

The Stromberg - Carlson
Telephone Manufacturing
Company : Chicago U S A

GENERATOR-CALL TELEPHONES
BULLETIN NO. 19, 1905

Catalog of S-C magneto telephones circa 1905

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STROMBERG-CARLSON

Telephone Manufacturing Co.

**ROCHESTER
NEW YORK**



**CHICAGO
ILLINOIS**

**BULLETIN NO.19
SUPERSEDING NO.11**

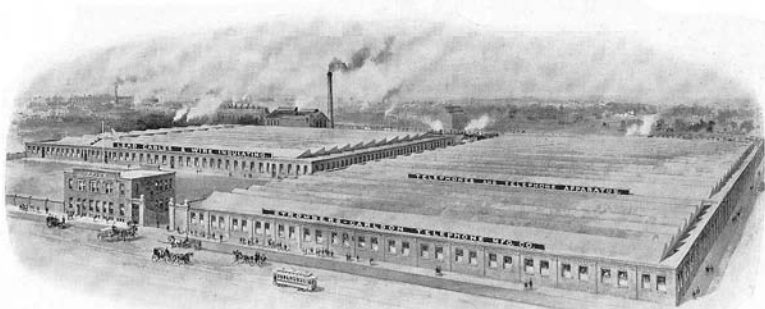
Generator-Call Telephones

Bulletin No. 19
Superseding Bulletin No. 11



Stromberg-Carlson Telephone Manufacturing Co.

General Offices: Rochester, N. Y.
Branch Sales Office: Chicago, Ill.
Factories: Rochester, N. Y., Chicago, Ill.



ROCHESTER FACTORY
Culver Road and University Avenue



OUR CHICAGO BRANCH
Situated at Corner of W. Jackson Boulevard and Clinton St.

NOTICE

ON the following pages will be found a brief description of our Generator-Call or Magneto Telephones, together with Code numbers for both Series and Bridging instruments of various styles, and also a description of their various parts with Code numbers.

We would call your attention to the following, our No. 7 Transmitter, our Four-Party Line Selective Telephones, the "Sure-Ring" Telephone, the "Non-Interfering" Telephone, new type of Portable Desk Telephone, and the two types of Receivers we are offering.

We have abandoned the idea of publishing a complete catalogue, owing to the many classes of trade which we have to supply, and also because it is impossible to keep a book of this nature up to date, and instead are publishing bulletins which we are pleased to mail at all times to interested parties. These are bound on the loose leaf method and new bulletins or new sheets will be forwarded from time to time to customers and other parties upon request.

Style.—The word style, as used in connection with illustrations, designates the shape and general appearance of the telephone and has nothing to do with the circuit or equipment as far as the style of transmitter or receiver is concerned. The telephone may be wired with any of our different standard circuits and equipped with either type of receiver and a ringer of whatever resistance specified. Our standard equipments for any of these telephones are covered by Code numbers.

STROMBERG-CARLSON TELEPHONE MFG. CO.



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DRY BATTERY TYPE **SERIES TELEPHONE**



FIG. 1

The telephone illustrated on this and the following page is one we commonly call our No. 62. We recommend it for use on either grounded or metallic town or local exchange lines. As shown on page 6, it is equipped with a 3-bar generator and 100 Ohm ringer. Although there are some who prefer a higher-wound ringer, we have found this to be the most efficient for the majority of lines. Some of the noteworthy features in this telephone are as follows:

A carbon block lightning arrester with substantial binding posts provided with hexagon nuts. The wiring is carried in grooves or slots on the backboard and covered with beeswax, to keep out moisture. An induction coil that can be removed easily. See Figs. 23 and 24, page 30. The shelf upon which the generator is mounted is fastened to the sides of the cabinet, so that there can be no danger of the cabinet springing apart and the shelf getting out of place. This is something very likely to occur in a telephone with a heavy 5-bar generator. On the lower side of this shelf are mounted two heavy machine-made binding posts for connecting the batteries. A small wrench is provided on the inside of the door for tightening the hexagon nuts on the binding posts or for changing the adjustment of the ringer, if necessary.

We use a screw method of fastening the door of the cabinet. This is not only the most satisfactory but possesses some good features. The screw is mounted in a metal bushing and provided with a spring, preventing it from becoming lost or getting damaged when the door is closed. Connections are made between the apparatus mounted on the door and in the cabinet by soldered connections to the hinges. These are also provided with a small spiral spring, the ends of which are soldered to the hinge, in order to guarantee a perfect connection.

The cabinet is made of selected quarter-sawn oak, well seasoned and kiln dried, tongued, grooved, and glued at the corners. Each cabinet is sanded to a smooth surface and finished as follows: First, it is given a coat of golden oak stain, next a coat of golden oak filler, then one of white shellac, and afterwards two coats of rubbing varnish, which gives a finish better than two-thirds of the furniture on the market.

DRY BATTERY TYPE SERIES TELEPHONE

This illustration shows an open view of the telephone described on the previous page. We can furnish any of the other styles equipped with 3-bar generator, same as illustrated in this telephone, although this is the style that is most generally used.

Code Numbers Series Telephones

CODE NO.	WOODWORK	GENERATOR TYPE AND NO.	RESISTANCE OF RINGER AND NO.	LIST PRICE
62	Golden Oak	3-bar No. 20	100 Ohm No. 6-H	\$11.25
63	Walnut	3-bar No. 20	100 Ohm No. 6-H	11.50
64	Golden Oak	4-bar No. 21	100 Ohm No. 6-H	11.75
65	Walnut	4-bar No. 21	100 Ohm No. 6-H	12.00

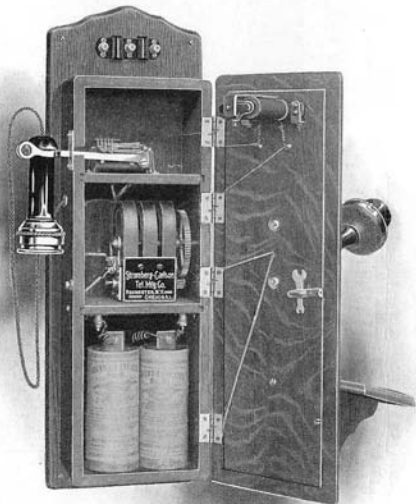


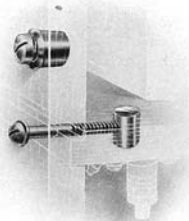
Fig. 2



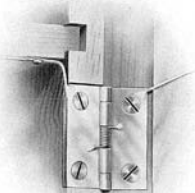
15-43

DRILLING OF CABINET

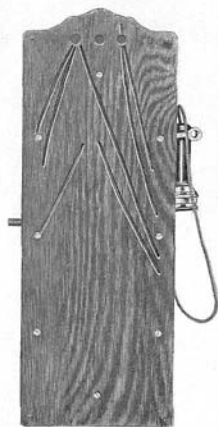
Note how accurately this is done by referring to
Fig. 56, page 50



DOOR FASTENING, GENERATOR
SHELF FASTENING, AND BATTERY
BINDING POST



SOLDERED CONNECTIONS



WIRING IN GROOVES, AND COVERED
WITH BEESWAX

DRY BATTERY TYPE BRIDGING TELEPHONE

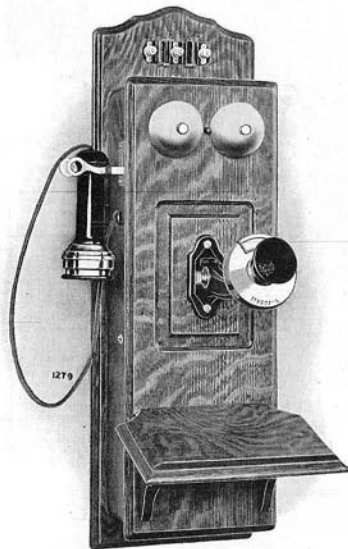


FIG. 3

On this and the following page is shown our standard 4-bar bridging telephone. The cabinet is the same size and style as that described on the previous page. The instrument may be equipped with a ringer of any desired resistance for bridging work. We recommend either the 1,000, 1,600, or 2,000 ohm according to the length of the line and the number of telephones used on it. Higher resistance ringers could be furnished, if ordered special, but we do not recommend them. In fact, the 1,600 ohm will be found to give the best of service on the majority of lines. There are, however, in some cases very heavily loaded bridging lines that give better service if 2,000 ohm ringers are used.

Each telephone is equipped with a carbon block lightning arrester, long distance transmitter and receiver, adjustable transmitter arm with concealed cord, hookswitch with German silver springs, and pure platinum contacts, self-contained ringer, and two cells of dry battery.

DRY BATTERY TYPE BRIDGING TELEPHONE

This shows an open view of our 4-bar bridging telephone and gives you an idea of how the apparatus is mounted. In ordering, if you will use the code numbers given below it will simplify matters. In doing this it is not necessary to give a description of the telephone, providing the description as covered by code number meets your requirements, but simply order the telephone by number.

Code Numbers Bridging Telephones

CODE NO.	WOODWORK	GENERATOR TYPE AND NO.	RESISTANCE OF RINGER AND NO.	LIST PRICE
102	Golden Oak	4-bar No. 23	1,000 Ohm No. 6-A	\$13.25
103	Walnut	4-bar No. 23	1,000 Ohm No. 6-A	13.50
104	Golden Oak	4-bar No. 23	1,600 Ohm No. 6-C	13.50
105	Walnut	4-bar No. 23	1,600 Ohm No. 6-C	13.75
106	Golden Oak	4-bar No. 23	2,000 Ohm No. 6-E	13.75
107	Walnut	4-bar No. 23	2,000 Ohm No. 6-E	14.00

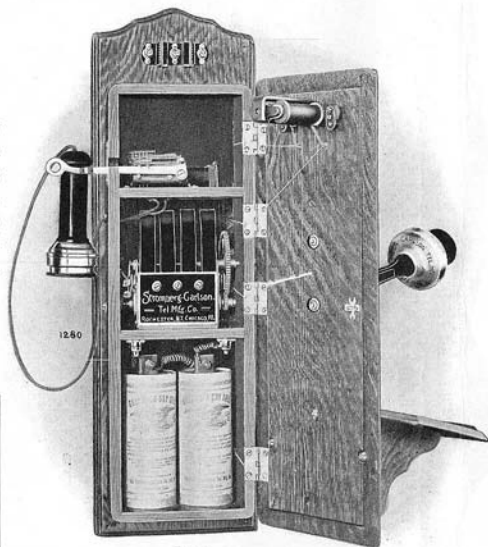
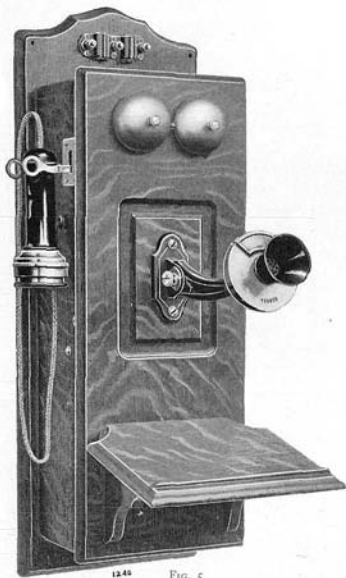


FIG. 4

DRY BATTERY TYPE BRIDGING TELEPHONE



1240 FIG. 5

The telephone here illustrated, open view of which is shown on the following page, is the strongest bridging telephone manufactured. It is built especially for heavily-loaded toll or rural party lines. Because of the superior service it gives, our customers have chosen to call it the "STRONG PHONE." In appearance it is essentially the same as the instrument described on the previous page, except, of course, the cabinet is wider to permit using a 5-bar generator. This generator is so heavy that we found it necessary to fasten the shelf, upon which it is mounted, to the sides of the cabinet in such a way that it would never get loose in transit. Those who have had occasion to carry a heavy telephone like this out into the country may have experienced trouble of this kind. The generator is so extremely heavy that without our method of fastening there are many chances that it would break down the shelf by the cabinet springing apart.

