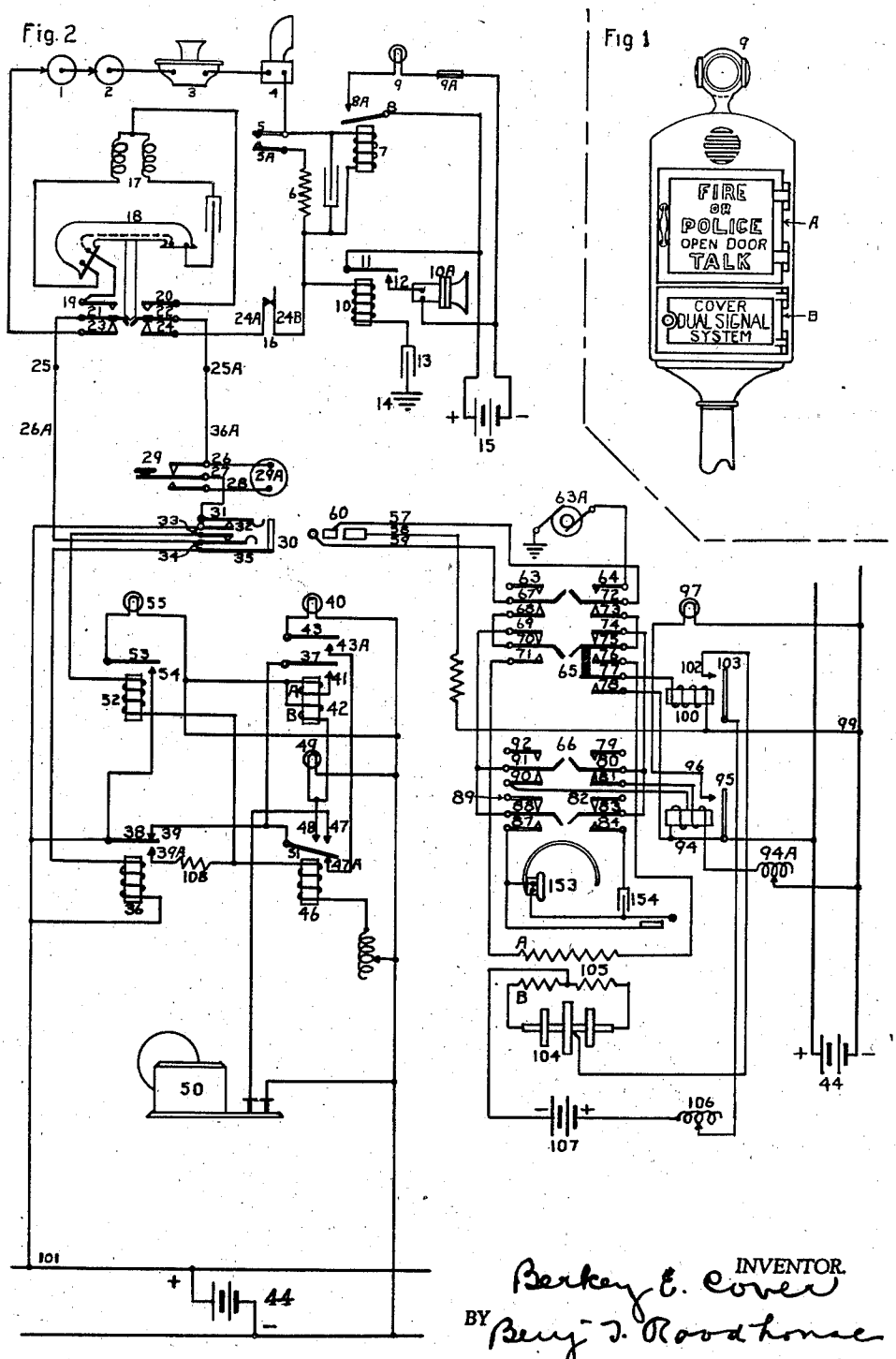
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COMBINED FIRE ALARM, POLICE ALARM, AND INTERCOMMUNICATING SYSTEM

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COMBINED FIRE ALARM, POLICE ALARM, AND INTERCOMMUNICATING SYSTEM

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My present invention relates to the provision of a combined fire alarm, police alarm and intercommunicating system between street boxes and a central office, and my objects are to provide facilities which will permit official or non-official individual members of the community to communicate from a street box with the central office, without any technical knowledge, either orally or by means of coded signals, and will also permit the operator at central office to create signals at a particular street box for the purpose of calling the attention of officials in the vicinity of the box and will permit the central operator to communicate orally with the person who answers the signals at the street box.

