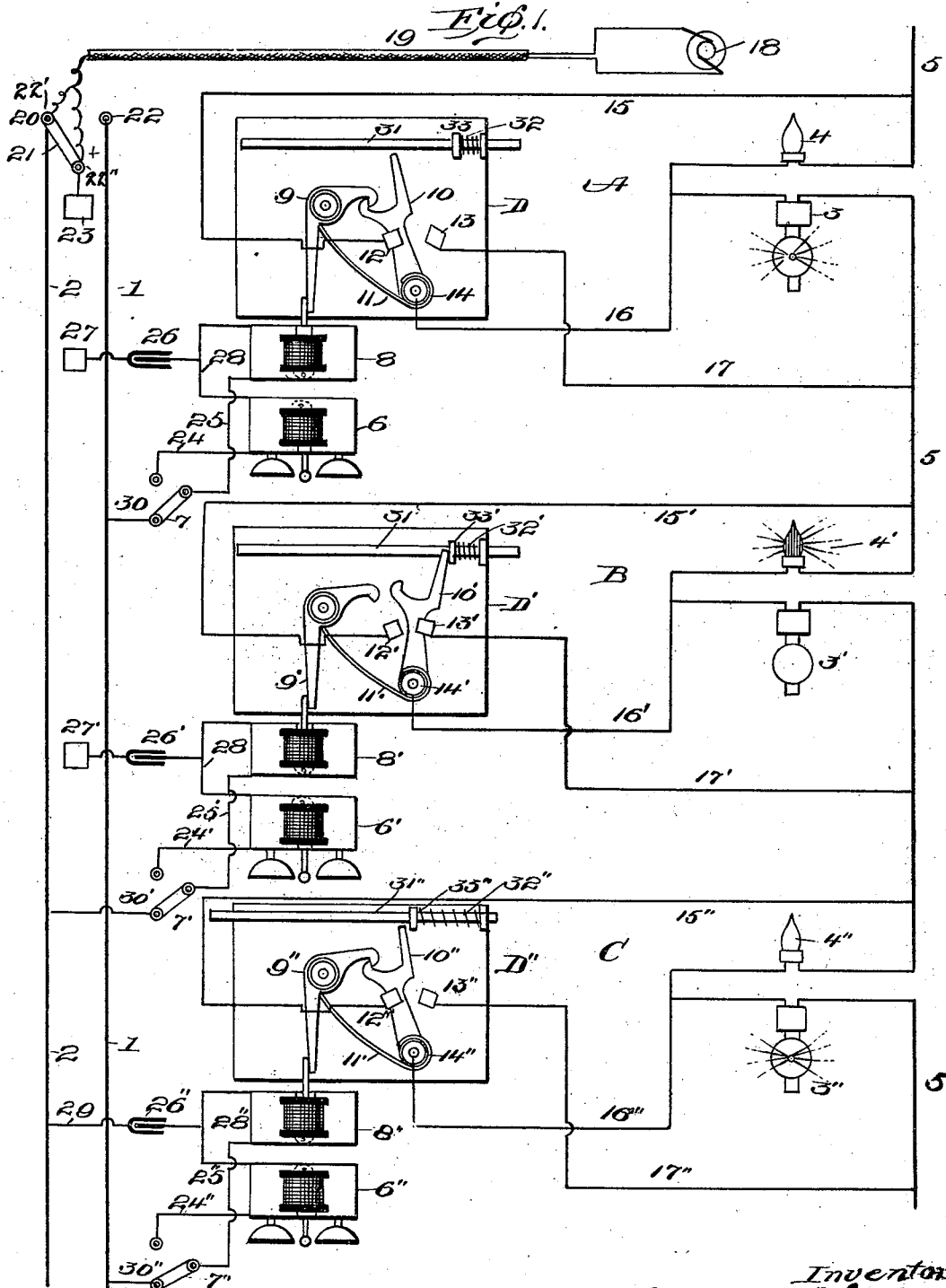


S. C. SHAFFNER.
SIGNAL APPARATUS.

(Application filed Jan. 9, 1902.)

(No Model.)

