TELEPHONES and SUPPLIES

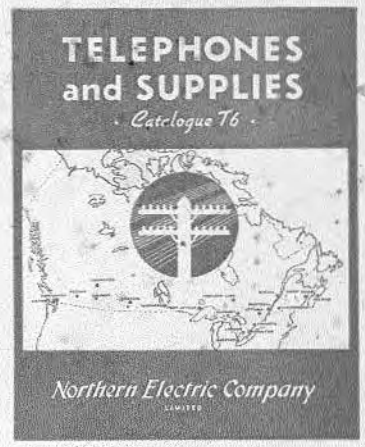
Catalogue T6

Northern Electric Company

LIMITED

TELEPHONES *and* SUPPLIES

CATALOGUE T6



Northern Electric
COMPANY LIMITED

A NATIONAL ELECTRICAL SERVICE

ST. JOHN, N.B. HALIFAX QUEBEC SHERBROOKE MONTREAL OTTAWA TORONTO HAMILTON LONDON WINDSOR
NEW LISKEARD SUDBURY PORT ARTHUR WINNIPEG REGINA CALGARY EDMONTON VERNON VANCOUVER VICTORIA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FOREWORD

THE NORTHERN ELECTRIC COMPANY LIMITED needs no introduction to the Telephone Industry of Canada. Fifty-five years' experience in the manufacture and distribution of apparatus and materials adapted to Canadian Telephone Systems enables us to furnish Telephone Equipment for all types of service. The Factory, located at 1261 Shearer Street, Montreal, has a floor space of approximately one million square feet.

Scope of Catalogue: This catalogue has been compiled and issued for the purpose of bringing to the attention of telephone buyers some of our most generally used magneto, central battery and automatic telephones and associated equipment. With a line so extensive it is only possible to show a few types and combinations in this catalogue. If your requirements are not covered by the apparatus described, write us regarding the conditions to be met so that we may discuss your problem to our mutual advantage. We are prepared to offer recommendations for dial and manual central offices serving communities of all sizes, as well as completely installed telephone and telegraph carrier and repeater installations.

Ordering: So that we can give you our best service, inquiries should clearly describe the apparatus and quantity desired; wherever possible reference should be made to code numbers or catalogue reference. When repair parts are ordered samples are of great assistance in fulfilling the requirement. When these are included with your order, they should be carefully designated, mentioning, if possible, the code number of the item from which the part was removed.

Prices: Telephone apparatus is sold F.O.B. Distributing House. Prices on apparatus listed in this catalogue, or on any other equipment which we are in a position to furnish, will be quoted upon application to our nearest Distributing House.

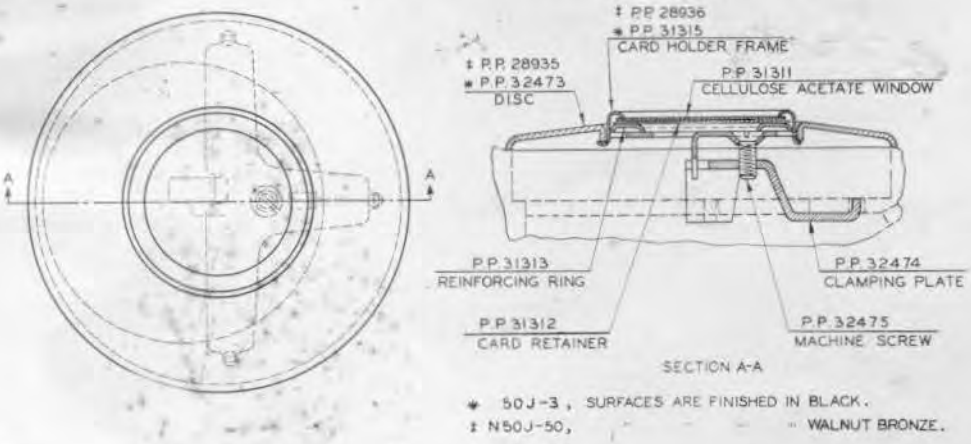
Shipments: Northern Electric Company Distributing Houses are located in the principal cities of Canada, insuring prompt filling of orders. Customers are requested to specify the method of shipment but in the absence of specific instructions we will use our best judgment in selecting the manner of shipment and the route. Breakage or damage in transit is rare. If you should receive a damaged shipment we would very much appreciate your comment if you suspect our packing was at fault. Claims for breakage and damage should be made without delay to the transportation company and we will gladly assist you in presenting these claims.

APPARATUS BLANKS

No. 42B Apparatus Blank

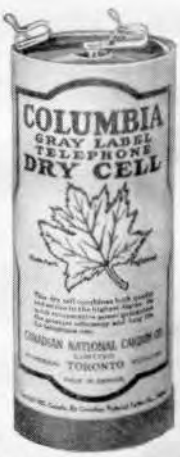
Code No.	Material	Finish	Used
25A	Steel	Black	In unequipped positions of No. 92 Signal Mountings.
28A	Steel	Black	In unequipped positions of No. 89 Signal Mountings.
38B	Aluminum	Black	In unequipped positions of No. 110 Plugs.
39B	Aluminum	Black	In unequipped positions of No. 218 and similar type Jacks.
42B	Aluminum	Black	In unequipped positions of No. 13 Lamp Socket drillings.
50J-3	Metal	Black	To clamp on Uniphones and Handset Mountings to cover the unequipped dial position when the mounting is used in manual service. Provided with card holder.
N50J-50	Metal	Walnut Bronze	

50 TYPE APPARATUS BLANK



* 50J-3, SURFACES ARE FINISHED IN BLACK.
‡ N50J-50, " " WALNUT BRONZE.

BATTERIES AND DRY CELLS



Columbia Gray Label
Dry Battery No. 6

No. 703
Dry Battery

No. 950
Dry Cell

Northern Telephone
Dry Battery No. 6

Each magneto telephone set is complete and ready for use with the exception of the Dry Cells, which should, of course, be purchased as required, in order to insure fresh ones being supplied. Standard "Northern" or "Columbia Gray Label" Telephone Dry Cells are recommended, as they have been specially developed to meet the exacting requirements of telephone work. Both types are available with screw binding posts or Fahnestock clips. Size 2½" diameter by 6¾" in height. Packed for shipment in boxes of 25 each, weighing 57 lbs.

The No. 703 and No. 714 are 4½ volt batteries used for the talking circuit of No. 1017 Test Sets.

The No. 950 is used in the Model 689 Ohmmeters.

Cat. No.	Size in Inches Height	Length	Width	Shipping Weight
703	$2\frac{13}{32}$	$2\frac{7}{16}$	$\frac{27}{32}$	4 oz.
714	3	4	$1\frac{3}{8}$	$14\frac{1}{2}$ oz.
950	$2\frac{27}{64}$	$1\frac{21}{64}$ Diameter		$3\frac{1}{2}$ oz.

Unless batteries are good transmission is poor

BATTERIES AND DRY CELLS—*Continued*

Air Cell Batteries

T300 Air Cell Battery

T600 Air Cell Battery

Practical operations in Telephone Exchanges have proven the Air Cell Battery to be the most satisfactory source available for current supply to operators' transmitters in magneto type switchboards. Two sizes are available: T300 a 1.25 volt one-cell unit and T600 a 2.5 volt two-cell unit. The conservatively rated 600 ampere-hour capacity insures at least 6,000 hours of peak transmission when used with telephone equipment imposing a drain of 100 milliamperes.

One T600 and one T300 unit in series are recommended for supplying operators' transmitters in magneto offices where the No. 23 Induction Coil telephone set with No. 234 transmitter is used, and three T600 units and one T300 unit in series where the No. 72A Induction Coil set with No. 396A Transmitter is employed.

The battery is manufactured and shipped dry, hermetically sealed. It is prepared for service by simply adding ordinary drinking water. It is a **primary battery** and cannot be recharged upon completion of its unusually long life and has no salvage value. Filled with water, the T300 and T600 Air Cell Batteries weigh 15¾ lbs and 30½ lbs. each respectively.

Size in Inches

Cat. No.	Height	Length	Width	Shipping Weight
T300	10⅞	6⅜	5¼	12 lbs.
T600	10¼	9⅞	6⅝	23 lbs

BATTERY BOXES

No. N1A Battery Box

Battery Boxes provide a neat and convenient means of mounting dry cells and protecting them from injury. These boxes are made of sheet metal finished with black japan and are lined with insulating material. Pear shaped mounting slots in the back of the boxes provide an easy means of mounting on vertical surfaces and in such a way that they are readily removable. This feature permits of their being located at the sides or under desks and in other places where they will be out of the way and adjacent to the telephone or other apparatus to which they are connected and yet be accessible for maintenance purposes.

No. N1A—Black japanned sheet metal box lined with an insulating material. Holds three No. 6 dry cells. Size of box, 9½" long by 3¼" wide by 7½" high.

Packed in boxes of 25 each, weighing 62 lbs

SWITCHBOARD CABLE

Northern Electric switchboard cables represent the highest developments in the art of switchboard cable manufacture. The cables listed herein are typical of those in common use. We manufacture many different sizes of Switchboard Cable with different gauges of wire and types of insulation, upon which information will be forwarded on request.

The Cable is protected from moisture and injury by a serving of metallic tape and a heavy braid and is given a coat of fire resisting paint.

In all types of switchboard cable, the conductors have their outer insulation colored in accordance with a definite color scheme, so that they may be easily identified. For the purpose of reference, the various color combinations have been numbered as follows:

Oval Type

Round Type

Color Scheme

1 Blue	6 Blue-White	11 Orange-White	16 Green-Brown
2 Orange	7 Blue-Orange	12 Orange-Green	17 Green-Slate
3 Green	8 Blue-Green	13 Orange-Brown	18 Brown-White
4 Brown	9 Blue-Brown	14 Orange-Slate	19 Brown-Slate
5 Slate	10 Blue-Slate	15 Green-White	20 Slate-White

Paired Cable

Pairs					
1–20	Colors	1–20	Paired	with	White
21–40	"	"	"	"	Red
41–60	"	"	"	"	Black
61–80	"	"	"	"	Red-Wh.
81–100	"	"	"	"	Blk-Wh.
101–120	"	"	"	"	Red-Blk.
121–140	"	"	Threaded Paired		Red White
141–160	"	"	Threaded Paired		Red Red
201	Or-Wh.	Paired	with		Or-Gr.
202	Or-Br.	"	"		Or-Sl.
203	Gr-Wh.	"	"		Gr-Br.
204	Gr-Sl.	"	"		Br-Wh.
205	Br-Sl.	"	"		Sl-Wh.

Spare Pairs

1	White	Paired	with	Red
2	White	"	"	Black
3	Red	"	"	Black
4	Red-White	"	"	White
5	Red-White	"	"	Red
6	Red-White	"	"	Black
7	Black-White	"	"	White
8	Black-White	"	"	Red
9	Black-White	"	"	Black
10	Red-Black	"	"	White
11	Red-Black	"	"	Red
12	Red-Black	"	"	Black

Single Cable

Conductors						Spare Conductors
1-20	Colors	1-20	threaded	with	Red	1 Red-White
21-40	"	1-20	"	"	Blk.	2 Black-White
41-60	"	1-20	"	"	Red-Blk.	3 Red-Black
						4 Red-Black-White

Dry Core, Metallic Taped, Braided, Tinned and Enamelled Conductors

Double Cotton Insulation

Code No.	†Conductors	Pairs No.	Pairs Gauge	Singles No.	Singles Gauge	Dimension (Inches)	‡Approx. Weight in lbs. per thousand ft.
6024	43	20	22	—	—	$\frac{27}{64}$ x $\frac{23}{64}$	130
6035	53	25	22	—	—	$\frac{5}{8}$ x $\frac{13}{32}$	155
*6066	103	50	22	—	—	$\frac{3}{4}$ dia.	280
6070	83	40	22	—	—	$\frac{27}{64}$ x $\frac{15}{32}$	228
6079	23	10	22	—	—	$\frac{29}{64}$ x $\frac{19}{64}$	78
6106	103	40	22	20	22	$\frac{35}{64}$ x $\frac{19}{64}$	274
6116	43	20	19	—	—	$\frac{25}{32}$ x $\frac{13}{32}$	243

Waxed Core, Braided, Tinned Conductors

Double Silk and Single Cotton Insulation

143	43	20	22	—	—	$\frac{11}{16}$ x $\frac{11}{32}$	158
144	63	30	22	—	—	$\frac{25}{32}$ x $\frac{7}{16}$	214

*Round Cables. All other cables are oval.

†The quantity shown under "Conductors" includes spares.

‡Reels not included.

Purified textiles for improved cables

CENTRAL OFFICE ENTRANCE CABLE
AND
INSIDE CONSTRUCTION CABLE

Cables having paper insulated conductors are usually terminated at the office end by splicing on an entrance section of textile insulated cable.

Types "FA" and "GA" cables are generally used for this purpose. They consist of pairs of No. 22 A.W.G. tinned annealed copper wires, each conductor being insulated with a double silk and single cotton wrapping. The pairs are stranded together to form a core which is protected by a pure lead sheath. In type "FA" cable, all pairs are coloured white and red-white except a tracer pair, which is coloured blue and white. In type "GA" cable, each pair is distinguishable from every other by a colour code.

Types "MFA" and "MGA" are similar to Types "FA" and "GA", respectively, except that the conductors are enameled. The enameled cables are intended for the same kinds of service as the other two types, but are used where the humidity may be relatively high.

Cables impregnated with a beeswax compound and otherwise similar to "GA" and "MGA" types are known as "UA" and "MUA" types respectively.

Type "FA" and "GA" Cable

Sizes commonly used.

Code No.	Number of Pairs Guaranteed	Mean Outside Diameter Inches	Approx. Weight in Pounds per Foot (Reels not included)	Convenient Number of Feet on Reels
FA101	101	1.00	1.42	2500
FA152	151	1.19	1.86	1600
FA202	201	1.41	2.93	1500
FA303	302	1.75	4.68	1200
GA6	6	.34	.25	3500
GA11	11	.41	.32	3500
GA16	16	.47	.39	2500
GA21	21	.52	.45	2000
GA26	26	.56	.51	1500
GA31	31	.59	.56	1500
GA41	41	.67	.67	2500
GA51	51	.77	.94	2500

Data regarding other types of textile cable furnished on request.

INTERPHONE CABLE

For Outside Use

For Interior Use

The tinned copper conductors are provided with single silk and single cotton insulation, which is coloured in accordance with a standard colour code, in such a way that each pair and each single wire can be identified. The pairs are properly twisted to prevent inductive disturbances. The cable is impregnated with a wax compound which prevents the insulation from fraying when the cables are installed and also serves to protect the formed ends against moisture. Servings of paper tape are applied prior to the application of the outer covering.

Three general types of cable are provided. Each type has its particular use and care should be taken to order the proper cable for any desired purpose. These types are as follows:

1—Interior Cable with outside braiding treated with gray fire resisting paint. Use only in dry places.

2—Interior Cable with glazed cotton outside braiding. Use only in dry places where exposed to view.

3—Outside Cable, lead covered. Always use this cable outside, and inside in every case where there is apt to be moisture even in a small degree.

Code No.	Conductors B. & S. Gauge No. 22, No. 18	Covering	Approximate Outside Diam. In.	Approx. Weight in lbs. per Thousand ft. (Reels not included)
*161 B	8 singles	Fire resisting braid		42
*161 BL	8 singles	Lead Sheath		227
142 B	8 singles	Brown cotton braid		36
*162 B	12 singles	Fire resisting braid		57
*162 BL	12 singles	Lead Sheath		262
164 B	6 singles, 2 pair	Fire resisting braid		73
164 BL	6 singles, 2 pair	Lead Sheath		307
*134 B	6 pair, 2 pair	Fire resisting braid		97
*134 BL	6 pair, 2 pair	Lead Sheath		355
155 B	6 pair, 2 pair	Brown cotton braid		83
*141 B	12 pair, 2 pair	Fire resisting braid		130
*141 BL	12 pair, 2 pair	Lead Sheath		453
156 B	12 pair, 2 pair	Brown cotton braid		122
157 B	16 pair, 2 pair	Fire resisting braid		161
*157 BL	16 pair, 2 pair	Lead Sheath		500
158 B	20 pair, 2 pair	Fire resisting braid		189
*158 BL	20 pair, 2 pair	Lead Sheath		709
136 B	24 pair, 2 pair	Fire resisting braid		215
136 BL	24 pair, 2 pair	Lead Sheath		609
140 B	31 pair, 2 pair	Fire resisting braid		258

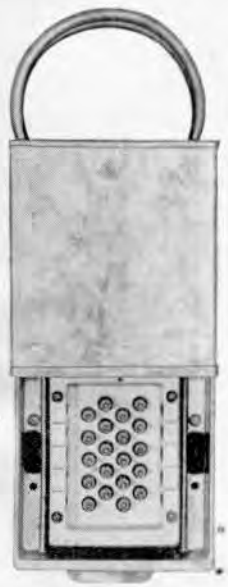
*Indicates standard stock sizes normally carried in stock.

CABLE TERMINALS

General

Cable Terminals used out-of-doors should include a means of effectively sealing the cable end in such a manner as to prevent the entrance of moisture into the cable core. Experience indicates that the most satisfactory results are obtained by the use of terminating chambers in which cable stubs are connected and sealed at the factory. It is then only necessary to splice the cable stub to the cable in the field. By this method, the connecting and potheading is accomplished in the factory with every facility for producing a perfect product and the best electrical and mechanical qualities are obtained.

The selection of Cable Terminals for use at various points in the plant involves the provision of suitable protection against lightning and crosses with neighboring light and power circuits and also proper cross-connecting facilities should be provided where required and provision made for future changes and additions. The Cable Terminals described below are a few typical types manufactured by the Northern Electric Company.



"F" Type Cable Terminal (Open)

"F" Type Cable Terminal (Closed)

Type "F" Cable Terminals (Unprotected)

This type Cable Terminal is intended for terminating lead covered cable in outdoor distribution systems where fuses and protectors are not required. It consists of a cast iron case equipped with a pressed steel slip cover, both thoroughly galvanized to withstand severe weather conditions. The terminal plate is of porcelain.

It is equipped with a detachable plate and is reversible so that it can be readily changed when a bottom stubbed terminal is desired.

Regularly supplied with 5½ foot cable stub having No. 24 gauge, paper-insulated conductors.

The capacity and overall dimensions of these Cable Terminals are as follows:

Cable Terminal	Capacity	Overall Dimensions (not including Cable Stub) Height	Width	Depth
F10	10 Pair	8½″	7½″	4 5/16″
F16	16 Pair	10 5/16″	7½″	4 5/16″
F26	26 Pair	15½″	7½″	4 5/16″

Packed in individual cartons	Shipping weight
F10 with 5½ foot cable stub	22 lbs.
F16 " " " " "	26 "
F26 " " " " "	34 "

No. 18 Type Cable Terminals (Protected)

No. 18E Cable Terminal, Open

This is a protected terminal for open wire distribution from lead covered underground or aerial cable. The heavy base is slotted at the back, forming a bracket suitable for either pole or wall mounting and both the base and the metal hood are protected from corrosion by galvanizing. A spring device holds the cover when it is raised to the top of the terminal, a chain attached to the base prevents it being dropped or mislaid when removed.

CABLE TERMINALS—*Continued*

No. 18 Type Cable Terminals (Protected)

Locknut type binding posts for the line connections are mounted directly on the sides of the sealed chamber and extensions of the walls of the chamber provide fanning strips. This construction is compact and strong. Each cable terminal is provided with a heavy, binding post locknut for connecting the ground wire of the protectors.

The fuses and open space protectors provided are designed for protection against lightning and crosses with light and power circuits and represent the most modern design.

The fuses make contact with the terminals by means of a screw connection at one end and a locknut at the other. The line connections can be changed without removing the fuses.

The terminals, as furnished, are equipped with:

No. 7A Fuses (7 ampere, unless otherwise specified).
No. 1 Protector Blocks. No. 2 Protector Blocks.
No. 3 Protector Mica.

A six-foot cable stub of No. 22 B. & S. gauge cable will be furnished properly connected and pot-headed within the terminal unless otherwise specified.

Code No.	Capacity (Pairs)	Length (Inches)	Diameter of Hood (Inches)	Shipping weight
18A	10	$19\frac{9}{32}$	$8\frac{9}{16}$	40 lbs.
18B	15	$22\frac{1}{32}$	$8\frac{9}{16}$	48 "
18C	25	$28\frac{29}{32}$	$8\frac{9}{16}$	64 "
18D	30	$33\frac{1}{32}$	$8\frac{9}{16}$	72 "
18E	50	$46\frac{25}{32}$	$8\frac{9}{16}$	102 "
18F	60	$53\frac{21}{32}$	$8\frac{9}{16}$	120 "

Packed in individual cartons.

N17 Type Cable Terminals (Protected)

N17F Cable Terminal

These Cable Terminals are adapted for providing fuse protection at the junction of open wire and underground cable, open wire and aerial cable or underground and aerial cable. For this purpose N7A Protectors mounted on N2 Protector Mountings should be used, but must be ordered separately. For protection against lightning No. 17 Protectors can also be provided. Cables terminated in this cable terminal must be potheaded.

The cable terminals are made from thoroughly seasoned first quality tongued and grooved lumber, with all joints white leaded. Metal parts are hot galvanized. The exterior, including exposed hardware, is finished with two coats of waterproof paint. The inside, including the fanning strips, is given two coats of fire resisting paint. The bottom is removable so that the cables may be brought in from the front.

Cable Terminal	Capacity	Overall Dimensions Height	Width	Depth	Approx. Shipping Weight
N17A	26 Pair	2'- $4\frac{1}{4}$"	1'-10"	$10\frac{7}{8}$"	38 lbs.
N17C	52 Pair	3'-$10\frac{1}{16}$"	1'-10"	$10\frac{7}{8}$"	55 lbs.
N17F	104 Pair	3'-$10\frac{1}{16}$"	3'- 0"	$10\frac{7}{8}$"	94 lbs.
N17K	208 Pair	4'- $2\frac{1}{16}$"	4'-10"	$10\frac{7}{8}$"	145 lbs.

CALLING DIALS

Calling Dials are designed for transmitting calls from telephones to automatic central office equipment. Northern Electric Calling Dials are reliable in operation and are designed to operate within very close speed limits.

FIG. 1 FIG. 2 FIG. 3

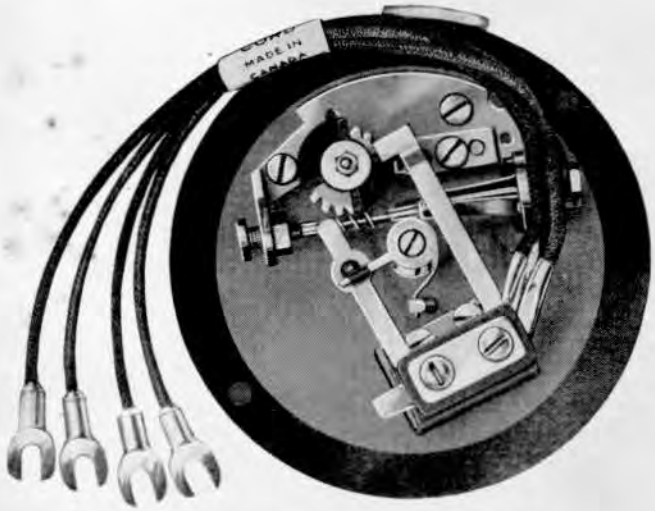
The spring combination shown in Fig. 1 is generally used in rural telephone sets and desk stands where simplex dialing is employed.

Fig. 2 is the spring combination used in series telephone sets, that is, telephone sets in which the receiver is wired in series with the transmitter.

The spring combination generally used on sets equipped with an induction coil is shown in Fig. 3.

There are calling dials to suit all conditions.

Front View Calling Dial



Back View of "N" Type Calling Dial.

These are improved Calling Dials having steel ball-bearing governor spindles and laminated worm wheels, the centre lamination of which is fibre, impregnated so as to provide an efficient lubrication between the rubbing surfaces of the worm and the gear. Fibre shoes on the governor balls give a more uniform speed and prevent the balls cutting the cup. A new design of governor pivot screw prevents back lash on the governor and also prevents it revolving when the dial is operated in a reverse or clockwise direction.

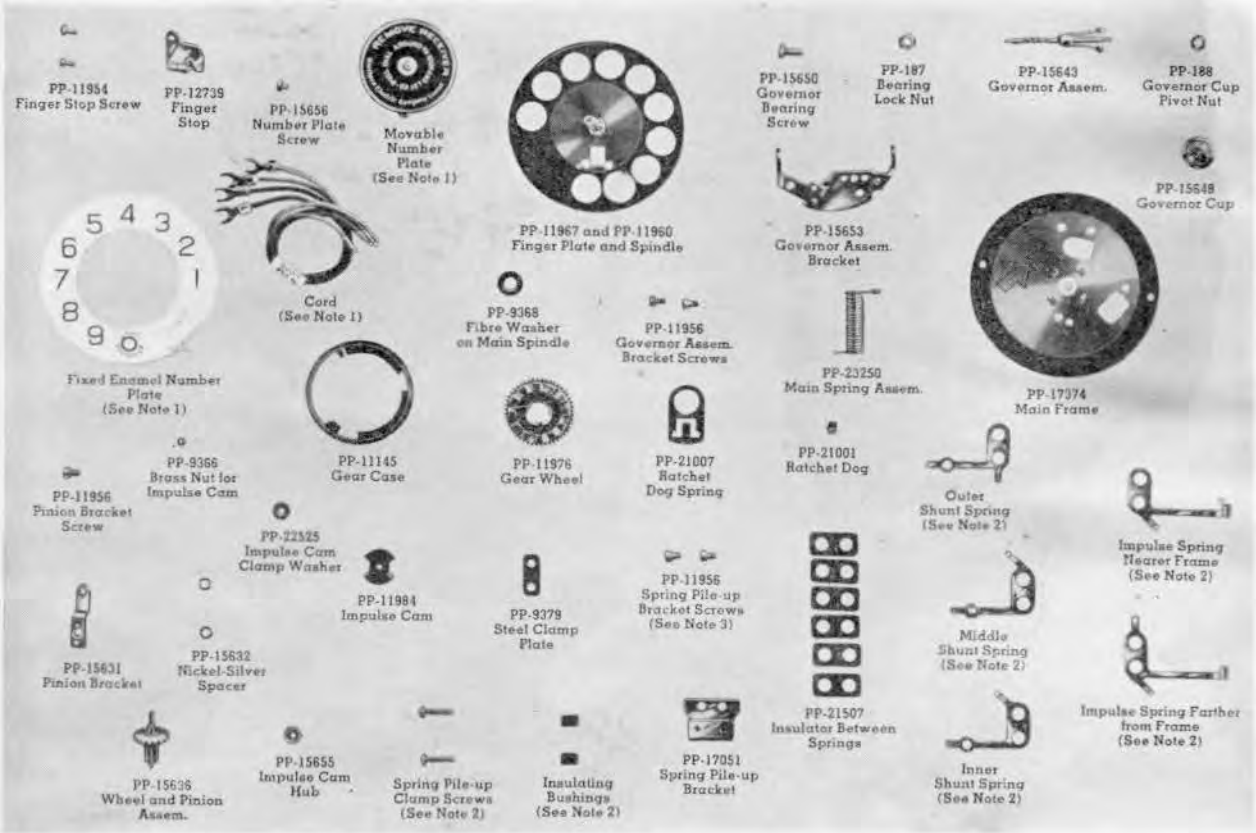
The following are a few of the more generally used types of Calling Dials:

Dial	*Cord	Enamel No. Plate	Removable No. Plate	Spring Combination
N13A	None	N135E		Fig. 1
N13C	None	N135E	N104 Type as	Fig. 2
N14M	N54	N135D	specified	Fig. 3
N14P	N54	N135E		Fig. 3

*For description of Dial Cords see Cords.

CALLING DIAL PARTS

N9, N10, N12, N13, and N14 TYPE



Note 1.—Specify code number of particular type Calling Dial for which parts are required. No. N10P Calling Dial with No. N104D Number Plate illustrated above.

Where more than one identical part is used in any particular assembly the catalogue number covers one of those parts only.

Note 2.

Spring Assembly Parts.

	N9 and N10 Types			N12, N13 and N14 Types	
	Fig. 1	Fig. 2	Fig. 3	Fig. 2	Fig. 3
Shunt Spring (Outer)	—	PP-11974	PP-11974	PP-17052	PP-17052
Shunt Spring (Middle)	—	—	PP-11971	—	PP-17054
Shunt Spring (Inner)	—	PP-17063	PP-11965	PP-17404	PP-17056
Spring Pile-Up Clamp Screws	PP-17034	PP-21665	PP-21665	PP-21665	PP-21665
Insulating Bushing	PP-17060	PP-17061	PP-9471	PP-17061	PP-9471
Brass Spacer	—	—	—	—	PP-17353
Impulse Spring (Nearer Frame)	PP-11964	PP-11964	PP-11964	PP-17055	PP-17055
Impulse Spring (Farther from Frame)	PP-11966	PP-11966	PP-11966	PP-17053	PP-17053

Note 3.—PP-17493 is required in place of PP-11956 on dials equipped with a cord clamp (PP-17495).

CALLING DIAL ADAPTERS

No. N1C Dial Adapter

No. N1F Dial Adapter

No. N1C Dial Adapter.

To mount N9, N10, N12, N13 and N14 Calling Dials on wall telephones or desk stands previously arranged for N1, N2 or N4 Calling Dials, it is necessary that the former be equipped with an N1C Calling Dial Adapter. This adapter is in the form of a flat metal ring with three lugs. It is fastened to the Calling Dials by two machine screws, while its lugs are attached to the corresponding lugs of the N1A Calling Dial Mounting by one machine screw and two fitting surfaces.

Furnished with mounting screws and lock washer.

No. N1F Dial Adapter.

To mount Northern Electric "N" Type Dials on Nos. 1 and 2 Type Uniphones a No. N1F Dial Adapter must be used.

Furnished with mounting screws and lock washers.

No. N1G Dial Adapter.

A No. N1G Dial Adapter must be used when dials of the "British Post Office Type" are to be mounted on Nos. 1 and 2 Type Uniphones.

Furnished with mounting screws and lock washers.

No. N1H Dial Adapter.

A No. N1H Dial Adapter must be used when dials of the "British Post Office Type" are to be mounted on N41A Dial Mountings used on No. 3 Type Uniphones.

Mounting screws are furnished with the N41A Dial Mounting.

The N1F, N1G and N1H Adapters are made of bakelite

CALLING DIAL MOUNTING

No. N1A Dial Mounting

No. N1A Dial Mounting.

Former types of Calling Dials N1, N2 and N4 required a mounting ring on wall type telephone sets. This mounting ring is known as an N1A Calling Dial Mounting and consists of a flat metal ring to be fastened to the wall type telephone sets by two screws. Three lugs on the Calling Dial Mounting are attached to the corresponding lugs on the Calling Dial by one machine screw and two fitting surfaces.

No. N9, N10, N12, N13 and N14 Calling Dials require no mounting ring when used on No. N1293G wall telephones or No. N1050 Type desk stands.

No. N41A-3 Dial Mounting.

Intended for use in mounting a dial on the No. N3-3 Uniphone Mounting. No. 4 and similar type dials, also N14 Type dials, will mount directly on this mounting. "British Post Office Type" dials require the N1H Dial Adapter.

CALLING DIAL NUMBER PLATES

Instruction Number Plate—N104 Type

This is a metal Number Plate used with "N" type dials, which is fastened to the latter by a central retaining screw. The lettering or instructions is etched on the surface and then nickel-plated over a black background. The following are a few of those in general use on our calling dials:

N104D Used on calling dials where no specific operating instructions are required.
N104F Used on calling dials in Halifax, N.S.
N104G Used on calling dials in Calgary, Alta.
N104P Used on calling dials in Edmonton, Alta

No. N104D Number Plate

Enamel Number Plate—N135 Type

This is a metal number plate, porcelain enamelled, bearing the figures one to zero arranged in contra-clockwise direction. The lettering on these number plates varies according to the requirements of the particular calling dial upon which they are used. The following is a description of those most generally used:

N135B—Figures one to zero with the word "Operator" appearing around zero. The lettering and figures are black on a white background.

N135D—Has the figures one to zero in black.

N135E—Has the figures one to zero in black with the words "Long Distance" in red appearing around zero.

No. 135B Number Plate

No. 135D Number Plate

No. 135E Number Plate

TELEPHONE OPERATORS' CHAIRS

No. 1 Type Operator's Chair

In order that the operator may perform her work at the switchboard with maximum efficiency, it is necessary that the Operator's Chair be comfortable, as well as correct in mechanical design. Operators' Chairs have been made a subject of close study, with the result that types of chairs have been designed to meet the requirements of each of the different switchboards.

The framework of the Operators' Chairs listed on the following page is of welded tubular steel construction.

The back is of wood, swivel-connected to the upright supports.

The revolving seat, which can be adjusted in height to suit the operator, is made of closely woven cane with a wooden rim which is squared off at the front enabling the operator to rise without seriously displacing the chair. The seats are detachable to facilitate replacement.

Foot rests add to the comfort of the operator and serve as a support when reaching across the face of the switchboard. The foot rests provided are of an improved design. They consist of mahogany-brown colored hard rubber, reinforced with a steel insert.

The chair rests on swivel-type bakelite gliders.

These chairs are only furnished in manufacturers' standard (ungrained) mahogany, walnut and dark oak finish.

No. 2 Type Operator's Chair

TELEPHONE OPERATORS' CHAIRS—*Continued*

Code No. Mahogany	Code No. Walnut	Code No. Dark Oak	Minimum Height Seat of Chair from floor	Range of Vertical Adjustment	Height of Rung from Floor	Used with
1A	1B	1C	18 inches	4 inches	2¾ inches	For low toll switchboards and switchboards where the keyshelf is approximately 2'6" from the floor and no raised floor is provided.
2A	2B	2C	20 inches	6 inches	6¼ inches	For switchboards where the keyshelf is 2'8" from raised floor. This condition is obtained where an 8" floor is provided with a No. 92 jack switchboard and a 4" raised floor with No. 49 jack switchboard.
3A	3B	3C	24 inches	6 inches	10¾ inches	For switchboards where the keyshelf is 3' from floor and no raised floor is provided as in some types of magneto switchboards.
4A	4B	4C	28 inches	6 inches	14¾ inches	For switchboards where the keyshelf is 3'4" from the floor and no raised floor is provided.

COMBINED JACKS AND SIGNALS

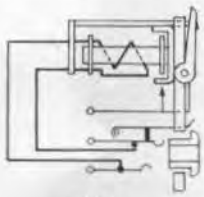
No. 22 Type on No. 92B Mounting, Signal Operated

Shutter type Combined Jacks and Signals are used as magneto line signals in switchboards where it is desirable to have the jack closely associated with its signal. This arrangement increases the ease and rapidity of operation as the signal is electrically operated and automatically restored by mechanical means when the plug is inserted in the jack by the operator. They are equipped with a night bell contact which is closed when the shutter is in the operated position.

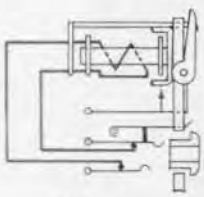
These Signals will be furnished mounted five per strip on a No. 89B. Signal Mounting, or mounted singly on a No. 92B Signal Mounting. When mounted five per strip these Signals are used on Nos. 1220, 1240, and N1317 type switchboards and when mounted singly they are used on Nos. 1228, 1248 and units of the No. 1800 Type switchboards. The signals are furnished unnumbered unless otherwise ordered. (For number plates refer to page 53.)

Four types of Combined Jacks and Signals are most generally used, these being the 22, 23, 27 and 31 Types. They are similar in form and operation.

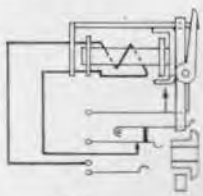
Each of the four types is divided into two classifications, designated as "C" or "D". The "C" designation indicates that the resistance of the coil used in signals of that code is 350 ohms, whereas the designation "D" indicates a resistance of 1000 ohms.



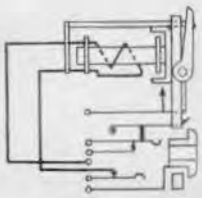
22 Type



23 Type



27 Type

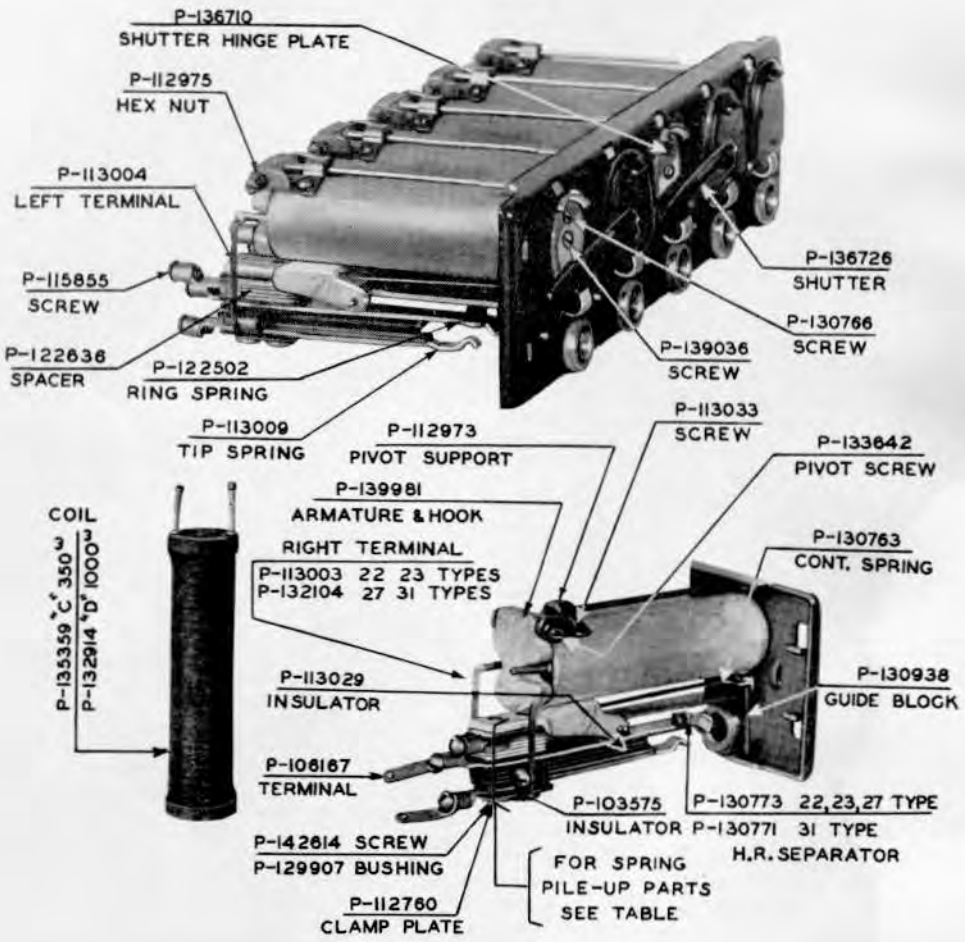


31 Type

Code No.	Approximate Resistance Ohms	Used with Plug No.	Description	Ordinarily Used with Mountings No.
22C	350	47	Equipped with night bell contact, which is closed when shutter is in operated position. Has single cut-off jack. Intended for use with Non-Multiple Magneto Switchboards. When plug is inserted, one end of coil winding is disconnected from the line.	89B or 92B
23C	350	47	Same as the No. 22 Type, except has double cut-off jack. Intended for use with Non-Multiple Magneto Switchboards. When plug is inserted, both ends of coil winding are disconnected from the line.	89B or 92B
27C	350	47	Same as No. 22 Type except that one lead is brought out to a separate terminal on the jack, thereby permitting its connection to either the "Tip" side of the circuit or to ground, depending on whether metallic or push-button ringing is to be employed.	89B or 92B
31C	350	110	Intended for use with Multiple, Non-Multiple Magneto or Convertible Switchboards. Equipped with a double cut-off jack and the sleeve is brought out to a terminal.	89C or 92C

COMBINED JACKS AND SIGNALS—*Continued*

REPLACEMENT PARTS
NOS. 22,23,27 & 31 TYPES COMBINED JACKS & SIGNALS.
NO. 22C SHOWN

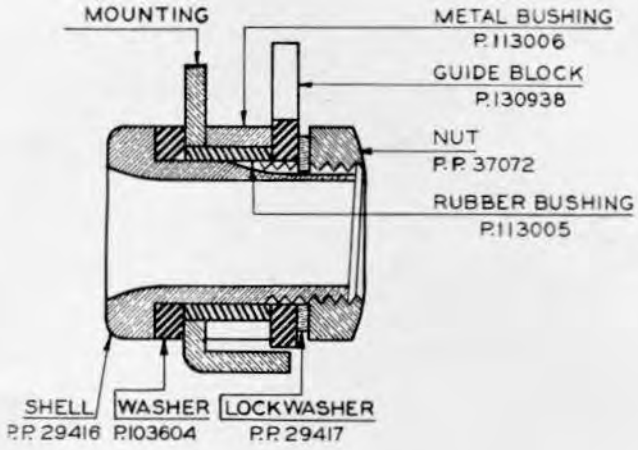


Jack Spring Pile-Up (in Piling Sequence)

	No. 22C&D	No. 23C&D	No. 27C&D	No. 31C&D
Spacer	—	—	—	P-122636
Insulator	—	—	—	P-103575
Contact Spring	—	—	—	P-130763
Terminal	—	—	—	P-122850
Insulator	—	—	—	P-103575
Terminal	—	—	—	P-122851
Metal Spacer	P-122636	—	—	—
Insulator	P-103575	P-103575	P-103575	P-103575
Contact Spring	P-130763	P-130763	P-130763	—
Terminal	P-122635	P-122635	P-122635	P-123239
Metal Spacer	(4) P-122636	(4) P-122636	(4) P-122636	—
Insulator	P-103575	P-103575	P-103575	P-103575
Ring Spring	P-122502	P-122502	P-122502	P-132105
Insulator	P-103575	P-103575	P-103575	P-103575
Contact Spring	P-122504	P-122504	P-122504	P-123238
Insulator	P-113029	P-113029	P-113029	P-113029
Terminal	P-113031	—	P-124745	—
Contact Spring	—	P-122504	—	P-122988
Metal Spacer	P-113000	—	—	—
Insulator	—	P-103575	P-113029	P-103575
Tip Spring	P-113009	P-132098	P-113009	P-123237
Insulator	P-103575	P-103575	P-103575	P-103575
Clamp Plate	P-112760	P-112760	P-112760	P-112760

COMBINED JACKS AND SIGNALS—*Continued*

Replacing Jack Sleeves for Combined Jacks and Signals



WHEN SHELL, WASHERS AND NUT ONLY ARE REQUIRED ORDER AS "SET OF SHELL PARTS PER MKS 266."

WHEN A COMPLETE SET OF REPLACEMENT PARTS ARE REQUIRED ORDER AS "SET OF SHELL PARTS PER MKS 283."

CONDENSERS

Northern Electric Condensers are the result of years of experience and represent the highest development in the field. They are of the rolled type, the paper dielectric used in separating the plates is prepared under rigid specifications, from materials carefully selected, of high and uniform quality. They are treated by a process which expels all moisture from the interior, and seals them against the admission of moisture. This is very important, as the presence of moisture renders the insulation more liable to breakdown when subjected to an abnormal dielectric stress. Each Condenser is tested at a voltage well above its normal operating voltage to ensure an ample factor of safety.

The Condensers, like many other items listed in this catalogue, represent a very small proportion of the types available.

No. N1 Type Condenser

N1 Type Condensers.—On rural lines trouble sometimes occurs due to parties leaving the receivers off the switchhooks or listening in during a call. On heavily loaded lines this practice makes it difficult and sometimes impossible to ring the bells. To secure good signalling in such cases it is necessary to have a Condenser wired in the receiver circuit and the N1 type is used for this purpose. Terminals are provided so that the Condensers can be connected in the receiver circuit of any of our Magneto Telephone Sets. Screw mounting holes are provided for the Condenser. There are, of course, many other uses for the N1 type Condensers.

Arranged to be mounted by means of wood screws, and mounting strap (PP-954), which must be ordered separately if required.

Code No.	Capacity MF	Type of Terminals
N1B	½	Regular terminals.
N1C	½	Flexible leads soldered to the regular terminals.
N21F	1	Flexible leads soldered to the regular terminals.

CONDENSERS – *Continued*

No. 147 and 149 Types

No. 147 Type Condenser

Arranged to be mounted by means of wood screws and mounting strap. Mounting strap (PP-31078) to be ordered separately if required

Where a No. 147 or No. 149 Type Condenser is being substituted for the No. 21 Type an Adapter is required. (P-409555 for the No. 147 and P-409556 for the No. 149).

Code No.	Capacity MF	Overall Dimensions Length	Width	Depth
147A	2.0	4″	$1\frac{7}{16}$″	1″
149A	1.0			
149B	.5	$3\frac{15}{16}$″	$1\frac{7}{16}$″	$\frac{5}{8}$″
149C	.1			
149D	.65			

Mounting Plate Type

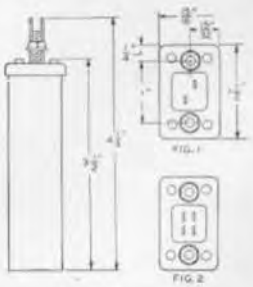
No. 139 Type Condensers, arranged to mount on 1″ horizontal and $1\frac{3}{4}$″ vertical centers. Furnished with two nuts and washers for mounting.

No. 141 Type Condensers, same as 139 type, except arranged to mount on $\frac{1}{2}$″ horizontal and $1\frac{3}{4}$″ vertical centers.

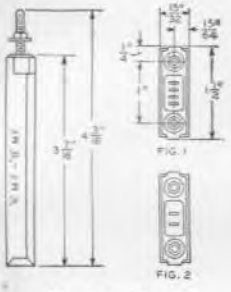
Code No.	Fig. No.	Cap. MF	
139A	1	2.00	
*139C	2	1.00 1.00	For dimensions see Illustrations.
141A	2	1.00	
141D	2	.25	
*141H	1	.02 .02	

*Consists of two separate condensers insulated but not shielded from each other. These condensers should not be used where the effect of the capacity between the separate units will be detrimental to transmission.

The No. 141H Condenser is recommended for use in filter circuits designed for the suppression of radio frequencies.



No. 139 Type Condenser



No. 141 Type Condenser

CONNECTING BLOCKS

No. 11 and 12 Types

No. 11A
Connecting Block

No. 11B
Connecting Block

No. 12E
Connecting Block

These styles consist of a composition base in which the screw terminals are embedded. Each terminal consists of two screw bushings electrically connected by means of a metal strip, and provided with screws and washers.

They make very convenient subscribers' station wiring devices.

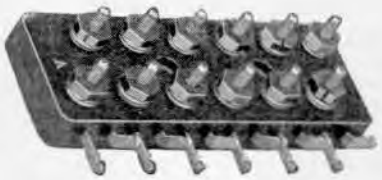
Covers may be ordered separately if required.

Code No.	No. of Terminals	Overall Size, Inches Length	Width	Height
11A Without Cover	2	$1\frac{1}{8}$ x	$1\frac{5}{32}$ x	$\frac{5}{8}$
11B With Cover	2	$1\frac{3}{8}$ x	$1\frac{5}{32}$ x	$\frac{29}{32}$
12E Without Cover	3	$1\frac{11}{16}$ x	$1\frac{3}{8}$ x	$\frac{5}{8}$
12F With Cover	3	$1\frac{15}{16}$ x	$1\frac{3}{8}$ x	$\frac{29}{32}$

CONNECTING BLOCKS—*Continued*

No. 30 and 31 Types

No. 30A Connecting Block



No. 31A Connecting Block

These blocks consist of brass studs embedded in a hard composition base. No. 30 Type are equipped with studs provided with two nuts (one a split check nut) and four washers. No. 31 Type, each connector has one lock nut binding post with two washers and one soldering terminal, brought out on the side.

