 2,000 ft. cable	8	7	15

INTERCOMMUNICATING SYSTEM



Code No. 102W Closed View, Wall Set, 23 Station Size

Wall Type

Code No.	Stations	Trunks
100W	11	....
101W	9	2
102W	23	....
103W	19	4

Wall Grabaphone Type

Code No.	Stations	Trunks
100WG	11	....
101WG	9	2
102WG	23	....
103WG	19	4



Code No. 100WG Wall Grabaphone Type Telephone



Code No. 101D

Wall Grabaphone Type

We can furnish a very convenient and attractive unit, using our code No. 732 wall grabaphone with a standard 11-station key box and buzzer as illustrated. This arrangement has proven very satisfactory for use in business offices with flat-top desks.

Code 104WG—11 stations.
Code 105WG—9 stations and 2 trunks.
Code 106WG—23 stations.
Code 107WG—19 stations and 4 trunks.



Code No. 104WG

Desk Telephone Type.

This is our desk telephone equipment for intercommunicating systems. The stand is made so that all parts are readily accessible. The finish is in black enamel and nickel, the transmitter and receiver are the same as used on our standard long distance telephones. It is non-interfering and as many conversations can be carried on at one time as there are pairs of telephones.

Code No. 104D—11 stations.
Code No. 105D— 9 stations and 2 trunks.
Code No. 106D—23 stations.
Code No. 107D—19 stations and 4 trunks.

Desk Grabaphone Type.

This is the Kellogg desk type grabaphone for intercommunicating service, finished in black enamel and nickel, and having the high grade equipment that marks all Kellogg products. Associated with it is our standard key box with the exclusive Kellogg features. The buzzer is a part of this unit.

Code No. 104DG—11 stations.
Code No. 105DG— 9 stations, and 2 trunks.
Code No. 106DG—23 stations.
Code No. 107DG—19 stations, and 4 trunks.



Code No. 104DG

INTERCOMMUNICATING SYSTEM

COMMON TALKING AND SELECTIVE RINGING SYSTEMS

Code Ringing—Common Talking

The code ringing, common talking intercommunicating system consists of a standard wall type or desk type telephone with a push button. A desk set box with buzzer is furnished for the desk type. Any number of stations can be connected. This system will give very fine service where common code ringing is satisfactory. We recommend 6 stations as a maximum for best service.

Code No.	Type	Code No.	Type
F-8531W	Wall Telephone	F-8531D	Desk Telephone
F-8531WG	Wall Grabaphone	F-8531DG	Desk Grabaphone

Selective Ringing—Common Talking



Code No. 8536WG (Special)

This system is ideal where the interconnection of only from three to seven stations is required. The talking sets are standard Kellogg equipment and well known for their transmission and service qualities. The signalling block, finished in mahogany and equipped with pearl buttons, adds to the appearance of this equipment.

The signalling of the desk type sets is furnished by a Kellogg standard buzzer, which can be conveniently mounted under the desk or table. The wall type sets are equipped with a standard ringer for signalling.

Code No. 8536WG (Special)—This combination consists of one of our black enamel bell boxes with long switchhook for a handy, well-designed grabaphone, together with signalling block, containing 6 buttons, with arrangement for 7 stations.



Code No. 8536W

Code No. 8536W—The Kellogg Enameled Steel Residence set is a neat, compact equipment that is used in some of our finest hotel, steamship and club installations besides thousands of residences. This unit includes the Code No. 777 Residence set; a 6-button mahogany signalling block.



Code No. 8536WG

In the following code numbers (8536WG, 8536D, 8536DG) we have arranged the apparatus in a more or less diagrammatical manner to show what equipment is included in each unit. The buzzer in each case is mounted behind the desk out of the way. The grabaphone shown in No. 8536WG is ordinarily mounted in a convenient place just below the edge of the desk, the push button on any convenient part of the desk.

Code No. 8536WG—This is our wall type grabaphone Code No. F-732 used with 6 button, 7 station felt bottomed signalling block. This equipment has proved very efficient and popular type of apparatus for intercommunicating service.



Code No. 8536D

Description of No. 8536D on following page.

INTERCOMMUNICATING SYSTEM

COMMON TALKING AND SELECTIVE RINGING SYSTEMS

Selective Ringing—Common Talking



Code No. 8536DG

Code No. 8536D—The Kellogg desk stand is one of the handsomest pieces of equipment we manufacture. This set (Code No. F-39) is provided with a buzzer, and a 6-button, 7-station signalling block as shown here.

Code No. 8526DG—There are a great many business offices who are enjoying the added advantage of this "one-armed" type of telephone—a great convenience. This set, with the handy grabaphone (Code No. 111) telephone buzzer and 6-button, 7-station signalling block.

See Page 191 for Call and Return Systems

Attendant's Station Boxes.



Attendant Station Cabinet

The Attendant's Station Box consists of a neat small oak cabinet of standard finish. It is large enough to contain supervisory equipment for two trunk lines, which consist of one mechanical signal, one relay, one condenser and a push button per trunk.

Box Number 1—One trunk to common battery exchange.
Box Number 2—Two trunks to common battery exchange.
Box Number 3—Three trunks to common battery exchange.
Box Number 4—One trunk to magneto exchange.
Box Number 5—Two trunks to magneto exchange.
For each trunk, equipped, an extension bell is required.

Codes are being made up for sets which do away with the necessity of keys and signals on attendant stations.

Any station can then be used for answering trunk calls.

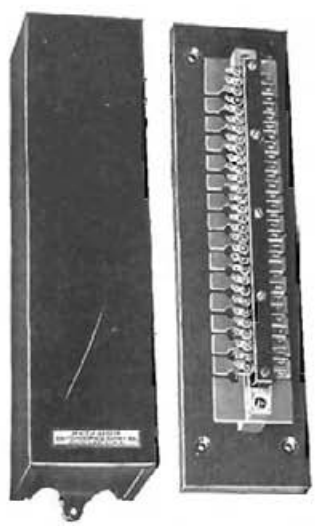
Junction Block.

This 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. Branch terminals are required. The cover is of metal thoroughly enameled and attached to the block with two screws.

Code No.	No. of Pair
2513B	13 Pair
2525B	25 Pair



Showing manner of connecting cable.



Terminal Strip.

Code No. 8000—We show here a lock nut terminal strip to be used where heavy wires are used and where no soldered connections are to be made. Sizes ranging from 1 to 26 pairs can be furnished.



Code No. 8000

JACKS—LAMP

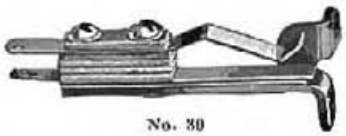
Kellogg lamp jacks are designed, so that the lamp is securely held in the proper position, furnishing maximum light to the caps.

Each lamp is partitioned by a brass strip, preventing leakage of light to the adjoining lamp caps.

The frame is of heavy brass with a dull nickel finish. The springs are German silver. The base strip is made of Kellogg Bakelite, a most desirable material for this purpose; it eliminates the fibre washers formerly necessary for each lamp cap, and also will not become marred by constant striking with plugs as in the case of metal with a black enamel finish.

The frame of the transfer jack is of hard rubber, and each lamp is entirely enclosed, making a most desirable jack for this purpose.

Individual Lamp Jacks



No. 30

Code No.	Centers	Thickness of Mtg. Material	Material	Remarks
39	5/8 in.	3/8 in. Slate	Steel	Will take both W. E. Co. and Kellogg lamps.

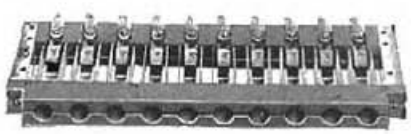


No. 9

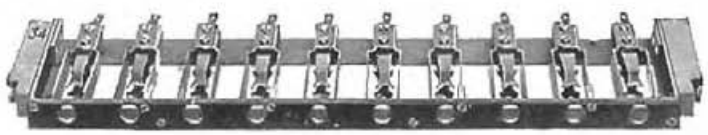
Five Per Strip

Code No.	Type	Centers	Face of Strip	Mtg. Pin Centers	Hole for Lamp Cap	Material	Remarks
9	Transfer	1 1/8 in.	5 3/32 x 1/2 in.	6 3/4 in.	1/2 in.	Hard Rubber	.....
37	Line	2 in.	10 1/4 x 1/2 in.	11 5/32 in.	1/2 in.	Brass	Separator on each side of lamp

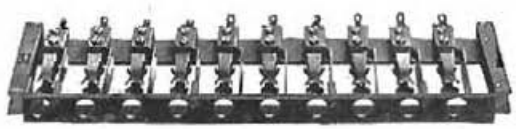
Ten Per Strip



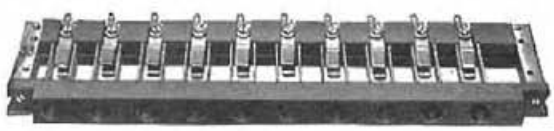
No. 15



No. 34



No. 31



No. 33

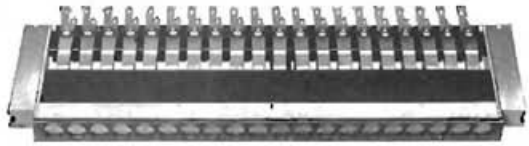
Code No.	Type	Centers	Face of Strip	Mtg. Pin Centers	Hole for Lamp Cap	Material	Remarks
15	Line	1/8 in.	6 1/8 x 1/2 in.	6 3/4 in.	1/2 in.	Brass	.....
23	Transfer	1/2 in.	5 3/32 x 1/2 in.	6 1/4 in.	1/2 in.	Hard Rubber	Lines up with No. 203 Springs
31	Line	3/4 in.	7 3/32 x 1/2 in.	8 5/32 in.	1/2 in.	Brass	.....
33	Line	3/4 in.	7.771 x 1/2 in.	8.677 in.	1/2 in.	Hard Rubber	.....
34	Line	1 in.	10 1/4 x 1/2 in.	11 5/32 in.	1/2 in.	Brass	Separator on each side of lamp

JACKS—LAMP

Twenty Per Strip



No. 25



No. 35

Code No.	Type	Centers	Face of Strip	Mtg. Pin Centers	Hole for Lamp Cap	Material	Remarks
25	Line	½ in.	10¼x½ in.	11⅝ in.	3/16 in.	Brass	.....
33	Line	3/8 in.	7.771x½ in.	8.677 in.	3/16 in.	Hard Rubber	.....
35	Line	3/8 in.	7.771x11/32 in.	8.677 in.	5/32 in.	Brass	.....
36	Line	½ in.	10¼x7/32 in.	11⅝ in.	7/32 in.	Brass	Lines up with No. 116 spring jack
41	Line	3/8 in.	7.656x7/32 in.	8⅝ in.	5/32 in.	Brass	.....

Miscellaneous

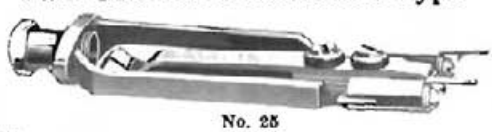
45	Special	5/8 in.	5½x½ in.	.....	3/16 in.	Brass	Arranged for mtg. in key frame. 8 per strip.

JACKS—SPRING

Kellogg spring jacks are designed to withstand the most rigid 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 Kellogg Bakelite Dilecto insulation. The mounting strips are made of a high grade hard rubber and all springs are of German silver.

Two Conductor-Individual Type



No. 25

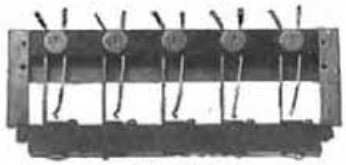
Code No.	Conductor Contacts	Local Contacts: Break	Make	Break & Make	Centers Spaced	Fits Plugs	Remarks
25	1	....	....	....	1 1/16"	42- 55-193 112-162-187	Removable sleeve.
53	....	....	....	1	5/16"	44- 70-130 168-165-194	Mounts on 5/16" panel.
61	2	....	....	....	1 3/16"	42- 55-112 162-187-193	Similar to No. 25.
85	....	....	....	....	5/8"	55-112-162 187-193-137	
87	....	....	....	1	5/8"	55-112-162 187-193-137	Similar to No. 85.
88	....	....	....	....	½"	26-128	Removable sleeve. Mounts on 11/32" panel.
98	2	....	....	....	5/8"	55-112-162 187-193-137	Mounts on 11/32" panel.
99	....	1	....	....	½"	26-128	No. 88, but spring combination.
207	....	....	....	....	1 1/16"	42- 55-112 162-187-193	Similar to No. 25.
208	....	....	....	....	5/8"	128	
209	2	....	....	....	5/8"	44- 70-130 168-165-194	Cut-off jack. Mounts on ½" panel.
237	2	....	....	....	1 "	42- 55-193 112-162-187	Used on old No. 29 Comb. drop and jack. Mounts on metal.
277	....	....	....	1	5/8"	42- 55-193 112-162-187	No. 87, but sleeve 1/32" longer.
301	1	....	....	....	.....	42- 55-193 112-162-187	Used on Nos. 100 and 101 Comb. drops and jacks.

JACKS—SPRING

Two Conductor-Individual Type

Code No.	Conductor Contacts	Local Contacts: Break	Local Contacts: Make	Make & Break	Centers Spaced	Fits Plugs	Remarks
302	2	....	....	....	.....	42- 55-193 112-162-187	Used on Nos. 100 and 101 Comb. drops and jacks.
315	2	....	....	....	.....	42- 55-193 112-162-187	No. 302 less restoring end of spring.
316	1	....	....	....	.....	42- 55-193 112-162-187	No. 315 with sleeve cut-off contact only.
319	1	....	....	....	.....	42- 55-193 112-162-187	No. 301 with restoring spring cut-off.

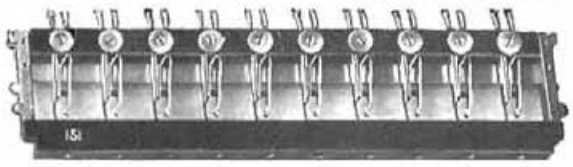
Two Conductor—Five Per Strip



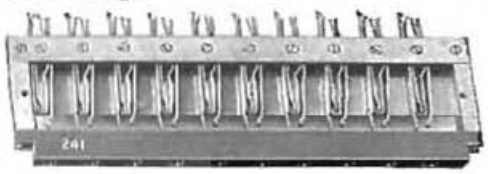
No. 227

Code No.	Cond. Contacts	Break	Make	Make & Break	Centers Spaced	Face of Strip	Mtg. Pin Centers	Fits Plugs	Remarks
215	—	....	....	1	1 3/16"	5 31/32" x 1/2"	6 1/4"	42- 55-112 162-187-193	Transfer jack with removable sleeve.
225	2	....	....	....	1 3/16"	5 31/32" x 1/2"	6 1/4"	42- 55-112 162-187-193	Similar to No. 215.
227	....	....	....	....	1 3/16"	5 31/32" x 1/2"	6 1/4"	42- 55-112 162-187-193	Similar to No. 215.
238	....	....	....	1	1 3/16"	5 31/32" x 3/4"	6 1/4"	42- 55-112 162-187-193	Screw mounted from front

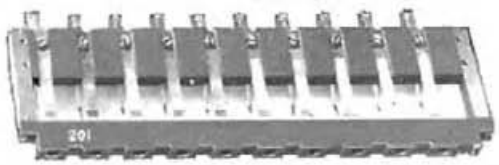
Two Conductor—Ten Per Strip



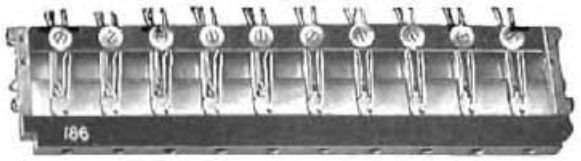
No. 151



No. 241



No. 201



No. 186

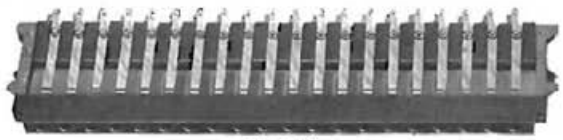
Code No.	Conductor Contacts	Local Contacts: Break	Local Contacts: Make	Local Contacts: Break and Make	Centers Spaced	Face of Strip	Mtg. Pin Centers	Fits Plugs	Remarks
37	—	....	....	....	1/4"	7 5/8 x 3/8"	8 1/4"	128	Slotted for number plates.
58	....	....	....	....	5/16"	6 1/8 x 5/8"	6 1/4"	26	
129	2	....	....	....	1"	10 1/4 x 1/2"	11 3/32"	55, 112, 162, 187, 193	
132	....	....	....	1	1"	10 1/4 x 1/2"	11 3/32"	55, 112, 162, 187, 193	
151	....	1	....	....	1"	10 1/4 x 1/2"	11 3/32"	55, 112, 162, 187, 193	
163	....	....	....	....	1"	10 1/4 x 7/8"	11 3/32"	55, 112, 162, 187, 193	Similar to No. 63.
186	(See Nos. 129 and 132 for contacts.)				1"	10 1/4 x 1/2"	11 3/32"	55, 112, 162, 187, 193	2 jacks Mtd. together; 1 No. 129 and and 1 No. 132.
195	....	....	....	....	1"	10 1/4 x 1/8"	11 3/32"	55, 112, 162, 187, 193	Lines up with No. 8 lamp jack. Slotted for number plates.
201	....	....	....	....	3/4"	7 5/8 x 3/8"	8 3/8"	128	Slotted for number plates.

JACKS—SPRING

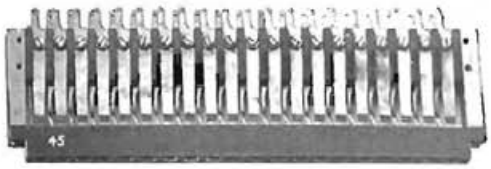
Two Conductor—Ten Per Strip

Code No.	Conductor Contacts	Local Contacts: Break	Local Contacts: Make	Local Contacts: Break & Make	Centers Spaced	Face of Strip	Mtg. Pin Centers	Fits Plugs	Remarks
240	....	....	....	....	¾"	7 31/32 x ⅜"	8 3/32"	128	No. 201, but not slotted.
241	....	....	1	....	¾"	7 31/32 x ⅜"	8 3/32"	128	
255	2	....	....	1	1"	10¼ x ½"	11 5/32"	55, 112, 162, 187, 193	
283	....	....	1	....	1"	10¼ x ½"	11 5/32"	55, 112, 162, 187, 193	

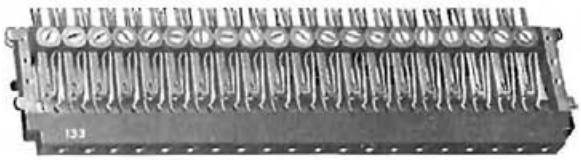
Two Conductor—Twenty Per Strip



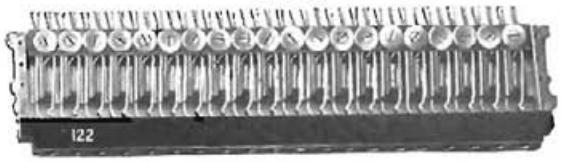
No. 116



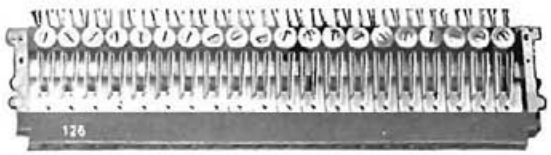
No. 46



No. 133



No. 122

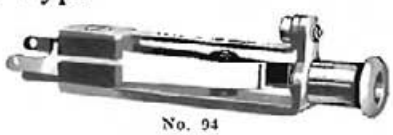


No. 126

Code No.	Conductor Contacts	Local Contacts: Break	Local Contacts: Make	Local Contacts: Break and Make	Centers Spaced	Face of Strip	Mtg. Pin Centers	Fits Plugs	Remarks
36	....	....	....	....	⅜"	7 5/32 x ¾"	8 1/32"	128	
45	....	....	....	....	⅜"	7 31/32 x ⅜"	8 3/32"	128	
55	....	....	....	....	1/10"	6¼ x 1/10"	6¾"	26	
116	....	....	....	....	½"	10¼ x 7/16"	11 3/32"	55, 112, 162, 187, 193	
122	....	1	....	....	½"	10¼ x ½"	11 5/32"	55, 112, 162, 187, 193	No. 22, but German Silver sleeves.
126	2	....	....	....	½"	10¼ x ½"	11 5/32"	55, 112, 162, 187, 193	No. 26, but German Silver sleeves.
133	....	....	....	1	½"	10¼ x ½"	11 5/32"	55, 112, 162, 187, 193	No. 33, but German Silver sleeves.
211	....	....	....	....	½"	10¼ x 7/16"	11 3/32"	55, 112, 162, 187, 193	No. 116, but arranged for party line indicators.
247	....	....	....	....	½"	10¼ x 7/16"	11 5/32"	55, 112, 162, 187, 193	Similar to No. 116 with special tip spring.
281	....	....	....	....	⅜"	7 31/32 x ⅜"	8 3/32"	128	No. 45, but drilled for party line indicators.

Three Conductor—Individual Type

Code No.	Conductor Contacts	Local Contacts: Break	Local Contacts: Make	Local Contacts: Break & Make	Centers Spaced	Fits Plugs	Remarks
94	....	....	....	....	5/8"	44, 70, 130, 168, 165, 194	
100	2	....	....	....	5/8"	44, 70, 130, 168, 165, 194	Mounts on ⅜" panel.
229	....	....	....	1	5/8"	44, 70, 130, 168, 165, 194	Mounts on ⅛" panel.
254	....	....	....	....	5/8"	141, 129, 201	Test jack mounts on 1/16" panel.
336	....	....	1	....	¾"	141, 129, 201	Similar to No. 229.
260	....	....	....	....	5/8"	138, 106	
286	....	....	....	1	5/8"	138, 106	



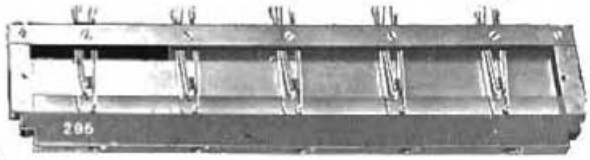
No. 94

JACKS—SPRING

Three Conductor—Individual Type

Code No.	Conductor Contacts	Local Contacts: Break	Local Contacts: Make	Local Contacts: Break & Make	Centers Spaced	Fits Plugs	Remarks
298	2	....	....	....	.....	16, 44, 70, 130, 168, 165 194	Used with old No. 65 comb. drop and jack; has restoring spring cut off.
299	....	....	....	....	.....	16, 44, 70, 130, 168, 165, 194	Similar to No. 298, but has no cut-off springs; mtgs. on 1/8" panel.
303	1	....	....	....	.....	138, 106	Used on Nos. 100 and 101 comb. drops and jacks.
304	1	....	....	....	.....	138, 106	Used on Nos. 100 and 101 comb drops and jacks.
311	....	....	....	....	5/8"	55, 112, 162, 187, 193, 137	
312	2	....	1	....	5/8"	44, 70, 130, 168, 165, 194	

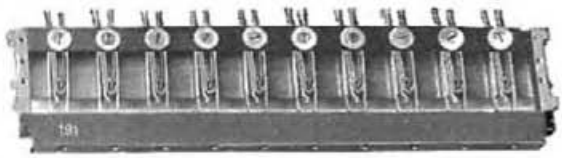
Three Conductor—Five Per Strip



No. 296

Code No.	Conductor Contacts	Local Contacts: Break	Local Contacts: Make	Local Contacts: Break & Make	Centers Spaced	Face of Strip	Mtg. Pin Centers	Fits Plugs	Remarks
152	2	....	....	....	2"	10¼×½"	11 3/32"	44, 70, 130, 168, 165, 194	
205	....	1	....	....	2"	10¼×½"	11 3/32"	44, 70, 130, 168, 165, 194	No. 152 except spring combination.
223	....	....	....	1	1 3/32"	5 31/32×½"	6¼"	44, 70, 130, 168, 165, 194	For transfer circuit No. 904.
296	2	....	....	....	2"	10¼×1 3/16"	11 3/32"	138, 106	For standard P. B. X. boards.
297	....	....	....	....	2"	10¼×1 3/16"	11 3/32"	138, 106	Similar to No. 296 for standard P. B. X. boards.
309	....	....	....	1	2"	10¼×½"	11 3/32"	138, 106	Lines up with No. 37 lamp jacks.
318	....	....	1	....	2"	10¼×1 3/16"	11 3/32"	138, 106	Similar to No. 296, for standard P. B. X. boards.

Three Conductor—Ten Per Strip

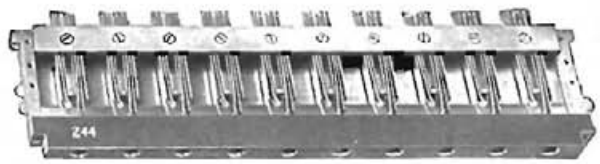


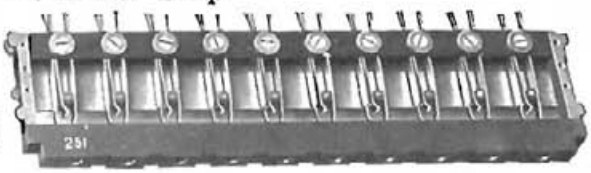
No. 101

Code No.	Conductor Contacts	Local Contacts: Break	Local Contacts: Make	Local Contacts: Break & Make	Centers Spaced	Face of Strip	Mtg. Pin Centers	Fits Plugs	Remarks
141	....	....	....	....	1"	10¼×½"	11 3/32"	44, 70, 130, 168, 165, 194	
147	2	....	....	....	1"	10¼×½"	11 3/32"	44, 70, 130, 168, 165, 194	
149	....	1	....	....	1"	10¼×½"	11 3/32"	44, 70, 130, 168, 165, 194	
101	....	....	1	....	1"	10¼×½"	11 3/32"	44, 70, 130, 168, 165, 194	
202	2	....	....	....	1"	10¼×½"	11 3/32"	13	No. 147, but larger sleeve.
204	2	....	....	....	3/5"	6⅛×½"	6¼"	44, 70, 130, 168, 165, 194	
217	2	....	....	....	1"	10¼×½"	11 3/32"	44, 70, 130, 168, 165, 194	No. 147, but slotted for number plates
218	....	....	....	1	1"	10¼×½"	11 3/32"	44, 70, 130, 168, 165, 194	Transfer jack.

JACKS—SPRING

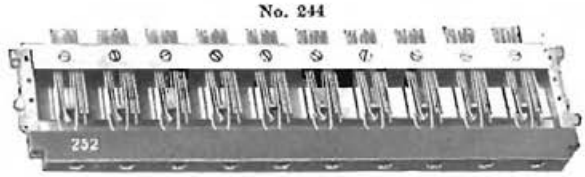
Three Conductor—Ten Per Strip

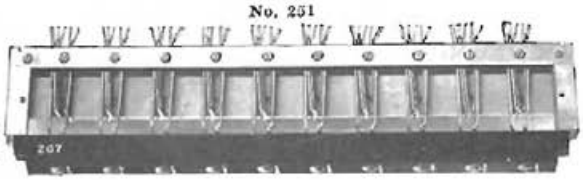




No. 244

No. 251



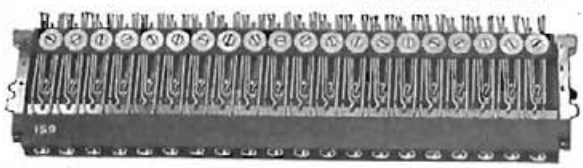


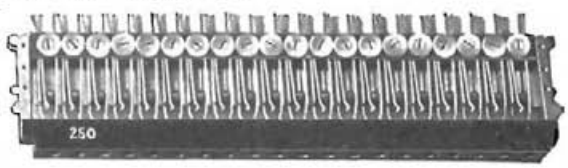
No. 252

No. 267

Code No.	Conductor Contacts	Local Contacts: Break	Local Contacts: Make	Local Contacts: Break & Make	Centers Spaced	Face of Strip	Mtg. Pin Centers	Fits Plugs	Remarks
232	....	....	....	....	1"	10¼×7/16"	11 3/32"	44, 70, 130, 168, 165, 194	Slotted for number plates
244	2	....	1	....	1"	10¼×½"	11 3/32"	44, 70, 130, 168, 165, 194	
251	....	....	....	....	1"	10¼×½"	11 3/32"	44, 70, 130, 168, 165, 194	Similar to No. 41, but slotted for number plates.
252	2	....	....	1	1"	10¼×½"	11 3/32"	44, 70, 130, 168, 165, 194	
253	....	....	....	....	¾"	7 21/32×3/8"	8 9/32"	141, 129, 201	Slotted for number plates.
259	....	....	....	....	1"	10¼×7/16"	11 3/32"	138, 106	Slotted for number plates.
267	2	....	....	....	1"	10¼×7/16"	11 3/32"	138, 106	
269	....	....	1	....	1"	10¼×7/16"	11 3/32"	138, 106	
271	....	1	....	....	1"	10¼×7/16"	11 3/32"	138, 106	
273	....	....	....	....	1"	10¼×7/16"	11 3/32"	138, 106	
274	....	....	....	....	¾"	7 21/32×3/8"	8 9/32"	141, 129, 201	No. 253, but not slotted.
279	2	....	....	....	1"	10¼×½"	11 3/32"	115	No. 147, but face is counter bored.
282	....	1	....	....	1"	10¼×7/16"	11 3/32"	138, 106	No. 271, but drilled for party line indicators.
285	2	....	....	....	1"	10¼×7/16"	11 3/32"	138, 106	No. 267, but slotted for number plates.
288	....	1	....	....	¾"	7 21/32×3/8"	8 9/32"	141, 129, 210	Similar to No. 274.
293	....	....	....	....	¾"	7 21/32×3/8"	8 9/32"	141, 129, 210	Slotted for number plates.
295	....	....	1	....	¾"	7 21/32×3/8"	8 9/32"	141, 129, 210	Similar to No. 253, not slotted.
313	....	1	....	....	¾"	7.71×3/8"	8 9/32"	141, 129, 210	
314	....	....	1	....	¾"	7.71×3/8"	8 9/32"	141, 129, 210	Similar to No. 313
322	....	....	2	....	1"	10¼×½"	11 3/32"	44, 70, 130, 168, 165, 194	
324	2	....	....	1	1"	10¼×7/16"	11 3/32"	138, 106	Similar to No. 267.

Three Conductor—Twenty Per Strip





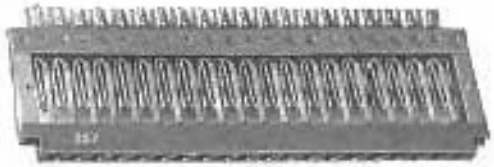
No. 159

No. 250

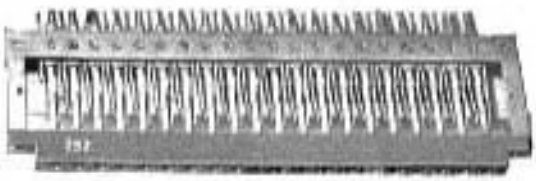
Code No.	Conductor Contacts	Local Contacts: Break	Local Contacts: Make	Local Contacts: Break & Make	Centers Spaced	Face of Strip	Mtg. Pin Centers	Fits Plugs	Remarks
134	2	....	....	....	½"	10¼×½"	11 5/32"	44, 70, 130, 168, 165, 194	No. 35, but with smaller sleeves.
135	2	....	....	....	½"	10¼×½"	11 5/32"	13	Similar to No. 34.
146	....	....	....	....	½"	10¼×½"	11 3/32"	44, 70, 130, 168, 165, 194	
148	....	1	....	....	½"	10¼×½"	11 3/32"	44, 70, 130, 168, 165, 194	
159	....	....	1	....	½"	10¼×½"	11 3/32"	44, 70, 130, 168, 165, 194	

JACKS—SPRING

Three Conductor—Twenty Per Strip



No. 287



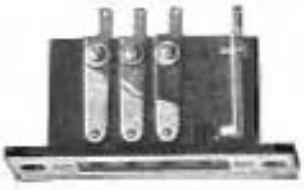
No. 202

Code No.	Conductor Contacts	Local Contacts Break	Local Contacts Make	Centers Spaced	Face of Strip	Mtg. Pin Centers	Fits Plugs	Remarks
230	—	—	—	½"	10⅛x$\frac{7}{16}$"	11$\frac{5}{8}$"	44, 70, 130, 188, 193, 194	
231	—	—	—	½"	10⅛x$\frac{7}{16}$"	11$\frac{5}{8}$"	44, 70, 130, 188, 193, 194	No. 230, but arranged for party line indicators.
239	—	—	—	⅝"	7$\frac{13}{16}$x½"	8$\frac{1}{16}$"	141, 129, 201	
250	—	—	—	½"	10⅛x½"	11$\frac{5}{8}$"	44, 70, 130, 188, 193, 194	No. 146, but arranged for party line indicators.
257	—	—	—	⅝"	7$\frac{13}{16}$x$\frac{7}{16}$"	8$\frac{1}{16}$"	141, 129, 201	No. 239, but arranged for party line indicators.
258	—	—	—	⅝"	10⅛x$\frac{7}{16}$"	11$\frac{5}{8}$"	138, 206	Drilled for party line indicators.
261	—	—	—	½"	10⅛x$\frac{7}{16}$"	11$\frac{5}{8}$"	138, 206	No. 258 but not drilled for party line indicators.
266	—	1	—	½"	10⅛x½"	11$\frac{5}{8}$"	44, 70, 130 188, 193, 194	No. 146 but drilled for party line indicators.
268	2	—	—	⅝"	16⅛x$\frac{7}{16}$"	11$\frac{5}{8}$"	138, 206	
270	—	—	1	⅝"	10⅛x$\frac{7}{16}$"	11$\frac{5}{8}$"	138, 206	
272	—	1	—	⅝"	10⅛x$\frac{7}{16}$"	11$\frac{5}{8}$"	138, 206	
278	2	—	—	1"	16⅛x1$\frac{1}{16}$"	12$\frac{5}{8}$"	112	No. 194 but face is counter-bored.
282	—	—	—	½"	1.771x$\frac{3}{16}$"	8.875"	141, 129, 201	

Operator's Jacks



No. 43



No. 325A



No. 87



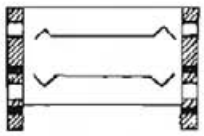
No. 97



No. 316

Code No.	Conductors	Local Contacts Break	Local Contacts Make	Centers Spaced	Face of Strip	Fits Plugs	Remarks
24	2	—	1	—	1⅞" diam.	107	Mounts on wood with mach. screws.
43	4	—	—	$\frac{3}{16}$"	2¼x1½"	143-146	Four individual jacks mounted in hard rubber.
87	4	—	1	—	3 " diam.	25	Similar to No. 24 for breast plate transmitters.
97	2	—	—	—	1⅞" diam.	107	Similar to No. 24 mounts with wood screws.
224	4	—	—	—	2 " diam.	25	Similar to No. 87.
276	8	—	—	—	2⅝x2"	25	To accommodate two No. 25 plugs.
288	2	1	—	—	1⅞" diam.	107	No. 24 but spring combination.
291	5	—	—	$\frac{1}{8}$"	2$\frac{13}{16}$x½"	131	Similar to No. 43, but 5 individual jacks.
310	6	—	—	⅜"	2$\frac{13}{16}$x$\frac{13}{16}$"	130	W. E. Co. No. 80.
325	4	—	—	$\frac{1}{16}$"	1$\frac{13}{16}$x$\frac{15}{16}$"	182	
325 A	4	—	—	—	1$\frac{7}{8}$x2½"	182	No. 325, but includes No. 453 mounting

JACK SPRING COMBINATIONS



276



67



60, 64, 141, 146, 230, 241, 242, 250, 251, 253, 254, 256, 257, 258, 259, 261, 273, 274, 292, 293, 297, 299, 314, 326, 327, 329,



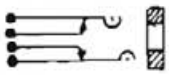
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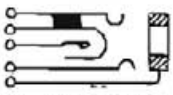
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238



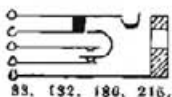
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150, 191, 269, 270, 318



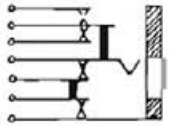
43, 201, 325



88, 132, 180, 215, 133



148, 149, 206, 266, 271, 272, 282



265



241, 283



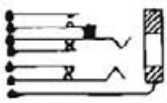
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22, 90, 151, 322



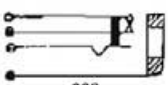
63, 87, 277



244, 332



218, 223, 229, 286, 309



228



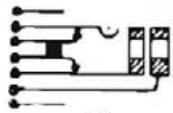
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319



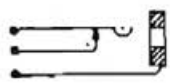
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10



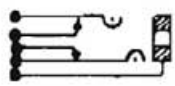
36, 37, 40, 46, 55, 58, 63, 86, 88, 95, 97, 116, 103, 106, 201, 207, 208, 211, 223, 240, 247, 281



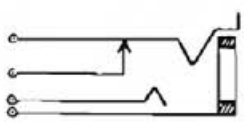
26



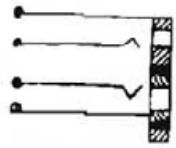
26, 61, 98, 126, 129, 188, 225



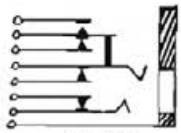
35, 100, 134, 147, 202, 204, 217, 136, 152, 267, 268, 278, 279, 285, 296, 298, 328



303



224



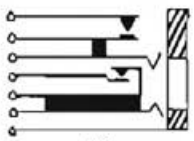
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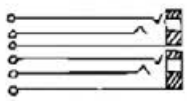
238, 313



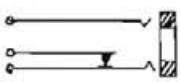
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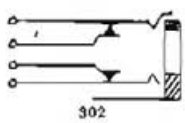
322



310



316



302



301

SPRING JACK GROUPS

Group No. 55

For Plug Group No. 26

Code: Brass Sleeve	Code: Ger. Silver Sleeve	Type	No. Per Strip	Conductor	Conductor Contacts	Local Contacts: Break	Local Contacts: Make	Local Contacts: Make & Break	Centers	Face of Strip	Remarks
....	55	55	20	2	....	....	....	....	7/16"	6 1/8 x 7/16"	
....	58	55	10	2	....	....	....	....	7/8"	6 1/8 x 7/8"	
88	....	88	1	2	....	....	....	....	1/2"		Mts. on 25-64" panel. Removable sleeve.
99	....	88	1	2	....	1	....	....	1/2"		No. 88 with different spring combination.

Group No. 36

For Plug Group No. 128

....	36	36	20	2	....	....	....	....	3/8"	7 5/8 x 3/8"	
....	37	36	10	2	....	....	....	....	3/4"	7 5/8 x 3/8"	Slotted for number plates.
....	45	45	20	2	....	....	....	....	3/8"	7 31/32 x 3/8"	
....	281	45	20	2	....	....	....	....	3/8"	7 31/32 x 3/8"	No. 45 drilled for party line indicator.
....	201	45	10	2	....	....	....	....	3/4"	7 31/32 x 3/8"	Slotted for number plates.
....	210	45	10	2	....	....	....	....	3/4"	7 31/32 x 3/8"	No. 201, less slotting for number plates.
....	241	45	10	2	....	....	1	....	3/4"	7 31/32 x 3/8"	
208	....	208	1	2	....	....	....	....	5/8"		

Group No. 134

For Plug Group No. 74

....	134	34	20	3	2	....	....	....	1/2"	10 1/4 x 1/2"	
....	146	34	20	3	....	....	....	....	1/2"	10 1/4 x 1/2"	
....	250	34	20	3	....	....	....	....	1/2"	10 1/4 x 1/2"	No. 146 drilled for party line indicator.
....	148	34	20	3	....	1	....	....	1/2"	10 1/4 x 1/2"	
....	266	34	20	3	....	1	....	....	1/2"	10 1/4 x 1/2"	No. 148 drilled for party line indicator.
....	159	34	20	3	....	....	1	....	1/2"	10 1/4 x 1/2"	
....	230	34	20	3	....	....	....	....	1/2"	10 1/4 x 7/16"	
....	231	34	20	3	....	....	....	....	1/2"	10 1/4 x 7/16"	No. 230 drilled for party line indicator.
....	141	34	10	3	....	....	....	....	1"	10 1/4 x 1/2"	
....	147	34	10	3	2	....	....	....	1"	10 1/4 x 1/2"	
....	149	34	10	3	....	1	....	....	1"	10 1/4 x 1/2"	
....	191	34	10	3	....	....	1	....	1"	10 1/4 x 1/2"	
....	261	34	10	3	....	....	....	....	1"	10 1/4 x 1/2"	
....	217	34	10	3	2	....	....	....	1"	10 1/4 x 1/2"	
....	218	34	10	3	....	....	....	1	1"	10 1/4 x 1/2"	
....	244	34	10	3	2	....	1	....	1"	10 1/4 x 1/2"	
....	252	34	10	3	2	....	....	1	1"	10 1/4 x 1/2"	
....	322	34	10	3	....	....	2	....	1"	10 1/4 x 1/2"	
....	232	34	10	3	....	....	....	....	1"	6 1/8 x 1/2"	Slotted for party line indicators.
.	204	34	10	3	2	....	....	....	7/16"	10 1/4 x 7/16"	
....	152	34	5	3	2	....	....	....	2"	10 1/4 x 1/2"	
....	205	34	5	3	....	1	....	....	2"	10 1/4 x 1/4"	
....	223	34	5	3	....	....	....	1	1 1/16"	5 27/32 x 1/2"	
94	....	94	1	3	....	....	....	....	5/8"		
100	....	94	1	3	2	....	....	....	5/8"		
229	....	94	1	3	....	....	....	1	5/8"		
332	....	94	1	3	2	....	1	....	5/8"		
53	....	53	1	2	....	....	....	1	7/16"		Mounts on 1/4" panel.
209	....	53	1	2	2	....	....	....	5/8"		Cut off jack mounts on 1/2" panel.
298	....	298	1	3	2	....	....	....			Jack of No. 63 Comb. D. & J. with restoring spring cut-off.
299	....	298	1	3	....	....	....	....			No. 298 less cut-off springs. Mounts on 7/16" panel.

SPRING JACK GROUPS

Group No. 116

For Plug Group No. 55 Also Plug Group No. 42

Code: Brass Sleeve	Code: German Silver Sleeve	Type	No. per Strip	Conductor	Conductor Contacts	Break	Make	Make & Break	Centers	Face of Strip	Remarks
	122	16	20	2		1			½"	10¼"x½"	No. 18 Modified.
	126	16	20	2	2				½"	10¼"x½"	
	133	16	20	2				1	½"	10¼"x½"	
59		16	20	2	1		1		½"	10¼"x½"	Test Ring.
	116	16	20	2					½"	10¼"x 7/16"	
	211	16	20	2					½"	10¼"x 7/16"	No. 116, but drilled for party line, Ind.
	347	16	20	2					½"	10¼"x 7/16"	Sim. to 116, but heavy Tip Spring.
	129	16	10	2	2				1"	10¼"x½"	
	132	16	10	2				1	1"	10¼"x½"	
	131	16	10	2		1			1"	10¼"x½"	
	355	16	10	2	2			1	1"	10¼"x½"	
	283	16	10	2			1		1"	10¼"x½"	
186	132	16	10	2				1	1"	10¼"x½"	Using half of spring jacks Nos. 132 and 129.
	129				2						
	163	16	10	2					1"	10¼"x 7/16"	Lines up with No. 8 Lamp Jack.
	195	16	10	2					1"	10¼"x 7/16"	Lines up with No. 8 Lamp Jack. Slotted for No. Plates.
85		85	1	2					5/8"		
87		85	1	3				1	5/8"		No. 85, but has local contact.
98		85	1	2	2				5/8"		Mounts on 3/64" Panel.
311		311	1	3					5/8"		

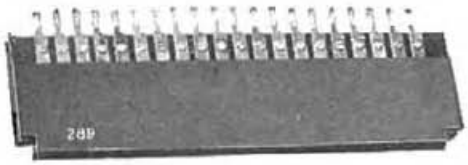
Group No. 215

For Plug Group No. 42 Also Plug Group No. 55

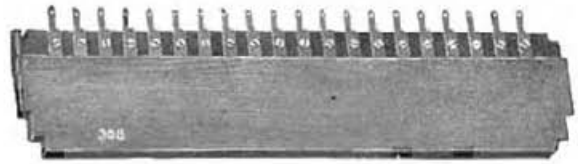
25		25	1	2	1		1 3/16"	Removable Sleeve.
61		25	1	2	2		1 7/16"	Similar to No. 25.
207		25	1	2			1 7/16"	Similar to No. 25.
237		25	1	2	2		1"	Mts. on Metal Jack of No. 29 Drop & Jack.
277		25	1	2		1	5/8"	
301		25	1	2	1			Used on Nos. 100 & 101 Comb. Drop & Jack.
302		25	1	2	2			Used on Nos. 100 & 101 Comb. Drop & Jack.
315		25	1	2	2			No. 302, Less Restoring Spring.
316		25	1	2	1			No. 315, with Sleeve cut off contact only.
319		25	1	2	1			No. 301, with Restoring Spring cut off.

JACKS—DUMMY

Twenty Per Strip



No. 289



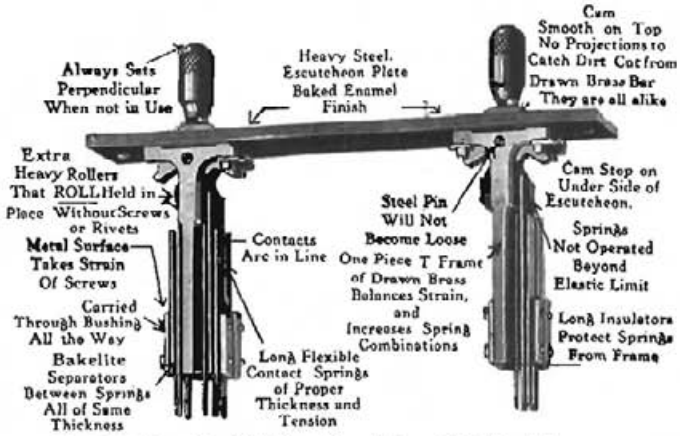
No. 308

Code No.	Centers Spaced	Face of Strip	Mtg. Pin Centers	Remarks
263	½"	10¼×½"	11$\frac{5}{32}$"	Maple ebonized face, lines up with No. 25 lamp jack.
289	$\frac{3}{16}$"	7$\frac{3}{32}$×½"	8$\frac{5}{32}$"	Maple ebonized face, lines up with No. 10 lamp jack.
294	$\frac{3}{16}$"	7$\frac{31}{32}$×½"	8.677"	Maple ebonized face, lines up with No. 32 lamp jack.
308	½"	10¼×$\frac{7}{16}$"	11$\frac{5}{32}$"	No. 263 with $\frac{7}{16}$" face, lines up with No. 36 lamp jack.
312	$\frac{3}{16}$"	7.77×$\frac{7}{16}$"	8.677"	Lines up with No. 35 lamp jack.
335	$\frac{3}{16}$"	7$\frac{31}{32}$×$\frac{7}{16}$"	8$\frac{5}{32}$"	Lines up with No. 41 lamp jack.

Code No., Type and Group No. of Kellogg Spring Jacks

Code No.	Type	Group No.
3	3	
6	3	
10	16	116
18	16	
22	16	
24	24	24
25	25	215
26	16	116
33	16	
35	35	35
36	36	36
37	36	
39	16	116
40	16	
43	43	42
45	45	36
53	53	134
55	55	55
57	57	57
58	55	55
61	25	215
63	16	116
69	34	134
85	85	116
87	85	
88	88	55
94	94	134
95	16	116
97	24	24
98	85	116
99	88	55
100	94	134
118	16	
122	16	
126	16	116
129	16	
132	16	
133	16	
134	34	134
135	35	35
141	34	134
146	34	
147	34	
148	34	
149	34	
151	16	116
152	34	134
159	34	
163	16	116
186	16	
191	34	134
195	16	116
201	45	36
202	35	35
204	34	134
205	34	
207	25	215
208	208	36
209	53	34
211	16	116
215	31	215
217	34	134
218	34	
223	34	
224	57	57
225	31	215
227	31	
228	24	24
229	94	134
230	34	
231	34	
232	34	
237	25	215
238	238	
239	239	239
239A	239	
240	45	36
241	45	
244	34	134
247	16	116
250	34	134
251	34	
252	34	
253	239	239
254	254	
255	16	116
257	239	239
257A	239	
258	258	258
259	258	
260	260	
261	258	
266	34	134
267	258	258
268	258	
269	258	
270	258	
271	258	
272	258	
273	258	
274	239	239
276	57	57
277	25	215
278	278	278
279	278	
281	45	36
282	258	258
283	16	116
285	258	258
286	260	
288	239	239
291	291	291
292	292	239
293	292	
295	239	239
296	296	258
297	296	
298	298	134
299	298	
301	25	215
302	25	
303	260	258
304	260	
309	296	
310	310	310
311	311	116
313	292	239
314	292	
315	25	215
316	25	
318	296	258
319	25	215
322	34	134
324	258	258
325	325	325
326	258	258
327	258	
328	258	
329	258	
332	94	134

KEYS—SWITCHBOARD



No. 1041 Key, No. 1033 Key Mounted on 1013 Escutcheon

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.

There is no hard rubber used in the construction of these keys. All bushings, insulations and rollers are made from Bakelite Dilecto, 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 pure platinum 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.

A complete list of escutcheons for these keys is shown on pages 66 and 67.

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.

Single Locking Type

Code No.	Contacts — Rollers Toward Head — Break	Make	Make & Break	Make Before Break	Sets of Springs	Contacts — Rollers Toward Nut — Break	Make	Make & Break	Make Before Break	Sets of Springs
1001		2			2					
1003	4				4					
1004	2	2			4					
1005		2			2					
1014				2	2					
1017	1	3			4					
1025		2		2	4					
1028			2		2					
1034			4		4					
1035		1	2		3					
1042		3			3					
1069	1	1	2		4					
1070	2	4			6					
1072		4			4					
1083	1		2		3					

Double Locking Type

1002		2			2	2				2
1010	2		2		4	2	2			4
1011		4			4	4				4
1013			4		4		4			4
1019			2		2		2			2
1020		2			2	2				2

KEYS—SWITCHBOARD

Double Locking Type

Code No.	Contacts — Rollers Toward Head: Break	Make	Make & Break	Make Before Break	Sets of Springs	Rollers Toward Nut: Break	Make	Make & Break	Make Before Break	Sets of Springs
1030	....	....	2	....	2	....	....	2	....	2
1036	....	....	2	....	2	....	1	2	....	3
1037	1	2	....	....	3	....	....	2	....	2
1039	....	....	....	2	2	....	....	....	2	2
1040	....	1	2	....	3	....	1	2	....	3
1052	....	2	....	2	4	1	3	....	....	4
1059	2	....	....	....	2	2	....	....	....	2
1067	1	1	2	....	4	1	1	2	....	4
1073	2	2	....	....	4	....	....	2	....	2
1074	....	1	....	2	3	....	1	....	2	3

Locking and Restoring Type

1016	....	....	4	....	4	....	....	2	....	2
1021	....	3	....	....	3	....	1	2	....	3
1023	....	4	....	....	4	....	....	2	....	2
1024	....	1	2	....	3	....	1	2	....	3
1026	....	2	....	2	4	....	....	2	....	2
1027	....	....	....	2	2	....	....	2	....	2
1029	....	....	2	....	2	....	....	2	....	2
1032	....	1	2	....	3	....	....	2	....	2
1040	1	2	1	....	4	....	....	2	....	2
1041	....	2	....	....	2	....	....	2	....	2
1043	....	3	....	....	3	....	....	2	....	2
1044	....	2	....	....	2	....	....	2	....	2
1045	....	3	....	....	3	....	....	....	....	....
1046	....	3	....	....	3	....	....	2	....	2
1047	....	2	....	....	2	....	....	....	....	....
1048	2	....	....	....	3	1	3	....	....	4
1053	2	2	....	....	4	....	....	....	....	....
1054	....	....	2	1	3	....	....	2	....	2
1057	....	4	....	....	4	1	....	2	....	3
1058	....	1	....	2	3	....	....	....	2	2
1062	....	2	2	....	4	....	....	....	....	....
1063	....	3	....	1	4	....	....	....	....	....
1076	....	....	2	2	4	....	....	2	....	2
1084	1	3	....	....	4	1	....	2	....	3
1089	....	1	....	1	2	....	....	2	....	2

Single Restoring Type

1000	....	....	....	....	....	....	....	....	....	....
1007	....	....	....	....	....	....	2	2	....	4
1008	....	....	....	....	....	2	....	2	....	4
1009	....	....	....	....	....	2	2	....	....	4
1015	....	....	....	....	....	....	....	2	....	2
1022	....	....	....	....	....	....	1	2	....	3
1033	....	....	....	....	....	....	....	2	....	2
1068	....	....	....	....	....	....	....	4	....	4

Double Restoring Type

1012	....	1	2	....	2	....	1	2	....	2
1031	....	....	2	....	2	....	....	2	....	2
1050	....	1	2	....	3	....	1	2	....	3
1060	....	....	....	....	....	....	2	2	....	4
1071	....	2	2	....	2	....	2	2	....	3
1075	1	....	2	....	3	....	1	2	....	3

KEYS—SWITCHBOARD

Four Party Type

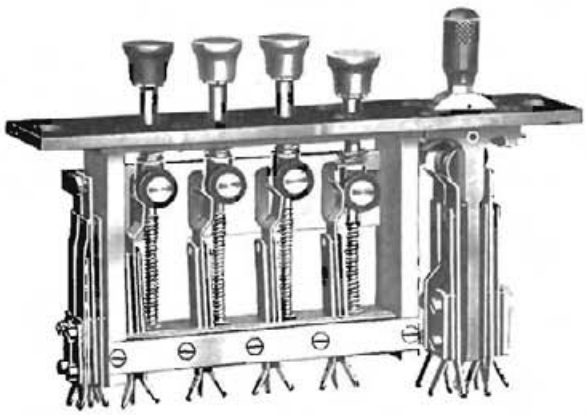
Kellogg Four Party Ringing Keys are made to give reliable and instantaneous service. The key buttons are of hard, yet not brittle, composition mounted on heavy brass rods, retained in position with tempered steel spiral springs.

The frame is of great strength and cannot warp or bind the keys.

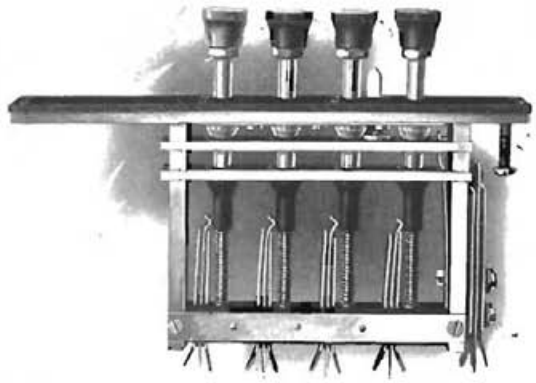
The springs are of German silver with platinum contacts. Bakelite Dilecto insulation used throughout.

It is impossible to ring more than one party on a line at one time.

These keys are of the same sturdy construction as our cam type key previously described.



No. 265



No. 270

Locking Type

Code	Length Over All	Type	Break	Make	Sets of Springs	End Springs	Remarks	
265	5½"	L	1	1	1	2	Make & Break	Similar to No. 264, but movement.
266	5½"	L	1	1	1	2	Make & Break	Similar to No. 265, not released by cam key.
267	5½"	L	1	1	1	....	.....	Master, similar to No. 265.
270	5½"	L	1	1	1	2	Make & Break	Locks in ringing position when operated. Trip restoring lever.
310	5½"	L	1	1	1	....	.....	No. 267 but not released by cam key, two end springs without contacts.
315	5½"	L	1	1	1	1	2 break, 3 makes	No. 266, but end springs.
317	5½"	L	1	1	1	2	Make & Break	No. 266, but only two buttons for 2-party. Buttons green and red.
319	5½"	L	2	2	2	....	.....	Two-party, 3 dummy terminals. Buttons red and black. Not released by cam key. Narrow mtg.
322	5½"	L	1	1	1	1	Make & Break	Mounts on ⅝" escutcheon, one extra dead spring; not restored by cam key.
324	5½"	L	1	1	1	2	Make & Break	Similar to No. 266 with special end spring.
326	5½"	L	2	2	2	....	.....	Similar to No. 319 except all buttons equipped.
328	5½"	L	1	1	1	2	Make & Break	Two-party, No. 266 less third and fourth buttons.

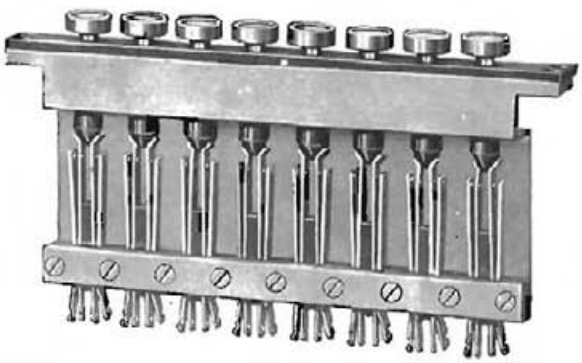
Restoring Type

264	5½"	R	1	1	1	2	Make & Break	Released by cam key.
320	5½"	R	2	2	2	....	.....	Not restored by cam key.
321	5½"	R	2	2	2	....	.....	Similar to No. 319, but restoring type; regular mounting.
323	5½"	R	1	1	1	2	Make & Break	Similar to No. 322, but restoring.

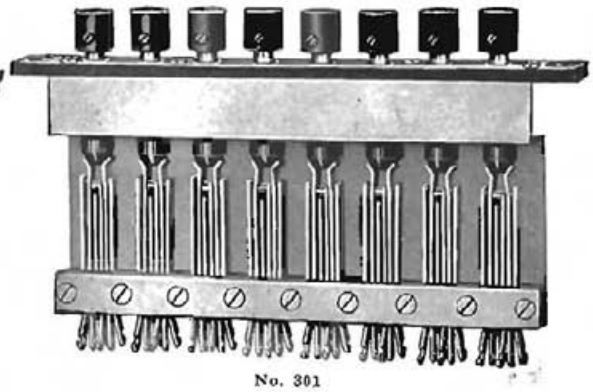
KEYS—SWITCHBOARD

Push Button Order Wire

Restoring Type—8 Per Strip



No. 318



No. 301

Code No.	Material of Frame	Mounting Space Exposed	Contacts Break	Contacts Make	Sets of Springs	Thickness of Mtg.	Mtg. Mat.	Remarks
179	Brass	5½x.498"	....	2	2	.221	Iron	
217	Brass	6⅛x.498"	....	2	2	.221	Iron	No. 179 but longer frame.
260	Brass	5½x.498"	....	3	3	.221	Iron	No. 179 but spring combination.
281	Brass	5½x.498"	....	3	3	.221	Iron	No. 260 but low button.
301	Brass	5½x.498"	....	3	3	.....	Iron	No. 260 but keys mount on esc. from top with oval head mach. screws.
309	Brass	5½x.498"	....	3	3	.....	Iron	No. 301 but low button.
318	Brass	5½x.498"	....	2	2	.....	Iron	No. 301 but spring combination.

Restoring Type—10 Per Strip

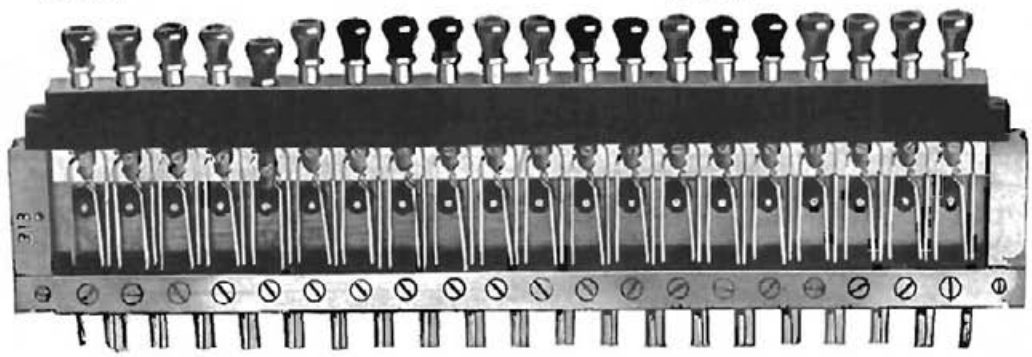
4	Hard Rubber	5 x.498"	....	2	2	⅞"	Wood	Flat rubber button.
26	Hard Rubber	5 x.498"	....	2	2	⅞"	Wood	No. 4 but with metal no. cap.
61	Brass	5 x.498"	....	2	2	⅞"	Wood	No. 26 but metal frame and spring type plunger.
206	Brass	5 x.498"	....	2	2	⅞"	Wood	No. 61 but high rubber button.
312	Brass	10¼x ½"	....	2	2	.....	.....	Similar to No. 217 but mounts in jack frame, lug mounted.
330	Brass	10¼x½"	2	....	2	.....	Wood	Same as No. 312, except spring combination.

Locking Type—10 Per Strip

314	Hard Rubber & Brass	10¼x$\frac{7}{16}$"	1	1	1	.....	.....	1" centers, mounts in jack frame, lug mounted.

Locking Type—20 Per Strip

313	Hard Rubber & Brass	10¼x$\frac{7}{16}$"	1	1	1	.....	.....	Same as No. 14 but 20 per strip on ½" centers.



KEYS—SWITCHBOARD

Push Button Order Wire

Individual Restoring Type



No. 5



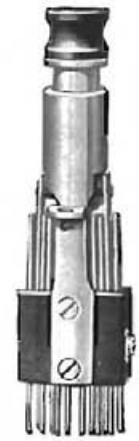
No. 172



No. 260



No. 300



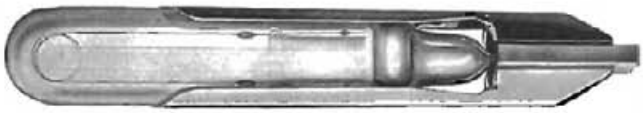
No. 303

Code No.	Material of Frame	Mtg. Space Exposed	Local Contacts: Break	Local Contacts: Make	Sets of Springs	Thickness of Mtg.	Mtg. Mat.	Remarks
5	Brass	½"	....	2	2	⅞"	Wood	Plunger turns flat rubber button.
24	Brass	½"	2	2	3	⅞"	Wood	No. 5, but spring combination.
60	Brass	½"	2	2	2	⅞"	Wood	Plunger solid high rubber button.
66	Brass	½"	2	3	3	⅞"	Wood	No. 5, but spring combination.
68	Brass	½"	2	2	2	.101"	Iron	Plunger turns, flat rubber button, square escutcheons.
163	Brass	½"	2	2	2	.101"	Iron	Similar to No. 68 with plunger for self restoring.
172	Brass	1¼"	2	2	2		Wood or Iron	Similar to No. 163, but escutcheon round and larger.
254	Brass	½"	2	2	2	¾"	Wood	Similar to No. 60.
296	Brass	½"	....	3	3	⅞"	Wood	No. 5, but spring combination.
302	Brass	½"	2	2	2	⅞"	Wood	Similar to No. 60 and No. 167, but restoring.

Individual Locking Type

93	Brass	½"	1	....	1	⅜"	Wood	Key frame strap brass, high rubber button.
121	Brass	½"	2	2	2	⅞"	Wood	Plunger turns, body made of metal, high rubber button.
162	Brass	½"	2	2	2	.101"	Iron	Plunger body is metal; high rubber button; round escutcheon.
167	Brass	½"	2	2	2	⅞"	Wood	Similar to No. 121, but plunger solid.
255	Brass	½"	2	2	2	¾"	Wood	Similar to Nos. 121-254, but locking.
269	Brass	½"	....	3	2	⅞"	Wood	No. 167, but spring combination.
273	Brass	½"	....	2	2	¾"	Wood	No. 255, but spring combination.
300	Brass	½"	....	2	2	⅞"	Wood	No. 269, but meteor metal contacts.
303	Brass	½"	4	4	4	⅞"	Wood	No. 167, but spring combination for standard magneto boards.

LAMPS—SWITCHBOARD



This Illustration Twice Actual Size.

Length, over all, 1 22/32".
Diameter, over all, 5/16"

Repeated tests we have made show that Kellogg switchboard lamps are superior to any other switchboard lamps on the market. They are made from best materials by expert workmen. The glass is of uniform thickness and texture, 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. Our mercury pumps give as near a perfect vacuum as possible.

Some Advantages of Kellogg Lamps

A separate inner mounting of glass for support of the filament.

An improved shape globe with smooth surface and uniform in outline.

Added strength is given in the method of attaching the terminal.

There is no exterior soldering or uneven surface to catch or wear in the jack.

The glowing filament is at uniform distance from the bulb or convex end of the lamp.

All Kellogg lamps are tipless. There are no parts to work loose. Terminal plates are clinched into the woodwork.

The brass contact terminals are designed to give strength and protection to the lamp, as well as perfect contact when placed in the jack.

The carbon filament is prepared by special formula to give longest life, greatest strength, and uniform illumination.

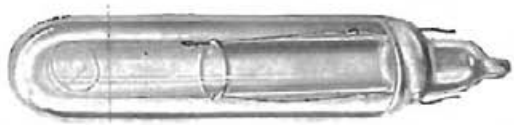
The great care in construction gives a lamp cheaper in first cost than others, because it guarantees one cheaper in final cost, it gives longer service under the same conditions than any other.

Kellogg lamps fit all standard lamp jacks.

The complete manufacturing equipment, the care and precision in Kellogg construction, give the Kellogg lamp all these important qualities with minimum production costs.

Code No.	Voltage	Current Consumption Min. Amperes	Max. Amperes
3A	3	.200	.260
4A	4	.175	.245
6A	6	.120	.170
6B	6	.270	.310
6C	6	.170	.210
8A	8	.085	.105
10A	10	.085	.105
12A	12	.085	.105
14A	14	.085	.105
16A	16	.085	.105
20A	20	.085	.105
24A	24	.085	.105

Code No.	Voltage	Current Consumption Min. Amperes	Max. Amperes
24B	24	.045	.065
24C	24	.025	.035
27A	27	.085	.105
30A	30	.085	.103
36A	36	.060	.080
40A	40	.055	.080
40B	40	(Voltage variation from 35 to 47 like W. E. No. 2-T)	
44A	44	.055	.080
48A	48	.045	.070
55A	55	.045	.070
110A	110		15 Watts



Lamp ready for attaching to base.

PANELS—AUXILIARY APPARATUS

Many towns have, in the last few years, installed electric light plants or have connections for commercial current with nearby towns.



No. 4

Telephone plants located in towns having commercial current can by connecting the current through a Kellogg apparatus panel, use it for operating the pole changer. The use of commercial current reduces the cost of ringing to a minimum.

Converters operating directly from 110 volt commercial alternating current and furnishing proper ringing current are listed on pages 35-38.

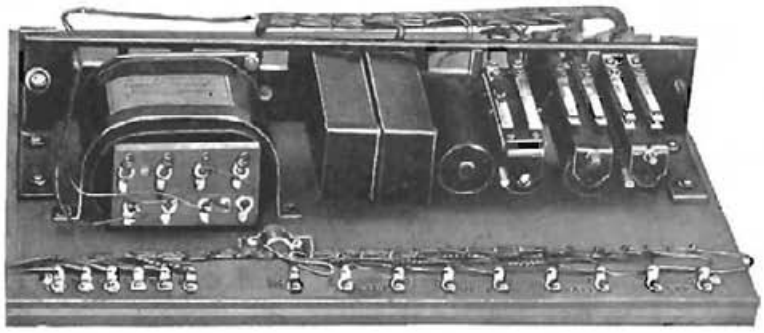
The Nos. 1, 4 and 5 are fitted with fused switches to throw the current on and off and No. 5 for protection in case of shorts, also lamp sockets for the necessary lamps in the circuits.



No. 5

The No. 2 is fitted with a fused switch for switching the current on and off and for protection in case of shorts.

Each code includes a heavy wood panel on which the apparatus is mounted.



No. 3 with Relay Covers Removed

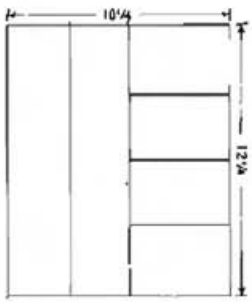


No. 2

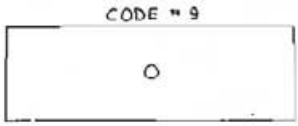
Code No.	Trans.	Repeating Coil	Relays	Cond.	Posts Binding	Remarks
2	No. 11-A Less Base				2 No. 11	Used on 110-volt, 25-cycle alternating current with No. 1-AT ringing set.
3		No. 16-A	1 No. 2004-S-V 1 No. 2002-S-BH 1 No. 2059-S-BX	2 No. 64 1 No. 35		Used on No. 2 composite ringing interrupter.
4	No. 37981		1 No. 2017-S-FK	1 No. 25	8 No. 11	Used with either No. 23 or No. 30 pole changer on 110-volt direct current.
5	No. 37981	No. 52 Res. Coil	1 No. 2017-S-FK	1 No. 25	8 No. 11	Used with either No. 23 or No. 30 pole changer on 220 volt direct current.
6						Harmonic master key. 4 and 8 party. For No. 150 magneto Swbds.

PIGEON HOLES

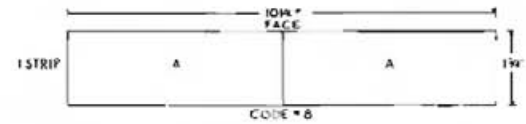
Below are sketches showing standard pigeon-hole and cash drawer equipments for magneto switchboards. Code No. 6 Pigeon-Hole takes No. 9 cash drawer and occupies space of 5 comb. drops and jacks.



Code No. 1
Occupies Space of 10 Combined Drops and Jacks



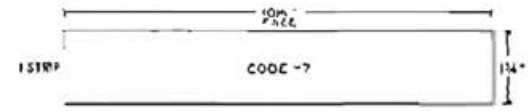
Cash Drawer
To Fit "A"



Occupies Space of 10 Combined Drops and Jacks with Compartments for Cash Drawers



Code No. 10
Occupies Space of 20 Combined Drops and Jacks



Occupies Space of 10 Combined Drops and Jacks

For 10 Per Strip Jack Space Having 10¼ Inch Face

Code No.	Vertical Spacing	No. of Book Stalls	No. of Pigeon Holes	Remarks
1	12¼ in.	2 left vertical	4 right horizontal	Pigeon hole takes no cash drawer.
2	5⅛ in.	1 above horizontal	4 below horizontal	Pigeon hole takes No. 5 cash drawer.
3	1⅞ in.	1 above horizontal		
4	1⅞ in.		2 horizontal	Pigeon hole takes No. 5 cash drawer.
7	1¾ in.	1 horizontal		
8	1¾ in.		3 horizontal	Pigeon hole takes No. 9 cash drawer.
10	3½ in.		2 horizontal	No cash drawer.

For 5 Per Strip Jack Space Having $5^{55}/_{84}$ Inch Face

6	1¾ in.		1 horizontal	Takes No. 9 cash drawer.
11	$9^{11}/_{12}$ in.		3 horizontal	Lower pigeon hole takes cash drawer.

Cash Drawers

5	1⅞ in.			Width is 4¾, depth 5⅛.
9	1¾ in.			Width is 4¾, depth 5⅛.

Miscellaneous

12	$9^{5}/_{12}$ in.		2 vertical	
13	2¼ in.	4 horizontal		4 book shelves and 2 cash drawers.

PLATES — NUMBER

The number plates for numbering subscribers lines, ringing keys, drops on magneto boards, switches on power boards, etc., are made up and carried in stock as follows:



No. 3



No. 5



No. 10



No. 16



No. 88



No. 57

Code No.	Size	Inscription	How Inscribed	Construction: Material	Construction: Finish	Construction: Shape	Where Used
2	3/8x1/4"	As specified	Stamped and filled with white lead	Brass	Oxidized and Lacquered		No. 37 and 201 Spring Jacks
3	1/8x5/16"	As specified	Stamped and filled with white lead	Brass	Oxidized and Lacquered		No. 40-95-195 Spring Jacks
4	3/4" diam.	As specified	Engraved and filled with black paint	Ivory	Polished	Round	Key and Plug Shelves
5	1/8" diam.	As specified	Engraved and filled with black paint	Ivory	Polished	Round	Key and Plug Shelves
10	5/8x5/16"	As specified	Stamped	German Silver	Oxidized and Lacquered		Drop Shutters
16	3x3/4"	As specified	Stamped and filled with black paint	Copper	Polished		Power Board Apparatus Labels
57	3/4x3/4"	As specified	Engraved and filled with black paint	Ivory	Polished	Square	Stile Strips
88				Steel	Black enamel		Transmitters
90	3 1/4x3/8"	As specified	Stamped and filled with white lead	Steel	Oxidized and Lacquered		No. 16 Arresters



46



98



113



87



38



17

Code No.	Size	Inscription	How Inscribed	Construction: Material	Construction: Finish	Construction: Shape	Where Used
17	5/8x 3/8 in.	As specified	Stamped	German Silver	Oxidized and Lacquered	Rectagonal	Stile Strips
38	3/4x1 in.	As specified	Stamped and filled with white lead	Steel	Oxidized	Angle	Kellogg Arrester Bars
46	1 1/4x1 3/4 in.	As specified	Engraved and filled with black paint	White Ivory	Polished	Rectagonal	Swbds.
50	1/2x 5/8 in.	As specified	Stamped and filled with white lead	Brass	Oxidized and Lacquered	Rectagonal	214 and 217 Spring Jacks
72	7/8x 3/4 in.	As specified	Engraved and filled with black paint	Celluloid	Polished	Rectagonal	Stile Strips replace No. 30
87	1 x2 in.	As specified		Brass, Paper and Celluloid	N. P.		Transmitters
98	1 1/2x1 in.	As specified	Stamped and filled with black enamel	White opaque Celluloid	N. P.	Rectagonal	Stile Strips
99	1 1/2x 11/16 in.	As specified	Stamped and filled with black enamel	White opaque Celluloid	Polished	Rectagonal	Stile Strips
101	3 x 1/2 in.	As specified	Stamped and filled with black paint	Copper	Polished	Rectagonal	Power Plug Switches
102	5 1/2x 1/2 in.	As specified	Stamped and filled with black paint	Copper	Polished	Rectagonal	Power Plug Switches
103	8 x 1/2 in.	As specified	Stamped and filled with black paint	Copper	Polished	Rectagonal	Power Plug Switches
104	10 1/2x 1/2 in.	As specified	Stamped and filled with black paint	Copper	Polished	Rectagonal	Power Plug Switches
105	13 x 1/2 in.	As specified	Stamped and filled with black paint	Copper	Polished	Rectagonal	Power Plug Switches
113	5/8x2 1/8 in.	As specified	Stamped and filled with white lead	Bakelite		Rectagonal	Power Board

PLUGS—SWITCHBOARD

Kellogg switchboard plugs are made to give maximum service. The heavy brass tips are made so as 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.

Whit, abbreviation for Whitworth tap having rounded top threads which prevent cutting cords.

Two Conductor



No. 3



No. 26



No. 42



No. 70



No. 130



No. 109



No. 122



No. 211



No. 387



No. 144

Code No.	Diam of Metal Sleeve	Shape of Tip	Tap for Cord	Fits Jacks Nos.	Fits Cords Nos. Steel	Tinsel	Remarks
3	.2495	Conical	$\frac{5}{16}$-18 whit.	3-6-25-61-207-237-277-301-302-315-316-319-215-225-227-233 and 100-101-102-103-105-113-112-118-30-comb. D&J.	304	301	Magneto switchboards. Sleeve conductor turned down.
26	.1775	Round	12-24 whit.	55-88-89	305	.....	Insulated metal ring.
29	.2495	Conical	$\frac{5}{16}$-18 whit.	For worn jacks	304	301	2 springs in sleeve.
42	.2495	Conical	$\frac{5}{16}$-18 whit.	same jacks as No. 3 plug.	304	301	Same as No. 3 but full sleeve.
44	.2495	Round	$\frac{5}{16}$-18 whit.	69-134-141-146-147-148-149-152-159-191-204-205-211-218-223-230-231-232-244-250-251-252-266-322-53-209-94-100-229-332-298-299	310	313	Test plug.

PLUGS—SWITCHBOARD

Two Conductor

Code No.	Diameter of Metal Sleeve	Shape of Tip	Tap for Cord	Fits Jacks Nos.	Fits Cords Nos. Steel and Tinsel	Fits Cords Nos. Tinsel	Remarks
55	.2495	Conical	6-18 whit.	10-18-22-26-33-30-40-63-95-116-122-126-129-132-133-151-163-186-195-211-247-255-283-85-87-98-311	304	301	No short circuit in jack
70	.2495	Conical	6-18 whit.	Same jack as No. 44 plug	304	301	
92	.2495	Conical	2-18 whit.	Dean jacks			Replaces Dean plug
109	.2495	Round	6-18 whit.	Same jacks as No. 44 plug	304	301	
122	.2013	Conical	12-24 whit.	Stromberg Carlson jacks	336		Replaces S. C. Co. No. 331 plug
130	.2495	Round	6-18 whit.	Same jacks as No. 44 plug	304	301	Replaces W. E. Co. No. 47 plug
144	.2485	Conical	6-18 whit.	Swedish-Am. jacks			Replaces Swedish Am. plugs
168	.2495	Round	6-18 whit.	Same jacks as No. 44 plug	304	301	Similar to 130 with large sleeve
187	.2495	Conical	6-18 whit.	Same jacks as No. 55 plug	304	301	Similar to No. 112 but tip and length
193	.2495	Conical	8-18 whit.	Same jacks as No. 55 plug	304	301	
195	.2013	Conical	12-24 whit.	Stromberg-Carlson jacks	336		Replaces S. C. Co. plug
141	.2215	Conical	4-32	239-253-257-274-288-295-254-292-293-313-314	325	323	No. 129 but two conductors
138	.2495	Conical	6-18 whit.	258-259-261-267-268-269-270-271-272-273-282-285-324-326-327-328-329-260-286-303-304-296-297-318-309	304	301	No. 106 but two conductors
211	.2215	Conical	2-24 whit.	36-37-45-201-240-241-281-208	323	324	

Three Conductor



No. 82



No. 137



No. 106

Code No.	Diameter of Metal Sleeve	Shape of Tip	Tap for Cord	Fits Jacks Nos.	Fits Cords Nos. Steel	Fits Cords Nos. Tinsel	Remarks
13		Round	6"-18 whit.	Group No. 35.			
82	.248	Round	6"-24	Sterling Elec. Co. jacks	335		Replaces Sterling plug
91	.2187	Conical	2-24 whit.	Dean jacks	342	329	Replaces Dean plug
106	.2495	Conical	6-18 whit.	258-254-261-267-268-269-270-271-272-273-282-285-324-326-327-328-329-260-286-303-304-296-297-318-309	303	309	Used on three wire Kellogg boards
111	.2495	Round	6-18 whit.	Fits North Elec. jacks			Replaces North Elec. plugs
137	.2495	Round	6-18 whit.	Same jacks as No. 55 plug	303	309	Used in Universal cord ckts. 3 wire board
165	.2495	Round	6-18 whit.	Same jacks as No. 44 plug	303	309	

PLUGS — SWITCHBOARD

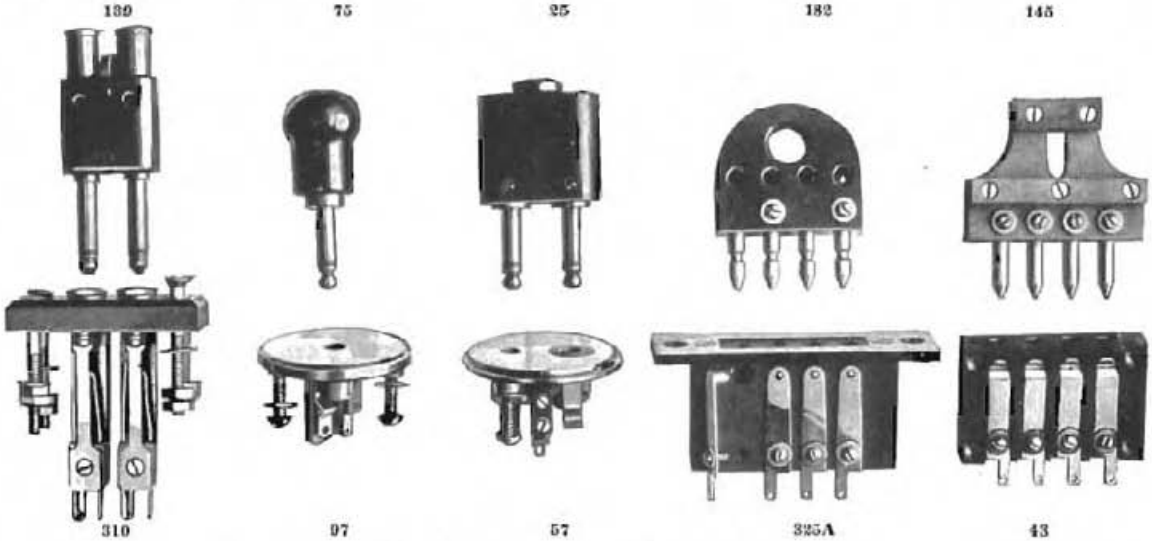
Three Conductor

Code No.	Diam. of Metal Sleeve	Shape of Tip	Tap for Cord	Fits Jacks Nos.	Fits Cords Nos. Steel and Tinsel	Fits Cords Nos. Tinsel	Remarks
175	.261	Round	12-24	Sterling Elec. Co. jacks			Replaces No. 31 Sterling plug for reamed out jacks
176	.2175	Conical	¼-32	Garford jacks		349	Replaces Garford plugs
177	.2175	Conical	¼-32	Garford jacks		439	No. 176 but extra insulator and dead metal ring
185	.210	Round	5/32-24 whit.	W. E. Co. jacks	368		Replaces W. E. Co. No. 109 plug
191	.2495	Round	5/16-18 whit.	W. E. Co. jacks	358		Replaces W. E. Co. No. 110 plug
194	.2495	Round	5/16-18 whit.	Same jacks as No. 44 plug	303	309	
199	.220	Conical	¼-32	Garford jacks 339 replaces Garford plug.			
201	.2215	Conical	¼-32	239-253-257-274-288-295-294-292-293-313-314	325	326	
202	.248	Round	5/16-18 whit.	Sterling Elec. Co. jacks			Replaces Sterling plug

PLUGS — OPERATORS

The construction of the No. 25,107 and 139 types is substantially the same as the regular switchboard plug except that they are mounted in hard rubber covers.

The No. 131, 145 and 146 types are of the same construction both as to design and material. 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.



One Prong—Two Conductor

Code No.	Diam. of Metal Sleeve	Shape of Tip	Tap for Cord	Fits Jacks Nos.	Fits Cords Nos.	Remarks
75	.2495	Round	12-24	24-97-228	237	
107	.2495	Round	5/16"-18 whit.	24-97-228	260-T	No. 75 but cord bushing
148	.2495	Round	12-24	24-97-228	237	Two one cond. plugs under one cover.

Two Prong—Two Conductor

Code No.	Diam. of Metal Sleeve	Shape of Tip	Tap for Cord	Fits Jacks Nos.	Fits Cord No.	Remarks
16	.2495	Round	5/32"-24 whit.	34 spring jacks in pairs for Test Panel	307-ST	Two 1 cond. plugs under one cover

PLUGS — OPERATORS

Two Prong—Four Conductor

Code No.	Diameter of Metal Sleeve	Shape of Tip	Tap for Cord	Fits Jacks Nos.	Fits Cord No.	Remarks
25	.2495	Round	7/16" Not Tapped	57-224-276	67-0	Two 2 cond. plugs under one cover
136	.2495	Round	9/32" Not Tapped	57-224-276	239-0	No. 25 but cord bushing
139	.2495	Conical	12-24	310	463-0, 440-0, 464-0	Two 2 cond. plugs under one cover

Two Prong—Six Conductor

81	.2495	Conical	7/16"-18 whit.	34 spring jack in pairs for Test Panel	316-T	Two 3 cond. plugs under one cover

Four Prong—Four Conductor

145	.210	Conical	1/4" Not Tapped	43	111-O	Used with breast plate sets.
146	.210	Conical	Half hole 1/4" dia.	43	110-OR	Used with Operators' Receiver and suspended trans.
182	.218	Conical	1/8" Not Tapped	325 and 325A	439-O	

Five Prong—Five Conductor

131	.210	Conical	1/4" Not Tapped	291	110-OR or 111-O	For boards with both suspended and breast plate type trans., 111-0 cord for breast plate type and 110-0R for suspended type.

SWITCHBOARD PLUG GROUPS

For Jack Group No. 215 — Plug Group No. 42 — Also Jack Group No. 116

Code No.	Conductor	Shape of Tip	Tap for Cord	Diameter of Metal Sleeve	Fits Cord	Fits Comb. D. & J.	Remarks
3	2	Conical	7/16"-18	.2495	304	101-103-5-100 102-117-301-113 118-300	Sleeve conductor turned down
42	2	Conical	7/16"-18		304	101-103-5-100 102-117-301-113 118-300	Same as No. 3 with full sleeve.

Plug Group No. 26 for Jack Group No. 55

26	2	Round	12-24	.1775	305	Insulated metal ring. Small tip

Plug Group No. 211 for Jack Group No. 36

211	2	Conical	9/32-24	.2215	324	

Plug Group No. 55 for Jack Groups Nos. 116 and 215

55	2	Conical	7/16-18	.2495	304	114-116	No. short ckt. in Jack
137	3	Round	7/16-18	.2495	303	114-116	Same as No. 55 except 3 conductor
187	3	Conical	7/16-18	.2495	304	114-116	Sim. to No. 112 except change in tip and length
193	2	Conical	7/16-18	.2495	304		

Plug Group No. 106 for Jack Group No. 258

138	2	Conical	7/16-18	.2495	304	104, 105, 106	Same as No. 106 but 2 conductor.
106	3	Conical	7/16-18	.2495	303	107, 114, 116, 119	

Group No. 129 for Jack Group No. 239

141	2	Conical	1/4-32	.2215	323	115	No. 129 but 2 conductor.
203	3	Conical	1/4-32	.2215	326	115	Replaces No. 129 and No. 154

SWITCHBOARD PLUG GROUPS

Plug Group No. 13 for Jack Group No. 35

For limited service, see plug group No. 74.

Code No.	Conductor	Shape of Tip	Tap for Cord	Diameter of Metal Sleeve	Fits Cord	Fits Jacks	Remarks
13	3	Round	7/8-18	.265	303		Similar to No. 12 except sleeve.

Group No. 74 for Jack Group No. 134

44	1	Round	7/8-18	.2495	310	110, 111, 112	Used for testing.
70	2	Conical	7/8-18	.2495	304	110, 111, 112	
130	2	Round	7/8-18	.2495	304	110, 111, 112	W. E. Co. No. 47 fits No. 66 Comb. D. & J.
168	2	Round	7/8-18	.2495	304	110, 111, 112	Sim. to No. 130 with large red fibre sleeve. Sim. to W. E. Co. No. 47.
165	3	Round	7/8-18	.2495	309	110, 111, 112	Sim. to No. 118 except insulator and middle conductor.
194	3	Round	7/8-18	.2495	309	110, 111, 112	Replaces No. 179.

OPERATOR PLUG GROUPS

Plug Group No. 107 for Jack Group No. 24

Code No.	Conductor	Shape of Tip	Tap for Cord	Diameter of Metal Sleeve	Fits Cord	Fits Jacks	Remarks
75	2	Round	12-24	.2495	26-237	24	
107	2	Round	7/8-18	.2495	26-237	24	No. 75 except cord bushing.
148	2	Round	12-24	.2495	26-237	24	No. 107 with adapter for No. 237 cord.

Plug Group No. 16 for Jack Group No. 298

16	2	Round	5/8-24	.....	307	298	2-4 conductor plugs under one cover for test panel.

Plug Group No. 25 for Jack Group No. 57

25	4	Round	7/8 Hole not tapped	.2495 Each	67	57	2-2 conductor plugs under one cover bushing No. 6208.
136	4	Round	3/4 Hole not tapped	.2495 Each	67	57	Same as No. 25 except size of cord bushing.

Plug Group No. 139 for Jack Group No. 310

139	4	Conical	12-24	.2495 Each	440-463-464	310	2 No. 130 plugs under one cover with No. 13034 bushings.

Plug Group No. 81 for Jack Group No. 134

Code No.	Conds.	Shape of Tip	Tap of Plug End	Diameter of Metal Sleeve	Fits Cord No.	Fits Jack No.	Remarks
81	6	Conical	7/8-18	.2495 Each	316	134	2 No. 152 Plugs under one cover for Test Panel

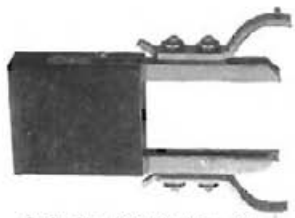
Plug Group No. 145 for Jack Group No. 43

145	4	Conical	1/4 Hole Not Tapped	.210 Each	111-0	43	New Magneto Boards
146	4	Conical	Half Hole for Cord 1/4" Diam.	.210 Each	110-0R	43	New Magneto Boards

Plug Group No. 131 for Jack Group No. 325

131	5	Conical	1/4" Hole Not Tapped	.210 Each	111	291	Similar to No. 145 but 5 conductor

PLUGS — TEST



Code No. 23—Testing Plug

No. 21. Test Plug for American Arresters. Total Length $1\frac{29}{32}$".

No. 23. Four Conductor Test Plug for No. 1 Kellogg Arrester.

No. 190. Test Plug for No. 16 Kellogg Arresters.

No. 30. Single Prong Test Plug. Length $1\frac{29}{32}$.

No. 41. Double Prong Test Plug for American Electric Fuse Co.'s combined cross connecting rack and fuse board.

PLUGS — DUMMY

Apparatus Blank Type



Code No. 6

Code No.	Shape of Tip	Diameter of Plug	Total Length	Material	Finish	Remarks
6A	Round	.500	$1\frac{3}{16}$"	Oak	Golden	Used with Pc. No. 25325 Bushing.
6C	Round	.500	$1\frac{3}{16}$"	White Maple	Mahogany	Same as No. 6A except finish.
7A	Round	.3437	$\frac{11}{16}$"	Oak	Golden	Used to cover blanks left in key shelf where lamps are omitted.
7B	Round	.3437	$\frac{11}{16}$"	Maple	Ebonized	
7C	Round	.3437	$\frac{11}{16}$"	Maple	Mahogany	
24	Round	.2495	$1\frac{13}{64}$"	Hard Rubber	Buffed	Used to plug out multiple jacks.
39	Round	.3437	$\frac{11}{16}$"	White Oak	Dead	Same as No. 7 series except finish.
60	Round	.3437	$\frac{7}{16}$" and Screw	Brass	Nickel Plated	Same use as No. 24.



Code No. 133

Code No.	Shape of Tip	Diameter of plug	Total Length	Material	Finish	Remarks
119-A	Round	.4375	$1\frac{7}{16}$"	Oak	Golden	Used with Pc. No. 25325 Bushing.
119-C	Round	.4375	$1\frac{7}{16}$"	Maple	Mahogany	Used with Pc. No. 25325 Bushing.
120	Spec.	.113	$\frac{3}{32}$"	Brass	Black Enameled	For No. 233 Mtg.
124	Round	.3125	$\frac{15}{16}$" & Screw	Birch	Imitation Leather	Used with Pc. No. 6074 Bushing.
125	Round	.4687	$1\frac{7}{16}$" & Screw	Birch	Imitation Leather	Used with Pc. No. 19322 Bushing.
126	Round	.4062	$1\frac{3}{16}$" & Screw	Birch	Imitation Leather	Used with Pc. No. 25325 Bushing.
132	Round	.115	$\frac{13}{32}$"	Brass	Black Enamel	Sim. to 120 but larger.
133-B	Round	.333	$1\frac{5}{64}$"	Muple	Ebonized	Used with Pc. No. 6074 Bushing.
134-B	Round	.490	$1\frac{21}{64}$"	Maple	Ebonized	Used with Pc. No. 19322 Bushing.
135-B	Round	.427	$1\frac{53}{64}$"	Maple	Ebonized	Used with Pc. No. 25325 Bushing.



Code No. 132

142	Flat		$1\frac{3}{64}$x$\frac{1}{8}$"	Cold Rolled Steel	Black Enameled	Used for 1000 type Key Esc.
149-B	Round	.490	1 19/64"	Maple	Ebonized	Sim. to 133 but Diameter.
150-B	Round	.5625	1 19/64"	Maple	Ebonized	Sim. to 149 but with Shoulder.
203	Round	.593		White Oak	Per Specs.	Fits Drilling for No. 39 Lamp Cap.
205-A	Round	.656		Oak	Golden	For No. 150 Magneto Swbds.

PLUGS—DUMMY

Designation Type



Code No. 134



Code No. 83



Code No. 93

Code No.	Shape of Tip	Diameter of plug	Total Length	Material	Finish	Remarks
27	Flat	.2495	$\frac{13}{16}$"	Hard Rubber	Buffed	Numbered.
46	Round	.2495	$\frac{1}{2}$"	White Oak	Golden	Fits No. 258 jack
83	Flat	.2495	$\frac{9}{16}$"	Brass	White Enam.	Fits No. 258 jack
84	Flat	.2495	$\frac{5}{8}$"	Brass	Black Enam.	Fits No. 258 jack
85	Flat	.2495	$\frac{9}{16}$"	Brass	Red Enam	Fits No. 258 jack
86	Flat	.2495	$\frac{9}{16}$"	Brass	Blue Enam.	Fits No. 258 jack
87	Flat	.2495	$\frac{9}{16}$"	Brass	Yellow Enam.	Fits No. 258 jack
88	Flat	.2495	$\frac{9}{16}$"	Brass	Green Enam.	Fits No. 258 jack
93	Flat	.221	$\frac{31}{32}$"	Non Exp. Celluloid	White	Fits No. 239 jack
94	Flat	.221	$\frac{31}{32}$"	Non Exp. Celluloid	Black	Fits No. 239 jack
95	Flat	.221	$\frac{31}{32}$"	Non Exp. Celluloid	Red	Fits No. 239 jack
96	Flat	.221	$\frac{31}{32}$"	Non Exp. Celluloid	Blue	Fits No. 239 jack
97	Flat	.221	$\frac{31}{32}$"	Non Exp. Celluloid	Yellow	Fits No. 239 jack
98	Flat	.221	$\frac{31}{32}$"	Non Exp. Celluloid	Green	Fits No. 239 jack
100-B	Flat	.2187	$1\frac{3}{32}$"	Maple	Black	Fits Dean Jack
101	Flat	.2187	$\frac{7}{16}$"	Brass	White Enam.	Fits Dean Jack
103	Flat	.181	$\frac{31}{32}$"	Brass	Red Celluloid	
104	Flat	.181	$\frac{33}{64}$"	Brass	White Cellu'd	
105	Flat	.181	$\frac{33}{64}$"	Brass	Blue Celluloid	
158	Flat	.212 to .217	$1\frac{3}{32}$"	Celluloid	White	
159	Flat	.212 to .217	$1\frac{3}{32}$"	Birch	Black	
160	Flat	.212 to .217	$1\frac{3}{32}$"	Birch	Yellow	
161	Flat	.212 to .217	$1\frac{3}{32}$"	Birch	Red	
169	Flat	.212 to .217	$\frac{31}{32}$"	Birch	Black	
170	Flat	.212 to .217	$\frac{31}{32}$"	Birch	White	
171	Flat	.212 to .217	$\frac{31}{32}$"	Birch	Red	
172	Flat	.212 to .217	$\frac{31}{32}$"	Birch	Yellow	
173	Flat	.212 to .217	$1\frac{31}{32}$"	Birch	Blue	
163	Tube		1 "	Fibre Tubing	Black	Trouble sleeve for designating defective cords and plugs. Fits No. 42 plug.
189	Flat	.2187	$\frac{7}{16}$"	Brass	Unglazed White Enam.	Suitable for writing on.

POLE CHANGERS

The following pole changers are made from the highest grade materials by the Kellogg Company. The cabinets are of high grade oak and designed for mounting in a vertical position on the wall, thus requiring no floor space. The backboard panel is made of either heavy oak or slate as required. To this backboard all equipment is securely fastened and wired to terminals at the base of the panel. All equipment is covered with a cabinet, using a hinged glass door, which when opened, makes all the equipment accessible for adjustments, etc. When desired this cabinet can be removed from the backboard panel by loosening two screws.

Kellogg Pole Changers are carefully tested and adjusted before leaving the factory so that when installed no adjustments should be necessary. When adjustments are required, they can be easily made as all springs are provided with adjusting screws which enable the operating man to change the adjustment without having to bend the spring with pliers.

Two distinct types of pole changers are made by the Kellogg Switchboard & Supply Co. One is used in connection with transformers and is designed to operate from 11-cell storage battery. The second type is used without transformers, with dry cells as the source of current.

In each case special care is taken to secure ringing current at the exact rated frequency, without regard to changes in voltage of the operating battery. As a result the battery may vary from 20 to 29 volts without changing the frequency of the ringing current or the rate of vibration of the pole changer reeds.

Each pole changer unit, with the exception of the pole changer which gives pulsating and alternating current, has but three spring contacts, two ringing and one operating contact. These contacts can be furnished in either platinum or tungsten (we recommmend platinum), and are very accessible and easily adjusted, although after being adjusted properly, very little attention is required.

All pole changers are designed to mount in a vertical position upon the wall, thus requiring no floor space.

POLE CHANGERS

Transformer Sets

The Transformer Set used with the harmonic pole changer consists of one transformer and one condenser for each vibrator and one retard coil with control switch.

See page 203 for listing.

Transformer

The Transformer is used to step up current (which has been converted into proper frequency for ringing purposes) from the potential of the main exchange battery up to a voltage suitable for ringing (100 volts).

Retard Coil

If the talking circuits in the exchange are being operated from the same battery, that is being used as a source for the ringing current, then the retardation coil is put in series with the pole changer battery lead to absorb potential disturbance.

Condenser

Condensers are bridged across the transformer primary to protect the pole changer contacts from sparking.



No. 13 Pole Changer

Single Frequency

The No. 13 Single Frequency pole changer when used with a 24 volt Storage Battery and a transformer furnishes ringing current at 20 cycles for ringing ordinary polarized bells. This pole changer is used in connection with transformer 5B. These pole changers can be furnished to operate on 24, 32, 48 and 56 volts and cycles 16⅔, 20, 66⅔ and 16.

Code No.	Operated By Voltage	Vibrators Frequency	Vibrators Resistance	Not Included in Pole Changers: Condensers	Used with Transformers	Retard Coil	Used with Transformer Set
8	24	33⅓	1200				
11	24	16⅔	2000	5	1C	23A	9B
13	24	20	2000	34	5B	41A	22A
14	24	66⅔	500	34	10A	23A	22 only with 10A Trans.
27	56	16⅔	4500	5	1D	23A	9B only with 1D Trans.
31	48	20	4500	34	5C	41A	22 only with 5C Trans.
35	24	20	2000				

If the Transformer and Retardation Coil mounted in a cabinet are desired, order a Transformer set. The above Transformer Sets have the Retardation Coil mounted in the cabinet.

Two Frequency

The No. 12 two frequency pole changer for use with common battery switchboards, furnishes ringing current at 33 and 50 cycles and is used with transformers and storage batteries.

These pole changers are arranged to operate on 24 volts and can be furnished with vibrators having 33 1/3 and 50, 20 and 60, or 16 and 60 cycle frequencies.

Code No.	Operated By Voltage	Vibrators Frequency	Vibrators Resistance	Not Included in Pole Changers: Condensers	Used with Transformers	Retard Coil	Used with Transformer Set
12	24	33⅓	1200	34	2A	23A	No. 21 less 1C and 4A Trans.
		50	800	34	3A		
21	24	20	2000	34	5B	23A	No. 21 with 5B and 6A Trans.
		60	500	34	6A		
22	24	16	2000	34	1C	23A	No. 21 with 1C and 6A Trans.
		60	500	34	6A		

The Retard Coil is not mounted in above Transformer Set cabinet.

POLE CHANGERS



No. 6 Pole Changer

Four Frequency

No. 6 Type Pole Changer

For use with Storage Batteries and Transformers.

The No. 6 type pole changer is the standard Kellogg four frequency party line pole changer for common battery switchboards. It consists of four units mounted upon a substantial slate slab, and with the assistance of transformers, furnishes ringing current at 16⅔, 33⅓, 50 and 66⅔ cycles per second, of the proper voltage for ringing harmonic party line bells.

The above pole changer is used in connection with our No. 21 transformer set operating on 24 volts.

These pole changers are also arranged to operate on 56 volts and can be equipped to furnish ringing current at 30, 42, 54 and 66 cycles per second.

				Not Included in Pole Changers			
Code No.	Operated by Voltage	Vibrators Frequency	Vibrators Resistance	Condensers	Used with Trans.	Retard Coil	Used with Trans. Set
6	24	16⅔	2000	No. 34	1C	1-23A	21A
		33⅓	1200	No. 34	2A		
		50	800	No. 34	3A		
		66⅔	500	No. 34	4A		
17	24	30	1200	No. 34	7A	1-23A	19A
		42	800	No. 34	8A		
		54	800	No. 34	9A		
		66	500	No. 34	10A		
26	56	30	3500	No. 34	7B	1-23A	20A
		42	3500	No. 34	8B		
		54	2500	No. 34	9B		
		66	2000	No. 34	10B		

The retard coil is not mounted in above transformer set cabinet.

Five Frequency

This pole changer is our standard five frequency common battery pole changer where frequencies of 16, 30, 42, 54 and 66 cycles are used. It is designed for use in connection with 24 or 40 volt storage battery and the proper transformer set.

It consists of five units mounted upon a substantial slate slab, in a cabinet with glass front cover and arranged for wall mounting.