If you have a bridging line on which this telephone fails to work, it is useless to try any other. There are a good many thousands of our customers who can testify to this fact. We have many unsolicited testimonials from parties who state that this instrument is giving them good service with as high as thirty-five and forty instruments on the same line. We would not recommend putting as many telephones as this on the same line, but we simply mention this fact as evidence of what the telephone will do. It will ring more telephones than any one would think of putting on the same line. We equip each instrument with a 5-bar generator, and either a 1,000, 1,600, or 2,000 Ohm ringer, our standard carbon block lightning arrester, long distance transmitter and receiver, adjustable transmitter arm with concealed cord, hook-switch with German silver springs, and platinum contacts, self-contained ringer, and two cells of dry battery.

DRY BATTERY TYPE BRIDGING TELEPHONE

This illustration shows an open view of one of the strongest bridging telephones that we make, as described on the previous page. We recommend this telephone wherever there are over fifteen instruments on the same line or where the most powerful is required. This illustration tells, more forcibly than words can express it, how easy you can get at any part of the telephone for inspection, adjustment, or repairs.

In ordering this telephone, please use the code numbers given below. If the description given in connection with the code numbers meets your requirements, it is unnecessary to give any description of the telephone, simply order by the number.

Code Numbers **Bridging Telephones**

CODE No.	WOODWORK	GENERATOR TYPE AND NO.	RESISTANCE OF RINGER AND NO.	LIST PRICE
108	Golden Oak	5-bar No. 24	1,000 Ohm No. 6-A	\$14.25
109	Walnut	5-bar No. 24	1,000 Ohm No. 6-A	14-50
110	Golden Oak	5-bar No. 24	1,600 Ohm No. 6-C	14-50
111	Walnut	5-bar No. 24	1,600 Ohm No. 6-C	14-75
112	Golden Oak	5-bar No. 24	2,000 Ohm No. 6-E	14-75
113	Walnut	5-bar No. 24	2,000 Ohm No. 6-E	15.00

Hookswitch number, 5; Receiver number, 3; Transmitter number, 7-B; Transmitter Arm number, 10; Induction Coil number, 20-A.

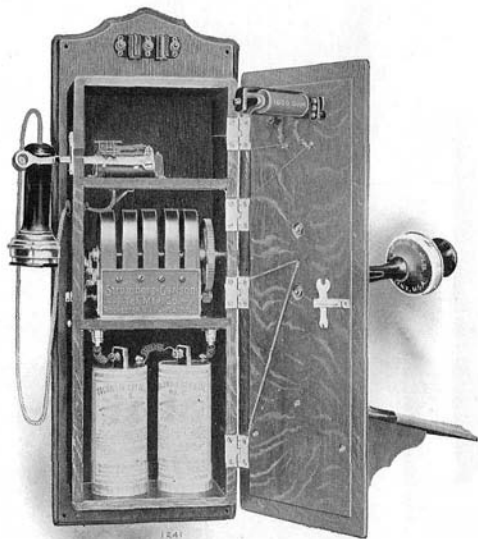


FIG. 6

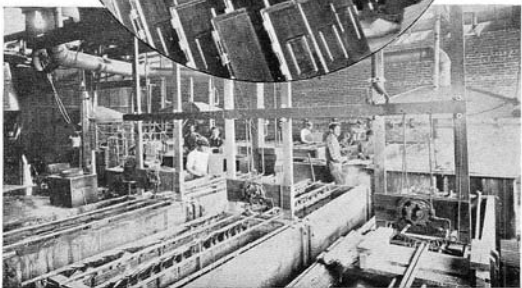
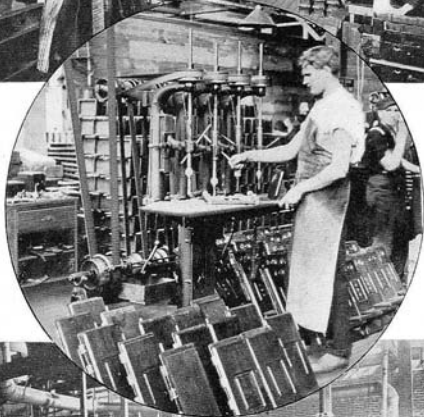


FIG. 58.—PLATING DEPARTMENT FIG. 56.—DRILLING TELEPHONE CABINETS
FIG. 57.—DRILLING DOOR OF TELEPHONE CABINET

WET BATTERY TYPE BRIDGING TELEPHONE

Style G-B

This is one of the most popular telephones that we manufacture in the *wet battery* type. It has many excellent qualities, although the use of the dry battery has become so general that it is fast giving way to the regular dry battery type telephone, as described on the previous pages. It is so rarely that we have a call for wet batteries that we don't include them even with this telephone unless specified, but furnish two dry batteries instead. We can furnish this style of telephone equipped for either series or bridging work, as per code given on the following page.

Each instrument is equipped with our standard carbon block lightning arrester, triplet (in which the hookswitch and induction coil are mounted, and upon which the transmitter arm is mounted), long distance transmitter mounted upon an adjustable transmitter arm with concealed cords, hookswitch with German silver springs and pure platinum contacts, a self-contained ringer, three, four, or five-bar generator, 100, 1,000, 1,600, or 2,000 ohm ringer.



FIG. 7

WET BATTERY TYPE TELEPHONE

Style G-B

An open view of this telephone as illustrated here shows you how the apparatus is arranged. The battery box is removed by giving a sharp rap from beneath.

Wet batteries are *not* furnished with this telephone, unless specified.

Code Numbers Series Telephones

CODE NO.	WOODWORK	GENERATOR TYPE AND NO.	RESISTANCE OF RINGER AND NO.	TRIPLET NO.	LIST PRICE
50	Golden Oak	3-bar No. 20	100 Ohm No. 6-H	22	\$11.25
51	Walnut	3-bar No. 20	100 Ohm No. 6-H	22	11.50
52	Golden Oak	4-bar No. 21	100 Ohm No. 6-H	22	11.75
53	Walnut	4-bar No. 21	100 Ohm No. 6-H	22	12.00
Bridging Telephones					
78	Golden Oak	4-bar No. 23	1,000 Ohm No. 6-A	22	\$13.25
79	Walnut	4-bar No. 23	1,000 Ohm No. 6-A	22	13.50
80	Golden Oak	4-bar No. 23	1,600 Ohm No. 6-C	22	13.50
81	Walnut	4-bar No. 23	1,600 Ohm No. 6-C	22	13.75
82	Golden Oak	4-bar No. 23	2,000 Ohm No. 6-E	22	13.75
83	Walnut	4-bar No. 23	2,000 Ohm No. 6-E	22	14.00
84	Golden Oak	5-bar No. 24	1,000 Ohm No. 6-A	22	14.25
85	Walnut	5-bar No. 24	1,000 Ohm No. 6-A	22	14.50
86	Golden Oak	5-bar No. 24	1,600 Ohm No. 6-C	22	14.50
87	Walnut	5-bar No. 24	1,600 Ohm No. 6-C	22	14.75
88	Golden Oak	5-bar No. 24	2,000 Ohm No. 6-E	22	14.75
89	Walnut	5-bar No. 24	2,000 Ohm No. 6-E	22	15.00

No. 22 Triplet consists of No. 7-B Transmitter mounted on an adjustable arm with concealed transmitter cords, No. 3 Receiver, No. 1 Hookswitch, and No. 24-A Induction Coil.



WET BATTERY TYPE TELEPHONE

Style G-D

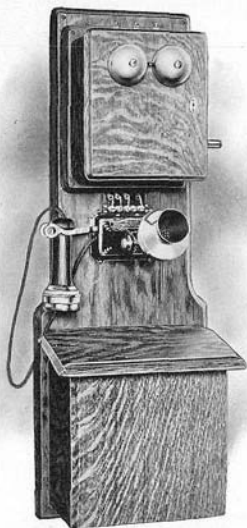


FIG. 9

We show here another style of wet battery telephone, one that used to be very popular, but, the same as all other wet battery type telephones, it is rapidly giving away to the dry battery type. We illustrate it, for the benefit of our customers in ordering and for those who prefer to continue using this instrument rather than mix up their style of equipment. We can furnish the instrument, equipped for series or bridging use according to the code numbers given on the following page. The instrument has no special advantage over the other types of wet battery instruments, except that the battery box is large enough to permit using two cells of the Le Clanche type of battery.

As we get comparatively few calls for this telephone, we do not aim to carry many of them in stock and orders may, on that account, be subject to delay. We equip each instrument with our standard carbon block lightning arrester, triplet (this consists of a pressed steel box in which the hookswitch and induction coil are mounted and upon which the transmitter arm is also mounted), our long distance transmitter and receiver, hookswitch with German silver springs and pure platinum contacts, hand generator, and two cells of *dry* battery, unless otherwise specified.

WET BATTERY TYPE TELEPHONE

Style G-D

The open view of this instrument as illustrated here shows a very clear arrangement of the apparatus and is a correct representation of the instrument in every detail. Each instrument is furnished with equipments as given by code numbers below.

Code Numbers Series Telephones

CODE NO.	WOODWORK	GENERATOR TYPE AND NO.	RESISTANCE OF RINGER AND NO.	TRIPLET NO.*	LIST PRICE
54	Golden Oak	3-bar No. 20	100 Ohm No. 6-H	22	\$11.25
55	Walnut	3-bar No. 20	100 Ohm No. 6-H	22	11.50
56	Golden Oak	4-bar No. 21	100 Ohm No. 6-H	22	11.75
57	Walnut	4-bar No. 21	100 Ohm No. 6-H	22	12.00

Bridging Telephones

CODE NO.	WOODWORK	GENERATOR TYPE AND NO.	RESISTANCE OF RINGER AND NO.	LIST PRICE
90	Golden Oak	4-bar No. 23	1000 Ohm No. 6-A	\$13.25
91	Walnut	4-bar No. 23	1000 Ohm No. 6-A	13.50
92	Golden Oak	4-bar No. 23	1600 Ohm No. 6-C	13.50
93	Walnut	4-bar No. 23	1600 Ohm No. 6-C	13.75
94	Golden Oak	4-bar No. 23	2000 Ohm No. 6-E	13.75
95	Walnut	4-bar No. 23	2000 Ohm No. 6-E	14.00
96	Golden Oak	5-bar No. 24	1000 Ohm No. 6-A	14.25
97	Walnut	5-bar No. 24	1000 Ohm No. 6-A	14.50
98	Golden Oak	5-bar No. 24	1600 Ohm No. 6-C	14.50
99	Walnut	5-bar No. 24	1600 Ohm No. 6-C	14.75
100	Golden Oak	5-bar No. 24	2000 Ohm No. 6-E	14.75
101	Walnut	5-bar No. 24	2000 Ohm No. 6-E	15.00

* No. 22 Triplet consists of our No. 7 B Transmitter mounted on adjustable arm with concealed transmitter cords, No. 1 Receiver, No. 1 Hookswitch, and No. 24-A Induction Coll.



