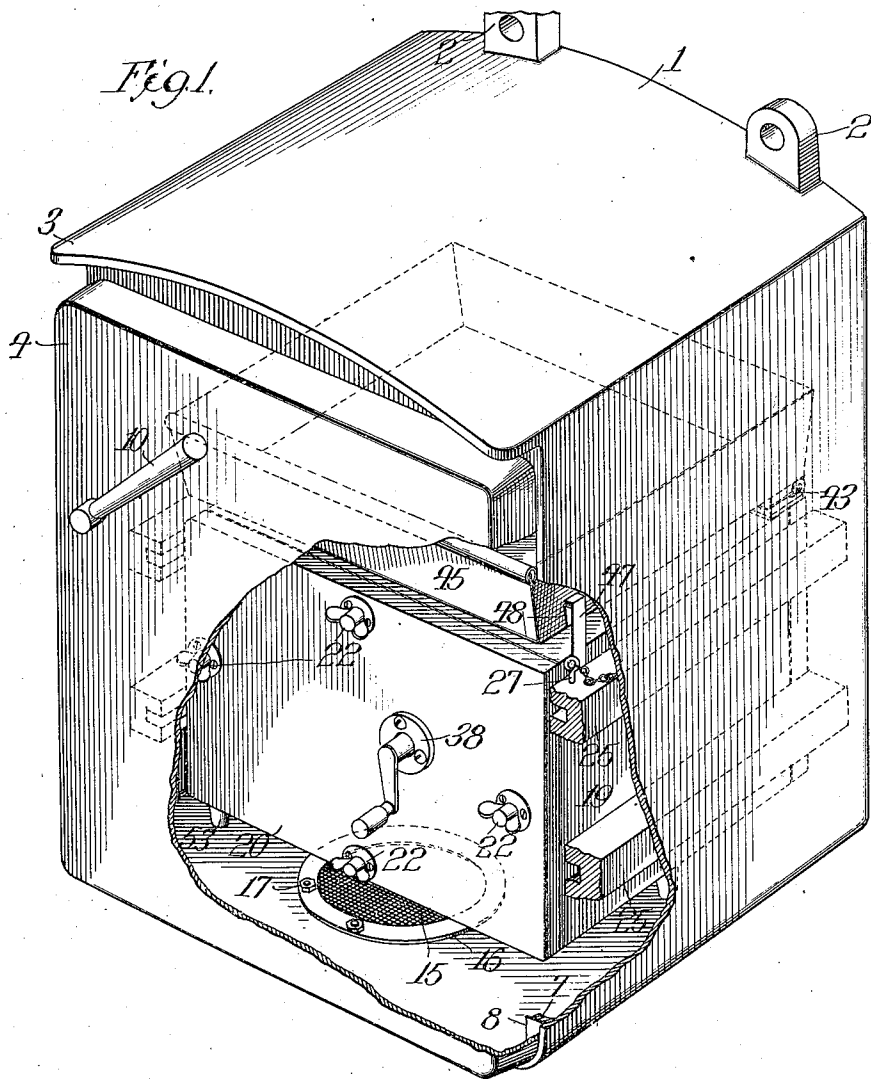


G. F. ATWOOD.
 SIGNALING APPARATUS.
 APPLICATION FILED FEB. 26, 1906.

1,000,572.

Patented Aug. 15, 1911.

