

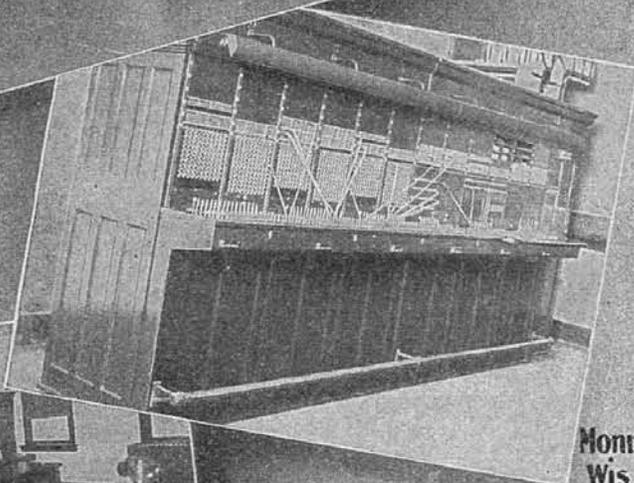
# Typical Western Electric Telephone Switchboards



Chelsea Exchange,  
New York



Plainfield, N.J.



Monroe  
Wis.



Lexington, Mo.

The Western Electric Company  
can supply any type of central  
office equipment from the  
smallest to the largest – to  
meet any condition of service.

# Typical Western Electric Telephone Switchboards



**Toll Board  
Lincoln, Neb.**



**Toll Board  
New York, N.Y.**

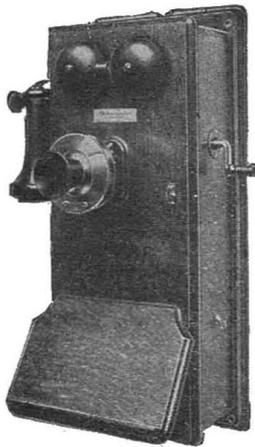
The Western Electric Company  
can supply common battery,  
convertible magneto multiple  
and other types of non-multiple  
and multiple switchboards.



**Toll Board  
Cedar Rapids, Iowa**

# Western Electric

## TELEPHONES



**Magneto Wall Telephone**

There is a Western Electric telephone which will satisfactorily meet any service condition, the telephones listed on the following pages being considered as meeting all usual requirements. For special requirements we have special telephones. Should special conditions be met which are not already covered by existing apparatus, our skilled force of engineers are at your service, and we invite inquiries and correspondence, which will be given immediate and cheerful attention.

Western Electric telephones can be relied upon to give perfect satisfaction. Our valuable and extensive experience in the manufacture of telephone equipment covers a continuous period of more than 38 years, and enables us to offer equipment which has proved its efficiency and reliability under most severe conditions. Through successful design, careful construction and the use of only the best materials and workmanship, Western Electric telephone apparatus has now come to be recognized by the leading telephone authorities throughout the world as standard.

Our large output enables us to purchase raw material under rigid specifications in large quantities at the lowest market prices. This, together with unequaled manufacturing facilities makes it possible for us to offer standard telephones at reasonable prices.

Every telephone, and in fact every part, is subjected to a rigid inspection both in the raw material and during manufacture, as well as before shipment. No expense is spared to make these telephones give perfect service during a long and useful life.

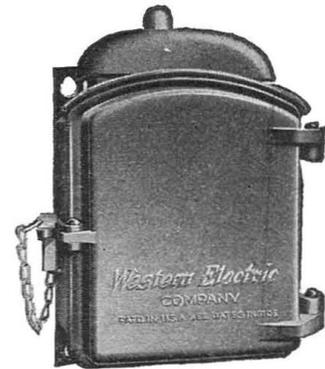
Large and complete stocks are carried in our numerous distributing houses which are located in thirty-two principal cities of the United States and are so situated as to make possible the delivery of goods in most cases within twenty-four hours of the receipt of the order. This system of locating distributing houses in the various commercial centers throughout the country insures prompt filling of orders together with a considerable saving in transportation, as our prices are F. O. B. the distributing houses.



**Inter-phone**



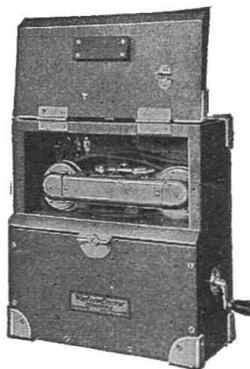
**Magneto Desk Telephone**



**Mine Telephone**



**Central Battery Desk Telephone  
Telephone Apparatus and Supplies**



**Portable Railway Telephone  
192**



**Central Battery Wall Telephone**

## TELEPHONE TERMS

### Definitions of Terms—General

The following definitions of terms used in connection with our telephones may be of interest and helpful in selecting the instruments best suited to any condition or requirement.

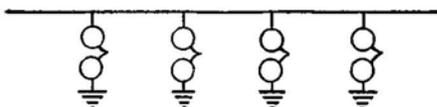
### Telephone Lines

**GROUNDING LINES** A grounded telephone line or system consists of only one wire, the ground being used for the return circuit, hence the term "grounded line."

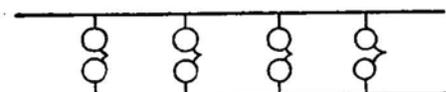
Grounded lines give fairly good results when properly installed, provided there are no electric light, power or trolley wires in the vicinity of the telephone line. In this case there is likely to be much objectionable humming and buzzing in the receivers when the line is in use.

**METALLIC LINES** A metallic line is one consisting of two line wires, the ground not being used in this instance to complete the circuit.

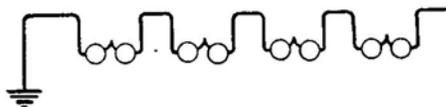
Metallic lines under almost every condition are the most satisfactory to build, maintain and operate and are almost universally used, grounded lines being very rarely considered when high class service is desired.



4 Ringers "Bridged" from the line to ground of a Ground Circuit



4 Ringers "Bridged" across the two Conductors of a Metallic Circuit



4 Ringers in series with a Grounded Circuit

**BRIDGING LINES** Practically all telephones in present day use are known as bridging telephones. In these telephones the ringers are connected in parallel across the line wires when used on a metallic circuit, or from the single line wire to ground when used on a grounded line.

**SERIES LINES—Magneto** Early in the development of the telephone art, magneto telephones were connected in series—like telegraph instruments are connected in a telegraph line. It was later found, however, that the voice currents by passing through all the ringers connected in the line were quite seriously impeded and lost much of their strength, thus making it impracticable or impossible to telephone over long distances or to place large numbers of telephones on one line and at the same time secure satisfactory service. As mentioned above, nearly all telephones in present day use are bridging, the use of series apparatus being discouraged and only recommended where conditions specifically warrant or require this equipment.

