April 14, 1925. 1,533,515

DE ELBERT A. REYNOLDS

SIGNALING SYSTEM

Filed Feb. 3, 1921 2 Sheets-Sheet 1

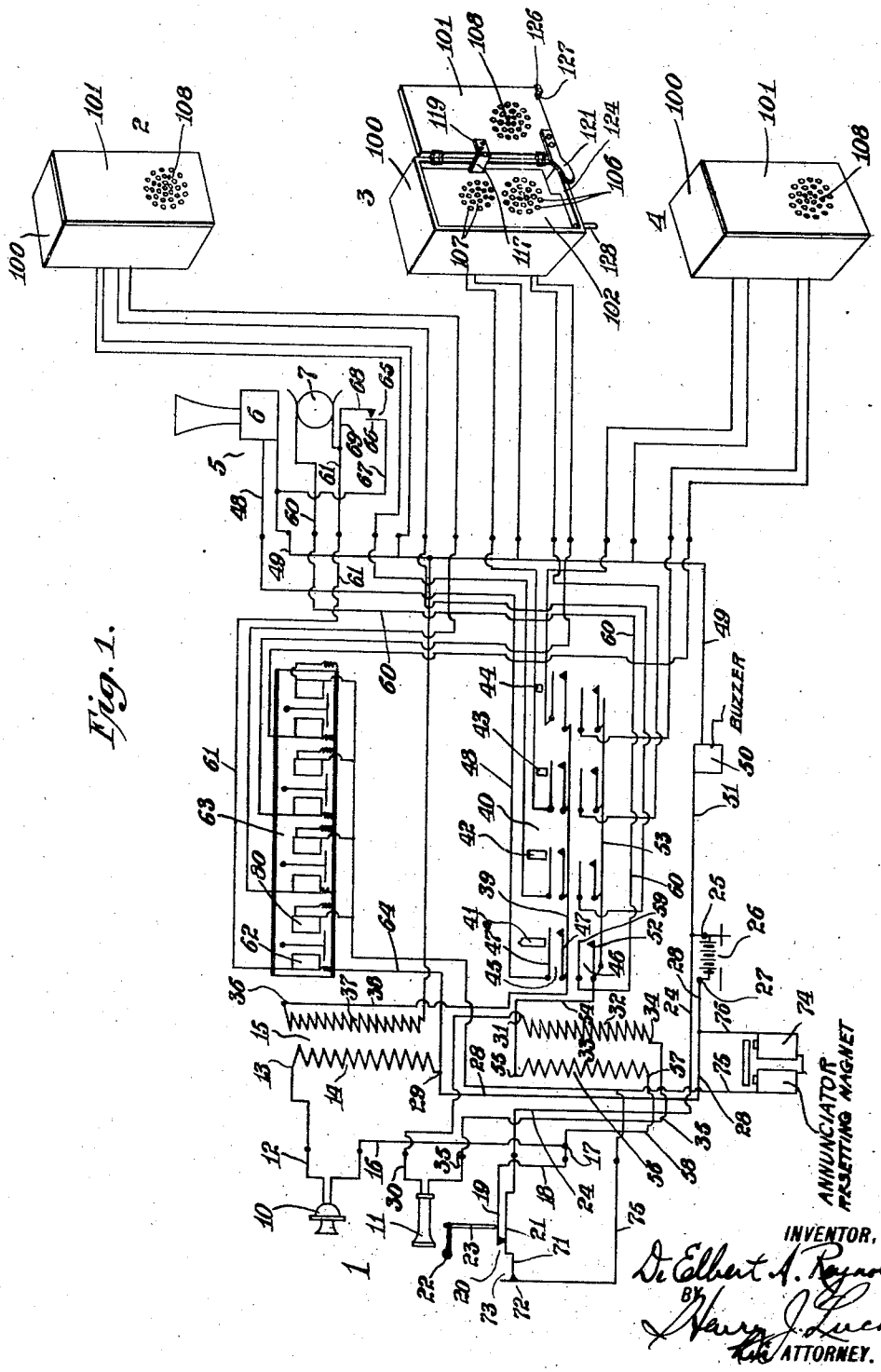


Fig. 1.

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Fig. 2.