Code No.	Code No.	Capacity Pairs	Size of Base, Ins. Length	Width	Height
30A	31A	6	$4\frac{3}{16}$	$1\frac{1}{2}$	$\frac{1}{2}$
30B	31B	11	$7\frac{5}{16}$	$1\frac{1}{2}$	$\frac{1}{2}$
30C	31C	16	$10\frac{7}{16}$	$1\frac{1}{2}$	$\frac{1}{2}$
30D	31D	26	$16\frac{11}{16}$	$1\frac{1}{2}$	$\frac{1}{2}$

CONNECTORS (BRIDGING TEST)

No. 6A
Bridging Connector

Code No.	Description
1A	Brass Connector, intended for use in connecting together bridle wire or drop wire.
2A	Brass Connector, intended for use in connecting bridle wire, drop wire, or No. 12 B & S copper wire to No. 12 B & S copper wire.
3A	Brass Connector, intended for use in connecting bridle wire or drop wire to No. 8 B & S or No. 10 B & S copper wire.
4A	Steel Connector, intended for use in connecting No. 10, No. 12, or No. 14 B.W.G. galvanized wire to No. 10, No. 12, or No. 14 B.W.G. galvanized wire.
6A	Brass and Steel Connector, intended for use in connecting bridle wire or drop wire to No. 10, No. 12, or No. 14 B.W.G. galvanized wire. Designed to minimize electrolytic action.

TELEPHONE CORDS

Northern Electric Telephone and Switchboard Cords are composed of high grade flexible conductors formed by twisting together a number of tinsel alloy threads, thoroughly insulated and equipped with tips at each end for connection with the apparatus. Each tinsel thread consists of two very fine metallic ribbons twisted around a cotton thread.

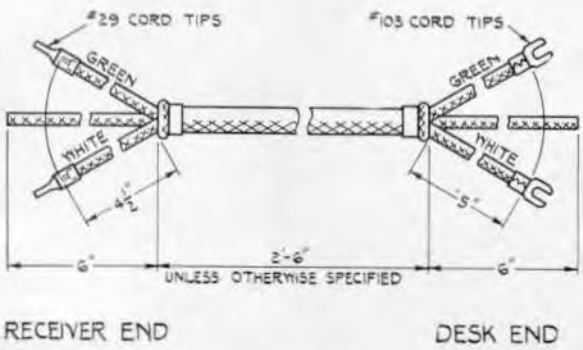
Stay Cords or "S" Hooks are provided where necessary to relieve the conductors of mechanical strain.

The effective length of a cord is taken as that portion of the main body covered by a common braid which terminates where the individual conductors separate, except for switchboard cords, in which case the effective length is taken as the distance from the end of the overall braid at the plug end to the end of the conductors at the cord fastener end.

Switchboard Cords are regularly made in three colors, red, green and gray, and the order should specify the color required.

If the cords mentioned below do not meet your requirements, write us, sending a sample cord (an old one will do) or give us full particulars, including use, length, color, size of the tips, etc.

Receiver Cords

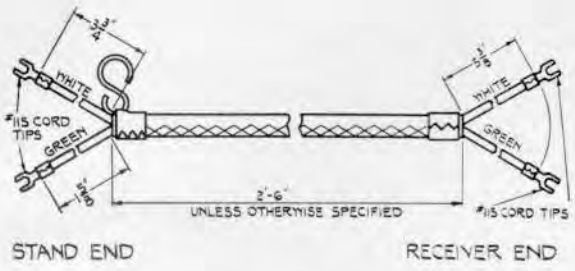


No. 92 Cord

Code No. 92.—Two conductor, tinsel Receiver Cord with brown mercerized cotton covering; for general use. Recommended length: 2'6".

TELEPHONE CORDS—*Continued*

Receiver Cords—*Continued*

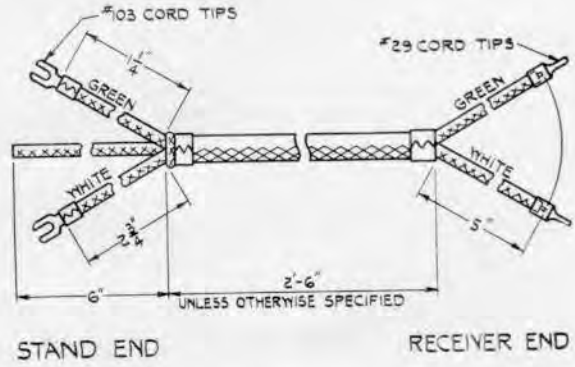


No. R2B Cord

Code No. R2A.—Two conductor, tinsel Receiver Cord with brown mercerized cotton covering. Dimensions same as R2B Cord except that conductors at receiver end 5″ long. All conductors terminated with No. 103 Cord Tips. Recommended lengths: 2′ 6″ and 6′ 0″.

Code No. R2B.—Two conductor, rubber-insulated, tinsel Receiver Cord with brown mercerized cotton covering; intended for general use instead of R2A Cord where a waterproofed cord is required. Recommended length 2′ 6″.

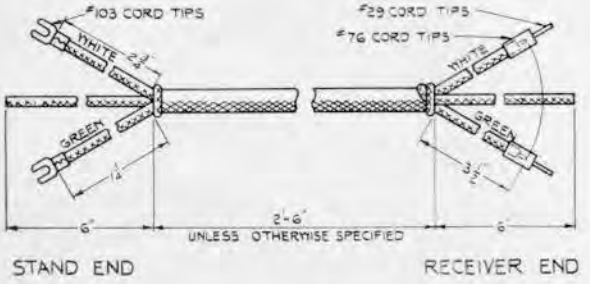
Code No. R2G.—Two conductor, tinsel Receiver Cord with worsted covering. Conductors at receiver end 4½″ long. Conductors at Set end, 2½″ long. 6″ tie cords and No. 62 Cord Tips at both ends. Length 2′ 6″. N549 Cord recommended.



No. 549 Cord

Code No. 549.—Two conductor, tinsel Receiver Cord; brown mercerized cotton covering. Recommended Length: 2′6″.

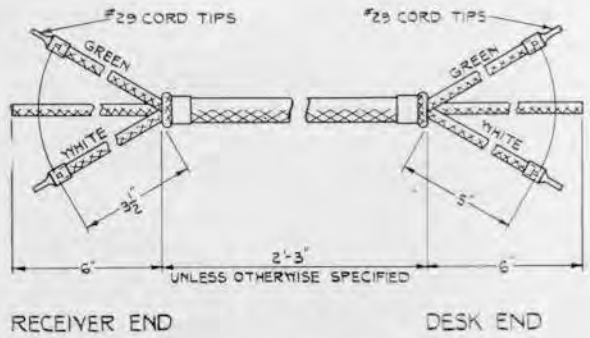
Code No. N549.—Two conductor, tinsel Receiver Cord; brown mercerized cotton covering. Similar to No. 549 except that No. 103 Spade Tips used on Receiver End, and both conductors 2¾″ long at stand end. Recommended length: 2′6″.



No. 408 Cord

Code No. 408.—Two conductor, tinsel, moisture-proofed Receiver Cord; black and maroon mercerized cotton covering. Recommended Length: 2′6″.

Code No. N408.—Two conductor, tinsel, moisture-proofed Receiver Cord; black and maroon mercerized cotton covering. Similar to No. 408 except that conductors at stand end are 5″ long. Recommended length: 2′6″

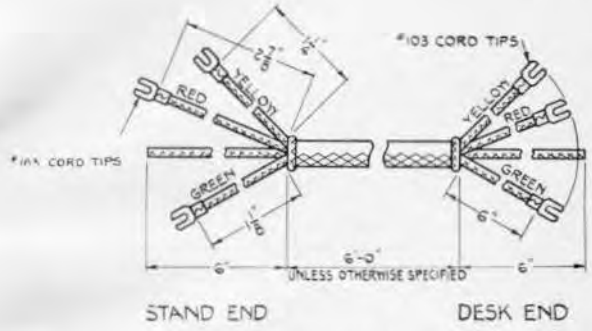


No. 454 Cord

Code No. 454.—Two conductor, tinsel Receiver Cord with brown mercerized cotton covering. Recommended length: 2′3″.

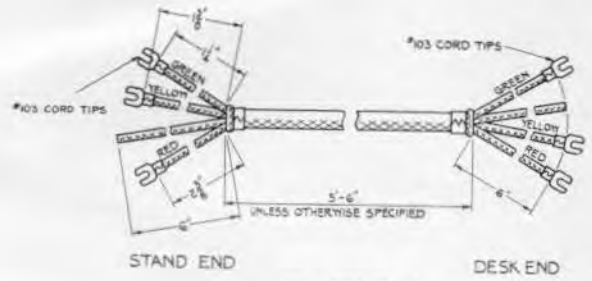
TELEPHONE CORDS—*Continued*

Desk Stand Cords



No. 409 Cord

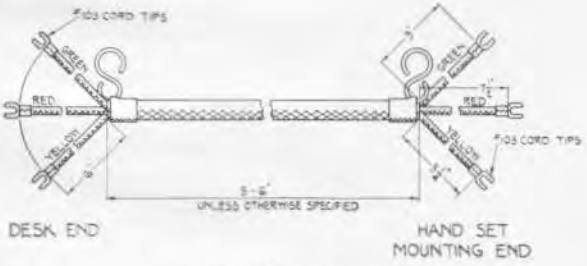
Code No. 409.—Three conductor, tinsel, moisture-proofed Desk Stand Cord, for use in humid places; black and maroon mercerized cotton covering. Recommended length: 6′0″.



No. 550 Cord

Code No. 550.—Three conductor, tinsel, moisture-proofed Desk Stand Cord; brown mercerized cotton covering. Recommended length: 5′6″, 9′0″, 13′0″ and 25′0″.

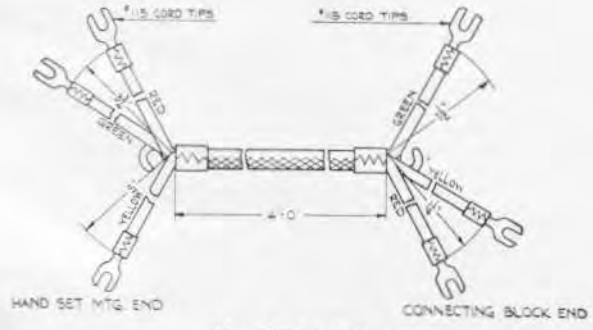
Uniphone and Hand Telephone Set Cords



No. D3H-9 Cord

Code No. D3H-9.—Three conductor, tinsel, Hand Set Cord; brown mercerized cotton covering. For use with Hand Telephone Set between hand set mounting and desk set box. Recommended length: 5′6″, 9′0″, 13′0″ and 25′0″.

Code No. D3P-9.—Three conductor, rubber insulated tinsel Hand Set Cord; brown mercerized cotton covering Dimensions same as D3H-9. Equipped with No. 115 Cord Tips. Recommended length: 5′6″, 9′0″ and 13′0″.

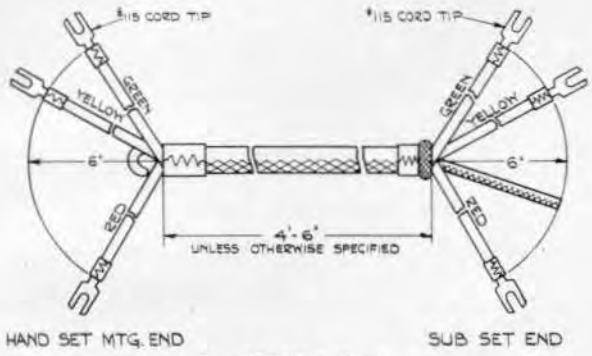


No. ND3A-9 Cord

Code No. ND3A-9.—Three conductor, tinsel, rubber insulated conductors, with brown mercerized cotton overall braid. For use with No. 1 Type Uniphone between the mounting and the N7A connecting block. Recommended length: 4′0″.

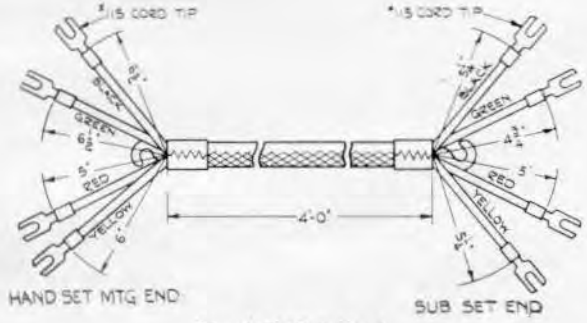
TELEPHONE CORDS—*Continued*

Uniphone and Hand Telephone Set Cords—*Continued*



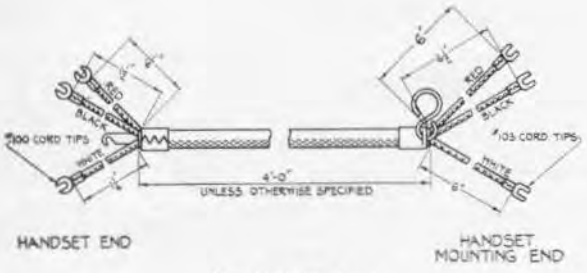
No. ND3B-9 Cord

Code No. ND3B-9.—Three conductor, tinsel, rubber insulated conductors with brown mercerized cotton overall braid. For use between the N1 Type Uniphone Mounting and a standard sidetone type desk set box. Recommended length: 4'6".



No. ND4B-9 Cord

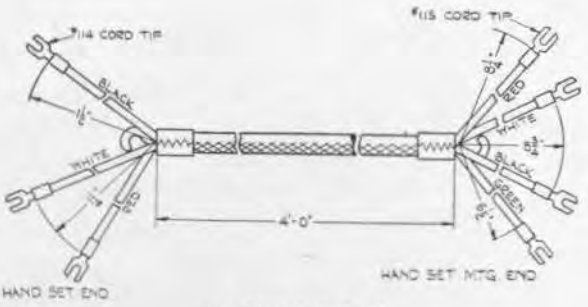
Code No. ND4B-9.—Four conductor, tinsel, rubber insulated conductors with brown mercerized cotton overall braid. For use between N1 type Uniphone Mounting and a No. N200A or other standard anti-sidetone type desk set box. Recommended length: 4'0".



No. H3B-9 Cord

Code H3B-9.—Three conductor, tinsel, Hand Set Cord; brown mercerized cotton covering. For use with 102 Type Hand Telephone Set between the hand set and hand set mounting. Recommended length: 4'0".

Code H3C—Three conductor, rubber insulated, tinsel Hand Set Cord with brown mercerized cotton covering. Dimensions same as H3B-9. Conductors at hand set end terminated in No. 100 Cord Tips. Conductors at Handset Mtg. End terminated in No. 114 Cord Tips. Intended for use instead of H3B-9 where a waterproof cord is required. Recommended length: 4'0".

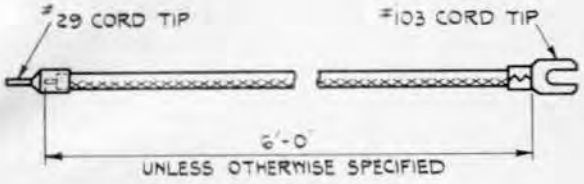


No. NH4A-9 Cord

Code No. NH4A-9.—Four conductor, tinsel, rubber insulated conductors with brown mercerized cotton overall braid. Handset cord for use between NF2A hand set and Nos. N1 and N2 type Uniphone Mountings. Recommended length: 4'0".

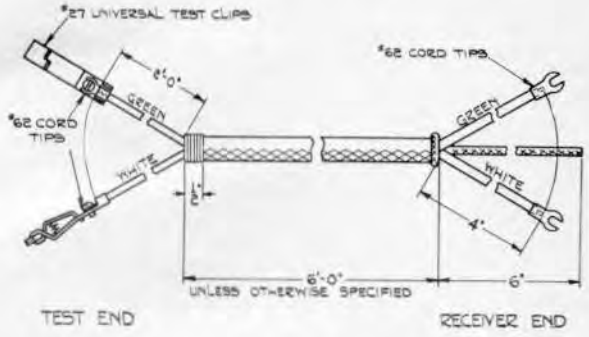
TELEPHONE CORDS—*Continued*

Miscellaneous Telephone Cords



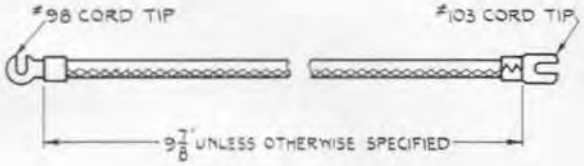
No. 437 Cord

Code No. 437.—Single conductor, tinsel, brown cotton covered cord with green tracer, arranged for operator's suspended type, No. 232 transmitter. Recommended lengths: 4'6" and 6'0".



No. 736 Cord

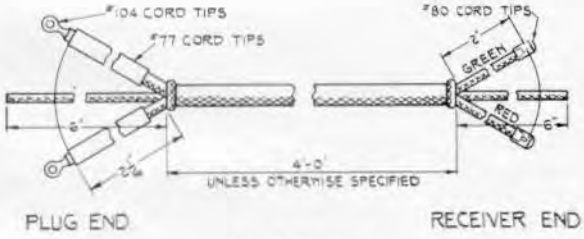
Code No. 736.—Two conductor, waterproof cord, equipped with No. 62 (spade) cord tips at one end and No. 27 Universal Spring Clips at the other end. Used with No. 1017 Type Test Sets. Recommended length: 6'0".



No. T1A Cord

Code No. T1A.—Single conductor, tinsel, brown cotton covered transmitter cord with yellow tracer. Six inch length used on Wall Telephones and nine and seven-eighths inch length used on Desk Stands. Recommended in place of 547 and 548 cords. Recommended lengths: 6" and 9 7/8".

Operators' Telephone Cords



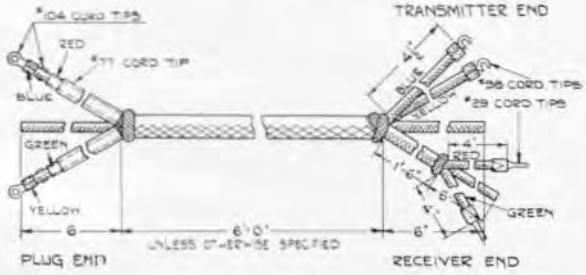
No. L2A Cord

Code No. L2A.—Two conductor, tinsel, brown mercerized cotton covered Operators' Set Cord, arranged for 528 Receiver and 137 or similar type Plug.* Recommended length: 4'0".

Code No. L2E.—Similar to L2A except arranged for N151 Receiver.* Recommended length: 4'0".

Code No. L2K.—Similar to L2A except arranged for No. 289A Plug.* Recommended length: 4'0".

*When ordered equipped with Plug, conductors will be connected to sleeve terminals unless otherwise specified.

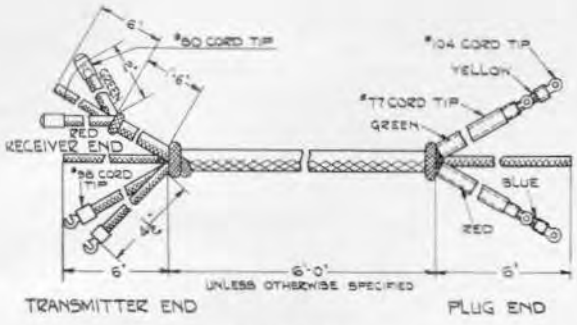


No. L4B Cord

Code No. L4B.—Four conductor, tinsel, brown mercerized cotton covered Operators' Set Cord, arranged for N103, 137, or similar type Plug, N151 Receiver and 234 Transmitter. Shanks of No. 98 Cord Tips are insulated. Recommended length: 6'0".

TELEPHONE CORDS—*Continued*

Operators' Telephone Cords—*Continued*



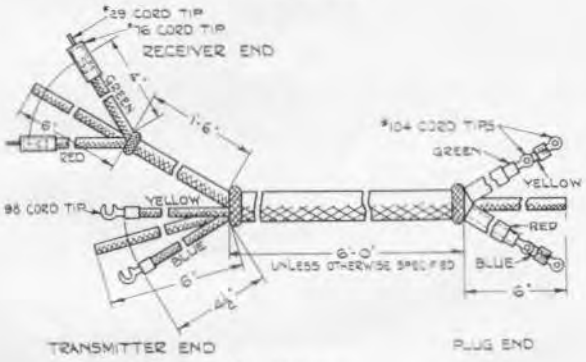
No. L4E Cord

Code No. L4E.—Four Conductor, tinsel, brown mercerized cotton covered Operators' Set Cord, arranged for N103, 137, or similar type Plug, 528 Receiver and 234 Transmitter. Shanks of No. 98 Cord Tips are insulated. Recommended length: 6′0″.

Code No. L4F.—Similar to L4E except arranged for No. 396A Transmitter. Recommended length: 4′6″.

Code No. L4P.—Similar to L4E except arranged for No. 289A Plug. Recommended length: 6′0″.

Code No. L4R.—Similar to L4E except arranged for No. 396A Transmitter and No. 289A Plug. Recommended length: 4′0″.

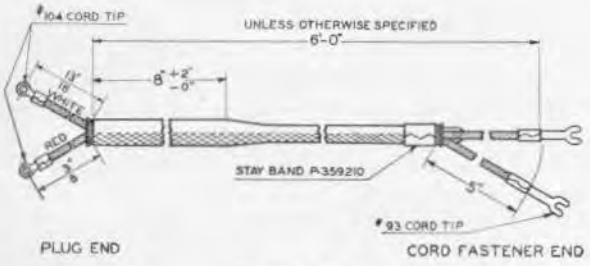


No. 375 Cord

Code No. 375.—Four conductor, tinsel, moisture-proofed Operators' Set Cord; black and maroon mercerized cotton covering. The No. 29 (round) Tips on the receiver end are protected by No. 76 (rubber) Tips, otherwise similar to No. L4B Cord. Recommended length: 6′0″.

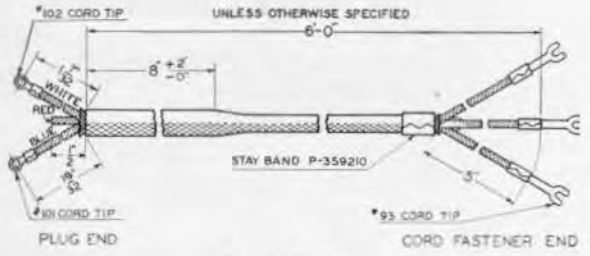
Switchboard Cords

Red, green and gray are standard colors.
Specify color desired in order



No. S2A Cord

Code No. S2A.—Two conductor, tinsel, moisture-proofed Switchboard Cord, arranged for the No. 47 or No. N47 Plug. Recommended lengths: 4′0″ and 6′0″.



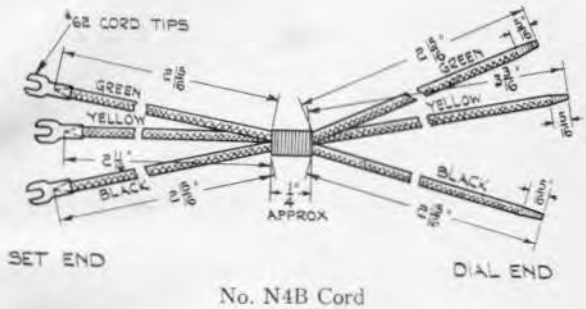
No. S3B Cord

Code No. S3B.—Three conductor, tinsel, moisture-proofed Switchboard Cord arranged for No. 110 Plug. Recommended length: 6′0″.

Purified textile construction for better cords

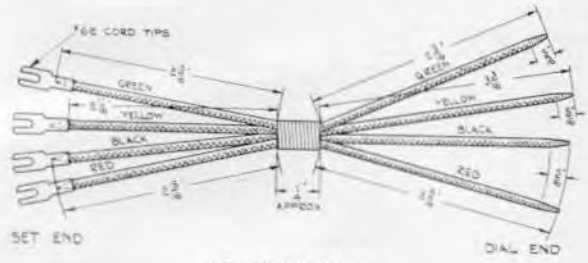
TELEPHONE CORDS—*Continued*

Calling Dial Cords



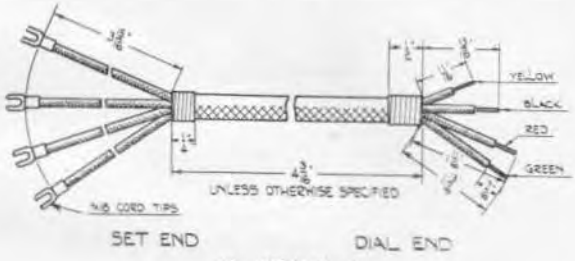
No. N4B Cord

Code No. N4B.—This is a three conductor cord used on the N9 Calling Dials. Conductors are colored green, yellow and black.



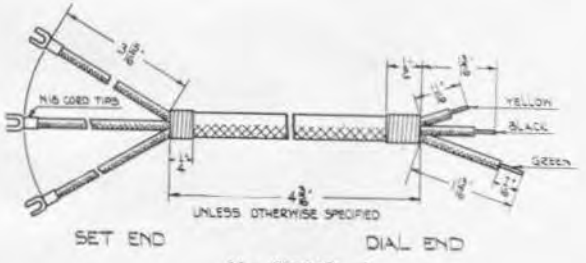
No. N13A Cord

Code No. N13A.—This is a four conductor cord used on the N10 Calling Dials. Conductors are colored red, green, yellow and black.



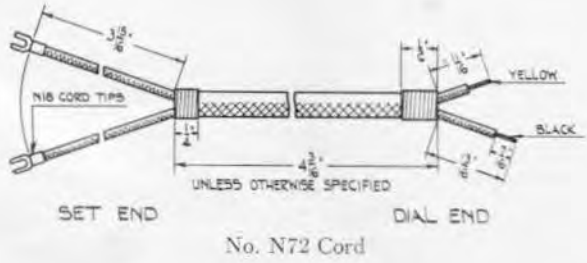
No. N54 Cord

Code No. N54 Cord.—This is a four conductor cord used on N14 Calling Dials. Conductors are colored yellow, black, red and green. Equipped with N18 Cord Tips on Set end. Recommended length: $4\frac{3}{16}$".



No. N55 Cord

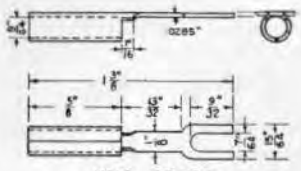
Code No. N55 Cord.—This is a three conductor cord used on N13 Calling Dials. Conductors are colored yellow, black and green Equipped with N18 Cord Tips on Set end. Recommended length: $4\frac{3}{16}$".

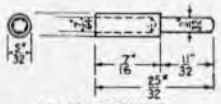


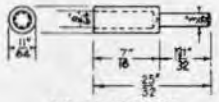
No. N72 Cord

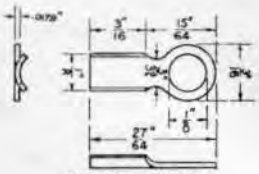
Code No. N72 Cord.—This is a two conductor cord used on N13 Calling Dials. Conductors are colored yellow, and black. Equipped with N18 Cord Tips on Set end. Recommended length: $4\frac{3}{16}$".

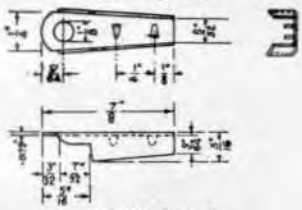
CORD TIPS

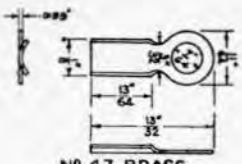

Nº 8 BRASS
Solder Dip Finish

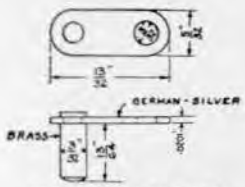

Nº 29 BRASS
Nickel-Dip Finish


Nº 30 BRASS
Nickel-Dip Finish

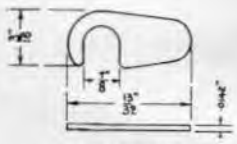

Nº 38 BRASS
Solder-Dip Finish

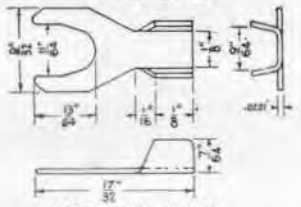

Nº 45 BRASS

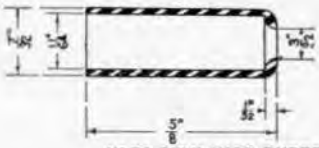

Nº 47 BRASS
Electro-Tin Finish

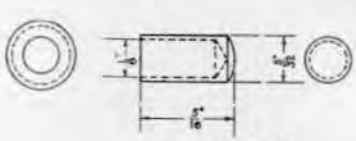


Nº 55 TINNED ALL OVER

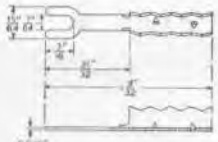

Nº 56 BRASS
Solder-Dip Finish

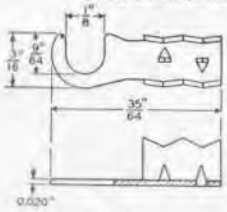

Nº62 NICKEL-SILVER
Acid Dip Finish


Nº 76 SEMI-HARD RUBBER

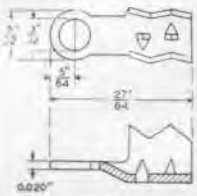

Nº 80 BRASS
Nickel-Dip Finish

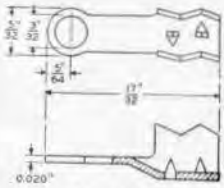

No.92
Nickel Finished

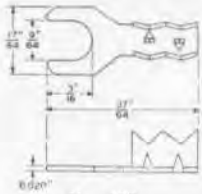

No. 93
Nickel Finished


No. 98
Nickel Finished


No. 100
Nickel Finished


No. 101
Nickel Fintshed


No. 102
Nickel Finished


No. 103
Nickel Finished


No. 104
Nickel Finished

Code No.

8 Tinned. For use on switchboard cords in connection with No. N9 cord fasteners.

29 Nickel plated. Ordinarily used on silk covered cords in connection with drilled binding posts.

30 Nickel plated. Ordinarily used on worsted or cotton covered cords in connection with drilled binding posts.

38 Tinned, eyelet tip; for use on plug end of switchboard cords.

45 Eyelet tip; for use on stay cord end of switchboard cords.

47 Tinned, eyelet tip; for use on plug end of switchboard cords.

55 Tinned; for use with transmitter cords.

56 Tinned; for use with transmitter cords. Slotted for No. 4 screw.

62 Tinned. Slot beveled to admit either a No. 6 or No. 8 screw.

76 Semi-hard rubber sleeve intended to cover the exposed portion of the No. 30 cord tip.

80 Nickel plated; for use with high efficiency receivers.

92 Solderless, nickel finished; having two tangs for making contact with conductors on cords having tinsel conductors. Slotted for Nos. 6 or 8 screw.

93 Solderless, nickel finished; having two tangs for making contact with conductors on switchboard cords having tinsel conductors. Used in connection with No. N9 cord fasteners.

98 Solderless, nickel-finished; having two tangs for making contact with tinsel conductor. For use on transmitter cords. Slotted for No. 4 screw.

100 Solderless, nickel-finished; having two tangs for making contact with tinsel conductor. For use on hand set cords. Slotted for No. 4 screw.

101 & 102 Solderless nickel-finished; having two tangs for making contact with tinsel conductor. For use on ring and tip conductors respectively of cords arranged for Nos. 109 and 110 type plugs.

103 Solderless nickel-finished; having two tangs for making contact with tinsel conductors. Slotted for No. 6 screw.

104 Solderless nickel-finished; having two tangs for making contact with tinsel conductor. For use on cords arranged for Nos. 47 and 137 type plugs.

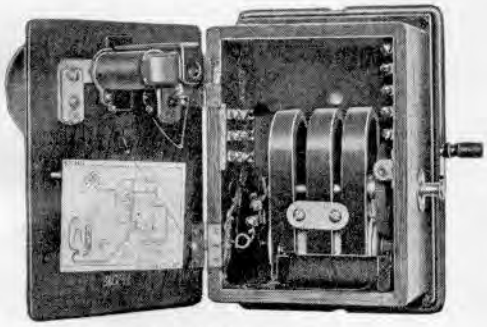
DESK SET BOXES

Magneto Service

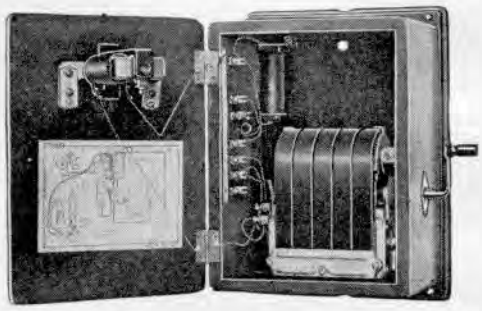
These Desk Set Boxes are for use with desk stands, transmitter arms and hand telephone sets at Magneto Telephone Stations. They contain a hand generator, ringer, induction coil, push button key, and condenser as required. The equipment is determined for a particular station in the same way as for a Magneto Wall Telephone Set.

These desk set boxes are of two types, namely, 315H for single party and lightly loaded magneto lines and N300 type for medium and heavy loaded magneto lines. Each type may be used either with a hand telephone set, or with a desk stand to form a desk telephone set. The woodwork is of oak.

The dry cells are mounted outside the desk set boxes and for this purpose an N1A battery box is recommended. More detailed information on the field of use of these magneto telephone sets is given elsewhere in this catalogue under "Selection of Telephone Sets for Magneto Service."



No. 315H Desk Set Box



No. N300A Desk Set Box

Code No.	Description
315H	For light load bridging service where code ringing is employed. Sets contain: One 1000-ohm No. 38AG Ringer, one 3-bar No. 22A Generator, one No. 13 Induction Coil. Shipping weight—6 lbs.
N300R	For medium load bridging service where push button system of signalling central without ringing other subscribers on the line is used. Set contains: One 1600-ohm No. 38FG Ringer, one 5-bar No. 48A Generator, one No. 13 Induction Coil, one .5 mf. No. N1C Condenser, one 3-spring, No. N1E Key. The N1C Condenser is wired in series with the receiver to insure the ringing of the bells, even if a receiver is left off the hook. Shipping weight—6 lbs.
N300A	For heavy load rural service where code ringing is employed. Set contains: One 2500-ohm No. 38BG Ringer, one 5-bar No. 48A Generator, one No. 13 Induction Coil. Shipping weight—6 lbs.

Code No.	Description
N300C	For heavy load rural service, where push button system of signalling central without ringing other subscribers on the line is used. Set contains: One 2500-ohm No. 38BG Ringer, one 5-bar No. 48A Generator, one No. 13 Induction Coil, one .5 mf. No. N1C Condenser, one 3-spring, No. N1E Key. The N1C Condenser is wired in series with the receiver to insure the ringing of the bells, even if a receiver is left off the hook. Shipping weight—6 lbs.
N300CG	For heavy load rural service, where push button system of signalling central office and simplex ringing is used. Set contains: One 2500-ohm No. 38BG Ringer, one 5-bar No. 48A Generator, one No. 13 Induction Coil, one 1 mf. No. N21F Condenser, one 5-spring No. N1G Key. The Condenser is wired in series with the receiver to insure the ringing of the bells, even if a receiver is left off the hook. Shipping weight—6 lbs.

Anti-Sidetone Desk Set Boxes

Magneto Service

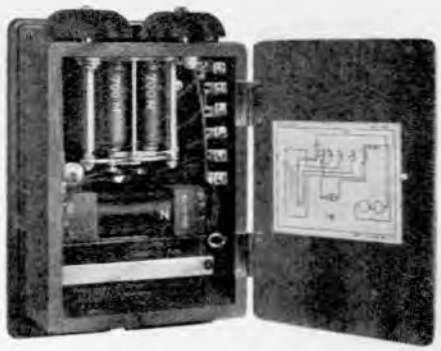
Anti-sidetone Magneto Type Desk Set Boxes are similar to the foregoing magneto desk set boxes. They differ in that a No. 113D Induction Coil is employed instead of the No. 13 Induction Coil, also changes in wiring.

Depending upon the impedance of the line to which they are connected they may require a No. 63FB Resistance or No. 149D Condenser. The No. 63FB Resistance is for matching the impedance of the set to long iron wire loops. The No. 149D Condenser for matching the impedance of the set to long non-loaded cable loops. Without condenser or resistance the set is used for short cable loops, loaded cable loops, short iron wire loops, copper open wire loops and loops consisting of combinations of short lengths of cable with short lengths of iron or copper open wire.

Either a hand set or desk stand equipped with a four conductor cord may be used.

DESK SET BOXES—*Continued*

Central Battery, Manual and Automatic Service



No. 295A Desk Set Box

Code No. 295A. — For central battery, manual and automatic service. Consists of a No. 8A (1500-ohm) Ringer, No. 21F (1 m.f.) Condenser and a No. 46 Induction Coil, mounted in a wooden box which is given a finish to match dark walnut.

Standard package of 10. Shipping weight 50 lbs.

Anti-Sidetone Desk Set Boxes

Central Battery Service

The No. 684A-3 Desk Set Box is recommended when a central battery desk set box of the anti-sidetone type is desired.

It consists of a No. 101A Induction Coil, No. 78A (1500 ohm) Ringer and No. 194A Condenser mounted on a metal base which is provided with a black bakelite cover. The overall dimensions are $5\frac{13}{32}$ inches wide, $7\frac{3}{32}$ inches high and $2\frac{3}{32}$ inches deep.

Standard package of 10. Shipping weight 36 lbs.

Uniphone Desk Set Boxes

The No. N200A-3 Desk Set Box is an anti-sidetone central battery desk set box for use with the No. 3 Uniphone. Consists of a metal base on which are mounted an NB1A Ringer, No. 101A Induction Coil and N3A Condenser. It is provided with a bakelite cover. The overall dimensions are $8\frac{3}{4}$" long, $5\frac{1}{2}$" wide and $2\frac{1}{8}$" high.

Standard package of 10. Shipping weight 32 lbs.

DESK STANDS

The illustrations on page 29 are of the manual (1020AL) and the dial (N1050AL) Type Desk Stands. They are simple in construction there being but three principal units, exclusive of the transmitter and receiver, namely: the terminal plate and switch hook assembly, the base and stem assembly and the base plate assembly. The switch hook lever acts directly upon the main spring of the switch, no intermediate parts being interposed. The contact springs are of nickel silver, backed up with a stop spring and all current-carrying parts are insulated from the frame. The entire terminal plate and switch hook assembly may be withdrawn from the stem and base assembly for inspection, without disconnecting the cords or interrupting the service in any way. This is accomplished by merely removing one screw from the bottom of the base plate. The base plate assembly may be removed from the stand for the purpose of connecting or disconnecting cords by the removal of two additional screws from the bottom of the base plate.

The bottom and edges of the base are covered with brown suede, which is held in place by a clamping ring which fits inside of the base plate. This feature prevents the desk stand from marking or scratching the table or desk on which it rests. The cords enter the desk stand through a hole at the back of the base.

Desk stands are regularly supplied with a black finish which will be found to be both durable and attractive but the N1020 type may also be obtained with the metal work finished in nickel.

DESK STANDS—*Continued*

No. 1020AL Desk Stand

No. N1050AL Desk Stand

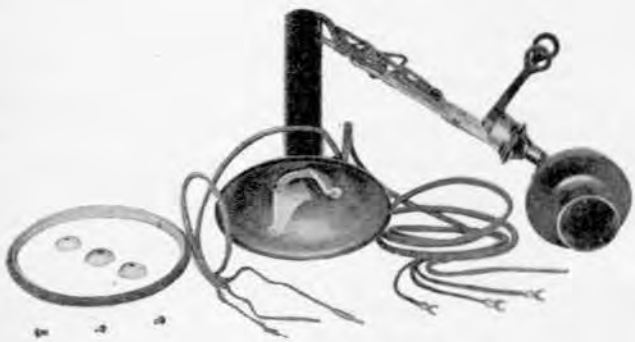
No. 1020AL and No. 1020PC are Manual Desk Stands for use at local battery stations, and also at central battery stations.

The N1050 type desk stand differs from the 1020 type in having an offset base to provide space for the dial and in having a terminal block in the base for making connections. The N1050 type desk stand may be used for manual service by equipping it with an N50A apparatus blank to cover the opening normally occupied by the dial and by adding two N35 strap cords to complete the circuit.

The following table lists the more commonly used types of desk stands. In each case, the desk stand includes the transmitter and the necessary cords, namely: No. 550 desk stand cord (5′6″ long), N549 receiver cord (2′6″ long) and T1A transmitter cords (9⅞″ long). Desk stands will be furnished with a No. 143 receiver or No. 144 receiver as ordered. The No. 143 and No. 144 type receivers are similar except for the case which is composition for the No. 143 and hard rubber for the No. 144. The N1050 type desk stands do not include a dial or an apparatus blank. These must be ordered separately. Desk stands equipped with 337 type transmitters are intended for long lines on which a more sensitive transmitter is required.

Code No.	Type	Desk Stand	Finish	Transmitter
1020AL	Manual	20AL	Black	323
1020PC	Manual	20PC	Nickel	323
N1020EL	Manual	20AL	Black	337
N1050AL	Dial	N50AL	Black	323
N1050EL	Dial	N50AL	Black	337

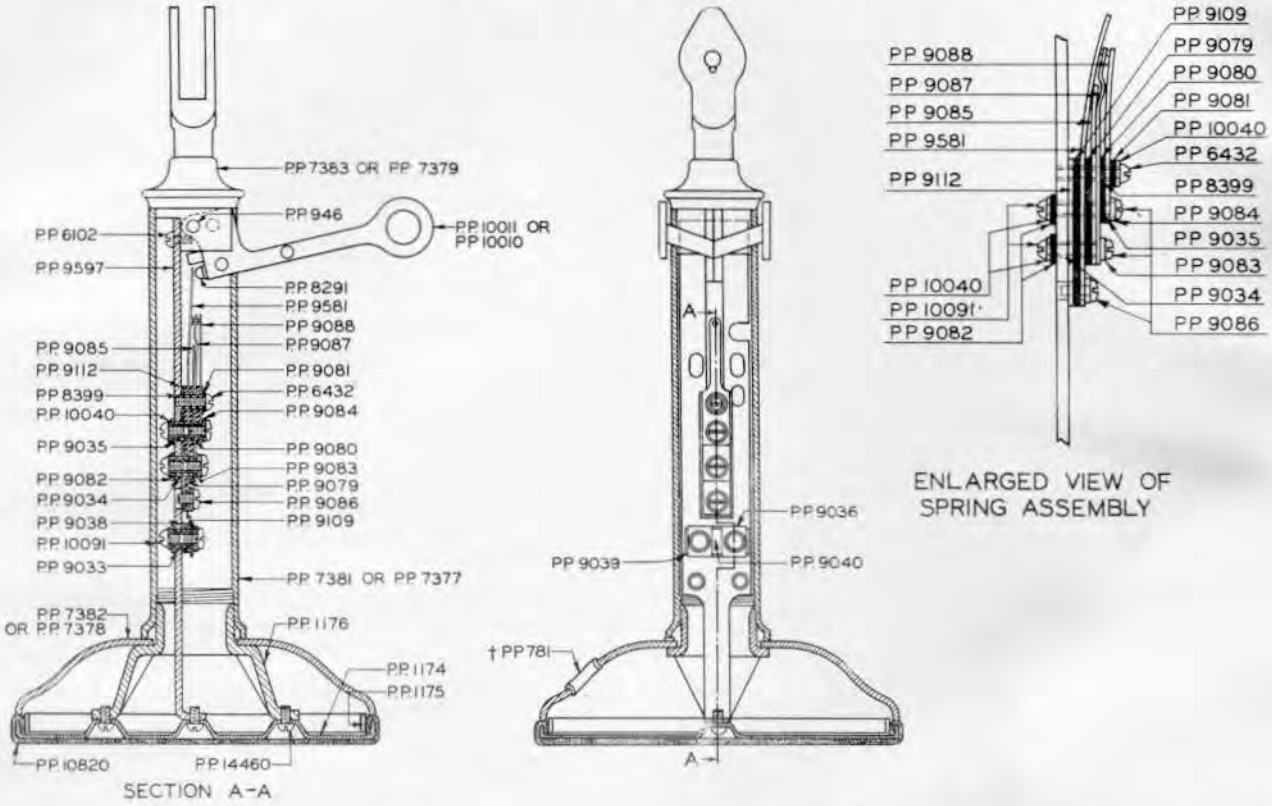
Standard package of 6. Shipping weight 31 lbs.



By removing the screws in the base plate, the Desk Stand may be resolved into its three principal parts, as shown above.

DESK STANDS—*Continued*

Replacement Parts—No. 20AL and 20PC Desk Stands



Base Plate Assembly

Piece Part No.	Quantity required	Name
P.P. 1174	1	Base Plate
P.P. 10820	1	Suede Cushion
P.P. 1175	1	Clamping Ring
P.P. 14460	3	R.H. Mach. Screws

Base and Stem Assembly

Piece Part No.	Quantity required	Name
P.P. 7382	1	Base Assembly (20AL, Black Finish)
P.P. 7378	1	Base Assembly (20PC, Nickel Plated)
P.P. 7381	1	Handle (20AL, Black Finish)
P.P. 7377	1	Handle (20PC, Nickel Plated)
P.P. 1176	1	Clamping Nut
†P.P. 781	1	Bushing (on old type only)

Terminal Plate and Switch Hook Assembly

Piece Part No.	Quantity required	Name
P.P. 7383	1	Lug Holder (20AL, Black Finish)
P.P. 7379	1	Lug Holder (20PC, Nickel Plated)
P.P. 10011	1	Hook Assembly (20AL, Black Finish)
P.P. 10010	1	Hook Assembly (20PC, Nickel Plated)
P.P. 8291	1	Hook Stop
P.P. 946	1	Pivot
P.P. 9597	1	Terminal Plate
P.P. 6102	2	R.H. Mach. Screws
P.P. 9038	1	Distance Piece

Terminal Plate, etc., Assembly—*Continued*

Piece Part No.	Quantity required	Name
P.P. 9039	1	Insulator
P.P. 9040	1	Insulator
P.P. 9036	2	Clamps
P.P. 9033	2	Insulating Bushings
P.P. 10040	2	Metal Washers
P.P. 9086	2	Button Head Mach. Screws
P.P. 9082	2	Insulating Washers
P.P. 10091	2	R.H. Mach. Screws
P.P. 9083	2	Screw Bushing

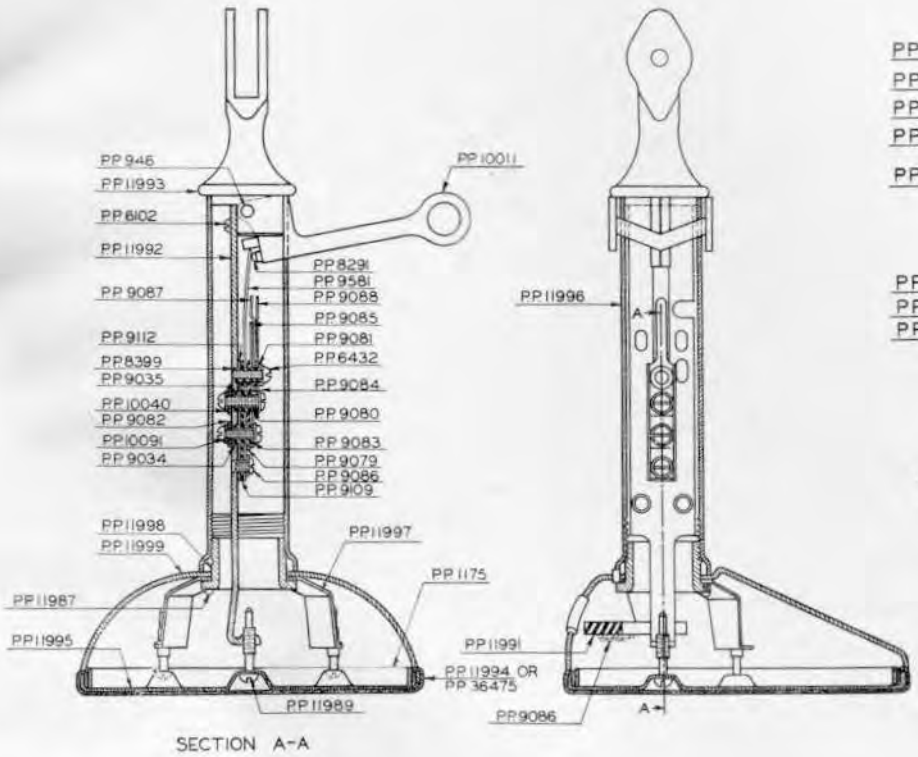
Terminal Plate Spring Assembly

(See separate view)

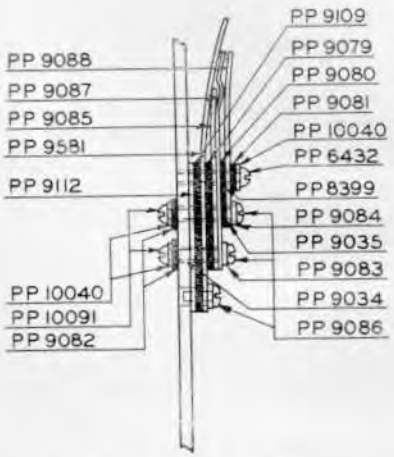
Piece Part No.	Quantity required	Name
P.P. 9088	1	Contact Spring Assembly
P.P. 9087	1	Contact Spring Assembly
P.P. 9085	1	Stop Spring
P.P. 9581	1	Contact Spring Assembly
P.P. 9112	1	Distance Piece
P.P. 10040	3	Metal Washers
P.P. 10091	2	R.H. Mach. Screws
P.P. 9082	2	Insulating Washers
P.P. 9109	1	Insulator
P.P. 9079	1	Insulator
P.P. 9080	1	Insulator
P.P. 9081	1	Insulating Washer
P.P. 6432	1	R.H. Mach. Screw
P.P. 8399	1	Insulating Bushing
P.P. 9084	1	Screw Bushing
P.P. 9035	1	Insulating Bushing
P.P. 9083	1	Screw Bushing
P.P. 9034	1	Insulating Bushing
P.P. 9086	3	Button Head Mach. Screws

DESK STANDS—*Continued*

Replacement Parts
No. N50AL Desk Stand



SECTION A-A



ENLARGED VIEW OF SPRING ASSEMBLY

Base Plate Assembly

Piece Part No.	Quantity required	Name
*P.P. 11995	1	Base Plate
P.P. 11994	1	Felt Cushion
*P.P. 36475	1	Suede Cushion
*P.P. 1175	1	Clamping Ring
P.P. 11989	3	Base Plate Screws

*When these parts assembled together are required order as P.P. 36477 Base Plate Assembly.