These instruments should not be confused with the Series Central Battery apparatus listed and described under Central Battery Telephones.

### Telephone Systems

There are two general classes of telephone exchange systems in present day use: Magneto (sometimes called local battery) and central battery (sometimes called common battery or central energy). These two systems differ principally in the details of operations, that is, in the method of signaling or calling the other telephones or "central" and in the method of furnishing current for talking.

**MAGNETO SYSTEMS** In magneto systems the telephone user signals or calls the exchange or other telephones on the same line by turning a crank at the side of the telephone, which operates a magneto generator mounted inside, the current thus generated causing a signal to be displayed or sounded at the central office (or exchange) or the bells of the other telephones to ring.

In magneto systems the current for talking is usually furnished by two or three dry cells or batteries, either located inside the telephone itself (in the case of wall telephones) or near by on a shelf or in a battery box.

**CENTRAL BATTERY SYSTEMS** In central battery systems the exchange is signaled by merely lifting the receiver from the hook on the telephone instrument. In these systems the other telephones on the same line cannot be rung except from the exchange.

In central battery systems the batteries, which supply current for talking, as the term implies, are located at the central office or exchange, one large battery usually supplying all the telephones connected to the exchange.

## TELEPHONE TERMS

### Telephone Systems (Continued)

**PRIVATE LINES** These are isolated lines or systems either grounded or metallic which do not come in contact or have any facilities for connecting with other lines for intercommunication, i. e., have no central office or exchange. They may consist of but two instruments connected to each end of the wires or they may have connected several instruments scattered along the line in different locations.

Private lines are principally used by railroads, mines and for farm or rural lines where no connection is possible or desired with other lines through a switchboard or exchange.

Standard bridging magneto telephone instruments are usually employed for private line work, although in the case of railway telephone train dispatching lines, special telephones are used which cannot be classified as either magneto or central battery, these instruments being best described as Railway Train Dispatching Telephones.

Private lines as above described should not be confused with individual or direct lines, later described, which refer to exchange lines equipped with only one telephone.

**INTERCOMMUNICATING SYSTEMS** These systems include a number of lines which usually cover a very limited area, generally within the premises of a single owner or concern. Such systems in general are of an automatic nature, that is, the user performs his own switching by pressing a button or key which rings the bell of the desired station and connects the two lines for talking. No operator is required for these systems and, in fact, no systems requiring a switchboard and attendant are considered under this classification.

As in the case of telephones for a railway train dispatching system, the instruments used in intercommunicating systems do not fall under either the magneto or central battery classification and they are best described and known as intercommunicating telephones. The Western Electric Company's trade name for intercommunicating telephones is "Inter-phone," and on the following pages will be found a very comprehensive listing of this class of equipment, listed under the heading "Inter-phones."

### Exchange Lines

**INDIVIDUAL LINES** An individual or direct line may be either metallic or grounded and has but one telephone instrument connected to it.

**PARTY LINES** A party line is one having two or more telephones connected to it. The number of telephones which can be connected to a party line varies all the way from two to forty or fifty, and depending entirely on the ringing system employed, the character of service desired and the local conditions encountered.

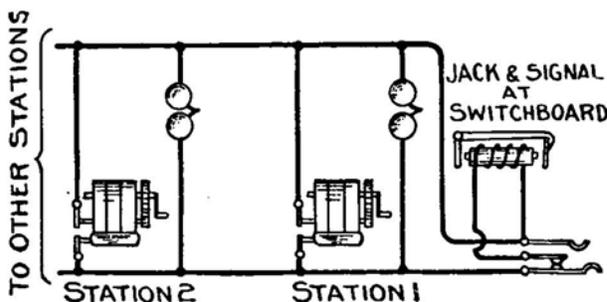
Under the following heading, "Signaling Systems," party lines of different types and capacities are described.

### Signaling Systems

It is doubtful if any branch of the development of the present day telephone system has received as great an amount of attention as the problem of signaling or ringing on party lines.

Individual or direct lines present no ringing difficulties as only one bell is rung when ringing current is sent out over the line from the switchboard. This is not true, however, with party lines, and how to signal or call any one of a number of telephones connected to a party line becomes at once one of the important problems of the design of the telephone apparatus.

**CODE-RINGING NON-SELECTIVE** The most universal method of signaling parties on a magneto telephone line is by code ringing. This method is also occasionally used on central battery lines, but not frequently. In the code ringing system rings of different codes are employed for each telephone, such as two short, three short, one long and a short, two long and two short or other combinations.



Code Ringing—Magneto Line

This system has the advantage that it can be used with a large number of telephones on the same line, any number in fact, the number which can be placed on a line depending on conditions other than ringing. Again, it is an economical system, as no special apparatus has to be used for either generator or bells, the only undesirable feature being that when one telephone is called, all the other telephones on the line are also rung, making it necessary for the user to count every signal in order to know when he is being called.

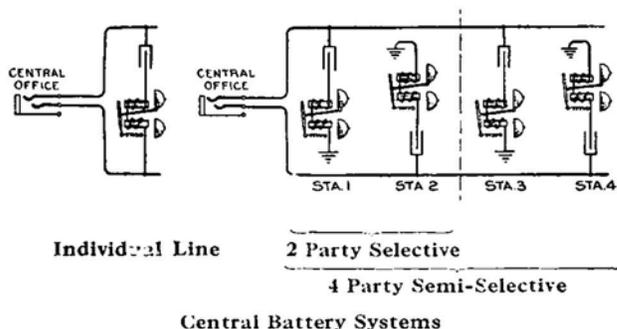
This system is most commonly used on rural or farmer telephone lines.

# TELEPHONE TERMS

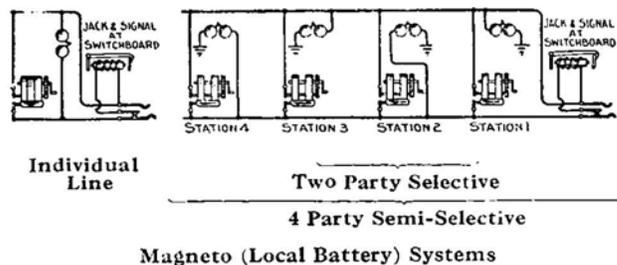
## Signaling Systems—Continued

**SELECTIVE SIGNALING** In order to enable the operator to call the various telephones on a party line a number of methods have been developed whereby the operator can ring the telephones selectively or semi-selectively, as the case may be. Selectively means, of course, that the operator can select and ring any one telephone without disturbing any of the others, semi-selectively meaning that the operator can select and ring any two of the telephones without disturbing the others, code ringing, of course, being employed for selecting out of the two telephones rung the one desired. Telephones arranged for this service can only signal the central office or exchange and cannot call each other without the assistance of the central office operator.