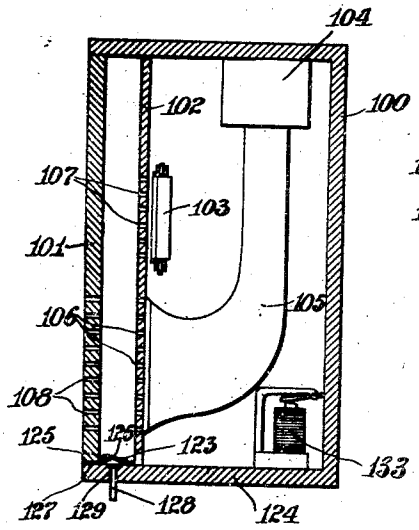


Fig. 3.

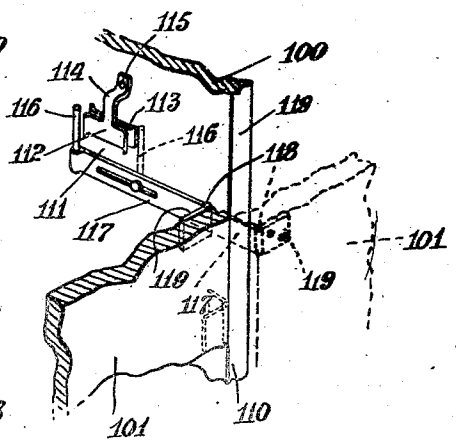
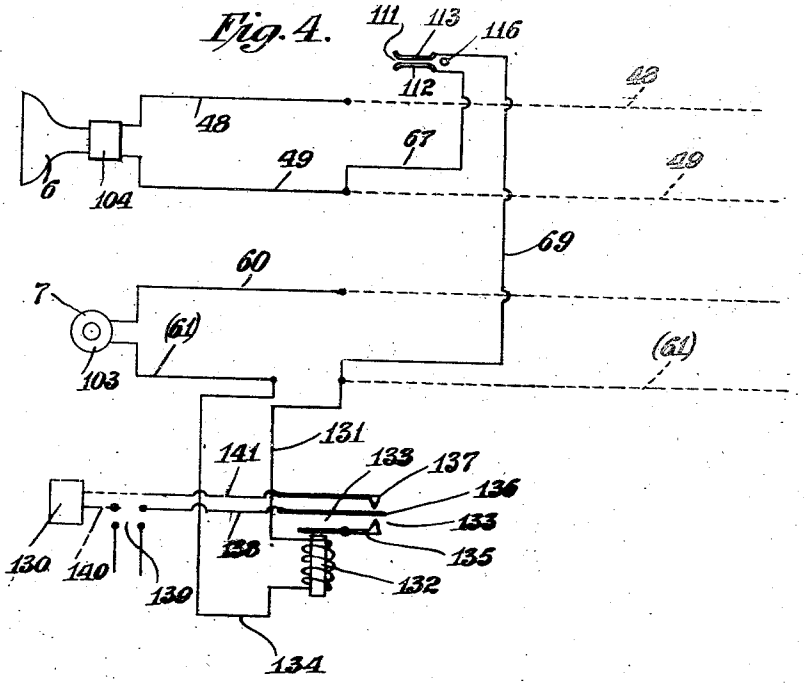


Fig. 4.



De Elbert A. Reynolds, INVENTOR.

BY Henry J. Locke, His ATTORNEY.

Patented Apr. 14, 1925. 1,533,515

UNITED STATES PATENT OFFICE.

DE ELBERT A. REYNOLDS, OF YONKERS, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO AUDIPHONE COMPANY OF AMERICA, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

SIGNALING SYSTEM.

Application filed February 3, 1921. Serial No. 442,051.

To all whom it may concern:

Be it known that I, DE ELBERT A. REYNOLDS, a citizen of the United States of America, residing at Yonkers, Westchester County, State of New York, have invented certain new and useful Improvements in Signaling Systems, of which the following is a specification.

This invention relates to improvements in signaling systems and is particularly directed to police call signaling systems.

An object of this invention is to provide a new and improved police call box for use in a signaling system whereby communication with headquarters from such call box is attained instantaneously.

A further object of the invention is to provide an improved police call box to enable the police officer or roundsman to establish communication with headquarters without the use of a key and without requiring the use of either hand for signaling or for transmitting to and receiving communication from headquarters.