3 SHEETS—SHEET 1.



Witnesses
 Edw. P. Barrett
 Edwin H. Smythe

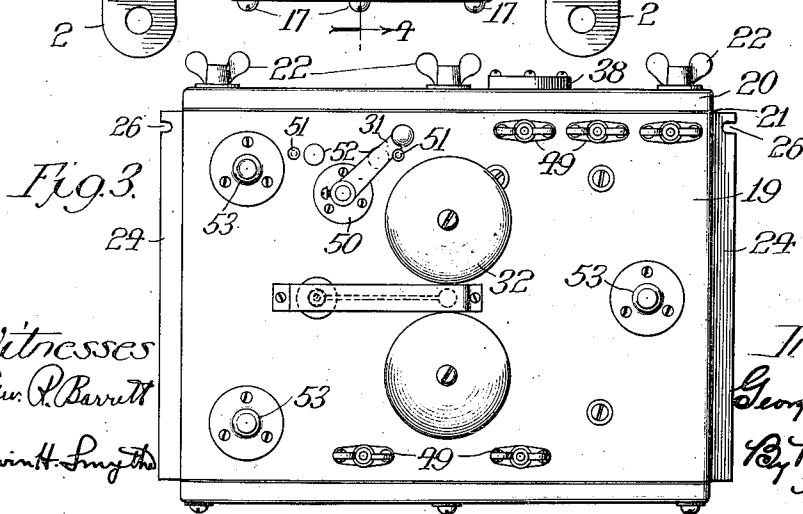
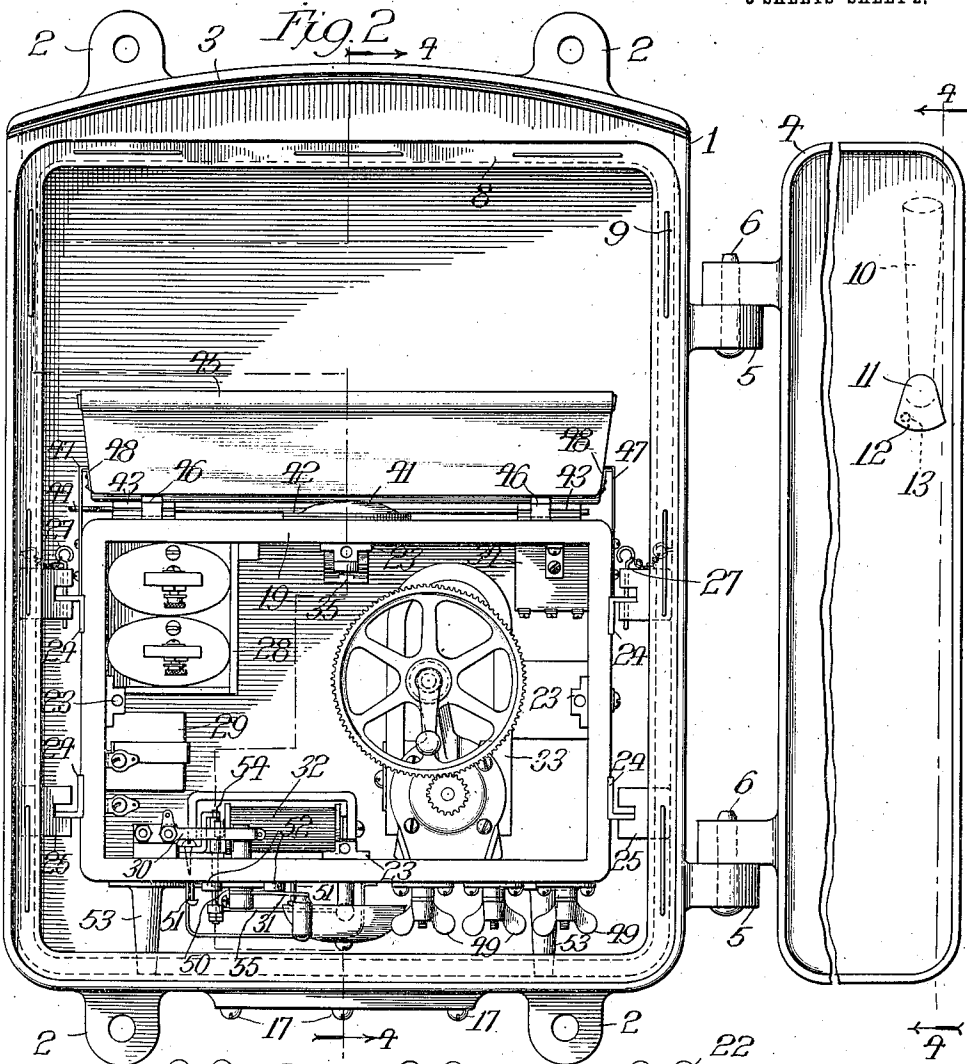
Inventor
 George F. Atwood
 By Rector & Hibben
 His Attys

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3 SHEETS—SHEET 2.