FIG. 10

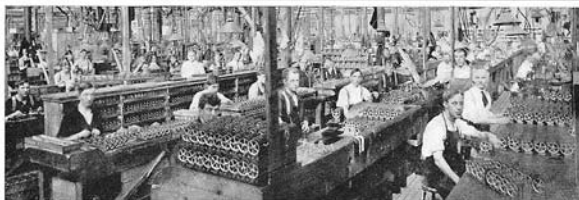


FIG. 59.—GENERATOR ASSEMBLING DEPARTMENT



FIG. 60.—ASSEMBLING TELEPHONES. SECTION I



FIG. 61.—ASSEMBLING HOOKSWITCHES AND TRANSMITTER ARMS



FIG. 62.—ADJUSTING RECEIVERS AND ASSEMBLING TELEPHONES. SECTION II

PORTABLE DESK TELEPHONE

Style D-C



FIG. 11
STYLE D-C

and does not show the effect of constant handling as much as hard rubber. The base is given the same kind of finish.

The contact springs of the hookswitch are mounted within the base. (See Fig. 12.) The movement of the hook lever is transmitted to these springs by a rod which extends up through the tube or pedestal, one end being fastened to the hook lever, the other provided with a hard-rubber plunger which passes through the main spring and engages the contact springs. There is also mounted within the base, as shown, a hard-fiber block upon which are mounted the binding posts

PORTABLE DESK TELEPHONE

for all the terminals, and also a hard-rubber block upon which is mounted the hookswitch contact springs. The terminal block is a self-contained unit, which can be removed easily if desired. It is fastened to the base with two machine screws.

The conductors of the desk-stand cord all terminate in loops.

The transmitter connections are brought from the transmitter to the terminal block by means of insulated cords terminating in brass tips. Each cord is numbered to correspond with the binding post on the terminal block in extension bell box. There are no springs, or anything of that nature, within the tube or pedestal to interfere with the transmitter connections or the operation of the hookswitch lever. Neither the pedestal or hook lever form any part of the circuit. An iron shield protects the parts within the base and there is no danger of its scratching a desk, as a strip of heavy leather surrounds the edge.

The transmitter is mounted on a transmitter arm of the ball-and-socket type, which gives the transmitter a wide range of adjustment, yet does not permit putting the transmitter in a position that would affect its operating. The proper amount of tension is given the transmitter arm by turning the nut on the top of the pedestal, which is provided with knurled edges. The arm is made of brass, nickel-plated. This is true of all of the nickel-plated parts used in this set. Each telephone is equipped with our standard long-distance transmitter and receiver and a six-foot green-silk-covered connecting cord. No terminal block is provided with this set, unless so specified.

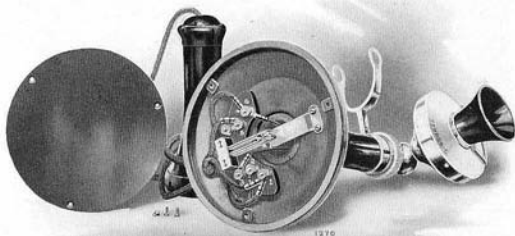


FIG. 12
STYLE D-C

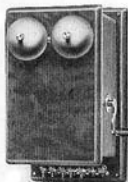


Fig. 12 1/2

PORTABLE DESK TELEPHONE

Series or bridging according to the equipment order, which is covered by code numbers given below.

We make quotations on Portable Desk Telephones as follows:

Portable Desk Telephone No. 682 includes desk stand with No. 7 transmitter, No. 6 receiver, and a six-foot connecting cord attached. Induction coil is mounted in the magneto.

Portable Desk Telephone complete includes magneto, battery, and desk stand No. 682. All rubber receivers furnished only. No. 74-A, 6-ft. five conductor cord for above desk stand \$0.90 net.

No. 682 Portable Desk Telephone only \$5.50 net.

Code Numbers—Series

DESK CODE NO.	DESK TELEPHONE	MAGNETO	WOODWORK	LIST PRICE
762	682	746	Golden Oak (3-Bar Gen. 100 Ohm Ringer)	\$11.75
763	682	747	Walnut (3-Bar Gen. 100 Ohm Ringer)	12.00
764	682	748	Golden Oak (4-Bar Gen. 100 Ohm Ringer)	12.25
765	682	749	Walnut (4-Bar Gen. 100 Ohm Ringer)	12.50

Bridging

DESK CODE NO.	DESK TELEPHONE	MAGNETO	WOODWORK	LIST PRICE
766	682	750	Golden Oak (4-Bar Gen. 1,000 Ohm Ringer)	\$13.75
767	682	751	Walnut (4-Bar Gen. 1,000 Ohm Ringer)	14.00
768	682	752	Golden Oak (4-Bar Gen. 1,600 Ohm Ringer)	14.00
769	682	753	Walnut (4-Bar Gen. 1,600 Ohm Ringer)	14.25
770	682	754	Golden Oak (4-Bar Gen. 2,000 Ohm Ringer)	14.25
771	682	755	Walnut (4-Bar Gen. 2,000 Ohm Ringer)	14.50
772	682	756	Golden Oak (5-Bar Gen. 1,000 Ohm Ringer)	14.75
773	682	757	Walnut (5-Bar Gen. 1,000 Ohm Ringer)	15.00
774	682	758	Golden Oak (5-Bar Gen. 1,600 Ohm Ringer)	15.00
775	682	759	Walnut (5-Bar Gen. 1,600 Ohm Ringer)	15.25
776	682	760	Golden Oak (5-Bar Gen. 2,000 Ohm Ringer)	15.25
777	682	761	Walnut (5-Bar Gen. 2,000 Ohm Ringer)	15.50



Fig. 12 1/2

RESIDENCE TYPE GENERATOR CALL TELEPHONE

Series of bridging according to the equipment ordered as per code numbers given below.

This telephone is intended for residences or places where wall space is limited and a writing shelf unnecessary.

The instrument is small in size although it will do the work of any of our larger telephones. It possesses all of the necessary features of the regular wall telephone except a battery box. This can usually be located in some convenient place near by. Each telephone is equipped with standard long-distance transmitter and receiver, adjustable transmitter arm, carbon block lightning arrester, self-contained ringer, hookswitch with German silver springs and pure platinum contacts, and two cells of dry battery.

It will facilitate ordering if you will use code numbers as given below.

Series Telephones

CODE NO.	WOODWORK	RESISTANCE OF RINGER AND NO.	GENERATOR TYPE AND NO.	LIST PRICE
575	Golden Oak	100 Ohm No. 6-H	3-bar No. 20	\$10.75
576	Walnut	100 Ohm No. 6-H	3-bar No. 20	11.00
577	Golden Oak	100 Ohm No. 6-H	4-bar No. 21	11.25
578	Walnut	100 Ohm No. 6-H	4-bar No. 21	11.50

Bridging Telephones

CODE NO.	WOODWORK	RESISTANCE OF RINGER AND NO.	GENERATOR TYPE AND NO.	LIST PRICE
579	Golden Oak	1,000 Ohm No. 6-A	4-bar No. 23	\$12.75
580	Walnut	1,000 Ohm No. 6-A	4-bar No. 23	13.00
581	Golden Oak	1,600 Ohm No. 6-C	4-bar No. 23	13.00
582	Walnut	1,600 Ohm No. 6-C	4-bar No. 23	13.25
583	Golden Oak	2,000 Ohm No. 6-E	4-bar No. 23	13.25
584	Walnut	2,000 Ohm No. 6-E	4-bar No. 23	13.50
585	Golden Oak	1,000 Ohm No. 6-A	5-bar No. 24	13.75
586	Walnut	1,000 Ohm No. 6-A	5-bar No. 24	14.00
587	Golden Oak	1,600 Ohm No. 6-C	5-bar No. 24	14.00
588	Walnut	1,600 Ohm No. 6-C	5-bar No. 24	14.25
589	Golden Oak	2,000 Ohm No. 6-E	5-bar No. 24	14.25
590	Walnut	2,000 Ohm No. 6-E	5-bar No. 24	14.50

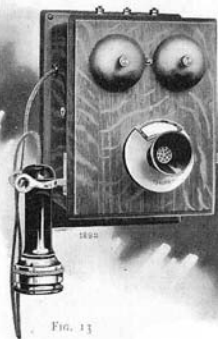


FIG. 13

PORTABLE COMBINATION TELEPHONE

Styles H-A and H-B



FIG. 14 STYLE H-A

The accompanying illustrations, Figs. 14 and 15, show our standard combination telephones with two styles of mounting. These have been designed to withstand the rough usage to which an office instrument is usually subjected. They are made with few parts and of such material as will stand hard knocks. Both instruments have many new features, which are considered very practical, and at the same time so substantial as to reduce troubles to a minimum. The receiver is fastened to the handle or support by means of a ball-and-socket joint. The distance from the transmitter to the receiver may be varied by moving the tube, which extends inside the handle, in or out. The instrument in Style H-A is supported on a vertically-pronged hookswitch, gracefully and substantially built, with all wiring parts concealed. The instrument in Style H-B, when placed upon the hookswitch, rests in a horizontal position and occupies very small space. This makes the instrument very practical for desk use, it being possible to mount it inside of a roll-top desk, where it will be very handy and free from meddlesome hands. The base in which the hookswitch is mounted is made of pressed steel, neatly japanned and finished with gold striping.

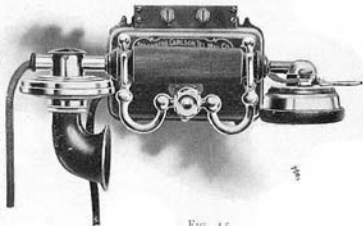


FIG. 15,
STYLE H-B



PORTABLE COMBINATION TELEPHONE

No. 17 hookswitch box, see Fig. 15.

No. 17 hookswitch box with No. 20-A induction coil, \$2.50 net.

No. 4 Combination Telephone only, \$6 net.

No. 20 hookswitch box, see Fig. 14.

No. 20 hookswitch box with No. 20-A induction coil, \$2 net.