A further object of the invention is to provide a police call box which is closed on all sides excepting at the front at which a door is provided and closure means for the door, which is concealed from general observation but which is readily accessible to the police officer or other reliable party who can be entrusted with the information, whereby the closure means can be operated without the use of a key and by mere contact of the elbow, knee or the foot of the officer for releasing the door.

A further object of the invention is to provide a signaling and communication system whereby the headquarters operator is enabled to announce directions or instructions within distinct audition at a distance from the call box, notwithstanding that the outer door of the call box may be in closed position, whereby members of the police corps or civilians are instantly informed of the flight of criminals or other miscreants, or other information.

In accordance with my invention, the system provides for call boxes distributed at the desired locations, preferably connected by independent wiring circuits with the switch board at headquarters, each such call box being preferably provided with an outer door suitably mounted on concealed hinges and closed by suitable closure means extending exteriorly of the call box but substantially concealed from the general public and operated in a positive and reliable manner by mere contact; each call box being equipped with a loud-speaking receiver and further with a sensitive transmitter operated without any special effort on the part of the police officer or roundsman and thereby affording him free use of both hands to insure the arrest of a desperate criminal or a prisoner struggling to escape, or under other conditions.

Upon the release of the closure means, the outer door swings open, and automatically operates at the headquarters switchboard an electric signal, instantly indicating the call box operated, enabling the headquarter's operator to connect in the local receiver and transmitter of the operated call box and instantly establish full connection of the local receiver and transmitter without any act on the part of the officer or roundsman. Such local receiver and local transmitter is preferably of the loud talking type to enable the communication to be had within any regulatable distance from the call box. Preferably, the receiver and transmitter are protected within the box by means of a partition and perforations are provided in the partition to facilitate the passage of sound to the transmitter and from the receiver. The wiring of the apparatus of the box is also fully protected.

Preferably the outer door of each call box is provided with perforations to transmit therethrough sounds emitted by the receiver and thereby enable the headquarters operator independently of the operation of the door of any desired call box to send out information to be heard at a distance from the call box. Signaling means is also provided for each call box to be set in position by the headquarter's operator to indicate to any member of the police force to proceed to the call box for instructions.

Further features and objects of my invention will be more fully understood from the following description and the accompanying drawings, in which—

Fig. 1 is a diagram of the wire circuit of a preferred form of central or headquarter's

switchboard, the transmitter and receiver therefor, and wiring and switching connections with the respective sets of local transmitters and receivers of the distributed call boxes; in this figure is also shown in perspective view three call boxes, one with its outer door closed; another with its outer door opened, and a third with the outer door closed.

Fig. 2 is a central vertical sectional view of a call box and its main interior parts, and also showing an electrical relay under the control of the central operator for throwing into circuit a lamp, buzzer, siren or the like to call to the box a distant roundsman for instructions from headquarters.

Fig. 3 is a perspective detail view on an enlarged scale of a hinged door for a call box and a contact arrangement for automatically signaling to headquarters from the call box; and

Fig. 4 is a detail diagram of the transmitter and receiver and also of the relay circuit connections of a local call box.

Referring to Fig. 1 the circuit arrangement is that of a preferred system of wiring connections between the central or headquarters switchboard indicated at 1 and a selected number of call boxes or other local stations distributed in location and in number, as may be desired, the particular wiring diagram showing the connections for four such call boxes, such preferred wiring system corresponds to that described and claimed in the application of Egbert A. Reynolds, entitled "Intercommunicating telephone systems," filed July 16, 1920 and bearing Serial No. 396,795.

Three of such call boxes or local stations are indicated in perspective view and designated respectively 2, 3, 4 and a fourth call box or local station indicated at 5 is illustrated to show diagrammatically its receiver 6 and transmitter 7 and the respective electrical circuits. The respective sets of transmitter and receiver of each of the local stations 2, 3, 4 and such additional number as may be desired, correspond to the set of transmitter 7 and receiver 6 of the station 5 and are similarly connected and operated, as is more fully set forth hereinafter.

Preferably, the receiver 6 of each local box is of the loud speaking type such as that disclosed in the patent of Egbert A. Reynolds and myself, entitled "Sound reproducing instrument," issued July 31, 1923, No. 1,463,372, whereby communication is emitted therefrom within any desired, regulatable distance from the receiver of from say 30 to 50 feet or more, if desired.