Base and Stem Assembly

Piece Part No.	Quantity required	Name
P.P. 11999	1	Base Assembly
P.P. 11996	1	Handle
P.P. 11998	1	Clamping Nut
P.P. 11997	1	Spider
P.P. 11987	1	R.H. Mach. Screw
P.P. 11991	1	Terminal Block Assembly
P.P. 9086	6	Button Head Mach. Screws
P.P. 6477	2	R.H. Mach. Screws

Terminal Plate and Switch Hook Assembly

Piece Part No.	Quantity required	Name
P.P. 11993	1	Lug Holder
P.P. 10011	1	Hook Assembly
P.P. 8291	1	Hook Stop
P.P. 946	1	Pivot
P.P. 11992	1	Terminal Plate
P.P. 6102	2	R.H. Mach. Screws

Terminal Plate Spring Assembly

(See separate view)

Piece Part No.	Quantity required	Name
P.P. 9088	1	Contact Spring Assembly
P.P. 9087	1	Contact Spring Assembly
P.P. 9085	1	Stop Spring
P.P. 9581	1	Contact Spring Assembly
P.P. 9112	1	Distance Piece
P.P. 10040	3	Metal Washers
P.P. 10091	2	R.H. Mach. Screws
P.P. 9082	2	Insulating Washers
P.P. 9109	1	Insulator
P.P. 9079	1	Insulator
P.P. 9080	1	Insulator
P.P. 9081	1	Insulating Washer
P.P. 6432	1	R.H. Mach. Screw
P.P. 8399	1	Insulating Bushing
P.P. 9084	1	Screw Bushing
P.P. 9035	1	Insulating Bushing
P.P. 9083	1	Screw Bushing
P.P. 9034	1	Insulating Bushing
P.P. 9086	3	Button Head Mach. Screws

DISTRIBUTING FRAMES

A Distributing Frame is an iron framework intended for supporting switchboard protective apparatus and terminal strips. It is usually located near the point where the outside wires enter the office building, and provides a satisfactory method of terminating such wires, as well as a flexible means of cross connecting any outside line to any switchboard drop without interfering with the wiring inside the switchboard.

Code No.	Capacity per Unit Inside Lines	Outside Lines	Used With
1431A	20	20–25	Any small switchboard.
1420B	100	100–125	Any non-multiple switchboard.
1430E	100	100–125	No. 1220 Type Switchboard.
1430F	100	100–125	No. 1240 Type Switchboard.
1425	(As many 100 line units as desired)		Magneto or Common Battery Switchboard.

No. 1431 Wall Type Distributing Frame

This frame has been designed to satisfy a demand for a small capacity, inexpensive and yet reliable distributing and protective equipment.

It is especially suitable for the small rural office operating a No. 1800 or other type switchboard, equipped for from ten to forty lines, with little prospect of immediate growth.

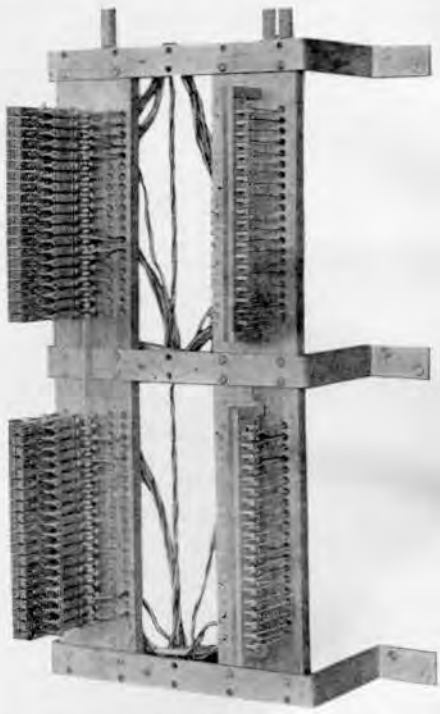
Where more than twenty lines are to be accommodated, two of these frames can be lined up, one above the other. Cross connecting facilities are provided by rings on the back of the frame.

The drilling is arranged for our standard protector groups.

In ordering this frame it will be necessary to specify the Protector Groups desired. For information on Protector Groups, see pages 58 and 59.

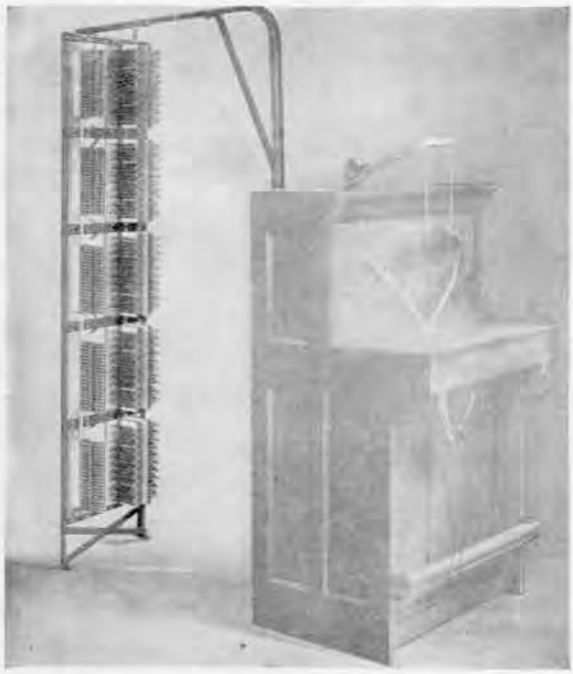
Shipping weight, Initial Unit, 8 lbs.

Shipping weight, Additional Unit, 5 lbs.



Two Units of No. 1431 Distributing Frame equipped with two No. N1435 MP and two No. 1435 Y Protector Groups.

Nos. 1420 and 1430—100 Line Types



No. 1430 Type Main Distributing Frame

These Distributing Frames are recommended for all No. 1220 Type and 1240 Type and similar switchboards.

They consist of units having a capacity of 100 lines each. Any number of units can be assembled together to provide accommodation for any number of lines.

They differ only in the supporting brackets, the No. 1430 type frames being designed to attach to the switchboard, and the No. 1420 being arranged to be braced to the wall and thus be independent of the switchboard for support.

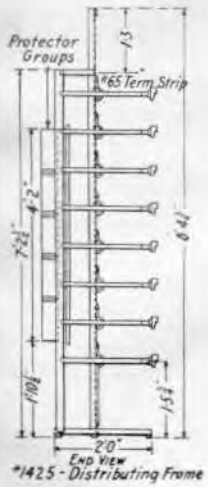
Shipping weight, Initial Unit 1420, 52 lbs.

Shipping weight, Initial Unit 1430, 58 lbs.

No. 1425 Type Distributing Frame

This is a unit type Distributing Frame, adapted for central office telephone or exchange protective apparatus where Nos. 1420 or 1430 type frames are too small for present requirements or future growth.

Initial Equipment. — For initial equipment at least two units or verticals must be installed (which provide space for a maximum of 200 inside lines and 160 outside lines) as the No. 65 terminal strips to which the outside lines connect are mounted horizontally between adjacent vertical units, thus requiring at least two verticals to support a row of them. Eight of these terminal strips, providing terminal facilities for 160 outside lines can be mounted between any two adjacent vertical units of the frame.



Shipping weight, Initial Unit, 137 lbs.

Shipping weight, Additional Unit, 86 lbs.

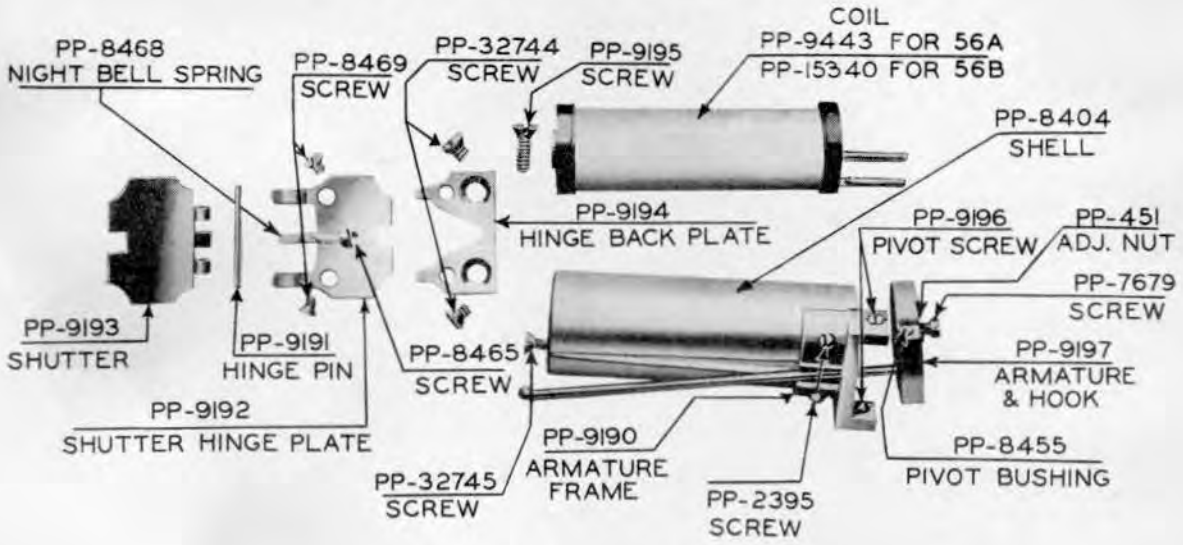
DROPS

No. 56 Type Drops are single coil drops with tubular iron shells and are cross-talk proof. Equipped with night bell contacts which remain closed until the drop is restored. They must be restored manually.

Code No.	Approx. Resist. (Ohms)	Finish of Shutters	Mounting Centers (Inches)	Overall Dimensions (Inches) High	Wide	Deep
56A	525	Black	1	$3\frac{11}{32}$	$3\frac{11}{32}$	$3\frac{47}{64}$
56B	670					

No. 56A Drop

Replacement Parts for 56 Type Drops



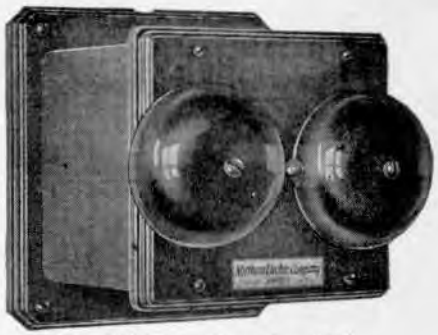
EXTENSION BELLS

Extension Bells are intended for use with telephone sets either as auxiliary signals or instead of the regular ringers, furnished with the sets. The resistance of the ringer in the Extension Bell should be the same as that of other ringers used on the same line.

The N43 Type Extension Bells consist of a ringer mounted in a wooden box and provided with three-inch gongs, black finished. The terminals are mounted on the inside of the box, the approximate outside dimensions of which are $6\frac{3}{8}$ inches wide, 6 inches high and 6 inches deep. The boxes are finished to match dark walnut.

Code No.	Ringer	Resistance Ohms	For Use on
N43AA	38AG	1000	Light Load, Rural Lines.
N43AB	38BG	2500	Heavy Load, Rural Lines.
N43AF	38FG	1600	Medium Load, Rural Lines.

Packed in cartons of 10. Shipping weight 34 lbs.



No. N43 Type Extension Bell

No. 584DF Extension Bell

No. 584 Type Extension Bells are similar in appearance to the No. 684 type desk set boxes. The cover is made of black bakelite. Its dimensions are $5\frac{49}{32}$ inches wide, $7\frac{9}{32}$ inches high, and $2\frac{3}{32}$ inches deep. Orders should specify whether or not condenser is required.

Code No.	Ringer	Resistance Ohms	Condenser When Specified	For Use on
584DE	78JA	4300	1149B	Central Battery Lines where high impedance ringer is required.
584DF	78A	1500	1149A	Central Battery Lines where low impedance ringer is required.

Packed in cartons of 10. Shipping weight 28 lbs.

EXTENSION BELLS—*Continued*

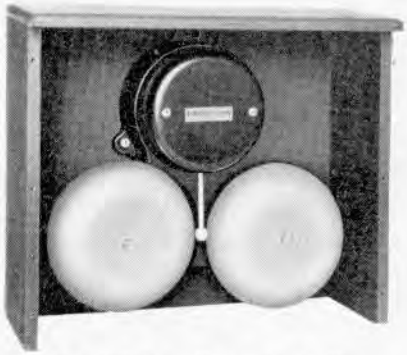
No. 392—Loud Ringing Type

The No. 392 Type Loud Ringing Extension Bells are used extensively in factories, mines, warehouses, in connection with police telephones, and in other places where the ordinary telephone ringer is inadequate, either due to excessive local noise or to the fact that the bells must be capable of being heard at a considerable distance. The windings of the No. 392 type bells are moisture-proofed and all metal parts are given a protective finish. The case and base are finished in black and the six inch gongs are given a hot dipped galvanized finish.

No. 392 Type Extension Bell

The No. 392 Type Extension Bell is designed to withstand normal weather conditions, but added protection may be obtained from mechanical injury and extreme weather conditions by mounting the Extension Bell on a No. 152A Backboard as shown.

These bells may be used on magneto telephone lines and in signalling systems without a condenser, but if they are to be bridged across a central battery telephone line, a condenser as specified below, must be connected in series with the ringer. Space is provided in the base of the bell for this purpose, but, except in the case of the No. 392L, the condenser must be specified when ordering.



No. 392 Type Extension Bell
With No. 152A Backboard
(Front Cover of Backboard removed)

Biasing Attachment

No. 392 Type Extension Bells which are furnished unbiased may be equipped with this feature by the addition of a D-76014 Biasing Attachment. A screwdriver and pliers are the only tools required for installing this attachment.

Code No.	Nominal Res. (Ohms)	Condenser	Biasing Feature
392A	1000	147A or 149A	None
392B	2500	149D	None
392E	1600	147A	None
392J	1000	147A or 149A	Bias Spring to prevent tapping.
*392L	2500	149D	Bias Spring to prevent tapping.

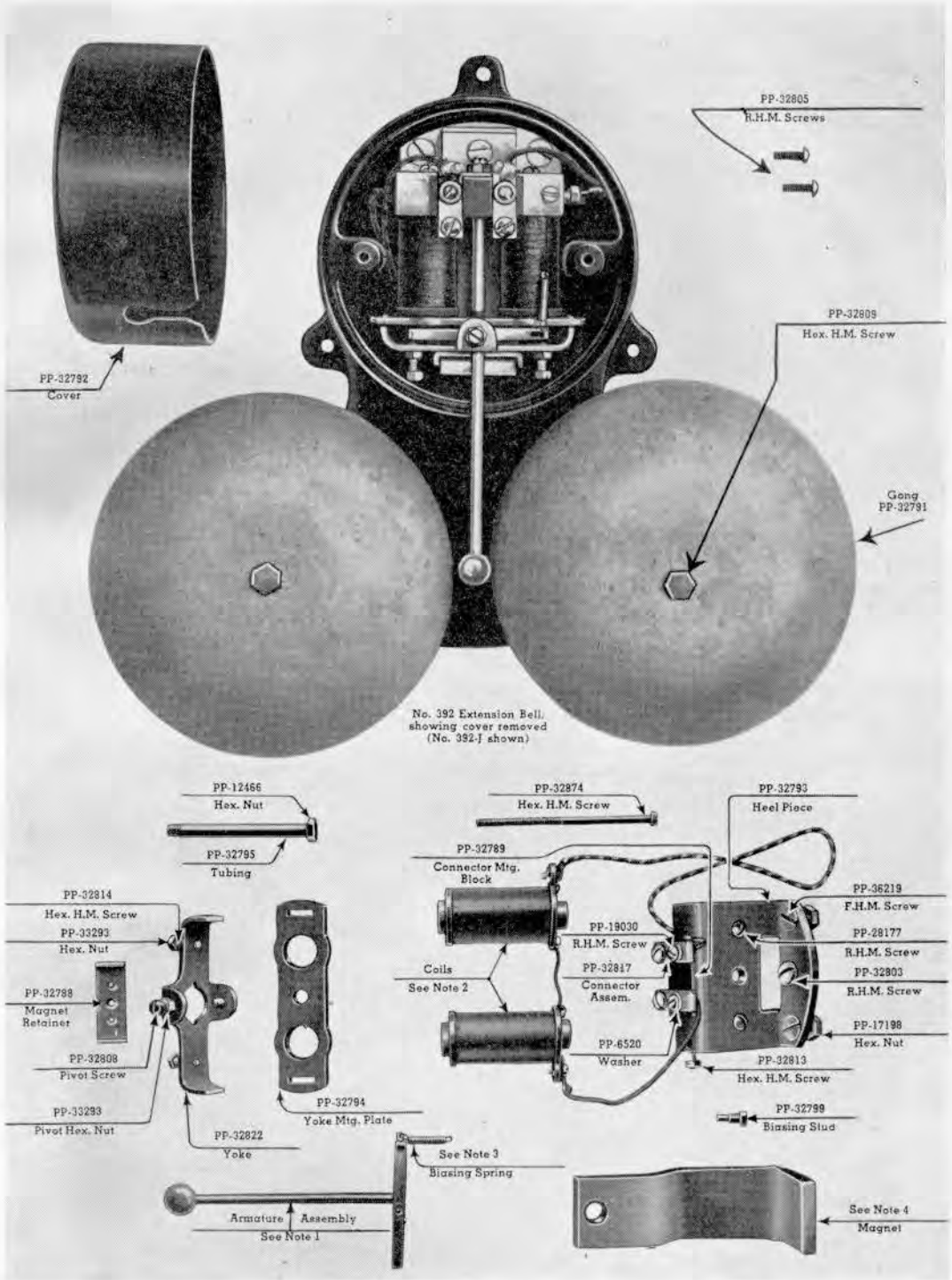
*Equipped with Condenser.

Packed individually. Shipping weight 15 lbs.

EXTENSION BELLS—*Continued*

Replacement Parts for No. 392 Extension Bells

(When ordering parts also specify code number of Extension Bell)



Bell Code No.	Note 1 Armature Assembly	Note 2 Ringer Coils	Note 4 Magnet
392A	PP-32829	PP-32840	PP-32797
392B	PP-32829	PP-32841	PP-32796
392E	PP-32829	PP-34886	PP-32797

Bell Code No.	Note 1 Armature Assembly	Note 2 Ringer Coils	Note 3 Biasing Spring	Note 4 Magnet
392J	PP-32829 & PP-32798	PP-32840	PP-32800	PP-32797
392L	PP-32829 & PP-32798	PP-32841	P-290166	PP-32796

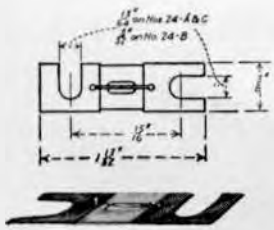
FUSES

Non-Alarm Type

The No. 24 Type fuses may be mounted by means of fuse posts or individual porcelain mountings such as the No. 22 Type Protector Mountings. The overall dimensions are: length $1\frac{13}{32}$ inches, width $\frac{3}{8}$ inch. The current carrying capacities and operating current values are specified in the table below.

In ordering it is necessary that both the code number and rated capacity be given.

Code No.	Rated Capacity Amperes	Operates in Less than One Minute on Amperes	Terminals Finish	Terminals Slotted for Screw No.
24A	½	1	Tinned	10
	1⅓	2	Tinned	10
24B	½	1	Copper	6
	1⅓	2	Copper	6
	2	3	Copper	6
	3	4	Copper	6
24C	2	3	Copper	10



No. 24 Type Fuse

Indicator Alarm Type

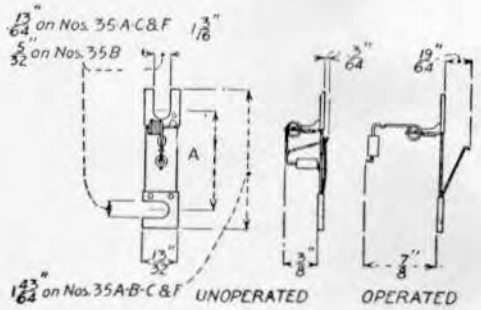
The No. 35 Type Fuses have the fuse wire so mounted that one end is fastened to a coiled spring and the other to a flat spring on the opposite side of the base. The copper terminal ends have a tinned finish.

When the fuse operates, the coiled spring causes a glass bead to be brought into a prominent position where it acts as a visible indication of the blown fuse. The mounting of the fuse may be so arranged as to cause the flat spring on the bottom of the fuse to make contact with an alarm circuit when the fuse wire is broken.

No. 35 Type Fuses may be mounted on No. 50 Type Protector Mountings or by means of Fuse Posts. They operate on currents fifty per cent in excess of those for which they are rated.

When ordering, both the code number and rated capacity should be specified.

No. 35 Type Fuse



Code No.	Rated Amperes	Operates on Amperes	Operates on In Less Than	Color of Bead	Slotted for Screw	"A" Mounting Centers Inches
35A	1⅓	2	1½ min.	White	No. 10	1¼
35B	1⅓	2	1½ min.	White	No. 6	1¼
35C	2	3	3 min.	Orange	No. 10	1¼
35D	1⅓	2	1½ min.	White	No. 6	1 3/16
35E	3	4	5 min.	White	No. 6	1 9/16
35F	½	¾	1½ min.	Red	No. 10	1¼
35G	3	4½	5 min.	Blue	No. 6	1¼
35H	5	6½	5 min.	Green	No. 6	1¼

FUSES — *Continued*

Tubular Fuses

No. 7A Fuse

No. N7A Fuse

No. 11C Fuse

These fibre shell type Fuses are carefully made from especially selected materials. The use of lead fuse wire prevents the possibility of overheating the shell. These fuses will carry their rated currents indefinitely without injury and will act reliably on one and one-half times their rated current values. Fuses of the same code number and rated capacity will give consistent performance.

The fuses listed below are supplied in 7 ampere capacity, unless otherwise ordered.

Code No.	Ampere Capacity	Used With
7A	7	No. 1435U Protector Group.
N7A	7	N7A Protector.
7T	7	Fuse Chambers used in "B" type Cable Terminals.
11C	7	58A and 58AP Protector.

GENERATORS

No. 22A Generator

No. 29F Generator

No. 48A Generator

Northern Electric Hand Generators are of compact, durable construction, with working parts designed to give years of continuous service. These generators are correct in both mechanical and electrical design, the materials used being such that their high efficiency is retained over a long period of service.

A few of the important features of these generators are as follows:—

All parts are machined to close limits, the gears being accurately cut, thus assuring ease in turning and resulting in smooth, noiseless operation. All metal parts are given a protective finish.

The magnets are made from steel that was developed especially for this purpose, the heat treatment employed being such that their efficiency is retained for a long period of service.

The armatures are automatically disconnected from the line when not in use.

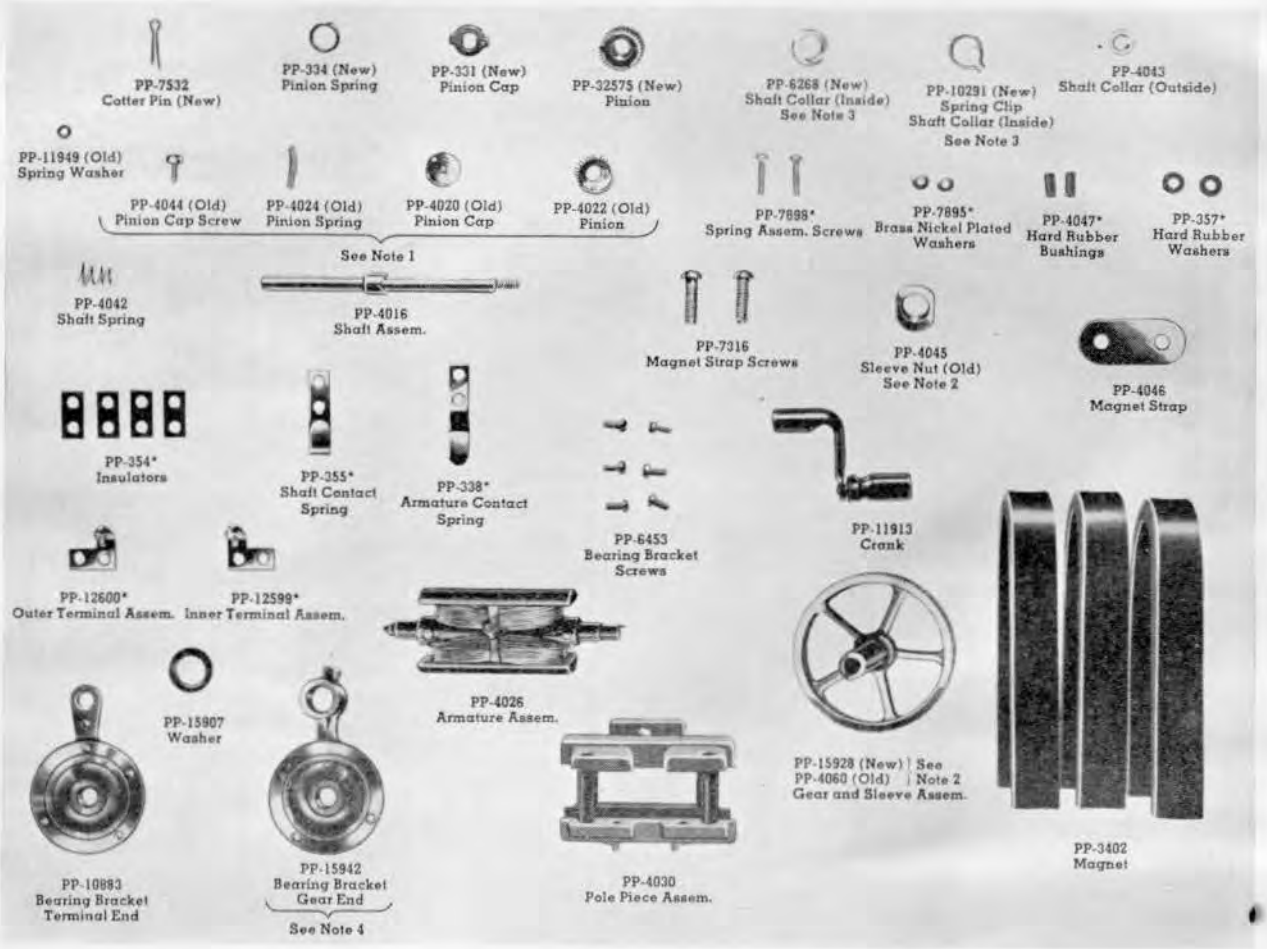
No. 22A.—Used on medium or lightly loaded magneto lines for supplying alternating current; equipped with three bars. Standard package of 10. Shipping weight 58 lbs.

No. 29F.—Used where light weight is essential, as in linemen's test sets and portable telephones; equipped with folding handle; equipped with two bars.

No. 48A.—This is our most powerful hand generator. It is used in telephones for heavy load line service and is equipped with five bars. The armature is automatically short-circuited when not in use—thereby being protected from lightning. Standard package of 10. Shipping weight 130 lbs.

GENERATORS—*Continued*

No. 22A Generator Parts



If complete spring pile-up is required, order as A-6431 which includes items marked thus *.

Where more than one identical part is used in an assembly, the catalogue number covers one of those parts only.

Note 1.—Old style piece parts must be used on old type armature assembly.

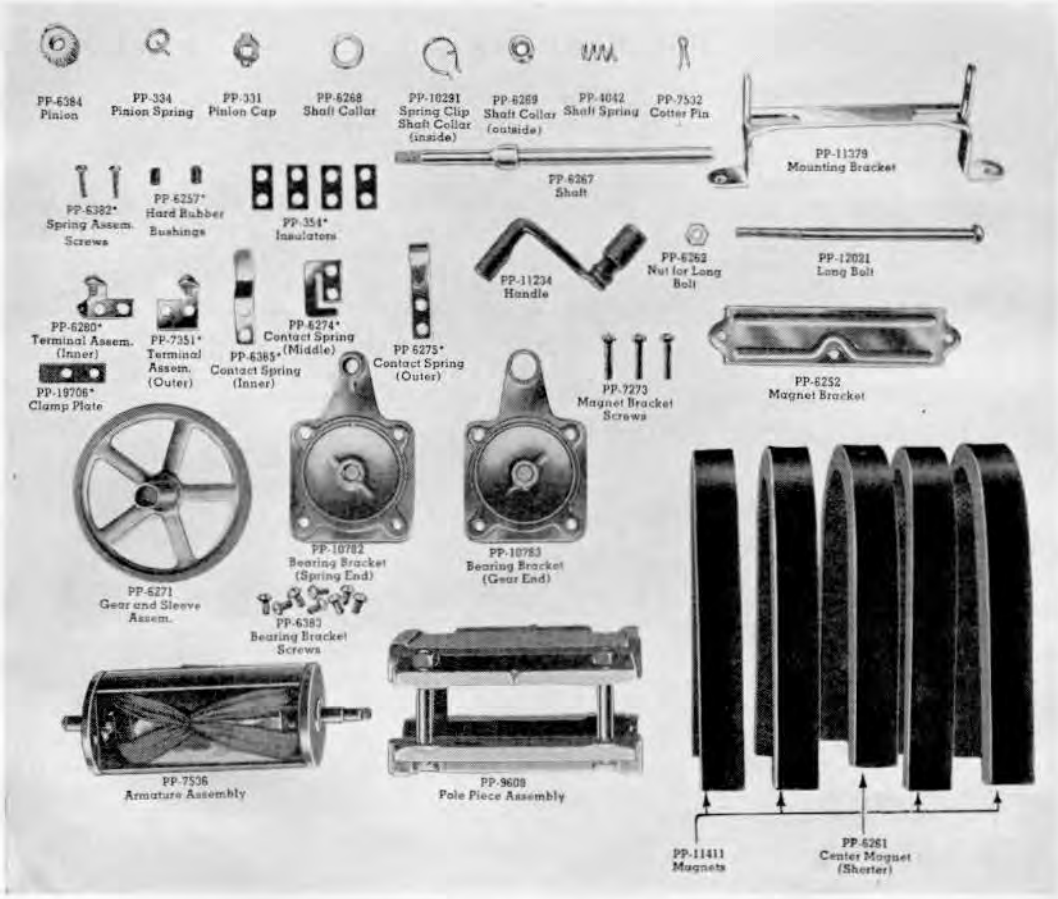
Note 2.—Old style threaded gear and sleeve assembly (PP-4060) with sleeve nut (PP-4045) must be used when existing generator is equipped with old type bearing bracket (PP-10882) which is no longer available.

Note 3.—Shaft collar (PP-6268) and spring clip (PP-10291) must be used with the new gear and sleeve assembly (PP-15928)

Note 4.—A washer (PP-15907) must be used with the new bearing bracket (PP-15942) and old type gear assembly (PP-4060). The washer is not required when all new parts are used.

GENERATORS—*Continued*

No. 48A Generator Parts



If complete spring pile-up is required order as A-6430 which includes items marked thus *.

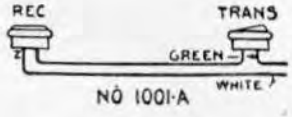
Where more than one identical part is used in an assembly, the catalogue number covers one of those parts only.

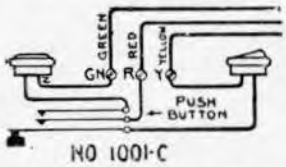
HAND SETS

No. 1001 Type

No. 1001A Hand Set

No. 1001C Hand Set





The No. 1001 Type Hand Sets were originally intended for the use of linemen and are designed to withstand the rough handling incidental to such service. This design proved to be so satisfactory that it is now used extensively for a number of different purposes.

The handles are made of brass tubing with drawn brass end pieces and the transmitter and receiver are provided with drawn brass cases equipped with screw clamping rings, thereby making an instrument that is extremely rugged.

The No. 1001C Hand Set is provided with a push button switch which is connected so that this hand set may be used instead of the No. 1020AL Desk Stand, where a rugged hand set is of importance.

HAND SETS—*Continued*

No. 1002 Type

No. 1002AC Hand Set

The transmitter and receiver of the No. 1002 Type Hand Sets are mounted on a nickel plated tubular brass frame, equipped with a hard rubber handle. A switch mounted within the frame is actuated by a plunger which terminates in a ring by which the Hand Set is suspended when not in use. When the Hand Set is removed from the hook, the switch is automatically closed. These Hand Sets function the same as certain desk stands, and may be used in place of desk stands if required A hook (No. 141A Switchhook) is furnished with each Hand Set.

Code No.	Transmitter	Receiver	Cords Code No.	Cords Length	Push Button Springs Combination	Use
1001A	244	131	243 (Two) 574	8 in. 5 ft. (Waterproof)	None	Test Set for Linemen.
1001C	285	131	366	6 ft. (Waterproof)	2 Make	Portable Telephones.
1002AC	267	141	415 414 318	9½ in. 4¼ in. 4 ft.	2 Make	No. 1800 Switchboard and Telephone Sets.

"E" Type

E Type Hand Set

The "E" Type Hand Sets listed below are made of a strong bakelite compound. They are light in weight and are used principally in hand telephone sets and at telephone switchboard positions.

E1E Type

The No. E1E Type Hand Set is intended for use with C1, D1 or similar type Hand Set Mountings as station Hand Telephone Sets.

Code No.	Transmitter	Receiver	Cord	Hand Set Handle
E1E-3	625A	557B-3	*H3B-9 4 ft.	E1-3

*If an E1E-3 Hand Set is desired equipped with a waterproof cord in place of the H3B-9 cord, order should specify H3C waterproof cord.

E2A Type

The No. E2A Type Hand Set is intended for use in central offices and in P.B.X. systems.

Code No.	Transmitter	Receiver	Cord	Plug	Hand Set Handle
E2A-3	625A	557B-3	H4G 4 ft.	289A	E2-3

Uniphone Handsets

Uniphone Hand Sets are made of a special strong grade of bakelite. The moulding process used in forming imparts a pleasing and lasting finish. They are moisture and dust resisting and can be used in any position. The transmitter and receiver units are completely self-contained.

Code No.	Finish	Transmitter Unit	Receiver Unit	Cord (4 ft. long)
NF2A-3	Black	F1	D96337	NH4A-9
NF2A-50	Walnut	F1	D96337	NH4A-9

No. 1B Hand Set Hanger

HAND SET HANGER

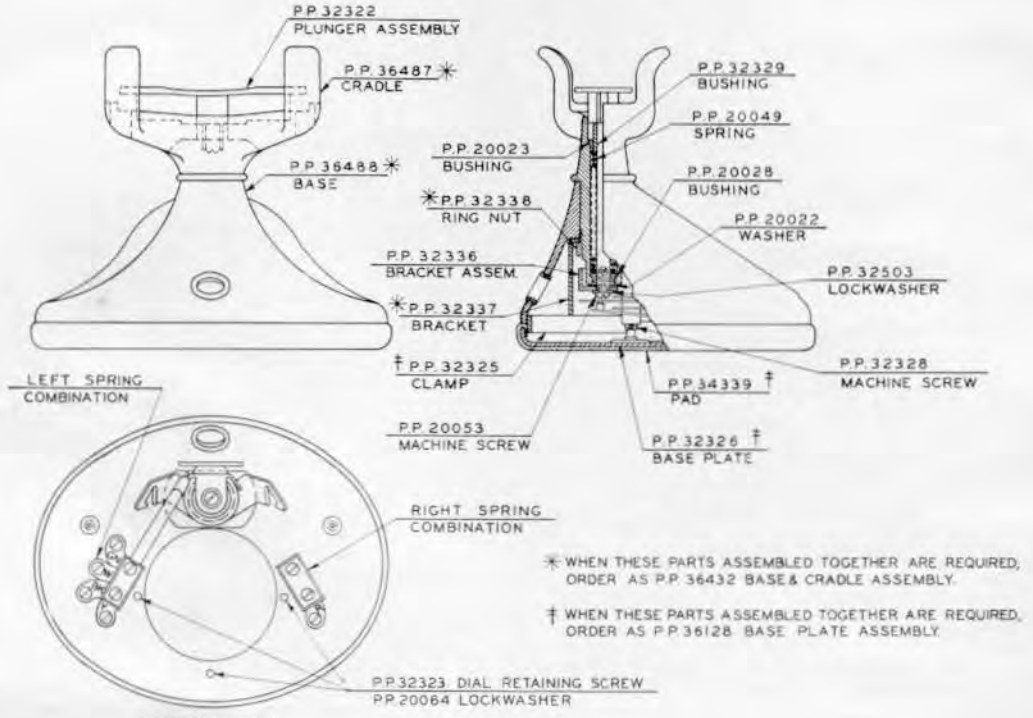
The No. 1B Hand Set Hanger mounts on a vertical surface and holds the No. 1001 type Hand Set when not in use. The Hand Set is suspended by its receiver, which fits into a recess in the hanger. This hanger is made of cast brass, black finish. Overall dimensions: $3\frac{1}{16}$ inches wide, $2\frac{1}{2}$ inches deep and $3\frac{3}{8}$ inches high.

HAND SET MOUNTINGS

"D1" Type

The "D1" Type Hand Set Mounting forms part of the No. 102 Type Hand Telephone Set. It consists of an elliptical die-cast metal base, to which is fastened the cradle assembly. The base provides mounting for a spring assembly, corresponding to the switchhook spring assembly in desk stands, and a mounting for a No. 4 Type Dial or a No. 50 Type Apparatus Blank, depending on whether the hand telephone set is for dial or manual service. The baseplate is easily removed by unscrewing two machine screws which are mechanically anchored to the baseplate.

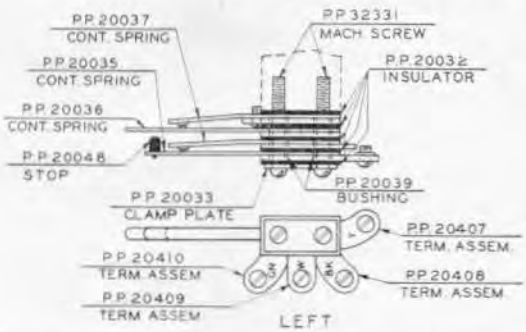
Replacement Parts D1 Type Hand Set Mounting



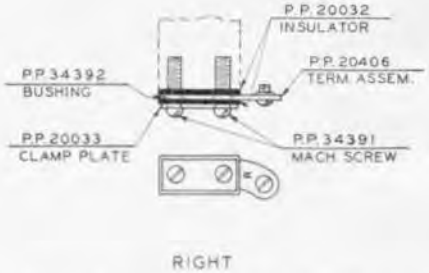
* WHEN THESE PARTS ASSEMBLED TOGETHER ARE REQUIRED, ORDER AS P.P. 36432 BASE & CRADLE ASSEMBLY.

† WHEN THESE PARTS ASSEMBLED TOGETHER ARE REQUIRED, ORDER AS P.P. 36128 BASE PLATE ASSEMBLY.

SPRING COMBINATIONS D1 TYPE HANDSET MOUNTING



WHEN COMPLETE ASSEMBLY IS REQUIRED ORDER AS P.P. 36490



WHEN COMPLETE ASSEMBLY IS REQUIRED ORDER AS P.P. 36489

N3-3 Uniphone Mounting

The N3-3 Uniphone Mounting forms part of the No. 3-3 Uniphone. It consists of a black finished rectangular die-cast box and cover enclosing a frame provided with terminals and a spring arrangement operated by a hand set hook. The box is provided with an adjustable mounting bracket and is arranged to support either a card holder or an N41A-3 Dial Mounting.

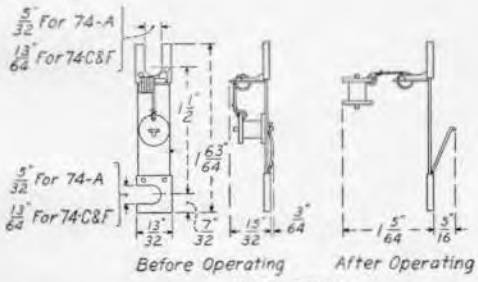
HEAT COILS

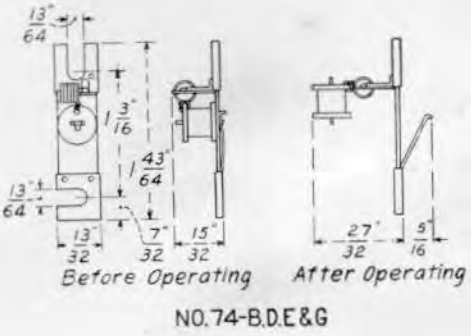
No. 76A Heat Coil

The No. 76A Heat Coil is used in protectors and protector groups to protect central office equipment against sneak currents. When an excessive current passes through the circuit the solder melts and allows a spring on the protector mounting to press the pin of the Heat Coil against a contact spring on the protector mounting and ground the line. This Heat Coil is provided with a black hard rubber shell and replaces the No. 73A and No. 67 types and will mount on protectors of one-half and three-eighths inch centres.

Code No.	Nominal Resistance Ohms	Will operate in 210 Sec. on Current of (Amperes)
76A	3.45	.54

No. 74 Type Heat Coil





These heat coils are designed to act on small current values at which fuses will not give reliable operation.

They are similar in mechanical construction to the No. 35 type fuses, differing in that a heat coil is used in place of a fuse wire. The spool of the coil is soldered to the alarm spring with low melting solder and the indicator spring is hooked into a hole in the upper spoolhead. When excessive current passes through the winding, the heat generated melts the solder, allowing the alarm spring to actuate the alarm and the indicator spring causes the spool to fly up, thereby giving a visible indication of the operated coil.

Fuse posts may be used in mounting the No. 74 Type Heat Coils. They will carry continuously one-half their operating current.

Code No.	Resistance Max.	Ohms	Min.	Will Operate in 210 Sec. on Current of (Amperes)	Size of Mounting Screw Required
74A	21.0		19.0	.18	No. 6
74B	4.1		3.7	.40	No. 10
74C	8.0		6.5	.265	No. 10
74D	4.7		4.4	.34	No. 10
74E	8.0		6.5	.265	No. 10
74G	57		53	.110	No. 10

INDUCTION COILS

No. 13 Induction Coil

No. 23 Induction Coil

INDUCTION COILS—*Continued*

No. 46 Induction Coil
Also general design of Nos. 63, 65 and 72

No. 101A Induction Coil

These Induction Coils are designed to obtain a high transmission efficiency. One of the important features is that the entire winding is included in the effective flux area, there being no dead sections of the winding to reduce its efficiency through the introduction of direct current resistance.

A core material made up of thin strips of special alloy steel has been adopted which permits of greater transmission efficiency than has been heretofore possible with any other Induction Coil core material.

Code No.	Overall Dimensions—Inches Length	Width	Height	Principal Use
13	3¼	1	1 3/16	Local battery telephones; Terminals No. 1 and 2 are the primary windings.
23	*6¼	*2	*1 7/8	Magneto and P.B.X. Switchboard operators' telephone circuit using N151 Receiver.
46	4 3/16	1 3/8	1 3/8	Central battery telephones of sidetone type.
63	4¼	1 9/16	1 9/16	Central Battery and P.B.X. Switchboard operators' improved telephone circuit.
65	4¼	1 9/16	1 9/16	"Toll" Switchboard operators' improved telephone circuit.
72	4¼	1 9/16	1 3/4	Magneto Switchboard operators' telephone circuit using 396A Transmitter.
101A	2 3/8	1 1/2	1 3/8	Central battery telephones of anti-sidetone type, including Uniphones.
113D	3¼	1	1 1/16	Local battery telephones where anti-sidetone circuit is used.

*Includes Mounting Base.

INTERRUPTERS

(Pole Changers)

No. 84H Interrupter

Interrupters provide a convenient means of obtaining alternating current from a direct current source of energy. They are suitable for Private Branch service and for use with Magneto Switchboards and Central Battery equipment. They serve as a battery operated ringing machine on telephone lines from the switchboard, thereby increasing the operating efficiency.

Each interrupter is mounted on the top of a metal base eight inches square, in which is mounted condensers, resistances and a switching key for starting and stopping. A metal cover with a glass window is hinged to the base and protects the moving parts. A circuit label is pasted on the inside of the cover. The interrupters occupy a small amount of space, are easily installed in either a horizontal or vertical position, have their adjustable parts readily accessible and require a minimum amount of maintenance.

No. 84F—This model is designed to operate from a 24-volt storage battery. The ringing current is derived from a 100-volt battery of dry cells. When used with a No. 56A Repeating Coil will produce approximately 95 volts A.C. for use with superimposed ringing and approximately 100 volts for A.C. ringing at approximately 1110 c.p.m. Shipping weight 19 lbs.