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3 SHEETS-SHEET 3.

Fig. 4

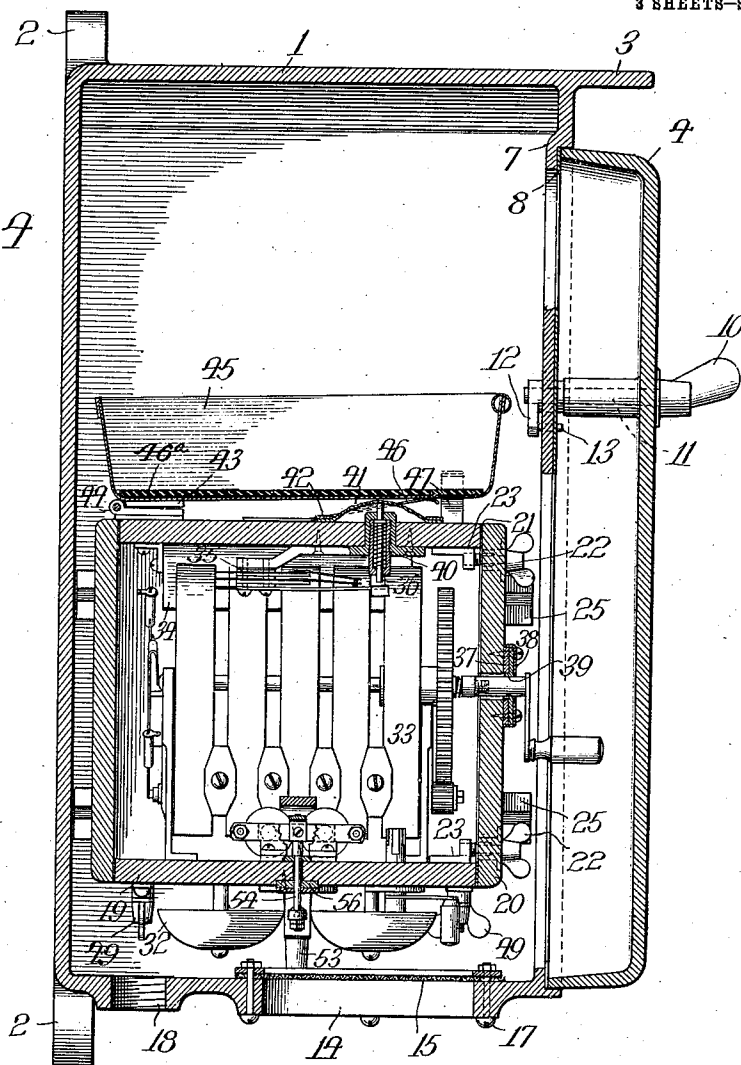
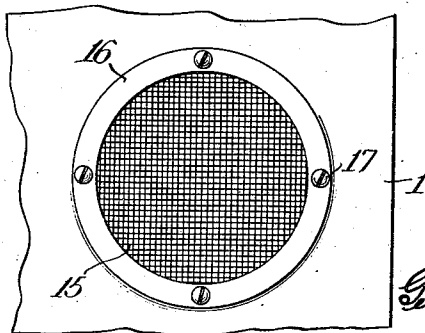


Fig. 5



Witnesses:
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UNITED STATES PATENT OFFICE.

GEORGE F. ATWOOD, OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO WESTERN ELECTRIC COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

SIGNALING APPARATUS.