No. 19 Pole Changer

				Not Included in Pole Changers			
Code No.	Operated by Voltage	Vibrators Frequency	Vibrators Resistance	Condensers	Used with Trans.	Retard Coils	Used with Trans. Set
19	24	16	2000	No. 34	1C	23A	18A
		30	1200	No. 34	7A		
		42	800	No. 34	8A		
		54	800	No. 34	9A		
		66	500	No. 34	10A		
28	40	16	4500	No. 68	1E	23A	18B
		30	2500	No. 68	7C		
		42	2000	No. 68	8C		
		54	1600	No. 68	9C		
		66	1000	No. 68	10C		

The retardation coil is not mounted in the above transformer set cabinets.

POLE CHANGERS

Single Frequency Pole Changer With Transformer on Back Board

The No. 29 and No. 32 pole changers were developed for use in conjunction with 32-volt farm lighting outfits, and it is usual that the exchange manager wishes to use this same battery source for the operators' circuits, in which case a No. 1 Operator's feed coil and a No. 81 Induction coil would be necessary for each operator's position. When this type pole changer is used for ringing only, the above operator's feed coil and induction coils are not necessary.

The No. 29-type pole changer is similar to the No. 13 pole changer only arranged to operate on 32 volts direct current battery to supply 20 cycles per second and has the transformer, condenser and resistance coil mounted on a long back board. Pole changer has glass front cover.

Code No.	Volts	Vibrator Frequency	Vibrator Resistance	Included In Pole Changer: Condenser	Included In Pole Changer: Transformer	Included In Pole Changer: Resistance Coil
29	32	20	2500	34	5D	5A

The No. 32 type pole changer is similar to the No. 29 pole changer, only arranged to operate on 32 volts direct current battery supply 20 cycles per second and has the transformer, condenser and resistance coil mounted on a long back board similar to the No. 29 pole changer. Pole changer has glass front cover.

Code No.	Volts	Vibrator Frequency	Vibrator Resistance	Included In Pole Changer: Condenser	Included In Pole Changer: Transformer	Included In Pole Changer: Resistance Coil
32	32	16⅔	2000	34	IC	5A

Alternating Current—Single Frequency

No. 25 Pole Changer



No. 25 Pole Changer

The No. 25 type pole changer is a combined pole changer and transformer equipment, arranged to operate from 24 or 50 volt storage battery and designed primarily for short ringing distances such as in conjunction with private branch exchanges or small private switchboard installations. Its use does away with the necessity of conducting ringing current for private branch installations through cable from the main exchange, saving cable pairs and eliminating generator noise from the cable. The pole changer is small yet durable and efficient. No dry cells or additional transformers necessary.

Code No.	Volts	Frequency	Vibrator	Resistance	Repeat Coil	Resist Coil	Condenser
25A	24	20	2025 Relay With S-A-L Coil	200	17B	2N	68
25B	50	20	2025 Relay With S-A-Q Coil	1000	17C	2N	68

For Use With Dry Cells Without Transformers

Single Frequency

The No. 9 type pole changer for several years has been our standard pole changer for operating small switchboards where dry cells are used as the source of current. Many thousand are in operation throughout the country.

It is operated from two sets of batteries, one set consisting of sixteen dry cells connected in series for operating the pole changer vibrator, and the other set of sixty dry cells in series for supplying current for ringing, making a total of seventy-six dry cells.

These pole changers are similar to the No. 23 and are arranged to deliver alternating and both negative and positive pulsating current for ringing both straight line and biased, 4-party selective telephones. They also can be furnished with pulsating current feature omitted for use with alternating ringing only.

POLE CHANGERS



No. 9-A Pole Changer

Single Frequency — No. 9 Type

For Pulsating and Alternating Current

Code No.	Vibrators Frequency	Resistance	Remarks
9	20	1000	Replaced by No. 30.
20	20	1000	(Same as No. 9, but require extra contacts in ringing keys)
30	20	1000	(Same as No. 9 with binding posts on outside of Set)

For Alternating Current

No. 23 Pole Changer



No. 23-A Pole Changer

The No. 23 pole changer is a later development in dry battery ringing machines. Since the Kellogg No. 9 pole changer was first introduced in the telephone field, it has become the standard both for efficiency and economy in operation. The Kellogg No. 23 pole changer is a further development of the No. 9, but delivers alternating current only for ringing standard polarized bells. This simplifies the construction and wiring of the machine and makes it easier to keep the springs in perfect adjustment.

It is operated with two sets of batteries, one set consisting of 16 dry cells connected in series for operating the pole changer vibrators, and the other set of 60 dry cells in series for supplying current for ringing, making a total of 76 dry cells.

Code No.	Vibrators Frequency	Resistance	Remarks
23	20	1000	(Same as No. 30 only pulsating feature omitted)
24	20	1000	(Same as No. 23 but require extra contacts on ringing keys)

DIRECT HARMONIC

Single Frequency

For Use with Dry Cells without Transformers.

No. 16 Pole Changer



No. 16 Pole Changer

This pole changer is a single frequency (20 cycle), direct ringing pole changer operated in a manner similar to the No. 15. It is used for ringing standard polarized bells only, and the circuit arrangement is the same as for one of the units of the No. 15. (See No. 15-type below.)

Code No.	Vibrators Frequency	Resistance
16	20	2000

Four Frequency

No. 15 Pole Changer

This is the Kellogg standard four-frequency direct ringing pole changer. It is designed for use in connection with magneto switchboards. It is operated from dry cells and delivers current direct from these cells to the line, without the use of transformers, at frequencies of 30, 42, 54 and 66 cycles. The vibrators are operated from 16 dry cells and the ringing current is supplied by two sets, each of which consists of 60 dry cells, making a total of 136 dry cells.



No. 16 Pole Changer

POLE CHANGERS

Four Frequency — No. 15

In connection with the above pole changer, it is necessary to supply switches, fuses and lamp resistance for protection and control of the pole changer; therefore, it is essential to order with the above pole changer an auxiliary apparatus board No. 14408, in case a single No. 15 pole changer is desired, and No. 14412 in case duplicate No. 15 pole changers are desired. When so ordered, this apparatus is mounted on an oak panel and completely wired.

When this pole changer is used, a condenser is not required in series with the telephone bell. Any bridging telephone can be converted into a four-party telephone for use with this pole changer by merely changing the bell, no alteration of the circuit or additional apparatus being required.

It will be found in some cases where long, heavily loaded farmers' lines are in use, that current of lower frequency than 30 cycles would meet the requirements more satisfactorily for straight line ringing. For these cases we recommend the No. 18 five frequency pole changer having vibrator units delivering 16, 30, 42, 54 and 66 cycles per second. (See No. 18 pole changer.)

If a No. 15 pole changer is already in use then a single frequency pole changer can be used in addition. The No. 16 is especially adapted for this purpose.

One of the most reliable features is the means for adjustment, which requires only a screw driver. No bending of springs with pliers is necessary.

A high resistance magnet operating from 16 dry cells gives the vibrator a firm, powerful action, insuring the delivery of a high voltage to the line and eliminating the waste found in most pole changers.

All connections are brought out on binding posts on the base of the machine, making it an easy matter to install and put into service.

Code No.	Vibrators	
	Frequency	Resistance
15	30	1200
	42	800
	54	800
	66	500

Five Frequency — No. 18 Pole Changer

This is the Kellogg standard five frequency direct harmonic pole changer. It is designed for use in connection with magneto switchboards, where it is preferable to use primary battery rather than storage battery.

It is operated from three sets of batteries, two sets each consisting of a series of sixty dry cells for supplying current for ringing, and one set consisting of a series of sixteen dry cells for operating the pole changer vibrators, making a total of one hundred and thirty-six dry cells.

This pole changer delivers alternating current at 16, 30, 42, 54 and 66 cycles.

In connection with the above pole changer, it is necessary to supply switches, fuses and lamp resistance for protection and control of the pole changer; therefore it is essential to order with the above pole changer, auxiliary apparatus board No. 14408 in case a single No. 18 pole changer is desired, and No. 14773 in case duplicate No. 18 pole changers are desired.

A 16-candle power 110-volt lamp, socket and No. 24 condenser are required at each position to prevent sparking at the pole changer contacts. This lamp and condenser are bridged across the frequency used for ringing by means of extra contacts at the master key or at the ringing key of each cord circuit.

In case of new switchboards equipped for the above party line ringing, the extra contact is provided at the ringing key and usually one locking four-party cam type key is supplied for each position, with which to select the desired frequency. When the master key is in normal position, the fifth frequency or 16 cycle is supplied to the ringing keys, the source of current being the hand generator or the pole changer, according to the position of the generator switching key which is usually provided.

In case of boards in service where extra contacts on each ringing key are not available, it is necessary to close the lamp and condenser circuit by means of extra contacts on the master key; therefore, the master key is usually of the non-locking cam type. This key is non-locking to eliminate the consumption of ringing battery which flows through the lamp and condenser while the master key is set.

In case eight party ringing is desired, the master key and reversing key are used, ringing four frequencies over either side of the line through the bells to ground.

The 16 cycles or fifth frequency is used for ringing on heavily loaded farmer lines where the 30 cycles is too fast to give a good ring. This frequency (16 cycles) is usually controlled by the generator switching key. This latter key is also used to connect the hand generator to the ringing circuit.

Code No.	Vibrators	
	Frequency	Resistance
18	16⅔	2000
	30	1200
	42	800
	54	800
	66	500

POSTS—BINDING

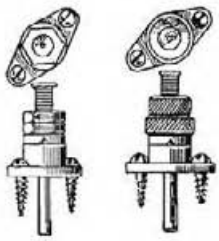
The accompanying illustrations reproduce the binding posts in half actual size. Two views, side and top, are shown of some of the binding posts, giving an accurate idea as to size, shape, location of mounting and terminal holes, etc.



No. 2 No. 6 No. 7 No. 11 No. 12 No. 13 No. 16 No. 17 No. 21

No.	Description	Use
1	Nickel-plated, drilled for tips used as line terminals. Mounts from bottom with one round head machine screw.	Compact Telephones.
2	White nickeled, size of hole No. 28 T. D. G. Terminal is 5/8-inch long by 1/8-inch diameter, and is tinned for soldering. Mounting screws are 2 No. 4x3/8-inch roundhead wood screws, plated.	In telephones, extension bells and desk set boxes for receiver terminal.
4	Nickel-plated, terminal is 5/8-inch long by 1/8-inch diameter and is tinned for soldering. Mounting screws are 2 No. 4 x 3/8-inch round head machine screws plated.	Old common battery line post.
5	Similar to No. 4 but mounts on base of old type transmitter arms.	Old type telephones.
6	White nickeled, size of hole in top and upper hole in side No. 42 T. D. G.; lower hole in side No. 29 T. D. G. Mounting screws are 2 No. 5 x 3/4-inch flat head wood screws plated.	For operators' transmitter cords.
7	White nickeled, size of hole No. 28 T. D. G. Mounting screws are 2 No. 4 x 3/8-inch round head wood screws plated.	Connecting racks and telephones.
11	White nickeled, end is tinned for soldering. Mounting screw is No. 5 x 1/2-inch roundhead, wood screw, plated.	Telephones, concealed binding post type.
12	Same as No. 2 binding post except that the hole for cord tip is drilled in line with screw holes in the base.	Telephones, extension bells and desk set boxes for receiver terminal.
13	White, nickeled. Size of hole No. 28 T. D. G. Hole for cord tip is drilled in line with screw holes in base. Mounting screws are 2 No. 4x3/8" roundhead wood screws, plated.	Connecting racks and telephones.
15	Nickel plated. Screw 3" long. Mounts with two hexagon nuts.	Test sets.
16	Nickeled and polished. Terminal is 5/8" long by 1/8" diameter and is tinned for soldering. Mounting screws are 2 No. 4x1/2" roundhead wood screws, plated.	Common battery telephones.
17	Nickeled and polished. Upper end is spun over after assembling; left hand end is tinned for soldering. Mounting screw is No. 5x1/2" roundhead wood screw, plated.	Common battery telephones.
18	Connecting rack binding post, brass; white nickeled. Mounting screw is No. 6x1/2" roundhead brass wood screw, plated.	Desk stands and connecting racks.
20	Nickeled plated. Size of hole is No. 28 T. D. G.	Ground plate of No. 6 and No. 7 arrester arranged to be riveted on.
21	Nickeled and polished. Mounting screw is No. 5x1/2" roundhead wood screw. Upper end is spun over after assembling; left hand end is tinned for soldering.	Telephones, concealed. Takes cord tip.

POSTS—BINDING


No. 22

No. 25


No. 31


No. 40


No. 41


No. 44


Pc. 36493


No. 59


No. 60


No. 61


No. 63

Code No.	Description	Use
22	Nickeled and polished. Site of hole No. 42 T. D. G. Terminal is 5/8" long by 1/8" diameter and is tinned for soldering. Mounting screws are 2 No. 4x1/2" roundhead wood screws, plated.	Common battery telephone receiver cord tip or wire.
25	White nickeled. Terminal is 5/8" long by 1/8" diameter and tinned for soldering. Mounting screws are 2 No. 4x3/8" roundhead wood screws, plated.	Lineman's test sets and portable railway sets.
26	White nickeled. Mounting screw is No. 5x1/2" roundhead wood screw. Left hand end is tinned for soldering. Nut slotted for screw driver.	Telephones, concealed.
29	Same as No. 16, but terminal post is slotted.	Common battery telephones.
31	Same as No. 12 binding post, but with 7/8" long terminal.	Telephones, extension bells and desk set boxes for receiver terminals.
33	Nickeled. Mounting screws are No. 5x1/2" roundhead wood screws.	Connecting racks.
40	Same as No. 2 binding post, but with 1/2" long terminal.	Telephones, extension bells and desk stand boxes for receiver terminal.
41	Dull nickeled. Mounting screw is 1 No. 4x3/8" round head wood screw, plated.	Telephones, new type.
44	Dull nickeled, similar to No. 22 but has no terminal.	Connecting racks.
59	White nickeled, end is tinned for soldering. Mounting screw is No. 6x1/2" flat-head wood screw, plated.	Compact type telephones for line and ground connections.
60	Dull nickeled, size of hole is No. 28 T. D. G. End tinned for soldering. Mounting screws No. 4x3/8 round-head wood screws, plated.	Compact type telephones. Receiver terminals.
61	Brass finish. Mounting screws are 2 No. 4x3/8", round-head wood screws, nickeled.	Connecting racks.
63	Same as No. 59 binding post but furnished with clip for cord tip.	Compact type telephones.
65	Dull nickeled, ends tinned for soldering.	No. 28 induction coils.
66	Nickeled, mounts on strip with machine screws.	Nos. 12, 13 and 14 connecting racks.
67	Same as the No. 66, but has different mounting screw.	No. 15 connecting rack.
68	Similar to No. 12, but has a thumb screw for securing terminal.	Miscellaneous.
Pc. 36493	Nickeled and polished. Terminal is 1/2" long by 1/8" diameter, mounts with wood screws. Has wing nut for securing terminal.	Miscellaneous.

POWER BOARDS

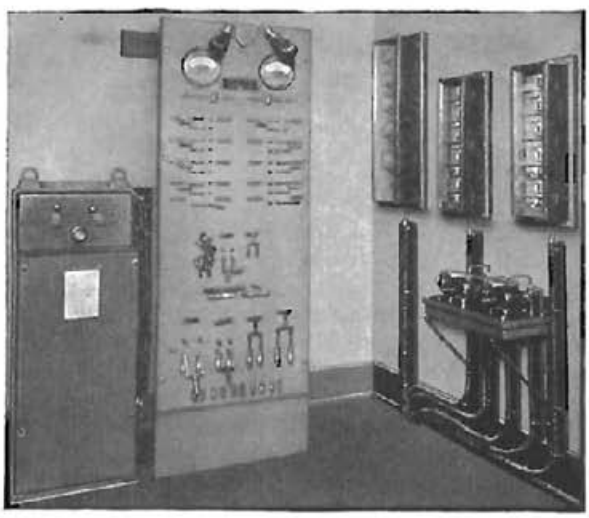
General

Kellogg Power Switchboards are designed to best meet the requirements of the installation with which they are to be used. Only the highest grade materials are used in their construction. The switches have polished copper blades and are the best obtainable. The meters and circuit breakers are types especially suited to the installation and are of high quality, the meters being finished in dead black to match the rest of the panel. Either electrical slate or ebony asbestos wood panels are used, the latter being especially adapted for use in damp climates. The wiring back of the panel is heavily insulated and arranged systematically to facilitate inspection or removal of connections without interfering with any of the other connections.

Inquiries

Inquiries for estimates on power boards should give full information regarding the kind of power available, that is, single, two or three phase and the voltage, the number of cells of battery to be charged and the normal charging rate or capacity of the battery, the type of ringing equipment and whether or not duplicate ringing sets are to be used, the type of charging equipment, and if a motor generator or engine driven generator is used, if it is desired to control the machine from the power board or at the machine.

Standard Size Power Boards



Power Equipment at Greencastle, Ind.

This illustration shows a typical Kellogg power installation equipped with our standard size power board, the panel of which is a slate slab 6′ high by 2′ 6″ wide by 1¼″ thick supported on a well braced angle iron frame 7′ high by 2′ 6″ wide. At the top of the power board is a two light bracket which illuminates the panel and particularly the meters. The voltmeter is on the left and the ammeter is on the right side of the power board near the top. Directly below each meter is an instrument switch to connect the respective meters to various parts of the circuit to read charge and discharge currents and voltages and other currents and voltages as required. The eight D. P. D. T. and two S. P. D. T. switches under the instrument switches are for the control of the pole changers and ringing interrupters shown on the right of the picture. The circuit breaker in the middle of the panel is of the "overload" type when used with a rectifier and the "overload and underload" type when used with a generator, the latter type being used to prevent the flow of current from the battery back through the generator if it accidentally stops while charging. However, both types serve to prevent too large a charging current to flow. In the illustration only one circuit breaker is used as only one rectifier, shown at the left of the power board, was supplied but sufficient space has been left for the addition of another circuit breaker on the right when the second rectifier is added to take care of the ultimate growth of the exchange.

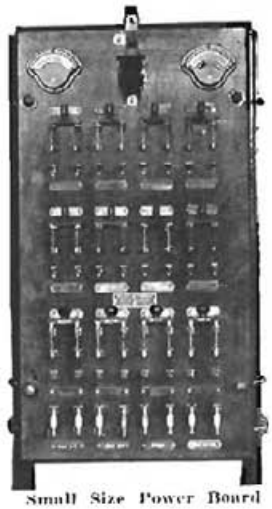
At the right of the circuit breakers, two D. P. S. T. switches are shown and these are used to start either interrupter motor, one of which runs from the commercial power circuit and the other from the exchange battery in case of emergency. Below these switches is a S. P. D. T. switch and two fuses connected in the main discharge lead in such a way that if one fuse blows, the other can be cut in the circuit by throwing the switch. The blown fuse can then be refilled. The four D. P. S. T. fused switches near the bottom control the rectifiers, two being required for each rectifier. Ten fuses are shown below

POWER BOARDS

the switches and these are for fusing the pole changers, interrupters, power board lights and miscellaneous circuits, and are refillable fuses.

Although the power board shown on page 115 is our standard, we can build power panels to any specification or for any special requirements.

Small Size Power Boards



Small Size Power Board

Our small power board is carried in stock and suitable for use in handling current up to 30-amperes. The panel is ebony asbestos wood but slate can be furnished if desired, although the former is recommended for its excellent insulating qualities and durability. This power board is supported on an iron pipe frame 5' 6" high. The panel measures 2' 7¾" by 17⅛" by 1" thick, contains twelve switches and embodies the same high class materials and workmanship as our large power board. While this panel does not contain all of the refinements of the large power board, it is unequalled for use with a small power plant and every attempt has been made to produce the most satisfactory power board for the price.

We also make a panel similar to the one described above, which contains fifteen switches and measures 2' 7¾" by 20" by 1". This panel is designed for carrying currents up to 30-amperes and to switch two sets of five frequency pole changers using interrupters for automatic ringing.

Fuse Boards



Fuse Board

The lower illustration shows a Kellogg fuse board made up of a number of slate slabs 22" by 7½" by 1¼" mounted on an angle iron frame strongly braced. The blank slabs are made of maple stained black and finished to match the slate. In building these fuse boards, provision is made for the addition of panels from time to time as the exchange grows. Each panel contains 75 fuses of 1⅓ amperes capacity each and is designed for fusing cord circuits individually, operator's circuits, pilot circuits, line circuits 20 per fuse, trunk circuits 20 per fuse, wire chief's desk, chief operator's desk and miscellaneous circuits instead of fusing these circuits in the switchboard sections, as fusing on a separate panel makes the fuses easily accessible and readily located when blown.

The arrangement is such that when a fuse blows, an alarm bell rings, a lamp lights opposite the bar containing the blown fuse and the fuse can be readily located by a white indicator on a projecting spring which is released when the fuse blows.

Examination of the illustration will show a row of 25 studs at the bottom of each panel; directly above, a narrow bar known as the alarm bar and above the alarm bar a wide bar containing 25 screws. The fuses are mounted on a mica strip and held between one of the studs and the opposite screw in the wide bar. The studs and wide bars are highly polished copper; lacquered to prevent tarnishing. The alarm bar is copper, gold plated and polished to provide a good contact surface for the contact spring on the fuse which is brought into engagement with the bar when blown, and operates the alarm as described above.

The same high class workmanship and care in the selection of materials prevails in the construction of this fuse board as in the construction of all power apparatus made by us.

PUSH BUTTONS

The following listing of push buttons contains two distinct types; one provided with mounting lugs where separate screws are required for mounting, and the other without mounting lugs where the screws used for holding the spring assembly intact are also used for mounting.

The springs are of German silver with genuine platinum contacts. Bakelite Dialecto insulation used with these push buttons, is unequalled.

The installation is simple and requires very little time.



No. 3



No. 5



No. 6



No. 14

Code No.	Contacts: Make	Contacts: Break	Contacts: Make & Break	Sets of Springs	Mtg. on	Remarks
3	1	....	....	1	⅜-in. wood	Mounting plate type.
4	1	....	....	1	⅛-in. steel	Mounting plate type.
5	....	....	1	1	½-in. wood	Mounting plate type. Similar to No. 30 but mounting lug reversed.
6	....	....	1	1	Mounted	No. 5 push button and 2 No. 16 binding posts mounted on 3 x 5 oak block.
8	....	1	....	1	½-in. wood	Similar to No. 5 but contacts.
11	....	....	1	1	½-in. wood	Mounting plate type. Combined cabinet lock and push button.
14	1	....	1	2	½-in. wood	Similar to No. 5. Mounting plate type.
15	....	1	....	1	⅛-in. steel	Mounting plate type. Used on desk stand bases transmitter cutout.
16	1	....	1	2	½-in. wood	Mounting plate type. Combined cabinet lock and push button.
20	....	2	....	2	⅜-in. wood	No mounting plate. Has two rows of springs.
21	1	....	1	2	Mounted	Includes five No. 11 binding posts mtd. on 3 x 4-⅛" oak block.
22	1	....	1	2	½-in. wood	Mounting plate type. Combined cabinet lock and push button for code ringing.
24	1	....	....	1	Special	
25	1	....	1	2	½-in. wood	Mounting plate type. Similar to No. 11 but spring arrangement of No. 14 push button.
26	2	....	....	2	⅜-in. wood	Mounting plate type. Similar to No. 21 push button.
27	2	....	....	2	3/32-in. wood	Mounting plate type. Same as No. 26 A. B. but mounts on heavier wood.
30	....	....	1	1	½-in. wood	Mounting plate type. Similar to No. 5 push button but mounting lug reversed.
32	1	1	1	3	⅜-in. wood	Mounting plate type.
34	....	1	....	1	⅜-in. wood	Mounting plate type.
37	2	....	....	1	⅜-in. wood	Mounting plate type.
42	3	1	....	2	⅜-in. wood	Mounting plate type. Combined cabinet lock and push button.
43	1	....	....	1	½-in. wood	Mtg. plate type. Similar to No. 30 push button but one make contact.
45	1	1	....	2		No mounting plate. Used with No. 97-E desk stands.
46	2	....	....	2	⅝-in. wood	Mounting plate type. Similar to No. 27 push button but longer plunger.
47	1	....	....	1	⅛-in. steel	Mtg. plate type. Used on desk stand as transmitter cutout.
48	....	....	1	1	Oak block 3x5"	Springs terminate at binding post.

RACKS—CONNECTING

For Installing Extension Sets, Etc.



No. 1



No. 2



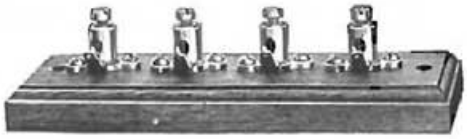
No. 7



No. 8



No. 10



No. 6



No. 5

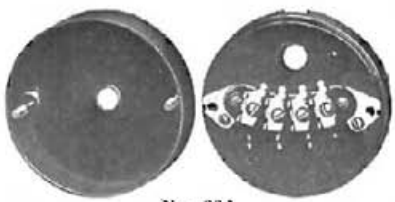


No. 11



No. 4

Code No.	Binding Posts No.	Mounting Block Code No.	Size	Material	Remarks
					2 Point
1	2	21	½x2⅛"	Maple	
2	2	18	⅞x2⅜"	Red Fibre	
8	2	61	2 x1"	Red Fibre	No. 8, but binding posts.
19	2	44	2 x1"	Red Fibre	No. 4, but base.
23C	2 Pc41419 3" diam.			Maple	
Similar to No. 23A.					
4	3	18	⅞x3⅜"	Hard Rubber	**3 Point**
9	3	18	⅞x3⅜"	Maple	
23B	3 Pc41419 3" diam.			Maple	
Similar to No. 23A.					
					4 Point
3	4	7	1 x3½"	Maple	No. 3, but posts wired in pairs.
5	4	7	1 x3½"	Maple	
6	4	33	2 x5"	Oak	No. 6, but binding posts.
7	4	44	2 x5"	Oak	
10	4	44	3½x1"	Black Fiber	
11	4	18	3⅝x1⅜"	Maple	
16	4	66	3⅛x⅝"	Bakelite	Mounted in wooden box 4½x3¼x1½"; used in 500 desk stand.
23A	4 Pc41419 3" diam.			Maple	Has steel cover which fits over mtg. block.
					5 Point
15	5	67	3⅛x⅝"	Interoid Composition	Used with No. 382 desk set box.
17	5	7	4¼x1"	Maple	



No. 23A
Universal Type. Takes Both Spike and Spade Tips.

For Desk Stands





Pc. No. 5034—Mounting block assembled; hard rubber; used on desk stand.
Pc. No. 5042—Connecting rack assembled; hard rubber; used on desk stand.

RACKS — CONNECTING

For Desk Stands



5307



6634

Pc. No. 5307—Connecting rack assembled; hard rubber; used on desk stand.
Pc. No. 6634—Connecting rack, assembled; hard rubber; used on desk stand.

For Intercommunicating Systems



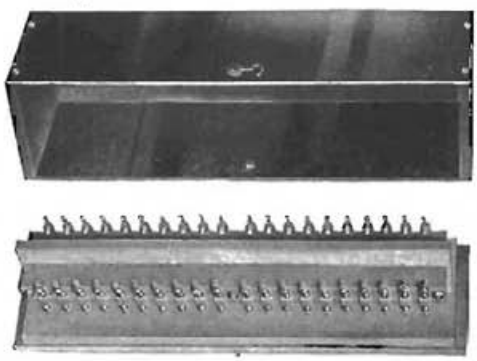
No. 22.

The No. 22 connecting rack is arranged for the connecting of ten lines. It consists of one No. 45 terminal strip mounted on a base and fitted with a steel cover, black enameled.

The connectors are arranged for either solder or screw connections.

An inexpensive, serviceable, connecting block for intercommunicating systems, etc., requiring the connection of not exceeding ten lines.

Dimensions, 2¼x14¼ inches.



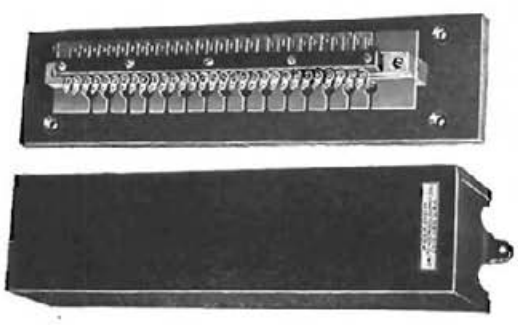
No. 21.

The No. 21 connecting rack is arranged for the connecting of twenty lines. It consists of two No. 45 terminal strips mounted on a base fitted with a steel cover, black enameled.

The connectors are arranged for either soldered or screw connections.

This makes an ideal connecting block for intercommunicating systems, requiring the connection of more than ten and not exceeding twenty lines.

Dimensions, 3½x14¼ inches.



No. 2500 Type.

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 the most flexible high-class terminal we make 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.

Code No.	No. of Pairs	Code No.	No. of Pairs
2505-B	5-pair	2517-B	17-pair
2509-B	9-pair	2521-B	21-pair
2513-B	13-pair	2525-B	25-pair

RECEIVERS — SUBSCRIBERS'

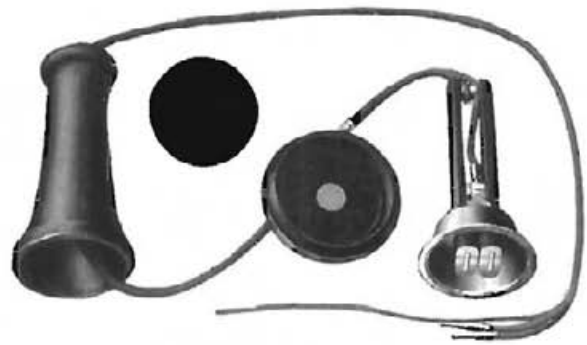
Kellogg receivers are scientifically correct in design and construction, insuring the maximum of efficiency combined with permanent adjustment and long life. These receivers are so designed that cords with either spade or spike tips can be used.

Thirty-six inch brown mercerized cords are furnished on all telephone receivers unless otherwise specified. If a different cord is required, full description can be had by referring to the cord list in this catalog.

The standard receiver shell is made from the famous Kellogg BAKELITE. The material itself is produced by the condensation of formaldehyde and carbolic acid to a powdered form. It is then moulded into shape with great pressure by steam heated hydraulic presses, the moulding temperature being 350° F. (120 lbs. steam pressure) and the hydraulic pressure is from 1,500 to 2,000 lbs. per square inch of mould surface. When moulded by the Kellogg process, Bakelite is:







1st—Practically 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 mile—many times as much as rubber.

3rd—Shape retaining. Will not warp or discolor; co-efficient 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.

5th—Odorless. Absolutely no obnoxious smell.

6th—Non-inflammable. Positively will not burn. Resists temperatures up to 350° F., and somewhat higher for short periods. At higher temperatures Kellogg Bakelite only chars.

7th—Light weight. Specific gravity of only 1.33. Weighs only as much as an equal volume of hard rubber.

A sanitary feature of Kellogg Bakelite receiver shells and mouthpieces is that they can be cleaned and disinfected by boiling in water.

Code No.	Resistance	Description	Use
41	60 ohms	Bakelite shell and cap. No. 96-TR cord.	Common Battery and Magneto Telephones. Any make.
F41	60 ohms	Same as No. 41 but with F96-TR cord.	Telephones requiring flat tips at set end.
F41-P	60 ohms	Same as No. F-41, but brown Bakelite.	
36	40 ohms	Similar to No. 41 but direct current.	Direct current Telephones.
F36	40 ohms	Similar to No. F41 but direct current.	Direct current. Telephones requiring flat tips at set end.

RECEIVERS — OPERATORS'



Kellogg operators' receivers are of the well known ring type magnet construction which insures the greatest efficiency and long life.

The outer case and cap are of Bakelite, which insures permanency thereby reducing maintenance to the minimum. The cord terminals are so located that cord tips are completely concealed. Operators' receiver caps are interchangeable with telephone receivers.

Head-bands are not included with the following operators' receivers. Customers should specify type of head-band desired.

Code No.	Resistance	Description	Use
14-A	140 ohms	Rubber shell and cap. Two circular magnets.	All switchboards.
46-A	140 ohms	Bakelite shell and cap. With mounting screw and knurled nut for Head Band.	All switchboards. Any make.
46-B	650 ohms	Same as No. 46-A but resistance.	Railway dispatching circuits.
48-A	60 ohms	Same as No. 46 but has 3 terminals.	
54-A	140 ohms	Rubber shell and cap. Horseshoe. magnets.	All switchboards Very light weight.





No. 54A Rec. with No. 8 Head Band. Total Weight 3.6 Ounces

Grabaphone Receivers

45-A	140 ohms	Bakelite shell and cap. Arranged for mounting on Grabaphone.	Nos. 13 and 14 grabaphones.
49-A	140 ohms	Same as No. 45 but includes mounting.	No. 11 grabaphones.
50-A	140 ohms	Same as No. 49 but with eye to hang on hook.	No. 12 grabaphones.

Radio Telephone Receivers

56-A	650 ohms	Same as 46-B except for special diaphragm. Set consists of 2 rec. and double head-band.	Radio telephone work.



No. 56A

HEAD BANDS

For Operators' Receivers



No. 2



No. 6

Code No. 2, flat spring steel, black enamel with leather cover for one receiver.

Code No. 3, flat spring steel plain with leather cover for two receivers.

Code No. 4, same as number two but less the leather cover.

Code No. 5, same as number 4 but has swivel joint instead of solid joint.

Code No. 6, same as number 5 but has wire band instead of flat steel.

Code No. 8, similar to No. 6, for No. 54A receiver.



No. 4

RECTIGON RECTIFIER

As Adopted for Charging P. B. X. Battery

The Rectigon Rectifier consists essentially of a transformer and two argon filled hot cathode bulbs. These operating parts are mounted on a cast iron base and enclosed in a sheet metal cover, which is readily removed to make bulb replacements. Ample ventilation is provided by openings in the base and cover.

The transformer insulates the battery circuit from the line, reduces the line voltage to a value suitable for charging an 11 cell battery, provides sufficient reactance to give the proper regulation characteristics to the direct current output, and furnishes exciting current for the filaments of the bulb.

The transformer is so designed, as to secondary voltage and reactance, that the direct current output is 3 amperes with a normal line voltage and a discharged battery. With changes

RECTIFIER — RECTIGON

As Adopted for Charging P. B. X. Battery

of battery and line voltage, the variation in direct current is slight.

The two bulbs are identical and each consists of a spherical glass blank or shell in which are sealed, with proper leading-in wires, an anode and a filament, all being mounted on and supported by an ordinary lamp base. During manufacture the bulb is exhausted of all air and filled with argon gas to a definite pressure.

In operation, the filament is excited by voltage from the transformer winding provided for this purpose, just as an incandescent lamp is lighted by voltage from the supply circuit. With the filament excited, current will flow in the bulb from the anode to the cathode, but will not flow in the reverse direction.

The operation of the outfit is thus:

The primary ½ of the transformer is excited by the line voltage.

The filament secondaries 5-C and C-6 excite the filaments of the bulbs to incandescence.

(See circuit, page 124.)

The main secondary 3-B-4 delivers current from whichever side is positive at any instant through one bulb and the load thus, during the half cycle when 3 is at higher potential than B, current flows from the anode to the filament or cathode through this bulb, through battery to point B of the main secondary. At the same time, B is at a higher potential than 4 and current tends to flow from B through the battery and from cathode to anode of bulb No. 2; but since current cannot flow from cathode to anode, no current flows in this circuit. During the next half cycle, current is delivered from 4-B, and flows through the battery in the same direction as before, while no current is taken from B-3. This circuit arrangement is the same as is used in many other types of rectifying devices, except for the addition of the filament winding.





Open View Showing Bulbs

Rectigon Battery Chargers are peculiarly suited to the charging of small batteries, because of compact arrangement of parts, small size, neat appearance, freedom from all chance of trouble due to moving parts, as no parts move in operation, inherent self starting with the application of line voltage, high efficiency compared to other low voltage equipment, and low cost.

Bulb replacements are simple. The bulb is screwed into a socket just as in an incandescent lamp, and one connection made at the top of the bulb by means of a spring clip. The bulb life is long and replacement bulbs inexpensive, so that the overall operating expense is low.

This particular outfit is designed especially for the purpose of charging telephone batteries, and is thus definitely suited to this use.

RECTIFIER — RECTIGON

As Adopted for Charging P. B. X. Battery

It is customary for companies operating P. B. X.s at some distance from the main exchange, to float the P. B. X. battery from the main exchange battery over a number of pairs in their local exchange cables and ground. This has necessitated the use of from 1 to 10 cable pairs between the Office and P. B. X. where the battery is from ¼ to 3-amperes, 8 hour normal charging rate, the number of pairs depending upon the normal discharge rate, and the distance the P. B. X. is located from the main exchange.

The investment, maintenance and depreciation expenses on these pairs, especially where a large number are used, is very high. The pairs are also often needed for telephone service, and in many cases growth is hindered by the fact that these pairs must be kept on the P. B. X. charging service. The average cost per cable pair of 22 gauge is $30.00 per mile. To obtain 3-ampere at a P. B. X. at the distance of one mile will require 5-cable pairs of 22 gauge, this represents the initial outlay of $150.00 for cable alone; in the average case the cost of erecting the cable will at least equal the cost of the cable making the average outlay for the 5-pairs $300.00 per mile.



No. 167 Key

The only supervision that can be given the battery under the above conditions is an occasional routine inspection or the repairman's call on a case of trouble.

To lower the investment, maintenance, and depreciation costs in connection with Private Branch Exchange Battery service the Kellogg Company have had a 3-ampere rectifier known as the Rectigon built for them. This rectifier operates from 110-volts, 60-cycles, single phase, alternating current, and it is capable of charging 11-cells lead battery at a rate of approximately 3-amperes.

The primary or line side of this rectifier is entirely insulated from the secondary. In controlling this rectifier the act of opening the primary circuit also opens the secondary or direct current circuit through the operating bulbs. With this feature it is practical to control the rectifier from a distance, it being merely necessary to place a solenoid relay in the circuit for operating an alternating current switch at the P. B. X.

The relay the Kellogg Company used for this purpose is known as the Telecode. By using the Rectigon Rectifier, the Telecode relay and 1-cable pair, an operating company may, by placing the relay between one side of the cable pair and ground at P. B. X. end, and by placing the A. C. circuit in series with the primary of the Rectigon Rectifier and the relay circuit of the Telecode relay, control the Rectigon Rectifier by means of a push button switch at the main exchange, preferably the wire chief's desk.

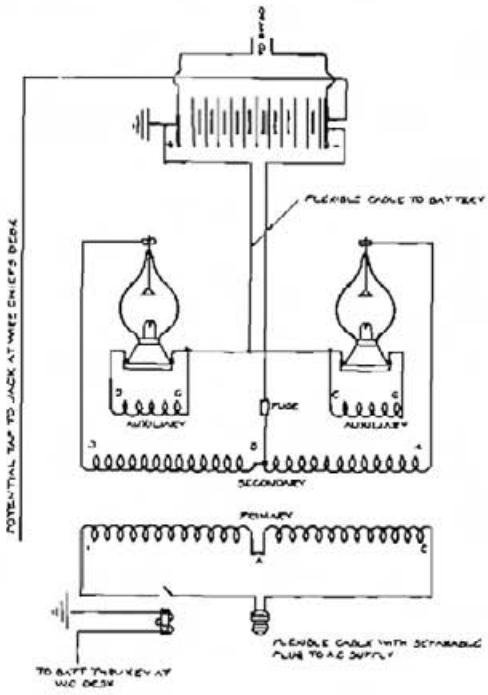
Closing the 24-volt circuit by means of the key at the wire chief's desk will operate the relay. This operation closes the primary of the Telecode relay, and operates the secondary or alternating current switch, starting the Rectifier; the operation of opening the switch at the wire chief's desk disconnects the rectifier.



Telecode Relay

RECTIGON RECTIFIER

As Adopted for Charging P. B. X. Battery



Circuit Showing Connection of Telecode Relay

The other side of the cable pair may be used as a potential tap, this in connection with the normal high resistance voltmeter that every wire chief's desk is equipped with, will allow the Wire Chief to supervise the voltage of the P. B. X. battery at all times, informing him when the battery may need charging, or when the charge is completed.

This outfit saves the cost of the cable pairs necessary for P. B. X. charging many times, it also has the added advantage of the fact that the P. B. X. battery is under the control of the Wire Chief and not dependent upon the occasional visits of the repairman.

In highly electrified districts, earth currents often make charging a P. B. X. battery by the usual method almost an impossibility. In many cases the P. B. X. battery ground is carried back to the main exchange over a number of cable pairs thus doubling the cable investment, depreciation and maintenance expense. With the Rectigon rectifier this is eliminated as the P. B. X. battery ground can be removed as the battery is charged metallic. In this case it will require three wires in the cables as one extra wire must be used as a potential tap for the side of the battery.

Instructions

Installation:—

Set up in a vertical position.
Connect the alternating current leads to a 110 volt 60 cycle line, and the direct current leads to a battery.
The polarity of the direct current leads must be correct.

To Install Bulbs:—

Remove the cover.
Screw bulbs in socket and attach anode leads by means of the spring clips and flexible leads.
Replace the cover.

Operation:—

To start, close the line switch.
To stop, open the line switch.
If one of the bulbs fail, the outfit will continue to operate, delivering half current, or approximately 1½ amperes to the battery.

RELAYS

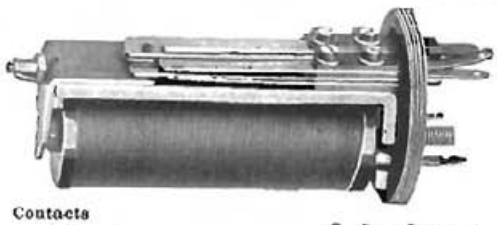
No. 2000 type relays listed on pages 138 and 139.

Kellogg relays have for more than twenty years, proven their superiority to any other designs. Their construction is expensive, but experience has proven its wisdom. They are the apparatus feature in all common battery switchboards which necessitates care in manufacture so as to maintain their efficiency in operation. The core and entire magnetic system of all Kellogg relays are of the finest grade of soft Norway iron "pot annealed" to guard against any trace of residual magnetism.

Kellogg relays are of the angle armature type, which has proven far superior to all other types, and insures a wide margin of operation. The armature is so mounted that it cannot move out of place. The springs are assembled with insulation of micarta and bakelite and are mounted so as to be readily accessible. Their coil volume is many times larger than other makes of coils.

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.

Kellogg No. 2000 type relays are wound single, tandem, parallel and concentric, and furnished with any combination of springs that are possible to assemble on relay construction.



No. 22 Type

Mounting Centers 1⅞"

Single Wound

Contacts

G. S.—German Silver
C.—Copper

Code No.	Make	Break	Make & Break	Sets of Springs	A	B	C	D	E	F	G	H	J	K	L	M	N
22			1	1	200-gs. Shunt 100-c.	20	6700-gs 3300-c	500	100	200	50	400-gs. 100-c.	300	1000	800-gs 200-c	1500 Series	
28			2	2	500	100	250	10	200	1000	1100-gs 3900-c						
31	1			1	100	500	1000	1500	65	250	200	300	400	40	150	10	125
32		1		1	100	20	200-gs. Shunt 100-c.	1000	50	250	200	1100-gs 3900-c.	500	80	350	120	
33	1		1	2	100	500	1000	200	40	20	50						
57			3	3	500	200	100	10	1000	4500							
58		2		2	500	50	100	1000	250	300	100-gs 20-c Shunt						
60	1	2		3	100	500	200	300									
61		1	1	2	100	500	200	1000	50	800-gs 200-c	Series						
65	2			2	500	100	200	1000	6	3	1300						
76		3		3	500	20	10 Enam.										
88		1		1	50	500	100	40									
93	1		2	3	100	1000	500										
94	2			2	500	250											
95			1	1	300	1000	500	50									
100	1	1		2	500	300	200	1000	100	250							
107	2		1	3	100	500											
378	6			6	4500												
401	1	1	1	3	500												
508	1	1		2	350-gs. 500-c	Inductive											

	P	Q	R	S	T	U	V	W
31	6	200-gs. Shunt 100-c	50	2000	3	25-gs Shunt 25-c	25	4000

RELAYS

No. 22 Type—Tandem Wound

Code No.	Contacts: Break	Make	Make & Break	Sets of Springs	A	B	C	D	E	F	G	H
34	1			1	100	100	500	200	250	50		
					100	500	500	200	500	50		
44			2	2	250	50	500	100	300			
					250	500	500	100	300			
51		1	1	2	500	200	100	200				
					500	200	100	500				
52	1	1		2	500	200	500	250	200			
					100	200	500	250	500			
53		1		1	250	500	100	225	20	500	1000	200
					250	500	100	225	20	200	1000	500
106		2		2	500	200	300	1000				
					500	500	200	1000				
130			3	3	200							
					500							
142	2			2	100	50						
					100	50						
239	1		1	2	200							
					200							

No. 22 Type—Concentric Wound

420	1	1	1	3	100-gs	
					500-c	
547	1			1	16	
					20000	

No. 22 Type—Parallel Wound

135		1		1	500					
					500					

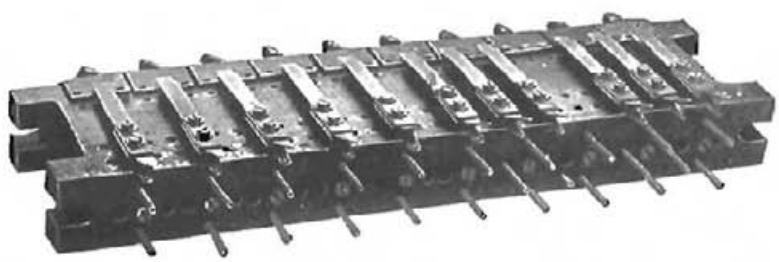


No. 10 Type

Mounting Centers $^{13}/_{16}$"

Single Wound

10		1	2	3	250	30	500			
25			1	1	250					
26		1		1	250	90	600	500	100 {500-gs, Shunt, 500-c}	6 {1000-gs, 1000-gs, Shunt}
21	2			2	250					
561		2		2	500					



No. 14 Type

Mounting Centers

$1^{5}/_{8}$"

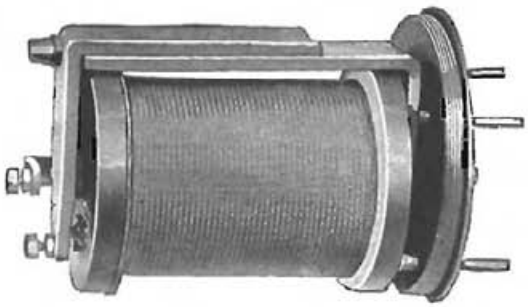
Concentric Wound

14		1		1	33	150	700
					31	150	50

RELAYS

No. 114 Type—Concentric Wound

Code No.	Make Break	Make	Make & Break	Sets of Springs	A	B	C	D	E	F	G	H
114	1			1	615	100	525					
					500	100	1500					



No. 56 Type

Mounting Centers 2⅝″

Single Wound

56			1	1	8000-gs		15000					
					7000-c	2500		10	2100			
62		1		1	1.56	5000	8000-gs	5	500	2100	10	.06
							7000-c					
74		1		1	500	2100	8000	5000	15000			

No. 440 Type

Mounting Centers 1⅞″

Single Wound

440	1		1	2	500		
441	2			2	200	500	300
442		1		1	550-gs		
					450-c		
510		2		2	500-gs } Series		
					450-c }		

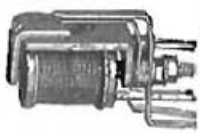
No. 440 Type—Concentric Wound

480		1		1	950-gs		
					950-c		

No. 440 Type—Tandem Wound

509	2			2	1000		
					1000		

No. 600 Type—Line Relays

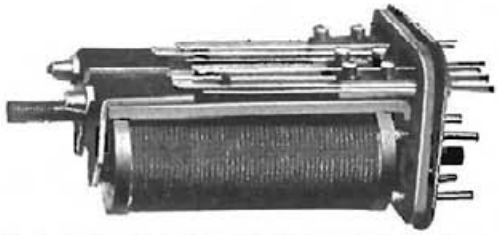


Code No.	Contacts: Make	Contacts: Break	Contacts: Make & Break	Sets of Springs	Remarks
600	1			1	Regular line ckt.
601	2			2	Universal line ckt.

Cut Off Relays

	602	2		2	Regular and universal ckts.

RELAYS



No. 72 Type
Mounting Centers 2 7/16"
Single Wound

Code No.	Break	Make	Make & Break	Make Before Break	Sets of Springs	A	B	C	D
286	1	1			2	1000	500		
	No. 3 Res. Coil					250	500		
311	No. 20 Ret. Coil					500	300	300	300
			1		1	100	100	200	500
320		No. 20 Ret. Coil				500	100	200	
		1			1	500	500	500	
386		2		1	3	500			
		No. 33 Ret. Coil				100			
		No. 3 Res. Coil				100			
474						500	1000	1000	
		1			1	3	6		

Code No.	Break	Make	Make & Break	Sets of Springs	A	B	C	D	E	F	G	H	J	K	L	M
72			2	2	500	1000	100	200	250	1000						
				1	100	500	100	100	250	6						
77	1			1	100	200	1000	100	50	500	50	1000	250	250	500	500
		1		1	100	200	200	500	50	100	20	100	250	500	500	50
78	1			1	100	200	100	50	50	43						
		1	1	2	100	200	500	50	500	43						
110		1	1	2	40	40	1000	50	43							
			1	1	500	100	200	50	43							
111			2	2	500	1000	200	1000								
			1	1	200	200	200	1000								
115		1		1	375	375										
		1		1	375	1.75										
119		1		1	300	300	500	100	1000	250-gs 1000c	500	800-gs 200-c	200	3	6	2500
		1		1	300	40	500	100	1000	250-gs 1000c	20	800-gs 200-c	200	3	6	500
125	2			2	500	1000										
	2			2	500	1000										
136			1	1	100	100	200	500	1000	1500	500	50	1.75	50	43	
		1		1	500	100	500	250	100	100	500	1000	10	50	43	
137	1		1	2	100	500	500	1000	500	1000						
		1		1	100	100	500	500	550-gs 450-c	1000 Series						
138			1	1	100	200										
			3	3	100	200										
139	1		1	2		500	1000									
			1	1		200	400									
140		1	1	2	20	500										
		1	1	2	20	500										
144		1		1	500	1000	300									
		1		1	500	1000	300									
153	2			2	100	500	500	200	100	500	500					
		1		1	500	100	500	550-gs 450-c	100	1000	550-gs 450-c					
154			3	3	500	100	1000	250	500							
			3	3	500	100	1000	250	1000							
153			2	2	500	3000	1000	200	100	1000	100					
			2	2	500	3000	1000	200	200	100	100					

RELAYS

No. 72 Type—Single Wound

Code No.	Break	Make	Make & Break	Sets of Springs	A	B	C	D	E	F	G
156		2		2	250	500					
	2		1	3	500	500					
165		2		2	1000	100	20	500			
		2		2	1000	100	20	500			
176	2		1	3	500	1000					
	2		1	3	500	1000					
179		1	2	3	500	1000	100				
		1	2	3	500	1000	100				
213			1	1	500	100	500	1000	100	50	2000
			1	1	1000	100	500	1000	500	500	2000
235	1			1	100	200	100	50			
		1	1	2	100	200	500	50			
229	1	1		2	1000	1000	500	1000			
			1	1	100	300	500	1000			
230		2		2	1000	500	1000				
	1			1	500	200	50				
237		3		3	500	1000					
		3		3	500	1000					
255		3		3	500	1000	500				
	1			1	100	100	50				
257	1		1	2	100	100					
		1	1	2	100	500					
274	1	1		2	500	1000	250				
	1	1		2	500	1000	250				
287		2		2	1000	2000					
	1	2		3	1000	1000					
310	1			1	100	200	50	50			
		3		3	100	200	50	500			
313	2			2	100	100	50	50			
		1	1	2	100	500	50	500			
317			2	2	100						
		1	1	2	100						
322	2	1		3	500	500					
		1		1	1000	500					
331		2	1	3	1000						
	1			1	100						
332		1		1	100	200					
	3			3	500	1000					
363	1	1	1	3	500						
		1		1	500						
365	1			1	100						
	2	1	1	4	100						
375	1	1		2	100	200					
	2	1	1	4	100	200					
389		1	2	3	500						
		2	1	3	500						
398	2	1		3	500						
		1		1	4000						
399			1	1	500	1000	1000				
	1	1	2	4	500	100	1000				

RELAYS

No. 72 Type—Single Wound

Code No.	Break	Make	Make & Break	Make Before Break	Sets of Springs	A	B	C	D	E	F
423	3	1			4	500	1000				
		1			1	4000	4000				
430		1			1	1000					
			1		1	100					
434	1		1	1	3	1000					
		2			2	2500					
439		3			3	500					
			1		1	500					
446		1			1	500	1000				
		1			1	500	1000				
447		1			1	500	1000				
		1	1		2	500	1000				
448		1	1		2	500	1000				
		1			1	500	1000				
449	1				1	500	1000				
		1			1	500	1000				
452	2				2	1000					
		1		1	2	4000					
462	2			1	3	1000					
	2			1	3	1000					
467	3		1		4	500					
		1			1	4000					
470	2			1	3	500					
		1			1	4000					
496	1		1	1	3	500					
		1			1	4000					
497	2	1	1		4	100					
	1		1		2	100					
500		3		1	4	1000					
	1	1	1		3	500					
512			2		2	500					
		3			3	500					
513		1		1	2	1000					
		1		1	2	1000					
514		1	1		2	1000					
		3			3	500					
515	1				1	10					
	1				1	10					
518		1	2		3	1000					
		2		1	3	1000					
532			1		1	63					
	No springs					63					

RELAYS

No. 72 Type—Tandem Wound

Code No.	Break	Make	Make & Break	Make Before Break	Sets of Springs	A	B	C	D	E	F
157	....	1	....	....	1	500	250	200	.....	.....	.....
						500	250	500	.....	.....	.....
	....	2	....	....	2	500	500	200	.....	.....	.....
						500	500	500	.....	.....	.....
163	1	....	....	....	1	100	200	500	.....	.....	.....
						100	500	500	.....	.....	.....
	....	1	....	....	1	100	100	500	.....	.....	.....
						100	100	500	.....	.....	.....
199	....	1	....	....	1	250	500	200	1000	100	100
						250	500	500	500	100	1000
	....	1	....	....	1	250	500	200	1000	200	100
						250	500	500	500	500	1000
246	....	1	....	....	1	200	.....	.....	.....	.....	.....
						500	.....	.....	.....	.....	.....
	....	1	....	....	1	200	.....	.....	.....	.....	.....
						500	.....	.....	.....	.....	.....
254	1	....	....	....	1	200	500	500	.....	.....	.....
						500	500	1000	.....	.....	.....
	1	2	....	....	3	200	500	500	.....	.....	.....
						500	1000	1000	.....	.....	.....
258	....	....	1	....	1	100	50	200	50	.....	.....
						100	50	200	50	.....	.....
	....	....	1	....	1	100	50	200	50	.....	.....
						100	50	200	50	.....	.....
298	....	2	....	....	2	1000	.....	.....	.....	.....	.....
						500	.....	.....	.....	.....	.....
	....	2	....	....	2	1000	.....	.....	.....	.....	.....
						500	.....	.....	.....	.....	.....
380	....	1	2	....	3	300	200	1000	500	100	.....
						100	100	200	100	500	.....
	....	....	1	....	1	100	100	200	100	100	.....
						500	500	500	500	500	.....
396	2	1	1	....	4	300	.....	.....	.....	.....	.....
						100	.....	.....	.....	.....	.....
	....	....	1	....	1	100	.....	.....	.....	.....	.....
						300	.....	.....	.....	.....	.....
456	....	....	....	1	1	300-gs	.....	.....	.....	.....	.....
						200-c	.....	.....	.....	.....	.....
						300-gs	.....	.....	.....	.....	.....
						200-c	.....	.....	.....	.....	.....
	....	....	....	1	1	300-gs	.....	.....	.....	.....	.....
						200-c	.....	.....	.....	.....	.....
						300-gs	.....	.....	.....	.....	.....
						200-c	.....	.....	.....	.....	.....
520	....	....	1	....	1	400	.....	.....	.....	.....	.....
						400	.....	.....	.....	.....	.....
	1	....	....	....	1	450	.....	.....	.....	.....	.....
						900	.....	.....	.....	.....	.....
						1000-gs	.....	.....	.....	.....	.....
129	1	....	....	....	1	200	100	250	500	150	.....
						200	100	250	500	150	.....
	1	....	....	....	1	300	100	250	500	150	.....
						200	100	250	500	150	.....

RELAYS

No. 72 Type—Concentric Wound

Code No.	Break	Make	Make & Break	Make Before Break	Sets of Springs	A	B	C	D
217	....	2	1	....	3	250-gs	.....	.....	.....
						1000-c	.....	.....	.....
	2	1	....	....	3	250-gs	.....	.....	.....
						3000-c	.....	.....	.....
300	1	....	2	....	3	100-gs	100-gs	1000-gs	.....
						500-c	1000-c	1000-c	.....
	....	....	1	....	1	500-gs	500-gs	250-gs	.....
						500-c	500-c	1000-c	.....
346	2	1	1	....	4	100-gs	.....	.....	.....
						300-c	.....	.....	.....
	....	....	1	....	1	300-gs	.....	.....	.....
						500-c	.....	.....	.....

No. 72 Type—Concentric and Single Wound

122	....	....	2	....	2	500-gs	.....	.....	.....
						100-c	.....	.....	.....
	....	1	....	....	1	100	.....	.....	.....
251	....	1	....	....	1	1000-gs	525-c	.....	.....
						475-gs	.....	.....	.....
	1	....	1	....	2	500	.....	.....	.....
269	....	1	....	....	1	950-gs	500-gs	.....	.....
						950-c	500-c	.....	.....
	2	....	....	....	2	200	200	.....	.....
277	1	....	1	....	2	500-gs	.....	.....	.....
						100-c	.....	.....	.....
	....	1	....	....	1	550-gs } Series	.....	.....	.....
						450-c }	.....	.....	.....
345	1	....	1	....	2	300-gs	300-gs	300-gs	300-gs
						500-c	500-c	200-c	100-c
	....	2	....	....	2	500	300	200	500
348	3	1	....	....	4	500-gs	.....	.....	.....
						500-c	.....	.....	.....
	....	....	2	....	2	1000	.....	.....	.....
358	....	1	1	....	2	100-gs	.....	.....	.....
						500-c	.....	.....	.....
	2	2	....	....	4	500	.....	.....	.....
397	1	....	....	....	1	100-gs	.....	.....	.....
						100-c	.....	.....	.....
	....	4	....	....	4	100	.....	.....	.....
400	....	1	1	....	2	500	.....	.....	.....
	1	1	1	....	3	100-gs	.....	.....	.....
						500-c	.....	.....	.....
438	....	3	....	....	3	500	.....	.....	.....
	....	....	1	....	1	100-gs Inductive	.....	.....	.....
						100-c	.....	.....	.....
445	2	....	....	1	3	100-gs	.....	.....	.....
						500-c	.....	.....	.....
	....	3	....	....	3	500	.....	.....	.....
468	2	....	2	....	4	500	.....	.....	.....
	....	1	2	....	3	20-gs	.....	.....	.....
						500-c	.....	.....	.....

RELAYS

No. 72 Type—Concentric and Single Wound

Code No.	Break	Make	Make & Break	Sets of Springs	A	B	C	D	E	F	G
491		2		2	500						
		1	1	2	500-gs						
					500-c						
492		2		2	2000						
	1	2		3	500-gs						
					500-c						
488	2	1	1	4	500						
	1	1	2	4	20-gs						
					500-c						
493	3		1	4	500						
		2		2	3700						
					300						
498		1	1	2	500						
			1	1	100-gs						
					500-c						

No. 72 Type—Concentric and Tandem Wound

350	1	1	1	3	70-gs	
					100-c	
			1	1	100	
					500	
374		2	1	3	500	1000
					500	1000
	1	1	2	4	100-gs	100-gs
					500-c	1000-c
387			1	1	100	100
					500	500
		1	3	4	70-gs	80-gs
					300-c	300-c
490		2		2	100-gs	
					200-c	
	1	2		3	200	
					300	
495			1	1	200	
					200	
			1	1	200-gs	
					30-c	

No. 72 Type—Tandem and Single Wound

128		1		1	500	500	500	200	200	500	400
					500	500	200	500	500	500	500
	2			2	300	1000	300	300	500	1300	600
138		1		1	500	250					
					500	250					
	2		1	3	200	400					
160	1			1	100						
					100						
		1		1	500						

RELAYS

No. 72 Type—Tandem and Single Wound

Code No.	Break	Make	Make & Break	Sets of Springs	A	B	C	D	E	F	G
164	....	....	1	1	100	50	.....	.....	.....	.....	.....
					100	50	.....	.....	.....	.....	.....
	....	1	1	2	100	250	.....	.....	.....	.....	.....
178	1	....	....	1	50	.....	.....	.....	.....	.....	.....
					50	.....	.....	.....	.....	.....	.....
	....	1	1	2	500	.....	.....	.....	.....	.....	.....
180	....	....	1	1	500	.....	.....	.....	.....	.....	.....
					500	.....	.....	.....	.....	.....	.....
	....	1	....	1	500	.....	.....	.....	.....	.....	.....
233	....	1	1	2	500	200	.....	.....	.....	.....	.....
					200	500	.....	.....	.....	.....	.....
	1	....	....	1	50	50	.....	.....	.....	.....	.....
235	1	....	....	1	50	100	100	100	25	50	10
					50	100	100	100	25	50	10
	....	1	2	3	500	500	300	300	300	300	500
245	1	....	....	1	100	.....	.....	.....	.....	.....	.....
					100	.....	.....	.....	.....	.....	.....
	....	....	3	3	100	.....	.....	.....	.....	.....	.....
264	2	....	....	2	500	500	.....	1000	Series	.....	.....
					500	500	.....	1000		.....	.....
	....	2	....	2	100	1000	.....	550-gs		.....	.....
					.....	.....	.....	450-c		.....	.....
265	1	....	....	1	100	50	50	100	.....	.....	.....
					100	50	50	100	.....	.....	.....
	....	....	3	3	100	500	106	300	.....	.....	.....
280	2	....	....	2	100	.....	.....	.....	.....	.....	.....
					100	.....	.....	.....	.....	.....	.....
	....	1	....	1	300	.....	.....	.....	.....	.....	.....
281	1	....	....	1	100	100	500	.....	.....	.....	.....
					100	100	500	.....	.....	.....	.....
	....	....	1	1	300	500	70	.....	.....	.....	.....
282	2	....	....	2	100	100	50	50	.....	.....	.....
					100	100	50	50	.....	.....	.....
	2	1	....	3	300	100	300	100	.....	.....	.....
295	2	....	....	2	500	.....	.....	.....	.....	.....	.....
					500	.....	.....	.....	.....	.....	.....
	....	2	....	2	1000	.....	.....	.....	.....	.....	.....
300	1	....	1	2	100	500	.....	.....	.....	.....	.....
					100	500	.....	.....	.....	.....	.....
	....	1	....	1	300	500	.....	.....	.....	.....	.....
301	1	....	1	2	100	50	.....	.....	.....	.....	.....
					100	50	.....	.....	.....	.....	.....
	....	1	2	3	300	200	.....	.....	.....	.....	.....
303	....	2	....	2	1000	200	400	.....	.....	.....	.....
					500	500	500	.....	.....	.....	.....
	....	1	....	1	1000	500	1000	.....	.....	.....	.....
337	2	....	....	2	100	50	.....	.....	.....	.....	.....
					100	50	.....	.....	.....	.....	.....
	....	1	2	3	100	300	.....	.....	.....	.....	.....

RELAYS

No. 72 Type—Tandem and Single Wound

Code No.	Break	Make	Make & Break	Make Before Break	Sets of Springs	A	B	C	D
339	2	....	....	....	2	100	50	.....	.....
						100	50	.....	.....
	....	2	2	....	4	100	100	.....	.....
344	....	2	....	....	2	1000	100	.....	.....
						1000	1000	.....	.....
	3	....	....	....	3	500	500	.....	.....
352	1	....	1	....	2	1000	50	100	50
						1000	50	100	50
	....	2	....	....	2	550-gs	50	300	500
						450-c	100	.....	.....
361	1	1	....	....	2	50	.....	.....	.....
						50	.....	.....	.....
	....	1	....	....	1	500	.....	.....	.....
369	....	....	1	....	1	500	.....	.....	.....
						500	.....	.....	.....
	1	....	....	....	1	300	.....	.....	.....
377	1	....	....	....	1	100	500	.....	.....
						100	500	.....	.....
	....	....	2	....	2	500	1000	.....	.....
424	1	....	....	....	1	100	50	50	.....
						100	50	50	.....
	....	4	....	....	4	300	300	100	.....
443	2	1	....	1	4	250	.....	.....	.....
						250	.....	.....	.....
	1	1	....	....	2	100	.....	.....	.....
444	2	1	1	....	4	500	.....	.....	.....
	....	2	1	....	3	500	.....	.....	.....
						500	.....	.....	.....
466	2	....	....	....	2	50	.....	.....	.....
						50	.....	.....	.....
	....	....	3	....	3	500	.....	.....	.....
487	1	....	....	....	1	50	.....	.....	.....
						50	.....	.....	.....
	....	2	2	....	4	300	.....	.....	.....
489	2	....	....	....	2	50	.....	.....	.....
						50	.....	.....	.....
	....	1	3	....	4	100	.....	.....	.....
494	2	....	....	....	2	50	.....	.....	.....
						50	.....	.....	.....
	2	1	1	....	4	150	.....	.....	.....
499	....	1	2	....	3	100	.....	.....	.....
						100	.....	.....	.....
	....	....	1	....	1	500	.....	.....	.....
501	1	....	2	....	3	500	.....	.....	.....
						500	.....	.....	.....
	1	1	2	....	4	500	.....	.....	.....

RELAYS



No. 36 Type
Mounting Centers 13/16″
Single Wound

Code No.	Break	Make	Make & Break	Sets of Springs	A	B	C	D	E	F	G	H	J	K	L	M	
36	1			1	100	250	500	200	75	1000	50	29					
37		1		1	500	100	1000	200	75	250	300	3	6	2000	50	350-gs 300-c	Mult.
38		1	1	2	500	100	200	1000									
43			1	1	500	100	1000	200	50								
46			3	3	500	400	300										
54	2			2	500	100	250	300	1000								
59			2	3	500	100	200										
73		1	2	3	500												
75		3		3	500	100	300										
83		2		2	100	500	50	200									
108	1	1		2	200	500											
168		2		1	100												

No. 36 Type—Concentric Wound

Code No.	Break	Make	Make & Break	Sets of Springs	A	B	C	D
47	1			1	100	200	300	50
					100	200	300	50

No. 36 Type—Tandem Wound

63		1		1	250	500	100	200
					250	500	100	200
105		2		2	500	100	200	
					500	500	500	
109			1	1	100	200	500	50
					100	200	500	50
503			3	3	300			
					100			

No. 36 Type—Parallel Wound

127		1		1	500			
					500			

Miscellaneous

Code No.	Break	Make	Make & Break	Sets of Springs	A	B	C	D	Mounting Centers	Remarks
17		1		1	1	50				2 single wound coils. Pony telegraph type
					1	50				
40			1	1	4100-gs 3400-c 4100-gs 3400-c				Indiv'l	2 single wound coils. Polarized. Made of ringer parts.

RELAYS

Miscellaneous

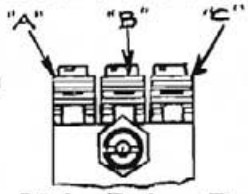
Code No.	Sets of Springs: Break	Make	Make & Break	Total	A	B	C	D	Mounting Centers	Remarks
169	....	1	....	1	65	200-gs	Shunt	.....	.....	1 single wound coil.
					65-c.				Indiv'l	Special for dispatching system.
170	....	1	....	....	1250				Indiv'l	Special for dispatching system.
					1250					2 single wound coils.
181	....	....	....	....						For coin box.
196	....	1	....	1	1500-gs } Series 2000-c }	250	200	.....	1⅜"	Brass shell, 2 single wound coils.
					1500-gs } Series 2000-c }	250	200	.....		
219	1	....	....	1	50	100	200	.....		Single wound coil.
	No. 20 Ret. Coils				300	100	200	.....	2 1/16"	
340	....	1	....	1	1600	300	50	⅓	1⅜"	A. C. relay. Special single wound.
353	....	1	....	1	500				1⅜"	A. C. relay on wood mtg. block. Single wound coil.
391	....	1	....	1	500	500				
	....	....	2	2	230	500			2 1/16"	Single wound coils. A. C. relay.
412	1	....	....	1	500				1⅜"	Single wound coil. A. C. relay.
482	1	....	....	1	260	5				2 concentric wound coils.
					.06	4				Vibrating type, busy back interrupter.
	No. 35 Condenser									
525	....	2	....	2	500				1⅜"	A. C. relay, same as No. 340-B with two "makes" similar to 2040.
526	....	....	1	1	300-gs 1.98-c 300-gs 1.98-c					Two coils wound concentric; no shell. Used on No. 1 light circuit converter.
531	....	....	1	1	300-gs. 0.2-c 300-gs. 0.2-c					Two coils wound concentric; no shell. Used on No. 2 light circuit converter. Similar to No. 526.
537	....	....	1	1	2500	200	1600	6500		Single wound coils.
					2500	200	1600	6500		
540	....	....	2	2	500					Single wound coils. No. 3 and No. 4 converters.
					500					
541	....	....	1	1	175					Single wound coils. Mtd. on wood base; used on composite ringer circuit.
					175					
546	....	....	1	1	40	200	1600	2500		Single wound coils.
					40	200	1600	2500		
555	....	....	1	1	300-gs 30-c 300-gs 30-c					Two coils wound concentric; no shell; two No. 3 condensers assembled as unit on mounting.

RELAYS—2000 Type

The No. 2000 type are our standard relays and are used on practically all new work. They can be furnished with any spring combinations required.

The following code numbers do not take care of the type of coil; they must be specified by adding the corresponding letter or letters found under the relay coil listing. S denotes single, C—concentric, P—parallel and T—tandem, the other letter indicates the resistance, for instance: A 2006 relay with a single wound coil of 1.75 ohms resistance should be ordered as a 2006S-A relay.





End view of Relay, showing position of spring combinations and slotted nut for holding armature in correct position.

Make Before Break

Code No.	Break	Make	Make & Break	Make Before Break	Sets of Springs	Position of Spring Combinations A	B	C	Remarks
2006	....	....	....	1	1				
2007	....	....	....	2	2				
2008	....	....	....	3	3				
2009	....	....	....	4	4				

Mixed Spring Combinations

2019	....	....	2	1	3				
2020	....	....	1	2	3				
2021	....	....	2	2	4				
2025	....	....	1	1	2				Used with No. 25 Pole changer.
2028	2	2	....	1	5				
2034	1	....	1	....	2				Interrupter relay. Special tension spring.
2036	....	1	....	1	2				Consists of heel iron and armature.
2053	....	....	....	....	....				
2063	....	....	2	3	5	2009	2028	2021	
2075	1	2	1	....	2	.....	.....	2023	

Make and Break Springs

2001	....	....	1	....	1				
2002	....	....	2	....	2				
2003	....	....	3	....	3				
2004	....	....	4	....	4				
2005	2	....	2	....	4				Similar to No. 2004—less 2 top makes.
2022	....	....	1	....	1				2 relays yoked at arm, no springs on left hand relay.
2023	....	5	....	....	5				
2027	....	1	4	....	5				
2029	....	1	....	....	1				For pilot relays.

RELAYS—2000 Type

Code No.	Break	Make	Make & Break	Make Before Break	Sets of Springs	Position of Spring Combinations A	B	C	Remarks
2030	1	....	....	....	1				For supervisory relays.
2031	....	2	3	....	5				
2032	....	4	1	....	5				
2037	....	2	....	....	2				
2038	....	....	1	....	1				
2039	....	....	3	....	3				
2041	1	....	....	....	1				One extra dead spring insulated for terminal.
2048	2	....	....	....	2				
2059	3	....	....	....	3				

Make and Break Springs With Light Armatures

2043	....	1	....	....	1				Same as No. 2029, but with light arm. for pilot relays.
2045	1	....	....	....	1				One extra dead spr. insulated for term. arm, same as No. 2043 relay.
2049	1	....	....	....	1				No. 2030 with light arm. like No. 2043.
2056	....	2	....	....	2				Sim. to No. 2043.

Buzzer Springs

2000	....	....	....	....	....				
2042	....	....	....	....	....				Tone buzzer.

Trip Restoring On Right Side Facing Armature

2010	....	....	....	....	....				No contact springs.
2011	....	....	1	....	1				
2012	....	....	2	....	2				
2013	....	....	3	....	3				
2014	....	....	4	....	4				
2060	....	....	4	....	4	(Same as above)		(Same as above.)	
2064	....	....	2	....	2	(Same as 2013)		(Same as 2012)	
2066	....	....	....	....	....				No contact springs.
2067	....	....	1	....	1		(Same as 2011)		
2068	....	....	3	....	3	(Same as 2013)		(Same as 2013)	
2082	....	....	....	2	2				

Trip Restoring on Left Side Facing Armature

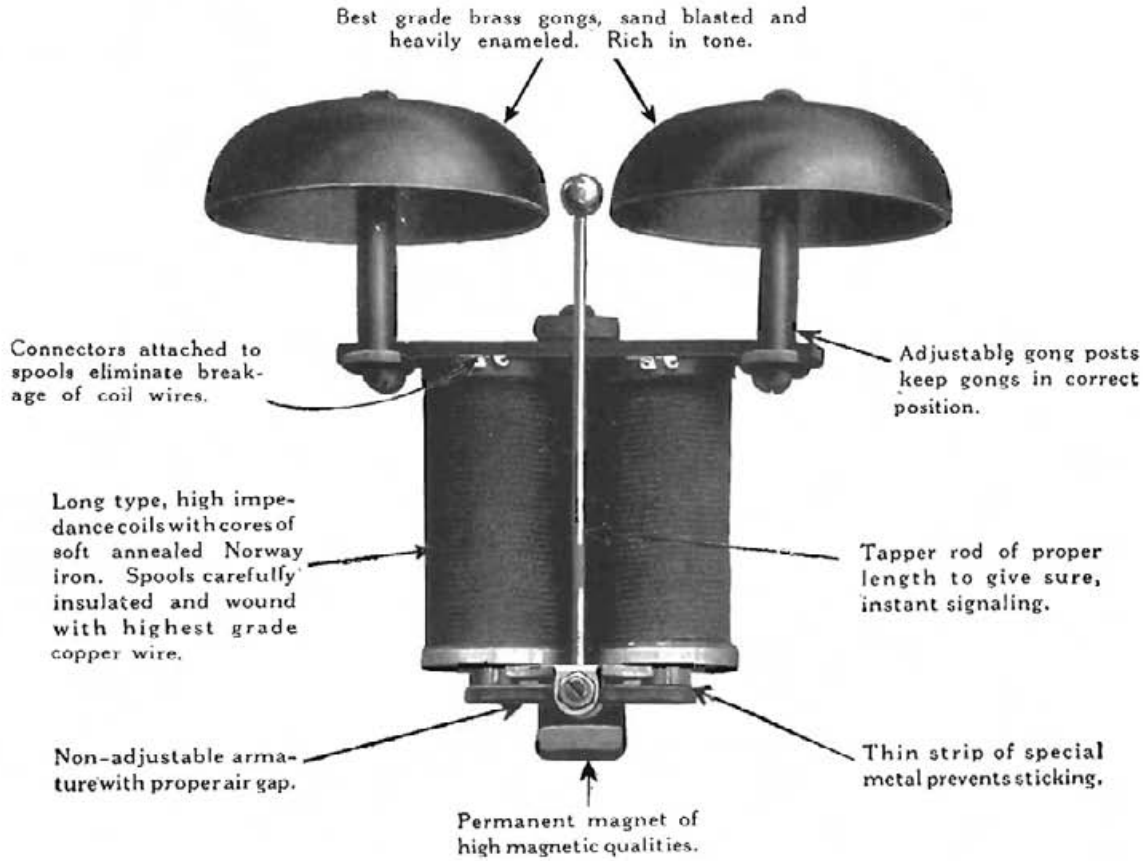
2061	1	1	....	....	2				
2062	....	1	....	....	1				

Alternating Current

2017	....	1	....	....	1				
2018	1	....	....	....	1				
2052	1	1	....	....	2				Used in composite ringer ckt.
2057	....	1	....	....	1				Extra adj. spring.

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 enameled.



Non-Adjustable Type

Code No.	Size of Gongs	Ohms Resistance A	B	C	D	E	F	G	H	J	K	Remarks
55	3 "	1000	80	500	1600	100	250	2500	2000	1200		Similar to No. 78.
61	4 "	1000		500	1600			2500				
69	6 "	1000		500	1600			2500				Similar to No. 61.
70	1¾"	1000										
78	2½"	1000			1600			2500	2000	1200		Mag. Tel's.
92	4 "	1000		500	1600			2500				Biased, similar to No. 61.
94	6 "	1000		500	1600			2500				Biased, similar to No. 69.

Adjustable Type

18	1¾"		1000	1600								Lineman's test sets.
36	4 "	1000	1600					2500				Railway telephone.
51	2½"	1000	1600									Mine sets. Right angle Clapper rod.
65	2½"	1000	80	500	1600	100	250	2500	2000	1200	120	Unit type desk stand.
66		1000	80	500	1600	100		2500				Test sets.
79	2½"	1000		500	1600		250	2500				Mag. & C. B. Tel's.
84	2½"	1000		500	1600			2500				Mag. & C. B. Tel's.
100	2½"	1000	80	500	1600	100	250	2500	2000	1200	120	Similar to No. 65 but biased.
85			1000	500								Biased.
86		1000		500								Biased.

RINGERS

Harmonic Type

Center Gongs



Kellogg harmonic ringers are equipped with a positive gong adjustment. Once set, the adjustment remains so indefinitely.

The gongs are of the center mounted type securely mounted on the gong posts.

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, and only requires a few minutes' time.

Code No.	Size of Gongs	Frequencies 1	2	3	4	1	2	3	4	1	2	
72-A	2½"	33⅓	50	66⅔	16⅔							
73-A	2½"					30	42	54	66			
74-A	2½"									20	60	Same as No. 72-A except heel iron for S. C. boxes.
75-A	2½"	33⅓	50	66⅔	16⅔							
87-A	2½"	33⅓	50	66⅔	16⅔							For Nos. 75 and 404 D. S. boxes.
88-A	2½"					30	42	54	66			For Nos. 75 and 404 D. S. boxes.
89-A	2½"									20	60	For Nos. 75 and 404 D. S. boxes.
43-A	6 "	33⅓	50	66⅔	16⅔							For No. 47 ext. bells.
67-A	6 "					30	42	54	66			For No. 47 ext. bells.
95-A	6 "									20	60	For No. 47 ext. bells.
44-A	4 "	33⅓	50	66⅔	16⅔							No. 43-A, but gongs for No. 43 ext. bells.
68-A	4 "					30	42	54	66			
93-A	4 "									20	60	

Vibrating Type

Code No.	Size of Gongs	Res. A	B	C	
24	2½"	4	50	300	
32	2½"	4	50	300	No. 24, but arranged for steel sets.
49	2½"	50	300		No. 24, but arranged for steel sets.



Code No. 1 Comb. Ringers and Drops

RINGERS AND DROPS—COMBINED

Combined ringers and drops for use in switchboard work where a drop shutter is not sufficient to signal the operator can be furnished in two types as listed below.

Adjustable Type

Code No. 1-A	1000 Ohms
Code No. 1-D	1600 Ohms
Code No. 1-E	2500 Ohms
Code No. 2-A	1000 Ohms
Code No. 2-D	1600 Ohms

Non-Adjustable Type

Code No. 3-A	1000 Ohms
Code No. 3-D	1600 Ohms
Code No. 3-E	2500 Ohms



Code No. 14—Mech. Signal



No. 12 Mech. Signal

SIGNALS—MECHANICAL

Code No.	Type Shutter	Mtg. Centers	Night Alarm	Resistances A	B	C	D	E	F	G	H	Where Used
7	Gridiron	1"	1	500	100	50	200	250	1000	150	3000	Line on C. B. systems.
8	Gridiron	1"		250	100	200	50	20				Supervisory on C. B. systems.
				250	100	200	50	20				
12	Target	½"		160	100	1600						Busy test on toll boards.
14	Gridiron	1"	1	250	200							No. 7, but insulated.

SEATS—PLUG



No. 1

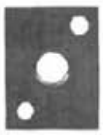




No. 2



No. 8



No. 10

Individual Type

No.	Material	Washer Thickness	Washer Size	Washer Hole	Seat Material	Seat Thickness	Seat Size	Seat Hole	Remarks
1	Leather	1/16"	1½x7/8"	5/16"	Brass	No. 15 B&S	1½x7/8"	5/16"	
2	Leather	1/16"	1/2" Diam.	.368	Brass	No. 15 B&S	1x¾"	.368	
3	Leather	1/16"	1/2" Diam.	5/16"	Brass	No. 15 B&S	1x¾"	5/16"	
4	Leather	3/16"	1/2" Diam.	¼"	Brass	No. 15 B&S	1x¾"	¼"	
5	Leather	1/16"	1/2" Diam.	5/16"	Brass	No. 15 B&S	1x.671	5/16"	
6	Leather	1/16"	1/2" Diam.	.344	Brass	No. 15 B&S	1x¾"	.344	
7	Leather	⅛"	1/2" Diam.	¼"	Brass	No. 11 B&S	1x¾"	¼"	
8	Red Fibre	2/16"	33/64" Diam.	33/64"	Brass	No. 16 B&S	5/8" Diam.	33/64"	
9	Leather	1/16"	1/2" Diam.	.368	Red Fibre	⅛"	1x¾"	.368	
10	Red Fibre	⅛"	1/2" Diam.	.368	Brass	No. 15 B&S	1x¾"	.368	No. 2 with fibre washer
11	Red Fibre	1/16"	1/2" Diam.	5/16"	Brass	No. 15 B&S	1x¾"	5/16"	No. 3 with fibre washer
12	Red Fibre	⅛"	1/16x¾"	.368	Brass	No. 15 B&S	1.10x¾"	.368	
13	Red Fibre	⅛"	1/16x¾"	5/16"	Brass	No. 15 B&S	1.10x¾"	5/16"	

Strip Type



Code No.	Material	Seat Thickness	Size	Hole	Remarks
14	Red Fibre Waxed	⅛"	12 3/16x2 1/16"		
15	Red Fibre Waxed	⅛"	19 3/16x2 1/16"		
16	Red Fibre Waxed	⅛"	25 3/16x2 1/16"		
20	Red Fibre Waxed	⅛"	10 3/16x2 1/16"		
21	Red Fibre Waxed	⅛"	6 3/16x2 1/16"		
22	Red Fibre Waxed	⅛"	20 3/16x2 1/16"		Used on 15-AB magneto boards.
23	Red Fibre Waxed	⅛"	26 3/16x2 1/16"		Used on 20-AB magneto boards.
24	Red Fibre Waxed	⅛"	20 3/16x2 1/16"		
25	Red Fibre Waxed	⅛"	21 3/16x2 1/16"		Used on 150 type magneto boards.
26	Red Fibre Waxed	⅛"	13 3/16x2 1/16"		Used on No. 37 P. BX.
27	Red Fibre Waxed	⅛"	14 3/16x2 1/16"		Used on No. 40 magneto boards.



Ring Type

17	Brass Wire	No. 15 BWG	.385" Diam.	.241"	For No. 26 plug P. C. 30187 extractor.
18	Brass Wire	No. 15 BWG	.503" Diam.	.359"	For No. 55 plug P. C. 30187 extractor.
19	Brass Wire	No. 15 BWG	.461" Diam.	.317"	For No. 78 plug P. C. 30187 extractor.

SETS—RINGING

For convenience in ordering ringing sets, the following codes, which include pole changers and the necessary circuits, instructions and equipment for installation and operation are offered. A full description of the various pieces of apparatus included in these codes will be found under their respective heads in other parts of this catalogue.

Code No.	TYPE	APPARATUS.	REMARKS.
1-PAD	Dry Battery Puls. and Alt.	1 No. 30 Pole Changer. No. 30 Pole Changer instructions. 1 Print No. 11564. 1 Print No. 11727.	Order to specify No. 18 B. R. C. twisted pair wire necessary for lengths from: Battery to pole changer, 2 pair; telephone switchboard to P. C. 2 pair.
1-AD	Dry Battery Alt.	1 No. 23 Pole Changer No. 23 Pole Changer instructions. 1 Print No. 19611. 1 Print No. 18171.	Order to specify No. 18 B. R. C. twisted pair wire necessary for lengths from: Battery to Pole Changer, 2 pair; P. C. to telephone switchboard, 1 pair.
1-DH	Sgl. frequency direct Harmonic.	1 No. 16 Pole Changer. 136 No. 6 dry cells. 1 No. 14408 Aux. App. Board. 1 Ckt. No. 16447. 1 P. C. instructions "K."	Order to specify necessary wire lengths as follows: Battery to auxiliary apparatus board, 1-59 cable; P. C. to auxiliary apparatus board, 1-59 cable; P. C. to telephone switchboard, 1 pair No. 18 B. R. C. wire.
4-DH	4-frequency direct Harmonic-30-42-54-66 cycles.	2 No. 15 Pole Changers. 1 No. 14773 Aux. App. Board. 136 No. 6 dry cells. 1 Ckt. No. 14263 1 P. C. instructions "G."	Order to specify necessary wire lengths as follows: Each pole changer to auxiliary apparatus board 1-105 cable and 1-59 cable; telephone switchboard to auxiliary apparatus board, 1-105 cable; batteries to auxiliary apparatus board, 1-59 cable.
5-DH	5-frequency direct Harmonic-16-30-42-54 and 66 cycles.	2 No. 18 Pole Changers. 1 No. 14773 Aux. App. Board. 136 No. 6 Dry cells. 1 Ckt. No. 14273. 1 P. C. instructions "H."	Order to specify necessary wire lengths as follows: Each P. C. to auxiliary apparatus board 1 No. 105 cable and 1 No. 59 cable; telephone switchboard to auxiliary apparatus board, 1 No. 105 cable; battery to auxiliary apparatus board, 1-59 cable.
1-PAC	110-volt, 60-cycle single phase Puls. and Alt.	1 No. 7 converter. 1 Print No. 20247. 1 No. 7 converter instructions.	Order to specify necessary wire lengths as follows: Converter to telephone switchboard, 2 pair No. 18 B. R. C., to 110-volt tap—No. 14 B. R. C.
1-AT	110-volt, 25-cycle single frequency A. C.	1 No. 2 Auxiliary App. Board. See page 98. 1 Print No. 20240.	Order to specify necessary wire lengths as follows: Converter to telephone switchboard, 1 pair No. 18 B. R. C., to 110-volt tap—No. 14 B. R. C.
1-AC	110-volt, 60-cycle single frequency A. C.	1 Print No. 202446. 1 No. 6 converter. 1 No. 6 converter instructions.	Order to specify necessary wire lengths as follows: Converter to telephone switchboard, 1 pair No. 18 B. R. C., to 110-volt tap—No. 14 B. R. C.

SETS — RINGING

Code No.	TYPE.	APPARATUS.	REMARKS
1-NH	Single frequency storage battery 20-cycles.	**1-NH Set** 2 No. 13 pole changers. 1 No. 22-A trans. set. 1 Print No. 11300. 1 P. C. instructions "E." 1 H. W. J. M. Fuse cut-out No. 3327 with Mtg. screws. 4 H. W. J. M. Fuses 3-amp. No. 2602. 2 2-P 2-T porcelain base Baby knife switches with Mtg. screws. 11 P. T. Glass jars No. 229. 11 P. T. elements No. 203 including 1 Neg., 1 Pos. term. plate. 2 Bolt connectors D-7082. 1 6-oz. rubber syringe. 1 Hydrometer E-7207. 55 lbs. Electrolyte 1-set of Batt. instructions 421-R-7. 1 Rectigon rectifier 110-volt 60-cycles S. P. A. C. double bulb 2½ amp. for 11-lead cells. 1 Extra bulb for above rectifier.	Order to specify quantity of No. 18 B. R. C. twisted pair to reach from battery to transformer set, transformer to pole changer and transformer to positions.



No. 13 Pole Changer



No. 22A Transformer Set
Furnished with quartered oak cover.

4-NH	4-frequency storage battery 30-42 54-66 cycles.	**4-NH Set** 2 No. 17 pole changers. 1 No. 19-A transformer set. 1 No. 23-A retard coil. 1 Print No. 22073. 1 P. C. instructions "W." 1 Fuse cut-out H. W. J. M. No. 3327 with mtg. screws. 4 Fuses H. W. J. M. No. 2602 (3-amp.) 5 D. P. D. T. Porcelain base baby knife switches with mtg. screws. 11 Pt. Glass jars No. 229. 11 Pt. elements No. 203 including 1 Neg., 1 Pos. term. plate. 2 Bolt connectors D-7082. 1 6-oz. rubber syringe. 1 Hydrometer E-7207. 55 lbs. Electrolyte. 1 Set of Batt. instructions 421 R-7. 1 Rectigon rectifier 110-volt, 60 cycles, S. P. A. C. double bulb, 2½ amp. 11 for lead cells. 1 Extra bulb for above rectifier.	Order to specify lengths as follows: Each pole changer to transformer set, No. 122 cable; transformer set to telephone switchboard, No. 59 cable; transformer set to battery, No. 14 B. R. C. twisted pair; rectifier set to battery, No. 14 B. R. C. twisted pair.



No. 17 Pole Changer



No. 19A Transformer Set

5-NH	5-frequency storage battery 16-30-42-54-66 cycles.	**5-NH Set** 2 No. 19 pole changers. 1 No. 18-A trans. set. 1 No. 23-A retard coil. 1 Print No. 26246. 1 P. C. Instruction "R." 1 Fuse cut-out H. W. J. M. No. 3327 with mtg. screws. 4 Fuses, 3-amp. H. W. J. M. No. 2602. 6 D. P. D. T. Porcelain base baby knife switches with mtg. screws.	Order to specify lengths as follows: Each pole changer to transformer set, No. 122 cable; transformer set to telephone switchboard, No. 105 cable; transformer to battery, No. 14 B. R. C. twisted pair; rectifier to battery, No. 14 B. R. C. twisted pair.

Apparatus continued on next page

SETS — RINGING

Code No.	TYPE	APPARATUS	REMARKS
5-NH		11 P. T. Glass jars No. 229 11 P. T. elements No. 203 including 1 Neg. 1 Pos. term. plate. 2 Bolt connectors, D-7082. 1 6-oz. rubber syringe 1 Hydrometer E-7207 55 lbs. Electrolyte 1 Set of Batt. instructions 421 R-7 1 Rectigon rectifier 110-volt, 60 cycles, S. P. A. C. double bulb, 2½ amp. for 11 lead cells 1 Extra bulb for above rectifier	
1-OH	Single frequency storage battery 16-cycles.	**1-OH Set** 2 No. 11 pole changers 1 Spec. No. 22 Trans, set with 1-C trans. instead of 5-B trans. 1 Print No. 11300 1 P. C. Instructions "E" 1 H. W. J. M. Fuse cut-out No. 3327 with mtg. screws. 4 H. W. J. M. Fuses, 3-amp. No. 2602 2 D. P. D. T. porcelain base baby knife switches with mtg. screws 11 P. T. Glass jars No. 229. 11 P. T. elements No. 203 including 1 Neg. 1 Pos. term. plate 2 Bolt connectors, D-7082. 1 6-oz. rubber syringe 1 Hydrometer E-7207 55 lbs. Electrolyte 1 Set of Batt. instructions 421 R-7 1 Rectigon rectifier 110-volt, 60 cycles, S. P. A. C. double bulb, 2½ amp. for 11 lead cells 1 Extra bulb for above rectifier	
4-OH	4-frequency storage battery 16-33-50-66-cycles.	**4-OH Set** 2 No. 6 pole changers 1 No. 21-A transformer set 1 No. 23-A retard coil 1 Print No. 22073 1 P. C. Instructions "W" 1 Fuse cut-out H. W. J. M. No. 2602 with mtg. screws 4 Fuses 3-amp. H. W. J. M. No. 2602 5 D. P. D. T. porcelain base baby knife switches with mtg. screws 11 P. T. Glass jars No. 229 11 P. T. elements No. 203 including 1 Neg. 1 Pos. term. plate 2 Bolt connectors, D-7082. 1 6-oz. rubber syringe 1 Hydrometer E-7207 55 lbs. Electrolyte 1 Set of Batt. instructions 421 R-7 1 Rectigon rectifier 110-volt, 60 cycles, S. P. A. C. double bulb, 2½ amp. for 11 lead cells 1 Extra bulb for above rectifier	



Rectigon Rectifier



No. 11 Pole Changer



No. 6 Pole Changer



PT. Battery Cells

Order to specify quantity of No. 18 B. R. C. twisted pair to reach from battery to transformer set, transformer to pole changer and transformer to positions.



No. 22 Transformer Set
Furnished with oak cover.

Order to specify lengths as follows: Each pole changer to transformer set, No. 122 cable; transformer set to telephone switchboard, No. 59 cable; transformer set to battery, No. 14 B. R. C. twisted pair; rectifier set to battery, No. 14 B. R. C. twisted pair.



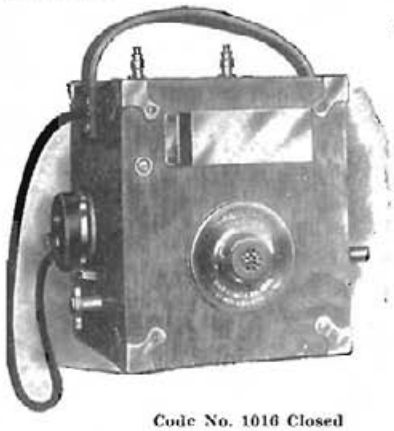
No. 21A Transformer Set

SETS—TEST

Kellogg Test Sets are compact, light in weight and properly proportioned so as to be easy to carry. The durable cabinet is reinforced with steel plates at each corner. The standard Kellogg equipment is securely mounted in the most practical manner for the convenience of the line man.

The service furnished by these sets in the World War prove them to be unequalled for reliability and long life.

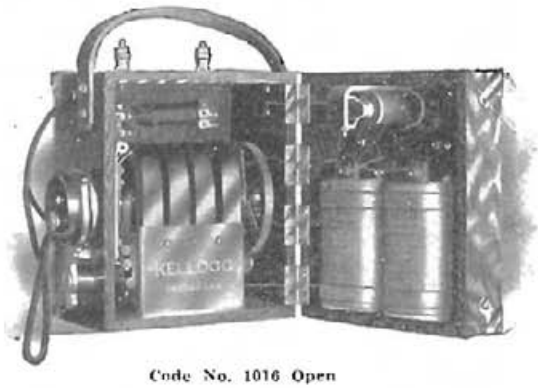
Any combination of generators and ringers, either series or bridging, furnished promptly to order.



Code No. 1016 Closed

See also, page 318

1003-1007-1008
Measurements
6⅞" h, 6⅛" w, 6" d
1001-1010-1016
Measurements
8" h, 7" w, 8⅜" d



Code No. 1016 Open

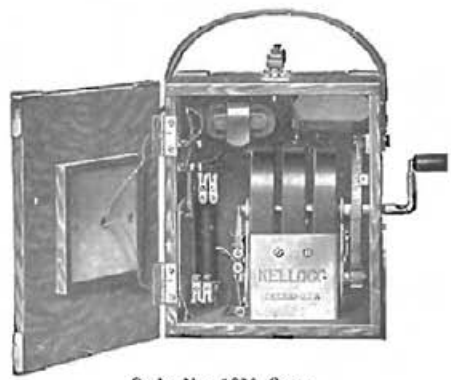
Bridging Type

Code No.	Generator Code No.	Bars	Ringer Code No.	Ohms	Hook Switch	Rec.	Trans.	Ind. Coil	Keys	Push Button	Oval Dry Cells	Remarks
1001	22	4	18-B	1000	47	46-A	32-L	1-A	.....	.....	2-No. 703	
1003	15	3	15-B	1000	....	.....	.....	.....	.....	.....	.....	Birch mahogany.
1007	15	3	15-B	1000	....	.....	.....	.....	.....	No. 7	.....	Birch mahogany.
1010	22	4	18-B	1000	47	46-A	32-L	1-A	.....	No. 7	2-No. 703	
1016	22	4	18-C	1600	47	46-A	32-L	1-A	.....	.....	2-No. 703	
1021	15	3	66-A	1000	94	46-A	32-L	28-A	.....	No. 3	2-No. 703	



Code No. 1020 Closed

1020-1021-1022
Measurements
8⅛" h, 6⅞" w, 5" d
1019 Measurements
9½" h, 9⅛" w,
4⅜" d



Code No. 1020 Open

Series Type

1008	15	3	15-A	80	....	.....	.....	.....	.....	No. 7	.....	Birch stained mahogany.
1020	15	3	66-B	80	94	46-A	32-L	28-A	.....	No. 3	2-No. 703	

Universal Type

1022	15	3	66-B	80	94	46-A	32-LC	28-C	167	No. 19	2-No. 703	Sim. to No. 1020, but has 1 No. 28 & 1 No. 62 condenser

Special Type

1019	....	....	.....	.....	76	46-A	32-L	35-A	172	No. 3	6-No. 703	Birch stained mahogany.

SETS—TEST

No. 1025 Lineman's Test Set



Code No. 1025—Test Set

This compact, easy-to-carry lineman's testing and talking set is arranged for use on common battery lines. A very desirable addition to the lineman'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.



Code No. 1—Test Set—Pole Changer

The set consists of a Code No. 19 grabaphone arranged for use with two single conductor cords, sixty-two inches long, equipped with two No. 13 Universal test clips. The grabaphone is made entirely out of metal, black enamelled, with one exception, the ear cap, which is made of hard rubber.

SETS—POLE CHANGER TEST

Pole changer test sets are made up of standard ringers and condensers mounted in a neat oak cabinet. They are so constructed that they can be mounted on the wall near the pole changers with which they are to be used. The ringers are accurately adjusted so that a positive test of the adjustment of the pole changer can be made at any time.

Code No.	Ringer Code No.	Frequencies Cycle	Cycle	Cycle	Cycle	Cycle	Condensers Code No.	Number	Where Used
1	4-72-A	16⅔	33⅓	50	66⅔	....	12	4	For No. 6 Pole Changer
2	4-73-A	30	42	54	66	....	....	....	For No. 15 Pole Changer
3	4-73-A	30	42	54	66	....	24	1	For No. 15 Pole Changer with keys, cond. and resis. coil.
4	4-73-A 1-72-A	16	30	42	54	66	....	....	For No. 18 Pole Changer
5	4-73-A 1-72-A	16	30	42	54	66	37	5	For No. 19 Pole Changer
6	4-73-A	30	42	54	66	....	12	4	No. 2 but has condensers, for No. 26 Pole Changer

STATIONS—CUT-IN



No. 5 Cut-in-Station

For intermediate toll stations, leaves the toll line free for thru connections. It eliminates the various contacts required when connected thru a switchboard which imparts transmission efficiency. Cut-in subscriber may enter or answer call at any time.

Code No.	Ringer Code	Ringer Ohms	Spring Jack No.	Jack Code	Cord Code	Cord Length	Plug No.	Plug Code	Key No.	Key Code	Key Esc.	Remarks
1	78-D	1600	3	56	18	36"	1	42	....	....	....	
5	78-A	1000	....	....	....	.....	....	....	1	30	1	
7	78-D	1600	....	....	....	.....	....	....	1 1	28 30	 3	Sim. to No. 5
8	.....	.....	1	277	304	Per Spec.	1	42	1	33	1	No. 8-A Rept. Coil, 2 No. 34 Cond. for small exchanges enables operator to connect grounded lines.