A further object is to provide such facilities in a form which will permit of their economical installation and which, when installed, will secure and assure great simplicity and dependability in operation without any interference between the divers signals.

As will hereinafter be seen, these combined facilities are secured through the use of a single metallic circuit between the street box and central office; that the nature of the call, whether relating to fire or police matters, is automatically disclosed at central office through the instrumentality of either the particular door opened at the street box or the particular code signal operated; that all that is required for communication from the street box is the opening of an unlocked door and either normally talking in response to questions or the turning of the arm of a plainly labeled code signal device, or the opening of a locked door and normally telephoning; and that all that is required for the central operator to communicate with the street box are the normal operations of plugging in a suitable connector and the manipulation of two usual central office or switch board switches.

I have attained the heretofore mentioned objects and results by means of the arrangement of instrumentalities illustrated in the accompanying drawing, in which—

Fig. 1 is an elevation of a desirable form of street box for employment with my organization, and

Fig. 2 is a schematic diagram of my system or organization for signal transmission and intercommunication.

Similar reference characters refer to similar parts throughout the respective views.

It has constantly been my object to depart as little as possible from the principles and instrumentalities employed in standard telephony, and to maintain the system constantly in condition to permit the employment of standard telephony thereon or thereover, and to link my system with standard telephone equipment, so that the messages and signals may be transmitted, when necessary and desirable, over standard telephonic systems by merely placing the plugs forming a portion of the standard systems in appropriate sockets or receptacles provided in my organization.

The street box, it will be seen from Fig. 1, is provided with an upper unlocked door A which may be readily opened by any individual of the public. Immediately behind the door A, as shown schematically in Fig. 2, are mounted a microphone 3 and spring rotated code transmitters 1 and 2, which respectively control the origination of coded police and fire alarm signals. Within the compartment behind the door A is also mounted a loud speaker 4. Below the door A is a locked door B, behind which is installed an ordinary cradle or monophone 18, which consists of a removable hand piece carrying both a receiver and transmitter and a stand for receiving the hand piece provided with the usual switching arrangement so that the lifting of the hand piece cuts the monophone in on the line and the replacing of the hand piece on the stand cuts the monophone out of the line.

As most clearly seen in Fig. 2 there is provided in the street box a switch having a blade 5 and contact 5a which is closed when the unlocked door is opened, the purpose of which will be hereafter described, and switch 16, which is momentarily opened when the locked door is opened, so that in co-operation with facilities provided at the central office ordinary telephony over the cradle or monophone may be conducted without interference from the other apparatus in the street boxes.

Upon the top of the street box is mounted a signal lamp 9 and within the street box is mounted a standard flashing switch 9a in association with the circuit of the lamp 9. Within the street box is also mounted a siren or other aural signal 10a and a local battery or connection for supplying power 15 to the lamp 9 and sound signal 10a. For controlling the operation of the lamp I provide a relay 7 and for controlling the operation of the siren or aural signal I provide a relay 10.

The battery 44, which normally energizes the line, has a lead 101 from the positive side thereof running to a contact 32, which is normally in contact with the ring contacting blade 31 of a

standard tip, ring, and sleeve contact jack. The ring blade 31 of the jack is connected through a testing switch (reference characters 26 to 29a inclusive) with the incoming contact 22 in the base of the monophone normally in contact with terminal 24 connected through blades 24a and 24b of the switch 16 through the winding of relay 7 with terminal 5 of the switch which is closed when door A of the street box is opened.

The circuit proceeds from terminal 5 through the loud speaker 4, microphone 3, code transmitters 2 and 1 through contact 23 and blade 21, held in contact with contact 23, when the monophone is on its stand, thence to the tip contacting blade 34 of the jack of which the ring contacting blade 31 is a portion, and from thence successively through contact 33, relay 52 and relay 46 to the opposite negative pole of battery 44.