3 Sheets—Sheet 1.



witnesses:
J. M. Fowler
C. D. Bull

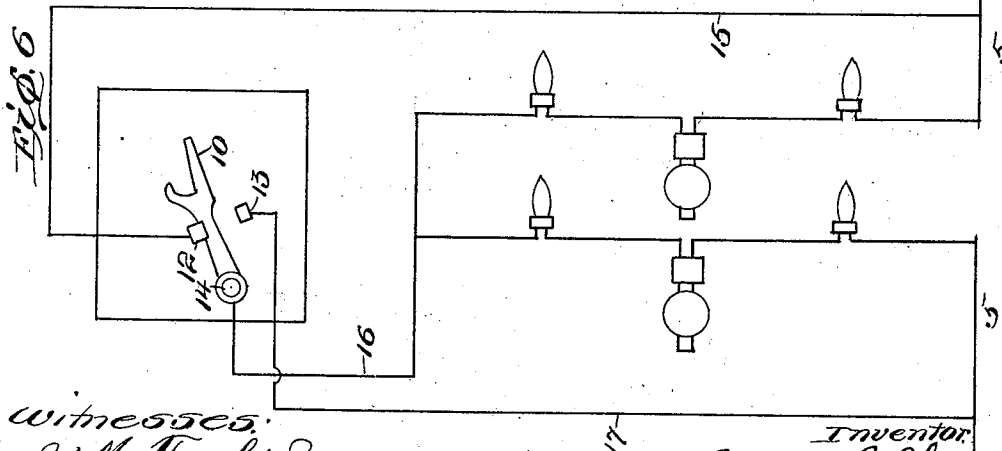
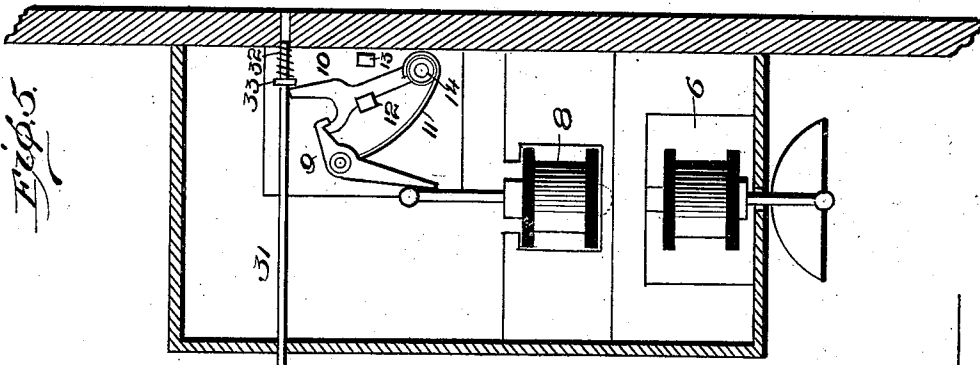
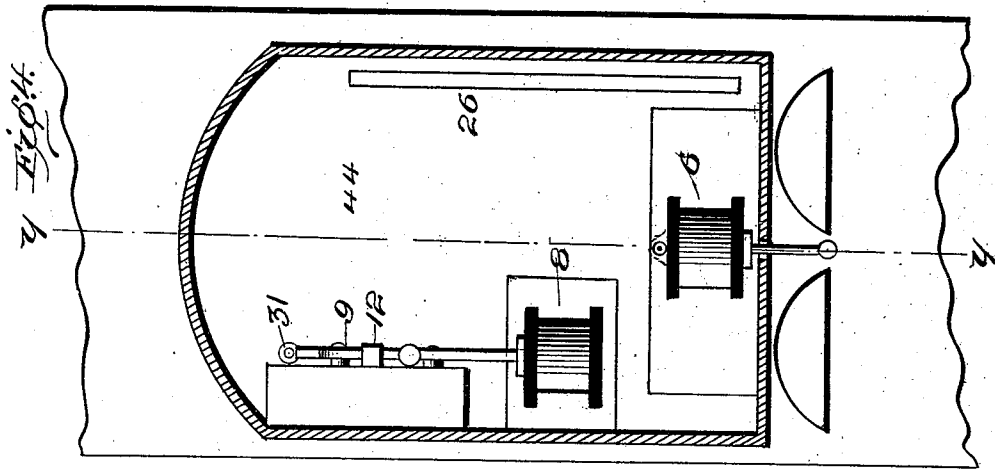
Inventor
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 Att'y

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3 Sheets—Sheet 3.



witnesses:
J. Mc. Fowler
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UNITED STATES PATENT OFFICE.