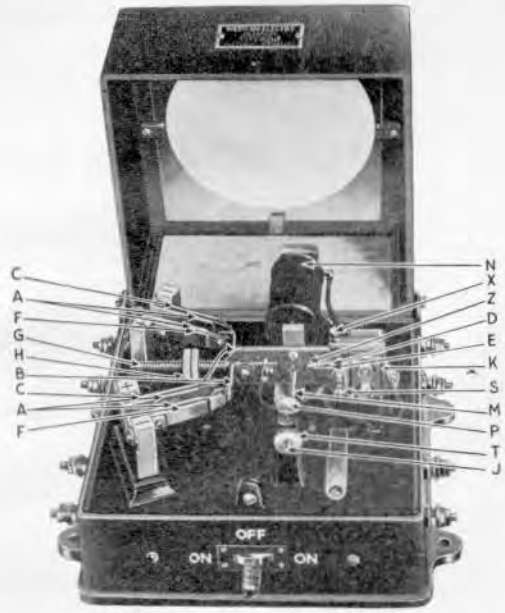
No. 84H—The operating coil is wound for current from two cells of Edison primary battery. Numbers S502 and S403 are two of the types of Edison Battery which may be used. One T-300 Air Cell Battery with a No. 18-GW Resistance (5.4 ohms) in series, may be used where it is desired to use only this type of battery in an office. A 100-volt dry cell battery will supply alternating current of 85 volts at approximately 1150 c.p.m. for ringing purposes. Shipping weight 19 lbs.

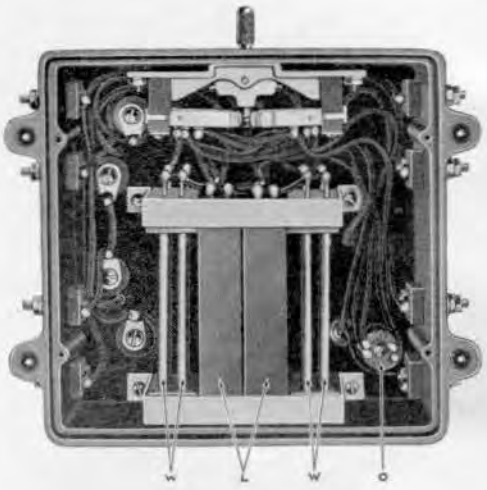
In order to obtain replacement parts for Nos. 84D, 84E and 84G, Interrupters, as well as those described above, we have included a list of parts for these Interrupters as well.

See also "Radio Interference Suppression Filters," page 60.

INTERRUPTERS—*Continued*

Replacement Parts





Bottom View

No. 84 Type Interrupter (showing location of replacement parts).

When ordering give piece part number indicated in column under type of Interrupter for which new piece part is wanted.

	Name	84D	84E	84F	84G	84H
A	Inner Ringing Spring	P-103970	P-106359	P-169848	P-169848	P-103970
B	Vibrator Arm	P- 46651	P- 46651	P-169847	P-169847	P-222397
C	Back Ringing Spring	.....	P-106356	.....	.....	.....
D	Inner Magnet Spring	P- 46668	P- 46668	P-149853	P-149853	P- 46668
E	Outer Magnet Spring	P- 46669	P- 46669	P-149851	P-149851	P- 46669
F	Front Ringing Spring	.....	P-106358	.....	.....	.....
G	Armature Arm	P-103975	P- 46673	P-149865	P-149865	P-222396
H	Weight Nut	P-103972	P-103972	P- 46650	P- 46650	P-222391
J	Spiral Spring Adjusting Screw	P- 46648	P- 46648	.....	.....	P- 46648
K	Adjusting Plate (assembly)	P- 46656	P- 46656	.....	.....	P-237712
L	Condenser	No. 21J	No. 21J	No. 21E	No. 21E	No. 21J
M	Spiral Spring	P-106011	P-106011	.....	.....	P-106011
N	Magnet Coils	P-133769	P-132828	P-132829	P-128185	P-133769
O	Resistance Across Contacts	Spl. No. 21 P-103977	Spl. No. 21 A- 38625	No. 21B	No. 21B	Spl. No. 21 P-103977
P	Spring Adjusting Screw Lock Nut	P-123818	P-123818	.....	.....	P-123818
R	Stiffening Spring	.....	.....	P- 46620	P- 46620	.....
S	Magnet Spring Adjusting Screw	P- 39625	P- 39625	P- 39625	P- 39625	P- 39625
T	Spring Adjusting Screw Nut	P- 46649	P- 46649	.....	.....	P- 46649
U	Contact Spring Adjusting Clamp	.....	.....	P-149849	P-149849	.....
V	Adjusting Clamp Screw	.....	.....	P-149856	P-149856	.....
W	Resistance in Series with Condenser	No. 18AC	No. 18AC	.....	.....	No. 18AC
X	Pivot Screw	P- 46654	P- 46654	.....	.....	P- 46654
Y	Reed	.....	.....	P-147480	P-147480	.....
Z	Bumper Pin	P- 48913	P- 48913	P-147489	P-148489	.....

JACKS

Northern Electric Jacks are equipped with springs which are hard, resilient and long-lived, the contacts of which are precious metal. Sleeves are accurately machined for inside diameter and length, and the structure is properly designed to hold the component springs and insulators firmly in place.

There are Northern Electric Jacks, both individual and strip mounted, to meet all requirements. A few of the generally used types are listed and illustrated. Information on others will be furnished on request.

Singly Mounted Jacks

Cast Frame Type

The N99 Jack exemplifies this type and has been in use for many years as the operator's telephone jack on magneto and central battery switchboards.

These jacks are generally mounted in pairs on an N80 Jack Mounting and used with N103 (Operator's) Plug.

The No. 364 Jack is of a more recent design and is arranged for the No. 199A and No. 200A Jack mounting when required mounted four or two per mounting respectively. The No. 289A Plug is particularly suitable for use with this jack and mounting since the length of the plug and jack sleeve and the thickness of the jack mounting have been considerably reduced.

The projection of the plug from the front of the key-shelf is also reduced to a minimum.

Welded Frame Type

Several of the more generally used welded frame jacks are listed in the following tables. The suffix letters A, B, C, and D of the code numbers listed, refer to figures A, B, C, and D, which indicate whether mounting lugs are single or double, and their arrangement with regard to the plane of the springs.

The terminals of welded frame jacks are arranged to accommodate two No. 19B and S gauge wires unless otherwise specified. Mounting screws are furnished with the jacks.

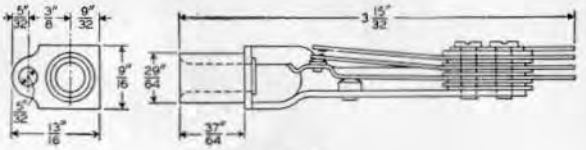


Fig. 1

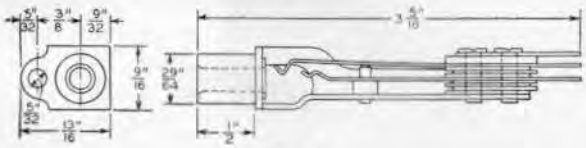


Fig. 2

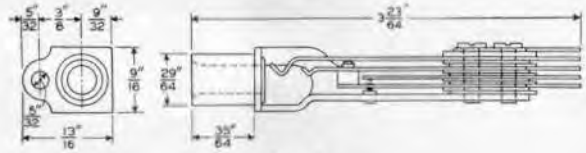


Fig. 3

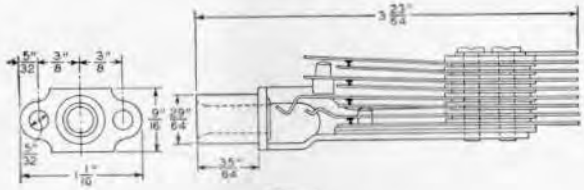


Fig. 4

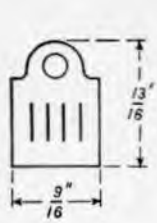


Fig. A

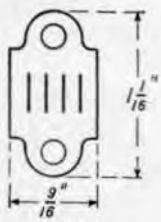


Fig B

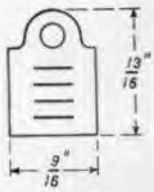


Fig. C

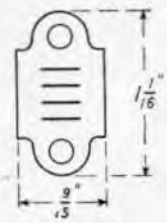
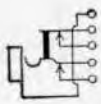


Fig. D



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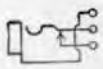

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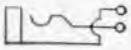

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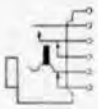
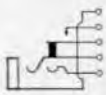
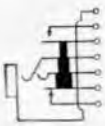


No. 236

No. 237



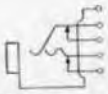
No. 241



No. 243

No. 245

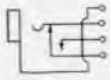
No. 246, 238



No. 248, 239

No. 284

No. 285



No. 303

JACKS—*Continued*

Jacks for use with Nos. 47, 137, 241 and other plugs of the same dimensions

Code No.	Dimensions Fig. No.	Mounting Centers Inches Horizontal	Vertical	Code No.	Dimensions Fig. No.	Mounting Centers Inches Horizontal	Vertical
221C	1	7/8	5/8	303A	1	5/8	7/8
236A	1	11/32	7/8	216A	1	5/8	7/8
236C	1	7/8	5/8	218A	1	5/8	7/8
237C	1	7/8	5/8				

Jacks for use with No. 109 Plugs

Code No.	Dimensions Fig. No.	Mounting Centers Inches Horizontal	Vertical	Code No.	Dimensions Fig. No.	Mounting Centers Inches Horizontal	Vertical
246A	3	5/8	7/8	248A	3	5/8	7/8

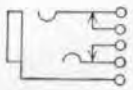
Jacks for use with No. 110 Plugs

Code No.	Dimensions Fig. No.	Mounting Centers Inches Horizontal	Vertical	Code No.	Dimensions Fig. No.	Mounting Centers Inches Horizontal	Vertical
238A	2	5/8	7/8	245A	2	21/32	7/8
239A	2	5/8	7/8	284A	2	1	7/8
241A	2	3/4	7/8	284B	2	1	1 1/8
243A	2	3/4	7/8	285A	2	13/16	7/8

Jacks for Mounting in Strips

No. 141 Jacks on No. 110 Jack Mounting

No. 49 and No. 92 Jacks



No. 141 Jack

Strip mounted jacks are designed for mounting in groups on jack mountings, and are not furnished unmounted.

In ordering, the quantity of jacks and their code number, as well as the code number of the jack mounting and the number of jacks per strip should be stated. The desired numbering should also be specified, as they will otherwise be furnished unnumbered.

Code No.	Used with Plug No.	Used with Jack Mounting	No. per Strip
49	110	1, 2, 34, 77	5, 10 and 20
92	109	18, 19, 113	10 and 20
141	110	109, 110, 112	10 and 20

JACK MOUNTINGS

No. N80 Jack Mounting with No. N99 Jacks

No. 200A Jack Mounting with No. 364 Jacks

For central battery exchanges it is customary to have the multiple jack strips in each panel separated into groups of five rows by thin white holly strips. Each group consists of one hundred jacks numbered 0 to 99. Each strip has twenty jacks and is divided by a distinctive mark into four smaller groups, each having five jacks, so that the operator may readily choose the proper jack. It is also usual to furnish these jack mountings with a groove on the lower edge for marking the jacks for various purposes such as for signifying that several adjoining jacks are connected to one private exchange.

In ordering jack mountings, the quantity and code number of the jacks should be specified as well as the code number of the jack mounting and the number of jacks required per strip. The desired numbering should be specified as the mounting will otherwise be furnished unnumbered. If holly strips are to be attached to the upper edge of any of the jack mountings, the mountings should be identified in the order by specifying the numbering of the strips.

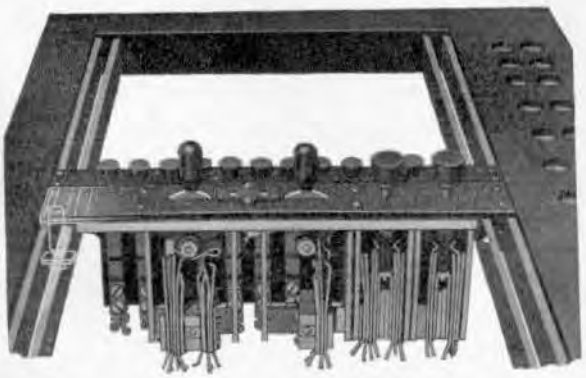
JACK MOUNTINGS—*Continued*

Code No.	Used for Mounting Jack No.	Ordinarily Used with Plug No.	No. of Jacks per Strip	Mounting Face Dimensions in Inches Length	Width	Projection from Mounting Surface, Inches
N80	N99	N103	2	2¼	1½	⅝
80	221C	137, 289A	2	2⅜	1¼	⅝
184	218 or similar type	47	24	16 15/16	1¼	3/16
185			48	16 15/16	2⅛	3/16
199A	364 or similar type	137 or 289A	4	3¾	1¼	¼
200A			2	2⅜	1¼	¼

KEYS

We manufacture telephone switchboard keys of many different designs and combinations and are always pleased to recommend a key to meet particular requirements.

Northern Electric Keys are easily manipulated and will give long service under heavy traffic conditions.



A2 and A3 Type Keys in Universal Key Shelf

Universal Type Keys

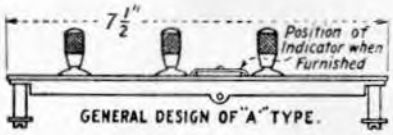
Universal Type Keys are arranged to mount in a key shelf, which, instead of being drilled and tapped for a definite location for each key, is provided with two mounting slots running lengthwise of the key shelf. A mounting stud at each end of the key fits in these slots as shown in the illustration.

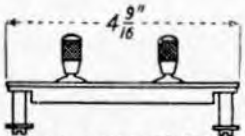
In coding these Universal Keys thay have been divided into three types according to the length of the base; "A" type, 7½ inches; "B" type 4 9/16 inches; "C" type 2¾ inches.

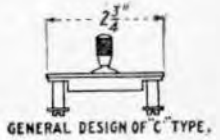
These types of keys are made in a variety of models, some of them mounting lever units and push button units.

A number of "A" and "B" types are available with indicators which show the last lever unit operated. The lever units are manufactured in both locking and non-locking arrangements.

Universal Type Keys with the same length base will mount in any keyshelf designed for that length of Universal type key, and keyspaces can be supplied to take the place of keys at non-equipped positions in the switchboard or to fill spaces between keys.



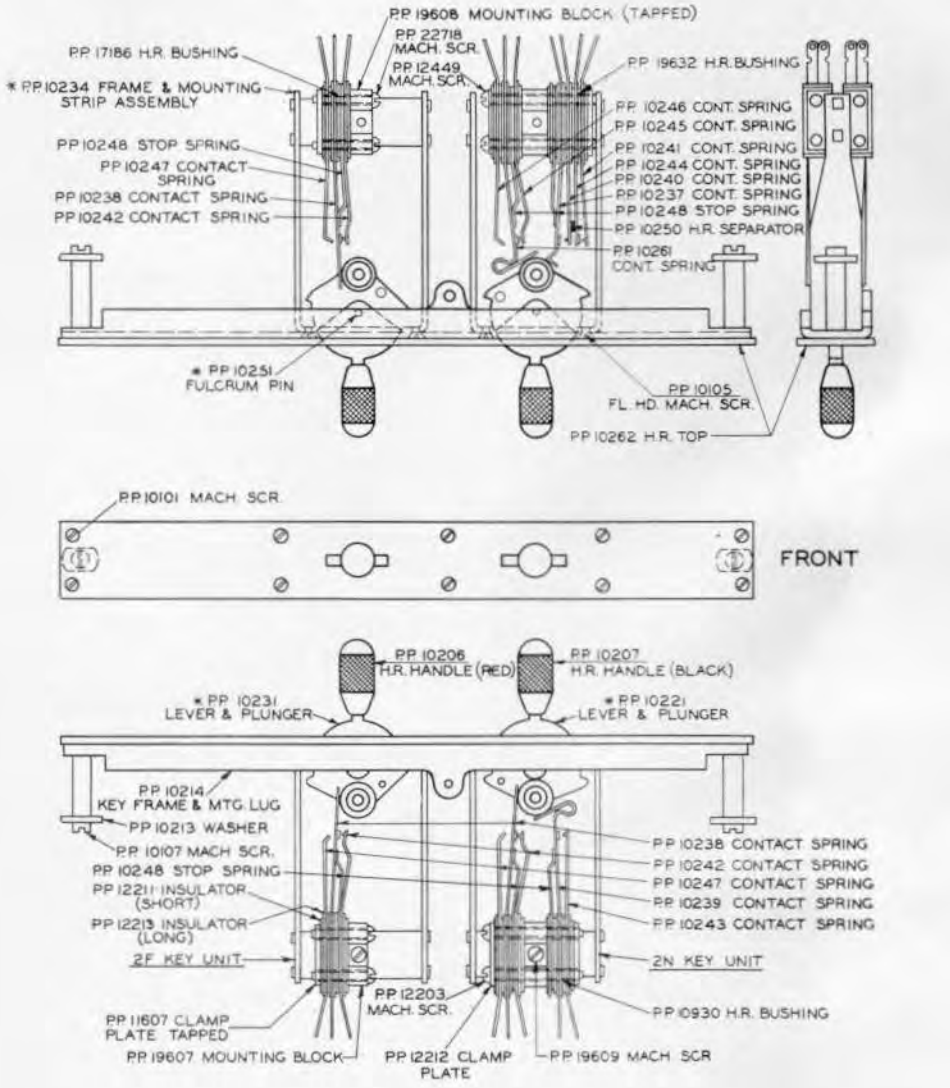




KEYS — *Continued*

The A1AF Key, which is commonly used in magneto switchboards, is illustrated below with its component parts.

When ordering replacement parts for keys, it is always preferable to submit a sample of the part required and in every case the code number of the key should be given.



AIAF KEY

* WHEN THESE PARTS ASSEMBLED TOGETHER ARE REQUIRED ORDER AS :
(2F KEY UNIT) PP29621 FRAME & LEVER ASSEM.
(2N KEY UNIT) PP29623 FRAME & LEVER ASSEM.

KEYS — *Continued*

Singly Mounted Type Keys

The mounting lugs of the No. 92 and 272 Type Keys are adjustable so that they may be mounted on material $\frac{11}{16}$", $\frac{7}{8}$" or $1\frac{1}{4}$" thick. The No. 92A and B and No. 272D may also be mounted on $\frac{5}{8}$" material. Unless otherwise specified they are arranged for the $\frac{7}{8}$" material.

No. 92 (Push Button Type)

No. 272 (Rotating Cam Type)

Locking Type

Code No.	No. of Springs	Spring Arrangement	
92B	6	2 sets Fig. C	See page 50
92D	9	3 sets Fig. C	
272A	6	2 sets Fig. C	
272C	9	3 sets Fig. C	
272D	12	4 sets Fig. C	
272G	3	1 set Fig. C	

Non-Locking Type

(Regular Push Button Operation)

Code No.	No. of Springs	Spring Arrangement	
92A	6	2 sets Fig. C	See page 50
92J	6	1 set Fig. A 2 sets Fig. B	
92Y	4	2 sets Fig. A	

No. 6017 Type Keys

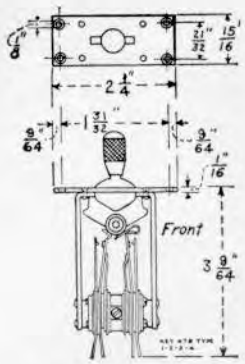
The No. 6017 Type Key is intended for use at subscribers' stations, as described below, and consists of a key unit, equipped with a hard rubber handle mounted in a black finished metal box. A connecting block with screw terminals is provided to facilitate wiring. Overall dimensions: length $7\frac{1}{2}$ inches; width $3\frac{13}{16}$ inches; depth $1\frac{5}{16}$ inches. Shipping weight $1\frac{1}{2}$ lbs.

No. 6017E—Cover Removed

Code No.	Key Unit No.	Lever Handle	Spring Combination	Intended for Use as
6017A	2 BF	Red	Locking-Locking	Switching key to connect a telephone instrument on either one or both of two lines.
6017B	2 GP	Black	Locking	Switching key to connect a telephone instrument on either one of two lines.
6017C	2 F	Black	Non-Locking	Ringing key at substations.
6017D	2 CL	Black	Locking	Switching key. Makes three and breaks three contacts (acts same as a 3 pole, double throw switch).
6017E	2 GR	Black	Locking-Locking	Switching key. Makes two and breaks two contacts when the lever is thrown to the left or to the right.

KEYS — *Continued*

A generally useful type of key is the No. 479 Type, which may be mounted on wood or metal and is available with a great number of spring combinations some of which are listed below.



General Dimensions of
No. 479 Type

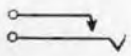


Fig. A
Make One

Fig. B
Break One

Fig. C
One Break
Before Make

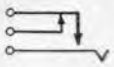


Fig. D
One Make
Before Break

Keys have black finished metal tops. Four No. 4 oval head wood screws are furnished with each key for mounting on wood.

The above contact spring arrangements represent the normal or unoperated contact spring position of the keys listed below.

No. 479 Type Keys

Locking Type

Code No.	No. of Contacts	Contact Spring Arrangement — Position 1 Figures A	B	C	D	Position 2 Figures A	B	C	D
479B	10	2	..	..	2	..	..	..	..
479F	5	..	..	..	..	1	..	..	1
479G	8	2	..	..	..	2	..	..	..
479H	12	..	..	..	2	..	..	..	2
479K	12	..	..	2	..	..	..	2	..
479AP	5	..	..	..	..	..	1	1	..
479AU	12	..	..	..	..	..	..	4	..
479AW	20	2	..	2	..	2	..	2	..
479AY	6	..	..	..	..	..	..	..	2
479BN	24	..	..	4	..	..	..	4	..

Non-Locking Type

479AD	6	..	..	2	..	..	..	..	..
479BD	8	2	..	..	..	2	..	..	..
479CG	14	1	..	2	..	..	..	2	..
479CS	12	..	..	2	..	..	..	2	..

Combination Locking and Non-Locking Types

		Locking				Non-Locking			
479D	14	2	1	..	..	1	..	2	..
479E	12	2	..	..	..	1	..	2	..
479T	8	..	..	1	..	..	..	1	..
479AK	12	..	..	2	..	..	..	2	..
479CH	16	1	1	2	..	..	..	2	..
479CM	12	..	2	..	..	1	..	..	2
479FC	14	..	1	2	..	..	..	2	..

KEYS — *Continued*

N1E and N1G Keys

N1E Key

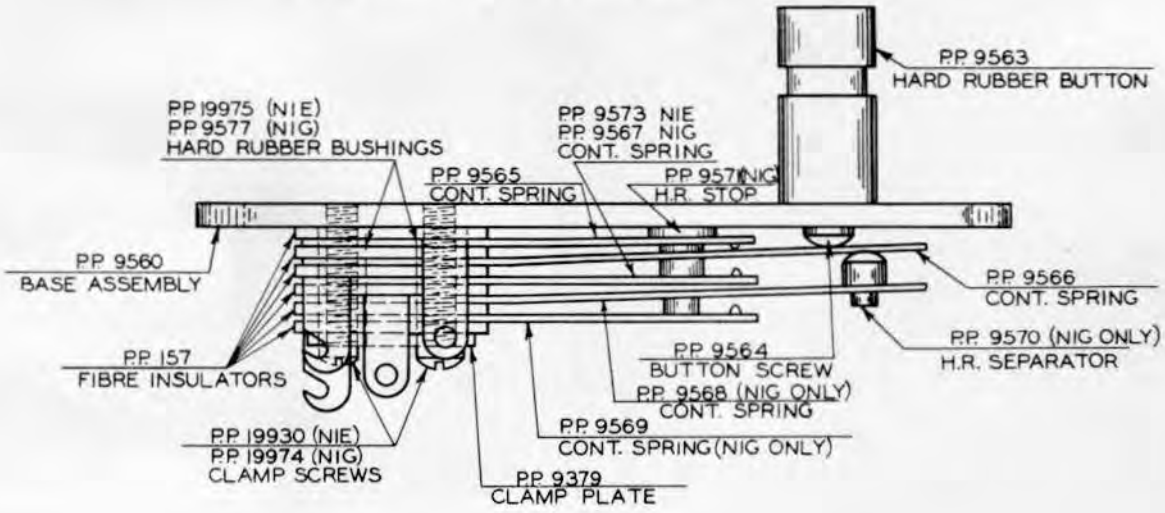
The No. N1E and No. N1G Keys are push button keys intended for use in magneto telephones for Selective Central Office Signalling Service. With telephone sets arranged for this service, central office may be signalled without ringing the other bells on the line, by depressing the key push button while cranking the generator. Other parties on the line may be called by code without ringing Central Office, when the key is not depressed.

The button is made of hard rubber and the springs are made of nickel silver with the terminal ends prepared so that wires can be readily soldered to them.

These keys are made up with three and five springs as listed below.

Code No.	Springs	For Use with
N1E	3	N1317F, G and E Telephone Sets and N300R and C Desk Set Boxes for Selective Central Office Signalling.
N1G	5	N1317 CG Telephone Sets and N300 CG Desk Set Box for Selective Central Office Signalling with Simplex Ringing.

Replacement Parts for N1E and N1G Keys



LAMPS

The manufacture of switchboard lamps is a highly specialized process.

Methods of manufacture and special treatments for filaments have been perfected which give the lamps long life, uniform quality and correct illuminating power.

The following switchboard lamps represent the latest developments and will give a consistent high standard of service.

They are approximately $\frac{5}{16}$" in diameter and $1\frac{3}{4}$" long. The bulb is made from clear glass and is tipless.

These lamps are intended for use with Nos. 12, 13, 34 or similar type lamp sockets.

LAMPS — *Continued*

Carbon Filament Lamps

Code No.	Voltage	Current Consumption Minimum Amperes	Current Consumption Maximum Amperes
2F	12	.105	.120
2G	24	.075	.115
2J	24	.018	.033
2T	40	.034	.046
2U	24	.035	.0475
2W	18	.035	.045
2Y	48	*.025	*.035

*Current at 40 volts.

Tungsten Filament Lamps

Code No.	Voltage	Current Consumption Minimum Amperes	Current Consumption Maximum Amperes
A1	24	.033	.045
A2	24	.075	.105
B2	18	.036	.048
C2	36	.032	.044
E1	6	.033	.045
E2	6	.27	.31
E3	6	.12	.16
F1	4	.17	.21
F2	4	.27	.31
G1	8	.085	.10
H1	16	.27	.31
J1	10	.23	.27

LAMP CAPS

No. 2 Type Lamp Cap

No. 2C Lamp Cap

The lenses of Northern Electric lamp caps are made from specially selected and treated glass. These lenses are held firmly in place in the cap cases by spinning the edges over the lenses. The cases are slotted, permitting a spring fit in the socket.

They are made in many varieties. A few commonly used are shown in the table.

No. 2 Type—Used with Nos. 12, 13 and similar type lamp sockets.

No 4 Type—Used with No. 34 and similar type lamp sockets when a larger signal is required.

Code No.	Symbol	Color
2A	⊕	White opalescent
2C	⊕	White opalescent
2H	○	Red opalescent
2L	○	Green opalescent
2U	○	Amber opalescent
2W	○	Blue opalescent
2AY	○	White opalescent

LAMP SOCKETS

No. 13 Lamp Socket

No. 34 Lamp Socket

Mounted Singly

These sockets are made of brass and are supplied with nickel silver springs, which are insulated with hard rubber. They mount individually and can, therefore, be ordered entirely separate from their mountings. The springs are insulated from the frame. The lamp mounts close to the lens of the lamp cap, giving the greatest possible amount of useful illumination.

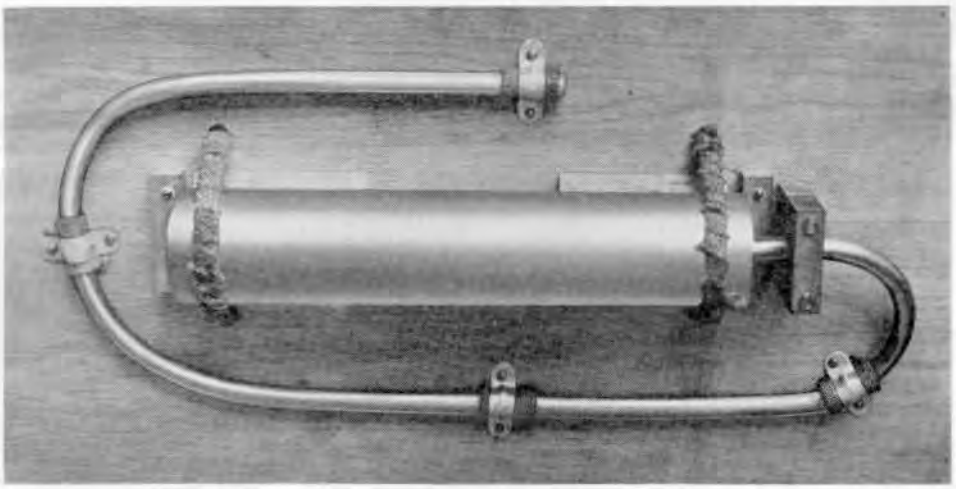
Code No.	Used with Lamp No.	Used with Lamp Cap No.	Used with (Thickness of Shelf in Inches)
13	2 Type, A, B, C, E, F, G, H & J Type	2	$\frac{7}{8}$
34		4	$\frac{7}{8}$, 1, $1\frac{3}{16}$, $1\frac{1}{4}$, $1\frac{13}{16}$

LOADING COILS

Loading Coils may be used to increase the transmission efficiency of long common battery or magneto (manual or dial) subscribers' lines enclosed in cable and also for local trunk cables. Loading coils are always enclosed in a suitable case for protection and mounting and furnished with a stub cable for splicing into the circuits.

The No. 93 type loading coil case, which is of the lead-antimony type, provides a simple and inexpensive means of loading small numbers of lines in exchange areas. There are no projections or fittings on the outside of the case. The cable stub is composed of textile insulated pairs of conductors appropriately color coded.

The cases are of such a size that they can be clamped firmly below the main cable and supported by the main cable itself or by means of an auxiliary lashing from the strand. The general appearance of the case with cable stub and method of mounting during transportation is shown in the illustration.



No. 93C Loading Coil Case

When less than the full complement of coils is required in a case, the unused cable pairs in the stub will be left "open" and insulated inside the case.

Further details regarding the use of the above cases or larger cases which we supply for other purposes will be furnished on application to our nearest Branch Office.

Code No. of Case	No. of Coils Min.	Max.	Case Length In.	Dia. In.	Stub Cable Cond. Gauge	Length Feet	Dia. In.	Approx Weight Pounds
93-A	2	5	6¾	3¼	22	4–10	9/16	10
93-B	6	10	11⅝	3¼	22	4–10	21/32	18
93-C	11	15	16⅜	3¼	24	4–10	21/32	25

MOUNTING PLATES

Two general types of mounting plates are available, namely the drilled plate and the punch frame types. Mounting plates of the punched frame type are recommended for mounting relays not equipped with individual relay covers. The drilled plate type is required for mounting relays using individual covers, and for other apparatus such as resistances, condensers, retardation coils, etc.

Punched Frame Type

Drilled Plate Type

Plates of different capacities and sizes and for different combinations of apparatus can be furnished, information on which will be supplied on request.

NUMBER PLATES

Number Plates for calling dials are shown under Calling Dial Number Plates.

The following are the Number Plates supplied for combined jacks and signals, but must be ordered separately.

Code No.	Type	Numbered	Used with
P-113032	Metal with raised numbers	O-499 As ordered	Shutter Type Signals
P-111104	Printed on cellulose faced paper.	O-399 As ordered	Ball Type Signals

OPERATORS' SETS

Breast Type

Suspended Type

There are two types of Operators' Telephone Sets in general use, namely, sets using a breast type transmitter and sets using a suspended transmitter. Both types give the operator full use of her hands for operating the switchboard while talking and listening. The breast type is the more convenient where the operator is at the switchboard continuously, as it is always in the correct talking position. The suspended type is generally used where the operator's whole time is not taken up in operating the switchboard, and where she leaves the board to perform other duties.

A typical breast type set, as illustrated, consists of:

Transmitter	No. 234
Transmitter Attachment	No. 3A
Receiver	No. 528
Plug	No. 137
Cord	L4E

A typical suspended type set, as illustrated, consists of:

Transmitter	No. 232
Transmitter Arm	No. 19C
Transmitter Cords	2 No. 437
Receiver	No. 528
Receiver Cord	L2A
Plug	No. 137

More detailed information on the individual items is given elsewhere in this catalogue. For other combinations of apparatus comprising Operators' Sets see Operators' Telephone Cords and Hand Sets.

PAY STATIONS OR COIN COLLECTORS

Pay Stations are valuable to an operating telephone company in affording convenient service to the transient public on a cash basis, and were developed in order that the non-subscriber might pay his proper share for the use of the Telephone Company's Plant.

The operation of the Pay Station is simple. The coin or coins are placed in their proper slot and descend by gravity, there being no levers to push or pull. The coins in their descent strike gongs of different tones denoting their respective values, and signal the receipt of the money to the telephone operator.

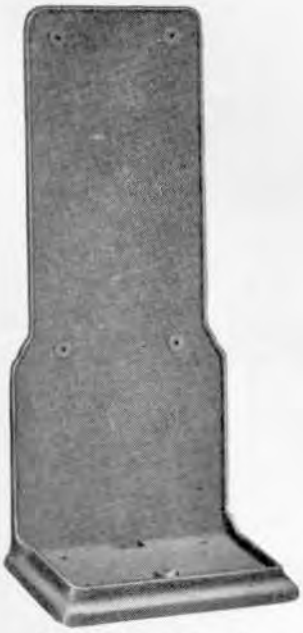
These Pay Stations have a general ruggedness of construction which enables them to withstand the rough usage incidental to public service. They are equipped with locks of an improved type on the upper housing and on the cash drawer, insuring a maximum of protection. The cash drawers are large, having an approximate capacity of sixty cubic inches and may be obtained either in the open type (No. 2A) or in the self-sealing type (No. 6001A).

A No. 143 or 144 Receiver, No. 323 or No. 337 Transmitter, No. 92 Cord and a Desk Set Box of the proper selection are required to complete these Pay Stations and must be ordered separately.

If it is desired to mount any of these Pay Stations on a table or on a shelf in a booth, a No. 139A Backboard is required. This Backboard is not included as part of the Pay Station and must be ordered separately.

PAY STATIONS OR COIN COLLECTORS—*Continued*

No. 50 Type Pay Station



No. 139A Backboard

No. 50 L—This Pay Station is of the post pay type arranged to operate with Canadian or United States coinage of the current issue. When arranged for use with anti-sidetone type desk set box it is known as No. 150L.

No. 50M—This Pay Station embodies the same operating features as the No. 50L. It will also operate with the small Canadian silver 5-cent piece.

No. 50H—This Pay Station is designed for prepayment type of service and will operate with Canadian or United States coinage of the current issue. When arranged for use with an Anti-sidetone Desk Set box it is known as No. 150H.

No. 50E—This Pay Station embodies the same operating features as the No. 50H. It will also operate with the small Canadian silver 5-cent piece.

Packed in carton containing 4, shipping weight 120 lbs.

No. 23 Type Pay Station

No. 23D Pay Station

No. 23D Pay Station can be furnished to operate with Canadian 25-cent, 10-cent and large 5-cent pieces of the current issue.

This Pay Station is compact and neat in appearance and consists of a complete telephone equipment, when provided with a No. 143 or 144 Receiver, No. 92 Cord, No. 323 or 337 Transmitter and a Desk Set Box of the proper selection. The universal mounting plate on these stations allows for either wall or shelf attachment.

PAY STATIONS OR COIN COLLECTORS—*Continued*

No. 11 Type Pay Stations

No. 11 Pay Station Attached to N1317 Telephone Set

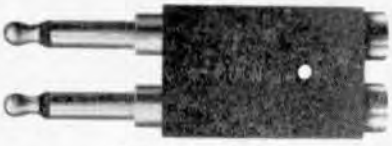
No. 11 Pay Station is arranged to operate with coins similar to the No. 23-D Type. It is designed to attach to any regular wall type telephone set and is connected to the wall telephone by means of a mounting plate which is included with the station.

PLUGS

Nos. 109 and 110 Plug

No. 47 Plug

No. 289A Plug



No. N103 Plug

No. 137 Plug

Northern Electric Plugs are manufactured to meet all requirements. They are sturdily constructed of materials which permit of rough usage.

The No. 47 type Plug is a 2-conductor plug, the No. 47A being provided with a red shell and the No. 47B with a black shell. Principally used with combined jacks and signals.

The No. N47A Plug, is similar to the No. 47A but is smaller and is provided with a spring tongue on the sleeve. Used with N99 and similar type jacks.

The No. 109 is a three-conductor plug principally used with No. 92 Jack.

The No. 110 is a three-conductor plug, principally used with No. 49 and No. 141 Jacks.

When an operator's head set is to be used at a switchboard it is convenient to wire two adjacent jacks to provide the necessary connections in the switchboard circuit and to use a twin plug so that the operator will not have to handle two separate plugs for this purpose. The No. N103, No. 137 and No. 289A Plugs are twin plugs for use with operator's head sets.

The No. N103 Plug is equivalent to two No. N47 Plugs held in a hard rubber shell. It is intended to engage the No. N99 Jacks mounted in pairs.

The No. 137 Plug, which has a metal shell, is intended for use with the No. 99, No. 221 or No. 364 Jacks mounted in pairs.

The No. 289A Plug is intended for use with the No. 364 or similar Jacks when mounted in pairs. The projection from the lock rail is reduced when this plug is used. It is provided with a bakelite shell.

PLUG SEATS

These red fibre Plug Seats are furnished complete with No. 4 round head wood screws, ½ inch long, for mounting.

No. 13 Plug Seat

Code No.	Mount on Center, Ins.	Used with Plug Nos.
12	$\frac{3}{4}$	110
13	$\frac{3}{4}$	109
15	$\frac{27}{32}$	47

PROTECTORS FOR TELEPHONES

No. 58-AP Protector

No. 60-AP Protector

Telephone protection is an essential feature in the operation of a telephone system, as protectors reduce the hazards to life, telephone equipment and property, which may result from outside sources, such as lightning or crosses with electric light, trolley or high tension wires.

In the requirements covering the wiring of buildings for telephones, recognized authorities prescribe that a protector must be mounted on a non-absorptive, non-combustible insulating base, and located as near as possible to the point where the telephone wires enter the building. This is to prevent, as far as possible, injury to persons using the telephone and to reduce to a minimum the possibility of fires due to lightning or crosses with power circuits.

The term "power circuits" includes direct current trolley lines, series arc and incandescent lighting circuits, as well as those lines used exclusively for power but not of excessive potentials. The protection of telephone lines exposed to very high potential circuits requires separate consideration in each case and we will be glad to advise in such cases.

We manufacture several types of Telephone Protectors to meet different local conditions. These protectors are accurately designed, constructed of first-class material and if properly installed give good results. In the protectors listed below there are several which employ our improved No. 26 and No. 27 Protector Blocks.

Code No.	Protector Micas	Protector Mounting	Protector Blocks	Fuses	Heat Coils	Protect Central Battery and Magneto Telephones against
17 Type	As required	1 No. 15	As required	—	—	Lightning; used with N7A Protectors located in No. 17 Type Cable Terminals for protecting one pair of wires. A No. 1 Type or P-100333 Ground Strip and P-100332 Connecting Strip are required but must be ordered separetely.
58A	2 No. 3	1 No. 16 1 No. 29B 1 No. 48B	2 No. 1 2 No. 2	2 No. 11 C (7 amp.)	—	High potential and abnormal currents.
58AP	—	1 No. 16 1 No. 29B 1 No. 48B	2 No. 26 2 No. 27	2 No. 11 C (7 amp.)	—	High potential and abnormal currents.
60A	2 No. 3	1 No. 49B	2 No. 1 2 No. 2	—	—	Lightning only.
60B	2 No. 10	1 No. 49B	2 No. 19 2 No. 20	—	—	Lightning only.
60AP	—	1 No. 49B	2 No. 26 2 No. 27	—	—	Lightning only.
76AP	—	1 No. 29B	2 No. 26 2 No. 27	—	—	Lightning only; arranged to be used as part of No. 58AP Protector.
87BA	2 No. 3	1 No. 64A	2 No. 1 2 No. 2	—	2 No. 76A	High potentials and sneak currents; switchboard side of distributing frame
89BA	2 No. 3	1 No. 65A	2 No. 1 2 No. 2	—	2 No. 76A	High potentials and sneak currents; line side of distributing frame.

PROTECTOR BLOCKS

No. 1

No. 19

No. 2

No. 20

No. 27

No. 26

All contact and sparking surfaces are ground to close limits in order to ensure operation within a narrow voltage range.

The No. 1 and No. 2 Protector Blocks form a pair that is used with one No. 3 protector mica. Both blocks are made of specially treated carbon, the No. 1 having a plug of fusible metal in its center. The No. 2 Protector Block is grooved on its outside surface to engage with the spring of the protector mounting which holds it in place.

PROTECTOR BLOCKS—*Continued*

The No. 19 and No. 20 Protector Blocks are used with the No. 10 Protector Micas. They are copper blocks, the No. 19 having two pins which fit into the two bushings on the No. 20. This combination has a slightly higher breakdown voltage than that of the carbon block type if the same air gap is used.

Nos. 26 and 27 Type Protector Blocks.—The No. 26 Protector Block is a solid piece of hard non-dusting carbon and is mounted on the ground side of the protector mounting. The No. 27 Protector Block consists of a porcelain frame with a hard carbon insert, which is fastened in place with low temperature fusing cement.

Ordinarily, lightning discharges will cause an arc across the air gap between the carbon insert and the ground block but will not heat them sufficiently to melt the cement used for holding the insert in place. A cross with an electric light or power line, however, will cause a discharge or repeated discharges of such duration that the heating of the carbon insert of the No. 27 block will melt the cement holding it and allow the mounting spring to push it into direct contact with the No. 26 Block, thus grounding the line.

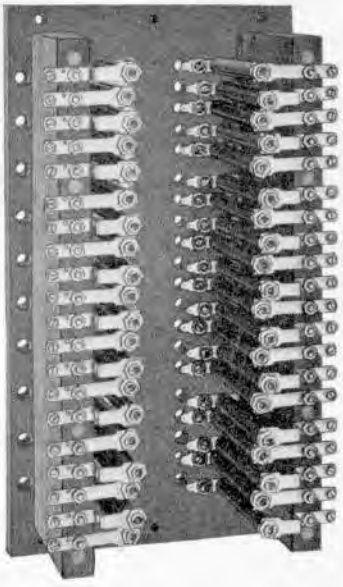
The Nos. 26 and 27 Protector Blocks are interchangeable with the combination of Nos. 1 and 2 Protector Blocks and No. 3 Protector Mica, both at subscribers' stations and central offices, and are, therefore, generally available for improving protective equipment.

The No. 30 Protector Block is similar to the No. 27 except that it has a higher breakdown voltage and to distinguish it from the No. 27 the porcelain is colored blue. It is intended for use in cable terminal protectors and to mate with the No. 26 Protector Block.

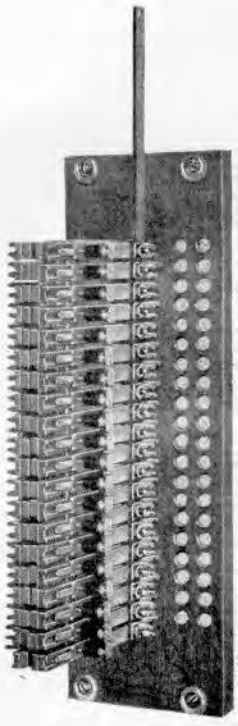
Code No.	Description	Used with Protectors
1	Carbon Block with fuse metal insert	58A, 60A, 87BA, 89BA and Protector Groups No. N1435M and MB.
2	Grooved Carbon Block without fuse metal insert.	
19	Copper Block with two pins which fit into two bushings of the No. 20 Prot. Block.	60B
20	Copper Block with two bushings.	
26	Carbon Block	58AP, 60AP, 76AP and Central Office Protectors.
27	Porcelain Frame with carbon insert	
30	Porcelain Frame with carbon insert	83A and similar types in outside cable terminal boxes. Used in combination with No. 26 Protector Block.

PROTECTOR GROUPS

No. 1435R & Y (R shown) Protector Group



No. 1435U Protector Group



No. N1435 MP Protector Group

The following types of Protector Groups are designed for either central battery or magneto telephone exchange lines and are intended to mount on distributing frames shown on page 32.

PROTECTOR GROUPS—*Continued*

Code No.	For Protecting	Consisting of
1435U	20 metallic lines against abnormal current. Arranged for line side of distributing frame.	40 No. 7A fuses mounted on a base which also serves as a fanning strip. Shipping weight, 15 lbs.
N1435MP	20 metallic lines against high potential and sneak currents. Arranged for switchboard side of distributing frame.	20 No. 64A Protector Mountings equipped with Nos. 26 and 27 Protector Blocks and No. 76A Heat Coils, mounted on a base which serves as a fanning strip. Shipping weight, 15 lbs.
N1435MBP	20 metallic lines against high potential and sneak currents Arranged for line side of distributing frame.	20 No. 65A Protector Mountings equipped with Nos. 26 and 27 Protector Blocks and No. 76A Heat Coils, mounted on a base which serves as a fanning strip. Shipping weight, 15 lbs.
1435R	25 metallic lines where fuse protection is unnecessary. Arranged for line side of distributing frame.	A terminal strip only, mounted on a base which serves as a fanning strip. Shipping weight, 2 lbs.
1435Y	20 metallic lines where fuse protection is unnecessary. Arranged for line side of distributing frame.	A terminal strip only, mounted on a base which serves as a fanning strip. Shipping weight, 2 lbs.

PROTECTOR MICAS

No. 3 Protector Mica

No. 10 Protector Mica

Protector Micas are made of selected mica of a uniform thickness. Mica is used because of its incombustibility; also it is non-hygroscopic and a good insulator. They are placed between the protector blocks to secure the necessary air gap.

Code No.	Used with Protector Blocks No.	Used with Protectors No.
3	1 and 2	58A, 60A,
10	19 and 20	60B

PROTECTOR MOUNTINGS

No. 83A Protector Mounting

Code No.	Description
N2	Used in N17 Cable Terminals. Arranged for mounting 26 N7A Protectors, which will also mount No. 17 Protector for protection against lightning.
15 Type	—Consists of two pairs of clips mounted on a hard rubber block and arranged for holding protector blocks on $\frac{11}{16}$-inch centers. Forms part of No. 17 Type Protector.
48B	An impregnated asbestos pad 8 x 4$\frac{3}{8}$ inches for use with the No. 58 Type Protectors. See Protectors.
64A	For use in mounting protective apparatus to form the No. 87BA Protectors. Mounted on $\frac{1}{2}$" centers and available in strips of 20. See also Protector Groups.
65 Type	— For use in mounting protective apparatus to form the No. 89BA Protectors. Mounted on $\frac{1}{2}$" centers and available in strips of 10, 20, 21, 22 and 23. See also Protector Groups.

Code No.	Description
83A	Designed to protect drop wires between the overhead lines and the subscriber's telephone set from lightning. This Protector Mounting consists of an iron box approximately 8$\frac{3}{4}$ x 3$\frac{1}{2}$ x 2$\frac{1}{2}$ inches, with a hinged cover having a No. 84A Protector Mounting within it. Arranged for pole mounting. Intended to be equipped with Nos. 26 and 30 Protector Blocks for cable protection for five pairs of wires. The box mounts directly underneath the crossarms on the poles. Two mounting lugs are provided for this purpose.
84A	Part of No. 83A. Consists of L shaped metal base and ground plate on which is mounted a porcelain terminal block and springs for holding Protector Blocks.
84B	Terminal block and springs for use as a replacement in the No. 84A Protector Mounting. Furnished with mounting screws and washers.

