(No Model.)

J. C. WILSON.

POLICE SIGNAL SYSTEM.

No. 486,206. Patented Nov. 15, 1892.

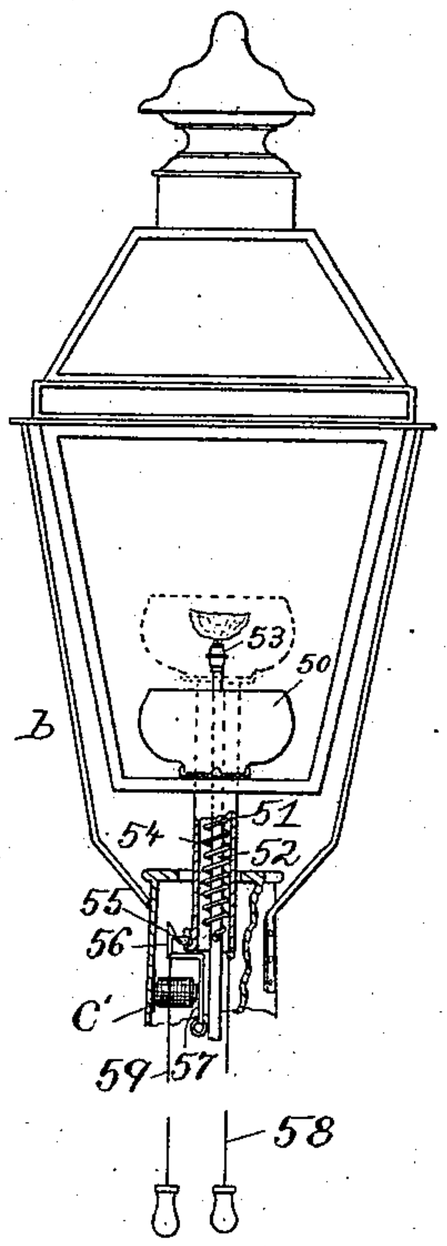
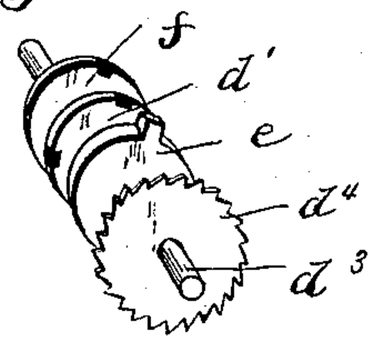
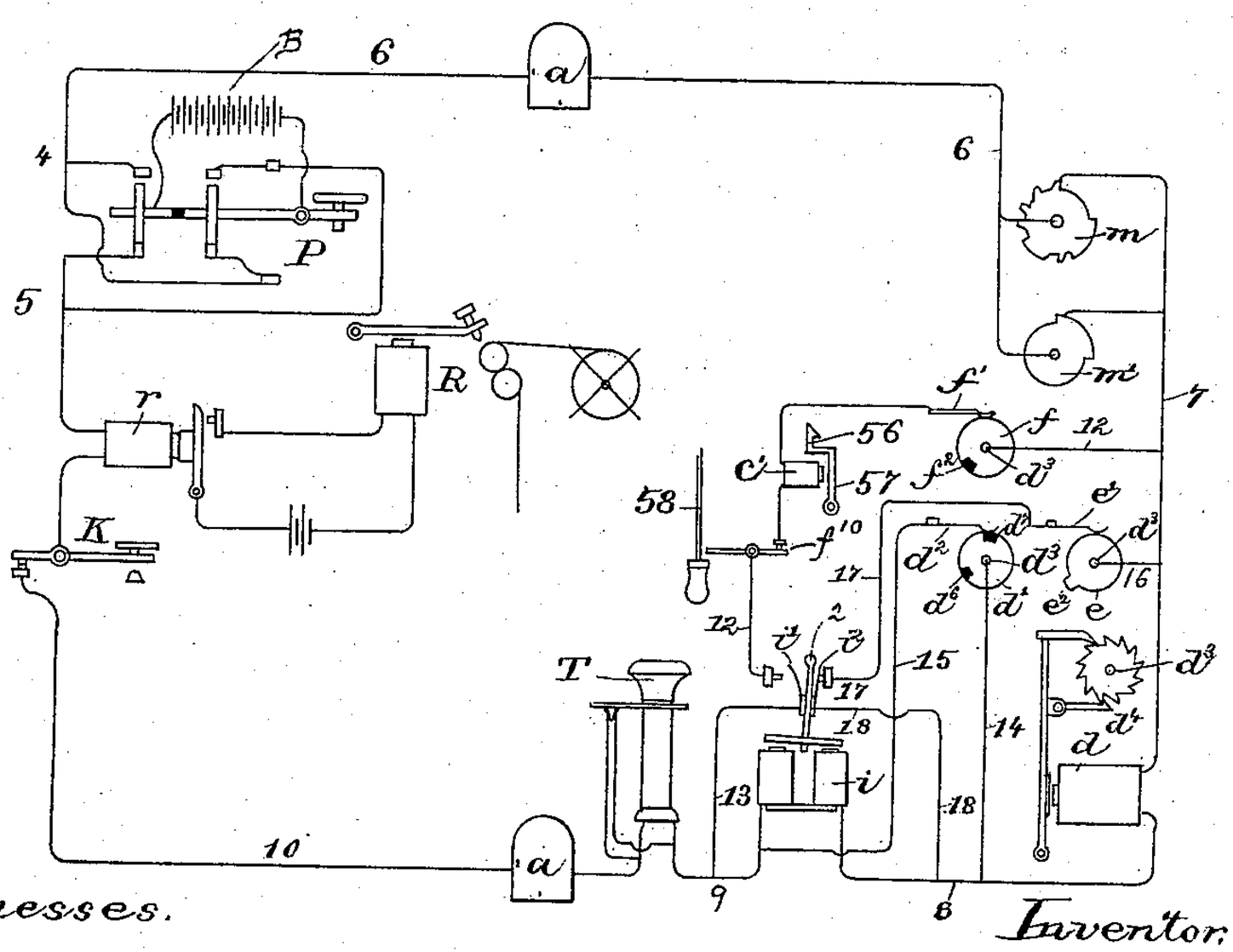