Whereas the particular arrangement shown in the wiring diagram of Fig. 1 is fully set forth in the said application of Egbert A. Reynolds, Serial No. 396,795, it is understood that my call box and other apparatus is applicable for use with other forms of circuits and wiring whereby the local stations are automatically connected in with the central station and whereby the central operator is enabled independently of the operation of any local station or call box to communicate at will with any local stations or call boxes as desired.

For the purpose of explaining the operation of my invention as connected in a circuit arrangement set forth in said application Serial Number 396,795, entitled "Intercommunicating telephone systems," I have shown in Fig. 1 at central or headquarters, indicated at 1, the central transmitter 10 and the central receiver 11. The transmitter 10 is connected on one side by the lead 12 to one terminal 13 of the primary coil 14 of the transformer 15 and on the other side to the lead 16 connected at 17 to the conductor 18 connected to contact 19 of the switch 20. The contact 19 cooperates with the contact 21, whereupon the central operator removing his receiver 11 from its usual pivoted hook 22, the stem 23 is depressed by its spring (not shown) to cause contact 19 to engage the contact 21 and connect in the central transmitter and receiver on the line, as set forth more fully in the said application Serial No. 396,795, and also referred to generally hereinafter.

The contact 21 is connected by the conductor 24 to the positive terminal 25 of the battery 26 and the negative terminal 27 of the battery 26 is connected by the conductor 28 to the remaining terminal 29 of the primary coil 14.

The central receiver 11 is connected on one side by the lead 30 to the terminal 31 of the secondary coil 32 of the transformer 33, the opposite terminal 34 of the secondary coil 32 being connected by the conductor 35 to the opposite terminal of the central receiver 11.

One terminal 36 of the secondary coil 37 of the transformer 15 is connected by the conductor 38 to the strap 39 of the switch box 40 located at central and embodying switches for respectively connecting in any desired call box. In the switch box 40, I have indicated four switch buttons designated 41, 42, 43, 44, for respectively connecting in with central the set of receiver and transmitter at the call boxes 5, 2, 3 and 4, respectively.

As is more fully set forth in the said application, Serial No. 396,795, each switch button upon depression closes two sets of contacts 45, 46, the contacts of one set connecting in the circuit, the local receiver and the contacts of the other set connecting in the transmitter of the local call box. Such sets of contacts for the respective local sets or call boxes are arranged and operated in

the same manner and accordingly the same reference numbers are used to designate the similar parts.

The contact 45 comprises the contact 47 connected to the strap 39 and also the contact 47ª connected by the line conductor 48 to a terminal of the loud speaking receiver 6 of the local station or call box 5, the opposite terminal of the receiver 6 being connected by the line conductor 49 to one terminal of the buzzer 50, or electric call bell or other like signaling device located at central or headquarters, the opposite terminal of which is connected by the conductor 51 to the positive terminal 25 of the battery 26. Each contact 46 comprises a contact 52 connected to the strap 53 and connected by the conductor 54 to the terminal 55 of the primary coil 56 of the induction coil 33, its opposite terminal 57 being connected by the conductor 58 to the conductor 16 connecting with one terminal of the central transmitter 10.

The other contact member 59 of each contact 46 is connected to the line conductor 60 to one terminal of the transmitter 7 at the local station or call box, its opposite terminal being connected by the line conductor 61 to one side of the actuating magnet 62 in the annunciator box 63 corresponding to the designation of the local station or call box. The annunciator 63 is located at central or headquarters as on the switchboard, on a desk or the like.

The opposite side of the magnet 62 is connected by the lead 64 to the terminal 29 of the primary coil 14 of the induction coil 15.

By means of such circuit as thus described, upon the central operator removing his receiver 11 from its hook 22 and by pressing the proper switch button of the switch box 40 corresponding to the call box desired to be thrown into circuit, the set of receiver and transmitter at the call box is instantly ready for communication in both directions between the call box and central.

The switch 65 indicated at the station 5 represents a switch operated upon opening of the door of the call box as is set forth more fully hereinafter, or may represent a push button or like manually operable circuit closing means for connecting in and actuating a buzzer 50 or the like at central or headquarters. One contact member 66 of the contact 65 is connected by the lead 67 to the line conductor 49 connected on one side of the signaling device 50, whereas the other contact member 68 of the contact 65 is connected by the lead 69 to the line conductor 61.