SAMUEL C. SHAFFNER, OF MOBILE, ALABAMA.

SIGNAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 699,582, dated May 6, 1902.

Application filed January 9, 1902. Serial No. 89,062. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL C. SHAFFNER, a citizen of the United States, residing at Mobile, in the county of Mobile and State of Alabama, have invented certain new and useful Improvements in Signal Apparatus; and I do declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to apparatus comprising a means of signaling to police officers by means of which a signal may be sent over the usual telephone or signal system from a central station to any street telephone or signal box calling from a distance the police officer who is on duty in the district in which the box is located. The signal will be audible by day and visual by night and will be operated by an electric current sent over the usual telephone or signal circuit by the operator in the central station. The day-signal will consist of a powerful electric bell directly operated by current sent over the wires of the telephone or signal system. The night-signal will consist of means whereby a street light or lights adjacent or removed from the street telephone or signal box may be extinguished and a signal light or lights (preferably colored) ignited by the action of a switch operated by current sent over the telephone or signal circuit. This switch will be positively actuated by an electrically-operated device from the central station and will remain in operative position until reset by the act of opening the telephone or signal box door by the officer in answering the call.

The invention relates to means whereby three or more street-boxes or sets of boxes may be actuated through one or double wire telephone or signal system to the use of condensers in the circuit to prevent loss of current and to the use of a separate box for holding the switch and actuating mechanism placed some distance from the telephone or signal box, so as to reduce the liability of accident to the police officer from high-tension street-lighting currents.

The invention also relates to details of improvement, as will more fully appear in this specification and the claims appended.

In order to better understand the nature

of my invention, attention is called to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 represents a diagram of the actuating and lighting circuits of three different street-boxes. Fig. 2 is a front view of the preferred form of street-box. Fig. 3 is a section on the line *xx* of Fig. 2. Fig. 4 is a front view of a modified form of box. Fig. 5 is a section on the line *yy* of Fig. 4; and Fig. 6 is a diagram of the light-circuits, showing a modification of Fig. 1.

In all the several views like parts are designated by similar letters and numerals of reference.

Fig. 1 represents a diagram of the circuits, signals, and switches of three street-boxes, (indicated by the letters A, B, and C, respectively,) controlled by a circuit in the wires 1 and 2 of the main telephone system. In the description of this figure I will designate the same parts in the three systems of boxes by the same numerals of reference, differentiating the parts in box B by the addition of a prime-mark (') and in box C by a double prime (''). In this figure the box A is supposed to be in the normal condition and the street-lamp 3, adjacent thereto, is burning and the signal-lamp 4 extinguished. The switch of the box B is in the position it will assume after a signal has been sent—viz., the street-lamp 3' is extinguished and the signal-lamp 4' lighted. In both boxes the door is closed. In the box C the door is supposed to be open, such action, as will be hereinafter described, resetting the switch and also extinguishing the signal-light 4'' and relighting the street-lamp 3''. After the box-door is closed the parts will assume the position illustrated at A. The box A is shown as being controlled by a circuit which passes through the wire 1 and ground 27. Box B is controlled by a circuit which passes through the wire 2 and ground, and box C is controlled by a circuit which passes through both wires 1 and 2 in multiple, thus forming three systems of boxes. The number of boxes in each system may be multiplied indefinitely; but to prevent confusion only one of each class is illustrated. At each box and controlled therefrom is an arc-light 3' 3'' of the street-service 5, and an incandescent signal-light 4' 4'' 4''' also in the same circuit. The

signal-lights have preferably colored globes. The street-lighting circuit 5 is shown as being in series; but multiple circuits may be used and both street and signal lights may be arc-
 5 lights or both may be incandescent lights, or a combination of the two kinds may be employed, as is shown in Fig. 6. The lights may be located adjacent to the street-box, or either
 10 or both may be removed therefrom, or two or more lights may be controlled from each box, as is shown in Fig. 6. At each box is a controlling-switch, (shown generally at D D' D''), a bell 6 6' 6'', and a three-pole switch 7 7' 7'' of the usual form to cut in either bell or light
 15 operating mechanism. The bells 6 6' 6'' are preferably polarized. The controlling-switch is actuated by a polarized vibrator 8 8' 8'', similar to the striking mechanism of the bell. This vibrator is arranged to trip the switch
 20 D D' D'' by engaging with a latch 9 9' 9'' against the tension of a spring 11 11' 11'' and change contact from the plate 12 12' 12'' to the plate 13 13' 13'' in each switch.