STRIPS—DESIGNATION

No. 1 Type



Code No.	Material: Frame	Card	Cover	Panel	Dimensions: Width	Length	Finish	Use
1	.....	White Paper	Celluloid	½" Maple	½"	10 3/32"	.....	Switchboards
2	.....	White Paper	Celluloid	7/16" Maple	7/16"	10 3/32"	.....	Switchboards
3	.....	White Paper	Celluloid	⅓" Maple	½"	6 1/16"	.....	Switchboards
32	.....	White Paper	Celluloid	½" Maple	½"	5 23/32"	.....	Switchboards
4	.....	White Paper	Celluloid	.....	½"	11¼"	.....	Miscellaneous
5	.....	White Paper	Celluloid	.....	½"	7½"	.....	Miscellaneous
6	.....	White Paper	Celluloid	.....	27/64"	19 23/32"	.....	Miscellaneous
37	.....	White Paper	Celluloid	.....	13/16"	3¾"	.....	Inter. Comm. Sets

No. 7 Type



7	Drawn Brass	White Paper	Celluloid	.....	1/32"	19½"	Oxid. Lac.	Miscellaneous
8	Drawn Brass	White Paper	Celluloid	.....	1/32"	21 11/16"	Blk. Lac.	Miscellaneous
9	Drawn Brass	White Paper	Celluloid	.....	1/32"	20 7/16"	Oxid. Lac.	Miscellaneous
10	Drawn Brass	White Paper	Celluloid	.....	1/32"	10¼"	Oxid. Lac.	Miscellaneous
11	Drawn Brass	White Paper	Celluloid	.....	1/32"	28⅜"	Blk. Lac.	Miscellaneous
12	Drawn Brass	White Paper	Celluloid	.....	1/32"	23½"	Blk. Lac.	Miscellaneous
15	Drawn Brass	White Paper	Celluloid	.....	1/32"	10"	Blk. Lac.	Miscellaneous
16	Drawn Brass	White Paper	Celluloid	.....	1/32"	9½"	Blk. Lac.	Miscellaneous
17	Drawn Brass	White Paper	Celluloid	.....	1/32"	5½"	Blk. Lac.	Miscellaneous
18	Drawn Brass	White Paper	Celluloid	.....	1/32"	5"	Blk. Lac.	Miscellaneous
19	Drawn Brass	White Paper	Celluloid	.....	1/32"	13 7/16"	Blk. Lac.	Miscellaneous
22	Drawn Brass	White Paper	Celluloid	.....	1/32"	1 7/16"	Nickel Plate	Miscellaneous
26	Drawn Brass	White Paper	Celluloid	.....	1/32"	15¼"	Nickel Plate	Miscellaneous
28	Drawn Brass	White Paper	Celluloid	.....	1/32"	8 3/16"	Nickel Plate	Miscellaneous
30	Drawn Brass	White Paper	Celluloid	.....	1/32"	17"	Blk. Lac.	Miscellaneous
33	Drawn Brass	White Paper	Celluloid	.....	1/32"	11½"	Nickel Plate	Miscellaneous
36	Drawn Brass	White Paper	Celluloid	.....	7/16"	7 3/32"	Blk. Enamel	Miscellaneous

No. 13 Type



13	Drawn Brass	White Paper	Celluloid	½" Maple	1/16"	9 31/32"	Nickel Plate	Switchboards
21	Drawn Brass	White Paper	Celluloid	1/16" Maple	1/16"	9 31/32"	Nickel Plate	Switchboards
20	Drawn Brass	White Paper	Celluloid	¼" Maple	¼"	9 31/32"	Nickel Plate	Switchboards
23	Drawn Brass	White Paper	Celluloid	⅜" Maple	27/64"	7 1/16"	Nickel Plate	Switchboards

STRIPS—DESIGNATION

No. 13 Type

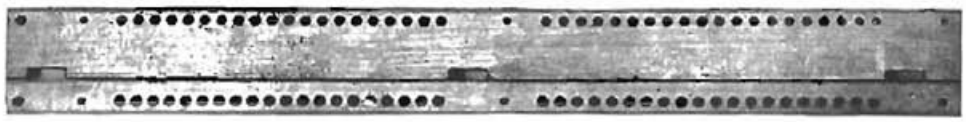
Code No.	Material: Frame	Card	Cover	Panel	Dimensions: Width	Length	Finish	Use
29	Drawn Brass	White Paper	Celluloid	7/16" Maple	7/16"	9 31/32"	Nickel Plate	Switchboards
31	Drawn Brass	White Paper	Celluloid	1/2" Maple	7/16"	7 29/32"	Nickel Plate	Switchboards
38	Drawn Brass	White Paper	Celluloid	1/2" Maple	1/2"	9 1/8"	Nickel Plate	With Sterling Jacks
39	Drawn Brass	White Paper	Celluloid	1/2" Maple	1/2"	8 11/64"	Blk. Enamel	With 332 Jacks
40	Drawn Brass	White Paper	Celluloid	3/8" Maple	3/8"	8 11/64"	Blk. Enamel	With 293 Jacks

No. 14 Type

14	Drawn Brass	White Paper	Celluloid	.....	7/16"	9 31/32"	Nickel Plate	Miscellaneous
24	Drawn Brass	White Paper	Celluloid	.....	7/16"	13/16"	Nickel Plate	Miscellaneous
25	Drawn Brass	White Paper	Celluloid	.....	7/16"	1 1/2"	Nickel Plate	Miscellaneous
27	Drawn Brass	White Paper	Celluloid	.....	7/16"	1 1/2"	Nickel Plate	Miscellaneous
34	Drawn Brass	White Paper	Celluloid	.....	1/4"	1 3/4"	Blk. Enamel	Miscellaneous
35	Drawn Brass	White Paper	Celluloid	.....	1/4"	9 31/32"	Nickel Plate	Miscellaneous

STRIPS—JUMPER

Arrester Type



No. 31

Code No.	No. of Strips	Rows of holes in each strip	Holes in each row	Mtg. centers	Use
6	2	1	102	11"	Arresters
12	2	1	160	11"	Arresters
16	2	1	100	11"	Arresters
17	2	1	160	11"	Arresters
18	2	1	120	11"	Arresters
21	2	1	200	11"	Arresters
26	2	1	140	11"	Arresters
31	2	1	100	11"	Arresters
33	2	1	60	Per. Spec.	Arresters
35	2	2	160	10½"	Arresters
39	2	1	180	11"	Arresters
41	2	1	100	10½"	Arresters
43	2	1	140	10½"	Arresters
46	2	1	200	10½"	Arresters
49	2	1	120	10½"	Arresters

Terminal Strip Type

					Terminal Strips
1	1	2	100	12"	14–16–17–19
2	1	3	100	12"	15–18
3	1	2	100	12"	14–16–17–19
5	1	2	140	11"	10–11–21–22
7	1	2	200	11"	10–11–21–22

STRIPS — JUMPER

Terminal Strip Type



No. 8

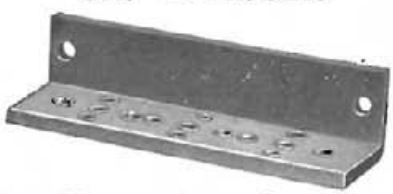
Code No.	No. of Strips	Rows of holes in each strip	Holes in each row	Mtg. centers	Terminal Strips
8	1	2	100	11 "	10–11–21–22
10	1	2	103	11 "	10–11–21–22
14	1	2	160	11 "	10–11–21–22
19	1	2	120	11 "	10–11–21–22
20	1	2	200	11 "	10–11–21–22
22	1	2	200	10⅜"	10–11–21–22
23	1	2	160	11 "	10–11–21–22
24	1	4	200	13½"	24
25	1	2	320	13½"	25
27	1	2	140	11 "	10–11–21–22
28	1	2	180	11 "	10–11–21–22
29	1	2	60	32 7/16"	10–11–21–22
30	1	4	2–65 2–60	11 "	39–44
32	1	4	2–39 2–36	Spec.	39–44
34	1	4	2–104 2–96	10½"	39–44
38	1	4	2–117 2–108	11 "	39–44
40	1	4	2–65 2–60	10½"	39–44
42	1	4	2–91 2–84	10½"	39–44
44	1	4	2–91 2–84	11 "	39–44
50	1	2	100	10½"	10–11–21–22
52	1	2	60	30 7/16"	10–11–21–22

STRIPS — MOUNTING

Arrester

Code No.	No. Per Strip	Apparatus Code No.	Width of Strip	Centers Spaced	Mtg. Cen.	Length Over All	Finish	Material	How Mtd.	Remarks
225	20	1-4-11	3"	½"	10-½"	10 31/32"	.....	Steel	.....	.....
428	20	16	3"	½"	10-½"	10 31/32"	.....	Steel	.....	.....

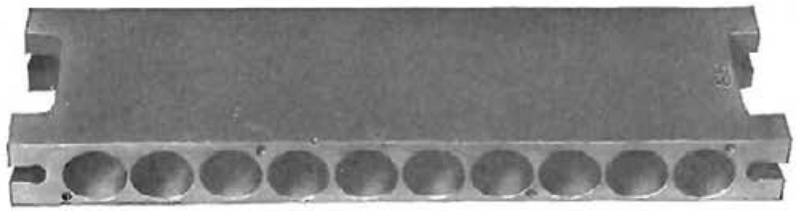
Coil — Resistance



229	3	3	1⅜"	1 5/32"	3 1/16"	3 7/16"	Oxidized	Steel	.....	Angle Type
242	2	3	1⅜"	1 5/32"	1 29/32"	2 3/32"	Oxidized	Steel	.....	Angle Type

STRIPS — MOUNTING

Coil — Retardation



No. 85

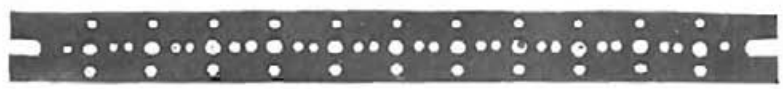
Code No.	No. Per Strip	Code No.	Width of Strip	Centers Spaced	Mtg. Cen.	Length Over All	Finish	Material	How Mtd.	Remarks
85	10	10	1 5/16"	1 3/16"	8¼"	9 1/16"	Oxidized	Cast Iron	Pins	Minor Relay Strip, 2 Term.
163	10	14	1 3/16"	1 3/16"	8¼"	9 3/16"	Oxidized	Cast Iron	Pins	Minor Relay Strip, 4 Term.
319	1	20-21	.....	.....	.....	.....	Oxidized	Steel	Screw	Angle. Mounts single or double wound coils.
		22-23	.....	.....	.....	.....				
		34	1"	.....	.....	.....				

Condenser



No. 356

Code No.	Cond. Per Strip	Code No. Cond.	Width of Strip	Cen. Spaced	Mtg. Cen.	Length Over All	Vertical Spacing	Material	Finish
272	11	36	2"	1 3/16"	13½"	13⅞"	.....	.....	.....
284	1	35	1⅞"	.....	½"	.....	.....	.....	.....
289	18	36	2"	1¼"	26¼"	26"	.....	.....	.....
301	1	24 or 25	¾"	.....	2 1/32"	2¾"	.....	.....	.....
320	45	36	6"	2⅛"	20⅜"	21⅛"	.....	.....	.....
334	27	36	3⅞"	2⅛"	20⅜"	21⅛"	.....	.....	.....
335	16	36	2"	1 3/16"	20⅜"	21⅛"	.....	.....	.....
337	13	36	2"	1 3/16"	17½"	18¼"	.....	.....	.....
356	10	36	2"	1 3/16"	13 3/16"	13 13/16"	.....	.....	.....



No. 370

Code No.	No. Per Strip	Code No.	Width of Strip	Centers Spaced	Mtg. Centers	Length of Face	Vertical Spacing
359	18	36	2"	1 3/16"	22 13/16"	23 5/16"	....
370	11	64	1¼"	1 3/32"	13 1/16"	13 13/16"	2"
371	15	64	1¼"	1 3/32"	17 15/16"	18 1/16"	2"
372	17	64	1¼"	1 3/32"	23⅝"	21⅛"	2"
373	22	64	1¼"	1 3/32"	25¼"	26"	2"
374	19	36	2"	1 3/32"	23⅝"	24⅜"	....
458	12	36	2"	1 3/32"	13½"	13¼"	....

Drop

{L—Lug / S—Screw}

Code No.	No. Per Strip	Code No.	Width of Strip	Centers Spaced	Mtg. Centers	Length of Face	Length Over All	How Mtd.	Where Used
117	10	8	1"	1"	11 3/32"	10¼"	10¾"	L	.....
149	5	9	1¾"	1 3/16"	6¼"	5 3/32"	6 1/16"	S	.....
109	5	9	1½"	2"	11 3/32"	10¼"	10¾"	L	.....
118	10	9	1½"	1"	11 3/32"	10¼"	10¾"	L	.....
129	10	9	1⅜"	1"	11 3/32"	10¼"	10¾"	L	.....
130	10	9	1 7/16"	1"	11 3/32"	10¼"	10¾"	L	.....

STRIPS—MOUNTING

Drop

{L—Lug / S—Screw}

Code No.	No. Per Strip	Code No.	Width of Strip	Centers Spaced	Mtg. Centers	Length of Face	Length Over All	How Mtd.	Where Used
171	10	9	1 5/16"	1"	11 3/32"	10 1/4"	10 3/4"	L	
238	5	19	1 1/4"	1 5/16"	6 1/4"	5 25/64"	6 11/16"	S	
296	1	22 & 51	1"	.....	1 1/4"	1 1/2"	1 1/2"	S	
259	5	22 & 51	1"	1 7/16"	6 1/4"	5 25/64"	6 11/16"	S	
449	5	22 & 51	1"	1 7/16"	6 1/4"	6 1/16"	6 1/16"	S	On Dean Switchboards.
260	10	22 & 51	1"	1"	11 3/32"	10 1/4"	10 3/4"	L	
261	10	22 & 51	1 3/8"	1"	11 3/32"	10 1/4"	10 3/4"	L	
262	10	22 & 51	1 7/16"	1"	11 3/32"	10 1/4"	10 3/4"	L	
328	8	22 & 51	1"	1 3/32"	11 3/32"	10 1/4"	10 3/4"	L	
332	10	22 & 51	1"	1"	11 3/32"	10 1/4"	10 3/4"	L	No. 260 But Location of Mtg. Lugs.
393	10	22 & 51	1"	1"	11 3/32"	10 1/4"	10 3/4"	L	
427	10	22 & 51	1"	1"	10 31/32"	10 1/4"	10 3/4"	S	No. 260 But Screw Mounted.
433	8	22 & 51	1"	1 3/32"	10 31/32"	10 1/4"	10 3/4"	S	No. 427 But 8 per Strip.
310	12	22 & 51	1"	1"	13"	12.61"	13 7/16"	S	
409	5	50	1 1/4"	1 7/16"	6 1/4"	5 25/64"	6 11/16"	S	No. 259 But for Adj. N. A. Screw.
410	10	50	1 1/4"	1"	11 3/32"	10 1/4"	10 3/4"	L	No. 393 But for Adj. N. A. Screw.



Drop and Jack—Combined

114	5	3	1 3/4"	1 7/16"	6 1/4"	5 25/64"	6 11/16"	S	
178	1	3	1 3/4"	.....	1 7/16"	1 3/4"	1 3/4"	S	
241	3	5	1 3/4"	1"	3 1/2"	3 25/64"	3 11/16"	S	
93	10	5	2"	1"	11 3/32"	10 1/4"	.....	L	
162	10	5	1 3/4"	1"	11 3/32"	10 1/4"	.....	L	
207	10	5	1 3/8"	1"	11 3/32"	10 1/4"	.....	L	
246	10	20	1 5/16"	1"	11 3/32"	10 1/4"	.....	L	
298	5	40	1 3/4"	1 7/16"	6 1/4"	5 25/64"	6 11/16"	S	
300	10	40	1 3/8"	1"	11 3/32"	10 1/4"	.....	L	
306	1	29, 101 & 301	1 3/4"	.....	1 1/4"	1 1/4"	1 1/2"	S	
307	2	29, 101 & 301	1 3/4"	1"	2 1/4"	2 1/2"	2 1/2"	S	
308	3	29, 101 & 301	1 3/4"	1"	3 1/4"	3 1/2"	3 1/2"	S	



257	5	29, 101 & 301	1 3/4"	1 7/16"	6 1/4"	5 25/64"	6 11/16"	S	
395	5	29, 101 & 301	1 3/4"	1 7/16"	6 1/4"	5 25/64"	6 11/16"	S	For W. E. Co. Board—2-pc. No. 28421 Adapters.
445	5	29, 101 & 301	1 3/4"	1 7/16"	6 1/4"	5 29/64"	6 31/64"	S	257 With Restoring Slot. For No. 22A Mag. Board.
304	7	29, 101 & 301	1 3/4"	1"	8 9/32"	7 31/32"	.....	L	
355	7	29, 101 & 301	1 3/4"	1"	8.677"	7.772"	.....	L	No. 304—But Mounts Flush.
258	10	29, 101 & 301	1 3/8"	1"	11 3/32"	10 1/4"	.....	L	
263	10	29, 101 & 301	1 3/4"	1"	10 1/2"	10 1/4"	10 1/4"	S	Fits S. C. Board.
294	10	29, 101 & 301	2"	1"	11 9/32"	10 1/4"	.....	L	
297	10	29, 101 & 301	1 3/4"	1"	11 3/32"	10 1/4"	.....	L	Lugs Mounted in Center of Strip.
329	10	29, 101 & 301	1 3/4"	1"	10 31/32"	10 1/4"	11 1/8"	S	

STRIPS—MOUNTING

Drop and Jack—Combined

Code No.	No. Per Strip	Code No.	Width of Strip	Centers Spaced	Mtg. Centers	Length of Face	Length Over All	How Mtd.	Where Used
425	10	29, 101 & 301	1¾"	1"	11 5/32"	10¼"	.....	L	No. 412 But not Drilled for Armature Contact Screws.
431	10	29, 101 & 301	1¾"	1"	10 23/32"	10¼"	.....	S	No. 329 With Restoring Slot Closed Half Way for No. 9A Bds.
333	5	59, 100 & 300	1¾"	1 3/16"	6¼"	5 43/64"	6 11/16"	S	
448	5	59, 100 & 300	1¾"	1 3/16"	6¼"	5 55/64"	6 11/16"	S	For Monarch, Dean and W. E. Boards.
426	10	59, 100 & 300	1¾"	1"	10 23/32"	10¼"	11⅛"	S	No. 329 But Drilled Like No. 412 Mtg.
412	10	59, 100 & 300	1¼"	1"	11 5/32"	10¼"	11⅛"	L	No. 318 But for Adj. N. A. Contacts.

Spring Jack



434	10	307	1"	1"	10 21/32"	10¼"	.....	S	Hard Rubber.
452	1	325	1 3/16"	.....	2 1/16"	3½"	3½"	S	Cold Rolled Steel.

Mechanical Signal

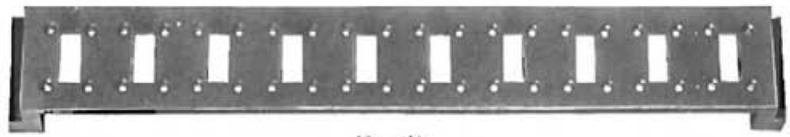
Code No.	No. Per Strip	Code No.	Width of Strip	Centers Spaced	Mtg. Centers	Length Over All	How Mtd.	Remarks.
145	2	7–8	1½"	1"	2 1/16"	2 3/16"	S	
256	2	10–13–14	1½"	1"	2 1/16"	2 3/16"	S	Insulates Signals.
226	5	7–8	1¼"	1 3/16"	6¼"	6 1/16"	S	
450	5	7–8	1¾"	1 3/16"	6¼"	6 1/16"	S	Fits same space as No. 257 Drop and Jack Mtg.
205	10	10–13–14	1¼"	1"	10½"	10¾"	S	Insulates Signals.
139	10	7–8	1¼"	1"	11 5/32"	.....	L	
200	20	12	1"	½"	11 5/32"	.....	L	For Busy Signals.
456	10	7–8	1¼"	1"	11 5/32"	.....	L	Similar to No. 139 But First 3 Spaces for No. 51 Type Drops.
457	10	7–8	1¼"	1"	11 5/32"	.....	L	Similar to No. 456 But First 2 Spaces for No. 51 Type Drops.
461	10	7–8	1¼"	1"	11 5/32"	.....	L	No. 456 But First 4 Spaces for No. 51 Type Drops.
462	10	7–8	1¼"	1"	11 5/32"	.....	L	No. 456 But First 5 Spaces for No. 51 Type Drops.
465	10	12	1 "	1"	11 5/32"	.....	L	Lines up with No. 273 Spring Jack.
467	10	7–8	1¼"	1"	11 5/32"	.....	L	Similar to No. 139 except mtg. lug for cordless P. B. X's.

Miscellaneous Blanks

Code No.	Width of Strip	Mtg. Centers	Length of Face	Material	Finish	How Mtd.
360	1/16"	11 9/32"	10¼"	Steel	Per Spec.	L
361	½"	11 5/32"	10¼"	Steel	Per Spec.	L
362	1"	11 5/32"	10¼"	Steel	Per Spec.	L
364	1½"	11 5/32"	10¼"	Steel	Per Spec.	L
365	1¾"	11 5/32"	10¼"	Steel	Per Spec.	L
366	1⅞"	11 5/32"	10¼"	Steel	Per Spec.	L
367	1"	6¼"	5 43/64"	Steel	Per Spec.	S
369	1¼"	6¼"	5 43/64"	Steel	Per Spec.	S
396	½"	6¾"	5 53/64"	Steel	Per Spec.	L
397	¾"	6¾"	5 53/64"	Steel	Per Spec.	L

STRIPS—MOUNTING

Key



No. 400

Code No.	No. Per Strip	Width of Strip	Centers Spaced	Mtg. Centers	Length of Face	Length Over All	Material	Remarks
352	5	1¾"	1 11/64"	6¾"	5 33/64"		Steel	Finish Per Spec.
353	3	1 "	1 3/32"	6¾"	5 33/64"		Steel	Finish Per Spec.
354	3	1¾"	1 3/32"	6¾"	5 33/64"		Steel	Finish Per Spec.
405	5	1¾"	1 3/64"	6¾"	5 33/64"		C. R. Steel	For 1000 Type.
406	3	1 "	1 3/32"	6¾"	5 33/64"		C. R. Steel	For 1000 Type.
407	3	1¼"	1 7/32"	6¾"	5 33/64"		C. R. Steel	For 1000 Type.
254	5	1½"	1 7/16"	6¼"	5 33/64"	6 1/16"	H. R. & B.	
447	7	1½"	1 "	8 3/32"	7 21/32"		Steel	Mount in Panel with No. 239 Spring Jack.
430	7	1¾"	1 "	8.677"	7.772"		Steel	For 1000 Type.
344	7	1¾"	1 "	7 11/32"		8 5/16"	H. R. & B.	
347	10	1½"	1 "	11 3/32"	10¼"		Steel	Finish Per Spec.
348	10	1¾"	1 "	11 3/32"	10¼"		Steel	Finish Per Spec.
349	10	1⅜"	1 "	11 3/32"	10¼"		Steel	Finish Per Spec.
350	5	1"	2"	11 3/32"	10¼"		Steel	Finish Per Spec.
351	5	1¼"	2"	11 3/32"	10¼"		Steel	Finish Per Spec.
400	10	1½"	1"	11 3/32"	10¼"		C. R. Steel	For 1000 Type.
401	10	1¾"	1"	11 3/32"	10¼"		C. R. Steel	For 1000 Type.
402	10	1⅜"	1"	11 3/32"	10¼"		C. R. Steel	For 1000 Type.
403	5	1"	2"	11 3/32"	10¼"		C. R. Steel	For 1000 Type.
404	5	1¼"	2"	11 3/32"	10¼"		C. R. Steel	For 1000 Type.
417	5	1¾"	2"	11 3/32"	10¼"		C. R. Steel	
453	10	1¼"	1"	11 3/32"	10¼"		C. R. Steel	No. 400 But Width.
454	5	1¼"	2"	11 3/32"	10¼"		C. R. Steel	No. 40A But Mount Keys Vertical.
233	10	1½"	1"	11 3/32"	10¼"	10¼"	H. R. & B.	
435	6	1¾"	1"	10 23/32"		11 3/32"	C. R. Steel	For 1000 Type.



Ringer Drop and Jack

Code No.	No. Per Strip	Width of Strip	Centers Spaced	Mtg. Centers	Length of Face	Material	Length Over All	Remarks
276	2	3½"	3 5/16"	6¼"	5 33/64"	H. R. & Metal	6¾"	No. 141 But Distance Between R. D. & Jack.
285	2	3 31/32"	3 5/16"	6¼"	5 53/64"	H. R. & Metal	6¾"	Used with 10 Per Strip Switchboards.
314	2	1¾"	3 5/16"	6¼"	5 37/64"	Metal	6¾"	Similar to No. 175.
444	4	3½"	4"	11 5/32"	10¼"	Ebonized Metal	6¾"	2 R. & D. 4 Jacks.
455	3	1¾"	1 13/16"	10 23/32"	11 3/32"	Ebonized Metal	11 3/32"	No. 29A Magneto Boards.

STRIPS—MOUNTING

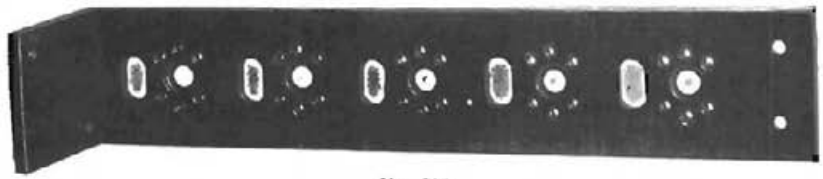
Meter and Automatic Dial



No. 338

Code No.	No. Per Strip	Width of Strip	Centers Spaced	Mtg. Centers	Length of Face	Material	Length Over All	Remarks
330	1	.....	.....	.....	.....	Steel	.....	Mounts on Ebonized Jack Panel
382	1	2 3/16"	.....	.....	.....	Steel	.....	Mounts on Ebonized Jack Panel.
343	6	1 3/16"	1 3/16"	10 5/32"	.....	Steel	10 23/32"	For No. 5 Meters.
338	10	1½"	2"	22"	.....	Steel	22¼"	For No. 5 Meters.
423	10	1½"	2"	22"	.....	Steel	22¼"	No. 338 but mounts perpendicular.
340	1	.....	.....	.....	.....	Steel	.....	Dial Mounts Flush.
463	1	.....	.....	.....	.....	Steel	.....	Dial Mounts Flush.

Relay — No. 22 Type



No. 315

Code No.	Relay No.	Relays per Strip	Length Over All	Mtg. Centers	Vertical Spacing	Width
383	22	1	2 7/16"	.....	....	2"
315	22	5	10¾"	.....	....	2"
384	22	5	11⅛"	10⅜"	2"	....
398	22	8	18¼"	17½"	2"	....
385	22	10	20½"	19¾"	2"	....



No. 384



No. 386

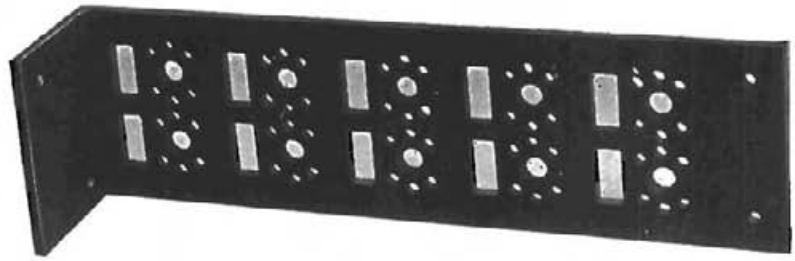
Code No.	Relay No.	Relays per Strip	Length Over All	Mtg. Centers	Width	Vertical Spacing
336	22	10	21⅛"	20⅜"	.....	2"
386	22	5	21 5/16"	20⅜"	.....	.....

No. 26 Type

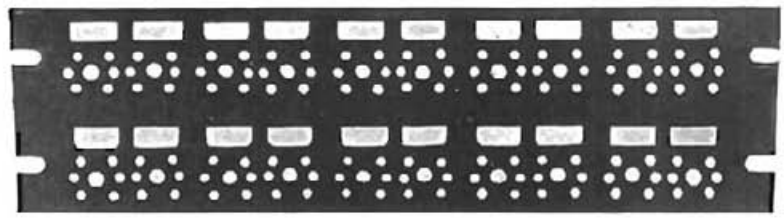
Code No.	Relay No.	No. Per Strip	Length Over All	Mtg. Centers	Width	Centers Spaced
62	26	1	.....	.....	13/16"	.....
16	26	10	10⅜"	9⅝"	⅝"	13/16"
375	26	15	13 13/16"	13 1/16"	¾"	13/16"
376	26	20	18 1/16"	17 15/16"	¾"	13/16"
459	26	20	18 1/16"	17 15/16"	1⅛"	13/16"
88	26	22	20½"	19¾"	¾"	13/16"
408	26	24	21⅛"	20⅜"	¾"	13/16"
377	26	30	26"	25¼"	¾"	13/16"

STRIPS—MOUNTING

Relay — No. 72 Type



No. 316



No. 230

Code No.	Relay No.	No. Per Strip Pairs of Relays	Length Over all	Mtg. Centers	Width of Strip	Vertical Spacing	Remarks
316	72	5	10¾"	.....	3 "	.....	Angle.
318	72	1	2⅝"	.....	2½"	.....	Angle swivel.
342	72	2	3 15/16"	.....	2½"	.....	Angle.
361	72	1	2⅝"	.....	1⅞"	.....	Angle.
230	72	10	13 13/16"	13 1/16"	3¾"	4 "	2 rows, 5 each.
282	72	5	13 13/16"	13 1/16"	1⅜"	2 "	



No. 279

Code No.	Relay No.	No. Per Strip Pairs of Relays	Length Over All	Mtg. Centers	Width of Strip	Vertical Spacing	Remarks
330	72	14	18 11/16"	17 13/16"	3¾"	4 "	2 Banks, 7 each.
331	72	7	18 11/16"	17 15/16"	1⅜"	2 "	1 Bank, 7 relays.
211	72	16	21⅛"	20⅜"	3¾"	4 "	
326	72	8	21⅛"	20⅜"	1⅜"	2 "	
339	72	5	21 5/16"	20⅜"	1⅞"	2 "	
451	72	16	21½"	20¼"	.....	4 "	
415	72	16	22½"	21 5/16"	4 "	4¼"	Fits S. C. frames.
358	72	9	23 3/16"	22 13/16"	1⅜"	2 "	
279	72	20	26 "	25¼"	3¾"	4 "	
411	72	10	26 "	25¼"	1⅜"	2 "	
414	72	20	26½"	26 "	3¾"	4 "	Fits S. C. frames.

No. 600 Type

Code No.	Relay No.	Relays Per Strip	Length Over All	Mtg. Centers	Width of Strip	Centers Spaced	Vertical Spacing	Remarks
439	600	15	13 13/16"	13 1/16"	1⅜"	11/16"	.....	
440	600	20	18 11/16"	17 15/16"	1⅜"	11/16"	.....	
432	600	40	21½"	20¾"	3¼"	⅞"	2"	One can cover over all.
441	600	30	26 "	25¼"	1⅜"	11/16"	.....	

STRIPS—MOUNTING

Relay — No. 2000 Type



No. 1002

Code No.	Relay No.	Spaces Per Strip Pairs of Relays	Length Over All	Mtg. Centers	Vertical Spacing	Remarks
1009	2000	....	.....	.....	.....	For mounting relay in No. 25 pole changer.
1012	2000	....	2⅜" Face	.....	.....	Mounts on right side of cabinet.
1013	2000	....	2⅜" Face	.....	.....	Mounts on left side of cabinet.
1014	2000	....	2⅜" Face	.....	.....	Mounts on roof of cabinet.
1000	2000	5	13 13/16"	13 1/16"	2 "	
1004	2000	10	13 13/16"	13 1/16"	4 "	
1001	2000	7	18 11/16"	17 15/16"	2 "	
1005	2000	14	18 11/16"	17 15/16"	4 "	
1002	2000	8	21⅛"	20⅜"	2 "	
1006	2000	16	21⅛"	20⅜"	4 "	
1015	2000	8	21½"	20¾"	2 "	Similar to 1002, but mounts flashing interrupter.
1016	2000	16	21½"	20¾"	4 "	No. 1006, but mtg. centers.
1003	2000	10	26 "	25¼"	2 "	
1007	2000	20	26 "	25¼"	4 "	
1008	3000	20	26 "	25¼"	4¼"	Single, can cover over all.

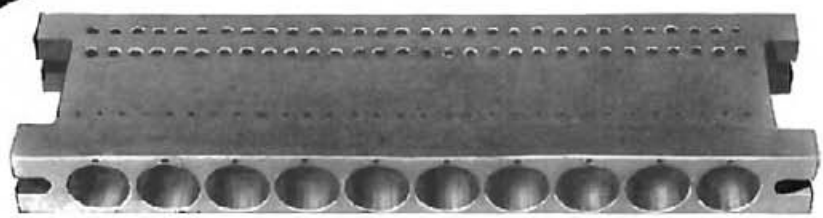
Relay — Miscellaneous



No. 429



No. 391

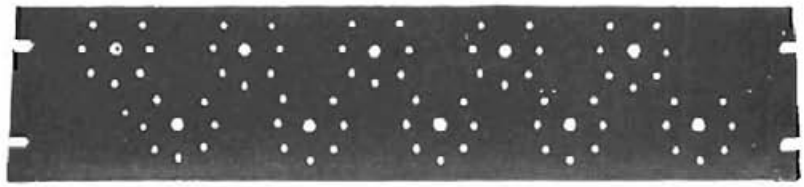


No. 394

Code No.	Relay No.	No. of Relays Per Strip	Length Over All	Mtg. Screw Centers	Vertical Spacing	Remarks
389	22 or 56	2	5 13/16"	.....	.....	Angle.
392	22 or 56	3	8¼"	.....	.....	Angle.
391	22 or 56	3	13⅜"	12⅜"	.....	Mounted vertically.
390	22 or 56	4	19¼"	17¼"	.....	Mounted vertically.
388	22 or 56	3	21½"	20⅞"	.....	Mounted vertically.
394	36	10	.....	8¾"	.....	Universal for minor type relay.
429	56	1	3¼"	.....	.....	Angle.
291	56	10	26 "	25¼"	4"	
270	87	1	2 "	.....	.....	
277	87	10	20½"	19¼"	2"	
290	87	10	26 "	25¼"	2"	

STRIPS—MOUNTING

Relay—Miscellaneous



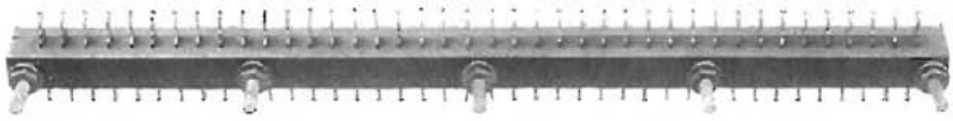
No. 442

413	244	6	13 13/16"	13 7/16"	2 5/8"	
436	244	7	18 11/16"	17 7/8"	2"	
303	244	10	20 3/8"	19 5/8"	2 5/8"	
327	244	10	21 1/8"	20 3/8"	2 5/8"	
346	440	40	26"	25 1/4"	4 1/4"	Can cover over all.
442	522	10	20 1/2"	19 3/4"	4 5/8"	Relays staggered. Drilled universal.
443	522	10	26"	25 1/4"	4"	Drilled universal.

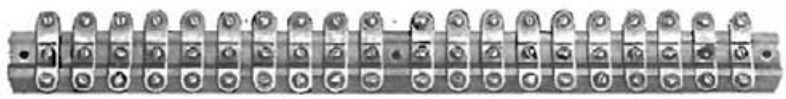
Power Plug Switch Mountings

Code No.	No. 8 Switches	Material	Finish	Code No.	No. 8 Switches	Material	Finish
511	1	Asbestos Lumber	Black Shellac & Stain	521	2	Asbestos Lumber	Black Shellac & Stain
512	2	Asbestos Lumber	Black Shellac & Stain	531	3	Asbestos Lumber	Black Shellac & Stain
513	3	Asbestos Lumber	Black Shellac & Stain	541	4	Asbestos Lumber	Black Shellac & Stain
514	4	Asbestos Lumber	Black Shellac & Stain	551	5	Asbestos Lumber	Black Shellac & Stain
515	5	Asbestos Lumber	Black Shellac & Stain				

STRIPS—TERMINAL



No. 11



No. 42

Code No.	No. of Lines	No. of Points	Base	Pairs of Holes	No. of Rows of Connectors	Connectors Per Row	Total Connectors	Centers Spaced	Length of Face Strip
34	5	2	Maple		2	5	10	1/2"	3 1/8"
41	5	2	Maple		1	10	10	1 1/4"	7 1/4"
33	5	3	Maple		3	5	15	1/2"	3 1/8"
32	10	2	Maple		2	10	20	1/2"	6 1/8"
45	10	2	Maple		1	20	20	1 1/4"	13 1/2"
42	10	2	Maple		1	20	20	1 1/4"	13 3/4"
37	21	1			1	21	21	3/16"	4 7/16"
38	26	1			1	26	26	3/16"	5 7/16"
36	15	2	Maple		2	15	30	1/4"	4 7/8"
31	10	3	Maple		3	10	30	1/2"	6 1/8"
47	15	2	Maple		1	30	30	5/8"	20 "
30	20	2	Maple		2	20	40	1/4"	6 1/8"
49	10	4	Maple		4	10	40	1/2"	6 1/2"
11	20	2			1	40	40	1/8"	9 3/32"
14	20	2			1	40	40	1/2"	10 1/2"
1	20	2	Maple	20 single	1	40	40	1/2"	11 7/8"
2	20	2	Maple	20 single	1	40	40	1/2"	11 7/8"
3	20	2	Maple	20 single	1	40	40	1/2"	11 7/8"
4	20	2	Maple	20 single	1	40	40	1/2"	11 7/8"
5	20	2	Maple	20 single	1	40	40	1/2"	11 7/8"

STRIPS—TERMINAL

Code No.	No. of Lines	No. of Points	Base	Pairs of Holes	No. of Rows of Connectors	Connectors Per Row	Total Connectors	Centers Spaced	Length of Face Strip
48	20	2	Maple	20 sin.	1	40	40	5/8"	26 1/4"
13	22	2			1	44	44	7/16"	12 5/32"
39	25	2			2	25	50	5/16"	9 3/32"
44	25	2			2	25	50	5/16"	9 3/32"
43	25	2	Maple		1	50	50	1 1/4"	32 1/2"
46	50	1	Maple		1	50	50	5/8"	32 1/2"
35	15	4	Maple		4	15	60	1/4"	4 7/8"
29	20	3	Maple		3	20	60	1/4"	6 1/8"
28	30	2	Maple		2	30	60	1/4"	8 3/8"
10	20	3			2	20 / 40	60	7/16"	9 3/32"
22	20	3			2	20 / 40	60	7/16"	9 3/32"
15	20	3			2	20 / 40	60	1/2"	10 1/2"
16	20	3			2	20 / 40	60	1/2"	10 1/2"
18	20	3			2	20 / 40	60	1/2"	10 1/2"
19	20	3			2	20 / 40	60	1/2"	10 1/2"
9	20	3	Maple	20	2	20 / 40	60	1/2"	11 7/8"
21	20	4			2	40	80	5/16"	9 5/32"
17	20	4			2	40	80	1/2"	10 1/2"
24	40	2	Maple	40	2	40	80	1/2"	10 1/2"
6	20	4	Hard Rubber	20 sin.	2	40	80	1/2"	11 5/8"
27	30	3	Maple			30	90	1/4"	8 5/8"
40	50	2	2		4	25	100	5/16"	10 3/32"
26	40	3	2	40	3	40	120	3/4"	10 1/16"
7	20	6	2	20	3	40	120	1/2"	11 7/8"
8	20	6	2	20	3	40	120	1/2"	11 7/8"
25	40	3			3	40	120	5/8"	12 5/16"
23	50	4	2		4	50	200	3/2"	13 7/16"

SWITCHBOARDS

ALL Kellogg switchboards, irrespective of size, are housed in strong, compact, well balanced cabinets of Kellogg manufacture.

The Kellogg wood working plant uses special care in the manufacture of switchboard and telephone cabinets. Only the best grade materials are used. The many coats of varnish are properly applied so as to withstand the severe wear to which the cabinet is subject.

All the iron work is securely mounted and reinforced where necessary.

All apparatus is of Kellogg standard types and can be purchased at all times.

The face equipment is so arranged that everything is at the operator's finger tips and the eliminating of lost motion makes fast service.

All equipment mounted in the cabinet is so placed that the inspection of connections or adding of additional equipment can be easily made.

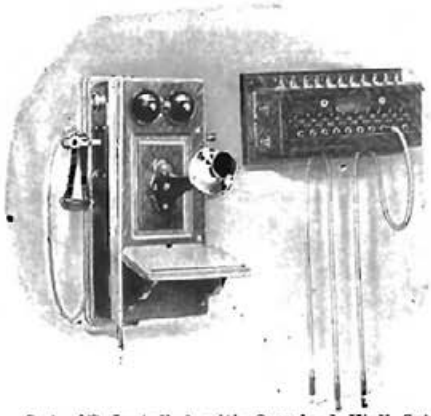
The low-key shelf switchboards are ideal where the operator also does clerical work. An ordinary office chair can be used—an added saving and convenience.

The 150 Type switchboards are made up in quantity lots insuring lowest price and prompt shipment.

SWITCHBOARDS

Magneto Wall Type

No. 9B Switchboard for Systems of Not More Than 10 Lines



Code 9B Installed with Standard Wall Set

Code No. 9B Magneto Wall Switchboard is a very desirable switchboard for a small community where the growth of a telephone system will not exceed 10 magneto lines at any time in the future.

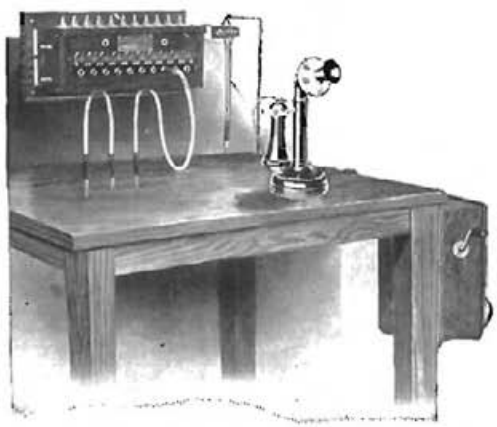
This switchboard is equipped with 10, No. 116E, 500 ohm combined drops and jacks which are wired to saw tooth spark gap lightning arresters and binding posts on top of the cabinet. It is arranged to be used with either grounded or metallic lines.

A night alarm circuit from the common night alarm contacts on the drops is terminated on two binding posts on the side of the cabinet.

Two cord circuits and a separate operator's cord and plug make it possible to have two connections set up at the same time while the operator is talking to another line, or in other words, three conversations may be carried on simultaneously.

Each pair of cords has a listening-in jack associated with it which allows the operator to listen in without taking down the connection. The plugs are so arranged that one drop remains in the circuit for clearing out supervision when a connection is set up.

Any standard magneto telephone, either desk or wall, as shown in the accompanying illustrations, may be used for an operator's telephone with this switchboard.



Code 9B Installed with Standard Desk Telephone

No. 9A Magneto Switchboard is the same as the No. 9B except not equipped with listening in jacks.

Operation of No. 9 Switchboards

In answering a call the operator inserts the plug that is attached to her telephone into the jack of the calling line and inquires what number is wanted.

When the calling subscriber gives the number that is desired the operator removes the plug from the calling subscriber's jack and inserts it into the called subscriber's jack to call.

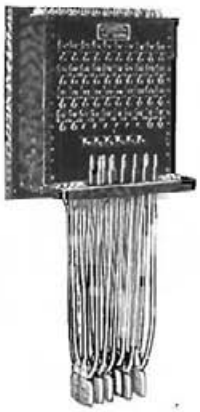
She then removes the operator's plug and inserts the plugs of either cord circuit one in each of the jacks of the lines that she has to connect.

Either subscriber in ringing off will operate the drop that remains in the circuit for supervisory purposes which indicates to the operator that the connection is to be taken down.

SWITCHBOARDS

Magneto Wall Type

No. 23A Switchboard for Systems of Not More Than 20 Lines.



Code No. 17A

Code No. 23A Magneto Wall Switchboard is equipped with 20 No. 101E combined drops and jacks and 4 single supervisory cord circuits each equipped with a single ringing and listening key and a 500 ohm clear out drop.

The No. 23A is very desirable for small switching stations requiring a larger board and one with greater facility in operation than the No. 9. The same cabinet is used in both the No. 23A and No. 17A.

No. 17A Switchboard for Systems of Not More Than 34 Lines.

This board is arranged for 30 local and 4 toll lines; six cord circuits, keys for ringing, listening and ring back features. It is strongly built and simple to operate. Equipped with standard Kellogg apparatus.

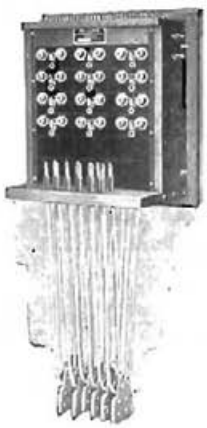
The cord circuits are arranged for single supervision. Also arranged for separate night alarm outfit.

Either a standard wall or desk type bridging telephone can be used with Kellogg magneto wall switchboards by connecting a pair of wires to the proper binding posts.

Operation of Code No. 23-A and No. 17-A Switchboards

Code No. 23-A and No. 17-A Magneto Wall Switchboards are operated in the same manner as our regular floor type magneto boards, except that the operator uses her telephone set for both ringing and listening purposes which makes the operation of the board slower than that of the floor types of magneto switchboards.

No. 29-A Magneto Switchboard



Code No. 29-A

For telephone system of not more than 12 magneto lines, where it is desired to distinguish signals of subscribers calling on their own line from those intended for the operator.

Code No. 29-A Magneto Wall Switchboard can be equipped with any number of 1600 ohm ringer drops and jacks and connecting cords up to 12. This board is especially convenient for use where long heavily loaded lines have a large part of their communication among subscribers on the same line.

Each line is equipped with a ringer drop and jack and connecting cord. The line is terminated in a saw tooth spark gap lighting arrester and two binding posts on top of the cabinet.

A separate operators' cord is provided with this board which can be used with any standard wall or desk type magneto telephone for the operators' set.

This board is suitable for either metallic or grounded line service.

SWITCHBOARDS

Magneto Wall Type

No. 50 for Systems of Not More Than 50 Lines.

This board is operated the same as our standard floor type boards and is ideal for small exchanges where a wall type board is desired.

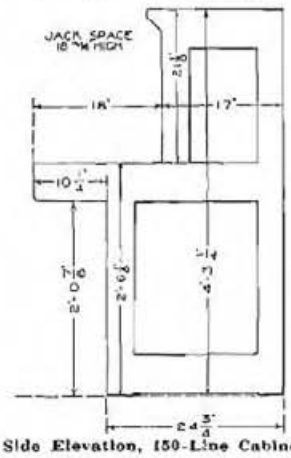
This wall cabinet, furnished in oak or walnut, has a capacity of 50 lines and is used for grounded or metallic line service. Has 6 single supervisory cord circuits, with single listening and ringing keys, 5 bar hand generator and night alarm with switch for code and regular ringing. No arresters are included. Line cable extends 12 feet from top of cabinet. Suspended type transmitter and 41-A receiver operator's set is standard. A grabaphone, instead of suspended transmitter and receiver, will be furnished when specified.



Wall Type With Grabaphone



Wall Type With Suspended Transmitter and Standard Receiver



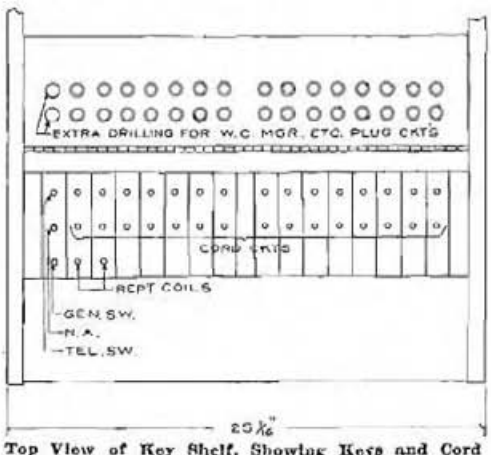
Side Elevation, 150-Line Cabinet

Standard Floor Type Switchboard

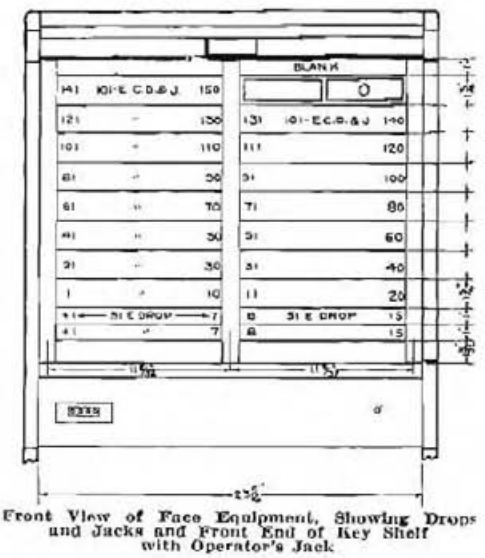
Dimensional Drawings—No. 150 Type

See Page No. 99 for Pigeon Holes

These illustrations show the dimensions of the 150 Type boards and the layout of the apparatus. The Generator is mounted in the keyshelf, making it accessible and eliminating the usual generator extension shaft.



Top View of Key Shelf, Showing Keys and Cord Equipment

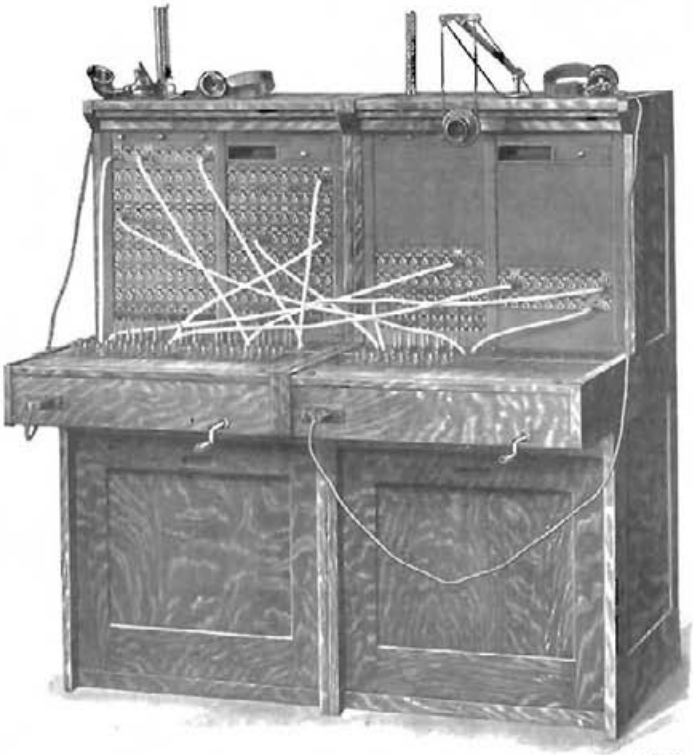


Front View of Face Equipment, Showing Drops and Jacks and Front End of Key Shelf with Operator's Jack

SWITCHBOARDS

Standard Magneto Type

A Switchboard for Any Magneto Exchange, Embodying the Very Latest Refinements and Up-to-Date Developments in Switchboard Engineering and Magneto Switchboard Design.



Code No.	Lines Wired	Lines Equipped	Cords Wired	Cords Equipped
150-A	50	30	15	5
150-B	100	50	15	7
150-C	150	100	15	10
150-D	150	150	15	13

Kellogg No. 150 Type Magneto Switchboards are designed to meet the needs of every magneto telephone exchange with equipment that will operate reliably and give the best class of service under all conditions. Everything has been done to eliminate complicated circuits and apparatus and to build every part with the idea of eliminating future maintenance costs. The Kellogg self-restoring drop and jack with its pure hard rubber insulation between drop shell and frame, its long lever hook and simple spring arrangement is giving good uninterrupted service in many thousand boards in this country and abroad.

Kellogg Bakelite and dialecto insulations and bushings are used in all key and jack assemblies, preventing shorts, crosses and all the troubles heretofore met with in key and jack construction.

Each drop coil with its core and containing shell is heavily insulated with hard rubber from the mounting plate, from the night alarm circuit, and from all other drop coils and adjacent parts. Such construction is very expensive, but it renders burnouts and damage from lightning highly improbable under any circumstances and practically impossible when proper carbon protection is employed.

The night alarm contact is held point up in a long and resilient German silver spring and will not fail to operate the bell on night calls.

In the keys a heavy T frame permits the contact springs with the platinum points to be mounted on both sides and the cam is so designed that the extra heavy rollers are held in place without screws, making these keys the smoothest operating and the longest wearing on the market.

The Key Shelf is equipped with a bracket support to hold it in a convenient open position when an inspection of the keys is necessary.

All cord circuits are of the double supervision type equipped with repeating coils to eliminate possibilities of unbalanced circuits when connections are set up between metallic and grounded lines. The first two cord circuits are also equipped with keys to cut out the repeating coils for the slight additional transmission that may be obtained for long distance connections.

A two compartment pigeon hole is provided in top of the right hand panel and the right compartment is furnished with a cash drawer.

SWITCHBOARDS—Standard Magneto Type



2 Standard 150 Type Magneto Boards Operated by One Girl

The operators' equipment consists of a suspended type transmitter, using our No. 48 arm and the No. 55 transmitter, a No. 46-A Bakelite shell receiver with No. 2 leather covered head band and a high grade green silk, operators' cord connected by a No. 182 plug and a No. 325 jack, which is mounted on the face of the key shelf.

An operators' telephone circuit switching key is permanently wired into the circuit which permits switching together two operators' circuits to enable one operator to use the cord circuits of two boards when they are installed next to each other where a larger capacity than one hundred and fifty lines is required.

The standard woodwork for all Kellogg magneto switchboards is heavy, quarter-sawed oak, in golden oak finish, and is steel reinforced. Two weeks' time is required in applying, drying in and rubbing down the several coats of shellac and varnish. In this manner it is possible to secure a finish that will endure through the long years of continuous and hard usage which most switchboards receive.

The finished cabinets present a most attractive appearance and are what is known as the low key shelf type, permitting the use of an ordinary office chair and providing sufficient space on the key shelf for making tickets or such other work as the operator may have occasion to do.

Although these capacities may not conform to the exact number of existing lines in the magneto telephone system for which the new switchboard is required, it is much more economical to purchase a switchboard with additional facilities to provide for the future growth of from three to five years because the extra expense involved in ordering and adding a small number of combined drops and jacks is much more than the interest on the investment in the extra equipment when included in the initial purchase.

These boards are wired with extra fine quality Kellogg fifty line cables and when it is desired to increase the 150-A or the 150-B switchboards to their full capacity, additional cables completely formed and ready to connect can be supplied.

For systems of more than 150 lines or where a system has grown to over this number after one Kellogg Magneto Switchboard of the Standard No. 150 Type has been installed, an additional section may be placed next to it and the capacity increased up to 300 lines.

To give customers the advantages in price of quantity production the Kellogg Magneto Switchboards of the Standard No. 150 Type are made in large numbers and placed in stock packed and ready for shipment.



Rear View of No. 150 Type

When a customer wishes to have a Kellogg Magneto Switchboard of the Standard No. 150 Type with more or with less equipment than listed above, it is necessary to make a small extra charge for unpacking and repacking the board.

Ordering the No. 150 type magneto switchboard with changes require placing it on schedule where it must take its turn in the shop, resulting in possibly several weeks delay.

If prompt shipment is wanted we suggest ordering the board nearest your requirements, and adding or changing equipment after receiving the board.

In this way immediate deliveries are assured, and in most cases changes are not required.



No. 150H Type

SWITCHBOARDS

High Key Shelf Type

To meet the demand for a high type Magneto switchboard of a 150 line capacity, we carry in stock, ready for shipment, the code numbers given below.

These cabinets are of the same sturdy construction and carry the same standard equipment as described for our 150 low keyshelf type boards, except the combined drops and jacks are five per strip.

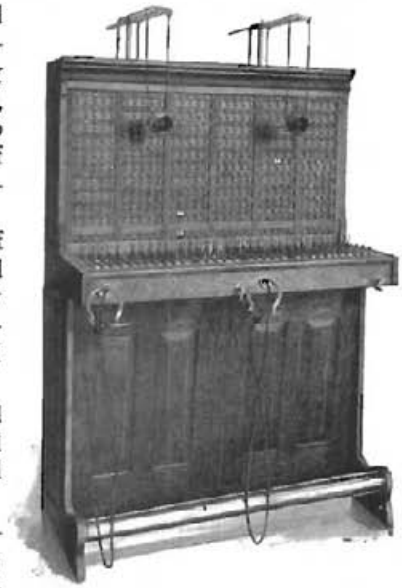
This type of board has been made by the Kellogg Company for many years, and those installed are still furnishing fine service today.

A five bar hand generator and switching key is furnished for ringing. Twelve feet of cable extending from the lower left hand rear corner, unless otherwise specified, is also furnished. A three inch keyshelf extension can be added when specified.

These boards are made so that if one board is filled up another board of this type can be placed alongside of the first one, and they will match up in every respect and be equivalent to a two position Magneto board, to which later another position board can be added.

All cord circuits are the double supervision type equipped with repeating coils to eliminate possibilities of unbalanced circuits when connections are set up between metallic and grounded lines.

When a customer wishes to have a Kellogg Magneto switchboard of the standard 150 high type equipment other than listed below, it is necessary to make a small charge for unpacking and repacking the board.

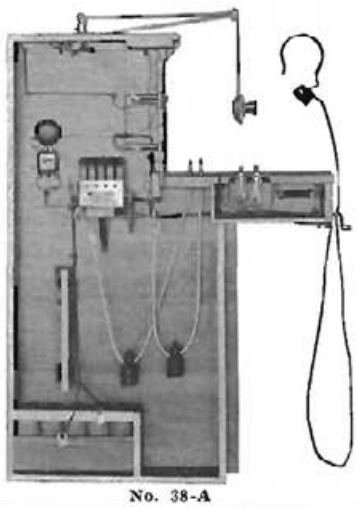


300 Line Type
Cab. No. 12293

Ordering the No. 150 high type Magneto board with changes requires placing it on schedule where it must take its turn in the shop, resulting in possibly several weeks' delay.

If prompt shipment is wanted, we suggest ordering the board nearest to your requirements and adding to or changing the equipment after receiving the board.

In this way immediate deliveries are assured, and in most cases, changes are not required.



No. 38-A

Code No.	Lines Wired	Lines Equipped	Cords Wired	Cords Equipped	Ds.&Js.
150HA	50	30	15	5	5 per strip
150HB	100	50	15	7	5 per strip
150HC	150	100	15	10	5 per strip
150HD	150	150	15	15	5 per strip

Cabinet 12293 is similar to the No. 150H type, but is a two position board with an ultimate capacity of 300 lines. These boards are not carried in stock, being made up on order only.

Demonstration Panel Switchboard No. 38-A

Note our telephone demonstrating panel, page 195

This board contains the same standard equipment as in our 150 type boards.

Two lines are wired complete.

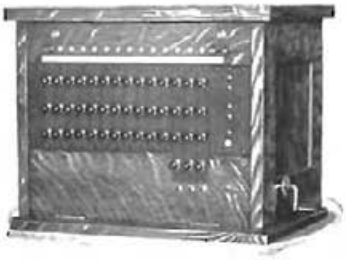
This makes an ideal class room study; all wiring is separated and can be easily traced.

This is wired according to our standard magneto circuit.

SWITCHBOARDS

Private Branch Exchanges

No. 6 Type Cordless



Code No. 6B Cordless P. B. X.
10 local lines, 3 trunk lines
5 connecting circuits.

For business houses that do not require the interconnection of more than ten telephones and three city lines, the cordless private branch exchange has been developed.

This consists of connecting keys arranged in a small compact cabinet of the same durable construction and finish as the regular private branch exchange switchboard.

The construction and woodwork of this cabinet will match the regular office furniture, and when placed on a flat top desk will present the appearance of a regular turret. Its simplicity of operation makes it very desirable where the attendant is required to do clerical work when not answering calls.

The key arrangements provide five connecting circuits, and five conversations can be carried on at the same time without interference. Each line and trunk circuit is a unit of three keys with a signalling lamp above each unit. The operator's key unit consists of three keys at the left, and she can answer any call by throwing one of these keys and then throwing the line key under the signal in the corresponding row in the same direction.

The five connecting circuits are obtained as follows:

The first circuit on the upper row, by raising keys associated with the lines that are to be connected.

The second circuit, by lowering keys.

The third connecting circuit on the middle row of keys, by raising keys associated with the lines that are to be connected.

The fourth connecting circuit, by lowering keys.

The fifth connecting circuit, on the bottom row of keys, by raising keys associated with the lines that are to be connected.

By lowering any of the bottom row of keys, the line associated with the key lowered, will be signalled.

Each connecting circuit has a supervisory signal mounted in a unit at the extreme right and indicates the upper and lower circuit of each row of keys. If, in the upper row of keys key No. 2 was raised and key No. 4 raised, lines No. 2 and No. 4 would be placed in a talking position and associated with the upper supervisory signal at the right; if, in this same row, keys No. 5 and 7 were lowered, lines No. 5 and No. 7 would be in a talking position and associated with the second upper supervisory signal at the right.

Two keys in the same row, operated in the same direction would show that circuit to be in use. To answer and complete a second connection on any row two keys must be operated in the opposite direction.

Answering and Completing Connections

Should a calling signal appear above line No. 2, the operator will select a listening key in a row where it can be thrown in a direction not occupied by any other keys. She will then operate a key directly under the signal, in the same direction and row as selected by the listening key. This will enable her to answer and extinguish the signal, and after finding the party desires a connection with line No. 6, she will then operate a key on line No. 6 in the direction and row as on the answered line No. 2. She will then press down the lower key of line No. 6, which will ring this telephone bell.



Code No. 43
Kellogg Cordless Switchboard Equipped with Mechanical Signals

The lines are now in the talking position and she can restore the listening key at the left. When conversation is completed and both parties return their receivers to the hook, the supervisory signal associated with these keys at the right will be displayed, and the operator notified to restore the keys to normal.

Should the party desire connection with the city exchange, a trunk key thrown in the same direction as the answering and listening key will connect this party to the city exchange when he can give the city operator the number desired. When conversation is completed and the party returns receiver to hook, supervisory signal at right of connecting circuit is displayed, notifying operator to restore key.

SWITCHBOARDS

Cordless Private Branch Exchange

When the city exchange calls the private branch exchange, a signal is displayed over the keys associated with the trunk and the operator answers and extinguishes the signal by throwing one of the trunk keys into one of the idle connecting circuits, and throws her listening key into the same circuit. After determining the information desired, if necessary, the operator presses one of the lower keys to ring the called party and then throws a key of this line into the same connecting circuit as held by the trunk key. When conversation is completed and the party returns receiver to hook supervisory signal at right of connecting circuit is displayed, notifying operator to restore key.

NIGHT SERVICE:

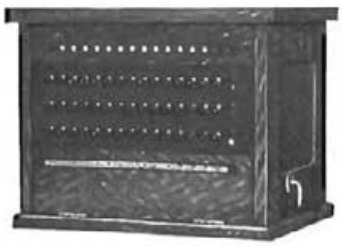
The three keys at the extreme right, designated as night trunks, can be thrown onto a connecting circuit to allow a party at the P. B. X. telephone to call the city exchange when the operator is off duty.

Any number of telephones can be connected to a trunk for night service, as desired, the night key being thrown onto a connecting circuit and the lines that are to be connected to this trunk thrown into this same position. When lines are connected for night service, the battery switch should be thrown to disconnect battery from the lines.

When the operator is engaged in clerical work, the night alarm key should be thrown to obtain an audible signal to attract her attention when a party calls.

FIRE ALARM:

Fire alarm can be given on this system by the operator quickly pressing the lower row of keys as fast as they are answered, giving the necessary information on the connecting circuit.



Code No. 6A Cordless P. B. X. 10 local lines, 3 trunk lines 5 connecting circuits.

The No. 6 type cordless switchboard is provided with front and rear doors for inspection and equipped with complete operator's set, consisting of a No. 97-B Desk Stand, No. 41-A receiver, 5 bar hand generator with generator switching key and night alarm buzzer with switching key. Night keys are provided so that lines can be connected to trunks for night service. Lines terminate on connecting rack in rear of cabinet. Arranged for use with a 24 volt battery unless otherwise specified. Regularly furnished in golden oak finish. Birch mahogany furnished when specified. For use with standard common battery telephones.

No. 6B, P. B. X. switchboard operates on metallic circuits in connection with the standard common battery wall or desk telephones. Equipped as outlined for ten lines and three trunks with direct lamp circuits. Complete night alarm circuit with buzzer and a battery switching key for disconnecting the battery when the board is not in use. This board is also equipped with charging trunk relays.

No. 6-A, P. B. X. switchboard is the same as No. 6-B except that it is not equipped with charging trunk relays.

No. 6AA, P. B. X. switchboard is the same as the No. 6A but is wired for line relays.

Code No. 6B cabinet, wired for 10 lines, less relays, 5 connecting circuits, 3 trunks, complete with wiring and operators' sets, and equipped with charging trunk relays.

Code No. 6A cabinet, wired for 10 lines, less relays, 5 connecting circuits, 3 trunks, complete with wiring and operators' set.

Code No. 6AA cabinet, wired for 10 lines, with relays, 5 connecting circuits, 3 trunks, complete with wiring and operators' sets.

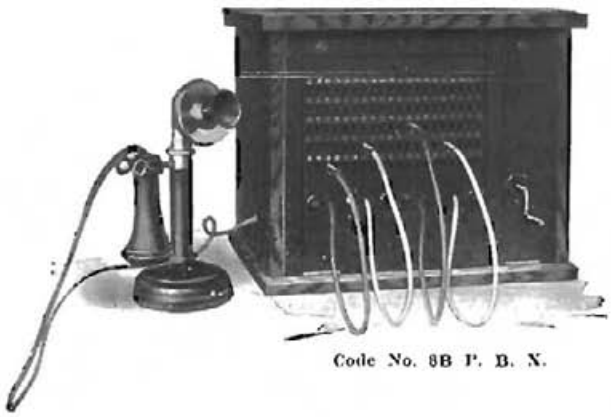
SWITCHBOARDS

Private Branch Exchange

No. 8 Desk Type

This type of board was designed for use in small and medium sized hotels and for other classes of business where the calls between telephones are few.

The cabinet is the same size and finish as the cordless P. B. X. and is suitable to mount on a desk, counter or brackets. The common answering feature makes it possible for the attendant to answer calls by merely using the operator's desk telephone set. Two pair connecting cord circuits are furnished, each having single lamp supervision and a plunger type ringing and listening key. Simplicity is the keynote of its operation. Two conversations can be carried on and a call answered by the attendant at one time. It is not possible to furnish more than two connecting cord circuits. The common ringing key provides for ringing telephones in groups of twenty. Eighteen No. 6 dry cells will ordinarily operate this board from four to six months, depending upon the number of calls.



Code No. 8B P. B. X.

Code No. 8-B cabinet, wired for 50 lines, less relays, 10 per strip, with line cables extending 12 feet from top of cabinet, equipped with 2 connecting cord circuits, 4-bar generator and switching key, night alarm buzzer and battery switch.

This type of board is for use in connection with metallic lines and regular standard common battery telephones.

Code No. 8-B cabinet, same as above, but wired for 100 lines, less relays, 20 per strip.

Code No. 8-D cabinet, wired for 50 lines, less relays, 10 per strip, with line cable extending 12 feet from top of cabinet, equipped with 2 connecting cord circuits, night alarm buzzer and battery switch. (No generator is furnished, as dry cells are used for ringing.) Metallic circuit and common return required.

This board uses 24-volt direct current for ringing and is for use with No. 759 wood common battery wall set and No. 54 desk set, and No. 126 bell box, which are equipped with D. C. ringers.

Kellogg Desk Type Private Branch Switchboard equipment is encased in compact, sturdy cabinets, built in our own woodworking plant. Heavy quarter-sawed oak is standard.



Code No. 8, Open, Rear View

Both front and rear panels open on heavy hinges, making all apparatus immediately accessible. This practical, efficient equipment, with the Kellogg unbreakable desk stand, is intercommunicating equipment for offices, hotels, etc., of the highest order.

SWITCHBOARDS

Private Branch Exchange

Equipped with either Suspended or Breast Plate Type Transmitter.



Code No. 2A

100 lines capacity Code No. 122 cabinet. Suspended type transmitter. 10 trunk lines. 18 cord circuits.

Features

A very durable cabinet which provides the maximum of equipment in the minimum of space.

Jacks rigidly mounted and arranged ten per strip to avoid cord congestion and to allow sufficient finger room for putting up and taking down connections.

The wood in these cabinets is heavy quarter-sawed oak. Not only will the wood work last almost indefinitely, but the finish will also endure through years of continuous and severe service.

Note the spacious key shelf, allowing ample writing space. Transmitter conveniently adjusted to position by raising or lowering arm. No transmitter weights to wear our transmitter cords or injure wiring. Operator's jack mounted under key shelf, keeping receiver cord from being jammed against plug.

These P. B. X. boards are built with a low key shelf, as are Kellogg magneto switchboards. This allows the use of an ordinary office chair, it being an economical and convenient arrangement. The operator is able to spend her spare moments on clerical work at an adjoining desk.

Advantages

Relays substantially and conveniently mounted on swinging rack, providing easy access to cords.

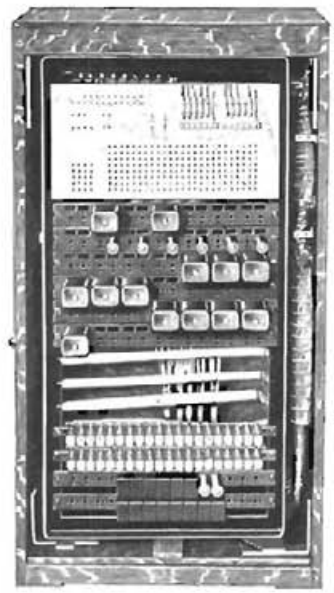
Connecting rack for terminating line and trunk cables hinged to allow ready access to lamp and jack mountings.

Cord racks arranged to prevent tangling of cords.

Apparatus is properly numbered and designated so that its particular function can be readily identified.

Relay rack and hinged heavy maple connecting rack securely locked in place when closed. In this position, they give added strength to the cabinet.

Heavy bus bars practically arranged for connecting and fusing the battery leads.



Rear View, No. 2A P. B. X. Relay Gate Closed

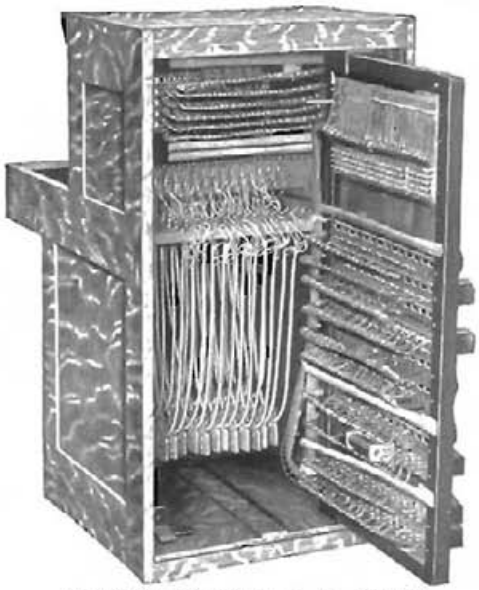
Equipment Facilities

The current supply to operate one of these boards may be from storage battery at the private branch exchange, charged with local charging equipment or over separate leads from the city exchange. It may also be furnished direct from the city exchange battery over a separate lead, provided for that purpose.

Trunks to the city exchange can be either jack ended or plug ended, as desired, and any phone on the private branch board can be connected to a city subscriber over any one of these trunks.

SWITCHBOARDS

Private Branch Exchange



Rear View, 200 Line P. B. X., Showing Relay Gate Open

All line circuits are our standard 10 per strip and can be equipped for common ringing and listening and for fire alarm service on either the direct line lamp or line relay type circuit.

The direct line lamp circuits are generally used as the Kellogg lamps give a brilliant and effective signal on the average line circuit. On especially long lines the line relay circuit is used.

The line circuits can be arranged to ring all telephones simultaneously as a fire alarm or for the purpose of calling any subscriber in a station separately without disturbing any of the other stations. Circuits are arranged so that any number of departments can be connected to the switchboard for inter communication. As many conversations can be carried on as there are pairs of cords or connecting circuits.

Trunks

Jack ended trunk circuits are furnished 5 and 10 per strip and are provided with a night jack. They can be equipped with a flash button to signal central without moving the plug.

Plug ended trunks have a line and disconnect lamp. This trunk is arranged so that no holding key is used and any station can signal the main exchange operator at the same time as the P. B. X. operator.

Trunks are equipped with night jacks and any number of plugs can be furnished connected together to allow for connecting as many lines as desired to one trunk for night service.

Circuits

Cord circuits are provided with double lamp supervision, also with two way ringing and listening keys.

Generator circuits are equipped with a powerful 4-bar hand generator and a generator switching key to switch to power when desired. The main battery lead is provided with a battery switching circuit to cut off the battery supply when the board is not in service.

The operators' circuit can be equipped with either the suspended type or the breast plate type transmitters or both. The efficiency of either of these sets is well known as the same equipment is used as on other Kellogg Boards.

Codes and Capacities

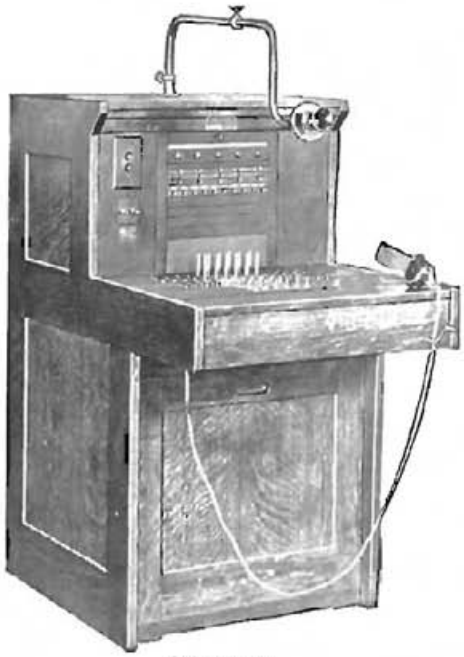
Jack Ended Trunks						Plug Ended Trunks					
No. Without Line Relays	No. With Line Relays	Cab.	Lines Capacity	Trunks	Cord Circuits	No. Without Line Relays	No. With Line Relays	Cab.	Lines Capacity	Trunks	Cord Circuits
1-A	1-AA	121	50	5	12	1-B	1-BB	121	50	5	7
2-A	2-AA	122	100	10	18	2-B	2-BB	122	100	10	8
3-A	3-AA	123	200	10	25	3-B	3-BB	123	200	10	15

SWITCHBOARDS

Private Branch Exchange

Nos. 25 and 26

Used with Common Battery and Two or Three Wire Automatic Switchboards



Code No. 25

Nos. 25 and 26 P. B. X. switchboards can be used with either common battery or two or three wire automatic switchboards.

These boards are equipped with standard Kellogg apparatus. Code No. 25 switchboard is arranged for an ultimate of 50 lines, using our cabinet No. 122 B. B., standard finish.

No. 26 switchboard is arranged for an ultimate of 100 lines and uses our cabinet No. 122 B. C., standard finish.

The cord circuits are arranged for double lamp supervision with ringing and listening keys. A through key is installed in each cord circuit, so as to be able to use the cord circuits for through night connections.

The trunk circuits are arranged to operate with a common battery main exchange, a two wire common battery automatic main exchange or a three wire automatic main exchange, by means of adding or omitting apparatus. The trunks are all of the jack ended type with night jacks.

The operator's equipment is of the suspended or breast plate type, whichever may be desired, no operator's jack or plug being furnished. The receiver and transmitter are wired direct to binding posts. The primary of the induction coil is closed by means of a contact on the listening key.

The night alarm circuit is arranged to operate from alternating circuit. A dial is furnished only when requested, in which case the trunks operate in connection with an automatic exchange.

A certain number of lines in each equipment only is equipped with line relays.

All trunks and lines are wired to punchings on the connecting rack.

The finish of the cabinets is standard oak.

Write for Bulletin No. 26.



Code No. 26

SWITCHBOARDS

Battery Supply for Private Branch Exchanges

I. BATTERY DIRECT FROM CENTRAL OFFICE:

To avoid the installation of a power plant at the exchange, battery is usually supplied from the central office over separate wires. Cable pairs are generally used for this purpose and a sufficient number of pairs to insure the proper current supply should be employed.

NUMBER OF CABLE PAIRS FOR BATTERY SUPPLY

No. 19 B. & S. Gauge Cable
Cord Pairs in Use at the Same Time

Distance from Office Feet	4	5	6	7	8	9	10	11	12
500	1	1	2	2	2	2	2	3	3
1000	2	2	3	3	3	4	4	5	5
1500	3	3	4	4	5	6	6	7	7
2000	4	4	5	6	6	7	8	9	10
2500	4	5	6	7	8	9	10	11	12
3000	5	6	7	8	10	11	12	13	14
3500	6	7	8	10	11	12	14	15	16
4000	7	8	10	11	12	14	16	17	19
4500	7	9	11	12	14	16	18	19	21
5000	8	10	12	14	16	18	19	21	23
5500	9	11	13	15	17	19	21	23	25
6000	10	12	14	16	19	21	23	25	28
6500	10	13	15	18	19	23	25	28	30
7000	11	14	16	19	22	24	27	30	32
7500	12	15	18	20	22	26	29	32	35

No. 22 B. & S. Gauge Cable
Cord Pairs in Use at the Same Time

Distance from Office Feet	4	5	6	7	8	9	10	11	12
500	2	2	3	3	3	4	4	4	5
1000	4	4	5	6	6	7	8	9	10
1500	5	6	7	8	9	11	12	13	14
2000	7	8	10	11	13	14	16	17	19
2500	8	10	12	14	16	18	20	21	23
3000	10	12	14	16	19	21	23	25	28
3500	11	14	16	19	22	24	27	29	32
4000	13	16	19	22	25	28	31	34	37
4500	14	18	21	25	28	32	35	38	42
5000	16	20	23	27	31	35	39	42	46
5500	17	22	26	30	34	38	43	46	51
6000	19	24	28	32	37	42	46	50	55
6500	20	25	30	34	39	44	49	53	58
7000	22	27	33	38	43	49	54	59	65
7500	24	29	35	40	46	52	58	63	69

II. BATTERIES CHARGED FROM CENTRAL OFFICE:

When power is supplied from a local storage battery, which is charged from the central office over leads provided for this purpose, the cable pairs should be of sufficient number to carry the proper amperage for the normal charging rate of the batteries.

III. BATTERY CHARGED LOCALLY:

When the battery is fed from a local storage battery plant which is charged locally, it is sometimes necessary to provide power panels, charging machines and measuring instruments.

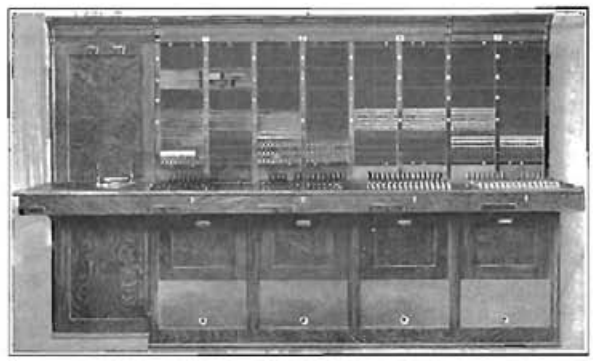
The Kellogg Company will be pleased to give this subject consideration from an engineering standpoint in regard to the necessary batteries and auxiliary apparatus required to operate the private branch.

SWITCHBOARDS—UNIVERSAL

It is conceded by recognized traffic experts throughout the country, that the Magneto system will remain the standard equipment for small town exchanges, where the number of subscribers do not exceed three or four hundred, a large part of which are rural or farm line subscribers.

It is also recognized that the full common battery system with its modern refinements of machine ringing, keyless listening, secret service, registered traffic meters, etc., will remain the standard for the large town and city exchanges.

This leaves a demand for a different kind of equipment for the medium sized towns, with exchanges having in the neighborhood of 300 to 900 lines. The most satisfactory offering for these exchanges is the Kellogg Universal switchboard, which combines both the Magneto and the Common Battery features for the most effective service, enabling operating companies to change to full common battery one or more lines at a time without adding or taking away a single piece of apparatus and without disturbing any of the permanent cabling; by merely changing a number of connections at the relay rack as the lines are "cut over."



Kellogg Universal Board at Elkhorn, Wis.

To illustrate the many advantages in favor of the installation of Kellogg Universal equipment, we have drawn a comparison between such equipment and a full multiple equipment with combined drop and jacks in an exchange of 800 lines.

800 Line Full Multiple Board.

Only possible for operator to handle 160 lines efficiently.

Five operators required for 800 local lines under consideration.

Number of lines per operator must be determined in the beginning.

Operators' maximum reach above plug shelf is twenty-five inches.

Accidental cut offs frequently occur, due to congestion of multiple jacks.

Not practical to answer remote calls.

False busy reports often given when person on four-party line calls for number on own line.

Board contains total of:
2,800 Five-spring Jacks.
2,800 Pairs Contact Points in Jacks.
14,000 Jack Springs.
11,200 Multiple Cable Conductors.
22,400 Soldered Joints in Multiple.
800 Line Drops.

One hundred and fifty ring-off drops subject to battering and likely to get into bad adjustment.

All lines must remain magneto at the old rates until a new board is installed, when the old one must be junked or sacrificed on the second-hand market. In other words there can be no progress toward better service and better rates while this board remains in service.

800 Line Universal Board

Operator can handle 200 to 300 lines, with double supervision more efficiently than 160 standard magneto multiple.

Only four operators necessary to give better service.

Number of lines per operator need not be definitely determined, but may vary from twenty to eight hundred by shifting lamp signals.

Operators' maximum reach above plug shelf is 16 inches.

Accidental cut-offs are practically impossible as operator has plenty of finger and thumb space.

Any operator can answer remote calls, without observing number of calling line.

Impossible for this confusion to arise.

Board contains total of:
1,600 Three-Spring Jacks.
No contact points in jacks.
4,800 Jack Springs.
4,800 Multiple Cable Conductors.
9,600 Soldered Joints in Multiple.

Eight hundred line and cut-off relays mounted in pairs under individual dust-tight steel covers, also 800 indestructible lamp jacks, caps and lamps.

One hundred and twenty pair cord relays mounted under dust tight steel covers. Also 120 supervisory lamp jacks, lamps and protecting caps.

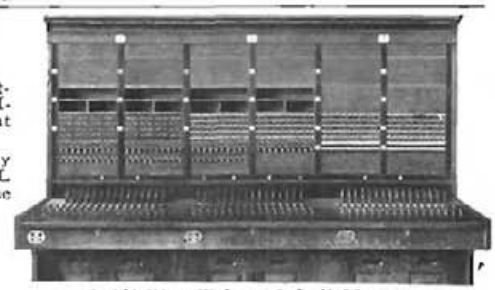
Any one of the magneto lines can be changed to common battery at any time by changing connections at line relay and without adding or removing any apparatus. In this manner the plant can be changed to common battery gradually and higher rates charged for the common batttery service.

The entire switchboard proposition resolves itself into the following:

1. For medium sized exchanges, expecting to cut over to common battery at some future time, use UNIVERSAL LAMP SIGNAL SWITCHBOARDS with which the installation of common battery telephones at higher rates can begin immediately.

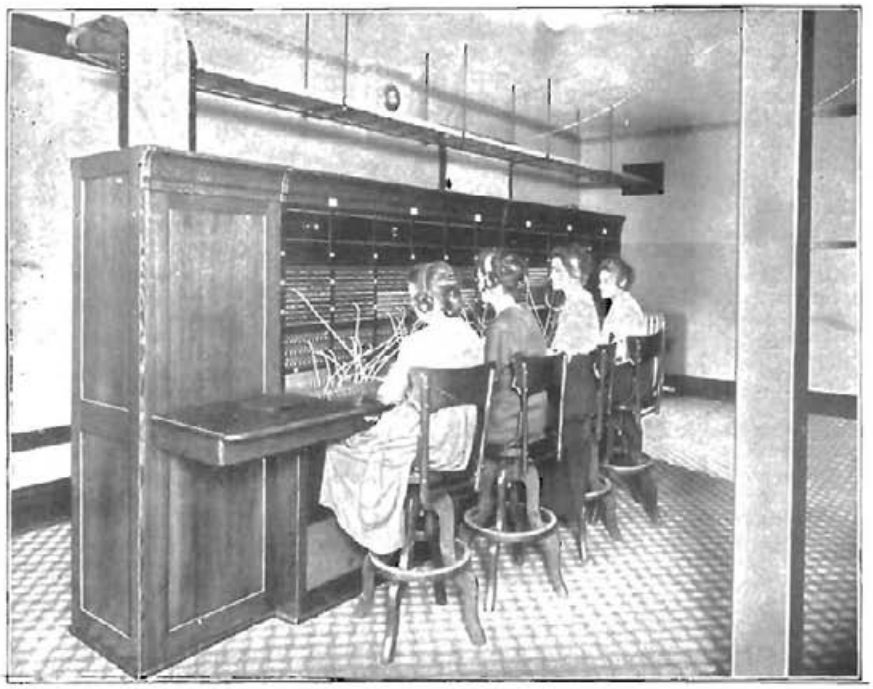
2. For medium sized exchanges, desiring to change to common battery at once, retaining a large number of farm lines, use magneto UNIVERSAL LAMP SIGNAL SWITCHBOARDS with which all cord circuits in the entire board can be used to switch farm and city lines indiscriminately.

3. For large magneto exchanges where for any reason full common battery cannot be installed at once, use UNIVERSAL LAMP SIGNAL SWITCHBOARDS so that common battery telephones can be introduced gradually and the rates raised without excitement or trouble.



A 300-Line Universal Switchboard

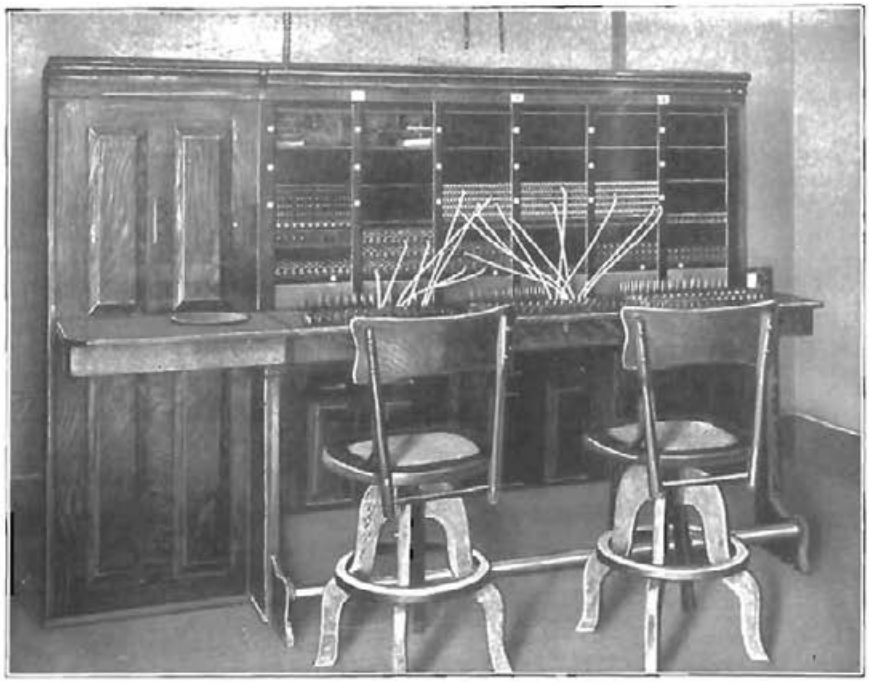
SWITCHBOARDS—UNIVERSAL



Two-Line Universal Switchboard at Holton, Kansas

The great simplicity of Kellogg Universal boards makes them the practical installation for the medium sized exchange. It enables the operating company to give common battery service to those desiring it and enables the manager to solve his rate raising problem.

The old Magneto manager finds no trouble whatever in operating Kellogg Universal boards as all circuits are extremely simple and it is possible to make connections between common battery and magneto lines with any pair of cords.



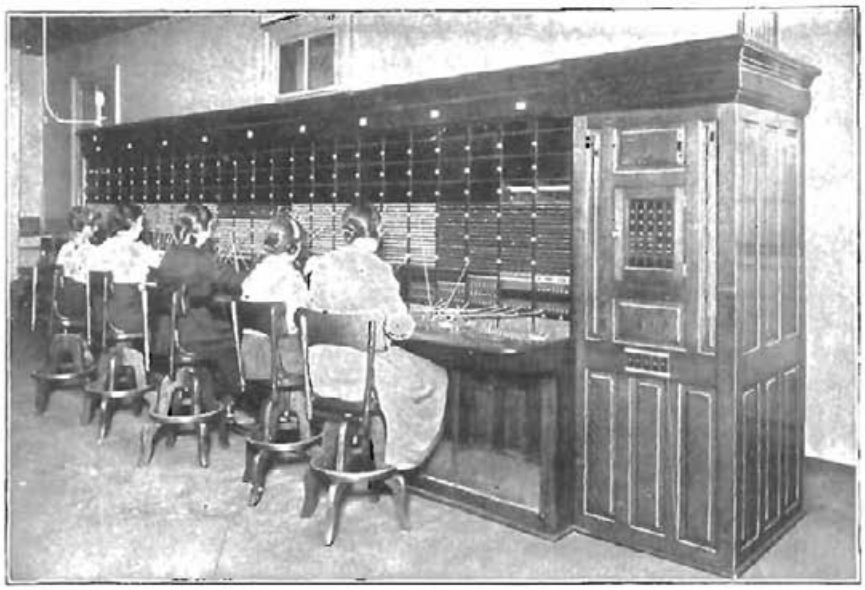
Two-Position Universal Board at Blair, Nebraska

A bulletin dealing especially with the Kellogg Universal Switchboards which gives many additional advantages, will be mailed upon request. If your exchange comes within the class for which Universal equipment was designed, and you are considering making a change in equipment, we shall be glad to have our engineers co-operate with you for a solution of your problem and aid you to arrive at a decision as to the equipment that should be installed.

SWITCHBOARDS — SERVICE

The Kellogg Service Switchboard represents the most advanced thought and highest type, in economical, money making telephone service. Twelve distinct features, of great service value, have been added to our regular type Common Battery Switchboard. We maintain that without these 12 features, our Common Battery equipment gives unexcelled service at moderate cost: with them, it gives super-service at lower cost—the very latest refinement in switching equipment.

This is best appreciated by a study of the cost of the Kellogg Service boards in use as compared with costs of other type apparatus. Nearly three hundred Service Switchboards are in highly successful operation at this time.



A Service Switchboard of 2,400 Lines Installed at Jacksonville, Illinois

Study these features:

1. Machine Ringing Relieves operator of ringing and of supervising unanswered calls.

Speeds up answering by called subscriber.

Calling subscriber gets revertive ringing tone signifying definitely that operator has done her work.

After operator has started ringing on a connection, her work is done excepting to take down the cords after both parties have hung up.

2. Keyless Listening Operator's telephone set is associated with calling subscriber the instant the plug is in the jack.

Operator can not keep a calling subscriber waiting by plugging out a line lamp.

Operator cannot tie up a subscriber line unanswered.

Makes for prompt and fast answering.

Every time operator inserts answering plug her telephone set is connected to the calling line and the only way for her to be disconnected is to insert the calling plug in the jack of the line called. This results in operator completing connection in shortest possible time.

SWITCHBOARDS — SERVICE

No listening keys.

Saves the time of searching out key both in answering and cutting out.

Cuts down the number of physical and mental operations.

Subscriber gives number more quickly because operator answers immediately.

Operator disconnects her telephone from the cord upon the insertion of the calling plug in the called for subscriber's jack.

3. Register Peg Count

Operators who are kept busy are more efficient than when idle a percentage of the time.

Tells the number of calls answered by any operator in any given time or period.

Tells the number of calls answered on any position.

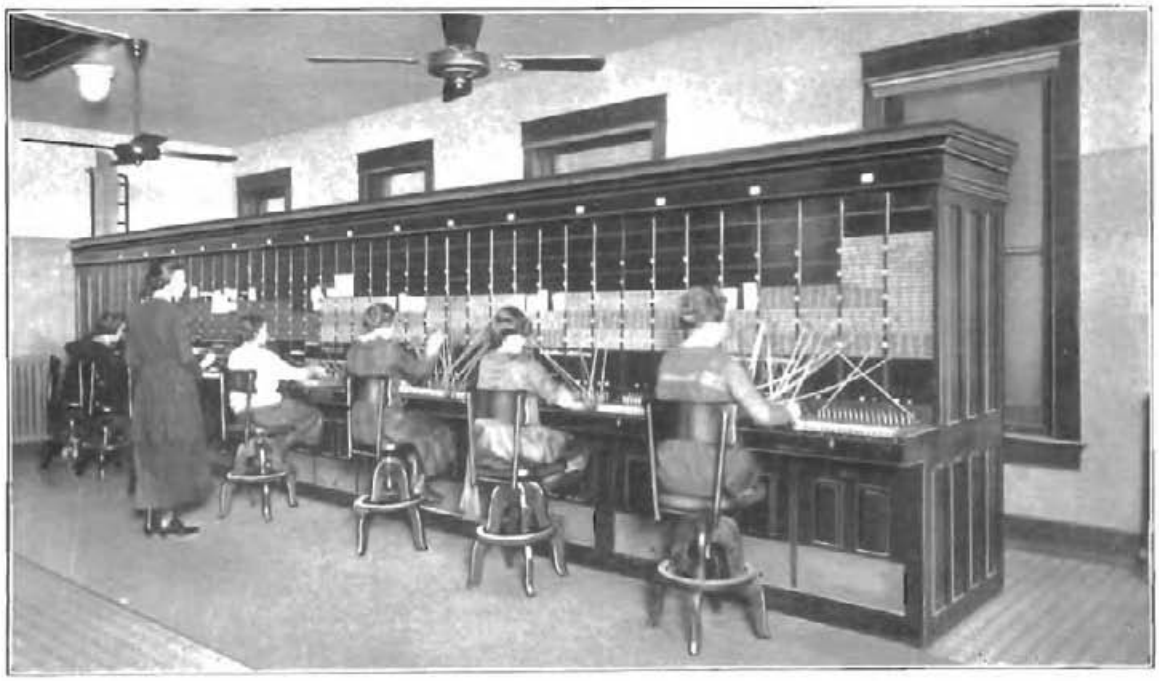
Tells you who the inefficient operators are.

Makes it possible to pay operators for work performed.

Makes it possible to know the unit cost per call.

Can schedule operators accurately from meter readings.

Maximum efficiency in operator hours is obtained.



Service Switchboard of 1,600 Lines Installed at Wabash, Ind.

4. Secret Service

Non-interfering.
Operators cannot listen to conversations.

Operators like it as they will not be accused of listening.

Good argument and talking point when soliciting new subscribers.

Circuits so designed that the first operator to plug in the calling line will be the only one who can communicate with the calling subscriber; hence Secret Service.

5. Traffic Distribution

Subscriber picks all idle operators as every call is available to every operator.

Result is the fastest possible answering time.

Uniformly distributed load.

All operators competing for all calls.

No two operators can answer the same call.

SWITCHBOARDS — SERVICE

Can get the most efficient operator scheduling.

Operator cannot plug out subscriber without answering him.

Two or more operators do not often answer the same number, and in actual operating practice the numbers of false moves where operators are properly scheduled is negligible.

Cheaper than answering jacks.

Fast answering is to the telephone user first class telephone service and Traffic Distribution makes fast answering possible.

6. Instantaneous Disconnect

Gives the calling subscriber the same service on recalls that he gets on an originating call.

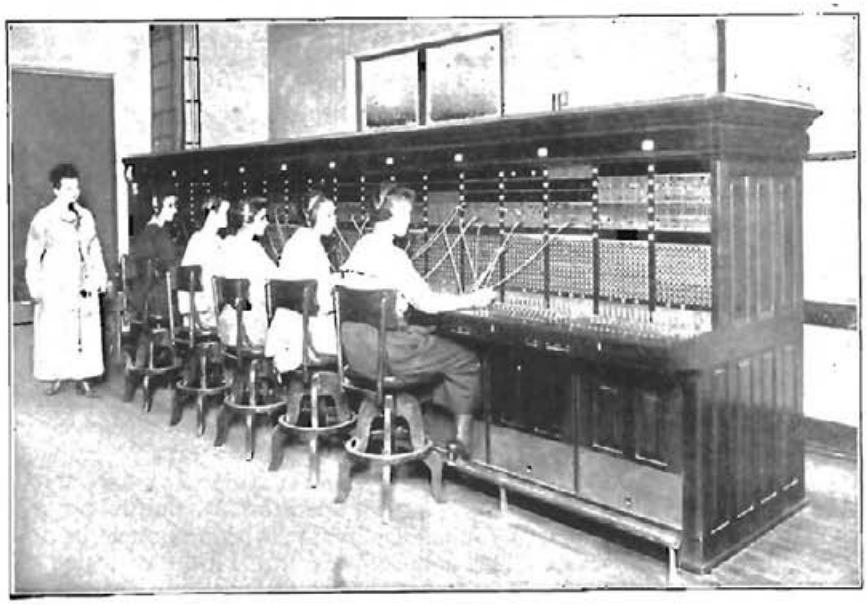
A feature more appreciated by the subscriber probably than any other.

Impossible to tie up calling subscriber's line.

Operator does not have to supervise recalls.

Takes busy test off of calling subscriber's line immediately he hangs up, whether answering plug is in jack or not.

No busy test on line when not busy.



A Service Switchboard of 3,000 Lines Installed at Ada, Oklahoma

7. Instantaneous Recall

Large percentage of service complaints is on account of not being able to get control promptly on a recall, notwithstanding the fact that the total number of recalls in the average exchange is a very small percentage of the total number of calls.

Makes it possible on a recall to get the same service as on an originating call.

Always able to recall on line lamps whether or not answering plug of former connection is still in jack.

All that is necessary to make recall is to pull hook down once and release, and call comes in on line lamp and is immediately available to all operators.

8. Revertive Ringing Tone

It tells the calling subscriber when the operator completes the connection.

It tells the calling subscriber when the ringing starts.

It satisfies the calling subscriber that the operator has done her work promptly.

It does away with all requests to ring again.

It answers practically all of the questions ordinarily asked the operator.

It tells the calling subscriber what he wants to know and the only thing he cares to know.

SWITCHBOARDS — SERVICE

9. Dark Keyshelf Calling supervisory acts as a guard lamp for ringing. Lamp is extinguished when ringing is started.

Lamps mean only two things, Ring or Disconnect.

Cuts down errors in disconnecting.

Operator working with normally dark key shelf makes Lamp more noticeable, the result is quicker action and better service.

No supervising connections, which is the hardest work an operator does.

Chief Operator can supervise work to better advantage.



New Service Board Installed at Freeport, Ill.

10. Ringing Control

Calling subscriber controls the ringing of the called subscriber's bell.

On the average connection, the calling subscriber knows how long it takes for the called subscriber to answer and upon his abandoning the call the ringing immediately stops.

11. Elimination of Order Wires in Multi-Office Selection

Permits the original operator to place a calling plug in an out trunk jack designated for some other exchange and immediately be in a position to repeat the number wanted in that exchange to an operator who is at once available to establish the connection.

12. Pre-Selection of Trunks In order wire operation it is obviously wrong to have a great number of A operators depend upon one B operator to assign the trunk, and by the elimination of order wires, provision is made in the design of the Central Office equipment for the trunk to be switched, and thus all the revertive assignments are done away with. This cannot but result in faster service and reduce the multi-office operation to practically the speed found in single office districts.



Service Board at Warren, Ohio

SWITCHBOARDS — TOLL



Eight-Position Kellogg Toll Switchboard at Eldorado, Kansas

Kellogg Toll Boards now serving throughout the world give evidence of Kellogg quality. Kellogg standard apparatus is used throughout.

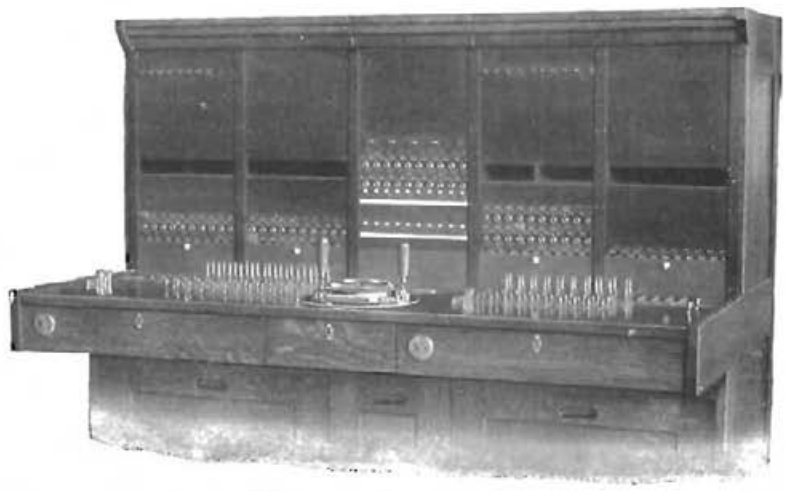
The circuits are especially designed for long distance work, and service results prove they are most practical.

The cabinets are of the same sturdy construction as in our standard local boards, and can be finished to match your local equipment.

A Kellogg Toll Board can be furnished to meet every need, whether a one position or a twenty position board is desired.

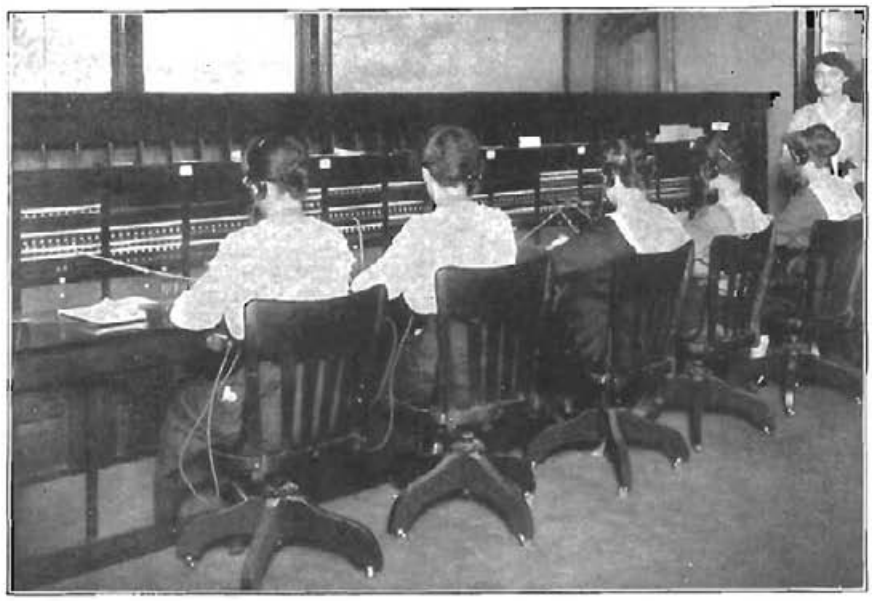
Let us know your toll requirements.

A standard two position toll section equipped with calculagraph.