Code Numbers Series Telephones

CODE NO.	COMBINATION TELEPHONE NO.	HOOKEWITCH BOX NO.	HAND GENERATOR	EXTENSION BELL	INDUCTION COIL	PRICE LIST
256	4	20	No. 304	No. 296	24-A	\$12.25
257	4	20	No. 305	No. 297	24-A	12.50
258	4	20	No. 306	No. 296	24-A	12.75
259	4	20	No. 307	No. 297	24-A	13.00
260	4	17	No. 304	No. 296	24-A	12.75
261	4	17	No. 305	No. 297	24-A	13.00
262	4	17	No. 306	No. 296	24-A	13.25
263	4	17	No. 307	No. 297	24-A	13.50

Bridging Telephones

CODE NO.	COMB'N TEL. NO.	HOOKEWITCH BOX NO.	HAND GENERATOR	EXTENSION BELL	INDUCTION COIL NO.	PRICE LIST	CODE NO.	COMB'N TEL. NO.	HOOKEWITCH BOX NO.	HAND GENERATOR	EXTENSION BELL	INDUCTION COIL NO.	PRICE LIST
264	4	20	No. 308	No. 298	24-A	\$14.75	276	4	17	No. 308	No. 298	24-A	\$14.75
265	4	20	No. 309	No. 299	24-A	14.75	277	4	17	No. 309	No. 299	24-A	15.00
266	4	20	No. 308	No. 300	24-A	15.00	278	4	17	No. 308	No. 300	24-A	15.00
267	4	20	No. 309	No. 301	24-A	15.00	279	4	17	No. 309	No. 301	24-A	15.25
268	4	20	No. 308	No. 302	24-A	15.25	280	4	17	No. 308	No. 302	24-A	15.25
269	4	20	No. 309	No. 303	24-A	15.25	281	4	17	No. 309	No. 303	24-A	15.50
270	4	20	No. 310	No. 298	24-A	15.75	282	4	17	No. 310	No. 298	24-A	15.75
271	4	20	No. 311	No. 299	24-A	15.75	283	4	17	No. 311	No. 299	24-A	16.00
272	4	20	No. 310	No. 300	24-A	16.00	284	4	17	No. 310	No. 300	24-A	16.00
273	4	20	No. 311	No. 301	24-A	16.00	285	4	17	No. 311	No. 301	24-A	16.25
274	4	20	No. 310	No. 302	24-A	16.25	286	4	17	No. 310	No. 302	24-A	16.25
274	4	20	No. 310	No. 302	24-A	16.25	286	4	17	No. 310	No. 302	24-A	16.25
275	4	20	No. 311	No. 303	24-A	16.25	287	4	17	No. 311	No. 303	24-A	16.50

SPECIAL BRIDGING TELEPHONE

The "Sure-Ring"

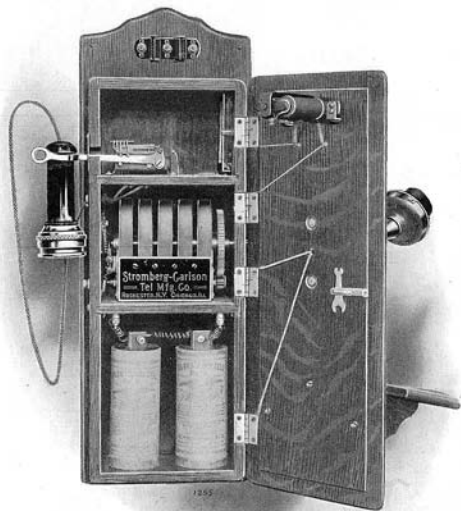


FIG. 16

There has always been more or less trouble on party lines caused by subscribers failing to hang up their receivers the moment they are through talking.

This not only prevented their being called, but in many cases made it possible to ring others on the line. Another annoying trouble sometimes experienced on party lines, where certain parties have a tendency to listen in, is the difficulty in ringing a party if you failed to get them the first time.

We have devised and patented (No. 743,421, Nov. 10, 1903) a simple arrangement which eliminates these troubles. It consists in equipping the telephone with a condenser connected so that it will be in series with the receiver when the receiver is off the hook and cut out of the circuit when the receiver is hung up. This arrangement prevents the condenser from being damaged by any lightning discharges. The condenser is mounted in the upper part of the cabinet and on the right, as shown in the illustration.

On a bridging party line equipped with twenty of these telephones it would be possible for the first party to ring the twentieth with the other eighteen receivers down.

A condenser offers a high resistance to a direct current, consequently the ringing current will go through the ringer instead of the receiver. The talking current, being of a very high frequency, is not retarded or cut down by the use of this condenser, hence the talking circuit is as good as in any bridging telephone.

We furnish this telephone in two styles of woodwork, as per code numbers on the following page.

THE "SURE-RING" BRIDGING TELEPHONE

Narrow Battery Box Type—(STYLE G-B)

CODE NO.	WOODWORK	RESISTANCE OF RINGER AND NO.	GENERATOR TYPE AND NO.	TRIPLET NO. #	CONDENSER NO.	LIST PRICE
485	Golden Oak	1,000 Ohm No. 6-A	4-bar No. 23	22	6	\$13.75
486	Walnut	1,000 Ohm No. 6-A	4-bar No. 23	22	6	14.00
487	Golden Oak	1,600 Ohm No. 6-C	4-bar No. 23	22	6	14.00
488	Walnut	1,600 Ohm No. 6-C	4-bar No. 23	22	6	14.25
489	Golden Oak	2,000 Ohm No. 6-E	4-bar No. 23	22	6	14.25
490	Walnut	2,000 Ohm No. 6-E	4-bar No. 23	22	6	14.50
491	Golden Oak	1,000 Ohm No. 6-A	5-bar No. 24	22	6	14.75
492	Walnut	1,000 Ohm No. 6-A	5-bar No. 24	22	6	15.00
493	Golden Oak	1,600 Ohm No. 6-C	5-bar No. 24	22	6	15.00
494	Walnut	1,600 Ohm No. 6-C	5-bar No. 24	22	6	15.25
495	Golden Oak	2,000 Ohm No. 6-E	5-bar No. 24	22	6	15.25
496	Walnut	2,000 Ohm No. 6-E	5-bar No. 24	22	6	15.50

* No. 22 Triplet consists of No. 7-B Transmitter mounted on adjustable arm with concealed transmitter cords, No. 3 Receiver, No. 1 Hookswitch, and No. 24-A Induction Coil.

Dry Battery Type

CODE NO.	WOODWORK	RESISTANCE OF RINGER AND NO.	GENERATOR TYPE AND NO.	TRANSMITTER NO.	RECEIVER NO.	INDUCTION COIL NO.	CONDENSER NO.	LIST PRICE
443	Golden Oak	1,000 Ohm No. 6-A	4-bar No. 23	7-B	3	20-A	6	\$13.75
444	Walnut	1,000 Ohm No. 6-A	4-bar No. 23	7-B	3	20-A	6	14.00
445	Golden Oak	1,600 Ohm No. 6-C	4-bar No. 23	7-B	3	20-A	6	14.00
446	Walnut	1,600 Ohm No. 6-C	4-bar No. 23	7-B	3	20-A	6	14.25
447	Golden Oak	2,000 Ohm No. 6-E	4-bar No. 23	7-B	3	20-A	6	14.25
448	Walnut	2,000 Ohm No. 6-E	4-bar No. 23	7-B	3	20-A	6	14.50
449	Golden Oak	1,000 Ohm No. 6-A	5-bar No. 24	7-B	3	20-A	6	14.75
450	Walnut	1,000 Ohm No. 6-A	5-bar No. 24	7-B	3	20-A	6	15.00
451	Golden Oak	1,600 Ohm No. 6-C	5-bar No. 24	7-B	3	20-A	6	15.00
452	Walnut	1,600 Ohm No. 6-C	5-bar No. 24	7-B	3	20-A	6	15.25
453	Golden Oak	2,000 Ohm No. 6-E	5-bar No. 24	7-B	3	20-A	6	15.25
454	Walnut	2,000 Ohm No. 6-E	5-bar No. 24	7-B	3	20-A	6	15.50



FIG. 63. — MAGNET DEPARTMENT

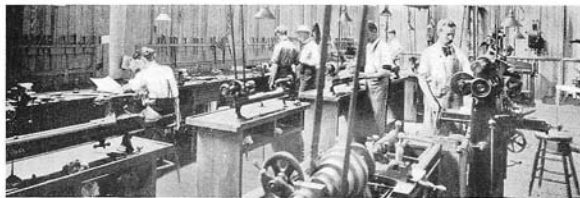


FIG. 64. — EXPERIMENTAL DEPARTMENT



FIG. 65. — WINDING DEPARTMENT



FIG. 66. — ASSEMBLING RECEIVERS

SPECIAL BRIDGING TELEPHONE

The "Non-Interfering"

This telephone is one that has become very popular for use on bridging party lines having a metallic circuit. It consists of our regular bridging telephone provided with a push-button key, so wired as to make it possible to ring any other subscriber without calling Central or ring Central without calling any of the other subscribers. When a subscriber wishes to call Central, he presses the button and calls in the usual manner; when calling a subscriber the button is not used.

To operate this type of telephone on a party line, it is necessary that the switchboard drop be connected, as shown in Fig. 19; that is, one terminal of the drop should be connected to the sleeve side of the line and the other terminal of the drop connected to the ground. This makes it possible to ring Central over the sleeve side of the line and ground and ring the subscribers metallic. The subscribers, however, will always talk full metallic. When connecting one of

these telephones to the line, always attach the sleeve side of the line to the right-hand binding post and attach the opposite side of the line to the left-hand binding post. Connect the middle binding post to the ground.

Party lines equipped with this type of telephone can use a regular drop as a switchboard signal instead of the polarized drop, because the drop does not fall except when a party calls Central.

We add this additional equipment to any of our standard bridging telephones for 25c. extra. With our wet battery type telephones we furnish the No. 8: key, and with our dry battery type our No. 99 key, both of which are similar to the one shown in the illustration herewith.

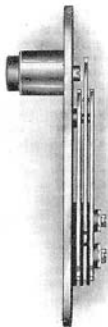


FIG. 17

SPECIAL BRIDGING TELEPHONE

"The Non-Interfering"

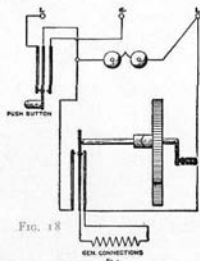


FIG. 18

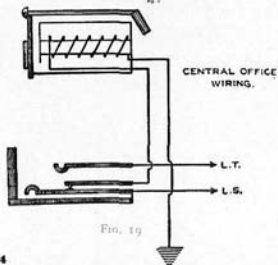


FIG. 19

"Combination Sure-Ring and Non-Interfering"

As the name implies, this telephone is a combination of the two telephones described on pages 21 and 23. For bridging party line work, this gives you a perfect instrument. It cuts out all of the annoyances caused by parties failing to hang up their receivers and permits you to call Central without other parties on the line knowing it.

We can furnish any of our standard bridging telephones, equipped with both condenser and key, for which we make an additional charge of 75c. per telephone.

SPECIAL BRIDGING TELEPHONE

Four Party Selective

This system consists in arranging four telephones on one line, so that any one of them can be called by Central without giving the signal to any other telephone on the line, or so that any of the four subscribers can call Central without disturbing the other three subscribers on the line. The instruments must be used on a metallic circuit and each instrument should be provided with a ground connection. The connections are clearly shown on the following page. Each telephone is made interchangeable, so that it can be used at any station desired on the line. These telephones may be used on a line whose length is the limit of ordinary transmission and the line can be terminated at the central office on any standard high-wound tubular drop.