RADIO INTERFERENCE SUPPRESSION FILTERS

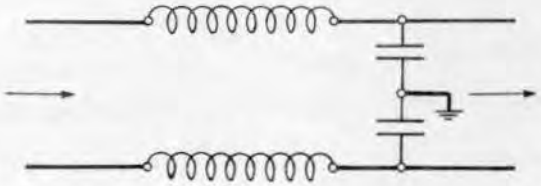
Central Offices

The signalling operations involved in central offices may, under some conditions, cause interference with radio reception in both the long and short wave bands. Such interference is caused by currents which undergo abrupt changes and, in consequence, contain some harmonic components which are within the radio frequency range. These radio frequency components may travel for some distance along the telephone circuits and may induce interference currents in nearby radio receivers and their aerial equipment. Naturally, one source of interference is that of telephone interrupters and ringing machines. In order to reduce this interference to less objectionable proportions, consideration should be given to obtaining a maximum separation between the radio aerial equipment and ground lead, and the telephone circuits. When such precaution is inadequate, the apparatus recommended below should be installed, and as near as possible to the source of the interfering currents.

The fundamental method involved in the suppression of radio frequency induction consists of providing, near the source, very low impedance shunt paths and relatively high impedance series paths, so as to prevent the currents from travelling any considerable distance from their source. The schematic of this circuit arrangement is shown below.

The low impedance paths are furnished by condensers. For the series impedances, retardation coils are used.

It is important to note that the tendency of apparatus to cause radio frequency induction is likely to be accentuated if it is out of adjustment or repair. The first step in investigating any case of radio interference, therefore, is to ensure that the equipment is in normal operating condition. It is important, also, that suppression measures be mounted as closely as possible to the sources of interference, with the connecting leads as short as possible. Furthermore, leads connected to the output side of the suppression apparatus should be isolated as much as possible from the leads connected to the input side of this apparatus, so as to avoid any tendency of the radio frequency currents to by-pass the suppression apparatus.



Filter Circuit

In the case of No. 84 type Interrupters, the following apparatus is recommended.

In general, the same apparatus and methods of use are equally suitable for use with approved Telephone Ringing Apparatus of various types, treating each ringing, tone or other interrupted current lead as a source of interference and equipping each with condensers and retardation coils.

No. 116A Retardation Coil. For description see page 66.
No 184A Retardation Coil. For description see page 66.
No. 141H Condenser. For description see page 18.

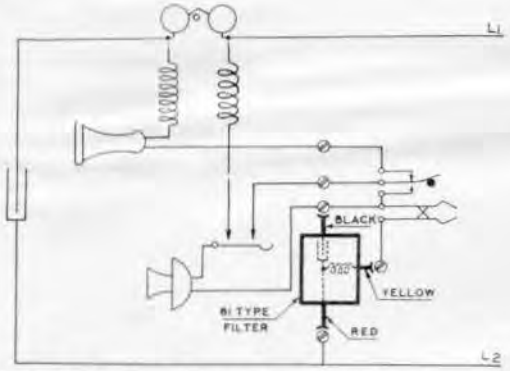
Subscribers' Telephone Sets

No. N61B Filter for mounting in N50 Type Desk Stands.

Another source of interference is the dial of automatic telephone sets. The induction into the radio receiving sets is caused both on the make and the break of the pulsing springs during operation of the dial. The current interruptions, together with the distributed inductance and capacitance of the station equipment, sets up an oscillatory current having radio-frequency components.

The No. 61 type Filter is designed for use in dial equipped telephone sets to reduce the flow of radio frequency currents caused by the dial impulses, thus reducing the dial interference with radio reception to a minimum.

The filter is a combination of inductance, capacity, and effective resistance. It is housed in a metal container, the dimensions of which are approximately $1\frac{5}{8}$" x $1\frac{1}{16}$" x $\frac{15}{32}$".



Typical Telephone Circuit showing Filter Connections.

The code numbers of suitable filters designed to mount in apparatus of our manufacture are listed below. When ordering, specify the code number of the telephone set for which the filters are required, and also the type of dial used, so that we may include the correct mounting details.

Code No.	Used With
61A	N1293 Type Telephone Sets and No. 1 and No. 2 Type Uniphones.
N61B	N1050 Type Desk Stands.
61F	No. 50 Type Coin Collectors.
61N	No. 102 Type Hand Telephone Sets.
61M	No. 3-3 Uniphone.

RECEIVERS

Central Battery and Local Battery Service for Wall Telephones and Desk Stands

No. 144 Receiver

Nos. 143, 143AX, 144 and 144AX.—These are Hand Receivers for use with telephone sets, desk stands, transmitter arms, etc. The bipolar permanent magnet is made of magnet steel especially prepared to make it efficient and lasting in its magnetic qualities. The pole pieces are constructed of annealed magnetic iron and the permanent magnets and spool cores are welded, producing a highly efficient magnetic circuit.

These Receivers will operate our 143 Type Switch Hooks and the switch hooks of our standard desk stands. Equipped with binding posts that will take either pin (No. 29 Type) or flat (No. 62 Type) Cord Tips.

All of these Receivers are identical electrically. Differences exist only in the shell, cap, and lock ring as stated below.

No. 143 Receiver has composition shell and cap.

No. 144 Receiver has hard-rubber shell and cap.

No. 143AX Receiver has composition shell, reinforced cap and lock ring.

No. 144AX Receiver has hard-rubber shell, reinforced cap and lock ring.

The Receiver Cord is not included in the code number and must be ordered separately.

Operators' Telephone Receivers

No. 528 Receiver

No. N151—This is a Single Receiver equipped with a steel head band, for use at operators' positions. D.C. resistance 70 ohms.

No. 525.—This is a high efficiency, green finished metal case Receiver provided with a No. 11A head band. Intended for use by supervisors. Also used in No. 1A public news telephone service sets. Impedance at 800 cycles is approximately 2,000 ohms.

No. 528.—This is a high efficiency Receiver designed for use by telephone operators at magneto and central battery switchboards. Includes a No. 11A head band. Due to the increased sensitiveness of this receiver it should, for magneto switchboard use, be employed in circuits with the No. 63 induction coil. D.C. resistance 56 ohms. Impedance at 800 cycles is approximately 260 ohms.

RECEIVERS—*Continued*

Hand Set and Test Set Receivers

Code No.	D.C. Resistance Ohms	Finish	Used with
131	71	Black	No. 1001 Type Hand Sets
141	70	Nickel Plated	No. 1002 Type Hand Sets
515	45	Black	No. 1017 Type Test Sets
557B3	30	Black	"E" Type Hand Sets

Receiver Units

Code No.	Used with	D.C. Resistance Ohms
D-96337	Uniphones	30

Replacement Parts

Receiver No.	Receiver Shell	Cap	Lock Ring	Diaphragm
131	P-98956	P-81496	P-98439	P-81525
141	P-90143	P-88295	P-88293	P-95114
143	PP-6200	PP-6199	—	PP-1154
143AX	PP-6200	P-236712	P-236713	PP-1154
144	PP-9312	PP-9313	—	PP-1154
144AX	PP-9312	P-236712	P-236713	PP-1154
N151	PP-4411	PP-4412	—	PP-1784
515	P-215905	P-94545	—	P-95225
525	PP-28767	PP-19988	—	PP-12076
528	PP-12077	PP-19988	—	PP-12076
557B3	—	PP-20490	PP-20491	PP-12076

RELAYS

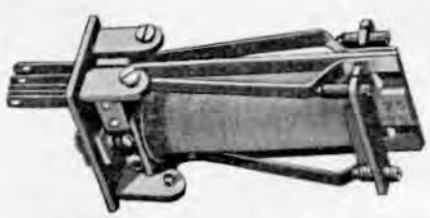
In central battery manual and automatic systems the Relay is an essential and important piece of telephone equipment. The correct design of this apparatus not only materially affects the quality of service rendered by the telephone plant, but also the cost of operation. Relays must of necessity meet many different operating requirements. Space is too limited here, but to describe very briefly a few of the types available. Further details of relays suitable for any particular requirement will be furnished on request.

"E" Type Relays on 737B Mounting Plate
(Cover not shown)

Flat Type Relays

Installation, operation and maintenance costs are reduced by using standardized forms of parts wherever possible. In the flat type relay, a form of construction has been standardized which lends itself readily to a great variety of coil windings and contact arrangements, thus providing a type of relay ideally suited to a multiplicity of applications. The "AB", "B", "E", "G", "H", and "R" series of relays described below are all flat type relays.

"AB", "E", "H" and "R" Type Relays



"B" and "G" Type Relays with Cover Removed

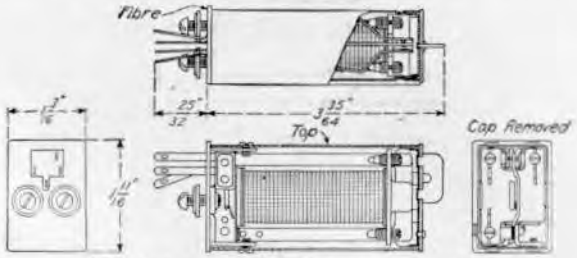
"AB" Type Relays

"AB" type relays are used generally as line and cut-off relays. They mount on ¾" or ⅞" horizontal and on 1¾" vertical centers and are intended to mount on plates provided with dustproof covers.

RELAYS—*Continued*

"B" and "G" Type Relays

"B" and "G" type relays are provided with a micrometer screw adjustment feature which permits extremely accurate adjustments to be made. They are used where a sensitive, highly efficient relay is required, such as for cord circuit supervisory relays. Each relay is provided with an individual cover having a removable cap which may be placed in position without affecting the adjustment of the relay. The "G" type relay differs from the "B" type in that it is designed to have a high impedance at talking frequencies. Both types mount on 1¼" horizontal and 1¾" vertical centers.



'B' ALSO GENERAL DESIGN & DIMENSIONS OF 'B' TYPE

"E", "H" and "R" Type Relays

These types are designed to serve as heavy duty general purpose telephone relays. They may be equipped with two sets of contacts, which do not need to be the same as to contact arrangement. They are designed to mount in groups on punched type mounting plates with a common dustproof cover, on ¾" or 1" horizontal and 1¾" vertical centers. Where an individual dustproof cover is required for each relay, the E1 relay cover should be ordered. In this case the relay mounts on 1¼" horizontal and 1¾" vertical centers. The "H" type differs from the "E" type in having a high impedance at talking frequencies, and the "R" type differs from the "E" type in the shape of its core which, instead of being rectangular in cross-section, approximates to an ellipse of the same area. This results in a shorter winding for the same number of turns.

RELAY COVERS

Relays equipped with Individual Covers

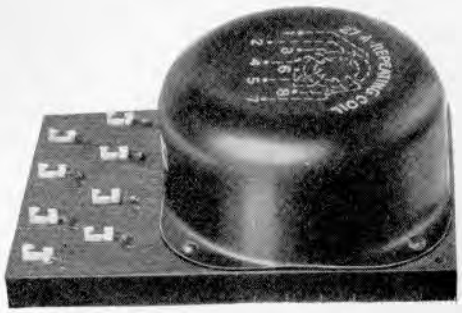
E1, R1 and R2 Relay Covers

These Relay Covers are individual dust covers for "E" and "R" Type Relays when used on mounting plates without the regular mounting plate cover. Have an aluminum finish and are furnished with a support which attaches to the relay and holds the cover in place. Centers on which these relays will mount when equipped with covers are 1¼" or 1⅜" horizontal and 1¾" vertical.

E2 and R3 Relay Covers

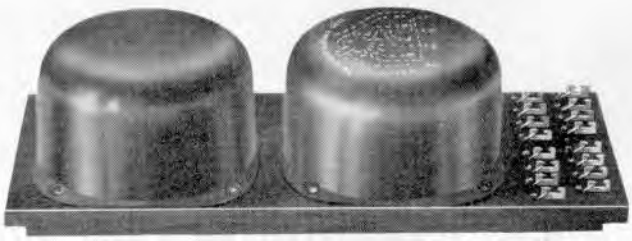
These Relay Covers are for use where a cross-talk proof cover is required. They have a removable cap, which when removed gives access to the contacts for examination, otherwise same as E1, R1 and R2 Relay Covers

REPEATING COILS



No. 27 Type Repeating Coil

Northern Electric Repeating Coils represent the highest development in the science of Repeating Coil design and manufacture. The cores of our Repeating Coils form a complete magnetic circuit thereby giving the highest possible transmission efficiency to voice currents. The coils are covered with an iron shell to prevent "crosstalk" and mechanical injury. This shell is filled with a special compound that produces a high insulation resistance and renders the coil impervious to moisture.



No. 76-A—Repeating Coil

The No. 25, 26 and 27 Types are used in magneto cord circuits to separate physically and couple inductively a grounded or common return telephone line with a full metallic line, thereby preventing circuit unbalance with resulting noise and loss of circuit efficiency. They are also used in central battery cord circuits.

Nos. 76A and 77A Repeating Coils are used for terminating phantom circuits.

Code No.	No. of Coils	No. of Windings Each Coil	Winding Resistances Ohms Primary	Winding Resistances Ohms Secondary	Impedance Ratio	Dimensions Wood Base	Shipping Weight
25A	2	4	2 of 21	2 of 21	1 to 1	10¾ x 4	7 lbs
26A	1	4	2 of 21	2 of 21	1 to 1	10¾ x 4	4 lbs
27A	1	4	2 of 21	2 of 21	1 to 1	6 x 4	4 lbs
76A	2	4	2 of 20	2 of 21	1 to 1	10¾ x 4	7 lbs
77A	1	4	2 of 20	2 of 21	1 to 1	6 x 4	4 lbs

RESISTANCES

Resistances enter into the equipment of magneto switchboards only to a limited extent, but much use is made of them in central battery and automatic systems.

It is not practicable to describe here all the different types of resistances that we manufacture but we shall be glad to discuss any particular problems on request and to make suitable recommendations. Three of our most widely used types are the No. 1, 18 and 19 types. These are described below and a few representative resistances of each type are listed.

No. 1 Type Resistance

No. 18 Type Resistance

No. 19 Type Resistance

No. 1 Type

These resistances are small compact spool type units having one winding. They are mounted by means of a round head brass machine screw passing through the core. The overall dimensions are: diameter ½", length 1¼". Each resistance will dissipate 1¼ watts without overheating.

Code No.	Resistance Ohms
1L	100
1W	2000
1AE	14.0
1AF	22.0
1AG	1000
1AK	2.4
1AL	1
1DC	250
1DE	190
1DF	337

No. 18 Type

Resistances of the No. 18 Type have a micanite core upon which a single winding is placed. The winding is protected by a covering of sheet mica. The ends of the winding are soldered to tinned terminal posts which are also used for mounting the unit. Each terminal post is provided with two fibre washers and a hexagonal nut.

The overall dimensions are: length $4\frac{21}{32}$", width $1\frac{31}{64}$", thickness $\frac{3}{8}$" and may be mounted on $\frac{3}{16}$" horizontal centers.

The resistance values do not vary more than plus or minus 5 per cent from those rated in the table below. Each resistance will dissipate six watts continuously without injury from heating.

The mounting plates listed elsewhere under the heading of "Mounting Plates", provide for assembling these resistances in compact groups and when so mounted the terminals are conveniently located for making soldered connections.

Code No.	Resistance Ohms
18A	37
18B	40
18C	83
18D	120
18E	140
18F	150
18G	200
18H	210
18J	30
18K	80
18L	170
18M	53
18N	180
18P	130
18R	10
18S	20
18T	50
18U	100
18AC	500
18AD	240
18AE	600
18AF	300
18AJ	400
18AK	60
18AL	4
18AM	250
18AN	350
18AT	1600
18AY	2.4
18BA	2000
18BH	1000
18BJ	1200
18BL	750
18CJ	5
18CK	440
18CN	800
18EF	2500

No. 19 Type

These resistances are similar in construction to the No. 18 Type. They differ from the No. 18 Type in that two windings are provided and one end of each winding is soldered to a center terminal. The two outside terminals are used as mounting posts.

Code No.	Resistance Ohms
19A	37 and 37
19B	40 and 40
19C	40 and 83
19D	83 and 83
19H	40 and 120
19K	100 and 100
19S	60 and 90
19T	25 and 25
19Z	120 and 120
19AJ	200 and 200
19AM	50 and 50
19EB	20 and 330
19EC	650 and 1600

RETARDATION COILS

No. 46P Retardation Coil

Space does not permit us to describe here all our types of Retardation Coils but we shall be glad to provide information on other types upon request.

The No. 46P and No. 47P are designed for use in line circuits of magneto switchboards terminating rural lines which are equipped with telephones using the five-spring selective push button. They each have two windings of approximately 500 ohms per winding. The No. 46P is used for mounting singly on a wooden base, and the No. 47P for mounting on a mounting plate.

No. 116A Retardation Coil

The No. 116A Retardation Coil is intended for use in radio frequency suppression circuits described under Radio Filters on page 60 of this catalogue. It has a resistance of approximately 2.6 ohms, an inductance of approximately 3 millihenrys and a current rating of 1 ampere. The diameter of the coil is $2\frac{3}{8}$" with an overall thickness of $1\frac{5}{16}$".

No. 184A is used for the same purpose as the 116A. It consists of two separate windings wound on a wooden spool and mounted in a metal container, the inductance of each coil being about 1 millihenry and the current rating, 1 ampere. When the current requirements are greater than this, two or more coils, as required, should be connected in parallel.

The dimensions of the retardation coil, exclusive of its terminals, are $3\frac{1}{2}$" x $1\frac{5}{8}$" x $1\frac{13}{32}$". It is designed for mounting on $1\frac{3}{4}$" mounting plates, on minimum horizontal centres of $1\frac{5}{8}$". When it is not feasible to mount this retardation coil on a mounting plate, two No. 24A brackets may be used.

RINGERS

All Northern Electric telephone sets are equipped with high efficiency Ringers which are designed to give maximum ringing efficiency and at the same time offer high impedance to voice currents.

No. 38 Ringer

The Ringers of all telephones on a line should have a similar resistance, otherwise some of them may not ring. The selection of the proper type of Ringer should be made as indicated under Telephone Sets.

RINGERS—*Continued*

No. 38 Type

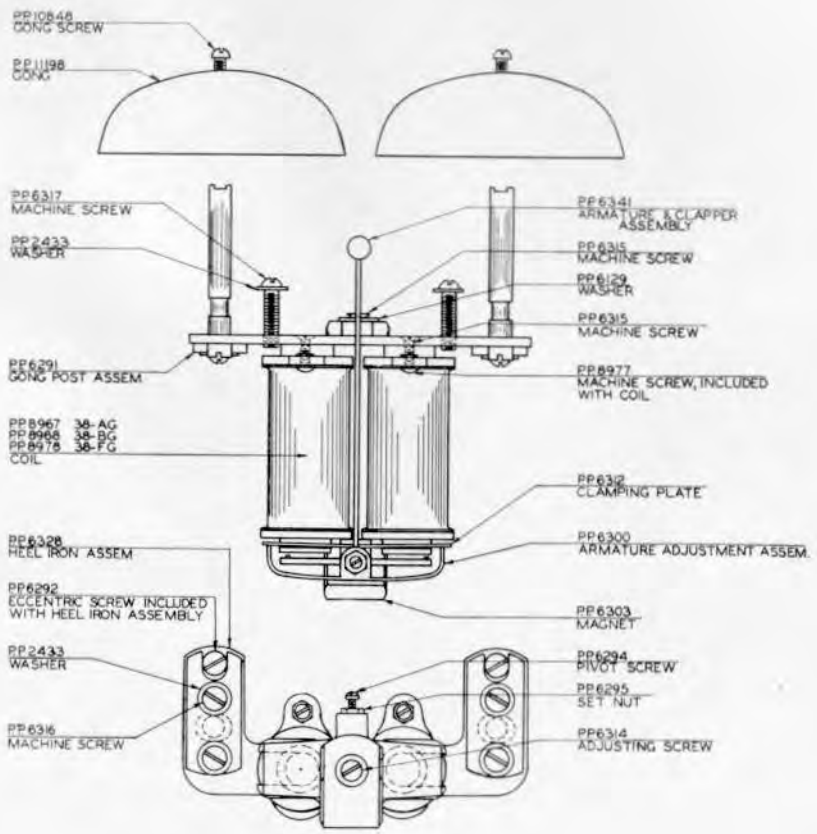
These Ringers are equipped with 3-inch brass gongs, black finished, together with the necessary gong mountings. They are not equipped with biasing springs and are suitable only for use with alternating current.

Adjustment can be easily made when required. The adjustment of the armature is made by means of a single screw and adjustment of each of the gongs by three screws, two for clamping the gong posts in position and one (an eccentric) for changing their position. A screw-driver is the only tool required in making these adjustments.

Code No.	Resistance Ohms	Gong Posts
38AG	1000	Mounts on $\frac{5}{8}$" woodwork
38BG	2500	Mounts on $\frac{5}{8}$" woodwork
38FG	1600	Mounts on $\frac{5}{8}$" woodwork

In the Ringers listed above the standard gong equipment is denoted by the letter "G." If gongs are not required omit the letter "G" from the code number when ordering.

Replacement Parts for No. 38 Type Ringers



Nos. 8 and 78 Types

The Nos. 8 and 78 Type Ringers are for use in central battery subscribers' sets.

The No. 8 Type is primarily for use in wooden subscribers' sets and is arranged for 2½ inch, black finished, brass gongs.

The No. 78 Type is primarily for use in No. 584 and No. 684 Type subscribers' set and is arranged for Nos. 36, 37 and similar type gongs.

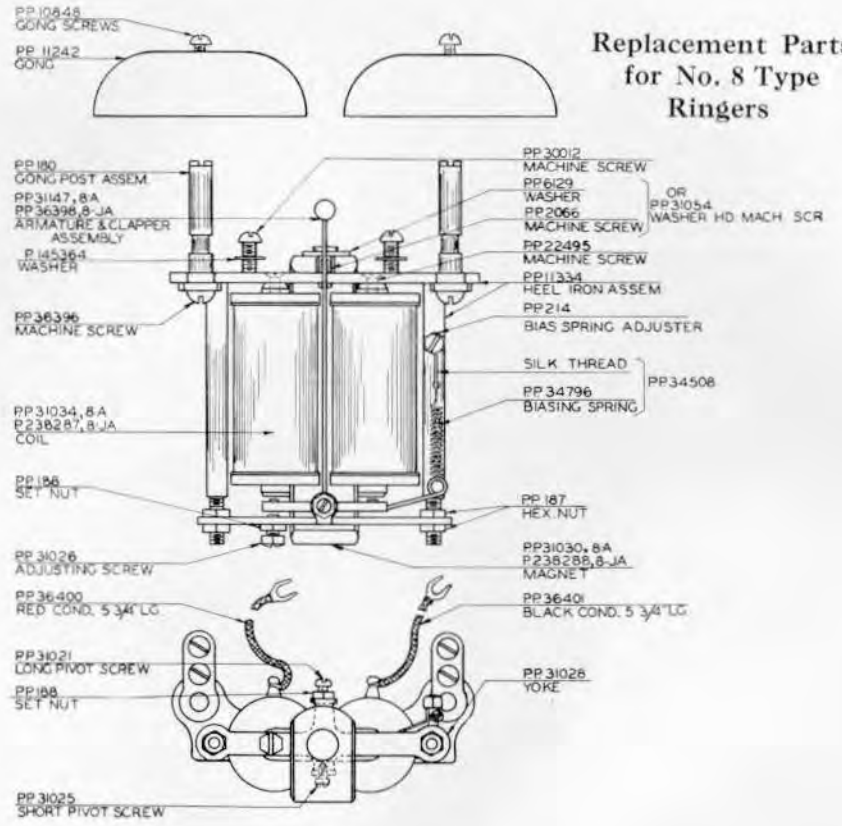
The No. 8 and 78 Type Ringers listed are equipped with biasing springs. No gongs are included.

Code No.	Resistance Ohms	Gong Posts
8A	1500	Mounts on $\frac{3}{8}$" woodwork
* 8JA	4300	Mounts on $\frac{3}{8}$" woodwork
78A	1500	—
*78JA	4300	—

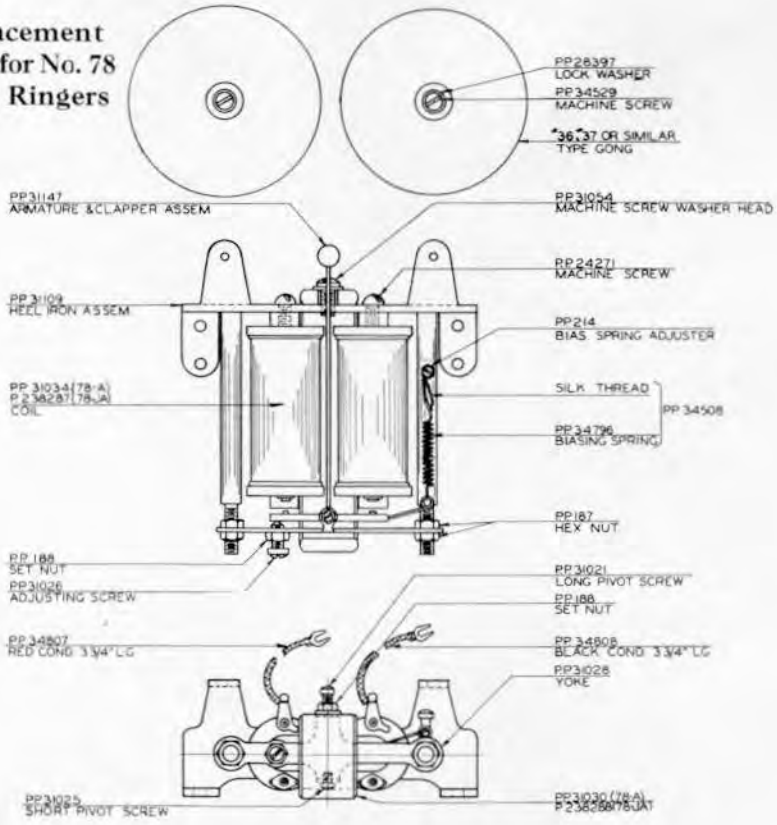
*Used where a high impedance ringer is required.

RINGERS—*Continued*

Replacement Parts for No. 8 Type Ringers



Replacement Parts for No. 78 Type Ringers



RINGING MACHINES

The Ringing Machine illustrated is a compact unit particularly suited for small central office use. It is designed to operate from sixty cycle alternating current supply with an average input of 65 watts.

Since the generator is of the inductor type, collector rings and brushes are completely eliminated thus reducing the amount of maintenance required to merely cleaning and oiling once a year. The output is 15 watts at 80 volts, 19 cycles.

An additional feature of this ringing machine is that it supplies a tone for "audible ringing" without the addition of a pulsating attachment, the tone being generated as a high frequency component of the regular ringing voltage wave.

Packed shipping weight 62 lbs.

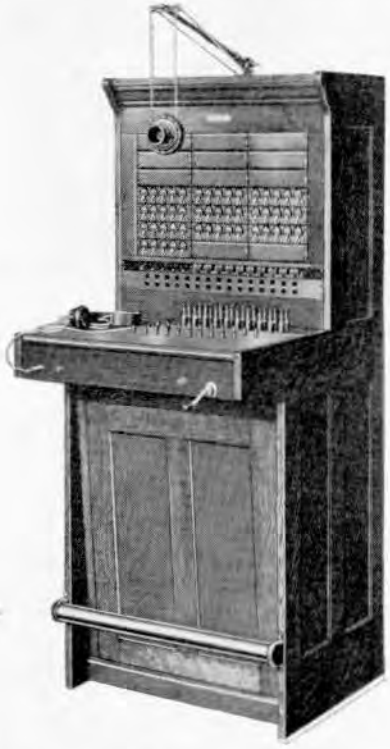
MG125 Magneto Ringing Set

MAGNETO SWITCHBOARDS

Only the smaller Switchboards are mentioned; the larger central offices must of necessity be designed to care for the individual requirements of each Exchange area and Northern Electric engineers are equipped to make studies and recommend correct central office equipment for any locality. If the Switchboards described in this catalogue do not meet your requirements, communicate with us and we will gladly advise you.

Northern Electric Switchboards have been the recognized standard of the leading telephone companies since their inception and have satisfactorily met every operating condition. The lumber used in their construction is thoroughly seasoned and kiln dried, which prevents warping and cracking. The exterior surface is given a golden oak finish and the interior an ample coat of shellac to completely fill all pores. All boards are equipped with a standard transmitter, head receiver, hand generator and night alarm, and all keys, cords, plugs, jacks, signals, etc., are standard apparatus, the same as used in the largest Exchange Switchboards. Northern Electric Switchboards are free from "crosstalk", all signal and drop windings being enclosed in soft Norway iron shells and all wiring being with twisted pair wire.

No. 1220 and No. 1240 Switchboards



No. 1220 Switchboard: 50 Lines and 10-Cord Circuits Equipped

MAGNETO SWITCHBOARDS—*Continued*

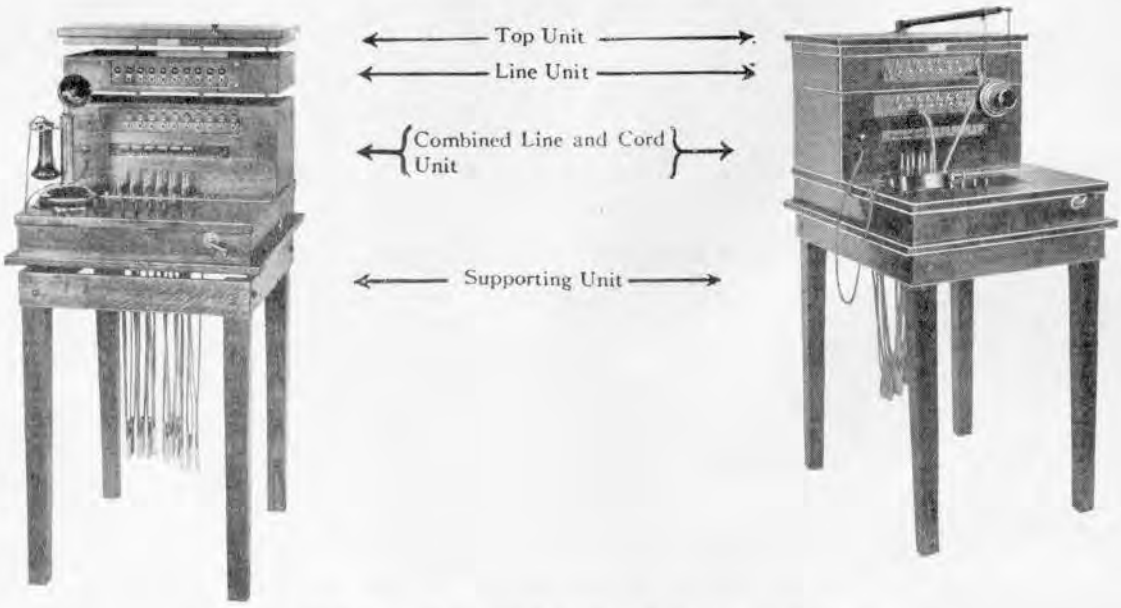
No. 1220 and No. 1240 Switchboards—*Continued*

These Switchboards are designed for the medium sized magneto office. The smaller board—the No. 1220—has an ultimate capacity of 105 lines, and the larger—No. 1240—a capacity of 165 lines, and are equipped as required.

The apparatus on the face of the Switchboard is supported by a rigid steel framework, to which it is fastened with machine screws. The plug shelf is covered with $\frac{3}{16}$" semi-hard rubber, affording protection to the woodwork from the impact of falling plugs when a connection is taken down by the operator. All the Switchboards are fitted with removable rear doors. The combined jacks and signals furnished with these boards are of the shutter type and on account of the exacting requirements made on them, are the most important pieces of apparatus in the Switchboard. When the signal is operated by a ring on the line, the shutter falls and in this way attracts the operator's attention. When a plug is inserted in the associated jack to answer the call, the shutter is automatically restored to its normal closed position.

These Switchboards have a capacity of 15 pairs of cords per position, and are equipped with as many as specified.

No. 1800 Sectional Unit Type



No. 1800 Type Sectional Switchboard showing method of assembling various units

This is an equipment for small, growing Telephone Offices having a maximum capacity of 30 lines. You buy as much equipment as your present needs require, and by adding units the Switchboard grows with your business. These units are easily assembled into a complete Switchboard, which presents a compact and serviceable appearance and can be arranged to meet any service conditions. Line units can be added at any time; in fact, the sections are built up like a sectional bookcase. All the apparatus and terminals associated with operator's cord and telephone circuits are mounted in the cord unit.

The circuits used are very simple, and a complete set of circuit and equipment blueprints is furnished with each Switchboard. The back of each unit is hinged and when open the wiring and equipment are easily accessible.

Units are shown with both ball and shutter type combined jacks and signals, but all new equipments should be of the shutter type. Ball type units can be supplied as extensions to equipments already using this type.

This Switchboard may be furnished with either a desk telephone, or with a suspended transmitter and arm, as shown.

MAGNETO SWITCHBOARDS—*Continued*

No. N1317 Switchboard

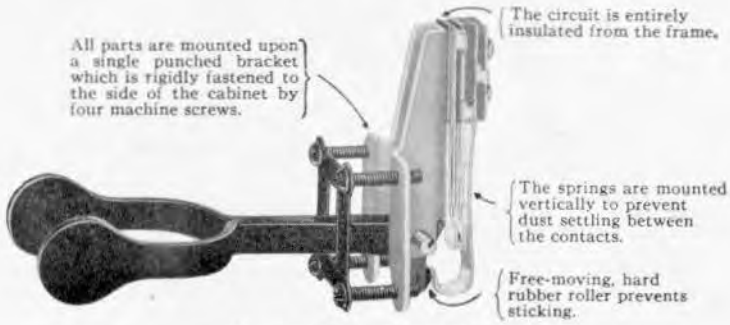
No. N1317A Wall Type Switchboard—showing 10 Lines and 5 Cords equipped

This is the most compact Switchboard equipment we furnish, even the necessary dry batteries being inclosed in the cabinet. The woodwork is of quarter sawn oak of substantial construction and dark golden finish. This is an ideal equipment where only a few lines enter an office, as all parts are accessible and it has the essential operating features of the larger Switchboards.

The No. N1317A Switchboard is intended for original installations of fifteen lines or less. It has a capacity of fifteen lines and five pairs of cords arranged for two-way ringing. One of the five cords may be equipped with a repeating coil if desired.

Should the office grow beyond the capacity of the original installation, an extension known as the No. N1317B Switchboard may be installed besides the original unit. The capacity of the No. N1317B extension Switchboard is twenty-five lines and five pairs of cords, arranged for two-way ringing.

SWITCH HOOK



No. 143 Type Switch Hook
(Showing hook depressed for purposes of illustration.)

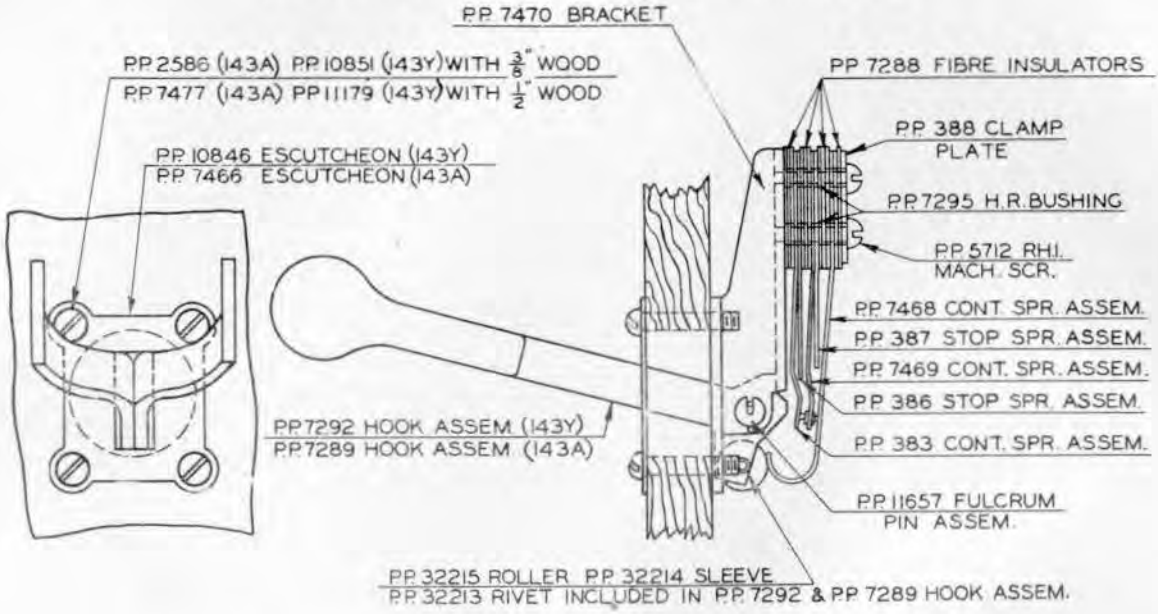
The No. 143 Type Switch Hooks are simple in construction, compact and self-contained. All the parts are mounted upon a single punched bracket which is fastened to the inner side of the cabinet. This bracket is made of extremely rigid steel, and it is protected against rust by an electro-galvanized finish.

SWITCH HOOK—*Continued*

The Switch Hook lever is made of brass with a nickel or black finish and is designed to withstand rough usage. Mechanical contact is made between the lever and the operating spring by a hard rubber roller. The lever pivots on a fulcrum pin which is normally locked in position by a retaining spring. The movement of the lever is limited by stops, in order to prevent damage to the springs. The springs are made of nickel silver and are backed up with brass stop springs. They are mounted vertically to prevent dust settling upon them.

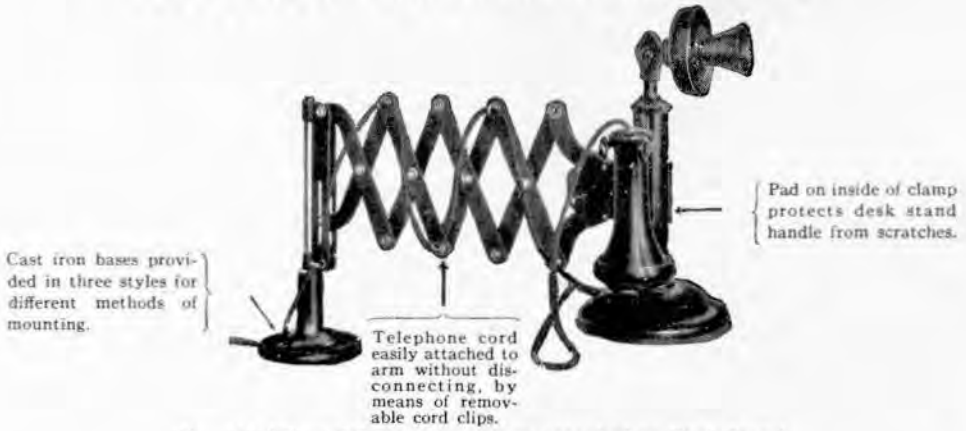
The No. 143 Type Switch Hook is designed for use with No. 143 and No. 144 Receivers.

143A and 143Y Switch Hook Replacement Parts



NOTE: IF COMPLETE BRACKET AND SPRING ASSEMBLY IS REQUIRED ORDER AS
P.P. 17580 FOR NO. (143A)
P.P. 7467 FOR NO. (143Y)

TELEPHONE ARMS FOR DESK STANDS



No. 147-AC or CC Telephone Arm, attached to Desk Stand which is not included in code number

When a Desk Telephone is used by two or more persons, the Telephone Arm is a great convenience and, in some cases, almost indispensable.

We can supply these Telephone Arms finished in black and having an extended length of either 24 inches or 36 inches as required.

Note.—The Telephone Arm does not include a Desk Stand.

Code No.	Method of Mounting	Length Closed	Length Extended
147-AA	Side of roll top desk	8¼ inches	24 inches
147-AB	Wall or side of flat top desk	8¼ inches	24 inches
147-AC	Top of flat top desk	8¼ inches	24 inches
147-CA	Side of roll top desk	10 inches	36 inches
147-CB	Wall or side of flat top desk	10 inches	36 inches
147-CC	Top of flat top desk	10 inches	36 inches

TELEPHONE SETS

N1317 Magneto Type

The No. N1317 Type Wall Telephone sets a standard in Magneto Telephone design and construction. High efficiency, reliability, and long life have been thoroughly proven by the many thousands in service.

No. N1317AP Wall Telephone Set

The cabinets of these Telephone Sets are strongly constructed of carefully selected quarter sawn oak and are given a durable attractive finish with a high grade varnish, rubbed down by hand. Unexposed surfaces of the Telephone are also given a protective finish, to prevent warping. The metal parts are given an extremely durable and pleasing black finish.

The door of the cabinet is hinged at the left, so that when open for inspection or adjustment, the ringer and generator can be seen while the generator crank is being turned. Also, by arranging the door to open towards the left, there is no danger of the door striking the generator crank and disfiguring the woodwork. The door is held closed by one self-centering screw lock.

A feature of these sets is the location of the main terminals inside the cabinet, thus preventing trouble from tampering with the connections or accidentally short circuiting the set. All terminals have screw connections and all permanent connections are soldered. A complete and explanatory wiring diagram is furnished with each Telephone.

These Telephones are carefully adjusted in the factory and are satisfactory for service as received by the customer, unless unusual service conditions should be encountered, in which case only the ringer will require readjustment; this is a very simple matter and instructions furnished on the wiring diagram are so clear that no difficulty will be encountered. These sets are very easy to install and may be installed at isolated points where skilled telephone men are not available, a screw-driver being the only tool required.

Our Magneto Telephones are designed to faithfully reproduce the natural tones of the speaker's voice on long or short lines. This is accomplished by means of highly efficient apparatus, which is the result of many years of engineering research and practical operation.

These Telephones, by means of their large gongs and efficient ringers, give a loud and distinct ring, which responds clearly to all code calls. Their powerful generators will enable you to ring other bells clearly under the most severe conditions.

The various parts of these Telephones are connected by a cable consisting of flexible conductors, highly insulated and moisture-proofed, each designated by a color and protected at points of wear.

TELEPHONE SETS—*Continued*

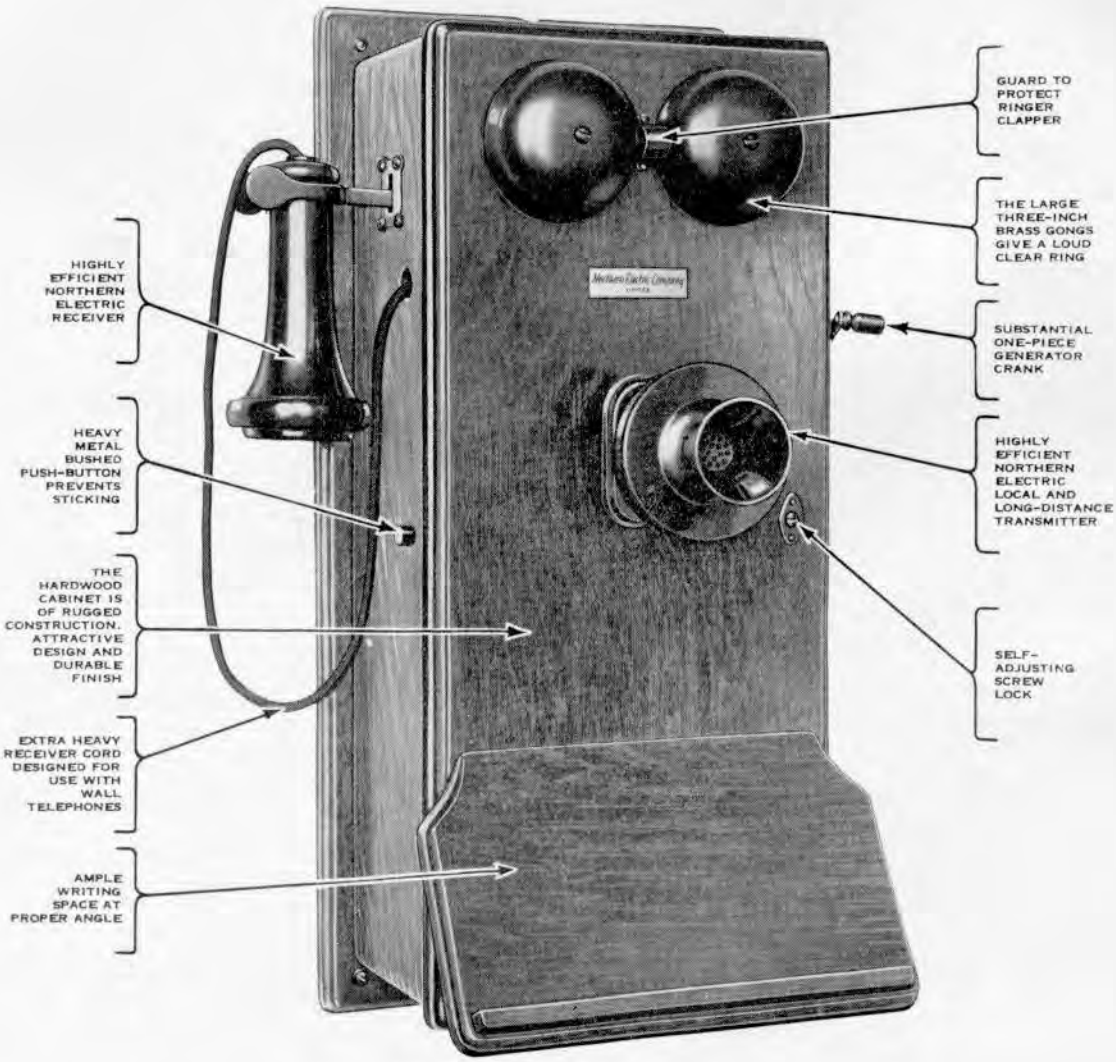
Before shipment from the factory, each telephone is completely assembled and carefully packed in an individual packing case. This method of packing greatly simplifies handling and installing.

Details and components of individual N1317 Type Telephone Sets are listed under Selection of Telephone Sets—Magneto Service.

Anti-Sidetone Magneto Telephone Sets

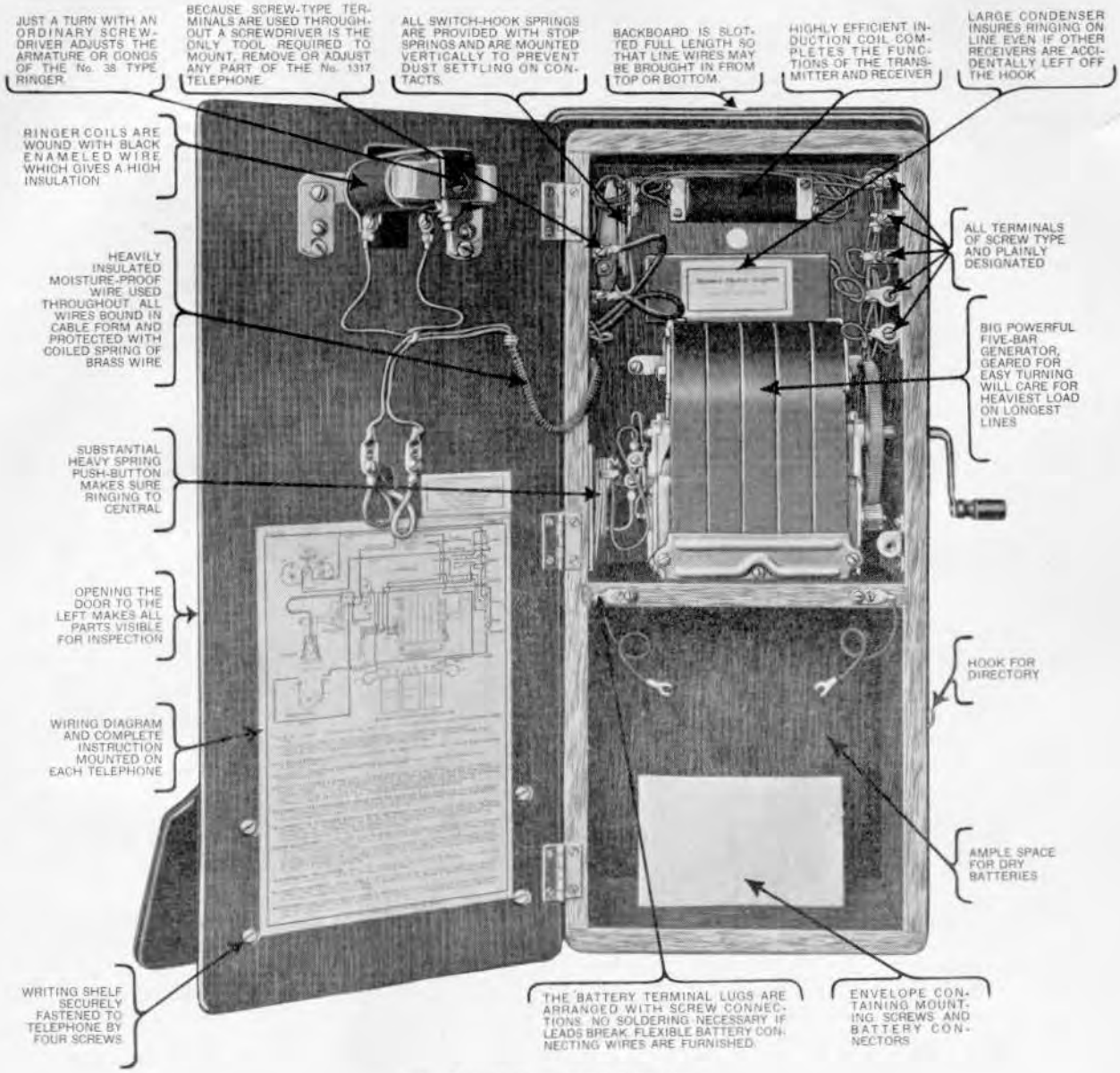
Anti-sidetone Magneto Telephone Sets are similar to the foregoing magneto telephone sets. They differ in that a No. 113-D Induction Coil is employed instead of the No. 13 Induction Coil, also changes in wiring.