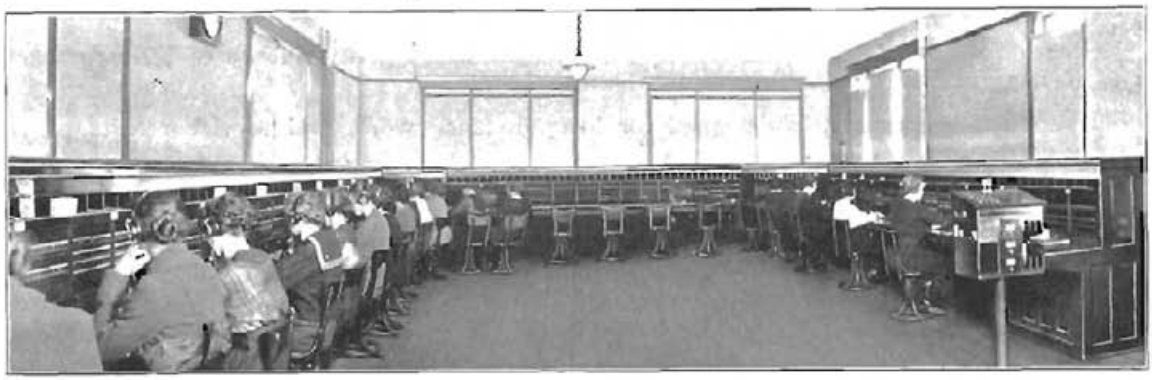


Key Shelf View of Two-Position Kellogg Toll Board

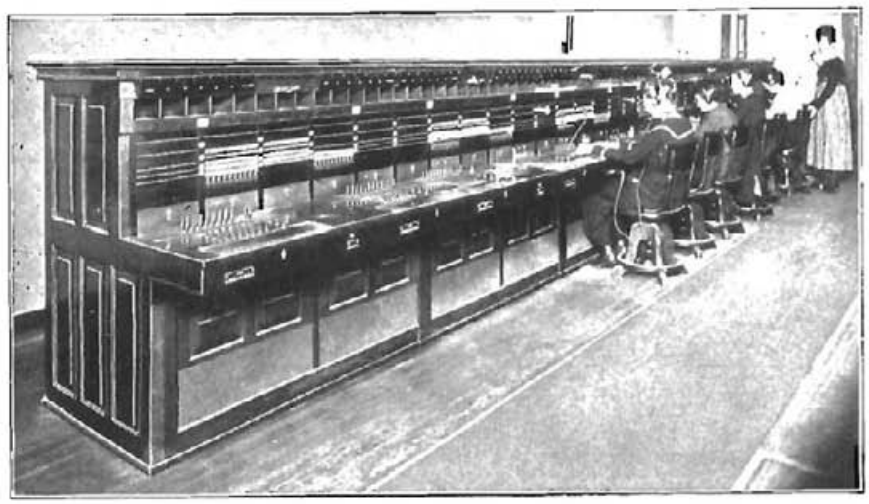
SWITCHBOARDS — TOLL



Kellogg Toll Switchboard at Chillicothe, Ohio

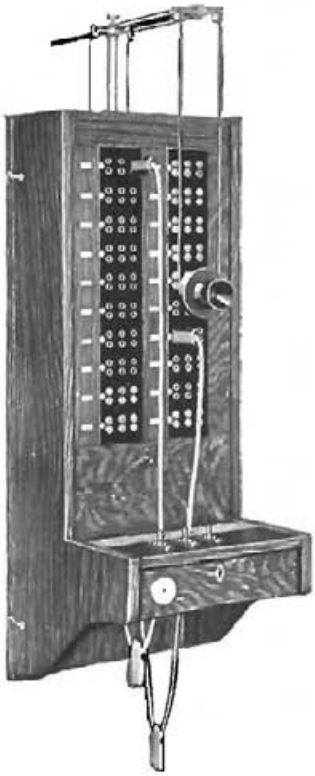


Kellogg Toll Board at Merriam Park Exchange, St. Paul, Minn.



12 Pos. Kellogg Toll Switchboard at Ada, Oklahoma

TOLL TEST PANELS



A twenty line, wall type toll test panel, 6 jacks per line

A toll test panel is a desirable convenience and a necessity in the operation of up-to-date toll equipment in connection with a city local exchange.

It affords a means of opening a toll line between the lightning arresters and the toll board, or for opening a toll line that can be looped through the toll equipment.

Trouble arising on toll lines such as the grounding or crossing of the lines can be readily located because of the convenience of opening the lines for testing purposes.

The toll lines looped through test panels can be switched from one line to another at the different stations if in trouble, thus keeping the important lines in service.

Toll lines wired through a test panel can be readily connected for phantom, simplex and composite service.

Toll Test Panel Construction

The spring jacks for the test panels are mounted on a heavy piece of hard rubber. This mounting is supported by means of an iron frame which is attached to the cabinet work of the test panel.

Each toll line wired through one of these test panels is equipped with four, or as many as specified, double cut-off spring jacks. The cut-off jacks afford a means of testing various portions of the lines, by isolating them for the time being from the remainder of the circuit. On a panel where four jacks per line are used, two of these spring jacks are for tip and sleeve wires "in" and two for tip and sleeve wires "out." The inside or cut-off springs of the spring jacks "out" on the toll lines are cabled to the inside springs of the "in" spring jacks, which are wired to the toll switchboard or out to another exchange.

A twin plug with two-conductor switchboard cord may be inserted into the jacks marked "out" which will disconnect the switchboard end of the line. Tests may be made for trouble outside the exchange. The same test may be made into the toll board, or, in the opposite direction, if the line is looped through by inserting the twin plug into the spring jacks marked "in" which will disconnect the outside line. Each side of the line may also be tested independently of the other.

Twin plugs with two-conductor switchboard cords attached, are provided as ordered for making test or phantom connections.

Single conductor plugs and single conductor switchboard cords are provided as ordered for making simplex connections.

Toll test panel equipment is usually provided with several short switchboard cords with single and twin plugs attached for patching through connections. This equipment is resorted to after a storm, as only a few lines may be in working condition and temporary circuits may be made up of wires not mates.

Kellogg toll test panels are of the same sturdy construction as our standard floor type and wall type switchboards.



Sixty line floor type toll test panel, 4 jacks per line

NO. 13545 WIRE CHIEF'S TESTING CABINET

Inquiries for estimates on this type of equipment should include full information as to the type of switchboard equipment in use and a detailed description of the desk required. It may be advisable and of considerable advantage to request a Kellogg engineer to get in touch with you and estimate on your requirements for such installations, thereby avoiding delay in arriving at an understanding on equipment required.



Kellogg Wire Chief's Desk.

The No. 13545 testing cabinet is especially designed for small or medium sized exchanges. It affords a means of making the same reliable test as can be made with the more elaborate wire chief's desk, such as the location of grounds, short circuits, crosses, opens, bad joints and practically all other troubles of the average telephone system. Tests can also be made for resistance of coils and voltage of batteries.

The cabinet measures 13½ inches high, 10 inches wide and 6 inches deep. It is substantially made of quarter sawed oak and has a golden oak finish. The equipment consists of one round pattern flush type Weston volt meter, the necessary keys, of the push button type, to make the various tests and two connectors for connecting a Wheatstone bridge.

The operator's set consists of a standard desk stand complete with operator's head band receiver, cord and induction coil or a standard breast plate set if preferred.

This testing cabinet can be arranged for testing either magneto, common battery, universal or combination switchboards of either the multiple or non-multiple type, and will be provided with either single party or four party ringing keys. In ordering a test cabinet, full information should be given as to the type of switchboard equipment installed with which testing outfit is to be used.



No. 13545 Test Cabinet—Closed View.



Open View.

CHIEF OPERATOR, WIRE CHIEF AND INFORMATION DESKS



Kellogg Chief Operator's Desk.

In large exchanges where new main switchboard equipment is being installed or where it is desired to install wire chief's desks, information desks or chief operator's desks regardless of whether the main board is Kellogg or of some other make, it is possible to install Kellogg equipment that will render high grade service.

The operation of this equipment has been simplified and is highly efficient. The engineering skill that has made all Kellogg apparatus the standard in telephone practice has been fully applied in the development of chief operators', wire chiefs' and information desks. The equipment commonly furnished consists of a flat top desk with a turret, containing standard apparatus and provided with pigeon holes as required for tickets, books, etc.

All apparatus such as keys, jacks, coils, plugs, cords, etc., is the same as is used in the well known Kellogg Common Battery boards. Meters for wire chiefs' desks are a standard make of recognized merit and proven worth. The arrangement of apparatus is compact but allows ample room for inspection and practical operation of the equipment.

Operators' sets, of either suspended or breast plate type transmitters, and head band receivers, or standard desk stands equipped with hand receiver or head band receiver can be furnished, or if required, a combination of two of these types of equipment can be furnished.

Kellogg Chief Operator, Wire Chief, and Information Desks and Turrets, like all other Kellogg switchboard cabinets, are built complete in our own woodworking plant at Cassopolis, Michigan. Heavy thoroughly seasoned quarter-sawed golden oak is standard. The durability and toughness of the finish on all Kellogg woodwork is well known. Kellogg standard desks are all sanitary type, embodying the most approved ideas in desk furniture.



Kellogg Information Desk.

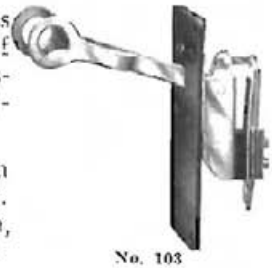
SWITCHES — HOOK



No. 100

Kellogg hookswitches are made of punched brass which is handsomely nickeled. The springs are of heavy German silver with platinum contacts and assembled with a strong, steel reinforcing spring. Kellogg Bakelite Dilecto insulation is used.

With these standard hookswitches, the hook can be removed by simply pushing the springs forward. These hookswitches are most simple in construction, but are reliable and require practically no attention.



No. 103

Code No.	Contacts Hook Down	Contacts Hook Up	Where Used
55	1	1-LOC	Long lever type for old style telephones.
47	1	2	Lineman's test sets.
98	....	2	Extension sets with Grabaphone. No escutcheon.
100	....	....	Dummy hook.
101	....	2	Common battery short backboard telephones.
103	....	2	Magneto and common battery telephones.
105	....	2	No. 103. Less escutcheon.
113	....	2	Common battery steel hotel sets.
116	....	2	Common battery steel wall sets with Grabaphone. No. 113 but hook
123	1	2	Extension sets with Grabaphone.
130	1	1-LOC	No. 123 except spring combination.
131	1	1-LOC	No. 113 except spring combination.
132	1-LOC	2	Similar to No. 113 but for Grabaphone.



No. 123 (Two Standard Hookswitches) No. 113

SWITCHES — PLUG

Kellogg plug switches for use in transferring circuits are especially adapted for this purpose, being so constructed that no particles of dirt can clog up the contacts. They are furnished in the following types:



No. 5 Plug Switch

For Switchboards

Code No.	Frame	Break	Make & Break	Sets of Springs	Remarks
5	Brass	....	1	1	Necessary to force plug down.
6	Brass	....	1	1	Similar to No. 5 but fits No. 78 plug.
7	Brass	1	....	1	Similar to No. 5 but fits No. 74 plug.

For Power Boards

Code No.	Horizontal Rows	Switches Per Row	Mountings No.	Number Plate No.
11	1	1	511	101
12	1	2	512	102
13	1	3	513	103
14	1	4	514	104
15	1	5	515	105
21	2	1	521	101
31	3	1	531	101
41	4	1	541	101
51	5	1	551	101

TELEPHONES

Magneto Wall Type

Kellogg Magneto Telephones include our compact quarter-sawed oak cabinet, and are wired for a condenser in the receiver circuit. They are drilled for the standard sizes of generators, also straight line or Harmonic ringers and are arranged so that the ringer can be connected from either side to ground for divided circuit and eight party Harmonic ringing.

Each telephone is furnished with a No. 3 carbon block lightning arrester, a bakelite receiver shell and a bakelite mouthpiece. Batteries and mounting screws are not furnished except when specified.

All Magneto telephones are convertible to common battery when desired, by taking out the batteries and generator and installing a condenser in place of the generator. This advantage involves no extra cost and does not detract from the simplicity and efficiency of the set for Magneto service.

Telephone Code Prefixes and Suffixes

The prefix F before the code number of telephones designates that the connecting rack is arranged to take the flat or spike type cord tip.

The suffixes after the code number of telephones denote the type of ringer furnished, viz.

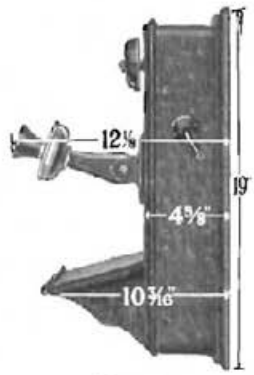
SA—straight line ringer
BA—biased ringer
HA—harmonic ringer frequencies—33⅓, 50, 66⅔, 16⅔
HB—harmonic ringer frequencies 30, 42, 54, 66
G—grabaphone type set

Desk sets, including desk stand and box, have the following suffixes:

SF—straight line ringer
BF—biased ringer
HAF—harmonic ringer frequencies—33⅓, 50, 66⅔, 16⅔
HBF—harmonic ringer frequencies 30, 42, 54, 66



No. 2820



Side View



Open View

Straight Line Ringers—No Push Button

Code No.	Ringer Ohms Rec.	Ringer Code No.	Generator No. Bars	Generator Code N.	Transmitter	Arm	Hook Switch	Ind. Coil	Condenser	Receiver	Remarks
F2809	1000	78-A	3	15	22-LC	42	103	28-C	....	F41-A	
F2810	1000	78-A	4	22	22-LC	42	103	28-C	....	F41-A	
F2811	1600	78-D	4	22	22-LC	42	103	28-C	....	F41-A	
F2812	1600	78-D	5	53	22-LC	42	103	28-C	....	F41-A	
F2859	2500	78-G	5	53	22-LC	42	103	28-C	....	F41-A	

Straight Line Ringers with Condenser in Secondary

F2813	1000	78-A	3	15	22-LC	42	103	28-C	28	F41-A	Cond. in sec'd'y
F2814	1000	78-A	4	22	22-LC	42	103	28-C	28	F41-A	Cond. in sec'd'y
F2816	1600	78-D	4	22	22-LC	42	103	28-C	28	F41-A	Cond. in sec'd'y
F2815	1600	78-D	5	53	22-LC	42	103	28-C	28	F41-A	Cond. in sec'd'y
F2880	2500	78-G	5	53	22-LC	42	.....	28-C	28	F41-A	Cond. in sec'd'y
F2837	1600	78-D	4	23	22-LC	42	103	28-C	28	F41-A	Cond. in sec'd'y
F2856	1600	78-D	5	55	22-LC	42	.....	28-C	28	F41-A	Cond. in sec'd'y

TELEPHONES

Magneto Wall Type

Straight Line Ringers, Condenser in Sec'd'y, Pulsating Current Generator

Code No.	Ringer Res.	Ringer Code	Generator Bars	Generator Code	Trans.	Arm	Hook Switch	Ind. Coil	Cond.	Rec.	Remarks
F2853	1000	78-A	3	19	22-LC	42	103	28-C	28	F41-A	Cond. in sec'd'y Pul. current Gen.
F2854	1000	78-A	4	23	22-LC	42	103	28-C	28	F41-A	Cond. in sec'd'y Pul. current Gen.

Straight Line Ringer, Pulsating and Alternating Current Generator

F2876	1000	78-A	4	68	22-LC	42	103	28-C	--	F41-A	Ring both sides of line to ground

Biased Ringer—No Push Button

F2808	1000	79-A	3	15	22-LC	42	103	28-C	....	F41-A
F2838	1600	79-D	3	15	22-LC	42	103	28-C	....	F41-A
F2878	2500	79-G	3	15	22-LC	42	103	28-C	....	F41-A

Harmonic Ringer—No Push Button

F2807	4-party	73-A	3	15	22-LC	42	103	28-C	....	F41-A	
F2873	4-party	72-A	3	66	22-LC	42	103	28-C	78	F41-A	Cond. in secondary.
F2874	4-party	73-A	3	66	22-LC	42	103	28-C	78	F41-A	Cond. in secondary.
F2877	4-party	72-A	3	68	22-LC	42	103	28-C	103	F41-A	Cond. in ringer ckt. Rings both sides of line to ground.

Straight Line Ringer—Push Button

Code No.	Ringer Res.	Ringer Code	Generator Bars	Generator Code	Trans.	Arm	Hook Switch	Ind. Coil	Push Button	Cond.	Rec.
F2821	1000	78-A	3	15	22-LC	42	103	28-C	5	28	F41-A
F2822	1000	78-A	4	22	22-LC	42	103	28-C	5	28	F41-A
F2823	1600	78-D	4	22	22-LC	42	103	28-C	5	28	F41-A
F2824	1600	78-D	5	53	22-LC	42	103	28-C	5	28	F41-A
F2881	2500	78-G	5	53	22-LC	42	103	28-C	5	28	F41-A
F2850	1600	78-D	5	53	22-LC	42	103	28-C	14	....	F41-A

Straight Line Ringer—P. & A. C. Generator Push Button

F2817	1000	78-A	3	31	22-LC	42	103	28-C	5	28	F41-A
F2818	1000	78-A	4	26	22-LC	42	103	28-C	5	28	F41-A
F2819	1600	78-D	4	26	22-LC	42	103	28-C	5	28	F41-A
F2820	1600	78-D	5	59	22-LC	42	103	28-C	5	28	F41-A
F2842	1600	78-D	5	59	22-LC	42	103	28-C	5 & 30	28	F41-A
F2860	2500	78-G	5	59	22-LC	42	103	28-C	5	28	F41-A

Straight Line Ringer—Transmitter Cut-in Button

F2847	1600	78-D	5	53	22LC	42	103	28-C	5	28	F41-A

Magneto Grabaphone—Wall Type

Straight Line Ringer—No Push Button

											Grabaphone Code
F2809-G	1000	78-A	3	15	....	....	110	28-C	....	....	F12-LC
F2812-G	1600	78-D	5	53	....	....	110	28-C	....	....	F12-LC
F2859-G	2500	78-G	5	53	....	....	110	28-C	....	....	F12-LC
F2816-G	1600	78-D	5	53	....	....	110	28-C	....	28	F12-LC
F2880-G	2500	78-G	5	53	....	....	110	28-C	....	28	F12-LC

TELEPHONES



No. F2824-G

Magneto Grabaphone—Wall Type

Straight Line Ringer—Push Button

Code No.	Ringer Res.	Ringer Code	Generator Bars	Generator Code	Hook Switch	Ind. Coil	Push Button	Push Button Cond.	Grabaphone Code
F2824-G	1600	78-D	5	53	110	28-C	5	28	F12-LC
F2881-G	1000	78-A	3	15	110	28-C	5	28	F12-LC



No. F5020

Magneto Type Wall Grabaphone

Straight Line Ringer—Cradle Hookswitch

Code No.	Ringer Res.	Ringer Code	Generator Bars	Generator Code	Hook Switch	Ind. Coil	Cond.	Grabaphone Code
F5020	1000	78-A	3	15	117	28-C	....	F11-LC
F5021	1600	78-D	5	53	117	28-C	....	F11-LC
F5022	1600	78-D	5	53	117	28-C	28	F11-LC

Straight Line Ringer—Standard Grabaphone Hookswitch

F5010	1000	78-A	3	15	110	28-C	....	F12-LC
F5011	1600	78-D	5	53	110	28-C	....	F12-LC

GRABAPHONES

The Kellogg Grabaphone used with wall sets and desk stands enables the telephone man to obtain an extremely convenient and serviceable telephone. These grabaphones include our standard transmitter with Kellogg Bakelite mouthpiece and Kellogg Bakelite receiver, with a neatly designed hard rubber handle and so assembled that they can be used by any person without any loss of transmission.

A 48 in., 4 conductor cord is furnished with these grabaphones. When ordering specify whether they are to be furnished with a C type transmitter for common battery service, an L type transmitter for local battery service or an L C transmitter for either local or common battery.



No. 11

Code No. 11. Grabaphone includes No. 50 Transmitter, No. 49-A Receiver and No. 454 Cord.

Code No. 12. Grabaphone, same as No. 11, but has a No. 50-A Receiver with eye for hanging on hook.

Code No. 13. Grabaphone with switch in handle includes No. 58 Transmitter, No. 45-A Receiver and No. 455 Cord.

Code No. 14. Grabaphone, same as No. 13, but has a No. 45-A Receiver with eye for hanging on hook.



No. 12

TELEPHONES

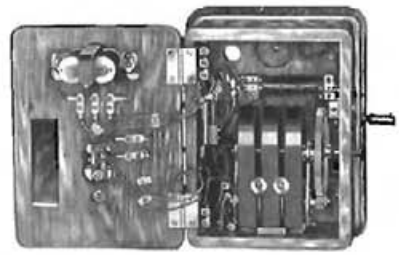
Magneto Residence Type



No. F1809

These sets are intended for use where a smaller telephone than the regular compact wall set is desired or required because of limited mounting space.

The cabinet backboard panel measures 7½" wide by 10" long. No writing shelf is furnished and no provision is made for batteries, otherwise they are of the same sturdy construction as the standard magneto wall telephone.



Open View F1809

For battery boxes for these sets, see page 267.

Straight Line Ringer—No Push Button

Code No.	Ringer Res.	Ringer Code	Generator Bars	Generator Code	Trans.	Arm	Hook Switch	Ind. Coil	Push Button	Cond.	Rec.
F1809	1000	78-A	3	15-AC	64-LC	41	103	28-C			F41-A
F2921	1000	78-A	4	22-AC	64-LC	41	103	28-C			F41-A
F2922	1600	78-D	4	22-AC	64-LC	41	103	28-C			F41-A
F1812	1600	78-D	5	53-AC	64-LC	41	103	28-C			F41-A
F1859	2500	78-G	5	53-AC	64-LC	41	103	28-C			F41-A

Straight Line Ringer with Condenser in Sec'd'y

F2924	1000	78-A	3	15-AC	64-LC	41	103	28-C		28	F41-A
F2925	1000	78-A	4	22-AC	64-LC	41	103	28-C		28	F41-A
F2926	1600	78-D	4	22-AC	64-LC	41	103	28-C		28	F41-A
F1816	1600	78-D	5	53-AC	64-LC	41	103	28-C		28	F41-A
F1880	2500	78-G	5	53-AC	64-LC	41	103	28-C		28	F41-A
F2936	1000	78-A	3	19-PC	64-LC	41	103	28-C		28	F41-A
F2937	1000	78-A	4	23-PC	64-LC	41	103	28-C		28	F41-A
F2938	1600	78-D	4	23-PC	64-LC	41	103	28-C		28	F41-A
F2939	1600	78-D	5	55-PC	64-LC	41	103	28-C		28	F41-A

Biased Ringer—No Push Button

F2805	1000	79-A	3	15-AC	64-LC	41	103	28-C			F41-A

Harmonic Ringer—No Push Button

F2804	4-party	73-A	3	15-AC	64-LC	41	103	28-C			F41-A

Straight Line Ringer—Push Button

F2932	1000	78-A	3	15-AC	64-LC	41	103	28-C	5	28	F41-A
F2933	1000	78-A	4	22-AC	64-LC	41	103	28-C	5	28	F41-A
F2934	1600	78-D	4	22-AC	64-LC	41	103	28-C	5	28	F41-A
F1824	1600	78-D	5	53-AC	64-LC	41	103	28-C	5	28	F41-A
F1881	2500	78-G	5	53-AC	64-LC	41	103	28-C	5	28	F41-A

TELEPHONES

Magneto Residence Type

Straight Line Ringer—P. & A. C. Generator—Push Button

Code No.	Ringer Res.	Ringer Code	Generator Bars	Generator Code	Trans.	Arm	Hook Switch	Push Button	Ind. Coil	Cond.	Rec.
F2867	1000	78-A	3	26	64LC	41	103	5	28-C	28	F41-A
F2928	1000	78-A	4	31	64LC	41	103	5	28-C	28	F41-A
F2930	1600	78-D	4	26	64LC	41	103	5	28-C	28	F41-A
F2931	1600	78-D	5	59	64LC	41	103	5	28-C	28	F41-A

Magneto Residence Grabaphone Type

Straight Line Ringer—No Push Button

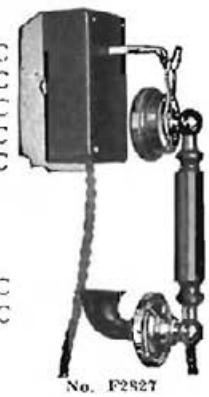


No. F1809-G Magneto Residence Set

Code No.	Ringer Res.	Ringer Code	Generator Bars	Generator Code	Hook Switch	Ind. Coil	Cond.	Grabaphone
F1809-G	1000	78-A	3	15	110	28-C	.....	F12-LC
F1812-G	1600	78-D	5	53	110	28-C	.....	F12-LC
F1859-G	2500	78-G	5	53	110	28-C	.....	F12-LC
F1816-G	1600	78-D	5	53	110	28-C	28	F12-LC
F1880-G	2500	78-G	5	53	110	28-C	28	F12-LC

Straight Line Ringer—Push Button No. 5

F1824-G	1600	78-D	5	53	110	28-C	28	F12-LC
F1881-G	2500	78-G	5	53	110	28-C	28	F12-LC

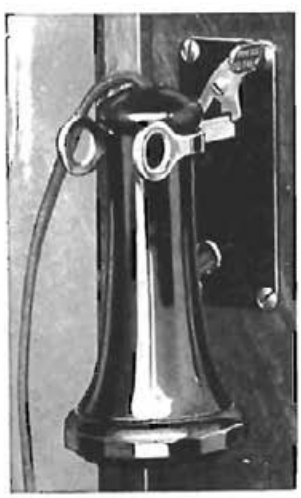


No. F2827

Magneto Extension Set

Code No.	Hook Switch	Ind. Coil	Grabaphone
Steel F2827	98	28-C	F12-LC

Magneto Telephone Battery Savers



No. 1 Battery Saver

A mechanical attachment which stops the hook switch in an intermediate position after the listening circuit is closed. May be attached to all type Kellogg wall phones and many other makes of telephones.

This simple attachment is put on in a jiffy with an ordinary screw driver, does not interfere, and has no direct connection with the wiring. Cannot get out of order or cause trouble.

It automatically stops the hook in an intermediate position before the battery circuit is closed.

In making or answering a regular call, the user merely releases this stop with his left thumb at the time he takes the receiver from the hook. When listening in, the receiver is removed without releasing the stop and the battery circuit is not closed unless the party desires to talk, in which case the stop can be released by touching it once, after which the user can both listen and talk in the usual manner.

Code No. 1 for Kellogg short lever hookswitch telephones.

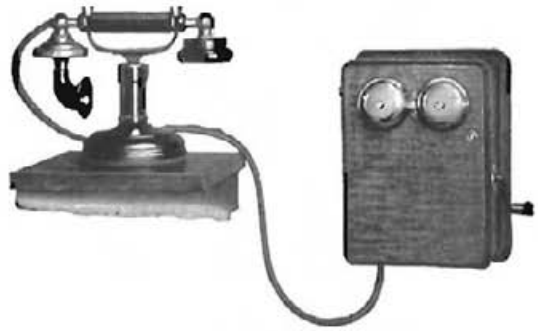
Code No. 2 for Kellogg older type, long lever hookswitch telephones and many other makes of phones. Attaches to wood work.

TELEPHONES

Magneto Desk Sets



Desk Stand Type



Grabaphone Type

DESK STAND TYPE

Straight Line Ringer—Induction Coil

Set Code No.	Desk Stand: Code	Conductor	Cord	Rec.	Trans.	Desk Set Box: Code	Ringer	Generator	Ind. Coil	Cond.	Push Button
F- 9	F-84	3	F-150D	F-41A	64LC	F-2328	No. 78A-1000 ohm	No. 15-3 bar alternating	28		
F-12	F-84	3	F-150D	F-41A	64LC	F-2361	No. 78D-1600 ohm	No. 53-5 bar alternating	28		
F-59	F-84	3	F-150D	F-41A	64LC	F-2362	No. 78G-2500 ohm	No. 53-5 bar alternating	28		

Straight Line Ringer—Induction Coil—Condenser

F-16	F-84	3	F-150D	F-41A	64LC	F-2370	No. 78D-1600 ohm	No. 53-5 bar alternating	28	28C½MF	
F-80	F-84	3	F-150D	F-41A	64LC	F-2371	No. 78G-2500 ohm	No. 53-5 bar alternating	28	28C½MF	

Straight Line Ringer—Induction Coil—Condenser—Push Button for Grounded Signalling

F-24	F-84	3	F-150D	F-41A	64LC	F-2376	No. 78D-1600 ohm	No. 53-5 bar alternating	28	28C-½MF	
F-81	F-84	3	F-150D	F-41A	64LC	F-2411	No. 78G-2500 ohm	No. 53-5 bar alternating	28	28C-½MF	

GRABAPHONE TYPE

Straight Line Ringer—Induction Coil

F- 9G	F-115	3	F-150D	F-11LC	F-2328	No. 78A-1000 ohm	No. 15-3 bar alternating	28	
F-12G	F-115	3	F-150D	F-11LC	F-2361	No. 78D-1600 ohm	No. 53-5 bar alternating	28	
F-59G	F-115	3	F-150D	F-11LC	F-2362	No. 78G-2500 ohm	No. 53-5 bar alternating	28	

Straight Line Ringer—Induction Coil—Condenser

F-16G	F-115	3	F-150D	F-11LC	F-2370	No. 78D-1600 ohm	No. 53-5 bar alternating	28	28C-½MF	
F-80G	F-115	3	F-150D	F-11LC	F-2371	No. 78G-2500 ohm	No. 53-5 bar alternating	28	28C-½MF	

Straight Line Ringer—Induction Coil—Condenser—Push Button for Grounded Signalling

F-24G	F-115	3	F-150D	F-11LC	F-2376	No. 78D-1600 ohm	No. 53-5 bar alternating	28	28C-½MF	
F-81G	F-115	3	F-150D	F-11LC	F-2411	No. 78G-2500 ohm	No. 53-5 bar alternating	28	28C-½MF	



TELEPHONES

Common Battery Oak Wall Type

Induction Coil Circuit

Straight Line Ringer

Code No.	Ringer Code	Ringer Ohms Res.	Trans.	Arm	Hook Switch	Ind. Coil	Cond.	Rec.	Remarks
730-SA	84-A	1000	22-C	42	101	79-A	66	41-A	Ringer to ground post.
F730-SA	84-A	1000	22-C	42	101	79-A	66	F41-A	Ringer to ground post.

Biased Ringer

730-BA	79-A	1000	22-C	42	101	79-A	66	41-A	Ringer to ground post.
F730-BA	79-A	1000	22-C	42	101	79-A	66	F41-A	Ringer to ground post.

Harmonic Ringers

730-HA	72-A	4-party	22-C	42	101	79-A	66	41-A	Ringer to ground post.
730-HB	73-A	4-party	22-C	42	101	79-A	66	41-A	Ringer to ground post.
F730-HA	72-A	4-party	22-C	42	101	79-A	66	F41-A	Ringer to ground post.
F730-HB	73-A	4-party	22-C	42	101	79-A	66	F41-A	Ringer to ground post.



Common Battery Oak Residence Type

Induction Coil Circuit

Straight Line Ringer

729-SA	84-A	1000	64-C	41	103	79-A	16	41-A	Ringer to ground post.
F729-SA	84-A	1000	64-C	41	103	79-A	16	F41-A	Ringer to ground post.

Biased Ringer

729-BA	79-A	1000	64-C	41	103	79-A	16	41-A	Ringer to ground post.
F729-BA	79-A	1000	64-C	41	103	79-A	16	F41-A	Ringer to ground post.

Harmonic Ringer

729-HA	72-A	4-party	64-C	41	103	79-A	16	41-A	Ringer to ground post.
729-HB	73-A	4-party	64-C	41	103	79-A	16	41-A	Ringer to ground post.
F729-HA	72-A	4-party	64-C	41	103	79-A	16	F41-A	Ringer to ground post.
F729-HB	73-A	4-party	64-C	41	103	79-A	16	F41-A	Ringer to ground post.

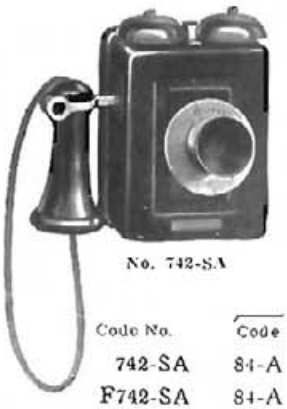


Call and Return Telephones
No. 767

This system is ideal for two phone service such as, between two offices, house and garage, from one room to another.

This telephone is furnished with our direct current receiver, double gong ringer and one push button.

It is finished in oak.



No. 742-SA

TELEPHONES

Common Battery Steel Residence Type

Induction Coil Circuit

Straight Line Ringer

Code No.	Ringer Code	Ringer Ohms Res.	Trans.	Arm	Hook Switch	Ind. Coil	Cond.	Rec.	Remarks
742-SA	84-A	1000	64-C	39	113	79-A	16	41-A	Ringer to ground post.
F742-SA	84-A	1000	64-C	39	113	79-A	16	F41-A	Ringer to ground post.

Biased Ringers

742-BA	79-A	1000	64-C	39	113	79-A	16	41-A	Ringer to ground post.
F742-BA	79-A	1000	64-C	39	113	79-A	16	F41-A	Ringer to ground post.

Harmonic Ringers

742-HA	72-A	4-party	64-C	39	113	79-A	16	41-A	Ringer to ground post.
F742-HA	72-A	4-party	64-C	39	113	79-A	16	F41-A	Ringer to ground post.
742-HB	73-A	4-party	64-C	39	113	79-A	16	41-A	Ringer to ground post.
F742-HB	73-A	4-party	64-C	39	113	79-A	16	F41-A	Ringer to ground post.
736	72-A	4-party	64-C	39	114	79-A	16	41-A	Arranged for automatic dial.
F736	72-A	4-party	64-C	39	114	79-A	16	F41-A	Arranged for automatic dial.

Series Circuit

Vibrating Ringer

755	40-A	50	64-C	39	111	.....	....	36-A	Ringer to ground post.
F755	40-A	50	64-C	39	111	.....	....	F36-A	Ringer to ground post.

COMMON BATTERY GRABAPHONE EXTENSION SETS



No. 732 Type

Retardation Coil Circuit

Code No.	Hook Switch	Retard. Coil	Cond.	Grabaphone	Remarks
732	98	18-A	10	12-C	
F732	98	58-A	10	F12-C	
772	123	18-A	10	12-C	Inter. Com. System.
F772	123	58-A	10	F12-C	Inter. Com. System.

Induction Coil Circuit

722	98	79-A	62	12-C
F722	98	79-A	62	F12-C


No. 9742-SA

TELEPHONES

Common Battery Wall Grabaphone Type
Induction Coil Circuit

Straight Line Ringer

Code No.	Code No.	Ringer Ohms Res.	Hook Switch	Ind. Coil	Condenser	Grabaphone
9742SA	84-A	1000	116	79-A	16	12-C
F-9742SA	84-A	1000	116	79-A	16	F12-C

Biased Ringer

9742BA	79-A	1000	116	79-A	16	12-C
F-9742BA	79-A	1000	116	79-A	16	F12-C

Harmonic Ringer

9742HA	72-A	4 party	116	79-A	16	12-C
F-9742HA	72-A	4 party	116	79-A	16	F12-C
9742HB	73-A	4 party	116	79-A	16	12-C
F-9742HB	73-A	4 party	116	79-A	16	F12-C


Desk Type Set

Common Battery Desk Sets
Desk Stand Type
Induction Coil in Base of Stand


Grabaphone Set

Straight Line Ringer—Condenser

Set Code No.	Desk Stand: Conductors	Cords: Code	Cords: D. S.	Cords: Rec.	Rec.	Trans.	Cond.	Ind. Coil	Desk Set Box: Code	Ringer	Cond.	Ind. Coil
97SF	2	97	100D	98TR	41A	64C	53-2MF	51A	75SA	No. 86A-1000 ohm	12-1MF	
97SF	2	F-97	F-100D	F-98TR	F-41A	64C	53-2MF	F-51A	F-75SA	No. 86A-1000 ohm	12-1MF	

Biased Ringer—Condenser

97BF	2	97	100D	98TR	41A	64C	53-2MF	51A	75BA	No. 85B-1000 ohm	12-1MF	
97BF	2	F-97	F-100D	F-98TR	F-41A	64C	53-2MF	F-51A	F-75BA	No. 85B-1000 ohm	12-1MF	

Harmonic Ringer—Condenser

97HAF	2	97	100D	98TR	41A	64C	53-2MF	51A	75HA	No. 87A-16⅔-33⅓-50-66⅔	12-1MF	
97HAF	2	F-97	F-100D	F-98TR	F-41A	64C	53-2MF	F-51A	F-75HA	No. 87A-16⅔-33⅓-50-66⅔	12-1MF	
97HBF	2	97	100D	98TR	41A	64C	53-2MF	51A	75HB	No. 88A-30 -42 -54-66	12-1MF	
97HBF	2	F-97	F-100D	F-98TR	F-41A	64C	53-2MF	F-51A	F-75HB	No. 88A-30 -42 -54-66	12-1MF	

Induction Coil in Desk Set Box

Straight Line Ringer—Condenser

118SF	118	3	452D	98TR	41A	64C	404-SA	No. 86A-1000 ohm	16-2MF	79A
118SF	F-118	3	F-452D	F-98TR	F-41A	64C	F404-SA	No. 86A-1000 ohm	16-2MF	79A

Biased Ringer—Condenser

118BF	118	3	452D	98TR	41A	64C	404BA	No. 85B-1000 ohm	16-2MF	79A
118BF	F-118	3	F-452D	F-98TR	F-41A	64C	F-404BA	No. 85B-1000 ohm	16-2MF	79A

Harmonic Ringer—Condenser

118HAF	118	3	452D	98TR	41A	64C	404HA	No. 87A-16⅔-33⅓-50-66⅔	16-2MF	79A
118HAF	F-118	3	F-452D	F-98TR	F-41A	64C	F-404HA	No. 87A-16⅔-33⅓-50-66⅔	16-2MF	79A
118HBF	118	3	452D	98TR	41A	64C	404HB	No. 88A-30 -42 -54-66	16-2MF	79A
118HBF	F-118	3	F-452D	F-98TR	F-41A	64C	F-404HB	No. 88A-30 -42 -54-66	16-2MF	79A

TELEPHONES

Common Battery Desk Sets—Grabaphone Type

See illustration page 193.

Induction Coil Circuit

Set Code No.	Desk Stand: Code	Conductors	Cord	Grabaphone	Desk Set Box: Cond.	Ringer	Code	Ind. Coil
115SF	115A	3	452D	11C	404SA	No. 86A-1000 ohm	No. 16-2MF	No. 79A
F-115SF	F-115A	3	F-452D	F-11C	F-404SA	No. 86A-1000 ohm	No. 16-2MF	No. 79A
Biased Ringer—Condenser								
115BF	115A	3	452D	11C	404BA	No. 85B-1000 ohm	No. 16-2MF	No. 79A
F-115BF	F-115A	3	F-452D	F-11C	F-404BA	No. 85B-1000 ohm	No. 16-2MF	No. 79A
Harmonic Ringer—Condenser								
115HAF	115A	3	452D	11C	404HA	No. 87A-16⅔-33⅓-50-66⅔	No. 16-2MF	No. 79A
F-115HAF	F-115A	3	F-452D	F-11C	F-404HA	No. 87A-16⅔-33⅓-50-66⅔	No. 16-2MF	No. 79A
115HBF	115A	3	452D	11C	404HB	No. 88A-30-42-54-66	No. 16-2MF	No. 79A
F-115HBF	F-115A	3	F-452D	F-11C	F-404HB	No. 88A-30-42-54-66	No. 16-2MF	No. 79A

Railway Telephones



No. 2731

Portable Sets

Birch Mahogany

Code No.	Trans.	Ind. Coil	Ret. Coil	Cond.	Push Button	Rec.
2731	22-L	28-C		28	4	46-A
2866	22-L	66-A	16-C	99	4&14	46-A
	PC No. 6092					
F2731	22-L	28-C		28	4	46-A
F2866	22-L	66-A	16-C	99	4&14	46-A
	PC No. 6092					

Above sets used with line connecting pole. See page 195.



No. 2681

Steel Type

Code No.	Description
2681	Portable Railway Set, steel case for railway work. May be used with line pole.

Contains—

No. 15 3-bar generator,
No. 14LC Micro telephone,
No. 28C induction coil,
No. 30A retardation coil,
No. 16 2 MF condenser,
No. 455G cord.



No. 2870

Dispatching Sets

Residence Type—No Ringer

Code No.	Trans.	Arm	Hook Switch	Ind. Coil	Retard. Coil	Cond.	Push Button	Rec.
F2870	64-L	41	109	28-C	4-L Resis.	25	14	46-A

Wall Type—Straight Line Ringers

Code No.	Ringer: Res.	Code	Gen.	Trans.	Arm	Hook Switch	Ind. Coil	Retard. Coil	Cond.	Push Button	Rec.
2735	2500	78-G	53	22-L	20	63	28-C	30-F	34	27	41-A
								30-G	37		
2840	1600	78-D	22	22-L	20	63	28-C	1Q Resis.	25	14	41-A
F2869				22-L	42	99	66-A	16-C	2-25		
									28	14	F41-A
F2885	1600	78-D	22	22-L	41	103	28-C	1Q Resis.	25	14	F41-A
2886	2500	78-G	53	22-L	41	103	28-C	30-F	34	27	F41-A
								30-G	37		



No. 2869

TELEPHONES



No. 2744

Insulated Telephones

Insulated Wall Telephone, compact wood-work with concealed binding posts, for use on lines in the vicinity of high-tension currents to safeguard the telephone circuit and avoid injury from shocks. No exposed connected metal parts.

No. 2744 Contains: No. 53 5-bar generator, No. 45G 2500 ohm ringer, No. 22L transmitter, No. 28C induction coil, No. 41A receiver, Special railway cord.

Oil Field Telephones

Wall Type

Heavy Duty Extra Powerful Set

Code No.	Description
2884	Wall telephone. Oak cabinet with concealed binding posts. Designed to meet the requirements of oil field and pipe line companies where highest transmission and ringing service is demanded. Separate primary and secondary circuit. Contains: No. 22L transmitter on No. 42 arm, No. 75 6-bar generator, No. 78G 2500 ohm ringer, No. 28C induction coil, No. 41A receiver with special railway cord.

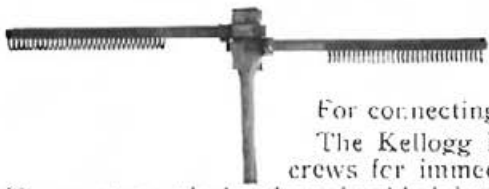


No. 2884

Desk Type

The desk type oil field telephone consists of our standard No. 90A desk stand and No. 2415 desk set box. This desk set box is equipped with a six bar generator and will give the same service as the 2884 wall set described above. The desk stand is handsomely finished in black enamel and equipped with Bakelite receiver shell and mouth piece, making this stand practically indestructible.

This desk set box contains: No. 75 6-bar generator, No. 28C induction coil, No. 78G 2500 ohm ringer



Kellogg Jointed Railway Connecting Poles

For connecting at any point on a pole line circuit.

The Kellogg No. 12 B telephone connecting arm is used by train crews for immediate connection along the lead with the dispatcher. The most practical and serviceable jointed pole equipment for this purpose. Seasoned hickory. Comes in three pieces. Quickly assembled. The connecting rods or arms at the top are of bronze and fitted with spiral springs which automatically scrape and grip the line wires making excellent connection. These connecting arms are hinged at the pole and fold close to the pole. The two arms, and connecting pole with twisted pair wire fold into a compact bundle. A number of railroads are using these poles with our portable telephone, Code No. 2731 or Code No. 2681. The bronze arms can be screwed into position at right angles to the pole or parallel with it so that contact can be made with two wires on the same level, from the same cross arm, or from a pair of wires, one above the other.



No. 2887

TELEPHONE DISPLAY PANEL

The display panel consists of the apparatus specified, mounted upon hard wood and wired up according to our standard circuits. This makes an ideal arrangement for demonstration purposes and can be used in exchanges as well as class rooms.

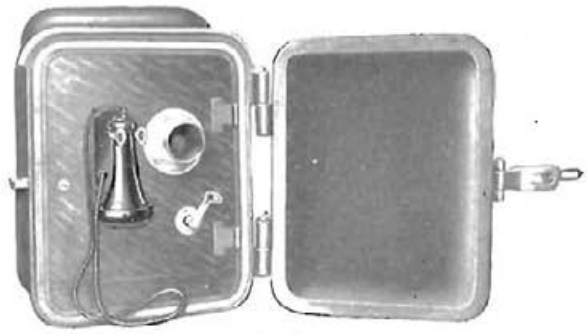
Note our magneto switchboard demonstrating panel, page 165.

Code No.	Ringer Res.	Ringer Code	Gen.	Trans.	Hook Switch	Ind. Coil	Receiver
F2887	1600	78–D	53	22–LC 42	103	28–C	F41–A

TELEPHONES — MALLEABLE IRON CASE



No. 2868

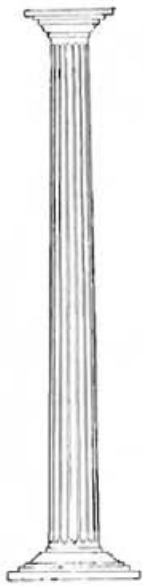


Open View No. 2868

These telephones are intended for use in mines, railroad yards, for street railways, and for all outdoor use. The case is of heavy malleable iron, designed to fasten on poles or on the wall. All parts are thoroughly protected from the weather and from mechanical injury. The malleable iron case is 16" high, 17¾" wide and 17½" deep. Net weight, 97 lbs. The front door, which opens on strong hinges, is provided with a heavy malleable iron hasp so it can be locked by means of an ordinary iron padlock. The bells are protected by a heavy malleable iron hood, provided with weatherproof openings, which allow the ringing to be heard at a considerable distance.

This set was designed at the request of one of the large railroads for yard service. It is unquestionably the most rigid and serviceable set ever built, and should not be confused with the ordinary cast iron mine telephone.

Code No.	Ringer	Trans.	Generator	Ind. Coil
2868	1,000 ohms	32L	4 bar	28-C
2882	1600 ohms	32L	5 bar	28-C
2883	2500 ohms	32L	5 bar	28-C



Code No. 1 Pedestal

TELEPHONES — Iron Housing

The Kellogg Iron Housing has been designed for use in railroad yards, along electric right-of-ways, in mines, for taxi service and for municipal use, as police or fire call stations.



Code No. 1 Housing

The box is mounted on a neat iron standard and is painted a luminous gray, which harmonizes well with any surroundings, but still of a color that makes locating the station an easy matter. This finish is made up of one dip coat of black asphaltum paint and one coat of aluminum paint.

The outstanding features are accessibility, safety from weather conditions and meddling, and its strong, sturdy construction. It has a Corbin lock and self closing door.

This housing can be equipped with either a magneto or common battery telephone as desired.

TELEPHONES
AUTOMATIC



Desk Type

The Kellogg Automatic Desk Stand is very similar to the Standard Kellogg Desk Stand except that the upright is set off center permitting the dial to be placed well onto the surface of the base to protect the dial mechanism from injury in case the desk stand is accidentally knocked over.

Another important feature of the Kellogg Automatic Desk Stand is that the weight of the instrument is such that numbers can be turned up on the dial with one hand not requiring the other hand to steady the base as is the case with automatic instruments of other manufacture.

The connecting rack in the base is Universal type, taking either spike or spade tips. It is accessible, convenient, durable and efficient.

For years the Kellogg Desk Stand has stood forth as an instrument of unusually good wearing qualities, of practical design, of handsome appearance. To this unusually fine type of desk equipment the Kellogg company is adding an Automatic dial which has been developed through long and careful laboratory experimentation, to the highest point of switching efficiency. The Kellogg Automatic Desk Stand is unsurpassed.

The desk set box is our standard compact steel type, finished a handsome black enamel.

The desk stands in the following codes are equipped with Kellogg Automatic dials, described on the next page.

Code No.	Cord	Remarks
301	F-150-B 3 cond.	Used with No. 404 B. A. Box. Booster or Induction Coil Circuit.
302	F-150-B 3 cond.	Used with No. 1075 B. A. Box. Retardation Coil Circuit.
303	F-150-B 3 cond.	Used with No. 1075 B. A. Box. Series, or Direct Current Receiver Circuit.



Oak Residence Type

The oak residence automatic telephone is of the same standard construction as our oak residence set except that the transmitter is mounted in the upper part of the cover, to make room for the dial. The receiver shell and mouthpiece are of Kellogg Bakelite.

The gongs are of brass heavily enameled.

The finish is our standard oak.

Code	Ringer	Trans.	Arm	Hook Switch	Retard. Coil	Ind. Coil	Cond.	Rec.
779	79A	64C	41	133	.....	.....	12	36A
780	79A	64C	41	133	.....	79A	16	41A
781	79A	64C	41	133	38A	.....	12	41A

Steel Residence Type

The steel residence automatic telephone is constructed of heavy planished steel. The transmitter is mounted at the top of the cover which makes ample room for the dial.

This set contains the same standard equipment that is furnished with our standard steel residence telephone. It is finished in black enamel with the exception of the hook switch and transmitter.

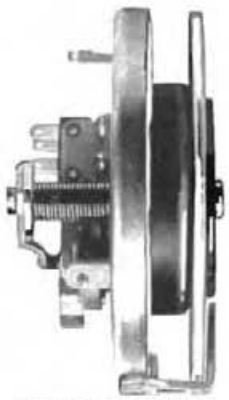
This instrument will withstand the hardest service, and is one of the most popular types.

Furnished with same equipment as the oak type.



TELEPHONES

AUTOMATIC DIALS



Side View Showing Compactness.

The outstanding feature of the Kellogg Automatic Dial is that it is a piece of mechanism that can be taken apart and put together easily by any one. This is of paramount importance to exchange managers who have had to carry the expense of highly salaried mechanics.

The following are some of the more important advantages of the Kellogg Automatic Dial.

Dust Proof

Without proper protection, dust will get in back of the dial face and clog up the mechanism and put it out of adjustment, rendering the instrument inoperative. The Kellogg dial face is especially designed to overcome this difficulty, and so soundly is the dial constructed that it will run indefinitely without variation in speed.

Simplicity

The Kellogg dial is built with the simplicity characteristic of all Kellogg products. Each screw, rivet and plate fits solidly and compactly in place, like a well-built watch. It has machine cut gears; it has a punch-pressed back frame of heavy brass; the indestructible name plate fits accurately under the finger plate and is held firmly in its proper place by a spur that fits into a small hole in the overlapping rim of the back frame on one side and another larger spur from the finger stop on the opposite side.



Face View of Kellogg Dial.

Off Normal Spring Group

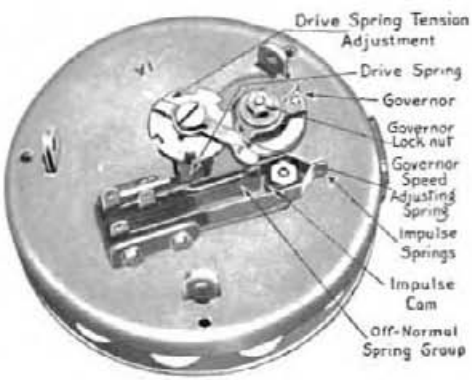
The off normal spring group is located in and with the impulse group and is operated by a cam on the spring end of the driving shaft to "short" the talking circuit during the dialing operation in different types as the conditions of these types require.

Drive Spring Adjustments

The drive spring is the motive power of the dial. This spring is easily and accurately adjusted by means of a notched disk 5/8 inch in diameter at the top of the spring. Correct tension is quickly attained by turning the disk a notch at a time. On the top of this notched disk is a piece, one end of which acts as a dog in notches of the disk retaining and regulating the tension, while the other end functions in such a way as to operate the off normal group.

Impulse Cam

The permanent construction of the cam and springs of the impulse group gives the Kellogg Automatic dial an unvariable impulse ratio; each impulse is clean cut, decisive, and absolutely unvarying.



Rear View

The Governor

This is the most important part of the dial. It consists of the fly ball type governor, the center of which is made of phosphor bronze, the wings of steel. A loose floating spring is anchored at the top of the governor and encompasses the wings of the mechanism giving flexibility, efficiency and a permanent braking friction. Forcing will not alter the adjustment or damage the Kellogg dial. It is adjustable to a variation of speed of approximately 50%. This mechanism is simply but substantially made—destined to run indefinitely without variation.

Kellogg Automatic Dial

Is made to fit all American types of automatic telephones of any manufacture.

DESK STANDS



Standard Desk Stand.
Fig. No. 2533



Code No. 67, Desk Stand and Receiver with Head Band

The Kellogg desk stand has been carefully designed to reduce maintenance to a minimum. It is graceful in appearance and light enough in weight to handle with ease, is sufficiently rugged to withstand ordinary knocks and continuous service. It is the only one on the market that is provided with a perfect transmitter adjustment which never requires attention. The transmitter back does not become loose on its mounting, as it is part of the lug.

The capital is non-breakable and holds the transmitter securely in any position. Instead of using an ordinary japan finish over the upright which always chips or wears off, a heavy Kellogg Bakelite protection tube is used, insuring a lasting finish that does not discolor, crack or chip.

The base is of steel, treated to prevent rusting after which it is given a heavy coat of dull, black enamel. It is equipped with a heavy felt ring which is securely held in a groove, encircling the outer edge of the base. This felt is securely held in position by prongs and protects the furniture as well as absorbing the shock of the impact when the stand is slammed down on the table.

The springs are of German silver equipped with platinum contacts, and with the connecting rack are located in an accessible manner in the base. The hookswitch has a very short action, yet a free movement of the contact springs is effected. All corners and sharp edges are rounded off, and the hook fork so formed that the receiver does not fall off should the stand be tilted. The standard finish is in a permanent black enamel with the exception of the hookswitch and transmitter which are nickel plated.

The superiority of this stand has caused the leading telephone companies to adopt it as a standard for long distance, as well as local work.

No rattle to hookswitch. Weight is in the right place. Acessibility and practicability in arrangement of the apparatus in base of stand. Absolute, unequalled transmission for either short or long distances.

Magneto Type

Code No.	Conductors	Spring Arrangement	Cords D. S.	Cords Rec.	Rec.	Trans.	Where Used
F28	4		F102-D	F98-TR	F41-A	64-LC	Magneto boxes.
67	4		102-D	98-TR	46 Type	64-L	Dispatching sets.
F67	4		F102-D	F98-TR	46 Type	64-L	Dispatching sets.
84	3		150-D	98-TR	41-A	64-LC	Magneto boxes.
F84	3		F150-D	F98-TR	F41-A	64-LC	Magneto boxes.
85-B	4		241-RD	242-RTR	41-A	64-L	Dispatching sets.
F85-B	4		F241-RD	248-RTR	F41-A	64-L	Dispatching sets.
90-A	4		102-D	98-TR	41-A	64-L	Dispatching sets.
F90-A	4		F102-D	F98-TR	F41-A	64-L	Dispatching sets.
F85-P	4		F421-RD	248-RTR	F41-A	64-L	Same as F85-B except brown finish.

Common Battery Type

Retardation Coil and Condenser in Base

Code No.	Conductors	Spring Arrangement	Coils	Condenser	Cords D. S.	Cords Rec.	Rec.	Trans.	Where Used
39	2		16-A ret.	10	100-D	98-TR	41-A	64-C	No. 75 and No. 259 D. S. boxes.
F39	2		16-A ret.	10	F100-D	F98-TR	F41-A	64-C	No. F75 and No. F259 D. S. boxes.
64	4		16-A ret.	10	102-D	98-TR	41-A	64-C	Inter. Com. sets.
F64	4		16-A ret.	10	F102-D	F98-TR	F41-A	64-C	Inter. Com. sets.
F123	4		16-A ret.	10	F103-D	F98-TR	F41-A	64-C	Inter. Com. sets.

DESK STANDS—Common Battery Type

Code No.	Cond.	Spring Arrangements	Coils	Condensers	Cords D. S.	Cords Rec.	Rec.	Trans.	Where Used
97	2	.....	51-A Ind.	53	100-D	98-TR	41-A	64-C	No. 75 & No. 259 D. S. boxes.
F97	2	.....	F51-A Ind.	53	F100-D	F98-TR	F41-A	64-C	No. F75 & No. F259 D. S. boxes.
97-B	4	.....	51-A Ind.	53	246-D	196-TR	41-A	64-C	
F97-B	4	.....	F51-A Ind.	53	F246-D	F196-TR	F41-A	64-C	
118	3	.....	.....	....	452-D	98-TR	41-A	64-C	No. 404 & No. 257 D. S. boxes.
F118	3	.....	.....	....	F452-D	F98-TR	F41-A	64-C	No. F404 & No. F257 D. S. boxes.
118-B	3	.....	.....	....	452-D	98-TR	41-A	64-C	No. 404 & 257. D. S. boxes.
F118-B	3	.....	.....	....	F452-D	F98-TR	F41-A	64-C	No. F404 & F257 D. S. boxes.

Miscellaneous

75	2	.....	.....	....	100-D	98-TR	36-A	64-C	Direct current sets.
F75	2	.....	.....	....	F100-D	F98-TR	F36-A	64-C	Direct current sets.
94	3	.....	.....	....	101-D	98-TR	41-A	64-C	Dial switch in base for automatic sets.
F94	3	.....	.....	....	F101-D	F98-TR	F41-A	64-C	Dial switch in base for automatic sets.
126	4	.....	.....	....	102-D	98-TR	41-A	64-C	Dial switch in base used with No 412 DS box.
F126	4	.....	.....	....	F102-D	F98-TR	F41-A	64-C	Dial switch in base used with No. F412 DS box
F127	4	.....	.....	....	F102-D	F98-TR	F41-A	64-C	Dial switch in base used with No. F413 DS box
F128	4	.....	F51-A Ind.	....	F100-D	F98	F41-A	64-C	Same as F97 except brown finish.



GRABAPHONE STANDS



Standard Type

Code No.	Conductors	Spring Arrangement	Cords	Coil Type & No.	Cond.	Where Used
11	2	.....	100-D	16-A ret.	10	No. 75 & No. 259 D. S. boxes. No. 11-C grabaphones.
F111	2	.....	F100-D	16-A ret.	10	No. F75 & No. F259 D. S. boxes. No. F11-C grabaphones.
115	3	.....	150-D	.....	....	No. 404 & 257 D. S. boxes No. 11-C grabaphones and magneto boxes.
F115	3	.....	F150-D	.....	....	No. F404 and F257 and magneto boxes. No. F11-LC grabaphones and magneto boxes.
115-A	3	.....	452-D	.....	....	Used with W. E. Co. boxes. No. 11-C grabaphones.
F115-A	3	.....	F452-D	.....	....	Used with W. E. Co. boxes. No. F11-C grabaphones.
F121	4	.....	F102-D	16-A ret.	10	Used with Inter. Com. sets No. F11-C grabaphones.
F124	4	.....	F103-D	16-A ret.	10	For Inter. Com. System No. 6 key box.

Unit Type

Code No.	Conductors	Spring Arrangement	Cord	Coil Type & No.	Cond.	Ringer Code	Ringer Res.	Where Used
110-SA	3	.....	150-D	52-A Ind.	96	65-A	1000	With No. 11-C. Grabaphone.
F110-SA	3	.....	F150-D	F52-A Ind.	96	65-A	1000	With No. F11-C Grabaphone.
110-BA	3	.....	150-D	52-A	96	100-A	1000	With No. 11-C. Grabaphone.
F110-BA	3	.....	F150-D	F52-A	96	100-A	1000	With No. F11-C. Grabaphone.
F120-SA	3	.....	F150-D	42-A ret.	103	65-A	1000	With No. F11-C. Grabaphone.
F120-BA	3	.....	F150-D	42-A ret.	103	100-A	1000	With No. F11-C. Grabaphone.

SWITCHBOARD TOOLS



No. 1—Relay spring adjuster with wood handle.



No. 3—Wrench for special screw in center of name plate on automatic dial.



No. 4—Key spring adjuster and contact scraper.



No. 8—Flat wrench for adjusting drop armatures.



No. 9—Flat wrench for adjusting drop ringers.



No. 10—Flat wrench for adjusting drop 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.



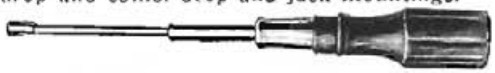
No. 13—Socket wrench for mounting major relays on mounting strips.



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 hooks.



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—Supv. lamp cap extractor.



No. 25—Steel lamp extractor for $\frac{7}{16}$-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.

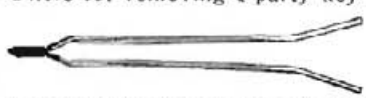
No. 31—Wrench for removable sleeve of jacks, regular size sleeve.



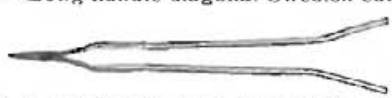
No. 32—Pliers for removing heat coils.



No. 33—Pliers for removing 4-party key buttons.



No. 35—Long handle diagonal Swedish cutters.



No. 36—Long handle, long nose chain pliers.

No. 37—Wrench for inserting and removing sleeve of No. 88 spring jack; similar to Code No. 30.

TOOLS—SWITCHBOARD



No. 38—Line Lamp Cap Extractor.



No. 39—Pliers for Placing Terminals on Tinsel Cords.



No. 40—Plug Gauge for Ganging Worn No. 106 Plugs.
No. 41—Plug Gauge for Ganging Worn No. 201 Plugs.



No. 42—Switchboard Cable Skinner.



No. 43—Relay Spring Adjuster, right hand bend.



No. 44—Relay Spring Adjuster, left hand bend.
No. 45—Plug Gauge for Ganging Worn No. 106 Plugs.
No. 46—Plug Gauge for Ganging Worn No. 152 Plugs.
No. 47—Plug Gauge for Ganging Worn No. 112 and 187 Plugs.



No. 48—Jack Gauge for Ganging Worn No. 239 Type Jacks.
No. 49—Jack Gauge for Ganging Worn No. 258 Type Jacks.

TRANSFORMERS

Kellogg Transformers are made in various types to operate from storage batteries of a voltage ranging from 24 to 56, and will transform these currents to a current of the proper voltage for ringing purposes. They are provided with suitable bases for mounting, and can also be mounted in the standard transformer set cabinets.



No. 6



No. 14



No. 15

Code No.	Cycles	Resistance Primaries	Resistance Secondary	No. of Laminations	Primary Power	Secondary Voltages
1-A	16	1.44–1.44	61.5	220	24	125 to 145
1-B	16	1.28–1.28	62	220	24	150 to 170
1-C	16	1.44–1.44	31	220	24	100
1-D	16	3.9–3.9	26.5	220	56	100 to 120
1-E	16	3.13–3.13	22.7	220	40	100 to 110
2-A	33	1.32–1.32	56	180	24	125 to 145
2-B	33	1.18–1.18	58.5	180	24	150 to 170
3-A	50	1.085–1.085	49.2	120	24	125 to 145
3-B	50	0.98–0.98	52	120	24	150 to 170
4-A	66	1.085–1.085	49.2	120	24	125 to 145
4-B	66	0.98–0.98	52	120	24	150 to 170
5-A	20	1.44–1.44	61.5	220	24	125 to 145
5-B	20	1.44–1.44	31	220	24	100
5-D	20	3.2–3.2	36.5	.....	....	100 to 110
6-A	60	1.085–1.085	49.2	120	24	125 to 145
7-A	30	1.32–1.32	29.5	180	24	100
8-A	42	1.32–1.32	29.5	180	24	100
8-C	42	2.87–2.87	21.1	180	40	110 to 120
9-A	54	1.085–1.085	25.5	120	24	100
9-C	54	2.4–2.4	18.5	120	40	110 to 120
10-A	66	1.85–1.85	25.5	120	24	100
10-C	66	2.4–2.4	18.5	120	40	110 to 120

TRANSFORMERS

The following transformers are designed to replace Kellogg Repeating coils of similar construction, which are used as drainage coils on telephone lines, paralleling high tension lines, or for other purposes around the telephone exchange where a high grade transformer is required.



No. 16

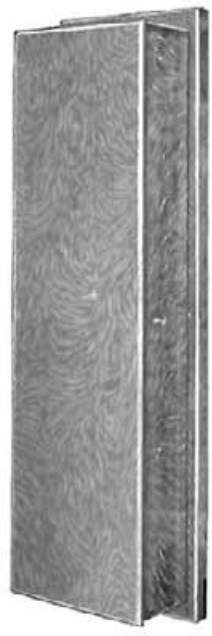
Code No.	Winding		A	B	C	D	E
12	1 coil single 1 coil parallel	Turns	800	800	800		
		Ohms	20	20	20		
		Terms.	1–2	7–8	5–6		
13	Concentric	Turns	450	650			
		Ohms.	11.5	12.5			
		Terms.	1–2	3–4			
15	4 coils separate	Turns	450	450	450	450	
		Ohms	12	12	12	12	
		Terms.	1–2	3–4	5–6	7–8	
16	4 coils separate	Turns	450	450	450	450	
		Ohms	12	12	12	12	
		Terms.	1–2	3–4	5–6	7–8	
17	Concentric	Turns	850	850	850	100	100
		Ohms	18.6	21.5	25	3.3	3.3
		Terms.	1–2	3–4	5–6	7–8	9–10

TRANSFORMER SETS

The transformer sets listed below include transformers shown on the preceding page. The transformers are mounted in a heavy oak cabinet which mounts in a vertical position on the wall and requires no valuable floor space. These cabinets are similar to those used with our pole changers, being provided with a hinged oak cover and the entire cabinet removable from the blackboard panel by simply loosening two screws. The transformers are wired to binding posts in the lower part of the cabinet where all connections can be conveniently made.



No. 19



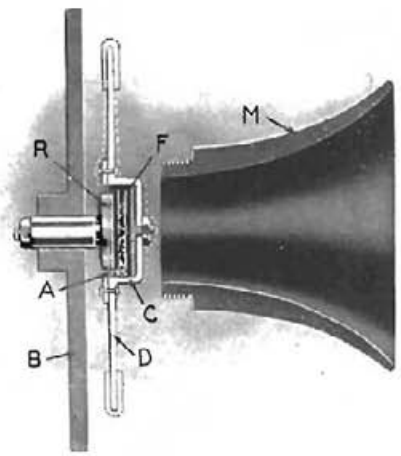
No. 18



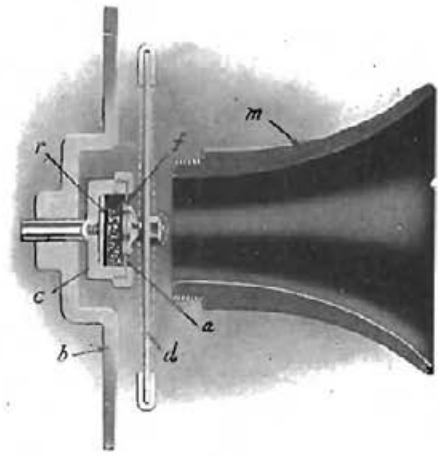
No. 21

Code No.	Transformer Cycles 16	30	33	42	50	Condensers 54	66		Remarks
18-A	1-C	7-A		8-A		9-A	10-A	34	For 5-NH ringing set with 19 pole changer.
19-A		7-A		8-A		9-A	10-A	34	For 4-NH ringing set with 17 pole changer.
21-A	1-C		2-A		3-A		4-A	34	For 4-OH ringing set with 6 pole changer.

TRANSMITTERS



Kellogg



Not Kellogg

Conditions throughout the country clearly indicate that telephone companies who are not using Kellogg transmitters are under heavy maintenance expense and are often continually changing from one type of transmitter to another in hope of reducing maintenance expense and securing satisfactory transmission.

In view of the above conditions, it is not only our desire but our duty to see that all telephone companies become thoroughly familiar with the superiority of Kellogg transmitters and adopt them as their standard.

The Kellogg reverse type solid back transmitter is well known to the telephonic world. Designed nineteen years ago, it has held the distinction of being the unchangeable standard of excellence for high grade transmission. There are today over three million in use giving unequalled service in all classes of work and in all parts of the world.

Except Kellogg, every transmitter manufactured today could be likened to all other transmitters:—Kellogg stands apart, unique in design and original in principle; a happy combination of quality and efficiency.

GUARANTEE: The Kellogg transmitter is guaranteed superior to any other make on the market, and any part showing an inherent defect within one year will be repaired or replaced free on being returned to the Kellogg Company, prepaid.

TRANSMITTER REPAIRS: Old Kellogg transmitters, when returned to the factory, charges prepaid, with no parts broken, will be reconstructed, carbon electrode reground, new granular carbon, and a new rubber gasket will be installed at a very small cost, making the transmitter as good as new so far as transmission is concerned. Unless otherwise instructed, we will re-nickel the case, for which an additional charge is made.

Our transmitters are regularly furnished in three different types: "LC"—used for local or common battery: "C"—used for common battery only: "L"—for special local battery conditions.

When specified, transmitters for telephones will be furnished with 2 connecting cords, 15 inches long.

Machine screws and washers for attaching the transmitter to arm will be furnished only when specified.

Net weight complete telephone transmitter (with mouthpiece) .....11½ ozs.
Net weight complete telephone transmitter (with mouthpiece) less back..... 8½ ozs.

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 our 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.

TRANSMITTERS



Complete Transmitter

No. 22 Type

For Magneto and Common Battery Telephones



Transmitter Front Only

Code No.	Description	Use
22–L	Low resistance, insulated contact N. P. finish. Attaches to arm by means of two screws. Includes back and mouthpiece.	For general service, including railway dispatching use.
22–C	Same as 22–L but high resistance.	Common battery telephones.
22–LC	Same as 22–C but universal.	Magneto telephones.
23–L	Same as 22–L but back has rubber bushing for exposed cord.	Old type magneto.
23–C	Same as 23–L but high resistance.	Old type common battery telephones.
44–L	Low resistance, insulated contact N. P. finish. Includes back with rubber bushing for exposed cord, mouthpiece and mounting lug.	Fits old Kellogg magneto desk stands.
44–C	Same as 44–L but high resistance.	Fits old Kellogg common battery desk stands.
57–L	Same as 22–L but plain front and back.	Same as 22–L.
57–C	Same as 22–C but plain front and back.	Same as 22–C.
70–L	Same as 22–L but moisture proof.	Same as 22–L.
70–C	Same as 22–C but moisture proof.	Same as 22–C.
70–LC	Same as 22–LC but moisture proof.	Same as 22–LC.
105–L	Similar to 22–L but special back and terminal block or bridge.	Fits Bell arm and cord.
105–C	Same as 105–L but high resistance.	Fits Bell arm and cord.
105–LC	Same as 105–L but universal.	Fits Bell arm and cord.

No. 64 Type

32–L	Low resistance, insulated contact N. P. finish. Includes mouthpiece, no back. Bridge drilled and tapped for mounting on steel sets.	Portable railway sets and mine telephones.
32–C	Same as 32–L but high resistance.	Portable railway sets and mine telephones.
32–LC	Same as 32–C but universal.	Portable railway sets and mine telephones.
64–L	Same as 22–L but no back.	Desk stands for railway dispatching service.
64–C	Same as 22–C but no back.	Desk stands for C. B. service.
64–LC	Same as 22–LC but no back.	Desk stands for magneto service.
104–C	Same as 64–C but dull black finish.	
106–L	Same as No. 70–L but less back.	To replace 64–L where moisture proof transmitter is required.
106–C	Same as No. 70–C but less back.	To replace 64–C where moisture proof transmitter is required.

Grabaphone Type

Code No.	Description	Use
50-L	Low resistance, insulated contact, N. P. finish, includes mouthpiece and back, attaches by means of two screws.	No. 11-L and 12-L grabaphones.
50-C	Same as 50-L, but high resistance.	No. 11-C and 12-C grabaphones.
50-LC	Same as 50-C, but universal.	No. 11-LC and 12-LC grabaphones.
58-L	Same as 50-L, but bridge assembly.	No. 13-L and 14-L grabaphones.
58-C	Same as 50-C, but bridge assembly.	No. 13-C and 14-C grabaphones.
58-LC	Same as 50-LC, but bridge assembly.	No. 13-LC and 14-LC grabaphones.

TRANSMITTERS

Operators



Suspended Transmitter

Code No.	Description	Use
55-L	Low resistance, insulated contact, semi-gloss black enamel finish, suspended by two 72-inch cords, complete with back and mouthpiece.	Magneto switchboards.
55-C	Same as 55-L, but high resistance.	Common battery boards and P. B. X.'s.
55-LC	Same as 55-C, but universal.	Universal switchboards.
76-L	Low resistance, insulated contact. Breast plate type, made of polished aluminum, includes neck band and mouthpiece. No cords.	Magneto switchboards.
76-C	Same as 76-L, but high resistance.	Common battery boards.
76-LC	Same as 76-C, but universal.	Universal switchboards.
1076	Same as 76 but white enamel.	



Breast Plate Transmitter

Transmitter Backs

For attaching Kellogg transmitters to other makes of telephones.



Pc. 10259



Pc. 34155



Pc. 29748



Pc. 5755



Pc. 27505

Piece Part No.	Description
Pc. 10259	Kellogg standard transmitter back, furnished on all telephone transmitters unless otherwise ordered. Will attach to any make telephone arm requiring two screws for mounting transmitter.
Pc. 34155	Back only, to fit all types of Western Electric telephone arms with concealed cord.
Pc. 29748	Back only, to fit all types of Western Electric telephone arms with exposed cord.
Pc. 5755	Back only, to fit old style American Electric telephone arm with exposed cord.
Pc. 27505	Back only, to fit Sterling Electric telephone arm with concealed cord.

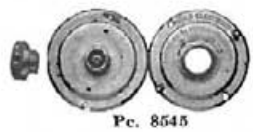
TRANSMITTER ADAPTERS



Pc. 6689



Pc. 8274



Pc. 8545



Pc. 5742



Pc. 33860

While we have listed many types of adapters for attaching our transmitter to other makes of special telephone arms, we do not recommend their general use, as experience has proven that it is more satisfactory to use our 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.

Piece Part No.	Description
Pc. 33860	Adapter for attaching our transmitter to Western Electric desk or wall set. Cast brass lug, drilled to fit our standard transmitter back, arranged for concealed cords. If exposed cords are in use specify No. 23 type transmitter.
Pc. 5742	Adapter for attaching our standard transmitter to old style Stromberg-Carlson telephone arms, concealed cord.
Pc. 8545	Adapter for attaching our standard transmitter to old style American Electric telephone arm, concealed cord.
Pc. 8274	Adapter for attaching our standard transmitter to Ericsson telephone arm, concealed cord.
Pc. 6889	Adapter for attaching our standard transmitter to North Electric telephone arm, concealed cord.

TRANSMITTER MOUTHPIECES

Telephone



Pc. No. 29779



Pc. No. 30995

All subscriber telephone mouthpieces are made of Kellogg Bakelite, which is unbreakable in ordinary service. These mouthpieces retain their glossy finish and are not affected by heat, chemicals, moisture, etc.

Pc. No. 29779 for telephones.

Pc. No. 30995 for grabaphones.

Operators' Set



Pc. No. 29776

Pc. No. 29776 is constructed of hard rubber and will fit all Kellogg operators' transmitters.

RECEIVER SHELLS



Kellogg Bakelite receiver shells are a big factor in the reduction of the maintenance of telephones.

They are practically unbreakable and have a beautiful finish that is lasting. After years of hard service they still retain their "newness." Some Kellogg Bakelite 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 temperatures Kellogg Bakelite only chars.

7th—Light weight; specific gravity of only 1.33 weighs only as much as an equal volume of hard rubber.

A sanitary feature of Kellogg Bakelite receiver shells and mouthpieces is that they can be cleaned and disinfected by boiling in water.

WEIGHTS—CORD



No. 8



No. 9

Code No.	Material	Length	Width	Thickness	Weight in Ounces	Where Used
4	Cast iron	3⅛"	1¼"	Round	16	On transmitter cords.
6	Cast iron	6⅞"	2½"	2⅝"	44	Main frame test shoe cords.
7	Cast iron	7⅝"	2½"	1¼"	28¾	Main frame test shoe cords.
8	Cast iron	7½"	2¼"	1 "	20¼	Main frame test shoe cords.
9	Steel and lead	4 "	1⅝"	½"	9 to 11	On switchboard cords.
10	Steel and lead	4 "	1⅝"	½"	18 to 22	Two No. 9 weights combined. Used on switchboard cords.

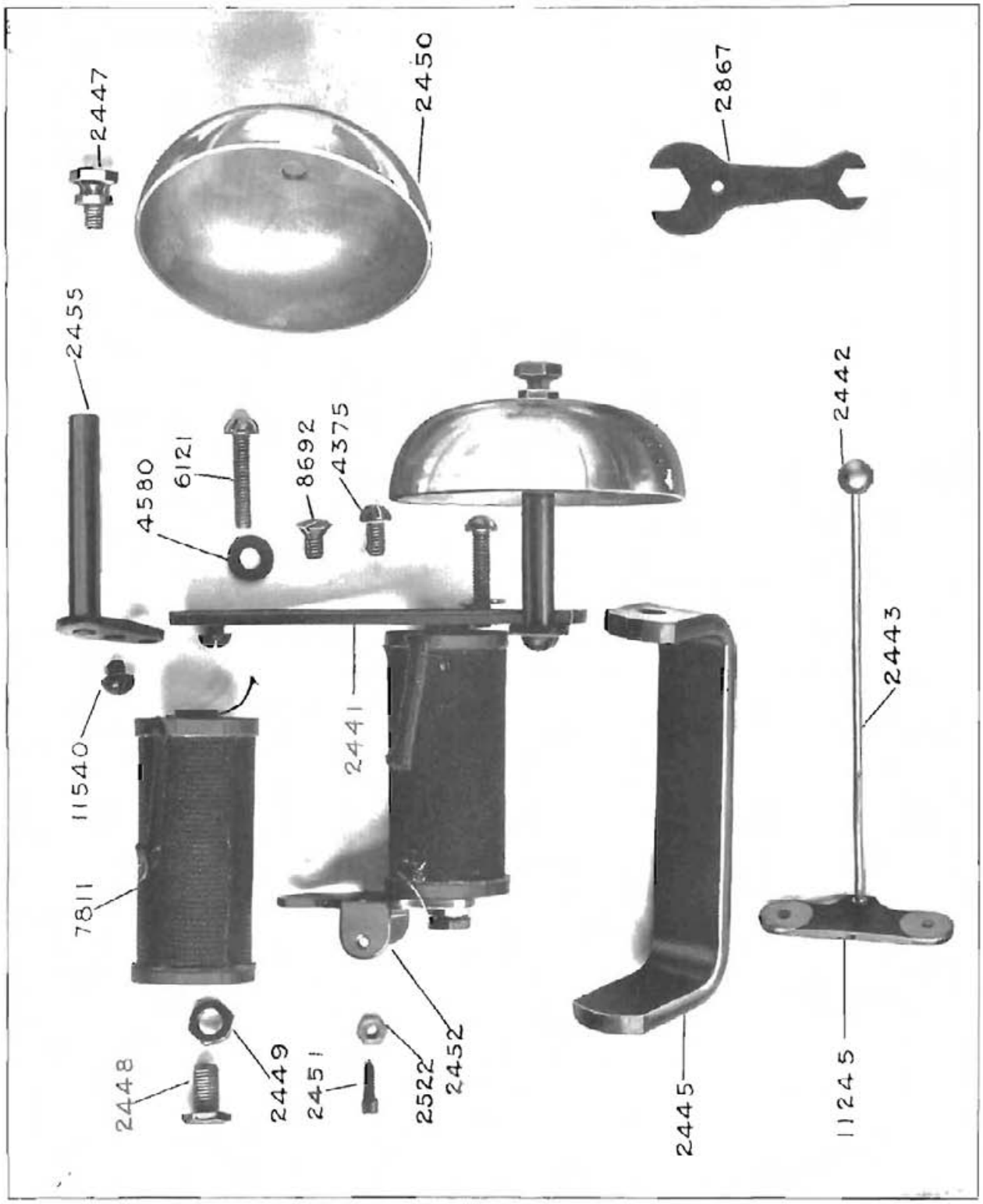


Plate No. 1—Type No. 1—Ringer
Pc. No. 2447 replaced by Pc. No. 32569

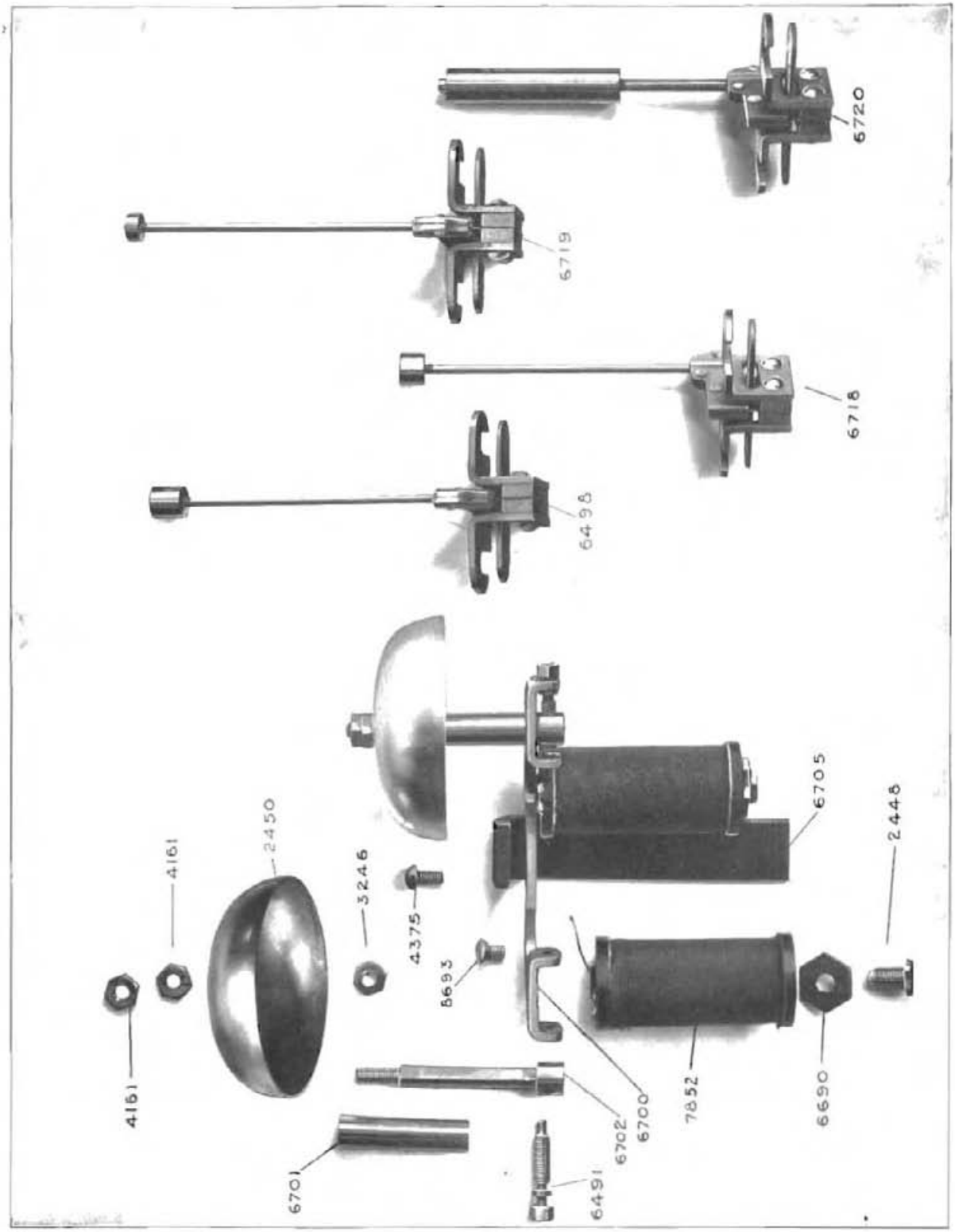


Plate No. 2—Type No. 28—Ringer
6498, 1st party. 6918, 2nd party. 6719, 3rd party. 6720, 4th party

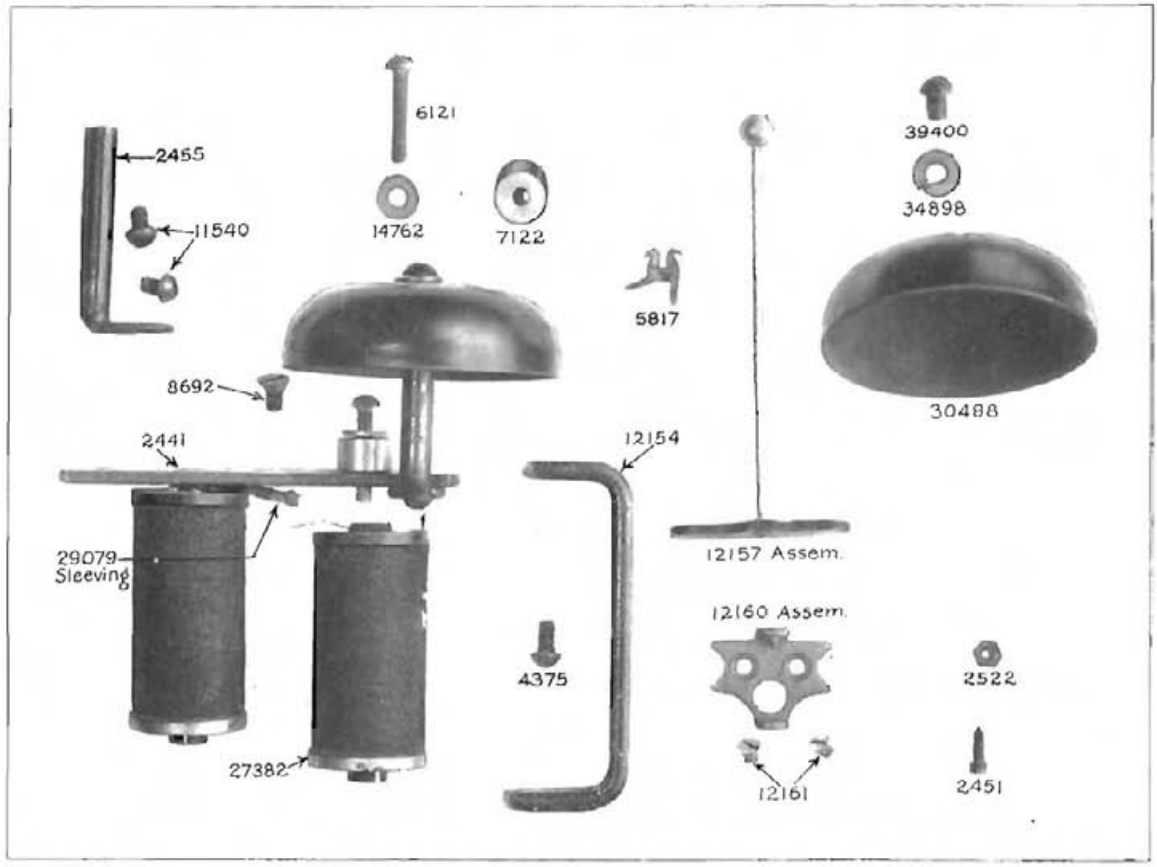


Plate No. 3—No. 78A Ringer

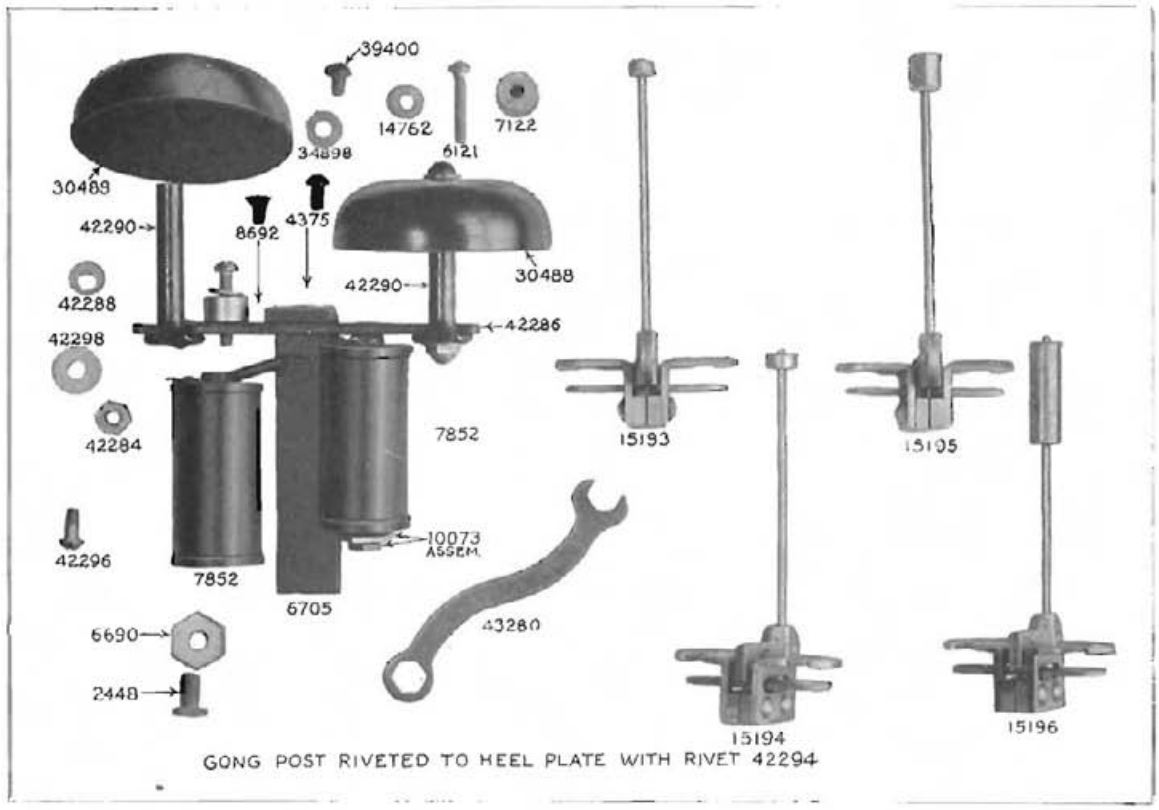


Plate No. 4—No. 73A Ringer



Plate No. 5—Kellogg Transmitter—No. 22L
Pc. No. 4172, Stud for 22 L Transmitter is set in place in Front of Screw, Pc. No. 1165
Pc. No. 1165 replaced by Pc. No. 12348

Pc. No. 9175 replaced by Pc. 12344. Pc. 6201 replaced by Pc. 12349
Pc. 4175 and 4176 are transposed

Pc. No. 8666 replaced by Pc. No. 6469
Pc. No. 5899 replaced by 3437

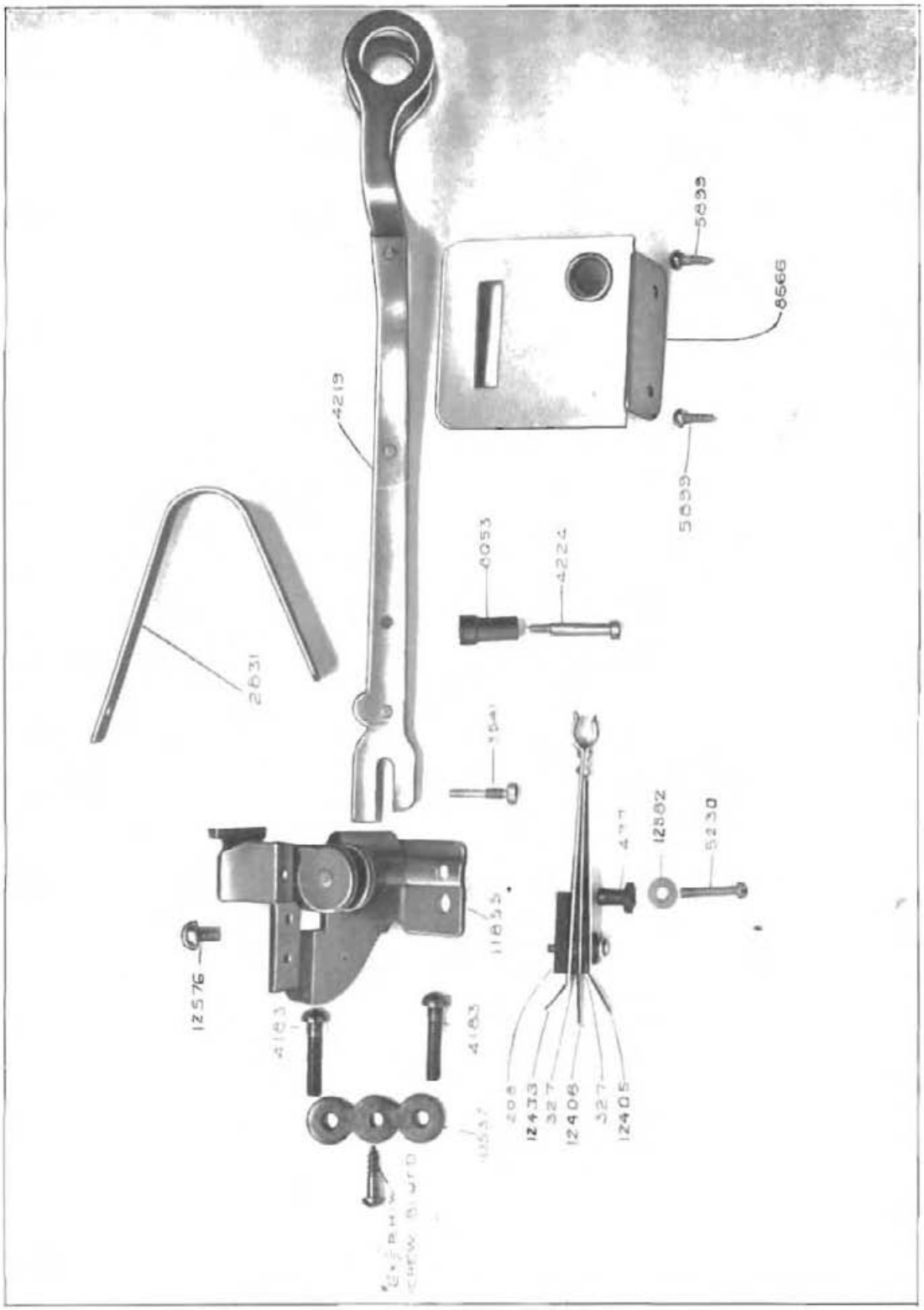


Plate No. 6—Type No. 63—Hook Switch

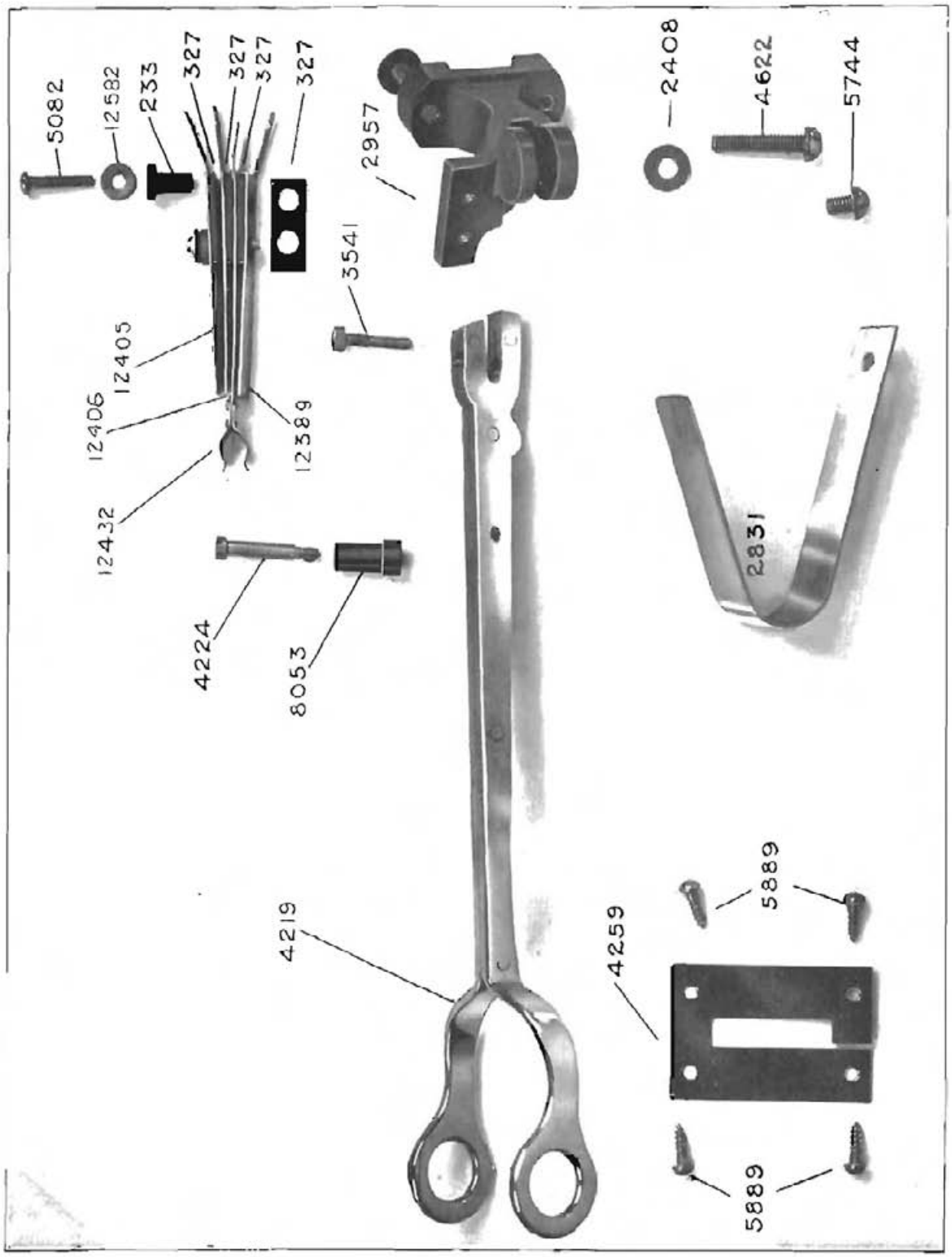


Plate No. 7—Type No. 33— Hook Switch

replaced by Pc. No. 4580

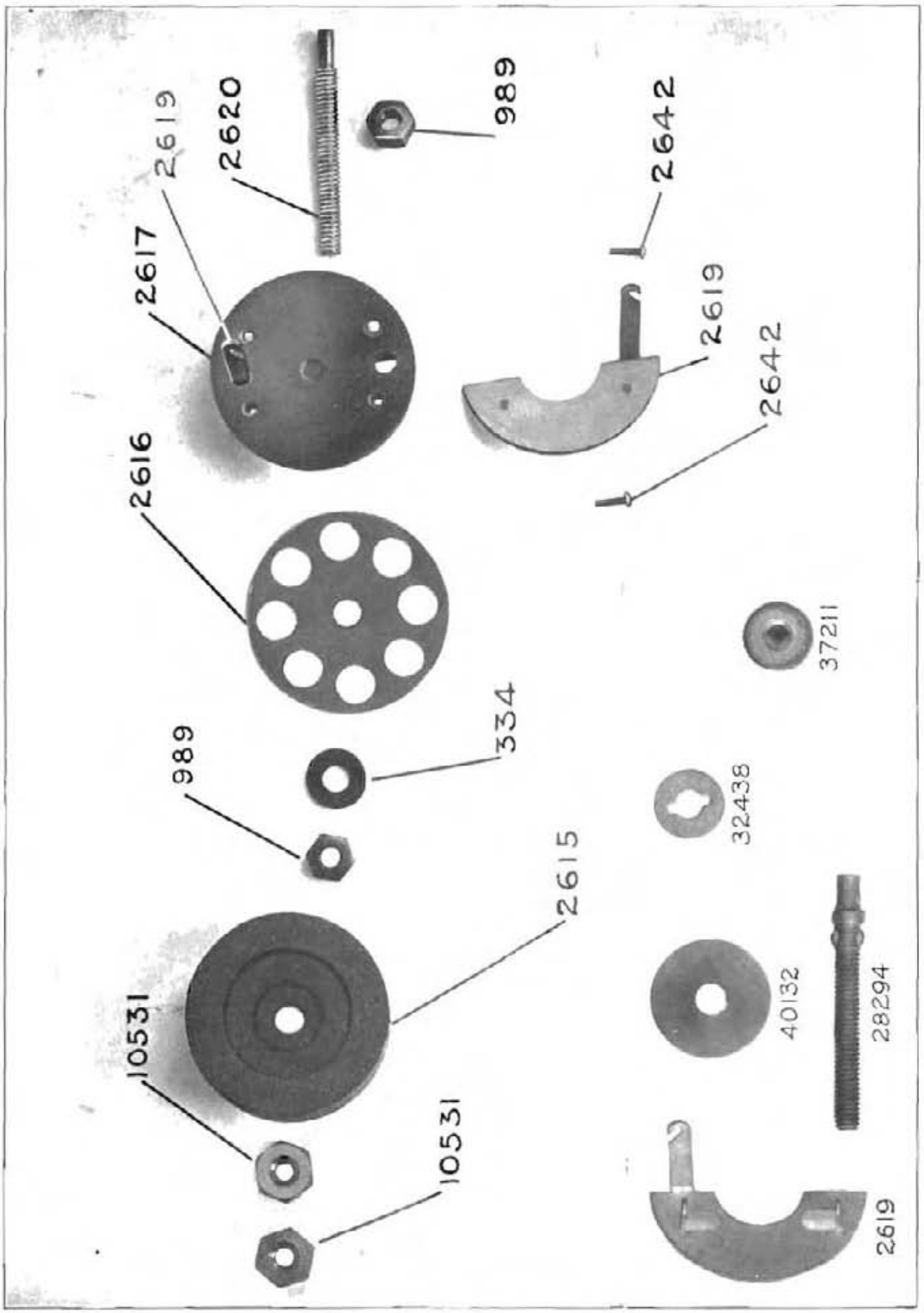


Plate No. 8—Type No. 3—Arrester
Both hex. nuts Pc. 10531 replaced by Pc. Nos. 37211 and 40132. Terminals Pc. No. 2619 is same Pc. No. but new design and fits red fibre base Pc. No. 2617 doing away with pins Pc. No. 2642 Pc. No. 28498

Pc. No. 15147 replaced by Pc. No. 27499.