The majority of the four-party selective generator call systems give false signals on a line of considerable length, on account of the line resistance and the use of alternating or pulsating currents, which are strong enough to operate the bells as well as the line signal at the switchboard. We have overcome this defect by having the generator at each subscriber's station send out a direct current of the same polarity as the bell of that station and at the same time so arranged as to cut out the bells on the other side of the line by grounding same *during the ringing*.

The switchboard cord pairs for use in connection with this four-party system must be provided with selective ringing keys, used as a master four-party key in the position, or individual four-party keys for each cord pair. The cord pairs are provided with low-wound clearing out drops, which prevents the subscriber when ringing off from ringing the bells on the line with which the calling subscriber is connected. The switchboard generator must be provided with attachments for giving out current of positive and negative polarity for ringing the subscriber's bells on the four-party line. Each telephone is equipped with a biased ringer, direct-current hand generator of the four or five-bar type, according to the work it is to perform; solid back transmitter No. 4, No. 3 receiver, and two cells of wet or dry battery.

The connections of the instrument line and switchboard are shown in the illustration on the following page. The two lines are represented by L-1, and L-2. L-1 should always be connected with the sleeve side of the jack and to the left-hand binding post, and L-2 with the tip of the jack, and to the right-hand binding post. The ringer and generator are provided with flexible cord connectors for making the necessary connections for each station, and to allow for using the instrument on any station on the line. The proper connections for stations Nos. 1, 2, 3, and 4 are shown in connection with the drawing on the following page. Station No. 1 rings with current of positive polarity; station No. 2 with current of negative polarity; station No. 3 with current of positive polarity; and station No. 4 with current of negative polarity. This arrangement gives two ringers bridged from each line wire to the ground.

Method of Operation

The subscriber calls Central in the usual manner by turning the crank of the hand generator, which sends a current over the line and throws the drop at the central office, but does not ring any of the bells on the line except his own. The operator answers the call in the usual manner and obtains the number desired, plugs into the called subscriber's jack and selecting the station desired on that line calls the party by pressing the key corresponding to that station. This sends a current over the line whose polarity corresponds with that station, thus ringing its bell. After the conversation is finished the subscribers hang up their receivers and ring off in the usual manner by giving the crank of the hand generator a few turns, which throws the clearing out drop at the switchboard and notifies the operator to disconnect.

We furnish two types of telephones with this equipment, namely the dry battery type telephone, and wet battery type of instrument, with narrow battery box. These are furnished in golden oak or walnut woodwork, as desired.



FIG. 67.—JAPANING DEPARTMENT

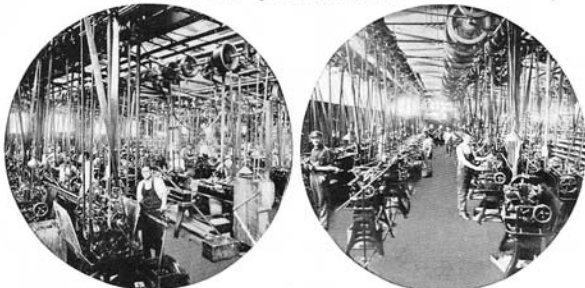


FIG. 68.—AUTOMATIC SCREW MACHINE DEPARTMENT



FIG. 69.—POLISHING DEPARTMENT

SPECIAL BRIDGING TELEPHONE

Divided Circuit—Central Checking

These telephones are used extensively on metallic bridging lines, because they improve the service. They reduce the number of signals one-half and make it possible for Central to check all calls made on the line, because subscribers cannot call each other except through Central. Each instrument is equipped with a direct-current generator, bridged across the line, and a high-resistance ringer of 1,000, 1,600, or 2,000 Ohms, bridged from one side of the line to ground. One-half of the telephones have their ringers bridged from one side of the line to ground, while the other half have their ringers bridged from the opposite side to ground. The metallic line is practically two ground lines, so far as the ringers are concerned. The generators, being of the direct-current type, will not operate the ringers in the telephones, but will operate a switchboard drop or a biased alternating current ringer, when properly attached to the line. The switchboard drop is bridged across the line and consequently is thrown when any of the generators are operated. The signaling from the switchboard is controlled by a two-way key which grounds one side of the generator according to the position of the key.

In one locking position of the key the generator is bridged from one side of the line and will ring all of the telephones which have their ringers bridged to ground from that side. In the other position the generator is bridged to ground from the opposite side of the line and will ring all of the telephones which have their ringers bridged to ground from that side.

To operate this type of telephone requires a metallic circuit line and switchboard wiring throughout.

Code Numbers Wet Battery Type (Style G-B)

CODE No.	WOODWORK	GENERATOR TYPE AND No.	RESISTANCE OF RINGER AND No.	LIST PRICE
166	Golden Oak	4-bar No. 39	1,000 Ohm No. 6-A	\$13.25
167	Walnut	4-bar No. 39	1,000 Ohm No. 6-A	13.50
595	Golden Oak	4-bar No. 39	1,600 Ohm No. 6-C	13.50
596	Walnut	4-bar No. 39	1,600 Ohm No. 6-C	13.75
597	Golden Oak	4-bar No. 39	2,000 Ohm No. 6-E	13.75
598	Walnut	4-bar No. 39	2,000 Ohm No. 6-E	14.00
168	Golden Oak	5-bar No. 40	1,000 Ohm No. 6-A	14.25
169	Walnut	5-bar No. 40	1,000 Ohm No. 6-A	14.50
170	Golden Oak	5-bar No. 40	1,600 Ohm No. 6-C	14.50
171	Walnut	5-bar No. 40	1,600 Ohm No. 6-C	14.75
172	Golden Oak	5-bar No. 40	2,000 Ohm No. 6-E	14.75
173	Walnut	5-bar No. 40	2,000 Ohm No. 6-E	15.00

Triplet number, 22.*

* No. 22 Triplet consists of No. 7-B Transmitter mounted on an adjustable arm with concealed Transmitter Cord, No. 1 Receiver, No. 1 Hookswitch, and No. 24-A Induction Coil.

Dry Battery Type

CODE No.	WOODWORK	TYPE OF GENERATOR	RESISTANCE OF RINGER	LIST PRICE
176	Golden Oak	4-bar	1,000 Ohm	\$13.25
177	Walnut	4-bar	1,000 Ohm	13.50
599	Golden Oak	4-bar	1,600 Ohm	13.50
600	Walnut	4-bar	1,600 Ohm	13.75
601	Golden Oak	4-bar	2,000 Ohm	13.75
602	Walnut	4-bar	2,000 Ohm	14.00
178	Golden Oak	5-bar	1,000 Ohm	14.25
179	Walnut	5-bar	1,000 Ohm	14.50
180	Golden Oak	5-bar	1,600 Ohm	14.50
181	Walnut	5-bar	1,600 Ohm	14.75
182	Golden Oak	5-bar	2,000 Ohm	14.75
183	Walnut	5-bar	2,000 Ohm	15.00

Transmitter Arm No. 10, Receiver No. 1, Hookswitch No. 5, Induction Coil No. 20-A.

SPECIAL BRIDGING TELEPHONE

"Central Checking"

This telephone is designed for bridging party and toll lines where it is desired to have all stations call one central point, and the signaling for the other parties to be done from that same point. It is nothing more than one of our standard bridging telephones equipped with a make and break pulsating current generator. It will not, of course, operate the ringers of the various subscribers' telephones on the line but will operate the drop on the switchboard at Central. One party to call another on the same line must ring Central and then replace his receiver while this party is being signalled by Central.

Code Numbers **Narrow Battery Box Type (Style G-B)**

CODE No.	WOODWORK	GENERATOR TYPE AND No.	RINGER RESISTANCE AND No.	LIST PRICE
152	Golden Oak	4-bar No. 39	1,000 Ohm No. 6-A	\$13.25
153	Walnut	4-bar No. 39	1,000 Ohm No. 6-A	13.50
419	Golden Oak	4-bar No. 39	1,600 Ohm No. 6-C	13.50
420	Walnut	4-bar No. 39	1,600 Ohm No. 6-C	13.75
421	Golden Oak	4-bar No. 39	2,000 Ohm No. 6-E	13.75
422	Walnut	4-bar No. 39	2,000 Ohm No. 6-E	14.00

Dry Cell Type

CODE No.	WOODWORK	GENERATOR TYPE AND No.	RINGER RESISTANCE AND No.	LIST PRICE
156	Golden Oak	4-bar No. 39	1,000 Ohm No. 6-A	\$13.25
157	Walnut	4-bar No. 39	1,000 Ohm No. 6-A	13.50
423	Golden Oak	4-bar No. 39	1,600 Ohm No. 6-C	13.50
424	Walnut	4-bar No. 39	1,600 Ohm No. 6-C	13.75
425	Golden Oak	4-bar No. 39	2,000 Ohm No. 6-E	13.75
426	Walnut	4-bar No. 39	2,000 Ohm No. 6-E	14.00
158	Golden Oak	5-bar No. 40	1,000 Ohm No. 6-A	14.25
159	Walnut	5-bar No. 40	1,000 Ohm No. 6-A	14.50
160	Golden Oak	5-bar No. 40	1,600 Ohm No. 6-C	14.50
161	Walnut	5-bar No. 40	1,600 Ohm No. 6-C	14.75
162	Golden Oak	5-bar No. 40	2,000 Ohm No. 6-E	14.75
163	Walnut	5-bar No. 40	2,000 Ohm No. 6-E	15.00

NOTE.—These telephones can be furnished with a condenser same as the "sure-Ring" Telephone, if so specified.



FIG. 70.—ASSEMBLING TELEPHONE RINGERS

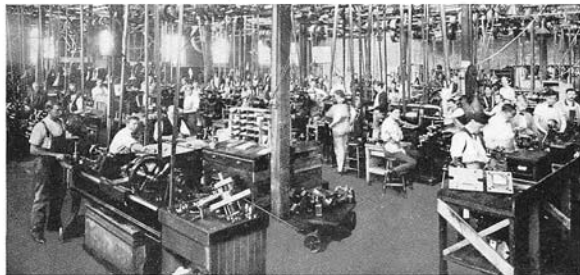


FIG. 71.—TOOL DEPARTMENT. SECTION I

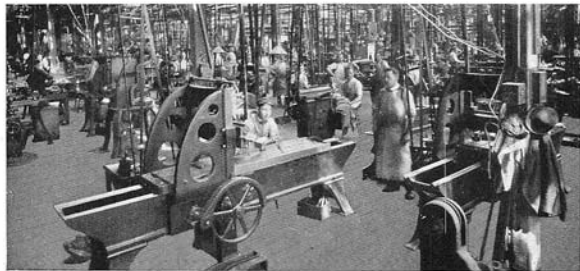


FIG. 72.—TOOL DEPARTMENT. SECTION II

SPECIAL BRIDGING TELEPHONE

"Party Line Selective"

This is another modification of our regular bridging telephone, being a two-party selective intercommunicating system designed for use on a grounded circuit. It may be used on a metallic circuit without any ground connections, thereby leaving the circuit free from any ground disturbances. This particular system is especially adaptable in places where there are power stations that tend to disturb telephone service. In Fig. 21 are shown the special features of the system.