It will be seen by an examination of the diagram in Fig. 2 that the circuit leading from switch 16, momentarily opened when the locked door B is opened, through solenoid 7, through contact 5 to the loud speaker 4, is by-passed through a suitable resistance 6 and contact 5a of the switch, closed when the door A is opened, so that immediately upon the opening of the door A the energy through the relay 7 is reduced so as to permit of the falling of the blade 8 of the relay out of contact with terminal 8a of this relay and the closing of the local circuit through the lamp 9 and flasher 9a.

It will thus be seen that the light 9 upon the street box will flash while door A is open and can also be made to flash from central office by any interruption of the line circuit from ring blade 31 heretofore referred to.

The aural signal 10a at the street box controlled by the relay 10 is caused to operate by sending an alternating current out over the line, in a manner hereafter to be described, through ring blade 31 and switch 16 through relay 10, the return of which is grounded at 14 through a condenser 13. When an alternating current is supplied to relay 10 from central station the local circuit through the aural signal 10a is closed and the siren is caused to operate.

When by-pass resistance 6 is cut into the line by the closing of contacts 5 and 5a, which occurs upon the opening of the door A, sufficient additional energy flows through the relay 52 to pick up the blade thereof and close the circuit through the switchboard light 55 from the positive side of battery 44 through terminals 53 and 54 of relay 52 and light 55 back to the negative pole of battery 44 which insures the energizing of relay 46 while light 55 is burning.

Relay 46 holds up, or is sufficiently energized to positively operate with the ordinary line current, and when the current is increased by closing the by-pass circuit through the resistance 6 it stays held up.

When the line current, heretofore described, is interrupted at the street box either momentarily through switch 16, when door B is opened, or through the operation of either of the code transmitters 1 or 2, relay 46 is de-energized. This immediately puts energy on the trouble light 49 at the switchboard from the positive side of battery 44 through blade 38 and contact 39 of relay 36 and blade 51 and contact 48 of relay 46 through the trouble light 49. This contact also sends energy through the end 42B of relay 42 back to the negative side of battery 44. The energizing of end 42B of relay 42 pulls blades 37 and 43 of relay 42 into contact respectively with terminals 41 and 43a. The closing of the circuit between blade 37 and terminal 41 locks relay 42 in closed position, no matter what might befall the circuit through the trouble light 49 until relay 36 is energized to interrupt the circuit between blade 38 and terminal 39.

The de-energizing of relay 46 also places positive energy from the battery 44 through blade 51 on terminal 47 which closes the circuit through the code recorder 50 back to the negative side of the battery.

As heretofore described blade 43 and terminal 43a have been locked in closed position through the energizing of relay 42 through contact between blade 37 and contact 41 so that a momentarily interrupted or intermittent current through relay 46 causes the flashing of both the trouble lamp 49 and the signal light 40 through blade 51 and contact 47a at central office.

To recapitulate: The opening of door A at the street box causes the lighting of lamp 55 at the central station and either the operation of the code transmitters 1 or 2 or the opening of door B causes the flashing of trouble light 49 and signal light 40 at the central station.

When the central operator receives a signal the central operator may, if desired, if the signal be a code, permit of its automatic reception by the code receiver 50. The central operator, however, may also insert the answering plug 60 into the receiving jack 30. The mere insertion of the plug 60 in the jack 30 breaks the line circuit between the blade 31 and contact 32 and blade 34 and contact 33, which kills light 55 and its associated mechanism. The mere insertion of the plug 60 in the jack 30 also places energy from the negative side of battery 44 through sleeve contact 58 of plug 60 and sleeve contact of jack 30 upon relay 36 which is connected directly with the positive side of battery 44 which breaks contact through blade 38 and terminal 39 of relay 36 and de-energizes both blades 51 of relay 46 and blade 37 of relay 42, thereby killing signal light 40. In the energized position of relay 36 contact is made between blade 38 of that relay, energized by direct connection with the positive side of battery 44, through terminal 39a, so as to re-energize relay 46 and extinguish the trouble light 49.

To recapitulate: Upon the insertion of plug 60 in jack 30, lights 55 and 40 are rendered inoperative and trouble light 49 is extinguished.