14 14' 14'' are contacts at the pivoting-point
 25 of the switch-arms 10 10' 10''.

The lighting-circuit at box A is by way of the wire 15, contact 12, arm 10, contact 14, wire 16 to street-light 3 and back to main 5, short-circuiting the signal-light 4. In the box
 30 B the switch-arm 10, shown as being released in the manner to be hereinafter described and forced by its spring 11' to a position to engage with the contact 13', the circuit will be by signal-lamp 4', wire 16' to contact 14',
 35 arm 10' to contact 13', thence by wire 17' to main 5, short-circuiting the lamp 3, which will not burn. In the box C, the switch parts being the same as in box A, the circuits will be the same—viz., street-light 3'' will be burning
 40 and signal-light 4'' will be extinguished. It will be noticed that the wires 15 15' 15'' act as short circuits for the signal-lamps 4 4' 4'' when the switch-arms 10 10' 10'' are in contact with the points 12 12' 12'' and that the
 45 wires 17 17' 17'' serve the same purpose for the street-lamps 3 3' 3'' by way of the arms 10 10' 10'' and the contacts 13 13' 13'', the wires 16 16' 16'' serving as common returns.

The exciting-current for the circuits 1 and
 50 2 is generated in any manner, as by a magneto-electric machine 18. Any suitable source of alternating current of slow frequency and sufficient intensity may be used, it being understood that the wires 1 and 2 form part of
 55 the police telephone or signal system and are always charged. The usual police telephone or signal apparatus, with automatic signal, is located in each box.

19 is a double flexible wire; 20 20, two plugs
 60 connected together at 21', and 22 22' 22'' three sockets connected to wires 1 and 2 and the ground 23. The sockets are located at the apices of an imaginary equilateral triangle, so that the plugs 20 20 may be adjusted to a
 65 combination of any two sockets and form a circuit to actuate the proper switch or bell.

The controlling-circuits are arranged as fol-

lows: At box A the switch 7 is connected to the wire 1 by a wire 30, one contact of the switch connecting by a wire 24 to the bell 6
 70 and the other contact connecting by a wire 25 to the vibrator 8, both afterward meeting at the condenser 26 through the wire 28. The other pole of the condenser connects with the
 75 ground at 27. With the switch in the position shown the circuit will be through the vibrator 8. At box B the circuits are the same, with the exception that the wire 2 connects with the switch 7' by the wire 30'. In
 80 box C both ends of the circuit are in contact with the wires 1 and 2 by the wires 29 and 30'. It is to be noted that a condenser is located in each box-circuit, so that the telephone system will not be short-circuited. It
 85 follows that box A will be controlled by a circuit which passes through the wire 1 and the ground, that box B will be controlled by a circuit flowing through the wire 2 and ground, and that box C will be controlled by a circuit
 90 flowing through both wires 1 and 2. As shown in Fig. 1, the sockets 22' 22'' are connected with wire 2 and ground 23, so that box B is in circuit. It is obvious that boxes A and C may be placed in circuit by shifting
 95 the plugs 20 20 to the other contacts 22' 22''.

As before described, the switch-arms 10 are held in contact with the plate 12 by the latch
 100 9 against the tension of the spring 11. Upon the latch being released from the arm by the action of the vibrator 8 it will be moved to engage with the contact 13, as shown at box
 105 B, Fig. 1. The arm is returned to its first position by mechanism actuated by the opening of the door of the box, which mechanism is to this extent automatic. As shown in Fig.
 110 1, this mechanism consists of a rod 31, mounted so as to freely slide above the free end of the arm 10. One extremity of the rod 31 is arranged to be engaged by the closing of the door. The rod is normally retracted by a
 115 spring 32.

33 is an offset on the rod, adapted to engage with and move the arm 10 during the retraction of the rod 31.

