Hall Switch & Signal Co.

SECTION 6
General Catalogue
Telephone and Telegraph Apparatus

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Section 6

GENERAL CATALOGUE

Telephone and Telegraph Apparatus

THE PRICES SHOWN IN THIS CATALOGUE ARE SUBJECT TO CERTAIN DISCOUNTS WHICH WILL BE QUOTED UPON APPLICATION

Hall Switch and Signal Company

50 Church Street
NEW YORK

Peoples' Gas Building
CHICAGO

MONTREAL

PRIMARY BATTERIES

DRY CELLS AND ACCESSORIES

GILL DRY CELLS



These dry cells are carefully constructed of high-grade materials. They are repeatedly tested at various stages of manufacture, and each cell can be relied upon to have full capacity.

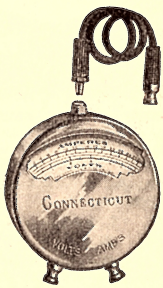
The Gill dry cell is made in No. 6 size only. It is designed for all classes of open circuit telephone service with the exception of Train Dispatcher's transmitter battery supply. Can be used with excellent results in main selector battery service.

COLUMBIA No. 4



Size, $2\frac{9}{16}$ x $2\frac{1}{2}$ x $\frac{3}{4}$ inches. Used in compact type portable telephone sets.

BATTERY GAUGES

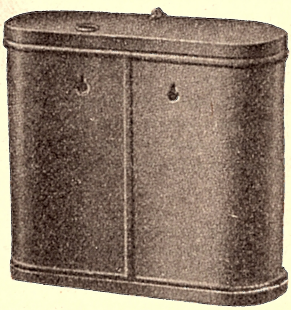


Code No.	VOLT AMMETERS	List Price, Each
802	O-30 amperes, O-8 volts.....	$4.00
O-802	O-30 amperes, O-15 volts.....	5.34

The casing of this instrument is made of extra heavy brass. It will withstand rough usage in a lineman's tool bag. Unlike most pocket battery gauges it will retain its accuracy for an indefinite period.

BATTERY BOXES

Code No.	Description	Capacity in No. 6 Dry Cells	List Price, Each
2-A	Japanned steel, fibre lined....	2	$0.60
2-B	Fibre.....	2	.54
3-A	Japanned steel, fibre lined....	3	.67
3-B	Fibre.....	3	.60

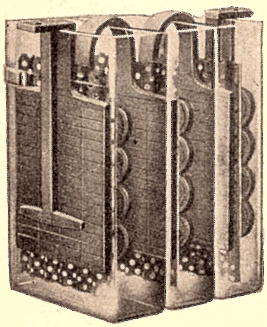


3-A Battery Box

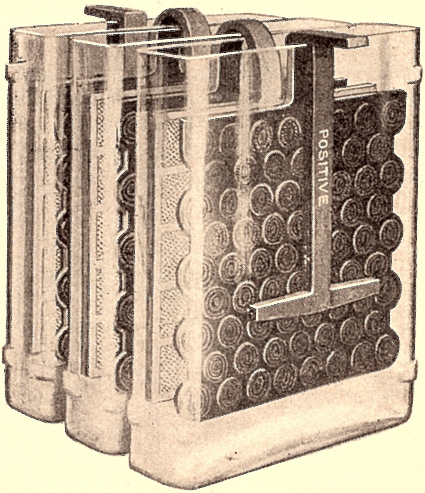
STORAGE BATTERIES

Chloride Accumulators, Two-Plate Types

These cells are recommended for main selector battery, telegraph, fire alarm, Dispatcher's transmitter and small private branch exchange service. The construction of the plates used in these cells is very substantial, and they successfully resist the warping action so detrimental to most two-plate cells.



TYPE BT



TYPE ET

	LT	BT	CT	PT	ET
Size of plate in inches	3½x1	4x3	5x5	8¾x5	7¾x7¾
Capacity in ampere hours at the 8 hour discharge rate	1⅗	6	12	24	36
Normal charge rate in amperes	⅕	¾	1½	3	4½
Outside dimensions of glass jar in inches:					
Length	1⅝	1¾	2¼	2½	2¼
Width	1¾	3¾	6¼	6	8¾
Height	4⅝	6¾	8	12	11
Extreme height of cell with plates in place	6⅞	7	8¼	12½	11 5/16
Weight of electrolyte required for each cell, in pounds	⅕	1	2¼	4½	5½
Weight of cell complete, in pounds	¾	3½	7½	13½	22
List price, each, of complete cell, less electrolyte	$0.80	$1.27	$2.39	$3.49	$4.75
List price, each, of element only	.60	.90	1.75	2.60	3.50
List price, each, of glass jar only	.20	.25	.50	.75	.95
List price, each, of glass cover only	.....	.12	.14	.14	.30
Perforated rubber separator, if desired.	.....	.09	.....	.....	.....

	List Price, Each
Bolt connectors complete for types LT and BT	$0.15
Bolt connectors complete for types CT, PT and ET	.15
Electrolyte, specific gravity 1.170 per 100 lbs	3.00
Electrolyte, specific gravity 1.210 per 100 lbs	3.00

Carboys, each, net $2.00. Credit will be allowed in full for carboys when returned in good condition, all charges prepaid.

BATTERY ACCESSORIES

FLOATING THERMOMETERS

Code No.		List Price, Each
1-F	Length, 9 inches. Diameter, 3/8 inches. Range, Fahrenheit + 20° to + 120°	$2.14

Other ranges and sizes can be furnished to order.
Prices upon application.

CHEMICAL THERMOMETERS
(Gas Filled)

Code No.		
1-C	Length, 15 inches. Diameter, 5/16 in. Range, Fahrenheit — 20° to + 220°	$4.00

Other ranges and sizes can be furnished to order.
Prices upon application.

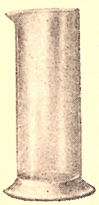
HYDROMETERS
(With Lead Ballast. Corrected to 70° F.)

These hydrometers are especially designed for storage battery testing. Readings can be made to .001 with great accuracy. This sensibility is secured by limiting the range between 1.130 and 1.230, which covers all of the electrolyte densities at which a storage cell should be permitted to operate. The bulbs are blown flat, which allows these hydrometers to float between the outside plate and the battery jar or tank without danger of breakage.

Code No.		List Price, Each
6	Specific gravity range, 1.130 to 1.230. Length, 6 inches.....	$1.60
8	Specific gravity range, 1.130 to 1.230. Length, 8 inches.....	2.40

Hydrometers of any range and size can be furnished to order.
Prices upon application.

HYDROMETER JARS



To be used where it is necessary to make hydrometer readings in electrolyte withdrawn from a storage cell; as in portable storage batteries or oil covered storage cells.

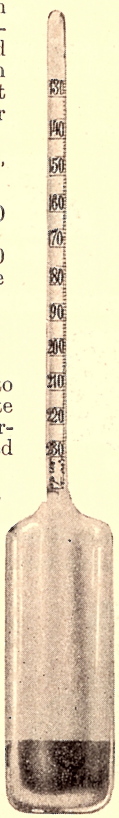
Code No.		List Price, Each
6	Used with Hydrometer No. 6..	$0.54
8	Used with Hydrometer No. 8..	.80

BATTERY SYRINGES



These battery syringes are made of hard rubber throughout. Capacity, one quart.

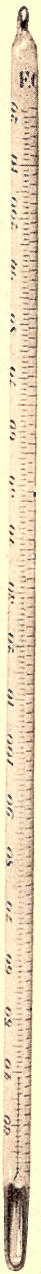
Code No.		List Price, Each
1-S	Battery syringe with straight nozzle.	$6.67
1-B	Battery syringe with bent nozzle...	6.67
	Extra nozzle for the above, straight or bent, as specified.....	1.79



Hydrometer No. 8

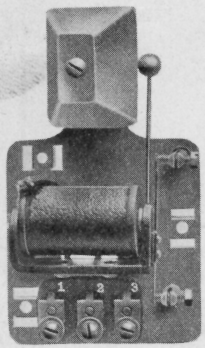


No. 1-F



No. 1-C

BELLS



No. 80-A

HALL SELECTOR BELLS (For Direct Current)

These bells are especially designed to secure the widest possible operating margins in current and adjustment, and are, therefore, particularly suitable for use in selector box outfits. Windings and terminals are arranged for single stroke operation if desired. These bells can be equipped with any one of five different gongs without change in price. Unless otherwise ordered, they will be equipped with gong H-1.

Code No.		List Price, Each
80-A	2500 ohms	$3.00
80-B	4½ ohms	2.34
80–AB	4½ ohms. Has answer-back attachment for use with No. 204–G selector box outfits	3.00

GONGS FOR HALL BELLS

All of these gongs are equipped with mounting stud adapting them for use with No. 80 type Hall bells.

Code No.	H-1	H-2	H-3	H-4	H-5
List Price, Each.	$0.32	$0.32	$0.32	$0.32	$0.32



H-1



H-2



H-3

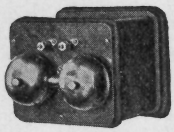


H-4



H-5

MAGNETO EXTENSION BELLS (For Alternating Current)



No. 25-B

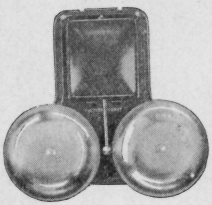
IN OAK BOX

Code No.	Ohms	Ringer Code No.	List Price, Each
5-B	500	5-A	$2.54
25-B	2500	25-A	3.00

Gongs of different tones can be furnished. See "Ringers."

LOUD RINGING, MAGNETO EXTENSION BELLS

LOUD RINGING POLARIZED EXTENSION BELLS (For Alternating Current)



Operate on any telephone generator, or A. C. power circuit of 60 cycles or less. Weatherproof; 6″ gongs only.

List No.		List Price, Each
201-200c	80 ohm	$6.94
202-200c	160 ohm	7.12
203-200c	300 ohm	7.27
204-200c	500 ohm	7.47
205-200c	1000 ohm	7.65

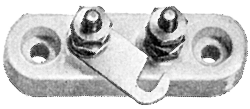
For 110-volt, 60-cycle current, use the 160-ohm bell. For 220-volt, 60-cycle current, use the 300-ohm bell.

BUZZERS (For Direct Current)

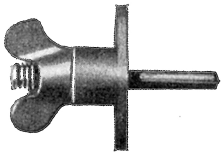
Code No.		List Price, Each
99	Faraday buzzer; resistance, 1¼ ohms. Used as a night alarm in connection with combined jack and signal boxes.....	$2.67



BINDING POSTS



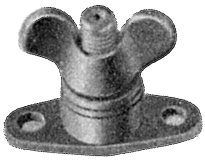
Code No..... 55.86
List Price, Each. $0.20



S32.03
$0.22



S32.07
$0.043



Code No..... S32.58
List Price, Each. $0.22



S32.27
$0.016



S32.60
$0.054



Code No..... S32.30
List Price, Each. $0.054



S32.57
$0.054

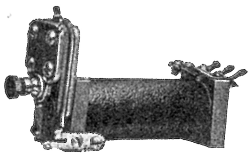


S32.34
$0.016

COILS—INDUCTION



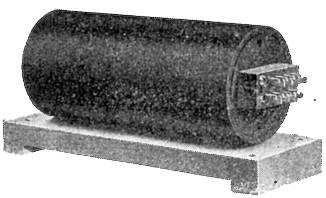
No. 8-A



No. 106-A

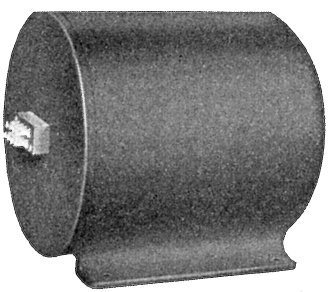
Code No.		List Price, Each
8-A	Used in all local battery talking circuits except in composite sets. Has 4 combination screw and solder terminals.....	$0.60
106-A	Induction coil with interrupter attached; used for talking and signaling with Nos. 7 and 15-A composite sets.....	3.20
106-B	Above coil only, less interrupter.	1.20
106-C	Interrupter attachment complete for No. 106-A.....	2.00

COILS—REPEATING



No. 9

Code No.		List Price, Each
9	Talk through and ring through for moderately heavy lines. Balanced for simplex and phantom circuits. 2 windings, 50 ohms each; 2 windings, 39½ ohms each.....	$6.00
92	Two No. 9 repeating coils mounted on one base. Selected and balanced.....	12.00

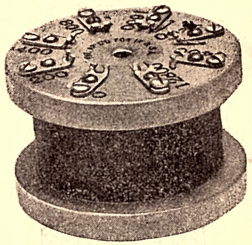


No. 15

Code No.		List Price, Each
15	Talk through and ring through for heavy lines. Balanced for simplex and phantom circuits. 2 windings, 26 ohms each; 2 windings, 25 ohms each.....	$16.67

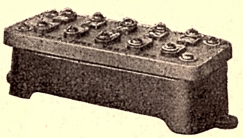
COILS—RESISTANCE

Code No.		List Price, Each
1-A	Universal resistance. Used as excess resistance in selector box outfits. Can be connected to give any resistance up to 25,400 ohms in multiples of 200 ohms	$2.34
1-B	Universal resistance. Same as No. 1-A, except that maximum resistance is 12,700 ohms in multiples of 100 ohms	2.00



No. 1-A

31-A For telegraph simplex on selector circuits. To be used in connection with a suitable retardation coil. Consists of two enameled resistance units mounted in an iron case with slate top. Size, 6⅜x2⅜x2 inches. Coils are insulated from each other and from the iron case. Each coil has four windings with resistances of 500, 1,000, 1,000 and 2,000 ohms; total, 4,500 ohms. These windings are brought out to separate binding posts in order to secure a bridging resistance varying from 1,000 to 9,000 ohms, as desired. Maximum current allowable in Morse circuit, 100 milli-amperes continuously $8.67



No. 31-A



No. 40-A

		List Price, Each
40-A	Resistance, 40 ohms. Used in Dispatcher's signaling sets	$0.67
165	Resistance, 8,000 ohms. Used in No. 204-G selector box outfits	$1.00
50-A	Resistance, 50 ohms. Especially designed for attachment to Faraday skeleton bells in local battery selector box outfits. Used as a non-inductive bell shunt for spark elimination at selector and bell contacts.	$1.00



No. 50-A



No. 400-A

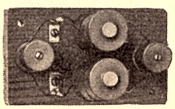
		List Price, Each
400-A	Non-inductive voltmeter shunt of 400 ohms, used in Wire Chief's test panels	$1.67

Special resistance coils, with any desired resistance and current capacity, made to order. Prices upon application.

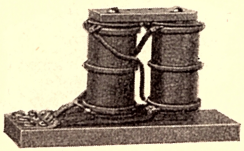
COILS—RETARDATION



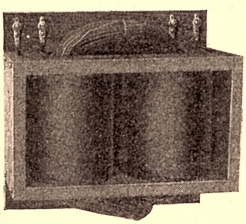
No. 1-A



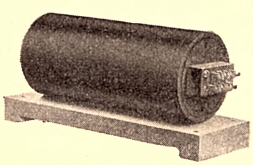
No. 3-A



No. 4-E



No. 5-L



No. 9

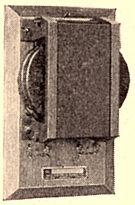


No. 12-D

Code No.		List Price, Each
1-A	40 ohms, single winding, solid core; used in Gill selector box outfits	$0.40
1-B	1 ohm, single winding, solid core; used as a receiver shunt in No. 15-A portable telegraphones	.40
3-A	Quadrilateral coil used in No. 7 telegraphone; resistance, 1 ohm per coil	1.20
4-E	4 windings, 20 ohms per winding, solid core, mounted on wooden base with 3 screw terminals; used in No. 24-E simplex sets	1.34
5-L	2 windings, 25 ohms per winding; used in Dispatcher's signaling sets and composite systems	12.54
9	2 windings, 50 ohms each; 2 windings, 39½ ohms each. A balanced retardation coil for use in simplex circuits	6.00
92	2 No. 9 coils mounted on one base	12.00
12-D	2 windings, 70 ohms per winding, wire core, mounted in oak box with 4 screw terminals	4.67
41-A	2 windings, 50 ohms per winding, wire core; used in No. 241-A simplex sets	2.00

COILS—RETARDATION

Code No.		List Price, Each
29-A	2 windings, 8½ ohms per winding, laminated iron core	$16.67
29 Special.	Windings as desired. Prices upon application.	
3-F	1 winding, 3.5 ohms, sliding core; used in "booster" circuit desk set boxes.....	1.34
3-G	1 winding, 150 ohms, sliding core; used in "booster" circuit desk set boxes.....	1.34
51-A	1 winding, 520 ohms, solid core; used in all high efficiency transmission circuits.	.80
59-B	2 windings, 200 ohms per winding, laminated iron core; used as a terminal coil in low resistance simplex circuits.....	46.67
62-A	2 windings, each removable, 16 ohms per winding, wire core. Size, 6¼x6¼x7⅛ inches; used in No. 61 type signaling sets.....	17.34
64-A	4 windings, each removable, 16 ohms per winding, wire core. Size, 6¼x6¼x12¾ inches; used in No. 61 type signaling sets.....	26.67
60-W	Separate winding for No. 62-A and 64-A retardation coils, resistance 16 ohms.....	5.34



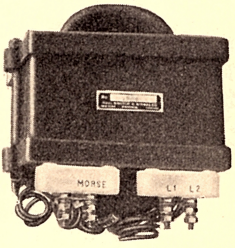
No. 29-A



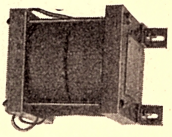
No. 3-F



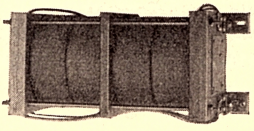
No. 51-A



No. 59-B

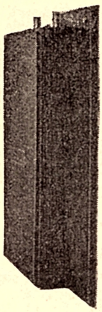


No. 62-A

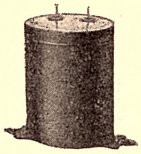


No. 64-A

CONDENSERS



No. 18-A



No. 25

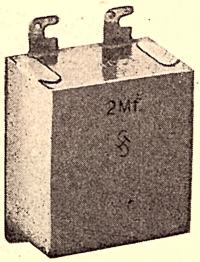


No. 76-D

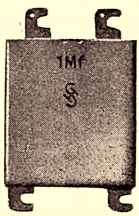


No. 313

Code No.	Capacity	Size	List Price, Each
12	1 M. F.	$\frac{3}{4}$x2x4$\frac{3}{8}$ inches	$0.67
18-A	1 M. F.	11$\frac{1}{2}$x6$\frac{1}{2}$x2$\frac{1}{2}$ inches	3.34
25	1 M. F.	2x2$\frac{5}{8}$ inches:	
		With No. S-23.23 mounting strap	1.07
		Less No. S-23.23 mounting strap	1.00
71	1 M. F.	4$\frac{3}{8}$x1$\frac{3}{4}$x1$\frac{17}{32}$ inches. Breakdown in excess of 2000 volts D. C	1.34
72	2 M. F.	4$\frac{3}{8}$x1$\frac{3}{4}$x1$\frac{17}{32}$ inches	1.00
76-D	1 M. F.	4$\frac{9}{16}$x1$\frac{5}{8}$x1 inches	.67
313	$\frac{1}{4}$ M. F.	2$\frac{1}{2}$x1$\frac{5}{16}$x$\frac{3}{4}$ inches	.47



No. 502-C



No. 516-D

Code No.	Capacity	Size	List Price, Each
502-C	2 M. F.	2x1$\frac{3}{4}$x1$\frac{3}{8}$ inches	$1.07
516-D	1 M. F.	2x1$\frac{3}{4}$x$\frac{5}{8}$ inches	.94

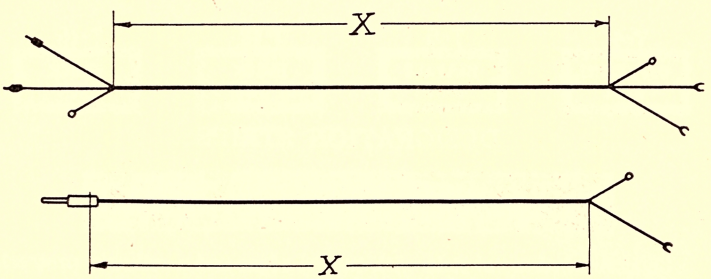
CORDS

Plugs will not be furnished with switchboard cords unless otherwise specified.

Code No.	Use	Used with Plug No.	No. of Conductors	Length in inches	Color	List Price, Each
202-A	No. 202-A test panel..	47	2	18″	Red, black, white, green.	$0.52
202-B	No. 202-B test panel..	47	2	24″	Red, white, black, green, neutral, red-white.....	.52
202-C	No. 202-C test panel..	47	2	36″	Red, white, black, green, neutral, red-white....	.58
201-A	Nos. 201-A, 201-C and 201-E test panels.	116	1	18″	Red, white, black, green.	.34
201-B	No. 201-B test panel..	116	1	24″	Red, white, black, green, neutral, red-white....	.40
201-D	No. 201-D test panel..	116	1	36″	Red, white, black, green, neutral, red-white....	.47
2-A	Wire Chief's test panel No. 2-A.....	116	1	42″	Red, white, black, green, neutral.....	.47
10-L	Wire Chief's test panel No. 10-L.....	47	2	42″	Red, white, black, green, neutral.....	.67
102-T	Concentration units...	47	2	66″	Black.....	.67
156	Jack and signal boxes.	47	2	18″	White.....	.34
*228-A	Receivers.....	...	2	28″	Worsted, moisture proof, extra heavy tinsel.....	.20
*10-B	Desk sets and No. 1000 type transmitter arms.....	...	4	64″	Worsted, moisture proof, extra heavy tinsel....	.60
*15-B	No. 1500 type transmitter arms.....	...	4	28″	Worsted, moisture proof, extra heavy tinsel....	.47
375	Breast telephone sets..	137	4	64″	Worsted, moisture proof, extra heavy tinsel....	1.00
364-A	No. S-5.73 hand set....	...	4	64″	Worsted, moisture proof, extra heavy tinsel....	1.00

*These cords have pin terminals at both ends.

METHOD OF MEASURING THE LENGTH OF CORDS





No. 116

CORD WEIGHTS

Code No.		List Price, Each
116	Lead, 9½ oz. For use with concentration units and Wire Chief's test panels.....	$0.24
106	Brass, 20 oz. For use with Wire Chief's test panels.....	.87



No. 13

PLUG SEATS

13	For use with concentration units and Wire Chief's test panels.....	.16



No. 2

CORD HOOKS

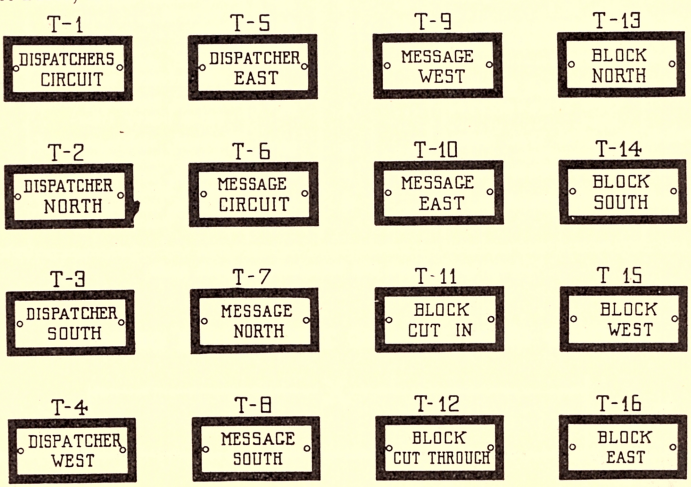
2	For use with concentration units and test panels.....	.04

DESIGNATION PLATES

For Test Panels, Jack Boxes, Etc.

These plates are of brass with whitened surface, 1 inch wide and ½ inch high. Etched lettering shows in white on a jet black ground. Order by code number only.

List Price, Each..... $0.067



DESIGNATION STRIPS



A black finished metal strip with turned edges and a celluloid protecting strip for typewritten or printed markings.

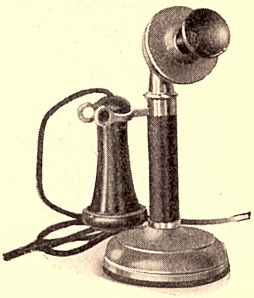
Code No.		List Price, Per Inch
8-G	Designation strips in the following standard lengths.....	$0.02

1½	inches	6	inches	10½	inches	18	inches
2	"	6½	"	12	"	19¼	"
3	"	8	"	12½	"	24	"
3½	"	8½	"	14½	"	26	"
4	"	10	"	16	"	28¾	"

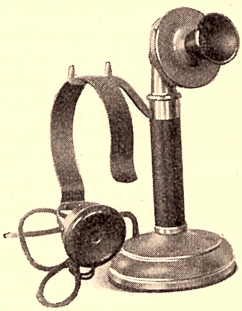
DESK STANDS

In these desk stands the hook switch contacts and cord terminals are located in the base in order to secure the greatest possible accessibility.

Code No.		List Price, Each
8-A	Standard local battery desk stand. Consists of: 1 No. 280 transmitter. 1 No. 144-AW receiver. 1 No. 228-A cord. 1 No. 10-B cord. Used with standard magneto desk set boxes.....	$6.87
18-A	Same as No. 8-A, arranged for use with No. 1006-B desk set box.....	6.87
7-A	Desk stand for Dispatcher's circuits. Consists of: 1 No. 280 transmitter. 1 No. 156-W receiver. 1 No. 228-A cord. 1 No. 10-B cord. Used in connection with No. 1006-A desk set box and push button or foot switch.....	8.08



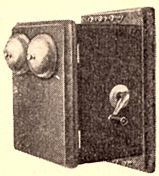
No. 8-A



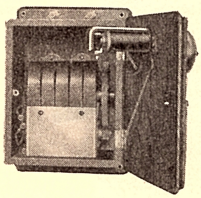
No. 7-A

DESK SET BOXES

NOTE.—Prices on all desk set boxes will be furnished upon application.



No. 525



No. 525 (open)

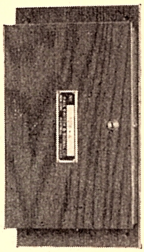
Standard magneto desk set boxes; used with No. 8-A desk stand, or special No. 1000 type telephone arms.