We will now proceed to the description of the mechanism manually operated at central station for sending signals to the street box and telephonic communication therewith.

So far as manipulation is required, central office equipment is standard and usual in all respects. The switchboard, as is usual, besides its row of sockets, one from each station, it is provided with jacks as exemplified by jack 30, heretofore described, with call light 55, alarm or police call light 40 and trouble light 49 suitably related with their respective jack and standard tip, ring and sleeve contact plugs, such as 60 heretofore described. There are a pair, as is usual, of standard switchboard cam keys 65 and 66. Cam key 65 is of the non-locking type in which the handle stands vertically in normal position and may be either pushed forward, away from, or pulled towards the operator in accordance with what result the operator wishes to secure. The cam key 66 is known as the locking type and remains in the position in which it is

placed until it is manually moved to another position.

The mere insertion of the plug 60 into the jack 30 opens the circuit between blade 31 and contact 32 and contact 33 and blade 34, and, as heretofore described, places negative energy from the battery 44 on the sleeve of jack 30, which, through the functioning of the relay 36, as heretofore described, cuts out lamps 55, 40, 49 and the code recording mechanism 50. Central operator, provided with head set 153, pushes the lever of cam key 66 forward, which closes the circuit between contacts 87 and 88 and 83 and 84. Contacts 80 and 81 and 90 and 91 remain closed in both the normal or vertical and in the forward position of cam key 66. The closing of contacts 80 and 81 closes a circuit from the negative pole of battery 44 through the variable resistance 94a through cord supervising relay winding 94 through contacts 80 and 81, through contacts 74 and 75, through contacts 73 and 72 to the ring contact 57 of plug 60, from whence negative energy from the battery goes out over the line through blade 31 heretofore described.

Positive energy from battery 44 proceeds through a portion of the relay winding 94 through contacts 90 and 91, through contacts 69 and 70, through contacts 68 and 67 to the tip 59 of plug 60 and thence through blade 34 out over the line, as heretofore described. The closing of contacts 83 and 84 and 87 and 88 closes the head set across the circuit just described.

Central operator now presses the lever of cam switch 65 backwardly, which causes contacts 69 and 70 and 74 and 75 to open and contacts 70 and 71 and 75 and 76 and 77 and 78 to close. The closing of contacts 77 and 78 closes the circuit through the winding 100 of the loud speaker control relay which closes the circuit from the positive side of the battery 107 through variable resistance 106, blade 103, contact 102 to the carbon buttons of a two button microphone 104, and thence to a central tap in the primary 105 of the microphone transformer back to the negative side of the battery 107.

The closing of the contacts 75 and 76 connects one side of the secondary of the microphone transformer through contacts 72 and 73 with the ring contact 57 of the plug 60 and the closing of contacts 70 and 71 connects the opposite end of the secondary of the microphone transformer through contacts 68 and 67 with the tip 59 of the plug 60, thereby closing the circuit from the secondary of the microphone transformer through the circuit of the street box. The operator is now equipped to talk to a party at the street box by means of loud speaker 4. Such a communication is an inquiry as to what is the nature of the call, and as soon as this inquiry is made the operator restores cam key lever 65 to a normal position, which closes contacts 69 and 70 and 74 and 75 and opens contacts 77 and 78, which opens the microphone circuit through the action of the relay 100 and restores the circuit through the head phones and the street box, thereby permitting the operator to hear a communication from or by means of microphone 3 located at the street box. Thus by moving the lever of cam key 65 forward to talk and normal to listen, loud speaker communication is provided between central office and the street box.

If central operator pulls the lever of cam key 66 forward the circuit will be opened between contacts 90 and 91 and 80 and 81 and the battery and head phone 153 will be separated from the line. This will cause the operation of relay 7 at the street box and the flashing of the light 9 at the street box. If the central operator pulls the lever of cam switch 65 forward the circuit out over the line will be broken between contacts 67 and 68 and 72 and 73, and the circuit will be closed between contacts 72 and 64, which sends an alternating current from a source thereof 63a to the ring contact 57 of plug 60 and from thence through blade 31 out over the line where it operates the relay 10 to cause the operation of the sound signal 10a at the street box.

