

STROMBERG-CARLSON TELEPHONE MFG. CO.

**ROCHESTER, N.Y. CHICAGO, ILL.
KANSAS CITY, MO. TORONTO, ONT.**

BULLETIN No. 1016

EDITION B-C

**Telephone Apparatus
Bulletin**

Cables—Intercommunicating



Showing general construction of Intercommunicating and Switchboard Cables with braided covering

All wires in standard intercommunicating cables are tinned copper with single silk and single cotton insulation and are color coded. The cores of the cables are saturated with a beeswax compound to facilitate installation work and to protect the cable from the effects of moisture.

The covering of the cable may be either a painted cotton braid indicated by the letter "B" or a pure lead sheath indicated by the letter "L" affixed to the code number of the cable.

Cables for System No. 1 Selective Talking—Selective Ringing

All cables used with System No. 1 are made up entirely of pairs of wires. In each cable all wires are No. 22 B & S Gauge, except the two pairs used for talking and signalling battery which are No. 18 B & S Gauge.

| Code | No. of Pairs | No. of Stations | Diameters Braided | Diameters Lead | Thickness Lead Sheath | Price Per 100 ft. |
|------|--------------|-----------------|----------------------|-------------------|--------------------------|----------------------|
| 70-B | 8 | 6 | $\frac{1}{16}$ | .. | .. | \$13.00 |
| 70-L | 8 | 6 | .. | $\frac{1}{16}$ | $\frac{1}{16}$ | 22.50 |
| 60-B | 14 | 12 | $\frac{1}{16}$ | .. | .. | 20.00 |
| 60-L | 14 | 12 | .. | $\frac{1}{16}$ | $\frac{1}{16}$ | 38.40 |
| 61-B | 24 | 22 | $\frac{1}{16}$ | .. | .. | 31.20 |
| 61-L | 24 | 22 | .. | $\frac{1}{16}$ | $\frac{1}{16}$ | 51.00 |
| 62-B | 34 | 32 | $\frac{1}{16}$ | .. | .. | 42.75 |
| 62-L | 34 | 32 | .. | $\frac{1}{16}$ | $\frac{1}{16}$ | 72.00 |

Cables for System No. 2 Common Talking—Selective Ringing

All cables used with System No. 2 are made up of both single conductors and pairs. In each cable all single conductors are No. 22 B & S Gauge and the two pairs used for common talking and common return circuits are No. 18 B & S Gauge.

| Code | No. of Conductors | No. of Stations | Diameters Braided | Diameters Lead | Thickness Lead Sheath | Price Per 100 ft. |
|------|-------------------|-----------------|----------------------|-------------------|--------------------------|----------------------|
| 77-B | 10 | 6 | $\frac{1}{16}$ | .. | .. | \$10.00 |
| 77-L | 10 | 6 | .. | $\frac{1}{16}$ | $\frac{1}{16}$ | 17.10 |
| 78-B | 15 | 11 | $\frac{1}{16}$ | .. | .. | 13.50 |
| 78-L | 15 | 11 | .. | $\frac{1}{16}$ | $\frac{1}{16}$ | 22.50 |
| 79-B | 20 | Special | $\frac{1}{16}$ | .. | .. | 17.00 |
| 79-L | 20 | " | .. | $\frac{1}{16}$ | $\frac{1}{16}$ | 27.00 |
| 80-B | 30 | " | $\frac{1}{16}$ | .. | .. | 21.00 |
| 80-L | 30 | " | .. | $\frac{1}{16}$ | $\frac{1}{16}$ | 39.50 |

Cables—Generator

Code No. 87-B. Consists of 6 single conductors No. 22 B & S Gauge with double silk and single cotton insulation. Exterior covering is of flame-proof cotton braid. Price per 100 ft. \$8.50.

Code No. 88. Consists of 6 single conductors No. 18 B & S Gauge, rubber covered and braided (no over-all braiding.) Price per 100 ft. \$17.00.

Cables

Cables—Switchboard

All wires in standard switchboard cables are tinned copper with double silk and single cotton insulation and are color coded. The cores of the cables are saturated with a beeswax compound to facilitate installation work and to protect the cable from the effects of the moisture.

The covering of the cable may be either a painted cotton braid indicated by the letter "B" or a pure lead sheath indicated by the letter "L" affixed to the code number of the cable.

No. 22 B & S Gauge Cables

| Code | No. of Pairs | Shape | Diameter | Thickness Lead Sheath | Price per 100 ft. |
|------|--------------|-------|------------------|-----------------------|-------------------|
| 71-B | 10 | Round | $\frac{3}{16}$ " | .. | \$17.00 |
| 71-L | 10 | " | $\frac{3}{16}$ " | $\frac{1}{8}$ " | 30.00 |
| 83-B | 15 | " | $\frac{1}{8}$ " | .. | 25.50 |
| 83-L | 15 | " | $\frac{1}{8}$ " | $\frac{1}{8}$ " | 43.50 |
| 66-B | 20 | " | $\frac{1}{8}$ " | .. | 34.50 |
| 66-L | 20 | " | $\frac{1}{8}$ " | $\frac{1}{8}$ " | 55.50 |
| 84-B | 25 | " | $\frac{1}{8}$ " | .. | 40.00 |
| 84-L | 25 | " | $\frac{1}{8}$ " | $\frac{1}{8}$ " | 67.50 |
| 90-B | 50 | " | $\frac{1}{8}$ " | .. | 71.25 |
| 90-L | 50 | " | $\frac{1}{8}$ " | $\frac{1}{8}$ " | 111.00 |
| 81-B | 100 | " | $\frac{1}{8}$ " | .. | 142.50 |
| 81-L | 100 | " | $\frac{1}{8}$ " | $\frac{1}{8}$ " | 210.00 |

Above cables from 10 to 50 pairs inclusive have one spare pair. 100 pair cable has two spare pairs.

No. 22 B & S Gauge Cables

| Code | No. of Triplets | Shape | Diameter | Price per 100 ft. |
|------|-----------------|-------|------------------------------------|-------------------|
| 72-B | 10 | Round | $\frac{1}{8}$ " | \$26.10 |
| 76-B | 20 | Oval | $1\frac{1}{8}$ " x $\frac{7}{8}$ " | 51.00 |
| 67-B | 100 | Oval | $1\frac{1}{8}$ " x $\frac{1}{2}$ " | 225.00 |

Above 10 triplet and 20 triplet cables have one square triplet. The 100 triplet cable has two spare triplets.

No. 22 B & S Gauge Cables

| Code | No. of Pairs | No. of Singles | No. of Triplets | Shape | Diameter | Price per 100 ft. |
|------|--------------|----------------|-----------------|-------|-----------------------------------|-------------------|
| 65-B | 20 | 20 | | Round | $\frac{9}{16}$ " | \$50.00 |
| 68-B | | 20 | 20 | Round | $\frac{1}{2}$ " | 63.00 |
| 69-B | | 20 | 20 | Oval | $\frac{7}{8}$ " x $\frac{1}{2}$ " | 68.00 |

Above cables have one spare pair or triplet and one spare single conductor.

No. 19 B & S Gauge Cables

| Code | No. of Pairs | Shape | Diameter | Price per 100 ft. |
|------|--------------|-------|-----------------|-------------------|
| 86-B | 10 | Round | $\frac{1}{4}$ " | \$28.50 |
| 85-B | 20 | Round | $\frac{3}{8}$ " | 52.00 |

Above cables have one spare pair.

No. 16 B & S Gauge Cables

| Code | No. of Pairs | Shape | Diameter | Price per 100 ft. |
|------|--------------|-------|-----------------|-------------------|
| 75-B | 10 | Round | $\frac{1}{4}$ " | \$34.50 |

Above cable has one spare pair.

Combination Telephones

No. 10 Type

The No. 10 Type Combination Telephone is supplied with several standard equipments for "Central Energy," "Magneto" and the various types of Private Line and Inter-Comm-Phone Systems. It is designed to mount upon a vertical surface such as the side of a desk, table or wall. This telephone is particularly advantageous for business offices, as it eliminates unsightly telephone brackets, arms and other desk-clearing devices.

