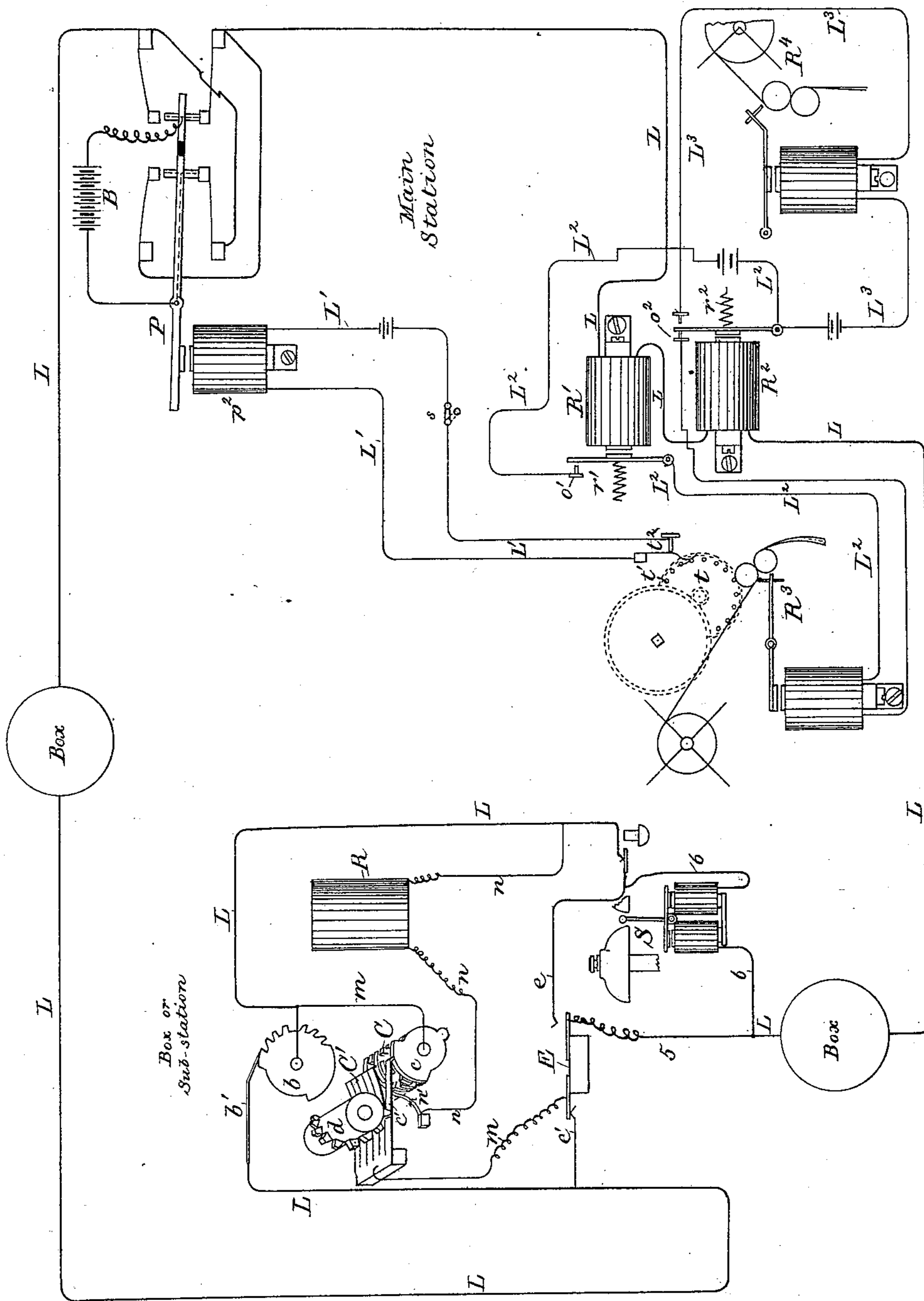


(No Model.)