As shown at boxes A and B, the door is sup-
 115 posed to be closed. At box C it is open to allow the telephone or signal to be used. Upon the door being opened the spring 32', shown at box C, will force the rod 31'' outward, causing the offset 33'' to engage with the arm 10''
 120 and move it from engagement with the contact 13'' to the contact 12'' and cause it to engage with the latch 9'' and be there held against retraction. Upon the door being closed the rod will be moved to the position shown at
 125 boxes A and B, which closing of the door will not affect the position of the arm 10 until the latch 9 is actuated, as at box B.

The preferred mechanical arrangement of the switch is shown in Figs. 2 and 3, in which
 130 most of the mechanism is in box 34, arranged some distance above the usual telephone or signal box 35. This is to place the switch in a separate box, thus avoiding all danger to

the person using the telephone or signal box by the action of high-tension street-lighting currents. As shown in Fig. 2, the bell 6 is horizontal. The vibrator 8 is vertical and is arranged immediately in front of the condenser 26. The bells or gongs are sufficiently large to make an audible signal capable of being heard several city squares. The control-circuit comes into the box 34 at one side near the top, and the wires are secured to the insulator 36. The street-circuits 15 16 17 enter the box from the opposite side and are secured to an insulator 37. By arranging the two circuits on the opposite sides of the box there is less danger of short-circuiting the two systems.

In Figs. 2 and 3 the rod 31 is vertical and the switch-arm 10 horizontal, a modification of the arrangement illustrated in Fig. 1. The rod 31 is actuated by mechanism contained in the telephone or signal box 35. This mechanism consists of a bell-crank lever 38, mounted in a bracket 39 and connected to a short horizontal rod 40. The spring 32 is connected to the bell-crank lever in lieu of the direct connection shown in Fig. 1. 41 is an adjusting-screw for the spring. The parts are so arranged that the door 42 will engage when closed with the pin or rod 40, move the bell-crank lever upon its pivot against the tension of the spring 32, and will cause the rod 31 to fall. Upon the door being opened the spring 32 will move the lever 38 and elevate the rod 31, causing the offset 33 to engage with the free end of the arm 10, raising it to its elevated position. The rod 31 passes through a casing 43 to protect it and also the circuit-wires 1 and 2 to the telephone within the lower box. The bell-crank lever 38 and actuating mechanism are so disposed within the box as to be out of the way of the usual telephone.

In the modification illustrated in Figs. 4 and 5 the signal-switch is arranged in the same box with the telephone, the box being sufficiently enlarged to permit this to be done. The rod 31 is arranged in somewhat the same manner as illustrated in Fig. 1 and previously described in connection therewith—viz., the rod 31 is horizontal and has an encircling spiral spring 32 and an abutment or lug 33, which engages the free extremity of the switch-arm 10. A sufficient space is left at 44 for the usual telephone instrument. This is not a preferred construction, unless the street-lighting system be of low tension.

The operation of the entire system will be obvious, it being understood that an audible or visual signal is actuated in any of the desired stations in the manner described, which signal remains in operation until the door of the box is opened, when the mechanism will be returned to the normal position.

In this specification I have described the mechanism for releasing or tripping the street-light switch as being polarized. This device, as before described, preferably con-

sists of the striking mechanism of a bell with the gongs removed. The advantage of this arrangement is twofold. First, I am enabled to secure a very powerful and reliable releasing mechanism, which is already on the market, which with but slight change may be used in my device. Second, the blow given by a polarized actuating mechanism is much harder than could be secured if the actuator were not polarized. This is of great importance, as the switch-retaining latch may be constructed to yield to a comparatively heavy blow only, thus making accidental releases impossible by the action of the wind on the signal or lighting wires or by a passing trolley-car.

In the foregoing specification I have described my invention as used for a police-signal system; but I desire it to be understood that my invention may be used with any other system of signaling.

It is evident that modifications of constructions and combinations herein described may be made by the skilful mechanic without departing from my invention, and such departures from what is herein set forth not involving invention I consider as within the terms of my claims.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a signal apparatus, the combination with the electric street-lighting system, of the street telephone or signal system, and a switch operated by the latter for affecting the former.

2. In a signal apparatus, the combination with the electric street-lighting system, of the street telephone or signal system, and a switch operated by the latter for affecting the former, and mechanical means for resetting the switch.

3. In a signal apparatus, the combination with the electric street-lighting system, a street signal-box, an electrically-operated switch therein for affecting the street-lighting system, and a mechanical connection between said box and switch for resetting the latter.