Depending upon the impedance of the line to which they are connected they may require a No. 63-FB Resistance or No. 149-D Condenser. The No. 63-FB Resistance is for matching the impedance of the set to long iron wire loops. The No. 149-D Condenser for matching the impedance of the set to long non-loaded cable loops. Without condenser or resistance the set is used for short cable loops, loaded cable loops, short iron wire loops, copper open wire loops and loops consisting of combinations of short lengths of cable with short lengths of iron or copper open wire.



No. N1317 Type Wall Telephone

TELEPHONE SETS—*Continued*



No. N1317 Type Wall Telephone

SELECTION OF TELEPHONE SETS MAGNETO SERVICE

Non-Selective Central Office Signalling (Manual)

Light Load—Rural Lines

Telephone Sets for light load service, where subscribers are called by code ringing. Ten or twelve of these sets may be operated on a twelve or fifteen mile line of No. 12 B.W.G. galvanized iron wire.

Code No.	Type	1,000 Ohm Ringer	3-Bar Generator	Condenser	Key	Shipping Weight
6003B	Desk	38AG	22A	None	None	17 lbs.
N1317AH	Wall	38AG	22A	None	None	22 lbs.

(The No. 6003B Set consists of a No. 1020AL Desk Stand and a No. 315H Desk Set Box.)

Moderate Load—Rural Lines

Telephone Sets for moderate load rural service where subscribers are called by code ringing. Thirty of these sets may be operated on a twenty-mile line of No. 12 B.W.G. galvanized iron wire.

Code No.	Type	1,600 Ohm Ringer	5-Bar Generator	Condenser	Key	Shipping Weight
N1300R	Desk	38FG	48A	N1C	N1E	26 lbs.
N1317N	Wall	38FG	48A	None	None	28 lbs.
N1317R	Wall	38FG	48A	N1C	None	29 lbs.

(The N1300R Set consists of a No. 1020AL Desk Stand and a No. N300R Desk Set Box.)

Heavy Load—Rural Lines

Telephone Sets for heavy load rural service, where subscribers are called by code ringing. Forty of these sets may be operated on a thirty-five mile line of No. 12 B.W.G. galvanized iron wire.

Code No.	Type	2,500 Ohm Ringer	5-Bar Generator	Condenser	Key	Shipping Weight
N1300A	Desk	38BG	48A	None	None	25 lbs.
N1317P	Wall	38BG	48A	None	None	28 lbs.
N1317S	Wall	38BG	48A	N1C	None	29 lbs.

(The N1300A Set consists of a No. 1020AL Desk Stand and a No. N300A Desk Set Box.)

SELECTIVE CENTRAL OFFICE SIGNALLING (Manual)

By means of a Selective Central Office Signalling System a large number of subscribers may be connected on one line, and each subscriber may signal Central Office without ringing the bells of the other parties on the line. This arrangement is known as push-button ringing and may be accomplished by one of two methods.

The first method is by bridging the telephone across the line, using it so that the generator is normally connected to the two sides of the line, but may be switched by the subscriber so that it is bridged between one side of the line and the ground. At the Central Office the signal is connected between one side of the line and ground so that if the subscriber operates the generator in the usual way he will ring the other bells on the line, but if he operates the three-spring push-button key while turning the generator crank he will operate the signal at the Central Office.

The second method, involving Simplex Signalling, is accomplished in so far as the subscriber's operation is concerned, in a similar manner. Telephones such as the No. N1300CG and No. N1317CG arranged for this service are equipped with five-spring push-button keys. When operated this push-button key connects one side of the generator to ground and the other side to both sides of the line, which provides two metallic conductors for the signalling current to Central Office.

Telephones arranged for Simplex Signalling under many conditions, particularly where there is inductive interference from power wires, provide a quiet circuit. They have a further advantage when transposition work is being done on the line in that there is less liability of a subscriber's station being accidentally left so that they cannot signal Central Office.

SELECTIVE CENTRAL OFFICE SIGNALLING (Manual)—*Continued*

Moderate Load—Rural Lines
(Grounded Signalling)

Telephone Sets for moderate load rural service with push button. As many as thirty (30) of these sets may be operated on a twenty (20) mile line of No. 12 B.W.G. galvanized iron wire.

Code No.	Type	1,600 Ohm Ringer	5-Bar Generator	Condenser	Key	Shipping Weight
N1300R	Desk	38FG	48A	N1C	N1E	26 lbs.
N1317F	Wall	38FG	48A	N1C	N1E	29 lbs.

(The No. N1300R Set consists of a No. 1020AL Desk Stand and a No. N300R Desk Set Box.)

Heavy Load—Rural Lines

Telephone Sets for heavy load rural service with push button. Forty of these sets may be operated on a twenty-five (25) mile line of No. 12 B.W.G. galvanized iron wire.

(Grounded Signalling)

Code No.	Type	2,500 Ohm Ringer	5-Bar Generator	Condenser	Key	Shipping Weight
N1300C	Desk	38BG	48A	N1C	N1E	26 lbs.
N1317G	Wall	38BG	48A	N1C	N1E	29 lbs.
N1317E	Wall	38BG	48A	None	N1E	28 lbs.

(Simplex Signalling)

Code No.	Type	2,500 Ohm Ringer	5-Bar Generator	Condenser	Key	Shipping Weight
N1300CG	Desk	38BG	48A	N21F	N1G	26 lbs.
N1317CG	Wall	38BG	48A	N21F	N1G	29 lbs.

(The Nos. N1300C and N1300CG Sets consist in each instance of a No. 1020AL Desk Stand and a No. N300C and No. N300CG Desk Set Box respectively.)

Selective Central Office Signalling (Automatic)

Where the central office equipment is of the automatic type, the rural lines may be so arranged as to permit the rural subscribers to call other lines by means of the dial, and to call other parties on the same line, by using the hand generator. There is a device on the switch hook, known as the switch-hook latch* which prevents one subscriber from unknowingly interrupting the dialing impulses of another subscriber.

*Switch-hook latch furnished only on N1317AP Telephone Set.

Moderate Load—Rural Lines

Code No.	Type	1,600 Ohm Ringer	5-Bar Generator	Condenser	Key	Shipping Weight
N6003B	Desk	38FG	48A	N1C	None	26 lbs.
N1317AP	Wall	38FG	48A	N1C	None	28 lbs.

Heavy Load—Rural Lines

Code No.	Type	2,500 Ohm Ringer	5-Bar Generator	Condenser	Key	Shipping Weight
N6003A	Desk	38BG	48A	N1C	None	26 lbs.

(The Nos. N6003A and N6003B Sets consist in each instance of a No. N1050AP Desk Stand and a No. N300AP and N300BP Desk Telephone Box respectively.)

TELEPHONE SETS—*Continued*

Central Battery Service
Wall Type Telephone Sets

No. N1293 Type Automatic Wall Telephone Set

N1293 Type—These are Wall Type Telephone Sets used for central battery manual and dial service. The cabinets are strongly constructed and given a durable attractive finish to match black walnut. The exposed metalwork is given a black finish. This type, as in the case of our magneto telephones, has all the terminals inside the cabinet; screw connections are used except for the permanent connections which are soldered; also the sets are wired with differently colored wires to facilitate the tracing of connections. All the apparatus used in these sets is of proven quality and is arranged in such a manner that when the door is opened every part of the interior is easily accessible.

The dial or apparatus blank used with the dial sets is not included as a part of the set and must be specified additionally.

We have listed below a few of our Wall Type Telephone Sets, but in cases where you have other requirements we will be glad to recommend a set to meet your requirements.

Code No.	Type	Transmitter	Receiver	Cord
N1293EA	Manual	No. 337	No. 143 or	N549
N1293G	Dial	No. 323	No. 144 as	N549
N1293GP	Dial	No. 323	required	N549

Note:—The No. N1293G and No. N1293GP Telephone Sets are normally used as dial sets. They differ in the arrangement for monting the dial. They may be equipped with an apparatus blank (which is not included in the code number) and used for manual operation until such time as it is desired to operate on a dial basis.

Packed in cartons of 4, weighing 28 lbs.

DESK AND HAND TELEPHONE SETS

Magneto and Central Battery Service

No. 6003 B Desk Telephone Set

No. 102A-3 Hand Telephone Set

In recent years Desk Sets, Hand Telephone Sets and our new line of Uniphones have met with such favor that they are now used in almost all business offices, and to a large extent in residences. Being portable, they can be placed upon a desk within easy reach of the user, enabling telephone calls to be made and answered with the greatest ease.

The Desk Set Box containing the ringer, induction coil, etc., can be attached to the underside of a desk or table or located in any position where it will be out of the way and at the same time, in the case of magneto service, within easy reach for cranking the hand generator. The Desk Stand or Hand Set Mounting and the Desk Set Box are connected together by means of a flexible cord.

Dry cells, when required for local battery operation are placed nearby in a suitable location, connected to the desk set box by two wires.

A description of the Desk Set Boxes, Desk Stands, Hand Set Mountings and Uniphones are listed elsewhere in this catalogue under their respective headings.

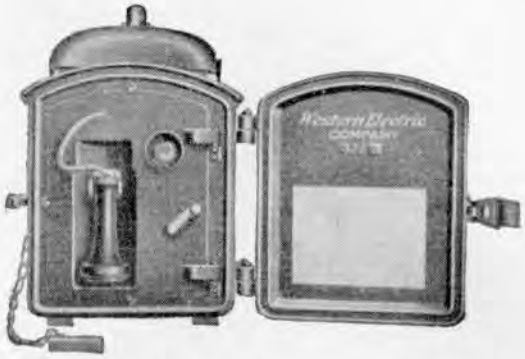
Code No.	Desk Stand	Desk Set Box
6003B	1020AL	315H
N1300R	1020AL	N300R
N1300A	1020AL	N300A
N1300C	1020AL	N300C
N1300 CG	1020AL	N300CG
N6003A	N1050AP	N300AP
N6003B	N1050AP	N300BP
102A-3	—	As required

See also Uniphones

MINE TELEPHONES

No. 1336E Telephones

No. 1336E Mine Telephone



No. 1336E Mine Telephone (Outer Door Open)

Briefly, these are metal case Magneto Telephones having all apparatus and parts treated to resist the action of moisture. They are primarily designed for use on heavily loaded lines where code ringing is employed and are intended chiefly for outdoor use, but are not to be used in presence of explosive gases.

No. 1536E Telephones

No. 1536E Mine Telephone

This type is permissible for use in mines or other locations where explosive gases or dust are likely to be present in dangerous proportions.

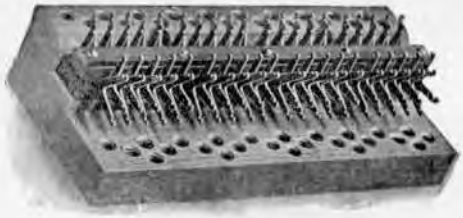
This Telephone Set is enclosed in a cast iron housing $8\frac{7}{16}''$ x $11\frac{1}{4}''$ x $17\frac{5}{32}''$ having a sloping roof and a hood extending out from the top of the door.

These two features protect the working parts of the set from damage by falling debris and facilitate the shedding of water. This construction permits mounting the transmitter, receiver and generator-handle entirely exposed on the door but under the protection of the hood. The set is therefore under all conditions immediately recognizable as a telephone.

The parts used in this Telephone Set are specially treated against the usual moist or damp conditions prevailing in mines. Safeguards against explosions due to sparking of the switch hook, generator shunt spring contacts or loose connections have also been incorporated. The possibility of loose connections is reduced to a minimum by the use of closed eye cord tips and screw and nut binding posts for all connections.

Code No.	Transmitter	Receiver	Receiver Cord	2,500 Ohm Ringer	Generator	Switchhook
1336E	312	144	384(10½″ long)	45BG	48C	143J
1536E	312	558	R2AD	63B	51A	149A

TERMINAL STRIPS



No. 65 Terminal Strip

The No. 65 Terminal Strip has a solid maple base upon which is assembled hard rubber insulating strips, which hold the terminal punchings in place. Each separate terminal has three lugs: one forms the terminal for the outside line, another for the jumper which connects with the protectors and the third terminal is available for testing purposes. The third terminal is also convenient when it becomes necessary to change numbers, as a new connection can be made before the old one is opened. The base is drilled to act as a fanning strip for wires and the edges of the holes are chamfered to prevent injury to the insulation.

This type of Terminal Strip is used on the main distributing frame, and accommodates cable conductors and jumper wires for twenty metallic lines.

Information on other types of Terminal Strips will be furnished on request.

TESTING APPARATUS

Lineman's Test Set—No. 1017 Type

No. 1017E Test Set

The No. 1017B Test Set is strong, reliable and especially adapted for the use of linemen. It comprises a substantial hardwood box with a mahogany finish, protected by metal corners and provided with a strap for carrying. The overall dimensions of the case are approximately 8¾ inches high, 6 inches wide and 4¾ inches deep.

This Test Set contains a two-position dial switch actuated by a knob which is located on the top of the cabinet. The dial switch is marked "Talk" and "Ring." In the "Talk" position, the operator can listen-in directly on the line. When he wishes to talk he must depress the push-button located on the front of the cabinet, and keep it depressed while talking. In the "Ring" position the buzzer and hand generator are connected in series to the line. The generator will operate the buzzer through a total line resistance of 2,500 ohms.

This Test Set includes a No. 266 Transmitter, No. 515 Receiver, No. 572 Cord, No. 29B Generator, No. 2D Buzzer, No. 13 Induction Coil and is arranged for, but not equipped with, a No. 703 "Eveready" tungsten battery, which is required and must be ordered separately.

The No. 1017E Test Set is similar to the 1017B, with several added advantages. It is equipped with a more powerful generator (No. 29F) and instead of using a push-button in the battery circuit, a receiver switch is provided which is actuated by the removal or replacement of the receiver in the side of the cabinet. The dial switch is marked "Talk and Listen", "Open" and "Listen Only." The generator will operate the buzzer through a total line resistance of 5,000 ohms.

It is also provided with an interrupter to enable the lineman to signal on composited circuits.

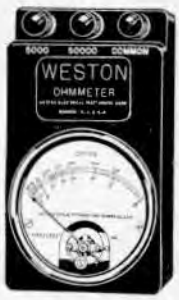
A No. 714 "Eveready" battery or equivalent is required for the local talking circuit, but must be ordered separately.

This Test Set is finished in olive green weatherproof enamel. Its overall dimensions are approximately 10⅛ ins. high x 6⅝ ins. wide and 5$\frac{1}{16}$ ins. deep.

Special literature on request.

TESTING APPARATUS—*Continued*

Test Sets for Measuring Resistance and Continuity



Model 689 Ohmmeter

The Model 689 Ohmmeters were designed for measuring resistance with ease and rapidity. These instruments have full moulded bakelite cases of identical size, measuring 2⅞" x 5" x 1¾" and employ a 3¼" instrument, the same type as used in larger Weston Units. There are six types of this instrument, one of which is illustrated above. Type 1B is a single range instrument calibrated to read up to 20,000 ohms. Type 1E is calibrated with a double range and resistance readings are available from 0-5,000 and 0-50,000 ohms.

A 1½ volt unit-cell battery, mounted inside the case, makes it independent of an outside source of potential. A magnetic shunt provides convenient adjustment to compensate for variations in battery voltage. This adjustment may be made before each series of tests, thus assuring accurate resistance readings.

Model 689 Type 1F, with ranges of 10 and 1,000 ohms, is of the normal series type when used on the 1,000 ohm scale. To use the 10 ohm scale, the high range terminals are shorted by means of a special link supplied, and readings are taken in shunt to the movement, giving low range readings of good accuracy.

In using this style ohmmeter, best accuracy may be had by confining readings to the center portion of the scale.

The following ohm readings are given as a guide for each of Model 689 listed below:

Type 1A— 50 ohms Type 1C— 5,000 ohms
Type 1B—500 ohms Type 1D—12,500 ohms
Type 1E—125-1,250 ohms
Type 1F—2-25 ohms.

Each Model 689 Ohmmeter is furnished complete with battery and a long pair of test leads.

Model 689 Ohmmeters

Type	Range Ohms
1A	0-2,000
1B	0-20,000
1C	0-200,000
1D	0-500,000
1E	0-5,000 0-50,000
1F	0-10 0-1,000

Leather Case for Model 689 is also available.

Cable Splicer's Test Set

No. 43A Test Set

This is a portable set, designed as a Cable Splicer's Test Set in connection with the installation and maintenance of cable in manual or dial system areas. It consists of a buzzer circuit which provides tone for identifying wires, for balance testing and for running down low resistance faults on short non-loaded cable by the exploring coil method; together with auxiliary circuits which provide a battery for detecting defective pairs by receiver battery tests or for energizing the transmitter of a talking set. It also includes a ringer buzzer by means of which the splicer may be called from a central office when communication with him is desired.

The woodwork is birch, finished in olive green. Its overall dimensions are approximately 10½ inches x 5⅜ inches x 6½ inches.

The following cords and apparatus are for use with the No. 43A Test Set but must be ordered separately.

Cable Splicer's Transmitter and Receiver Equipment consisting of:

1—N93 Cord 3' 6" long. 1—No. 528 Receiver.
1—No. 234 Transmitter.
1—No. 3A Transmitter Attachment.

N94 Cable Splicer's Test and Ground Cord 1' 6" long.
N95 Cable Splicer's Central Office Ringing Cord 3' 6" long.

Cable Helper's Transmitter and Receiver Equipment consisting of:

1—N96 Cord 5' 6" long. 1—No. 528 Receiver.
1—No. 234 Transmitter.
1—No. 3A Transmitter Attachment.

N97 Cable Helper's Test and Ground Cord 2' 6" long.
Splicer's Testing Point. Needle Point Test Pick.
No. 99A Condenser.

TESTING APPARATUS—*Continued*

Central Office Test Set

No. 1407C Test Cabinet

The No. 1407C Testing Cabinet provides efficient and reliable testing equipment which is adaptable to either magneto or small central battery systems. All classes of trouble, such as grounds, short circuits, crosses, open circuits and high resistance, can be tested for and the location calculated from the direct reading voltmeter, with no complicated mathematical calculations involved.

For Exchanges where the installation of a regular Wire Chief's Desk is not warranted, the installation of the No. 1407C Testing Cabinet is the ideal testing equipment. It can be installed at either side of the switchboard or at the end of the main frame, or any convenient place in the central office. The operation is simple and the operator can be trained to assist in making tests which would aid materially in clearing up trouble. Further particulars will be furnished upon request.

Magneto Test Sets

No. 90511 Test Set

The Test Sets listed below are contained in a solidly constructed box, provided with outside binding posts and equipped with a strap handle.

These Sets are equipped with a standard ringer and a strong 3-bar generator which will ring its own bell through the resistance for which it was designed.

The approximate dimensions of the Test Set are 6⅝ inches high, 5¾ inches wide and 5¼ inches deep.

Code No.	Will Ring Through Ohms	Contains
90510	35000	1 No. 22K Generator. 1 No. 19H Ringer and Gongs.
90511	50000	1 No. 22N Generator. 1 No. 19A Ringer and Gongs.
90512	100000	1 No. 22N Generator. 1 No. 19B Ringer and Gongs.
90530	10000	1 No. 22K Generator. 1 No. 19B Ringer and Gongs.

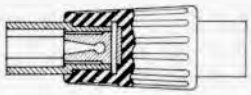
TOOLS FOR TELEPHONE MAINTENANCE

The Northern Electric Company can supply suitable Tools for maintenance purposes on all types of telephone apparatus. A few tools are listed below; information on other types will be furnished on request.

Code No.	Description
N8	Cable Box Wrench. $\frac{3}{8}$" hexagon socket wrench equipped with wooden handle. Overall length $8\frac{7}{8}$".
N9	Cable Box Wrench. $\frac{5}{16}$" hexagon socket wrench equipped with wooden handle. Overall length 8".

No. 96 Tool

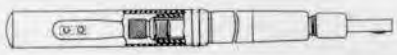
Code No.	Description
96	Double Screwdriver, for use on Ringers. Overall length $3\frac{1}{4}$ inches.
277	Open end off-set Wrench, intended for use on mounting nuts of Nos. 18 and 19 type Resistances when wired in position. Overall length $9\frac{1}{4}$".
265B	Designed for cleaning contact points of relays



No. 311 Tool

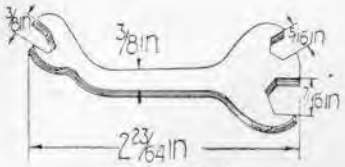
Code No.	Description
311	Double End Socket Wrench for use on $\frac{3}{8}$ inch and $\frac{7}{16}$ inch hexagonal nuts on Subscriber Station apparatus. Is also provided with slots at either end for inserting a screw-driver.
KS-2827	Pliers for use in handling Heat Coils of protectors.

Code No.	Description
40	Double Screw-driver, one end bent to an angle of 90 degrees. Intended for use on Drops. Overall length 7".
71	Wire Skinner, intended for use in removing the insulation from braided rubber covered wire. Has adjustable blades arranged to receive wire of different gauges.



No. 265B Tool

Code No.	Description
	Consists of a No. 266B Tool mounted in a chuck which has a rubber handle and a magazine containing 5 spare No. 266B Tools.
266B	Sand blasted steel blades. Part of No. 265B Tool for cleaning contact points of relays. Size of blades $1\frac{1}{2}$" x $\frac{3}{16}$" x .0035".



No. 63 Tool

Code No.	Description
63	Triple Wrench for use on nuts of binding posts of receivers and transmitters, also for screwing on the nut of sleeve replacement parts for combined jacks and signals.
461A	Tool for tightening lock ring in No. 143AX and No. 144AX Receivers.

TRANSMITTERS

Our Transmitters are designed to meet many different requirements. They have high transmitting efficiency. They are easily installed or removed.

No. 232 Transmitter

No. 234 Transmitter

No. 232.—Switchboard operator's suspended type Transmitter. Arranged to be suspended by means of two transmitter cords. Has a black finish and is intended for use at magneto and central battery switchboards where a hanging Transmitter is employed.

No. 234.—Operator's chest type Transmitter having an adjustable mouthpiece, arranged for, but not equipped with a No. 3 Transmitter Attachment. Has a black finish and is intended for operator's use at magneto and central battery switchboards.

No. 396A.—Operator's Transmitter is used for the same purpose as the 234 Transmitter at Central Offices and Common Battery Switchboards. It employs an A1 Transmitter Unit. It should be used in conjunction with the No. 72 Induction Coil at Magneto Central Offices.

TRANSMITTERS—*Continued*

No. 266 Transmitter

No. 323 or No. 337 Transmitter

No. 266.—Transmitter used in the No. 1017 type test sets. Mounts on back of perforated plate in test set. Has black finish and is equipped with mounting screws.

No. 267.—Transmitter arranged to be fixed to the No. 1002 type hand set handle. Has a nickel-plated finish.

No. 323.—Our standard Transmitter for general use on wall and desk telephones. Finished in black, unless nickel finish is specified in order.

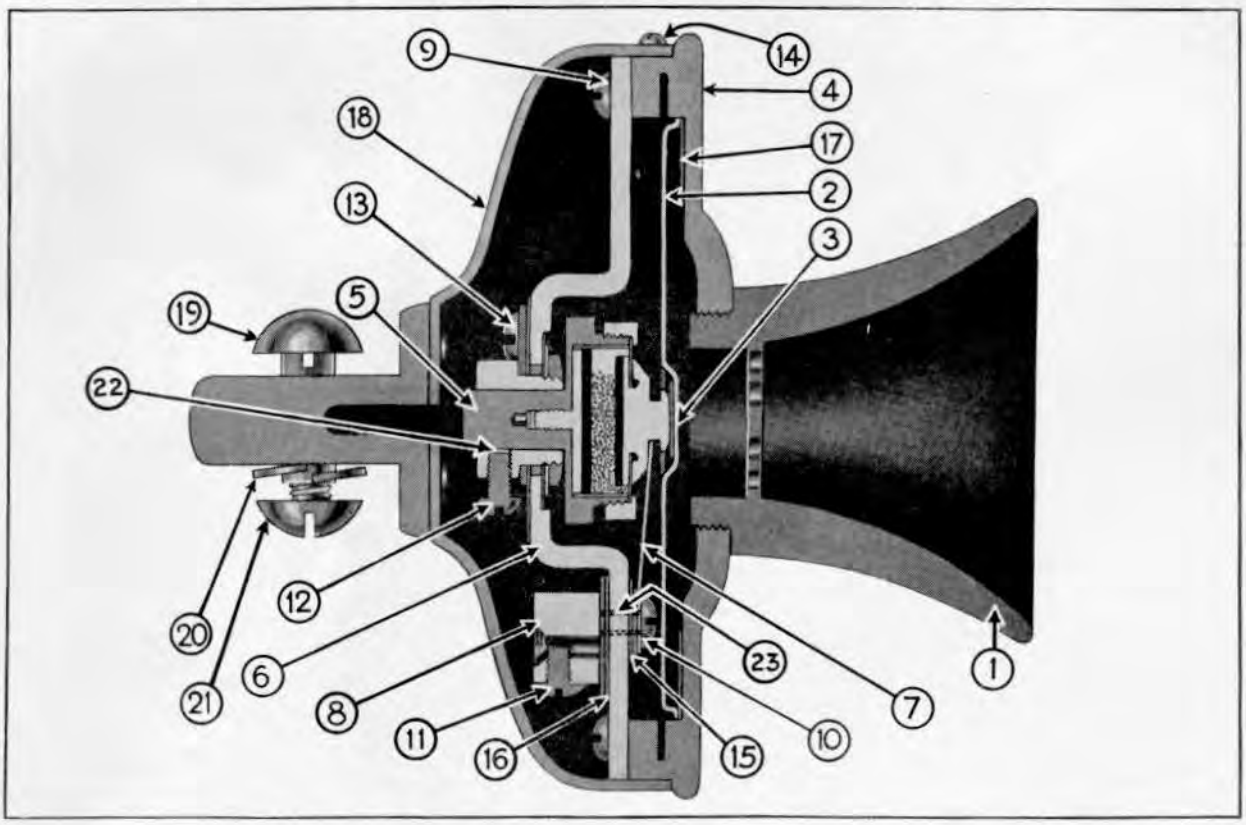
No. 337.—A Transmitter similar to the No. 323, For use on long central battery subscribers' loops, where the transmitter must operate with a reduced current supply.

No. N337.—For replacement purposes—consists of No. 337 transmitter less back and mounting lug.

No. N425.—For replacement purposes—consists of No. 323 transmitter less back and mounting lug.

No. 625A.—Transmitter used on "E" type hand sets. Includes an F1 Transmitter Unit.

Replacement Parts for 323, 337, N337 and N425 Transmitters



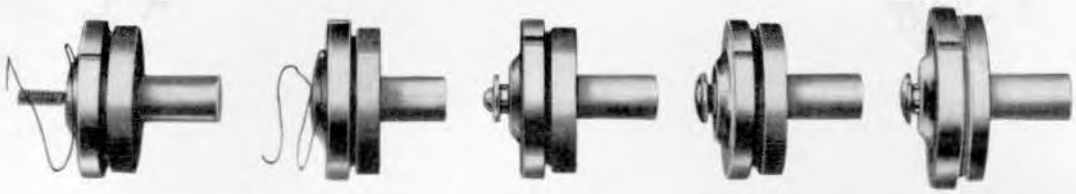
Cross Section of Transmitter

Symbol	Name of Part	
1	Mouthpiece	P.P. 17615
2	Diaphragm	P.P. 10662
3	Insulating Disc	P.P. 10661
4	Face	P.P. 15868
5	Carbon Button Assembly	See Note 1
6	Bridge and Centre Assembly	P.P. 9511
7	Damping Spring	P.P. 10660
8	Cord Tip Terminal	P.P. 10656
9	Machine Screw	P.P. 10696
10	Machine Screw	P.P. 8977
11	Terminal Screw	P.P. 10694
12	Adjusting Screw	P.P. 9521
13	Terminal Screw	P.P. 10694
14	Rim Mounting Screw	P.P. 28529
15	Insulator	P.P. 12744
16	Insulator	P.P. 12745
17	Cloth Washer	P.P. 10658
18	†Bell and Lug Assembly	P.P. 17856
19	Bolt	P.P. 8264
20	Washer	P.P. 8272
21	Clamp Screw	P.P. 8271
22	Disc	P.P. 9505
23	Hard Rubber Bushing	P.P. 10665

Note 1.—PP-10670 for No. 323 and N425. PP-12162 for No. 337 and N337. †PP-17852 Bell only.

TRANSMITTERS—*Continued*

Transmitter Buttons



P.P. 13926 P.P. 36479 P.P. 9536 P.P. 10670 P.P. 12162

Used in Transmitter Nos:

225	234	291	323	337
228		297	353	N337
229		301	N425	
232				
325				
329				

Transmitter Units

Electrical connections to the transmitter units are provided by spring contacts. They can be removed and replaced without the use of tools.

The working parts of the A1 Transmitter Unit are protected from moisture by a rubber membrane fastened to the front of the unit, and the F1 Transmitter Unit is protected by a metal grid and oiled silk membrane.

Code No.	Used in Transmitter Nos.
A1	396A Operators' Transmitter.
F1	625A Transmitter and Uniphone Hand Sets.

Transmitter Attachments

No. 3A Transmitter Attachment

Code No. 2A—Nickel plated buckle used in connection with the No. 3 Type Transmitter Attachments.

Code No. 3A—These transmitter attachments consist of a tape strap, slate coloured, equipped with two No. 2A Transmitter Attachments. They are used for supporting operator's chest type transmitters. Overall length, $15\frac{5}{16}$ inches. (Used with No. 234 and 396A Transmitters.)

UNIPHONES

No. 1 Type Uniphone

No. 2 Type Uniphone

The Uniphone is a self-contained telephone set embodying all of the most up-to-date features known to the telephone art. It has a pleasing appearance and the well-balanced lines render it suitable for use in any surroundings. It is available in both wall and table types for use in manual or dial common battery systems. When required for magneto systems it may be used in conjunction with a regular ringer box and two dry cells as local battery.

The hand set and hand set mountings are made of bakelite and are available in black, or grained walnut finish.

The Uniphone will require the minimum of maintenance and such as may be required is greatly facilitated by the ease with which all apparatus may be inspected or removed. A screwdriver is the only tool required for the removal of the cover or any of the associated parts.

The overall dimensions of the Table and Wall Type Uniphones, including hand set are approximately as follows:—

No. 1 Table Type—8¾" long, 5½" wide, 5½" high.
No. 2 Wall Type —8¾" long, 6½" wide, 5½" high.

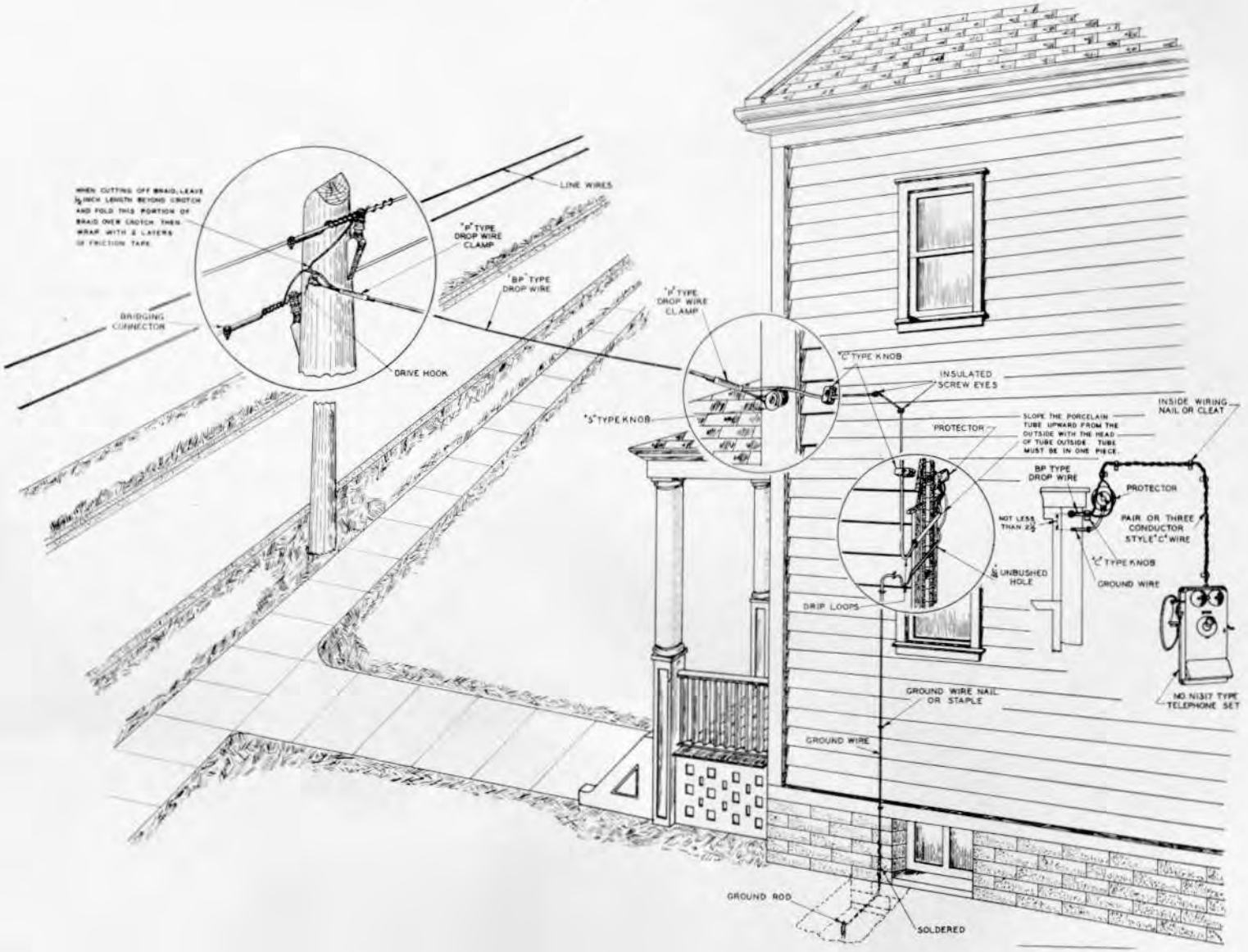
In addition to the Table and Wall Type Uniphones, the No. 3-3 type is available. The hand set mounting of this type Uniphone may be located at the side of a desk or table. The No. 3-3 Uniphone is intended to be used in connection with an N200A-3 Uniphone Desk Set Box. It is furnished in black finish only.

Order for Uniphones should state the type, color and whether they are for manual, magneto or dial service. If for dial service, the type of dial required should also be stated.

No. 3 Type Uniphone
Manual Service

No. 3 Type Uniphone
Dial Service

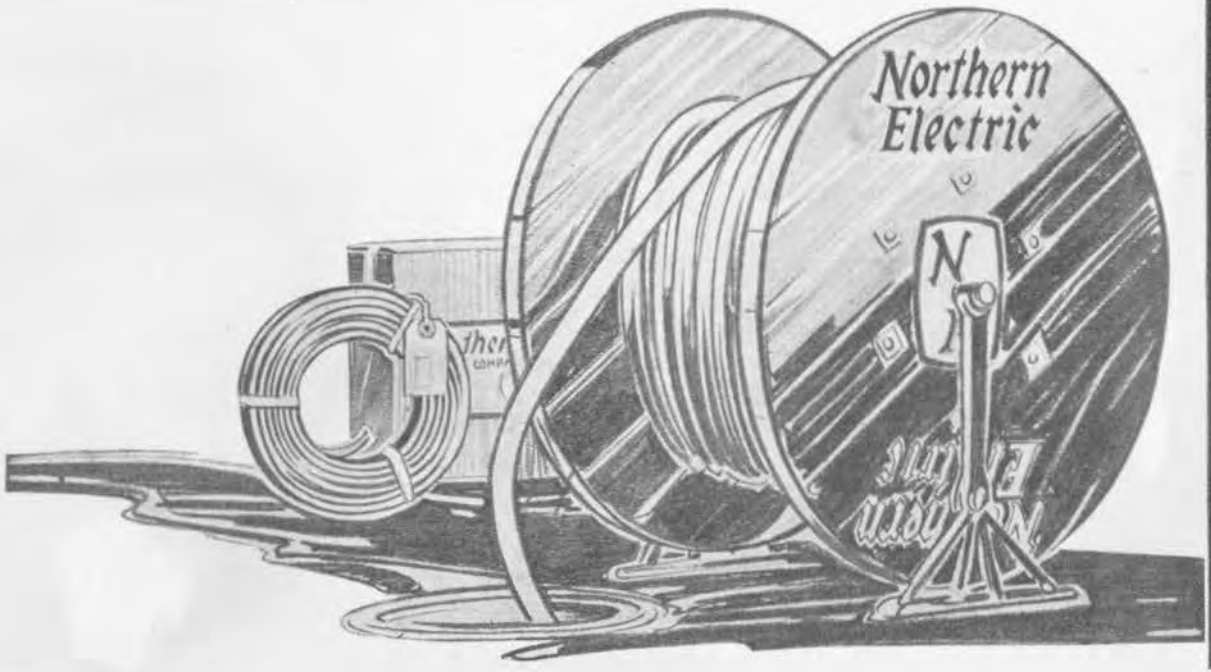
When the best is required — use a Uniphone



Method of Installing Telephone Set and Protector

WIRE AND CABLE

The Northern Electric Company manufactures and distributes all types of standard and special wires and cables. The buyer of wires and cables is interested in true quality, prompt delivery and fair price. It is by meeting these demands and satisfactorily serving discriminating buyers that the Northern Electric Company has achieved its position in the wire and cable field.



WIRES AND CABLES

Wires and Cables are a very important part of a telephone system. Because of the extreme variations in climatic conditions imposed upon them, and the many other hazards they must withstand, they should be very carefully selected. The Northern Electric Company, Limited, manufacture wires and cables to meet every telephone need. Backed by the experience of many years in design and manufacturing technique and by extensive research both in the laboratory and in the field the resulting products have become leaders in the telephone field. In the following paragraphs are given characteristics and special features of the various types of Wires and Cables in general use.

Hard Drawn Bare Copper Line Wire

Copper Wire is necessary on lines where good transmission is an important factor or where climatic or other conditions require a wire with great resistance to corrosion. Hard drawn copper wire may be supplied in any gauge and a recent development in manufacturing technique has made it possible to ship standard gauges of copper line wire for telephone or telegraph use in uniform weight coils having a variation of +2 or —2 pounds from the weight desired. This is of considerable importance in building new lines as it greatly facilitates the distribution of supplies and construction equipment without loss due to the necessity of scrapping odd lengths of wire or the splicing of wires at the pay-out swifts.

Size Designation	Diam. in Ins.	Weight in lbs. per mile	Breaking Weight Lbs.	Approx. Wt. of Coils	Resistance Ohms per Mile	Approx. Use up to Miles
080 (approx. 12 B&S)	.080	102	330	85	8.846	—
104 (" 10 B&S)	.104	173	550	120	5.216	100
128 (" 8 B&S)	.128	262	819	120	3.444	200
165 (" 6 B&S)	.165	435	1325	185	2.16	250

Copperweld Line Wire

Copperweld Wire for Telephone Lines is desirable as a substitute for solid copper in cases where some of the conductance of the solid copper wire can be sacrificed for greater tensile strength, or where an iron or steel conductor would be subjected to rapid corrosion. It has approximately 50 per cent greater tensile strength than copper or galvanized wire. It consists of a steel core over which a copper sheathing is permanently welded under very high temperatures by the molten welding process.

Size B&S Gauge	Diam. in Inches	Weight in Lbs. per Mile	Breaking Weight in Lbs.		Resistance in Ohms per Mile	
			40% Cond.	30% Cond.	40% Cond.	30% Cond.
12	0.081	96	710	—	21.289	—
10	0.102	153	1,130	1,230	13.427	17.899
8	0.128	240	1,650	1,800	8.527	11.368

Tree Wire

Type S Tree Wire

Rubber Insulated and Weatherproof Braided Tree Wire, as its name implies, is used where telephone lines run through trees, to obviate the possibility of the lines becoming noisy. Such wire is required where trees cannot be avoided or where branches cannot be trimmed to prevent them touching the wires.

Construction:—A hard drawn tinned copper conductor insulated with rubber and covered with an abrasion-resisting braid of tough cable laid twine thoroughly saturated in weatherproof compounds.

Tree Wire is supplied in the same sizes as bare line wire and is shipped in coils in lengths up to 2,500 feet each as required.

WIRES AND CABLES—*Continued*

Lead Covered Paper Insulated Telephone Cables

ASM-606 Cable

Paper Insulated Lead Covered Telephone Cables have replaced open wire lines almost exclusively for subscribers' loops. They are used in underground duct systems or aerially suspended from messenger strands. They are also used largely for toll circuits between areas of dense population and where open wire lines are subjected to the ravaging effects of sleet and wind.

In loop cables each circuit consists of two copper wires individually insulated with very tough paper and twisted into pairs. The twisted pairs are cabled together and bound with two or more wrappings of paper and covered with a lead alloy sheath to exclude moisture and protect the insulated conductors from mechanical damage.

Paper insulated lead covered telephone cables are manufactured in many specialized forms for use as toll cables with or without quadded conductors, with or without shielded programme pairs and sometimes contain a number of groupings of different gauges of wire for various applications. Many important quadded cables are tested and shipped under gas pressure to make sure that the lead sheaths are in perfect condition when installed. Toll cables are very carefully balanced, so that minimum capacity unbalance may be obtained over the total length of the circuit.

CODED PAPER INSULATED CABLES

General Details

Size B&S	Type	Ave. Value per Loop-Mile Conductor Resistance (Ohms) Max.	Ave.	A.C. Mutual Capacitance Microfarads Max. Ave.	Ave.	Non-loaded Transmission Equivalent Decibels per Mile	Non-loaded effective Transmission Equivalent Decibels per Mile	Cable Mileage for 20 Decibel Transmission
24	ASM	290	276	.080	.075	2.14	2.57	10.3
22	BSA	184	175	.090	.083	1.79	2.15	12.0
19	CNB	92	86	.090	.085	1.26	1.51	15.2
19	DNB	92	86	.072	.066	1.11	1.34	19.9
16	NH	46	42.3	.072	.064	.75	.91	27.1

A minimum insulation resistance of 500 megohms per mile at 60° Fahrenheit between any one wire and all the others connected to the sheath is guaranteed.

The dielectric strength of the insulation between any one wire and all the other wires connected together is measured with an alternating current potential whose maximum instantaneous value is guaranteed to be not less than 500 volts for Types ASM and BSA cables. 700 volts for Types CNB and DNB cables and 1,000 volts for Type NH cable.

Cables help to prevent sleet damage

WIRES AND CABLES—*Continued*

Paper Insulated Lead Covered Telephone Cables

Table No. 1—Coded Cables

Code No. and No. of Pairs	Size (B&S)	Guaranteed No. of Pairs	Max. Average Mutual A.C. Capacitance Micro-farads per Mile	Nominal Thickness of Sheath (Inches)	Approximate Outside Diameter (Inches)	Approximate Weight per 1,000 ft. (lbs)	Max. Convenient No. of Feet on Reels.
ASM-1212	24	1200	.080	.115	2.61	7970	650
ASM-909	24	900	.080	.105	2.21	6060	900
BSA-909	22	900	.090	.115	2.61	8500	650
ASM-606	24	600	.080	.098	1.88	4440	1100
BSA-606	22	600	.090	.104	2.15	5970	900
CNB-455	19	450	.090	.115	2.61	8480	650
ASM-404	24	400	.080	.090	1.56	3220	1400
BSA-404	22	400	.090	.095	1.78	4280	1200
CNB-404	19	400	.090	.112	2.48	7680	700
ASM-303	24	300	.080	.085	1.36	2560	1600
BSA-303	22	300	.090	.091	1.59	3450	1400
CNB-303	19	300	.090	.104	2.15	5970	900
DNB-303	19	300	.072	.112	2.51	6960	700
ASM-202	24	200	.080	.080	1.14	1910	1800
BSA-202	22	200	.090	.084	1.32	2510	1600
CNB-202	19	200	.090	.095	1.78	4270	1200
DNB-202	19	200	.072	.102	2.08	4990	1000
ASM-152	24	150	.080	.076	1.00	1520	2500
BSA-152	22	150	.090	.080	1.16	2010	1600
CNB-152	19	150	.090	.090	1.56	3380	1400
NH-152	16	152	.072	.113	2.54	7050	750
ASM-101	24	100	.080	.073	0.85	1200	2500
BSA-101	22	100	.090	.076	0.98	1510	2500
CNB-101	19	100	.090	.084	1.29	2460	1600
DNB-101	19	100	.072	.088	1.49	2840	1500
NH-101	16	101	.072	.103	2.11	5070	1000
ASM-51	24	50	.080	.068	0.64	740	3000
BSA-51	22	50	.090	.070	0.73	950	3000
CNB-51	19	50	.090	.075	0.95	1460	2500
DNB-51	19	50	.072	.079	1.10	1710	1800
NH-51	16	51	.072	.089	1.52	2920	1500
ASM-26	24	25	.080	.065	0.51	520	3500
BSA-26	22	25	.090	.066	0.57	630	3500
CNB-26	19	25	.090	.070	0.72	930	3000
DNB-26	19	25	.072	.073	0.83	1100	2500
NH-26	16	26	.072	.080	1.13	1780	2000
ASM-16	24	15	.080	.063	0.42	400	3500
BSA-16	22	15	.090	.064	0.47	480	3500
CNB-16	19	15	.090	.067	0.60	700	3500
DNB-16	19	15	.072	.069	0.68	810	3000
ASM-11	24	10	.080	.062	0.37	330	3500
BSA-11	22	10	.090	.063	0.42	400	3500
CNB-11	19	10	.090	.065	0.52	560	3500
DNB-11	19	10	.072	.067	0.59	640	3000
CNB-6	19	5	.090	.063	0.42	410	3500
DNB-6	19	5	.072	.064	0.46	460	3500

Details of special cables will be furnished upon request.