J. C. WILSON.  
MUNICIPAL SIGNAL APPARATUS.

No. 405,235.

Patented June 11, 1889.



Witnesses:  
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C. M. Cone.

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his attys.

# UNITED STATES PATENT OFFICE.

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## MUNICIPAL SIGNAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 405,235, dated June 11, 1889.

Application filed August 24, 1885. Serial No. 175,196. (No model.)

*To all whom it may concern:*

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

My invention relating to a municipal-signaling apparatus is shown embodied in an apparatus especially intended for police-signaling, such as described in United States Patent No. 344,467, granted June 29, 1886, which may be referred to for fuller description of the parts used in connection with but not essential to the present invention. The apparatus described in the said application is used in connection with a central office or station and series of signal boxes or out-stations connected therewith and each adapted to transmit a box-signal, usually a number characterizing the box or station from which it is sent, and also any desired one of a series of special signals in connection with the box-signal, which indicate at the central office the different wants which are to be supplied at the particular station from which the signal is sent—such, for instance, as ambulances or fire-extinguishing apparatus, &c. It is intended also in the use of the said apparatus that the policeman should stop at each box or out-station in passing and send a signal called, for distinction, the “patrol” or “on-duty” signal, which would merely indicate that he was on duty at this locality and that nothing special was needed. The apparatus is so constructed that the on-duty signal, which requires no immediate attention at the main office, is received on separate instruments from the other signals, which indicate that something is needed at the out-station and which consequently require immediate attention.

In the application referred to there was also shown at the main office a multiple signal-transmitting apparatus, which could be set to transmit any desired one of a large number of different signals to the person at the sub-station, the said transmitting appa-

ratus being called into operation only by a person at the sub-station. While an apparatus of this kind is of great value, it is somewhat expensive, and in many cases is not required, although it is desirable always to be able to summon an officer from the out-station to the main station or to direct him to place himself in telephonic communication with the main station.

The object of the present invention is to provide means for thus summoning an officer while dispensing with the somewhat expensive and complicated apparatus for automatically transmitting a large number of varied signals from the main office; and the invention consists, essentially, in means controlled by the attendant at the main office for producing a single definite signal at the out-station or box when the latter is operated to transmit a patrol-signal in order to summon the officer to the main station or to direct him to place himself in telephonic communication therewith, or, on the other hand, to cause that no signal shall be sent from the main office to the out-station, so that the officer on arriving at a box and sending the patrol-signal will know that nothing special is required of him, and that he is to merely continue on in the regular course of duty.

The instrument employed at the box or out-station for producing the signal when required is shown in this instance as consisting of a polarized bell, substantially the same as used in the former application, and the instrument at the main station for operating the same consists of a pole-changing transmitter, which reverses the polarity of the current without interrupting the same or opening the circuit, just as in the said application; but instead of having the said pole-changer controlled by a multiple signaling-instrument set in operation every time a patrol-signal is received, as in the said application, it is, as shown in this instance, controlled by the receiving-instrument for the patrol-signal, and also by a key or switch that may be operated by an attendant at the main office, so that when the said switch is in one position or closed the pole-changer will be set in operation upon the receipt of the patrol-signal; but

when the said switch is in the other position the said pole-changer will not be affected by the receipt of the patrol-signal. Thus it is in the power of the attendant at the main office  
5 to summon or give the single definite signal to the policeman whenever he next arrives at a box in the performance of his duty.

The drawing represents in diagram the essential portions of a municipal signal apparatus embodying this invention and the circuits connecting them.

The apparatus at the box or sub-station comprises a signaling device for producing a signal characterizing the box or station, the  
15 said device being shown as a break-wheel *b* and co-operating contact spring or pen *b'*, it being understood that the box includes a motor or train of wheel-work of any suitable or usual construction for revolving the said  
20 break-wheel when the box is set in operation. The box also contains a multiple signaling device consisting of a series of break-wheels *C* and a series of corresponding contact-springs *C'*, normally removed from the surface of the  
25 corresponding wheels, but adapted to be placed one at a time in contact with the corresponding wheel by a signal-selecting device *d*, it being understood that the series of break-wheels *C* are revolved simultaneously with  
30 the break-wheel *b* by the same motor, and may be on the same shaft, although shown separately in the diagram for greater clearness.