The transmission efficiency of this instrument is unequalled because the user involuntarily speaks directly into the mouthpiece and operates the transmitter at its highest efficiency. Furthermore, the transmitter and receiver parts are of the same perfect designs that appear in our wall or desk telephones. The efficiency of the receiver is further increased through the measures taken to eliminate eddy current losses in the spool-head. Moreover the coils are impregnated after winding, with a moisture-proofing varnish. A broad bearing surface is provided for mounting the diaphragm, which is clamped evenly, and at a proper distance from the pole pieces. These features insure a permanent air gap adjustment and prevent distortion of the diaphragm.

The upkeep of this type of telephone is very low. It is not exposed to accidental falls and breakage like a desk stand. There is but one cord to maintain and the mouthpiece is practically unbreakable, being made of a hard, resilient material that will withstand rough handling.

Instruments of this type are given a dull black finish which is more pleasing, more lasting and more economical than nickel plate—it neither corrodes nor discolors. It may be readily cleaned with a dry cloth and any worn parts retouched with our air-drying lacquer.

The No. 10-B Combination Phone, which we particularly recommend for exchange use, is wired for operation upon the well-known "Booster" principle. This type of circuit is generally conceded to give the highest grade of transmission and is also unsurpassed in receiving qualities. This high efficiency is obtained

through the super-imposed effect of a condenser properly connected in the transmitter circuit. A ringer box containing an induction coil and condenser correctly wired for the "Booster" circuit must always be used with the No. 10-B Combination Phone. For this purpose we recommend our No. 1132-BY Desk Set Box.

The No. 10-B and 10-L Combination telephone are also used to a great extent for residence service, with extension bells for main sets and without extension bells for upstairs or bedside telephones.

For various standard equipments offered in this type of telephone see the following page.



Combination Telephones

Code List

No. 10-B Used with "Central Energy" Systems, and wired for "Booster" type of telephone circuit. Magnetic receiver. Consists of P-13782 Telephone, No. 37 Hookswitch Box and C4B-4½ Ft. Cord. Must be used with ringer box wired for "Booster" (1132-BY Desk Set Box.)

No. 10-L Used with Magneto Systems. Magnetic receiver. Consists of Pc. No. 12032 Telephone, No. 33 Hookswitch Box with induction coil and 3CB-4½ Ft. Cord.

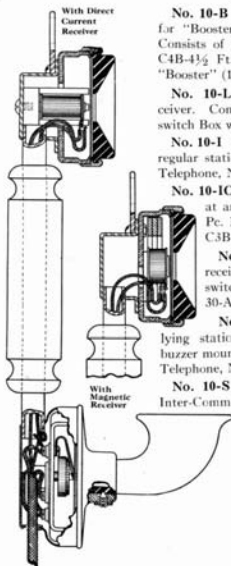
No. 10-I Used with Key Type Inter-Comm-Phone System at regular stations. Magnetic receiver consists of Pc. No. 12377 Telephone, No. 28 Hookswitch Box and C3B-4½ Ft. Cord.

No. 10-IC Used with Key Type Inter-Comm-Phone System at answering stations. Magnetic receiver. Consists of Pc. No. 12377 Telephone, No. 29 Hookswitch Box and C3B-4½ Ft. Cord.

No. 10-P Used with Private Lines. Direct current receiver, push button and buzzer mounted in hookswitch box. Consists of Pc. No. 12031 Telephone, No. 30-A Hookswitch Box and C2B-4½ Ft. Cord.

No. 10-PC Used with Centerphone System at outlying stations. Direct current receiver. Push button and buzzer mounted in hookswitch box. Consists of Pc. No. 12031 Telephone, No. 30-B Hookswitch Box and C2B-4½ Ft. Cord.

No. 10-S Used with Common Talking Selective Ringing Inter-Comm-Phone Systems. Direct current receiver. Buzzer mounted in Hookswitch Box. Consists of Pc. No. 12031 Telephone, No. 31-A Hookswitch Box and C2B-4½ Ft. Cord.



Combination Telephones

No. 11 Type



This combination telephone is intended primarily for use as a testing set for telephone linemen, but is also used as an extension station equipment for office and residence service.

The instrument consists of our standard long-distance type transmitter and bipolar watch case receiver mounted upon a seamless brass handle. All exposed parts except the receiver ear cap are made of metal so that the apparatus will withstand the abuse of rough handling in the open. Removable plates are provided at both ends of the handle so that the transmitter, receiver and cord connections can be easily examined and to permit changing cords conveniently when required.

A finger switch is mounted inside the handle so that a slight pressure of its operating lever serves to operate the switch positively. This arrangement is a decided improvement on the now obsolete type of push-button switch as it does not tire the user when lengthy conversations are carried on.

In combination telephones of this type Codes, 11-D and 11-E, a 4/10 M. F. condenser is contained within the handle so as to adapt the instrument for use in making service tests or for working with machine switching systems.

All exposed metal parts of No. 11 Type Combination Telephones are furnished with a tough elastic semi-glossy black enamel which will out-wear a nickel finish and which may be easily made to look as good as new at any time by the use of a black air drying retouching enamel.

The following page lists the four standard equipments furnished in No. 11 Type Combination Telephones, including circuit diagrams and prices.

Combination Telephones



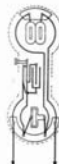
No. 11-L—Used with No. 843 Magneto Test Set, also in portable field telephones of the magneto type. Finger switch is wired to close a pair of contacts that control the flow of battery current through the transmitter. Furnished complete with No. C-3-B 6-foot moisture-proof cord. Price \$8.00



No. 11-C—Used with "Central Energy" (common battery) systems for extension telephone service and as a pocket test set for inspectors and linemen. Finger switch closes line circuit through the transmitter and receiver connected in series. Furnished complete with No. C-2-C 6-foot moisture-proof cord with test clips. Price \$8.00



No. 11-D—Used with "Central Energy" (common battery) and machine switching systems for testing and service observation purposes. Transmitter and receiver are wired in series with a 4/10 M. F. condenser. Operation of finger switch shunts out condenser to call central. Furnished complete with No. C-2-C, 6-foot moisture-proof cord with test clips. Price \$8.75



No. 11-E—Used with "Central Energy" (common battery) and machine switching systems for testing and service observation purposes. Transmitter and receiver are wired in series with finger switch contacts which are normally closed. Operation of finger switch connects a 4/10 M. F. condenser in series with talking equipment. Furnished complete with No. C-2-C, 6-foot moisture-proof cord with test clips. Price \$8.75

Condensers

The high quality and efficiency of our telephone condensers is uniformly constant, due to the care exercised in the selection of the materials used and the manufacturing process employed. The condensers illustrated and listed herein are of the rolled type in which each plate consists of a continuous long strip of tinfoil and the interleaved dielectric of paraffin impregnated paper.

The illustrations show the four standard styles of condensers which we regularly manufacture and carry in stock. Styles A, B and D are provided with black japanned



Style A



Style B



Style C



Style D

sheet metal cases which are filled with a solid compound to make the condenser assembly moisture-proof. Style C is mounted within the handle of No. 11 Type Combination Telephones and requires no protection other than the bookbinder's cloth with which it is covered. Style D is designed for use in magneto telephones, principally for "Sure-Ring" equipment.

Our condensers are guaranteed to have a capacity not less than the rated capacity of the condenser when measured with alternating current. The insulation resistance will be not less than 40 megohms per microfarad and the condenser will withstand a break-down test of 350 volts direct current. The rated capacity is marked plainly on the case of the condenser.

We are prepared to furnish special tinfoil and paper condensers for radio-telegraph instruments, ignition systems, high frequency machines and other purposes, in large quantities, at reasonable prices.

Condensers

Style A

No. 18—Capacity 1 M. F. Dimensions of case $4\frac{3}{4} \times 1\frac{7}{8} \times 31/32$ inches. Arranged to mount on metal mounting strips like relays. Used in central office equipment. Price, \$.85 each.

No. 19—Capacity 2 M. F. Dimensions of case $4\frac{3}{4} \times 1\frac{7}{8} \times 31/32$ inches. Arranged to mount on metal mounting strips like relays. Used in central office equipment. Price, \$1.15 each.

No. 28—Capacity $3\frac{1}{2}$ M. F. Dimensions of case $4\frac{3}{4} \times 1\frac{7}{8} \times 31/32$ inches. Arranged to mount on metal mounting strips like relays. Used in central office equipment. Price, \$2.00 each.

Style B

No. 21—Capacity 1 M. F. Dimensions of case $4\frac{7}{16} \times 2\frac{13}{16} \times \frac{5}{8}$ inches. Used in Nos. 1130 and 1132 Telephones. Price, \$.85 each.