**Individual, 2 Party Selective or 4 Party Semi-selective ALTERNATING CURRENT** On an individual line the bell is bridged across the two line wires, (in the case of central battery systems a condenser is connected in series with the bell). On a two-party selective line one bell is connected from each side of the line to ground, and on a four-party semi-selective line two bells are connected from each side of the line to ground, the switchboard at the central office being so arranged that by means of a key, current can be sent out over either side of the line through the bells connected to that side of the line to ground. (This class of ringing is often referred to as "divided circuit ringing." On central battery systems a condenser is also connected in series with the bells to ground.)

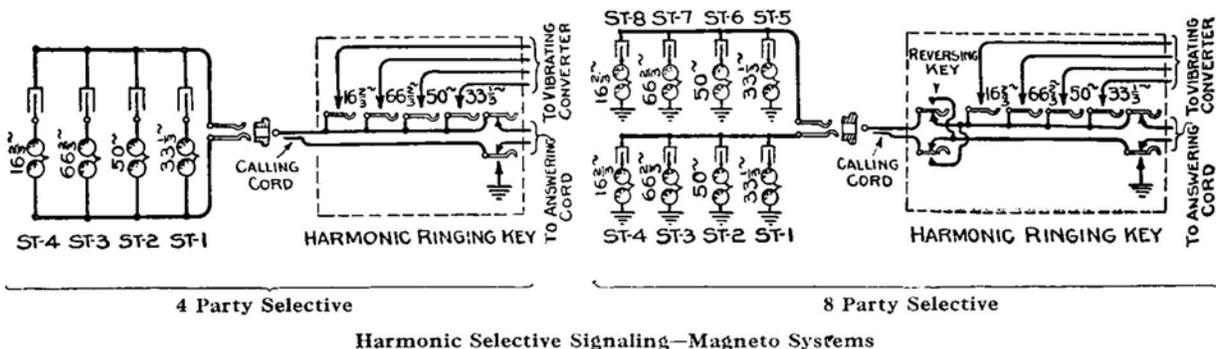


Telephones arranged for this service can only signal the central office and cannot call each other without the assistance of the central office operator.

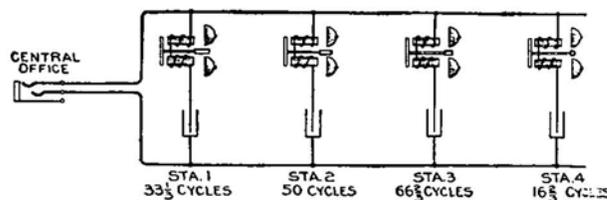


Telephones arranged for this service can only signal the central office and cannot call each other without the assistance of the central office operator.

**HARMONIC, 4 and 8 Party Selective or 16 Party Semi-selective** The telephones used with this system are equipped with special ringers or bells which are made to ring only when alternating current of a given frequency is sent over the line. The frequencies employed are  $16\frac{2}{3}$ ,  $33\frac{1}{3}$ , 50 and  $66\frac{2}{3}$  cycles.



On a four-party selective line the ringers of each

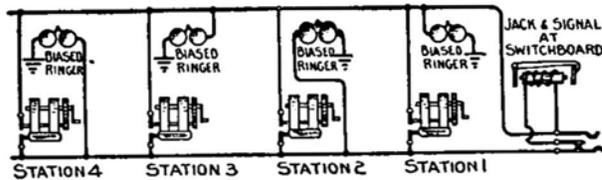


telephone are bridged across the two line wires, on an eight-party selective line four ringers are connected between each side of the line and ground, and on a sixteen-party semi-selective line the ringers are connected between line and ground, eight from each line wire (in this system a condenser is connected in series with each ringer).

Harmonic Selective Signaling—Central Battery Systems

## TELEPHONE TERMS

## Signaling Systems—Continued

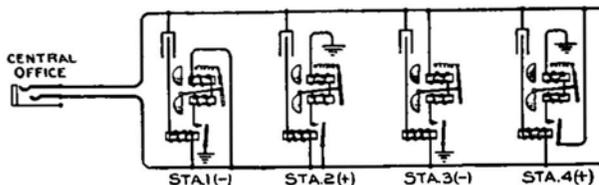
**4 PARTY SELECTIVE (Magneto Systems)  
—Pulsating Current.**

**Pulsating Current 4 Party Selective Signaling—Magneto Systems**

The pulsating selective signaling system answers the same requirements as the harmonic selective system, namely: being able to ring any one of four telephones on the same line without ringing any of the other telephones. This system is worked out by sending a positive or negative pulsating current out over either side of the line to ground.

The ringers of the telephones used in this service are biased, i.e., the ringers have a spring on the armature which tends to hold it to one side.

Two of these ringers are connected to each side of the line and so connected that one will respond to positive and the other to negative pulsating current.

**4-PARTY SELECTIVE (Central Battery Systems)  
—Pulsating or Superimposed Current**

**Pulsating Superimposed 4 party Selective Signaling  
Central Battery System**

In Central Battery systems each of the four telephones is equipped with a high impedance relay which is bridged across the two line wires in series with a condenser, and two biased ringers are connected from either side of the line to ground through the contacts of the relays when the latter are operated.

When pulsating or superimposed current of either polarity is sent out over one side of the line to ground, the other side of the line is automatically grounded by the operation of the switchboard key.

This in turn closes up the four relay contacts and one of the two bells connected to the line over which the current is passing will respond.

## MAGNETO TELEPHONES

### Definitions of Terms

The following definitions refer to terms used on the following pages in connection with our magneto telephones.

#### SERVICE

The number of telephones that can be connected on the same line varies, ranging from 1 to 40 or more. However, a line having more than 20 or 30 telephones connected is usually very unsatisfactory from a service standpoint, except in case of necessity or for temporary service. The reason for this being that a line carrying so many instruments is bound to be in use almost continuously, the bells ringing at very frequent intervals and the user almost sure to be "rung in the ear" or otherwise interrupted during the conversation.

The following definitions of what may be considered a lightly loaded, medium or heavily loaded line are submitted with the thought that its limits are conservative enough so that under all but extreme conditions the figures given can be relied upon. On the following pages will be found a complete catalog of telephones and opposite the listing of each type is specified the kind of loaded line upon which the particular telephone will give best service. Telephones should never be used on lines loaded heavier than indicated as the maximum for each type.

The telephone lines referred to are assumed to be well insulated and free from high resistance joints.

**Light Loaded Lines** A light loaded line is one of less than 15 miles in length and not equipped with more than 12 telephones.

**Medium Loaded Lines** A medium loaded line is one between 10 and 30 miles long and equipped with from 10 to 30 telephones.