Fig: 1.

Fig: 2.

Fig 3





Witnesses.
Howard F. Eaton.
Fred L. Emery.

Inventor.
John C. Wilson
by Lemby & Gregory
Attys.

UNITED STATES PATENT OFFICE.

JOHN CORNELIUS WILSON, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE MUNICIPAL SIGNAL COMPANY, OF PORTLAND, MAINE.

POLICE SIGNAL SYSTEM.

SPECIFICATION forming part of Letters Patent No. 486,206, dated November 15, 1892.

Application filed October 14, 1887. Serial No. 252,335. (No model.)

To all whom it may concern:

Be it known that I, JOHN CORNELIUS WILSON, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Police Signal Systems, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention relates to police signal apparatus, and is an improvement upon application Serial No. 209,304, filed July 28, 1886, and has for its object to provide as a visual signal a light the appearance of which is changed by an electro-magnetic device.

The invention consists in the combination, in a police signal system, of a main electric circuit, a main station and a series of sub-stations thereon, each sub-station containing a light-signal, a controlling electro-magnet therefor in a normally-open shunt-circuit, a circuit-closer for the shunt-circuit, a polarized actuating-magnet therefor in the main circuit, a low-resistance shunt, including a circuit-controller, around said magnet, an electro-magnetically-movable step-by-step individual-call mechanism in the main circuit to operate the circuit-controllers at the sub-stations successively and open the corresponding low-resistance shunt, whereby its polarized magnet is thrown into the main circuit, and a circuit-changing device at the main station to close the normally-open shunt and energize the light-controlling magnet therein at any predetermined sub-station, substantially as will be described; also, in a municipal telegraph system comprising a main office and several sub-stations or boxes connected by a single wire, the combination, substantially as described, of circuit-changing devices contained in the boxes for transmitting signals, a receiving-instrument at the main office for receiving the said signals from the boxes, with light-signals and electro-magnets controlling their operation, and electro-magnetically-movable step-by-step individual-call switches controlling the circuits of said light-signal-operating magnets, and a circuit-changing device at the main station for effecting the movement of the said switches, whereby two independent systems of communications are effected over one wire between the main and the several sub-stations—namely, a system of signaling from the several sub-stations to the main station for aid, &c., and a system of light-signaling from the main station to the several sub-stations independently to call the attention of a passing officer, as will be described.