Code No.	Wood	Generator	Bars	Ringer	Ohms	Induction Coil
525	Oak	5	5	25-A	2500	8-A

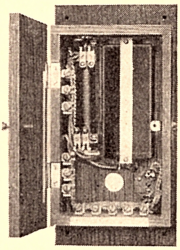
Condenser can be added, if desired.

DESK SET BOXES

FOR DISPATCHER'S CIRCUITS



No. 1006-A



No. 1006-A (open)

Code No.

The following desk set boxes will be furnished in oak only:

1006-A High efficiency transmission circuit. Contains:
- 1 No. 8-A induction coil.
- 1 No. 51-A retardation coil.
- 1 No. 71 condenser.

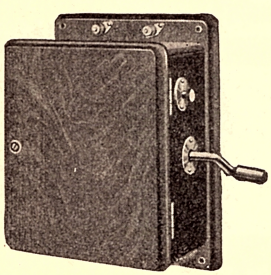
For use with No. 7-A desk stand or No. 1000-D telephone arm, and No. 21 key box or No. 3-A foot switch.

1006-B Standard local battery transmission circuit. Contains:
- 1 No. 8-A induction coil.
- 1 No. 71 condenser.

For use with No. 18-A desk stand.

1006-C Same as No. 1006-B. Terminals arranged for use with No. 1012-D telephone arm.

"BOOSTER" CIRCUIT DESK SET BOXES



No. 22-A

NOTE.—These desk set boxes can be furnished to conform to all existing standard designs.

Code No.

22-A Contains:
- 1 No. 8-A induction coil.
- 1 No. 3-F and 1 No. 3-G retardation coil.
- 1 No. 12 or No. 25 condenser as specified.
- 1 No. 5 magneto generator.
- 1 No. 172 key.

Used with No. 1000-D telephone arms.

Code No.

22-B Same as No. 22-A, less magneto generator.

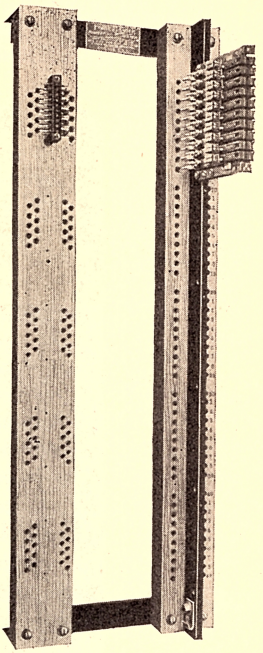
28-A Same as No. 22-A, less key. For use with No. 1010-D telephone arm.

28-B Same as No. 22-A, less key and magneto generator. For use with No. 1012-D telephone arm.

DISTRIBUTING FRAMES

TYPE No. L-3 WALL FRAME

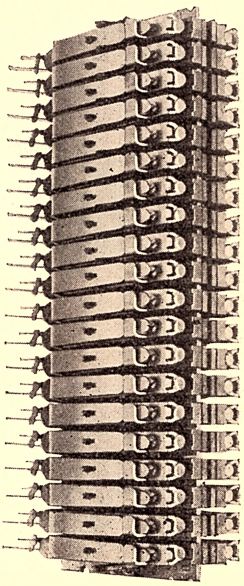
(Less protectors and terminal blocks)



Wall frames with ultimate capacity of 50 or 100 pairs as specified. Used in connection with No. 10 or No. 10-W protectors in banks of 10 or 20 pairs as desired. Thus the initial installation can be as low as 10 pairs, protectors and terminal blocks being added from time to time, as required, up to the ultimate capacity of the frame.

Code No.		List Price, Each
L-3	Wall frame, capacity 50.....	$6.67
L-3	Wall frame, capacity 100.....	13.34
L-3	Terminal blocks in banks of 10 only.....	1.34

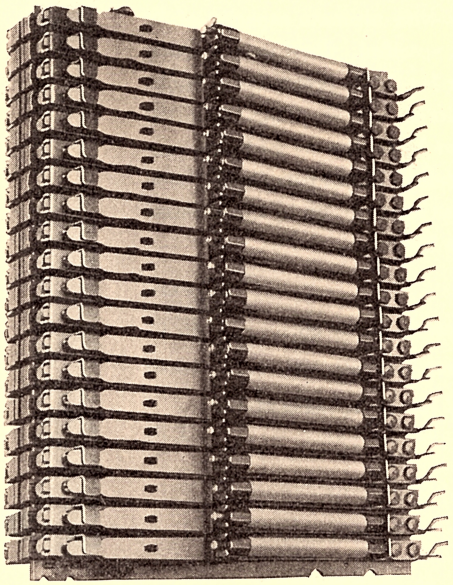
No. 10 PROTECTOR



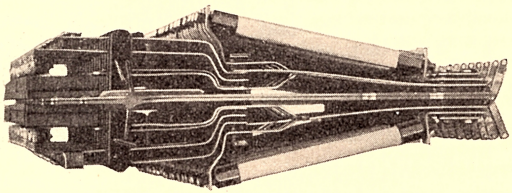
Code No.		List Price, Each
10	Protector arranged in banks of 10 or 20 pairs for mounting on No. L-3 wall frames. Consists of carbon block arresters and heat coils. Heat coils can be reset and resoldered in place by means of the No. 10 resoldering tool and four dry cells. Price per pair in banks of 10 or 20 pairs.....	$1.07
10	Resoldering tool.....	2.67
10	Heat coil solder, per oz.....	.54
10	Heat coils.....	.14
10	Carbon blocks, per pair.....	.04
10-C	Celluloid dielectrics perforated or "U" shaped, per hundred.	.67
10-M	Mica dielectrics, per hundred.	1.34
10	Test plug.....	2.67
10	Test switch for use with No. 10 test plug.....	3.34
10	Test cord, 6-conductor, per yard.....	.34

DISTRIBUTING FRAMES

No. 10-W PROTECTOR



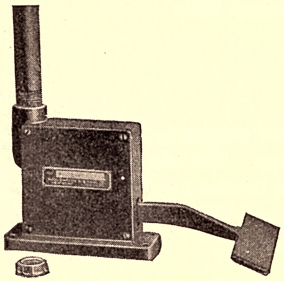
Side View



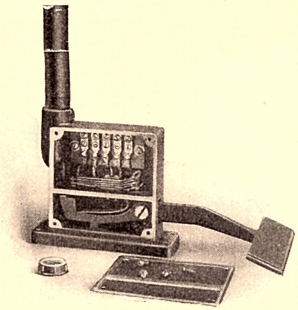
End View

Code No.		List Price, Each
10-W	Protector arranged in banks of 10 or 20 pairs for mounting on L-3 wall frames. Same as No. 10, with No. A-22 magnesia line fuses. Price per pair in banks of 10 or 20 pairs	$1.47
A-22	Line fuses for the above, each.....	.16

FOOT SWITCHES

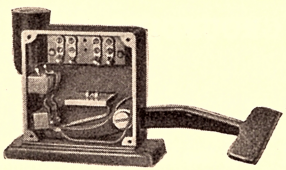


No. 3-A



No. 3-A (Open)

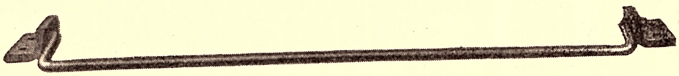
Code No.		List Price, Each
3-A	Used with No. 1006-A desk set boxes, and No. 1000-D and No. 1500-D telephone arms or No. 7-A desk stand. Equipped with 6-inch T pedal and 20 inches of pipe conduit. Has gun lock restoring spring. Closes 2 contacts, breaks 1 contact. Has 5 screw terminals	$5.20
3-B	Same general construction as No. 3-A. Closes 1 contact. Used with No. 1006-B desk set boxes and No. 18-A desk stand or special No. 1000 type telephone arms	5.07



No. 4-A

Code No.		List Price, Each
4-A	Used as a telephone booth switch to keep both sides of the drop line open, except when the telephone is in actual use. Extra precautions are observed to secure high insulation. This switch closes two contacts when operated. Equipped with 6-inch T pedal and 20 inches of pipe conduit. Has 4 screw terminals	$6.67

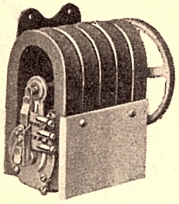
FOOT SWITCH ATTACHMENT



Code No.		List Price, Each
1	Length, 18 inches. Forms a convenient extension to the T pedals of foot switches No. 3-A and No. 3-B when used by Train Dispatchers	$1.34

MAGNETO GENERATORS

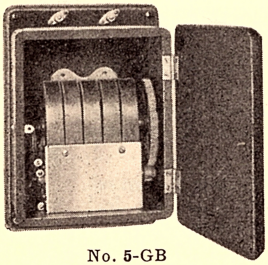
For Alternating Current Only



No. 5

Code No.		List Price, Each
5	A powerful, but compact, 5-bar magneto generator. The armature shaft makes 1 and breaks 1 contact.....	$4.34

GENERATORS MOUNTED IN OAK BOXES

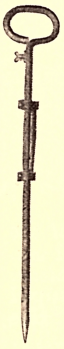


No. 5-GB

Code No.	Generator	Condenser	List Price, Each
5-GB	No. 5	....	$5.94
5-CB	No. 5	No. 72	6.94

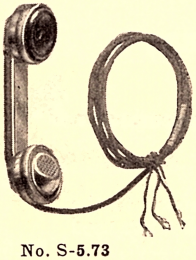
Generator cranks for the above..... .20

GROUNDING RODS



Code No.		List Price, Each
1	For use in connection with portable telegraphone No. 15-A and line pole No. 4. Permanently attached to this grounding rod is a conducting abrasive surface to assist in making connection to rails, structural iron work, etc.....	$2.00

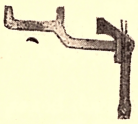
HAND SETS



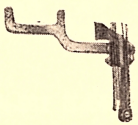
No. S-5.73

Code No.		List Price, Each
S-5.73	Used in portable telegraphones and portable telephones in connection with cord No. 364-A. Price includes cord.....	$9.00

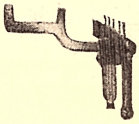
HOOK SWITCHES



No. S-3.42

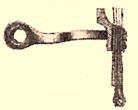


No. S-3.50

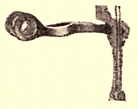


No. S-3.58

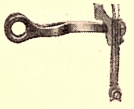
Code No.		List Price, Each
S-3.42	Makes 1 contact; used in No. 1000 type telephone arms...	$1.74
S-3.50	Makes 1 contact; carries 3 springs for push key; used in No. 1010 type telephone arms.....	2.07
S-3.58	Makes 1 contact; carries 5 springs for push key; used in No. 1012 and No. 1512 type telephone arms.....	2.34



No. S–5.42



No. S–3.134



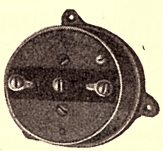
No. S–3.135

S–5.42	Makes 2, breaks 1 contact; used in No. 7 telegraphones..	1.07
S–3.134	Makes 1 contact; used in high efficiency wall telephones..	1.07
S–3.135	Makes 2 contacts; used in magneto wall telephones.....	1.07

HOWLERS

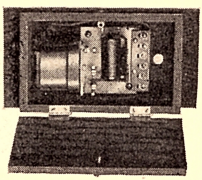
For Use in Connection with Composite Apparatus

Code No.		List Price, Each
102-A	Howler, unmounted.....	$4.00
102-B	Same as No. 102-A, mounted in oak box with metal horn attached. Has 2 screw terminals.....	5.34



No. 102-A

124-A	Howler, bell-ringing type. Howler and relay mounted on brass base with 6 screw terminals.....	9.67
124-B	Same as No. 124-A, mounted in oak box.....	11.67



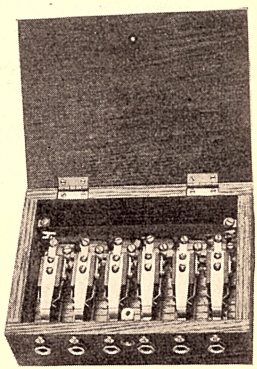
No. 124-B

SANDWICH CORDLESS JACK BOXES

One No. 152-A plug is furnished with each of the following cordless jack boxes. Larger sizes than those listed below can be made to order. Prices upon application.

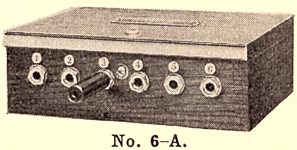
TELEPHONE TYPE, for use at way stations to connect one telephone to any one of several telephone lines as desired.

Code No.	Description	List Price, Each
2-A	2-line—2 No. 152-A telephone jacks installed.....	$3.60
3-A	3-line—3 No. 152-A telephone jacks installed.....	4.54
4-A	4-line—4 No. 152-A telephone jacks installed.....	5.47
6-A	6-line—6 No. 152-A telephone jacks installed.....	7.27
8-A	8-line—8 No. 152-A telephone jacks installed.....	9.07
10-A	10-line—10 No. 152-A telephone jacks installed.....	10.87



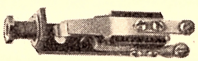
No. 6–A (open).

TELEGRAPH TYPE, for use at way offices to switch a pilot relay, key and sounder to any one of several telegraph wires as desired.

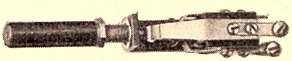


No. 6–A.

Code No.	Description	List Price, Each
2-B	2-line—2 No. 152-B telegraph jacks installed.....	$3.67
3-B	3-line—3 No. 152-B telegraph jacks installed.....	4.64
4-B	4-line—4 No. 152-B telegraph jacks installed.....	5.60
6-B	6-line—6 No. 152-B telegraph jacks installed.....	7.47
8-B	8-line—8 No. 152-B telegraph jacks installed.....	9.34
10-B	10-line—10 No. 152-B telegraph jacks installed.....	11.20



No. 152-B Jack (normal)



No. 152-B Jack (operated)

Jacks No. 152-A, used in telephone type cordless jack boxes can be readily adapted for use as telegraph jacks by substituting contact spring No. S10.46 (List Price, each, $0.07) for the spring originally installed.



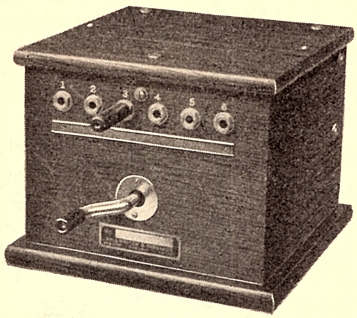
No. S10.46

Jacks No. 152-A and No. 152-B used in the above cordless jack boxes are equipped with Bakelite insulation blocks, thereby securing high insulation and great mechanical strength. These blocks, No. S10.15 (List Price, each, $0.32), are interchangeable with the old style rubber blocks heretofore used in these jacks.



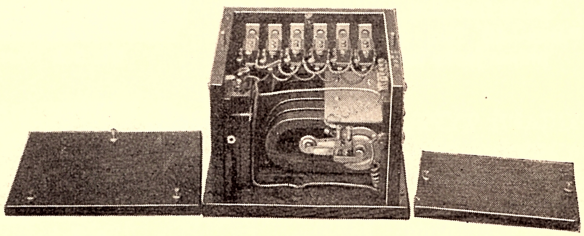
No. S10.15

COMBINED JACK AND GENERATOR BOXES



No. 56-C

These combined jack and generator sets consist of a cordless telephone jack box and a magneto generator in one oak cabinet 9x8½x7⅛ inches. This arrangement effects a great saving in table space and permits both of these important pieces of apparatus to be installed in the most convenient location.



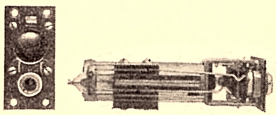
No. 56-C, open; showing the removable top and back

Combined jack and generator boxes are equipped with 5-bar magneto generators only. In all cases the cabinets are drilled for six No. 152-A jacks. Where less than six jacks are installed, the unused drilling is fitted with removable plugs, enabling additional jacks to be installed as required.

Code No.	No. 152-A Jacks	No. 72 Condenser	List Price, Each
52	2	...	$10.00
53	3	...	10.80
54	4	...	11.60
55	5	...	12.40
56	6	...	13.20
52-C	2	1	11.34
53-C	3	1	12.14
54-C	4	1	12.94
55-C	5	1	13.74
56-C	6	1	14.54

COMBINED JACKS AND SIGNALS

Used in Jack and Signal Boxes, Types No. 4, 6 7 and 8, with Plugs No. 47, No. 116 or No. 117-A.



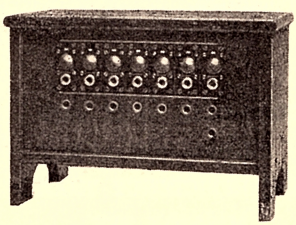
Combined Jack and Signal

Code No.	Resistance of Drop Coil Winding	Complete with Coils, List Price, Each	Code No.	Coils only, List Price Each
9-B	100 ohms	$3.14	B	$0.60
9-C	500 "	3.27	C	.74
9-D	900 "	3.40	D	.87
9-E	1600 "	3.54	E	1.00

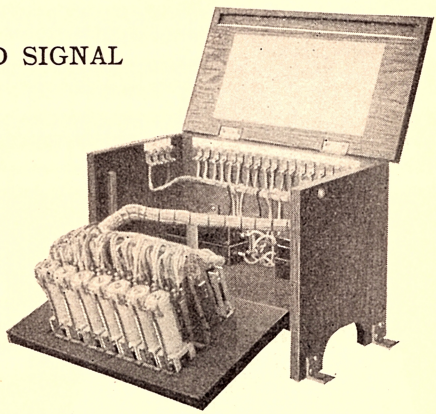


Coil

COMBINED JACK AND SIGNAL BOXES



No. 4-A



No. 4-A (Open)

These combined jack and signal boxes provide means for connecting one telephone set to any one of a number of telephone lines by means of a cordless plug. Each line is provided with a self-restoring signal arranged to be operated by a selector or a magneto generator. Jacks are also provided which permit the connection of any two lines without interference with the common telephone connection. This is accomplished by means of a double conductor cord with plugs attached to either end. In addition to this cord, each combined jack and signal box is furnished with one No. 99 buzzer and one No. 117-A plug.

Code No.	Capacity	Main Battery Bell Selectors (1000-ohm drop coils)	Local Battery Bell Selectors (100-ohm drop coils)	Magneto Lines (1000-ohm drop coils)
4-A	7 lines	.....	2	5
4-B*	7 lines	.....	2	3
4-G	7 lines	2	.....	5
4-H*	7 lines	2	.....	3
4-J	7 lines	3	.....	4
4-C	7 lines	.....	3	4
4-D	10 lines	.....	5	5
4-K	10 lines	5	.....	5

*Partially equipped. Has complete form wiring.

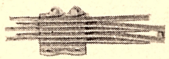
Circuits can be varied to meet individual requirements.

Prices upon application.

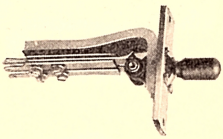
KEYS

NOTE.—The following list is intended to illustrate the general types carried in stock. Many variations in key movements and contact combinations can be furnished:

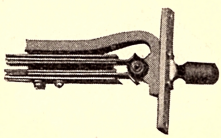
Code No.		List Price, Each
21	Push button type with mounting bracket; closes 2 and breaks 1 contact	$0.70
28	Locking lever type on No. 1 escutcheon; closes 2 and breaks 2 contacts	1.34
30	Locking lever type on No. 1 escutcheon, three position; closes 2 and breaks 2 contacts in one direction, closes 2 and breaks 2 contacts in reverse direction	2.07
32	Push button type. Same as No. 21, except that it breaks 1 additional contact	.80
34	Push button type with mounting bracket; breaks 1 contact	.56
38	Push button type with 4 springs; breaks 1 and closes 3 contacts.	.80
39	Push button type with mounting bracket; closes 1 contact	.56
97-132	Two non-locking keys on No. 3 escutcheon (see Circuit Section)	3.00
126	Locking lever type on No. 1 escutcheon; closes 2 contacts	1.00
132	Non-locking lever type on No. 1 escutcheon; closes 2 contacts.	1.00
172	Non-locking plunger type; closes 2 and breaks 2 contacts	1.34
235	Three-position, locking and non-locking; closes 2 contacts on non-locking, breaks 2 on locking side	2.00
272-B	Rotating button type, locking; closes 2 and breaks 2 contacts.	1.34



No. 21



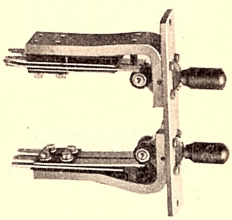
No. 28



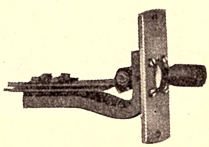
No. 30



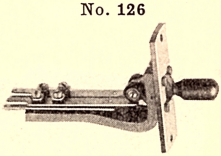
No. 39



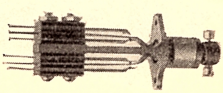
No. 97-132



No. 126

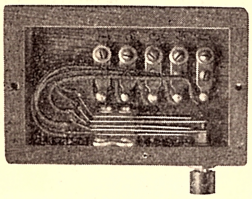


No. 132

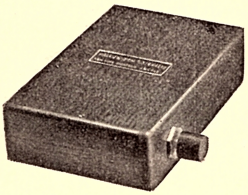


No. 272-B

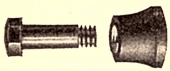
KEY BOXES



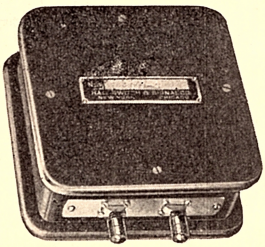
No. 21



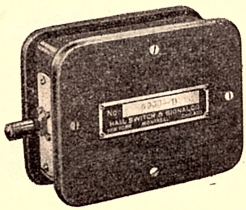
No. 21



Push Button and Plunger



No. 6000-C



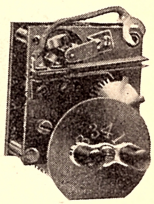
No. 6000-D

Code No.		List Price, Each
21	No. 21 key, No. S-3.54 plunger, No. S-3.55 push button, and 5 screw terminals, mounted in oak box. Can be used in place of foot switch No. 3-A, in connection with high efficiency transmission circuits. Plunger moves in a metal sleeve which will maintain perfect alignment with the key springs.....	$1.67
	No. S-3.55 push button..	.04
6000-B	No. 30 key, mounted in oak box with 12 screw terminals.....	4.34
6000-C	No. 97-132 key, mounted in oak box with 10 screw terminals.....	4.67
6000-D	No. 126 key, mounted in oak box with 4 screw terminals.....	2.67
6000-K	No. 28 key, mounted in oak box with 6 screw terminals.....	3.00
6000-L	No. 235 key, mounted in oak box with 4 screw terminals.....	3.00

GILL AUTOMATIC CALLING KEYS

Combinations as specified

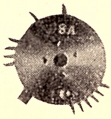
FOR TELEPHONE SELECTORS

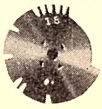


Code No.

8 11-second, adjustable speed, silent calling key. For use with four-figure local battery bell selectors, models No. 45-L, 80-L, E, E-3 and E-25. Has tooth to shut off the bell automatically. Clear out impulses first.







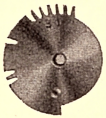


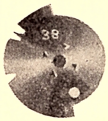
Code No.

8-A Same as No. 8, except with clear out impulses at end of ring.

18 Same as No. 8, except for use with four-figure main battery bell selectors. Models No. 45-M, 80-M and E-6.

18-A Same as No. 18, except clear out impulses at end of ring.









Code No.

31 Same as No. 8, except for selector model No. E-7, 2-figure one time wheel, main battery bell. Six clear out impulses first.

38 Same as No. 8, except for selector model No. E-15, 2-figure two time wheel, main battery bell.

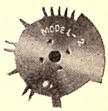
39 Same as No. 8, except for selector model No. E-14, 2-figure one time wheel, local battery bell. Seven clear out impulses first.

44 Same as No. 8, except for selectors No. E-22 and E-23, 2-figure two time wheel, local battery bell.

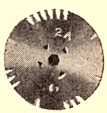
Adjustable keys for telephone selectors, not mounted. List price, each **$4.67**

FOR TELEGRAPH SELECTORS

Non-Adjustable Speed



2 For use in operating telegraph selectors which are connected to the back contact of telegraph relays. This key keeps the circuit closed when normal. It, therefore, can be inserted in the line. Speed, 15 seconds for complete revolution of the combination wheel.

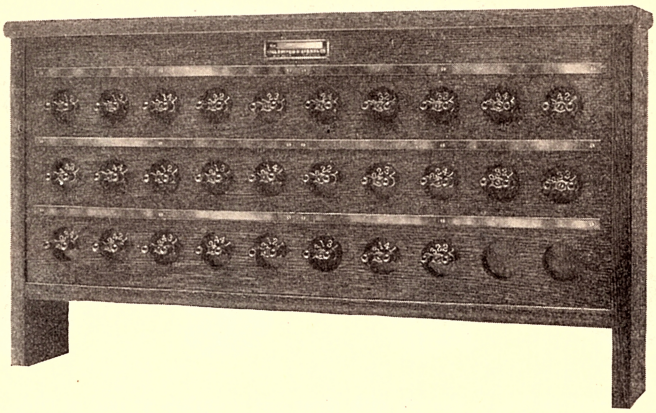


2-A Same as No. 2, except for use in operating telegraph selectors which are connected to the front contact of telegraph relays.

Keys for telegraph selectors, not mounted. List price, each. $4.00

This price includes nuts and washers for mounting. For prices to add when mounted, see Gill Automatic Key Cabinets.

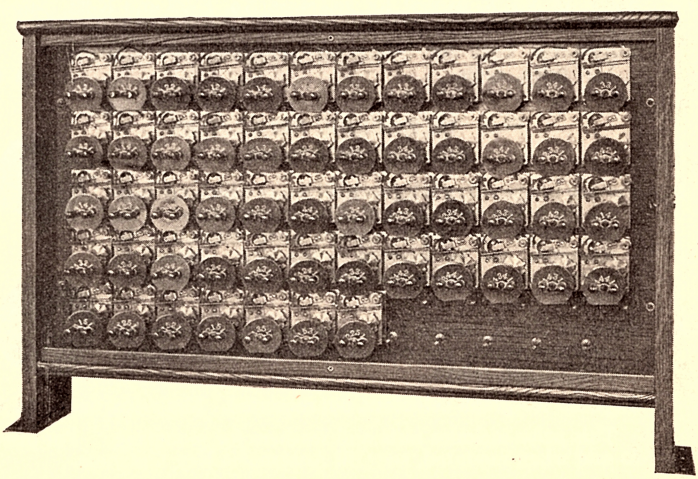
GILL AUTOMATIC KEY CABINETS



These key cabinets are equipped with unit key mountings. The front can be removed by pressing a spring release at one end of the cabinet, thereby exposing all of the key mechanisms for inspection.