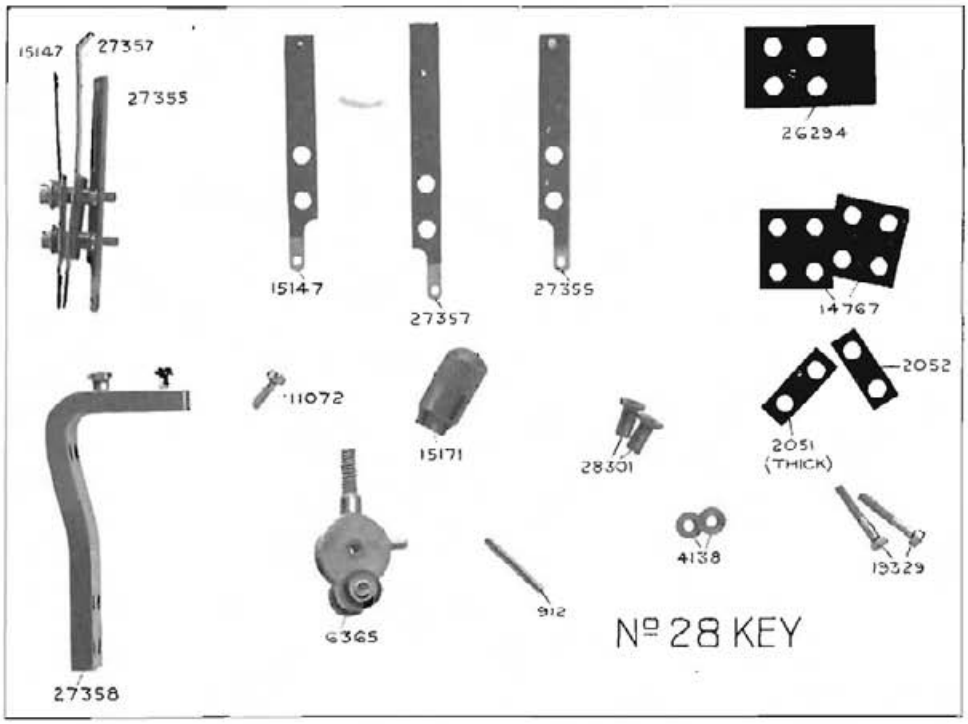


Plate No. 9—Code No. 28 Key

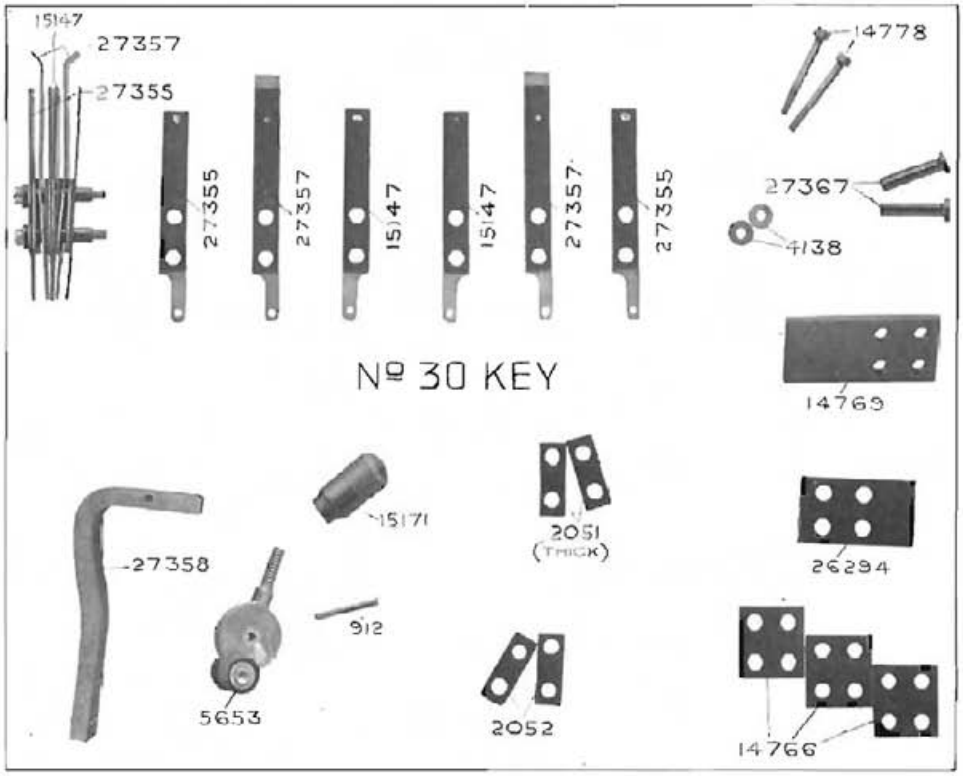


Plate No. 10—Code No. 30 Key
Pc. No. 15147 replaced by Pc. No. 27499

Piece No. 15147 Replaced by Piece No. 27499

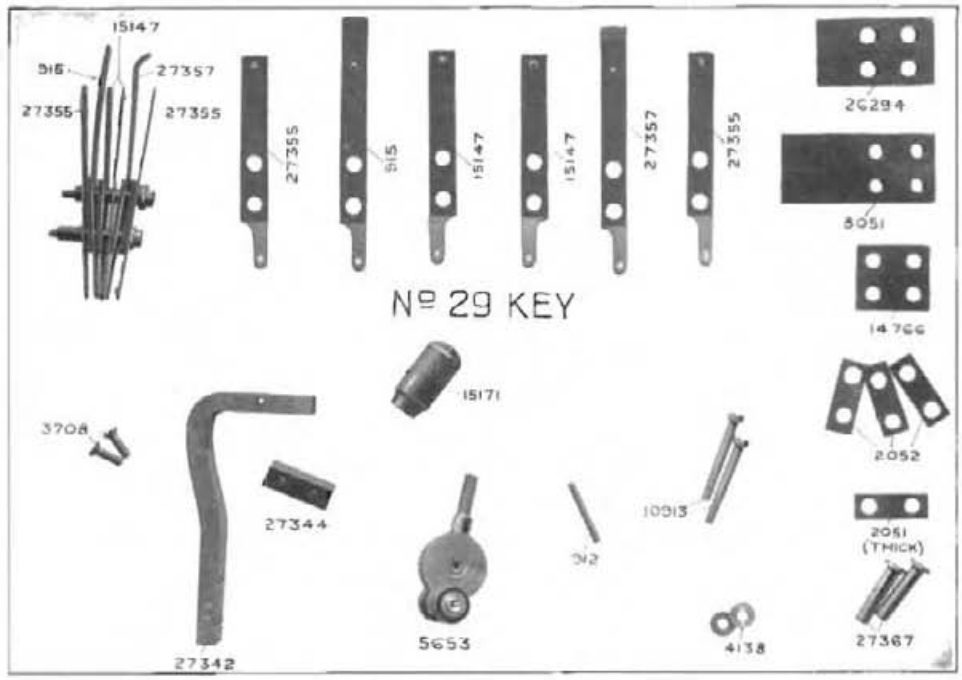


Plate No. 11—Code No. 29 Key

Piece No. 7022 replaced by Piece No. 19329; Piece No. 27476 by Piece No. 28301; Piece No. 2052 by Piece No. 2051; Pc. No. 15147 by Pc. No. 27499.

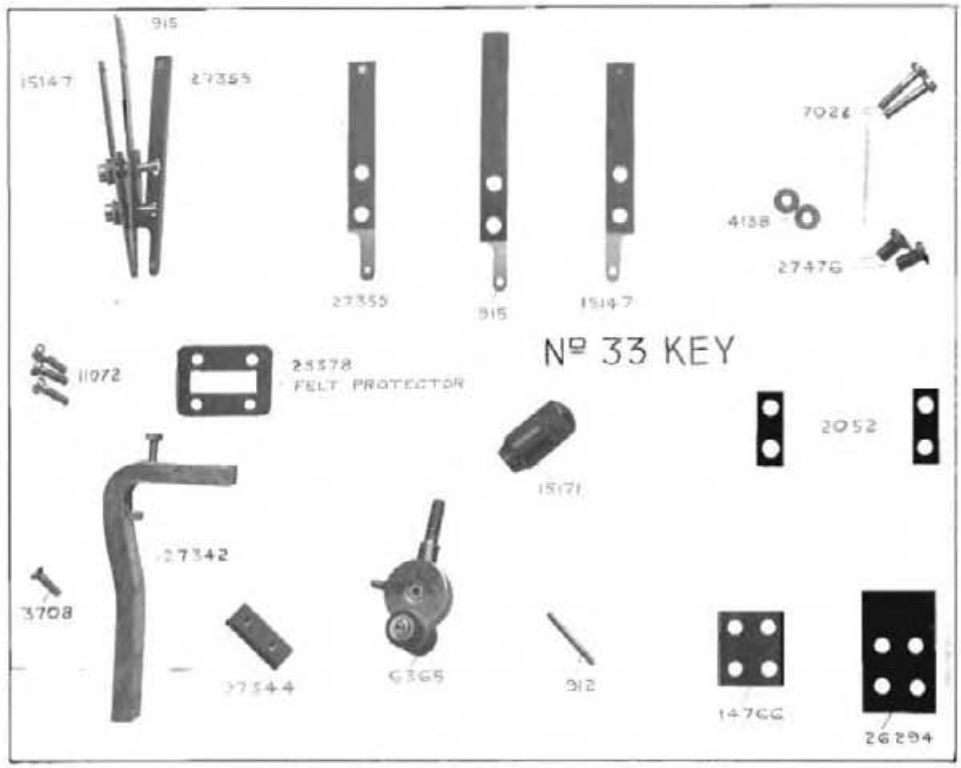


Plate No. 12—Code No. 33 Key

Piece No. 15147 replaced by Piece No. 27499; Piece No. 14778 by Piece No. 10875; Piece No. 27367 by Piece No. 27368; Piece No. 1245 by Piece No. 907; Piece No. 2052 by Piece No. 2051

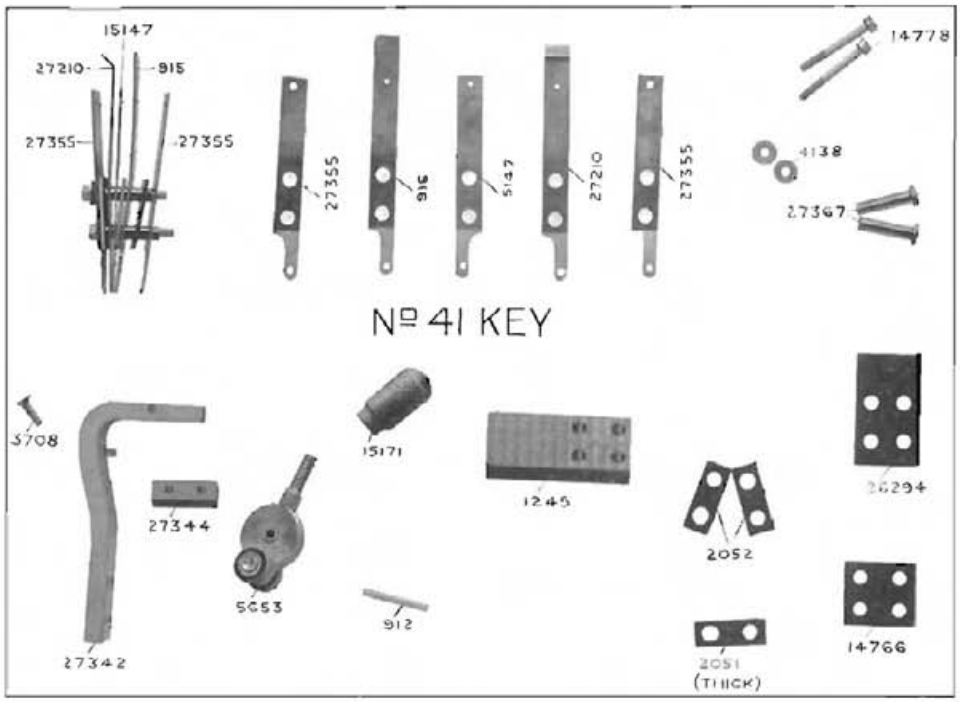


Plate No. 13—Code No. 41 Key

Piece No. 15147 replaced by Piece No. 27499

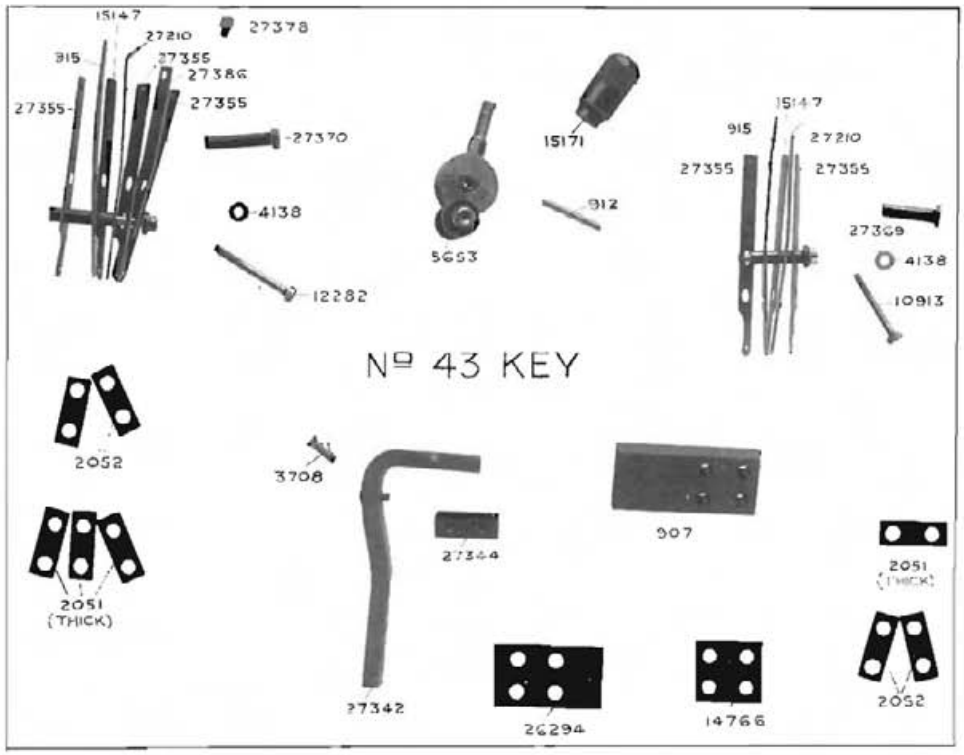


Plate No. 14—Code No. 43 Key

Piece No. 10907 replaced by Piece No. 10987; Piece No. 16211 replaced by Piece No. 1245; Piece No. 2052 by Piece No. 2051; Piece No. 16213 by Piece No. 14767; Piece No. 1450, and (2) Piece No. 2051, removed.

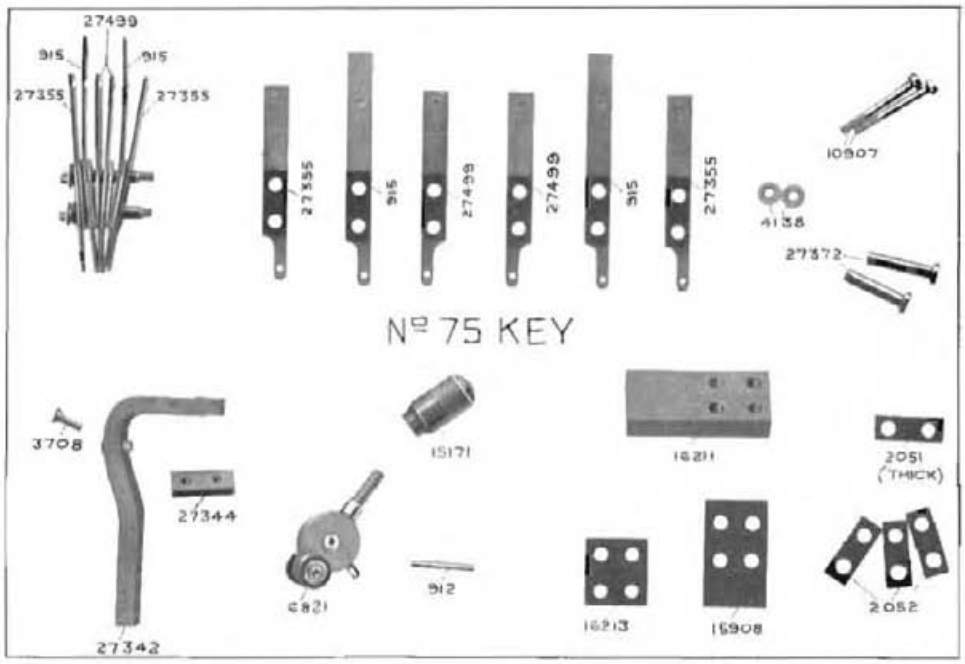


Plate No. 15—Code No. 75 Key

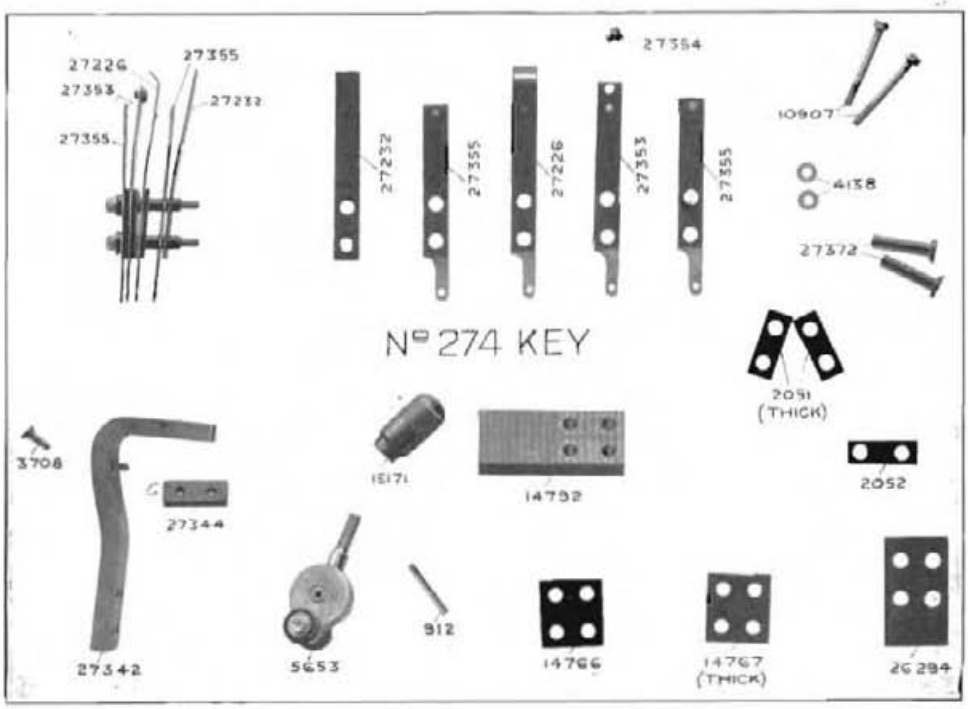


Plate No. 16—Code No. 274 Key

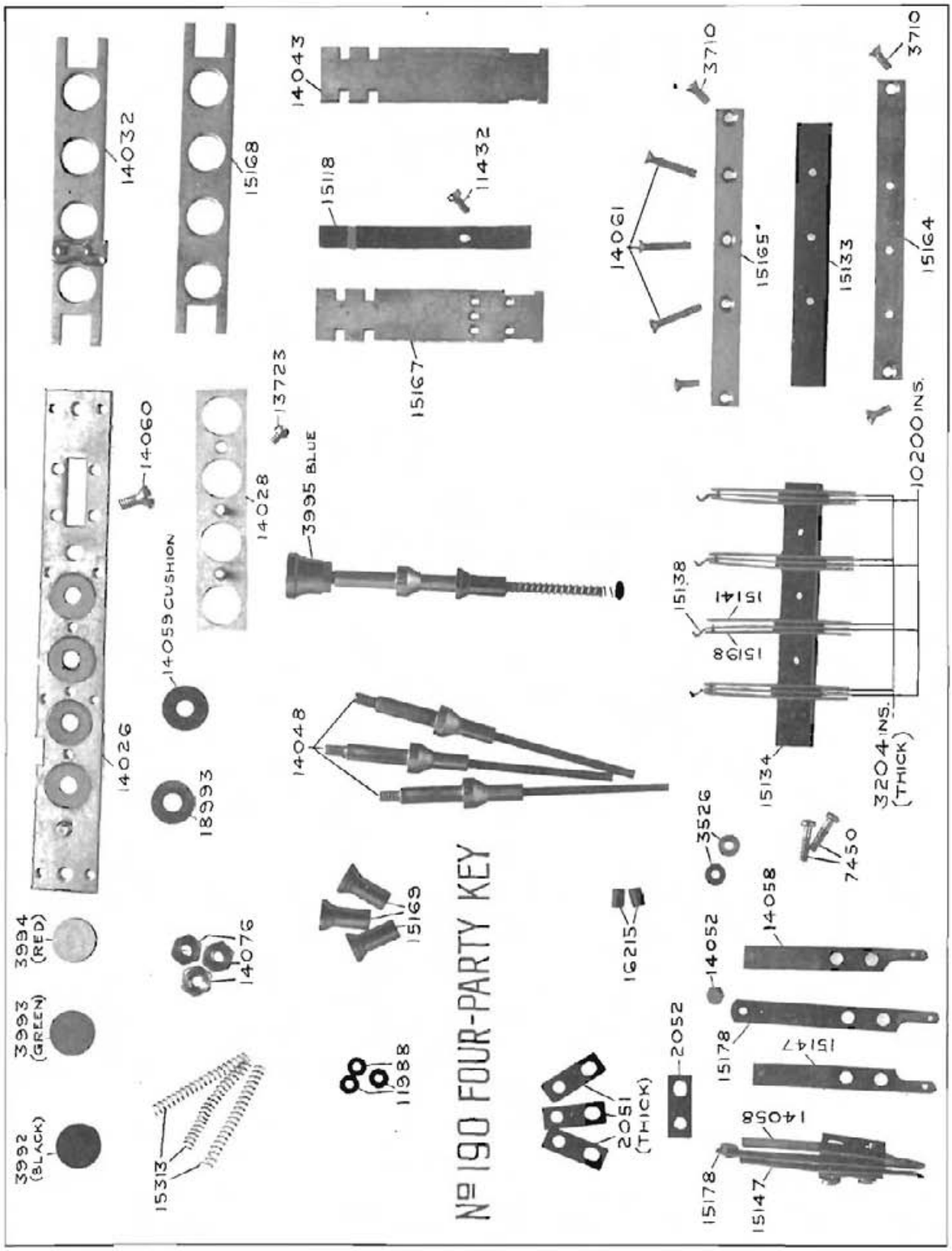


Plate No. 17—Code No. 190—Four Party Key

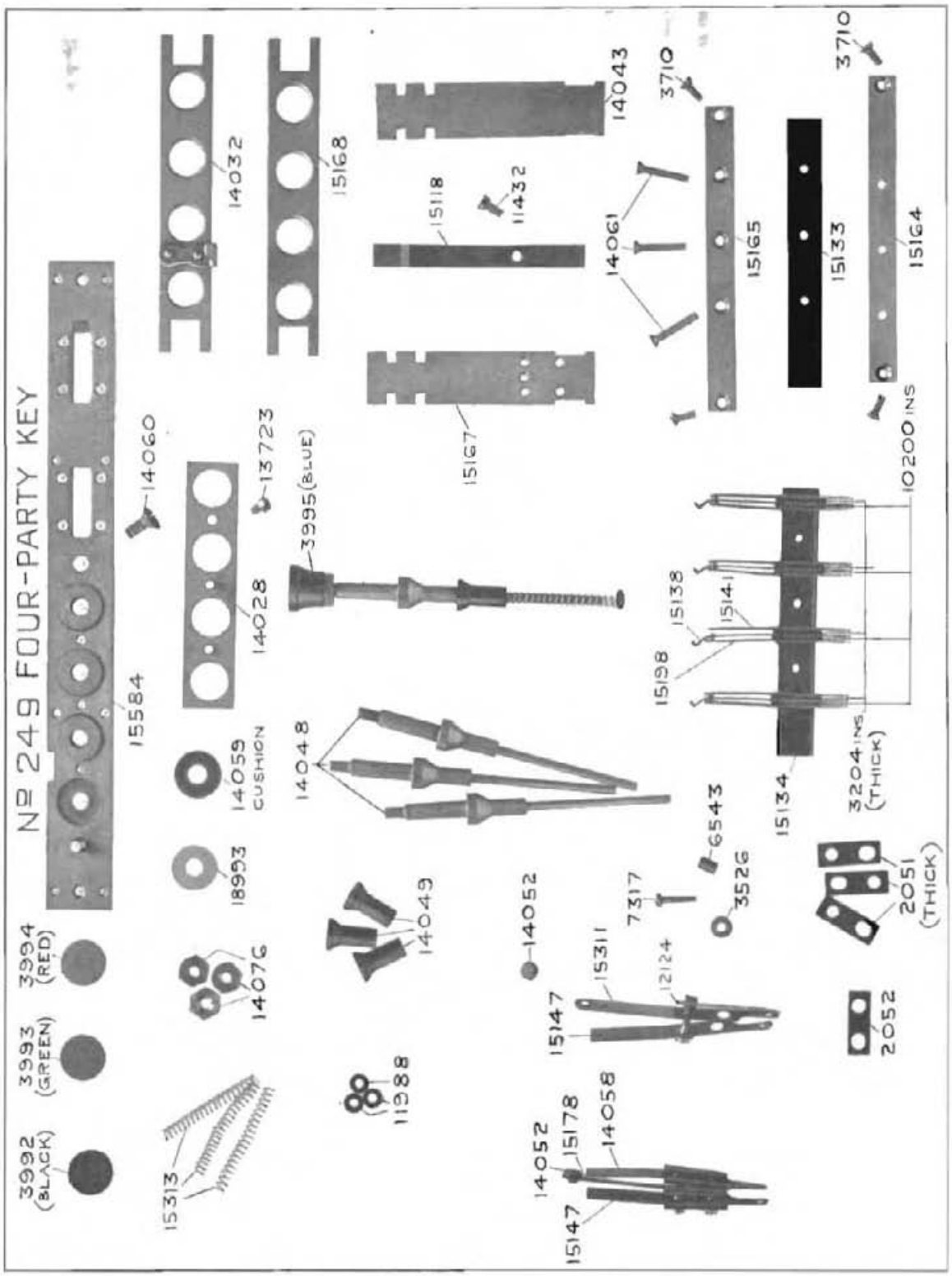


Plate No. 18—Code No. 249 Key—4 Party

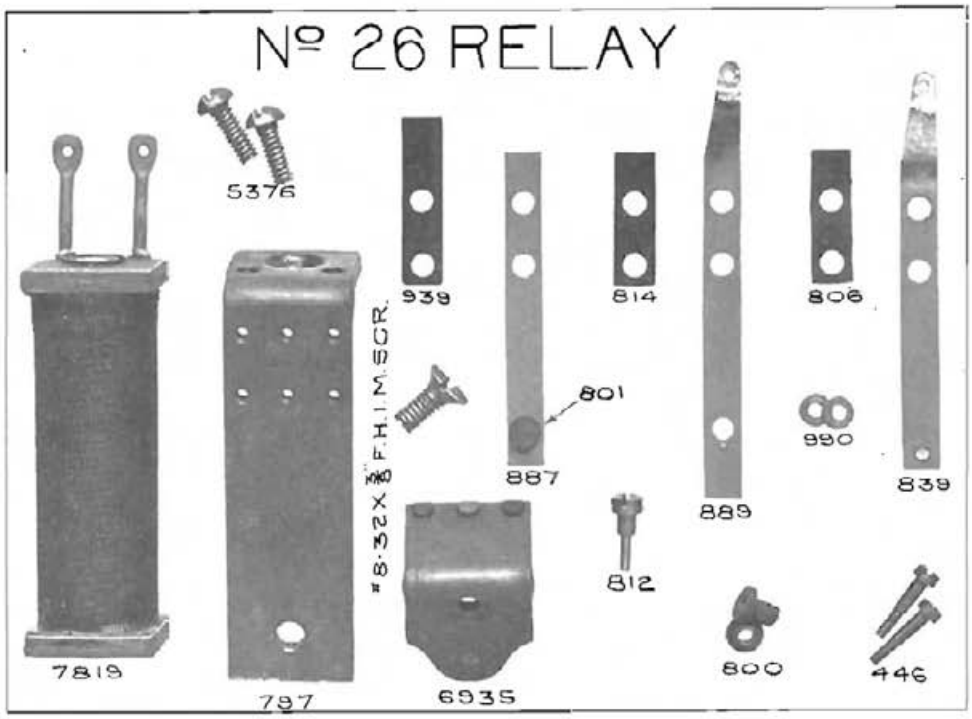


Plate No. 19—Code No. 26 Relay

Pc. No. 1583 replaced by Pc. No. 1946

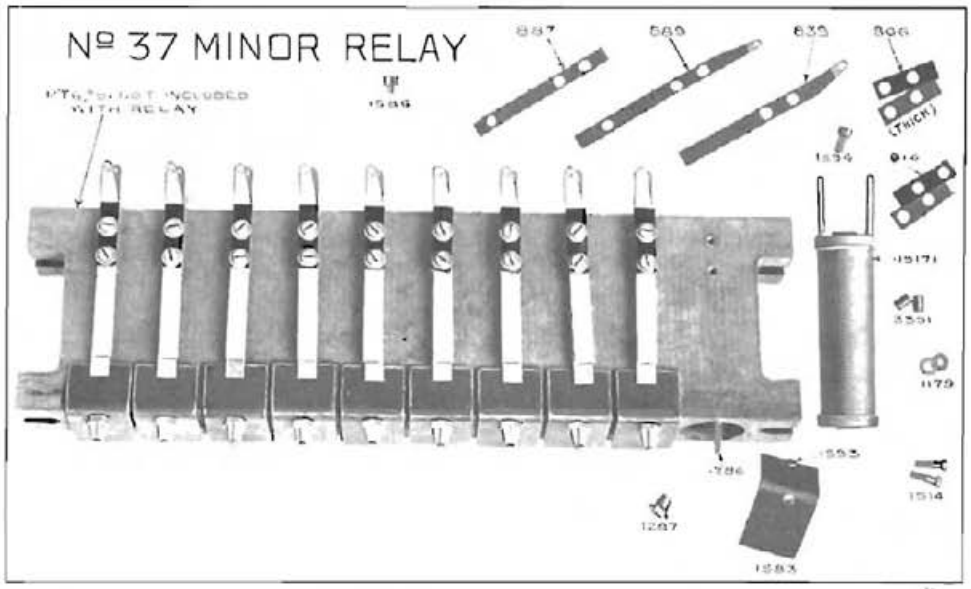
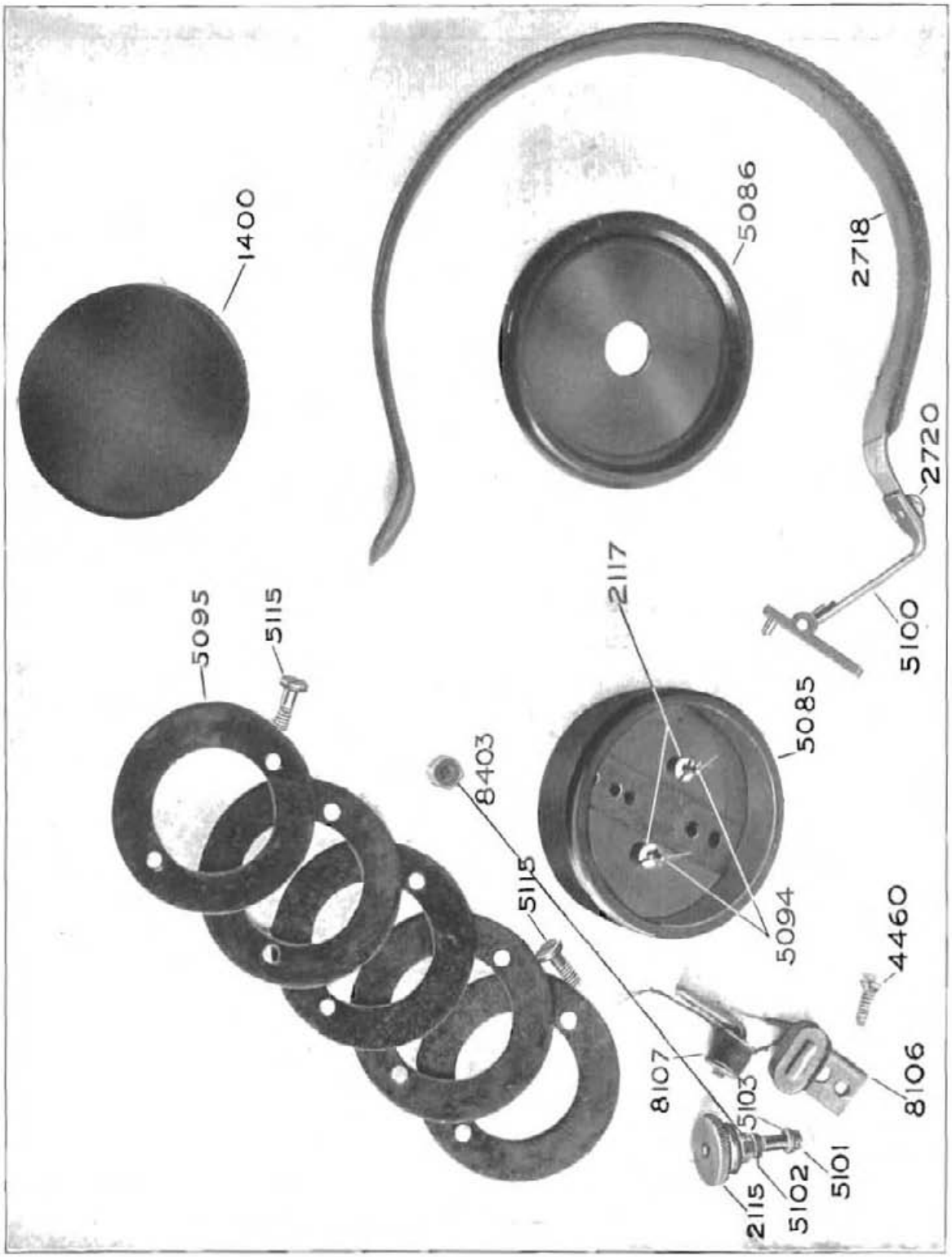


Plate No. 20—Code No. 37 Minor Relay



(5) Piece No. 5095 are now replaced by (2) Piece No. 13602

Plate No. 21—Code No. 14—Head Receiver



Plate No. 22—Type No. 18—Receiver
The only difference between No. 17 and No. 18 Receiver is in the shell and cap. No. 17 shell is Piece No. 5313; No. 17 cap is Piece No. 2657

ed by Pc. No. 25954

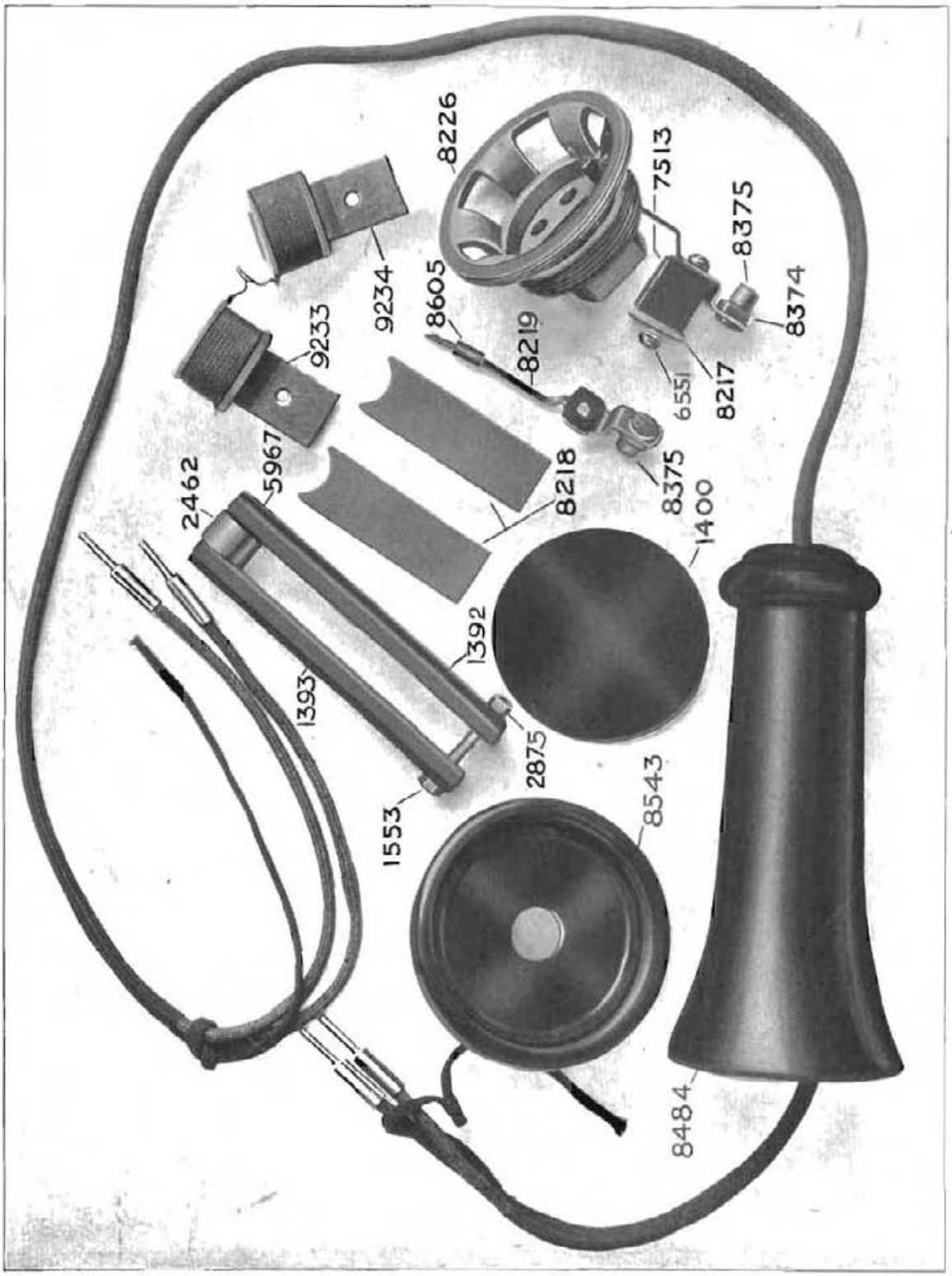


Plate No. 23—Type No. 23—Receiver. Composition or Hard Rubber (Type No. 22) Shell

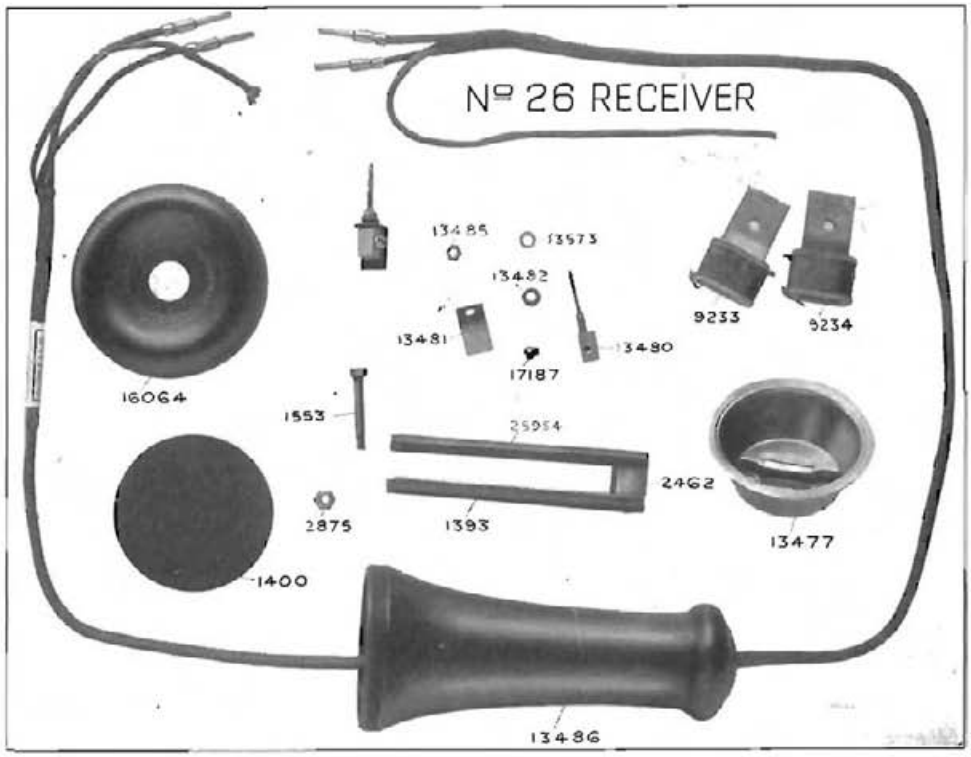


Plate No. 24—Code No. 26 Receiver

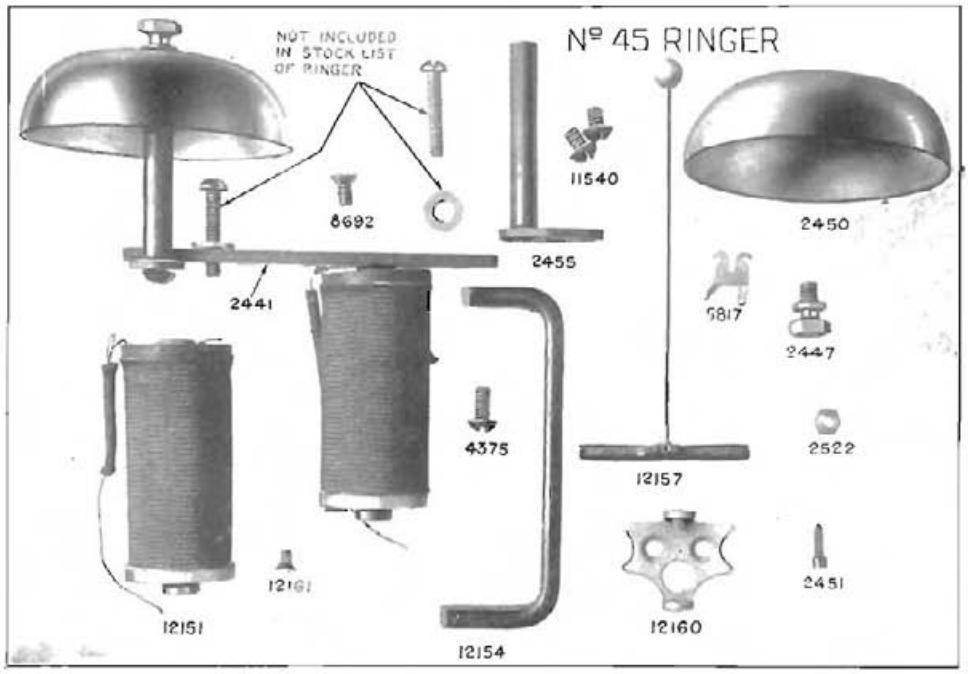


Plate No. 25—Code No. 45 Ringer
The only difference between No. 45 and No. 54 Ringer is that in the No. 54 Ringer
Piece No. 5817 is substituted for Piece No. 12151
Piece No. 5817 is not part of No. 45 Ringer
Pc. No. 2447 replaced by Pc. No. 32569, 32576 Black

Pc. No. 3231 should be 3281; Pc. No. 1714 replaced by Pc. No. 10106; Pc. No. 203, by Pc. No. 18070; Pc. No. 3285, by 10061; Pc. No. 3286, by 10060; Pc. No. 327, by Pc. No. 18071; Pc. No. 3291, by Pc. No. 39293.

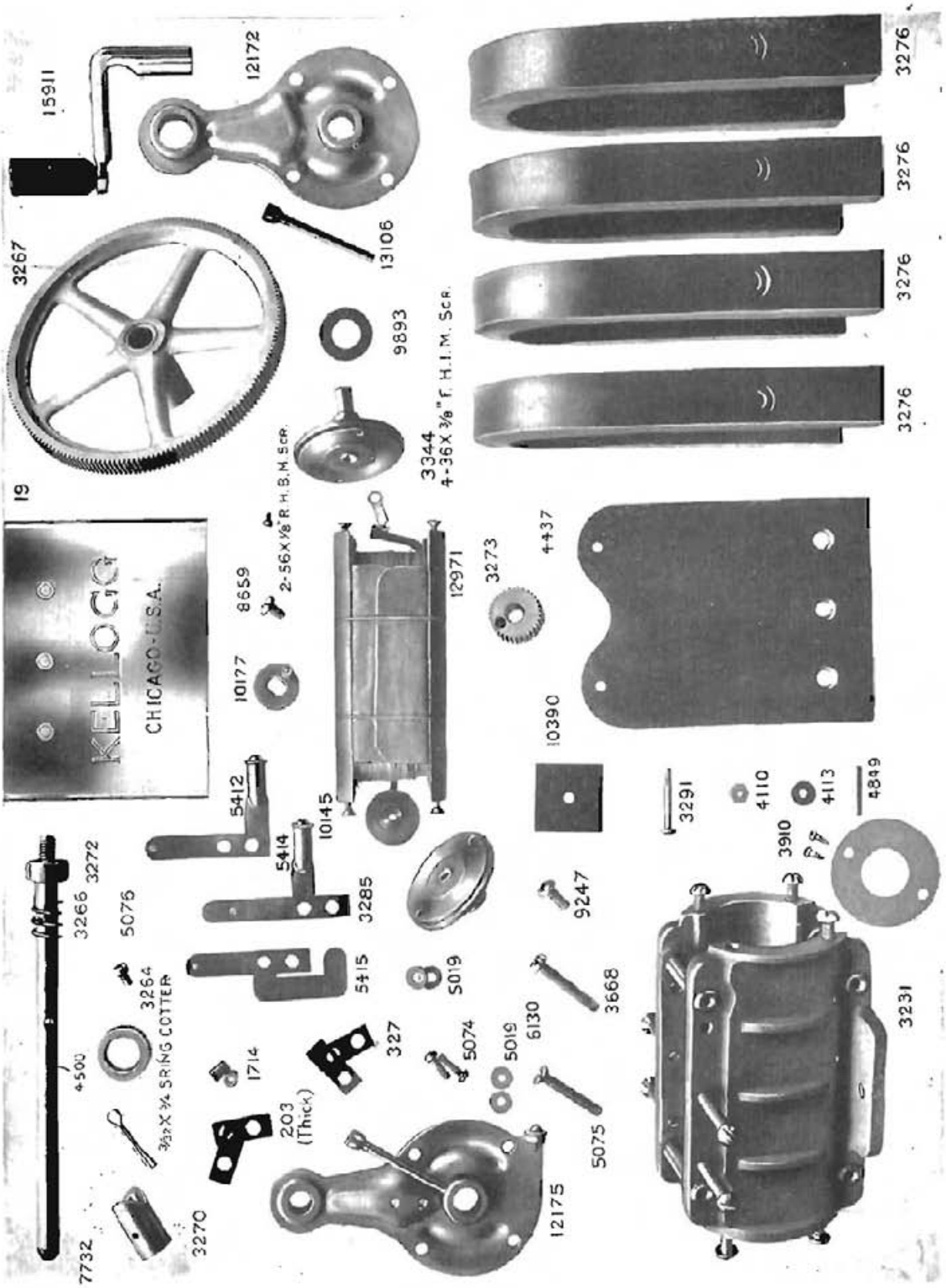


Plate No. 26—No. 22 Generator

Punched brass end plates—Pc. No. 12175 and 12172 now replace all old end plates. Handle Pc. No. 15911 is now black enameled throughout, with same piece number. Screw Pc. No. 8659 now replaced by hexagonal head screw. Pc. No. 28670 with spring washer Pc. No. 22073. Pc. No. 3344 belongs fastened to Pc. No. 3286, with a 3½x16 tubular rivet in place of the 2-56x⅛" R. H. B. M. screw shown in plate. Pc. No. 10145 belongs fastened to Pc. No. 3285. Pc. No. 4849 replaced by Pc. No. 39290.

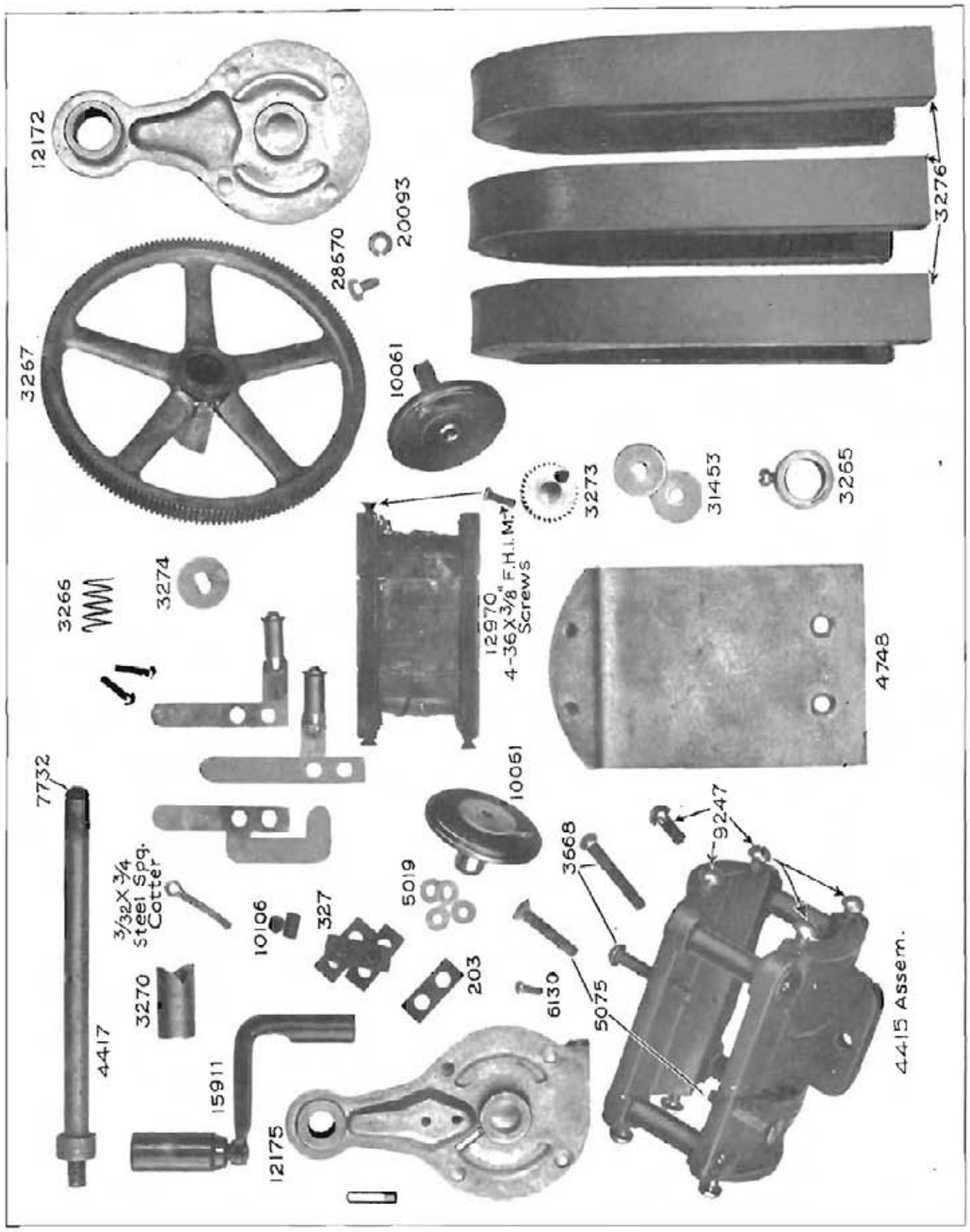
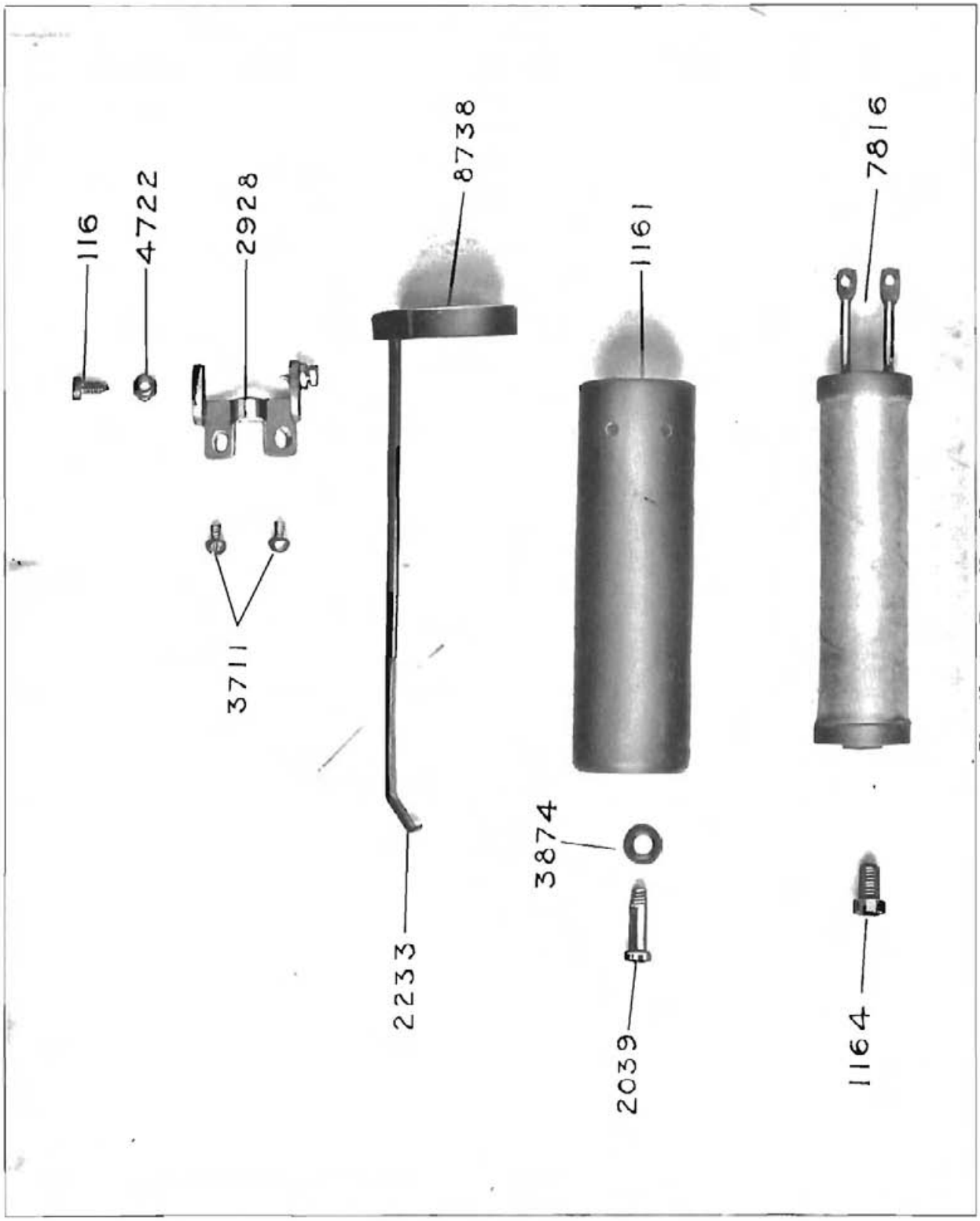


Plate No. 27—No. 15 Generator.
Springs (left to right) Pc. No. 5415—Pc. No. 5414—Pc. No. 5412. Binding Posts—Screw Pc. No. 5026; Washer Pc. No. 5019. Oil Tube Pc. No. 13106.



Piece No. 1161 changed to Piece No. 12891

Plate No. 28—Type No. 8 Drop

Piece No. 1161 replaced by Piece No. 12891
Piece No. 5079 replaced by Piece No. 5426

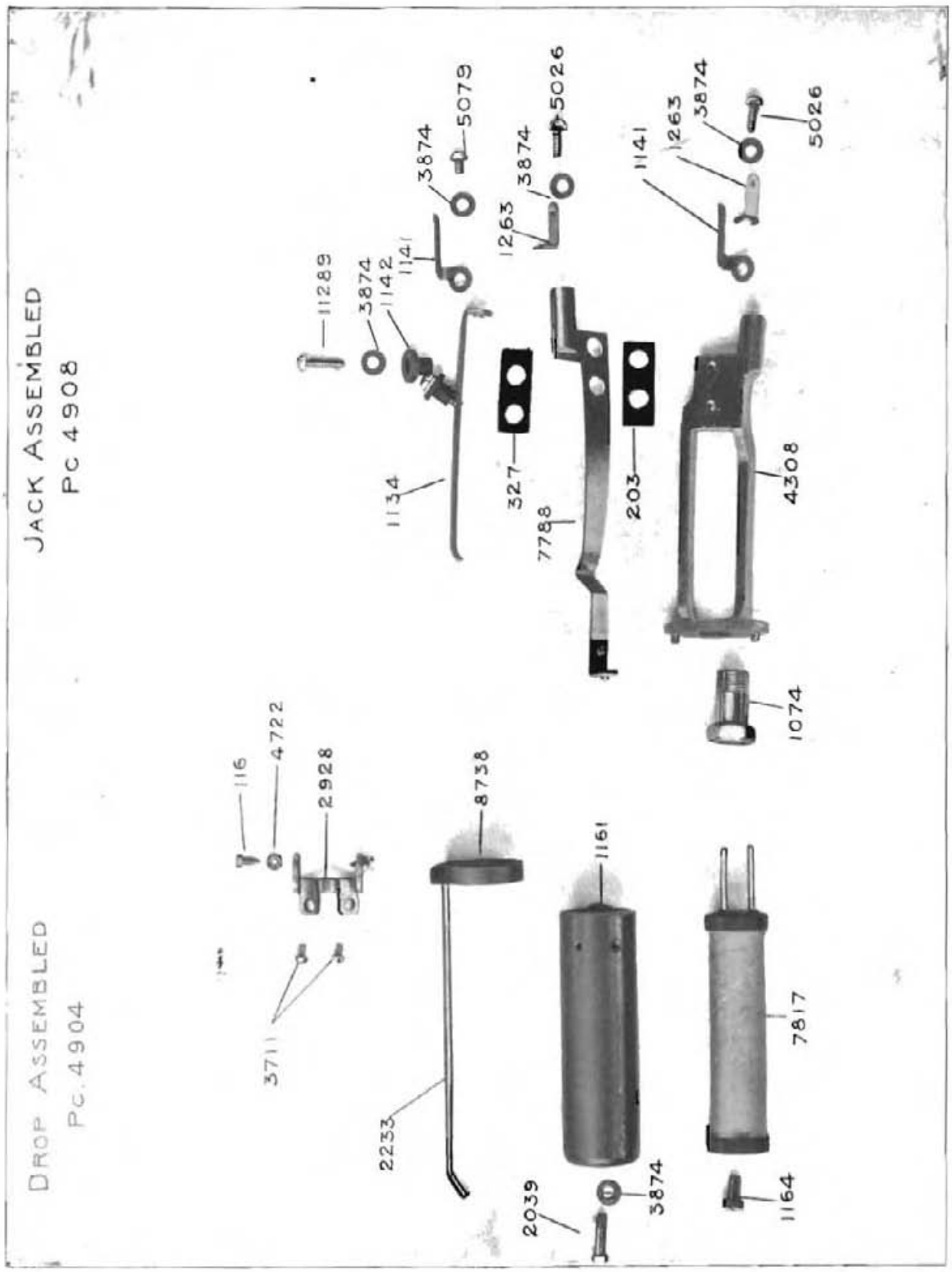


Plate No. 29—Type No. 3—Drop and Jack
Piece No. 025 and Piece No. 030 washers are used for adjusting Piece No. 1074

Piece No. 1443 replaced by Piece No. 13446; Piece No. 9908 replaced by Piece No. 13150; Piece No. 4140 replaced by Piece No. 13149; Piece No. 8738 replaced by Piece No. 14993

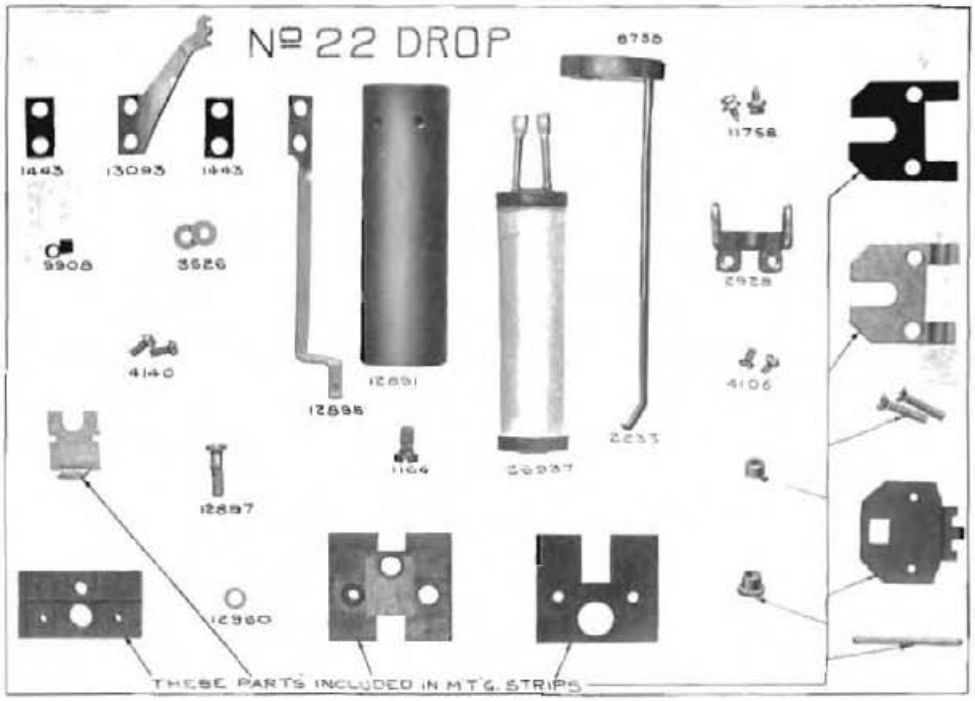


Plate No. 30—Code No. 22—Drop

Piece No. 1443 replaced by Piece No. 31446; Piece No. 13150 replaced by Piece No. 19107; Piece No. 12882 replaced by Piece No. 29293



Plate No. 31—Code No. 51—Drop and Jack

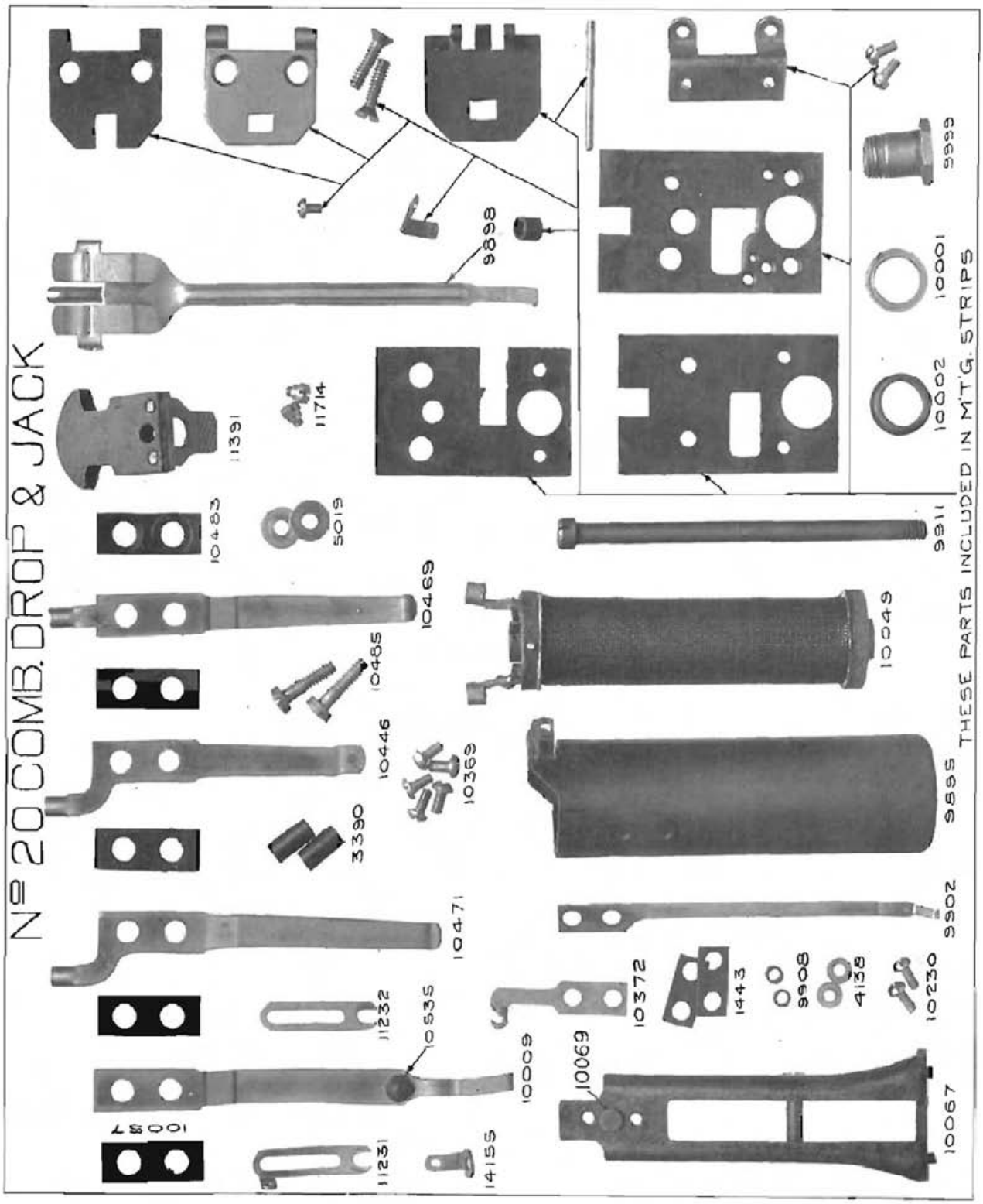
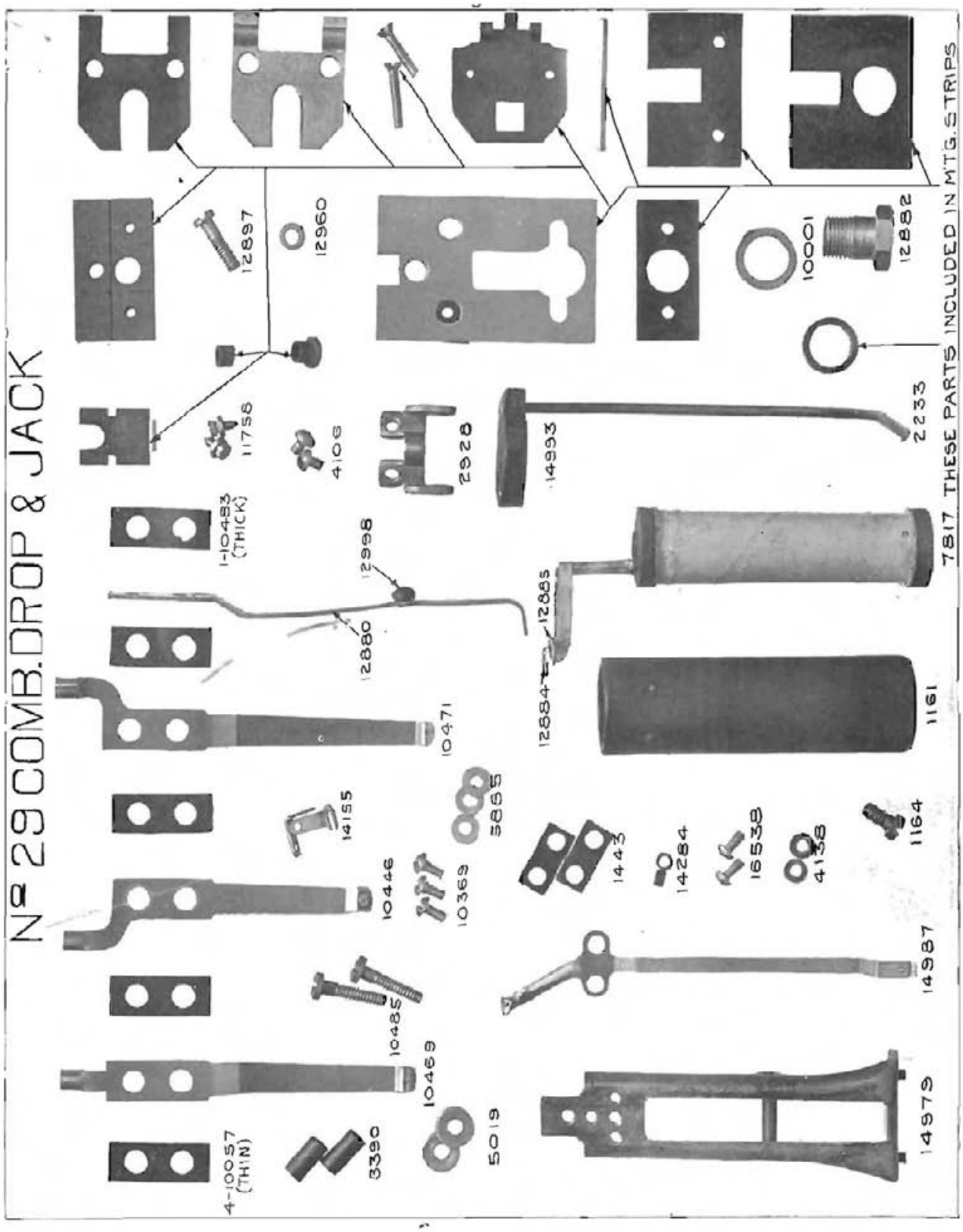


Plate No. 32—Code No. 20 Comb. Drop and Jack
Piece No. 9999 replaced by Piece No. 29293



Piece No. 12882 replaced by Piece No. 29293 Piece No. 10483, by Piece No. 18071

Plate No. 33—Code No. 29—Combined Drop and Jack

Piece No. 10067 replaced by Piece No. 10077

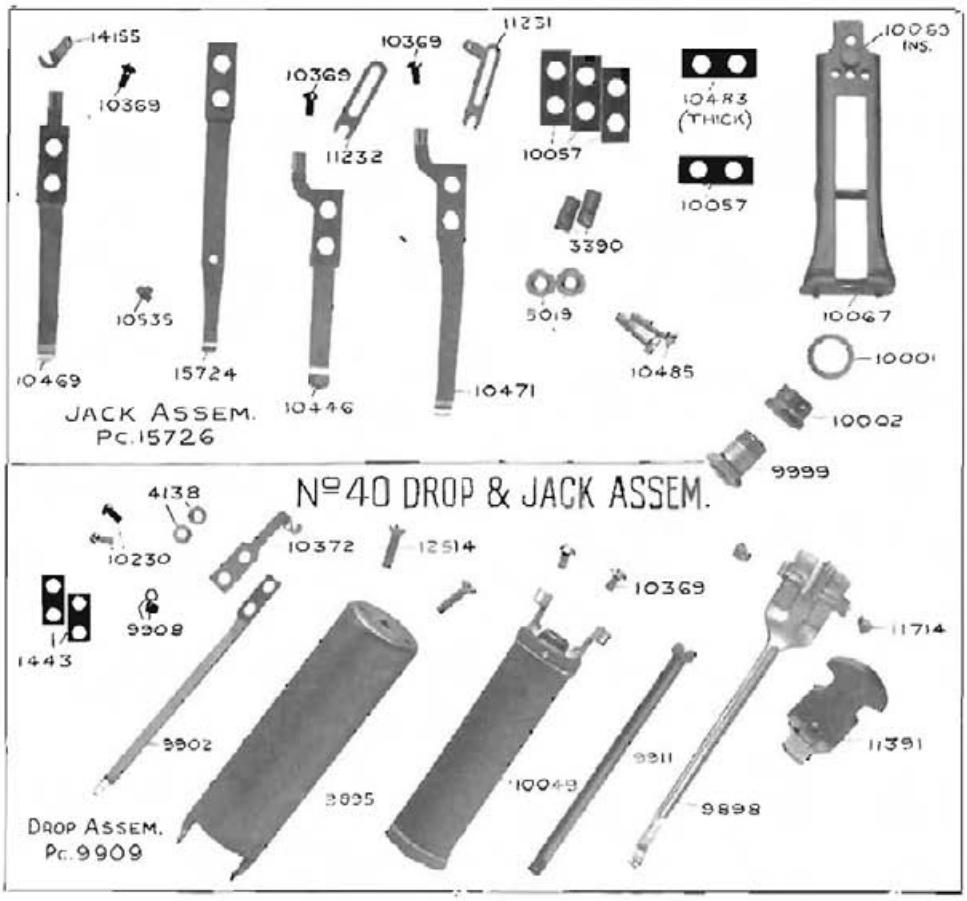


Plate No. 34—Code No. 40—Drop and Jack

Piece No. 122 replaced by Piece No. 30452

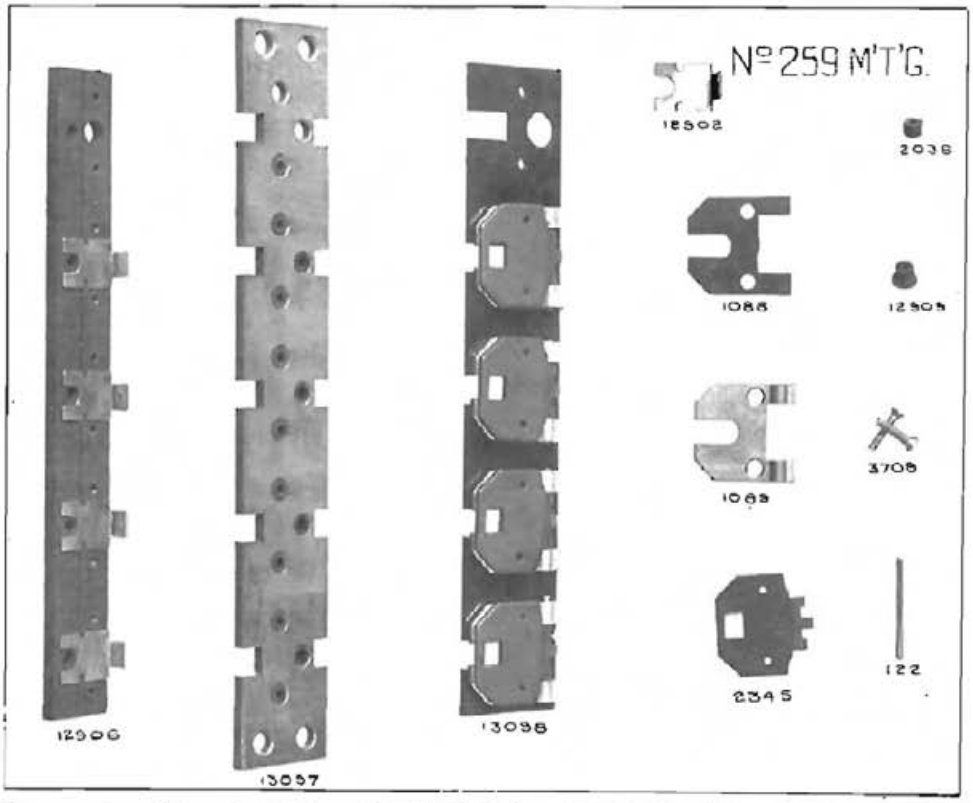


Plate No. 35
Code No. 259 Mounting for No. 22 and No. 59 Drops

Piece No. 18392 changed to 14987; Piece No. 12882 changed to 29283; Piece No. 1161 changed to 12891.

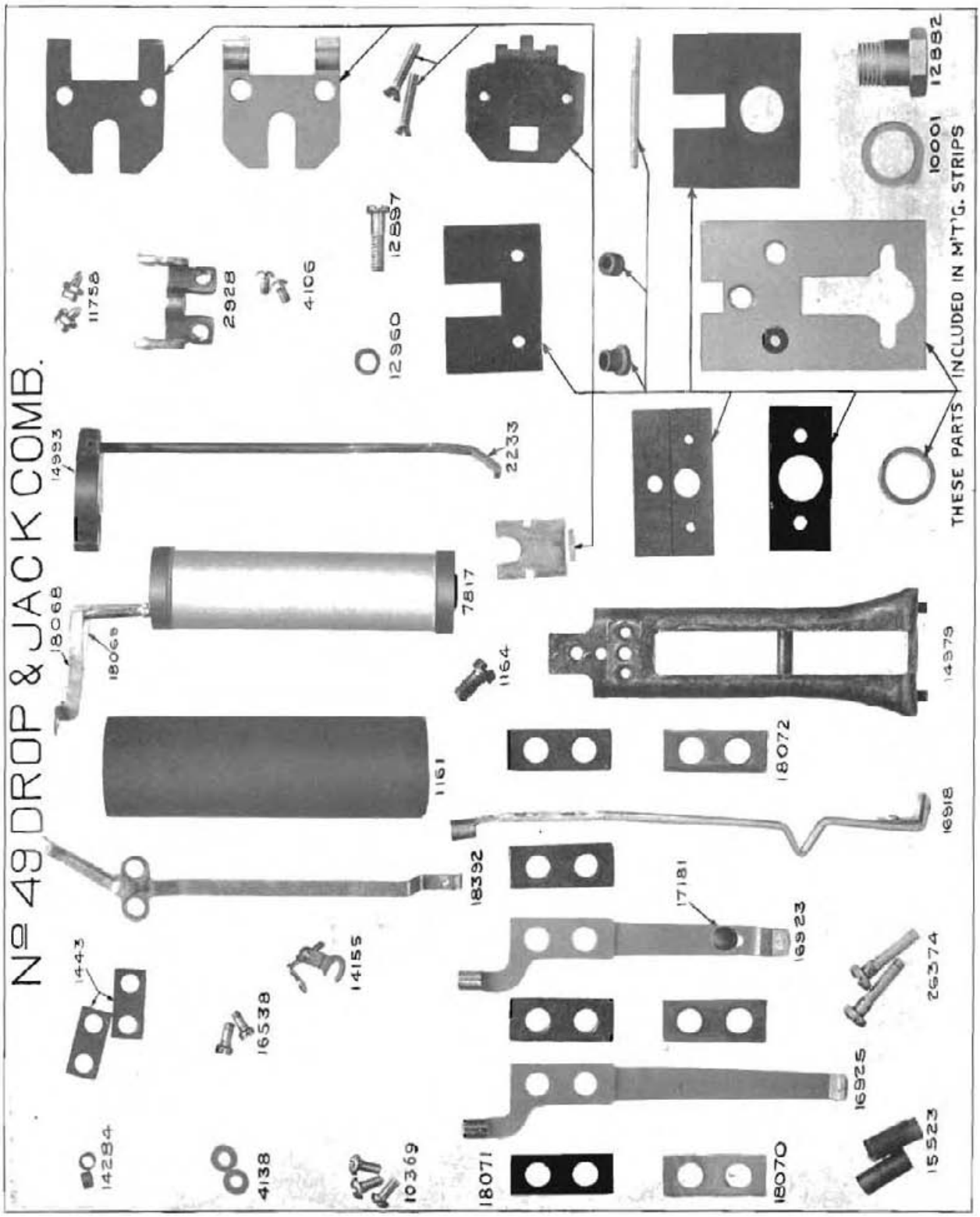


Plate No. 36—Code No. 49—Drop and Jack Combined

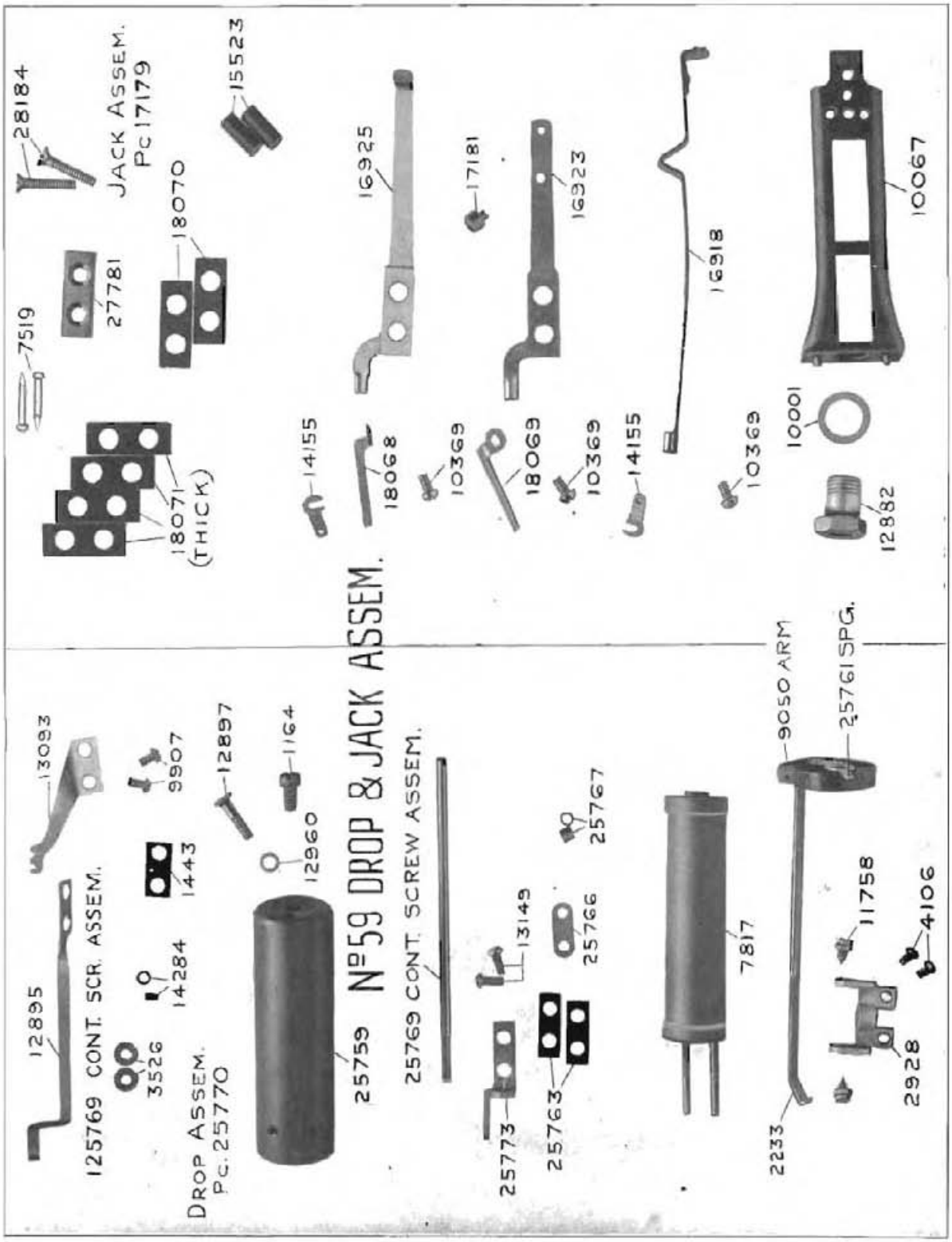


Plate No. 37—Code No. 59—Drop and Jack

Piece No. 12882 replaced by Piece No. 29293; Piece No. 1443 replaced by Piece No. 31446; Piece No. 25763 replaced by Piece No. 17795

Piece No. 14979 replaced by Piece No. 14976; Piece No. 26673 by Piece No. 27438; Piece No. 26374 by Piece No. 28184; Piece No. 1161 by Piece No. 12891
The only difference between the No. 62 and No. 49 Drop and Jack is in the thimbles
Plate No. 33 shows No. 29 Drop and Jack assembly

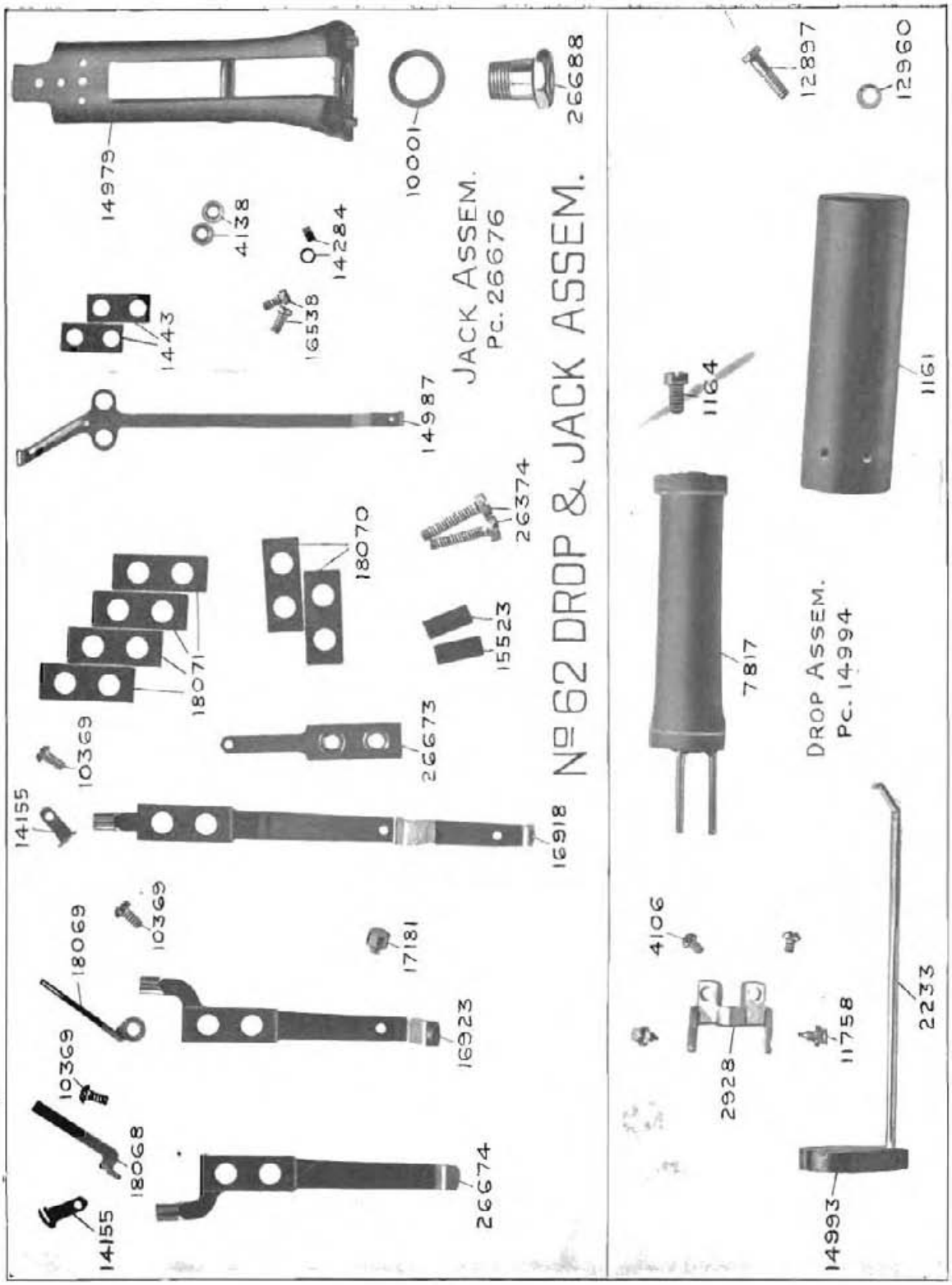


Plate No. 38—Code No. 62—Drop and Jack

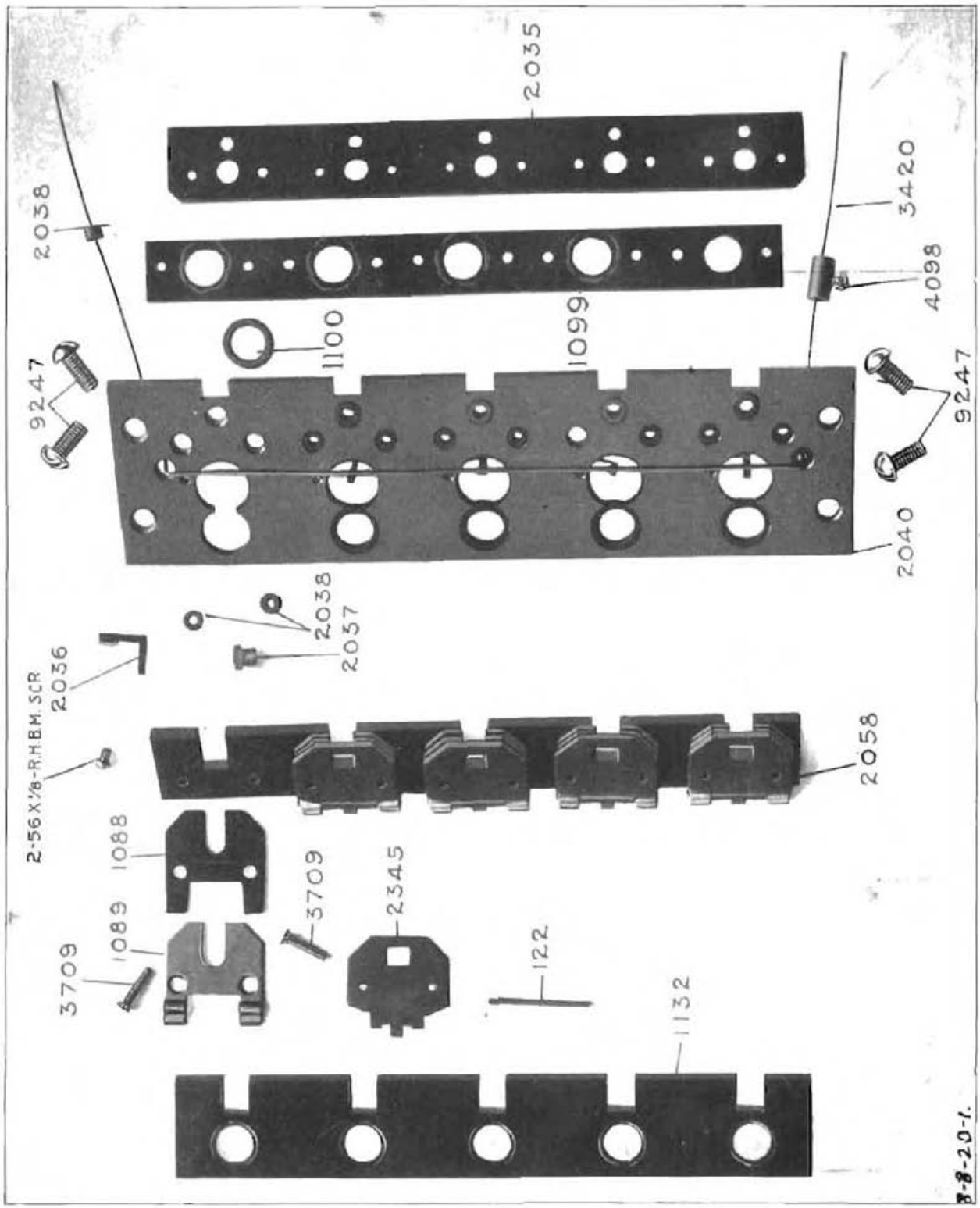


Plate No. 39—Type No. 114—Mounting Strip for No. 3 Combined Drop and Jack
Piece No. 2038 refers to bushing only. Piece No. 4098 does not include screw (2—56x⅛ R. H. B. M. Scr.)

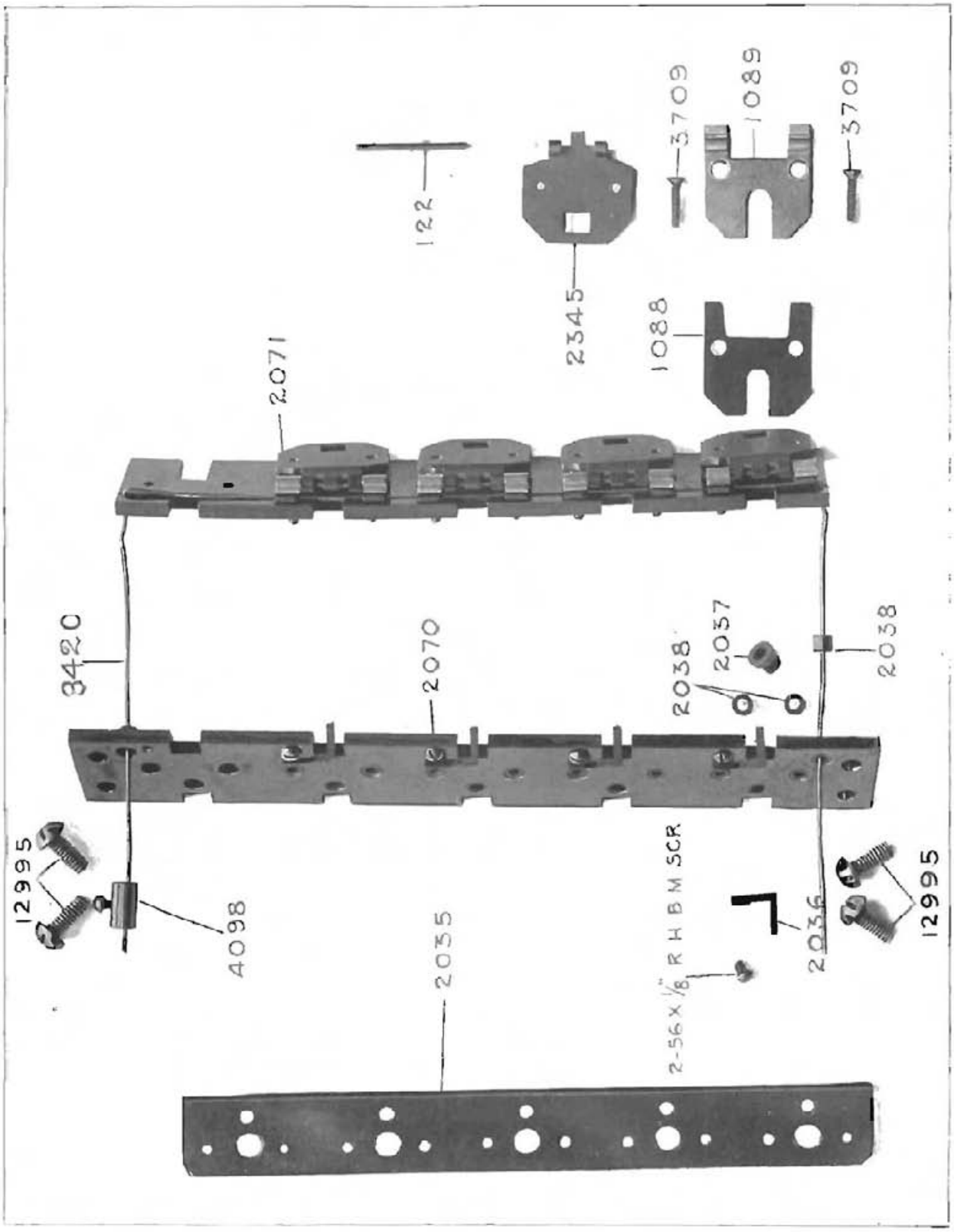


Plate No. 40—Type No. 115—Mounting Strip for No. 8 Drop

Piece No. 2071 Refers to Mounting Strip—not Shutter. Piece No. 4098 does not include screws (2—56x⅛ R. H. B. M. Scr.)