Upon the central operator completing communication with any call box, the circuit is broken automatically, upon placing the central receiver 11 on its hook 22, thereby leaving the stem 23 to open contact between the contact members 19, 21 of the switch 20, and upon the stem 23 being moved upwardly, the contacts 71, 72 of the switch 73 are brought into momentary engagement to connect in and energize the reset magnet 74 for throwing out of operative position the depressed switch button corresponding to the call box with which communication has been had. The circuit of connection of the reset magnet and the detailed construction and operation of the same is fully set forth in said application Serial No. 396,795; as shown the contact member 72 of the switch 73 is connected by the conductor 75 to one terminal of the reset magnet 74, this opposite terminal being connected by the conductor 76 to the conductor 28 connected to the negative terminal 27 of the battery 26, whereas the contact member 71 of the switch 73 is connected by the conductor 24 to the positive terminal 25 of the battery 26.

Upon the closure of the contacts of the switch 73, the restoring magnet 80 of the annunciator box 63 is operated to reset to neutral the indicator corresponding to the call box with which communication has been had.

Referring to Fig. 2, each call box embodies a casing 100 provided with the door 101 which is preferably hinged on canceled hinges as is indicated at the call box 3 in Fig. 1. Within the interior of the casing 100, I provide the partition 102 for permanently enclosing the transmitter 103 and receiver 104. The partition may be mounted to be removed. The horn 105 of the receiver 104 extends toward the partition 102, and perforations 106 or other openings are provided in the partition 102 to afford free emission of the sounds reproduced by the receiver 104. At 3 in Fig. 1 I have indicated the outer door 101 in open position and it will be readily perceived that the sounds from the receiver 104 are readily transmitted through the openings 106.

The partition 102 is also provided with the perforations or other recesses 107 in suitable proximity to the transmitter 103 whereby upon the door 101 of the call box being opened, the voice of the patrolman or other party is transmitted through the perforations 107 into the transmitter 103 and thus through the line to the headquarters operator.

I have also provided perforations 108 of the outer door 101 of the call box to enable communication to be sent from central or headquarters and reproduced by the receiver 104 and emitted through the perforations 106 and thence through the perforations 108 exteriorly of the box, thereby affording instantaneous communication between the headquarters operator and any patrolman or other party within audition range of the call box. Such communication,

it will be noted, is made independently of the opening of the outer door of the call box and independently of any act on the part of the patrolman or other operator at the call box.

In Fig. 3 I have illustrated in enlarged view a casing 100 in this instance with its door 108 hinged to the right-hand wall 110 of the casing 100. Such hinge is preferably of the inwardly or concealed type of any approved arrangement. Within the casing 100, as for example, see Fig. 3, on the inner face of its lateral wall 110, I have arranged the contact device 111, and as shown, comprises the oppositely disposed spring contact members 112, 113, carried by the bracket 114, secured by a screw 115, or otherwise to the wall 110, said contact members 112, 113, coacting with the movable contact 116 carried on the link 117, pivoted at 118 to the plate 119, secured to the inner face of the door 101.

The circuit connection of the contact device 111 corresponds to that of the contact device 65, of Fig. 1.

The full outline of the door and the contacts shown in Fig. 3, is the position of the same when the door is in its closed position, and upon opening the door 101, the contact 116 is brought into temporary electrical connection, whereby any suitable signal 50, see Fig. 1, at the central or headquarters switchboard is actuated to indicate the operation of the door of the particular call box or local station. This circuit connection is broken when the door is fully opened. The signal 50 is similarly operated when the door is being closed.

It will be noted that the particular circuit arrangement shown in Fig. 1 secures the actuation of the annunciator during the stage of opening the door to set the indicator of the annunciator corresponding to the call box operated.

Preferably, the door of the call box is opened automatically upon the operation of suitable means substantially concealed from the general public but readily accessible from the exterior by a police officer, roundsman or other party to whom the information can be given with reliance and operable by mere physical contact and with but slight effort by any available portion of his body, as by his elbow, knee, foot or the like.

For such purposes, I provide the spring 121, see call box 3, Fig. 1, which is compressed upon closing the door 101 and upon release of the closure means of the door automatically opens the door 101.