				Length	Height	Depth	List Price, Each
Individual key box.....				4⅞ inch.	4½ inch.	2¾ inch.	$2.00
15	Capacity,	3	rows of 5	16⅝ "	15¼ "	4½ "	10.67
24	"	3	" " 8	23⅝ "	15¼ "	4½ "	11.34
30	"	3	" " 10	28⅜ "	15¼ "	4½ "	12.00
40	"	4	" " 10	28⅜ "	18¼ "	4½ "	12.67
50	"	5	" " 10	28⅜ "	21¼ "	4½ "	13.34
60	"	5	" " 12	33⅛ "	21¼ "	4½ "	14.67

Other sizes and capacities can be furnished to suit requirements.



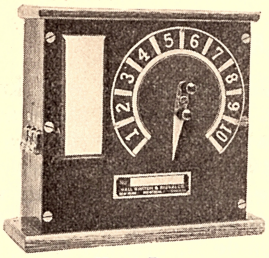
GILL UNIVERSAL CALLING KEYS

Used principally at way stations on intercommunicating circuits, or in main office installations where space will not permit the installation of a Gill automatic key cabinet.

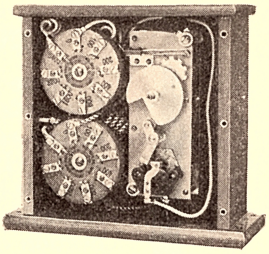
Code No.		List Price, Each
1-A	Universal calling key in enameled iron case; closes one contact. Used with selectors No. 45-L, 80-L, E, E-3, E-14, E-25, E-27	$6.67



No. 1-A



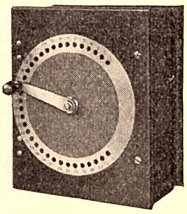
No. 1-D



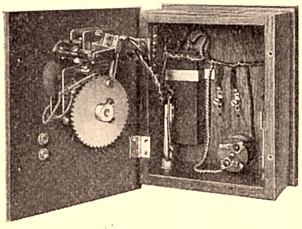
No. 1-D (open)

Code No.		List Price Each
1-D	Oak case with enameled sheet metal front containing one No. 1-D universal calling key movement, 2 No. 1-B universal resistance coils, 3 No. S-32.28 terminals, and designation holder for list of station names. Used with local battery bell selectors No. 45-L, 80-L, E, E-3, E-14, E-25, E-27	$13.34
2-D	Same as No. 1-D, arranged for use with selectors No. 45-M, 80-M, E-6, E-7, E-15	16.00

SANDWICH UNIVERSAL CALLING KEYS



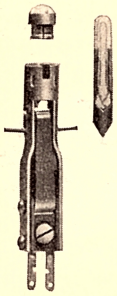
No. 76-D



No. 4-G

76-D	Sandwich calling key with No. 148 mounting. Used with No. 9-B and 9-G selectors	$20.00
4-G	Sandwich calling key with No. 4-G mounting. Used with No. 4-G and 4-D selectors	20.00

LAMPS



Code No.		List Price, Each
2–F	12 volts. Used in concentration units..	$0.24
2–G	24 volts. Used in concentration units..	.24

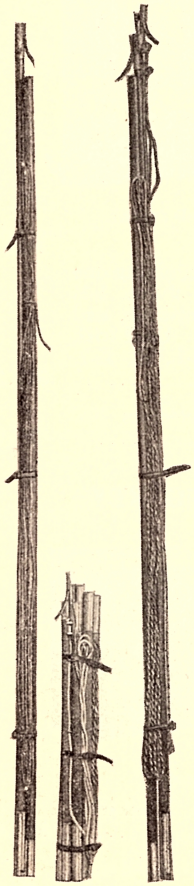
LAMP CAPS

2–AY	White opalescent. Used in concentration units.....	.067

LAMP SOCKETS

13	Used with lamps 2–F and 2–G and lamp cap 2–AY. For mounting on wood or other material ⅞ inches thick.....	.22

LINE POLES

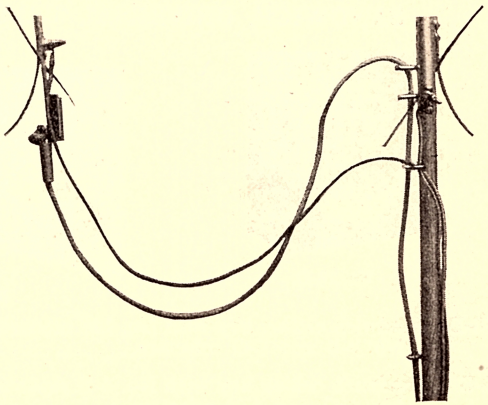


No. 4 No. 7 No. 5

These line poles are of the well known Richardson type. Connectors make a firm spring contact without injury to the line wire. In the two conductor types it is possible to make connection to two wires regardless of their relative positions. Connection can be made to bracket lines, lines on two different cross-arms, etc., with equal facility.

These line poles are equipped with bayonet joints, and suitable lengths of flexible conductor cord.

Code No.	Conductors	Total Length in Feet	No. of Joints	List Price, Each
4	1	15	2	$5.67
5	2	15	2	7.34
7	2	15	7	10.00



PHANTOM APPARATUS

Complete phantom sets consisting of repeating coils, retardation coils, condensers, terminals, etc., can be made to order to meet any requirements. Special attention paid to the design of phantom apparatus to be applied to telephone circuits employing selective calling.

Prices and information upon application.

PLUGS

Code No.	No. of Conductors	Used with Jacks No.	Apparatus	List Price, Each
47	2	201, 215, 216, 217, 218, 219	Concentration units, jack and signal boxes and No. 202 type and No. 10-L test panels.....	.48
116	1	216	No. 201 type test and patch panels, No. 2-A Wire Chief's test panel and No. 61 type signaling sets.....	.24
117-A	1	No. 9 type combined jack and signal....	Jack and signal boxes.	.36
137	4		Dispatcher's breast telephone sets...	$1.47
152-A	2	152-A 152-B	Cordless jack boxes..	.67



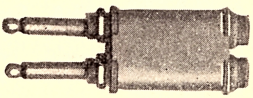
No. 47



No. 116



No. 117-A



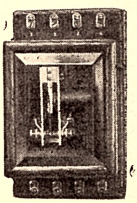
No. 137



No. 152-A

POLE CHANGERS

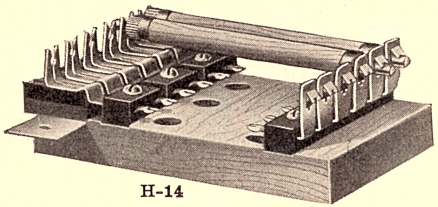
Code No.		List Price, Each
4-G	Resistance, 40 ohms; used in connection with No. 4-G calling keys on Sandwich selector circuits to reverse the main battery.....	$20.00



No. 4-G

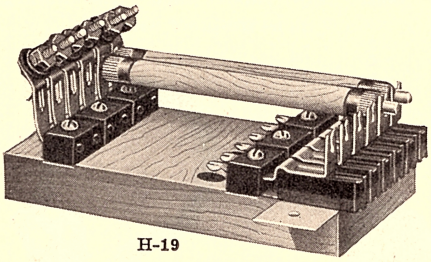
PROTECTOR STRIPS

Designed for mounting in a wooden pole house. High insulation. Fuses held in spring clips and can be replaced without tools.



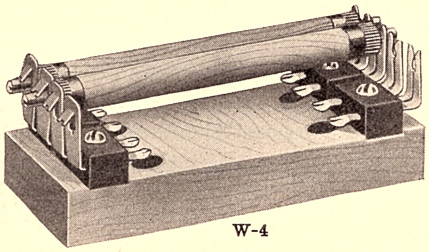
H-14

Code No.		List Price, each
H-14	With carbon block arresters. Solder connections for line and jumper wires. In 20 or 50 pair strips. Per pair	$0.47



H-19

H-19	With carbon block arresters. Solder connections for line; screw connections for jumper wires. In 20 or 50 pair strips. Per pair	$0.47

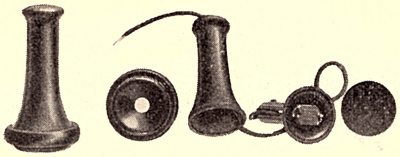


W-4

W-4	Without arresters. Fuses only. Solder connections for line and jumper wires. In 20 or 50 pair strips. Per pair	$0.34
A-7	Fuses for the above. 3 or 5 amperes	.14
	Carbon blocks for the above. Per pair	.04
	Celluloid dielectrics for the above, U shaped or perforated. Per 100	.67

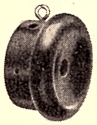
RECEIVERS

NOTE.—Cords will not be furnished with these receivers unless otherwise ordered. All hand and head receivers except double head receivers use cord No. 228-A.

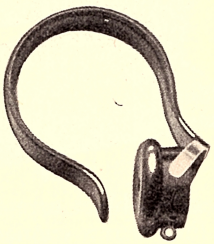


No. 166-W

Code No.	Type	Resistance in Ohms		List Price, Each
144-AW	Hand	70	Hard rubber shell	$1.67
166-W	Hand	650	Hard rubber shell. Has impregnated, moisture-proof windings	2.67



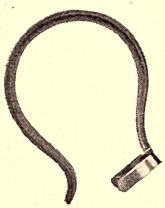
No. 145-W



No. 156-W

Code No.	Type	Resistance in Ohms		List Price, Each
145-W	Head	70	Hard rubber shell. No head band	$1.54
148-W	Head	70	Same as No. 145-W, with leather-covered head band	2.80
156-W	Head	650	Same as No. 148-W, except resistance	3.07

RECEIVER HEAD BANDS



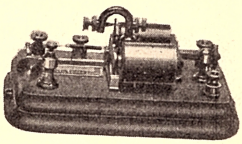
No. S-5.33

Code No.		List Price, Each
S-5.33	Leather covered steel head bands for receivers No. 145-W, No. 148-W and No. 156-W	$0.67

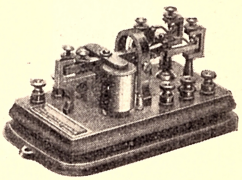
RELAYS

The following list illustrates the general types carried in stock. Resistances differing from those listed below can be furnished as specified. Prices upon application.

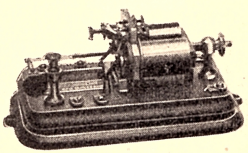
Code No.		List Price, Each
1-A	Resistance, 35 ohms; closes 1 contact	$4.67
1-B	Resistance, 150 ohms; closes 1 contact	5.34
1-C	Resistance, 2500 ohms; closes 1 contact	8.00
1-D	Resistance, 37½ ohms; has 2 75-ohm coils in parallel; closes 1 contact	5.34
S-35.32	 S-35.32 — Insulated back contact for use with No. 1 type relays. Used to operate Gill telegraph selectors	1.00
2-A	Resistance, 6 ohms; closes 2, breaks 2 contacts. For low resistance simplex circuits	13.34
5-A	Resistance, 6 ohms; closes 1, breaks 1 contact. Same construction as No. 2-A	9.34
3-A	Resistance, 6 ohms; closes 2 contacts	10.00
4-A	Resistance, 6 ohms; closes 2, breaks 2 contacts	13.34
118-U	Resistance, 0.7 ohms; closes 1 contact. Used in concentration units	2.00
118-AE	Resistance, 12 ohms. Same as No. 118-U	2.00
11-B	Resistance, 1000 ohms. Polarized. Used in series with the selector in No. 500-LT selector box outfits and arranged to tap the bell for time sending	3.34



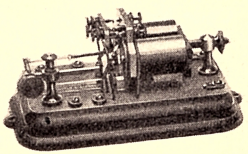
No. 1-A



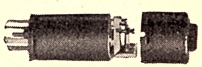
No. 2-A



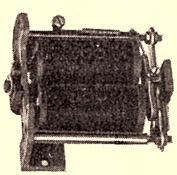
No. 3-A



No. 4-A



No. 118-U



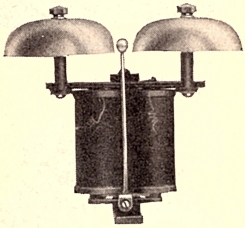
No. 11-B

RINGERS

Used in magneto wall telephones and magneto desk set boxes.

Unless otherwise ordered, these ringers will be furnished with gongs No. R-6.

If ordered without gongs, deduct 14 cents list from these prices.



Code No.	Resistance	List Price, Each
5-A	500	$1.54
25-A	2500	2.14

GONGS FOR RINGERS



R-1



R-2



R-3



R-4



R-5

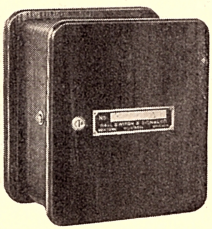


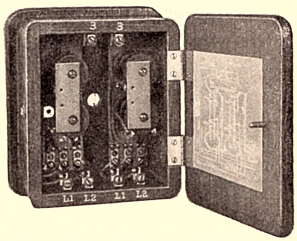
R-6

These gongs are sold in pairs and are equipped with mounting stems adapted to the ringers shown above.

Code No.....	R-1	R-2	R-3	R-4	R-5	R-6
List Price, per pair.....	$0.40	$0.40	$0.40	$0.40	$0.40	$0.40

SIMPLEX SETS



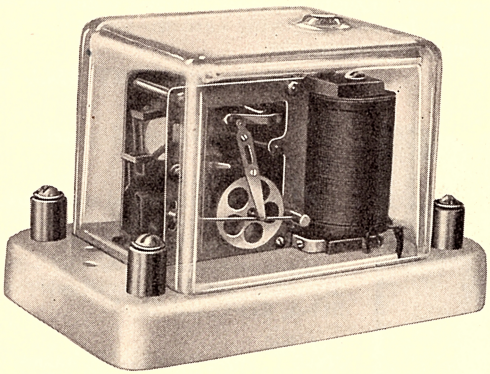


These sets are especially designed for use in connection with metallic block telephone circuits, enabling a through Morse circuit to be superposed on a series of such telephone circuits.

Code No.		List Price Each
24-E	Contains 2 No. 4-E retardation coils, screw connected by means of flexible leads to 6 binding posts.....	$4.67

SELECTORS

GILL TELEGRAPH SELECTORS



Gill telegraph selectors are used at main offices and way stations to provide a distinctive bell or lamp signal as a substitute for Morse call letters. Usually operated from the back contact of a telegraph relay, the selector armature is operated with each Morse impulse, but fails to close its contact unless these impulses occur in the exact sequence corresponding to the selector combination. For this reason Gill telegraph selectors are usually furnished in 5 figure combinations in order to render it highly improbable that an accidental combination of Morse characters will close the selector contact. Calling impulses are usually sent by means of the Morse key, but an automatic calling key can be used if desired.

The Gill selector mechanism is expressly designed to withstand the constant wear incident to Morse operation as outlined above.

Years of constant service fail to produce any appreciable signs of wear, and if cleaned at intervals of 4 to 5 years, this selector will operate indefinitely without further attention or adjustment.

Code No.		List Price, Each,
1-A	Five-figure combinations as specified; resistance, 15 ohms; is designed to operate on one or two gravity cells	$26.67
D	(Marked No. 1041 for Postal Telegraph-Cable Co.) Five-figure combinations as specified. Has 4 coil terminals on the base allowing the coils to be connected in series or multiple, giving resistances of 2 or 8 ohms, as desired. Designed to operate on 160 to 260 milli-amperes at 2 ohms and on 80 to 130 milli-amperes at 8 ohms	26.67
8-A	(Marked No. 1048 for Postal Telegraph-Cable Co.) Five-figure combinations as specified. Has 4 coil terminals on the base; 37½ ohms or 150 ohms as connected. Designed to operate on 40 to 70 milli-amperes at 37½ ohms and 20 to 35 milli-amperes at 150 ohms.	26.67

GILL TELEPHONE SELECTORS

Same mechanism as the Gill telegraph selector. In four figure combinations, as specified. See combination list on sheet No. 23.

NOTE—These selectors are not provided with a separate terminal for connection with intercommunicating apparatus.

LOCAL BATTERY BELL TYPE

This type of selector is so arranged that there is no main battery current on the line during the ringing interval.

Code No.			List Price, Each
45-L	Resistance, 4500 ohms.	Supersedes models No. E-2 and E-3	$26.67
80-L	Resistance, 8000 ohms.	Supersedes model No. E-25	26.67

MAIN BATTERY BELL TYPE

45-M	Resistance, 4500 ohms.	Supersedes models No. E-5 and E-6	26.67

SELECTOR BOX OUTFITS

GILL SELECTOR BOX OUTFITS

Note.—Prices do not include Selectors. Unless otherwise ordered these box outfits will not be provided with separate terminals for connection with intercommunicating apparatus.

LOCAL BATTERY BELL TYPES



No. 500-L

Code No. — List Price, Each

500-L Size, 9¼x23x5½ inches..... $10.00

Contains:

1 No. 80-B bell.
1 No. 1-A universal resistance.
2 No. 1-A retardation coils.
Terminals for line, battery and drop.

Space provided for one Gill selector and two dry cells. 500-L (without selector) supersedes 511-A, 511-C and 511-F.

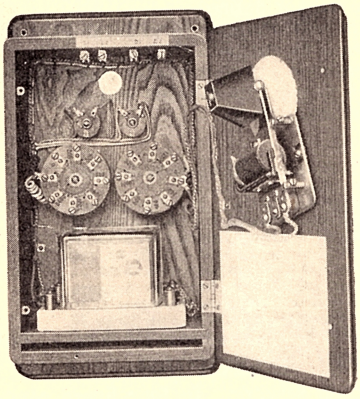
Code No. — List Price, Each

500-LT Size, 9¼x23x5½ inches..... $12.67

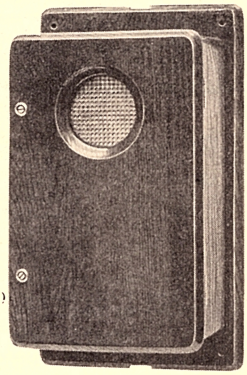
Contains:

1 No. 80-B bell.
1 No. 11-B time sending relay.
1 No. 1-A universal resistance.
2 No. 1-A retardation coils.
Terminals for line, battery and drop.

Space provided for one Gill selector and two dry cells. 500-LT (without selector) supersedes 511-B.



No. 500-M



No. 500-M (closed)

MAIN BATTERY BELL TYPE

Code No. — List Price, Each

500-M Size, 9¼x15⅞x5½ inches..... $11.67

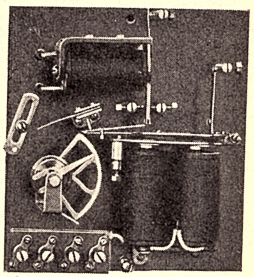
Contains:

1 No. 80-A bell.
1 No. 1-A universal resistance.
1 No. 1-B universal resistance.
2 No. 1-A retardation coils.
Terminals for line and drop.

Space provided for one Gill selector. 500-M (without selector) supersedes 506-B, 502-D.

SANDWICH TELEPHONE SELECTORS

These selectors operate on the step-by-step principle. Therefore, the maximum number of electrical impulses required to operate a given circuit will equal the number of stations on that circuit. This extreme simplicity of operation is combined with the fullest accessibility for inspection and repairs, all of the parts being assembled in one plane.



No. 9-B

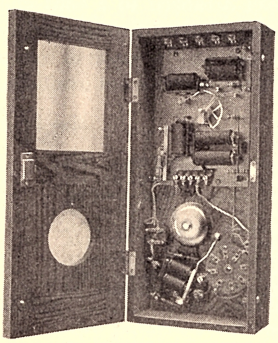
Code No.	LOCAL BATTERY BELL TYPE	List Price, Each
4-G	Resistance, 5000 ohms; capacity, 70 stations. Has polarized line coils which admits of very wide time and current margins. Bell contact is closed by a slow relay	$26.00

NOTE.—The maximum number of impulses required to operate a circuit equipped with No. 4-G selectors will be equal to ½ the number of stations on that circuit.

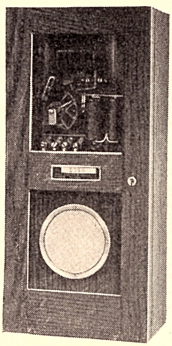
MAIN BATTERY BELL TYPE

9-B	Resistance, 5000 ohms; capacity, 35 stations. Bell contact is closed by short circuiting the holding coils	22.00
9-G	Resistance, 5000 ohms; capacity, 35 stations. Bell contact is closed by an external slow relay	22.00

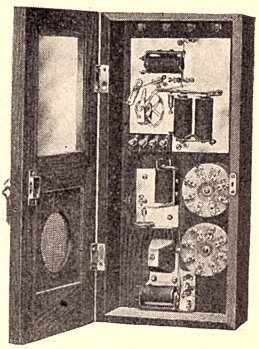
SANDWICH SELECTOR BOX OUTFITS



No. 204-G (open)



No. 209-G

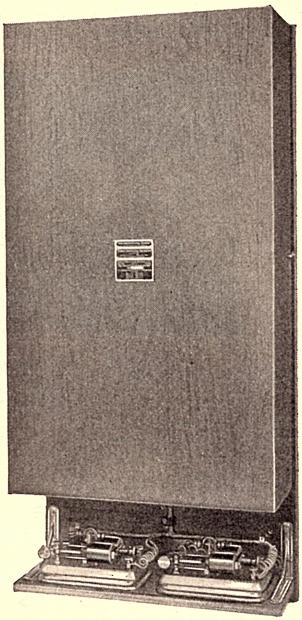


No. 209-G (open)

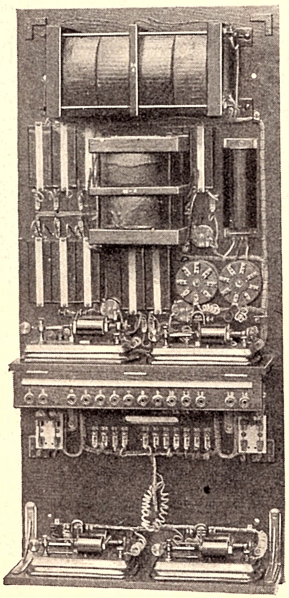
Code No.	LOCAL BATTERY BELL TYPE	List Price, Each
204-G	Size, 9x18½x4¼ inches. Contains: 1 No. 4-G selector; 1 No. 80–AB bell; 1 No. 165 answer back resistance; 1 No. 1-A universal resistance; terminals for line, battery and drop	$35.34

MAIN BATTERY BELL TYPE

209-B	Size, 9x18½x4¼ inches. Contains: 1 No. 9-B selector; 1 No. 80–A bell; 1 No. 1-A universal resistance; 1 No. 1-B universal resistance; terminals for line and drop	32.00
209-G	Size, 9x18½x4¼ inches. Contains: 1 No. 9-G selector; 1 No. 80–A bell; 1 No. 124-A relay; 1 No. 1-A universal resistance; 1 No. 1-B universal resistance; terminals for line and drop	35.34



No. 61-D



No. 61-D (Open)

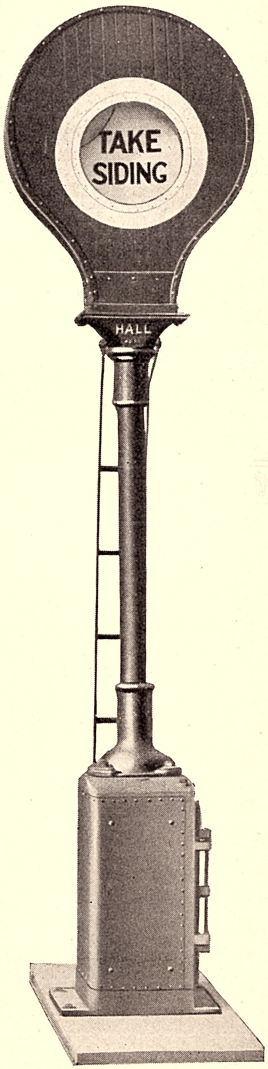
SELECTIVE SIGNALING SETS

The following signaling sets are all exactly similar, except that in some types certain pieces of apparatus are omitted. The form wiring is complete in all cases, so that if it should be desired, for instance, to equip a No. 61-A signaling set for time sending, it would be necessary only to add one No. 1-D relay in the space provided for it; where all of the proper and heretofore unused wires will be found convenient for attachment. These signaling sets are strongly constructed of oak and occupy a wall space 42 x 19¼ inches. All of the apparatus except the main relays is protected by a removable cover. These relays are exposed in order to facilitate inspection. Jacks are inserted in the circuit in such a manner that all of the coils and condensers can be readily tested by means of a voltmeter or milli-ammeter attached to a cord and plug. By this method a wide variety of line tests can also be made in case a Wire Chief's test panel is not available.

Code No.		List Price, Each
61-A	For selective calling only. No apparatus is installed for intercalling or time sending. Contains: 1 No. 64-A retardation coil, 1 No. 62-A retardation coil, 2 No. 1-A relays, 9 No. 71 condensers, 3 No. 40-A resistance coils, 2 No. 709 test switches, 14 No. 216 jacks.....	$100.00
61-B	For selective intercalling only. No apparatus is installed for time sending. Same as No. 61-A, except that additional apparatus is installed as follows: 1 No. 1-C relay, 2 No. 1-B resistance coils, 1 No. 9 retardation coil.....	120.00
61-C	For selective calling and time sending only. No apparatus is installed for intercalling. Same as No. 61-A with addition of 1 No. 1-D relay.....	106.00
61-D	For selective intercalling and time sending. Same as No. 61-A, except that additional apparatus is installed as follows: 1 No. 1-C relay, 2 No. 1-B resistance coils, 1 No. 9 retardation coil, 1 No. 1-D relay.....	126.00

SELECTIVE SIGNALS

These signals are designed to operate in connection with a telephone train dispatching circuit equipped with selectors of any model. For each selective signal installed, the Dispatcher's office is provided with two additional Gill keys, one of which sets the signal to the stop position, the other being used to clear the signal. Each signal is provided with a motor-driven answer-back which repeats a series of Morse code letters on the telephone circuit in order to notify the Dispatcher that a particular signal has been operated and which position it has assumed. The Dispatcher may repeat this answer-back as often as desired without changing the position of the signal.