No. 22—Capacity 2 M. F. Dimensions of case $4\frac{7}{16} \times 2\frac{13}{16} \times \frac{5}{8}$ inches. Used in Nos. 1130 and 1132 Telephones. Price, \$1.15 each.

***No. 24**—Capacity 1 M. F. Dimensions of case $4\frac{7}{16} \times 2\frac{1}{32} \times 13/16$ inches. Used in No. 948 Extension Bell. Price, \$.85 each.

No. 27—Capacity 5 M. F. Dimensions of case $4\frac{15}{16} \times 4\frac{13}{32} \times \frac{3}{4}$ inches. Replaces Garford No. 845. Price, \$2.50 each.

*Replaces Garford Code 1110 without adapter.

Style C

No. 20—Capacity $4/10$ M. F. Dimensions $3\frac{1}{2} \times 1 \times 9/32$ inches. Provided with Bookbinder's cloth cover and 9 inch terminal wires. Used in Nos. 11-D and 11-E Combination Telephones. Price, \$.60 each.

Style D

†**No. 26-T**—Capacity $\frac{1}{2}$ M. F. Dimensions of case $4\frac{7}{16} \times 2\frac{13}{16} \times \frac{5}{8}$ inches. "Sure-Ring" Condenser with Fahnestock clip terminals used in the receiver circuit of magneto telephones. Price, \$.60 each.

†When No. 26-T Condenser is mounted in either No. 896 Wall Telephone or No. 327 Desk Set Box, the following parts are used: 3 Pc 2494 Clips, 3 Pc 5202 Screws.

All Prices F. O. B. Rochester, N. Y. and Chicago, Ill.

No. 63 Switchboard Generator



This generator is used principally in rural line switchboards which terminate long and heavily loaded party telephone lines subject to unusually severe ringing conditions. Our standard five-bar type switchboard generators are highly efficient and will serve very satisfactorily under all normal operating conditions. Where the demands for ringing power are in excess of the output of any five-bar type we recommend the use of the No. 63 Type Switchboard Generator illustrated above.

Tests made in our laboratory, based upon current output as registered on measuring instruments and also upon the actual number of telephone ringers operated satisfactorily, show that this type of switchboard generator is capable of delivering an output at least 38% greater than that of any other five-bar type—our own make included. These tests have been proved in actual operation in many rural and toll line switchboards.

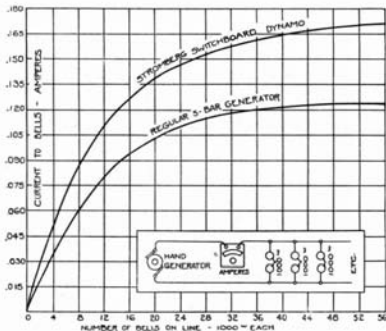
The No. 63 Generator is similar in construction to our other standard five-bar switchboard hand generators and has the same overall dimensions, viz.: $6\frac{1}{4}'' \times 5\frac{1}{2}'' \times 3\frac{1}{2}''$. It is interchangeable with the previous types and its installation in a Stromberg-Carlson switchboard does not necessitate re-drilling the generator mounting shelf or bracket. This equipment can be used in switchboards of other makes with equally satisfactory results.

The magnetic field in which the armature revolves and the strength of which determines the efficiency of the generator to a large extent is established and maintained by three large size permanent magnets similar to those used in automobiles for ignition purposes. The steel from which these magnets are made is a special alloy made to

Generators, Hand

our specifications which possesses exceptionally fine magnetic qualities and which retains these qualities indefinitely so that the generator shows no appreciable loss of power throughout its useful life.

The armature core, as in our other types, is built up of laminated stampings, to avoid eddy current losses in this part of the apparatus. Around this core we wind silk



Performance Curve of No. 63 Generator

insulated copper magnet wire of our own manufacture. During the winding process we provide extra high insulation between the wires and the core to prevent breakdowns in service and impregnate the winding with a moisture-proof compound.

Naturally when the No. 63 Generator is operated under a heavy load it turns harder than less powerful types because increased output of ringing current requires increased mechanical input; regardless of the high efficiency of the generator. The effort required to turn the generator when a large current is being generated is well within the capabilities of the operator and is facilitated by the smooth, quiet operation of the rotating parts. The bearings are broad and the system of oiling ducts facilitates free operation. The tendency toward jerkiness in the rotation of the armature due to the strong field is smoothed out by lost-motion springs in the pinion gear so that the turning effort is constant. The gear wheels are accurately cut and the teeth intermesh evenly and noiselessly.

The No. 63 Generator is regularly furnished for straight alternating current ringing systems with screw terminals for brush and frame connections so that wires can be attached without resorting to the use of a hot soldering copper.

Hookswitches

No. 17 Type



No. 17



No. 39



40-A



40-B



40-C



40-D



40-E



40-F

Hookswitches of this general type are used in the hookswitch boxes that form a part of our combination telephone sets and differ only in the number and arrangement of the contact springs. They are made with cast brass frames and levers and are equipped with german silver springs and securely riveted contact points.

- 17 Used in No. 30-A Hookswitch Box.....\$1.50
39 Used in No. 36 and 37 Hookswitch Boxes... 1.50

No. 40 Type

Standard type of hookswitch for all wall telephones of our manufacture. Consists of stamped steel frame with removable lever. The springs are made of german silver of sufficient length and weight to retain a permanent adjustment. Furnished with various interchangeable spring combinations as listed below.

- 40-A Used in Central Energy wall telephones except those wired for booster circuit.....\$.75
40-B Used in new type No. 896 wall telephones (arranged for battery-saver operation) and booster type Central Energy wall telephones..... .75
40-C Used in common talking selective ringing intercommunicating telephones..... .75
40-D Used in selective talking selective ringing intercommunicating telephones..... .75
40-E Used in old style No. 896 wall telephones with series line equipment..... .75
40-F Used in old style No. 896 wall telephones with bridging line equipment..... .75
If hook is omitted deduct \$.15.

Dummy Hooks

The No. 23 Dummy Hook is used on switchboards for holding our Nos. 3, 6, 14 and 27 Type Receivers. It consists of a diamond shaped plate with projecting yoke for the receiver. Made of nickel plated cast brass and designed to fasten on any vertical surface.

The No. 32 Dummy Hook is used for suspending any of our combination telephones. It is similar to the No. 23 Dummy Hook but is made with a projecting hook instead of the yoke.

- 23 Dummy Hook.....\$1.00
32 Dummy Hook..... 1.00
F. O. B. Rochester, N. Y. and Chicago, Ill.

Hookswitches

Battery Saver Hookswitch

Attachment for No. 40-B Hookswitch which eliminates waste of battery when No. 896 Wall Telephones are used for listening purposes.



Fig. 1—Battery-saver latch in normal position—receiver on hook



Fig. 2—Listening position—receiver off and hook half-way up



Fig. 3—Pressing latch back to put telephone in talking condition



Fig. 4—Fully operated; hook up as far as it will go

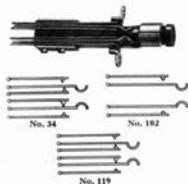
Battery Saver Attachment for old style No. 896 Wall Telephones equipped with No. 34 Hookswitch can be equipped with Pc. 12766 Battery-Saver Latch and Pc. 12748 Switch Assembly (No. 40-F Hookswitch less lever, escutcheon and screws). Group price \$.75.

Battery Saver Attachment for new type No. 896 Wall Telephones includes Pc. No. 12766 Battery Saver Latch only. Price \$.25.