Piece No. 3420 replaced by Piece No. 17744 wire. Piece No. 9247 replaced by Piece No. 12995 (1) Piece No. 122 pin replaced by (2) Piece No. 30452 pins

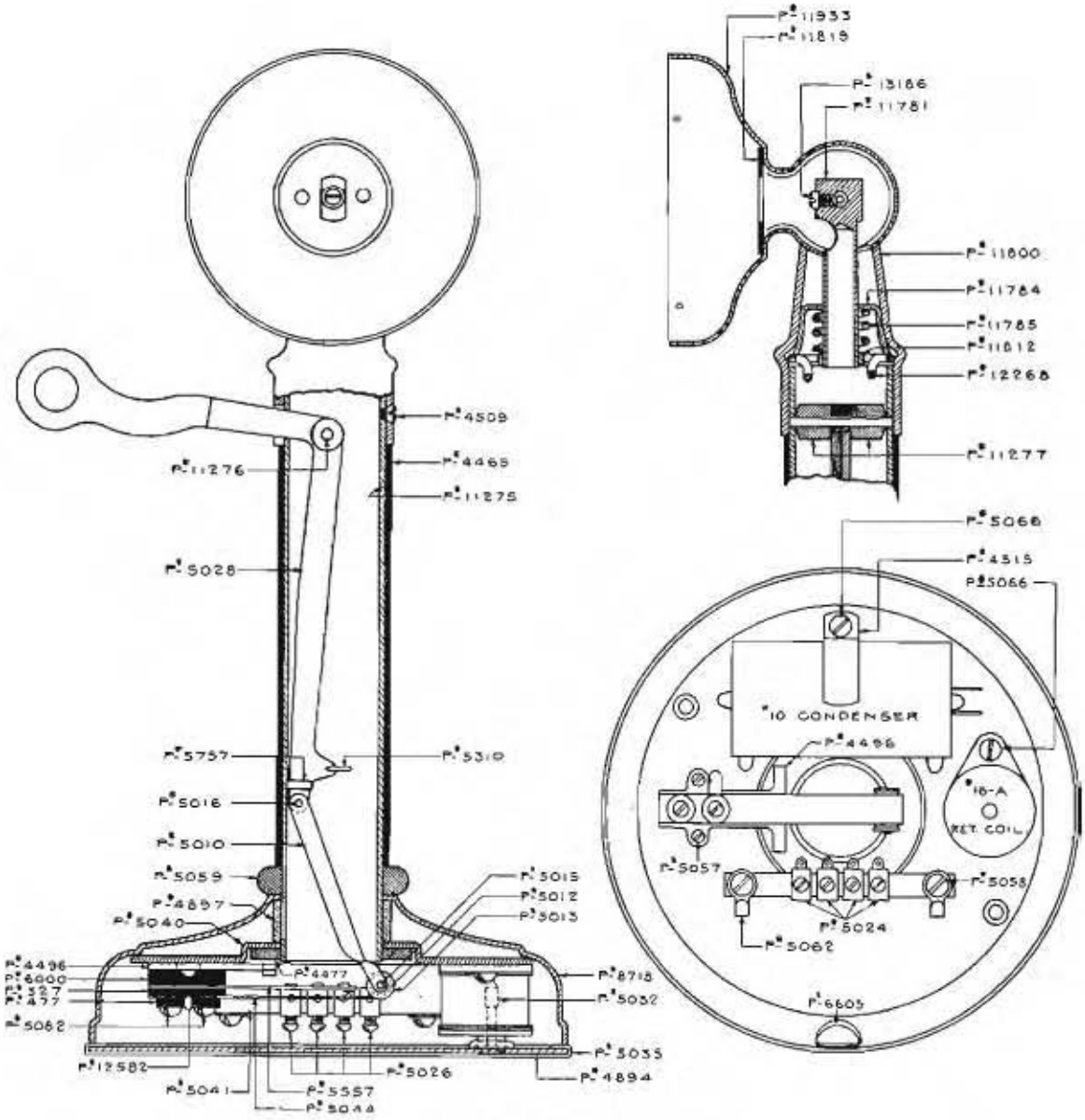


Plate No. 41—No. 39 Type Desk Stand
Piece No. 8718 is finished in two ways
When nickel plated it is Piece No. 6606
When black enameled it is Piece No. 8057
Piece No. 5059 replaced by Piece No. 15707

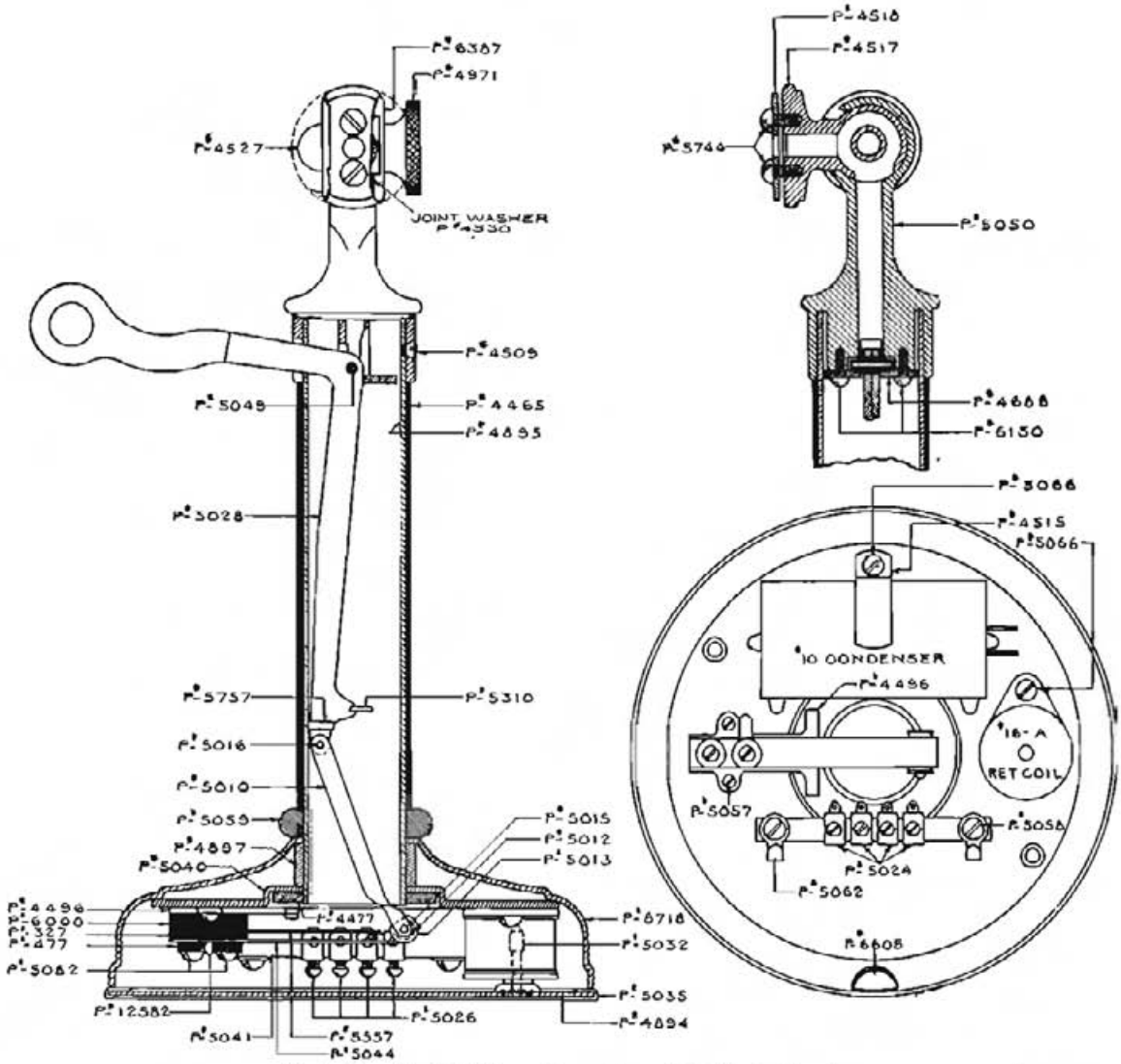


Plate No. 42—Old Type Nos. 28 and 39 Desk Stand

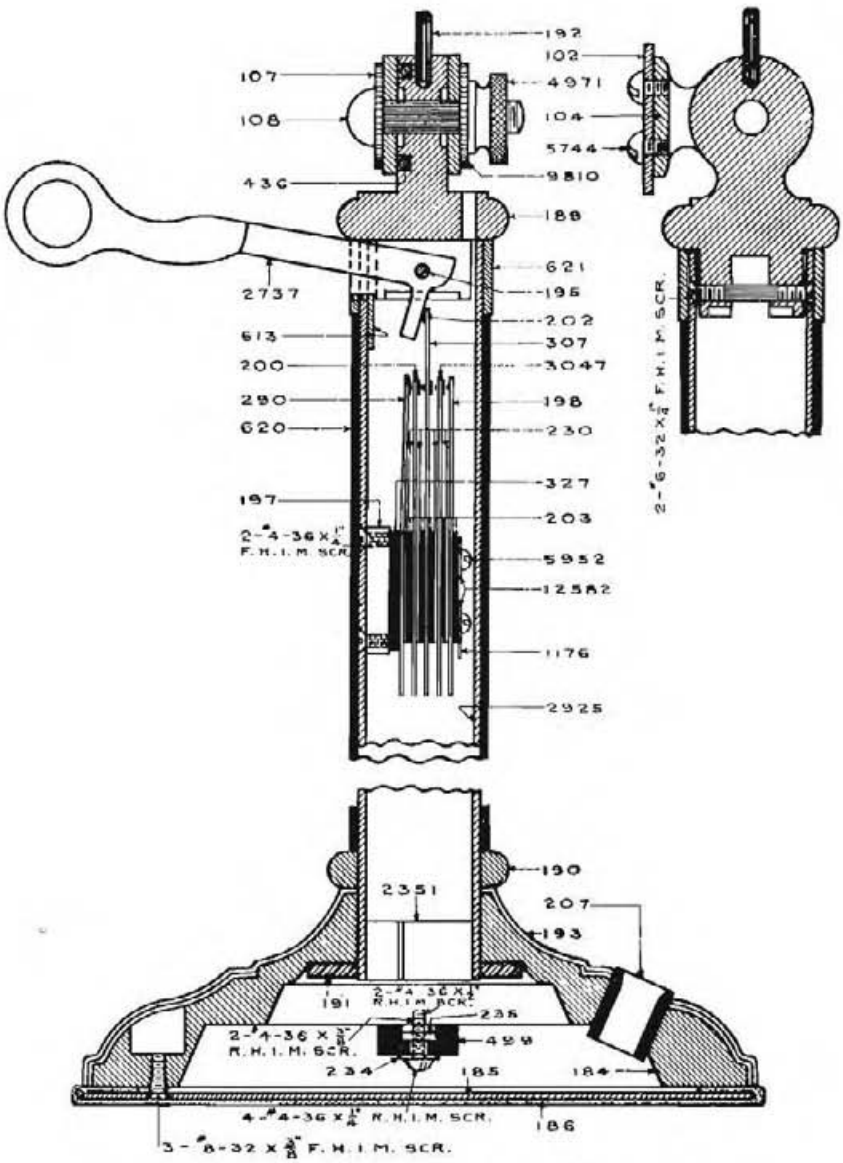


Plate No. 43—Old Type Nos. 4 and 9 Desk Stand

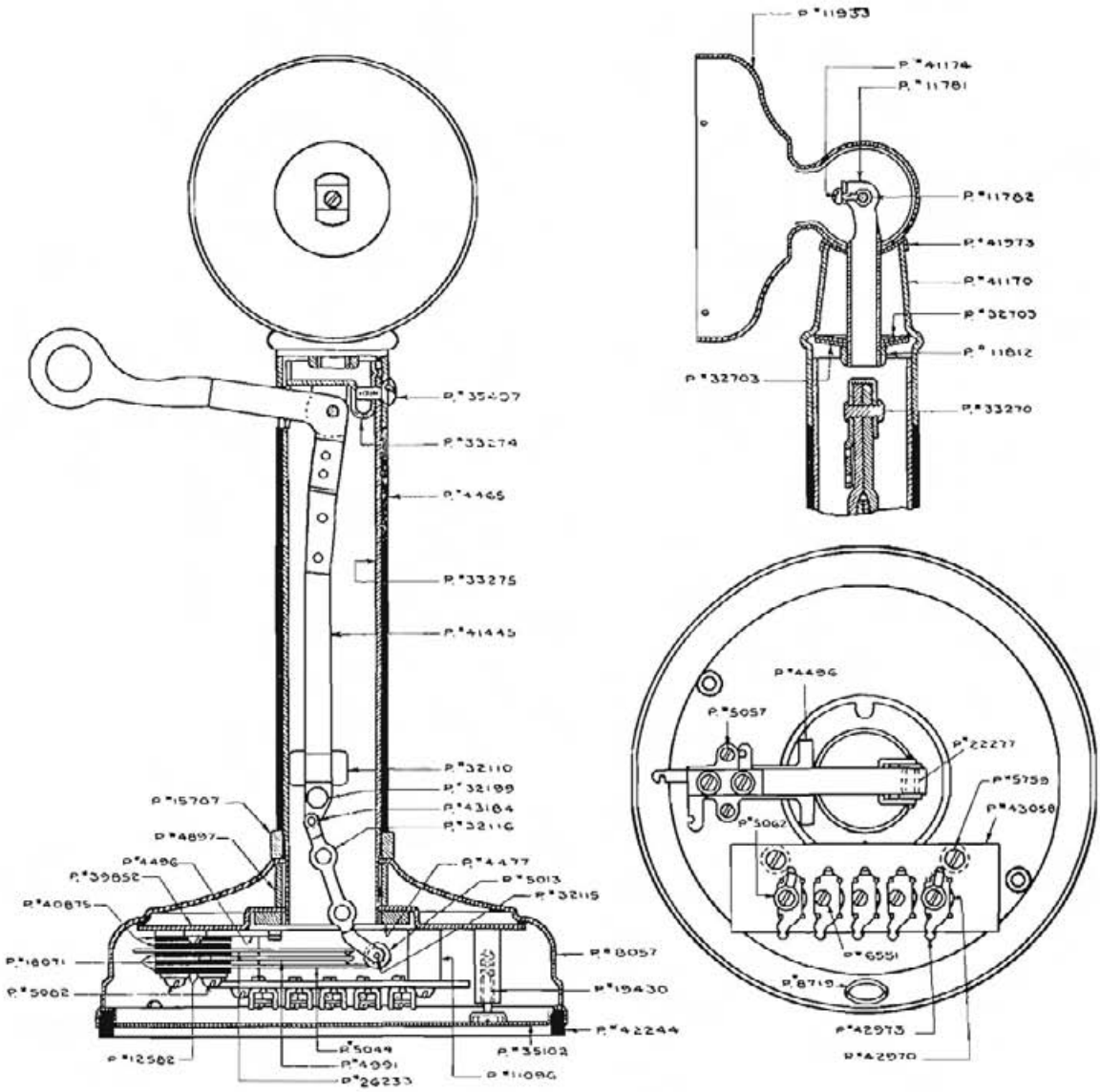


Plate No. 44—No. 118 Desk Stand

Pc. No. 1288 replaced by 2 Pc. No. 1289
Pc. No. 10203 replaced by Pc. No. 1527

Pc. No. 4150 replaced by Pc. No. 34183

Pc. No. 10197 replaced by No. 1295

Pc. No. 10193 replaced by Pc. No. 1293
Pc. No. 10239 replaced by Pc. No. 1294

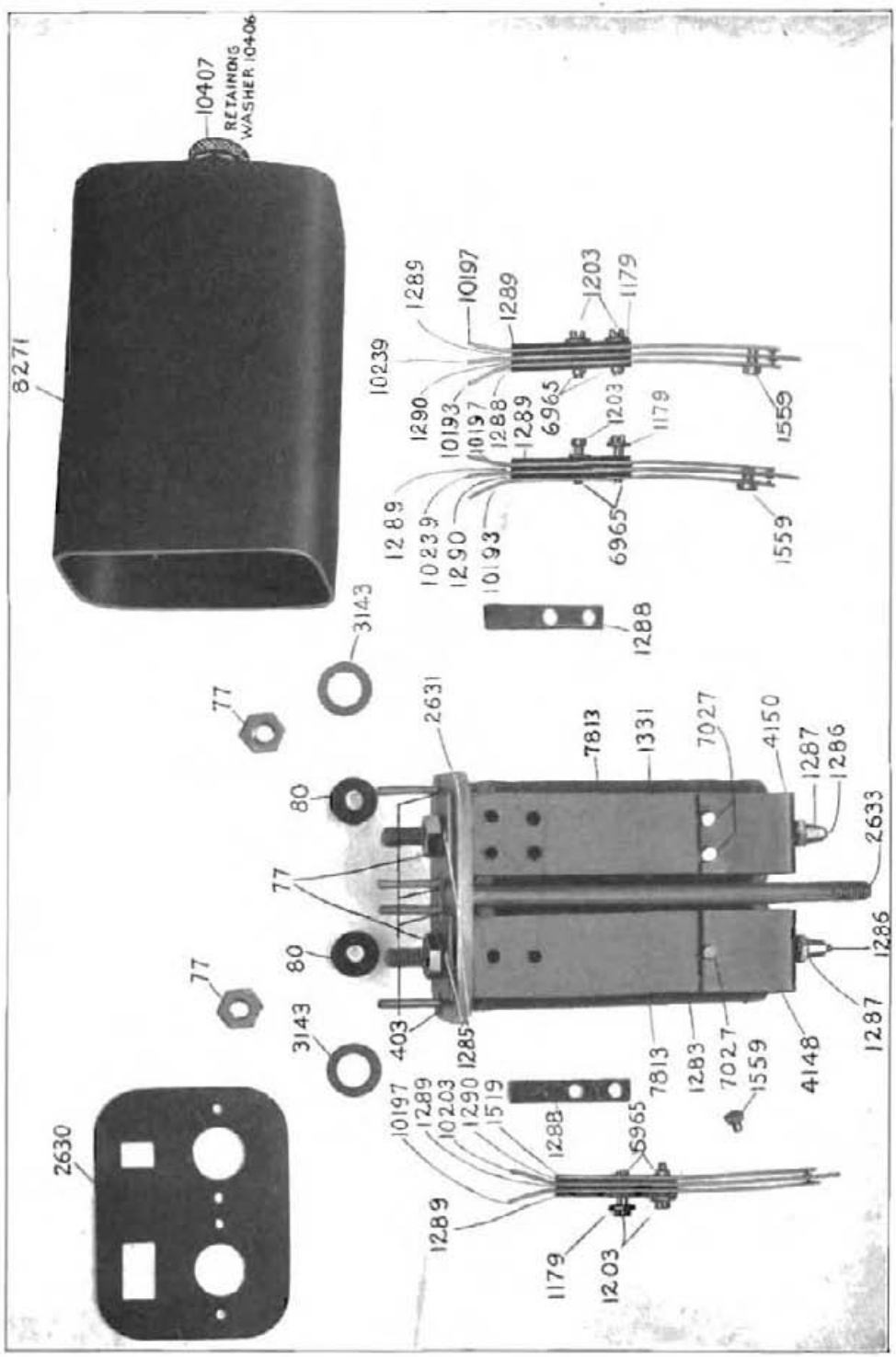


Plate No. 45—No. 72 Type Relay

Pc. No. 28689 should be Pc. No. 28688

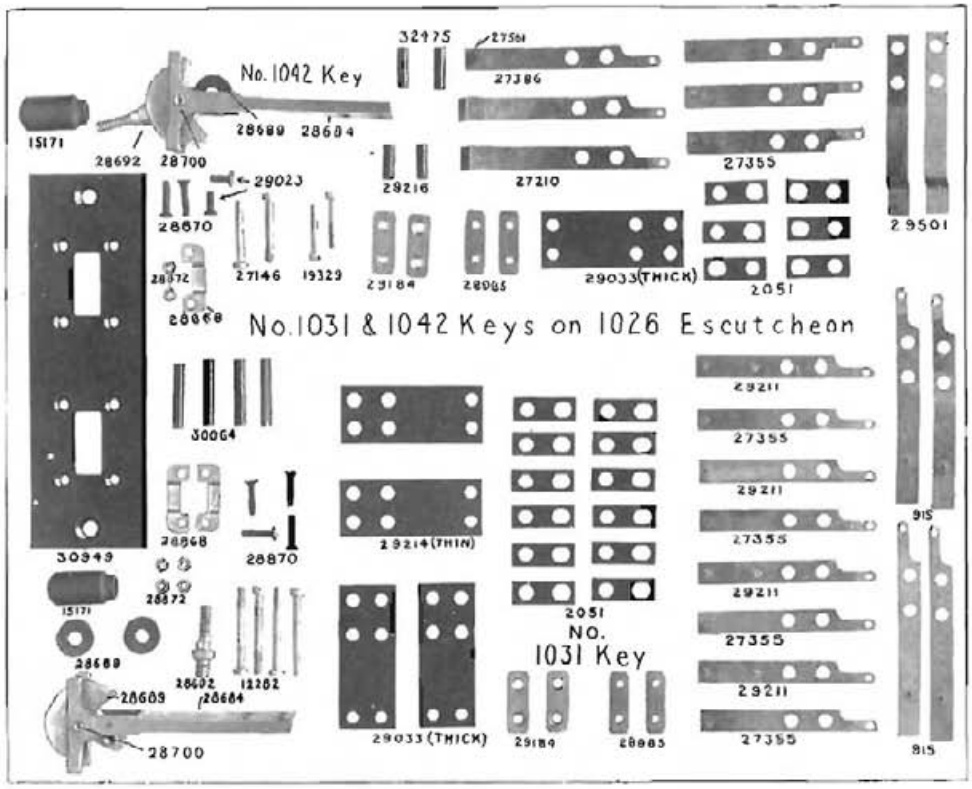


Plate No. 46. No. 1031 and 1042 Keys on 1026 Escutcheon

Pc. No. 28689 should be Pc. No. 28688

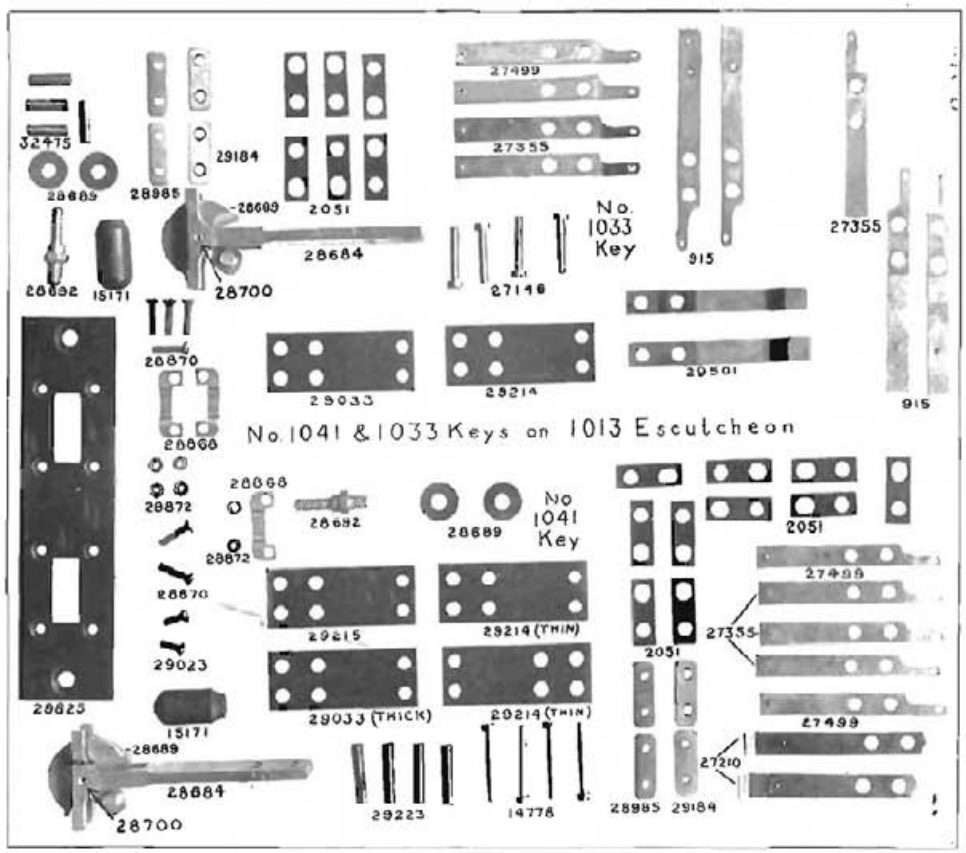


Plate No. 47. No. 1041 and 1033 Keys on 1013 Escutcheon

Pc. No. 29290 replaced by Pc. No. 14155; Pc. No. 29304, by Pc. No. 29293

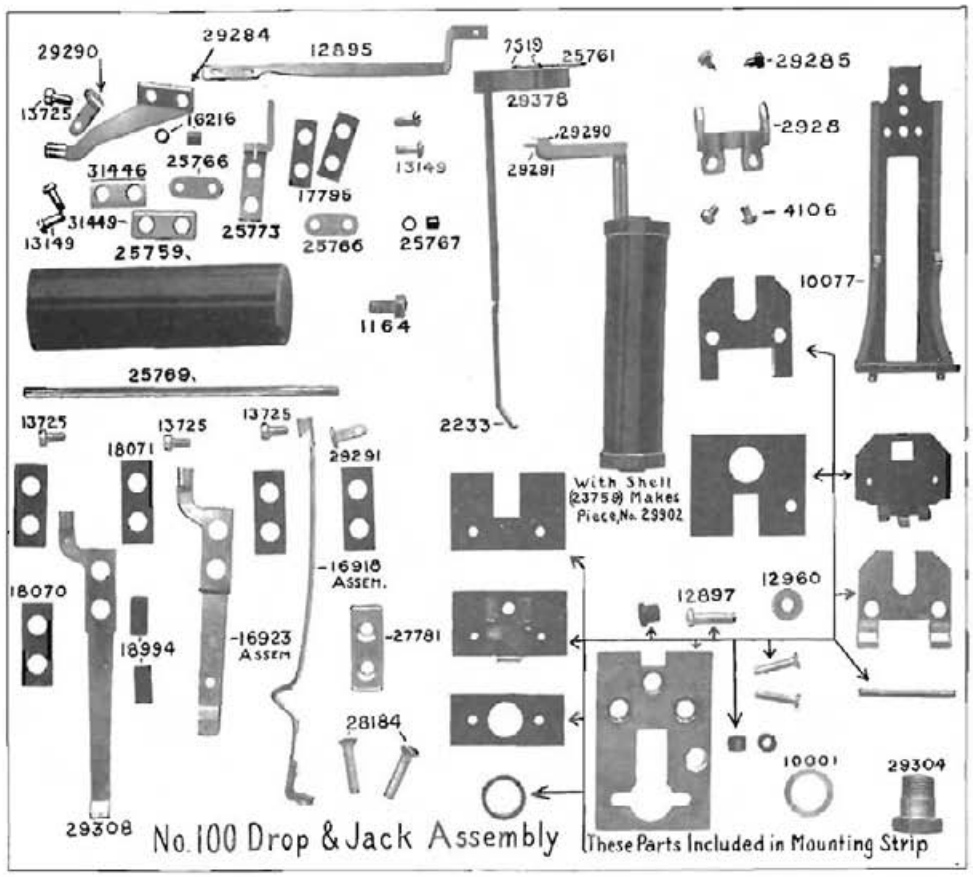


Plate No. 48. No. 100 Drop and Jack Assembly

Pc. No. 29290 replaced by Pc. No. 14155; Pc. No. 29304, by Pc. No. 29293

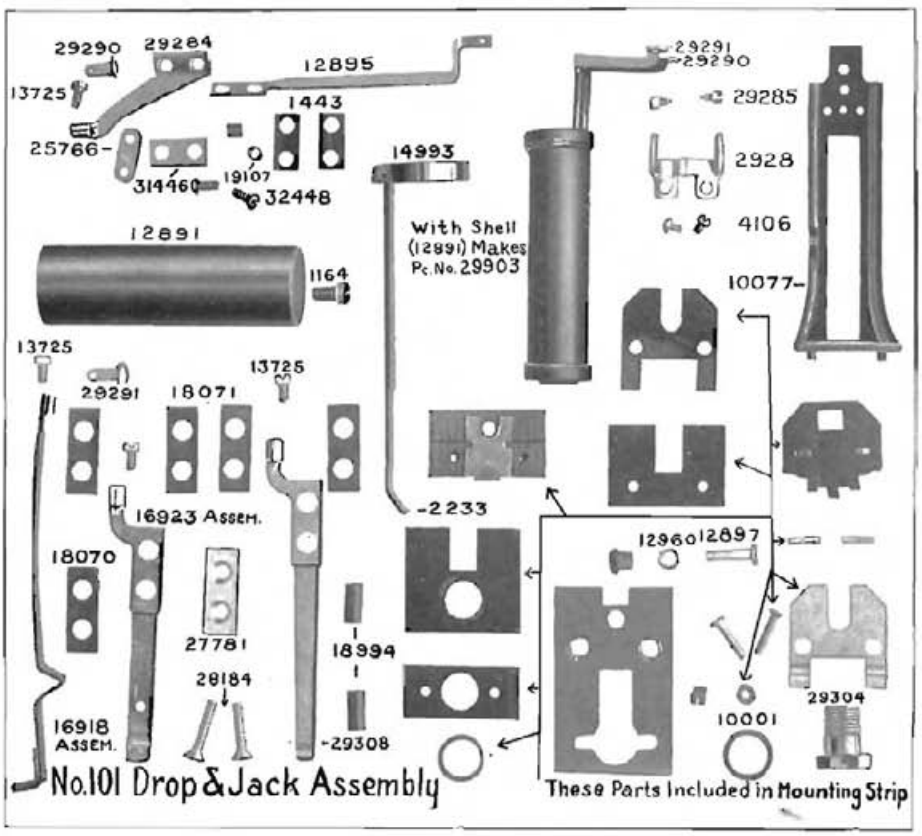


Plate No. 49. No. 101 Drop and Jack Assembly

Pc. No. 32039 should be Pc. No. 32034. Pc. No. 9130 replaced by Pc. No. 5876.
Pc. No. 6018 replaced by Pc. No. 34900; Pc. No. 30995, by Pc. No. 38191.

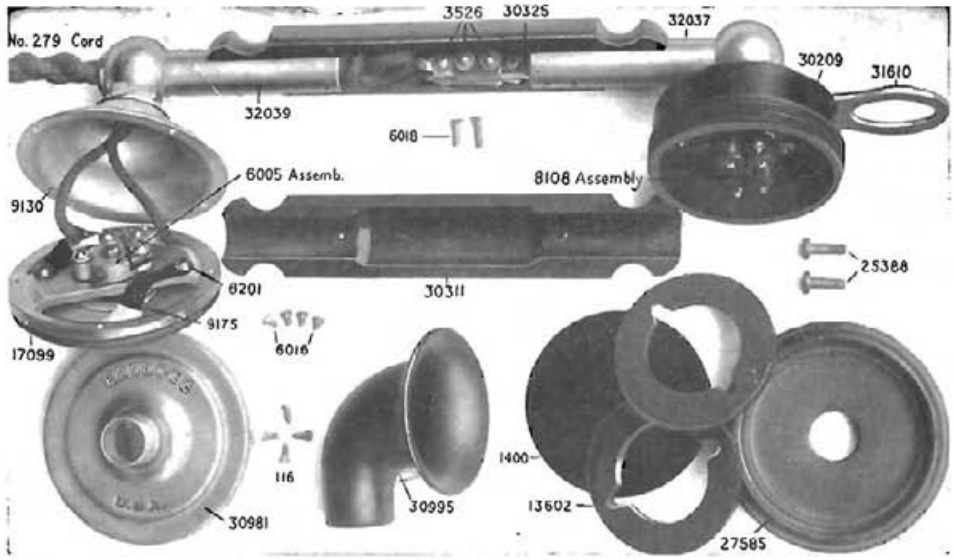


Plate No. 50

Code No. 12-C Grabaphone Assembly

Only difference between 11C and 12C is that 11C has not Pc. No. 31610

Pc. No. 30311 replaced by Pc. No. 5868

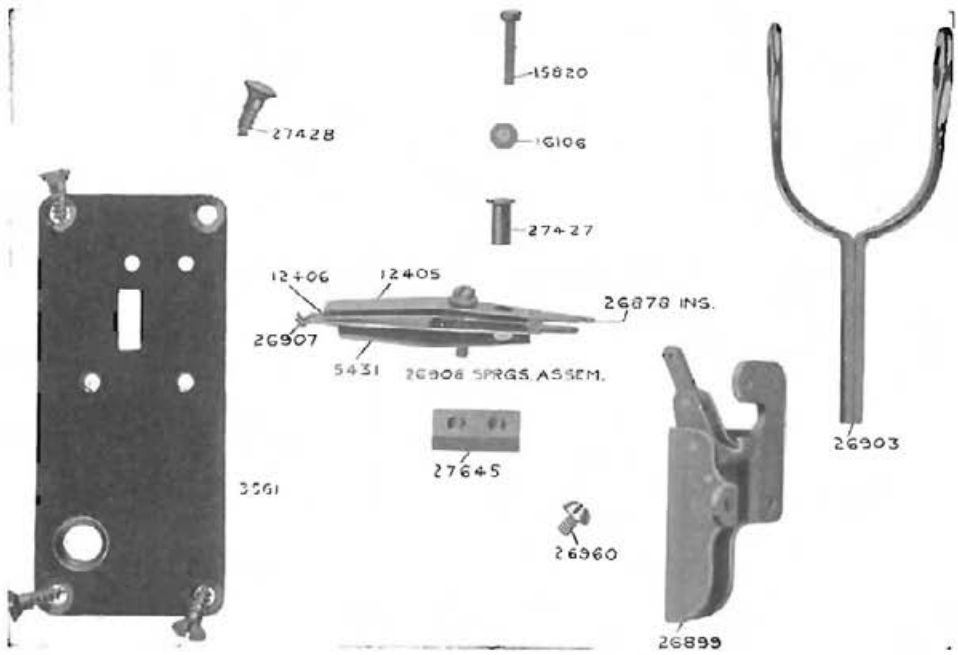


Plate No. 51

Code No. 103—Hookswitch

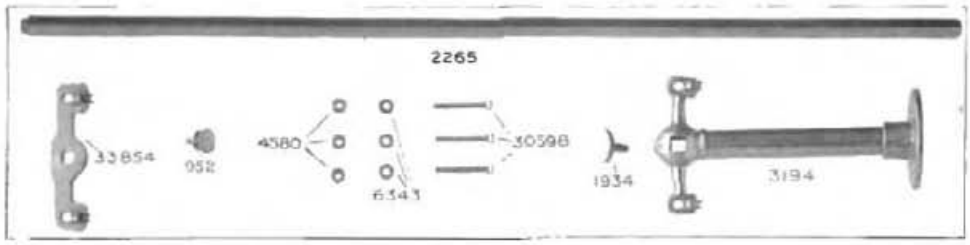


Plate No. 52
No. 24 Transmitter Arm

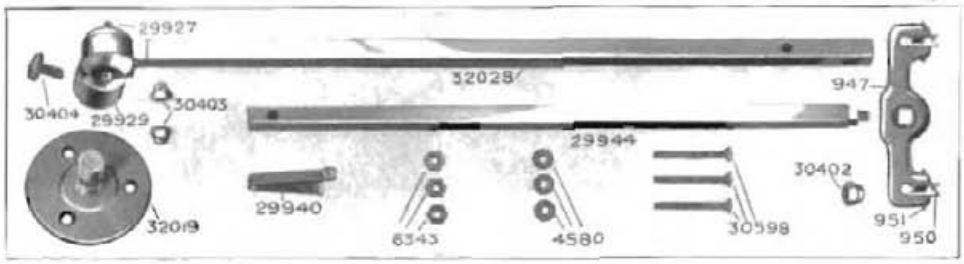
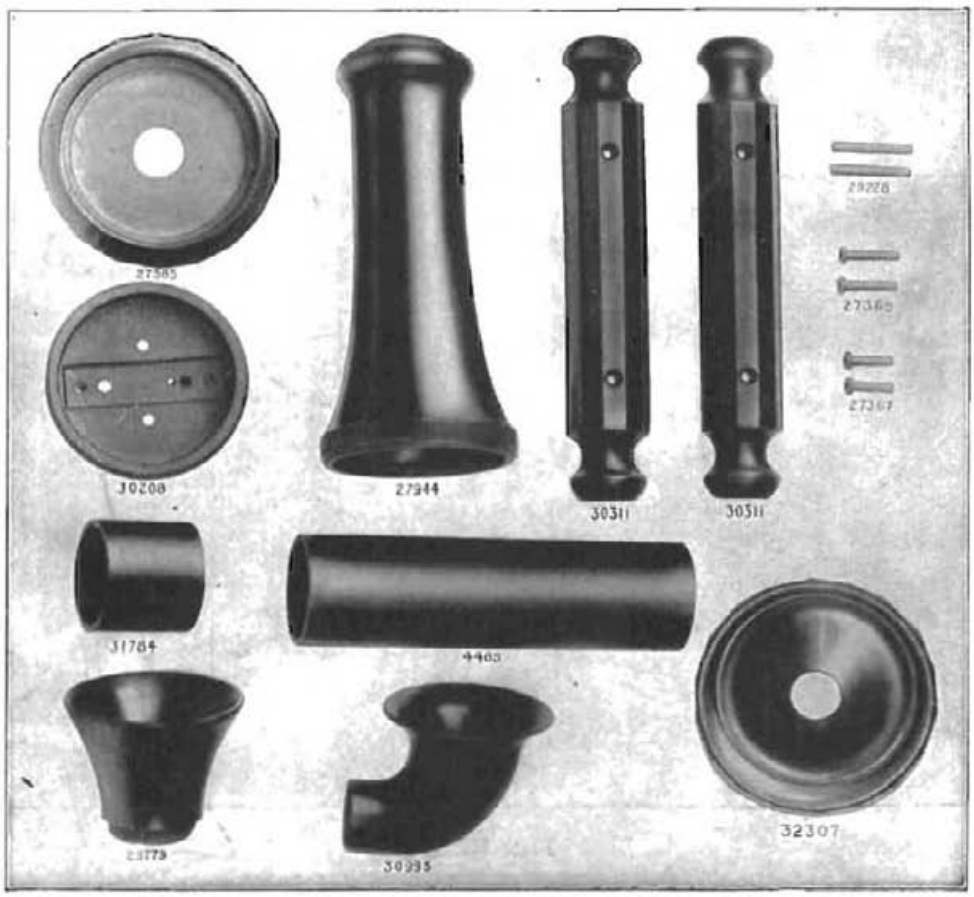


Plate No. 53
No. 48 Transmitter Arm



Pc. No. 30311 replaced by Pc. No. 5868
Plate No. 54
Bakelite Parts

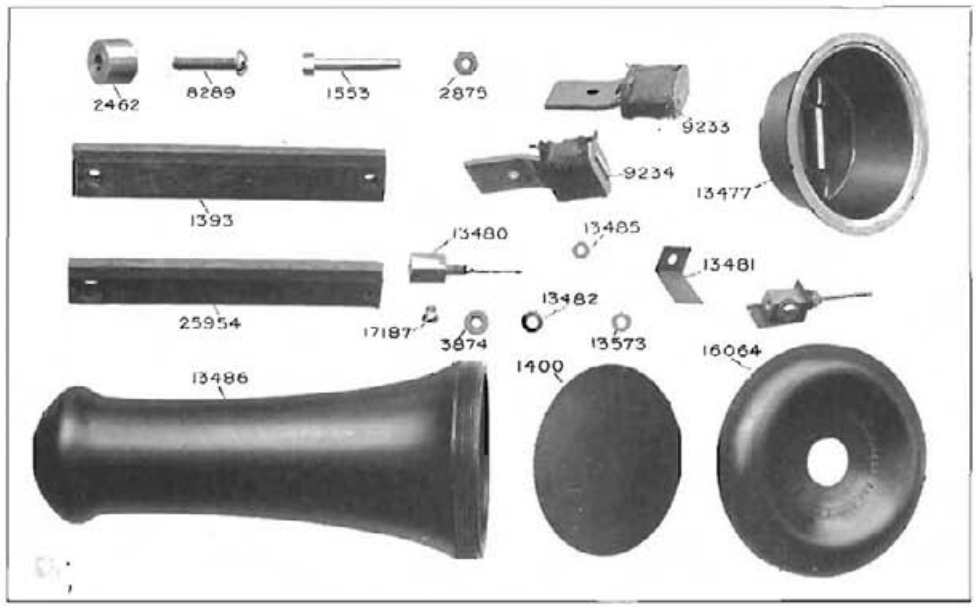


Plate No. 55

Receivers, Code Nos. 41A, 32A and 26A.

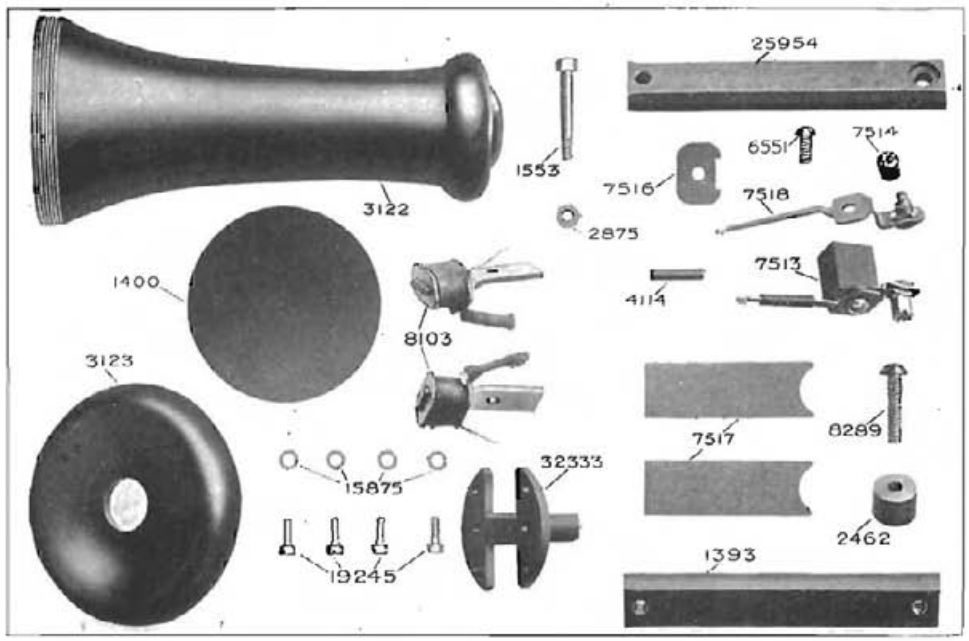


Plate No. 56

Receivers, Code Nos. 8A, 12A, 17A, 18A, 19A and 20A.

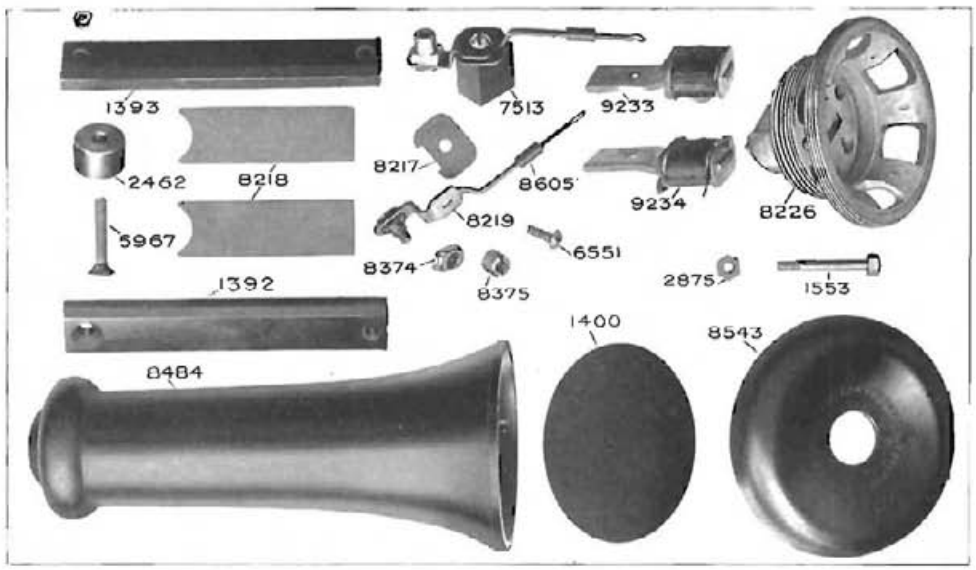


Plate No. 57

Subscribers' Receivers, Code Nos. 22A and 23A

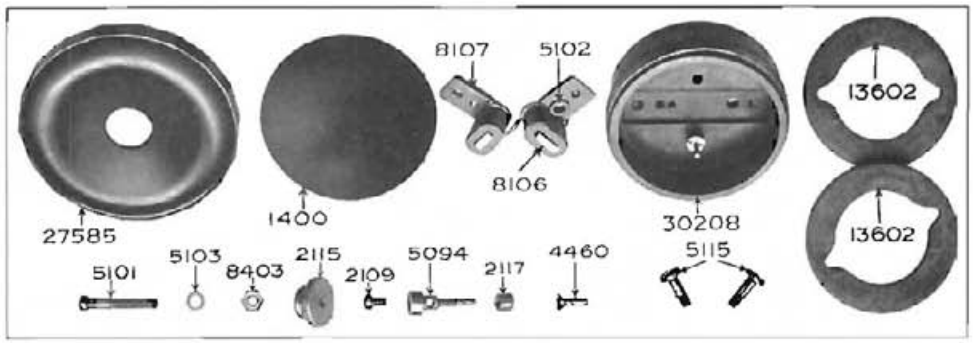


Plate No. 58

Operators' Receivers, Code Nos. 14A, 25A and 46A

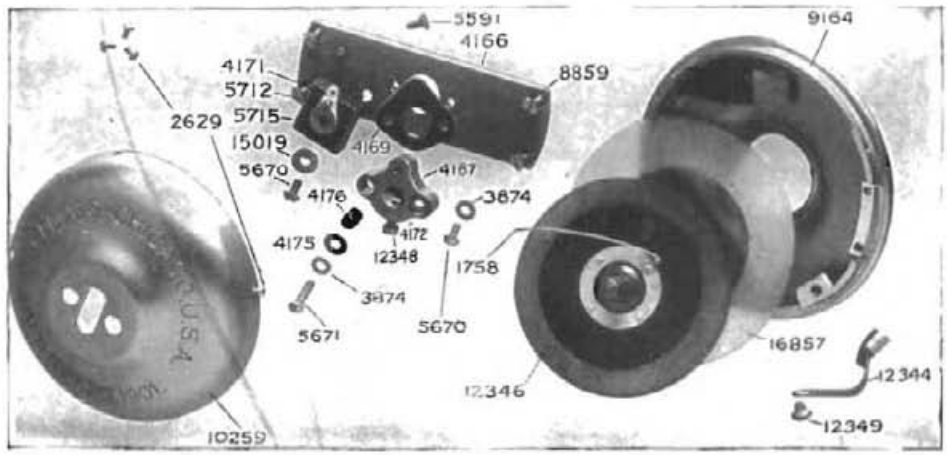


Plate No. 59

Standard Telephone Transmitter

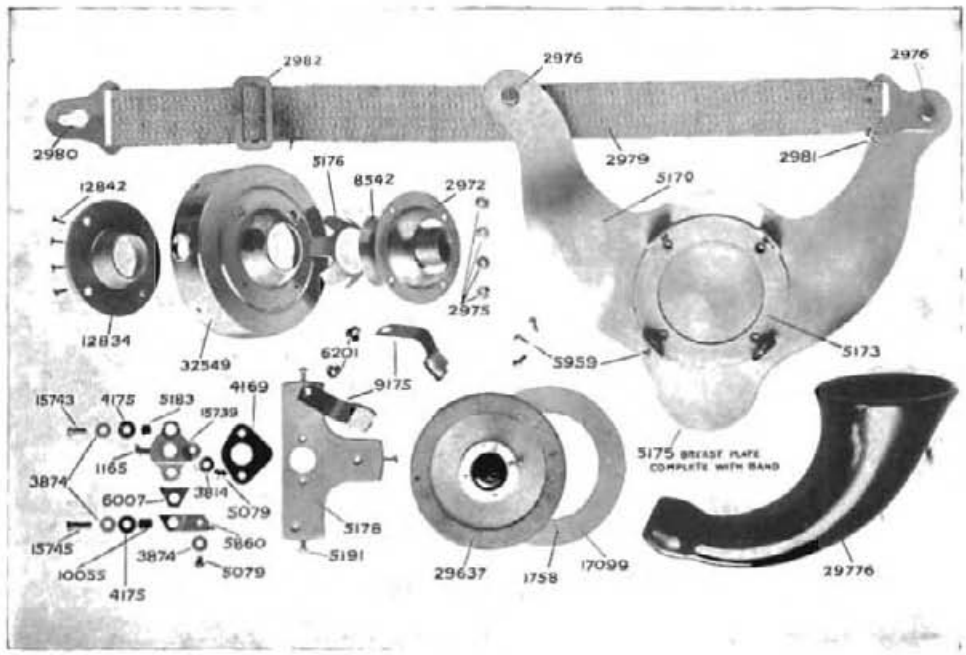


Plate No. 60

No. 76 L Transmitter

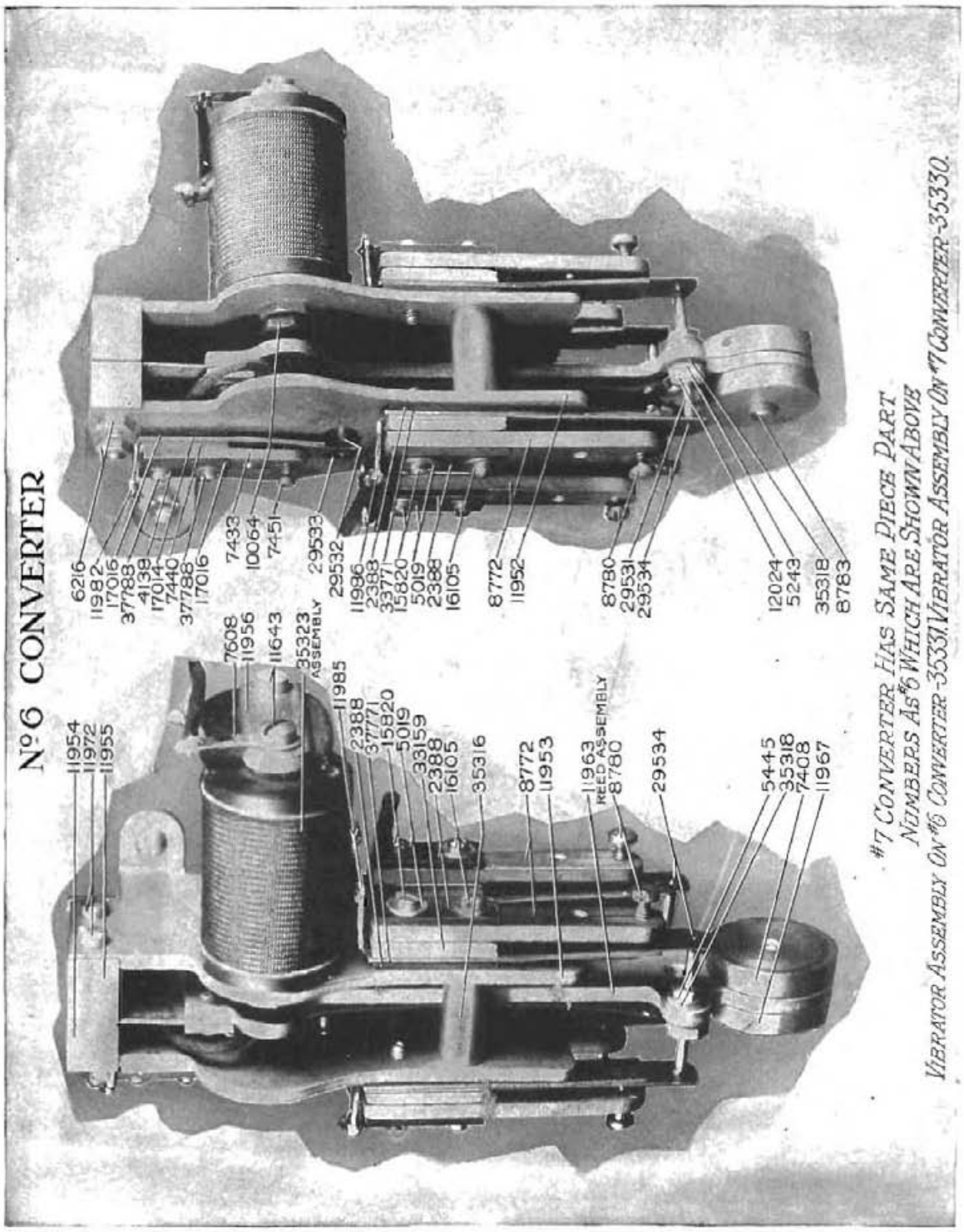
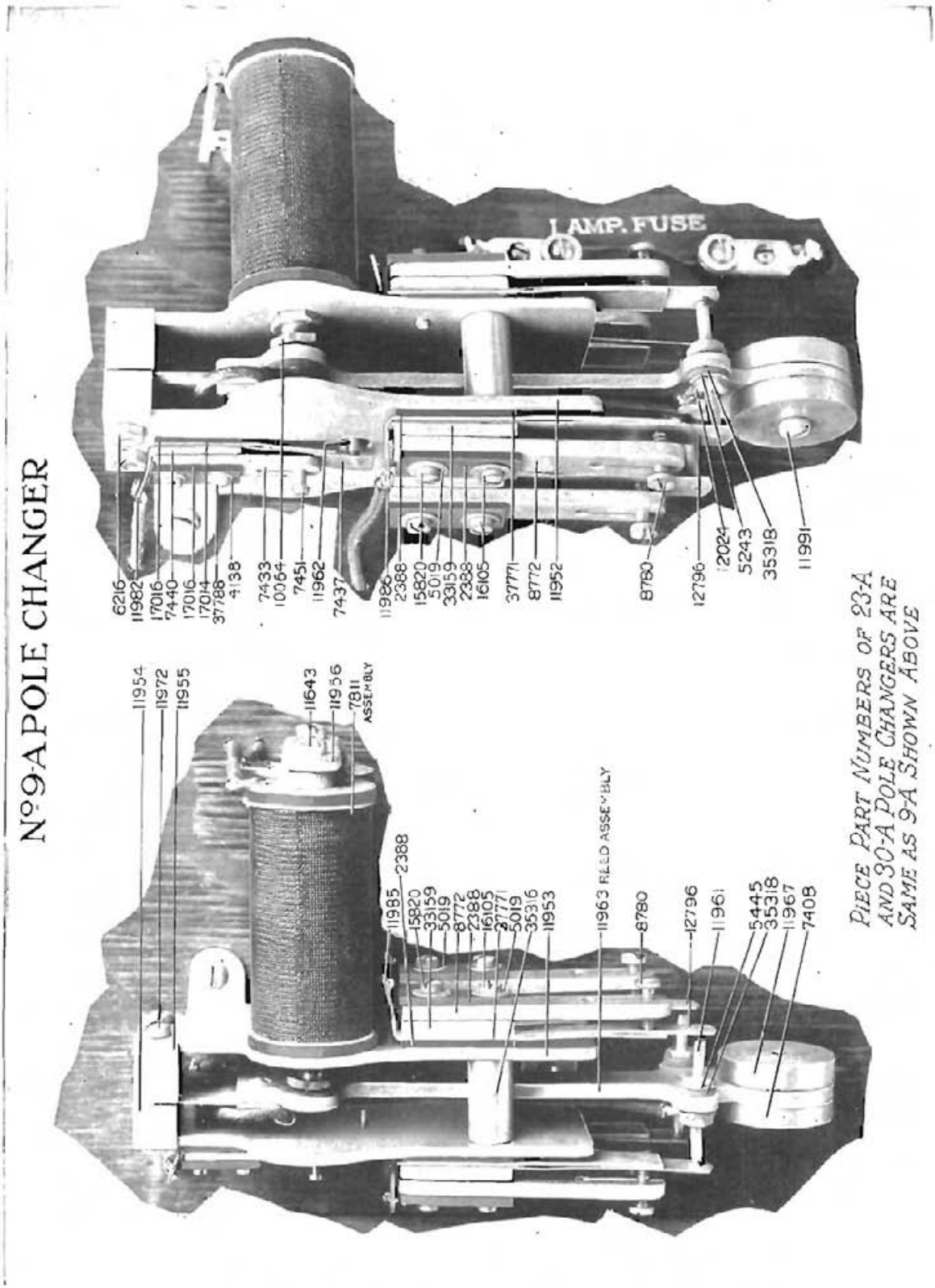


Plate No. 61—No. 6 Converter

No. 9-A POLE CHANGER



PIECE PART NUMBERS OF 23-A AND 30-A POLE CHANGERS ARE SAME AS 9-A SHOWN ABOVE

Plate No. 62—No. 9A Pole Changer

Pc. No. 29566 replaced by Pc. No. 8764; Pc. No. 29567, by Pc. No. 8792; Pc. No. 29561, by Pc. No. 8802 and Pc. No. 29562, by Pc. No. 8803

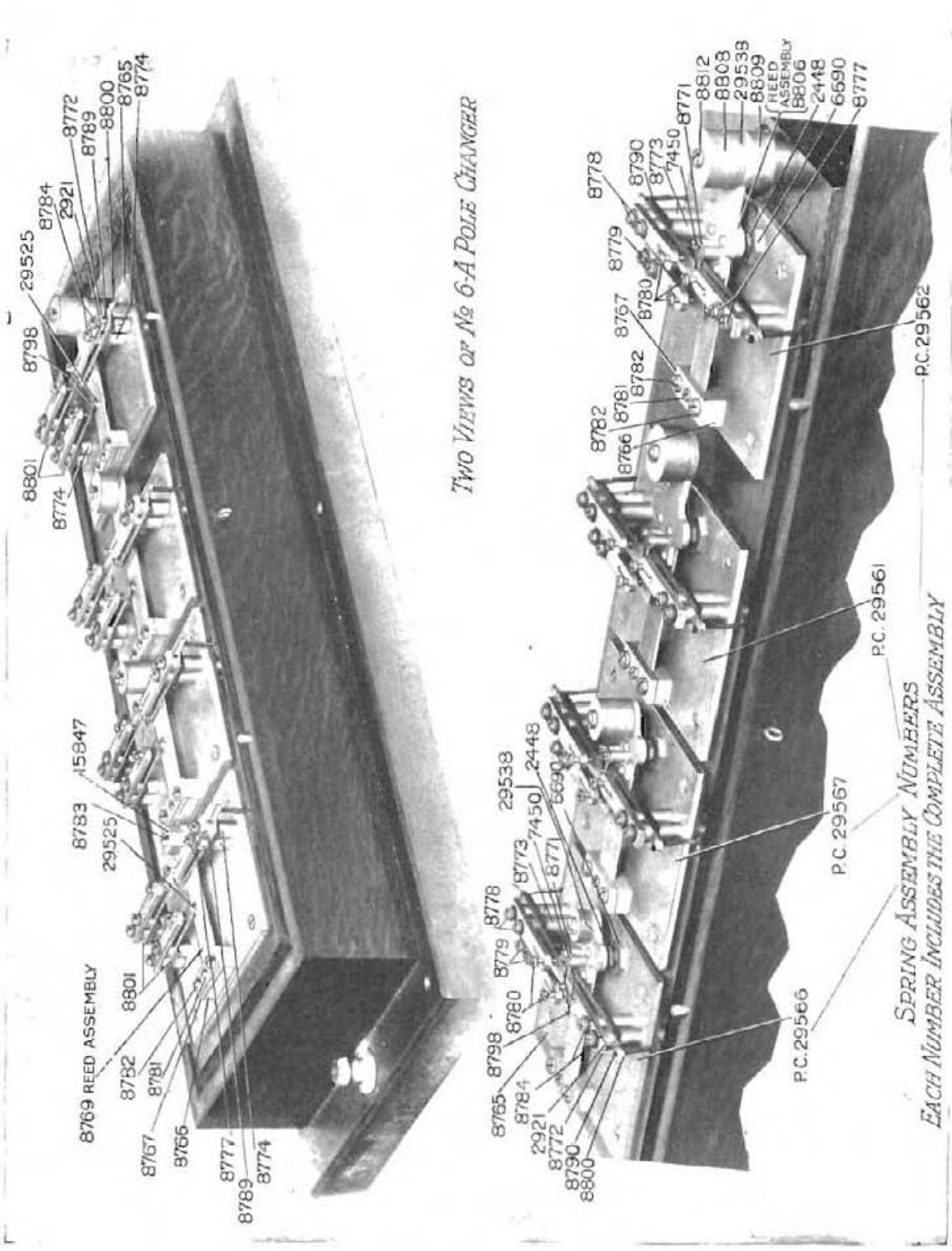
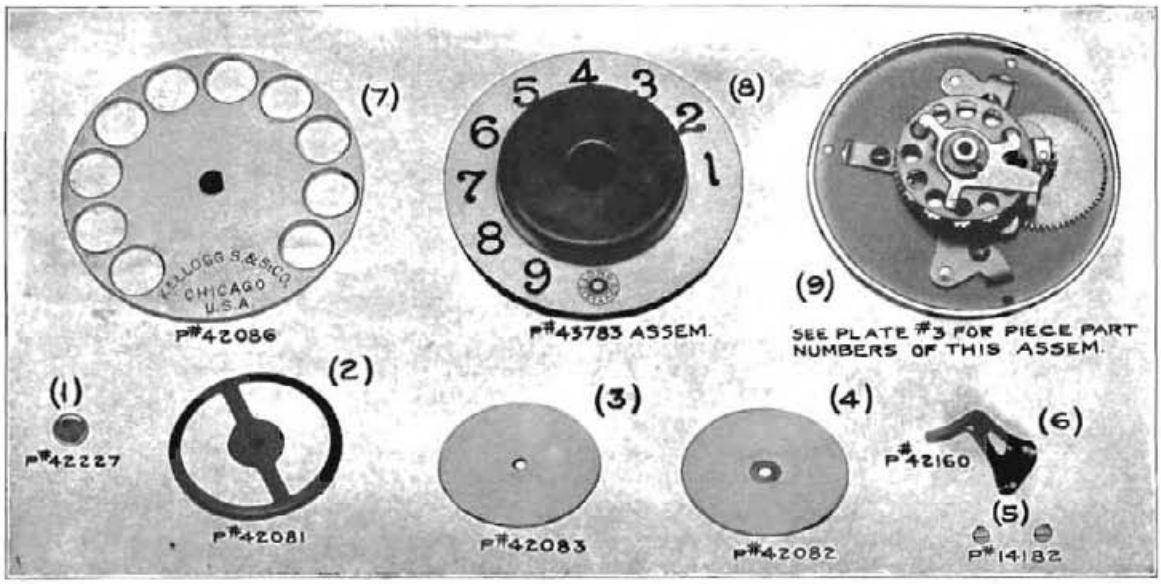


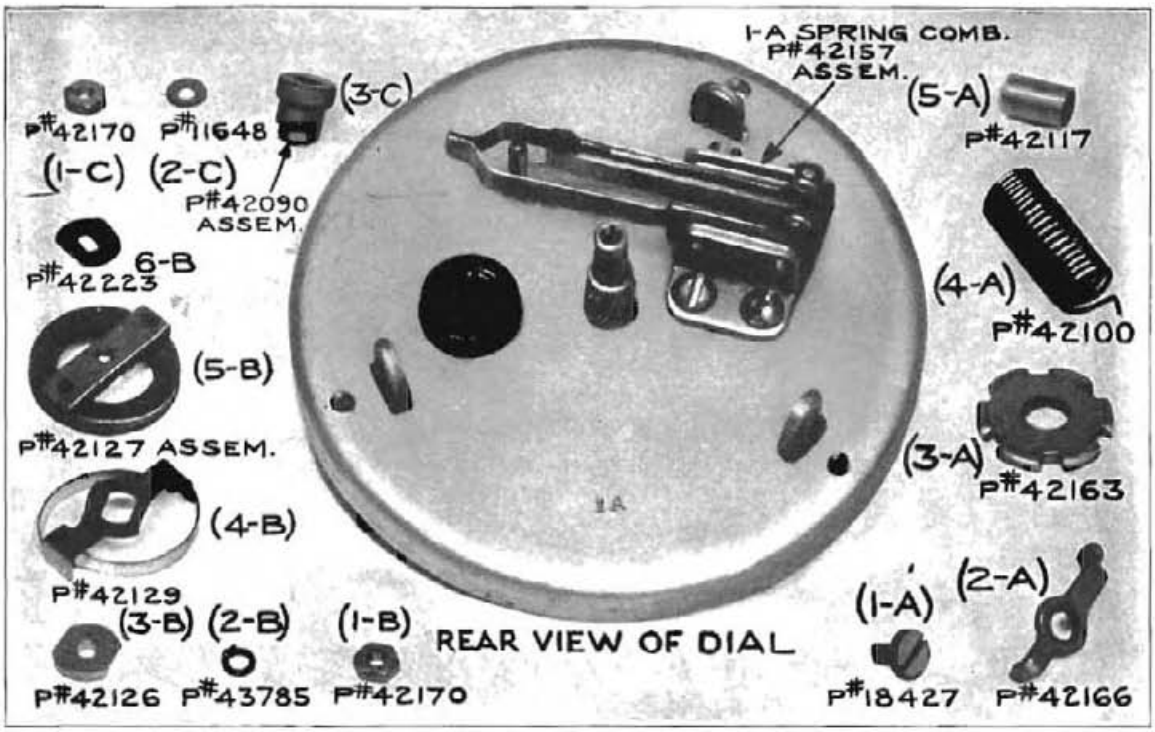
Plate No. 63—No. 6A Pole Changer

Numbers and letters in parentheses on these plates indicate order of assembly



No. 1

Plate No. 64—No. 1A Automatic Calling Dial

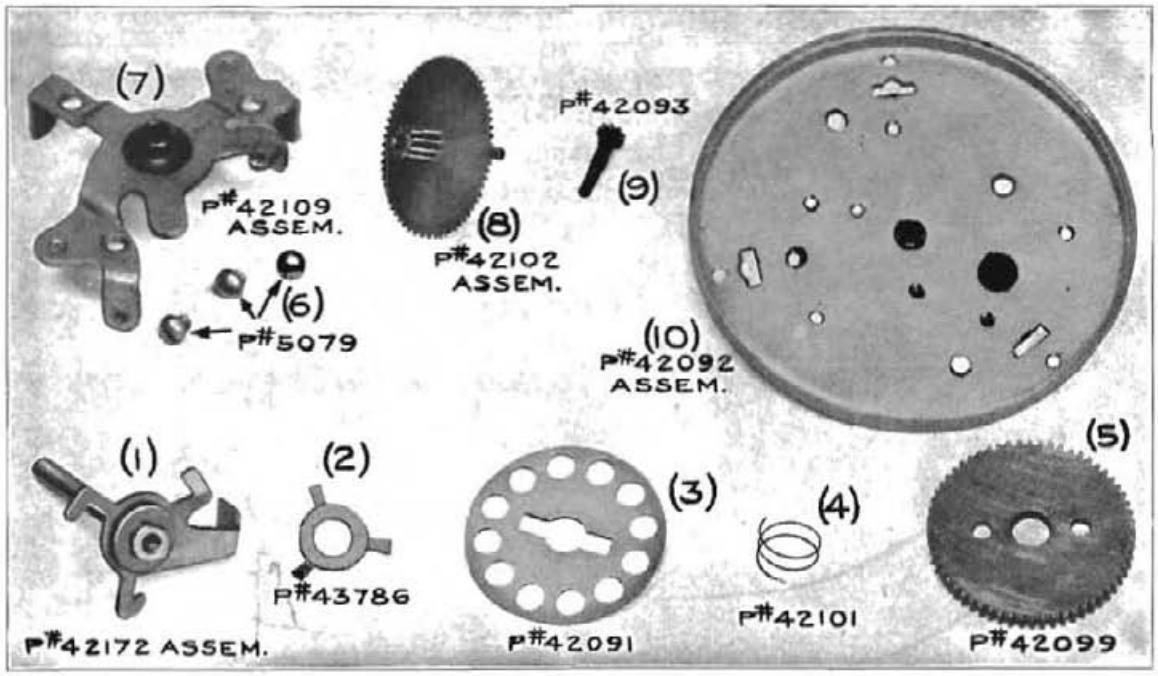


No. 2

Plate No. 65—No. 1A Automatic Calling Dial

"A" designates Drive Spring Assembly; "B" the Governor Assembly; "C" the Impulse Cam Assembly.

Numbers in parentheses on plate 66 indicate order of assembly.



No. 3 Plate No. 66—No. 1A Automatic Calling Dial

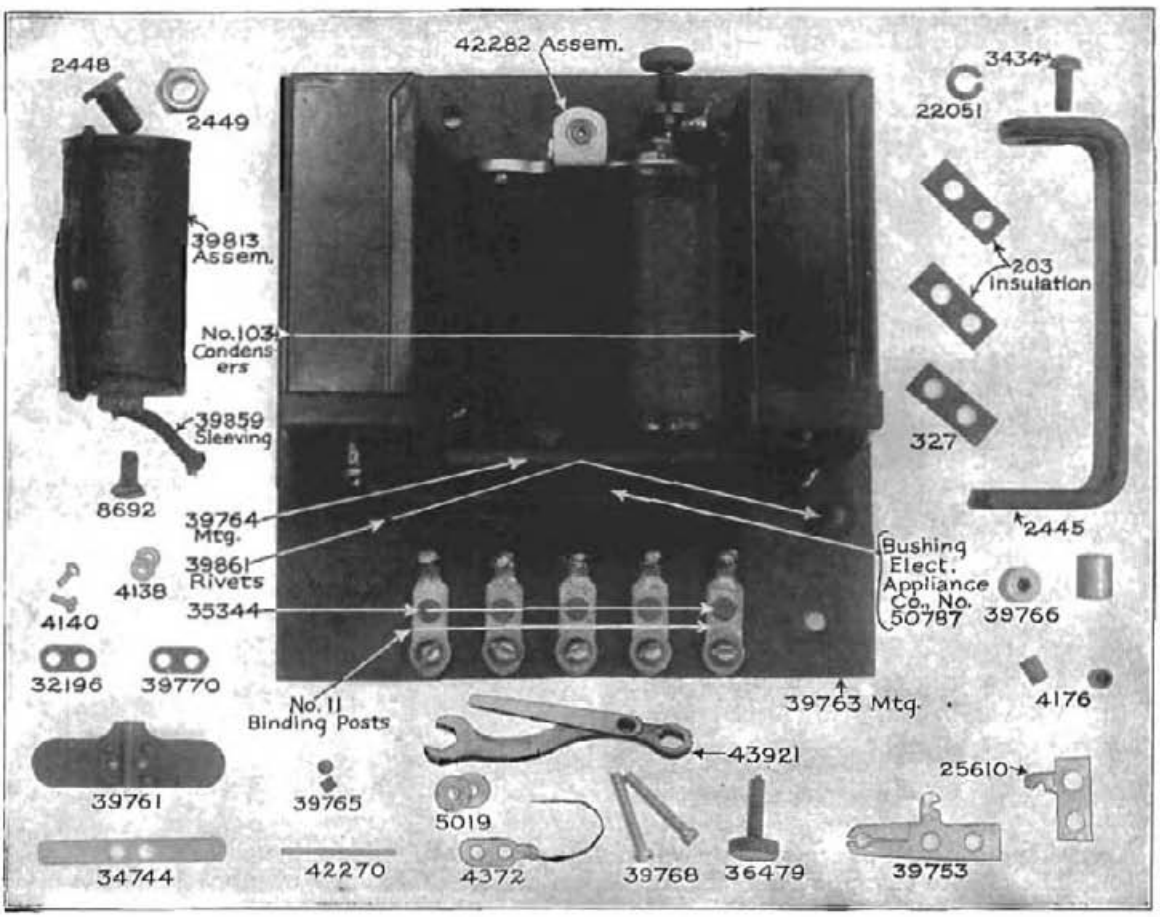


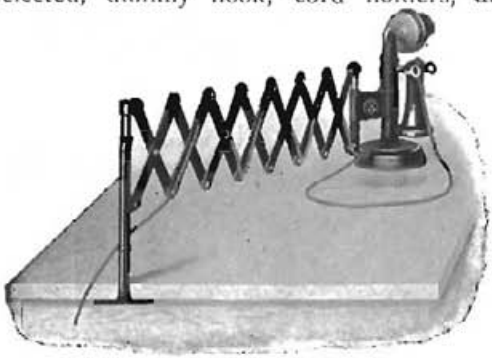
Plate No. 67—No. 555 Relay

ARMS—TELEPHONE

Extension

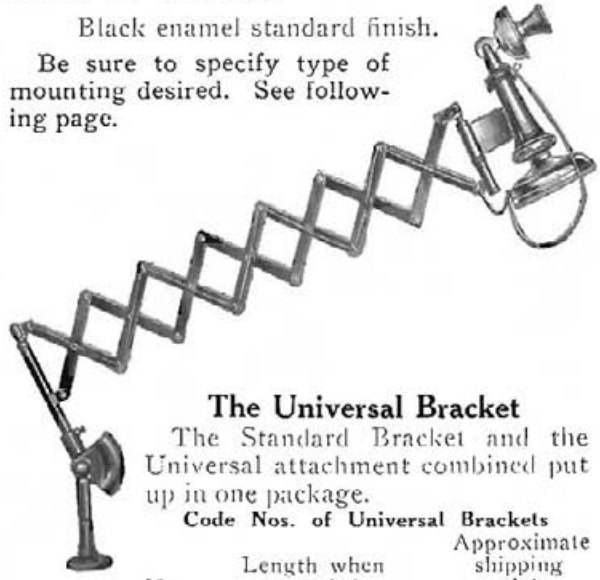
The Sperry Standard Bracket

The Standard Bracket works horizontally only. Strong and durable construction. The lazy-tongs are made of ¾x⅛ in. steel. The closing of the bracket is provided for by posts made of ½-in. screw-steel telescoping in steel tubes. It is absolutely locked when fully extended and does not sag. Furnished complete with the minute clamp, any mounting selected, dummy hook, cord holders, and screws for mounting.



Black enamel standard finish.

Be sure to specify type of mounting desired. See following page.



Code Nos. of Standard Brackets

No.	Length when extended	Approximate shipping weight
8	26 inches	5 pounds
10	30 inches	5½ pounds
12	34 inches	6 pounds
14	38 inches	6½ pounds
16	42 inches	7 pounds

The Universal Bracket

The Standard Bracket and the Universal attachment combined put up in one package.

Code Nos. of Universal Brackets

No.	Length when extended	Approximate shipping weight
8	26 inches	7 pounds
10	30 inches	7½ pounds
12	34 inches	8 pounds
14	38 inches	8½ pounds
16	42 inches	9 pounds



Utility Type

The Sperry Utility

Up and down motion only, 34-in. extension. Suspends the telephone in vertical position, below the holder. Neat, practical, inexpensive. Made of $\frac{11}{16}$-in. steel tubing. Furnished in black enamel finish only.

Nos. 20 or 21 clamp furnished only when specified. No. 21 clamp is used for the old automatic telephone with the convex barrel. No. 20 clamp fits all telephones and cylindrical barrels.

Minute Clamp

The Minute Clamp is furnished with all Standard and Universal telephone brackets unless otherwise specified. Requires no tools or screws to attach Quick and simple in operation.



Minute Clamp



No. 21



No. 20

Always specify type of mounting when ordering brackets. Black Enamel is the Standard finish. The minute clamp is the Standard Clamp. If any other finish or type of clamp is desired, it must be specified.

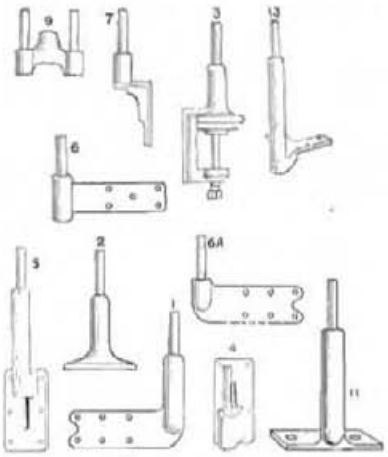
ARMS — TELEPHONE

Mountings

Place your telephone in the most convenient location with any of these

Mountings

for Top, Side, or Edge of Desk, or Wall



No. 1 Mounting especially designed to be attached to the side of a flat-top desk or table. It can also be used for side of a roll-top desk.

No. 2 is used on the top of desk or table.

No. 3 clamps on edge of a flat-top desk or table.

No. 4 is used on wall or partition.

No. 5 is used on side of flat-top desk or table.

Nos. 6 and 6-A are designed to use on a roll-top desk only. It should be attached to the side of the housing of the desk. If it is attached below it will bring the bracket down too far.

No. 7 is used on a flat-top desk only. It brings the bracket down rather low and as a rule the No. 5 mounting is preferable.

No. 9 Double Phone Attachment fits any mounting. It is used for the purpose of attaching two telephone brackets to one mounting.

No. 11 Mounting fastens under the surface of the desk or table top and is especially designed to avoid marring any visible part of the furniture with screws. The No. 11 Mounting is designed for a flat-top desk or table. No. 13 Mounting is of the same general type as the No. 11, but is designed for a roll-top desk.

No. 13 Mounting fastens under the table or desk at the corner.

Standard—THE SPERRY DE LUXE—Universal

The Sperry Brackets are also furnished in a special mahogany—De Luxe finish. Selected materials, case-hardened steel, perfect workmanship.



The Universal Attachment

The Universal Attachment fits any Sperry Standard Bracket. It is inserted between the bracket and the mounting and serves to give it a vertical, as well as a horizontal movement.



ARRESTERS

Interior Type



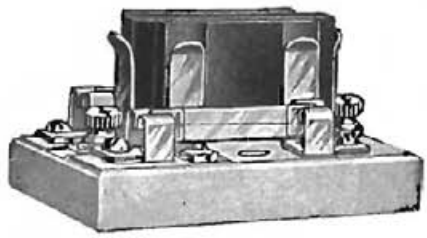
No. 400.

No. 400

The No. 400 Lightning Arrester is considered standard for farm line and toll line protection. This arrester is strongly built with heavy porcelain base, substantial brass mountings, large thumb nuts and three very large carbons. The arrester carbons are sufficiently large to carry on exceptionally heavy discharges of lightning. Insulating cloth dielectrics are used. Weight, each ¾ lb. Size 3⅜x2x2 inches.

No. 401

The No. 401 Fuse and Lightning Arrester is the same as the No. 400 except that it takes No. 8—¼ amp. copper terminal mica fuses. Weight each ¾ lb. Size 4x2¼x2¼.



No. 401.



No. 204.

No. 204

The No. 204 is an inexpensive mica and carbon arrester designed for interior use, and consists of four No. P-52 carbons, separated by P-53 mica dielectrics. The hole being mounted on a round porcelain base. It is of the double pole type. Weight each 1 lb. Size 3x2⅜.



No. 977A

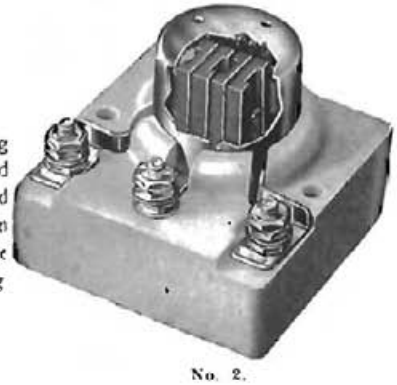
No. 977A

The No. 977A Lightning Arrester is a carbon block air gap protector to be used for protection against lightning where crosses with the electric circuits are not likely to occur, and is enclosed by a brass screw cover. Consists of four P-367 carbon blocks with two P-312 "U" shaped mica dielectrics. Weight each ¾ lb. Size 3½x2½x2¼ inches.

The No. 977AA Lightning Arrester is the same as the above except that it is equipped with the 495 self cleaning discharge block.

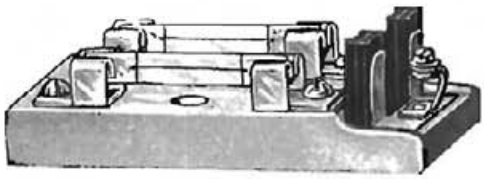
No. 2

The No. 2 arrester is designed especially for an efficient lightning arrester. It is enclosed in a brass cap fibre insulated, and perforated to allow for the expansion of heated air. It is especially recommended for use on long country lines, as it requires practically no attention when once installed, and properly grounded. The carbons are treated by a special process to make them practically self cleaning Weight each 1 lb. Size 2¾x2¾x2.



No. 2.

Fuse Blocks



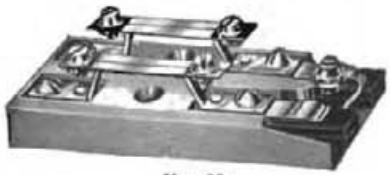
No. 57.

No. 57 Double Pole

Weight each ½ lb. Size 4⅛x1¾x1⅜. Equipped with four P-22 carbons and two P-23 Dielectrics. Use No. 8 Fuses.

ARRESTERS

Fuse Blocks



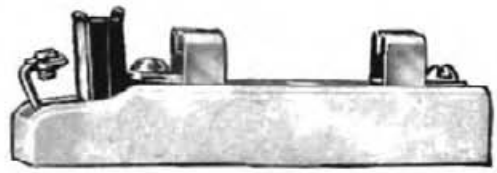
No. 89.

No. 89 Double Pole

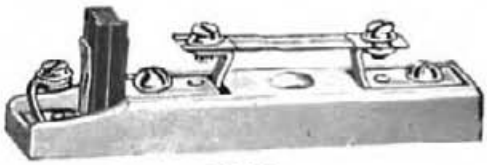
Weight each ½ lb. Size 4½x1¾x1¼. Equipped with four P-22 carbons and two P-23 Dielectrics. Use No. 11 Fuses.

No. 42 Single Pole

Weight each ¼ lb. Size 4⅛x¾x1½. Equipped with two P-22 carbons and one P-23 Dielectrics. Use No. 8 Fuse.



No. 42.



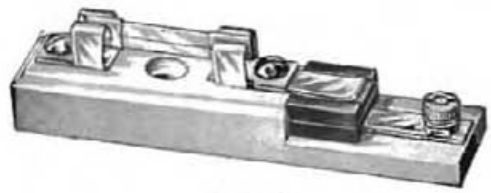
No. 47.

No. 47 Single Pole

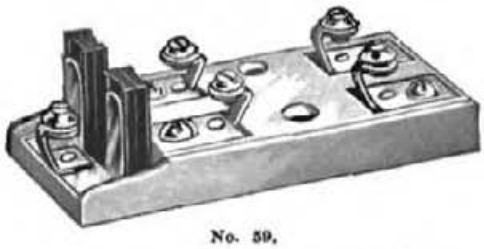
Weight each ¼ lb. Size 4⅛x¾x1½. Equipped with two P-22 carbons and one P-23 Dielectrics. Use No. 11 Fuse.

No. 41 Single Pole

Weight each ½ lb. Size 5⅛x1x1¼. Equipped with two P-12 carbons and one No. P-11 Dielectrics. Use No. 19 Fuse.



No. 41.



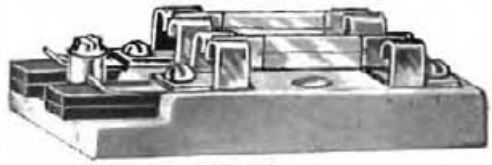
No. 59.

No. 59 Double Pole

Weight each ½ lb. Size 4⅜x1¾x1⅜. Equipped with four P-22 carbons and two No. P-23 Dielectrics. Use No. 11 Fuses.

No. 86 Double Pole

Weight ½ lb. Size 4½x1¾x1⅛. Equipped with four P-22 carbons and two P-23 Dielectrics. Use No. 8 Fuses



No. 86.

Individual Station Protectors



Type B-5

TYPE B-5

Equipped with A-12 three-ampere composition tubular fuses, 3 inches long and with specially treated carbon lightning arrester blocks, mounted upon a substantial porcelain base, furnished with Fahnestock spring binding post. Weight, 1½ lbs.



Type B-13

TYPE B-13

Designed to carry either a long or a short fuse, the porcelain being in two pieces, one carrying clips for the line end of the fuses only, and the other carrying clips for the instrument end of the fuses, and also carbons. Carbons are standard type, chemically treated, and are practically self-cleaning.

Regularly furnished with 3-ampere A-9 composition tubular fuse, 4¼ inches long between shoulders. Weight, 1½ lbs.

ARRESTERS

Individual Station Protectors

TYPE B-7

Equipped with Type A-9 standard 3-ampere tubular fuses, and with self-cleaning carbons. The carbons are set into the porcelain base and are covered by a brass cap. The cap is perforated to allow for the expansion of heated air, and insulated from all parts of the protector. Weight, 2 lbs.



Type B-7



Type B-9

TYPE B-9

Designed to be used either for indoor or outdoor protection; is absolutely weatherproof under the most severe conditions. Heavy weatherproof cover included with each protector.

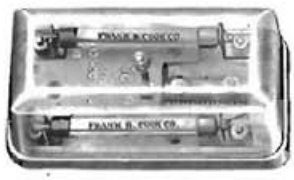
Equipped with Type A-9 standard 3-ampere tubular fuses, and specially treated carbons. Weight, 4 lbs.

TYPE B-12

Designed for use where there are no long aerial lines. Consists of a heavy porcelain base, with strong fuse clips and wire connections, and is equipped with 3-ampere A-12 composition tubular fuses. Weight, 1 lb.



Type B-12



Type B-20

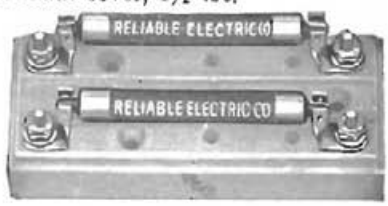
TYPE B-20

A saw-tooth air gap, high potential discharger is combined with Cook tubular fuses in this protector.

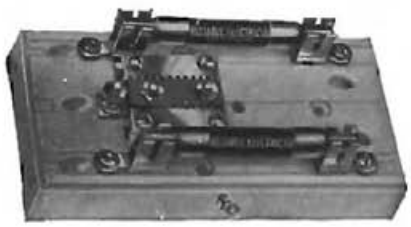
3-ampere, A-48 composition fuses are furnished unless otherwise specified. Weight, with cover, 1¾ lbs.; without cover, 1½ lbs.

No. 975-D

A fuse protector to be used for protection against crosses with electric circuit. Can be supplied with or without all over metal cover which completely encloses fuses. Equipped with two 3 amperes, No. 48 tubular fibre fuses held in place by phosphor bronze contact springs which grip the tips of the fuses. Size 5x2x1¾ inches. Weight ⅞ lb.



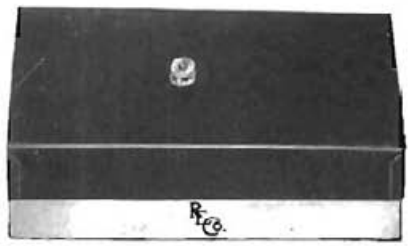
Type 975-D



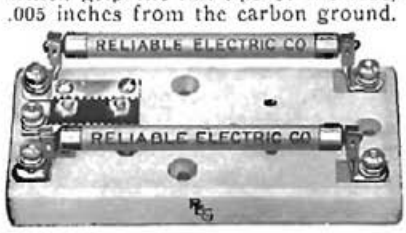
No. 976 without cover
Approved by the National Board of Fire Underwriters

No. 976

A self-cleaning saw tooth air gap protector to be used for protection against lightning and crosses with electric circuits. Can be supplied with or without "all-over" metal cover which encloses the fuses as well as the lightning arresters. Consists of two No. 44 Blow-Rite flat wood fuses, 2 amperes, held in place by phosphor bronze contact springs which grip the flat tips of the fuse, and two adjustable, saw tooth metal discharge plates normally placed .005 inches from the carbon ground. Weight, 1⅝ pounds; size, 5⅞x3x2 inches.



No. 976 with "all over" cover



No. 998C

No. 998C

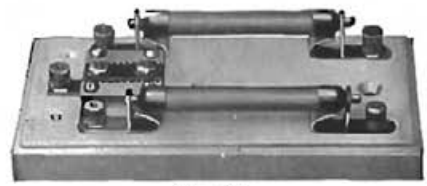
A self-cleaning saw tooth air gap protector to be used for protection against lightning and crosses with electric circuits. Consists of two No. 27 Blow-Rite tubular wood fuses, 3 amperes, held in place by phosphor bronze contact springs with four projections which bite into the fuse tips, and two adjustable, saw tooth metal discharge plates normally placed .005 inches from the carbon ground. Weight 1⅜ pounds, size 6½x3x1⅞.

ARRESTERS

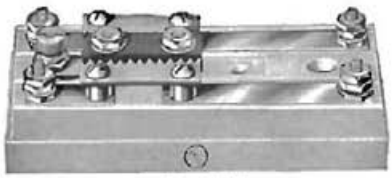
Individual Station Protectors

No. 998

A self cleaning saw tooth air gap protector to be 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 arresters. Consists of two No. 6 Blow-Rite tubular wood fuses, 3 amperes, 3⅜ inches shoulder to shoulder. Held in place by loose contacts, with phosphor bronze tension springs and two adjustable saw tooth metal discharge plates, normally placed .005 inch from the carbon ground. Weight 2 pounds, size 7⅛x3¾x1⅝.



No. 998
Approved by the National Board of Fire Underwriters



No. 975B

No. 975B

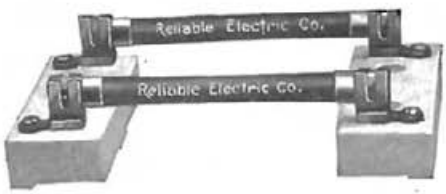
A self-cleaning, saw tooth air gap protector to be used for protection against lightning, and where crosses with electric circuits are not likely to occur. Consists of two adjustable saw-tooth metal discharge plates normally placed .005 inch from the carbon ground. Can be supplied with or without "all over" metal cover. Weight 15 oz. Size 5x2x1½ inches.

No. 977B

A carbon block air gap protector to be used for protection against lightning and crosses with electric circuits. The lightning arresters are enclosed by a brass screw cover. Consists of two No. 49 Blow-Rite tubular fibre fuses with flat tips 7 amperes, 5 inches tip to tip, held in place by phosphor bronze contact springs which grip the flat tips of the fuses; and four No. P367 carbon blocks with two P312 "U" shaped mica dielectrics. Weight 1¼ pounds. Size 6⅜x3½x2¼ inches.



No. 977B



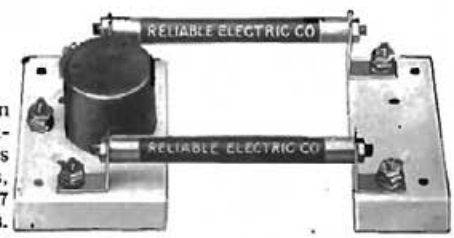
No. 977C

No. 977C

A fuse protector to be used for protection against crosses with electric circuits. Consists of two No. 49 Blow-Rite tubular fibre fuses with flat tips, 7 amperes, 5 inches tip to tip, held in place by phosphor bronze contact springs which grip the flat tips of the fuses. Weight ⅞ pound. Size 6⅜x3½x1⅝ inches.

No. 977H

A carbon block air gap protector to be used for protection against lightning and crosses with electric circuits. The lightning arresters are enclosed by a brass screw cover. Consists of two No. 55 Blow-Rite tubular fibre fuses with lock-nut tips, 7 amperes, 4 inches shoulder to shoulder, and four No. P367 carbon blocks with two P312 "U" shaped mica dielectrics. Weight 1⅛ pounds. Size 7x3½x2¼ inches.



No. 977H



No. 977K

No. 977K

A fuse protector to be used for protection against crosses with electric circuits. Consists of two No. 55 Blow-Rite tubular fibre fuses with lock-nut tips 7 amperes, 4 inches shoulder to shoulder. Weight ¾ pound. Size 7x3½x1⅞ inches.

Note

In ordering be sure and specify whether arresters are to be furnished with or without covers. Orders not specifying will be furnished with covers.



No. 997A. Open.

ARRESTERS

Individual Station Protectors

No. 997A

A perfectly waterproof large carbon air gap protector for outdoor mounting, to be used for protection against lightning and crosses with electric circuits. It is mounted in a vitrified porcelain box with the top shaped to shed water away from the cover and with protected vents under the eaves to insure ventilation and prevent sweating. A smooth cast-iron cover, red enameled, is fitted with a pure rubber gasket and locked in place by means of two wing nuts. Consists of two No. 3 Blow-Rite tubular wood fuses, 3 amperes, 4⅞ inches shoulder to shoulder, held in place by goose neck contacts with phosphor bronze tension springs, and four No. P376 large carbon blocks with two No. P375 "U" shaped mica dielectrics. Weight 3¾ pounds. Size, 8¾x4⅛x2¾ inches.



No. 997. Closed.

No. 997B

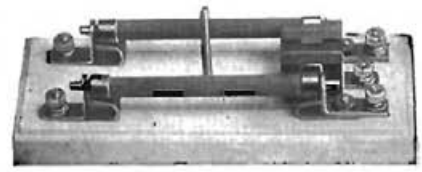
The No. 997B is a self-cleaning saw-tooth air gap lightning arrester mounted in a perfectly weatherproof housing like the No. 997A shown above. Consists of two No. 3 Blow-Rite tubular wood fuses, 3 amperes, 4⅞ inches shoulder to shoulder, held in place by nickeled phosphor bronze contact springs with four projections which bite into the fuse tips, and two adjustable saw-tooth metal discharge plates normally placed .005 inch from the carbon ground. Weight 3¾ pounds. Size, 8¾x4⅛x2¾ inches.



No. 997B. Open.

No. 991

A large carbon block air gap protector to be 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 arresters. Consists of two No. 3 Blow-Rite tubular wood fuses, 3 amperes, 4⅞ inches shoulder to shoulder, held in place by goose neck contacts with phosphor bronze tension springs and four No. P376 large carbon blocks with two No. P375 "U" shaped mica dielectrics. Weight 1¾ pounds. Size 7¾x2⅞x1¾ inches.



No. 991.

Note

In ordering be sure and specify if arresters are to be furnished with or without covers; orders not specifying will be furnished with covers.

Exterior Type

No. 1



No. 1

This is an individual arrester designed for one pair of wires and for exterior work only. Is mounted on a galvanized iron bracket, has a strong porcelain base, heavy clips and galvanized can cover, held securely by a spring. All connections are accessible without removal of carbons. The carbons are large and are treated by our special process to make them practically self-cleaning. The carbons are separated at the top by a thin celluloid, and at the bottom are held ⅛ inch apart by glass studs, which forms a wedge-shaped air space. There is also an air space under the carbons, as they are held above the floor of the porcelain. These air spaces form the best known mechanical design for self-cleaning. This arrester, having three carbons grouped together as a unit, provides for discharges from one terminal to either of the others without having to pass through two gaps. Shipping weight, 1½ pounds each.

No. 3



No. 3

Designed especially for toll line use on the pole or outside of buildings. Cover is held in place under spring tension; line and ground connections are of the old-time and well tried lock-nut type, making an efficient and durable arrester for use in exposed places. Shipping weight, 1¼ pounds each.

ARRESTERS

Exterior Type

No. 5



No. 5.

This is a multiple type arrester of 10 line capacity, designed for outdoor or indoor use. This arrester has a heavy porcelain base, mounted on a strong galvanized bracket, and a galvanized metal cover securely held by a spring. Cast iron cover and metal discharge surfaces recommended for exterior installation. The carbon blocks, strips and dielectrics are set up vertically on the porcelain base with ample air space underneath. Carbons are of our standard type, same as used on nearly all forms of protective equipment. All connections to this arrester are accessible. Shipping weight, 1 pound each.

No. 202



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 case to protect them from the weather and from sharpshooters and rock throwers. The arresters should be mounted on the cross-arm 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. Weight, 5½ pounds. Size 7x2⅝x5¼ inches.

No. 402



No. 402.

The No. 402 Arrester is usually mounted on the pole or outside of building. Its use has been steadily increasing during the last eight years as the importance of keeping lightning out of doors is brought home to the operating man. Large discharge area is of maximum importance in arresters of this character and we fit the No. 402 with specially treated carbon blocks 1½ inches long and ⅜ inch wide. The carbons are mounted on a heavy porcelain base 3 inches in diameter and are held in place by wide, heavy retaining springs. The wire terminals are a unique feature. We have omitted the conventional screw and nut binding post, and equipped the arresters with heavy square posts with hollow shanks extending through the porcelain base. To attach wires it is only necessary to slip them into the posts from below and tighten the set screws. Heavy iron wire is easy to attach as light, soft copper. A close-fitting, galvanized iron cover extending two inches below the top of the porcelain base makes the arrester dust and weatherproof. Weight, 1 pound.

No. 700

The No. 700 Aerial Line Arrester is extensively used for protecting toll line and farmer line telephones, especially at isolated stations. Its efficiency has been proven by seven years' service. A carbon rod, with a Fahnestock clip bolted to one end for attaching the ground wire, is insulated from the brass shell, which is suspended from the line wire by means of two Fahnestock clips. Net weight, 6 ounces. Length, 6 inches.



No. 700.

Knife Switch Type

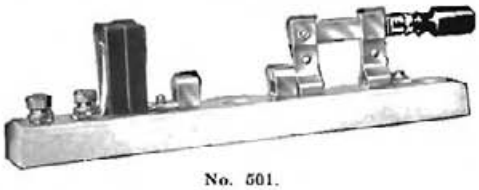
The Combination Baby-Knife Switch and Arresters shown on the following page eliminate the necessity of installing two separate pieces of apparatus to accomplish the desired results. The Knife Switches are of heavy copper, nickel-plated, with phosphor-bronze spring washers under the hinge post rivet heads to insure good contact in the talking circuit. The large carbon blocks and the mica fuses afford ample protection from lightning and high tension circuits. The heavy glazed porcelain base and high polished, nickel-plated metal parts give the arresters a very attractive appearance.

On long telephone lines, especially where a large number of telephones are installed on the same line, these combination arresters are indispensable. The opening of switches at the various stations

ARRESTERS

Knife Switch Type

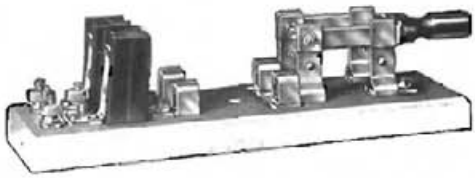
enables the maintainer to locate trouble without the expense of going over the entire line. Opening switches during electrical storms prevents burning out fuses with consequent loss of service and troublesome replacement of fuses.



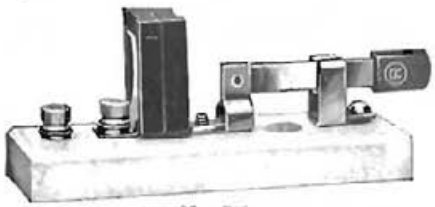
No. 501.

Single pole. Size 8x1½x2¼ inches. Weight, ¾ lb. each. Equipped with P-52 Carbons, P53 Mica Dielectric; uses No. 19 Mica Fuse. Price does not include fuses.

Double Pole. Size 8x3x2¼ inches. Weight 1¾ lbs. each. Equipped with P-52 Carbons, P-53 Mica Dielectrics; uses No. 19 Mica Fuse. Price does not include fuses.



No. 500.



No. 511.

Single Pole. Size 6¼x1½x2¼. Weight ¾ lb. Equipped with P-52 Carbons and P-53 Mica Dielectrics; no fuses needed.

Double Pole. Size 4½x3½x2. Equipped with P-268 Carbons and P-56 Carbons and P-57 Varnished Cambric Dielectrics. Weight ¾ lb.



No. 406.

Copper and Carbon Discharge Block

No. 495



No. 495.

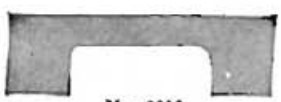
It is designed to replace the line carbon and dielectric in existing and in new cable terminals, switchboard protectors and telephone arresters.

Its use will eliminate all interruptions to telephone service caused by grounds at the lightning arrester. Only one block is necessary for each wire. The carbon ground block of the arrester should be retained.

Cut shows No. 495 self cleaning discharge block with carbon ground block ready for insertion in the lightning arrester. Carbon ground blocks of various shapes and thicknesses adopt the discharge block with any lightning arrester which uses a ⅜x1¼ inch carbon or copper block.



No. 2091.



No. 2090.

Celluloid Dielectrics

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. The U shaped dielectric is furnished by us as standard on all Cook equipment shown in this catalogue.



No. 2081.



No. 2080.

Carbon Lightning Arrester Block

All Cook carbon arrester blocks are specially treated under our 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.

ARMS — CROSS



CROSS ARM SPECIFICATIONS:

McCormick Fir: Yellow Douglas Fir; straight grained; 75 per cent heart, free from rot, rotten or unsound knots, shakes, worm holes or excessive wane, pitch-pockets or checks or sound knots larger than one inch in diameter.

Select Common Fir: Sound Timber, well machined; free from loose or unsound knots; free from any knots over one and one-half inch diameter, pitch-pockets over twelve inches long, loose heart, rot or worm holes.

Mississippi Yellow Pine: Genuine Mississippi Longleaf Yellow Pine, guaranteed every arm at least 75 per cent Heart (or all Heart, if so specified), and free from defects, except small, sound knots, not over one inch in diameter, measurement to be made at right angles to the longitudinal axis of the knot.

Standard Grade Yellow Pine: Free from loose or unsound knots, or other defects which would injure the arm. Painted red or dipped in hot creosote oil.

N. E. L. A. Specifications are same as specifications on McCormick Fir and 75 per cent heart Mississippi Yellow Pine.

Minimum Carload Weight: Fir, 42,500 pounds (cars must be loaded to full visible capacity). Yellow Pine, 34,000 pounds.

Arms of standard size and lengths but with special borings furnished at same price as regular Arm from either warehouses or factories. Arms not of standard length will be furnished from warehouses at price of next longer standard. Standard lengths from warehouse stocks are 3, 4, 5, 6, 8 and 10 foot in all sizes except 2¾x3¾ on which standard lengths are those shown on this sheet.

Special Arms can be furnished from warehouses in the following sizes:

From Chicago, Fir and 75 per cent or all Heart Yellow Pine: 2¾x3¾, 3x4¼, 3¼x4¼, 3½x4½, 3¾x4¾ and 4x5.

From Kansas City, Fir only: 2¾x3¾, 3x4¼, 3¼x4¼ and 3½x4½.

From Minnesota Transfer, Fir only: 2¾x3¾, 3x4¼, 3¼x4¼, 3½x4½, 3¾x4¾ and 4x5.

Arms of other sizes can be shipped from factories in carloads with other material to warehouses and reshipped to destination.

McCORMICK FIR OR LONG LEAF YELLOW PINE CROSS ARMS

SPACINGS			BRACE	Weight	SIZE AND LENGTH
Center	Sides	Ends			
Electric Light Arms					3¼x4¼
28	....	4	25	1020	3 foot 2 pin
16	12	4	28	1360	4 foot 4 pin
18	17	4	28	1700	5 foot 4 pin
22	21	4	32	2040	6 foot 4 pin
16	12	4	32	2040	6 foot 6 pin
30	14½	4	32	2720	8 foot 6 pin
16	12	4	38	2720	8 foot 8 pin
16	9¾	4	32	2890	8½ foot 10 pin
17½	15¾	4	42	3400	10 foot 8 pin
16	12	4	42	3400	10 foot 10 pin
16	9⅝	3⅞	42	3400	10 foot 12 pin
N. E. L. A. Arms					3½x4½
30	....	4	28	1267	3 foot 2 inch 2 pin
30	14½	4	38	2233	5 foot 7 inch 4 pin
30	14½	4	38	3200	8 foot 6 pin
30	12	4	38	3667	9 foot 2 inch 8 pin

SPACINGS			BRACE	Weight	SIZE AND LENGTH
Center	Sides	Ends			
Railroad Arms					3x4¼
22	21	4	32	1920	6 foot 4 pin
16	12	4	32	1920	6 foot 6 pin
18	17½	4	32	2560	8 foot 6 pin
16	12	4	32	2560	8 foot 8 pin
17½	15¾	4	42	3200	10 foot 8 pin
16	12	4	42	3200	10 foot 10 pin
Telephone Arms					2¾x3¾
18	....	3	....	500	24 inch 2 pin
24	....	3	....	625	30 inch 2 pin
30	....	3	25	750	36 inch 2 pin
16	10	3	28	875	42 inch 4 pin
16	10	3	28	1300	62 inch 6 pin
16	10	3	28	1700	82 inch 8 pin
16	10	3	28	2125	102 inch 10 pin
16	9⅝	3⅞	28	2500	120 inch 12 pin

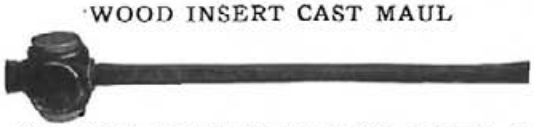
ANCHORS

The Never-Creep Anchor

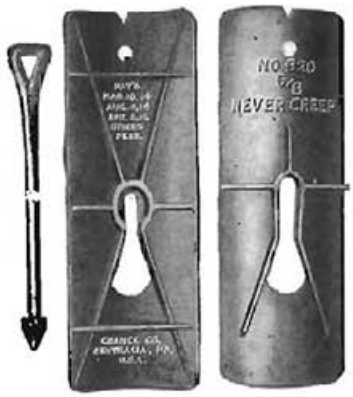
NEVER-CREEP INSTALLING BAR



WOOD INSERT CAST MAUL



These mauls are built for heavy duty and have two wooden and two iron faces. The wooden faces are replaceable.



Never-Creep Anchor Rod and Plate

Never-Creep anchor is very powerful because it actually bolts through solid earth, and it is not necessary to fill the hole to secure the holding power. The rods are formed with drop forge heads and eyes. The plates are made of malleable iron. To install the anchor simply bore the hole, drive the rod and hang on the plate. In ordering give the number of the plate and the length of the rod desired. If plates or rods are wanted separately always state, **plates only** or **rods only**, as the case may be. Don't use the word anchor unless you mean the complete rod and plate.

We recommend the following sizes for the various strains:

For 3,000-lb. strand, use No. 615⅝x6.

For 4,000 to 6,000-lb. strand, use No. 620⅝x6.

For 8,000-lb. strand, use No. 820⅝x6.

For 10,000-lb. strand, use No. 825¾x6 or 7.

For 12,000 to 16,000-lb. strand, use No. 830¾x7.

For heavier strand, use No. 735¾ or 1040-1.

Holding power can be doubled by using two anchors in a "Y" installation.

NEVER-CREEP ANCHORS

No.	Size of Plate	Size of Rod	Weight	No.	Size of Plate	Size of Rod	Weight
510½	5x10 in.	½x5 ft.	7 lbs.	825¾	8x25 in.	¾x6 ft.	26 lbs.
510½	5x10 in.	½x6 ft.	8 lbs.	825¾	8x25 in.	¾x7 ft.	27 lbs.
615½	6x15 in.	½x5 ft.	10 lbs.	825¾	8x25 in.	¾x8 ft.	29 lbs.
615½	6x15 in.	½x6 ft.	11 lbs.	830¾	8x30 in.	¾x6 ft.	32 lbs.
615⅝	6x15 in.	⅝x6 ft.	14 lbs.	830¾	8x30 in.	¾x7 ft.	33 lbs.
620⅝	6x20 in.	⅝x6 ft.	16 lbs.	830¾	8x30 in.	¾x8 ft.	35 lbs.
620⅝	6x20 in.	⅝x7 ft.	17 lbs.	835¾	8x35 in.	¾x6 ft.	38 lbs.
820⅜	8x20 in.	⅝x6 ft.	20 lbs.	835¾	8x35 in.	¾x7 ft.	39 lbs.
820⅝	8x20 in.	⅝x7 ft.	21 lbs.	835¾	8x35 in.	¾x8 ft.	41 lbs.
820¾	8x20 in.	¾x6 ft.	23 lbs.	1040-1	10x40 in.	1x7 ft.	63 lbs.
820¾	8x20 in.	¾x7 ft.	24 lbs.	1040-1	10x40 in.	1x8 ft.	65 lbs.