Selective signals are not intended to supplant or in any way interfere with the existing block system. They provide, however, an added means to safety and convenience where block sections are greatly lengthened during the hours of light traffic density.

The particular signal shown in the engraving is designed to indicate that an approaching train is desired to take siding. This instruction being obeyed, the Conductor reports to the Train Dispatcher by means of a siding telephone, and receives further orders as required. The "Take Siding" indication is painted on a white, opalescent surface which is normally covered by a black disc. This surface is very evenly illuminated from the rear by means of a small battery lamp which is lighted when the black disc is withdrawn, whereby an excellent night indication is secured.

A wide variety of selective signals can be furnished with circuits and equipment modified to meet special requirements.

Prices upon application.

EXCESS RESISTANCE CALCULATIONS FOR SELECTOR CIRCUITS.

NOTE.—This simple and rapid method has been in use since 1908, and a large number of circuits have been calculated by means of it.

All selectors of the same model are adjusted to operate on the same value of current. Having the circuit balanced so that each selector draws the same current makes the interchange of selectors possible without readjustment, besides making the most economical use of main battery. No matter what the operating current may be, the balancing or excess resistance is necessarily the same, as current is not a factor in the calculations. In making a set of calculations for a given circuit, a list of stations is made showing the resistance between stations (total of both wires). Table No. 1 is an illustration.

TABLE No. 1.

1	2	3	4	5	6	7
Station Number	Station Name	Miles Between	Resis. at 10 Ohms	Col. No. 1 Multiplied by Col. No. 4	Theoretical Excess Value	Practical Excess Value
0	U. N.....	...	...	0	0	0
1	Shelby.....	.5	5.	5.	0+5=5	0
2	Hill.....	.6	6.	12.	5+12=17	0
3	Crosby....	.2	2.	6.	17+ 6=23	0
4	Dix.....	5.0	50.	200.	23+200=223	200
5	Briar.....	4.5	45.	225.	223+225=448	400
6	Fairland...	4.6	46.	276.	448+276=724	800

In column 6 is shown the theoretically accurate excess resistance value, and the method by which it was derived; namely, the addition of the figure in column 5 to the theoretical excess resistance for the previous station.

The value of ten ohms per mile (metallic) is used in the calculations for No. 9 B. & S. ga. hard drawn copper (commonly called 210 lb.), and also for No. 11 B. W. G. which is approximately of the same diameter. This value is slightly higher than the actual value and makes the calculations show a

slightly higher line drop than is theoretically correct. With perfect weather and insulation the stations farthest from the battery, therefore, draw slightly more current than the ones near the battery. But with bad weather and line leaks the line drop actually becomes greater, therefore the voltage falls toward the end of the line; but, since the calculations have allowed for this, the stations at the distant end get a good operating current regardless of weather conditions.

The excess or universal resistance coil consists of seven divisions of 200, 400, 800, 1,600, 3,200, 6,400 and 12,800 ohms. The terminals of adjacent windings are connected to a common binding post. Any value up to 25,400 by steps of 200 ohms can readily be cut in by short circuiting the windings not needed. No value less than 200 is considered in practice. An excess resistance list (shown in column 7) is made from the exact list in column 6, approximating the exact to the closest figure possible in multiples of 200. For instance, 724 is made 800, and 448 is made 400. It is customary to put half as much excess resistance in the bell circuit of main battery bell selectors as is used in the selector excess resistance coil.

TO FIND THE VOLTAGE NECESSARY FOR MAIN BATTERY.

Suppose, for instance, that Fairland is to be the Dispatcher's office. The selector bridge at that station would have a resistance of 5,750 ohms should a selector be installed there. The resistance is made up of two parts: The selector resistance, which we will assume to be 5,000 ohms, and the excess resistance, which in this case will be 750 ohms, total, 5,750 ohms. The voltage necessary at this station to operate the selectors on 8 M. A. is 5,750 x .008 = 46.00 volts. To this voltage must be added the voltage drop caused by the resistance of the retard coils in Dispatcher's equipment which is, say, 60 ohms. The drop is equal to this resistance multiplied by the total current through it. In the example there are six stations each receiving 8 M. A. (no selector at Fairland), a total of 48 M. A.

The voltage drop through the 60 ohms, therefore, is 60 x .048 = 2.68 volts. The total main battery voltage, therefore, is 46 + 2.68 = 48.68 volts.

BRANCH LINES.

If a circuit has a branch, the method is to calculate the excess resistances for the branch as if the branch was a separate line. Then to this resistance at each station on the branch add the difference between the values of the resistance at the junction office shown by the branch line list and by the main line list. Suppose the line has a branch at Fairland with three stations. Calculate the excess for the branch. The resistance found for Fairland on the branch line list is 250 ohms. See Table No. 2.

TABLE No. 2.

1	2	3	4	5	6	7
Station No.	Station	Miles Between	Resis. at 10 Ohms	Col. No. 1 Multiplied by Col. No. 4	Theoretical Excess Value	Practical Excess Value
0	Martinsville .	.0	0	0	0	0
1	Trafalgar....	4.0	40.	40.	0+ 40= 40	0
2	Franklin.....	4.5	45.	90.	90+ 40=130	0
3	Fairland.....	4.0	40.	120.	130+120=250	250

The voltage at Fairland for the branch with resistances as found in Table 2 would be (250 + 5000) x .008 = 42.00. But the voltage at Fairland necessary to operate the main line was found to be 46 volts and it follows that resistance must be added at each station on the branch to compensate for this 4 volts higher pressure in order that branch line selectors shall not receive more current than the main line stations. 8 M. A. will cause a drop of 4 volts through 500 ohms. Therefore 500 ohms must be added to the excess values found for each station on the branch. This 500 is a factor of the difference in voltage of the two lines at the junction office and **in all calculations for branch lines it is only necessary to add the difference between the two junction office excess values to the value of the excess at each station on the branch.**

In calculation of the main line, proceeding down the list from Fairland, the next station must be counted number 10, since in the line between Fairland and the next station there will be current flowing to seven stations on the main line and three on the branch, a total of ten, causing a line drop of 10 x .008 x line resistance.

SIMPLEX TELEGRAPH COILS.

When Simplex telegraph circuits are installed on metallic telephone selector circuits, it is unnecessary, as a rule, to make allowance for the current consumption in the simplex coils when making the excess resistance calculations. Sometimes, however, it is desirable to do this, especially on heavy circuits where the bridging resistance of the simplex coils at the end distant from the main office is unusually low. This can easily be accomplished if the simplex coils are considered the equivalent of one or more selectors bridged across the circuit at that point, depending on whether these coils consume one or more times as much current as the selector bridge at that point. Assume, for example, that we have simplex coils bridged across the extreme end of the circuit, and that they consume twice as much current as the selector which is also bridged across at that point, then in making up the list of stations we should consider the end station as No. 0 and the next as No. 3, as three times the usual current will flow between these two stations. At the main office end the resistance of the simplex coil can be made as low as consistent with the current carrying capacity of the simplex coil, at the same time keeping in view the main battery consumption. Divide the voltage on the line by the resistance of this coil which will give the current consumption of the coil. Add this to the total current for the line when calculating the main battery voltage and the voltage drop through the signaling coils. Two No. 9 retardation coils and two No. 31-A resistance coils constitute the essential apparatus necessary for installing a simplex circuit in accordance with the foregoing method. It is evident that the No. 31-A resistance coils can be adjusted to any value without disturbance to the selector circuit if their presence is provided for in the excess resistance and main battery calculations.

BATTERY SUPPLY IN SPECIAL CASES.

If the Dispatcher's office is not at the end of the line, but is an intermediate office with selectors on both ends, there are two plans, either of which can be used for supplying main battery:

Plan A is to have the line cut straight through and the main office simply a bridge; supplying current to all stations simultaneously. Excess resistance is calculated for each end of the line, then to the excess on the shorter end, add the difference between the two values found for the main office. In this case the circuit is practically a main line with a branch as described above, considering the long end as the main line and the short end as a branch.

Plan B is to have the Dispatcher's telephone set connected directly to one end of the line, receiving transmission through a repeating coil from the other end of the line, in which case the battery is delivered to each end of the line separately. Either of two arrangements can be used: have the same main battery supply both ends, or have a separate battery for each. In either case separate sending relays are used for each end operated by separate key circuits. The excess values for each end have no relation to each other, except when both ends feed from the same battery, in which case resistance must be added in the main battery circuit of the short end to cause a voltage drop which will produce the proper voltage at the line. Find the voltage necessary for each end. The difference between the two represents the drop needed in the short end to enable it to use the long end battery. The resistance necessary to cut in is this voltage drop divided by the total current on the short end. With plan B it is possible to use the same combination numbers on both ends. In this same manner one battery can feed two separate lines using resistance to produce the desired voltage drop to the smaller of the two.

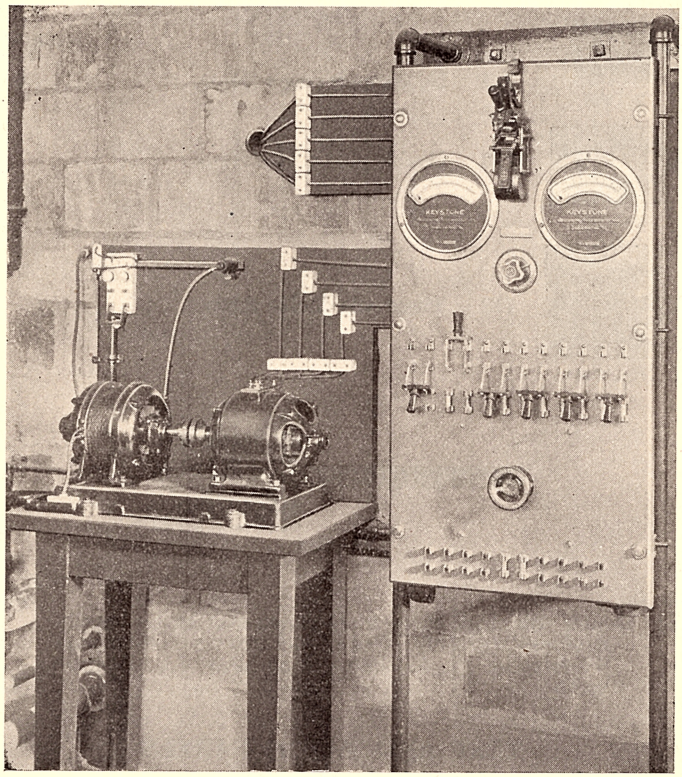
GILL SELECTOR COMBINATIONS

Gill Selectors No. 45-L, 80-L and 45-M are usually furnished with any one of the following combinations as specified:

1121	3131	3241	1151	1551
1131	3221	3331	1251	2451
1221	4121	3421	1521	2541
2121	1341	4141	2151	3351
1141	1431	4321	1351	3531
1231	2241	4231	1531	4251
1321	2331	2441	2251	4521
2131	2421	3341	2521	2551
2221	3141	3431	3151	3451
3121	3231	4241	1451	3541
1241	3321	4331	1541	4351
1331	4131	4421	2351	4531
1421	4221	3441	2531	3551
2141	1441	4341	3251	4451
2231	2341	4431	3521	4541
2321	2431	4441	4151	4551

NOTE.—Additional combinations, approximately five hundred in number, can be furnished to meet special requirements, without materially reducing the speed of calling.

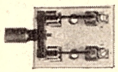
POWER SWITCHBOARDS



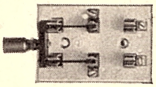
MOTOR Generators, Power Switchboards, Battery Charging Panels, etc., can be furnished in any size and in accordance with any specifications submitted. The battery charging panel shown in the engraving is made in accordance with the Railway Signal Association specifications for this class of equipment. The slate panel is two feet wide and four feet high, and is mounted on standard pipe supports in such a manner that additional panels can be installed on either side as desired.

SWITCHES

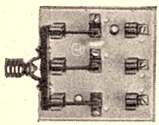
PORCELAIN BASE KNIFE SWITCHES



No. 709

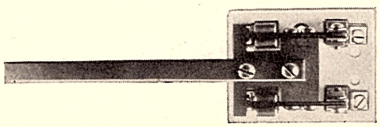


No. 710



No. 712

Code No.		List Price, Each
709	Double pole single throw	$0.36
710	Double pole double throw	.48
712	Three pole double throw	.92

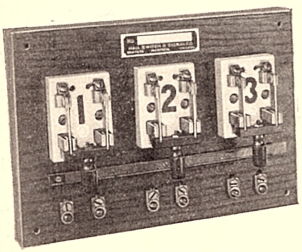


No. 2034

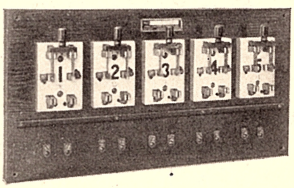
Code No.		List Price, Each
2034	Double pole single throw knife switch with blades heavily reinforced with fibre. Has a 4-inch metal handle adapted for operation by the closing of the door of a telephone booth	$1.34

TEST AND PATCH PANELS

KNIFE SWITCH TYPE



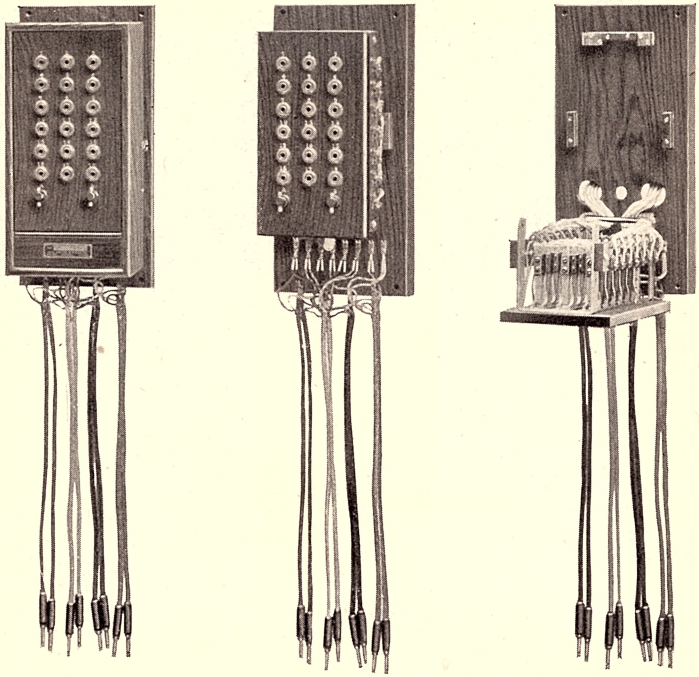
No. 50A



No. 50B

Code No.	No. of Metallic Circuits	D. P. S. T. Switches	D. P. D. T. Switches	Screw Terminals	Size of Oak Panel	List Price, Each
50A	1	3	..	..	7″x10	$3.34
50B	2	..	5	10	10″x19	6.00
50E	2	..	6	12	10″x23″	8.00
50F	2	1	4	14	10″x19″	6.67

TEST AND PATCH PANELS



SINGLE CONDUCTOR JACK TYPE

Finished Oak Cabinet, Containing the Following Apparatus:

Code No.	Metallic Circuits	Telephone Sets	No. 216 Jacks	No. 272-B Keys	No. S-32.30 Terminals	No. S-32.34 Terminals	No. 201-A Cords
201-A	4	2	17	2	24	8	8
201-B	5	3	21	3	26	12	..
201-C	4	2	17	2	24	8	8
201-D	10	2	81	2	84	8	..

Code No.	No. 201-B Cords	No. 201-D Cords	No. 116 Plugs	Size	List Price, Each
201-A	..	..	8	8x16½x7½	$24.67
201-B	12	..	12	8x19½x7½	31.34
201-C	..	..	8	8x16½x7½	24.67
201-D	..	8	8	8x31½x7½	60.00

DOUBLE CONDUCTOR JACK TYPE.

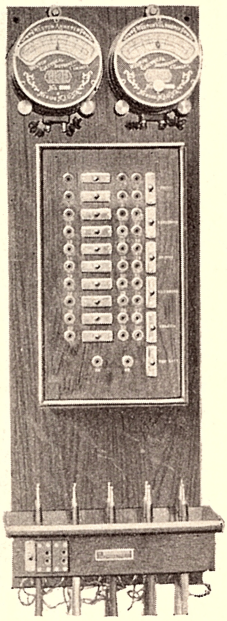
Finished Oak Cabinet, Containing the Following Apparatus:

Code No.	Metallic Circuits	Telephone Sets	No. 218 Jacks	No. 215 Jacks	No. 272-B Keys	No. S-32.30 Terminals	No. S-32.34 Terminals
202-A	6	2	12	6	2	28	16
202-B	10	2	20	10	2	44	16
202-C	20	2	40	20	2	84	16

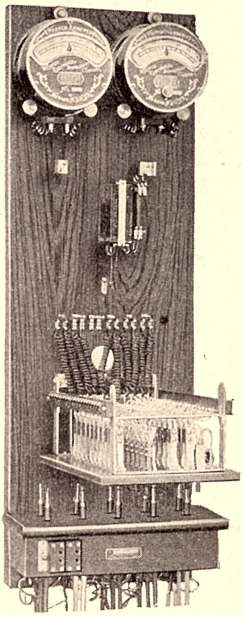
Code No.	No. 202-A Cords	No. 202-B Cords	No. 202-C Cords	No. 47 Plugs	Size	List Price, Each
202-A	8	..	..	8	8x16½x7½	$33.34
202-B	..	8	..	8	9x21½x7½	50.00
202-C	..	..	8	8	9x31½x7½	73.34

NOTE.—The circuits of test panels No. 201-A, 201-B, 201-C, 201-D, and No. 202-A, 202-B and 202-C can be modified to meet special requirements. All of these tests panels can be furnished partially equipped if desired. Prices upon application.

TEST AND PATCH PANELS



No. 10-L



No. 10-L (open)

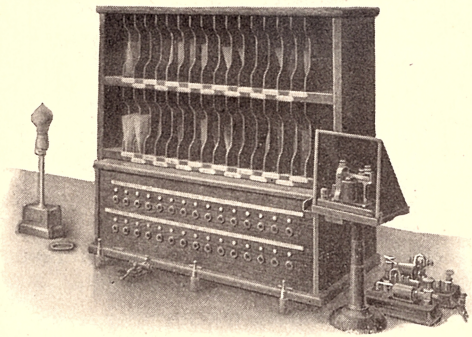
WIRE CHIEF'S TEST PANELS

These test panels are especially designed for making all of the customary voltmeter and milli-ammeter tests on Train Dispatchers' telephone circuits. Complete patching facilities are also provided. Unless otherwise ordered, these test panels will be equipped with type "C" voltmeters and milli-ammeters with ranges as specified, and two No. 80 jack mountings for use with two No. 137 plugs and two breast telephone sets.

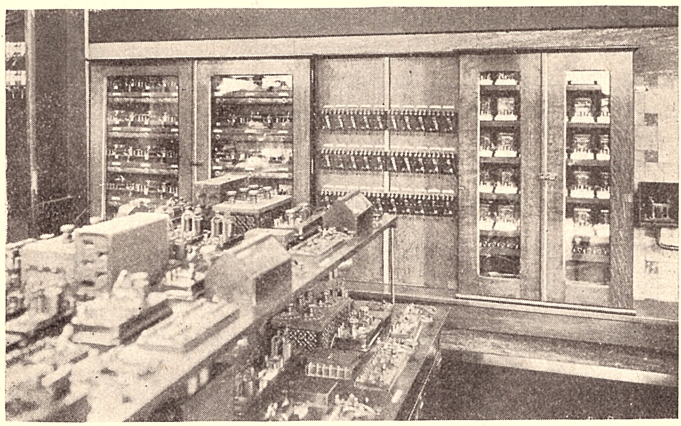
Code No.		List Price, Each
2-A	Single conductor jack type for 5 metallic circuits. Finished oak cabinet, 15 x 44 x 9¼ inches. Contains: 1 No. 400-A resistance coil. 1 No. 8-A induction coil. 1 No. 71 condenser. 12 No. 28 keys. 20 No. S-32.34 terminals. 15 No. S-32.28 terminals. 10 No. 116 cord weights. 21 No. 216 jacks. 10 No. 2-A cords. 10 No. 116 plugs.	$133.34
10-L	Double conductor jack type for 10 metallic circuits. Same as No. 2-A, excepting jacks, cords and plugs. Contains: 17 No. 28 keys. 20 No. 218 jacks. 2 No. 215 jacks. 10 No. 106 cord weights. 10 No. 10-L cords. 10 No. 47 plugs.	220.00

NOTE.—The circuits employed in these test panels can be modified to meet special requirements.

TELEGRAPH CONCENTRATION SYSTEMS



Operator's position for a thirty-line concentration system. The line jacks and lamps shown in the engraving are multipled on the opposite side of this cabinet, thereby permitting four operators to man these lines if necessary.



Morse relays and telegraph selectors for a thirty-line concentration system. Note the line jack under each relay. These jacks are used in connection with a cord and plug, and pilot Morse set to facilitate relay adjustment when required. The two point switches are designed to throw any one of these lines from the concentration set to a regular table position in case one or more of these lines should become abnormally busy.

Telegraph selector cabinet for a thirty-line concentration system. These selectors operate on 110 volt D.C. lighting current, through enameled resistance units mounted on the slate shelf at the bottom of the cabinet.



TELEGRAPH CONCENTRATION SYSTEMS

(Patented April 13, 1915)

The cuts appearing on the preceding page are intended to illustrate a typical installation of telegraph concentration apparatus.

This apparatus permits the grouping of a large number of telegraph lines in such a manner that they are all readily accessible to one or more operators; the number of operators depending on the traffic density at any given time. This is rendered possible through the use of the telegraph selector which is arranged to provide a lamp signal for each telegraph line; thereby eliminating the necessity of listening for Morse code calls on these lines.

The essential apparatus required for each telegraph line grouped in such a concentration system is as follows:

One Morse relay which operates a telegraph selector on the local contact.

One telegraph selector which operates a lamp signal on its local contact.

One or more lamp signals as desired.

One or more jacks in series with the telegraph line as desired; depending on whether it is necessary to install one or more operators' positions.

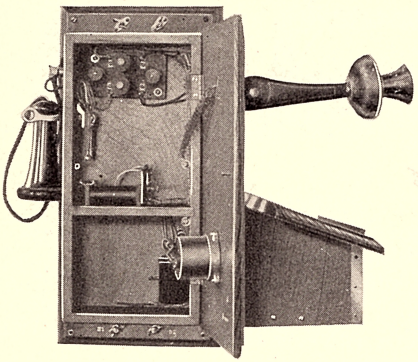
Each operator's position is, of course, provided with a number of cords and plugs, to each of which is connected a pilot relay, key and sounder.

Variations in apparatus and circuits can be made to meet individual requirements; telephone lines, for instance, being sometimes brought into the same operator's position with a number of telegraph lines.

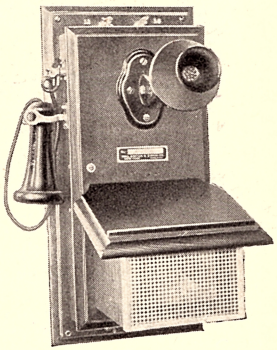
Prices and information upon application.

TELEGRAPHONES

Composite Telephones



No. 7 (Open)



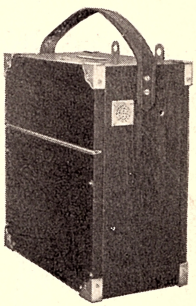
No. 7

Code No.		List Price, Each
7	Wall telegraphone adapted for series connection on a Morse telegraph circuit..... Oak cabinet, 9x19 inches, contains the following apparatus:	$26.67

1 No. 280 transmitter with No. S-5.106 mouthpiece.
1 No. 144-AW receiver.
1 No. 228-A receiver cord.
1 No. 3-A retardation coil.
1 No. 106-A induction coil.
1 No. 102-A howler.
1 No. 313 condenser.
1 No. 38 key.
Binding posts for line and battery.

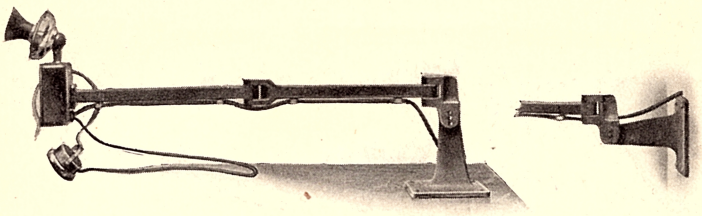
Code No.		List Price, Each
15-A	Portable telegraphone adapted for bridging connection on a Morse telegraph circuit. Used with No. 4 line pole, and No. 1 grounding rod for earth connection..... Oak case with reinforced corners. Contains the following apparatus:	$32.00

1 No. S-5.73 hand set.
1 No. 364-A cord.
1 No. 106-A interrupter.
1 No. 102-A howler and horn.
1 No. 38 key.
1 No. 1-B retardation coil.
1 No. 71 condenser.
1 No. 313 condenser.
4 No. 6 dry cells.
Binding posts for line and ground.



No. 15-A

GILL TELEPHONE ARMS

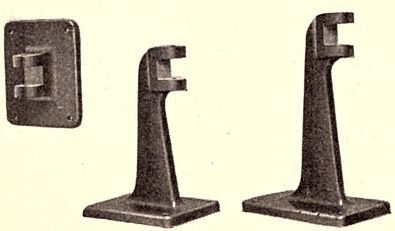


No. 1000-D

Code No.		List Price, Each
1000-D	Jointed iron arm, black enameled, with 6½-inch convertible bracket for either wall or desk mounting. Consists of: 1 No. 280 transmitter with reinforced mouthpiece. 1 No. 156-W or No. 148-W receiver, as specified. 1 No. S-3.42 hook switch. 1 No. 5034 cord terminal strip. 1 No. 10-B 4-conductor cord. 1 No. 228-A 2-conductor cord. For high efficiency transmission circuit when used in connection with No. 1006-A desk set box and No. 21 key box or No. 3-A foot switch.....	$13.67
1010-D	Same as No. 1000-D except with 3 spring push key on the hook switch, and No. 148-W receiver. For "booster" circuit, with No. 22 or No. 28 type desk set boxes.....	16.00
1012-D	Same as No. 1000-D except with 5 spring push key on the hook switch, and No. 51-A retardation coil. For high efficiency transmission circuit with No. 1006-C desk set box.....	17.00

NON-CONVERTIBLE BRACKETS

For No. 1000 Type Telephone Arms



All of the above telephone arms are equipped with convertible brackets for either desk or wall mounting. If any one of the following non-convertible brackets are required, deduct $1.00 list from the above prices.