Battery Saver Attachment for other makes of telephones includes Pc. No. 12766 Latch, Pc. No. 12748 Switch Assembly, Pc. No. 8741 Lever, Pc. No. 8772 Escutcheon and 2 Pc. 3929 Screws. Group price \$.90

Keys

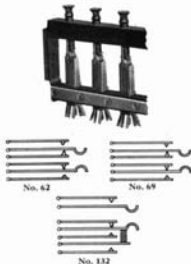
No. 34 Type



Individual push button type key designed to mount in a $\frac{1}{2}$ inch hole drilled in $\frac{3}{4}$ inch woodwork. Furnished with locking and non-locking plungers and with the various contact spring combinations as shown in the marginal sketches.

| Code No. | Plunger | Price |
|----------|-------------|--------|
| 34 | Non-locking | \$.90 |
| 102 | Non-locking | .75 |
| 119 | Locking | 1.00 |

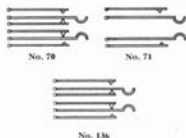
No. 62 Type



Push button type used principally in switching circuits of toll and local switchboards. The keys are assembled on hard rubber strips of standard jack strip length and mount on the same centers. Dimensions of strip 10-15/32 inches by $\frac{1}{2}$ inch. Strip mounts on 10-15/16 inch centers.

| Code No. | No. per strip | Plungers | Price per Key |
|----------|---------------|-------------|---------------|
| 62 | 5 | Non-locking | \$1.50 |
| 62 | 10 | Non-locking | 1.10 |
| 69 | 10 | Locking | 1.00 |
| 132 | 10 | Locking | 1.50 |

No. 70 Type



This type of key is the same as our No. 62 Type with the exception that the hard rubber face strips measure 6-43/64 inches by $\frac{1}{2}$ inch and mount upon 7-5/16 inch centers.

| Code No. | No. per strip | Plungers | Price per Key |
|----------|---------------|-------------|---------------|
| 70 | 5 | Locking | \$1.00 |
| 70 | 10 | Locking | 1.00 |
| 71 | 10 | Locking | .75 |
| 136 | 10 | Non-locking | 1.50 |

Note: To arrive at price of strip of keys multiply price per key by number of keys in strip.

Keys



No. 99

No. 133



No. 167

No. 99 Type

Individual push button type key designed to mount in $\frac{1}{2}$ inch hole drilled in $\frac{1}{2}$ inch woodwork. Furnished only in the non-locking plunger type. Used principally in local battery telephones for generator switching.

| Code No. | Plunger | Price |
|----------|-------------|--------|
| 99 | Non-locking | \$.35 |
| 133 | Non-locking | 1.00 |
| 167 | Non-locking | .75 |

No. 152 Type

This key used only in our local battery switchboard cord circuits that are arranged for single supervision. It includes in its assembly the ringing key, ring-back key, listening key and the clearing-out signal. The listening key is mechanically linked with the shutter of the clearing-out signal, so that the latter is automatically restored to its normal position when the listening key lever is operated to the listening position. The clearing-out signal is equipped with night alarm bell contacts and removable operating coil. The accompanying diagram shows the complete circuit arrangement.



Nos. 152A and 152F

| Code No. | C. O. Signal Resistance | Complete Key | Coil only |
|----------|-------------------------|--------------|-----------|
| 152-A | 500 ohms | \$ 6.25 | \$.90 |
| 152-F | 1000 ohms | 6.35 | 1.00 |

No. 169 Type

Used only in our local battery switchboards. This key is the same as our No. 152 Type except that it is equipped with two clearing-out signals for use in cord circuits that are arranged for double supervision. Both clearing-out signals are provided with night alarm bell contacts.



Nos. 169A and 169F

| Code No. | C. O. Signals Resistance | Complete Key | Coil Only |
|----------|--------------------------|--------------|-----------|
| 169-A | 500 Ohms | \$7.50 | \$.90 |
| 169-F | 1000 Ohms | 7.60 | 1.00 |

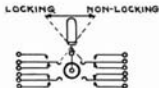
All prices F.O.B. Rochester, N.Y. and Chicago, Ill.

No 170 Type Keys



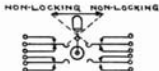
finishing escutcheon and mounting screws. When two keys are mounted on one escutcheon add \$.75 for the mounting plate.

Code No. 170



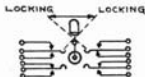
Standard ringing and listening (6 spring) key. Locking in listening position, non-locking in ringing position. Price each. . **\$2.50**

Code No. 171



Standard double ringing key. Non-locking in both positions. Price each. **\$2.50**

Code No. 172



Standard double listening key. Locking in both positions. Price each. **\$2.50**

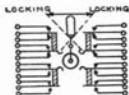
Code No. 173



Standard ringing and listening (4 springs) key. Locking in listening position, non-locking in ringing position. Price each. . **\$2.50**

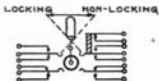
Keys

Code No. 175



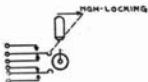
Switching key for repeating coil cord circuits. Locking in both positions. Price each \$3.00

Code No. 176



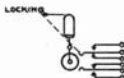
Ring and listening key with local break on listening key. Locking in listening position, non-locking in ringing position. Price each \$2.65

Code No. 178



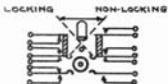
Single ringing key. Non-locking in single position. Price each \$1.75

Code No. 179



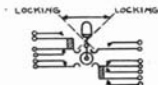
Single listening key (6 springs). Locking in single position. Price each \$1.75

Code No. 184



Ring and listening key for P.B.X. trunk circuits. Locking in listening position, non-locking in ringing position. Price each \$3.00

Code No. 186



Ring and listening key. Locking in both positions. Price each \$2.65

All Prices F.O.B. Rochester, N. Y., and Chicago, Ill.

No. 190 Type

Order wire keys used on "Central Energy" multiple switchboards. Each key has an extra "make" contact which can be used to close a separate circuit when the plunger is depressed. The standard $5\frac{1}{2}$ inch escutcheon accommodates an ultimate of 8 keys and can be furnished equipped with 2, 4, 6 or 8 keys as desired. If the keys are originally ordered with a partial equipment then additional contact spring groups can be added in groups of two at any future time. When the key mounting is furnished partially equipped the vacant key plunger spaces are neatly filled with black finished plugs.



ALL BUTTONS
HAVE SAFETY
SPRING AIR-
RAINFIGHT.

No. 190-D



No. 201

| Code No. | No. of Keys | Plunger | Size of Escutcheon | Price Complete |
|----------|-------------|-------------|------------------------------------|----------------|
| 190-A | 2 | Non-locking | $5\frac{1}{2}$ " x $\frac{1}{2}$ " | \$3.50 |
| 190-B | 4 | Non-locking | $5\frac{1}{2}$ " x $\frac{1}{2}$ " | 5.00 |
| 190-C | 6 | Non-locking | $5\frac{1}{2}$ " x $\frac{1}{2}$ " | 6.50 |
| 190-D | 8 | Non-locking | $5\frac{1}{2}$ " x $\frac{1}{2}$ " | 8.00 |

No. 200 Type

Four-party master key for harmonic party line ringing systems. Key plungers lock down in operated position and restore automatically when any other plunger on the same key is depressed. Provided with key buttons colored blue, red, green and black.

| Code No. | No. of Keys | Plunger | Size of Escutcheon | Price Complete |
|----------|-------------|---------|-------------------------------------|----------------|
| 201 | 4 | Locking | $5\frac{1}{2}$ " x $1\frac{1}{4}$ " | \$5.00 |

No. 210 Type

Individual four-party harmonic ringing and listening key for use in "Central Energy" multiple switchboards arranged for automatic ringing. Key plungers lock down to retain ringing springs in operated position and restore automatically when any other plunger on the same key is depressed. The end springs close contact only when a key plunger is fully depressed and open immediately when this pressure is removed. Provided with key buttons colored blue, red, green and black, the blue button being adjacent to the cam lever handle.



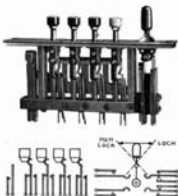
No. 211-R

| Code No. | No. of Plunger Keys | No. of Lever Keys | Size of Escutcheon | Price Complete |
|----------|---------------------|-------------------|-------------------------------------|----------------|
| 211-R | 4 | 1 | $5\frac{1}{2}$ " x $1\frac{1}{4}$ " | \$6.00 |

Keys

No. 220 Type

Individual four-party harmonic ringing and listening key for switchboards arranged for manual ringing. Key plungers have three positions, ringing, indicating and normal—non-locking in ringing position. The end springs operate only when a key plunger is fully depressed and restore to normal when the pressure is removed. Provided with key buttons colored blue, red, green and black, the blue button being adjacent to the cam lever handle.