Rubber Insulated Telephone Cables

Rubber Insulated Telephone Cables are sometimes used for short runs inside where moisture is present and where the use of paper insulated cables is undesirable. They are also used in some cases for aerial and submarine work. These cables are usually made up with Nos. 19, 18, 16 or 14 B&S conductors. The conductors are insulated with rubber and twisted into pairs. The pairs are stranded in layers and covered with insulating tape, and over this core is applied the required outer covering consisting of either a weatherproof finished braid or a lead sheath.

Rubber Insulated Telephone Cables have a higher electrostatic capacity than paper insulated cables, and as this reduces their transmission value they are not recommended for use in long lenghts.

Armoured Telephone Cables

Flexible Steel Armoured Underground Cable

Armoured Telephone Cables are divided into two classes as follows:—

1.—Underground Cable placed directly in the ground without using conduit.

2.—Submarine Cable placed under water on the bottom of rivers, lakes, etc.

Two types of armouring are generally used for Underground Cables. Where the maximum protection is desired double steel tape armouring is used. This consists of a layer of compounded jute over the cable which serves as a bedding. Over this is placed a layer of flat steel tape wound on with sufficient space between each turn of the tape to enable the cable to be easily bent. A second steel tape is then applied in a similar manner so that it will cover the spaces left by the first tape. An outer layer of jute is then applied and saturated in a weatherproof and preservative compound. A more economical type of armouring, yet one that offers quite a high degree of protection is flexible steel armour, as illustrated above.

This cable consists of either rubber or paper insulated conductors covered with a lead sheath, a jute bedding, a layer of interlocking armour and an outer weatherproofed jute braid. It is well adapted for burying directly in the earth for carrying underground telephone lines. Its design can, of course, be modified to meet individual requirements.

A third type of underground telephone cable construction is also used in which no metallic armouring is applied to the cable. The lead sheathed cable is first flooded with weatherproof compounds, then covered with a layer of paper and a heavy jute braid or serving thoroughly saturated in preservative compounds. Such cable is light, flexible, easy to handle and is comparatively low in cost. It, of course, has no metallic armouring and does not offer the same degree of resistance to mechanical injury as the steel armoured types do.

WIRES AND CABLES—*Continued*

Armoured Telephone Cables—*Continued*

Submarine telephone cables are protected by means of steel wire armour applied over a jute bedding in a similar manner to steel tape armoured cables. The size and number of steel armour wires required depend upon the size of cable, the importance of the line and the conditions under which it is to operate.

DROP WIRE

Twisted Pair Type Drop Wire

Parallel Pair Type Drop Wire

Drop Wire or Outside Distributing Wire is used to connect the pole terminal with the subscriber's house. There are several different types in general use depending on the preference of the user and the conditions under which they are to operate. We give below a description of the different types.

Style	
HC	Consists of two tinned copper conductors, each insulated with rubber and covered with a cotton braid saturated in stearine pitch, and finished with mica. Conductors twisted together to form a pair. Sometimes termed Style B Wire. No. 14 B&S and No. 16 B&S gauges mostly used.
CS	Similar to Style HC except conductors are of copperweld wire. Copperweld drop wire has high tensile strength providing a greater margin of safety. No. 17 B&S gauge mostly used.
B	Similar to Style HC except conductors consist of a bronze alloy. Like Style CS it has high tensile strength. No. 17 B&S mostly used.
CP	Copperweld parallel drop wire. Each conductor consists of a tinned copperweld wire covered with rubber insulation. Two insulated conductors are laid parallel and covered overall with a cotton braid saturated in stearine pitch, and finished with mica. No. 17 B&S mostly used.
BP	Bronze parallel drop wire. Similar in construction to Style CP except that conductors are of bronze alloy.
CR	Copperweld tree wire. Construction the same as Style CP except that the overall braid is of heavy hawser cord saturated in stearine pitch, and finished with mica. The heavy overall braid is extremely resistant to abrasion. Used for drop wire runs through trees. No. 17 B&S mostly used.
BR	Similar construction to Style CR except conductor is of bronze alloy. No. 17 B&S mostly used.
ST	Iron drop wire. Same construction as Style HC, except conductors are of iron. Iron drop wire is quite strong but has relatively high resistance compared with other types. No. 16 B&S mostly used.
Cadmium	Similar in construction to Style HC except conductors are of a special cadmium copper alloy. While of somewhat higher resistance than copper, this alloy possesses comparatively high tensile strength. No. 17 B&S mostly used.

Pothead Wire

Style A Pothead Wire

Used in interior and pothead work for terminating a paper insulated telephone cable. It is composed of an annealed copper conductor carefully tinned and covered with a high quality of rubber compound. Two such wires are twisted together to form the twisted pair, one conductor having a raised tracer on the surface of the rubber. No braid is placed over this wire, as it would act as a wick to convey moisture into the pothead and probably ruin the paper insulated cable.

Inside Wire

Style "C" Interior Wire

Used for interior connections between the telephone and the entrance to the building. It consists of a tinned annealed copper conductor insulated with rubber and covered with a glazed cotton braid. Two or three of these conductors are twisted together, the braid of each conductor having a colored thread for tracing purposes. The usual colors of braid are brown or ivory. Other colors, however, may be had to order.

Duct Wire

Used instead of Inside Wire in conduit systems in buildings. Also used instead of Inside Wire in exposed installations where subject to very damp conditions. Similar in make-up to inside wire except has weatherproof braids.

WIRES AND CABLES—*Continued*

Ground Wire

Used for making the connections between the telephone protector and the ground at the subscriber's station. It consists of a tinned annealed copper conductor, insulated with rubber and covered with an impregnated braid.

Distributing Wire

Style LR

Used in place of twisted pair outside distributing wire when it is necessary to run the connection underground or in other places where braided wire would be unsuitable. It consists of two tinned, annealed, copper conductors, insulated with rubber, twisted together with jute and covered with insulating tape and a lead sheath. This cable supersedes the old style D.

Style E

Sometimes used as a substitute for lead covered distributing wire (style LR), but generally for inside work where moisture is present. It is made up in the same manner as style LR, except that a weatherproof braid is used in place of a lead sheath.

Style NJR

Similar in construction to type LR except a layer of paper and a jute braid is applied over the lead sheath, and thoroughly impregnated with preservative compounds. This extra protection makes the cable well suited for burying directly in the ground.

Bridle Wire

This is similar to style HC wire, except that the conductors are annealed instead of hard drawn copper. This wire is generally used between open line wires and terminal boxes.

Distributing Frame or Jumper Wire

E Type

A flameproof wire used principally for cross connecting work on distributing frames. It consists of a tinned annealed copper conductor, enamelled, insulated with servings of purified silk and moistureproofed. The wire is then covered with a flameproof cotton braid. Available in two, three and four conductors with each conductor marked for tracing purposes.

TELEPHONE SWITCHBOARD WIRE

Switchboard Wire is used for the wiring of telephone and telegraph switchboards and miscellaneous purposes in central offices. This wire is supplied in single conductor, pair, triple or quadruple conductor form.

TSDC Wax Impregnated Switchboard Wire

This wire consists of Nos. 14, 16, 18, 19, 20, 22 or 24 A.W.G. tinned annealed copper conductors covered with a single purified silk wrapping and double wrapping of purified cotton, and impregnated with a transparent wax moistureproofing compound. Supplied in assorted colors and combinations of colors. Recommended where Code No. 2 was formerly used.

TESDC Wax Impregnated Switchboard Wire

This wire is similar to TSDC Wax Impregnated Switchboard Wire except that the conductors are enamelled after being tinned in addition to being insulated with single purified silk wrapping and double wrapping of purified cotton. This wire is used in particular circuits and locations of high humidity. Recommended where Code No. 4 was formerly used.

TESCB Wax Impregnated Switchboard Wire

This wire is used for the interconnections and battery-leads of apparatus in telephone and telegraph circuits. This wire was formerly known as "Keyboard Wire", "B.B.E. Wire" or Code No. 8 Switchboard Wire.

This wire consists of Nos. 16, 19 or 20 A.W.G. tinned annealed copper wire insulated with enamel, one serving of purified silk and a braid of purified cotton and impregnated with a transparent wax moistureproofing compound.

WIRES AND CABLES—*Continued*

Shielded Wire

Shielded wires are for use in circuits susceptible to the interference of stray electrostatic and electromagnetic fields. The shielding is accomplished by means of a copper braid, which may be covered, when required, with a black or grey glazed cotton over-all braid. Purified textiles are used for insulating the conductors.

Insulated Telephone Wires

Table Showing
Insulation, Diameters and Weights

	Size of Conductor B. & S.								
	22	20	19	18	17	16	14	13	12
	Diameter over Insulation Inches								
Style A	5/64	..	3/32	..	..	9/64	5/32	5/32	..
Drop Wire HC	..	..	..	5/64	..	9/64	5/32	..	11/64
Drop Wire CS	..	..	..	..	.120	..	..	..	..
Drop Wire B	..	..	..	..	.120	9/64	5/32	..	..
Drop Wire CP	..	..	..	..	.110	..	..	..	..
Drop Wire BP	..	..	..	..	.110	..	..	..	..
Drop Wire CR	..	..	..	..	.110	..	..	..	..
Drop Wire BR	..	..	..	..	.110	..	..	..	..
Drop Wire Cadmium Copper	..	..	..	..	.104	..	..	..	..
Drop Wire Iron	..	..	..	7/64	..	5/32	5/32	..	11/64
Inside Wire	.082	3/32	3/32	7/64	..	9/64	5/32	..	..
Style LR	..	..	..	7/64	..	9/64	5/32	..	..
Style E	..	..	..	7/64	..	9/64	5/32	..	..
Bridle Wire	..	.085	..	7/64	..	..	..	..	..
E. Type	.072	.086	..	..	..	..	..	..	..
Ground Wire	..	..	..	7/64	..	1/8	5/32	..	..
Duct Wire	.060	..	..	..	..	..	..	..	..
	Weight per 1,000 Feet (Pounds)								
Style A	12	..	17	..	..	33	51	56	81
Drop Wire HC	..	..	..	32	..	47	61	..	..
Drop Wire CS	..	..	..	..	36	..	..	..	..
Drop Wire B	..	..	..	..	37	..	..	..	..
Drop Wire CP	..	..	..	..	29	..	..	..	..
Drop Wire BP	..	..	..	..	30	..	..	..	..
Drop Wire CR	..	..	..	..	47	..	..	..	..
Drop Wire BR	..	..	..	..	47	..	..	..	..
Drop Wire Cadmium Copper	..	..	..	..	47	..	..	..	..
Drop Wire Iron	..	..	..	34	..	46	60	..	..
Inside Wire	14	19	21	27	..	42	56	..	..
Style LR	..	..	..	..	..	385	..	..	..
Style E	..	..	..	29	..	44	58	..	..
Bridle Wire	..	20	..	32	..	..	..	..	..
E Type	6	10	..	..	..	..	..	..	..
Ground Wire	..	..	..	15	..	18	31	..	..
Duct Wire	13.3	..	..	..	..	..	..	..	..

SEALING COMPOUND

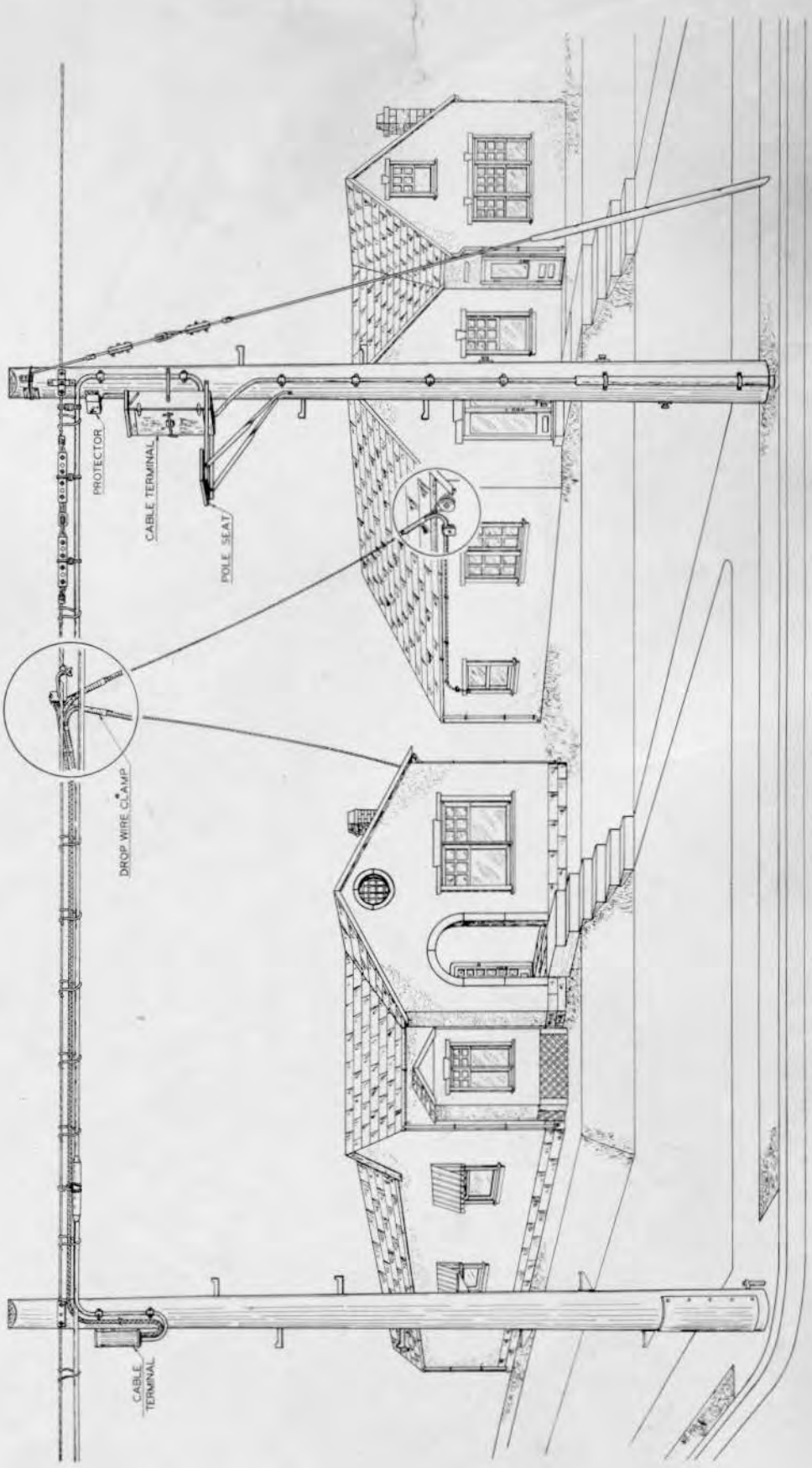
No. 23 Sealing Compound

Standard for use in filling telephone cable potheads, telephone cable terminals and telephone condensers.
Put up in 5 lb. cans.

LEAD SLEEVING

We carry in stock lead antimony sleeving in the sizes more commonly required for splicing purposes. Lengths listed below are standard stock lengths, but shorter sections can be furnished when required at slight additional expense.

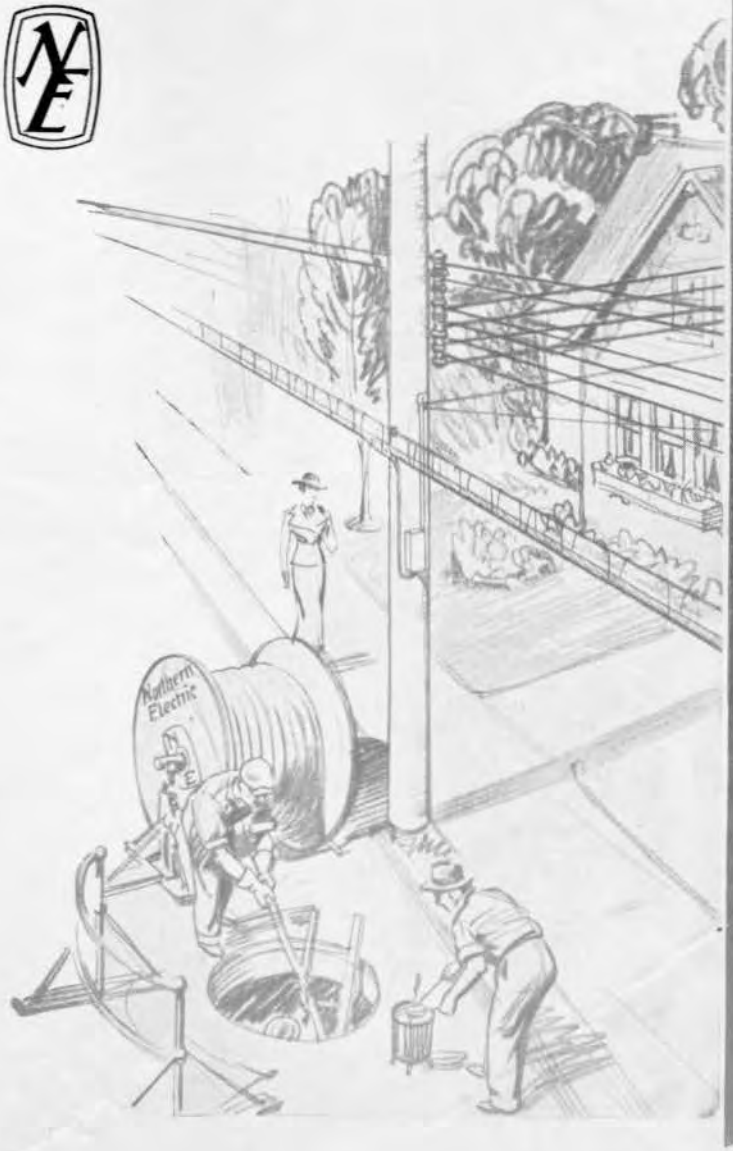
Inside Diam. In.	Thickness Inches	Length Inches	Approx. Wt. Lbs. per Length
1	.125	15	2.71
1¼	.125	17	3.76
1½	.125	17	4.71
1¾	.125	17	5.13
2	.125	17	5.82
2¼	.125	20	7.64
2½	.125	20	8.45
2¾	.125	20	9.26
3	.188	20	15.44
3½	.188	20	17.90
4	.188	22	22.31
4½	.188	22	24.90
3	.188	6	4.63
3½	.188	6	5.36
4	.188	6	6.09
4½	.188	6	6.81



Typical Telephone Pole Line Equipment

OVERHEAD *and* UNDERGROUND

The following pages list Material and Tools in most common use in the outside plant of Communication Companies. We are constantly in touch with latest developments and if you are interested in anything not listed please let us have your inquiry.



MATERIALS AND TOOLS

ANCHORING AND GUYING MATERIAL

Anchors

Slater Unbreakable Anchors

Hot Galvanized or Painted

Anchor and Guy Rod assembled

Four-Way Anchor

Expanding and Tamping Tool

Unbreakable Anchor expanded

The Slater Unbreakable Expansion Anchor is an all-steel Anchor of such balanced strength and pressure area that it has shown a strength that is surprising. It is made with either two plates or four plates, which are extended by the action of the expanding tool which is also used for tamping. The expansion links are made of steel strongly looped into the plates and into a square collar, which forms the expansion hinge.

Tests have shown that there is no creeping, while there has not been a breakage of the Anchor even up to 20,000 pounds pull. This is a record which warrants the use of the name "Unbreakable."

Installation is made by the auger method. The anchor is lowered into the hole and then opened with the expanding tool and the earth tamped with the same tool. In ordinary soil this Anchor will hold full strength of a ⅝-inch anchor rod.

The anchor rod must be ordered separately.

Specify whether galvanized or painted is desired.

Type	Plates	Diam. Closed	Inches Expanded	Approx. Ship. Wt. ea.
2-Way 6″	2	6	9	6 lbs.
4-Way 6″	4	6	10½	8 lbs.
4-Way 8″	4	8	14	15 lbs.
4-Way 10″	4	10	18	28 lbs.

Slater Chance Never Creep Anchor

Never Creep Anchor in position

The Slater Chance Never Creep Anchor consists of a galvanized rod with a drop forged thimbleye, and a certified malleable iron plate. The thimbleye eliminates the use of thimbles. List No. of Plate does not include Rod.

Plate Only List No.	Plate Size	Hole for Dia. Rod	Wt. of Plate Per C
C615	6″ x 15″	⅝″	1200
C620	6″ x 20″	⅝″	1500
C820	8″ x 20″	⅝″ or ¾″	2550
C825	8″ x 25″	¾″	3000
C830	8″ x 30″	¾″	3300
C835	8″ x 35″	¾″ or 1″	5500

Details of Rods to be ordered separately.

List No.	Size	Wt. per C
4316	⅝″ x 6′	680
4318	⅝″ x 8′	900
4327	¾″ x 7′	1140
4328	¾″ x 8′	1280
4329	¾″ x 9′	1440
4338	1″ x 8′	2300

ANCHORING AND GUYING MATERIAL—*Continued*

Swan Anchor

The Swan Anchor is a drive anchor for light loads made of a steel blade attached to the end of a 5′ Slater Anchor Rod. It is driven into position by the use of a special drive-rod, which is withdrawn after the anchor has been sunk to desired depth. The Swan Anchor is generally used where light strains are being taken care of. It is effective and sure in its principle of leverage operation, and is economical in its installation cost.

List No.	Dimension of Blade Length	Dimension of Blade Width	Dia. of Eye Inside Inches	Wt. Lbs. Per 100
7	11″	4″	$\frac{11}{16}$	570
8	13″	4″	$\frac{11}{16}$	650

Swan Anchor

Steelwing Anchor

Slater Steelwing Anchor

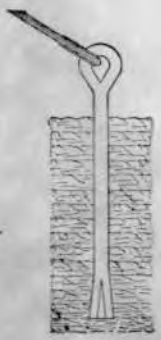
The Slater Steelwing Anchor is installed at low cost.

List No.	Diam. in Inches Plate	Diam. in Inches Rod	Over-All Length Rod Feet	Wt., Lbs. Each
7526	6	¾	5½	12
7527	7	1	5½	17
7528	8	1	5½	18
7530	10	1¼	5½	29

Rock Anchor

No. 5747

Installed



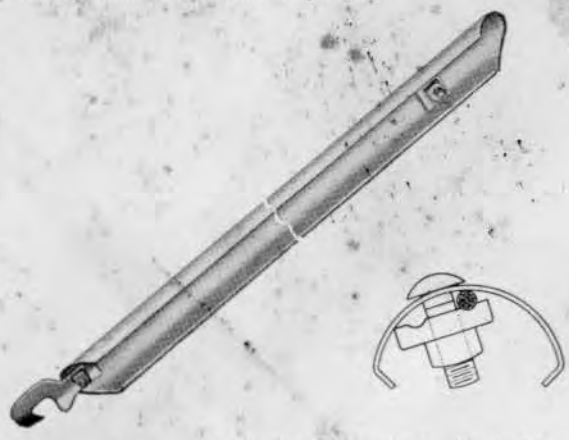
This anchor is simplicity itself. It is self-anchoring by the simple method of forcing the wedge into the slotted end of the anchor when driven into the hole. The wedge forces the expanded rod solidly against the sides of the drilled hole.

List No.	Length Inches	Approx. Wt. Lbs., 100 Pcs.
7547	18	600

Slater Universal Guy Guard
(Half Round)

This type of guy guard was first introduced by Slater in 1920. In 1931, the hand-gripping attachment at the lower end was introduced, and the one-bolt assembly was adopted. These major improvements eliminated U-bolts.

In 1935, turned-in edges were added. By these several improvements, strength and protection were increased, visibility retained and installation simplified.



Cat. No.	Length	Inside Dia., Inches	Standard Package	Wt. in Lbs., (Each)
7557	7 feet	2¾″	2	9
7558	8 feet	2¾″	2	11

Slater EnCirCall Guy Guard
(Full Round)

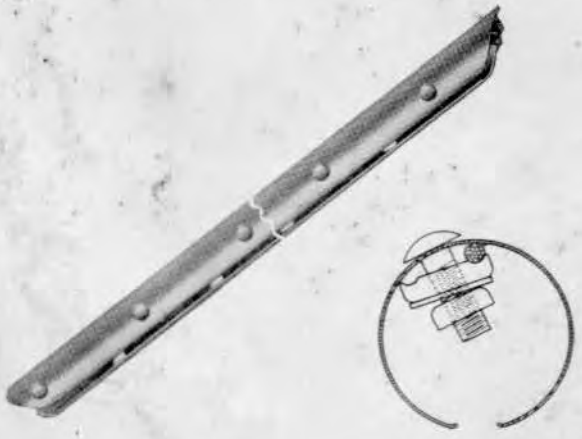
The most important contribution to safeguarding traffic from injury on guys is the Slater EnCirCall.

Stronger than the half-round type.

Visible from all angles.

Easily installed. Raise over guy clamp and drop to ground line. Tighten the one bolt at the top end. Covers single or double guys. A series of holes punched at intervals prevents wind whistling.

Especially necessary on vertical guys where guy struts are used, near schools and playgrounds, and in positions of heavy traffic.



Cat. No.	Length	Inside Dia., Inches	Standard Package	Wt. in Lbs., (Each)
7577	7 feet	3⅜″	2	16
7578	8 feet	3⅜″	2	18

ANCHORING AND GUYING MATERIAL—*Continued*

Slater Thimbleye Anchor Rod

Either one or two guy strands may be used.

By standardizing on this one type of rod we are able to furnish a double thimbleye at the usual price of single.

The use of this rod eliminates entirely the use of thimbles

List No.	Size	Weight per 100
8505	½" x 5′	380
8506	½" x 6′	430
8515	⅝" x 5′	570
8516	⅝" x 6′	680
8517	⅝" x 7′	790
8527	¾" x 7′	1140
8528	¾" x 8′	1280
8529	¾" x 9′	1440
8538	1" x 8′	2300
8539	1" x 9′	2550
8540	1" x 10′	2800
8541	1¼" x 10′	4200

Galvanized Steel Wire Strand C.E.S.A.

For Guys and Cable Messenger

Stand. Brit. Wire Gauge S.W.G.	Nom. Dia. of Strand inch	Approx. Wgt. per 100 ft.	Minimum Breaking Load Lbs. Soft Grade	Hard Grade	Crucible Grade
16	3/16	75 lbs.	1400	2300	4200
14	1/4	120 lbs.	2300	3400	5700
13	9/32	174 lbs.	3000	4300	8100
12	5/16	210 lbs.	3800	5300	10000
10	3/8	320 lbs.	5600	7500	14600
9	7/16	415 lbs.	7000	9200	18000
7½	½	510 lbs.	9000	11000	21000

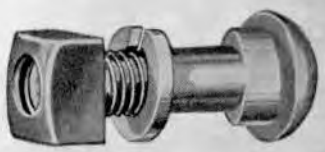
Copperweld Strand

Furnished in standard sizes.
Further information on request.

Slater Snubbereye Anchor Rod

The fork is notched to engage the teeth of the roller.

The Snubbing Roller—note the teeth.



The oval shouldered bolt that holds the roller in position.

This anchor rod is provided for the engineer who favors the roller type of rod.

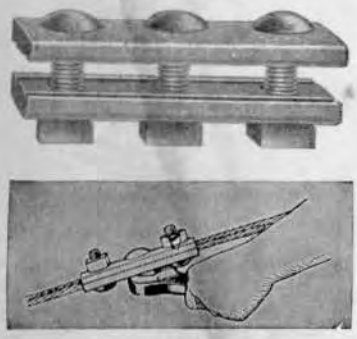
The roller is loose and free when the guy is being made. When the guy is made the roller is snubbed by tightening the nut.

Single Roller List No.	Size	Weight per 100	Double Roller List No.	Size	Weight per 100
8455	⅝ x 5	570	8555	⅝ x 5	570
8456	⅝ x 6	680	8556	⅝ x 6	680
8457	⅝ x 7	790	8557	⅝ x 7	790
8458	⅝ x 8	900	8558	⅝ x 8	900
8466	¾ x 6	980	8566	¾ x 6	980
8467	¾ x 7	1150	8567	¾ x 7	1150
8468	¾ x 8	1280	8568	¾ x 8	1280
8469	¾ x 9	1480	8569	¾ x 9	1480

Slater Snubbereye Rods cannot back-up. They are snubbed

ANCHORING AND GUYING MATERIAL—*Continued*

Guy Clamps



Showing the reversible centre bolt feature of the three-bolt clamp.

Slater and Stelco Clamps are made in 1-bolt, 2-bolt or 3-bolt type. They are made of hot rolled steel plates with a smooth clamping groove which provides a sure and safe grip on the strand. All 3-bolt Clamps are made so that the centre bolt can be reversed when required.

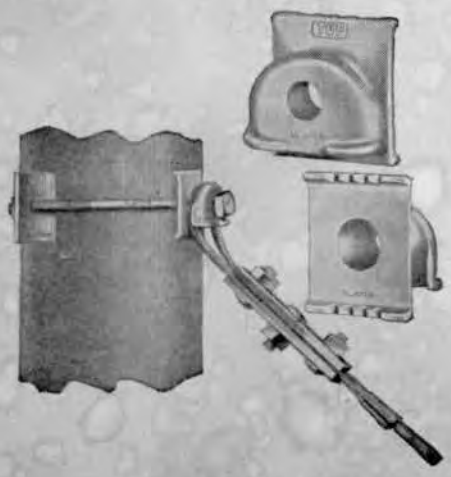
Stelco	Slater	No. Bolts	Size Bolts	Wt., Lbs. per 100
—	7441	1	½"	62
20	7448	2	½"	126
30	7449	3	½"	155
10	7450	3	½"	208
35	7455	3	⅝"	230
50	7461	3	⅝"	260

Thimbleye Bolts

Straight and Angle

See listing under "Cable Accessories"

Guy Fitting



Slater No. 7587 Guy Fitting saves wrapping the strand around the pole. May be used for either pole or arm guys.

List No. 7587—Guy Fitting; weight per 100, 180 lbs.

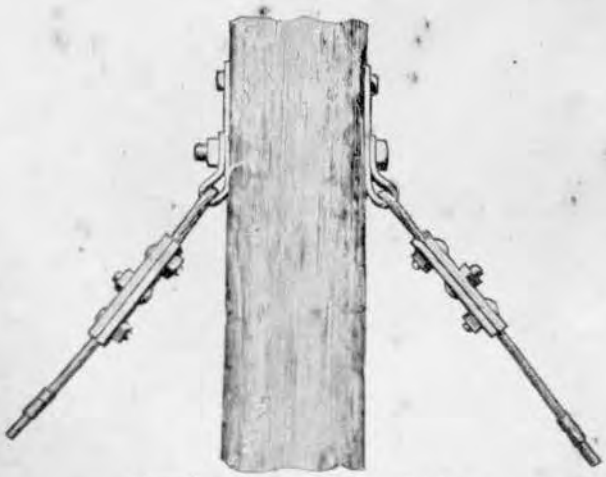
Strain Plates

No. 7575

List No.	Dimensions in Inches	Wt., Lbs. per 100
7575	4 x 8 x 14 Ga.	90

Storm Guy Strap

No. 2063 Storm Guy Strap



Complete Storm Guy Installation

This strap is made of ¼" x 1½" special high strength steel. The lower end is a thimbleye formed at a 45° angle.

It is mounted by a ½" lag screw in top hole and ⅝" or ¾" machine bolt in bottom hole.

List No. 2063—Storm Guy Strap; weight per 100, 200 lbs.

ANCHORING AND GUYING MATERIAL—*Continued*

Guy Thimbleye

No. 1100

By using the Slater forged Guy Thimbleye there is no need of wrapping the guy strand around the pole. All that is required is to run the strand through the Thimbleye.

List No.	Through bolt hole Diam. Inches	Ship., Weight Lbs., 100 pcs.
1100	5/8	70
1101	3/4	105

No. 7583½

Guy Hooks

No. 7583½

No. 7586

No.	Size Steel Inches	Length	Hole Diam. In.	Wgt., Lbs. per 100
7583½	1¼ x ¼	3¼	9/16	38
7584	1¾ x 3/8	4	11/16	87
7585	1½ x 3/8	3½	9/16	60
7586	1½ x 3/8	6	9/16	95

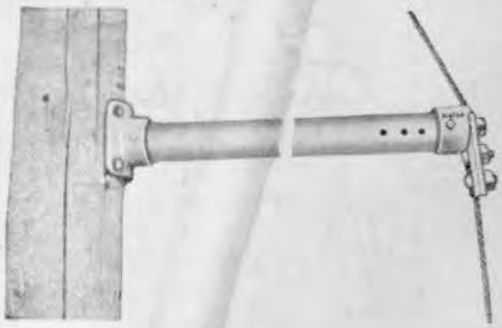
Slater Pole Dating Nail

The Slater Dating Nail is used to identify dates of new construction, new crossarms on old poles, and also to note the depth at which poles are set—for instance, if the pole is set six feet deep the nail is placed six feet above the ground line.

The distinctive features of this nail is that the body of the nail is oval in shape, the figures are stamped in the same plane as the long axis of the nail and the point is chisel shaped to make it easy to drive. Nails are supplied with single figures from 0 to 9, and also year figures 32 and up.

List No.	Length, Inches	Wt. per 100	Packages of
32 and up	1¼	4	200
0 to 9.	1¼	4	200

Guy Struts



No. 2055

The most practical pipe guy strut for all purposes. It consists of three main parts—two malleable end fittings designed to engage pipe of either 2″ or 2½″ diameter; and the length of pipe itself. A Slater guy clamp is an integral part of the fitting at the outer end.

To meet all requirements, the pipe sections of the Slater Guy Strut are made in 6′, 8′ and 10′ lengths, and each length is provided with five holes at intervals of 6″ from the outer end. This feature permits the cutting of the pipe to meet any local requirements as regards length.

Cat. No.	Description	Approx. Shipping Weight, Each
2055	Slater Guy Strut, complete, pole fitting, Pipe* and End Fitting.	42 lbs. (8′ length) 2″ Pipe
2056	Pole Fitting only.	5 lbs.
2057	End Fitting only.	6¾ lbs.

*Pipe—supplied in 6′, 8′ and 10′ lengths, either 2″ or 2½″ diameters.

Specify pipe diameter and length required.

Stubbing Washer

No. 7825

The Stubbing Washer is used in securing a pole, rotted off at the butt, to a new stub. A washer is used on each end of a through bolt bolted through the pole and stub, also, on each end of the bolt used for drawing together the wire wrapped around the pole and stub.

List No.	Dimensions in Inches Size Washer	Diam. Hole	Size Bolt	Wt. Lbs. per 100
7825	3¼ x 3¼ x ¼	¾	⅝	75

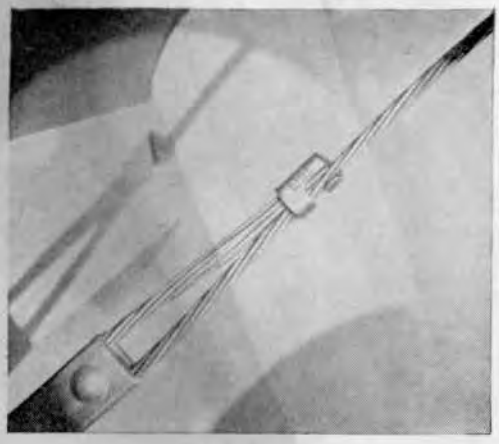
Guy Thimbles

List No.	Size	Wt., Lbs. per 100
7593	3/8″	10
7594	½″	22
8595	⅝″	50

ANCHORING AND GUYING MATERIAL—*Continued*

Slater Servisleevs

Slater Servisleev



This picture shows Slater Servisleev installed on two guy wires.

The Servisleev is a pre-formed galvanized steel guy clip, with a size available for every size of strand. The Servisleev is installed by placing it on the main strand and forcing it down over the free end of the strand by tapping it briskly. Can be removed and used again—for example, after taking the slack out of the guy. It is a positive time saver. Does not require crimping with pliers after installation.

List No.	Diam. Strand	Wt., Lbs. per 100
7451	3/16	3
7452	1/4	3
7453	5/16	5
7454	3/8	8
7458	7/16	10
7456	1/2	10
7457	9/32	3

Porcelain Strain Insulators

List No.	Length	Diam.	Diam. Hole
500	2 1/2"	2 1/4"	3/8"
502	3 1/2"	3 1/4"	1/2"
504	4 1/2"	3 1/2"	13/16"
506	5 1/2"	3 5/8"	3/4"

Slater Stubbing Bands

The life of a pole showing butt decay, can be extended by the use of a wood stub to reinforce it, provided that effective means are used to band the pole and stub together, to develop full strength.

This is the most efficient stubbing band yet placed on the market. Tests have proven that poles stubbed with this band give greater strength and permanency at half the cost of installing a new pole.

In ordering, all you need to specify is the diameter of the poles and stubs being used. Order two bands per pole.

Where the stub and the pole are not of equal diameters, a larger half-band should be used around the stub than around the pole. Thus, for a 14" stub and a 12" pole, use one-half a 14" band and one-half a 12" band for the stub and pole respectively.

List No.	Pole and Stub Diam. (inches)	Length of Sleeve Nut (inches)	Wt. lbs. Per C.	Std. Pkg.
1817	8	4 1/2	367	10
1821-A	10	6	550	10
1822	12	6	625	10
1823	14	6	700	10
1824	16	6	780	10
1825	18	8	950	10
1826	20	8	1020	10
1827	22	8	1100	10

These stock numbers indicate one band only—namely two half-bands of the same diameter and two sleeve nuts.

A Stub in time may save the line

LINE SUPPLIES

Crossarms

Douglas Fir

Size 3¼" x 4¼", pin boring for 1¼" pin, center boring for one ⅝" crossarm bolt, brace bolt boring for ⅜" carriage bolts. Arms can also be supplied in other sizes bored to customers' specifications.

List No.	No. of Pins	Length	Standard Center	Spacing Side	Approx. Wt. Lbs. ea.
1	2	36"	28"	—	10.62
2	4	48"	16"	12"	14.16
3	4	60"	18"	17"	17.7
5	6	72"	16"	12"	21.24
6	6	96"	18"	17½"	28.32
7	8	96"	16"	12"	28.32
10	10	120"	16"	12"	35.4

Wood Pins

Standard Pin

Transposition Pin

Description of Grades

A1 Grade Pins—Telephone and Telegraph

These are High Grade Pins made from live, strong, sound yellow locust. They are the same as A.T.&T. Co. grade pin but are not individually inspected except as, during manufacture pins which show worm holes or other defects are thrown out. These No. A1 Grade pins are much superior to what is commonly called "Commercial" Grade.

A.T.&T. Co. Grade Pins—Telephone and Telegraph

These are individually inspected pins, made strictly to the specification of the A.T.&T. Co.

Locust is the ideal wood for top pins. It is so dense-grained that it does not require treating.

Standard Pins

Size.	Grade	Approx. Wt. Per 1000
1¼" x 8"	A1	310 lbs.
1¼" x 8"	A.T.&T. Co.	310 lbs.

Transposition Pins

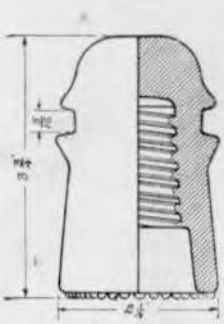
Size	Grade	Approx. Wt. per 1000
1¼" x 9"	A1	350 lbs.
1¼" x 9"	A.T.&T. Co.	350 lbs.

Oak Bracket

Plain Oak Brackets—Strictly First Quality

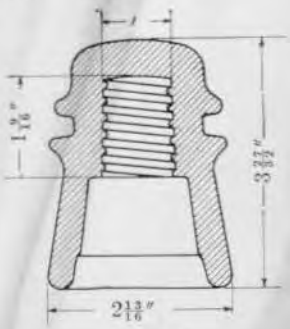
Size	Approx. Wt. per 1000
1½" x 2" x 12"	545 lbs.
1⅝" x 2" x 12"	650 lbs.
1¾" x 2" x 12"	775 lbs.
2" x 2½" x 12"	1100 lbs.

Glass Insulators



No. 9

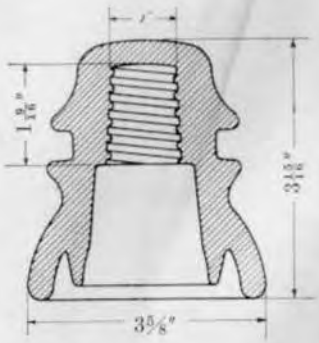
Pony



No. 16

Toll Line

	No. 9	No. 16
Quantity per Carton	80	72
Weight packed per Carton	55 lbs.	72 lbs.



No. 42

Heavy Double Petticoat

No. 50

Two-Piece Transposition

	No. 42	No. 50
Quantity per Carton	40	75
Weight packed per Carton	62 lbs.	141 lbs.

Metal Bracket

Made of steel, galvanized, and equipped with wood cob.

List No.	Wt., Lbs. per 100
141	70

(Insulator not included)

LINE SUPPLIES—*Continued*

Galvanized Telephone Wire

STELCO

Tight Galvanized

OR

FROST

Zinc Bonded

The Canadian Electrical Standards Association specification for manufacture of galvanized telephone and telegraph wire was adopted by manufacturers and large users in 1921. It is still the recognized standard. Under this specification it is required that the wire wrap around a mandril having a diameter 12 times the diameter of the wire under test.

Improvements in the art of galvanizing in the past few years have been such that wire is now produced which meets all the specification requirements and in addition, will wrap around a mandril of smaller diameter without the zinc flaking off. All Galvanized Telephone and Telegraph Wire which we sell is known as Frost Zinc Bonded or Stelco Tight Galvanized.

We carry in stock as standard, wire having a constant of "5600", commonly referred to as "5600 constant" wire, the term constant meaning equivalent of weight per mile times resistance per mile. On special orders, 5000 constant wire can be supplied.

C.E.S.A. (5600 constant) galv. Tel. and Tel. Wire

Birmingham Wire Gauge B.W.G.	Nominal Diameter in Mils.	Breaking Load Lbs.	Approx. Weight per Mile, Lbs.
12	109	460	171
9	148	850	315
8	165	1060	392
6	203	1600	593
4	238	2210	816

Plain Oak Pole Steps

Strictly First Quality.

Size	Grade	Approx. Wt. per 1000
1¾" x 2⅝" x 7½"	Best Quality	500 lbs.

GALVANIZED HARDWARE

All pole line hardware shown in this catalogue is galvanized by the Double-Dip Hot Process

Only sizes in regular demand shown. Others available on request.

Crossarm, Machine or Through Bolts

Our machine bolts, like all other items of pole line hardware, are hot galvanized and will meet standard galvanizing tests. They are provided with a long thread to accommodate variations in pole sizes.

Size	Length	Thread	Wt., Lbs. per 100
⅝	10"	4"	108
⅝	12"	6"	124
⅝	14"	6"	140
⅝	16"	6"	158
⅝	18"	6"	176

Double Arming or Spacing Bolts

Hot Galvanized

Double Arming Bolts, used with four square washers, represent a more satisfactory means of bolting two crossarms together for double arming at dead ends than the old method of a wooden block with a long machine bolt. These bolts include 4 square nuts but no washers, which must be ordered separately.

Size	Length	Thread Each End	Wt., Lbs. per 100
⅝	14"	6"	161
⅝	16"	7"	182
⅝	18"	8"	194

Steel Pole Steps

No. 7125

List No.	Type	Diameter Inches	Length Inches	Wt., Lbs. per 100
7125	Std. Hook Head	⅝	10	89

LINE SUPPLIES—*Continued*

Carriage or Crossarm Brace Bolts

Size	Length	Thread	Wt., Lbs. per 100
3/8"	4"	1 3/4"	17
3/8"	4 1/2"	1 3/4"	19

Lag or Coach Screws

Gimlet Point
(Fetter Drive or Twist Drive Types also available)

Size	Length	Wt., Lbs. per 100
1/4"	2 1/2"	3.5
5/16"	2 1/2"	5.5
5/16"	3"	7
3/8"	3"	10
3/8"	3 1/2"	11
1/2"	3"	18.5
1/2"	3 1/2"	22
1/2"	4"	26

Flat Crossarm Braces

Size 1" x 1/4"		Size 1 1/4" x 1/4"	
Length	Wt., Lbs. per 100	Length	Wt., Lbs. per 100
22	110	24	224
24	120	26	236
26	130	28	248
28	140	30	277
30	150		

Washers

Galvanized Washers are cleanly cut and are galvanized in such a manner as to insure a heavy, even coat of pure zinc with no large drops to interfere with the fit of the bolt or nut.

Round Washers

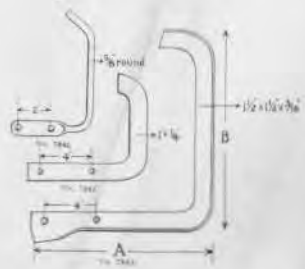
List No.	Outside Diam.	Dimensions in Inches: Diam. Hole	Size Bolt Mach.	Size Bolt Carriage	Thick Gauge	Galv. Wt., Lbs. per 100
1	1	7/16	3/8	..	14	1.6
2	1 1/4	1/2	..	3/8	14	3.0
3	1 3/8	9/16	1/2	3/8	12	4.2
4	1 3/4	11/16	5/8	1/2	10	8.4
5	2	13/16	3/4	5/8	9	14.0

Washers—*Continued*

Square Washers

List No.	Size Washer	Dimensions in Inches: Diam. Hole	Size, Bolt or Rods	Galv. Wt., Lbs. per 100
6	2 x 2 x 1/8	11/16	1/2 or 5/8	15.0
7	2 1/4 x 2 1/4 x 3/16	13/16	5/8 or 3/4	26.0
8	3 x 3 x 3/16	13/16	5/8 or 3/4	49.0
9	3 x 3 x 1/4	13/16	5/8 or 3/4	61.0
10	4 x 4 x 3/16	13/16	5/8 or 3/4	83.0
11	4 x 4 x 1/4	13/16	3/4 or 7/8	110.0

Guard Hooks



No. 7843

Guard Hooks are advisable in many places, to prevent wires which have become loosened from insulators falling upon foreign wires or endangering life by falling from the pole.

List No.	Dimensions in Inches: A	B	Wt., Lbs. per 100
7840	5 1/2	8 1/2	118
7842	9 1/2	9 1/4	180
8943	9 1/2	12	312

EVERYTHING
For Your Outside Plant

Whatever your line requirements, we can supply them. For more than thirty years we have specialized in this field, always keeping abreast of the times with new and improved devices. From the ground to the top of the pole, you can standardize on Northern Electric material. This Catalogue lists material required to build a safe and highly efficient line: crossarms, wires and cables, galvanized hardware, pins, insulators, guy strand, specialties, tools and underground conduit. Should you be interested in any material not shown we will appreciate your inquiry. Quality, prices and deliveries are in keeping with our position—

A National Electrical Service.

LINE SUPPLIES—*Continued*

One-Point Transposition Bracket

No. 9251

This one-point Transposition Bracket is drilled for ½" shank pin. A carriage bolt for clamping to arm and a lag screw to prevent shifting are included. The following auxiliary equipment is to be ordered separately for each bracket.

One No. 8010 Pin or one No. 972 Pin.

List No.	Dimensions in Inches Steel	Crossarm	Wt., Lbs. per 100
9251	1¼ x 5/16	3¼ x 4¼	300

Transposition Bracket for Phantom Circuits

No. 9275

Transposition Bracket No. 9275 is the Standard for 4-wire transpositions.

It is fastened to the crossarm by a ½" "U" bolt, which will fit crossarms of 3¼" x 4¼". Two heavy cleats, which are forced into the side of the crossarm by tightening the "U" bolt, prevent any movement of the bracket.

The bracket is made with holes for ½" pins, but the pins are not included with the bracket and should be ordered as a separate item. (Three pins per bracket.)