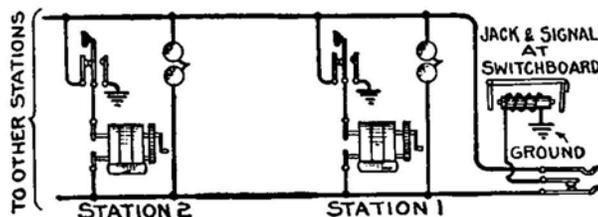
**Heavy Loaded Lines** A heavy loaded line is one up to 40 or 50 miles long or equipped with up to 40 telephones. Lines loaded with this number of telephones are rapidly going out of use and being broken up into shorter lines with fewer number of telephones. Lines of this length or loaded with this great number of telephones should be discouraged in all cases except as before stated, in cases of extreme necessity or for temporary service.

#### CENTRAL OFFICE SELECTIVE SIGNALING

Telephones for this service are so wired that the switchboard drop or signal is operated without ringing the bells of any of the other telephones on the same line by pressing a button while turning the generator crank.

We are prepared to furnish three different telephones, each equipped with a different type of push button which perform similar service, but in a slightly different manner, the results, however, being much the same.

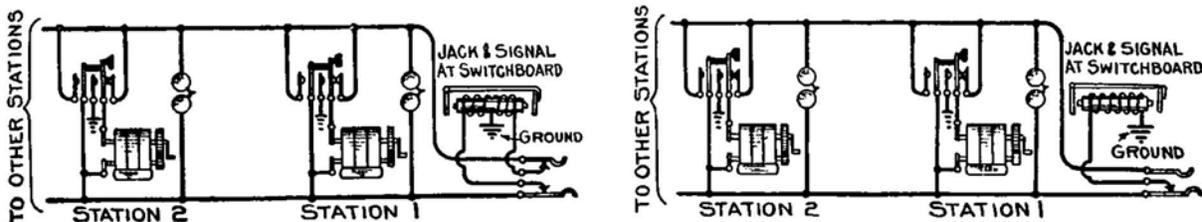
**Using No. 1006A Push Button** Operating this push button connects the generator to one side of the line and to the ground. These telephones can be used only on metallic lines and where the switchboard drop is single wound and has one terminal of its winding connected (or arranged for connecting) to ground. When the generator is operated without pressing the push button, all the other



Wiring of Telephones and Switchboard Apparatus when No. 1006A Push Buttons Are Used

telephones on the line are rung without operating the drop at the exchange. When the push button is pressed while turning the generator crank, the drop is thrown, but none of the other telephone bells on the line are rung. This makes it possible to "call central secretly."

**Using No. 1002A Push Button** Operating this push button connects the generator to both sides of the line and to the ground. Telephones equipped with this push button are used where a special double wound drop, having the middle of its winding brought out to a terminal which is connected to the ground, is mounted in the switchboard.



Double Wound Drop Single Wound Drop  
Wiring of Telephones and Switchboard Apparatus When No. 1002A Push Buttons Are Used

Telephones equipped with this push button can also be used where the switchboard is equipped with regular single wound drops one side of which is (or can be) connected to ground. When so used, it is not necessary to watch which way the line wires are connected to the telephone, as this push button connects one side of the generator to both sides of the line, and the other to ground.

The operation of this telephone is the same as those equipped with No. 1006A push buttons above described.

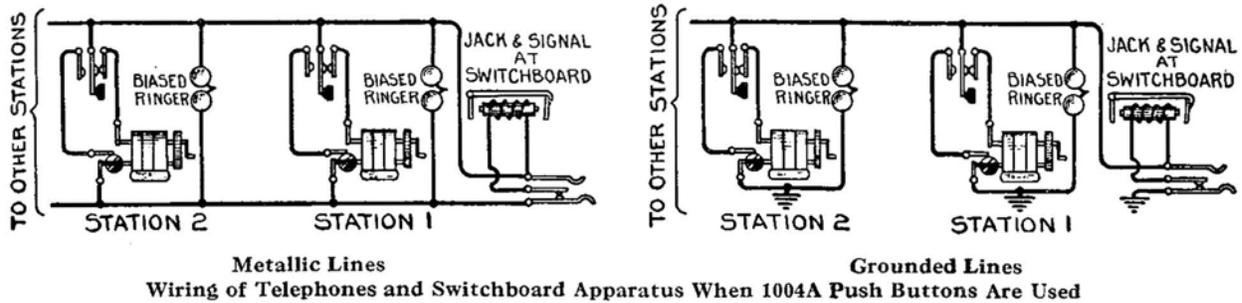
# MAGNETO TELEPHONES

## DEFINITIONS OF TERMS

### Signaling Central Secretly

#### Using No. 1004A Push Button and Pulsating Current Generator

In addition to the push button these telephones are equipped with a special generator, which delivers both pulsating and alternating current. Operating the push button while turning the generator crank throws pulsating current out over the line, which operates the switchboard drop without ringing the other telephone bells connected to the line. In order to operate this system satisfactorily all the telephones



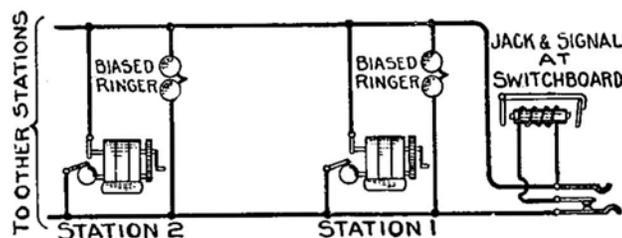
on the line must be equipped with biased ringers and so connected as to have the armature biasing spring pulling in the same direction as the direction of the pulsating current flow, thus preventing their "tapping" when "central" is rung.

When the generator is operated without pressing the push button it sends out alternating current over the line which rings all the telephone bells on the line and also operates the switchboard drop or signal.

With this equipment "central" is signaled on every call, secretly or not, as desired.

### CENTER CHECKING

Telephones arranged for this service are equipped with a special generator which delivers pulsating current only, and standard alternating current ringers. When the generator is operated central is signaled secretly, that is, none of the other telephone bells on the line are rung. When it is



desired to call any other telephone on the line it is necessary to call the central operator and ask to have the telephone desired rung. This scheme gives the central operator control over the line and prevents calls being made without her knowledge. This is sometimes desirable when the telephone is connected to a toll or pay station line running between two exchanges located in different districts, where the calls should all go to one exchange and not to the other.