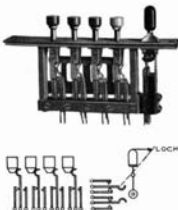


No. 221-T

| Code No. | No. of Plunger Keys | No. of Lever Keys | Size of Escutcheon | Price Complete |
|----------|---------------------|-------------------|--------------------|----------------|
| 221-T | 4 | 1 | 5½" x 1½" | \$6.50 |

No. 240 Type

Eight-party master key for harmonic party line ringing systems. Key plungers lock down to retain the contact springs in operated position and the plungers restore automatically when any other plunger on the same key is depressed. This key can be wired in the circuit so as to ring selectively four telephones connected across the metallic line or ring selectively four telephones connected from the "tip" side of line to ground, when the cam key handle is vertical. Then when the cam key handle is thrown in its operated position the four key plungers will ring selectively four additional telephones connected from "ring" side of line to ground. This gives the 8-party selective service. Provided with key buttons colored blue, red, green and black, the blue button being adjacent to the cam lever handle.



No. 241-A

| Code No. | No. of Plunger Keys | No. of Lever Keys | Size of Escutcheon | Price Complete |
|----------|---------------------|-------------------|--------------------|----------------|
| 241-A | 4 | 1 | 5½" x 1½" | \$6.50 |

Operator's Telephone Set



No. 2 Type

A new type of operator's telephone equipment for use with Magneto and "Central Energy" multiple and non-multiple switchboards, which we have standardized in place of previous types because of its extremely high transmission efficiency, clearness of articulation and increased convenience in use. Reasons for the success of this instrument will be found in the following specifications covering the various component parts of the apparatus.

Transmitter

A powerful instrument which gives clear, strong transmission in the natural tones of the speaker's voice and which is free from the super-sensitiveness that is often mistaken for good transmission efficiency in other kinds of equipment designed for the same service. The tonal properties contain no trace of harsh, metallic or ringing sounds, which are often caused by vibration of parts of the transmitter other than the diaphragm.

The transmitter with mouthpiece weighs only 10 ounces, but notwithstanding its light weight it is strongly constructed throughout so that it will successfully resist the effects of possible rough handling in service. The operating parts of the transmitter are mounted upon a cast aluminum bridge and are enclosed within a nickel-plated metal case fastened to a white-enamelled aluminum breast-plate. There are no sharp edges or bare metal parts to injure or discolor the operator's clothing.

A positive acting, spring retained, universal ball-and-socket joint on the front of the transmitter case provides complete adjustment of the mouthpiece as required by the operator. This allows the mouthpiece to be swung sideways out of the line of the operator's vision when desired.

Operator's Telephone Set

Semi-Vulcanized Mouthpiece

The curve of the semi-vulcanized rubber mouthpiece is accurately designed to insure proper deflection and concentration of voice waves of maximum intensity directly upon the transmitter diaphragm. In vulcanizing the rubber the process is stopped before all elasticity disappears, which insures a tough and resilient material that is practically unbreakable.

Receiver

The receiver used is our standard No. 20-A Operator's Receiver with a sanitary enameled wire headband. In this receiver the permanent magnets and silk insulated copper wire have been scientifically determined to produce maximum receiving efficiency. The lightweight ear cap is made of moulded Phenol product, and is practically unbreakable. It is shaped to fit the operator's ear comfortable and to avoid the irritation often caused by improperly shaped ear caps. The use of aluminum for the case reduces the weight of the receiver to a minimum. Temperature changes cannot affect the diaphragm air-gap and the coils are moisture-proof. Concealed cord connections prevent tampering.

Headband

The sanitary double wire headband readily adapts itself to the contour of the operator's head and is light and comfortable to wear. It serves to balance the apparatus and to distribute the fit with a gentle even pressure. The sanitary advantage over leather-covered or plain metal bands is self-evident.

Duratex Cord

Each set is equipped with a four-conductor "Duratex Cord" which will neither kink nor stretch. The rope form of cord body protects the individual tinsel threads and prolongs the life of the conductor as a whole. Each conductor is impregnated with a moisture-proofing compound that not only preserves high insulation but also prevents corrosion of the tinsel through local chemical action.

Code List and Prices

No. 2-C Operator's Telephone Set, "Central Energy" complete..... \$8.50
 No. 2-L Operator's Telephone Set (Magneto) complete..... 8.50
 When No. 2-C or 2-L Operator's Telephone Sets are ordered less essential parts the following deductions should be made from the price of complete set:

| | |
|--|--------|
| No. 18-C or L Breastplate Transmitter, complete with mouthpiece, breast plate and neck-band..... | \$5.00 |
| No. 20-A Receiver less cord..... | 2.25 |
| No. 23 Plug..... | .75 |
| No. O-4-C 5-foot 4-conductor Duratex Cord..... | .90 |
| Pc. 13483 Neckband..... | .25 |
| Pc. 5419 Mouthpiece..... | .50 |
| No. 93 Operator's Jack (not included in price of complete set) additional..... | 1.00 |

Receivers

No. 20 A Operator's Receiver

This apparatus forms a part of the operator's telephone equipment in our standard "Central Energy" and local battery switchboards in connection with either the suspended type switchboard transmitter or the No. 2 Type Operator's Set.

The foundation of the receiver is of one-piece aluminum stamping in which the operating parts are mounted. This aluminum cup is superior to the commonly used hard rubber and composition cups, not only in mechanical strength but also in that it is free from unequal expansion and contraction of its parts due to changes in temperature. Such inequalities tend to destroy the true plane in which the diaphragm should be mounted to produce the best results. The diaphragm bearing surface in the No. 20 Type Receivers is formed by rolling the upper edge of the cups inwardly so as to increase its width. The diaphragm is laid upon this surface and clamped evenly around by our improved type of ear cap. This system of clamping avoids sagging and buckling of the diaphragm.

The receiving efficiency of receivers of this type is remarkably high due to our precise determination of the amounts of steel, iron and copper in the electro-magnetic system and the measures we have taken to eliminate eddy current losses. The coils are wound with silk insulated copper magnet wire and are impregnated after winding with a high grade insulating varnish. Tungsten steel is used in the magnets to insure a strong and permanent magnetic field.

As the complete No. 20-A Operator's Receiver weighs only eight ounces, it can be worn without fatigue or discomfort for many hours. The wire frame headband is preferred because of its lightness, comfort and sanitary advantage over plain metal and leather covered head bands. The wires readily conform with the contour of the user's head and the small pad serves to balance the instrument and distribute the fit of the headband.



No. 20 A Receiver with Sanitary Wire Headband

Code List

No. 20-A Operators' Receivers are furnished complete with headband and with No. 0-2-F 6-foot two-conductor cord attached. This receiver can be purchased less headband or less both headband and cord. The standard No. 0-2-F cord is provided with tips designed to fit our No. 40 Operator's Receiver Plug. Price, \$2.50 ea.

STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY

Receivers

No. 18-A Receiver

A watchcase type receiver used on our No. 570 Semi-Portable Car Telephone. Equipped with concealed binding posts. This instrument is completely encased in hard rubber. Furnished complete with No. M-2-F 36-inch cord attached. Price, \$2.50 ea.

No. 19-A Receiver

A watchcase type receiver similar to No. 20-A Operator's Receiver less the headband. Used by linemen and inspectors for testing purposes. Furnished complete with No. R-2-A 36-inch cord attached. Price, \$2.50 ea.

No. 24-A Receiver

A watchcase type receiver used on our No. 844 Type Lineman's Test Set. Equipped with concealed binding posts. No metal parts are exposed as the instrument is completely encased in hard rubber. Furnished complete with No. M-2-J 24-inch cord attached. Price, \$2.50 ea.

No. 26-A Receiver

An auxiliary receiver for use with either wall or desk type telephones. This receiver makes telephone conversations easy for persons who are hard of hearing or who are obliged to use a telephone in very noisy places. Use this type on telephones equipped with receivers having concealed cord connections. Furnished complete with metal hanger to go under mouthpiece and No. R-2-C 36-inch cord. Price \$3.00 ea.

No. 26-B Receiver

This receiver is identical with the No. 26-A Receiver with the exception that it is arranged to connect with receivers having old style exposed binding posts. Furnished complete with metal hanger and No. R-2-C 36-inch cord. Price, \$3.00 ea.

All Prices F. O. B. Rochester, N. Y., and Chicago, Ill.

No. 27 Type Magnetic Receiver

The transmission efficiency of our new No. 27 type Receiver is guaranteed to equal that of any other magnetic receiver. The mechanical correctness and small number of simple parts insures continued good service at minimum cost.