1,000,572.

Specification of Letters Patent. Patented Aug. 15, 1911.

Application filed February 26, 1906. Serial No. 303,019.

To all whom it may concern:

Be it known that I, GEORGE F. ATWOOD, a citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Signaling Apparatus, of which the following is a specification.

My invention relates to electrical signaling apparatus, and more particularly to a telephone set adapted for use in locations where it is exposed in more than an ordinary degree to conditions tending to interfere with its proper operation.

My principal object has been to design a telephone set adapted for use in forts, and on the battle-field, as part of a telephone system employed in directing fire during battle, wherein it is necessary that the telephone sets be mounted on parapets and emplacements adjacent to the big guns, or even on the guns themselves. It will be appreciated that in an instrument of this character it is necessary so to construct and assemble the associated parts of the set that they will be given the greatest possible protection, not only against the mechanical disturbances and concussions due to the discharge of the heavy guns, but against rain and atmospheric disturbances as well, and against the entrance of insects to the delicate working parts of the apparatus when the set is used in exposed locations. To this end, and to the end that the resulting instrument may combine the maximum efficiency, accessibility, and ease of operation with the minimum liability of disarrangement of its working parts from the causes above mentioned, I have incorporated in the telephone set of my invention a number of features of novelty which will be more particularly described in the following specification and pointed out in the claims.

Referring to the accompanying drawings, Figure 1 is a perspective view of a telephone set embodying the features of my invention, a portion of the inclosing shell being broken away to show the interior arrangement; Fig. 2 is a front elevation of the set with the door of the shell open and partially broken away, and the front panel removed from the apparatus case; Fig. 3 is a plan view of the lower side of the inner apparatus case; Fig. 4 is a side sectional elevation of the set on line 4—4 of Fig. 2; and Fig. 5 is a detail

view of a portion of the bottom of the shell showing the screened opening therein.

The particular embodiment of my invention illustrated in the drawings comprises, in the present instance, an inclosing or protecting shell 1 of iron or other strong material, inclosing and protecting the telephone apparatus. The protecting shell, as illustrated, is preferably in the form of a heavy casting provided with lugs 2 for securing the same to a suitable support, which may be a parapet or emplacement adjacent to a large gun, or, if desired, to the gun itself. The top 3 of the protecting shell may be slightly rounded as shown, and caused to project slightly beyond the face of the shell to aid in shielding the apparatus mounted within the shell from rain and the like. The shell is provided with a heavy door 4 of metal, which, in the present instance, is secured to the shell by hinges 5, which comprise an upper and a lower lug extending from one side of the door and cooperating with corresponding lugs projecting from the side of the shell. Each of the hinges is completed by a pintle 6 which is permanently secured to one of the lugs (in the present instance, the lug associated with the shell) and has a loose connection with the other lug to serve as a fulcrum therefor. The hinged connection of the door with the shell is such that, when desired, the door may readily be removed from the shell to allow the greatest freedom of use of the telephone. The inner surface of the door is preferably concave or dish-shaped, while the edge of the shell which serves as a seat for the door is provided with a flange 7 upon which a gasket 8 of rubber or other suitable material is secured by the staples 9 to insure a watertight engagement when the door is closed. The door is provided with a locking member which comprises a handle 10 secured to a shaft 11 that passes through the door and has secured to its inner end a segmental shoe 12 having a cam surface on its upper side adapted to engage and cooperate with the inner side of the flange 7 which serves as a seat for the door. A pin 13 is carried at one end of the segmental shoe to serve as a stop to limit the rotation of the handle as it is turned to bring the segment into its locking position.