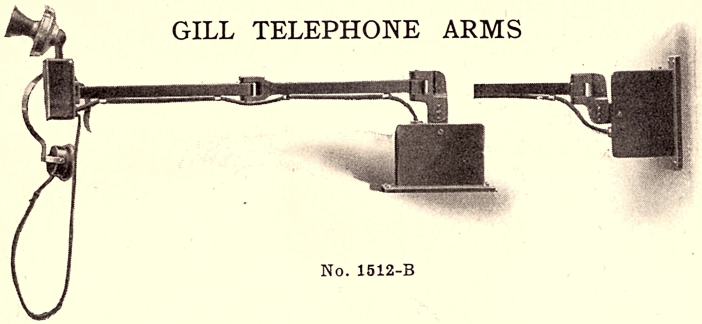
Code No.

S-3.31 wall bracket.

S-3.30 6½-inch desk bracket.

S-3.22 7½-inch desk bracket.

GILL TELEPHONE ARMS



No. 1512-B

Code No.

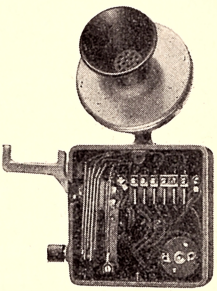
1512-B Consists of a black enameled telephone arm and desk set box with convertible bracket for either desk or wall mounting. This is a complete high efficiency transmission set in one unit. Has a 5 spring push key in the transmitter head. Desk key or foot switch not required. Wire connections are necessary from line and battery only. Telephone arm consists of:

List Price, Each

1 No. 280 transmitter with reinforced mouthpiece.
1 No. 156-W receiver.
1 No. S-3.58 hook switch and 5 spring push key.
1 No. 51-A retardation coil.
1 No. 5034 cord terminal strip.
1 No. 15-B 4-conductor cord.
1 No. 228-A 2-conductor cord.

Desk set box contains the following apparatus mounted on a removable wooden base to facilitate inspection:

1 No. 8-A induction coil.
1 No. 71 condenser.
1 No. 5034 cord terminal strip.
Terminals for line, battery and magneto generator. $20.00





Transmitter Head for No. 1512-B

1500-B Same as No. 1512-B, except that the 5-spring push key is omitted from the transmitter head and that the desk set box is equipped with binding posts for connection to a No. 21 key box or a No. 3-A foot switch..... List Price, Each $18.00

1510-B Same general construction as No. 1512-B, except that wiring and apparatus is arranged for "booster" circuit transmission.

Telephone arm consists of:

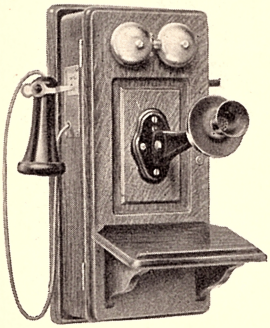
1 No. 280 transmitter.
1 No. 148-W receiver.
1 No. S-3.50 hook switch and 3-spring push key.
1 No. 15-B cord and 1 No. 228-A cord.

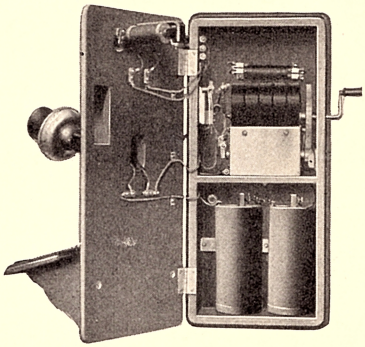
Desk set box contains:

1 No. 3-F and 1 No. 3-G retardation coil, in addition to the apparatus used in No. 1512-B..... 22.00

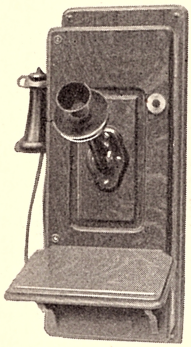
MAGNETO WALL TELEPHONES

Oak cabinet, 9¼x23x5½ inches. Consists of the following apparatus: 1 No. 280 transmitter, 1 No. 144-AW receiver, 1 No. 228-A cord, 1 No. 5 magneto generator, 1 No. 25-A ringer, 1 No. 8-A induction coil. Has space for 3 dry cells.



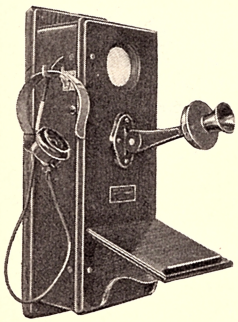


Code No.		List Price, Each
525	As described above	$13.34
525-C	Same as No. 525, with No. 72 condenser in line circuit	14.68



HIGH EFFICIENCY WALL TELEPHONES

These sets are designed for use in telephone booths, etc., on selector circuits, and, therefore, no ringers are included. Equipped with high efficiency transmission circuit and provided with push-button for use when talking. Oak cabinet, 9¼x23x5½ inches. Consists of the following apparatus: 1 No. 280 transmitter, 1 No. 166-W receiver, 1 No. 228-A cord, 1 No. 8-A induction coil, 1 No. 51-A retardation coil, 1 No. 71 condenser, 1 No. 21 key. Has space for 3 dry cells.

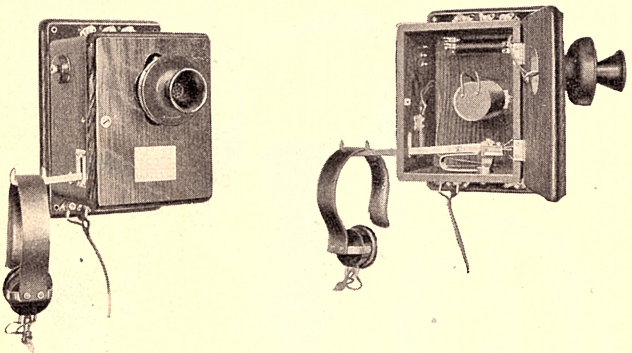


Code No.		List Price, Each
1-A	As described above	$12.67
1-B	Same as No. 1-A, except with No. 156-W receiver	12.67
51-A	Same as No. 1-A, except with No. 5 magneto generator and No. 72 condenser	16.00
51-B	Same as No. 1-B, except with No. 5 magneto generator and No. 72 condenser	16.00

SPECIAL WALL TELEPHONES

Special wall telephones containing selective apparatus; for use in section houses, freight houses, etc., can be furnished to order. Prices upon application.

BOOTH TELEPHONES



Compact booth telephones can be furnished with circuits and apparatus arranged to meet individual requirements. The set shown in the engraving consists of 1 No. 280 transmitter, 1 No. 148-W receiver, 1 No. 228-A cord, 1 No. 8-A induction coil, and 1 No. 25 condenser. The hook switch controls the receiver circuit only; the battery circuit being controlled by means of a key, which must be pressed while talking. This arrangement prevents battery consumption in case the receiver is left off the hook for a long period.

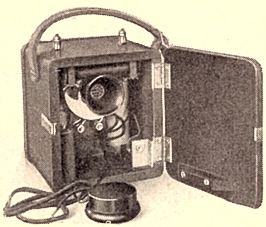
No space for dry cells is provided in these booth telephones.

Prices and information upon application.

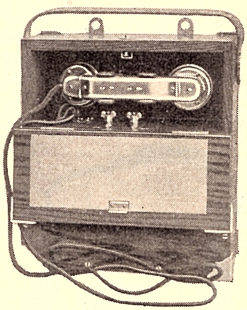
PORTABLE TELEPHONES



No. 1-A



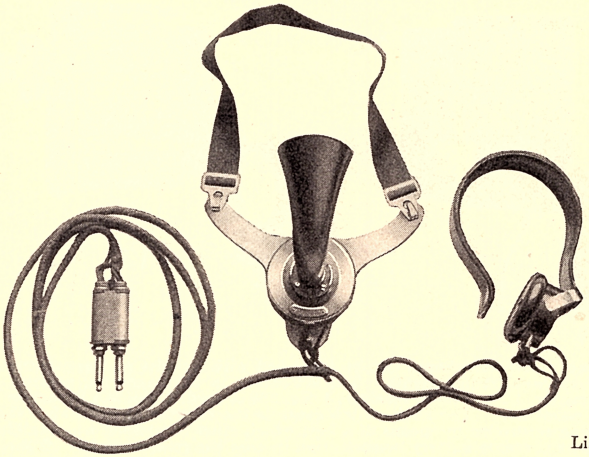
No. 1-A (Open)



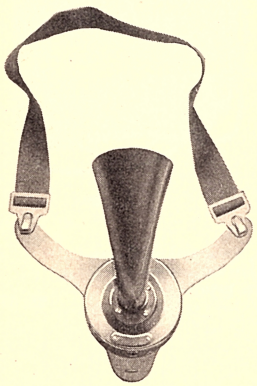
No. 56

Code No.		List Price, Each
1-A	This portable telephone is small, light in weight, and will withstand rough usage. It is especially designed as a train telephone set for connection to Dispatcher's telephone circuits by means of a No. 5 or a No. 7 line pole.....	$8.67
	Consists of: 1 No. 280 transmitter. 1 No. 145-W receiver. 1 No. 228-A cord. 1 No. 8-A induction coil. 1 No. 71 condenser. 2 Columbia No. 4 dry cells.	
	Has a push key to control the battery circuit.	
56	Train telephone set for connection to block, message or other telephone circuits where magneto ringing is employed. Used with No. 5 or No. 7 line pole where connection is made to metallic circuits. Used with No. 4 line pole and No. 1 grounding rod where connection is made to grounded circuits.....	30.00
	Consists of: 1 No. S-5.73 hand set. 1 No. 364-A cord. 1 No. 8-A induction coil. 1 No. 72 condenser. 1 No. 5 magneto generator. 2 No. 6 dry cells.	

TELEPHONE SETS

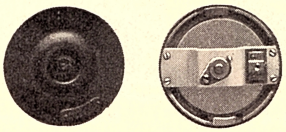


Code No.		List Price, Each
4883	Dispatcher's Breast Telephone Set. Consisting of: 1 No. 283-W transmitter. 1 No. 375 cord, 6 feet. 1 No. 137 plug. 1 No. 148-W receiver. Used in connection with No. 30 jack mounting as installed in No. 345 jack boxes and Wire Chief's test panels.....	$8.27
5683	Same as No. 4883, except with No. 156-W receiver.....	8.54

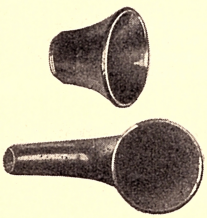


No. 283-W

TRANSMITTERS



		List Price, Each
280	Insulated transmitter for local battery. Black finish. This transmitter will be furnished less bell and mouthpiece unless otherwise ordered.....	$1.87.
283-W	Breast type transmitter for local battery with No. S-5.111 mouthpiece.....	3.54



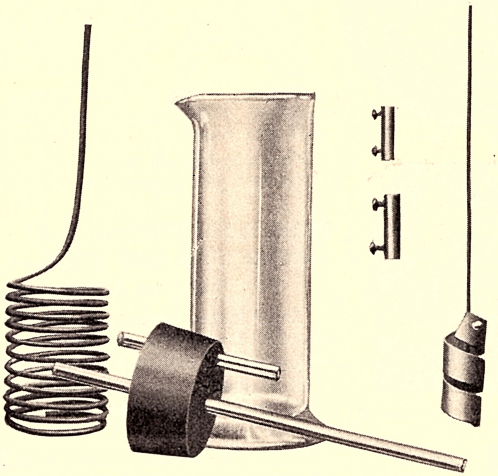
TRANSMITTER MOUTHPIECES

Code No.		List Price, Each
S-5.106	Metal reinforced mouthpiece for No. 280 transmitter.....	$0.80
S-5.111	Mouthpiece for No. 283-W transmitter.....	.67

TESTING APPARATUS

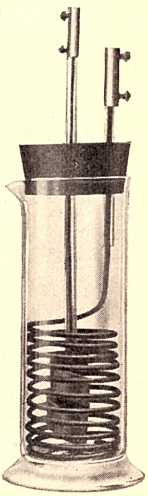
COPPER VOLTAMETER

RITTER'S PATTERN



For making D. C. ampere-hour measurements. An accurate method of measuring small pulsating or variable currents. Can be used in the measurement of battery consumption on selector circuits, transmitter circuits, working Morse circuits, etc.

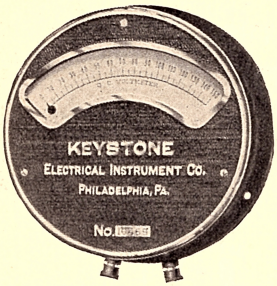
The chief peculiarity of this Voltameter lies in the small mass of the negative electrode which can be accurately weighed to .0001 grams. Current values as low as .001 ampere hours can, therefore, be measured with accuracy. Further advantages are as follows: Large cathode area; almost perfect uniformity of deposit; low internal resistance; freedom from internal short circuits and ease of manipulation.



Code No.		List Price, Each
1	Copper Voltameter as illustrated above. Complete with 2 oz. C. P. Copper Sulfate ($Cu S O_4 + 5 H_2 O$) and negative electrode weighed to .0001 grams.....	$3.00



NOTE.—Negative electrode weights can be made for our customers from time to time, as required. Correspondence invited.



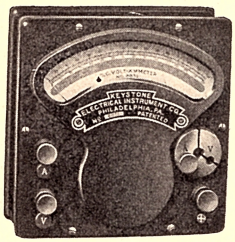
TESTING APPARATUS

KEYSTONE SWITCHBOARD VOLTMETERS, AMMETERS, MILLI-VOLTMETERS AND MILLI-AMMETERS

Type "S"—Diameter, 8½ inches.
Type "C"—Diameter, 6¾ inches.

These instruments can be furnished front connected, back connected or flush type, as specified. All types are equipped with a zero corrector.

Furnished in all ranges.
Prices upon application.



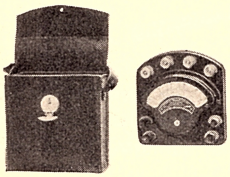
Precision Portable Voltmeter

PRECISION PORTABLE VOLTMETERS, AMMETERS AND VOLT-AMMETERS

For Direct and Alternating Current

These instruments are furnished with carrying cases and are readily portable. Guaranteed accurate to 1/10 of a small scale division.

Furnished in all ranges.
Prices upon application.

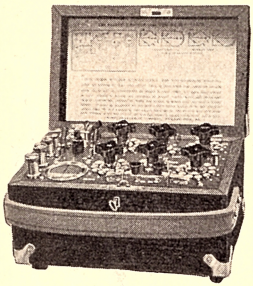


Weston Miniature Volt-Ammeter

WESTON MINIATURE VOLTMETERS, AMMETERS AND VOLT-AMMETERS

Size, 4⅜x4⅝ inches. Voltmeters and Ammeters can be furnished in one, two or three ranges; Volt-Ammeters in two, four or six ranges. Lowest maximum ammeter scale, 50 milli-amperes; highest, 30 amperes. Lowest maximum voltmeter scale, 1 volt; highest, 150 volts.

Prices upon application.



Switch Dial Testing Set

PEERLESS DECADE SWITCH DIAL TESTING SET

A high grade test set adaptable to all Wheatstone Bridge measurements.

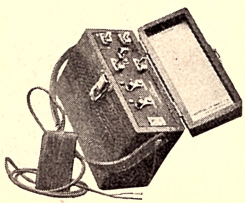
Bridge arms each 1, 10, 100, 1000. Rheostat has 4 dials of 10 coils each. Accuracy 1/20 of 1 per cent.

Galvanometer is equipped with Ayrton shunt.

Code No.	List Price, Each
T-2000	$100.00

Sole leather carrying case for the above:

Code No.	List Price, Each
T-2015	$10.00



Inductive Fault Finder

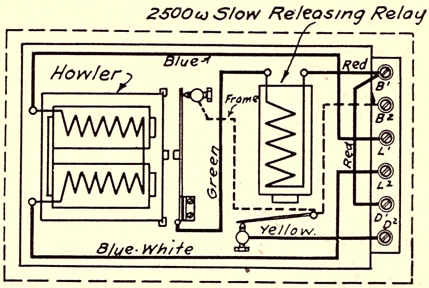
PEERLESS INDUCTIVE FAULT FINDER

	List Price, Each
Used for locating defects in telephone or telegraph cable Complete with exploring coil and telephone receiver. T-2065.....	$30.00

HALL SWITCH AND SIGNAL COMPANY

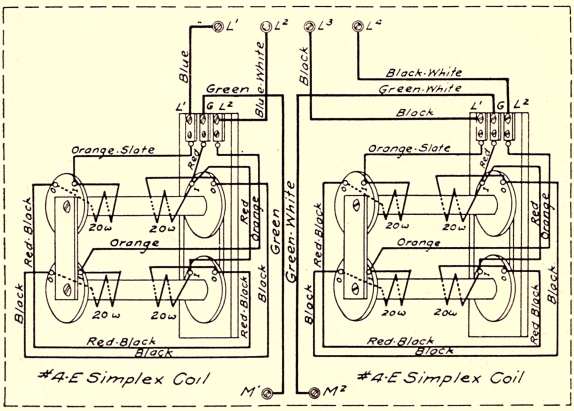
CIRCUIT SECTION

BELL SIGNAL HOWLER



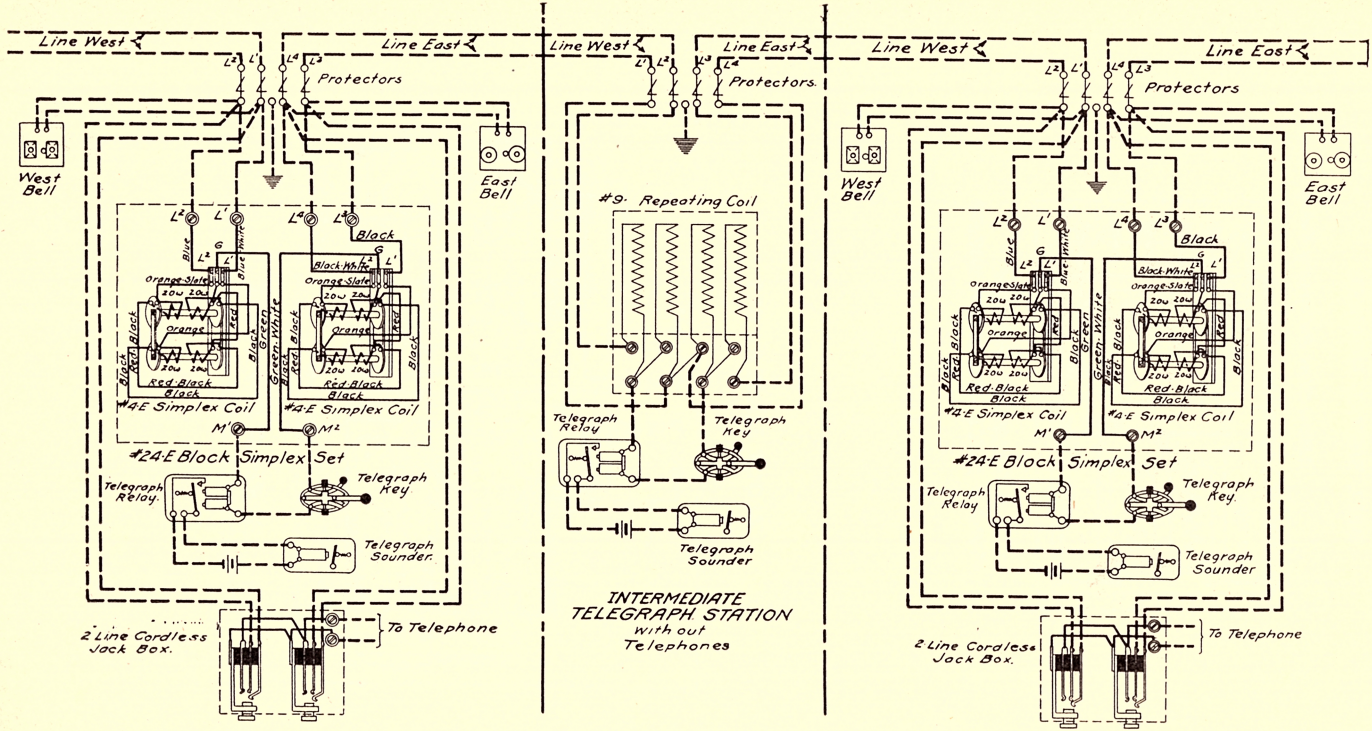
WIRING DIAGRAM.
#124-B BELL SIGNAL HOWLER

BLOCK SIMPLEX SET



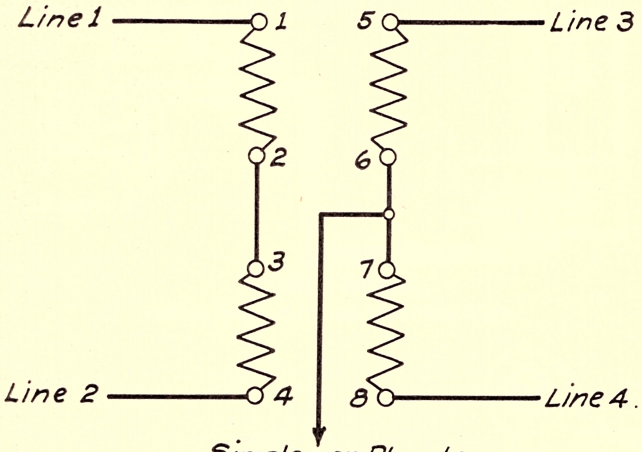
WIRING DIAGRAM.
#24-E BLOCK SIMPLEX SET.

CIRCUIT SECTION—BLOCK SIMPLEX CIRCUIT



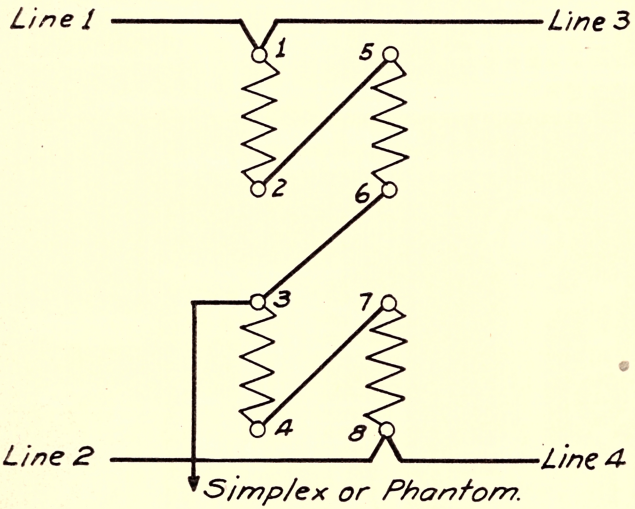
CIRCUIT SECTION

REPEATING AND RETARDATION COILS



WIRING DIAGRAM.

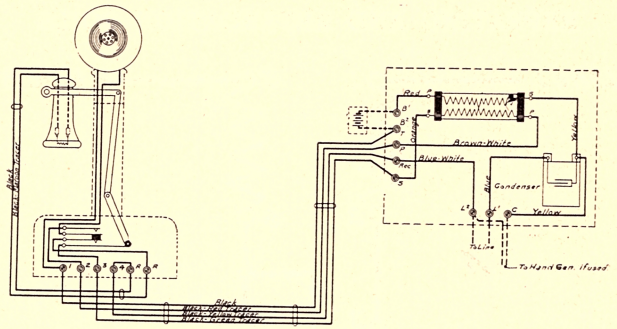
#9 & #15 REPEATING COILS.



WIRING DIAGRAM.

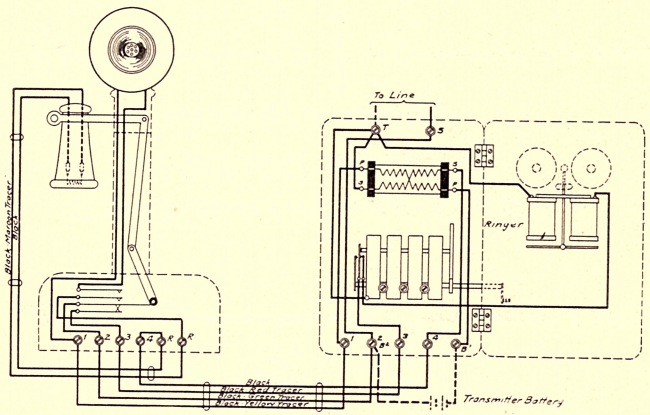
#9 & #15 RETARDATION COILS

CIRCUIT SECTION—DESK STANDS



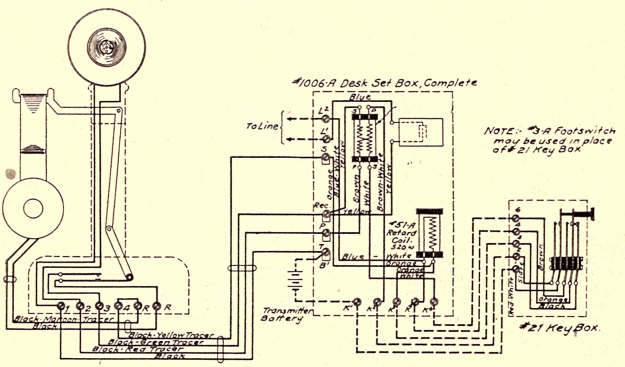
WIRING DIAGRAM

#18-A Desk Stand and #1006-B Desk Set Box



WIRING DIAGRAM

#8-A Desk Stand and #525 Desk Set Box

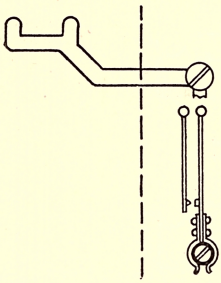


WIRING DIAGRAM

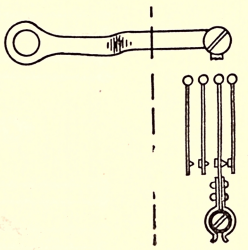
#7-A Desk Stand and #1006-A Desk Set Box

HALL SWITCH AND SIGNAL COMPANY

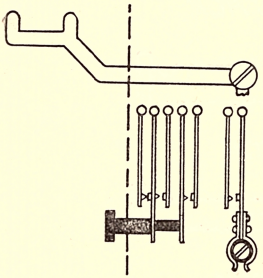
CIRCUIT SECTION—HOOK SWITCHES



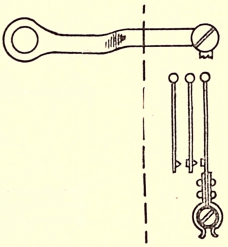
 # S-3.42



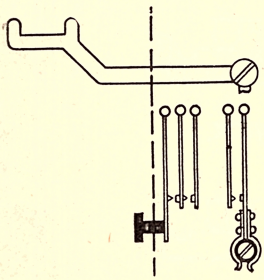
 # S-5.42



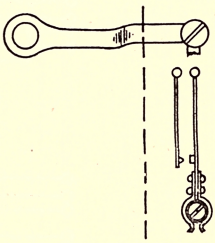
 # S-3.58



 # S-3.135

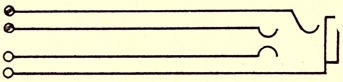


 # S-3.50

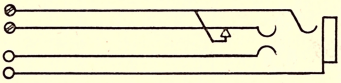


 # S-3.134

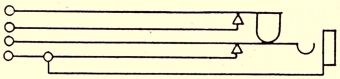
CIRCUIT SECTION—JACKS



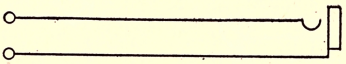
#152-A JACK.