Examine the cross-section view of this new receiver. There are no joints, breaks or welds in the permanent magnet. This one piece construction in combination with a high quality of magnet steel produces a greater magnetic flux. The amounts of iron and copper in the pole piece electro-magnets have been precisely calculated and correctly balanced for highest efficiency. There are no metallic spool heads in which eddy currents can flow and the energy thus saved is converted into sound. The broad diaphragm clamping surface and the compression ring in the ear cap prevent distortion of the diaphragm and loss of air-gap adjustment.

If the receiver shell breaks the operation of the receiver is not affected and the telephone remains serviceable. Provision has been made to facilitate tightening and loosening either the shell or the cap with a key. Dust cannot sift down and settle behind the diaphragm. Moisture and variation of temperature will neither change the adjustment nor impair the efficiency of the receiver.



No. 27 Receiver with cord attached



Cross-Section view of
No. 27 Receiver

No. 27-A Receiver

Used on all "Central Energy" and Magneto telephones which are arranged for a hand receiver and equipped with an induction coil, except the Nos. 890 and 950 Iron Clad Telephones. It is regularly furnished with composition shell and ear cap but can be supplied with hard rubber shell and cap when specified in order. Price of the receiver includes a No. R-2-E 36 inch receiver cord attached.

| | |
|--------------------------------------|-------------|
| No. 27-A Receiver (Composition)..... | \$1.75 each |
| No. 27-A Receiver (Hard Rubber)..... | 2.20 " |

No. 27-B Receiver

Used on the Nos. 890 and 950 Iron Clad Telephones. It is regularly furnished with hard rubber shell and ear cap. Price of the receiver includes a No. M-2-I 16-inch Mine telephone receiver cord attached.

| | |
|--------------------------------------|-------------|
| No. 27-B Receiver (Hard Rubber)..... | \$2.45 each |
|--------------------------------------|-------------|

F. O. B. Rochester, N. Y., or Chicago, Ill.

Receivers



No. 28 Receiver with cord attached



Cross-Section View of No. 28 Receiver

No. 28 Type Direct Current Receiver

Receivers of this type are used in the talking circuits of some of our "Central Energy" telephones wherein the transmitter and receiver are connected in series. The transmission efficiency of such telephones is considerably more than that of telephones equipped with magnetic receivers and with other kinds of direct current receivers when used on the longest city subscribers' lines. High efficiency of the receiver and the elimination of induction coil losses are the reasons for the superior transmission efficiency of instruments equipped with this apparatus.

The sectional view of the No. 28 Receiver shows that no permanent magnet is used as its action is entirely electro-magnetic. The single coil is wound upon an "E" shaped core built up of silicon steel laminations to a thickness of $\frac{1}{4}$ inch. The laminations and non-metallic spool heads effectively prevent eddy current losses and assist in raising the receiving efficiency. The pole pieces are placed so that a maximum number of lines of force pass through the diaphragm. The windings are impregnated with high grade armature varnish and baked to render them moisture-proof.

The diaphragm is held securely in a true plane by the broad diaphragm bearing surface and by the ear cap which clamps the diaphragm evenly and at the center of the bearing surface. Breakage of the receiver shell will not interfere with the operation of the receiver. The shell and ear cap used on this receiver are interchangeable with our other types to avoid the necessity of carrying duplicate stocks of these parts.

No. 28-A Receiver

The receiver is regularly furnished with composition shell and ear cap but can be supplied with hard rubber shell and cap when specified in order. Price of the receiver includes a No. R-2-E 36 inch receiver cord attached.

| | |
|---------------------------------|-------------|
| No. 28-A Receiver (Composition) | \$1.65 each |
| No. 28-A Receiver (Hard Rubber) | 2.10 " |

Nos. 27 and 28 Receiver Parts

| | |
|---|------------|
| Pc. 7784 Composition Shell | \$.35 each |
| Pc. 11171 Composition Ear Cap | .12 " |
| Pc. 2833 Hard Rubber Shell | .75 " |
| Pc. 2834 Hard Rubber Ear Cap | .22 " |
| No. R-2-E 36-inch Receiver Cord (Standard) | .25 " |
| No. M-2-I 36-inch Receiver Cord (Mine Tel.) | .45 " |

Quantity prices on parts upon application

F. O. B. Rochester, N. Y., or Chicago, Ill.

Ringer Signals

No. 46 Type



No. 46 Type

The straight line polarized ringer here illustrated is used in all of our standard "Central Energy" and Magneto Telephones equipped for straight line ringing. The method of mounting the armature pivots on a brass yoke bridging the pole pieces provides for a single screw adjustment. Further adjustment is obtained through eccentric gong drillings. Spool terminals are arranged for both screw and soldered connections.

| Code No. | Resistance | Coils Per Pr. | Complete less Gongs and Mtgs. |
|----------|------------|---------------|----------------------------------|
| 46-A | 1000 Ohms | \$1.50 | \$2.00 |
| 46-C | 1600 " | 1.60 | 2.10 |
| 46-E | 2000 " | 1.70 | 2.20 |
| 46-F | 2500 " | 1.80 | 2.30 |
| 46-L | 500 " | 1.40 | 1.90 |

Additional for gongs, cap screws, lock-nuts or screws for mounting ringers, \$.25 Per Set

No. 47 Type (Harmonic)

These ringers are regularly furnished with reed armatures tuned to the standard frequencies used in Harmonic Four-Party Systems, namely, 16, 33, 50 and 66 cycles. The armatures and ringer coils are interchangeable and conversions from one frequency to another can be easily and quickly made on all but 16 cycle type. The pole-pieces of the ringer coils are made with a locknut adjustment which provides for exceedingly close regulation of the air-gap. Ringers of this type mount upon the same cabinet drilling as our No. 46 Type Ringer, which facilitates changes in sub-station equipment. Each ringer is carefully tuned and permanently adjusted to operate with highest efficiency at the normal voltages and rated frequencies.

| Code No. | Frequency | Resistance | Coils Only Per Pr. | Complete less Gongs and Mtgs. |
|----------|-----------|------------|-----------------------|----------------------------------|
| 47-E | 16 Cycles | 2500 Ohms | \$1.80 | \$2.50 |
| 47-F | 33 " | 500 " | 1.40 | 2.50 |
| 47-G | 50 " | 500 " | 1.40 | 2.50 |
| 47-H | 66 " | 500 " | 1.40 | 2.50 |

Additional for gongs, cap screws, lock-nuts or screws for mounting ringers, \$.25 Per Set

Armature
Pc. 12562
16 cyclesArmature
Pc. 12599
33 cycles

No. 47 Type

Armature
Pc. 12566
50 cyclesArmature
Pc. 12561
66 cycles

Signals Ringer



No. 49 Type

No. 49 Type

Ringers of this type are used in party line telephones which are selectively signalled by means of positive and negative pulsating current. Equipped with an adjustable tension biasing spring. Single screw armature adjustment.

| Code No. | Resistance | Coils Per Pr. | Complete less Gongs & Mrgs. |
|----------|------------|---------------|-----------------------------|
| 49-A | 1000 Ohms | \$1.50 | \$2.25 |
| 49-C | 1600 " | 1.60 | 2.35 |
| 49-F | 2500 " | 1.80 | 2.75 |
| 49-L | 500 " | 1.40 | 2.15 |

Additional for gongs, cap screws, lock-nuts and screws for mounting ringers, \$.25 Per Set.

No. 28 Type

An alternating current buzzer similar to No. 46 Type Ringer but less gong posts and clapper rod. Used principally in generator circuits of switchboards and in our Lineman's Test Sets.



No. 28 Type

| Code No. | Resistance | Coils Per Pr. | Complete less Gongs & Mrgs. |
|----------|------------|---------------|-----------------------------|
| 28-A | 1000 Ohms | \$1.50 | \$2.00 |
| 28-C | 1600 " | 1.60 | 2.10 |
| 28-H | 100 " | 1.40 | 1.90 |

No. 35 Type

Moisture-Proof ringer used on our No. 890 Iron-Clad Mine Telephones. Mounted on a brass plate which contains no openings through which air, gases or moisture can penetrate. Equipped with impregnated coils and double permanent magnets. Arranged for 4-inch gongs.

| Code No. | Resistance | Coils Per Pr. | Complete less Gongs & Mrgs. |
|----------|------------|---------------|-----------------------------|
| 35-A | 1000 Ohms | \$1.50 | \$3.80 |
| 35-B | 1600 " | 1.60 | 3.90 |
| 35-E | 2500 " | 1.80 | 4.00 |

Additional for gongs, cap screws, lock-nuts and screws for mounting ringers, \$1.20 Per Set.