In the lower side of the shell 1 is an opening 14, the shell about the opening prefer-

ably being made somewhat thicker, as shown, in order to afford greater strength. Across this opening is secured a screen or grating 15, in the present instance by means of a ring 16 between which and the inside of the shell the screen or grating is clamped by means of screws 17 passing through the enlarged ring around the opening, and carrying nuts on their inner ends. The screen 15 is preferably of heavy wire better to resist mechanical injury, and of relatively fine mesh to prevent the entrance of insects to the interior of the shell. The shell is also provided with another and smaller opening 18 in the lower side thereof through which the conductors may be led to the apparatus mounted within the shell. This opening, which may also be provided with a strengthening rim, is preferably screw-threaded as shown.

Within the shell is located the telephone apparatus, and in the present embodiment of my invention this apparatus is mounted within and carried upon a case 19 secured to the inner walls of the shell, so as to be readily removable therefrom as a unit. As illustrated, the case 19, which may be of wood or other suitable material is provided with a removable side or panel 20 between which and the portion of the case which serves as a seat for the panel is interposed a gasket 21 of felt or like material to insure a weather and insect-proof joint when the panel is in place. The panel is secured to the case preferably by means of thumb screws 22 arranged to cooperate with screw-threaded lugs 23 secured to the interior walls of the case, the screws preferably being so related to their associated escutcheons that while they may readily be unscrewed from their cooperating lugs to permit the removal of the panel, they are held in the panel to avoid being lost.

The case 19 containing the telephone apparatus, as has been stated, is secured to the protecting shell in such a manner that it may readily be removed therefrom, and this, in the present instance, is accomplished by securing to each side of the case angle pieces 24, the projecting flange of each of which is adapted to slide in a corresponding groove or guideway in strips 25 projecting from, and, if desired, formed integrally with, the walls of the shell 1. In order to hold the case in position within the shell, the projecting flange of one or more of the angle pieces 24 may be slotted, as indicated at 26, to receive a pin 27 which may be secured to the inner wall of the shell by an eye and chain, the pin passing through a hole in the flanges of the guideway and through the slot 26 in the angle piece.

Within the case 19 is mounted the telephone apparatus, the character of which may be varied as desired, but which as

shown in the present instance comprises two cells of dry battery held in a pigeon hole 28 in one corner of the interior of the case, a condenser 29 secured to one wall of the case by means of a metal strap immediately beneath the pigeon hole containing the battery, a switch 30 comprising contact members actuated by a shaft passing through the lower wall of the case and carrying an operating lever or handle 31 at its outer end, a telephone bell or ringer 32 the electro-magnetic portion of which is mounted within the case while the gongs are secured to the lower wall of the case on the outside thereof, a generator 33 for producing alternating ringing currents, firmly secured to the lower and a side wall of the case, and having an operating handle passing out through the front panel 20 of the case, an induction coil 34 mounted on the upper wall of the case, and a switch 35 also mounted on the upper wall of the case and having an actuating rod or key 36 passing through the top of the case to the outside thereof, with its upper end in position to be engaged and depressed by a telephone receptacle carried on the top of the case.

In the use of the set certain of the apparatus mentioned above must be directly actuated from the outside of the case, and in order that this may be done without at the same time providing a path for the entrance to the case of rain, insects and the like, I make use of special construction to prevent the access of such disturbing elements. As to the generator, this consists, in the present instance, in providing a stuffing box secured to the front panel 20, comprising a centrally perforated washer or ring 37 lying within an annular escutcheon 38 with a ring 39 of felt or like suitable material between them, and with its inner edge bearing against the generator shaft where it passes through the panel. As to the telephone bell or ringer 32, I adopt a materially modified construction in order that the electro-magnet in the inside of the case may act upon the gongs on the outside without leaving any opening through the wall of the case, the substance of the modification being that motion is transmitted from the armature to the tapper of the bell by way of a shaft, instead of by the usual oscillating tapper arm. In the present instance, the electro-magnet of the ringer 32 lies flat on the bottom of the case with the shaft 54, which serves as a fulcrum for the armature of the magnet, extending transversely through the bottom wall, and carrying on its outer end a tapper arm 55 lying parallel with the wall and arranged to strike the gongs as the shaft is twisted by the armature. Where the shaft passes through the wall it is surrounded by a felt washer 56 held in place by an annular escutcheon.