4. In a signal apparatus, the combination with the electric street-lighting system, a street signal-box, an electrically-operated switch therein for affecting the street-lighting system, and a mechanism controlled by the opening of the box-door for resetting the switch.

5. In a signal apparatus, the combination with the street-lighting system, a street signal-box, an electrically-operated switch therein, controlling mechanism for said switch, a street-lamp in the street-circuit, a signal-lamp in shunt therewith, electrical connections between said switch and signal-lamp so that the operation of the switch will extinguish the street-lamp and ignite the signal-lamp, and mechanical connections between said box and switch for resetting the latter.

6. In a signal apparatus, the combination with the street-lighting system, a central office, the street-signal controlled therefrom, a series of street signal-boxes thereon, 5 switches within the boxes electrically operated from the central office, the said switches affecting the street-lighting system, and mechanical connections between said boxes and switches for resetting the latter.

10 7. In a signal apparatus, the combination with the street-lighting system, a central office, a two-wire street signal system controlled therefrom, a series of street signal-boxes, some of said boxes being connected 15 with one or the other wire and the ground, and other boxes being connected with both wires, switches within the boxes electrically operated from the central office, the said switches affecting the street-lighting system, 20 and mechanical connections between said boxes and switches for resetting the latter.

8. In a signal apparatus, the combination with the street-lighting system, a central office, a two-wire street signal system controlled 25 therefrom, a series of street signal-boxes, some of said boxes being connected with one wire and the ground, and the remainder being connected with the other wire and the ground, switches within the boxes electrically 30 operated from the central office, the said switches affecting the street-lighting system, and mechanical connections between said boxes and switches for resetting the latter.

9. In a signal apparatus, the combination 35 with the street-lighting system, a central office, a two-wire street signal system controlled therefrom, a series of street signal-boxes, some of said boxes being connected with the first wire and the ground, other of said boxes 40 being connected with the second wire and the ground, and the remainder being connected to both wires, switches within the boxes electrically operated from the central office, the said switches affecting the street-lighting system, and mechanical connections between 45 said boxes and switches for resetting the latter.

10. In a signal apparatus, the combination with the street-lighting system, a central office, a street signal system controlled therefrom, a series of street signal-boxes thereon, switches within the boxes for affecting the street-lighting system, a polarized actuating 50 device for each switch in circuit with the street-signal system, a condenser in each box, means for passing a suitable actuating-cur-

rent of electricity over the signal system for energizing the actuating device, and mechanical connections between each box and switch for resetting the latter. 6c

11. In a signal apparatus, the combination with the street-lighting system, a central office, a street signal system controlled therefrom, signal-boxes thereon, a switch and an audible alarm within the box, both being 65 electrically operated from the central office, the said switch affecting the lighting system, and mechanical connections between said box and switch for resetting the latter.

12. In a signal apparatus, a signal-box, a 70 door, a switch, the said switch having a movable arm, a latch, electrically-operated means for actuating the latch to release the arm, and mechanical connections actuated by the door for returning the arm to engagement with 75 the latch.

13. In a signal apparatus, a signal-box, a door, a switch, the said switch having a movable arm, a latch, electrically-operated means for actuating the latch to release the arm, a 80 rod actuated by the door having an offset or lug for returning the arm to engagement with the latch.

14. In a signal apparatus, a signal-box, a door thereon, a switch-box, a switch therefor, 85 said switch having a movable arm, and an electrically-operated latch therefor, and mechanical connections between said box-door and switch-arm for returning it to engagement with the latch. 90

15. In a signal apparatus, a signal-box, a door thereon, a switch-box, a switch therefor, said switch having a movable arm and an electrically-operated latch therefor, a movable 95 rod connecting the two boxes, and engaging with the switch-arm, and a bell-crank lever within the signal-box actuated by the door of the latter.

16. In a signal apparatus, the combination with the street-lighting system, a street signal-box, a switch therein for affecting the street-lighting system, a latch for holding the switch in signaling inoperative position, polarized means for tripping the latch, and mechanical means for resetting the switch. 105

This specification signed and witnessed this 7th day of January, 1902.

SAMUEL C. SHAFFNER.

Witnesses:
 H. W. SHIEBS,
 L. S. RUBIRA.