No. 37 Type—D. C. Vibrating

This type of ringer is designed to operate on direct current and is used in our Inter-Comm-Phones requiring a vibrating armature and an adjustable break contact. Arranged for 2-inch gongs.

| Code No. | Resistance | Complete less Gongs & Mrgs. |
|----------|------------|-----------------------------|
| 37-A | 20 Ohms | \$1.50 |

Additional for gongs, cap screws, lock-nuts and screws for mounting ringers, \$.25 Per Set.



No. 37 Type

Prices F. O. B. Rochester, N. Y. and Chicago, Ill.

Magneto Telephones

No. 896 Compact Wall Telephone



Closed View No. 896 Wall Telephone

Our No. 896 Wall Telephone illustrated on this page contains a large number of distinctively new features in telephone design. Besides making this instrument most efficient in its transmission and ringing qualities, we have made it more convenient to use and more adaptable to the various kinds of service required in rural line operation than all other types of telephones.

The quarter-sawn oak cabinet is more compact than in our previous types of wall telephones and is fitted with new style writing shelf which is inclined at the correct angle for writing purposes. The talking circuit apparatus consists of our standard transmitter with short type transmitter arm, receiver, induction coil and removable lever hookswitch. Ringers wound to standard resistances and hand generators of either three or five bar types are furnished to meet the various operating conditions. The line and ground wire connections are made on screw type terminals which are mounted inside of the cabinet to adapt the telephone for either concealed or exposed house wiring. An efficient carbon block lightning arrester is mounted

on the side of the cabinet where dust cannot collect upon it and impair its action.

For use on short lines connecting one or two telephones in cities and towns, we recommend our No. 896-R Telephone which is equipped with a three-bar generator and 1000 ohm ringer. For service on long rural party lines it has been our experience that five-bar generators and 1600 ohm ringers prove most satisfactory and we accordingly advocate our No. 896-I Telephone for such lines.

No. 896 Wall Telephones are packed and shipped in a fully assembled condition in strong individual wooden packing boxes. The gross shipping weight of the telephone in the standard package is approximately 31 lbs., or when batteries are ordered additional and included in the package the shipping weight is approximately 33 lbs.

Full instructions for setting up and installing the telephones are contained in an instruction book which is packed in each box.



Open View No. 896 Wall Telephone

Telephones, Magneto

"Sure-Ring" Condenser

The addition of a No. 26-T $\frac{1}{2}$ M. F. "Sure Ring" Condenser in the receiver-induction coil circuit of a bridging telephone aids in signalling between stations on party lines when the receiver is left off the hook. To obtain full benefit from the "Sure Ring" condensers all telephones on the same line should be equipped with them. All of our bridging telephones are wired for this feature and the condenser can be added at any time.

"Non Interfering" Push Button

When this additional equipment is specified on a standard bridging instrument an A. C. Generator is used and Central may be called without signalling the other subscribers on the line, or the other subscribers may be called without signalling Central. The "Non-Interfering" push button feature is of benefit on a metallic circuit only, although telephones equipped with push button may be used on grounded lines, in which case the push button would be of no value unless the purchaser contemplates a future change of the grounded lines into a metallic circuit.

Battery-Saver Attachment

The Battery-Saver Attachment is a latching device which is designed to attach to the hookswitch escutcheon plate on No. 896 Wall Telephones. This device allows subscribers to use their telephones for listening purposes, when desired, without wasting current from the telephone dry cells which ordinarily is consumed whenever the telephone receiver is lifted from its hook. To use the telephone for both talking and listening the user of the instrument presses a button on the Battery-Saver Attachment which then permits complete conversational facilities. Ask for our special Bulletin No. 1020 on the Battery-Saver Attachment.

Code List and Prices

| Code No. | Generator | Ringers | Rochester Chicago | Kansas City Atlanta | San Francisco Seattle |
|----------|-----------|-------------------|----------------------|------------------------|--------------------------|
| 896-R | 3 Bar | 1000 Ohm Bridging | 16.00 | 16.40 | 17.00 |
| 896-I | 5 Bar | 1600 Ohm Bridging | 16.50 | 16.90 | 17.50 |
| 896-L | 5 Bar | 2500 Ohm Bridging | 16.60 | 17.00 | 17.60 |

Additions

| | | | |
|--|--------|--------|--------|
| For "Sure Ring" Condenser ("K") (on 5-bar types) | \$.60 | \$.60 | \$.60 |
| For "Non-Interfering" Push Button ("P") (on 5-bar types) | .25 | .25 | .25 |
| For Battery Saver Attachment ("W") (on all types) | .25 | .25 | .25 |

The above prices do not include batteries. Batteries if ordered will be billed separately at the nearest even figure to the prevailing barrel lot price.

F. O. B. Shipping Points

No. 1000 Desk Telephone

Our No. 1000 Desk Telephone for service in connection with magneto exchanges consists of our No. 992 Desk Stand and our improved No. 327 Type Desk Set Box. Its equipment includes apparatus of the same high quality as in our other types of magneto telephones, and its transmission and ringing efficiencies are equally high.

The framework of the No. 992 Desk Stand is made of steel and put together in a practically unbreakable manner. The finish is a durable semi-glossy black enamel with nicked trimmings which presents a pleasing appearance and withstands the wear and tear of daily service. The induction coil, hookswitch mechanism and cord terminals are contained within the base and are easily exposed to view by giving one screw a quarter turn and removing the base plate. The transmitter is mounted upon an adjustable transmitter arm in which any wear can be taken up by turning the ring on the top of the column. A rubber ring inserted in the bottom of the stand prevents its scratching the desk or table.

The No. 327 Desk Set Box is a re-designed type in which the line, ground and instrument terminals are located within the cabinet so that the apparatus may be used in connection with either exposed or concealed house wiring. Each terminal is numbered or lettered so that the proper line and cord connections can be made quickly and easily. An improved lightning arrester with a large discharge area is mounted on the side of the box where it is not liable to short circuiting, either by metallic articles or through the collection of dust. The door of the cabinet is hinged on the left side to facilitate the operation of the generator when the door is open. We regularly furnish No. 327 Desk Set Boxes in quarter sawed oak woodwork with a dull golden oak finish.

The No. 1000 Desk Telephones are furnished with three standard equipments for use on grounded or metallic bridging lines. For use on short city or town lines we strongly recommend our No. 1000-R Desk Telephone which is equipped with a three bar generator and 1000 ohm ringer. For use on long rural lines where greater ringing power is required our No. 1000-I Desk Telephone equipped with five bar generator and 1600 ohm ringers will give excellent service. On the following page are listed standard outfits with different ringer and generator equipments.

Approximate shipping weight of the complete outfit less batteries is 26 pounds. No. 992 Desk Stand only, 5 pounds.



No. 1000 Desk Telephone Includes No. 992 Desk Stand and No. 327 Desk Set Box

Telephones, Magneto

"Sure-Ring" Condenser

The addition of a No. 26-T $\frac{1}{2}$ M. F. "Sure Ring" Condenser in the receiver-induction coil circuit of a bridging telephone aids in signalling between stations on party lines when receiver is left off the hook. To obtain full benefit from the "Sure Ring" condensers all telephones on the same line should be equipped with them. All of our bridging desk set boxes are wired for this feature and the condenser can be added at any time.

"Non-Interfering" Push Button

When this additional equipment is specified on a standard bridging instrument Central may be called without signalling the other subscribers on the line, or the other subscribers may be called without signalling Central. The "Non-Interfering" push button feature is of benefit on a metallic circuit only, although telephones equipped with push button may be used on grounded lines, in which case the push button would be of no value unless the purchaser contemplates a future change of the grounded lines into a metallic circuit.