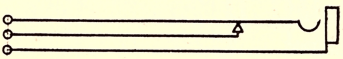
#152-B JACK



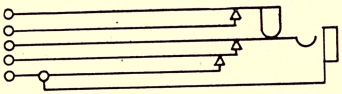
#201 JACK



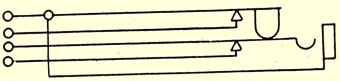
#215 JACK



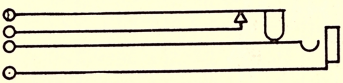
#216 JACK.



#217 JACK

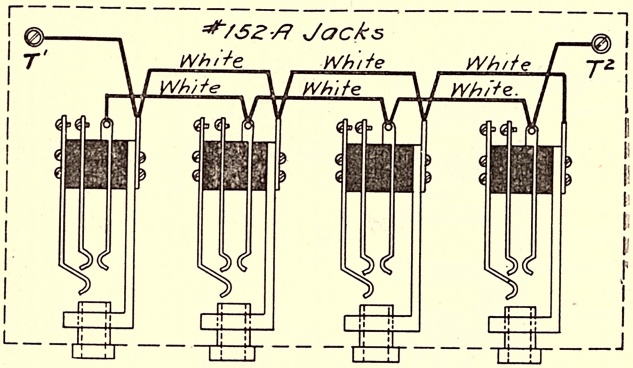


#218 JACK.

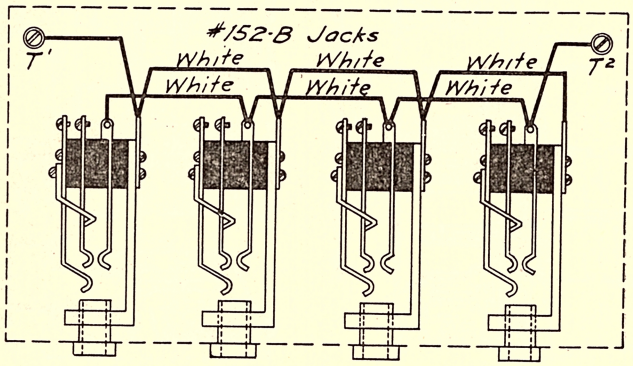


#219 JACK.

CIRCUIT SECTION—CORDLESS JACK BOXES

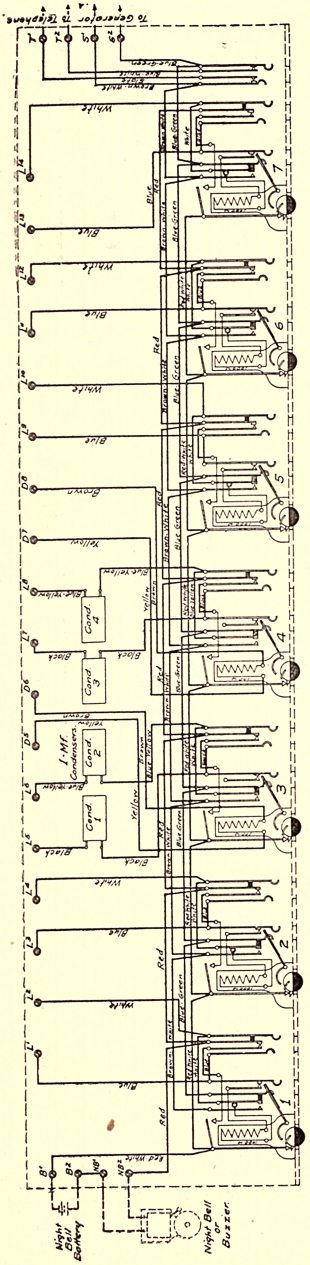


WIRING DIAGRAM.
TELEPHONE CORDLESS JACK BOX.

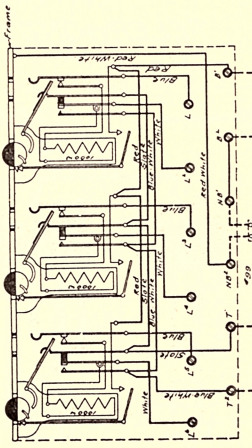


WIRING DIAGRAM.
TELEGRAPH CORDLESS JACK BOX.

CIRCUIT SECTION—COMBINED JACK AND SIGNAL BOXES



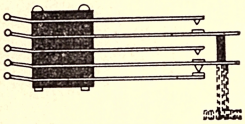
WIRING DIAGRAM.
#4A COMBINED JACK AND SIGNAL BOX.



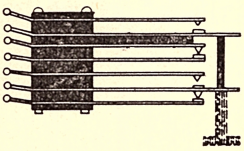
WIRING DIAGRAM
#6A COMBINED JACK AND SIGNAL BOX.

HALL SWITCH AND SIGNAL COMPANY

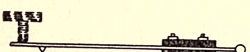
CIRCUIT SECTION—KEYS



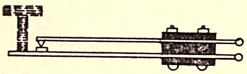
#21 KEY



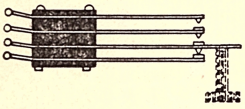
#32 KEY.



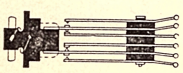
#39 KEY.



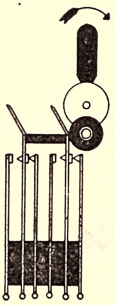
#34 KEY.



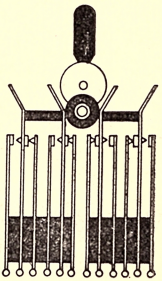
#38 KEY.



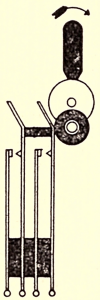
#272-B KEY



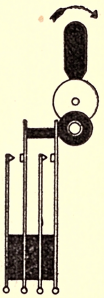
#28 KEY.



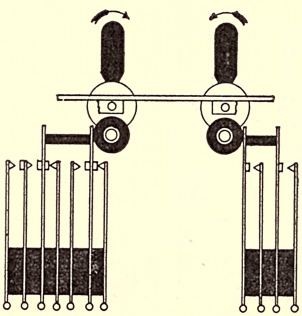
#30 KEY.



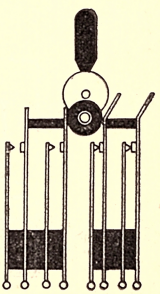
#126 KEY



#132 KEY.

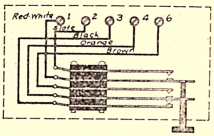


#97 & #132 KEYS

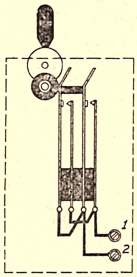


#235 KEY.

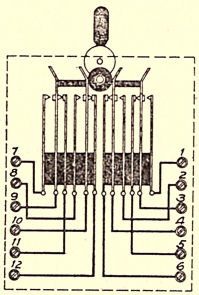
CIRCUIT SECTION—KEY BOXES



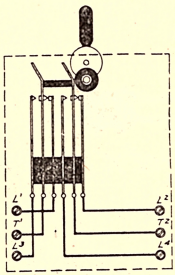
WIRING DIAGRAM
#21 KEY



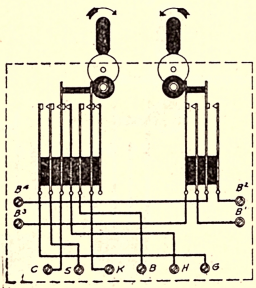
WIRING DIAGRAM
#6000-D KEY.



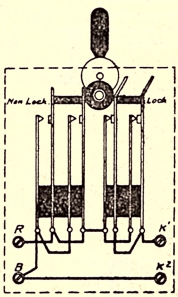
WIRING DIAGRAM.
#6000-B KEY.



WIRING DIAGRAM.
#6000-K KEY.

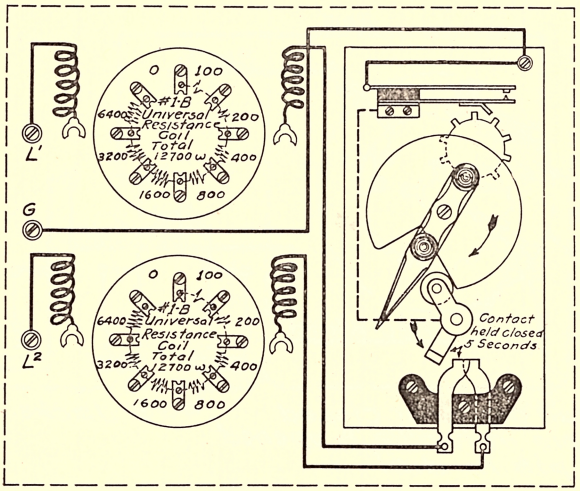


WIRING DIAGRAM
#6000-C KEY.

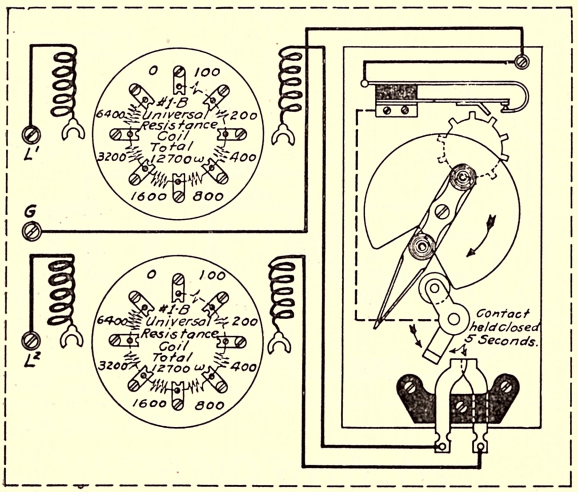


WIRING DIAGRAM
#6000-L KEY

CIRCUIT SECTION—UNIVERSAL CALLING KEYS

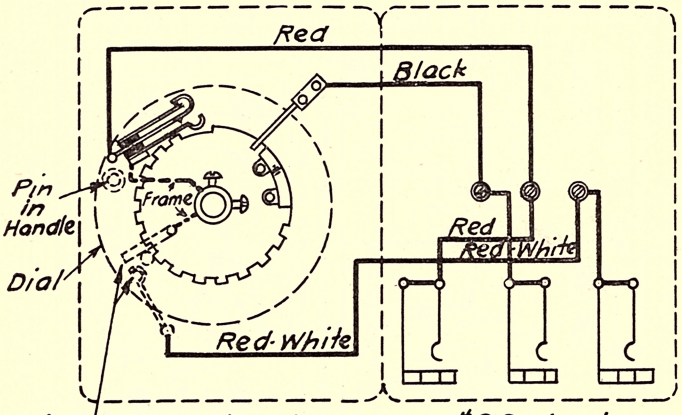


WIRING DIAGRAM
#1-D UNIVERSAL CALLING KEY.

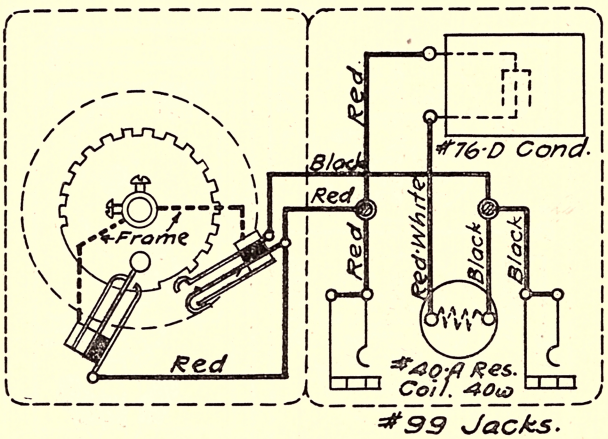


WIRING DIAGRAM.
#2-D UNIVERSAL CALLING KEY

CIRCUIT SECTION—UNIVERSAL CALLING KEYS

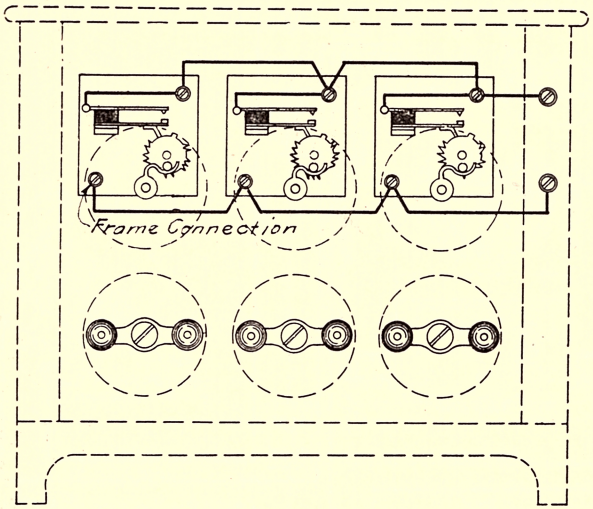


WIRING DIAGRAM.
#4-G UNIVERSAL CALLING KEY.

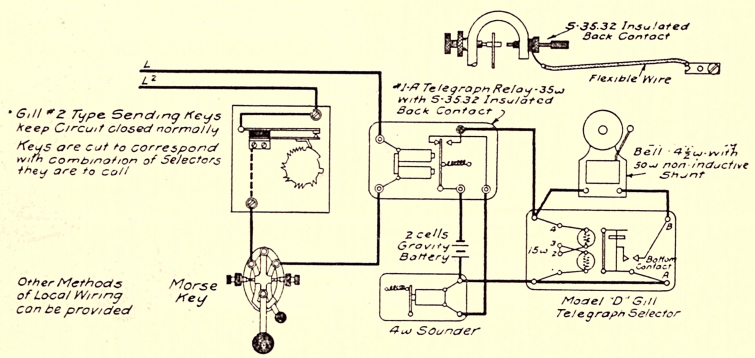


WIRING DIAGRAM.
#76-D UNIVERSAL CALLING KEY.

CIRCUIT SECTION—SELECTORS



WIRING DIAGRAM.
GILL TELEPHONE SELECTOR KEYBOARD.



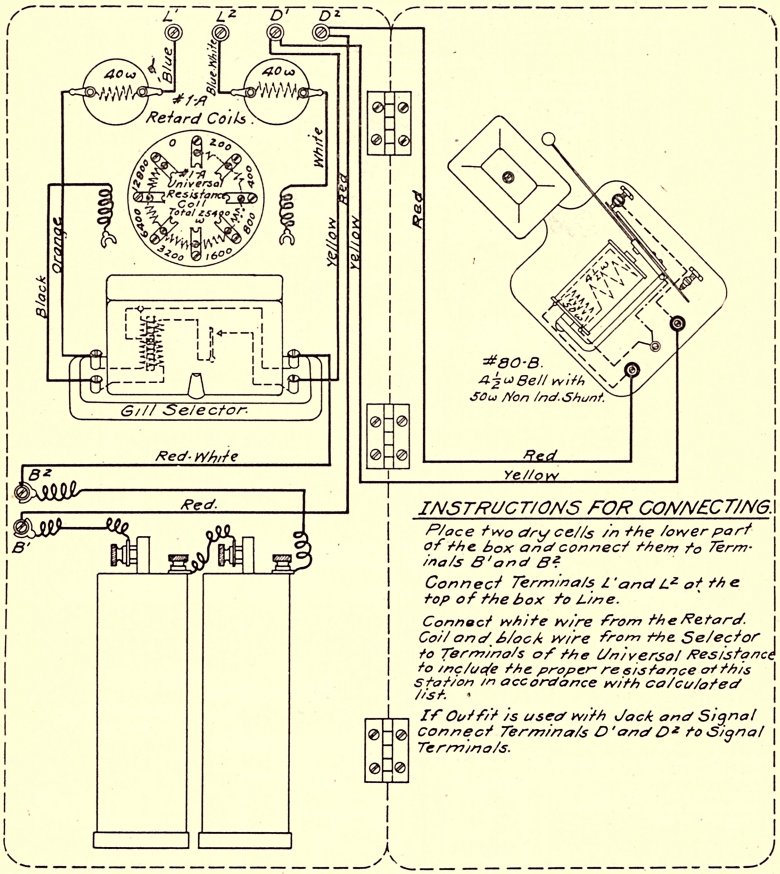
A Tape Recorder would make impulses as shown below if cut in on a circuit using #2 Key and Selector on Back Contact

Combination 22321 for example — Clear out impulses — 2 — 2 — 3 — 2 — 1 — Ringing interval — Shut off impulse

It is easy to make the combination with the Morse Key. Make the dots the same length as the Morse letter "I"

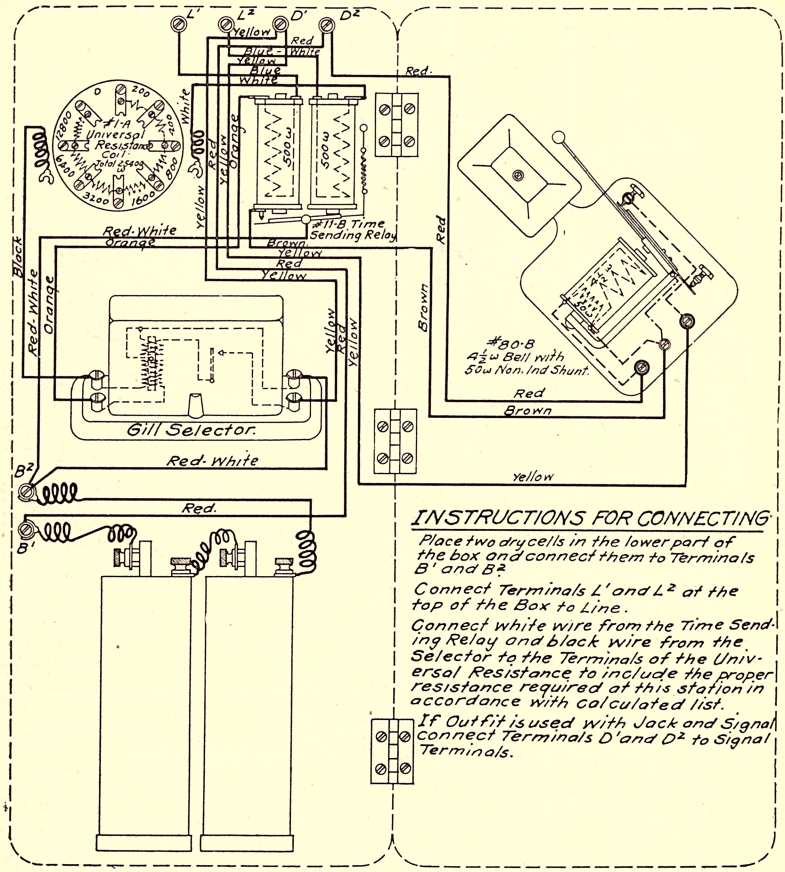
THEORY OF GILL TELEGRAPH SELECTOR
USING BACK STOP CONTACT & #2 KEY.

CIRCUIT SECTION—SELECTOR BOX OUTFIT



WIRING DIAGRAM.
#500-L GILL SELECTOR BOX OUTFIT.

CIRCUIT SECTION—SELECTOR BOX OUTFIT



INSTRUCTIONS FOR CONNECTING

Place two dry cells in the lower part of the box and connect them to Terminals B' and B².

Connect Terminals L' and L² at the top of the Box to Line.

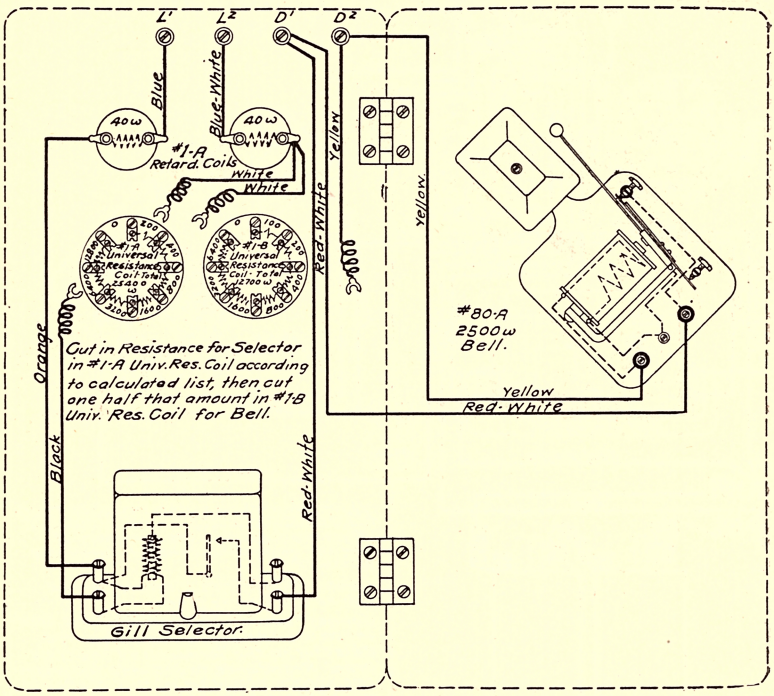
Connect white wire from the Time Sending Relay and black wire from the Selector to the Terminals of the Universal Resistance to include the proper resistance required at this station in accordance with calculated list.

If Outfit is used with Jack and Signal connect Terminals D' and D² to Signal Terminals.

WIRING DIAGRAM.

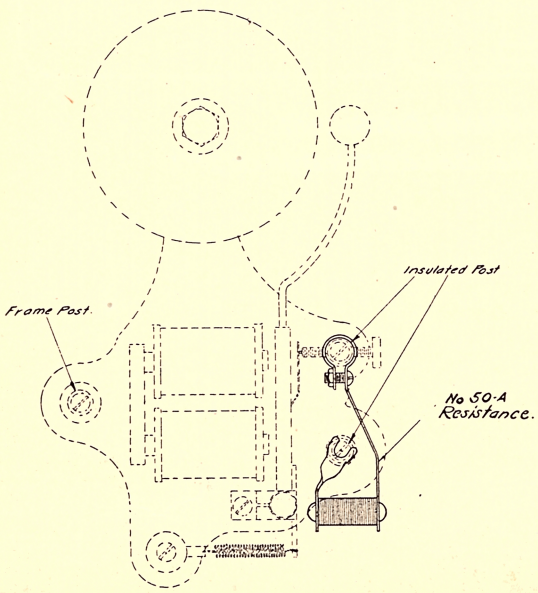
#500-LT GILL SELECTOR BOX OUTFIT.

CIRCUIT SECTION—SELECTOR BOX OUTFIT



WIRING DIAGRAM

#500-M GILL SELECTOR BOX OUTFIT WITH MAIN BATTERY BELL.

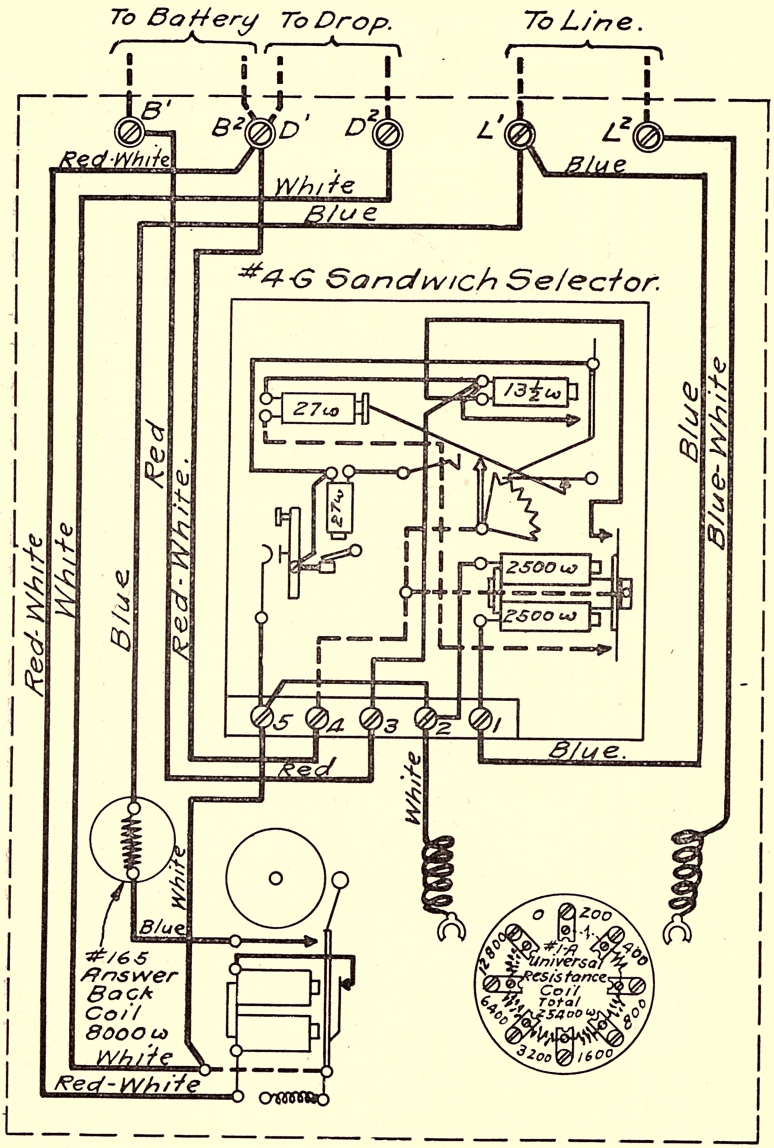


SELECTOR BELL SHUNT

#50-A RESISTANCE COIL. SHOWING METHOD OF ATTACHMENT TO FARADAY BELLS FOR SPARK ELIMINATION.