The telephone bell is so mounted that its gongs may be secured on the outside of the case in proximity to the screened opening 14 in the bottom of the protecting shell, in order that the sound may readily be heard on the outside. I also provide special means for sealing the case where the operating rod or key 36 of the switch 35 passes through it. The rod or key is surrounded by a cylindrical collar 40, which passes through the upper wall of the case and which in a hollow space in its interior carries a helical compression spring encircling the actuating rod and holding it normally with its outer end elevated above the end of the collar, and in position to be depressed to actuate the switch. To permit the depression of the actuating rod or key to operate the switch, and at the same time prevent the entrance of moisture and the like into the case, I provide, in the present instance, a flexible diaphragm 41 of leather or like material, preferably treated to render it impermeable to moisture. This diaphragm is held in place by screws passing through a metal ring 42 which clamps the diaphragm to the top of the case, making a tight joint therewith.

Movably secured to the top of the case, preferably by the hinges 43 the members of which are fulcrumed upon each other by the rod 44, as illustrated, is a receptacle 45 adapted to receive the telephone instrument when the same is not in use. This receptacle may, as shown, be in the form of a pan of metal resting upon and normally held in an elevated position by the leaf springs 46 fastened at one end to the case and engaging the pan at the other end. A mat 46^a of insulating and cushioning material such as soft rubber may be laid in the bottom of the pan to prevent contact of the telephone with the pan. The upward movement of the pan is limited by means of the stops 47 carried upon the case, which engage lugs 48 secured to the sides of the pan. When the receptacle or tray 45 is depressed by the weight of the telephone it is caused to engage the top of the actuating rod or key 36 through the diaphragm 41 and, by depressing the rod, to actuate the switch.

The binding posts 49, which serve as terminals for the circuits of the apparatus within the case, and with which the wires from the outside are to be connected, are mounted in suitable positions on the outer wall of the case 19, in the present instance upon the lower wall. The switch 30 on the lower wall of the case, as has been stated, is provided with an actuating shaft which passes through the wall of the case and carries an operating handle or lever 31 on the outside thereof. The actuating shaft is journaled in the cylindrical barrel of an escutcheon 50 the enlarged flange of which is screwed to the outside of the case. The op-

erating handle or lever is arranged to move between two pins 51 serving as positive limit stops, and a metallic contact head 52 associated with each pin and arranged to be engaged by the operating handle at that end of its movement serves as a friction stop to hold the handle in the position to which it has been moved.

Upon the bottom of the case are mounted the feet 53 upon which the case containing the telephone apparatus is adapted to rest when it is removed from the protecting shell, the feet being so proportioned that the parts projecting from the lower wall of the case are held clear of the support upon which the case rests when it is removed from the shell. It will be noted that the apparatus case is thus adapted both for use within the shell, where it is provided with means for suspending it from the walls, and for use outside of the shell, where it has provision for resting it upon any suitable support. The relation of the parts is such that the case with its associated apparatus is held clear of the body of the protecting shell, in which position it is less likely to be injured by mechanical shocks such as result from the concussion of gun fire.

The telephone instrument, not shown, which may consist of a combined receiver and transmitter, and which may be connected by means of a flexible cord to the proper binding posts on the wall of the case, normally rests in the receptacle or tray 45 depressing the same and causing it to maintain the switch 35 actuated. When the telephone set is to be used, the door may be opened by giving the locking handle 10 a half revolution in a counter-clockwise direction, and, if desired, the door may be entirely removed by lifting it from its hinges. The distant station is signaled by turning the crank of the generator 33 and communication may then be had by means of the combined receiver and transmitter, which is lifted from the receptacle or tray for that purpose. Removing the telephone instrument from the tray automatically actuates the switch to establish the required connections. If for any reason the supply of current for the operation of the transmitter, which current is arranged in the present instance to be supplied normally over the line wires from some distance point, is interfered with or cut off, the user is able by throwing the operating handle 31 of the switch 30 from its right hand to its left hand position to connect in circuit the local dry battery mounted in the pigeon hole 28, which operates as an alternative source of current supply. In case any trouble should develop in the apparatus mounted within the case 19 requiring the repair or replacement of any part, the removable mounting of the case within the shell 1 enables it