Each instrument is equipped with a direct-current generator, push button, and a special ringer. Otherwise the equipment is the same as in our standard bridging telephones. When these instruments are connected to

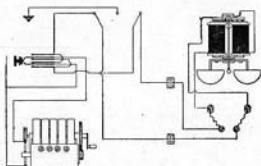


FIG. 21

the ground returned system, the line wires are attached to the left hand binding post of one-half the instruments and to the right hand binding post for the remaining half. After this has been accomplished the cross connecting terminals of the ringing circuit must be so connected as to ring the instrument's own bell without pressing the push button, when the generator is operated. This station may call other stations on the same line connected likewise without pressing the button, but must do so, when calling stations connected opposite. The switchboard signal in this case is a regular drop.

Where the instruments are connected to a metallic circuit, one of the line wires takes the place of the ground. This system may be furnished with an additional push button in the generator circuit, whereby Central can be called over the grounded circuit by pressing this extra push button, thus preventing Central from being disturbed by subscribers when calling each other. Furthermore, this ground connection is disconnected when the operator inserts the switchboard plug in the line jack, thereby leaving the line clear for metallic connections and free from ground disturbances. This is, of course, accomplished only in metallic circuit work and the switchboard drop must be connected to the break contact in the line jack and the ground.

Where these instruments are installed, it is necessary that the switchboard be equipped with a direct-current generator and a selective key. We only furnish these instruments as per code numbers given below.

Code Numbers Dry Battery Type Telephone

CODE NO.	WOODWORK	GENERATOR TYPE AND NO.	RESISTANCE OF RINGER	LIST PRICE
379	Golden Oak	4-bar No. 39	1,000 Ohm No. 5-B	\$13.75
380	Walnut	4-bar No. 39	1,000 Ohm No. 5-B	14.00
381	Golden Oak	4-bar No. 39	1,600 Ohm No. 5-C	14.00
382	Walnut	4-bar No. 39	1,600 Ohm No. 5-C	14.25
383	Golden Oak	4-bar No. 39	2,000 Ohm No. 5-E	14.25
384	Walnut	4-bar No. 39	2,000 Ohm No. 5-E	14.50
385	Golden Oak	5-bar No. 40	1,000 Ohm No. 5-B	14.75
386	Walnut	5-bar No. 40	1,000 Ohm No. 5-B	15.00
387	Golden Oak	5-bar No. 40	1,600 Ohm No. 5-C	15.00
388	Walnut	5-bar No. 40	1,600 Ohm No. 5-C	15.25
389	Golden Oak	5-bar No. 40	2,000 Ohm No. 5-E	15.25
390	Walnut	5-bar No. 40	2,000 Ohm No. 5-E	15.50

TELEPHONE PARTS

Lightning Arrester

The illustration shows style of lightning arrester used on all our telephones, a type which is very well known in the telephone field. The carbons are of such size as to offer a good discharge surface between them and are inserted between stiff springs which keeps them under constant pressure. The support at one side of the carbon block extends over the top of the



FIG. 22
 No. 20 LIGHTNING ARRESTER
 Price, \$0.30 net

carbons sufficiently to cover the opening between them, thus preventing dust and other particles from collecting at this point. The carbons may be removed without difficulty by simply pushing them upwards from between the springs. The arrester is equipped with our standard No. 7 machine-made binding post and each is fitted with two hexagon nuts.

Induction Coil

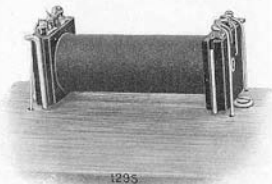


FIG. 23
 No. 20 INDUCTION COIL
 Price, \$0.50 net

The accompanying illustration, Fig. 23, shows our No. 20 induction coil, such as used in all of our generator call telephones, and

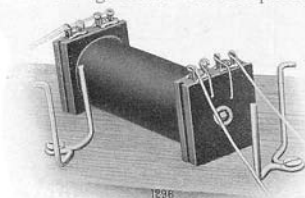


FIG. 24

TELEPHONE PARTS—continued

Hookswitches

our method of mounting it. Fig. 24, page 30, shows the coil as it appears when removed from its fastening. This coil is designed for high efficiency and special attention is given to its mechanical construction. Considerable automatic machinery is used in its manufacture, which enables us to produce a coil that gives absolutely uniform results. The core consists of soft annealed iron wires. Special attention being given to the annealing. The wires are annealed in a sealed case and allowed to cool in the fire, thus preventing any air from coming in contact with them and forming a scale. The wires are held in a paper shell, the whole being supported by thoroughly-seasoned maple heads about one inch square. The windings are made of the best quality of copper wire, silk insulated in our own factory. The terminals of the windings are brought out and fastened to clips of a special design mounted on the maple heads, as shown in the illustration. The two ends of the primary winding terminate in clips on one head, while the secondary winding terminates in clips on the other head. The outside of the coil is covered with a heavy glazed linen cloth to protect it from mechanical injury.

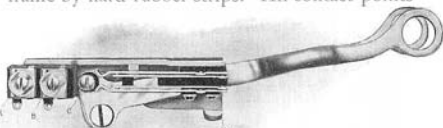


FIG. 25

Hookswitch, complete, . . \$0.75 net
 Switch Hook, only, . . .35 net

are pure platinum. The receiver cord terminals are attached to our patent fasteners (A and B), which are supported on a hard-rubber block. The operation of the hookswitch is as follows: The movement of the hook downward causes the hard-rubber insulated pin (C) to be drawn in between the springs, causing them to be spread apart, thus breaking contact, while the upward movement of the hook dis-

TELEPHONE PARTS—Continued

engages the springs and allows them to come to a position as shown in the illustration. The stop D prevents the hook from moving too far downward when the receiver is restored. Its points of merit are simplicity, good mechanical construction, positiveness in action. The No. 5

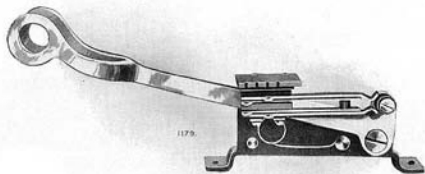


FIG. 26

Hookswitch, complete, . . . \$0.75 net
 Switch Hook, only,35 net

hookswitch is the type used in our dry cell type telephones. The operation and construction are the same as the No. 1, with the exception of the mounting plate and hook lever.

Ringers

In practically all of our Central Energy Telephones we use what is known as the self-

contained type ringer, same as shown in Fig. 28. In Fig. 27 is shown a sectional view of the armature end. The permanent magnet (A) is made of the finest grade of magnet steel carefully tempered. The adjustment screw (B) is made of brass and large enough to perform its work without any danger of twisting. This adjusting screw is hexagon shaped and the end is slotted so that the adjustment may be changed either by a screw-driver or wrench. The armature (C) and cores (E) are made of annealed

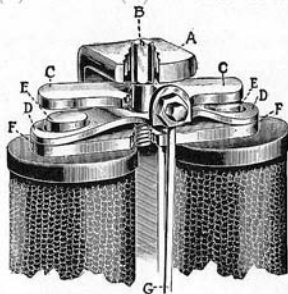


FIG. 27

TELEPHONE PARTS—Continued

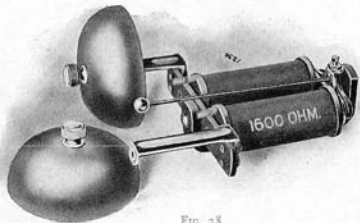


Fig. 28

soft iron. The plate (D) which supports the armature is made of spring brass of sufficient thickness to possess the proper amount of tension. The spool binding plate or yoke (F) is made of brass forced over the cores (E). The spool heads are made of red fiber board. The spools are carefully wound with the best grade of fine copper wire, silk insulated. The outside of the windings of the spools are covered with heavy glazed pebble linen cloth. The adjustment of the ringer is effected by turning the screw (B) which has a shoulder resting on plate (D), the lower end being threaded into

plate (F). Turning the screw to the right brings the armature toward the core (E) and thus lessens the movement of the striker.

We have several hundred thousand of this type of ringer in use on our various styles of

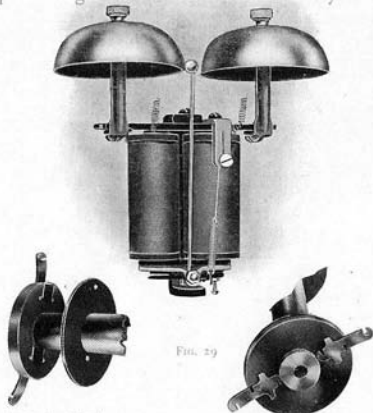


Fig. 29

Construction of Spool Head, showing Hard Fiber Head with Auxiliary Hard Rubber Head

Spool Head and Terminals

TELEPHONE PARTS—Continued

telephones, and the fact that we have never received a complaint from them is sufficient recommendation as to the efficiency of this piece of apparatus. Fig. 29 shows the same ringer with biased attachment for party line ringing.

Code Numbers

Self-Contained Ringers		Biased Ringers for 4-party Selective Telephones	
No. 6-A	1,000 Ohm, \$2.00 net	No. 5-B	1,000 Ohm, \$2.25 net
" 6-C	1,600 " 2.25 "	" 5-C	1,600 " 2.50 "
" 6-E	2,000 " 2.50 "	" 5-E	2,000 " 2.75 "
" 6-F	2,500 " 2.75 "	" 5-F	2,500 " 3.00 "
" 6-H	100 " 1.00 "		

Magnets for Above Ringers, each, \$0.10 net

No. 5-B or 6-A	Ringer coils, per pair,	\$1.50 net
" 5-C or 6-C	" " " "	1.75 "
" 5-E or 6-E	" " " "	2.00 "
" 5-F or 6-F	" " " "	2.25 "
" 6-M	" " " "	1.00 "

Generators

In a generator there are three important considerations: workmanship, construction, and design. Our experience in this line has been very extensive (extending over a period of twelve years), as we have always built our own



FIG. 30

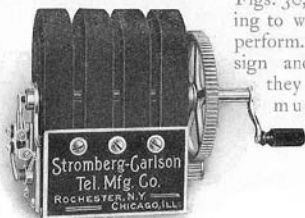


FIG. 31

generators. The success that our telephones have met with is good evidence that nothing is lacking in this part of their equipment, but, of course, the generators themselves must be seen and tried to be appreciated. The design represents a development which has been gradually going on since we placed our first generator on the market, some of which are in use to-day. The generators used in our telephones are of the 3, 4, or 5-bar type, Figs. 30, 31, 32, according to work they are to perform. In their design and construction they differ very much from the ordinary apparatus on the market.

TELEPHONE PARTS—Continued

Armature

In Fig. 34 is shown a laminated armature the same as we use in all of our generators. The very best quality of metal possible to obtain is used for the laminations, thus keeping the hysteresis loss down to a minimum.



FIG. 32

The winding is of the best grade of copper wire, insulated with silk. We give more than ordinary attention to the matter of insulation and winding. Results prove that it is time well spent. We very seldom ever receive a com-

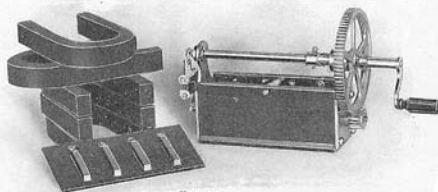


FIG. 33

plaint from this source. This would not be remarkable were it not for the fact that we make hundreds of thousands of generators every year.