HALL SWITCH AND SIGNAL COMPANY

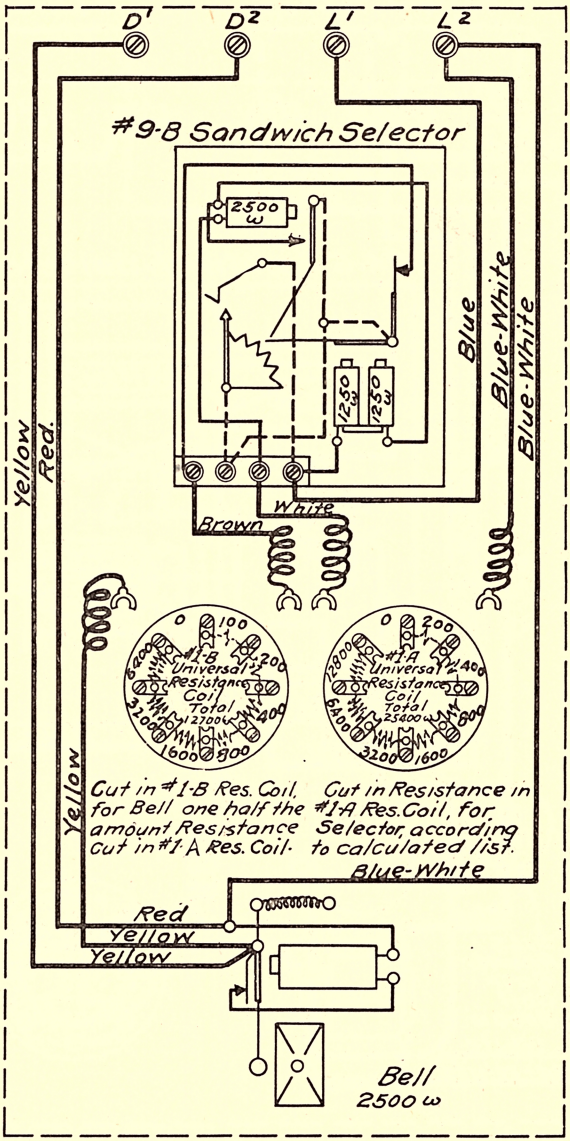
CIRCUIT SECTION—SELECTOR BOX OUTFIT



WIRING DIAGRAM.

204-G SANDWICH SELECTOR BOX OUTFIT.

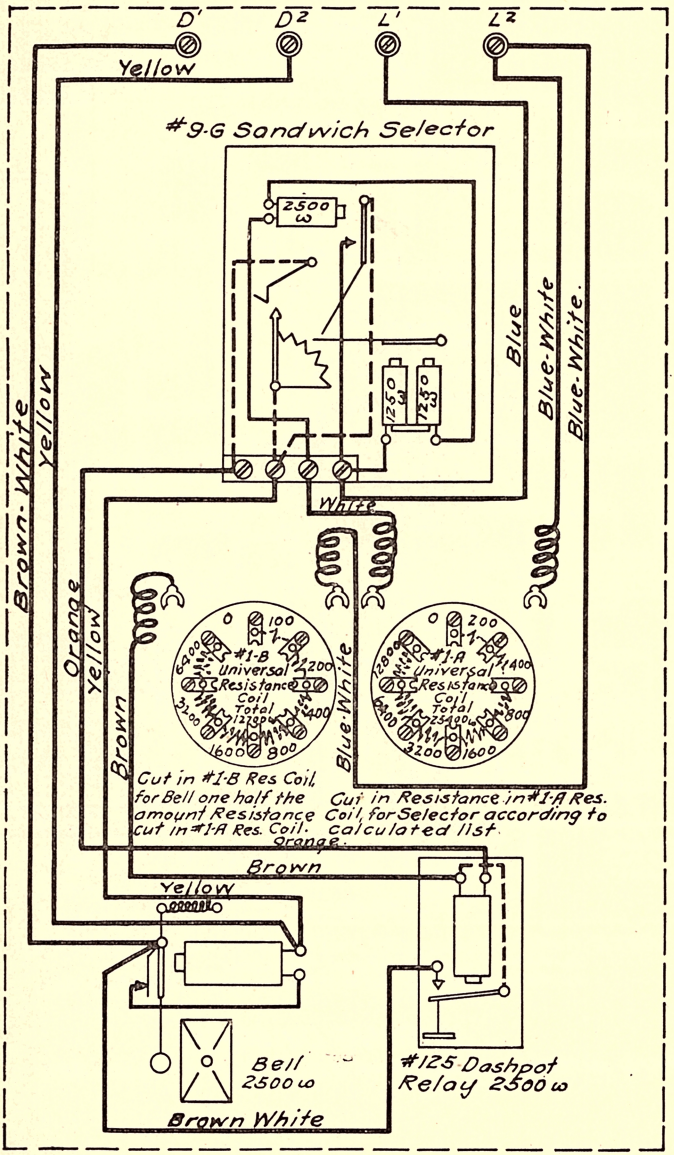
CIRCUIT SECTION—SELECTOR BOX OUTFIT



WIRING DIAGRAM.

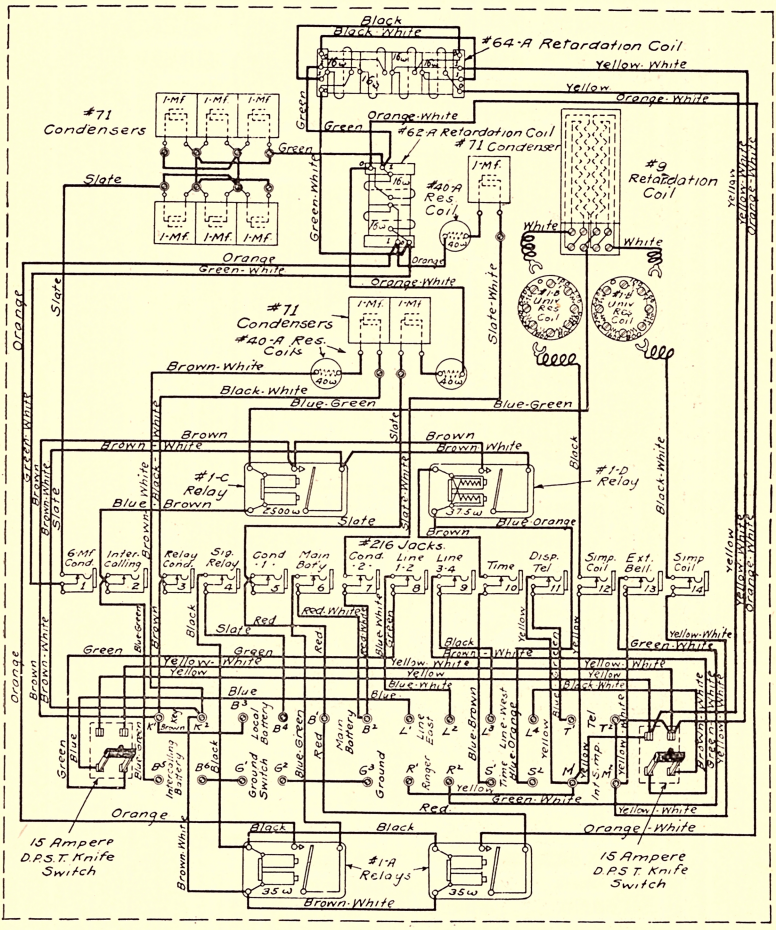
#209-B SANDWICH SELECTOR BOX OUTFIT.

CIRCUIT SECTION—SELECTOR BOX OUTFIT



WIRING DIAGRAM.
#209-G SANDWICH SELECTOR BOX OUTFIT.

CIRCUIT SECTION—SIGNALING SET



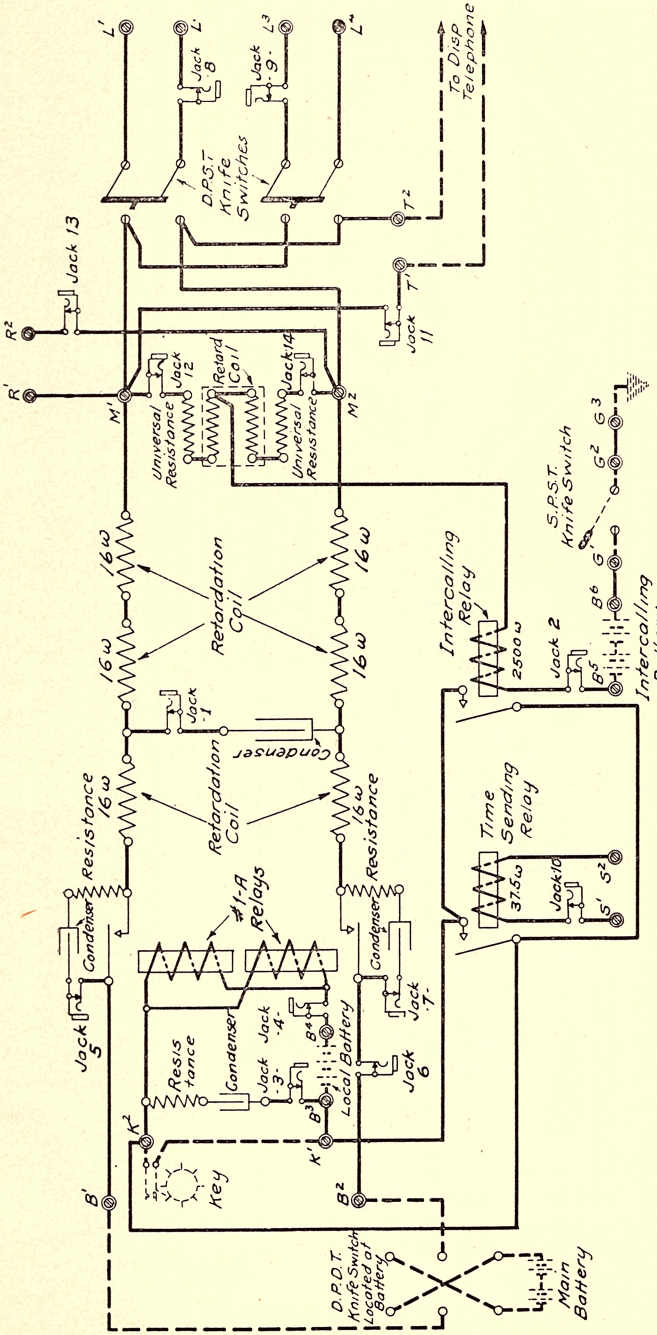
NOTE:- For #61-A Signaling Set omit #1-C & #1-D Relays, #9 & 2 - #1-B Coils
For #61-B Signaling Set omit #1-D Relay.
For #61-C Signaling Set omit #1-C Relay, #9 & 2 - #1-B Coils

WIRING DIAGRAM.

#61-D INTERCALLING & TIME SENDING SIGNALING SET.

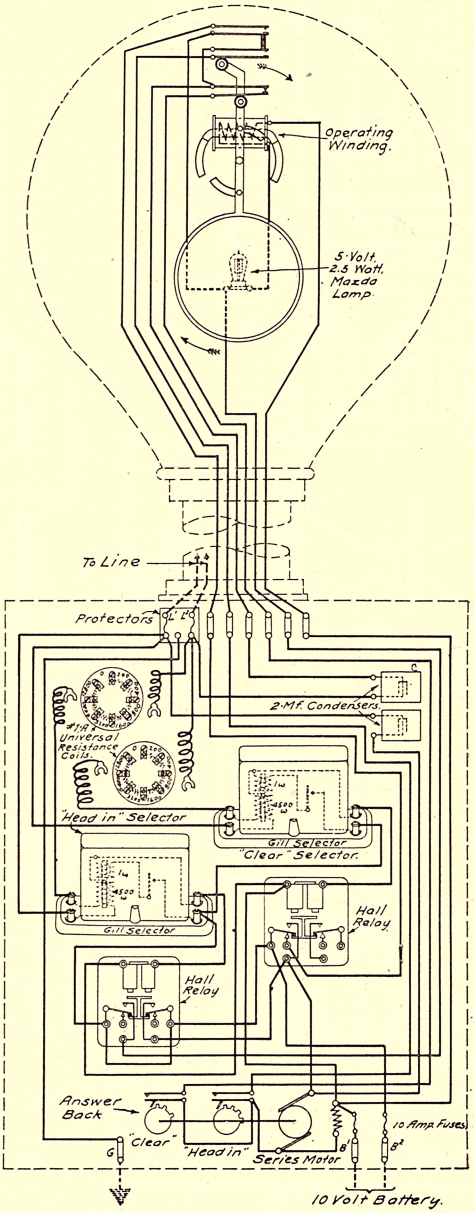
HALL SWITCH AND SIGNAL COMPANY

CIRCUIT SECTION—SIGNALING SET



SCHEMATIC CIRCUIT
#61-D INTERCALLING & TIME SENDING SIGNALING SET

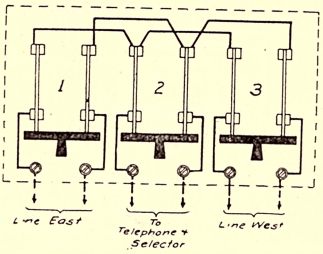
CIRCUIT SECTION—TAKE SIDING SIGNAL

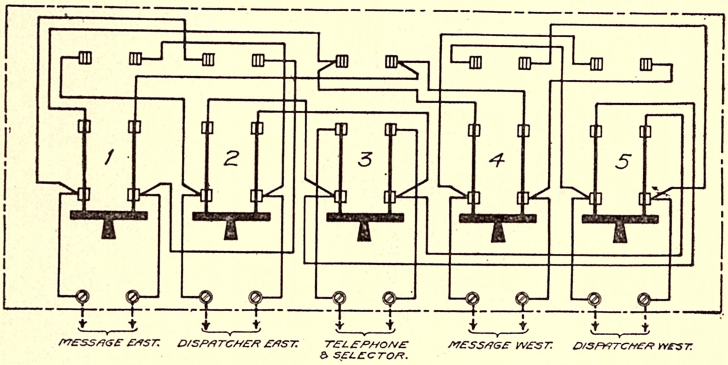


WIRING DIAGRAM.
TAKE SIDING SIGNAL.

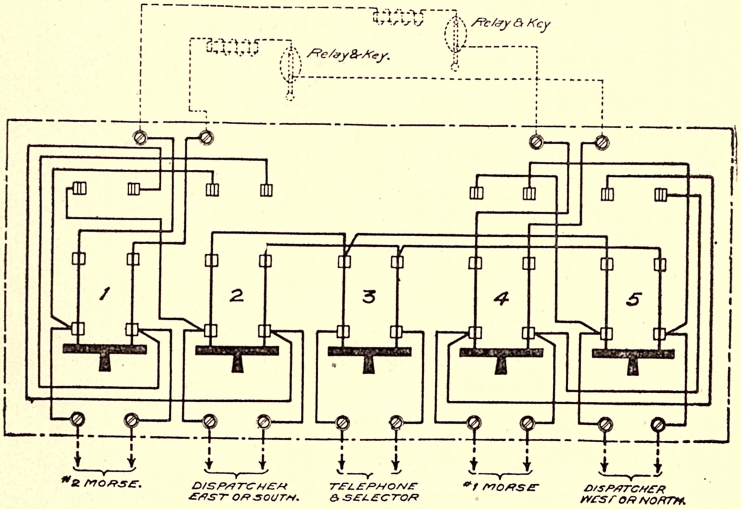
CIRCUIT SECTION—TEST AND PATCH PANELS

WIRING DIAGRAM
#50-A TEST PANEL



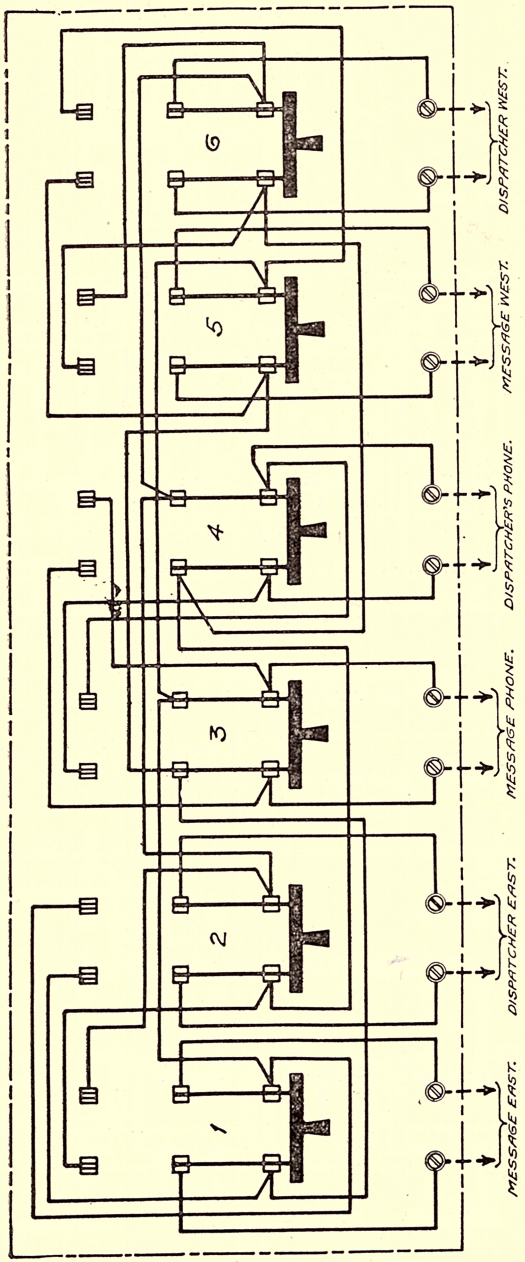


WIRING DIAGRAM.
#50-B TEST PANEL.



WIRING DIAGRAM.
#50-F TEST PANEL.

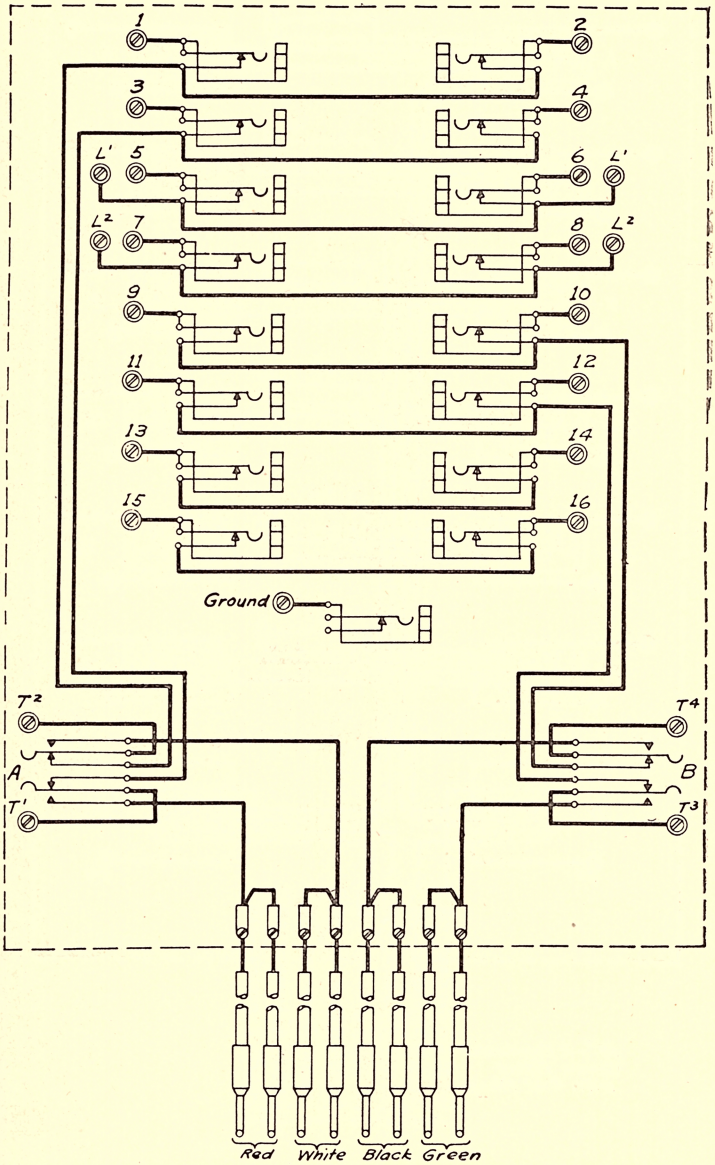
CIRCUIT SECTION—TEST AND PATCH PANEL



WIRING DIAGRAM.
#50-E TEST PANEL.

HALL SWITCH AND SIGNAL COMPANY

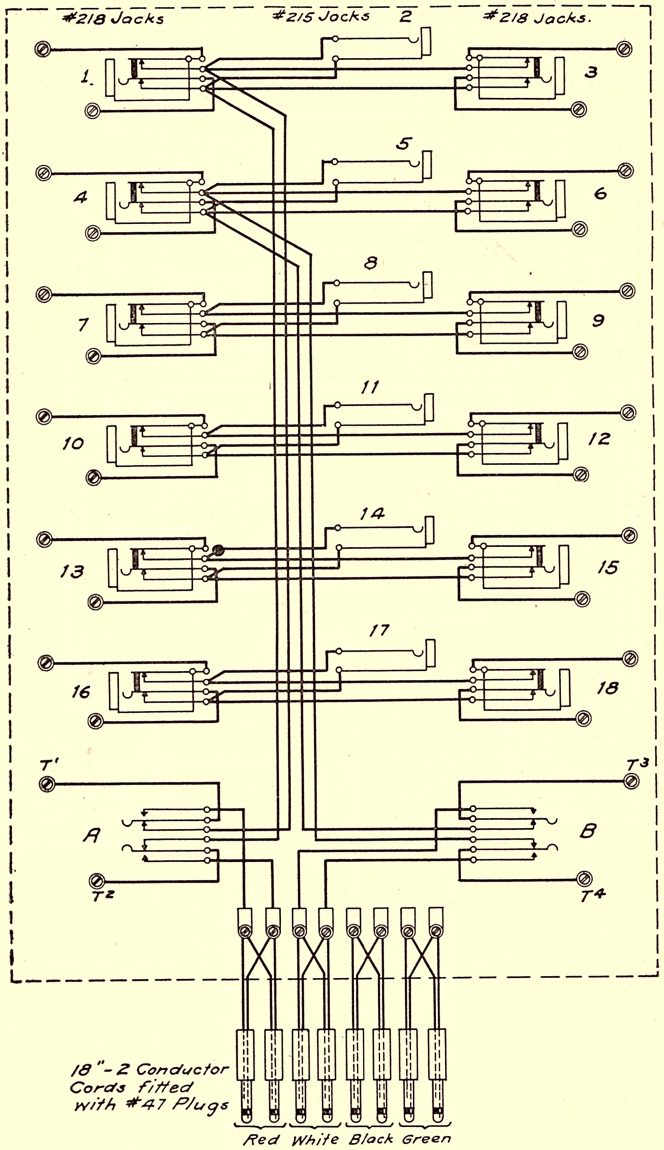
CIRCUIT SECTION—TEST AND PATCH PANEL



WIRING DIAGRAM

#201-A TEST PANEL

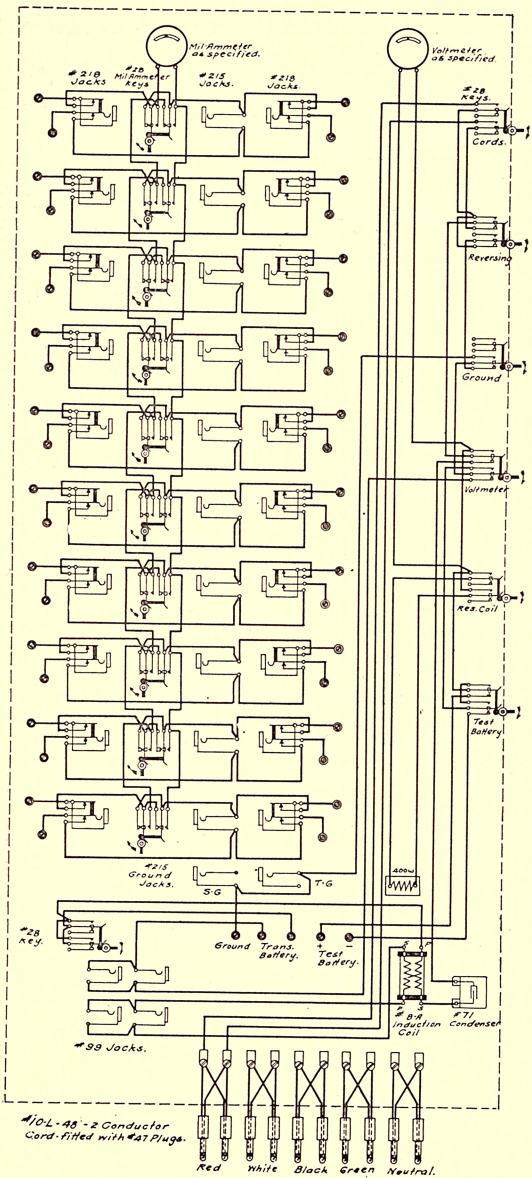
CIRCUIT SECTION—TEST AND PATCH PANEL



WIRING DIAGRAM
#202-A TEST PANEL.