It will therefore be seen that the central operator may cause the flashing of the light 9 at the street box so as to call the attention of a policeman or squad car thereto by pulling the lever of cam key 66 forward, and if the matter be very urgent the central operator can, at the same time, cause the operation of the siren or sound signal 10a by pulling forward the lever of cam key 65.

When door B is unlocked and open the circuit is closed, as heretofore described, through the switchboard lamp 40 by the opening of the circuit through the momentary operation of switch 16. The lifting of the cradle or monophone 18 from its carriage breaks the line circuit at 21 and 23 and 22 and 24, cutting out the circuit through the other apparatus located at the street box and closing circuits at 19 and 21 and 20 and 22 through the monophone 18. Therefore, when the light 40 is received and if it is not in a characteristic code form, as would be caused by operation of code transmitters 1 and 2, central operator is aware that the call is coming from the monophone and inserts into jack 30 a standard answering plug instead of the plug 60, as heretofore described, as the telephone over the cradle phone 18 is standard in all particulars.

Having described my invention what I claim is new and desire to secure by Letters Patent is:

1. An alarm and an inter-communicating system comprising a plurality of separated stations and a complete metallic circuit therebetween, a pair of independently, automatically operated means located at one of said stations, one of said means for changing the resistance in said circuit and the other of said means for interrupting said circuit and three interacting means located at the other of said stations, one responsive to an increase of current flow in said circuit, one responsive to the interruption of said circuit and the third, the action of which is initiated at its station of location, which blocks the operation of said other two means.

2. An alarm and an inter-communicating system comprising a central and remote station and a complete metallic circuit therebetween, a pair of independently, automatically operated means located at said remote station, one of said means for changing the resistance in said circuit and the other of said means for interrupting said circuit, and three interacting means located at the said central station, one responsive to an increase of current flow in said circuit, one responsive to the interruption of said circuit and the third, the action of which is initiated at its station of location, which blocks the operation of said other two means.

3. An alarm and an inter-communicating system comprising a central and remote station and a complete metallic circuit therebetween, a pair of independently, automatically operated means located at said remote station, one of said means for changing the resistance in said circuit and the other of said means for interrupting said cir-

cuit, and a third locally installed control means responsive to the operation of said other two locally installed means whereby its action may be initiated by either of said means or by interrupting said circuit at central station.

4. An alarm and an inter-communicating system comprising a central and remote station and a complete metallic circuit therebetween, a pair of independently, automatically operated means located at said remote station, one of said means for changing the resistance in said circuit and the other of said means for interrupting said circuit, and a third locally installed control means responsive to the operation of said other two locally installed means whereby its action may be initiated by either of said means or by interrupting said circuit at central station and a fourth locally installed control means responsive to a grounded alternating current transmitted over a leg of said circuit and operable alone or co-temporaneously with said last mentioned means.

5. An alarm and an inter-communicating system comprising a central and remote station and a complete metallic circuit therebetween, a pair of independently, automatically operated means located at said remote station, one of said means for changing the resistance in said circuit and the other of said means for interrupting said circuit, and a third locally installed control means responsive to the operation of said other two locally installed means whereby its action may be initiated by either of said means or by interrupting said circuit at central station, and an independently powered signal means, the action of which is controlled by said last mentioned means.

6. An alarm and an inter-communicating system comprising a central and remote station and a complete metallic circuit therebetween, a pair of independently, automatically operated means located at said remote station, one of said means for changing the resistance in said circuit and the other of said means for interrupting said circuit, and a third locally installed control means responsive to the operation of said other two locally installed means whereby its action may be initiated by either of said means or by interrupting said circuit at central station and a locally powered signal means, the action of which is controlled by said last mentioned means.

7. An alarm and an inter-communicating system comprising a plurality of separated stations and a complete metallic circuit therebetween, there being included in said system and installed at one of said stations means responsive to an increase of current in said circuit and other means responsive to an interruption of said circuit, said last mentioned means being provided with facilities for locking itself in operation and a third means operative to prevent the operation of said first two operative means.

8. An alarm and an inter-communicating system comprising a plurality of separated stations and a complete metallic circuit therebetween, there being included in said system and installed at one of said stations means responsive to an increase of current in said circuit and other means responsive to an interruption of said circuit, said means being related so that the operation of the means responsive to an increase of current during its operation will prevent the operation of said other means.

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