As one example of closure means for the door I illustrate in Fig. 2, the spring locking arm 123 suitably secured at one end to an inner face of the bottom wall 124 of the casing 100 and having at its free end a locking lug 125 coacting with the locking lug 126 of the plate 127 carried on the inner face of the door 101 to lock the door 101 when pushed against the action of the spring 121 to closed position. The pin 128 is seated in the recess 129 in the lower wall 124 of the casing 100 and projects exteriorly a sufficient distance to be readily engaged by the elbow, knee or foot of a person to be pushed upwardly and thereby raise the spring arm 123 to disengage its lug 125 from the lug 126 and allow the door 101 to be thrown open by the spring 121.

It will be noted that the spring catch or closure means of the door of the call box is concealed when the door is closed to preclude tampering with the same.

Also, the hinges are preferably of the form as to be concealed when the door of the call box is opened. The casing of the call box is preferably of weather proof or water proof material and its parts are tightly fitted.

I also provide means whereby central or headquarters is enabled to actuate a signal at any desired call box for the purpose of attracting the attention of a distant officer, roundsman or of any civilian. In Fig. 4 I have shown one form of circuit connection of such signaling device 130, which may be suitably located on or adjacent the call box and may be in the form of a light having a distinctive color, a buzzer, siren or the like. Such signaling device may be operated at central or headquarters by depressing the key or plunger of the switch box thereby connecting a relay across the line conductors 49, 61, respectively corresponding to the line conductors 49, 61 of the circuit diagram of Fig. 1, the line conductor 61 in the modification shown in Fig. 4 being disconnected at a location adjacent the transmitter 103 of the call box as follows. The lead 131 is connected at one end of line conductor 61 and connects with one end of the coil 132 of the relay 133, the opposite end of the coil 132 being connected by the conductor 134 to the remainder of the line conductor 61 and to one terminal of the transmitter 103. The pivoted armature 135 of the relay 133 is arranged with respect to the normally separated spring contacts 136, 137, to close the same upon energization of the winding 132 of the relay 133. The spring contact 136 is connected by the lead 138 to a terminal of the switch 139 for connection in any suitable electric lighting circuit or other outside circuit, or to a storage battery or the like, the other terminal of the switch being connected by the lead 140 to one terminal of the signaling device 130, its opposite terminal being connected by the conductor 141 to the other spring contact 137. Accordingly, upon closure of the switch at central or headquarters corresponding to the particular call box, the coil 132 of the relay 133 is energized, causing closure of contact between

the spring contacts 136, 137 and thus energizing the signaling device 130.

In the said pending application Serial No. 396,795, the preferred form of the switch buttons or plungers of the switch box 40 as set forth is such that but one switch key or button can be depressed at a time.

Upon the close of conversation between central or headquarters and any call box, I have arranged means automatically operated upon the placing of the central or headquarter's receiver 11 on its hook 22 to actuate a reset or restoring device for restoring to normal the depressed switch key and for restoring to neutral position the "drop" of the annunciator. Such arrangement is set forth in detail in the said application of Egbert A. Reynolds, Serial Number 396,795 and comprises the switch 73 whose contacts 71, 72 are momentarily closed to energize the reset magnet indicated diagrammatically at 74, one terminal of which is connected by the conductor 75 to the contact 72 and its opposite terminal connected by the conductor 76 to the negative pole 77 of the battery 26.

In the circuit arrangement shown in the diagram of Fig. 1, the switches controlling the talking circuits are located solely at the central or headquarters and thus solely within the control of the central headquarters operator and fully out of the control of operation at any call box. Such provision of means is effected by arranging the talking circuits as permanently closed from a contact member of the switch corresponding to the call box, over the line conductor, to and through the receiver of the call box, back over the line conductor to the other contact member of the switch; and similarly over the line conductors to and through the transmitter of the call box, and back to the switch of the central or headquarters switch box.

It will be noted that the circuit of the relay effects a permanent closed connection between the portions of the line conductor 61, that is to say, over the conductor 131, coil 132 and conductor 134, which connection is entirely independent of the circuit of the signal device 130 and of the signaling device 130 itself. Accordingly, in the event that the signaling device be out of order or tampered with or its circuit destroyed, the talking circuit between the call box or central and headquarters is notwithstanding maintained.

Whereas I have described my invention by reference to specific forms thereof, it will be understood that many changes and modifications may be made without departing from the spirit of the invention, as defined by the appended claims.

I claim.

1. A police call system comprising a plurality of call boxes, each of said call boxes being provided with a loud speaking receiver and a sensitive transmitter, a central station comprising a transmitter and receiver therefor, and further comprising a set of individual switches respectively for said plurality of call boxes and separate circuit means for connecting the loud speaking receiver and the sensitive transmitter of any individual call box with its said individual switch and said central transmitter and said central receiver respectively independently of the remainder of said individual switches.