Gear Wheels

The large gear wheel is very heavy and made of cast brass, with sufficient width of face and size of tooth to insure smooth running qualities and long life. The small gear wheel

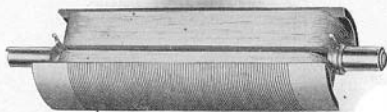


FIG. 34

TELEPHONE PARTS—Continued

or pinion is not cast brass, but is drawn from hard brass rod. This produces a much harder pinion than the regular machine-cut pinion, consequently is not subject to any appreciable wear. Another arrangement designed to lessen the wear on the gear wheels and make them run

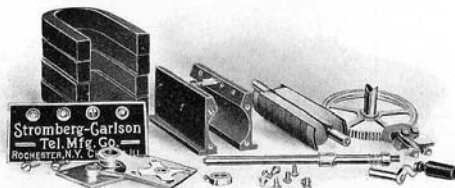


Fig. 35

more smoothly consists of a spiral spring contained within the pinion, which allows it to make part of a revolution when pressure is applied to the crank, thus bringing the pressure on the teeth gradually instead of with a sudden jerk. The bearings for crank shaft and armature are made of hard drawn brass, each being provided with oil holes.

End Plates

The end plates of the generator are made of heavy brass and firmly fastened to the pole pieces, as shown in Fig. 33. These plates removed, shown in Fig. 35.

Pole Pieces

The pole pieces or fields are made of soft drawn steel and prevented from coming too close together when assembled by means of a spider fastened to the inside of each of the end plates, as shown in Fig. 35. On the 4- and 5-bar type an additional provision is provided in the form of an adjustable post spreader (Fig. 35) to prevent the fields from coming too close together, caused by the pressure of the magnets against them.

Field Magnets

The magnets are bent from heavy bars of a special grade of magnet steel and magnetized to obtain the greatest possible strength and long life. Each magnet is copper plated and oxidized. This is a somewhat more expensive finish than nickel plating, but is a much more permanent finish, and for that reason we have decided to finish all of our generators in this

TELEPHONE PARTS—Continued

by simply making connection as indicated. The springs are all made of German silver, provided with pure platinum contacts, and insulated with hard rubber.

Connect to No. 1 and No. 4 for Alternating Current.

Connect to No. 2 and No. 3 for Direct Current. Connect to No. 2 and No. 4 for Negative Pulsating Current.

Connect to No. 3 and No. 4 for Positive Pulsating Current.

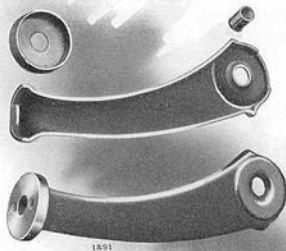
Transmitter Arms

The three standard types of transmitter arms that we manufacture are the Nos. 10, 11,



FIG. 37
 No. 10 ARM

Price, \$0.50 net



1291

FIG. 38

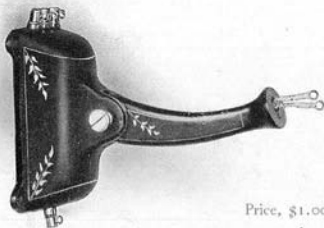
THIS SHOWS HOW THE NO. 10 ARM IS MADE

and 14, which are complete, ready for mounting a solid back type transmitter, the same as our No. 7.

The No. 10 transmitter arm is made of pressed steel with pressed steel base, and is neatly japanned and striped in gold.

The No. 11 transmitter arm gives sufficient space for mounting an induction coil in the base instead of in the telephone. This arm is

TELEPHONE PARTS—Continued



Price, \$1.00 net

FIG. 39
No. 11 ARM

made of cast iron neatly jappaned and striped in gold.



FIG. 40
No. 14 ARM

Price, \$0.50 net

The No. 22 triplet shown in the illustration is the type used on all our Magneto or Generator-Call Telephones. It consists of our No. 7-B transmitter mounted on adjustable arm with concealed transmitter cords, No. 3 receiver, No. 1 hookswitch, and No. 24-A induction coil

mounted in neatly jappaned pressed-steel box. Binding posts are mounted on a hard-rubber block as shown.



FIG. 41

No. 22 TRIPLET

Price, complete, \$6.00 net

TELEPHONE PARTS—Continued



FIG. 42

Receivers

In the illustrations are shown a complete Stromberg-Carlson receiver; also its principal parts, which are entirely original in design and construction. It is of the horseshoe magnet (B) bi-polar type with all parts securely fastened

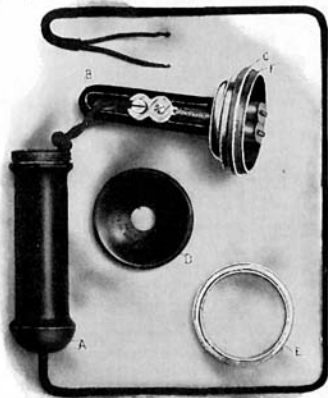


FIG. 43

TELEPHONE PARTS—Continued

in a heavily nickel-plated brass cup (F). The diaphragm is firmly clamped at its edge in the adjustable cap (E) and then screwed to the cup (F) until the proper adjustment is attained, when the lock ring (C) is screwed down against this cap (E), thus assuring permanent adjustment. The cord passes through the end of the shell (A) and is held in such a manner as to remove the strain from the conductors, which are firmly attached to the fiber block between the magnets. Both the hard-rubber shell (A) and the cap (D) are entirely independent of the receiver proper; hence the permanency of the adjustment is in no way affected by variation in temperature.

Code Numbers

No. 3 Receiver with cord,	\$2.00 net
Hard-Rubber Receiver Shell for above (length 4 $\frac{3}{4}$ in.), . . . . .	.35 "
Receiver Ear Cap for above, . . . . .	.15 "
Receiver Diaphragm, . . . . .	.02 "
Receiver Magnet, . . . . .	.25 "
Receiver Coils, 50 Ohms each, per pair, . . . . .	.40 "
No. 7-A-3, 3-foot Receiver Cord, . . . . .	.18 "
No. 7-A-3-5, 3 $\frac{1}{2}$ -foot Receiver Cord, . . . . .	.21 "
No. 7-A, 6-foot Receiver Cord, . . . . .	.35 "
Additional for terminals, . . . . .	.02 "

Figs. 44, 45, and 46 show illustrations of our No. 6-A receiver. The one described on

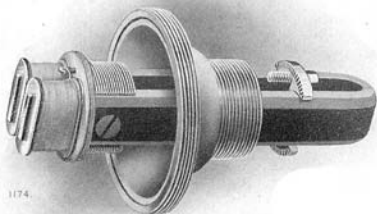


FIG. 44

the previous page, known as our No. 3, has always given such excellent satisfaction that we patterned the adjustment of our No. 6 after it. The principal difference between the two

TELEPHONE PARTS—Continued

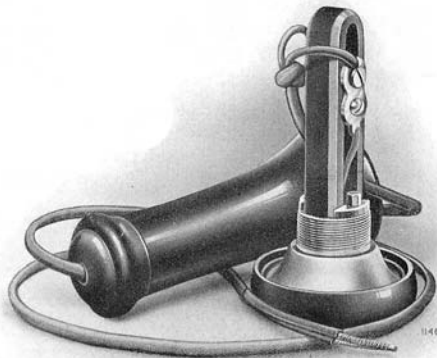
receivers is in their external appearance, there being no metal parts exposed on the No. 6.



1174

FIG. 45

Fig. 46 shows the receiver with the shell removed. This does not in any way affect the operation of the receiver, it being merely an enclosing case for giving the receiver a finished appearance. All of the working parts of the receiver are contained in a non-magnetic metal cup, as shown in Figs. 45 and 46. The cup is threaded on one end for the ear cap and on the other for the shell. The cup when in place is supported on a bridge fastened securely by a



1146

FIG. 46

clamp, shown above it, and between the permanent magnet. This clamp is provided with two substantial bolts which screw into the bridge. The underside of the clamp is corrugated, also the edge of the cup upon which it rests, thus making it impossible for the adjustment to become changed after this clamp is locked.

TELEPHONE PARTS—Continued

The adjustment may be changed by loosening the two screws provided with hexagon heads. This allows the permanent magnet to be turned to the right or left, which varies the distance between the diaphragm and the face of the magnets.

With this method of adjustment it is possible to adjust the receiver, not only very easily and quickly but to almost any degree of sensitiveness; thus meeting the various conditions found in the operating field.

NOTE—We are now furnishing both styles of receivers with a pure hard-rubber shell and ear cap that we guarantee will never break, either in transit or actual use. If they do, we will replace them free of charge.

Code Numbers

No. 6-A Receiver with cord,	\$2.00 net
No. 7-A-3, 3-foot Receiver cord, . . . . .	.18 net
No. 7-A-3-5, 3½-foot Receiver cord, . . . . .	.21 net
No. 7-A-6, 6-foot Receiver cord, . . . . .	.35 net
Additional for terminals, . . . . .	.02 net
Hard-Rubber Receiver shell for above, . . . . .	.40 net
Receiver Diaphragm for above, . . . . .	.02 net
Receiver Ear Cap for above, . . . . .	.20 net
Receiver Magnet for above, . . . . .	.20 net
Receiver Coils, 50 Ohms each, per pair, . . . . .	.40 net

TELEPHONE PARTS—Continued



FIG. 48

is vibrated with the diaphragm, and in the better forms this one electrode takes up the same amplitude of vibration as the central point of the diaphragm, which, of course, is the point of maximum movement. In our new transmitter we attach both of the electrodes to the central point of the diaphragm and thus produce a variation in the distance between the electrodes of twice the amplitude of vibration of the central point of the main diaphragm.

It is perfectly evident that a transmitter constructed along these lines will produce a greater volume of transmission than if only one of the electrodes is movable. This transmitter is given such an adjustment that under ordinary tones of voice the volume is even less loud than some of the forms of sensitive transmitters now being manufactured, but as the voice is raised the volume of transmission from the instrument is multiplied twofold, so that the transmission when talking

Transmitter No. 7 B

In presenting to our customers a new type of telephone transmitter, we have aimed to cater to the ever-increasing demands of the American public for telephone apparatus capable of being used indiscriminately over short and long distances.

The transmitter described in this booklet has been carefully designed to give soft and pleasing transmissions over short distances, and still be capable of transmitting speech over very long lines with the least possible exertion on the part of the speaker.

Without going deeply into the theory of telephone transmitters, it can be safely stated that the volume of transmission depends upon the change of distance between the electrodes, brought about by the vibration of the diaphragm. In all of the forms of transmitters now in use only one of the electrodes

TELEPHONE PARTS—Continued



FIG. 49

over the main diaphragm, thus preventing any chemical action of the main diaphragm, due to moisture or alkali from the breath.