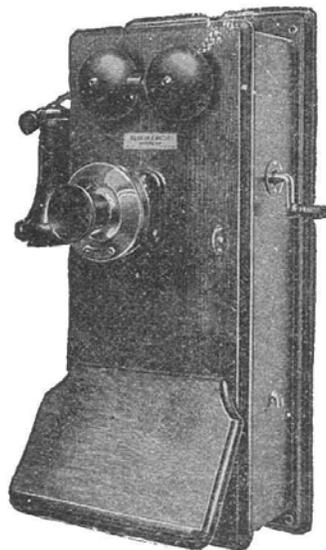
### CONDENSERS

On rural lines, trouble sometimes occurs due to parties "listening in" whenever their bells ring, regardless of whether the call is for them or not. Whenever this is done, it is usually impossible to ring on the line after the receiver is off the hook. To overcome this, it is customary to furnish telephones equipped with a condenser wired in the receiver circuit.

All No. 1317 and No. 1305 wall telephones and corresponding desk telephones, arranged for code ringing, have terminals provided so that a condenser can be connected in at any time, and certain types of the No. 1317 telephones are furnished equipped with a condenser as standard.

## MAGNETO TELEPHONES

## No. 1317 Type



No. 1317C Type (2 Cell)  
Magneto Telephone



No. 1317 (3 Cell)  
Magneto Telephone

## General

The No. 1317 wall type magneto telephones listed herein represent the highest development yet attained in magneto telephone design and construction.

This result is due to the exceptional engineering skill employed and to our forty years' experience in the manufacture of telephones and telephone apparatus, which has enabled us to produce an instrument simple, yet pleasing in design, compact, yet with every part accessible for instant inspection, rugged, yet light in weight and more efficient than any other magneto telephone on the market.

## Cabinet and Assembly

**Finish and Appearance**

The design of this telephone is such that it is simple and pleasing in appearance, the dimensions being of good proportion and a durable high polished, hand rubbed finish is given the woodwork, which adds greatly to the appearance, while the interior of the cabinet is also given a protective finish.

**Woodwork**

Carefully quarter-sawed oak is used and the construction is strong and durable. All joints are tongued and grooved, the best quality of glue being used. The backboard is slotted its full length to permit the telephone wires entering either from the bottom or top of the instrument.

**Compactness and Accessibility**

These telephones are constructed with the aim of producing an instrument which will occupy a minimum of wall space yet with every part easily accessible for inspection.

**Door**

The door is plain without paneling, thus permitting a better finish, and is hinged at the left by three electro-galvanized hinges so that when opened the operation of the ringer and generator can be observed while the generator crank is turned, without inconvenience and scratching of the door finish, which is likely to be the case when the door is hinged at the right side. The door is locked when closed by a self-centering screw of substantial design.

**Wiring**

All interior wire is in cable form, the conductors in this way being rendered less liable to damage and at the same time making a much neater appearance.

Connections between the apparatus on the door and in the cabinet are made by means of a flexible cable. This obviates the necessity for soldered connections and minimizes the chances for trouble. The cable is held in place by a steel wire spiral.

The main binding posts are inside the cabinet, thus preventing tampering with the connections, accidental short circuits, etc. All terminals including those for the transmitter and receiver cords are screw terminals, and are plainly marked so that there can be no possible mistake when making connections or tests. The various cords, such as those for the transmitter or receiver, and the flexible leads running to the condenser, ringer and battery are all furnished with cord tips.

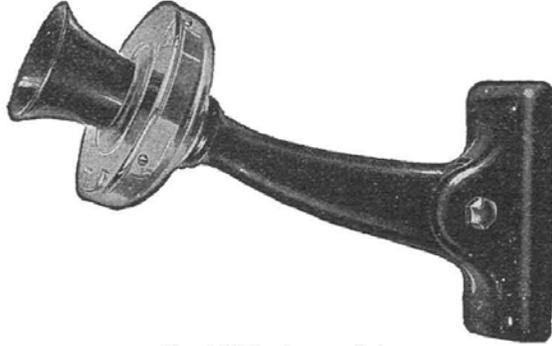
**Miscellaneous**

Each telephone is equipped with a directory hook and the four mounting screw holes are bushed with metal sleeves, thus enabling the installer to put up or take down an instrument without marring the woodwork. A complete and explanatory circuit label or wiring diagram is also pasted on the inside of the door of each telephone.

## MAGNETO TELEPHONES

### No. 1317 Type

#### Transmitters

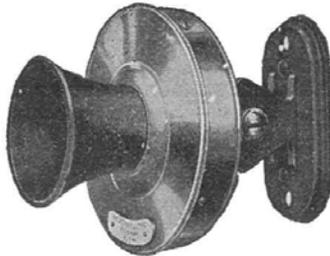


No. 350W Transmitter

The transmitters furnished with these telephones are of the most advanced and efficient design and are recognized as standard throughout the world by leading telephone authorities for the longest toll lines as well as short local lines.

Western Electric transmitters are carefully manufactured, every detail being as carefully worked out as those of the finest watch. They have maximum efficiency, are practically indestructible, maintain perfect adjustment throughout life, do not "pack," "burn," or "sputter," consume a minimum amount of current and work equally well in local battery (magneto) or central battery systems.

All exposed metal parts are insulated from the current carrying parts. The diaphragms are made of aluminum which respond readily to sound vibrations, and the face plates are made extra heavy to prevent excessive vibrations and microphonic overtones.



No. 329W Transmitter  
With No. 8A Transmitter Bracket

#### Receivers

The receivers are scientifically correct in design and are manufactured to give maximum efficiency, long life and to maintain permanent adjustment. A special grade of steel is used in the manufacture of the permanent magnets, enabling them to retain their full strength indefinitely. They respond readily to every variation of the voice currents and faithfully reproduce every spoken word and every voice modulation with full volume and perfect articulation. The spool cores which form the pole pieces are made of specially annealed Norway iron. The permanent magnets and spool cores are electrically welded together forming a perfect magnetic circuit and producing maximum efficiency. The ends of the electro-magnetic cores are absolutely smooth and are lacquered to protect them from rust. The cup or recess back of the diaphragm is made airtight, thus preventing dust from accumulating, or local exterior noises from interfering with the vibrations of the diaphragm, this air chamber also having the effect of damping or cushioning the diaphragm. The shell and cap are smooth and highly polished. The cord hole has a rounded edge which prevents wearing of the cord, and all cord terminals are concealed within the shell. The ear cap is scientifically designed to perfectly fit the orifice of the ear and has no objectionable raised lettering around the rim.