Figure 1 shows in elevation and partial section the light-signal and mechanism for controlling it; Fig. 2, a diagram showing the circuit and instruments at the sub-stations and main station to carry out the essential features of this invention, and Fig. 3 a detail of the light-controlling device of one of the light-signals to be described.

The present invention consists, mainly, in providing each sub-station with a light-signal *b*, consisting, as herein shown, of a colored globe 50, fixed to a sleeve 51, adapted to slide upon the usual gas-tube 52 of a street-light, said tube having at its upper end the usual gas-burner 53. The sleeve 51 is recessed to receive a spiral spring 54, surrounding the gas-tube 52, one end of said spring being attached to the sleeve and the other end to the gas-tube. A detent 55 is pivoted to the lower end of the sleeve 51, which is engaged by a latch 56, fixed to or formed as a part of the armature 57 of the electro-magnet *c'*. A cord 58 is attached to the sleeve 51, by which it may be lowered to be engaged by the latch, which latch upon releasing the pivoted detent allows the sleeve to rise by the aid of the spring. Another cord 59 is attached to the armature of the magnet *c'* for releasing the spring-controlled sleeve. The two cords 58 and 59 pass down into a box or chamber *a*, placed in the post or formed as a part of the post supporting the light, said cords being accessible when the door of the box or chamber is opened. The colored globe is normally held just below the flame, but when raised incloses the flame. The magnet *c'* is placed in a normally-open branch of the main circuit, controlled by a device having a step-by-step movement and also by a circuit-controlling device or switch shown as operated by an electro-magnet and polarized armature, which may also operate a bell-hammer 2, used in the box as an audible signal-receiving instrument.

The operation of the devices controlling the movement of the light-signal 50 in the various boxes may be best understood by referring to the diagram Fig. 2, which shows the instruments at the main office and at one of the boxes and the circuit connecting the same.

The apparatus at the main office comprises a receiving-relay r, controlling a local circuit containing a register R, of usual construction, for receiving telegraphic messages, and also a pole-changing instrument P, of usual construction, by which the connection of the terminals of the main battery B with the terminals 4 5 of the main line may be reversed in the usual manner, and also a switch or key K for breaking the circuit.

From the terminal 4 at the pole-changer P the main line continues, as shown at 6, to the boxes or out-stations a, at which the line entering passes through the transmitting apparatus, consisting of the usual break-wheels m m', the former for transmitting the number of the box and the latter for transmitting the desired one of the special want-signals, as in other apparatus of this class previously in use, it being understood that there are several wheels m', each having a different-shaped signaling-surface, and that any desired one of said wheels is brought into circuit by the movement of a pointer.