The illustrations 52, 53, and 54 clearly show the construction of the instrument. You will observe that what corresponds to the front electrode in the ordinary transmitter is divided into two halves, each forming a terminal. The back disc with highly polished carbon is used only as an electrical connection between the two halves of the transmitter. Fig. 51 shows the diaphragm with the connectors and cup attached. Fig. 52 shows the front view of the cup with the diaphragm removed, and the method of fastening the connectors to the electrodes. Fig. 53 shows the cup dismantled with the granular

in a loud tone of voice has much more volume than that from any other type. The advantage of this is readily seen.

The mechanical construction of the transmitter follows out the practice that has been found to be the most satisfactory for high-class apparatus; that is, the use of highly-polished carbon electrodes and irregularly formed carbon granules enclosed in a practically moisture-proof case, using no absorbent material whatever, so that the transmitter when once assembled should be entirely free from any bad effects due to atmospheric changes, and should be equally as efficient in any climate. The transmitter is made more durable, particularly in damp climates, by the use of an auxiliary moisture-proof diaphragm

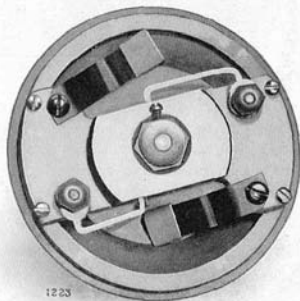


FIG. 50

TELEPHONE PARTS—Continued

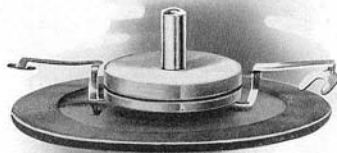


FIG. 51

discs without the use of any salts or acid. The surfaces of the carbon buttons are very highly polished, which lessens the danger of the transmitter packing, and prevents arching.

Granular Carbon

We also manufacture our own granular carbon and exercise great care in selecting the raw material in preparing the product, so as to produce the proper resistance to give the best results, and to cleanse the carbon and have it of such density that it will be entirely free from dust, which has a tendency to film the electrodes and seriously impair the transmission.

Diaphragm

The diaphragm is made of extra hard aluminum, and is carefully straightened in a powerful machine of our own design. It is protected by a celluloid disc.

carbon removed; "a" shows the front of the cup with the electrodes fastened to the auxiliary mica diaphragm; "b" shows the cup with the back carbon disc. Fig. 54 illustrates the parts of the cup; "c" is the back or neutral carbon disc; "d," the cup; "e," the separating ring; "f," the electrodes and mica diaphragm; "g," the clamping ring.

Electrodes

The carbon electrodes used in this transmitter are manufactured by ourselves, of a special grade of very dense carbon properly treated, so that it is of exceedingly low resistance, and securely soldered to the back connecting

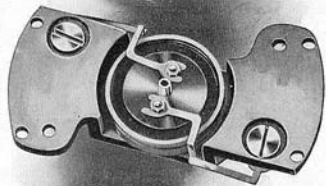


FIG. 52

TELEPHONE PARTS—continued

Auxiliary Diaphragm

The auxiliary diaphragm for sealing the carbon cup is made of the best selected India mica carefully gauged to thickness, so that each transmitter will be alike, and is securely held in place by the clamping ring.

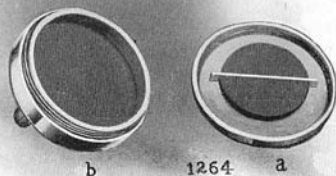


FIG. 53

The bridge is made from heavy solid brass, the binding posts being insulated therefrom with mica, so that no part of the retaining case of the transmitter, or any exposed portion, is connected with the circuit.

Rubber Band

The rubber band for insulating the diaphragm against vibration from the retaining case is made of a very high grade of rubber, in order to insure its remaining soft and pliable and to prevent any tarnishing of the inside of the retaining case.

Bridge

Front

The front is made from heavy brass, of simple design, and accurately turned.

Back

The back is made of heavy sheet brass.

Numbering

Each transmitter bears a serial number followed either by the letter "C" or the letter "L." "C" is for Central Energy transmitters, and "L" for Local Battery transmitters.



TELEPHONE PARTS—Continued

Testing

Each transmitter is accurately measured for resistance and given a practical test on both short and long lines in comparison with other instruments, thus assuring that each transmitter has been properly assembled and received an accurate adjustment.

Card Holder

A card holder of neat design, held in place by two of the transmitter mounting screws, is furnished with each instrument. It is provided with a transparent celluloid disc and white paper back, on which may be printed the telephone number.

In conclusion, we wish to call attention to the fact that no metal whatever is used in the construction of this transmitter excepting brass, thus insuring sufficient weight and freedom from warping, which is more than liable to occur if any composition parts are used, as it is evident that the slightest movement on the part of the framework would throw the transmitter completely out of adjustment and render it practically worthless.

Finally

No exposed part of the transmitter is connected with the telephone circuit—a principle that is carried out in all of our telephone apparatus, thus insuring the subscriber freedom from any disagreeable shocks or injury.

No. 7-B Transmitter, each,	\$1.75 net
Mouthpiece, each,	0.15 "



FIG. 54

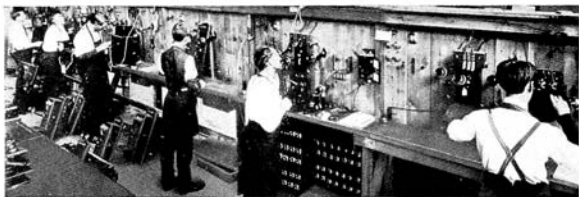


FIG. 73. — TESTING TELEPHONES — A



FIG. 74. — TESTING TELEPHONES — B



FIG. 75. — FINAL INSPECTION DEPARTMENT

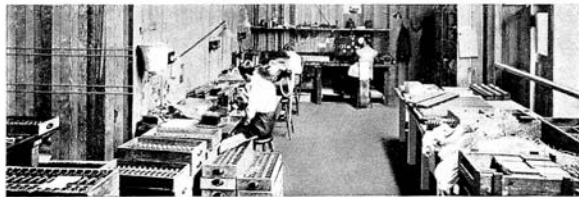


FIG. 76. — FINAL INSPECTION DEPARTMENT

TELEPHONE PARTS—continued

Magnetos

Illustration Fig. 55 shows one of our standard magnetos, the same as used with Portable Desk Telephone shown on page 15. We furnish these with series 3- or 4-bar or bridging 4- or 5-bar Generators.

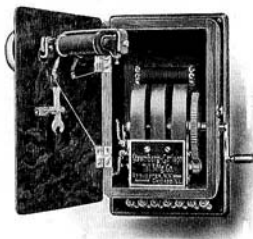


FIG. 55

Series

CODE No.	WOODWORK	GENERATOR TYPE AND No.	RINGER RESISTANCE AND No.	INDUCTION COIL No.	NET PRICE
746	Golden Oak	3-bar No. 20	100 Ohm No. 6-H	20-A	\$4.60
747	Walnut	3-bar No. 20	100 Ohm No. 6-H	20-A	4.85
748	Golden Oak	4-bar No. 21	100 Ohm No. 6-H	20-A	5.10
749	Walnut	4-bar No. 21	100 Ohm No. 6-H	20-A	5.35

Bridging

CODE No.	WOODWORK	GENERATOR TYPE AND No.	RINGER RESISTANCE AND No.	INDUCTION COIL No.	NET PRICE
750	Golden Oak	4-bar No. 23	1,000 Ohm No. 6-A	20-A	\$6.35
751	Walnut	4-bar No. 23	1,000 Ohm No. 6-A	20-A	6.60
752	Golden Oak	4-bar No. 23	1,600 Ohm No. 6-C	20-A	6.60
753	Walnut	4-bar No. 23	1,600 Ohm No. 6-C	20-A	6.85
754	Golden Oak	4-bar No. 23	2,000 Ohm No. 6-E	20-A	6.85
755	Walnut	4-bar No. 23	2,000 Ohm No. 6-E	20-A	7.10
756	Golden Oak	5-bar No. 24	1,000 Ohm No. 6-A	20-A	7.35
757	Walnut	5-bar No. 24	1,000 Ohm No. 6-A	20-A	7.60
758	Golden Oak	5-bar No. 24	1,600 Ohm No. 6-C	20-A	7.60
759	Walnut	5-bar No. 24	1,600 Ohm No. 6-C	20-A	7.85
760	Golden Oak	5-bar No. 24	2,000 Ohm No. 6-E	20-A	7.85
761	Walnut	5-bar No. 24	2,000 Ohm No. 6-E	20-A	8.10

TELEPHONE PARTS—continued



FIG. 56

Extension Bells

Our standard extension bells are mounted in Oak or Walnut woodwork, with door hinged at one side.

Code Numbers

No. 296	100 Ohm Ringer, Golden Oak woodwork,	\$1.60 net
No. 297	100 Ohm Ringer, Walnut woodwork,	\$1.85 net
No. 298	1,000 Ohm Ringer, Golden Oak woodwork,	\$2.50 net
No. 299	1,000 Ohm Ringer, Walnut woodwork,	\$2.75 net
No. 300	1,600 Ohm Ringer, Golden Oak woodwork,	\$2.75 net
No. 301	1,600 Ohm Ringer, Walnut woodwork,	\$3.00 net
No. 302	2,000 Ohm Ringer, Golden Oak woodwork,	\$3.00 net
No. 303	2,000 Ohm Ringer, Walnut woodwork,	\$3.25 net



FIG. 57

Generator Call Extension Bell with Induction Coil

Code Numbers

No. 477	Golden Oak woodwork, 100 Ohm Ringer, No. 20-A Induction Coil, \$2.10 net	
No. 478	Walnut woodwork, 100 Ohm Ringer, No. 20-A Induction Coil,	\$2.35 net
No. 479	Golden Oak woodwork, 1,000 Ohm Ringer, No. 20-A Induction Coil, \$3.00 net	
No. 480	Walnut woodwork, 1,000 Ohm Ringer, No. 20-A Induction Coil,	\$3.25 net
No. 481	Golden Oak woodwork, 1,600 Ohm Ringer, No. 20-A Induction Coil, \$3.25 net	
No. 482	Walnut woodwork, 1,600 Ohm Ringer, No. 20-A Induction Coil,	\$3.50 net
No. 483	Golden Oak woodwork, 2,000 Ohm Ringer, No. 20-A Induction Coil, \$3.50 net	
No. 484	Walnut woodwork, 2,000 Ohm Ringer, No. 20-A Induction Coil,	\$3.75 net

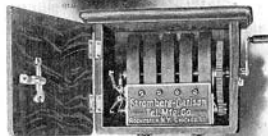


FIG. 58

Hand Generators

Mounted in Oak or Walnut woodwork.

Code Numbers

Series

No. 304	3-bar Generator, Golden Oak woodwork,	\$3.50 net
No. 305	3-bar Generator, Walnut woodwork,	\$3.75 net
No. 306	4-bar Generator, Golden Oak woodwork,	\$4.00 net
No. 307	4-bar Generator, Walnut woodwork,	\$4.25 net

Bridging

No. 308	4-bar Generator, Golden Oak woodwork,	\$4.25 net
No. 309	4-bar Generator, Walnut woodwork,	\$4.50 net
No. 310	5-bar Generator, Golden Oak woodwork,	\$5.00 net
No. 311	5-bar Generator, Walnut woodwork,	\$5.25 net

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