No. 143AW Receiver  
Equipped With Cord  
Telephone Apparatus and Supplies

## MAGNETO TELEPHONES

### No. 1317 Type

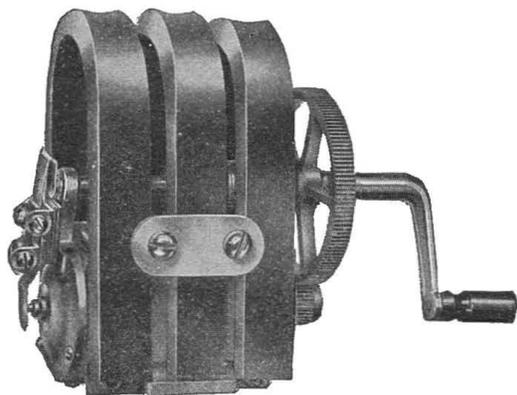
#### Induction Coils

The relation of the windings of the induction coil is such that maximum transmission and efficiency is secured on either long or short lines. The terminals are firmly fastened to the spool heads and so located that the ends of the coils which are fastened to them are not liable to be broken off. The spool heads are amply large and securely held in place. Specially prepared iron is used for the cores of these induction coils which has been selected after years of painstaking research.

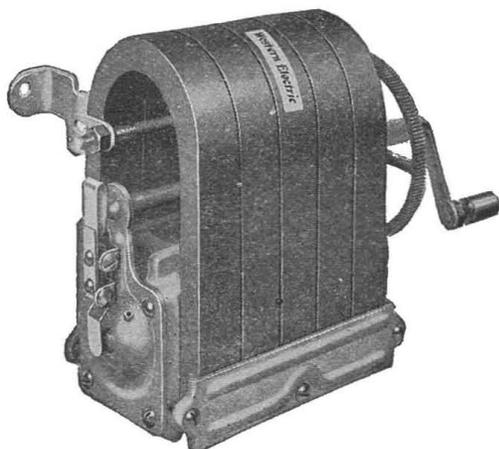
#### Switchhooks

The switchhooks used are simple, compact and self-contained. The base, or frame work, has a channel construction which assures rigidity with light weight. The springs are of heavy German silver backed by brass stop springs, insuring positive operation and maximum contact pressure, and are mounted vertically

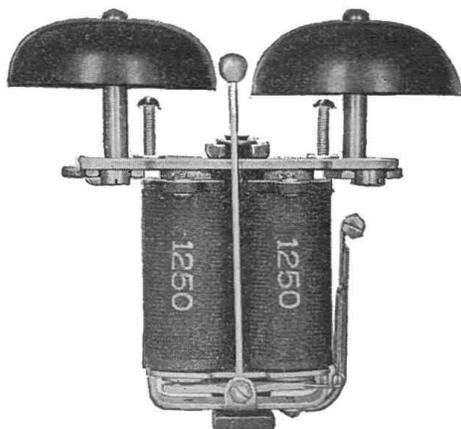
to prevent accumulation of dust on the contacts. A hard rubber roller is provided on the end of the switchhook which rests against the master spring, the latter being adjusted to the proper tension, thus eliminating friction. All of the current carrying parts are well insulated from the frame and all terminals are easily accessible.



No. 22 Type Generator



No. 48 Type Generator



Ringer

#### Generator

The generators used in these telephones are substantially constructed with large bearings for the revolving parts. The armatures are wound with black enamel covered wire, making them moisture-proof, and when not in motion the terminals are either short circuited or disconnected from the line in order to provide complete protection against possible damage from lightning, which may break through the instrument protectors. The act of turning the crank automatically connects the generator to the line and the circuit is automatically broken as soon as the crank is released. The magnets are made of special steel and specially hardened to insure their magnetic strength indefinitely. The crank is made in one piece to give it the necessary strength to withstand rough handling. An oil tube is provided in order that the bearings can be easily oiled when necessary. The gear wheels are carefully cut and finished, which makes possible smooth and noiseless running without appreciable wear.

Generators having 2, 3 or 5 bars with consequent varying strength are furnished for different service conditions. They are the most powerful generators of their type on the market, the No. 50 3 bar generator being the best 3 bar generator yet produced, and, in fact, will ring more bells than many 4 or 5 bar generators.

#### Ringers and Gongs

The ringers furnished with these telephones have specially loud, clear tones and operate on a minimum amount of current and at the same time offer a very high impedance to voice currents. The ringer coils are wound with black enamel wire, which produces more effective ampere turns than a silk insulated wire. This wire also makes the ringer impervious to moisture. The ringer terminals have screw connections and the resistance or impedance is plainly marked. Both the gongs and armature may be easily and accurately adjusted, a screw driver being the only tool needed.

The gongs are black finish and have slotted holes which prevent them from turning on the gong posts and becoming loose. Both 2½ and 3 inch gongs are used, depending on the particular design and construction of the individual telephone.

Western Electric ringers are made in a variety of resistances and frequencies and can be furnished to work satisfactorily on any line with ringers of other manufacture. These ringers are attached to the instrument cabinet by two screws, which can be easily removed when desired.

## MAGNETO TELEPHONES No. 1317-C Type (2 Cell)

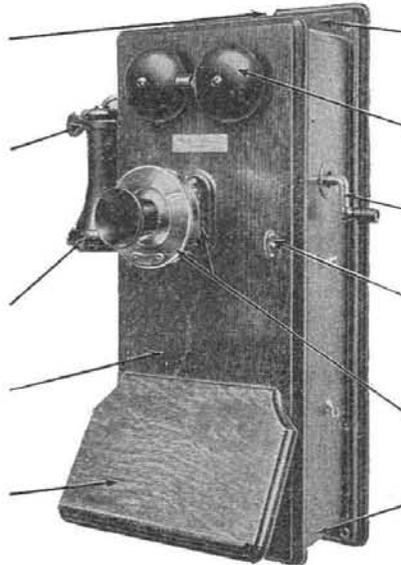
Backboard grooved for entrance of line wires at top or bottom.

Switch hook is compact, strong and durable. Finished in durable black.

Receiving efficiency is unsurpassed. Receiver strong and durable. Fits the ear.

Cabinet of solid quarter sawed oak, substantially made. Attractive design.

Writing-shelf placed at convenient and comfortable angle, securely fastened and supported.



No outside binding posts.

The 2½ inch brass gongs give a loud, clear tone. Finished in black.

One-piece generator crank. Finished in black.

Special self-adjusting lock.

High efficiency transmitter with low battery consumption. Mounted on substantial black enameled bracket, securely fastened to cabinet.

All corners dovetailed and glued.