readily to be removed therefrom as a unit without interfering with any of its circuit connections, and by unscrewing the thumb screws 22 the front panel may be removed and access quickly had to the interior of the case. When a station equipped with the apparatus of my invention is to be signaled, this may be done by causing the bell 32 to ring. The location of this bell in proximity to the opening in the underside of the shell enables its sound to be readily heard, while at the same time the screen 15 across the opening prevents the access of insects to the apparatus within the shell.

I claim:

1. In a telephone set, the combination with a switch, of telephone apparatus controlled by said switch, a movable receptacle adapted to support the telephone and be depressed thereby to actuate said switch, a support for said receptacle and a hinged connection between said support and said receptacle whereby the receptacle is adapted to be tilted back to permit access to the switch.
2. In a telephone set, the combination with a closed compartment containing the telephone apparatus, of a circuit controlling switch within said compartment, a receptacle external to said compartment adapted to support the telephone and to be depressed thereby, actuating means extending between said receptacle and said switch, and a diaphragm interposed between said switch and said receptacle adapted to maintain the closure of said compartment while permitting the actuation through it to said switch by said receptacle.
3. The combination with a closed compartment, of electrical apparatus mounted therein, a switch comprising contact parts secured to one of the walls of said compartment, an actuating key extending through said compartment and engaging said contact parts, a flexible diaphragm secured over the end of said key projecting through the outside of said wall, apparatus associated with said compartment on the outside thereof, and means external to said compartment automatically responsive to the manipulation of said apparatus for actuating said contact parts through the medium of said key.
4. In a telephone set, the combination with a protecting shell having an opening in the bottom thereof, of a case having apparatus mounted therein inclosed and removably supported by said shell, a telephone bell mounted in said case the gongs whereof

are secured to the bottom of said case in proximity to the aforesaid opening, and legs depending from the bottom of said case whereon the same is adapted to be supported when it is removed from said shell.

5. In a telephone set, the combination, with an outer inclosing shell, of a closed apparatus case removably supported within said shell and inclosing signaling apparatus and a switch, a movable receptacle upon the top of said case adapted to support the telephone apparatus and be depressed thereby to operate said switch, ringing apparatus including gongs secured to the under side of said case, and legs depending from the bottom of said case and projecting below said gongs whereon said case is adapted to be supported when removed from said shell.

6. In an artillery telephone set, the combination, with a massive metallic protecting shell, of a closed apparatus case inclosing signaling apparatus and a switch, said shell and case having cooperating supporting means whereby the case is removably supported in said shell clear of the interior walls thereof, a movable receptacle upon the top of said case adapted to support the telephone apparatus and be depressed thereby to operate said switch, ringing apparatus including gongs secured to the under side of said case, and legs depending from the bottom of said case and projecting below said gongs whereon said case is adapted to be supported when removed from said shell.

7. In an artillery telephone set, the combination, with a massive metallic protecting shell provided on its inner surface with projecting strips having guide-ways formed therein, of a closed apparatus case inclosing signaling apparatus and a switch, and having portions adapted to engage the guide-ways in said projecting strips whereby said case is removably supported within said shell clear of the interior walls thereof, a receptacle hinged upon the top of said case adapted to support the telephone apparatus and be depressed thereby to operate said switch, ringing apparatus including gongs secured to the under side of said case, and legs depending from the bottom of said case and projecting below said gongs whereon said case is adapted to be supported when removed from said shell.

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Witnesses:

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