List No.	Dimensions in Inches Steel	Crossarm	Wt., Lbs per 100
9275	1½ x 3/8	3¼" x 4¼"	800

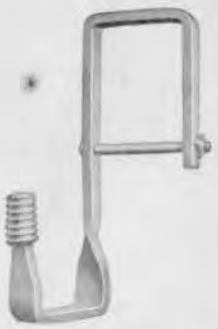
Top Pins for Transposition Bracket

No. 8010

These are the standard pins for use with transposition brackets. ½" shank and 1" thread for insulator.

List No.		Wt., Lbs. per 100
8010	Wood Cob	53
972	Lead Thread	108

One-Piece Transposition Bracket

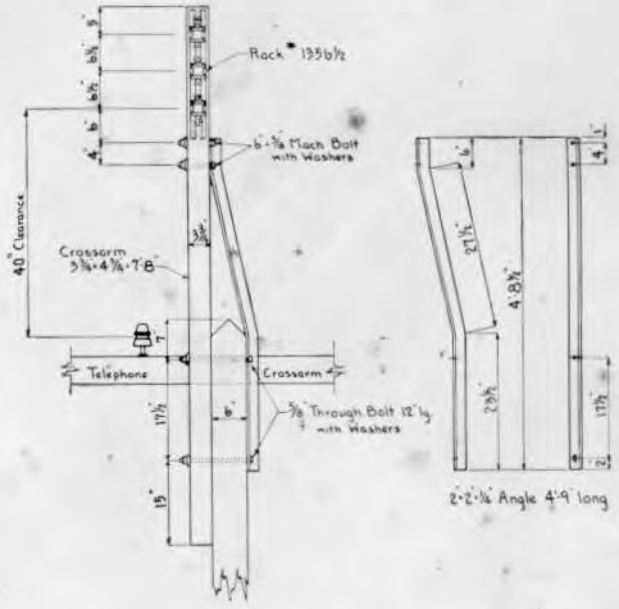


No. 22051

Furnished complete with 1" lead thread and ⅜" x 4½" carriage bolt as illustrated. A lag screw ⅜" x 2½" is also supplied with this bracket. The lead thread is securely bonded to steel body and will not work loose.

List No.	Wt. per 100
22051	374 lbs.

Slater Extension Bracket



It is often necessary to carry electric light or power service across a telephone line, when the telephone pole line is between the power line and the house. An approved method is illustrated above.

A standard wood crossarm is bolted to the top of the telephone pole in a vertical position and is braced by a 2" x 2" x ¼" angle shown at the right.

A Standard Slater Secondary Rack is bolted to the top end of the vertical crossarm—allowing a 40" clearance from lowest power wire to the telephone wire.

List No.	Description	Wt., Lbs. each
22003	Angle, 2" x 2" x ¼" x 4'9"	15

LINE SUPPLIES—*Continued*

Nicopress Sleeves

For Line Joints that are air and moisture proof and stronger than the wire itself

Nicopress Sleeve before being compressed

Nicopress Sleeve after being compressed

This operation is carried out as follows:

First—See that the ends of the wire are perfectly clean, then place one end of the conductor in the sleeve, being sure that it is pushed in until it butts in center, as shown in illustration above.

Second—Pinch end of sleeve with pliers, as shown above, just enough to insure wire being held in place. Then repeat this operation on other side of sleeve.

Third—Place sleeve in position in tool, being sure that it is in the die groove. Apply pressure on the tool handles, bringing them together until small metal bumpers on the inside of handles touch. Move tool forward and make a second compression. Reverse tool and make two compressions on opposite end of sleeve. Two compressions on each side of sleeve are required for copper or tinned steel sleeves.

Final—Illustration shows position of tool at end of squeeze. Note that the two little metal bumpers on inside of handles are tight together. It is very important that pressure be carried through until these bumpers touch.

Sectional view showing that sleeve and wires form what is practically a welded joint.

A line is no better than its poorest joint

LINE SUPPLIES—*Continued*

Nicopress Sleeve Tool No. 0

Nicopress Tool No. 0

This Tool will accommodate a range of sizes from 12 B&S (.080) to 6 B&S (.1625) in copper and from 14 BWG (.083) to 12 BWG (.109) in tinned steel.

The die groove in the standard telephone tool will take .104 and .080 copper and .083 and .109 tinned steel.

Weight each, 2 lbs.

Other sizes and combinations can be furnished.

Nicopress Copper Sleeves
(Patented)

For Copper Wire

Size B & S	Size BWG	Size NBS	Length Inches	Wt., Lbs. per 100
6	8	8	2¾	4½
8	10	10	1¾	1½
9	11	..	1¾	1¼
10	12	12	1¾	1
12	14	14	1¾	1¼

Nicopress Tinned Copper Sleeves

For Galvanized Telephone Wire

Size BWG	Length Inches	Wt., Lbs. per 100
8	2¾	4½
9	2¾	4¼
10	2¼	3¼
12	1¾	1

Nicopress Tinned Steel Sleeves

For Galvanized Telephone Wire

Size BWG	Length Inches	Wt., Lbs per 100
9	2¾	3
10	1¾	1½
12	1¾	1

National Splicing Sleeves
(Twisted)

These sleeves are manufactured accurately to size from the best grade of pure material.

Double Tube Copper Sleeves for Solid Wire

List No.	Gauge No.	Diam. Wire Inches	Length Inches	Wt., Lbs. per 1000
221	7 B&S	.144	5¾	85
222	8 B&S	.128	5½	60
223	8 BWG	.165	6	100
224	9 B&S	.114	5¼	50
225	9 BWG	.148	5¾	85
226	10 B&S	.102	4¾	30
227	10 BWG	.134	5½	60
228	11 BWG	.120	5¼	50
229	12 B&S	.081	4½	23

Double Tube Copper Sleeves for Solid Wire—*Continued*

List No.	Gauge No.	Diam. Wire Inches	Length Inches	Wt., Lbs. per 1000
230	12 BWG	.109	4¾	35
231	12 NBS	.104	4¾	30
232	14 B&S	.064	4	20
	Double Tube Tinned Steel Sleeves			
250	8 BWG	.165	6¾	90
251	9 BWG	.148	5¾	60
252	10 BWG	.134	5½	55
253	12 BWG	.109	4¾	35

Longer lines with improved transmission demand best possible joints

CONDUIT

Cornwall Fibre Conduit

Tapered Sleeve Joint. 5 ft., Length Standard.

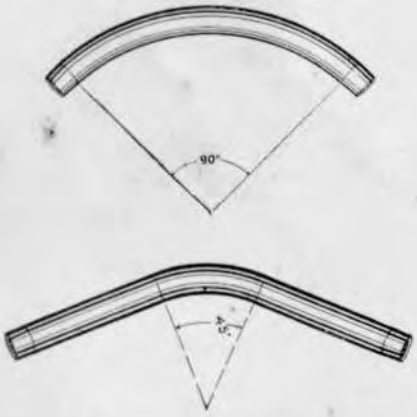
"Cornwall" Fibre Conduit is manufactured in Canada at Cornwall, Ontario, exclusively from Canadian materials under the supervision of men who have obtained the greatest measure of success in fibre conduit production.

Straight Cornwall Conduit

(One coupling supplied with each length)

Inside Diameter	Approx. Net Wt. per Foot	Approx. Number Ft. (Min. Car 30,000 lbs.)	Std. Crate Contains	Approx. Crated Gross Wt. per Foot
2″	1.00	30,000	200′	1.4 lbs.
2½″	1.20	25,000	200′	1.6 lbs.
3″	1.45	20,700	150′	1.9 lbs.
3½″	1.75	17,200	125′	2.4 lbs.
4″	2.00	15,000	100′	2.8 lbs.
4½″	2.45	12,300	80′	3.5 lbs.
5″	2.90	10,300	60′	4.5 lbs.

Cornwall Bends



Standard 45° and 90°
One coupling supplied with each bend

Inside Diameter	Radius Standard 45° and 90° Bends	Approx. Gross Weight per Bend Crated	Standard Crate Contains Bends
2″	18″–24″, 36″	10.8 lbs.	25
2½″	24″–36″	12.4 lbs.	25
3″	36″	14.7 lbs.	20
3½″	36″	21.3 lbs.	15
4″	36″	25.4 lbs.	12
4½″	36″	28.8 lbs.	9
5″	36″	45.8 lbs.	6

Clay Conduit

A wide variety of shapes and sizes is available in both the single and multiple duct styles.

A variety of split sections is available, making repairs and replacements easy. Inner edges of ducts are beveled; cable pulling is easy and safe. Scarifications provide a firm anchorage for joint and bedding mortar.

Single Duct Square Bore with Dowel Holes, 18″ long

Single Duct Round Bore, 18″ long

Two Duct Standard, 24″ long

Other multiple sections are three duct, four duct, six duct and nine duct.

Masson Conduit Rods

Masson Rods are the result of years of experience gained through the actual use of various conduit rods. Both ends are the same, and all couplings being interchangeable, it is never necessary to watch ends or look for the proper coupling.

The castings are the best malleable iron obtainable. Sticks are hickory. Standard length 3 feet and 4 feet.

We have found the three-foot length to be more convenient for most conditions.

CABLE ACCESSORIES

Cable Suspension Clamps

No. 8901

No. 8903

These clamps are used for suspending cable messenger and are attached to the pole with 5/8" machine bolt.

The auxiliary bolts are tightened after the strand is pulled to prevent any slipping.

Both sizes accommodate 1/4" to 7/16" strand.

The No. 8901 should be used for small cables only.

List No.	Length Inches	Wt., Lbs. per 100
8901	2 3/8	75
8903	5 5/8	210

Universal Messenger Hangers

Two 1/2" high carbon steel guy clamp bolts clamp the messenger securely at each pole. The hanger is mounted to the pole by a 5/8" through bolt and a 1/2" lag screw.

List No.	Dimensions in Inches Size Steel	Length of Legs	Wt., Lbs. per 100
8911	2 x 1/2	4 7/8 x 4 1/4	300
8912	1 3/4 x 3/8	4 7/8 x 4 1/4	230

Thimbleye Bolts, Straight

This bolt has a thimbleye and provides a convenient method of dead-ending messenger strand. It is passed through the pole and a large washer placed under the nut end.

List No.	Size	Length	Wt., Lbs. per 100
9060	5/8"	10"	143
9062	5/8"	12"	163
9080	3/4"	10"	200
9082	3/4"	12"	228

Thimbleye Bolts, Angle

This eye-bolt is used with eye-nut shown below for both dead-ending messenger and attaching guy strand to the same pole.

The bolt is passed through the pole with the threaded end facing the cable run. A large square washer should be placed under the nut and Guy Plate No. 8891 under the eye.

The eye nut is screwed on the thread and the messenger deadended to it. This makes a particularly neat and effective installation.

List No.	Size	Length	Wt., Lbs. per 100
9151	5/8"	10"	143
9152	5/8"	12"	163
9161	3/4"	10"	200
9162	3/4"	12"	228

Guy Plate

Used under eye of Angle Thimbleye Bolts for heavy strains. Attached with two 1/2" lag screws.

Stock No.	Plate Size Inches	Holes Upper	Holes Lower	Approx. Shipping Wt., Lbs., 100 Pcs.
8891	7 x 2 1/2 x 5/16	9/16	1 1/16	142

Thimbleye Nut

Used on threaded end of angle bolt shown above for dead-ending messenger.

List No.	Bolt Size	Wt., Lbs. per 100
7510	5/8"	150
7511	3/4"	150

CABLE ACCESSORIES—*Continued*

Wall Strap—Thimbleye

Drilled $\frac{9}{16}$" holes for two $\frac{1}{2}$" lag screws for mounting.

List No.	Length	Wt., Lbs. per 100
8895	16 7/8"	240

Wall Strap—Loop Type

Requires thimble. See Page 102 Mounting holes $\frac{9}{16}$".

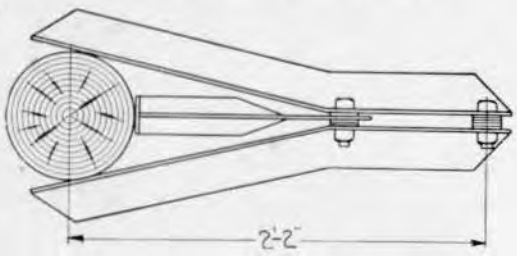
List No.	Length	Wt., Lbs. per 100
8892	8"	95

Strand Connector

An iron casting, galvanized, used for making a splice in a span of messenger strand. Holes $\frac{5}{8}$" diameter.

List No.	Wt., Lbs. per 100
2151	200

Cable Extension Arm



Used at points where it is essential to extend the cable from the pole. Mounted to pole with one $\frac{3}{4}$" through bolt and two $\frac{1}{2}$" lag screws. Mounting bolt and lags not included.

Stock No.	Extension from Center of Pole	Angle Size Inches	Approx. Shipping Wt., Lbs., 100 Pcs.
8920	26	3 x 2½ x ¼	3000
8921	44½	3½ x 2½ x 5/16	6000

Guard Arm Brace

Used for supporting wood cable Guard Arms on poles.

Stock No.	Steel—Size	Dimensions in Inches Hole Straight End	Hole Bent End	Approx. Shipping Wt., Lbs., 100 Pcs.
8904	18 x 1¼ x ¼	7/16	9/16	175

Crossover Clamps

No. 8930

Crossover Clamps are used for joining two cable messengers when they cross each other at right angles, where a cable turns a corner, or where branch cables leave the main line at points some distance away from the supporting poles.

List No.	Size Strand	Wt. per 100
8930	¼" to 7/16"	130 lbs.

Reinforcing Links

These links used on both sides of suspension clamp at angles to relieve strain on clamp.

List No.	Length	Wt. per 100
8929	8¾"	116 lbs.

Cable Guards

The following guards are used to protect cable on side of buildings or poles near ground. No. 14 gauge steel—"U" shaped.

List No.	Size	Wt. per 100
7531	6' x 1⅛"	350 lbs.
7532	5' x 2 3/16"	900 lbs.
7533	8' x 2 3/16"	1300 lbs.

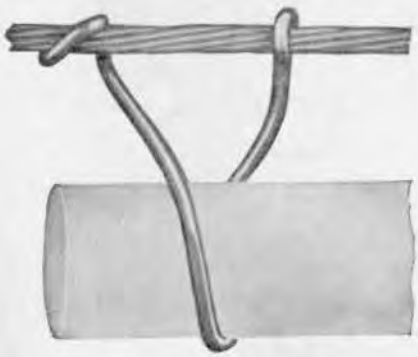
Straps for Above

7538	1" Cable	13 lbs.
7539	2" Cable	21 lbs.
7540	3" Cable	55 lbs.

A good cable installation is a real paying investment

CABLE ACCESSORIES—*Continued*

Slater National Cable Rings



These Rings are made of a high carbon spring steel wire (galvanized after forming) or copperweld. A flattened tread is provided, which has no sharp edges of any kind to abrade the cable. They are easily and rapidly attached to the messenger by hand. They are self-locking. The spring tension of the wire holds them in position. They positively will not creep.

A new feature is the longer hook which now completely encircles the wire.

The extra long type is used to suspend a second cable below the original cable on an existing messenger strand.

Slater National Cable Rings

List No.	Size	Weight, Lbs. per Thousand	Stand. Pkg. Contains	Strand Size
2161½	1½″	38	2000	Made in all
2162	2″	70	1000	strand sizes
2162½	2½″	100	1000	
2163	3″	110	500	Specify size
2163½	3½″	125	500	desired

Copperweld and extra long Rings.
(Information on request.)

Grade Clamps

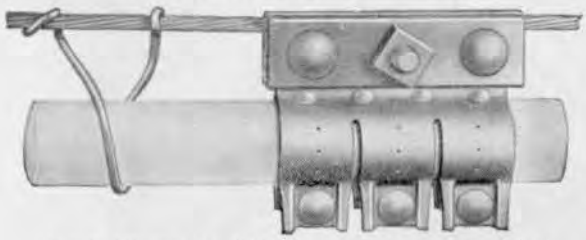
It is often necessary to run overhead cables up inclines or over hills. In order to prevent the creeping of the cable through the cable rings, in such cases, these Grade Clamps are clamped around the cable and the messenger strand. The Grade Clamp thus prevents the motion of the cable.

Adjustable Grade Clamp No. 22053

No. 22053

Fits all sizes of lead-covered telephone cables supported in 1½″ rings.

Grade Clamps—*Continued*

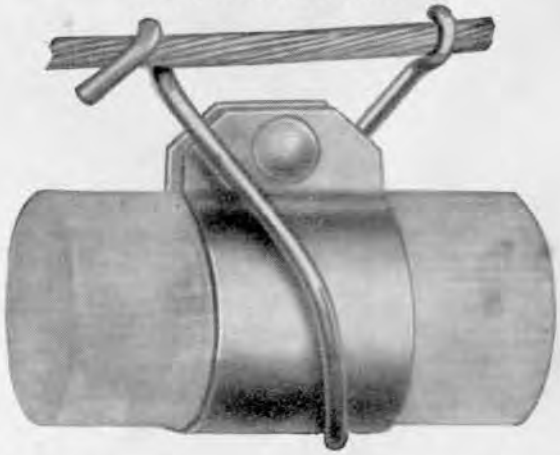


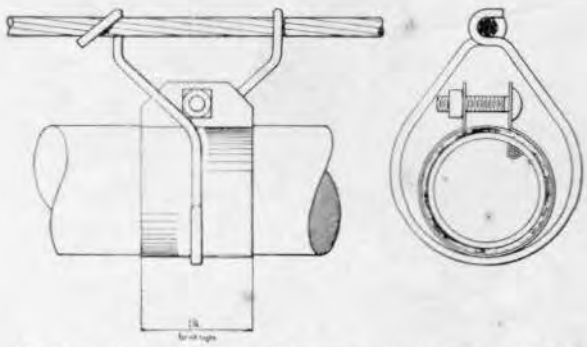
Grade Clamp No. 2094 Shown in Use with a 2½″ National Cable Ring on a 2″ Overhead Cable with 3-bolt Guy Clamp

List No.	Item	Cable Diameter	Weight, Lbs. per 100 pcs.
2054	Grade Clamp	1½″	100
2074	Grade Clamp	$1\frac{11}{16}$″	100
2094	Grade Clamp	$1\frac{15}{16}$″	100

Note—The list number does not include the Guy Clamp.

Zinc Cable Shields





Made of sheet zinc, No. 18 gauge, 2¼″ long. Used for clamping around lead-covered cable.

The shield is placed inside the cable ring to prevent injury to the sheath of the cable, which sometimes occurs at the first, second and possibly the third ring position on each side of the pole.

List No.	Used With Ring	Size of Cable (Outside Diam.)	Wt., Lbs. per 100
2242½A	2½	$1\frac{21}{64}$ to 1½	18
2242½B	2½	$1\frac{33}{64}$ to $1\frac{11}{16}$	20
2242½C	2½	$1\frac{45}{64}$ to $1\frac{13}{16}$	21
2243A	3	$1\frac{13}{16}$ to $2\frac{3}{16}$	34
2243B	3½	$2\frac{3}{16}$ to $2\frac{7}{16}$	36
2243½	3½	$2\frac{7}{16}$ to $2\frac{5}{8}$	40

CABLE ACCESSORIES—*Continued*

Slater Boston Cable Hangers

No. 2271 Installed

No. 2271, as shipped

This hanger is used for two special applications:

1. In short, slack spans of cable between a building and the first pole of the lines.
2. In the long spans to prevent sheath injury at the first, second and possibly the third ring positions on each side of the pole.

Due to the tight fit on the cable, the hooks will creep along the messenger strand if the cable moves due to temperature changes.

The strap section of this hanger is made of zinc ¾" wide which is threaded through the hook and locks securely due to the weight of the cable.

Slater Boston Cable Hangers—*Continued*

The hook is formed of steel wire, hot galvanized.
They are available in two sizes:
No. 2271 for 1½" rings for maximum size cable of 1" diam.
No. 2277 for 2" rings for maximum size cable of 1" diam.

List No.	Description	Length of Hook, Inches	Wt., Lbs. per 100
2271	Complete hanger	For 1½" rings	6
2277	Complete hanger	For 2" rings	7

Leather Cable Hangers

A specially treated leather strap with eyelet in each end, into which a galvanized steel hook is placed. Used for supporting cables on bridges or other locations exposed to excessive vibration.

Size	Max. Size of Cable	Wt., Lbs. per 100
1½"	1½"	5
2"	2"	6
2½"	2½"	7
3"	3"	9

DROP AND STATION WIRING

Steel Telephone Brackets

No. 9200

No. 9204

No. 9202

List No.	Type	Mtg. Holes	Bolt Holes	Wt., Lbs. per 100
9200	House	9/32"	7/16"	44
9202	Pole	13/32"	15/32"	88
9204	Corner	13/32"	15/32"	70

Bolts for Telephone Brackets

These bolts are used for attaching porcelain knobs to brackets shown above.

Size	Length	Type	Wt., Lbs. per 100
5/16"	2"	Stove F.H.	6
5/16"	2½"	Stove F.H.	8
5/16"	3"	Stove F.H.	9
5/16"	3½"	Stove F.H.	11
3/8"	3"	Mach.	13
3/8"	5½"	Mach.	20

Porcelain Knobs for Twisted Pair Drop Wire

No. 6061

No. 6062

These Knobs are of dry process white glazed porcelain, and are for use with the Telephone Brackets listed above.

List No.	Type	Bolt Hole	Height	Wt., Lbs per 100
6061	Two-groove	3/8"	1½"	18
6062	Four-groove	½"	2¼"	33

Porcelain Knobs for Parallel Pair Drop Wire

Type S

Type T

Type	Grooves	Bolt Hole	Height	Wt., Lbs per 100
S	One	3/8"	1 1/16"	12
T	Two	7/16"	1 13/16"	20

Subscribers appreciate a neat job on their premises

DROP AND STATION WIRING—*Continued*

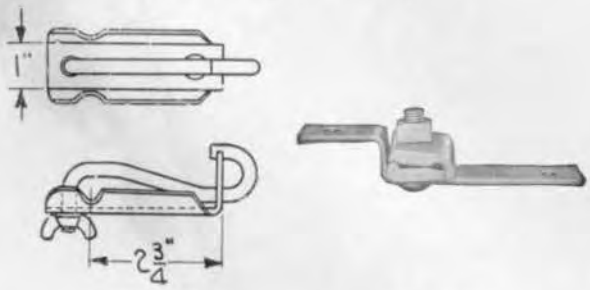
Angle Screw

No. 2214 No. 2215

These screw fixtures provide a convenient and economical fastening for Drop Wiring. Knobs not included.

List No.	Diam.	Knob End	Wt., Lbs. per 100
2214	5/16"	2"	12
2215	3/8"	3"	2

Slater Span Clamps



No. 8917 No. 8918

These Span Clamps are used for making station drop wire attachments to cable messenger strand. No. 8918 is fitted for two 5/16" or 3/8" bolts.

Stock No.	Cable Size Inches	Approx. Shipping Wt. Lbs., 100 Pcs.
8917	1/4 to 7/16	131
8918	1/2 or under	138

No. 8917 used for attaching Drop Wire Clamp.

Insulated Screw Eye

The porcelain ring has a diagonal opening which allows the easy insertion of wires and when pulled taut they cannot become released from the ring.

The steel Screw Eye is hot galvanized.

List No.	Diam. Eye	Shank	Wt., Lbs. per 100
2217	5/8"	1"	8
2218	5/8"	2"	9
2219	5/8"	6"	14
2220	1"	1 3/4"	17
2222	1"	2 3/4"	19
2221	1"	6 3/4"	23

Bridle Rings

List No.	Type	Diam. of Ring	Length of Shank	Net Weight Lbs. per 1000
2154	E	5/8"	1"	3
2155	E	5/8"	6"	8
2156	C	1 1/4"	1 7/16"	10
2157	C	1 1/4"	6"	15
2158	A	1 5/8"	1 7/16"	15

Drive Ring (Nail)

Galvanized nail, 2 1/4" long, to which is firmly attached a galvanized 1/2" loop, open at one end. Used for supporting drop wire on walls.

List No.	Wt. per 100
22004	3.2 lbs.

Drive Ring (One piece)

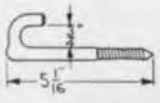
Side View Front View

These Drive Rings are usually used for inside use in roughly finished interiors for carrying telephone wires.

List No.	Wt. per 100
2161	1.8 lbs.

Inside diam. 1/2"

Drive Hook



Galvanized steel drive screw with hooked end. Used on poles for attaching one or more drop wire clamps.

List No.	Diam.	Length	Wt. per 100
1316	7/16"	5"	36 lbs.

DROP AND STATION WIRING—*Continued*

Drop Wire Clamp

Consists of a tapered, corrugated copper sleeve and brass slide with copper loop. Used for supporting drop wires, either parallel or twisted pair. When latter is used should be untwisted where wires pass through clamp.

Type P—For ordinary parallel or twisted pair drop wire.
Type R—For abrasive resistant or HC drop wire.

Where requirements demand clamp be supported on an insulated support, use porcelain knob on bracket to hold these clamps.

Drop Wire Hook

No. 2270 Hook

This hook is used on buildings where no insulation required to support one or more drop wire clamps. Types P and R.
This hook is formed of No. 7 special steel wire, to accurate dimensions, and is hot galvanized.

Hammer Drive Anchors

Made of aluminum alloy with hot galvanized nails.

It is easy to nail to concrete, brick or stone, with Hammer Drive Anchors.

Fastening the Anchor

1. Drill hole.
2. Pass the anchor through the hardware into the hole.
3. Hammer the nail home.

Dimensions

Diam. and Length of Shield	Diam. of Drill to Use	Standard Package	Wt., Lbs. per 100
3/16" x 7/8"	3/16"	100	1¼
3/16" x 1¼"	3/16"	100	1½
¼" x 1"	¼"	100	2¼
¼" x 1¼"	¼"	100	2¾
¼" x 1½"	¼"	100	3½
5/16" x 1¼"	5/16"	100	3½
5/16" x 1¾"	5/16"	100	5
5/16" x 2¼"	5/16"	100	6
5/16" x 2¾"	5/16"	100	7½
3/8" x 2"	3/8"	100	8
3/8" x 3¼"	3/8"	100	14
½" x 2¼"	½"	50	17
½" x 3½"	½"	50	25

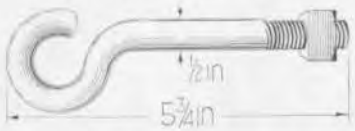
In ordering specify the two dimensions shown in the first column—for instance 3/16" x 7/8". Use a drill of the diameter shown in the second column.

Wood Screws

Hot galvanized wood screws for mounting hooks, brackets, etc., are produced specially for this purpose in flat or round head.

Orders should state size, length and F.H. or R.H. These screws meet same galvanizing test as our hot dip galvanized hardware.

Guard Arm Hook



½" diam., 5¾" long. Used to support drop wire clamps on cable guard or crossarms.

Drop Wire Clip

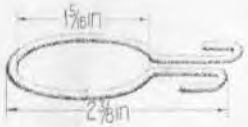
Length 2¾"

A "U" shaped Brass Clip for attaching to No. 1316 Drive Hook for suspending drop wires on intermediate poles.

Type S Wire Clip

An "S" Brass Clip ¾" long. For binding drop wires on knobs at dead ends to prevent excessive wrapping or loops.

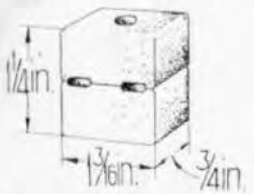
Knob Adapter



Diameter of Ring 1 5/16"; length 2 3/8".

A spring bronze wire formed to fit porcelain knobs with hook on each end. Used to attach drop wire clip to knobs.

Knobs—Type C



Porcelain Type C Two-piece. Used for supporting drop or ground wire on walls of buildings. Mounted with 2" x No. 8 R.H. galvanized wood screws.

DROP AND STATION WIRING—*Continued*

Swinging Knob

No. 10066 consists of a No. 6061 Knob and a hot galvanized wire loop, used for supporting drop wire on poles or buildings. Weight 25 lbs. per 100.

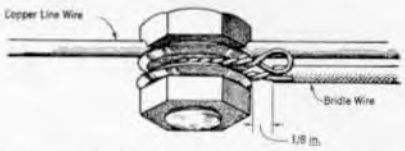
Telephone Knob Screw

No. 2920

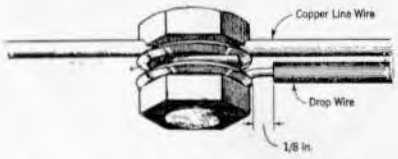
For twisted drop wires.

List No.	Size of Screw	Wt. per 100
2920	$\frac{3}{16}$" x 2$\frac{1}{2}$"	44 lbs.

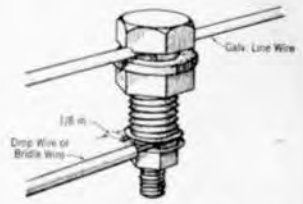
Connectors (Bridging Test)



Method of connecting bridle wire to copper line wire with No. 2A or 3A Bridging Connector.



Method of connecting drop wire to copper line wire with No. 2A or 3A Bridging Connector.



Method of connecting drop wire or bridle wire to galvanized iron line wire with No. 6A Bridging Connector.

For description of Bridging Connectors see page 19.

Slater Wireholders

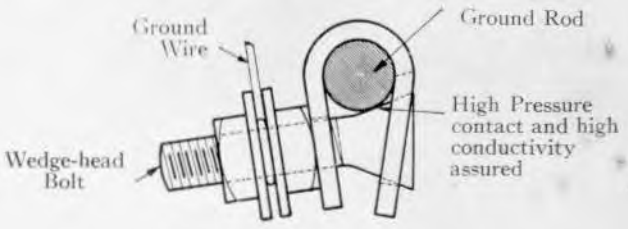
No. 190 No. 1607D No. 1621D

List No.	Wt. per 100
190	92 lbs.
1607D	108 lbs.
1621D	60 lbs.

Station Ground Clamp

Has a hexagonal head brass screw and will fit a pipe up to 1$\frac{1}{2}$" outside diameter.

Slater Ground Wire Connector



Section view of Slater Ground Wire Connector clamped in position.

List No.	Wt., Lbs. per 100
9320 for $\frac{1}{2}$" Steel Rod	50
9350 for $\frac{5}{8}$" Steel Rod	60

Connectors with Copper Liner and Bronze Nut

List No.	Approx. Shipping Wt., Lbs. per 100
9320C for $\frac{1}{2}$" Copperweld Rod	60
9350C for $\frac{5}{8}$" Copperweld Rod	75

Save trouble reports by using connectors

DROP AND STATION WIRING—*Continued*

Iron Ground Rods with Copper Wire

No. 12 wire soldered to rod; free end, five inches long.

List No.	Diam. Inches	Length Feet	Wt., Lbs. per 100
9505	½	5	320
9506	½	6	395
9516	⅝	6	595

Iron Ground Rods Without Copper Wire

Made of stiff, high carbon open hearth steel, with long sharp points. Unwired rods are provided with holes through the upper ends for attaching grounding wires. These holes are located one inch from ends of rods.

List No.	Diam. Inches	Length Feet	Wt., Lbs. per 100
9565	½	5	330
9566	½	6	395
9576	⅝	6	600
9577	⅝	7	700

Copperweld Ground Rods

The copper exterior, molten welded to the rigid steel core assures long life and full electrical advantages.

Stock No.	Diam. Inches	Length Feet	Approx. Shipping Wt., Lbs. 100 Pcs.	Stock No.	Diam. Inches	Length Feet	Approx. Shipping Wt., Lbs. 100 Pcs.
9415	⅜	5	200	9428	½	8	560
9416	⅜	6	240	9435	⅝	5	540
9425	½	5	350	9436	⅝	6	650
9425	½	6	420	9437	⅝	7	760
9427	½	7	490	9438	⅝	8	870

Slater Ground Rod Driving Tool

Showing the installation of a ¾" Ground Rod

The driving tool is repeatedly raised a few inches and allowed to fall freely; replacing the heavy sledge hammer usually used to drive a ground rod.

The tool is suitable for ¾" ground rods or smaller, either copperweld or iron. Every line truck should be equipped with one of these economical tools.

List No.	Dimensions in Inches: Outside Diam.	Inside Diam	Length	Weight Pounds Each
2005	1.9	1.1	40	24

Too many service complaints are traced to a poor ground

TOOLS

Universal Single Eye Cable Grips

Cable pulling grip, made either single or double weave.

List No.	Size Inches	List No.	Size Inches
201	1 x 24	210	2½ x 36
202	1½ x 24	211	3 x 36
203	2 x 24	216	2½ x 48
208	1½ x 36	217	3 x 48
209	2 x 36	218	3½ x 48

Split Cable Grips

Designed for use on a working cable. It can be attached to any point on a cable without cutting it.

List No.	Size Inches	List No.	Size Inches
25	1 x 18	33	2 x 24
26	1½ x 18	34	2½ x 24
27	2 x 18	35	3 x 24
28	2½ x 18	36	3½ x 24

Klein Eastern Climbers

No. 1901—Punched Strap Loops

Made in sizes 15″, 15½″, 16″, 16½″, 17″, 17½″ and 18″, measured from instep to end of shank. Furnished without straps.

Eastern Climber Straps

No. 61 No. 62 No. 63

List No. 60—Eastern Climber Straps are made from prime harness leather. Made up 1¼″ wide and 24″ long, with wrought iron buckle, well stitched and rivetted.

List No. 61—Plain pad for Eastern Climber Strap, made from heavy harness leather, with loops hand rivetted on.

List No. 62—Felt-lined pad for Eastern Climber Straps.

List No. 63—Lamb's wool lined pads for Eastern Climber Straps.

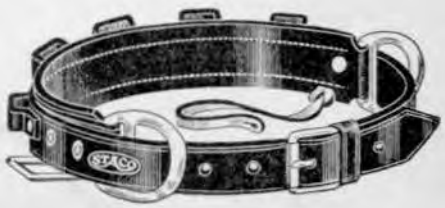
Trees (Staco) Belt and Safety Strap

No. 80—Safety Strap or Pole Belt

No. 82—Lineman's Belt

Made from select best quality union oak-tanned harness leather, cushion is 3″ wide and the outer layer and billet is 2″ wide. The tool rack is made from sole leather 1″ wide, loops moulded. Plier holster is made of select harness leather in the form of an open bottom pocket, which is rivetted on the body belt. Pole belt or safety strap is made from extra heavy leather, 2″ wide. Leather is protected at return buckle with heavy galvanized iron clip. All rivets are solid copper hand set.

The dees and snaps are drop-forged steel. Buckles are wrought iron.



No. 53—Lineman's Belt

Same as above but has plier loop instead of leather holster.

Both Types made in following sizes:—36″, 38″, 40″, 42″, 44″ and 46″.

TOOLS — *Continued*

Klein Splicing Clamps

All Klein Splicing Clamps have polished heads and black handles.

No. 102-3

For Nos. 4, 6, 8, 9, 10, 12, 14 B.W.G. iron wire; Nos. 2, 4, 6, 8, 10, 12 B. & S. copper wire. Length, 10¾".

Bell System Type

No. 105-17, Size 10¾-inch

For copper sleeves Nos. 6, 8, 10, 12, 14, 17, B. & S.
For iron sleeves, Nos. 8, 10, 12, 14, 16, 19, B.W.G.

No. 105-15, Size 8-inch

For copper sleeves, Nos. 8, 10, 12, 14, 17, B. & S.
For iron sleeves, Nos. 10, 12, 14, 16, 19, B.W.G.

No. 132-12, Size 9-inch

For copper wire Nos. 6, 8, 10, 12, B. & S.
For iron wire Nos. 8, 10, 12, 14, B.W.G.
For copper sleeves, Nos. 8, 10, 12, 14, 17, B. & S.
For iron sleeves, Nos. 10, 12, 14, 16, 19, B.W.G.

No. 132-15, Size 11¼-inch

For copper wire, Nos. 4, 6, 8, 10, 12, B. & S.
For iron wire, Nos. 6, 8, 10, 12, 14, B.W.G.
For copper sleeves, Nos. 6, 8, 10, 12, 14, 17, B. & S.
For iron sleeves, Nos. 8, 10, 12, 14, 16, 19, B.W.G.
Oval strand opening .437 x .624.

Hammer forged from high grade crucible tool steel. Designed for general telephone and telegraph work where a large range of wires is used.

NICOPRESS TOOLS—See page 109

Lindstrom Sleeve Twisters

Type "B"

For copper sleeves Nos. 8, 10, 12, 14, 16, 17, 18, N.B.S.
For galvanized iron sleeves Nos. 10, 12, 14, B.W.G.

Black handles and polished heads 10⅝" long. Used for twisting copper and tinned steel sleeves.

Type "C"

For copper sleeves Nos. 12, 14, 16, 17, 18, N.B.S.
For galvanized sleeves Nos. 12, 14, B.W.G.

Black handles and polished heads. 8¼" long. Used for twisting copper and tinned steel sleeves.

Klein Long Nose Side Cutting Pliers

No. 203-5, 5 inches; No. 203-6, 6 inches

Designed for work in restricted spaces. Equipped with cutting knives.

Klein Side Cutting Plier

No. 201-6 N.E.
No. 201 N.E., 6-inch; No. 201-7 N.E., 7-inch
No. 201-8 N.E., 8-inch; No. 201-9 N.E., 9-inch

A modification of the well-known Klein Side Cutting Pliers. For use on bare or insulated wire. The nose and all edges are rounded and the sharp shoulder of head is entirely removed, will not accidentally nick the wire and the new shape of the nose permits use in confined space not accessible to the regular pattern.

Klein Side Cutting Plier
With Sleeve-Joint Twister

No. 212

For linemen and electricians. Specially designed for telegraph and telephone work.

This plier is the same as No. 201 series, but with opening provided for twisting double sleeve joints.

*Sleeve opening in 6-inch plier for Nos. 14 and 17 N.B. & S. and No. 12 B. & S. .045.

*Sleeve opening in 7-inch plier for Nos. 14 and 17 N.B. & S. and No. 12 B. & S. .045.

*Sleeve opening in 8-inch pliers for No. 12 N.B. & S. and No. 10 B. & S. .104.

*No. 212-6, 6-inch; *No. 212-7, 7-inch; *No. 212-8, 8-inch.

TOOLS — *Continued*

Klein Oblique Cutting Pliers

No. 202-5, 5-inch; No. 202-6, 6-inch
No. 242-6, 6-inch (Heavy Type)

Cuts close, the narrow head permitting its use in confined places.

Knives are perfectly fitted. Lap joint type.

Oblique Plier with Wire Stripping Notch

No. 240-5, 5-inch; No. 240-6, 6-inch

No. 240 Klein plier is same as No. 202 but has small notch in jaws for stripping drop and station wire.

Klein Long Nose Pliers, Without Cutters

Adapted for stripping the ends of insulated wire and for work in confined spaces.

No. 301-5, 5-inch; No. 301-6, 6-inch

Buffalo Grips

No. 1 Buffalo Grip with Pulley

No. 1 Buffalo Grip with Loop

The Buffalo Grip is simple in design and will give long and satisfactory service. It is carefully proportioned for maximum strength without undue weight, and the entire surface is nickel-plated over a plating of copper.

No. 1 has flat jaws for bare wire from smallest to No. 6 inclusive. When equipped with pulley, use $\frac{3}{8}$" rope.

No. 2 has flat jaws for bare wire from smallest to No. 0 inclusive. When equipped with pulley, use $\frac{3}{8}$" rope.

Be sure and specify whether with or without pulley.

List No. - - -	1	2	3
Extreme Opening	.22"	.35"	.48"

Buffalo Lineman's Tools

Lineman's Tool
with
Strap and Hook

The Buffalo Lineman's Tool combines the advantages of the Buffalo Grip with those of a specially-designed tackle assembly. It is an extremely convenient and desirable hand tool, having increased power for taking up slack in line and guy wires. The strap or operating member passes over freely-turning rolls to reduce friction, and can instantly be locked against release when proper tension of the wire is secured. A freely-swiveling hook, large enough to be placed around an insulator pin or other anchorage of equal size, adds greatly to the efficiency of the whole tool.

No. 1—Has flat jaws for bare wire from smallest to No. 6 inclusive. Equipped with swivel hook and 80" strap.

No. 2—Has flat jaws for bare wire from smallest to No. 0 inclusive. Equipped with swivel hook and 80" strap.

List No. - - -	1	2
Extreme Opening	.22"	.35"

Chicago Strand Pullers

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.

Specially designed to accommodate the heavy tensions used in stringing messenger strand.

List No.		Weight Each	Max. Opening
1628-6	For bare wire No. 0000 and smaller and for 600 lbs. messenger strand.....	8½ lbs.	$\frac{13}{32}$"
1628-16	For 10M and 1600 lb. messenger strand.....	14 lbs.	$\frac{11}{16}$"

TOOLS — *Continued*

Klein Haven's Steel Grips

Almost automatic in action. Handle and eccentric allow instantaneous hold. A shake of the rope on the tackle disengages the grip.

No. 1604-10 for No. 4 Wire and smaller.

No. 1604-20 for ½-inch Wire and smaller.

Strand Cutter

This tool is recommended for cutting messenger and heavy strand used commonly in guying poles and other construction. The center cut jaws give maximum support to the cutting edge. The strand cutter jaws are of a temper somewhat harder than the standard type of jaws.

List No.	Description	Length	Cuts Strand	Net Wt., Lbs.
3	Strand Cutter	36″	½″	12¼

Klein Combination Steel Wrench

This wrench is forged from select bar steel. The slot is formed in a cross shape and will fit machine bolts, nuts or lag screws from ⅜″ to ⅝″. The small end of the wrench is arranged for $\frac{5}{16}$″ machine bolts or lag screws. The round hole allows the end of a bolt to come through as the nut is run on.

Nos. 3109-20—Length 13½ inches.

Klein Lineman's Wrench

(Bell System Type)

No. 3146 and 3146-A

These wrenches are forged from selected bar steel and are of the open end type with two openings of different size at each end. A hole is also provided for turning in pole steps, etc., etc.

List No.		Wt., Lbs. per doz.
3146	For ⅝″ Hardware	21
3146-A	For ¾″ Hardware	21

C & L Torches and Fire Pot

No. 32A Standard

No. 325—Heavy Duty

No. 32A—Generates powerful blue flame of large volume which can be reduced to a small pointed flame for light work. Performs perfectly indoors or outdoors under severe weather conditions. Blunt control valve. Impossible to enlarge orifice. Removable jet and cleaner tip. Bronze burner, wind shield, brass tank, re-inforced fittings, bottom filler. Perfectly balanced, sturdy construction.

Capacity one quart. Shipping weight 5¼ lbs.

No. 325—Operates in any position and under the most severe weather conditions. Two vaporizing veins generate an extra powerful flame of enormous size. Smooth flame control from wide open to off. Blunt control valve. Removable jet and cleaner tip. Bronze burner with wind shield. Brass tank has over-sized pump. Top filler. Perfectly balanced. Rugged construction.

Capacity one quart. Shipping weight 6 lbs.

No. 600A—Ordinary Service

No. 88—Multi-flame Control

No. 600A—Made for ordinary service. Sharp point control needle with shoulder to protect orifice. Bronze burner generates a hot blue flame of suitable volume. Brass tank, botton filler.

Capacity one quart. Shipping weight 4 lbs.

No. 88—Precise flame control from wide open to off. After quickly melting solder, lead, paraffin or insulating compound the volume of flame can be reduced to a small fire to keep the material in kettle hot without burning it. Large top plate. Bronze burner is quickly removed through the hinged door and easily replaced. Easy to clean. No uprights to rattle loose. Steel tank heavily tinned inside and outside to prevent rusting.

Capacity one gallon. Shipping weight 22¾ lbs.

Do not use old or damaged tools. They are dangerous

TOOLS — *Continued*

Barrow Reels

Made of hard rock maple strongly reinforced with angle iron braces.

No. 900—Weight 80 lbs. each

Post Hole Spoons

Eastern Pattern

Western Pattern

Made with high carbon steel blades, with 22-inch straps, and equipped with rock maple or northern white ash handle. Extra heavy handles furnished.

Maple Handles			Ash Handles		
List No.	Size Feet	Wt., Lbs. Each	List No.	Size Feet	Wt., Lbs. Each
			1023E	7	9
859E	7	9	1024E	8	10
860E	8	10	1025E	9	11
861E	9	11	1026E	10	12
862E	10	12	1027E	12	14

Standard Crooked Long Handle Shovels

Maple Handles				Ash Handles			
List No.	Size Feet	Strap	Wt. Lbs. Each	List No.	Size Feet	Strap	Wt., Lbs. Each
874	7	22″	8	1040	7	22″	8
875	8	22″	9	1041	8	22″	9
				1042	9	22″	10
				1043	10	22″	11

Oshkosh Digging Spuds

The blade measures 3½″ in width—just right for most efficient work.

List No.	Size	Wt. Each
852	9′	20 lbs.

Coghlin Digging Spuds

The Coghlin digging spud was designed especially for the Bell Telephone Company. It is made of octagon steel. Weighs 21 lbs.

Plain Pike Poles

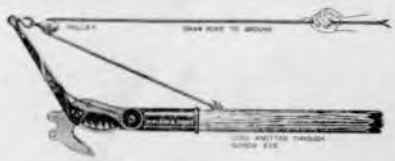
Handles of old growth yellow fir, straight grained, and free from defects. Pike is of crucible steel with upset shoulder, which distributes the thrust on the entire top of the pole. The pike is driven in and fastened with a rivet running through ferrule, pike and pole.

Standard Small Size

Handle is 2″ even diameter—no taper.

List No.	Size	Wt. Each
805	2″ x 10′	6 lbs.
806	2″ x 12′	8 lbs.
807	2″ x 14′	10 lbs.
808	2″ x 16′	11 lbs.

Klein Favorite Tree Trimmer



List No.	Size	Wt. Each
3600-20	19″ over all (without saw)	3½ lbs.
3600-21	21″ over all (with saw)	4 lbs.

Boulian Slack Puller

No. 2024—Boulian Guy Slack Puller; weight 19 lbs.

Boulian Slack Puller—No. 2024, used in tightening ⅜″ guy wire. The slack puller is holding a tension of approximately 1200 pounds while the guy clamp is being installed.

TOOLS — *Continued*

Simplex Pole Jacks

Simplex Jack No. 335

A one-man Jack for pulling poles, straightening poles, tightening guy lines. Capacity 5 tons.

The No. 325 Simplex is furnished complete with the following equipment:

4′ steel pinch bar lever, 52″ steel chain for pulling a portable 8″ x 15″ steel channel, an 8′ pipe equipped with a malleable iron forked cap for biting into the pole when the Jack is used for straightening.

Weight complete as above, 97 lbs.

Can also be supplied less equipment except lever bar, in which case weight is 28 lbs.

Simplex Pole Jack

Capacity 15 Tons
Single Acting—Automatic Lowering

Illustrating the pivoting feature of the Simplex Pole Pulling and Pole Straightening Jack

No. 329

The No. 329 Simplex Pole Pulling Jack was designed for pulling, straightening and moving heavier poles, and has accomplished remarkable records in reducing maintenance costs.

The No. 329 is automatic in raising and lowering, and cannot be tripped. It is furnished with the following equipment: 8′ steel chain, 5′ steel pinch bar and 10″ x 24″ I-beam base with hand hole punched.

Specifications

Capacity, 15 tons; height, 37½ inches; lift, 21 inches; weight (without equipment), 96 lbs.; (with equipment), 193 lbs.

Slater Pulley Blocks

Slater No. 2096 Pulley Block
(With Clevis)

Slater No. 2097 Pulley Block
(With Swivel)

A very light and compact set of pulley blocks for the telegraph or telephone patrolman. The triple sheave allows a lineman to pull up the wire slack even in the most awkward position at the top of the pole.

The blocks are made of steel throughout with the exception of the pulleys, which are self-lubrucating bronze. All steel parts are cadmium plated. A ⅜″ "sash-cord" rope is used, but is not included with the set as the length required varies.

List No.	Description	Wt. ozs. Each
2096	Pulley Block with Clevis	20
2097	Pulley Block with Swivel	23

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