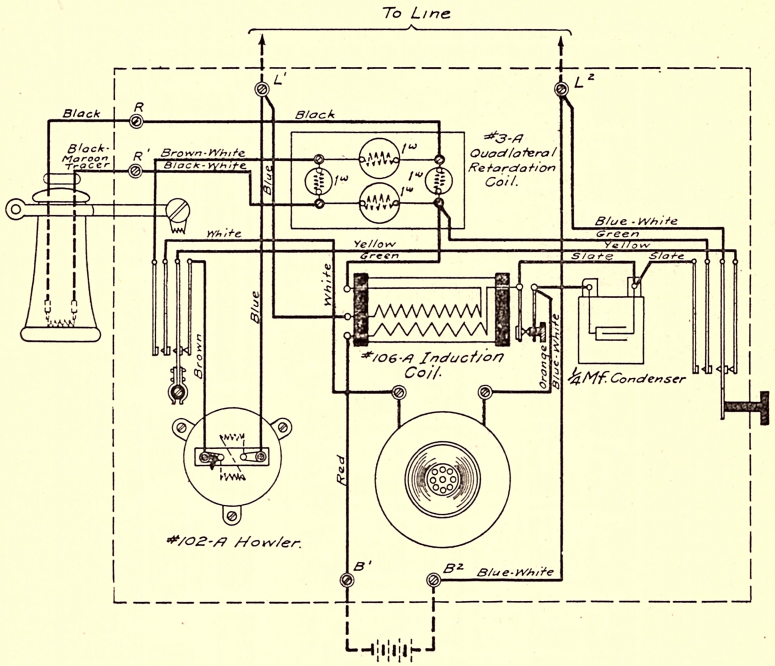
HALL SWITCH AND SIGNAL COMPANY

CIRCUIT SECTION—TEST AND PATCH PANEL

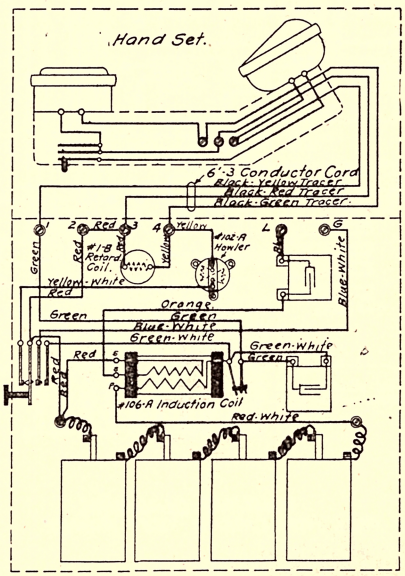


WIRING DIAGRAM.
#10-L WIRE CHIEF'S TEST PANEL.

CIRCUIT SECTION—TELEGRAPHONES



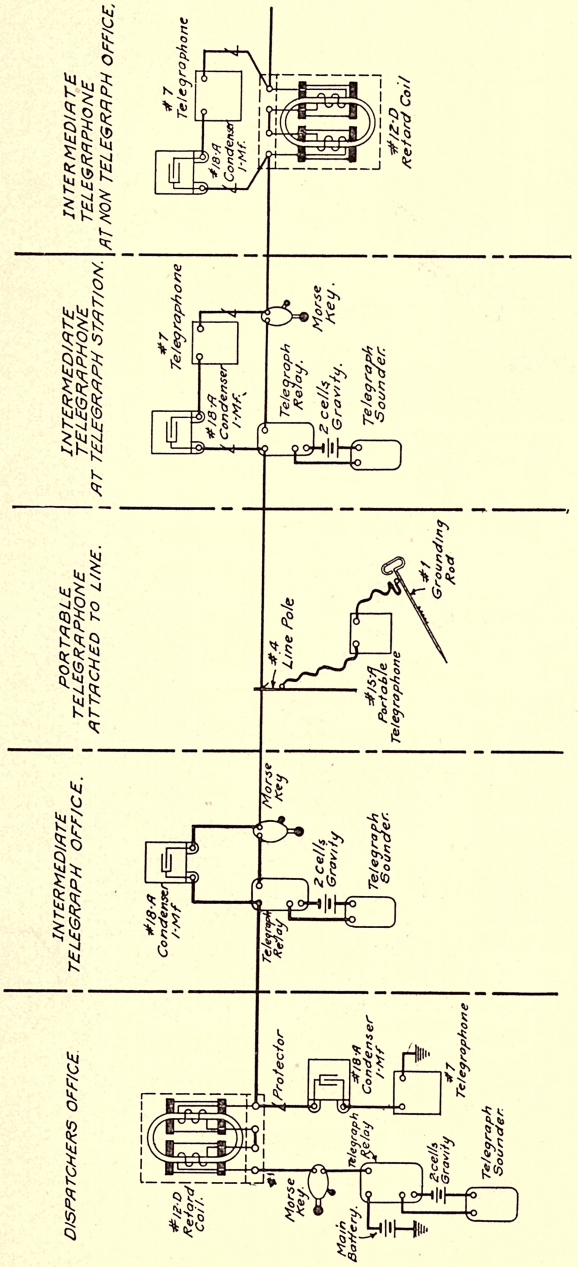
WIRING DIAGRAM.
#7 TELEGRAPHONE.



WIRING DIAGRAM.
#15-A PORTABLE TELEGRAPHONE SET.

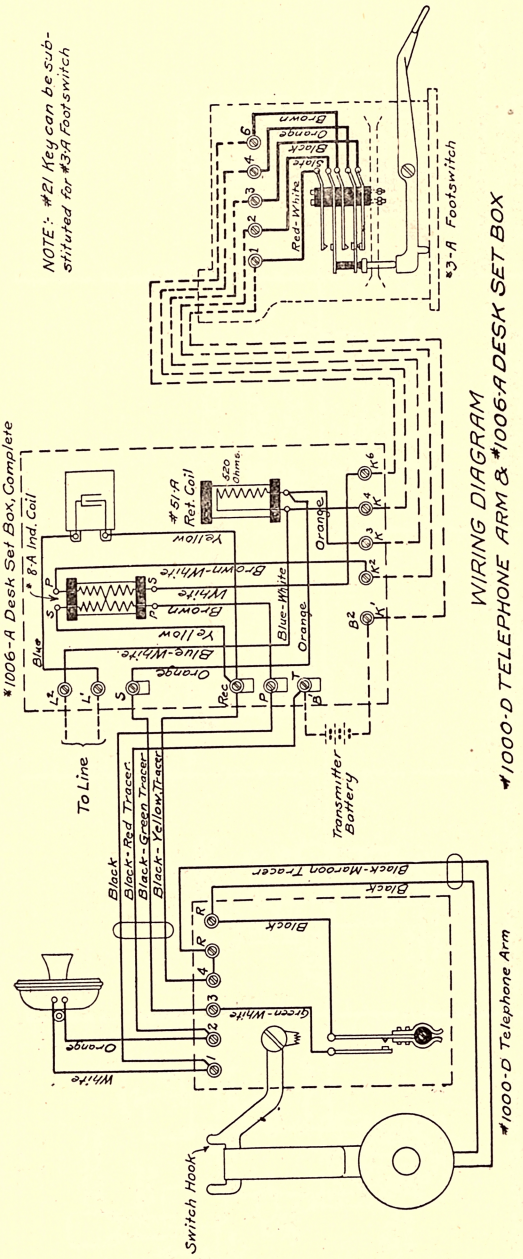
CIRCUIT SECTION

SCHEMATIC—TELEGRAPH AND TELEGRAPHONE INSTALLATION



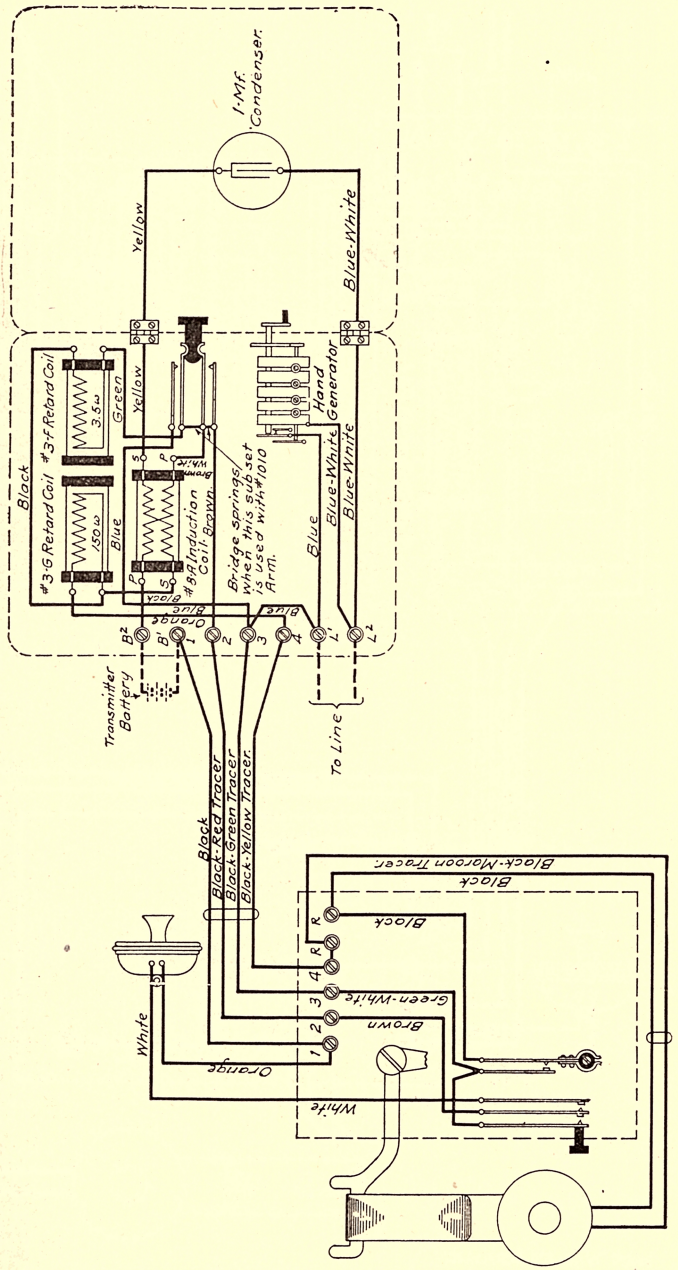
SCHEMATIC WIRING
TELEGRAPH & TELEGRAPHONE INSTALLATION.

CIRCUIT SECTION—TELEPHONE ARM



HALL SWITCH AND SIGNAL COMPANY

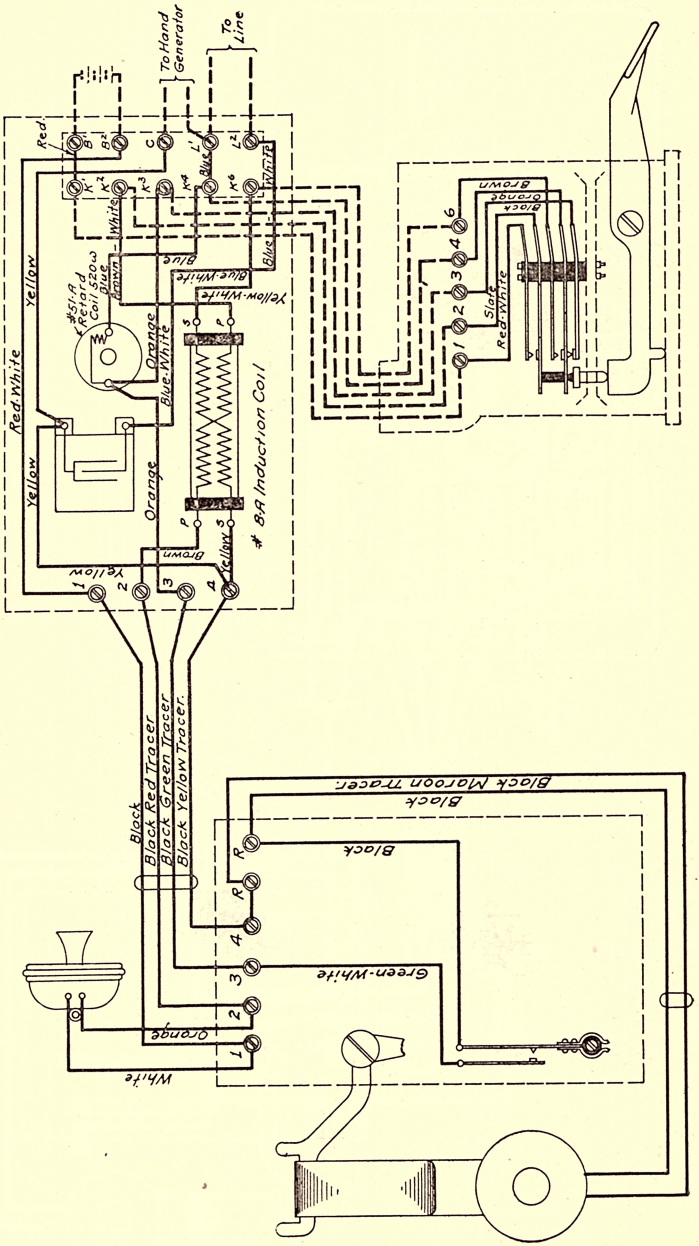
CIRCUIT SECTION—TELEPHONE ARM



WIRING DIAGRAM

 # 1010-D Telephone Arm and #22-A Desk Set Box

CIRCUIT SECTION—TELEPHONE ARM

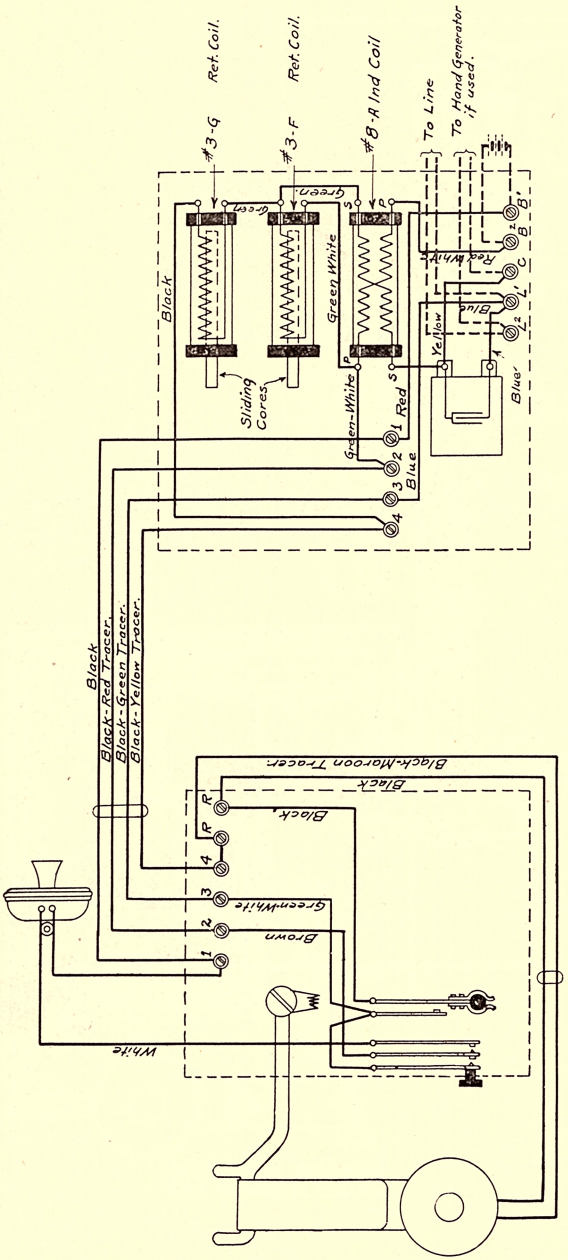


WIRING DIAGRAM

#1500-B TELEPHONE ARM AND #3-A FOOT SWITCH

HALL SWITCH AND SIGNAL COMPANY

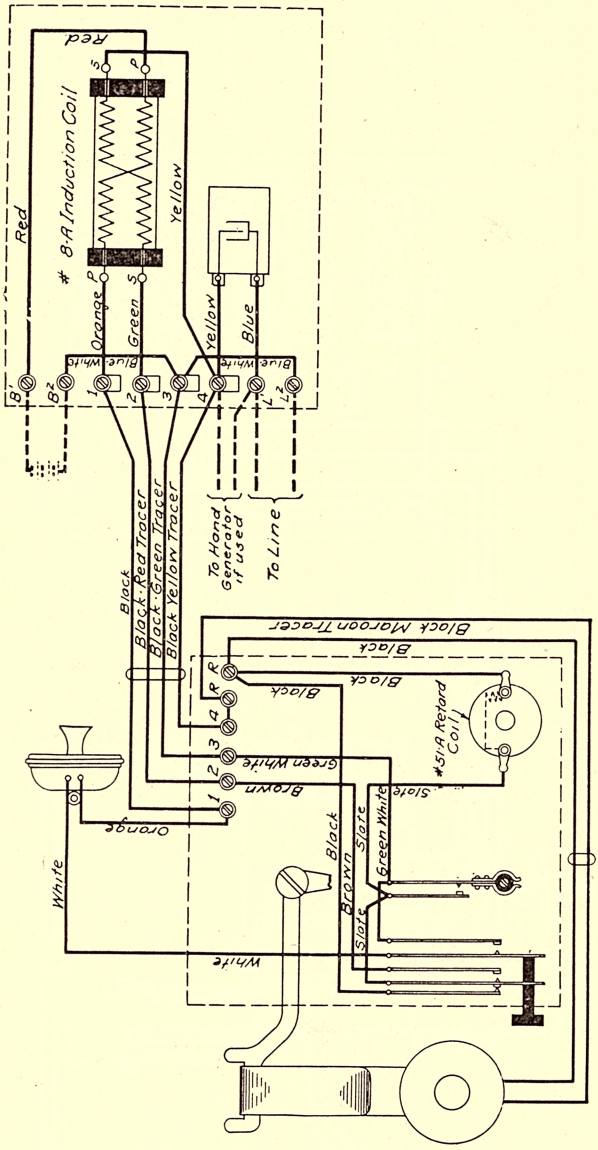
CIRCUIT SECTION—TELEPHONE ARM



WIRING DIAGRAM

#1510-B Telephone Arm

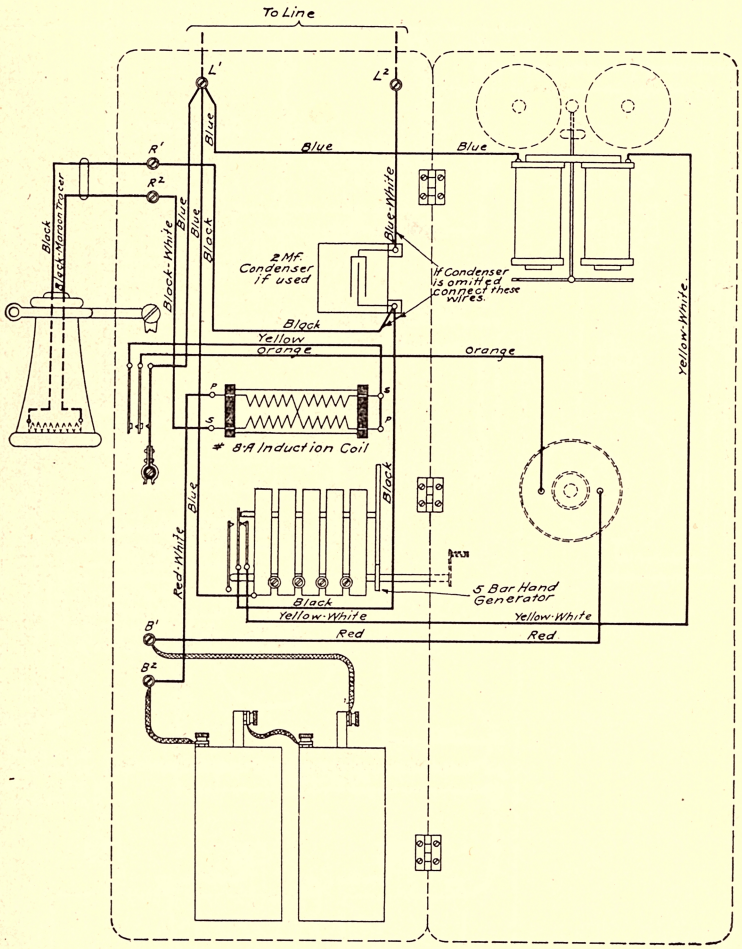
CIRCUIT SECTION—TELEPHONE ARM



WIRING DIAGRAM
#1512-B TELEPHONE ARM

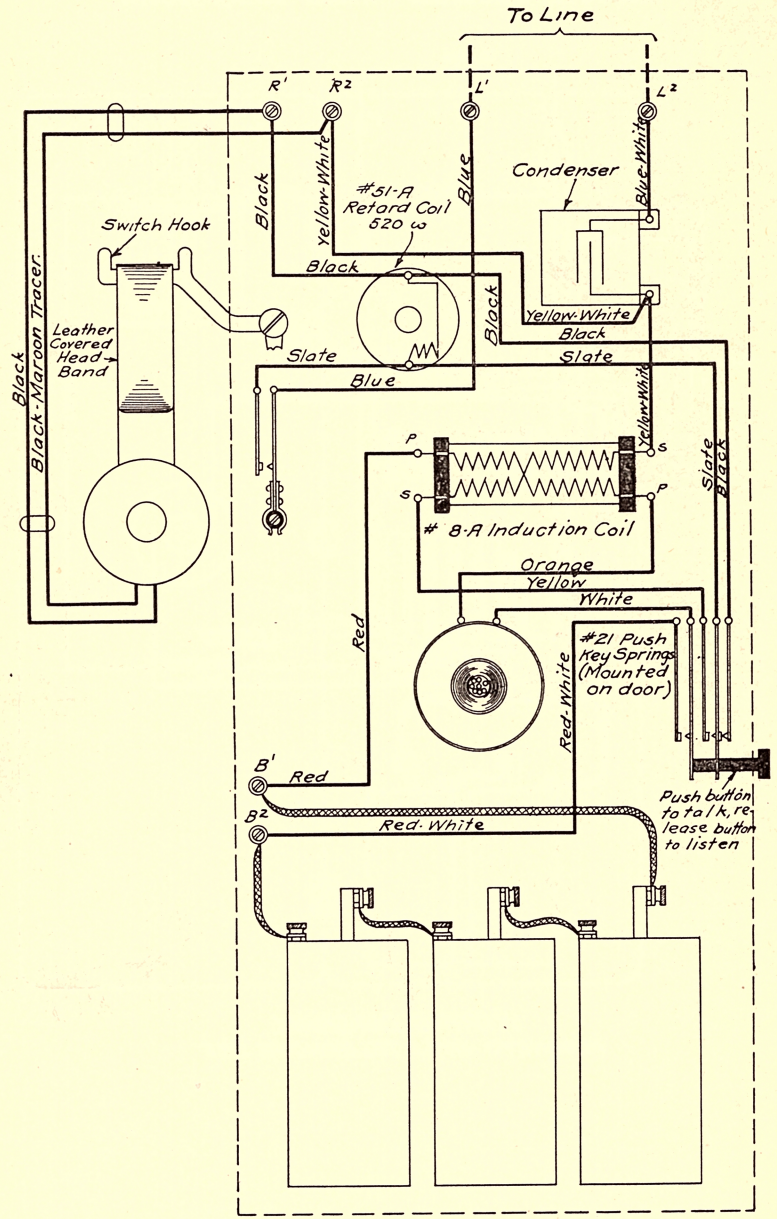
HALL SWITCH AND SIGNAL COMPANY

CIRCUIT SECTION—WALL TELEPHONE



WIRING DIAGRAM.
MAGNETO WALL TELEPHONE SET.

CIRCUIT SECTION—WALL TELEPHONE

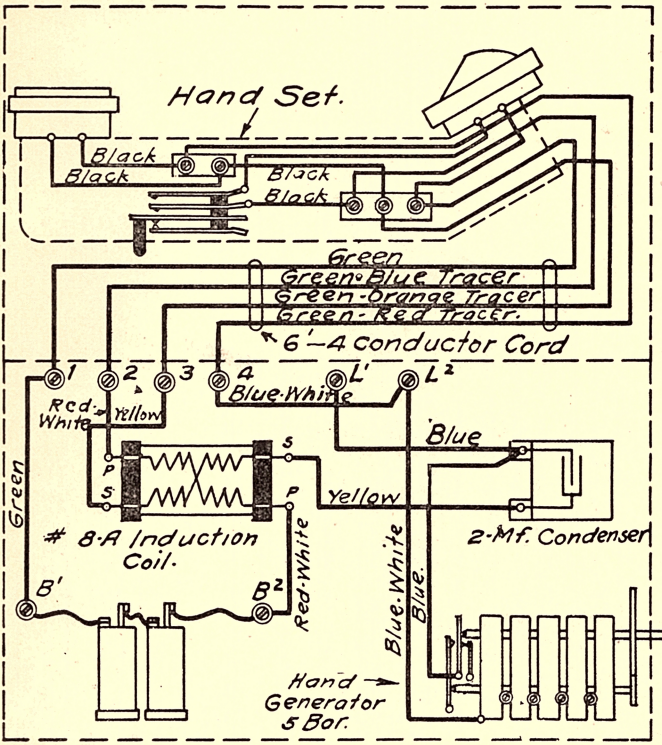


WIRING DIAGRAM.

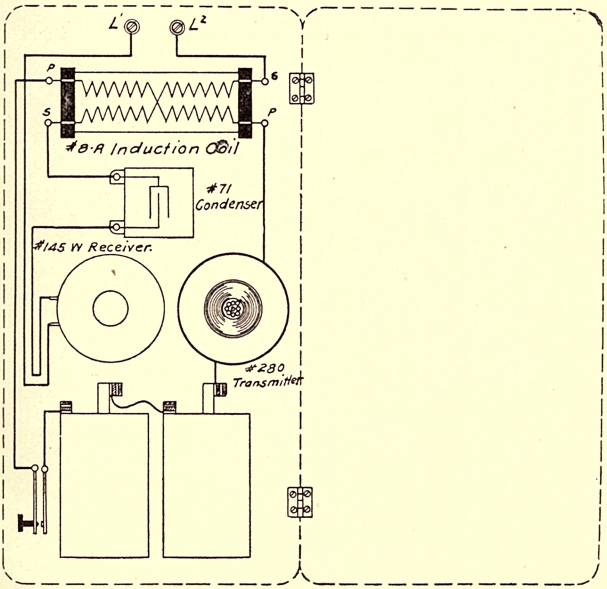
HIGH EFFICIENCY WALL TELEPHONE SET.

HALL SWITCH AND SIGNAL COMPANY

CIRCUIT SECTION—PORTABLE TELEPHONES



WIRING DIAGRAM
#56 PORTABLE TELEPHONE SET



WIRING DIAGRAM
#1-A PORTABLE TELEPHONE SET