Drive and Twist Anchors



Drive and twist anchors are so well known that very little mention is necessary. A maul is all that is needed for their installation. They are driven into the ground and by simply twisting the wings are opened and the anchor made secure.

Trade No.	Span of Blades	Diam. of Rod	Weight	Length of Rod
1	8 in.	¾ in.	8 lbs.	4 ft.
2	10 in.	⅞ in.	12 lbs.	5 ft.
3	12 in.	⅞ in.	15 lbs.	6 ft.

ANCHORS

Scrulix



Scrulix

The name SCRULIX is a coined trade name which has been registered in the United States Patent Office and Canada. It is a protection to you and to us against "The Just-as-Goods." If you don't find SCRULIX on the anchor head, don't accept the anchors.

General—The 6, 7 and 8-inch Matthews Scrulix Anchors will be furnished with Matthews Armco Rods.

There has been no change in the wrench or ratchet handle except to make them stronger. If you have a 567 wrench it can be used on them.

All anchors are 6 feet long over all. A number 567 wrench must be used with all anchors smaller than 800; no wrench is needed for the 800, 1000 and 1200 anchors.

Note.—The 765 ratchet handle is for use with the 567 wrench, and is very useful where it is desirable to screw the anchors down next to walls, fences, etc.

Mfrs. No.	Diameter of Anchor	Weight per 100	Size of Rods	Mfrs. No.	Diameter of Anchor	Weight per 100	Size of Rods
612R	6 in.	750	⅝ in. round	800	8 in.	3700	1⅛ in. square
758R	7 in.	1200	⅝ in. round	1000	10 in.	5700	1¼ in. square
858R	8 in.	1500	⅝ in. round	1200	12 in.	7900	1½ in. square
567	Wrench	2900					
765	Ratchet	850					
1332	Above Comb.	3750					

Everstick

Two-Way Anchors, Without Rods



Two-Way, Closed



Two-Way, Expanded

Note: Standard anchor rod used with Everstick anchors.

Four-Way Anchors, Without Rods



Four-Way Anchor, Closed



Four-Way Anchor, Expanded

Size Inches	Weight Pounds	Size, In. Anchor Expanded	Sq. In. of Holding Surface	Size Inches	Weight Pounds	Size, In. Anchor Expanded	Sq. In. of Holding Surface
5	4	5x 9	45	6	10½	11x11	121
6	7½	6x11	66	8	18½	15x15	225
8	13½	8x15	120	10	31	19x19	361

BATTERY BOXES



No. 2

Battery Boxes are for use with desk or hotel types of local telephones, intercommunicating telephones, electric bell installations or wherever dry cell batteries are used. They are inexpensive, save batteries and store them neatly and conveniently where they can be readily inspected.

The Battery Box is neat and attractive in appearance and does not have to be concealed or consigned to the basement or to a dark corner. It can be hung on a hook or nail on the wall or alongside a desk; set on a shelf, on the floor or wherever it is needed, and can be readily taken down to inspect or renew the batteries.

Protect the Batteries! Keep them free from dust and dirt and prevent broken connections.

They hold two or three standard size (No. 6) Dry Cells. The box is made of sheet steel, finished in black Japan, and is lined throughout with heavy insulating fibre which protects the sides of the box and the edges of the holes. Has holes at top and bottom for leading in wires. The cover is attached to the box by a nickel plated chain.

BATTERIES

Dry



French



French Ignitor



Oval



Ignitor



Gray Label

French Ignition Dry Batteries are high in amperage and are particularly adapted to ignition and other heavy duty work. They are recommended for use with pole-changers. Size 2½x6 inches. Weight 2¼ lbs.

French No. 44 Batteries are small, light batteries designed for telephone test instruments. Size 1¼x4 inches. Weight 12 ounces.

French Telephone Dry Batteries are made for telephone service exclusively and by actual service they have demonstrated their long lasting qualities. These batteries are made with an internal protective coating which reduces shelf deterioration to a minimum. This feature makes these batteries especially serviceable in telephone work. The initial amperage is low, there is practically no action when they are idle, and their life in service is exceedingly long. Size 2½x6 inches. Weight 2¼ lbs.

Gray Label Columbia is a medium low current, long life cell designed especially for telephone service, door bells and any other low current drain service. Initial amperage, 18 to 22 amp.

Columbia Ignitor is supreme among dry batteries. It was the first cell designed especially for ignition and heavy duty. Shipping amper ge of Ignitor is about 32 amperes.

Oval No. 4 is a small battery designed for telephone testing instruments. It only weighs 11¼ ounces and can be carried in the pocket. The size is 1¼x4 inches.



Gravity Battery Complete

BATTERIES

Gravity

Gravity batteries 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. They should not be recommended for telephone use.

BATTERIES

Edison Primary Batteries



"BSCO" Type 403

There are many types and capacities of Edison Primary Batteries, but we have selected the sizes most suitable for telephone work and recommend the Types No. 403 and No. 502.

The number 403 is provided with a porcelain container and has 400 ampere hours capacity.

The number 502 is provided with a rectangular heat resisting glass jar and is rated at 500 ampere hours.

These types are adaptable to Railway signal work. Train dispatchers talking and ringing circuits, supervisory lamps, Private Branch Exchanges, telephone switchboard, intercommunicating telephones and fire alarms.

The type "RR" cell is now obsolete, but renewals will still be furnished. By using the 400 type renewal and No. 403 cover and nuts they may be converted into type No. 403 cell with 400 ampere hour capacity.



LOUD RINGING BELLS

Loud Ringing Polarized Extension Bells

These bells, while primarily intended for telephone work, are equally well adapted for use as call systems in factories, schools, and mines. The cases are of stamped steel heavily enameled; the coils are treated with insulating varnish, and the bells are to all intents and purposes waterproof and suitable for installation in exposed places.

They are equipped with 6-inch gongs and a special polarized ringer movement, operating on any alternating current telephone generator or commercial alternating current of 110 or 220 volts at 60 cycles or less. Nickel plated gongs.

Furnished for either common battery or magneto telephone systems.

List No.	Resistance	List No.	Resistance
200-010	80 ohms, no Condenser	200-032	2500 ohms, no Condenser
200-018	500 ohms, no Condenser	200-040	2 M. F. Condenser
200-020	1000 ohms, no Condenser	200-042	4 M. F. Condenser
200-025	1600 ohms, no Condenser	200-044	Biasing Attachment
200-030	2000 ohms, no Condenser		



VIBRATING BELLS

FARADAY VIBRATING BELLS

Nickel plated gong operating on 2 dry cells.

Enclosed type Faraday signal gongs are far superior to the ordinary bell and are recommended for installations exposed to dust, dampness or mechanical injury.

Model A-4. Size of gongs, 4 inches.
Model A-3. Size of gongs, 3 inches.

Bells and Buzzers

These Iron Box Bells and Buzzers are built on a different principle than other box bells in that they have a plunger hammer. They are specially built for operation from two dry cells or from the 6-volt secondary circuit of a bell ringing transformer. The mechanism needs no adjustment, due to the free action of the armature, and the bell will operate perfectly on one, two or three dry batteries. The mechanism is rustproof, being entirely copperized, and the case is dust and bugproof. Our Iron Box Bells are guaranteed to be superior in appearance, operation and durability to any other iron box bell manufactured. Standard windings two ohms resistance.



No. 27

Code No	Size Gong	Weight
27 B Bell	3½ inches	10 oz.
27 BB Bell	3 inches	12 oz.
28 B Buzzer	None	8 oz.



No. 28B

BOLTS

The rolled type of bolt thread occupies a rather peculiar position in that, notwithstanding that over 90 per cent of the bolts, cross arm, double arming and carriage, used in the construction of pole lines are of the rolled thread type, the advantages of the rolled thread have not been publicly proclaimed and no thorough comparison of rolled and cut threads has appeared in the technical press.

Bolts are threaded by either cutting or rolling, and the shapes of the threads are exactly alike, whichever process is followed. In cutting, a rod of the same diameter as the finished thread is used, and the metal is cut away to form a continuous groove, which, of course, weakens the threaded end of the bolt. If, however, the thread is to be rolled, a rod of slightly smaller diameter must be used because the metal, instead of being cut away, is rolled or spun up into the grooves of two flat, grooved dies to form the thread, the diameter of the rod before rolling being about half way between the diameters at the top and at the bottom of the finished thread. In other words, the thread is formed by the displacement of the metal, some part of which is forced up to form the top of the thread.

Tests show that when a cut thread ⅝ inch through bolt is subjected to tensile stress, it always breaks in the thread, where its smallest diameter is about ½ inch, which is natural, as this is its point of smallest cross-section. But when a rolled thread ⅝ inch through bolt is pulled apart, it breaks in the shank or unthreaded portion, 19/32 inch in diameter, and does so at a load which averages 13 per cent. greater than the breaking strength of cut thread bolts. Why doesn't the rolled bolt break at the bottom of its thread like the cut bolt? Because this, the smallest part of the bolt, is strengthened, instead of weakened by the rolling process. The result is the same as that of cold rolling steel shafting, or hammering a steel bar; that is, it greatly increases the strength and improves the surface finish of the threads.

Rolled threads are more uniform and smoother than cut threads. On account of rolling the full length of the thread at one time, instead of starting at one end of the bolt, as is done in cutting the thread, a nut will not fit loose on the end and tight on the rest of the rolled thread, which it will do on most cut thread bolts, due to the cutting dies opening slightly after the bolt enters them.

Rolled thread bolts have been adopted as standard by Independent telephone companies, the American Telephone and Telegraph Company, The Western Union Telegraph Company, the Postal Telegraph Cable Company and most of the large users of pole line hardware in the central station field.

For attachment of cross arms, machine or "through bolts" ⅝ and ¾ inch diameter, and from 8 to 24 inches in length are used. They are made of steel having a tensile strength of 55,000 to 65,000 pounds per square inch. Bolts from 8 to 12 inches long have 4 inches of thread, and all longer bolts have 6 inches of thread.

These long threads reduce the number of different length bolts it is necessary to carry in stock and on the construction wagon.

They have, unless otherwise specified, rolled threads, which, as explained above, are stronger than cut threads. They are galvanized by the hot-dip process, and the coating on the threads as well as the shanks is guaranteed to stand the four-immersion test. Ordinary machine bolts, not especially made for pole line work, have threads which are either cut or recut after galvanizing, which destroys the protective coating on the most important part of the bolt.

Carriage or Brace Bolts



Standard carriage bolts are used for attaching the braces to cross arms on most overhead lines. It is customary to order bolts ¼ inch longer than the thickness of the cross arm or a bolt ⅜x4 inches should be used in connection with a 3¼x4¼-inch cross arm. The ⅜-inch carriage bolts used for this purpose are supplied with 1¼-inch thread. Length measured from inside of head to tip.

Size	Weight per 100	Size	Weight per 100	Size	Weight per 100
⅜x3	13	⅜x4½	18	½x4½	33
⅜x3½	15	⅜x5	19	½x5	36
⅜x4	17	½x4	30	½x6	41

BOLTS

Double Arming or Spacing Bolts



Bolt includes four nuts but no washers. Bolts up to 12 inches have 4-inch thread on each end. Bolts longer than 12 inches have 6-inch thread on each end. Length is measured from tip to tip.

To determine the correct length in inches for a double arming or spacing bolt, take twice the thickness of the arm to be used plus the thickness of the pole top, less the depth of the gain, plus 1¼-inch to 1½-inch for washer and nut room. For example: A corner pole with an 8-inch top to be installed with double arms of 3¼x4¼-inch dimensions would take the following space:

Arms (2)	6½ inches
Pole, 8 inches, less 1 inch for gain	7 inches
Nut and washer space	1¼ inches
Use a 15-inch bolt.	14¾ inches total

Size	Wgt. per C	Size	Wgt. per C	Size	Wgt. per C	Size	Wgt. per C
½x12	86	½x22	123	⅝x18	171	¾x15	209
½x14	93	⅝x12	129	⅝x20	186	¾x16	219
½x15	96	⅝x14	143	⅝x22	200	¾x17	230
½x16	100	⅝x15	150	⅝x24	214	¾x18	240
½x18	107	⅝x16	157	¾x12	198	¾x20	261
½x20	115	⅝x17	164	¾x14	177	¾x22	282

Machine Bolts or Cross-Arm Through Bolts



All bolts 6 inches and shorter have 1½-inch threads.
All bolts 7 inches to 12 inches, inclusive, have 4-inch threads.
All bolts 13 inches and longer have 6-inch threads.

In order to determine the correct length in inches for a machine or cross arm through bolt it will be necessary to add the sum of the thickness of the cross arm and pole top and then allow about ¼ of an inch for washer and nut room. Length measured from inside of head to tip. **Furnished galvanized or plain.**

Machine Bolts or Cross-Arm Through Bolts

Size	Wgt. per C	Size	Wgt. Per C	Size	Wgt. Per C	Size	Wgt. Per C
⅜x 3	14	½x 8	53	⅝x10	102	⅝x24	214
⅜x 3½	15	½x 9	58	⅝x11	110	⅝x26	230
⅜x 4	16	½x10	64	⅝x12	118	¾x10	150
⅜x 4½	18	½x11	69	⅝x13	126	¾x11	162
⅜x 5	19	½x12	74	⅝x14	134	¾x12	173
⅜x 5½	22	½x13	80	⅝x15	142	¾x13	185
½x 4	32	½x14	85	⅝x16	150	¾x14	196
½x 4½	35	½x15	90	⅝x17	158	¾x15	208
½x 5	37	½x16	96	⅝x18	166	¾x16	219
½x 6	43	⅝x 8	86	⅝x20	182	¾x17	231
½x 7	48	⅝x 9	94	⅝x22	198	¾x18	242
						¾x20	265

Welded Eye Bolts



Bolts up to 12 inches long have 4-inch thread. Bolts longer than 12 inches have 6-inch thread. Length measured from center of eye to tip.

Size	Weight per 100	Size	Weight per 100	Size	Weight per 100
½x 6 in.	56 lbs.	½x20 in.	144 lbs.	⅝x20 in.	227 lbs.
½x 8 in.	69 lbs.	⅝x 8 in.	113 lbs.	¾x10 in.	205 lbs.
½x10 in.	82 lbs.	⅝x10 in.	132 lbs.	¾x12 in.	233 lbs.
½x12 in.	95 lbs.	⅝x12 in.	151 lbs.	¾x14 in.	260 lbs.
½x14 in.	107 lbs.	⅝x14 in.	170 lbs.	¾x16 in.	287 lbs.
½x16 in.	119 lbs.	⅝x16 in.	189 lbs.	¾x18 in.	314 lbs.
½x18 in.	132 lbs.	⅝x18 in.	208 lbs.	¾x20 in.	341 lbs.

CROSS ARM BRACES

Back Braces

No part of line construction is more slighted, nor less considered, than the terminals. Everywhere you go you see the effect of poorly constructed terminals. Wires dead-ended on pins exert a heavy twisting strain on the arms; the result is a bent arm soon to be split and broken. Back Trusses are installed in one-fourth the time required for back brace and are much stronger. The end castings of the truss clamp over the end of the arm and are bolted in place before arm is raised. The truss rod is passed through the end castings, dropped into the pole clamp and the nuts tightened. The Back Truss holds the arm perfectly straight and rigid and it takes the line strain off the arm. Additional tension can be given the arm at any time by tightening the nuts of the truss rod. Each set consists of two end pieces, two piece pole clamp, and rod with nut and washers. All material is galvanized by the hot process



Length of Arm	Weight	Length of Arm	Weight
42 in.	5 lbs.	82 in.	8½ lbs.
48 in.	5½ lbs.	96 in.	9½ lbs.
62 in.	6½ lbs.	102 in.	10 lbs.
72 in.	7½ lbs.	120 in.	11½ lbs.

Flat Cross Arm Braces



The standard arrangement for bolt holes in flat cross arm braces is $\frac{5}{8}$ and $\frac{7}{8}$ inch hole drilled one inch from each end. This arrangement is standard with many large Independent companies, Postal Telegraph, Western Union and Bell Companies and willbe furnished on all orders unless otherwise specified, although special arrangement of holes can be furnished when desired. These braces are put up in bundles of twenty (20) to the bundle and are furnished in hot galvanized or plain.

Size inches	Weight per 1000	Size inches	Weight per 1000	Size inches	Weight per 1000
1x$\frac{7}{16}$x20	1000 lbs.	1$\frac{7}{16}$x$\frac{5}{16}$x24	1700 lbs.	1¼x¼x22	1835 lbs.
1x$\frac{7}{16}$x22	1100 lbs.	1$\frac{7}{16}$x$\frac{7}{16}$x26	1840 lbs.	1¼x¼x24	2000 lbs.
1x$\frac{7}{16}$x24	1200 lbs.	1$\frac{7}{16}$x$\frac{7}{16}$x28	1980 lbs.	1¼x¼x26	2165 lbs.
1$\frac{7}{16}$x$\frac{5}{16}$x20	1420 lbs.	1$\frac{7}{16}$x$\frac{7}{16}$x30	2120 lbs.	1¼x¼x28	2335 lbs.
1$\frac{7}{16}$x$\frac{7}{16}$x22	1560 lbs.	1¼x¼x20	1670 lbs.	1¼x¼x30	2500 lbs.

Cross Arm Back Braces

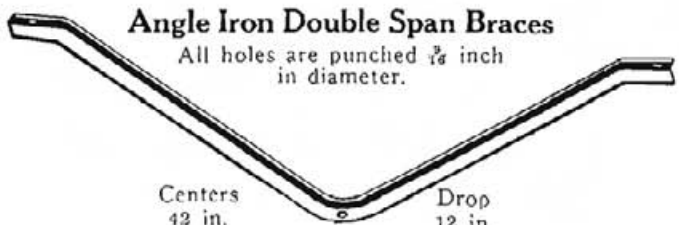


Back braces are used for bracing cross arms at corners and terminal poles or any place subjected to heavy strain. They are made of flat and angle open hearth steel, fastened to the cross arm by ½ inch carriage bolts and to the pole by ⅝ inch through bolts. They support the arms making them rigid and can often be used to eliminate double arming.

Size	Description of Material	Weight lbs. per 100
1½x ⅜x6 ft.	Flat	1150
1½x1½x$\frac{3}{16}$x5 ft.	Angle	900
1½x1½x$\frac{3}{16}$x6 ft.	Angle	1100
1¾x1¾x$\frac{3}{16}$x9 ft. 3 in.	Angle	1935

Angle Iron Double Span Braces

All holes are punched $\frac{3}{8}$ inch in diameter.



Size	Centers	Drop	Weight Lbs. Per 100
1½x1½x$\frac{3}{16}$ in.	42 in.	12 in.	780
1½x1½x$\frac{3}{16}$ in.	48 in.	14 in.	890
1½x1½x$\frac{3}{16}$ in.	60 in.	18 in.	1110
1¾x1¾x$\frac{3}{16}$ in.	66 in.	20 in.	1220
1¾x1¾x$\frac{3}{16}$ in.	72 in.	22 in.	1330

CROSS ARM BRACES

In order that the proper length of cross arm braces may be specified on all orders we have prepared the following table. It is not desirable to use braces of such short length that the altitude of the triangle formed by the pole, brace and arm, is shorter than the base, but the greater the altitude the better. It is better to use the maximum length in preference to the minimum.

Size of cross arm	Distance between brace holes	Length of braces where cross arms are spaced on 18 in. centers		Length of braces where cross arms are spaced on 24 in. centers	
		Minimum	Maximum	Minimum	Maximum
3¼x4¼x3 ft.	25 in.	20 in.	20 in.	20 in.	22 in.
3¼x4¼x4 ft.	28 in.	20 in.	22 in.	20 in.	26 in.
3¼x4¼x5 ft.	26 in.	20 in.	22 in.	20 in.	26 in.
3¼x4¼x6 ft.	32 in.	22 in.	24 in.	24 in.	28 in.
3¼x4¼x8 ft.	32 in.	22 in.	24 in.	24 in.	28 in.
3¼x4¼x8 ft. 6 in.	32 in.	22 in.	24 in.	24 in.	28 in.
3¼x4¼x10 in.	42 in.	26 in.	26 in.	28 in.	32 in.
2¾x3¾x24 in.	No holes provided				
2¾x3¾x30 in.	No holes provided				
2¾x3¾x36 in.	25 in.	20 in	20 in.	20 in.	22 in.
2¾x3¾x42 in.	28 in.	20 in.	22 in.	20 in.	24 in.
2¾x3¾x62 in.	28 in.	20 in.	22 in.	20 in.	24 in.
2¾x3¾x 82 in.	28 in.	20 in.	22 in.	20 in.	24 in.
2¾x3¾x102 in.	28 in.	20 in.	22 in.	20 in.	24 in.
2¾x3¾x120 in.	28 in.	20 in.	22 in.	20 in.	24 in.

Angle Iron Vertical Braces



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 ⅞-inch bolt holes.

Size Stock	Number of Arms	Spacing of Arms	Weight Per 100	Size Stock	Number of Arms	Spacing of Arms	Weight Per 100
1½x1½x⅛ in.	2	18	210	1½x1½x3/16 in.	2	24	402
1½x1½x⅛ in.	3	18	410	1½x1½x⅜ in.	3	24	763
1½x1½x⅛ in.	4	18	610	1½x1½x¼ in.	4	24	1122
1½x1½x3/16 in.	2	18	315	1¾x1¾x3/16 in.	2	24	495
1½x1½x¼ in.	3	18	525	1¾x1¾x¼ in.	3	24	935
1½x1½x¼ in.	4	18	870	1¾x1¾x¼ in.	4	24	1373

Angle Iron Alley Arm Braces With Forged Ends and Steps



Alley or side arm braces made of forged steel angles are used extensively on distributing lines in alleys. They fasten by lag screws to the street side of the pole and by carriage bolt on the side of cross arm. Where more than one arm is used an angle vertical brace is used in connection with this one. They are punched with ⅞-inch holes, one for attaching to cross arms, and two for attaching to the pole.

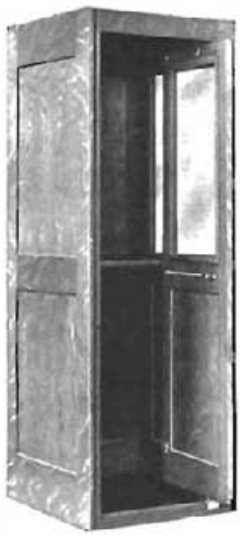
These braces cover the best modern practice, but prices will be quoted on any special type or size of brace upon receipt of drawings. Galvanized by the hot process.

Size	Weight Per C	Size	Weight Per C
1½x1½x⅛x5	750 lbs.	1½x1½x⅜x 7	1430 lbs.
1½x1½x3/16x5	1050 lbs.	1¾x1¾x⅜x 7	1725 lbs.
1½x1½x⅜x6	1240 lbs.	2 x2 x¼x10	3600 lbs.

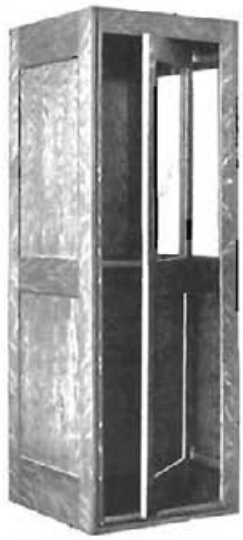
BOOTHS—TELEPHONE

Portable—Unit Type

No. 3-S Sliding Door Type



Open View



Door Partly Open



Closed View

These telephone booths are durably constructed, spacious and of neat appearance. They are manufactured from genuine kiln-dried selected grade of plain white oak thoroughly seasoned having glass panel in door and right side. The door fastens securely making the booth as near sound-proof as possible and operates smoothly and noiselessly without binding or excessive play and requires very little space in the booth leaving practically full space for occupant. All booths are shipped "knocked down" and are packed and crated in such a manner that they will reach destination without breakage. All parts are interchangeable, and are easily assembled. Standard finish is golden oak but can be furnished in birch mahogany, if desired.

Dimensions	Inside	Outside
Height	80½ inches.	83½ inches.
Width	27 inches.	28½ inches.
Depth	27½ inches.	29½ inches.

Shipping weight 300 lbs.

Door opening 22 inches.

No. 3-F Folding Door Type



Open View



Door Folds Compactly



Closed View

BOOTHS—TELEPHONE

Portable—Unit Type

No. 3-F Folding Door Type

These telephone booths are durably constructed, spacious and of neat appearance. The front frame and door are of heavy quarter-sawed white oak thoroughly seasoned, having glass panel in door and right side. The door fastens securely, making the booth as near sound-proof as possible. It also operates smoothly and noiselessly without binding or excessive play and requires very little space in the booth leaving practically full space for occupant. These booths are shipped "knocked down" and are packed and crated in such a manner that they will reach destination without breakage. All parts are interchangeable and are easily assembled. Standard finish is golden oak and can be furnished in birch mahogany if desired.

	Dimensions	
	Inside	Outside
Height	80½ inches.	83½ inches.
Width	27 inches.	28½ inches.
Depth	27 inches.	29½ inches.

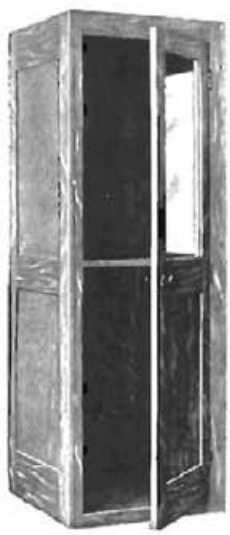
Shipping weight 300 lbs.

Door opening 22 inches.

No. 3-H Hinged Door Type



Open View



Door Partly Open



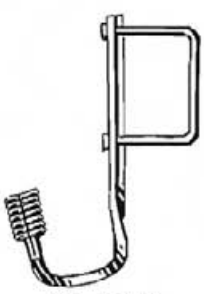
Closed View

These telephone booths are durably constructed, spacious and of neat appearance. They are manufactured from genuine kiln-dried selected grade of plain white oak thoroughly seasoned having glass panel in door and right side. The door fastens securely making the booth as near sound-proof as possible. All booths are shipped "knocked down" and are packed and crated in such a manner that they will reach destination without breaking. All parts are interchangeable and are easily assembled. Standard finish is golden oak but can be furnished in birch mahogany if desired.

	Dimensions	
	Inside	Outside
Height	80½ inches.	83½ inches.
Width	27 inches.	28½ inches.
Depth	27½ inches.	29½ inches.

Shipping weight, 300 lbs.

Door opening, 22 inches.



Nos. 110-18
111-19



No. 145-5



No. 150-6



Nos.
234-40
235-41



No. 237-20



No. 437-21



No. 227-22

BRACKETS

(Galvanized)

Specifications

Mfrs. No.	Wire Spacing	Extension	Size Channel	Mtg. Holes	Standard Bundle	Wt. per 100
Wall Brackets						
145-5	.....	3½"	¾"	⅜"	25	56
Corner Bracket						
150-6	.....	3½"	¾"	⅜"	25	74
Vertical Brackets						
234-40	8	3½"	¾"	⅜"	25	90
235-41	12	3½"	¾"	⅜"	25	110
236-42	10	3½"	1"	⅜"	25	143
Transposition and Cross Arm Brackets						
110-18	.....	3½"	¾"	⅜ U bolt	25	108
111-19	.....	3½"	1"	⅜ U bolt	25	170
237-20	10	3 "	¾"	⅜ U bolt	20	201
437-21	6½x10	3 "	¾"	⅜ U bolt	10	400
227-22	8	.....	¾"	⅜ U bolt	20	195

Brackets shown with "U" bolts are furnished with bolts bent for 3¼"x4¼" cross arms unless otherwise specified, but can be furnished to fit any standard cross arm.

The No. 237-20 affords sufficient pin room for one metallic circuit, and the No. 437-21 pin room for two metallic circuits.

Distributing Brackets

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 1¾x¾ inch channel, while a ⅜ inch bolt is provided for mounting.

Mfrs. No.	No. Knobs	Over all Lengths	Mounting Holes	Wt. per 100
2900-73	4	10	⅜ in.	225 lbs.
2901-74	6	13	⅜ in.	300 lbs.
2902-75	8	16	⅜ in.	475 lbs.



No. 2901-74

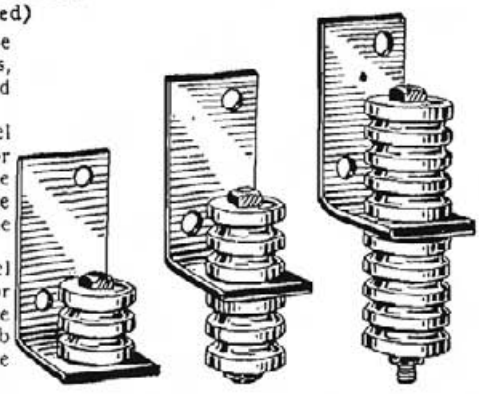
House and Pole

(Galvanized)

This cut illustrates manner in which these brackets are usually assembled, although Brackets, Bolts and Porcelain Knobs are always shipped unassembled.

House Brackets are made from ⅛x1¾ inch steel with three holes ⅜-inch diameter provided for mounting to wall. A ⅜x2-inch machine or stove bolt is used for mounting one Double Groove Knob or a ⅜x3½-inch for mounting two Double Groove Knobs.

Pole Brackets are made from ¼x2-inch steel with two holes ⅜-inch diameter provided for mounting to pole. A ⅜x3-inch machine or stove bolt is used for mounting one Four Groove Knob or a ⅜x5½-inch for mounting two Four Groove Knobs.



BRACKETS

House and Pole

The pole bracket is secured to the pole by two ⅜x4-inch galvanized lag screws and the house bracket to the building by means of three 1½-inch, No. 16 galvanized wood screws, and we recommend a round head screw for this purpose.

Two and four groove porcelain telephone knobs are used in connection with these brackets and may be found on Page 292.

For convenience we are listing below shipping weights of bolts and screws used in connection with above brackets and knobs.

Bolts and Brackets are always furnished hot galvanized. (Carried in stock.)



Terminal Bracket

	Weight per C
⅝x1¼, House Brackets	57 lbs.
¼x2, Pole Brackets	100 lbs.
1½ x No. 16 Galv. R. H. Wood Screws	2 lbs.
⅜x2" Galvanized Stove Bolts	6 lbs.
⅜x3½" Galvanized Stove Bolts	9 lbs.
½x3" Galvanized Stove Bolts	12 lbs.
½x5½" Galvanized Stove Bolts	19 lbs.
⅜x2" Galvanized Machine Bolts	7 lbs.
⅜x3½" Galvanized Machine Bolts	10 lbs.
½x3" Galvanized Machine Bolts	15 lbs.
½x5½" Galvanized Machine Bolts	22 lbs.

Terminal Brackets

These terminal brackets are for all kinds of dead-ending and terminal use. They are much stronger than wooden or U-shaped steel brackets. The insulator bolt locks in when it falls into position—no nuts to lose. This method or dead-ending is inexpensive and the only way to dead-end that will outlast the remainder of the line. The strain comes on the terminal bracket pulling from the center of the arm while the back truss supports and trusses the arm, giving it great rigidity. Each terminal bracket is furnished complete with bolt and two groove porcelain insulator. One bracket packed to the carton. Shipping weight, 12 oz. Brackets are hot galvanized.

CABLE

Paper Insulated Lead Encased Telephone
For Aerial and Underground Use



Following are the more common sizes of cable, upon which we are able to quote without factory information. Any number of pairs of any sized wire with any kind of insulation and lead sheath will be made to order. The following cable is double paper wrapped with pure lead sheath. Cable with a percentage of antimony in the sheath can be furnished with equal promptness and we recommend it wherever long lengths of cable are to be pulled underground, or 3% tin when procurable.

Ordinarily all telephone cable is made up of No. 22 B. & S. gauge copper wires with a double paper wrapping applied in reverse directions. The average electrostatic capacity of this cable is, 12 M. F. per mile, one wire being measured against the remaining wires grounded to the sheath.

No. Pair	Thickness of lead sheath	Outer diam.	Full reel lengths	Shipping wt. Per M ft.	No. Pair	Thickness of lead sheath	Outer diam.	Full reel lengths	Shipping wt. Per M ft.
5	1/32 in.	3/16 in.	2640 ft.	395 lbs.	150	1/8	1 3/32	1000	3980
5	64	3/16	2640	490	175	64	1 5/32	1000	3930
10	1/32	7/32	2640	565	175	1/8	1 1/2	1000	4290
10	64	3/16	2640	675	200	64	1 9/64	1000	4295
15	64	7/32	2640	810	200	1/8	1 5/32	1000	4675
20	64	3/16	2640	900	225	1/8	1 3/16	1000	4915
25	64	1/8	2640	960	250	1/8	1 1/4	500	5810
25	32	64	2640	1115	275	1/8	1 13/64	500	6050
50	64	32	2000	1500	300	1/8	1 5/16	500	6355
50	32	1/8	2000	1710	325	1/8	1 21/64	500	6690
75	32	1 32	2000	2115	350	1/8	2 3/32	500	6935
100	32	1 1/8	1500	2500	375	1/8	2 7/32	500	7175
100	64	1 5/32	1500	2775	400	1/8	2 5/16	500	7600
125	32	1 1/4	1000	3010	500	1/8	2 3/8	500	8770
125	64	1 3/16	1000	3315	600	1/8	2 7/16	500	9625
150	64	1 3/8	1000	3645					

CLIPS



Wire Rope Clip

Standard Malleable Iron Wire Rope Clips

Wire rope clips are used for light guying, some companies use a rope clip between the guy clamp and wire rope thimbles and also between the guy clamps and pole to prevent spreading at clamp.

Size	Weight Per 100
¼ inch, galvanized	16 lbs.
⅜ inch, galvanized	17 lbs.
½ inch, galvanized	27 lbs.
½ inch, galvanized	46 lbs.
⅝ inch, galvanized	70 lbs.
¾ inch, galvanized	100 lbs.

Genuine Crosby Drop Forged Wire Rope Clips

Size	Weight per 100
¼ inch, galvanized	25 lbs.
⅜ inch, galvanized	25 lbs.
⅜ inch, galvanized	57 lbs.
½ inch, galvanized	75 lbs.
⅝ inch, galvanized	87 lbs.
¾ inch, galvanized	175 lbs.
⅞ inch, galvanized	200 lbs.
1 inch, galvanized	300 lbs.

TEST CONNECTORS

20 Ampere



Actual Size
No. 27

20 Ampere



Actual Size
No. 13

10 Ampere



No. 2521

20 Ampere



Actual Size
No. 14 Insulated

35 Ampere



Actual Size
No. 21-A

No. 27, 28 and 2521 clips are primarily for telephone companies; No. 13 and 14 clips for electric light companies and No. 21-A for storage battery charging.

Numbers 27, 28, 21-A, 13, 14 and 2521 carried in Chicago stock.

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. 27 and No. 28 are used for test sets, voltmeters and by telephone linemen for various other purposes.

Code No.	Stock	Connections	Insulated or Bare	Spread of Jaws	Amperage	Per C Wgt.
27	Copper	Screw	Bare	⅛"	10	4 lbs.
28	Copper	Screw	Insulated	⅛"	10	5½ lbs.
13	Copper N. E.	Screw	Bare	¾"	20	5 lbs.
14	Copper N. F.	Screw	Insulated	¾"	20	6 lbs.
21-A	Lead P. Steel	Screw	Bare	1½"	35	15 lbs.
2521	Brass N. P.	Screw	Bare	⅛"	10	5 lbs.

CLAMPS



No. 8930

Cross Over Clamps (Galvanized) No. 8930

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.



Cable Suspension Clamp

Cable Suspension Clamps (Galvanized)

A cable suspension clamp is used where it is desired to install small cables at a minimum expense and heavier cables on cable arms. They are shaped so as to securely grip the messenger strand.

These clamps should be installed by using a double arming ½ or 5/8-inch bolt through the pole which permits of an additional cable being installed on the opposite side of the pole without disturbing the present installation. Galvanized by the hot process.



No-Slip Guy Clamp

A neat, light weight, inexpensive rolled steel guy clamp, easily installed and with a holding power that will break the strand. It absolutely eliminates slipping nor will it kink or injure the strand. Its great holding power is secured by diagonal ridges, rolled in the grooves, which fit the lay of the strand.

The clamps will fit seven wire strand from ¼ inch to ½ inch, inclusive, and are furnished in the following sizes:

	Per 100
2 bolt 3 inch	110 lbs.
3 bolt 4 inch	150 lbs.
3 bolt 6 inch	210 lbs.

Blackburn's 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.

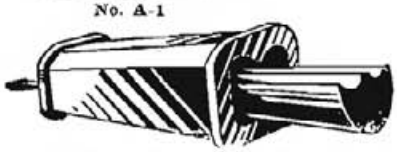


No. A-1

Code No.	What they fit	Shipping Weight, per 1000
No. 0	⅛" & ½" ground rods	30 lbs.
No. A-1	⅛-½-¾-1 & 1¼" pipe	50 lbs.



No. 0



Mathews Boltless Guy Clamps

Mathews Boltless Guy Clamps

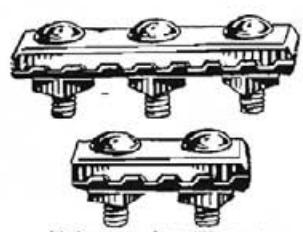
	Weight per 100		
Giant	130 lbs.	Baby	50 lbs.

Universal Malleable Iron Guy Clamps

Universal malleable iron guy clamps are used for light construction and for the same purpose as the smaller rolled steel clamps are, but for service we would recommend the rolled steel clamp, thereby making all construction standard and eliminating so far as possible all special material.

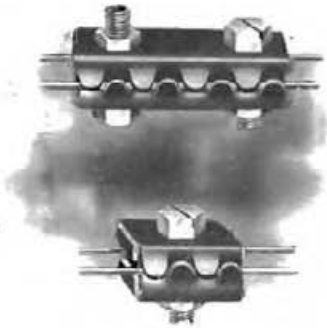
Weight per 100

2 bolt, galvanized only 113 lbs. 3 bolt, galvanized only 180 lbs.



Universal Guy Clamps

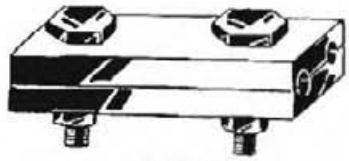
CONNECTORS



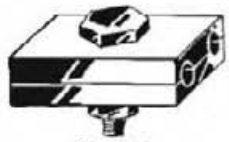
No. 00



No. 000



No. 257



No. 255



No. 260



No. 1025



No. 155



No. 7A

No.	Style	Weight per 100	No.	Style	Weight per 100
00	1 Bolt	3½ lbs.	7-A	1 Bolt	6¼ lbs.
00	1 Bolt with wing nut	4 lbs.	155	Battery	2½ lbs.
00	2 Bolt	7 lbs.	255	1 Bolt Test	6¼ lbs.
00	2 Bolt with wing nut	8 lbs.	257	2 Bolt Test	11 lbs.
000	Test connector	16 lbs.	260	1 Bolt with wing nut	10 lbs.
			1025	Bull Dog	2½ lbs.



No. 3

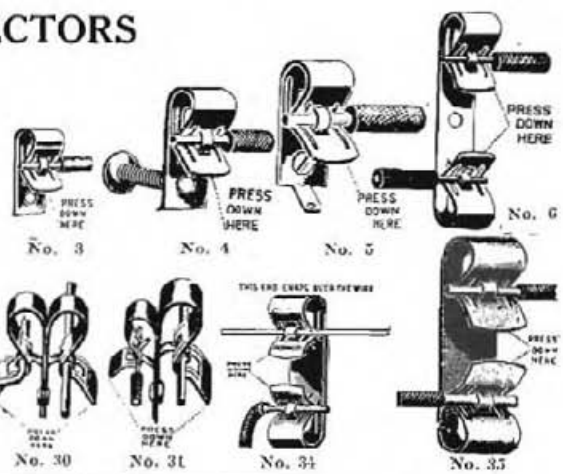
GROUND CONES

These grounds are made of a perforated sheet of pure copper. The cone is filled with pea-sized charcoal or coke as desired. Furnished with five feet of No. 4 soft copper leading-in wire welded to the grounds. Used for electric light, power, telephone, telegraph and trolley installations.

Cat. No.	Length Feet	Gauge Copper
3	1	21
4	2	21

CONNECTORS

Type	Takes B & S Gauge Wire Number	Size Length	Size Width	Screw Holes
3	10	1 1/16	x 3/8	No. 8
4	10	1	x 3/8	No. 8/32 threaded
5	10	1 1/16	x 1/8	No. 8
9	10	2 1/16	x 3/8	No. 8
30	....	1 1/16	x 5/8	
31	....	1 1/16	x 5/8	
34	10	2 3/4	x 5/8	
35	9BWG	2 3/4	x 3/8	



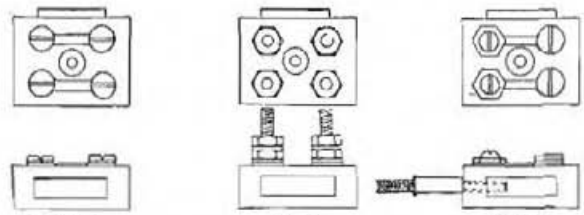
CONNECTORS

Interlocking



No. 1

HALF SIZE



No. 1. No. 2. No. 3.

Terminal connection units extensively used in telephone and telegraph practice, and suitable for any installation requiring the distribution of many low voltage wires. The feature especially commending their employment is their adaptability to any installation, as there may be increase or decrease of the number of pair connectors at pleasure. The interlocking feature makes them as readily installed as strips. Made of moulded composition of the highest insulating properties. Unit size 1½x1⅝x⅞ inches. Made in sizes shown in diagrams above.

Cat. No.

1 Fitted with 4 binding head screws with one washer under each; detachable links.

2 Fitted with 4 screws projecting ⅝ inch with 2 nuts and 3 washers on each screw. Links may be attached.

3 Fitted with 2 binding head and 2 round head screws, the latter with check nuts. Two holes in side for entering wires or cord tips. Links are attached.

CABLE CLAMPS

"Long Saut" Type



"Long Saut" Type

These clamps are used for attaching telephone cables to brick or wooden buildings, fences, etc. They are simple to attach, requiring the drilling of but one hole, and are provided with threaded holes so that bridle rings for parallel runs of twisted bridle wire may later be attached without additional drilling.

Cat. No.	Diameter	Standard Pkg.	Weight per 100 Lbs.
00000	⅜ in.	500	1
0000	7/16 in.	500	1½
000	½ in.	500	1½
00	9/16 in.	500	2
0	11/16 in.	500	4
1	¾ in.	250	4½
2-A	1 in.	250	6
2	1⅛ in.	250	6
3-A	1¼ in.	250	17½
3	1½ in.	250	17
4-A	1¾ in.	100	19½
4	2 in.	100	20
5	2⅜ in.	100	31

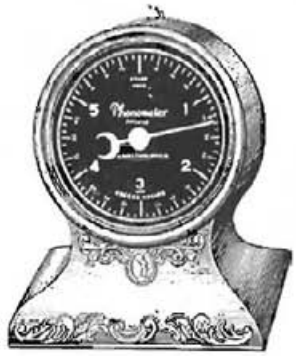
JIFFY CLIPS



The Jiffy Clip is made to meet the demand for a low-priced but substantial clamp for hanging pipe, conduit and lead covered cables. With this clip only one screw or bolt is required to hold the pipe, conduit or cable and clip firmly in place. The Jiffy Clip is made to afford great strength without being heavy or bulky, by having a rib drawn in the center of the clip. A round boss is also raised on the clip, through which is a hole for the screw or bolt. This boss serves the purpose of a lock washer to prevent the clip from working loose.

Size of Conduit or Pipe in Inches	Size Inches	Shipping Weight	Standard Package
⅛	.406	7½ lbs.	500
¼	.515	10 lbs.	500
⅜	.675	3 lbs.	100
½	.840	4 lbs.	100
¾	1.050	4½ lbs.	100
1	1.315	8½ lbs.	100
1¼	1.688	11½ lbs.	100

COUNTERS AND TIMING DEVICES



Phonometer

Phonometers

The Phonometer is a practical device for timing toll calls in a small exchange where an expensive timing device is not necessary. Measures time up to six minutes, being started by means of a lever at beginning of a conversation and stopped in the same manner at end of conversation. It is simple, accurate and inexpensive.

Hand Tally Counter



No. AB2

No. AB2 This is a new instrument with four figures embodying a number of desirable features not found in any other hand tally, chief among which is the fact that it can be quickly set to zero by one turn of the knob. The case is small in size and has been designed with rounded corners so as not to irritate the hand to the user, nor to wear the pockets when carrying it. Also, the finger ring has been so located that it can be held in either hand when being used.



No. Z8T

Set Back Ratchet Counter

No. Z8T. 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.



Calculagraph Model 6, Case A Mounted on Pedestal

Pedestal adjustable in height from 26 to 40 inches, floor to top of card plate.

Straight Counters

No. 8

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 then be 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.



No. 8 Straight Counter

CALCULAGRAPHS, CLOCKS, COUNTERS AND TIMING DEVICES

Calculagraphs

The use of toll circuits is the stock in trade of a telephone company. It is their use that the company sells to the public at so much per minute and as such it represents money just as fully as does stock carried by any merchant.

The function of the calculagraph is to calculate and record by mechanical means the time in minutes and quarter minutes which elapses during toll conversations, thereby assuring the correct fee and effectively stopping a leak in the telephone company's revenue.

It definitely fixes the time in minutes and quarter minutes (up to a maximum time of one hour) on all toll conversations carried on over a company's line, recording the time of beginning, the ending and the elapsed time.

It makes no clerical errors and is easily operated without mental effort on the part of the operator, and without taking her attention from other calls.

In ordering a calculagraph to be sunk in a switchboard shelf, or in a bracket shelf Model 6-Case C should be ordered, and when it is intended to mount upon a pedestal Model 6-Case A should be ordered. If Pedestal is desired it should be separately specified.

CALCULAGRAPHS, CLOCKS, COUNTERS AND TIMING DEVICES

Calculagraphs

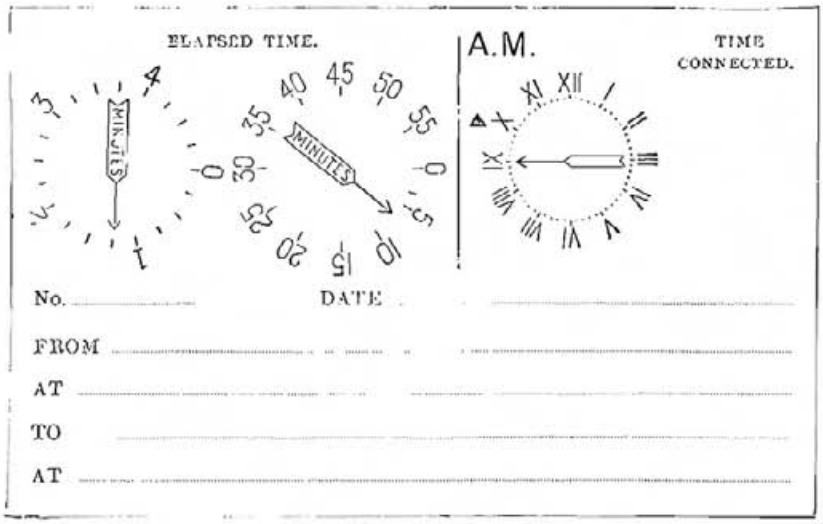


Figure 6

Record of Calculagraph Model 6, showing that connection was completed at 9.45 a. m. and that the circuit was in actual use six and one-quarter minutes.



Calculagraph Model 6, Case C

For Mounting Flush with Top of Key-shelf.

FUSES

Wood, Fibre and Composition



Type A-1

Vertical Line Fuse. Wood, with brass ends, mountings and nuts. Distance between shoulders, 4 1/16 inches. Weight, 10½ pounds per 100.



Type A-2

Wood Fuse, with brass ends, threaded. For use with old types of protectors and terminals. Distance between shoulders, 4 5/8 inches. Weight, 7 pounds per 100.



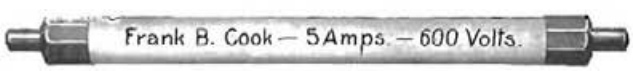
Type A-3

Wood Fuse, with brass ends, threaded. One end larger than other. For use with old types of protectors and terminals. Distance between shoulders, 4 5/8 inches. Weight, 7 pounds per 100.



Type A-7

Wood Fuse, with copper tips. For use with standard protector strips and pole cable terminals. Distance between shoulders, 4¾ inches. Weight, 7 pounds per 100.



Type A-9

Composition Fuse, for use with types B-4, B-7, B-9, B-13, B-14 and B-15 sub-station protectors, or with pole cable terminals. Does not give a flash and does not continue the arc when blown. Distance between shoulders, 4¾ inches. Weight, 9 pounds per 100.

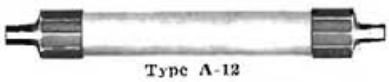


Type A-11

Short Wood Fuse, with copper tips. Distance between shoulders, 3¼ inches. Weight, 3 pounds per 100.

FUSES

Wood, Fibre and Composition



Type A-12

Short Composition Fuse, for use with types B-5 and B-6 sub-station protectors. Distance between shoulders, 3 inches. Weight, 6 pounds per 100.



Type A-13

Wood Fuse, Sterling Type, with copper tips. Distance between shoulders, 4 inches. Tips are extra long, 7/8 inch each. Weight, 7 pounds per 100.



Type A-44

Short Wood Fuse, with copper tips. For use in H-40 central office protector and S-19 pole cable terminal. Distance between shoulders, 3 1/8 inches. Diameter, 7/8 inch. Weight, 3 pounds per 100.



Type A-45

Short Composition Fuse, with copper tips. For use in H-36 central office protector. Distance between shoulders, 3 1/8 inches. This fuse is of smaller diameter than A-12. Weight, 5 pounds per 100.



Type A-46

Short Wood Fuse, with copper tips. Used in H-36 central office protector. Diameter, 3/4 inch. Distance between shoulders, 3 1/8 inches. Weight, 3 pounds per 100.



No. 44

Flat Wood Fuse. Wire lies in open slot. 3 1/2 inches over all. Weight, per M, 35 lbs.



No. 49-52

Round fibre with flat tip. Made in two lengths as follows:

No. 49. 5 in. over all. Wt. per M, 50 lbs.
No. 52. 3 1/2 in. over all. Wt. per M, 48 lbs.



No. 53-55

Round fibre with nutted ends. Made in two lengths as follows:

No. 53. 3 3/4 in. over all. Wt. per M, 55 lbs.
No. 55. 4 in. over all. Wt. per M, 60 lbs.



No. 56

Round fibre, 7/8 in. hexagon nut, 8/32 in. threaded tip.

No. 56. 4 1/8 in. shoulder to shoulder. Wt. per M, 63 lbs.



No. 78-81

Diameter 3/8". Round fibre telegraph fuse. Made in two lengths as follows:

			Wt. per M				Wt. per M
No. 78.	4 1/2 in. over all.	8/10 ampere	50 lbs.	No. 80.	4 1/2 in. over all.	1 to 10 amperes	50 lbs.
No. 79.	5 1/2 in. over all.	8/10 ampere	53 lbs.	No. 81.	5 1/2 in. over all.	1 to 10 amperes	53 lbs.

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.

FUSES

Wood, Fibre and Composition



Tip 13/64" diameter. Made in two lengths as follows:

No. 27	Wood,	4¾"	shoulder to shoulder.	Wt. per M. 43 lbs.
No. 28	Porcelain,	4¾"	shoulder to shoulder.	Wt. per M. 80 lbs.
No. 77	Fibre,	4¼"	shoulder to shoulder.	Wt. per M. 45 lbs.
No. 29	Wood,	3"	shoulder to shoulder.	Wt. per M. 38 lbs.
No. 30	Porcelain,	3"	shoulder to shoulder.	Wt. per M. 65 lbs.
No. 48	Fibre,	3"	shoulder to shoulder.	Wt. per M. 40 lbs.



Tip 11" diameter. Made in three lengths, as follows:

No. 3	Wood,	4⅞"	shoulder to shoulder.	Wt. per M. 43 lbs.
No. 5	Wood,	2¼"	shoulder to shoulder.	Wt per M. 35 lbs.
No. 6	Wood,	3⅞"	shoulder to shoulder.	Wt. per M. 40 lbs.
No. 35	Porcelain,	3⅞"	shoulder to shoulder.	Wt. per M. 70 lbs.
No. 75	Fibre,	3⅞"	shoulder to shoulder.	Wt. per M. 42 lbs.



Tip ¼" diameter. Made in two lengths as follows:

No. 37	Wood,	5"	tip to tip.	Wt. per M. 48 lbs.
No. 43	Wood,	3½"	tip to tip.	Wt. per M. 43 lbs.



Tip ¼" diameter. Made in three lengths as follows:

No. 4	Wood,	4"	shoulder to shoulder.	Wt. per per M. 45 lbs.
No. 36	Fibre,	4"	shoulder to shoulder.	Wt. per per M. 53 lbs.
No. 9	Wood,	3⅛"	shoulder to shoulder.	Wt. per per M. 40 lbs.
No. 38	Wood,	2⅝"	shoulder to shoulder.	Wt. per per M. 40 lbs.

BLOW-RITE FUSE WIRE



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 fear of 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 for use in relining telephone fuses.

Made in 1, 2, 3, 4, 5, 7 and 10 amperes blowing point.

FUSES

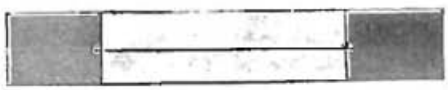
Copper Terminal Fuses



No. 19—2x⅜ in.



No. 131—1¾x½ or 2x¼



No. 8—2½x⅜ in.



No. 21—2x⅜



No. 32—2½x½



No. 11—2¼x⅜ in.



No. 26—2x½



No. 25—2½x½

Standard mica fuses are made the exact size of the cuts on this page and are provided with copper terminals. The workmanship is excellent, insuring 100 per cent good fuses. Special mica and fibre fuses of every description can be furnished promptly.

When ordering specify code number and amperage. Send samples of special fuses with order. Fuses packed 50 per box.

Note: The enclosed type of fuse is recommended and all orders not specifying will be filled with that type. All of the above styles are carried in stock in the enclosed type in both ¼ and ½ amperes.

Renewable Type

National Electric Code Standard



THE National Renewable Fuse is the only fuse with the renewable feature that is APPROVED by the Associated Factory Mutual Fire Insurance Companies and is endorsed by the Underwriter's Laboratories, and has passed all their tests and meets all their requirements. Here is one renewable fuse which may be used without sacrificing the security a fuse must give to electrical equipment.

The "Tell-Tale" indicator keeps the amperage rating always in plain view when installed—the rating is stamped in metal. A single glance at the fuse tells you that the circuit is properly guarded.

This fuse cannot be improperly loaded. It is constructed so that it is impossible to use more than one element at a time, and it cannot be overloaded.

When a fuse blows, simply slip out the discharged cartridge and insert a new one. The cartridge costs but a small fractional part of the complete fuse. National Renewable Fuses are furnished in both 250 and 600 volts, up to and including 600 amperes.

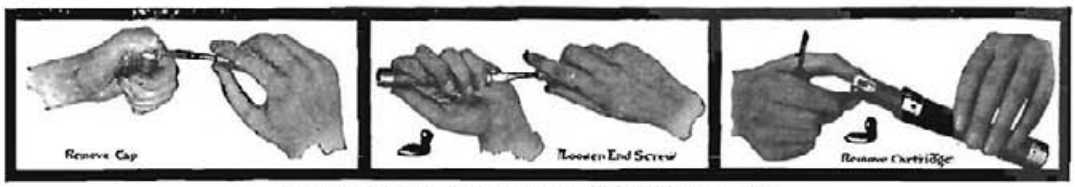
The National Renewable Fuse provides the security features of the old style "one-time" fuse in exactly the same way. The element is in a powder-packed cartridge which confines and smothers the fierce heat of the arc when the fuse blows. It is a complete fuse within a protective shell.

Safe - Simple - Economical

FUSES

Renewable Type

One extra renewable cartridge free of charge with every complete NATIONAL RENEWABLE FUSE.



Easy to Renew—Only 3 Parts—Reloaded in a Jiffy

250 Volts, 3-60 Amperes



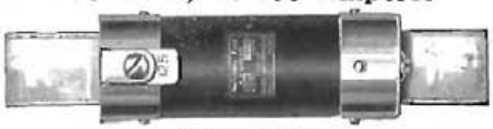
Complete Fuse



Renewable Cartridge

Cat. No.	Amp.	Over all Length	No. in Box	No. Std. Pkg.
203	3	2"	10	100
204	4			
205	5			
206	6			
207	7			
208	8			
209	9			
210	10			
212	12			
215	15			
220	20			
225	25			
230	30			
235	35	3"	10	100
240	40			
245	45			
250	50			
255	55			
260	60			

250 Volts, 65-600 Amperes



Complete Fuse



Renewable Cartridge

Cat. No.	Amp.	Over all Length	No. in Box	No. Std. Pkg.
2065	65	5⅞"	5	50
2070	70			
2075	75			
2080	80			
2090	90			
20100	100			
20110	110	7⅛"	2	20
20125	125			
20150	150			
20175	175			
20200	200			
20225	225	8⅝"	2	20
20250	250			
20275	275			
20300	300			
20350	350			
20400	400			
20450	450	10⅜"	2	10
20500	500			
20550	550			
20600	600			

600 Volts, 0-60 Amperes



Complete Fuse



Renewable Cartridge

Cat. No.	Amp.	Over all Length	No. in Box	No. Std. Pkg.
603	3	5"	10	100
604	4			
605	5			
606	6			
607	7			
608	8			
609	9			
610	10			
612	12			
615	15			
620	20			
625	25			
630	30			
635	35			
640	40	5½"	10	100
645	45			
650	50			
655	55			
660	60			

600 Volts, 70-600 Amperes



Complete Fuse



Renewable Cartridge

Cat. No.	Amp.	Over all Length	No. in Box	No. Std. Pkg.
6070	70	7⅞"	5	50
6080	80			
60100	100			
60110	110	9⅝"	2	25
60125	125			
60150	150			
60175	175			
60200	200			
60225	225	11⅝"	2	25
60250	250			
60275	275			
60300	300			
60350	350			
60400	400			
60450	450	13⅝"	1	10
60500	500			
60550	550			
60600	600			



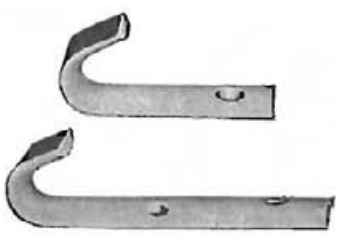
FUSE WIRE

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 table. If wire is used in shorter pieces than there given, its carrying capacity will be raised. Persons entrusted with the replacing of fuses should have their attention called to this point.

Put up on Wooden Spools and Packed in Tin Boxes. We do not break spools.

Tested Lead Fuse Wire From 1-8 to 200 Amperes

Safe Carrying Capacity Amperes	Best Lengths for Use and Fusing Currents for Such Lengths: Inches	Amperes	Length Per Pound	Millimeters Diameter	One Package Contains
⅛	1	½	40,725 ft.	2½	250 feet
¼	1	¾	12,350 ft.	4½	250 feet
½	1	1½	2,550 ft.	10	8 2-oz. spools
¾	1	2¼	1,316 ft.	13	2 8-oz. spools
1	1¼	3	993 ft.	16	2 8-oz. spools
2	1½	5	407 ft.	25	3 8-oz. spools
3	1½	7	265 ft.	31	2 8-oz. spools
4	1¾	9	207 ft.	36	1 1-lb. spool
5	1¾	10	167 ft.	39	1 1-lb. spool
6	2	12	144 ft.	42	1 1-lb. spool
7	2	13	120 ft.	46	1 1-lb. spool
8	2	15	106 ft.	49	1 1-lb. spool
9	2	16	94 ft.	52	1 1-lb. spool
10	2¼	17	84 ft.	55	1 1-lb. spool
12	2¼	20	68 ft.	61	1 1-lb. spool
14	2¼	23	58 ft.	66	1 1-lb. spool
15	2¼	24	55 ft.	68	1 1-lb. spool
16	2½	25	49 ft.	72	1 1-lb. spool
18	2½	28	43 ft.	77	1 1-lb. spool
20	2½	30	37 ft. 10 in.	82	1 1-lb. spool
25	2¾	37	28 ft. 9 in.	94	1 1-lb. spool
30	2¾	43	24 ft.	103	1 1-lb. spool
35	3	49	20 ft.	113	1 1-lb. spool
40	3	56	17 ft. 2 in.	122	1 1-lb. spool
45	3	62	15 ft. 4 in.	129	1 1-lb. spool
50	3	69	13 ft. 6 in.	137	1 1-lb. spool
60	3¼	81	10 ft. 3 in.	158	1 5-lb. spool
70	3¼	93	8 ft. 10 in.	170	1 5-lb. spool
75	3½	99	7 ft. 9 in.	182	1 5-lb. spool
80	3½	106	7 ft. 2 in.	189	1 5-lb. spool
90	3½	118	5 ft. 8 in.	212	1 5-lb. spool
100	4	129	5 ft.	226	1 5-lb. spool
110	4	140	4 ft. 6 in.	234	1 5-lb. spool
125	4	155	4 ft.	259	1 5-lb. spool
150	4	187	3 ft. 6 in.	291	1 5-lb. spool
200	5	235	2 ft. 3 in.	346	1 5-lb. spool



Guy Hooks

Guy or Jay Hooks

The 1¼x⅜x4-in. one bolt Guy Hooks should always be recommended for use in connection with guys to keep them from slipping down. We recommend the one bolt 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 ½-in. or ⅝-in. thru bolt in preference to a lag screw as they hold better and are not apt to tear the wood.

Description	Weight Per C	Description	Weight Per C
1¼x¼x3 -in. 1 bolt	35 lbs.	1½x⅜x6 -in. 2 bolt	90 lbs.
1½x⅜x3½-in. 1 bolt	75 lbs.	1¼x⅜x4 -in. 1 bolt	90 lbs.

HANGERS

Marline Cable Hangers



Marline.

Number 3

Size of Cable in Pairs	Size of Loop	Weight per 1000
25	9 in.	35 lbs.
50	11 in.	37 lbs.
75	12 in.	38 lbs.
100	14 in.	40 lbs.
150	15 in.	42 lbs.
200	16 in.	45 lbs.

No. 3 hangers are made up of 3-ply housecline.

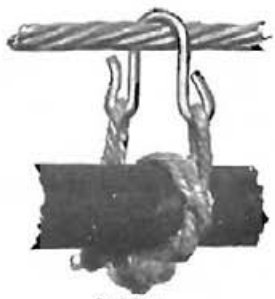
The Housecline used in the manufacture of these hangers is of the very best grade. The hooks are made from No. 9 wire regalvanized after forming.

Swisher and Pierce Cable Hangers



Pierce Standard.

Size of Cable in Pairs	Will Hang Maximum Diameter of Cable	Weight Per 1000
25	1⅜	35
50	1⅛	38
75	1⅞	40
100	1½	43
150	1¾	45
200	1⅞	48
250	2¼	52
300	2⅜	58
400	2⅝	65



Swisher.

Standard package of Pierce hanger is 2000 for all sizes up to 200 pair and 1000 for sizes from 250-400.

Hooks are made of No. 9 wire which is hot galvanized after forming. Packed 100 in a carton.

Davidson Cable Hangers



Davidson Type

Davidson Cable Hangers are made from pure iron and coated with heavy coating of lead and tin. This hanger performs the double feat of bonding and hanging at the same point. The large bearing surface does not dent or crystallize the cable. The Davidson Cable Hanger embodies the best feature of Marline Hangers in addition to bonding permanently.



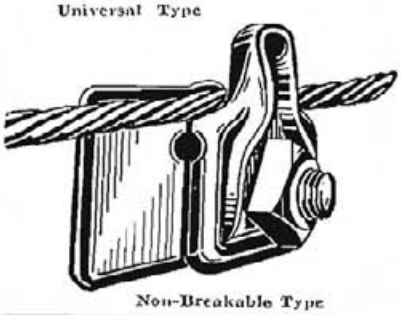
Universal Type

Code No.	Length	Strand	Cable	Weight per 1000	Diam. of Cable
1	7⅞	5/16	5- 25 pr.	80 lbs.	¾
2	11	⅜	30-150 pr.	65 lbs.	1⅛
3	14	½	175-300 pr.	50 lbs.	1⅝
4	16	⅝	Spec. for RR work	30 lbs.	2

Universal Messenger Hangers

Universal Messenger Hangers are arranged with specially curved grooves to allow them to be used on corners as well as on straight lines. They are equipped with two ⅛x1⅝-in. track bolts. Galvanized hot process.

Size	Weight	Size	Weight
No. 1—⅛x2 2 bolt	300 lbs.	No. 2—⅛x1¾ 2 bolt	240 lbs.



Non-Breakable Type

Non-Breakable Messenger Hangers

Non-breakable messenger hangers are very economical to install. They are placed on a standard through or double arming bolt and the vertical finger keeps the messenger in place while being pulled taut after which the strand is dropped into the groove and nut set up. It is made with the back curved to fit the pole. By using this in connection 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. Galvanized hot process.

Size Messenger	Weight Per 100	Size Messenger	Weight Per 100
⅜-in. and smaller	150 lbs.	½-in. and larger	150 lbs.

INDUSTRIAL SIGNALS



No. 8311R

Telecode Relay

The Telecode Relay may be equipped for operation on telephone circuits, utilizing either A. C. or D. C., as their ringing energy. If for operation on standard telephone circuits, the relay is wound by resistance, as is standard practice in the telephone industry, and in ordering kindly specify the resistance of the telephone bells on the telephone system where the relay is to be installed. If the relay is to be used in conjunction with an intercommunicating telephone system, utilizing D. C. for its ringing energy, specify the voltage of the ringing current.

Catalog No.	Description
8311-R	**Telecode Relay, Complete with pressed steel cover**
8311-WP	Telecode Relay, Weatherproof



No. 8301C

Master Relay Panels

Master Relay Panels are arranged for use with Industrial Signals as a circuit-closing means, controlling the high voltage current to the industrial signals. The relay is of carbon contact type, arranged with primary opening switch, test button and four sets of binding post for distribution of the various incoming circuits. The equipment is mounted on a substantial slate base, encased in a sheet steel box equipped with lock.

Catalog No.	Type	Magnet Winder
8301-C	D. C. only	**2, 4 or 6 volts**
8301-D	D. C. only	Special

Master relay panels arranged for operation from A. C. circuits will be furnished at the same list price.



No. 8299M

Mine Buzzers

These Heavy Duty Mine Buzzers are weatherproof signals for use under severe conditions of service where great volume of tone is not desired. The tone, however, has a peculiar pitch, making them extremely effective as audible signals. These signals are furnished arranged with two types of casing, one for conduit installations and the other for use with open wiring. This type is same as illustration 8296-D, but with lead wires.

Cat. No.	Type	Connection	Standard Voltage
8298-D	D. C.	Open Wiring	110
8299-A	A. C.	Open Wiring	110
8347-M	D. C.	½" conduit	110
8299-M	A. C.	½" conduit	110

Marine Buzzers

The Marine Type Buzzer is designed with the idea in view of supplying an audible signal which will withstand the action of the sea atmosphere and produce a strong volume of tone of distinctive tone pitch. This signal is arranged for ½" pipe connection, bulkhead mounting. Construction is such as to make this device durable under most severe operating conditions.

Cat. No.	Type	Connection	Voltage
8299-M	Marine A. C.	½" conduit	110
8347-M	Marine D. C.	½" conduit	110



No. 8296D

Office and Factory Buzzers

These signals are effective for offices, stock rooms, shipping rooms, etc. The mechanisms are the same as those used in the standard Mine Signals, but are not arranged with weatherproof casing.

Cat. No.	Type	Standard Voltage
8296-D	D. C.	110
8297-A	A. C.	110
8297-C	A. C.	*

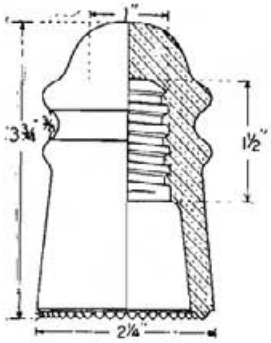
*For higher voltages to and including 260 volts A. C.

NOTE: All Alternating Current Buzzers may be wound for voltages as high as 260 volts A. C.

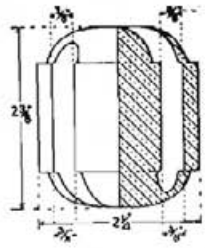
Direct Current Buzzers are not intended for use on circuits over 130 volts D. C. unless used in series with external resistance.

INSULATORS

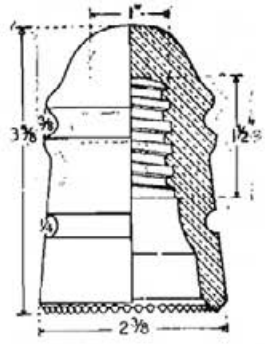
Glass Insulators



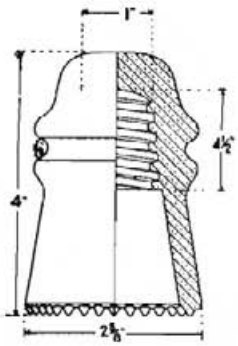
No. 9



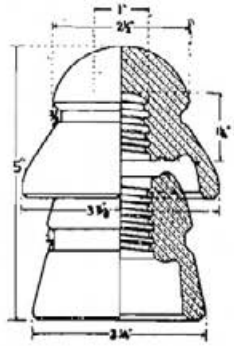
No. 90



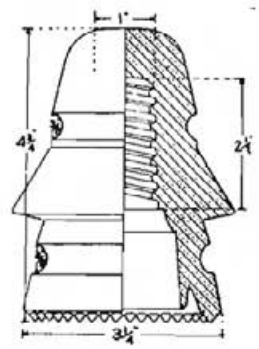
No. 12



No. 16



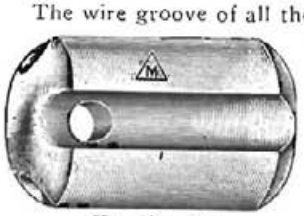
No. 50



No. 52

Code No.	Description	Weight per 1000	Number per bbl.
9	Pony	675	400
12	DG Pony	750	400
16	Long Distance	970	300
40	22 oz. W. U. Tel. Standard	1550	200
50	Two piece transposition	1950	125
52	One piece transposition	2100	125
90	Span wire	720	500

The wire groove of all the above insulators is ⅛ in.



No. 500, 502

Strain Insulators (Porcelain)

Code No.	Diameter	Height	Size of hole	Number per bbl.	Weight per 1000
500	1½ in.	2¼ in.	⅛ in.	1700	265 lbs.
502	2½ in.	3 in.	⅜ in.	500	880 lbs.

Number 500 is used for dead-ending No. 12 and No. 14 wire or bracket lines, while No. 502 is used for No. 10 wire and larger. No. 500 and No. 502 are the same general type except size and weight. Terms: 1%, 10 days. Carried in stock.



Self Tying Knobs

Self Tying Knobs

Self Tying; weight per 1000, 490 lbs.; size of mounting screw, 4 in., No. 18.

INSULATORS

Porcelain Knobs



4 Groove Tel.



No. 4



No. 22 Split



2 Groove Tel.

Code No. or Name	Height	Diameter	Size of hole	Size of groove	No. per barrel	Weight per 1000
2 Groove Tel.	1½ in.	1⅝ in.	⅜ in.	⅞ in.	1900	221
4 Groove Tel.	2¼ in.	1¾ in.	⅜ in.	⅞ in.	1000	395
No. 4	1⅛ in.	1½ in.	⅜ in.	⅜ in.	2200	230
2 Groove No. 4	1⅛ in.	1½ in.	⅜ in.	⅞ in.	2000	225
5½ Solid	1⅜ in.	1 in.	¼ in.	⅝ in.	4700	100
No. 22 Victor	1⅝ in.	2⅛ in.	1 in.	1⅛ in.	1200	332



Knob Screw

Knob Screws

Hot galvanized screw eye complete with porcelain insulator.

Code No.	Wt. per 100	Size of screw eye
Knob Screws	35 lbs.	⅜ in.

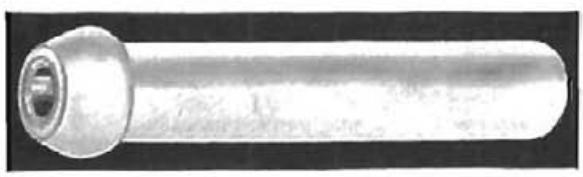
Description	Weight per 100
Single groove knob	250 lbs.
Double groove knob	250 lbs.



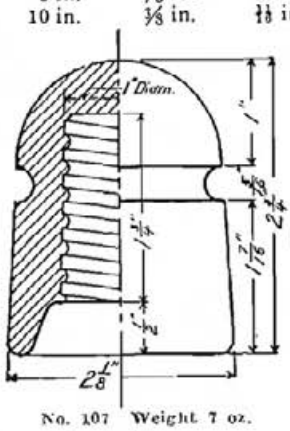
CB Knob

Porcelain Tubes—Unglazed

Length under head	Size of hole	Outside diameter	Number per bbl.	Weight per 1000
3 in.	⅜ in.	⅝ in.	4500	64
4 in	⅜ in.	⅝ in.	3600	78
6 in.	⅜ in.	⅝ in.	2000	118
6 in.	⅜ in.	11/16 in.	1400	172
8 in.	⅜ in.	11/16 in.	1200	210
10 in.	⅜ in.	11/16 in.	1000	265

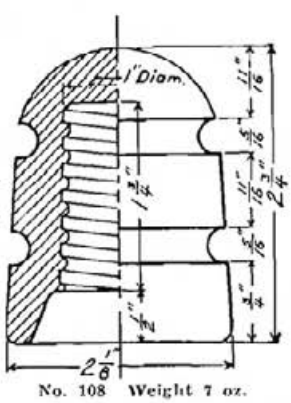


Porcelain Knobs



No. 107 Weight 7 oz.

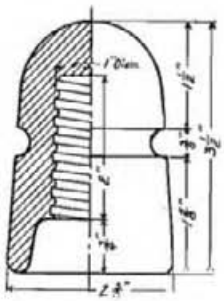
Code No.	Description	Shipping Weight Per 1000	Number per Bbl.
107	Single groove	480 lbs.	750
108	Double groove	465 lbs.	750



No. 108 Weight 7 oz.

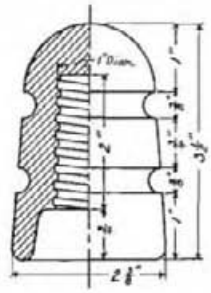
INSULATORS

Porcelain Insulators



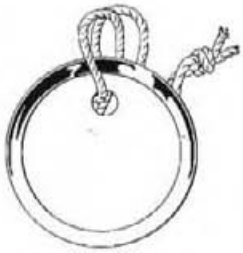
No. 109 Weight 10 oz.

Code No.	Description	Shipping Weight per 1000	No. per barrel
109	Single groove	720 lbs.	500
112	Double groove	700 lbs.	500



No. 112 Weight 10 oz.

MISCELLANEOUS



No. 32

Metal Rim Tags

No. 32

Used for any purpose where it is found necessary to tag 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.

Kellogg Black Friction Tape

An excellent tape with good adhesive qualities and made to our specifications. Put up in ½ lb. rolls. Standard width, ¾ inches.



Kellogg Friction Tape

Manson Friction Tape

Put up in ½ lb. tins, width ¾ inches



Manson Friction Tape

Okonite Tape

A rubber tape put up in ½ pound packages, ¾ inch wide and suitable for all telephone or electrical purposes.



Okonite Rubber Tape

Installers and Cable Splicers Supplies
Star Soldering Paste



No. 2776

Will not corrode or injure surface to which it is applied. Ideal for soldering with torch or soldering copper.

2775—2-oz. Box. 2776—4-oz. Box. 2777—8-oz. Box. 2778—1-lb. Box.

Star Soldering Stick

A convenient form of soldering flux of the same quality as Star Paste.



No. 2774

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.



Solderall

MISCELLANEOUS

Installers and Cable Splicers Supplies



No. 2780

Crescent 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.

2780—½-lb. Bottles. 2779—1-lb. Bottles.

Kester Resin Core Solder



Kester Rosin Core Solder

Half and Half; also National

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.

Bar Solder

Wiping solder is used by cable splicers in making wiped joints.

No. 111. Half and Half.

No. 888. National wiping solder.

Ordinary Bar Solder
"Half and Half" for Cable Splicing



List No. 111

National Wiping Solder
Preferred by Many for Cable Splicing



List No. 888

Plain Wire Solder

Used for general line work in connection with some kind of flux. Same as list 111 only in wire form.


1003 Volt-ammeter

Ammeters and Voltmeters Ever-Ready

No. 1002. Ammeters. Range 0 to 30 amperes for testing amperage of dry batteries.

No. 1003. Volt-ammeter. Ranges 0 to 11 volts, 0 to 35 amperes, for testing voltage and amperage of dry batteries.

Cable Compound

For insulating and sealing potheads and cable terminals or for any purpose 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. Will not run in temperature less than 190 degrees. Do not ship less than one-gal. can. Approx. wt. 10 lbs.



Marlin

Made from the best grade of long line American hemp selected material and thoroughy tarred.

Two and three ply, 1 pound ball.

Paraffine

We furnish commercially refined, white paraffine to be used for "boiling out" paper insulated cables before splicing. Furnished in any quantity desired.

MISCELLANEOUS



Perfection Nail

Installers and Cable Splicers Supplies

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.

List No.	Color	Head	Length
1877½G	Dark Green	No. 18	½"
1882½T	Oak Tan	No. 18	½"
1896½B	Black	No. 18	½"
1877⅝G	Dark Green	No. 18	⅝"
1882⅝T	Oak Tan	No. 18	⅝"
1896⅝B	Black	No. 18	⅝"
2077¾G	Dark Green	No. 20	¾"
2082¾T	Oak Tan	No. 20	¾"
2096¾B	Black	No. 20	¾"
2077⅞G	Dark Green	No. 20	⅞"
2082⅞T	Oak Tan	No. 20	⅞"
2096 ⅞B	Black	No. 20	⅞"

These are packed 1,000 to carton. We do not break packages.

Lead Sleeves

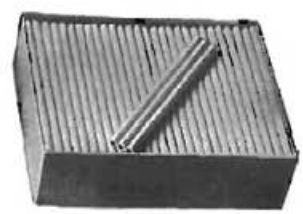
Lead sleeves for making splices at cable junctions are furnished with a ⅛" wall, and the following table is furnished based on straight and branch splices using No. 22 gauge conductors for convenience in determining the proper number of pounds to specify for each sleeve. These estimates are approximate only.

	Straight Splice			Branch Splice		
Size of Cable	Inside Diameter	Length	Weight of Sleeve	Inside Diameter	Length	Weight of Sleeve
10-15	1¼ in.	16 in.	3.5 lbs.	1½ in.	16 in.	4.25 lbs.
25-30	1½ in.	16 in.	4.25 lbs.	1½ in.	16 in.	4.25 lbs.
50-100	2 in.	20 in.	7. lbs.	3 in.	20 in.	10. lbs.
150	2½ in.	22 in.	9.25 lbs.	4 in.	22 in.	14.5 lbs.
200	3 in.	22 in.	11. lbs.	4 in.	22 in.	14.5 lbs.
300	3.5 in.	22 in.	12.75 lbs.	4.5 in.	22 in.	16.25 lbs.
400	4 in.	22 in.	14.5 lbs.			
600	4.5 in.	22 in.	16.25 lbs.			

Length of sleeve is of course optional, according to splices. We cut to any length.

Paper Sleeves

Paper sleeves are used to insulate bare joints of cable construction where splices have been made, one sleeve used on each wire of each pair at junction making a compact and reliable insulation.



Diameter Inches	Wgt. lbs. per 1,000	Standard package	Used for Straight splices
⅛x3	1	150	22 ga.
7/32x3	1	110	19 ga.

Rawl Plugs



The use of these Rawl plugs will enable an ordinary screw to hold in any material. These tubes are made of stiffened, longitudinal, jute fibre strand so cemented that once in position they never crumble or pulp, and are unaffected by heat, cold or moisture and impervious to decay. They replace the old metal and lead expansion shields and other cumbersome, inefficient expensive methods. Particularly valuable to electricians and telephone men. These plugs require no special screws. Use ordinary wood screws corresponding with the size of the Rawl plug, i. e., a No. 8 plug takes a No. 8 screw, etc. Rawl plugs can be had in sizes from 1 to 22, and in ½, ⅝, ¾, 1, 1½, 2 inches in length. They come packed in boxes of 100 of a size or in a handy box of 100 plugs of assorted sizes.

MISCELLANEOUS

Installers' and Cable Splicers' Supplies

Blake Insulated or Saddle Staple



For retaining interior telephone or bell wire on wood surface.

Mfg. No.	Description	Length	Mfg. No.	Description	Length
1	For hardwood	½ in.	5	For hardwood	⅝ in.
3	For general use	¾ in.	6	For general use	¼ in.

Plumbers' Candles

Used to apply to lead sheath before pouring on hot lead in making splices; also used by installers for illumination while working in dark places.

Mfg. No.	Length	Diameter	Weight each
No. 3	7½ in.	1¼ in.	4.5 oz.
No. 5	5½ in.	1¼ in.	3.3 oz.

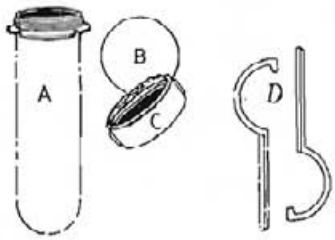
Fibre Cleats

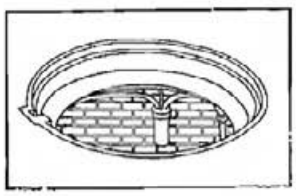


Fibre cleats are furnished in three colors—red, grey and brown. These cleats furnish a neat and substantial method of permanently retaining interior wire in place, especially on lath and plaster walls where it is not desirable to fasten with nails or staples.

Cable Pasters

Small strips of white paper gummed on one side are provided for use in limiting the length of a wiped joint and giving it a neat and finished appearance. These strips are 2"x11".





Cable Splicing Joints

This device is designed to take the place of horizontal splices in multi-conductor lead-covered cables, and is adapted particularly for underground manholes. The joint consists of three parts as shown in the illustration: "A" lead pot or sleeve, which is lined with galvanized iron to insure stability, and sweated to a threaded brass ring "C," brass collar internally threaded to fit ring and tinned on upper edges; "B" lead gasket through which cables pass. In attaching, the cables are "wiped in" and the lead sleeve is screwed into the brass collar "C" by means of "D" spanner wrenches. The threads of ring "A" are well coated with red lead before screwing into collar "C." The complete splice is absolutely moisture-proof, and is readily accessible for line tests or change in multiples. Any lineman can learn to make an absolutely moistureproof cable joint after an hour's practice on the directions that are furnished with them, avoiding delay in case skilled cable splicers are not obtainable. These splicing joints will save their cost in the reduction of maintenance expenses each year.

1. Will take for straight away splice any cable up to and including 1 inch outside diameter for each cable, 2¼x8..... 3 lbs.
2. Will take any cable up to and including 1½ inches outside diameter for each cable, 3⅛x8..... 4 lbs.
3. Will take any cable up to and including 2⅛ inches outside diameter for each cable, 4⅜x9..... 7½ lbs.
4. Will take any cable up to and including 2¾ inches outside diameter for each cable, 5¾x11⅞.....15 lbs.

MISCELLANEOUS

Installers' and Cable Splicers' Supplies



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.



Wood



Copper

Push Buttons

Push buttons for use on buzzer circuits furnished in wood and in copper finished metal.

Fire Extinguishers



Pyrene with Bracket

Pyrene Fire Extinguishers are the safest and most efficient type for electrical and all fires starting in oil, gasoline, shellac, paints, or other highly inflammable substances. Water only spreads oil fires and it is dangerous to use water on electrical fires.

Insurance companies recognize the value of Pyrene and grant a 15% reduction in automobile fire insurance when cars are equipped with Pyrene. Reduction in premium is also given for Pyrene equipment on other risks.

It will subdue electrical fires without damage to insulation or apparatus and it will do so without risk or danger. A stream of Pyrene has been directed upon a circuit carrying 110,000 volts without the least harm to the operator.



Pyrene Liquid

Pyrene Liquid will not injure switchboards, rheostats, controller boxes, oil transformers or any other electrical devices. It is a non-conductor of electricity. Always use Pyrene liquid in refilling Pyrene extinguishers.

Tested, approved and labelled by the Underwriters' Laboratories, Inc.



Pyrene Metal Box



Pyrene Syphon

Pyrene Acid Syphons

The Syphon is constructed so that the flow of acid is rapid and smooth. A valve is simply pressed down and a few strokes of the pump start the flow. The syphon is not affected by sulphuric acid or its fumes. Weight, 7 pounds.

MISCELLANEOUS



Electric Vacuum Cleaners

These cleaners are equipped with a strong, powerful motor which enables them to accomplish the most difficult work in the shortest space of time.

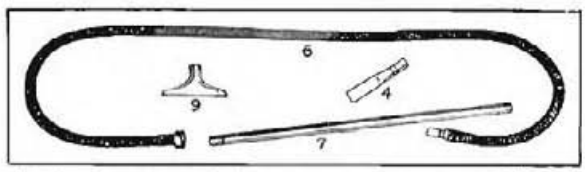
The nozzle is 12 inches wide and runs on rollers, enabling the operator to secure rapid results and allowing the machine to cover a wide space with every stroke. Its fan is made of steel, and practically indestructible, and its oiling device is automatic, requiring attention only once every six months.

These features, together with the strong mechanical construction throughout, enable the Eureka to stand up against hard usage and give long service.

The Eureka is equipped with a floor brush, which enables it to remove threads, ravelings, lint, etc., as easily and rapidly as it removes the dust.

Attachments

With the attachments the operator is able to get the dust from places where it would be impossible to get at with a cloth or brush. Many telephone companies have found them 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.



KELLOGG TELEPHONE VOLT—OHM—METER WITH MILLIAMPERE CALIBRATIONS

"Three in One"



No. 279

A necessity for those who desire to "know their equipment and substitute facts for guesswork."

This Voltometer has been specially designed and developed by the Kellogg Company, manufactured by the Weston Electrical Instrument Company, and is used for testing armatures, dry cells, drop coils, fuses, heat coils, induction coils, key contacts, receivers, ringer coils, switchboard cords, transmitters and many other tests ordinarily required in local battery or magneto telephone systems. More useful than a $75.00 bridge.

BRISTLE BRUSHES—JACK CLEANER



We recommend these brushes 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. This liquid is also an excellent cleaner for both plugs and jacks.

PAY STATIONS



No. 23-D

No. 23-D

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. Nickel, dime and quarter slots. Weight each, 20 lbs.



No. 14

No. 14

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. Nickel, dime and quarter slots. Weight each, 16 lbs.



No. 24

No. 24

The No. 24 portable station is especially designed for P. B. X. service. Made of aluminum. It is light in weight and embodies all the good features of other stations and is also neat in appearance. Finished in black enamel and nickel. Size 10½ inches high, 4½ inches wide, 4½ inches deep. Nickel, dime and quarter slots. Prompt shipments from factory. Weight each, 14 lbs.

The No. 21 is the same in all respects as the No. 24 but is made up of iron instead of aluminum.



No. 8-A

No. 8-A

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. 10-A

No. 10-A

The No. 10-A pay station is especially recommended to independent telephone companies as it not only serves for the use intended, but as a distinctive advertising feature as well. Finished in red, white and blue enamel. Attached directly to the back board. Size 8½ inches high, 6¾ inches wide, 3¼ inches deep. Weight, each, 17 lbs.

The No. 10 pay station is identical with the No. 10-A except that it attaches to the right of the telephone by means of a mounting plate.

No. 7

The No. 7 is one of the most popular type of stations made. Over 30,000 in service. 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. Weight, each, 11 lbs.

No. 7-A—Same as above, with large money drawer.



No. 7



No. 11

No. 11

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. Nickel, dime and quarter slots. Weight, each, 17 lbs.

No. 11-A—Same as above with extra large money drawer.

PINS, BRACKETS AND POLE STEPS


Standard

Wood Insulator Pins

Size	Description	Weight Per 1000
1¼x8 in.	Painted Oak	300 lbs.
1¼x8 in.	Standard Locust	325 lbs.
1¼x8 in.	Bell Grade Locust	325 lbs.
1½x9 in.	Painted Oak	400 lbs.
1½x9 in.	Standard Locust	450 lbs.
1½x9 in.	Bell Grade Locust	450 lbs.

Put up in bags containing 250 pieces.

Standard Transposition Pins

Size	Description	Weight Per 1000
1¼x9 in.	Painted Oak	350 lbs.
1¼x9 in.	Standard Locust	400 lbs.

Duplex Insulator Pins

1¼x11½ in.	Locust	500 lbs.
1½x12 in.	Locust	650 lbs.


Transposition

Corner Pins, Complete with ⅜" Bolts and Round Washers


Corner


Western Union Pin

Size		Description	Wt. per 1000
1¼x8 in.	Kalkeen	Plain Bolt	600 lbs.
1¼x8 in.	Kalkeen	Galv. Bolt.	600 lbs.
1¼x8 in.	Locust	Plain Bolt	625 lbs.
1¼x8 in.	Locust	Galv. Bolt	625 lbs.
1½x9 in.	Kalkeen	Plain Bolt	725 lbs.
1½x9 in.	Kalkeen	Galv. Bolt	725 lbs.
1½x9 in.	Locust	Plain Bolt	775 lbs.
1½x9 in.	Locust	Galv. Bolt	775 lbs.

Western Union Steel Pins with Wood Tops

Description	Grade	Wt. per C
½x9½ in. Plain	Steel	60 lbs.
½x9½ in. Galv.	Steel	60 lbs.
⅝x9½ in. Plain	Steel	95 lbs.
⅝x9½ in. Galv.	Steel	95 lbs.


Duplex

Wood Brackets


Pole or Side Bracket

Standard pole or side brackets are used for single conductor lines (usually grounded) or for taking off drop wires or on buildings. Fastened to pole or building by spikes, each one being provided with two (2) ⅞-inch nail holes bored at right angles to the face of bracket.

Code	Size, Inches	Material	Weight per 1000
No. 4	1½x2 x10	Painted Oak	500 lbs.
No. 1	1½x2 x12	Painted Oak	700 lbs.
No. 3	1½x2¼x12	Painted Oak	800 lbs.
L. D.	1⅝x2 x12	Painted Oak	800 lbs.
No. 2	2 x2¼x12	Painted Oak	1000 lbs.
W. U.	2 x2¾x12	Unpainted Oak	1100 lbs.
Duplex	1½x2 x16		1000 lbs.

Put up in sacks containing 100 pieces.


Pole Step

Wood Pole Steps

We furnish wood pole steps in plain, painted and creosoted oak for butt steps on cable terminal, or any stepped pole.


Wood Top Steel Rim

Size	Description	Weight per 1000	Size	Description	Weight per 1000
1½x2x7	Plain or Painted	500 lbs.	1¾x2⅝x7	Plain or Painted	700 lbs.
1½x2x7	Creosoted	500 lbs.	1¾x2⅝x7	Creosoted	700 lbs.

All Wood Top Steel Pins

These pins consist of a thoroughly paraffined wood top with a bolt extending through the top for clamping to cross arms.

Under extraordinary strain these pins will bend, but on account of being reinforced will not break. They also increase the strength of the line over the use of wood pins on account of the smaller holes required in the cross arms.

Size		Weight per 100	Size		Weight per 100
No. 10	Galv. Bolt	55 lbs.	No. 30	Galv. Bolt	117 lbs.
No. 11	Galv. Bolt	77 lbs.	No. 40	Galv. Bolt	132 lbs.
No. 20	Galv. Bolt	70 lbs.	No. 50	Galv. Bolt	142 lbs.
No. 21	Galv. Bolt	90 lbs.	No. 60	Galv. Bolt	165 lbs.
No. 22	Galv. Bolt	97 lbs.			

POLES

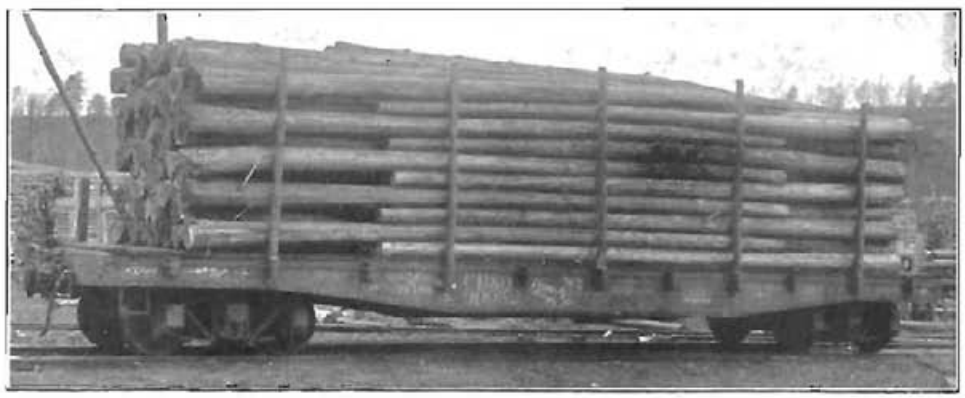
For general telephone line construction we recommend Northern White Cedar Poles. Where large numbers of very long poles are needed or appearance is most essential we advise Western Red Cedar Poles. It is very important in considering Western Poles to have them plenty large at top. Experience has proven and authorities are agreed that because of greater taper—hence more timber at ground line—a 6-inch top Northern Pole is equal to a 7-inch top Western Pole. We advise butt treatment of all Western Poles—Northern Poles will render excellent service without treatment; however, treatment by either the dipping process or the brush method is a very good investment.

All Cedar Poles furnished by us are thoroughly seasoned—carefully selected and graded—each pole must be fully up to Standard Specifications to pass the critical judgment of our inspectors.

All shipments are made from stock, immediately when ordered, subject only to car supply. Principal shipping points—Gladstone, Michigan; Minneapolis and Duluth, Minnesota.

A POLE FOR EVERY PURPOSE under standard or special specifications, including butt treatment. When full carload of poles is not needed, we can fill with fence posts.

Full price data supplied promptly upon receipt of list of needs, and point of delivery.



Official Specifications of the Northern White Cedar Association.

Governing the manufacture and grading of Northern White Cedar Posts, Poles, etc.

1. **Live Timber.** All Posts and Poles shall have been cut from live, green growing Northern White Cedar timber.

Note.—The test of live timber is to whittle a shaving from the sapwood. If the sap is white, the timber was live when cut, no matter how discolored the piece may be on the outside.

2. **Limit of Maximum Defects.** No post or pole shall contain both the maximum crook and the maximum butt rot.

3. **Percentages of Maximum Defect.** Not more than 10% of the number of pieces of any lot or shipment shall contain the maximum crook or butt rot.

4. **Variation in Sizes.** If not to exceed 2% of the pieces in any lot or shipment are below the minimum size, and there is an equal number of pieces as large as the minimum of the next larger size, the shipment shall be considered as conforming to these specifications so far as size is concerned.

5. **Method of Measuring Tops.** Minimum size of tops shall be as shown in Table No. 1. Diameter shall govern top sizes for lengths shorter than 16 ft. and circumference shall govern top sizes for lengths 16 ft. and longer.

6. **Lengths.** Any post or pole 7 ft. to 18 ft. inclusive may be either two inches longer or two inches shorter than its specified length. Any pole 20 ft. and longer may be short of its specified length one-half an inch for each five feet of its length, or it may be six inches longer than its specified length.

7. **Manufacture.** All posts and poles shall be peeled, and knots closely trimmed.

8. **Knots.** Knots are permitted if sound, smoothly trimmed and do not plainly impair the strength of the pole or post.

9. **Short Kinks.** Short kinks not permitted.

10. **Rot.** (a) Sap or skid rot not permitted. (b) Poles 16 ft. and longer having minimum top sizes of the dimensions required, must have sound tops. Poles 16 ft. and longer having tops one inch or more in circumference above the minimum top sizes, may have one pipe rot not more than one half inch in diameter. Posts or poles 7 ft. to 14 ft. inclusive, pipe rot is permitted.

(c) Butt and ring rot combined shall not exceed 10% of the area of the butt.

(d) **Sawed Posts:** Rot in butt not to exceed 10% of area of the butt. Rot on face of five-inch halves shall not exceed an average of one-half inch, if running the entire length of the post; one inch if for only one-half of the length; and one and one-half inches if for only one-fourth of the length.

Rot on face of six-inch halves shall not exceed an average of one inch, if running the entire length of the post; two inches if for only one-half of the length; and three inches if for only one-fourth of the length.

POLES

OFFICIAL SPECIFICATIONS OF THE NORTHERN WHITE CEDAR ASSOCIATION.

Rot on face of seven-inch halves shall not exceed an average of one and one-half inches, if running the entire length of the post; three inches if for only one-half of the length; and four inches if for only one-fourth of the length.

Rot on corners of quarters shall not exceed an average of half an inch in depth if for entire length of post; one inch for half of the length; and one and one-half inches for one-fourth of the length.

11. Twist. Winding twist permitted unless very unsightly and exaggerated.

12. Cat Faces. Cat faces permitted if sound, and if their distance from the top of the pole is not less than 20% of the length of the pole in 30 ft. and shorter poles, and 25% on 35 ft. and longer poles.

13. Discoloration. Discoloration not considered a defect under these specifications.

TABLE NO. 1—MINIMUM TOP SIZES

Designated Size	Lengths shorter than 16 ft. Diameter		Lengths 16 ft. and over Circumference	
	Green and Watersoaked	Seasoned	Green and Watersoaked	Seasoned
2 in.	2 in.	1¾ in.	.....	.....
3 in.	3 in.	2¾ in.	.....	.....
4 in.	4 in.	3¾ in.	12½ in.	12 in.
5 in.	5 in.	4¾ in.	16 in.	15 in.
6 in.	6 in.	5¾ in.	19½ in.	18½ in.
7 in.	7 in.	6¾ in.	23 in.	22 in.
8 in.	8 in.	7¾ in.	25 in.	24 in.
9 in.	9 in.	8¾ in.	28 in.	27 in.

OFFICIAL SPECIFICATIONS OF THE WESTERN RED CEDAR ASSOCIATION.

Revised April 30, 1918.

1. LIVE TIMBER.
   All poles must be manufactured from live growing cedar timber.
2. MANUFACTURE.
   All poles must be peeled, knots trimmed close and butts and tops sawed square.
3. VARIATION IN LENGTH.
   Poles may be 6 inches longer or 3 inches shorter than length specified.
4. KNOTS.
   Knots are not a defect, if sound, trimmed smoothly and do not plainly impair the strength of the pole.
5. DISCOLORATION.
   Discoloration is not a defect.
6. MISCELLANEOUS DEFECTS.
   No poles shall contain sap rot, woodpecker holes, plugged holes or evidence of having been eaten by ants.
7. ROT.
   Tops of poles must be free from rot. Butt rot in center, including small ring rot, shall not exceed 10 per cent of the area of the butt. Butt rot of a character which impairs the strength of the pole above the ground line is a defect.
8. CAT FACES.
   Sound cat faces are not a defect if no part of the cat face shows on the upper one-fifth of the length of the pole or within 2 feet above or 1 foot below the ground line.
9. DEAD OR DRY STREAKS.
   A sound dead or dry streak is not a defect if it does not cover more than 25 per cent of the surface of the pole at any one point.
10. MINIMUM MEASUREMENTS.
   (a) The tops of all poles shall have a minimum circumference measurement as shown in table No. 1.
   (b) The extreme butt of all poles shall have a minimum measurement as shown in table No. 2.
   (c) Poles having a decided swell or flare at the butt shall have a sufficiently larger measurement at butt to insure a reasonable measurement at the ground line.

POLES

OFFICIAL SPECIFICATIONS OF THE WESTERN RED CEDAR ASSOCIATION.

11. SHORT KINKS.

Short kinks are not permitted.

12. REVERSE SWEEP.

Reverse sweep and two way sweep, meaning a sweep in two planes, is permitted, provided a straight line drawn from the center of pole at top to center of pole at ground line does not leave the pole at any point.

13. ONE WAY SWEEP.

One way sweep is permitted provided it does not exceed maximum shown in Table No. 3.

14. METHOD OF MEASURING SWEEP.

That part of the pole below the ground line not to be taken into consideration. Tightly stretch a tape line from point at the ground line (see paragraph 15) on the side of the pole where the sweep is greatest to the upper surface at the top of the pole, and having so done, measure widest point from tape to surface of pole and if, for illustration, upon a 30-foot pole the widest point does not exceed 4 inches, this pole shall be accepted.

15. EXPLANATION OF TERM "GROUND LINE."

The term "Ground Line" as used in these specifications shall mean a point on the pole a distance of 4 feet on 20-foot, 5 feet on 25-foot and 30-foot, and 6 feet on 35-foot and longer poles from the extreme butt.

TABLE NO. 1

Minimum Top Measurement

Top Designation	Circumference
5 in. Top	12 in.
6 in. Top	16 in.
6 in. Top	18½ in.
7 in. Top	22 in.
8 in. Top	25 in.
9 in. Top	28 in.
10 in. Top	31 in.

TABLE NO. 2

Poles 35 ft. and longer shall have a minimum circumference measurement at extreme butt as follows:

Length	7 in. Top	8 in. Top	9 in. Top	10 in. Top
35 ft.	33 in.	36 in.	39 in.	42 in.
40 ft.	34 in.	37 in.	40 in.	44 in.
45 ft.	.....	39 in.	42 in.	46 in.
50 ft.	.....	41 in.	44 in.	47 in.
55 ft.	.....	42 in.	45 in.	48 in.
60 ft.	.....	44 in.	47 in.	50 in.
65 ft.	.....	45 in.	48 in.	51 in.
70 ft.	.....	47 in.	50 in.	53 in.
75 ft.	.....	48 in.	51 in.	54 in.
80 ft.	.....	50 in.	53 in.	56 in.
85 ft.	.....	51 in.	54 in.	57 in.
90 ft.	.....	52 in.	55 in.	58 in.