From the transmitting devices m m' the circuit is continued, as shown at 7, to the actuating-magnet d of the step-by-step device that controls the operation of the indicating-signal b, and from the said magnet the circuit is continued, as at 8, to the magnet i of the polarized signaling-instrument, used in this case also as a switch or circuit-changer. From said magnet i the circuit is continued, as at 9, to the telephone T, from which it continues through the other boxes a to the apparatus at the main office before mentioned. The magnet c' of the indicating-instrument is in a branch 12 from the main line 7 before it reaches the magnet d, the said branch 12 being continued to a contact-piece forming one member of a circuit-closer, the other member i' of which is movable and actuated by the armature of the magnet i and is connected by wire 13 with the wire 9 beyond the magnet i. Thus if the branch 12 13 is closed at i' the current will divide between the magnet c' in one branch and the magnets d and i in the other branch, a sufficient amount passing through the magnet c' to energize the same and to release the sleeve 51, which in rising causes the handle attached to the cord 58 to operate to open a normally-closed circuit-breaker f^{10} in the branch 12, leaving said branch open as long as the signal remains displayed. The normal polarity of the line-current is such as to retain the armature of the magnet in position to open the branch 12 13 at i' and to close a similar circuit-controller i^2 at the other side of the said magnet, the purpose of which will be hereinafter described, and it will be seen that it is only necessary to cause a current of the opposite polarity to pass through the magnet i in order to open the circuit at i^2 and close the branch circuit at i', and thus cause the sleeve to rise. In order to enable the magnet i to be thus affected at any desired station, but unaffected at the other stations, the said magnet is provided with a shunt 14 15, of low resistance, that includes a circuit-controller d' d^2, one member of which consists of a disk fixed on the shaft d^3, that is provided with a ratchet d^4, arranged to be operated with a step-by-step movement of the armature of the magnet d in the well-known manner. The main portion of the periphery of the wheel d' is arranged to maintain contact with the spring d^2, closing the shunt 14 15 of the magnet i, so that the currents on the main line do not affect the said magnet; but each of the said wheels d' at the different boxes is provided with a notch d^6, that comes opposite the spring d^2 and opens the shunt 14 15 at the unison or common starting point for the movement of the step-by-step devices of the different boxes. Each disk d' is also provided with a second notch d^7 at a different distance from the notch d^6 in each different box, so that the notch d^7 at any given box is brought opposite to the spring d^2 to open the shunt after a definite number (different for each box) of step movements of the ratchet d^4 from the unison or common starting point, the magnets i in the different boxes thus being brought into circuit one at a time. Thus when desired to operate the light-signal at any station the proper number of step movements is given to the ratchet d^4 by opening and closing the circuit, and thus affecting the magnets d in the usual manner, and at the end of said movements the notch d^7 will be brought under the spring d^2 at the station in question, as shown in drawings, but at no other station, and then by reversing the polarity of the current in the main circuit the armature of the magnet i at that station only is affected and closes the branch 12 13, causing the sleeve to rise, as before described.

If it is desired to operate the indicating-signals at more than one box or station, they may be successively operated in this manner, the apparatus differing from the usual individual signals in this particular—namely, that one or more of said signals may be operated, as desired.

The unison of the step-by-step devices is effected in the following manner: The normally-closed circuit-closer i^2 of the magnet i is in a shunt 16 17 18 for the magnet d, which shunt also includes a circuit-controlling device e e', the member e of which is rotated by the ratchet d^4 and is so arranged that during the main portion of its rotation the shunt 16 17 18 is open; but when the wheel e arrives at the unison-point a projection e^2 thereof comes in contact with the spring e', thus closing the shunt 16 17 18, so that any additional impulses that may be applied to the line to