2. A police call system comprising a plurality of call boxes, each of said call boxes being provided with a loud speaking receiver and a sensitive transmitter, each call box having a door provided with perforations, said door being disposed between its sensitive transmitter and the exterior of the call box, a central station comprising a transmitter and receiver therefor, and further comprising a set of individual switches respectively for said plurality of call boxes and separate circuit means for connecting the loud speaking receiver and the sensitive transmitter of any individual call box with its said individual switch and said central transmitter and said central receiver respectively independently of the remainder of said individual switches.

3. A police call system comprising a plurality of call boxes, each of said call boxes being provided with a loud speaking receiver and a sensitive transmitter, each call box having a door provided with perforations, said door being disposed between its sensitive transmitter and the exterior of the call box, a central station comprising a transmitter and receiver therefor, and further comprising a set of individual switches respectively for said plurality of call boxes and separate circuit means for connecting the loud speaking receiver and the sensitive transmitter of any individual call box with its said individual switch and said central transmitter and said central receiver respectively independently of the remainder of said individual switches, signaling means disposed at said central station and means for actuating said signaling means upon the opening of a door of one of said local call boxes.

4. A police call system comprising a plurality of call boxes, each of said call boxes being provided with a loud speaking receiver and a sensitive transmitter, each call box having a door provided with perforations, said door being disposed between its sensitive transmitter and the exterior of the call box, a central station comprising a transmitter and receiver therefor, and further comprising a set of individual switches respectively for said plurality of call boxes

and separate circuit means for connecting the loud speaking receiver and the sensitive transmitter of any individual call box with its said individual switch and said central transmitter and said central receiver respectively independently of the remainder of said individual switches, common signaling means disposed at said central station and means for actuating said signaling means upon the opening of any of said doors.

5. A police call box comprising a casing substantially closed on all sides excepting one, a door provided with perforations for closing said one side, a loud speaking receiver and a sensitive transmitter disposed within said casing and a partition closing said one side of the casing, said partition being provided with recesses to permit sounds emitted exteriorly of the casing to impinge on said transmitter and sounds reproduced by said receiver to be transmitted exteriorly of said casing.

6. A police call box comprising a casing substantially closed on all sides excepting on one side, a removable partition closing said one side, said partition being provided with perforations, a transmitter and a receiver disposed within said partition, a door for said one side, said door being provided with perforations and means for opening said door.

7. A police call box comprising a casing substantially closed on all sides excepting on one side, a partition closing said one side, a loud speaking receiver and a sensitive transmitter disposed within said partition and said casing, said partition being provided with two sets of perforations respectively for said receiver and said transmitter, a door for said one side, said door being provided with perforations corresponding to the perforations in said partition for said receiver and means for opening said door.

8. A police call system comprising a plurality of local call boxes, each call box having a casing substantially closed on all sides excepting on one side, a removable partition closing said one side, said partition being provided with perforations, a transmitter and a receiver disposed within said partition, a door for said one side, said door being provided with perforations and means for opening said door, a central switchboard, a transmitter and receiver therefor, wiring connections connecting respectively said transmitter and receiver and a signal device actuated upon opening the door of any one of said call boxes.

9. A police call system comprising a plurality of local call boxes, each call box having a casing substantially closed on all sides excepting on one side, a removable partition closing said one side, said partition being provided with perforations, a transmitter and a receiver disposed within said partition, a door for said one side, said door being provided with perforations and means for opening said door, a central switchboard, a transmitter and receiver therefor, wiring connections connecting respectively said transmitter and receiver of each call box with said central transmitter and receiver and a signal device actuated upon closing the door of any one of said call boxes.

10. A police call system comprising a plurality of local call boxes, each call box having a casing substantially closed on all sides excepting on one side, a loud speaking receiver and a sensitive transmitter disposed within said partition and said casing, said partition being provided with two sets of perforations respectively for said receiver and said transmitter, said door being provided with perforations corresponding to the perforations in said partition for said receiver means for opening said door, and a signal device actuated upon opening the door of any one of said call boxes.

In testimony whereof I have signed this specification this 31st day of January, 1921.

DE ELBERT A. REYNOLDS.