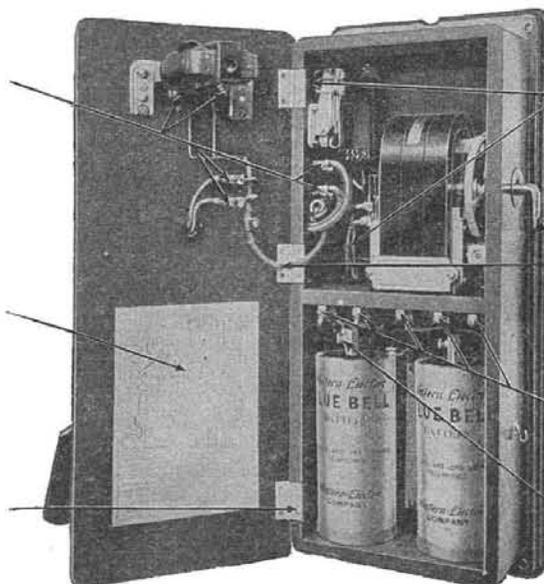
The new No. 1317C type magneto telephone is the result of a demand by many of our customers for a more compact type of telephone. The principal features of this new type telephone are as follows:

1. It is more compact, smaller and more pleasing in appearance than any telephone of this type.
2. The writing shelf is placed on a more perpendicular angle, which makes it more convenient for writing and also decreases the over-all outside depth of the cabinet. This also makes it impossible for the user to lean on the shelf hard enough to pull the instrument from its fastenings.
3. A short black finished transmitter bracket is provided.
4. Telephones of this type are shipped with the transmitter and writing shelf assembled and attached. Even with these parts attached, the shipping box is approximately the same size as the box used to ship the larger type instruments, which are furnished with the transmitter and writing shelf detached.
5. The new C type has been designed with a battery compartment only large enough to accommodate two cells, thus making possible a smaller and neater cabinet.
6. The No. 50 type 3 bar generator furnished with all C type telephones recommended for moderate and heavy loaded service is exceptionally efficient and powerful, it being capable of giving satisfactory ringing service over at least 95 per cent. of existing magneto lines now in use; for example, this generator will ring at least thirty 2500 ohm ringers connected on a No. 12B.B. iron metallic telephone line, 15 miles in length, assuming, of course, that the line is in good electrical condition, that is, if it is properly insulated and free from high resistance joints. This generator will operate more telephones on one line than many of the 4 and 5 bar generators now in the field. For other use, as indicated in the following listings, our well known No. 22 type 3 bar generator is employed, the service in these cases requiring that a generator which is not so powerful be used.
7. The transmitter bracket, gongs, switchhook, generator handle and lock escutcheon are given a permanent and pleasing black finish, which prevents tarnishing of the metal parts, which is the case when these parts are nickel plated.

Terminals have screw connections. A screw-driver only tool necessary to install and maintain.

Complete wiring diagram showing color and location of every wire.

Door is hinged at left, permitting full view of all operating parts when turning generator.



All interior wiring insulated and in cable form. No wires run in slots in back of cabinet.

Flexible armored cable connects apparatus on door and in interior.

Terminals have screw connections. All permanent connections soldered.

Battery terminals extend from cable.

## MAGNETO TELEPHONES

## No. 1317C (2 Cell) Type—Continued

CENTRAL OFFICE  
SELECTIVE SIGNALING

Bridging code ringing telephones not listed as equipped with a push button for the above service can be so arranged by ordering a No. 465D key, which is intended for mounting on the side of the telephone and which can be easily wired into the circuit to perform the same function as the telephone equipped with No. 1006A push buttons described on the preceding page.

The No. 1317C type telephones, in addition to the apparatus listed below, are equipped with our standard long distance transmitter, concealed binding post receiver, induction coil, and all necessary cords.

Those telephones for use in harmonic systems are equipped with a 1 Mf. condenser wired in series with the ringer. All other telephones of this type are arranged for a 1 Mf. condenser which may be connected in series with either the receiver or ringer as desired, but with the exceptions indicated below condensers are not furnished unless specified in the order.

Two Blue Bell Batteries and One No. 60A Protector Are Furnished with Each of the  
Following Listed Telephones and Are Included in the Price

**Note:** If batteries are not desired, deduct 60 cents from the list price.  
If protector is not desired, deduct 50 cents from the list price.

## SERVICE DATA AND LIST PRICES

Code No.	Ringer Resistance Ohms	Generator	Push Button	Con- denser	Service	†List Price Each
<b>RINGERS OPERATED BY ALTERNATING CURRENT</b>						
Code Ringing						
1317CN	1600	50 type (3 bar A.C.)	.....	.....	Medium loaded lines	\$22.50
1317CR	1600	50 type (3 bar A.C.)	.....	1 Mf.	Medium loaded lines	23.50
1317CP	2500	50 type (3 bar A.C.)	.....	.....	Heavy loaded lines	23.00
1317CS	2500	50 type (3 bar A.C.)	.....	1 Mf.	Heavy loaded lines	23.90
1317CH	1000	22 type (3 bar A.C.)	.....	.....	Light loaded lines	20.50
1317CG	1000	50 type (3 bar A.C.)	.....	.....	Light loaded lines	22.10
1317CA	1600	50 type (3 bar A.C.)	1006A	.....	Central office select- ive signaling	23.00
1317CB	2500	50 type (3 bar A.C.)	1006A	.....	Central office select- ive signaling	23.40
1317CE	1600	50 type (3 bar A.C.)	1002A	.....	Central office select- ive signaling	23.20
1317CT	1600 (biased)	50 type (3 bar A.C. and pulsating)	1004A	.....	Signaling central secretly	23.60
1317CU	2500 (biased)	22 type (3 bar pulsating)	.....	.....	Center checking	22.10
1317CK	2500 (biased)	50 type (3 bar pulsating)	.....	.....	Center checking	23.80

## RINGERS OPERATED BY PULSATING CURRENT

## Four-party Selective Signaling

1317CJ	2500 (biased)	22 type (3 bar A.C.)			Any one of four parties	\$22.10
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## RINGERS OPERATED BY HARMONIC CURRENT

## Four or Eight-party Selective, Sixteen-party Semi-selective Signaling

Code No.	Ringer	Frequency (Cycles)	Generator	Condenser	Service	†List Price Each
1317CHA	41 type	16 $\frac{2}{3}$	22 type (3 bar *)	1 Mf.	Harmonic selective signaling lines only	\$23.70
1317CHB	41 type	33 $\frac{1}{3}$	22 type (3 bar *)	1 Mf.		23.70
1317CHC	41 type	50	22 type (3 bar *)	1 Mf.		23.70
1317CHD	41 type	66 $\frac{2}{3}$	22 type (3 bar *)	1 Mf.		23.70

\*Arranged to give alternating current, but contact springs are arranged so that approximately one impulse of current out of four is sent over the line.

†These prices include furnishing a No. 143AW composition shell receiver. If the No. 144AW hard rubber shell receiver is required add 50 cents to the list price of each telephone to be so equipped.

Instructions for installing will be furnished on request.

## MAGNETO TELEPHONES

### No. 1317 (3 Cell) Type



No. 1317N

The No. 1317 wall telephones listed below are equipped with our standard long distance transmitter, concealed binding post hand receiver and cord, induction coil, and two battery connecting cords.