TABLE NO. 3

Length of Pole	Maximum Sweep Between Top and Ground Line
20 ft.	3 in.
25 ft.	3 in.
30 ft.	4 in.
35 ft.	5 in.
40 ft.	5½ in.
45 ft.	6 in.
50 ft.	7 in.
55 ft.	8 in.
60 ft.	9 in.
65 ft.	10 in.
70 ft.	10½ in.
75 ft.	11 in.
80 ft.	12 in.
85 ft.	13 in.
90 ft.	14 in.

NUMBER OF POLES REQUIRED FOR STANDARD CARLOAD.

Size	Estimated Weight	Standard Carload	Size	Estimated Weight	Standard Carload
6 in. 25 ft.	250 lbs.	175-225 pcs.	7 in. 40 ft.	675 lbs.	90-120 pcs.
7 in. 25 ft.	325 lbs.	150-175 pcs.	8 in. 40 ft.	800 lbs.	85-110 pcs.
8 in. 25 ft.	400 lbs.	120-140 pcs.	8 in. 45 ft.	1,000 lbs.	70- 85 pcs.
6 in. 30 ft.	325 lbs.	130-175 pcs.	8 in. 50 ft.	1,200 lbs.	60- 75 pcs.
7 in. 30 ft.	400 lbs.	120-150 pcs.	8 in. 55 ft.	1,400 lbs.	55- 70 pcs.
8 in. 30 ft.	550 lbs.	90-120 pcs.	8 in. 60 ft.	1,600 lbs.	50- 65 pcs.
6 in. 35 ft.	450 lbs.	120-150 pcs.	8 in. 65 ft.	1,850 lbs.	45- 60 pcs.
7 in. 35 ft.	550 lbs.	100-120 pcs.	8 in. 70 ft.	2,200 lbs.	40- 50 pcs.
8 in. 35 ft.	650 lbs.	90-110 pcs.			

40 ft. and shorter poles load in single cars.

45 ft. and longer poles load in double cars.

TREATMENT OF POLES.

This is without doubt one of the most important subjects to the Independent telephone companies in sections which have such climatic extremes of cold and hot, wet and dry, as to render pole treatment most advantageous, and, considering the great increase in life which can be had from proper treatment, the setting of untreated poles is absolutely wrong from an economic standpoint and is wholly inexcusable in view of the fact that the cost of a thorough and effective treatment is now much less than formerly.

Brush treatments are recommended only for now existing lines set untreated and when for any reason the poured treatment herein recommended cannot be used. Brush treatments are also valuable for touching up defects in poured treatment due to abrasions in handling between pole yard and line. Anyone, however, can heat up a quantity of preservative in his pole yard in an old iron kettle or similar container, and pour the hot oil over the pole butts, catching the drippings in a shallow pan so they

POLES

TREATMENT OF POLES.

can be re-heated. The saving in labor costs by this method is almost sufficient to pay for the extra quantity of oil so used, while there is absolutely no comparison in the efficiency of results. The pouring method should be used regardless of whether the entire butt is to be treated or whether the treatment is to be confined to a short distance above and below the neck rot line. What we recommend is a heavy poured treatment at the neck rot line, giving the pole at this point all the oil it can be made to absorb, while the lower portion, well below the ground line, can be given a lighter treatment, consisting of a single pouring. Be sure to remove all inner bark before attempting treatment.

Pole tops and gains can be treated in the same manner by pouring the hot oil with a large cup or dipper and catching the surplus in an ordinary pail.

We recommend the use of "Barrett's Carbosota Grade One Liquid Creosote Oil," or its equivalent, as per Government reports available to you on other oils of like nature. **We stock Carbosota.**

THE ECONOMY OF CREOSOTING YOUR POLES.

The average life of untreated cedar poles is 14 years.

The approximate **increase in life** due to treatment with creosote by the brush method is 5 years.

The approximate **increase in life** due to creosote treatment by the open tank or poured system is 10 to 13 years.

The life of a pole is dependent upon its **decay resisting qualities.**

93 per cent of all poles are destroyed by **decay.**

4 per cent of all poles are destroyed by **insects.**

1 per cent of all poles are destroyed by **mechanical abrasion.**

Coal-tar creosote oil has proved to be the most efficient agent to protect wood from decay.

Coal-tar creosote oil has been practically in use as a wood preserver since 1838.

Good engineering practice requires that poles shall be preserved from decay, under all conditions.

Coal-tar creosote oil is recommended as the most efficient preservative.

TREATMENT OF CROSS-ARMS.

While the majority of Independent companies have already adopted the practice of treating poles, very few of them realize that equal advantages are to be derived from the treatment of cross-arms, which is very inexpensive and a necessary procedure if maximum life is to be secured from the arms.

For proper results, heat the oil in the dripping pan recommended for poured treatment of pole butts. Don't get the oil hotter than 150 degrees Fahr., as overheated oil may make the arms brittle. The treatment of arms in this manner is rapid and convenient, involving very little labor expense and using a comparatively small quantity of oil. Arms must be thoroughly dry at time of treatment. If they are exposed to sun and wind for a few days after treatment they will not be disagreeable to handle, although gloves should be of course worn at all times when handling either freshly treated arms or poles.

For best results arms should be pinned up before being treated. The taper of the pin allows the hot oil to enter perfectly and when arms are treated before being pinned it is frequently found almost impossible to insert either treated or untreated pins.

QUANTITY OF CARBOSOTA REQUIRED FOR SURFACE TREATMENTS OF CEDAR POLES.

Diam. Top	Length	Diameter at Ground Line	Carbosota Required for 100 Poles	Diam. Top	Length Feet	Diameter at Ground Line	Carbosota Required for 100 Poles
5 in.	20 ft.	7 in.	27 gals.	6 in.	40 ft.	13 in.	41 gals.
6 in.	20 ft.	9 in.	29 gals.	7 in.	40 ft.	14 in.	51 gals.
6 in.	25 ft.	10 in.	31 gals.	8 in.	40 ft.	15 in.	53 gals.
7 in	25 ft.	11 in.	35 gals.	7 in.	45 ft.	14 in.	58 gals.
6 in.	30 ft.	11 in.	36 gals.	8 in.	45 ft.	16 in.	67 gals.
7 in.	30 ft.	12 in.	37 gals.	7 in.	50 ft.	15 in.	62 gals.
6 in.	35 ft.	12 in.	37 gals.	8 in.	50 ft.	16 in.	67 gals.



Decay.



Shaving.



Brush Treating.

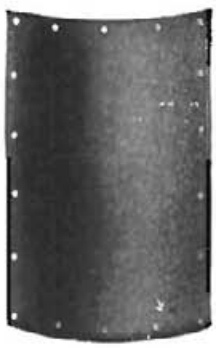
PLATES



Strain Plates

Strain plates are used for the same purpose as pole shims, that is, to protect the pole where guy wires pass around it. The strain plates have been adopted by some companies in preference to shims as they cost no more and are very easy to install. Galvanized hot process.

Size	Gauge Stock	Weight Per C.
4x8 inch	No. 14	90 lbs.



Butt Plates, or Hub Guards

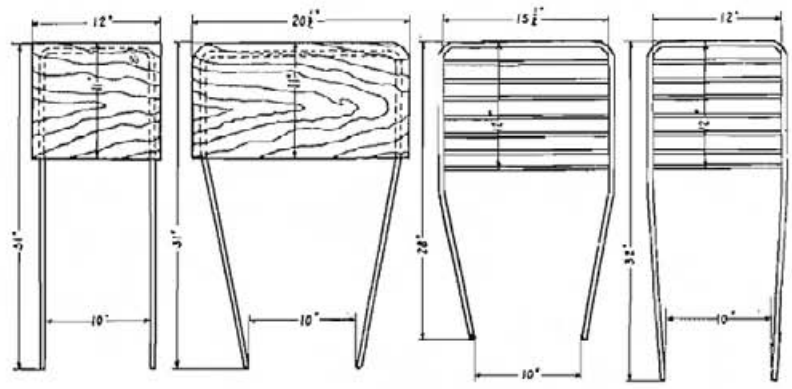
Butt plates are used to protect the base of poles from injury by wheel hubs, etc. Holes are punched ⅜ in. diameter for ⅝ in. boat spikes or nails.

Size	Weight Per C.
15x18 inch	1335
18x22 inch	2100

POLE SEATS

The frames and braces of all styles are of 1x½ inch channel steel and are much stronger than the ordinary angle iron seats of 50% heavier material. They have, under competitive tests, sustained a weight nearly 100% greater than that which broke the angle iron seat. The wood seats are made of 1¼ inch cypress boiled in creosote and the bars of the all-steel seats are ⅜-inch square steel let into the frame in a manner that leaves no projections. Bars are placed with corners up to prevent slipping. Put up in bundles of five each.

Numbers 750-280 to 753-283 are wood seats. Numbers 754-284 to 757-287 are all steel.



No. 751-281 No. 753-283 No. 755-285 No. 757-287

Stock No.	Old No.	Finish	Weight per 100	Stock No.	Old No.	Finish	Weight per 100
750-280	1	Painted	1260 lbs.	754-284	3	Painted	1400 lbs.
751-281	1	Galvanized	1260 lbs.	755-285	3	Galvanized	1400 lbs.
752-282	2	Painted	1400 lbs.	756-286	4	Painted	1260 lbs.
753-283	2	Galvanized	1400 lbs.	757-287	4	Galvanized	1260 lbs.

POLE SHIMS, STEPS AND PROTECTION STRIPS

Pole Shims

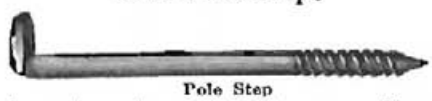


Pole Shim

Size	Weight per 100
1 x 3/16 x 8 in.	45
1¼ x 3/16 x 8 in.	60

Pole shims (or strain plates) should always be used underneath guy wires to protect the wood. They are punched with ¼-inch nail hole ¾-inch from each end.

Iron Pole Steps



Pole Step

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.

Size	Wt. per 100	Per keg
3/16 x 9 in.	69	325
5/16 x 9 in.	83	250
5/16 x 10 in.	92	250

Pole Protection Strips or Cribbing Guards



This piece of hardware is used to protect the butts of poles from injury where horses are frequently tied to or near them.

Size	Gauge of metal	Description
2 in. x 4 ft.	24	Galvanized

RODS

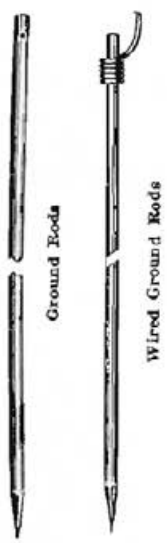
Ground Rods

Ground rods are furnished in two styles—those with No. 10 copper wire attached with five turns around the rod and soldered with 6-inch free end—and those without wire but drilled with wire hole one inch from end. The ⅜-inch rod has a 7/16-inch hole, the ½-inch a 9/16-inch hole, and the ⅝-inch a 11/16-inch hole. The wired ground rods are to be preferred as a good connection is assured at all times.

Size	Weight Per 100	Size	Weight Per 100
⅜x5	176	½x7	390
⅜x6	213	⅝x6	555
½x5	330	⅝x7	640
½x6	360	⅝x8	725

WIRED GROUND RODS

Size	Weight Per 100
½x5	340
½x6	370
⅝x6	365



Ground Rods

Wired Ground Rods

Guy Rods

Guy or Anchor Rods with welded eyes are furnished unless otherwise specified. Forged eyes can be furnished when requested.

Size	Weight Per 100	Diameter of eye
½x5	295	¾"
½x6	340	¾"
½x7	395	¾"
⅝x5	500	7/8"
⅝x6	590	7/8"
⅝x7	680	7/8"
⅝x8	770	7/8"
¾x6	840	1⅛"
¾x7	950	1⅛"
¾x8	1080	1⅛"
¾x9	1210	1⅛"
1x8	2350	1⅜"
1x10	2900	1⅜"



Guy Rods

RINGS

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 also have the additional feature of capacity for future growth as more wires may be added as desired. The rings are screwed into place and wires slipped in as additional installations are made. 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 galvanized but the galvanized is much cheaper.



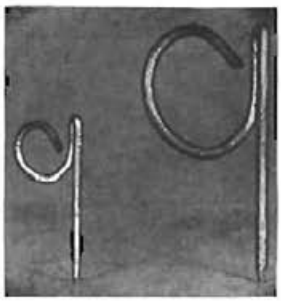
Bridle Ring

Style	Size Eye inches	Length of shank	Opening	Weight per 1,000
A	1⅜	1¼	¾	160 lbs.
C	1¼	1¼	¾	140 lbs.
E	⅝	⅞	¼	48 lbs.

Bridle Rings for Long Saut Cable Clamps

With Machine Thread

Size	Size of eye	No. of Wire
K	¾	10
M	1¼	10



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, being driven in with an ordinary hammer and will hold securely. They are made of hard nail wire galvanized by the hot process.

Diameter of eye	Wire gauge	Overall length
½ in.	No. 11	2 in.
1¼ in.	No. 9	3 in.

Aerial Cable Rings, Cameron Type

Single hook standard and lapped type rings are used for bridle wires and small cables. Double hook type should be recommended for all cable larger than fifty pair.

These rings are fastened on messengers by means of special crimping pliers, and in doing this the lineman threads these rings with a small pilot line, and with this pulls in the regular running rope, which in turn pulls in the cable by means of a team or automobile.

They are made from a high grade quality of mild steel, galvanized by hot dip process after being formed. The galvanizing is smooth and guaranteed to comply with standard specifications. They are strong, neat in appearance, and allow cable freedom of expansion and furnish a perfect bond.

Type C rings are of the double hook style, but hooks are turned in opposite directions. They can be furnished on shipments from factory only.

1¾" and 2" Rings are usually spaced 20" apart. 2½" Rings and larger are spaced 15" apart.



Single Hook, Standard Type, Style A

Single Hook, Lapped Type, Style B

Double Hook Type, Style D

Size in diameter	Style	Size Cable	Wt. per 1000	Standard package
Single Hook Type				
1¾ in. standard	A	6-45 pr.	60	1000
1¾ in. lapped	B	6-45 pr.	62	1000
Double Hook Type				
1¾ in. dbl. hook	C or D	5-100 pr.	73	1000
2 in. dbl. hook	C or D	100-150 pr.	82	1000
2½ in. dbl. hook	C or D	150-300 pr.	90	500
3 in. dbl. hook	C or D	300-500 pr.	105	500
3½ in. dbl. hook	C or D	500 pr. and over	136	250

No. 1 Crimping pliers for 1¾" and 2" Rings.
No. 2 Crimping pliers for 2½" Rings and larger.

RINGS

Never-Slip Type

Never Slip Cable Rings are applied by hand no tools being required. Rings fit ¼ in. to ½ in. strand. Neverslip 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. Therefore cheaper in the long run.

1½", 2" and 2½" rings are usually spaced 24" on centers while 3" and larger are spaced 30" apart.



Code No.	Size Inches	Size of Cable	Weight Per 1000
1½	1½	5-50 pr.	150
2	2	50-150 pr.	200
2½	2½	150-300 pr.	225
3	3	300-500 pr.	250
3½	3½	500 pr. and over	275

Rings packed 250 to sack.

SCREWS—IRON WOOD



Carried in All Standard Sizes from ¼ in. to 6 in.

SLEEVES

Double Tube Splicing

We recommend the use of double tube sleeves for making all connections in straight line splices. Use copper sleeves for copper wire. Use tinned copper or tinned steel for iron wire, but for best results always use tinned copper. 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.

Copper B&S	Copper BWG	Copper NBS	Steel BWG	Shipping weight per 1000	Length inches
8	10			68 lbs.	5½ in.
9	11			60 lbs.	5¼ in.
10	12	12		35 lbs.	4¾ in.
12	14	14		29 lbs.	4½ in.
14	16			20 lbs.	4 in.
16	18			20 lbs.	4 in.
17				17 lbs.	4 in.
			8	85 lbs.	6¾ in.
			9	68 lbs.	5¾ in.
			10	53 lbs.	5½ in.
			12	38 lbs.	4¾ in.
			14	30 lbs.	4½ in.
			16	22 lbs.	4 in.



This cut shows sleeves after being twisted, sleeve and wire forming one solid piece. Joint is as durable as if welded.

Combination of different sizes of tubes are used for splicing different sizes of wires.

Half sleeves are for dead-ending open line wire on insulators.

Gimlet Point Lag Screws or Heel Bolts



Lag Screw.

This lag screw can be driven into the wood without tearing, and after a few turns with the wrench has as great holding power as other types which have been turned with a wrench all the way.

Size inches	Weight Per C	Size inches	Weight Per C	Size inches	Weight Per C
⅜x2¼	9 lbs.	⅜x5	14 lbs.	½x4	23 lbs.
⅜x3	10 lbs.	½x2½	16 lbs.	½x4½	26 lbs.
⅜x3½	11 lbs.	½x3	19 lbs.	½x5	28 lbs.
⅜x4	12 lbs.	½x3½	21 lbs.	½x6	32 lbs.
⅜x4½	13 lbs.			½x7	37 lbs.

GALVANIZED STEEL STRAND



Galvanized Steel Strand is regularly offered in four grades, Regular, Siemens-Martin Strand, High Strength and Extra High Strength strand. Regular strand can be obtained either single or double galvanized. The first two grades only should be used for regular exchange, farm line and toll construction, as the extra cost and difficulty of handling the High Strength or Extra High Strength strand renders its use inadvisable in small exchanges.

Single galvanized Regular Strand should be used in country line construction only, where there is no possibility of deterioration from smoke conditions. The size and grade of strand necessary, whether for guying or the suspension of cable, can be determined from the following table.

Its double galvanizing insures long life under smoky conditions, it is tempered highly enough to be strong but is not so highly tempered as to prevent its being tough, and when not convenient to use clamps it can be successfully "made up" in the old-fashioned way, provided the twist is made in the direction which increases the twist in the body of the strand and, in country line construction, a substantial saving can be effected through using old-fashioned "make ups" in place of guy clamps.

All grades are formed by twisting seven single wires into a single strand.

Size Ins.	Size Wires	Wt. Per 100 Feet	Strength in Pounds: Regular Single Galv.	Regular Double Galv.	Siemens-Martin	High Strength
3/16	16	8 lbs.	1,150	1,150	1,900	2,850
1/4	14	13 lbs.	1,900	1,900	3,150	4,750
5/16	12	22 lbs.	3,200	3,200	5,350	8,000
3/8	11	30 lbs.	4,250	4,250	6,950	10,600
7/16	10	40 lbs.	5,700	5,700	9,450	14,500
1/2	9	52 lbs.	7,400	7,400	12,100	18,800

SWITCHES

Baby Knife



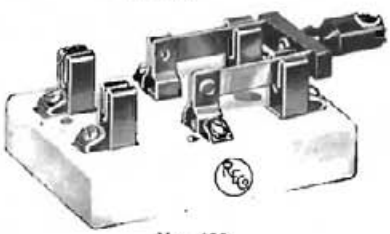
No. 450.



No. 452.



No. 454.



No. 456.

Code No.	Style	Dimensions	Weight per C
450	S-P-S-T	3¼x1⅛ in.	29 lbs.
452	S-P-D-T	4¼x1⅛ in.	41 lbs.
454	D-P-S-T	3¼x2 in.	43 lbs.
456	D-P-D-T	5 x2⅜ in.	80 lbs.

Keystone Switches

No. 921—1 point
No. 922—2 point
No. 923—3 point



Style 921. Lever.

Wood Base Switches



Wood Base Switch. Style No. 951.

Round, well made and durable. Furnished in one, two and three points.

No. 951—1 point
No. 952—2 point
No. 953—3 point

TERMINALS

Protected Type

Type A-27



Type A-27.

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 galvanized iron cover 8⅛ inches in diameter.

The treated maple protector mounting panels open wide to facilitate soldering and the cable compartment is made airtight by means of rubber gaskets. When specified, these terminals are equipped with a No. 22 B. & S. gauge, 6-foot cable stub.

Each pair of protectors consists of two No. 37 tubular wood fuses, lined with five ampere Blow-Rite fuse wire, four P367 carbon blocks and two P312 U-shaped mica dielectrics. The fuse posts are phosphor bronze with contact points which bite into end pieces of the fuse, insuring good contact even if fuse end is corroded.

Capacity Pair	Height Inches	Weight Pounds
11	15	18
16	18	20
26	25	25
50	40	36



Advantages of Fuse Posts and Clips Used in this Terminal.

A. Contact points bite into fuse ends insuring good contact even if fuse end is corroded.

B. Cable soldering terminal is formed deep into slot to prevent turning.

C. Screw is soldered to cable wire terminal to insure perfect contact.

D. Fuse clips are readily removable.

E. Lock nut binding post for attaching drop wires.

F. Projection on fuse clips fits into groove to prevent turning.



Type A-G

A protected cable terminal to be used without pothead for open wire distribution from lead covered aerial or underground cable. Arranged for mounting on pole and provided with galvanized iron cover 6⅞ inches in diameter.

The treated maple protector mounting panels open wide to facilitate soldering and the cable compartment requires only a small amount of compound. When specified, these terminals are equipped with a No. 22 B. & S. gauge 6-foot cable stub.

Each pair of protectors consists of two No. 44 renewable wood fuses, lined with 5-ampere Blow-Rite fuse wire, four P367 carbon blocks and two P312 U-shaped mica dielectrics. The fuse posts and carbon springs are heavy nickeled phosphor bronze. The screw binding posts for terminating drop wires have spring lock washers to prevent loosening of wires. The renewable flat fuse is constructed so that anyone can rewire it in a moment and obtain a renewed fuse which is as good as a new one.

Capacity	Height	Weight
11 pair	14 in.	15 lbs.
16 pair	17 in.	17 lbs.
26 pair	23 in.	20 lbs.
50 pair	38 in.	36 lbs.



Type A-G.

TERMINALS



Type F. and F. P.

Protected Type

Type F. and F. P.

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 pole and provided with galvanized iron cover 6⅞ inches in diameter.

The treated maple protector mounting panels open wide to facilitate soldering, and the cable compartment requires only a small amount of compound. When specified, these terminals are equipped with a No. 22 B. & S. gauge 6-foot cable stub.

Each pair of protectors consists of two No. 19 Western Union type enclosed mica fuses, 5 amperes, four P367 carbon blocks and two P312 mica dielectrics.

The Type FP Cable Terminal is the same except that No. 21 Postal type enclosed mica fuses are used.

Capacity	Height	Weight
11 pair	15 in.	10 lbs.
16 pair	18¾ in.	13 lbs.
26 pair	26¼ in.	18 lbs.
50 pair	43 in.	26½ lbs.

Type D

An unprotected cable terminal to be used without pothead for multiple tap distribution from lead covered cable. Arranged for mounting on pole and provided with galvanized iron cover 6⅞ inches in diameter.

The treated maple protector mounting panels open wide to facilitate soldering and the cable compartment requires only a small amount of compound. When specified, these terminals are equipped with a No. 22 B. & S. gauge 6-foot cable stub.

Lock nut binding posts and cable soldering terminals are securely anchored to prevent twisting and breaking of the cable wires.

Capacity	Height	Weight
11	12-in.	12 lbs.
16	12-in.	12½ lbs.
26	15-in.	14 lbs.
50	21-in.	15½ lbs.



Type D



Type G-R

Type G-R

A hot-galvanized cast iron cable terminal to be used without pothead for multiple tap distribution from lead covered cable. Arranged for mounting on pole and provided with gravity cover.

The cable is brought into the terminal through a tinned brass nipple to which the sheath of the cable is soldered. The cable is protected from sharp bends by a bell-mouthed lead sleeve. The cable wires are soldered to heavy brass studs which are grooved into the maple panels to prevent turning and these studs are threaded for the heavy split lock nuts with which drop wires are attached.

The wire openings at the bottom are just large enough to admit No. 17 B. & S. drop wires. The sides of the terminal are made a part of the cover to give plenty of room for dressing the bridle wires through the fanning strips to the binding posts.

When specified these terminals are equipped with a No. 22 B. & S. gauge six foot cable stub at top or bottom.

Capacity	Height	Weight
11 pair	8 in.	8 lbs.
16 pair	10 in.	11½ lbs.
26 pair	12 in.	18 lbs.



Type S-6

TERMINALS

Protected Type S-6

No Pothead Necessary

Type S-6 is an improved all metal terminal.

The cable wires, when formed, are led through hollow rivets to the outside of the box where they are soldered, thus doing away with the necessity for opening the box to inspect a connection. The drop wires are insulated from fanning strips and bracket by specially treated fibre. Copper tipped tubular fuses (Type A-7, 5 ampere, Standard), and specially treated carbons and celluloids, are furnished with this terminal. Equipped with self-soldering nozzle. A galvanized steel cover makes the terminal weatherproof.

Capacity	Weight
10 pair complete with fuses	20 lbs.
16 pair complete with fuses	25 lbs.
26 pair complete with fuses	30 lbs.
51 pair complete with fuses	53 lbs.
102 pair complete with fuses	100 lbs.

Type S-M-1

No Pothead Necessary



Type S-M-1

This is a high-grade, self-contained pothead terminal of the protected type, designed to be sold at a moderate price. It is suitable for use wherever the flat mica fuse is considered satisfactory for the fuse element of the protection. The self-soldering cable nozzle affords a means of forming out and connecting the cable conductors directly into the protector fuse supporting springs without splicing of conductors or cable sheath.

The general construction is the same as that of the S-6 terminal, except that the fuse mountings are arranged for the use of the flat mica fuse in place of the standard tubular pencil fuse. With the exception of the fuse, the protection is the same in every particular as that used in the other protected pole terminals. Specially treated, self-cleaning carbons are used in the lightning arresters, with U-shaped celluloid dielectrics.

The front of the steel terminal box is entirely open when the cover is removed in installing, affording easy access to the cable conductors and the inside terminals of the fuse supporting springs.

Capacity	Weight	Capacity	Weight
10 pair complete with fuses	15 lbs.	51 pair complete with fuses	54 lbs.
15 pair complete with fuses	20 lbs.	102 pair complete with fuses	105 lbs.
26 pair complete with fuses	25 lbs.		



Type S-22

Type S-22

No Pothead Required

This is the newest design of protected terminal. Except for its maple core box and fittings for cable wire connections, it is exactly like the type S-6. The fuse mounts are easily attached, and we will furnish this terminal without fuse mounts, and protection, or partially or wholly equipped, as desired. Complete equipment can be installed later, as needed. Fuse clips are of phosphor bronze, of patented design, which keeps the fuse constantly under tension. It uses A-7 fuses and standard carbons. The base, hood and jumper panels are of galvanized steel. It has a self-soldering nozzle, which makes pothead splicing unnecessary. The core box is of kiln-dried hard maple, boiled in beeswax and paraffine at a temperature of 280 degrees Fahrenheit, and finished with shellac. All insulation in direct contact with current carrying parts is of a hard rubber. The front panel can be removed easily to install the cable, after which the box should be filled with cable compound. The front panel carries a spring which holds the cover in place when raised or lowered. We furnish 5-ampere fuses, unless otherwise specified.

Cat. No.	Capacity	Weight	Cat. No.	Capacity	Weight
1827	10 pair complete with fuses	10 lbs.	1833	51 pair complete with fuses	26 lbs.
1829	16 pair complete with fuses	12 lbs.	1834	102 pair complete with fuses	26 lbs.
1831	26 pair complete with fuses	16 lbs.			



Type S-19

TERMINALS

Protected Type

Type S-19

No Pothead Required

This is a low priced, protected terminal, in which the A-44 tubular fuses and standard carbons are used. The galvanized metal bracket and cover are our standard design. The box on which the fuses and carbons are mounted is of hard maple. The front panel is removable, giving easy access to the cable, the wires of which are led through hollow studs and soldered on the outside of the box. The base is equipped with the self-soldering nozzle, and the box is designed for filling with water-proofing compound. Five ampere fuses will be furnished unless otherwise specified.

While low in price, this terminal is of good quality and should fill requirements where any wooden core terminal is acceptable. It is very accessible, light and strong.

Cat. No.	Capacity	Weight
1750	10 pair complete with fuses	15 lbs.
1751	16 pair complete with fuses	20 lbs.
1753	26 pair complete with fuses	25 lbs.
1754	51 pair complete with fuses	45 lbs.

Unprotected Type

Type M-10-1

No Pothead Required

This is an unprotected porcelain terminal, enclosed in an iron box. Unlike the ordinary circular type of unprotected terminal, this is designed to lie flat against a wall or pole, while the hinged cover swings upward, exposing the terminal connecting posts for the purpose of inspection or for making connections.

The connecting posts, which are hollow, extend through the porcelain block and are provided with hexagon heads, which fit into similarly shaped recesses on the rear side of the mounting panel. This construction prevents the annoying and expensive form of trouble, due to the turning of the bolts when drop wires are being connected. The design of the terminal has been worked out with the object in view of economizing to the greatest possible extent in the amount of insulating compound required.

The entire construction of the terminal is such as will afford the greatest possible mechanical strength and rigidity. Openings at the bottom of the iron box permit the entrance of the drop wires, while screw holes of ample size afford a means of securing the terminal firmly in its place. The inside of the cover is provided with a conductor chart having a space for listing all the conductors terminated in the box.



Type M-10-1

Capacity	Weight	Capacity	Weight
11 pair	15 lbs.	21 pair	20 lbs.
16 pair	17 lbs.	26 pair	25 lbs.



Type R

TYPE R

An unprotected porcelain cable terminal to be used without pothead for multiple tap distribution from lead covered cable. Arranged for mounting on pole and provided with galvanized iron cover.

The cable is brought into the terminal through a lead nipple and soldered to hollow lock nut binding posts which are embedded in the porcelain panels to prevent twisting and breaking of cable wires. When specified, these terminals are equipped with a No. 22 B. & S. gauge 6-foot cable stud.

Capacity	Height	Weight	Capacity	Height	Weight
5 pair	7¼ in.	4 lbs.	21 pair	10 in.	6½ lbs.
11 pair	7¼ in.	4 lbs.	26 pair	11 in.	8 lbs.
16 pair	10 in.	6 lbs.			

TERMINALS

Unprotected Type

Type M-9

No Pothead Required



Type M-9

This design of unprotected terminal is made of two duplicate, carefully moulded pieces of porcelain, arranged to permit ease in wiring and assembling and to insure durability and high insulation.

The porcelains are mounted on a strong galvanized metal bracket and protected with a galvanized metal cover. The brass connecting posts are hollow, to permit the cable leads being inserted in them, and soldered at the head of the post. These posts are each mounted on a raised boss in the porcelain, which affords increased mechanical strength and increased insulation. The posts have hexagonal heads, which fit into similar shaped recesses, and thus prevent the post turning when the nuts on the outside are tightened.

The two pieces of porcelain are fastened together with galvanized bolts, the joint being made tight with an elastic gasket, which is placed between the two porcelain surfaces.

This terminal is designed to have the core filled with compound, and can be made absolutely weather-proof, as well as fireproof. It is an unprotected terminal in which the self-soldering nozzle is standard.

The drop wires enter the terminal through two large openings in each side of the base, and pass directly to the outside ends of their proper connecting posts.

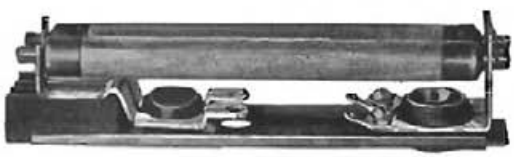
Capacity	Weight
11 pair	7 lbs.
16 pair	9 lbs.
21 pair	11 lbs.
26 pair	12 lbs.

Type S-16-D

No Pothead Necessary

Is of all steel construction and furnished without protectors but with connecting posts only, enabling the complete installation of the cable with the terminal, yet permitting the protection of such cable pairs as are connected with subscribers' stations when the initial installation is made. Equipped with self-soldering nozzle.

Capacity	Weight	Capacity	Weight
10 pair without protectors	15 lbs.	51 pair without protectors	48 lbs.
16 pair without protectors	20 lbs.	102 pair without protectors	80 lbs.
26 pair without protectors	25 lbs.		



Type M-29-D Unit Protector Mount for Types S-16-D, S-18-D and T-29-D Cable Terminals.



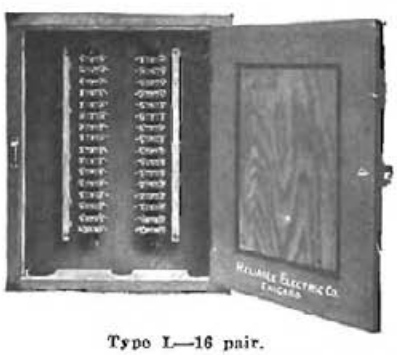
Type S-16-D. (Cover Up)

Type L Building Terminal

A box containing terminal strips to be used for distributing telephone wires in buildings where several sub-stations are to be located.

Boxes are attractively finished in light oak. Screw binding posts for terminating all wires are mounted on hard rubber strips. (Cable wires may be soldered.) The space between the terminal strips is used for the cable, and the fanning strips at the sides hold the distributing wires.

Capacity	Dimensions	Net Weight
11 pair	11x12¼x3 inches	5¼ lbs.
16 pair	15x12¼x3 inches	6¼ lbs.
26 pair	21x12¼x3 inches	10¼ lbs.



Type L—16 pair.

TERMINALS

Type E Building Terminal

This is the same as Type L Box equipped with a more compact terminal strip giving double capacity for the same size box.

Type E Terminal Strips are used. The screw binding posts for distributing wires with soldering terminals for cable wires are embedded in hard maple strip.

Capacity	Dimensions	Net Weight
11 pair	11x12¼x3 inches	5¼ lbs.
22 pair	11x12¼x3 inches	5¾ lbs.
26 pair	15x12¼x3 inches	6¼ lbs.
30 pair	15x12¼x3 inches	6¾ lbs.
52 pair	21x12¼x3 inches	11 lbs.



Type E

Type E Terminal Strip

Screw binding posts with soldering terminals embedded in hard maple mounted on maple back strip.

Made in 11, 15, 22, 26, 30 and 52 pair strips.



Type L

Type L Terminal Strip

Twin screw binding posts with one soldering washer mounted on hard rubber with maple back strip.

Made in 5½, 11, 16 and 26 pair strips.



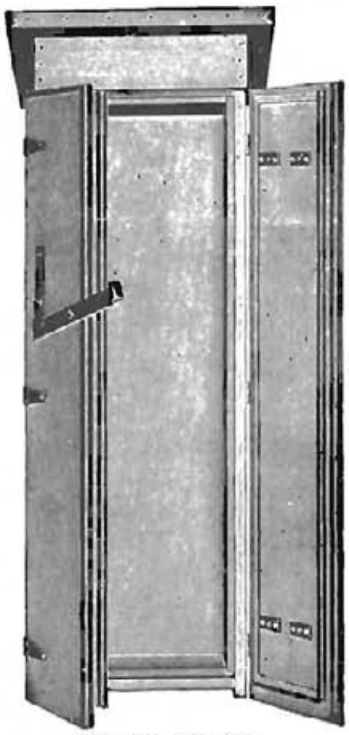
Type T

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.

POLE HOUSE



Type EE—No. 1961

Type EE

This pole house is substantially made of a good grade of pine lumber, well joined. It is painted to render it thoroughly waterproof. The hinged doors, when closed rest against a rubber gasket which extends along the open side.

The space available inside of all these pole houses measure 16 inches wide by 6¼ inches deep, and the overall outside dimensions are 20 inches wide by 10⅛ inches deep.

The cable holes in the 25 and 50 pair boxes are 1¾ inches and in the 75 and 100 pair 2¼ inches in diameter.

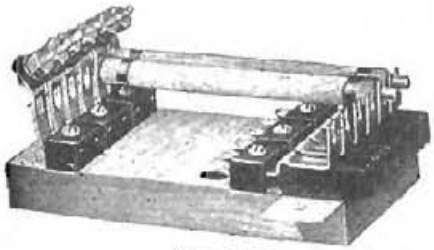
No protectors are included; if protection is desired, use H-19 or H-20 protectors.

List No.	Capacity	Inside Height	Outside Height	Weight Each
1960	25 pairs	18 inches	25½ inches	50 lbs.
1961	50 pairs	34 inches	41½ inches	85 lbs.
1962	75 pairs	49¾ inches	55½ inches	110 lbs.
1963	100 pairs	63¾ inches	71½ inches	135 lbs.

Types H-19 and H-20 Protector Strips

Two types of protector strips are regularly furnished for the Type EE pole houses. Both types are combinations of the 5-ampere type A-7 line fuse and specially treated carbon lightning arrester, the clips being mounted in individual hard rubber blocks which in turn are fastened to the hard maple strips. These strips are drilled to admit the cable or jumper wires and the fuse contact clips are a new type which insures positive contact. A heavy metal ground strip also insures a good ground.

TERMINALS



Type H-19



Type H-20

Types H-19 and H-20 Protector Strips

The maple mounting strip is ¾x5⅝ inch and the space required for each pair of protectors is 1⅛ inches. The overall dimension from back of mounting strip to outside of lock nuts on the H-19 is 2¾ inches and on the H-20 2⅜ inches for corresponding dimensions.

The H-19 is provided with lock nut binding posts for jumper connection where the H-20 is arranged for soldering.

If used to equip an existing pole house be sure and specify angle irons for mounting. The actual inside depth required in a pole house to mount these strips is 6¼ inches.

Socket Wrenches for Cable Terminals

No. 1874 Socket Wrenches will fit any of the hexagon nuts on the Cook terminals.

List No.	Type	Wt. per pair
2010	H-19	½ lb.
2020	H-20	½ lb.

Junction Boxes



No. 1885

This junction box affords a method of splicing and tapping lead covered telephone cable, without incurring the expense of making splices or wiped joints in the lead sheath. The general construction is that of a pressed steel cylindrical box which has been heavily galvanized. The front of the box is cut away sufficiently to afford a large opening for testing or inspection. This opening is provided with an accurately formed steel cover and a rubber gasket to make it absolutely weather-proof.

In the bottom of the junction box are mounted the self-soldering nozzles, and the lower part of the box is formed into a shallow pocket that may be filled with compound.

The use of this junction box will not only reduce the cost of making splices and taps in main cables, but will also enable the telephone troubleman, inexperienced in cable work, to make all the cable splices and taps without outside help.

The design of the junction box has been worked out so that it may be installed at any desired time and to provide for the later addition of the distributing terminal, when it is desirable to add one. This junction box may be used with terminals, S-6, S-16-D and S-M.

This method of making cable splices and taps will be especially attractive to the engineer about to make extended cable changes for cut-overs.

The junction box must be assembled with the desired terminals at the factory.

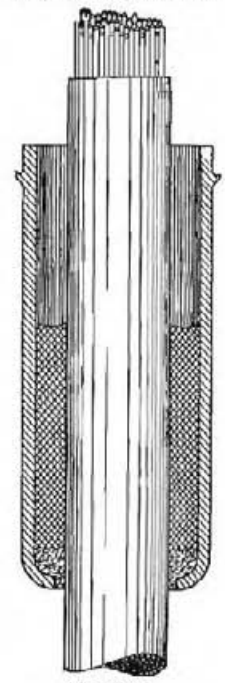
Code No.		Weight
1885	Junction Box only for use without terminal	27 pounds
1886	Junction Box only for use with terminal	27 pounds

Addition for Self-Soldering Nozzles

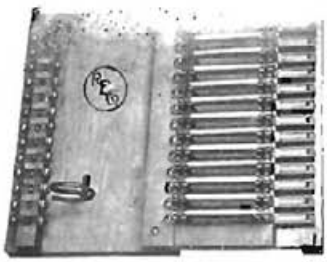
Self-soldering nozzles are furnished with cable terminal containing the necessary solder sleeves with the flux applied, and with the asbestos plug in place.

The process of installing a cable end in one of the self-soldering nozzles is very simple. After scraping the lead sheath in the cable bright and clean, it should be inserted in the nozzle in its final position. The asbestos packing is then carefully packed around the cable sheath inside the nozzle, to prevent the escape of the solder. Immediately above the asbestos packing the solder sleeve is inserted and pressed firmly down. When these parts have all been properly assembled, the blow torch is applied around the outside of the nozzle until the solder begins to flow, when the torch should be instantly withdrawn.

Cat. No.	Size	Outside Diam. of Nozzle, Inches	Opening Inches
1890—	10 pair	1	⅝
1891—15 or	20 pair	1¼	¾
1892—	25 pair	1½	1
1893—30 to	50 pair	1¾	1¼
1894—60 to	75 pair	1¾	1⅜
1895—75 to	100 pair	2	1½
1896—	150 pair	2	1⅝
1897—	200 pair	2½	2⅛



No. 1892



No. 132

No. 132 SWITCHBOARD PROTECTOR AND DISTRIBUTING BOARD

(ECONOMICAL FLAT WOOD FUSE)

Same as the No. 131 only equipped with flat fuses.

Capacity	Length	Width	Net Weight
12½ pair	17 in.	12 in.	6¾ lbs.
25 pair	32⅝ in.	12 in.	13½ lbs.



No. 727

No. 727 PROTECTOR STRIP

(Uses No. 27 Fuse)

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" wide by 3' 5" high and in 50 pair pole houses 20¼" wide by 3' 5" high.

Each pair consists of two No. 27 fuses, 7 amperes, 4¾ in. 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	Width	Net Weight
26 pair	29⅛"	7¼"	7 lbs.



No. 927

No. 927 PROTECTOR STRIP

(Uses No. 27 Fuse)

A protector strip for mounting in pole houses. To be used for protection against lightning and crosses with electric circuits.

Each pair consists of four P367 carbon blocks, two P312 mica dielectrics 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.

P495 self-cleaning sawtooth discharge blocks may be used instead of line carbon blocks and mica dielectrics.

Capacity	Length	Width	Net Weight
13 pair	15½"	5⅛"	3 lbs.
26 pair	30⅛"	5⅛"	6 lbs.



No. 944

No. 944 PROTECTOR STRIP

(ECONOMICAL FLAT WOOD FUSE)

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	Width	Net Weight
12½ pair	19"	6½"	3½ lbs.
25 pair	38"	6½"	7 lbs.

TEST SETS



STEWART TEST SET

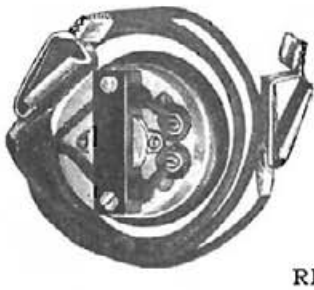
This Test Set tells which way and how far trouble is from the tester without opening the line.

It also 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, full length shoulder strap, and leather top cover.

"Midget" for light service, size 3½ by 5¾ by 6¾ inches; weight 7 lbs.

"Heavy Duty" Midget Type, size 4½ by 6¾ by 8 inches; weight 10 lbs.



POCKET PHONE.

This Pocket Phone is 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.

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. By far the most efficient common battery test set on the market. Weight 4 oz.

See also page 146.

RESISTANCE METER.

Reads resistance to trouble in ohms, and a card furnished with each instrument tells how far trouble is from office for each reading.

Operates on current from a hand generator. No batteries are necessary.

When used with a telephone, it makes an ideal test board for a small exchange. Anyone can install it and anyone can use it. The meter does the figuring.

Shipping weight 12 pounds.



Resistance Meter



Detecto-Meter

DETECTO-METER.

By far 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 volt-meter reads volts. Operates on one dry battery.

The instrument is also a 150-volt voltmeter and a battery tester.

It is portable, only weighing 4 lbs.

A very reliable, inexpensive instrument.

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.

This instrument will pay for itself many times each year.

Shipping weight 18 pounds.



Cable Tester



Test Cabinet

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



Matthews Telefault

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 only sends 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.

TOOLS

Sheath Splitting Knives



No. 1515-1

We furnish two styles of cable sheath knives, one with durable leather handle, and one forged all in one piece of solid tool steel. They are knife edge tempered and ground to a keen edge.

Code No.	Handles	Weight per doz.
1515-1	Leather	6⅜ lbs.

Cable Stripper Knives

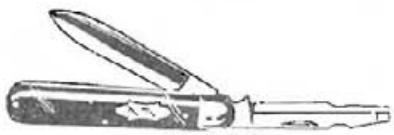


No. 1560-2

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 chance of shock.

Code No.	Length over all	Length of blade	Weight per doz.
1560-2	8½	3½	2¼ lbs.

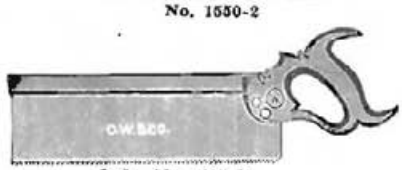
Electricians' Knives



No. 1550-2

1550-2 Double blade

Cableman's Saw

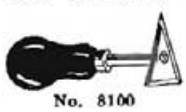


Code No. 425-12

This saw is arranged particularly for use on Cable work. One of these saws should be in every tool kit. Will also cut wood.

Length of Blade	Weight each
12 inches	1 lb.

Shave Hooks



No. 8100

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.

Code No.	Pattern	Weight per doz.
8100	Triangle	2½ lbs.

Pure Gum Rubber Gloves



No. 5005-10

The pure gum rubber gloves have been adopted as a "safety first" glove by many of the large companies. The 5004 series is an ideal glove for workmen working on voltage up to 4,000. The 5005 series is heavier and intended for voltage up to 10,000. All gloves are guaranteed by the factory.

5004- 9	Seamless for	4,000 volts.
5004-10	Seamless for	4,000 volts.
5004-11	Seamless for	4,000 volts.
5005- 9	Seamless for	10,000 volts.
5005-10	Seamless for	10,000 volts.
5005-11	Seamless for	10,000 volts.

TOOLS

Pouring Ladles

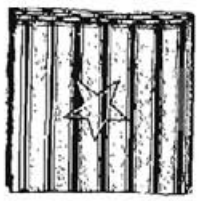


No. 373

This is the standard type of ladle used for general construction where soldering by means of the pouring method is required.

Code No.	Diameter of bowl
373-3	3

Wiping Cloths



No. 371

Made in two styles; one of moleskin and the other of ticking, used especially for wiping of lead joints.

Code No.	Size	Style
371-3	3x3	Moleskin
371-4	4x4	Moleskin
372-3	3x3	Ticking
372-4	4x4	Ticking

Turn Pins—Hardwood



No. 7700-2

For expanding ends of lead shelves, pipe and pot heads.

Code No.	Size of sleeve expanded
7700-1	For 1 inch
7700-2	For 2 inch
7700-3	For 3 inch

Hardwood Dressers



No. 296

No. 296

For shaping and dressing lead sleeving, pipe, potheads, etc.

Melting Pots

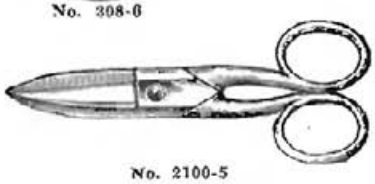


No. 398-6

This pot is made of heavy cast iron to retain the heat as long as possible, provided with steel handle.

Code No.	Diameter, top of pot
398-6	6 inches

Electricians' Scissors



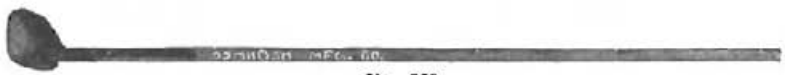
No. 2100-5

A scissor 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.

Code No.	Size	Weight, per doz.
2100-5	5-inch	2 lbs.

POST HOLE SPOONS—MAPLE HANDLES

We manufacture spoons with maple, hickory or ash handles, as desired, although we strongly recommend the use of maple handles. These handles are as strong as hickory or ash and do not bend so easily; they will stand up under just as hard service and cost considerably less. All maple spoon handles are 1⅜ inches in diameter, of perfect, straight grained, genuine rock maple. They can be had in practically any length desired. The blades are genuine .70-.80 carbon crucible steel and of regular weight. These spoons are made for hard service.



No. 860

Improved Western Union Pattern—Flat Toe

	Weight each
No. 856—7 foot handle, 9 inch straps	9 lbs.
No. 857—8 foot handle, 9 inch straps	10 lbs.
No. 858—9 foot handle, 9 inch straps	10½ lbs.
No. 859—7 foot handle, 22 inch straps	11 lbs.
No. 860— 8 foot handle, 22 inch straps	10½ lbs.
No. 861— 9 foot handle, 22 inch straps	11½ lbs.
No. 862—10 foot handle, 22 inch straps	12 lbs.

TOOLS

Pike Poles



No. 819

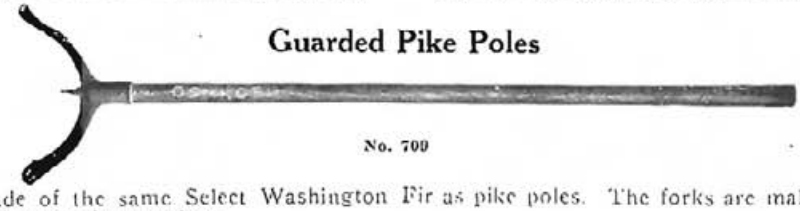
No one doubts the fact that Washington Fir is far superior to ash or hickory for making raising pole handles. It is practically as strong as hickory and at the same time far lighter, and can be had straight grained in practically any length.

Very few people, however, know that there are dozens of different kinds and grades of Washington Fir. To simply say that a pole is made of "Washington Fir" does not necessarily mean that it is a good one.

After years of experiment we have decided to make all our poles of "soft, old growth, yellow Washington Fir, free from defects, absolutely straight grained and running from 14 to 18 annular rings to the inch." This fir has proved to be lighter and stronger than any other kind and it does not easily splinter off in the user's hands as do the hard, brittle varieties. Of course, it costs us more than other kinds, as our specifications are very severe, but we feel it is well worth it. All poles are nicely sanded before leaving the factory. The pikes are of genuine hand-forged crucible steel with a long taper and screwed in.

	Weight, each		Weight, each
No. 817—2½ inch x 10 foot	12 lbs.	No. 820—2½ inch x 16 foot	13 lbs.
No. 818—2½ inch x 12 foot	12½ lbs.	No. 821—2½ inch x 18 foot	18 lbs.
No. 819—2½ inch x 14 foot	13½ lbs.	No. 822—2½ inch x 20 foot	20 lbs.

Guarded Pike Poles

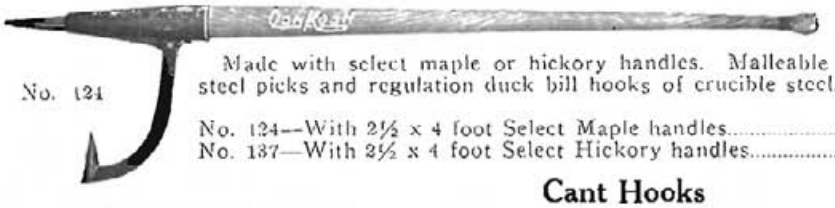


No. 709

Handles made of the same Select Washington Fir as pike poles. The forks are malleable iron with the fork and socket cast in one piece.

	Weight, each		Weight, each
No. 832—2 inch x 10 foot	10 lbs.	No. 796—2½ inch x 12 foot	16 lbs.
No. 833—2 inch x 12 foot	12 lbs.	No. 797—2½ inch x 14 foot	17½ lbs.
No. 834—2 inch x 14 foot	13½ lbs.	No. 835—2½ inch x 16 foot	20 lbs.

Malleable Socket Peavies

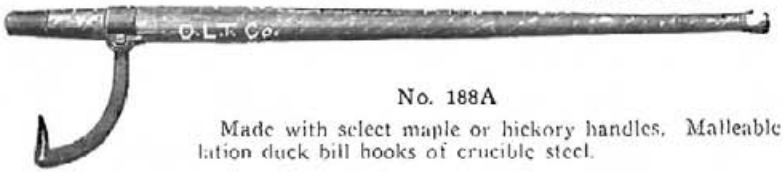


No. 124

Made with select maple or hickory handles. Malleable solid sockets driven crucible steel picks and regulation duck bill hooks of crucible steel.

	Weight, each
No. 124—With 2½ x 4 foot Select Maple handles	9 lbs.
No. 137—With 2½ x 4 foot Select Hickory handles	9 lbs.

Cant Hooks



No. 188A

Made with select maple or hickory handles. Malleable iron clasps and toe rings and regulation duck bill hooks of crucible steel.

	Weight each
No. 188A—With 2¼ inch x 4 foot Select Maple handles	7½ lbs.
No. 189A—With 2¼ inch x 4½ foot Select Maple handles	8 lbs.
No. 188 —With 2½ inch x 4 foot Select Maple handles	8 lbs.
No. 189 —With 2½ inch x 4½ foot Select Maple handles	8½ lbs.
No. 199A—With 2¼ inch x 4 foot Select Hickory handles	7½ lbs.
No. 200A—With 2¼ inch x 4½ foot Select Hickory handles	8 lbs.
No. 199 —With 2½ inch x 4 foot Select Hickory handles	8 lbs.
No. 200 —With 2½ inch x 4½ foot Select Hickory handles	8½ lbs.

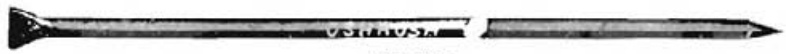
TOOLS

DIGGING BARS

Our bars are all hand-made of specially selected crucible steel. We use no mild steel in any of our bars. Made for service.

It is a waste of money to purchase cheap bars, for they will bend or break on the first hard job; or, if they are too brittle, the digging blade will chip off. The steel that goes into our bars is rolled for just this purpose and the small additional cost to the user is more than justified by the additional service derived.

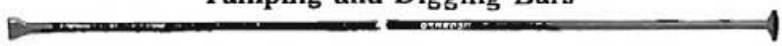
Crow and Digging Bars



No. 1060

	Weight, each		Weight, each
No. 1060—1 inch Octagon, 6 foot long	17 lbs.	No. 1063—1⅛ inch Octagon, 6 foot long	22 lbs.
No. 1061—1 inch Octagon, 7 foot long	20 lbs.	No. 1064—1⅛ inch Octagon, 7 foot long	26 lbs.
No. 1062—1 inch Octagon, 8 foot long	23 lbs.	No. 1065—1⅛ inch Octagon, 8 foot long	30 lbs.

Tamping and Digging Bars



No. 1070

	Weight, each		Weight, each
No. 1070—1 inch Octagon, 6 foot long	17 lbs.	No. 1073—1⅛ inch Octagon, 6 foot long	22 lbs.
No. 1071—1 inch Octagon, 7 foot long	20 lbs.	No. 1074—1⅛ inch Octagon, 7 foot long	26 lbs.
No. 1072—1 inch Octagon, 8 foot long	23 lbs.	No. 1075—1⅛ inch Octagon, 8 foot long	30 lbs.

Plain Digging Bars



No. 1080

	Weight, each		Weight, each
No. 1080—1 inch Round, 6 foot long	16½ lbs.	No. 1083—1⅛ inch Round, 6 foot long	21 lbs.
No. 1081—1 inch Round, 7 foot long	19 lbs.	No. 1084—1⅛ inch Round, 7 foot long	24½ lbs.
No. 1082—1 inch Round, 8 foot long	21½ lbs.	No. 1085—1⅛ inch Round, 8 foot long	28 lbs.

TREE TRIMMER
(Favorite)



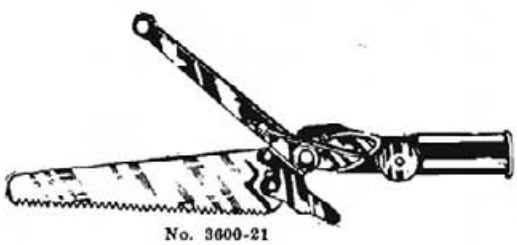
No. 3600-20

This trimmer, as its name implies, is a favorite among users. The head is constructed of malleable iron, and comprises the hook portion with which the knife operates and the socket into which the handle is inserted. This socket is perfectly straight, eliminating the necessity of tapering the end of the handle. The knife is forged from crucible steel and is integral with the lever, and the cutting edge is carefully tempered and ground making it very effective. This trimmer will sever a 1-inch branch. The knife is held open by a flat steel spring and is operated by a rope attached to the end of the lever.

Two threaded holes are provided for attaching a saw.

An 18-foot handle can be furnished made up of two nine-foot handles joined with ferrule.

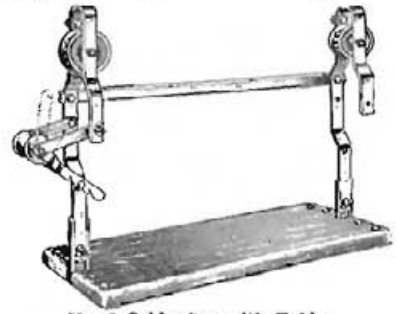
Code No.	Description	Length over all	Weight, each
3600-20	Trimmer only	19″	3½ lbs.
3600-21	Trimmer with saw	21″	4 lbs.
913-12	Saw only	12″	6 oz.
3601-18	One-piece handle	18′	9 lbs.
3601-9	Two-piece handle	18′	9¼ lbs.



No. 3600-21

CABLE CARS

These Cable Cars have been designed with a view of reducing the weight to a minimum and increasing the strength to a maximum. All the metal parts are made of cold rolled and cast steel, Sherardized (rust proof) which assures free working of all parts at all times. The seat and pickup attachment are of the best grade of oak.



No. 1 Cable Car with Table

TOOLS

FOLDING TAKE-UP REEL



Open

This is the handiest device on the market for handling wire. It will save two men's work in taking down wire and will coil the wire up in whatever your standard size coil is. It does away entirely with the old method of throwing the tangled wire on a wagon. With this reel you can take down miles of wire and not injure a foot of it, and the wire is all ready for future use.

The reel is light, weighing only about 45 pounds, but strongly constructed of rock elm, malleable iron and steel.

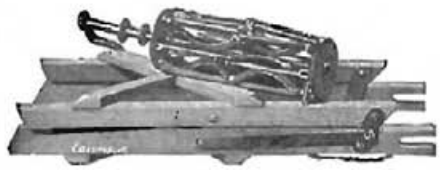
The frame folds up into a neat, compact bundle and the reel in throwing off the coil automatically collapses into a very small space.

This reel will pay for itself on the first big job you work with it. Easily pulls one-half mile of wire.



Throwing Off the Coil

The wagon space alone saved by this reel will pay for its cost in a short time, not to mention the time saved by your men. It can be taken down in a moment by merely pulling the pin out of the shaft, throwing off the coil and folding up the frame.



Folded

	Weight
No. 896—For 18 inch coil	40 lbs.
No. 897—For 21 inch coil	41 lbs.
No. 898—For 24 inch coil	42 lbs.

BARROW REELS

Light Reel—For Telephone Work

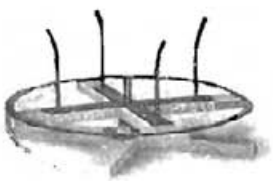
These reels are usually used for light or telephone construction, but can be used for heavier work, as they are of very strong construction, being built throughout of rock elm and heavily braced and reinforced with steel. The legs are of heavy steel and bolted onto the barrow handle. Guard pins are adjustable for 12, 18, 21 and 24 inch coils.

No. 899—Weight, 70 lbs.



No. 899

PAY-OUT REEL



No. 902

This reel is made of rock elm, well braced and reinforced with sheet steel throughout. A reel built for "real" service.

No. 902—Weight 40 lbs.

TOOLS (Lineman's)

Side-Cutting Pliers—Diamond Special



Lineman's Special
No. 201 Pattern
1950-Type

POLISHED HEADS AND BLACK HANDLES.

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.

Code No.		Size in inches	Weight, lbs. per doz.	Code No.		Size in inches	Weight, lbs. per doz.
201-6	Kleins	6 inches	5	1950-7	Red Devil	7 inches	9
201-7	Kleins	7 inches	7½	1950-8	Red Devil	8 inches	13
201-8	Kleins	8 inches	12	1950-9	Red Devil	9 inches	14
201-9	Kleins	9 inches	12½				

Oblique Cutting Pliers

For Close Cutting.



Oblique Cutting Pliers.
No. 202 Pattern
526-Type

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.

Code No.		Size in inches	Weight, lbs. per doz.
202-5	Kleins	5	4 lbs.
202-6	Kleins	6	4¼ lbs.
526-5	Swedish	5	4 lbs.

Long Oval Nose Pliers

WITH OR WITHOUT CUTTERS



Long Oval Nose Plier
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 shown above, 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

Code No.		Size in inches	Weight, lbs. per doz.
301-6	Kleins (without cutter)	6	3 lbs.
203-6	Kleins (with cutter)	6	3 lbs.
590-6	Swedish (with cutter)	6	3 lbs.

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

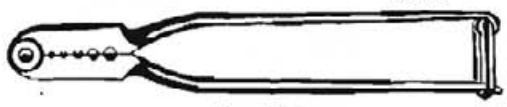


No. 102-1

No. 102-1—Baby Pattern

A handy vest pocket size adapted for telephone troublemen. Has four round holes, accommodating all sizes of copper wire from 10 to 16 B. & S. gauge, and all sizes of iron wire from 12 to 18 B. W. G.

Code No.	Size in length	Weight per dozen
102-1	7"	4½ lbs.



No. 102-3

Code No.	Size in length	Weight per doz.
102-3	10½	14¾

No. 102-3—Standard Size

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 five round holes accommodating all sizes of iron wire from 6 to 14 B. W. G., and all sizes of copper wire from 4 to 12 B. & S gauge.

TOOLS (Lineman's)

Combination Wire and Sleeve Clamps



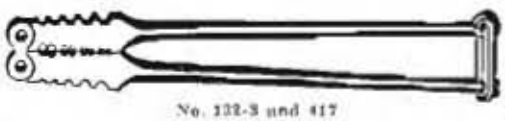
No. 132-2 and 424

Code No.	Size in length	Weight per doz.
132-2—Kleins	9 in.	10¼ lbs.
424-9—Red Devil	9 in.	10½ lbs.

No. 132-2—Light Weight

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 three sets of chambers adapted for twisting double tube copper sleeve joints Nos. 10 to 14 B. & S. gauge, and iron sleeve joints Nos. 12 to 16 B. W. G.

No. 132-3—Heavy Weight



No. 132-3 and 417

Code No.	Size in inches	Weight per doz.
132-3—Kleins	10¼	15½ lbs.
417 —Red Devil	10¼	17 lbs.

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 iron wire Nos. 6 to 14 B. W. G., and all sizes of copper wire Nos. 4 to 12 B. & S. gauge. The reverse side has four sets of chambers adapted for twisting double tube copper sleeve joints Nos. 8 to 14 B. & S. gauge, and iron sleeve joints Nos. 10 to 16 B. W. G.

Splicing Clamps of different combinations from our regular stock patterns made to order at special prices.

The dies in the above clamps fit the sleeves snugly so the sleeve is not injured in twisting.

Eastern Climbers



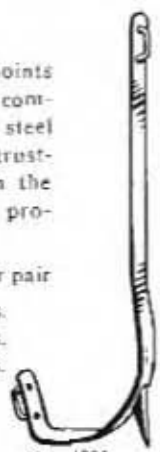
No. 1901-253
Punched Loop

In considering the manufacture of lineman'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 lineman the greatest freedom of action and comfort. The stock from which they are produced insures long life and service.

Code No.	Style of loop	Weight, per pair
1901—Kleins	Punched	3⅝ lbs.
1904—Kleins	Riveted	3½ lbs.
253—Red Devil	Punched	3½ lbs.

Sizes 15½ to 17 inches carried in stock.

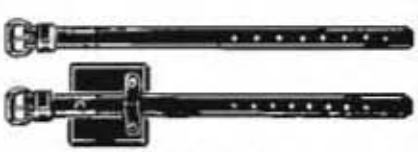
Lengths from 15 to 18 inches from the instep to the end of shank, by ½-inch variations, can be furnished.



No. 1904
Riveted Loop

The No. 1904 type of climber is a little different from the No. 1901 type. The foot rest is slightly more rounded—a feature sometimes preferred. The bar is slightly curved and tapered somewhat at each end. Always advise if straps are wanted; no straps sent unless ordered.

Straps for Eastern Climbers



No. 5301-1 and 245-5

A set consists of four straps, two equipped with plain leather pads to be used on top of climber and two used as ankle straps. They are made of select oak tanned harness leather, with extra heavy roller buckles. All straps are 22 inches long by 1¼ inches wide over all.

Code No.	Weight
5301-1—Kleins	Per doz. sets, 15 lbs.
245-5—Red Devil	Per doz. sets, 15 lbs.

TOOLS—LEATHER

Tool Belts



No. 5202

This belt is made of select harness leather. The lop layer is 1⅛" wide, formed into six tool loops. It is provided with strong "D" rings securely sewed in and riveted to the main belt which also passes through the "D" rings. This arrangement makes a strong, safe belt. They are made in lengths of 38-40-42-44 and 46 inches. Always specify length. Sizes 38, 40 and 42 carried in stock.

Code No.	Size in inches	Weight per dozen
5202	2¼	22 lbs.
5204	3½	24 lbs.



No. 5206-1-A

Tool Belt and Safety Strap

The tool belt in this outfit is the same as No. 5202. The safety strap is the same as No. 5250, is 1¾ inches wide and 6 feet long, and is provided with a strong snap at each end. Strap may be shortened or lengthened by adjusting buckle, or it may be detached from the belt.

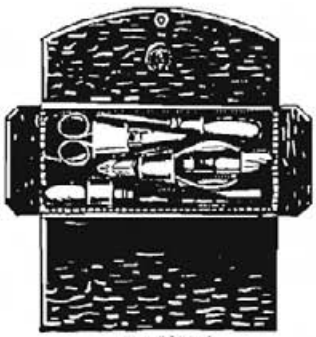
Code number	Weight per doz.
5206-1-A Complete Outfit	42 lbs.

Safety Straps



This style of safety strap is known as the standard type. These straps are cut out of selected harness leather, securely sewed, riveted and doubly reinforced. Only the best grade hardware is used. The snaps are of Imperial type, japanned. Strap may be shortened or lengthened by adjusting buckle.

Code Number	Description	Size in inches	Weight per dozen
5250	Imperial Snap	1¾"x6'	30 lbs.
5251	Roller Snap	1¾"x6'	32 lbs.



No. 1301-2

Electricians' Pocket Tool Kits

Genuine leather case, contains a selection of good tools such as have been found particularly desirable by electricians and wire men on switchboard and telephone work. It is of convenient pocket book style, with firm metallic clasp and measures 4x9 inches. It contains the following tools, one double blade electrician's knife, one 5-inch special side cutting plier, one 5-inch oblique diagonal plier, one 6-inch long nose side cutting plier, one 3½-inch blade screw driver, one pair 5½-inch electrician's scissors, one 3¼-inch file and handle and 4½-inch nickel-plated tweezer.

Code No.	Description	Weight, each
1301-2	Case with tools	1½ lbs.
1301-1	Case only	½ lbs.



No. 5101 Pattern

Inspector's Tool Bag—Black Leather

This bag is made of one piece of heavy oak tanned harness leather which does not absorb moisture. It is equipped with two buckles and billets and has a 1¼-inch shoulder strap. All seams are hand sewed with waxed linen thread, lock stitched.

Code No.	Size	Weight, each
5101-15	15x12	3 lbs.
5101-20	20x12	3¾ lbs.

TOOLS (Leather)

Lineman's Tool Bag—Canvas With Leather Bottom



No. 5102 Pattern

This bag is made of one piece of No. 6 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.

Code No.	Size	Weight, each
5102-12	12 in.	2⅝ lbs.
5102-14	14 in.	3 lbs.
5102-16	16 in.	3½ lbs.
5102-18	18 in.	3¾ lbs.
5102-20	20 in.	3⅞ lbs.
5102-22	22 in.	4 lbs.
5102-24	24 in.	4½ lbs.

Inspector's 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.

Code No.	Size	Weight, each
5108-14	14x8 in.	3 lbs.
5108-16	16x8 in.	4⅛ lbs.
5108-18	18x8 in.	4½ lbs.
5108-20	20x8 in.	5⅛ lbs.
5108-22	22x8 in.	6 lbs.
5108-24	24x8 in.	7¼ lbs.



No. 1 Universal Duster

Universal Dusters

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.

No. 1 Length, 20 inches. Weight, each, 10½ ounces.

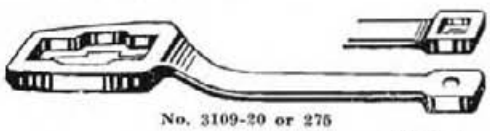


No. 281 and 188

Wire Gauge—American Standard

A gauge made from the best of steel, tempered, adjusted and warranted accurate.

No. 281 American Standard 0 to 36 B. & S.
No. 188 English Standard 1 to 36 B. W. G.



No. 3109-20 or 275

Combination Steel Wrench—For Lag Screws

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 ⅜ inch to ⅝ inch. The small end of the wrench is arranged for ⅜ 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.

Code No.		Length	Weight per dozen
3109-20	Kleins	13½ inches	20 lbs.
275	Red Devil	14 inches	20 lbs.

TOOLS

Screw Drivers

These screw drivers are well made and well finished. The blades are hammer forged from a high grade of tool steel and are carefully hardened and oil tempered. A square tang holds the blade in place. The handles are polished hard wood.

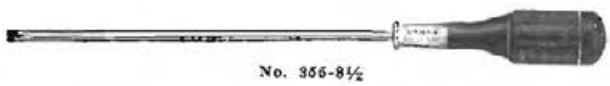
Plain Standard Blade



No. 909

Cat. No.	Length of Blade	Diameter	Weight Per Doz.
909-3	3-in.	1/8	2 -lbs.
909-4	4-in.	5/32	2 3/16-lbs.
909-6	6-in.	3/16	2 5/8-lbs.
909-8	8-in.	7/32	4 7/8-lbs.
909-10	10-in.	1/4	5 1/2-lbs.

Plain Cabinet Blade



No. 355-8½

Cat. No.	Length of Blade	Diameter	Weight Per Doz.
355-4½	4½-in.	1/8	2 3/8-lbs.
355-6½	6½-in.	5/32	2 7/8-lbs.
355-8½	8½-in.	3/16	2 3/4-lbs.
355-10½	10½-in.	7/32	3 -lbs.
355-12½	12½-in.	1/4	3 1/2-lbs.

Ratchet Screw Drivers



No. 66-3

Cat. No.	Length of Blade	Diameter	Weight Per Doz.
66-3	3-in.	1/4	2 3/4-lbs.
66-4	4-in.	1/4	2 5/8-lbs.
66-6	6-in.	1/4	3 -lbs.

Automatic Screw Drivers



No. 22

Cat. No.	Length of Blade	Diameter	Weight Per Doz.
22	9-in.	1/4	11 1/4-lbs.
111	10-in.	1/4	12 -lbs.

Assemblers Screw Driver



No. 611-8

Cat. No.	Length of Blade	Diameter	Weight Per Doz.
611-8	4½-in.	1/8	12-oz.

Automatic Drills



No. 185

These drills are furnished with a patented magazine handle containing eight fluted drill points 1/8 to 11/64, each drill point in a separate numbered compartment from which they can be released one at a time through hole in rotating cap. All exposed metal parts are polished, nickel plated and buffed, giving a bright and lasting finish.

Cat. No.	Length	Weight Each
03	9½-in.	3/8-lbs.
185	10 -in.	3/8-lbs.

TOOLS

Torches



No. 31

This torch is fitted with back-flow burner, made of bronze which generates a blue flame of intense heat. Works in wind and cold weather. The burner is made without the hook and support for the soldering copper. Tank made of heavy gauge seamless drawn brass, re-inforced and has concaved brass bottom. No. 37 torch same in construction as No. 31 only it is pint size.

	Gasoline Capacity	Consumption per hour	Shipping weight
No. 31	1 qt.	½ pt.	5½ lbs.
No. 37	1 pt.	½ pt.	3½ lbs.


No. 32

This torch is fitted with back-flow burner, made of bronze, which super-heats the gas and produces a perfect blue flame of intense heat in wind or extreme cold. Hook for soldering iron cast in burner tube. Heavy gauge seamless drawn brass tank, re-inforced and has concaved brass bottom. Fitted with automatic brass pump with double spring check valve. No. 38 torch same in construction as No. 32 only it is pint size.

	Gasoline Capacity	Consumption per hour	Shipping weight
No. 32	1 qt.	½ pt.	5½ lbs.
No. 38	1 pt.	½ pt.	3½ lbs.


No. 201

The No. 201 torch is equipped with improved burner and latest style automatic brass pump in tank. This torch will generate a high degree of heat and produce a solid blue flame which is easily regulated. No. 301 torch is same in construction as No. 201 only it is pint size.

	Gasoline Capacity	Consumption per hour	Shipping weight
No. 201	1 qt.	½ pt.	5½ lbs.
No. 301	1 pt.	½ pt.	3½ lbs.


No. 202

This torch is very similar to No. 201 and is furnished with attachments for holding soldering copper. It will generate a large volume of heat with minimum consumption of fuel. No. 302 torch is same in construction as No. 203 only it is pint size.

	Gasoline Capacity	Consumption per hour	Shipping weight
No. 202	1 qt.	½ pt.	5½ lbs.
No. 302	1 pt.	½ pt.	3½ lbs.

Gasoline Furnaces

The tank is made of heavy galvanized iron, fitted with galvanized cast iron top plate and bottom ring. All small or light castings are malleable iron or brass. Coil is made of extra heavy pipe. Generating power, intensity of heat and economy in fuel consumption are the distinguishing features. Rubber bulb supplies the air pressure. The No. 20 furnace is exactly like No. 10 except that it is fitted with automatic brass pump which is more durable than a bulb.

	Gasoline Capacity	Shipping Weight
No. 10	1 gal.	9¾ lbs.
No. 20	1 gal.	9¾ lbs.



No. 10

TOOLS



No. 53

Gasoline Furnaces

The tank is made of heavy galvanized iron, double-seamed throughout and is reenforced and strengthened at all joints. The castings are of brass or malleable iron as found most serviceable. The shield is made of heavy drawn steel. All parts are made interchangeable. Shipped with one shield unless otherwise specified. No. 63 furnace same as No. 53 except that it is fitted with automatic pump in tank.

Code	Gasoline Capacity	Shipping Weight
No. 53	7 pts.	15½ lbs.
No. 63	7 pts.	15½ lbs.



No. 83

Kerosene Furnaces

The safest, strongest and most economical furnace made. Produces more heat and less fuel at a lower price than is possible with any furnace burning gasoline. The flame is split by the burner coil and spreads around bottom of melting pot, heating it evenly. The patented burner is constructed to burn kerosene or gasoline and can be used equally as well when exposed to a draught in windy weather as on the inside.

Code	Kerosene Capacity	Shipping Weight
No. 83	7 pts.	16½ lbs.

Torches

Staysalite Lineman's Torch

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.

No.	Weight
3420	1¼ lbs.



No. 3420



No. 4547

Baby Gasoline Torch

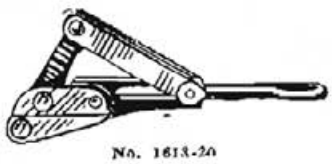
A necessity in every repair kit. The smallest practical torch made, tank being only two inches in diameter by three inches high. Simple and effective; can be carried in lineman's pocket to top of pole. Lights quickly with a match and gives a steady, hot flame for two hours on one filling; has no valves to get out of order and requires no pumping.

Cat. No.	Weight
4547	4 oz.

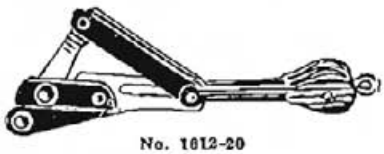
TOOLS

Wire Pulling

Chicago Grips



No. 1613-20



No. 1612-20

With and Without Pulleys

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.

Code No.	Size of wire smaller than	With or without Pulleys	Size of Rope	Weight Each
1613-20	No. 10	Without		1 lb.
1613-30	No. 6	Without		1½ lb.
1613-40	No. 0	Without		2⅝ lb.
1613-50	No. 0000	Without		7½ lb.
1612-20	No. 10	With	¼-in.	1¼ lb.
1612-30	No. 6	With	⅜-in.	1¾ lb.
1612-40	No. 0	With	½-in.	3 lb.
1612-50	No. 0000	With	⅝-in.	8½ lb.

Haven's Steel Grip



No. 1604-10-368

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.

Code No.		Can be used on wire size	Weight Per Doz.
1604-10	Kleins	No. 8 and smaller	12 lbs.
1604-20	Kleins	⅛-in. wire and smaller	30 lbs.
368	Red Devil	No. 8 and smaller	14 lbs.
360	Red Devil	⅛-in. wire and smaller	29 lbs.

Come-Along Grip



No. 1609-30

This style of grip is frequently used for fence work. The body of the grip is cast from refined malleable iron. Eccentric is forged from high grade tool steel, hardened and tempered. The ring is hand forged and welded through the eyes of the clamp.

Code No.	Can be used on wire size	Weight Per Doz.
1609-30	No. 6 and smaller	24 lbs.

TOOLS

Wire Pulling

Wire Grip With Strap—Howe's Wire Tool



No. 1702-20

The swivel hook is steel with an opening large enough to go over an insulator pin or other convenient object to anchor to. The forward end has a locking device to hold the load at any distance. It is arranged so that either a vise or grip can be attached.

Code No.	Description	Size of Straps	Weight Each
1702-20	Single Purchase	1¼"x 9'	2 lbs.
1702-30	Double Purchase	1⅛"x10'	2½ lbs.

Chicago Grips

For Insulated Wire



Enlarged View of Upper Jaw

Observe particularly how the "teeth" facilitate gripping of insulated wire. This is accomplished, however, without the slightest injury to the insulation.

The upper jaw has a series of transverse shallow grooves into which, on applying strain, the insulation is tightly compressed but not injured.

Code No.	Size of wire	With or Without Pulley	Weight Each
1611-10	10 and smaller	Without	1½ lb.
1610-10	10 and smaller	With	1¾ lb.
1611-20	4 and smaller	Without	2⅝ lb.
1610-20	4 and smaller	With	2⅞ lb.

The No. 1610-10 is equipped for a ¼-in. rope.
The No. 1610-20 is equipped for a ⅜-in. rope.

Buffalo Grips

For Bare and Insulated Wire
With and Without Pulleys

These pulleys are designed to fill the same requirements as stated under heading of "Chicago Grips."



No. 771

Code No.	Size of wire	With or Without Pulley
471	smaller than No. 6	Without
771	No. 6	With

Gem Wire Grips



Gem Single Eye Grip



Gem Double Eye Grip



Gem Double Eye Split Grip

These grips are very essential in underground cable construction and can also be used to an advantage on overhead work. They are made in three styles as shown in the illustrations and used for the following purposes:

Single Eye grip is used for simple pulling operations where cable is to be pulled underground and where attachment can be made on end of cable.

Double Eye grip is used for pulling anywhere on a cable where the grip may be slipped over the end into the point desired in the middle of the cable.

Double Eye Split grip is used where a regular double eye cannot be slipped over the end and a pull is desired around a corner or in the middle of a long run. Ideal for taking up slack in aerial construction.

These are split down one side and laced around the cable.

Size in.	Description	Size in.	Description	Size in.	Description
1	Single Eye	1	Double Eye	1	D. E. Split.
2	Single Eye	2	Double Eye	2	D. E. Split.
3	Single Eye	3	Double Eye	3	D. E. Split.

TOOLS

Lifting and Pushing Jacks



No. 328 Simplex, 15 tons

No. 328 Pole Pulling and Straightening Jack

This is the only jack designed and made especially for pulling, straightening and lowering telephone, telegraph, electric light, power and railway poles—also for municipalities and public utilities having pole equipment.

Present day efficiency standards of public utilities demand better, quicker and more economical methods of handling this pole construction and maintenance work than insured by ordinary labor with ordinary tools. The No. 328 Simplex handles every phase of pole work with unequalled efficiency, dispatch and economy.

PIVOTING BASE

This jack pivots on its base to any angle within 60° of vertical, permitting jack to operate at full capacity at any angle as well as vertically. Simplex is the only jack made having hinged base. which is an exclusive Simplex feature.

STRONG—POWERFUL—SAFE



No. 328 Simplex Pulling Pole

This jack is built for great strength, and exerts great power—all working parts of drop steel forging—the standard of malleable iron—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.

Code	Capacity	Lift	Total Weight
No. 328	15 tons	23 inches	187 lbs.

EQUIPMENT FURNISHED

8 ft. steel chain with pear shaped link.

6 ft. steel lever or pinch bar

2 ft. of 10 inch 25 lb. I beam base with hand hole punched.

PULLING POLES



No. 328 Simplex Straightening Pole. A one man—one minute job.

With this jack the heaviest and meanest poles can be pulled—regardless of the soil, depth or other conditions, with one-third the men and in a fraction of the time required by ordinary methods. No preliminary digging. picking or softening of the ground—no breaking up of pavements or curbings—necessary. Jack can be set in position in a minute and pole pulled in a very few minutes. Short fulcrum and long lever bar enables one man easily to operate jack with any pole.

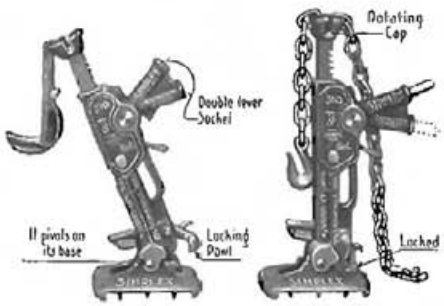
STRAIGHTENING POLES

For straightening poles after a wind or sleet storm this jack proves itself a most effective "first aid". One man holds it firmly erect until pole is lined up and ground tamped. Also invaluable in keeping pole equipment in proper position, avoiding undue strain upon cross-arms and wires.

TOOLS

LIFTING AND PUSHING JACKS

No. 310 Pole Pulling and Straightening Jack



No. 310 Simplex Emergency Jack—15 ton

NO. 310 SIMPLEX AS POLE PULLING JACK

This is the most complete and valuable tool of its kind made. Has same hinged base design as the No. 328 Simplex, and is especially suitable for handling small and medium sized poles. Has shorter lift than the No. 328, but same high class material and construction—highly serviceable tool for small and rural telephone companies having smaller sized pole equipment.

Furnished with 5 ft. steel chain—steel auxiliary shoe and 5 ft. steel pinch bar.

Code No.	Capacity	Lift	Total Weight
310	15 tons	12½ in.	89 lbs.

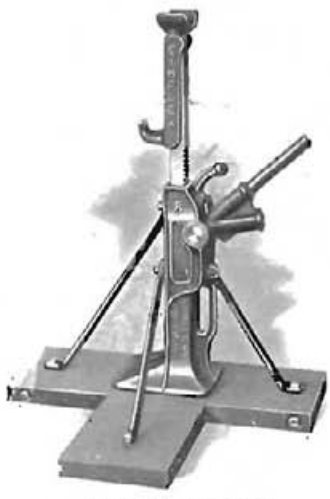


No. 310 Jack pulling heavy pole

NO. 310 AS EMERGENCY JACK

In addition to satisfactorily handling all small to medium pole work—this jack is an indispensable time and labor saver for industrial and manufacturing plants; mine, bridge and construction work; for contractors, steam and electric railroads, docks and oil fields—also for heavy trucks—light cars, etc.

Its pivoting base enables jack to be used in scores of emergencies, that cannot be touched with lifting jack alone. Very frequently this jack has paid for itself in one day's service.



No. 22 Cable Jack

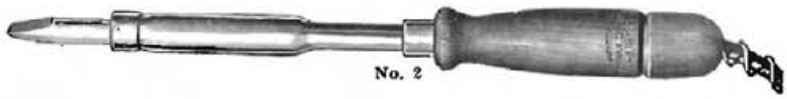
Cable Reel Jacks

"Safety First." A pair of these jacks will safely handle cable reels 4 to 8 ft. in diameter. Side foot on base prevents jack tipping over and endangering workmen or cable.

Code No.	Capacity	Height	Lift	Weight
22	10 tons	34½ in.	13 in.	98 lbs.

TOOLS

Electric Soldering Irons



No. 2

The Electric Soldering iron was produced in response to a well-defined industrial need. Study the method of a man using an externally heated soldering iron and the reason for the introduction of the electric iron at once becomes apparent. He inserts the iron in the heating furnace, waits for it to heat, takes it out, cleans the tip, sometimes tins it, then begins to solder. In a few seconds the temperature of the iron has fallen to such a degree that the iron must be reheated. This heating again and again, this cleaning, this waiting consumes time for which the man must be paid. The whole process is inefficient. An electric soldering iron will save money in your plant by saving high-priced time and the operating cost unit for unit is much less than that of an externally heated iron.

No.	Weight oz.	Tip Diam. Inches	Length Inches	Watts
2	10	½	13½	85
2½	13	½	14	95
3	15	¾	15½	170
5	32	1⅛	16	275

Vulcan Electric Soldering Copper



No. 100.

No. 100 Vulcan soldering iron has a one-piece handle which unscrews and slides back on cord, exposing conveniently arranged terminals.

No.	Weight Oz.	Length In.	Watts
100	12	13¾	70

All electric irons are furnished with 6-foot cord and attachment plug, wired for 110 volts when not otherwise specified.

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.

No.	Inches Length	Ounces Weight
680-5	8	1¼
680-4	8½	1½
680-3	9	1¾
680-2	11	2
680-1	11½	3

Manual Irons



No. 1. Manual Type

These are carried in stock and are furnished without handles.

No.	Weight Each
1	½ lb.
2	1 lb.
6	3 lb.

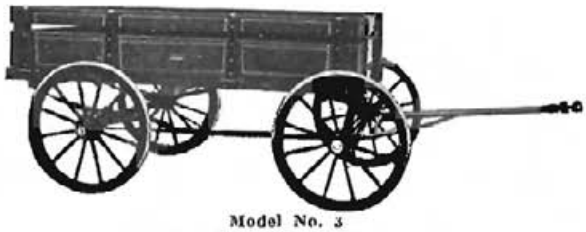
TRAILERS

An automobile that has a load capacity of one thousand pounds has a draw bar pull of one-half its rated load capacity or 500 pounds of draw bar pull. As it takes 250 pounds of draw bar pull to move one ton of material at a speed of 15 to 25 miles per hour on a level paved road, the car will pull two tons or two and one-half tons in all.

Therefore Miami Trailers can be successfully operated with any make or model of car that has a load capacity of 500 pounds or more and are easily attached by affixing the hitch, which is furnished with trailer, to the rear cross member of the chassis frame. A hitch for a Ford is attached to the rear spring clips directly over the differential housing—and not to the axles.

Telephone companies throughout the United States have recognized the Miami Trailer to be the greatest expense killer and the most efficient in speeding up all construction work, because tools and materials can be hauled to the construction base, leaving the automobile or truck free to haul the men—then if the car is wanted for duties elsewhere all that is necessary is to detach the trailer, which can be done in a second's time, enabling the workman to use the trailer for a cart in stringing wire, etc.

Miami Trailers are of automobile construction throughout and will run at automobile speed under nearly all kinds of conditions. Standard specifications include Timken axles, Timken roller bearings, artillery wheels, oil tempered springs and a special shock absorbing drawbar that positively relieves all strain from the car.



Model No. 3

SPECIFICATIONS No. 3

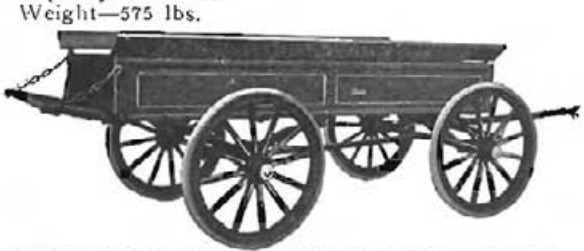
Axles—1¼" Timken.
Bearings—Timken Roller.
Wheels—Artillery, 32" front and rear, 1¼" spokes, 1¼" rims.
Tires—1¼" solid rubber.
Gear—Short turn, specially designed.
Springs—Oil tempered semi elliptic, 1½"x38" front six leaves, 1½"x38" rear five leaves.
Track—56 inches.
Height—From ground to bed, 26".
Drawbar—Special shock absorbing.
Wheelbase—70 inches.
Body—96"x42", 12" lower panel, 4" upper panel, sides and ends removable.
Finish—Black, striped and varnished.
Lamp—Electric tail light.
Capacity—1500 lbs.
Weight—575 lbs.



Model No. 12

SPECIFICATIONS No. 12

Axles—1⅝" Timken.
Bearings—Timken Roller.
Wheels—Artillery 32" front and rear, 1¾" spokes, 2" rims.
Tires—2" solid rubber, truck type.
Gear—Short turn, specially designed.
Springs—Oil tempered semi elliptic, 1¾"x40" 8-leaf front, 2"x42" 9-leaf rear.
Track—56 inches.
Height—From ground to bed, 28".
Drawbar—Special shock absorbing.
Wheelbase—84".
Body—11'6"x42" stake side, front and rear, 6 stakes each side, 2 each end, 30" high.
Finish—Black, striped and varnished.
Capacity—3000 lbs.



Model No. 10 (withdrawn; use No. 12, with No. 10 body)

SPECIFICATIONS No. 10

Axles—1¼" Timken Roller Bearing, 1⅜".
Wheels—Artillery type, 32" high, rivet each side each spoke, 1½" spokes, 1½" rims.
Tires—Solid rubber 2" side wire motor truck type.
Springs—Motor type oil tempered, 2", 8 leaf.
Drawbar—Special shock absorbing.
Wheelbase—76 inches.
Body—114"x40" or 42" of best Ohio oak, 8" oak flare board.
Finish—Black, striped and varnished.
Capacity—2000 lbs.



Model No. 100

SPECIFICATIONS No. 100

Axles—1¼" Timken.
Bearings—Timken Roller.
Wheels—Artillery, 32".
Tires—1¼" solid rubber.
Springs—Oil tempered semi elliptic 1½" 5 leaf.
Track—56 inches.
Drawbar—Special design shock absorbing.
Height—From ground to bed, 26".
Body—78"x42", 9" panel, 5" flare board. Drop end gate with chains.
Finish—Black, striped and varnished.
Lamp—Electric tail light.
Weight—300 lbs.
Capacity—1000 lbs.

WIRE ROPE THIMBLES AND TURNBUCKLES

Wire Rope Thimbles



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.

Size inches	Weight Per C	Size of Guy Rod
¼	6	½-⅝
5/16	8	½-⅝
⅜	10	½-⅝
7/16	15	⅝-¾
½	18	⅝-¾
⅝	36	1
¾	55	1

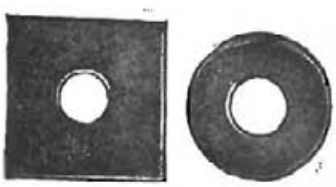
Turnbuckles

These turnbuckles are furnished with either two eyes or one eye and one hook.



Size Inches	Weight Per C
½x 6	170
½x 9	225
½x12	300
⅝x 9	340
⅝x12	435
¾x12	510

WASHERS



Square and Round Washers

Used in connection with pole line construction work, with carriage bolts, used to bolt cross arm braces to arm, or through bolts for bolting cross arms to poles and heavy square washers are used to reinforce nuts of guy rods when buried in the ground.

Size	Size of bolt	Weight per C	Description
2x2x1/8 in.	½ & ⅝ in.	13 lbs.	Square
2¼x2¼x5/16 in.	⅝ & ¾ in.	25 lbs.	Square
3x3x5/16 in.	¾ in.	45 lbs.	Square
4x4x5/16 in.	¾ & 1 in.	84 lbs.	Square
5x5x5/16 in.	1, 1¼ & 1½ in.	128 lbs.	Square

Size	Size of bolt	Weight per C	Description
1⅛ diam. x 7/16 hole	No. 14 ga.	2 lbs.	Round
1¼ diam. x ½ hole	No. 14 ga.	2 lbs.	Round
1⅜ diam. x 5/8 hole	No. 12 ga.	3 lbs.	Round
1½ diam. x ⅝ hole	No. 10 ga.	3½ lbs.	Round
1¾ diam. x 11/16 hole	No. 10 ga.	4 lbs.	Round
2 diam. x 13/16 hole	No. 9 ga.	7 lbs.	Round



BARE AND INSULATED TELEPHONE WIRES

Galvanized Telephone and Telegraph Wire

This wire is made in three grades, Extra B. B., B. B. and Steel. Extra B. B. is made from the very best material and has the highest conductivity of any galvanized wire. Mile Ohm 4700 to 5000.

B. B. wire is somewhat stronger than Extra B. B., but has a lower conductivity. It is used mostly on farm line circuits, by telephone companies and for railroad work. Mile Ohm 5600 to 6000.

Steel wire is made from a special grade of material of greater strength, but less conductivity than the other grades. Mile Ohm 6500 to 7000.

We Do Not Break Coils

Size B. W. G. No.	Diameter in Inches	—Breaking Strain in Lbs.— E. B. B.	B. B.	Steel	Put up in Bundles of	Approx. Wt. in Lbs. per Mile
4	.238	2028	2271	2433	¼ mile	811
6	.203	1475	1652	1770	⅓ mile	590
8	.165	975	1092	1170	½ mile	390
9	.148	785	879	942	½ mile	314
10	.134	645	722	774	½ mile	258
11	.120	515	577	618	½ mile	206
12	.109	425	476	510	½ mile	170
14	.083	247	277	297	½ mile	99

Recommend No. 12 B. B. for all country line service and No. 14 for general city construction work. Use B. W. G. in specifying.

Bare Copper Line Wire

We furnish copper wire regularly drawn to B. & S. gauge. We are in a position to furnish either hard, medium hard, or soft drawn wires. All orders will be filled with soft drawn wire unless otherwise specified.

Size B. & S. Gauge	Diam. in Mils	Capacity Circular Mils	Pounds per 1000-ft.	Pounds per Mile	Approx. Weight per Coil
6	162	26251	79	419	200
8	128	16510	50	263	200
9	114	13094	40	209	200
10	102	10382	31	166	200
12	81	6530	20	104	100
14	64	4107	13	66	100

Weatherproof Copper Wire

Triple braided weatherproof copper wire is especially adaptable to telephone, telegraph and railway signal work, combining high conductivity with great tensile strength. Double braid will be furnished if desired. Use B. & S. gauge in specifying. Always sold by weight.

Size B. & S. Gauge	Approx. weight lbs. per M ft. Double Braid	Triple Braid	Approx. weight lbs. per mile Double Braid	Triple Braid	Size B. & S. Gauge	Approx. weight lbs. per M ft. Double Braid	Triple Braid	Approx. weight lbs. per mile Double Braid	Triple Braid
6	100	112	529	590	12	30	35	158	185
8	66	75	349	395	14	20	25	107	130
10	46	53	241	280	16	16	20	83	105

For capacity in circular mills, see Copper line wire. Orders not specifying will be filled with triple braid insulation.

Weights do not vary more than 3 per cent from figures given in table.

INSULATED TELEPHONE WIRES

Weatherproof Iron "Tree Wire"



These wires are extensively used in connection with telephone and telegraph work. Especially so where wires pass through tree tops and it is desired to keep them free from grounds during damp weather. They are insulated in the same manner as copper wire and put up in burlapped one-half mile coils. Use B. W. G. in specifying.

Code No.	Insulation	Size B. W. G.	Weight per Mile	Code No.	Insulation	Size B. W. G.	Weight per Mile
910-AA	Double Braid	10	350	914-AA	Double Braid	14	145
910-AAA	Triple Braid	10	400	914-AAA	Triple Braid	14	175
912-AA	Double Braid	12	225	916-AA	Double Braid	16	100
912-AAA	Triple Braid	12	260	916-AAA	Triple Braid	16	125

Put up in half-mile coils within 3 per cent of weights shown. Orders not specifying will be filled with double braid insulation.

Rubber Covered Weatherproof Copper Wire. Black Saturated Heavy Weatherproof Braid. Single or Duplex Conductor.



These wires are extensively used in telephone construction. They were formerly used for drop wires from pole to house, but have to a great extent been superseded by either iron or No. 17 copper clad Duplex drop wire, due to greater strength, smaller first cost and only slight reduction on conductivity. Use B. & S. gauge in specifying.

Code No.	Size B. & S.	Diam. over rubber insulation	Weight lbs. per M. ft.
1214-B	14	5/32-in.	55
1216-B	16	4/32-in.	40

Rubber Covered Weatherproof Iron Drop Wire Rubber and Saturated Braid Insulation



The insulation of this wire is the very best rubber compound that can be used and will show 100 megohms test. It is protected by a closely woven tough braid of selected cotton which is well saturated with a weatherproof compound. The conductor has greater tensile strength than copper and will not stretch, draw down or sag under the most extreme weather conditions and can be drawn up tight without danger of breakage so that there is no swaying in the wind, which is apt to cause chafing and break the conductor and wear out the insulation. The conductor is a specially drawn open hearth steel wire, thoroughly protected against rust, and the difference in conductivity of this conductor and pure copper is not over one ohm on the average drop wire length, so small as to be absolutely negligible, and in all other ways is more serviceable for drop wire use than pure drawn copper and much cheaper. Use B. W. G. in specifying.

Code No.	Size B. W. G.	Diam. over rubber insulation	Weight lbs. 1000 ft.
1018-B	18	4/32-in.	39 lbs.
1016-B	16	5/32-in.	65 lbs.

INSULATED TELEPHONE WIRES

No. 17 Copper Clad Steel Duplex Rubber Insulated Weatherproof Drop Wire



No. 17 copper clad steel twisted pair drop wire has largely replaced the No. 14 B. & S. gauge copper wire formerly used for this purpose. It has approximately the same tensile strength as copper and is smaller, lighter, and cheaper and has sufficient carrying capacity for telephone requirements. The insulation will last longer as the wire will not stretch. Use B. & S. gauge in specifying.

Code No.	Grade	Gauge B. & S.	Diam. over rubber	Weight per 1000 ft.
1117-B	Commercial	17	7/64-in.	37 lbs.
1117-B	100 Meg.	17	7/64-in.	37 lbs.

Rubber Covered Copper Interior Wire Rubber and Dry Braid Insulation



Dry glazed braid telephone wires are furnished for interior telephone wiring in single, duplex and triple conductor. When furnished in duplex and triple the wires are traced with colored thread in covering to distinguish between them, to facilitate installation. Each coil tagged showing number of feet it contains. Furnished in oak tan braid. Use B. & S. gauge in specifying.

Code No.	Size B. & S. Gauge	Diam. over rubber	Weight lbs. per 1000 ft.	No. of conductors	Code No.	Size B. & S. Gauge	Diam. over rubber	Weight lbs. per 1000 ft.	No. of conductors
1619-A	19	3/32-in.	14	Single	1618-A	19	7/64-in.	16	Single
1619-B	19	3/32-in.	28	Duplex	1618-B	18	7/64-in.	32	Duplex
1619-C	19	3/32-in.	42	Triplex	1618-C	18	7/64-in.	48	Triplex

Bridle or Spider Wire Rubber and Saturated Braid Insulation, Copper Conductor



These wires are used for connecting open line wires to cable terminals and single conductor No. 18 for installing grounds at subscribers stations. Use B. & S. gauge in specifying.

Code No.	Size B. & S. Gauge	Diam. over rubber	Weight lbs. per 1000 ft.	No. of conductors	Code No.	Size B. & S. Gauge	Diam. over rubber	Weight lbs. per 1000 ft.	No. of conductors
1519-A	19	3/32-in.	14	Single	1518-B	18	7/64-in.	32	Duplex
1519-B	19	3/32-in.	28	Duplex	1516-A	16	4/32-in.	20	Single
1518-A	18	7/64-in.	16	Single	1514-A	14	5/32-in.	28	Single

INSULATED TELEPHONE WIRES

Pot Head Wire

Plain Rubber Covering, No Braid, Copper Conductor



If it is desired to terminate a paper insulated cable for distribution in a cable box, to prevent moisture entering the cable, rubber covered copper wire with no braid is used to splice on and carry the ends outside the pot head. It can be furnished in paired or single, and if used in pairs the insulation on the two wires is of a different color for a tracing purpose. Use B. & S. gauge in specifying

Code No.	Size B. & S.	No. of Cond.	Diam. over rubber
1419-B	19	Duplex	7/32-in.
1420-B	20	Duplex	3/16-in.
1422-B	22	Duplex	3/16-in.

Rubber Covered Flameproof Tinned Copper Jumper Wire
Rubber and Flameproof Braid Insulation



Used on main distributing and intermediate distributing frames, distributing boxes and cross connecting racks. Use B. & S. gauge in specifying.

Weight of No. 20 Duplex, 12 lbs. per 1000 ft. Weight of No. 22 Duplex, 10 lbs. per 1000 ft.

Code No.	Size B. & S.	Number and Color of Cond.	Diam. over rubber
1320-A	20	Red	4/64-in.
1320-B	20	Red & White	4/64-in.
1320-C	20	Red, White & Blue	4/64-in.
1322-A	22	White	4/64-in.
1322-B	22	Red & White	4/64-in.
1322-C	22	Red, White & Blue	4/64-in.

Electric Light or Power Wires



A single, soft drawn copper conductor, rubber insulated with saturated braid over all. Use B. & S. gauge in specifying.

Code No.	Size B. & S Gauge	Braid	Weight per 1,000 ft.
804AA	4 B. & S. Stranded	Double	230 lbs.
806A	6 B. & S. Stranded	Double	158 lbs.
308A	8 B. & S. Stranded	Single	82 lbs.
810A	10 B. & S. Solid	Single	60 lbs.
812A	12 B. & S. Solid	Single	45 lbs.
814A	14 B. & S. Solid	Single	33 lbs.

Other sizes in either solid or stranded conductor with single or double braid furnished promptly.

BARE AND INSULATED TELEPHONE WIRES

COMPARISON OF WIRE GAUGES

No.	Millimeters	Brown & Sharpe— B. & S. G. Decimal of an inch	Stub's or Birmingham B. W. G.	Washburn & Moen W. & M.	Old English or London O. E. G.	New British Standard E. S. G.
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	.0093	.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 specifying copper or copper clad wire. Use B. W. G. when specifying iron wire. Orders not specifying the gauge will be filled according to this method.

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