bring up the step-by-step devices that may have lagged behind will have no effect on the magnet *d* of the instrument that has arrived at the unison-point. In practice it will generally be best to bring the instruments to the unison-point after the sleeves 51 have been released at the desired boxes and then have the apparatus with the magnets *d* shunted out of circuit. In order to start the step-by-step devices from the unison-point, it is necessary to break the shunts 16 17 18 around the magnets *d*, which is effected by the polarized instruments *i*, and for this purpose the said instruments *i* have to be in circuit at all the boxes when the step-by-step instruments are at the unison-point. This is effected by the second notch d^6 in the wheel *d'*, that controls the shunt 14 15 for the magnet *i*, the said notch coming into position to open the said shunt around the magnet *i* at the same moment that the circuit-closer *e e'* closes the shunt for the magnet *d*. A wheel *f* and cooperating pen *f'* are included in the branch 12, said wheel being fixed to the shaft carrying the wheels *d'*, *e*, and d^4 and having a notch f^2, corresponding in position with the notch d^6 of the wheel *d'*, so that when the shunt 16 17 18 is closed by the projection e^2 at unison-point and the shunt 14 15 is opened by the notch d^6 of the wheel *d'* the branch 12 will be opened by the notch f^2 of the wheel *f* for purposes to be described. When the instruments are again to be operated, the line-current will be reversed from the polarity by which the step-by-step instruments are normally operated, thus changing the position of the armatures of the instruments *i* at all the boxes and opening at i^2 the shunt 16 17 18 for the magnet *d*, which will thus be energized and move the ratchet ahead one step, which will be sufficient to break said shunt 16 17 18 at *e e'*, so that when the current is again reversed for the purpose of opening the branch 12 13 at *i'* the magnet *d* will still remain in circuit. When the armature of instrument *i* is moved to open the shunt 16 17 18, it closes the shunt 12 13, and were it not for the branch being opened at f^2 the sleeves would rise. The sleeves 51 will be restored by hand by the officer upon arriving at the box, and when the signal-light is found displayed the officer will understand that he is directed to open the box and communicate with the main office by means of the telephone, or in cases where telephonic communication is not provided for the displayed signal may be understood as a direction for the officer to proceed to the main office. Signals of this kind may be used both for discovering whether or not the officer is attending to his duty and also for facilitating police operations when required. For instance, if there is reason to suppose that an officer neglects to visit any particular box so often as required the signal may be set at that box only to discover whether or not the officer will respond within a reasonable time; but if the attendant at the main office desires to communicate with the officer on some matter of importance the signals may be set at all the boxes, so that the officer will respond from whichever box he may next come to.

I do not desire to limit myself to the construction of signal-light herein shown, but intend to cover, broadly, any light the appearance of which is changed by electrically-operative devices controlled individually or independently upon a single wire.

I am aware that audible signals have been controlled independently or individually on a single circuit and that semaphoric disks, which may during the day be called "visual" signals, have also been controlled independently or individually, as in my application herein referred to; but I am not aware that several light-signals have been controlled independently on a signal-circuit.

For police signal purposes it is absolutely necessary that the signal used to call the attention of a passing officer shall be one discernible in the night, and hence a semaphoric disk is inadequate to meet the demands; also, in order to have all the officers in a division under the control of one central office all wires should radiate therefrom, and if a large number of boxes is used the expense of constructing and operating a system is very large if not reduced by putting several boxes on one wire. Hence it becomes of the greatest importance to operate a number of light-signals on a single wire.

In police work the audible signal is objectionable, because an alarm at a box informs passers-by and people in the neighborhood that an officer is expected.

I claim—

1. In a police signal system, the combination of a main electric circuit, a main station and a series of sub-stations thereon, each sub-station containing a light-signal, a controlling electro-magnet therefor in a normally-open shunt-circuit, a circuit-closer for the shunt-circuit, a polarized actuating-magnet therefor in the main circuit, a low-resistance shunt, including a circuit-controller, around said magnet, an electro-magnetically-movable step-by-step individual-call mechanism in the main circuit to operate the circuit-controllers at the sub-stations successively and open the corresponding low-resistance shunt, whereby its polarized magnet is thrown into the main circuit, and a circuit-changing device at the main station to close the normally-open shunt and energize the light-controlling magnet therein at any predetermined sub-station, substantially as described.

2. In a municipal telegraph system comprising a main office and several sub-stations or boxes connected by a single wire, the combination, substantially as described, of circuit-changing devices contained in the boxes for transmitting signals, a receiving-instrument at the main office for receiving the said signals from the boxes, with light-signals and

electro-magnets controlling their operation, and electro-magnetically-movable step-by-step individual-call switches controlling the circuits of said light-signal-operating magnets, and a circuit changing device at the main station for effecting the movement of the said switches, whereby two independent systems of communication are effected over one wire between the main and the several sub-stations—namely, a system of signaling from the several sub-stations to the main station for aid, &c., and a system of light-signaling from the main station to the several sub-stations independently to call the attention of a passing officer—as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN CORNELIUS WILSON.

Witnesses:

G. W. GREGORY,

F. L. EMERY.