Code List and Prices

| Code No. | Generator | Ringer | Rochester Chicago | Kansas City Atlanta | San Francisco Seattle |
|----------|-----------|-------------------|----------------------|------------------------|--------------------------|
| 1000-R | 3 Bar | 1000 Ohm Bridging | 17.25 | 17.65 | 18.25 |
| 1000-I | 5 Bar | 1600 Ohm Bridging | 17.75 | 18.15 | 18.75 |
| 1000-L | 5 Bar | 2500 Ohm Bridging | 17.85 | 18.25 | 18.85 |

Additions

| | | | |
|--|--------|--------|--------|
| For "Sure Ring" Condenser ("K")..... | \$.60 | \$.60 | \$.60 |
| For "Non-Interfering" Push Button ("P").. | .25 | .25 | .25 |
| The above prices do not include batteries. Batteries if ordered will be billed separately at the nearest even figure to the prevailing barrel lot price. | | | |

F. O. B. Shipping Points

No. 1138 Combination Telephone

As shown in the accompanying illustration our No. 1138 Combination Telephone is a two-piece subscriber's station equipment consisting of a No. 10-L Combination Telephone and an associated No. 327 Type Desk Set Box. The apparatus is suitable for either residence or office service as a desk or wall installation.

The No. 10-L Combination Telephone is light, convenient and requires the use of but one hand to operate it. Its transmission efficiency equals and generally exceeds our other types of instruments because the user naturally speaks directly into the transmitter mouthpiece. The equipment includes a transmitter of our standard size and type, permanent magnet receiver, induction coil and hookswitch. The induction coil and hookswitch are contained within the pressed steel hook-switch box from which the combination telephone is suspended when not in use. Maintenance charges on this style of instrument are very low as the instrument is mounted where it is seldom in the way or exposed to injury.

The No. 327 Desk Set Box is a re-designed type in which the line, ground and instrument terminals are located within the cabinet so that the apparatus may be used in connection with either exposed or concealed house wiring. Each terminal is distinctively numbered or lettered so that the proper line and cord connections can be made quickly and easily. An improved lightning arrester with a large discharge area is mounted on the side of the box where it is not liable to short circuiting, either by metallic articles or through the collection of dust. The door of the cabinet is hinged on the left side to facilitate the operation of the generator when the door is open. We regularly furnish No. 327 Desk Set Boxes in quarter sawed oak woodwork with a dull golden oak finish.

The No. 1138 Combination Telephones are furnished in three standard equipments for use on grounded or metallic bridging lines. For use on short city or town lines we strongly recommend our No. 1138-R Combination Telephone which is equipped with a three bar generator and 1000 ohm ringers. For use on long rural lines where greater ringing power is required our No. 1138-I Combination Telephone equipped with a five bar generator and 1600 ohm ringers, will give excellent service.

The No. 10-L Combination Telephone may be used without the desk set box as an extension telephone. The approximate shipping weight of the complete outfit is 21 pounds. No. 10-L Combination Telephone only, 3 pounds. A wiring diagram showing the method of connecting the instruments for both main and extension telephone service is packed with each instrument.



No. 1138 Combination Telephone
Includes No. 10-L Combination
Telephone and No. 327
Desk Set Box

Telephones, Magneto

"Sure-Ring" Condenser

The addition of a No. 26-T $\frac{1}{2}$ M. F. "Sure Ring" Condenser in the receiver-induction coil circuit of a bridging telephone aids in signalling between stations on party lines when the receiver is left off the hook. To obtain full benefit from the "Sure-Ring" condensers all telephones on the same line should be equipped with them. All of our bridging desk set boxes are wired for this feature and the condenser can be added at any time.

"Non-Interfering" Push Button

When this additional equipment is specified on a standard bridging instrument Central may be called without signalling the other subscribers on the line, or the other subscribers may be called without signalling Central. The "Non-Interfering" push button feature is of benefit on a metallic circuit only, although telephone equipped with push button may be used on grounded lines, in which case the push button would be of no value unless the purchaser contemplates a future change of the grounded lines into a metallic circuit.

Code List and Prices

| Code No. | Generator | Ringers | Rochester Chicago | Kansas City Atlanta | San Francisco Seattle |
|----------|-----------|-------------------|----------------------|------------------------|--------------------------|
| 1138-R | 3 Bar | 1000 Ohm Bridging | 18.00 | 18.40 | 19.00 |
| 1138-I | 5 Bar | 1600 Ohm Bridging | 18.50 | 18.90 | 19.50 |
| 1138-L | 5 Bar | 2500 Ohm Bridging | 18.60 | 19.00 | 19.60 |

Additions

| | | | |
|---|--------|--------|--------|
| For "Sure Ring" Condenser ("K")..... | \$.60 | \$.60 | \$.60 |
| For "Non-Interfering" Push Button ("P").. | .25 | .25 | .25 |

The above prices do not include batteries. Batteries if ordered will be billed separately at the nearest even figure to the prevailing barrel lot price.

F. O. B. Shipping Points

Testing Equipment

No. 2 Wire Chief's Test Set

In exchanges where the volume of routine testing and supervision of maintenance crews does not require the constant attention of the wire chief nor warrants the installation of a desk type wire chief's switchboard, this equipment will give excellent results and entire satisfaction.

It is designed to mount upon the side of a switchboard section or a wall of the terminal room where there is convenient access to the terminals of the various incoming lines. The equipment is assembled within a quarter-sawed oak cabinet which occupies the same amount of wall space as our standard Magneto wall telephone—9 x 19 inches.

The equipment includes a complete wire chief's telephone set with head-band receiver, the necessary switching keys for setting up the various testing circuits and a standard Weston No. 280 Voltmeter having two separate scales reading 0—5 and 0—50 volts. The various terminals for the attachment of test leads, battery leads, ringing leads, etc., are arranged in two horizontal rows on the lower end of the backboard—all labeled to facilitate identification of the separate circuits.

Two sets of batteries are required for testing. A sufficient number of dry cells, all connected in series to give 40 volts in one set and 4 volts in the other. Five dry cells are also required in connection with the No. 2-A Wire Chief's Test Set for operating the telephone transmitter.

Facilities are provided in test sets of this type for making the following tests on either "central energy" or magneto lines.

- (a) Continuity Test (Opens or bad splices)
- (b) Tests for Short Circuits.
- (c) Tests for Grounds.
- (d) Tests for Crosses with lines carrying current.
- (e) Tests for Crosses with other telephone lines.
- (f) Location of Crosses or Grounds by means of Wheatstone Bridge.
- (g) Measurement of voltage of batteries.

No. 2 Type Wire Chief's Test Sets

| Code | For use with | Price |
|--|------------------------|----------|
| 2-A | Magneto systems | \$117.50 |
| 2-B | Central Energy Systems | \$120.00 |
| For 4-party master ringing key in either set add | | \$ 5.00 |

Full instructions for setting up the wire chief's test sets, and for making all tests are packed with each shipment. Approximate shipping weight 75 Lbs.



Closed View Showing Arrangement of Face Equipment



Open View Showing Accessibility of Apparatus, Wiring and Terminals

Testing Equipment

No. 3-A Test Set for P. B. X. Trunk Circuit Plates

In order to obtain the greatest benefits to be derived from the use of our standardized P. B. X. switchboards, it is essential that each telephone company operating one or more switchboards of this type be also in possession of at least one of our No. 3-A Test Sets for P. B. X. Trunk Circuit Plates as illustrated on this page.

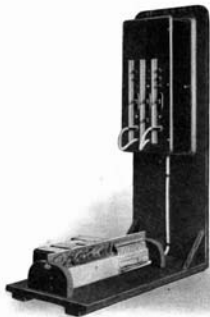
It is intended that this testing set be located in the telephone company's repair shop or wire chief's test room so that the testing, inspection and adjustment of all P. B. X. trunk circuit plate equipment can be performed in the exchange building where proper facilities for the work are at hand. By having one or two extra trunk circuit plates at hand, it will be unnecessary to perform any work on the trunk circuits of the P. B. X. station other than the substitution of a new circuit plate for the old. This substitution of circuit plates can be performed by any employee so that trained P. B. X. inspectors are not required in clearing cases of trunk trouble.

The No. 3-A Test Set contains all of the apparatus required to put a circuit plate through its proper sequence of operations and duplicates the operating conditions as they exist in actual trunk service. By operating the various keys the actions of the various operating elements can be observed under ideal

conditions and the necessary adjustments to relays can be made quickly, easily and at minimum cost. Detailed testing instructions are furnished with each test set.

The development of the P. B. X. trunk circuit plate and the circuit plate testing set by this company is one of the most progressive steps in P. B. X. switchboard equipment ever made. Through the use of our standardized P. B. X. switchboards and this associated apparatus, it is possible to produce economies in operation and maintenance that hitherto have been out of question.

Shipping weight approximately 100 lbs. Price complete \$135.00.



No. 3-A Test Set for P. B. X. Trunk Circuit Plates