All of these telephones are wired for a 1 m.f. condenser to be inserted in the receiver circuit. If condensers are desired, however, it should be so stated in the order excepting in the case of the No. 1317R and No. 1317S telephones, which are furnished equipped with a condenser as standard. This equipment should not be confused with the telephones for harmonic ringing service, which are furnished equipped with a 1 m.f. condenser wired in the ringer circuit.

The battery compartments in these telephones provide space for three standard  $2\frac{1}{2} \times 6$  ins. dry cells. This number is recommended and usually employed on extremely long distance connection or under severe service conditions where maximum obtainable transmission is absolutely necessary. However, for local exchange and moderate toll service two standard Blue Bell dry cells have been found entirely satisfactory.

#### Two Blue Bell Batteries and One No. 60A Protector Are Furnished with Each Telephone and Are Included in the Price

**Note:** If batteries are not desired, deduct 60 cents from the list price.  
If protector is not desired, deduct 50 cents from the list price.

#### SERVICE DATA AND LIST PRICES

Code No.	Ringer Resistance Ohms	Generator	Con-denser	Service	*List Price Each
<b>RINGERS OPERATED BY ALTERNATING CURRENT</b>					
(Code Ringing)					
†1317N	1600	48 type (5 bar A.C.)	.....	Medium loaded lines	\$24.10
†1317P	2500	48 type (5 bar A.C.)	.....	Heavy loaded lines	24.50
†1317R	1600	48 type (5 bar A.C.)	21 type	Medium loaded lines	25.10
†1317S	2500	48 type (5 bar A.C.)	21 type	Heavy loaded lines	25.40
†1317AH	1000	22 type (3 bar A.C.)	.....	Light loaded lines	20.50
1317AK	2500 (biased)	48 type (5 bar pulsating)	.....	Center checking	26.20

#### RINGERS (BIASED) OPERATED BY PULSATING CURRENT

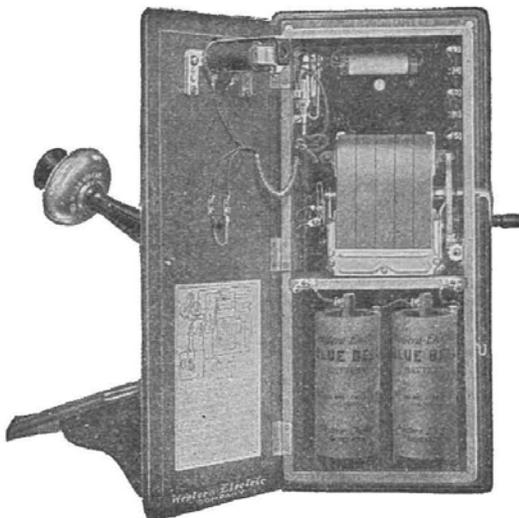
##### Four-party Selective Signaling

1317BS	(a)	22 type (2 bar A.C.)	Any one of four parties	\$22.10
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(a) The ringer furnished with this telephone has an inductive winding of approximately 1000 ohms and a non-inductive winding of approximately 3000 ohms, wound over the inductive winding of the spool. These two windings are connected in series and the junction brought out to an extra terminal for use in connecting an extension instrument or bell.

\*These prices include furnishing a No. 143AW composition shell receiver. If the No. 144AW hard rubber shell receiver is required, add 50 cents to the list price of each telephone to be so equipped.

†These code ringing telephones can be arranged for "Central office selective signaling," by ordering a No. 465D key for each telephone to be so equipped. These keys are intended for mounting on the side of the telephones and can be easily wired into the circuit to perform the same function as telephones equipped with No. 1006A push buttons described on a preceding page.



No. 1317N

Telephone Apparatus and Supplies

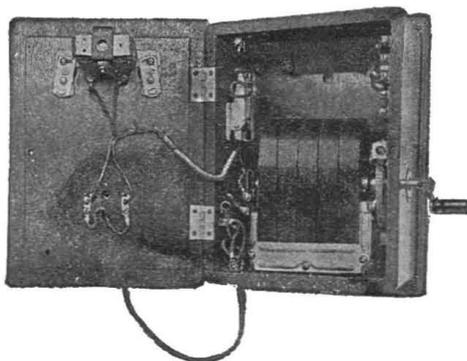
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## MAGNETO TELEPHONES

### No. 1305 Type



No. 1305R



No. 1305R—Open

The No. 1305 type magneto telephones listed below are intended for use in places where a smaller telephone than the No. 1317 type is desired or made necessary on account of available space, the approximate dimensions of the backboard being 7½ inches wide by 10⅝ inches long.

This telephone has no space for batteries, nor is a writing shelf provided. The batteries in this case are supposed to be mounted in some out of the way place, either in a battery box or on a shelf.

The woodwork of the cabinet and the associated parts is of the same high standard as that of the No. 1317 telephone, the transmitting, receiving and ringing apparatus and efficiency of the two types being the same.

Our recommendation regarding batteries is the same as referred to under the No. 1317 (3 cell) type telephone, that is, when it is desired to secure the very highest transmission for long distance service or over lines where transmission conditions are very poor, three dry cells are recommended, but for all average local service and over all but the long toll lines, two Western Electric Blue Bell dry cells have been found to give perfectly satisfactory results.

The gongs of these telephones have a pleasing black finish which prevents tarnishing of the metal.

**The Following Prices Do Not Include Either Batteries or Protector, and These Should Be Ordered Separately as Desired**

#### SERVICE DATA AND LIST PRICES RINGERS OPERATED BY ALTERNATING CURRENT (Code Ringing)

Code No.	Ringer Resistance, Ohms	Generator	Service	†List Price Each
*1305R	1600	48 type (5 bar A.C.)	Medium loaded lines	\$25.90
*1305AS	1600	50 type (3 bar A.C.)	Medium loaded lines	On request
*1305M	2500	48 type (5 bar A.C.)	Heavy loaded lines	25.70
*1305AT	2500	50 type (3 bar A.C.)	Heavy loaded lines	On request
*1305P	1000	22 type (3 bar A.C.)	Light loaded lines	18.20
1305N	50	22 type (3 bar A.C.)	Series lines	19.70
*1305AC	2500	48 type (5 bar A.C.)	For railway telephone service. Has an insulated generator crank. The induction coil and ringer coils are moistureproofed and the transmitter and switch-hook are black finish. Otherwise similar to the No. 1305M.	On request

#### RINGERS OPERATED BY PULSATING CURRENT (Four-party Selective Signaling)

1305U	2500 ohms (biased)	22 type (2 bar A.C.)	Any one of four parties	\$20.80
*Arranged for a 1 Mf. condenser to be wired in the receiver circuit, but not so equipped unless specified on order.				
†These prices include a No. 143AW composition shell receiver. If the No. 144AW hard rubber shell receiver is desired, 50 cents should be added to the list price of each telephone to be so equipped.				