The spring *c'*, co-operating with that one of the wheels *C* which is used for the patrol-signal and is marked *c*, also co-operates with a contact-spring *n'*, which it touches when pressed  
35 against the wheels *c* by the selecting devices *d*, as shown in the drawing, but from which it is disconnected when the spring *c'* is permitted to rise from the wheel *c*, which takes place when the selecting device *d* is turned to press another one of the springs *C'* against a corresponding wheel to send some special  
40 signal. The box also contains a circuit-changing device *E*, co-operating with two contact-springs *e e'*, which, with the changing device *E*, constitute two switches, one of which is open when the other is closed, the said device being normally in condition to close the switch  
50 *e* when the box-number signal alone is to be sent, as is done when a citizen requires police aid at the box. When, however, a patrol or one of the special-want signals is to be sent, the switch *E* is moved to its other position,  
55 (that shown in the drawing,) leaving the switch *e* open and closing the switch *e'*, as shown in the drawing. The box also contains a signal-receiving instrument *S*, operated by an electro-magnet having a polarized armature, so that the signal is sounded when the polarity of the current is reversed, but is unaffected by interruptions or changes in strength of the current.

The currents employed for transmitting the  
65 signals are derived from the battery *B* at the main station, the opposite poles of which are connected with a pole-changing device *P*, op-

erated by an electro-magnet *p*<sup>2</sup>, by which the connection of the poles of the said battery with the main line *L*, extending through the  
70 sub-stations, may be reversed without opening the circuit, the construction of such pole-changing device being well known and readily understood from the drawing without detailed description.

The main line *L* at one side of the box is connected with the spring *b'* of the break-wheel *b*, and normally the circuit is continued from the said break-wheel to the spring  
80 *e*, and thence by wire 5 to the main line beyond the box leading to the main office; or if the switch *e* is open, as shown in the drawing, the main-line circuit includes the branch 6 and signal-instrument *S*.

A branch *m*, including the springs *C'* and  
85 break-wheels *C* of the multiple signal device, forms another path for the current besides that through the break-wheel *b* and spring *b'*, the said branch *m* being completed or connected with the main line by the switch *e'*  
90 when in the position shown in the drawing, which is the position assumed when the patrol-signal or one of the special signals is to be sent, in addition to the number-signal produced by the break-wheel *b*, which is provided with a long notch that opens the branch  
95 containing it while the raised portions of the different wheels *C* are passing beneath the corresponding contact-springs, thus placing the circuit under control of the wheels *C* if  
100 the branch *m* is closed at *e'*, or wholly breaking the circuit if the said branch *m* is open at *e'*.

The contact-spring *n'*, co-operating with the spring *c'* of the patrol-signal, is connected  
105 with a third branch *n* around the break-wheel *b*, including resistance *R*, of sufficient amount to greatly reduce the strength of the current, the said resistance being in circuit when the spring *c'* is in contact with the springs *n'* and  
110 the branch *m* closed at *e'*, but open between *c'* and *c* and the circuit also open between *b'* and *b*. Thus when the device *E* and multiple signal device *d* are in the position shown in the drawing and the box set in operation the circuit will  
115 first be open between *b'* and *b*, but will at the same time be closed between *c'* and *c*, so that no effect is produced on the normal current. As soon, however, as the raised portion of the wheel *c* passes from beneath the spring *c'* the  
120 current will, unless the circuit is closed at *b b'*, be caused to pass through the branch *n* and resistance *R* and will thus be weakened, and such weakening will consequently occur as each notch of the wheel *b* passes beneath the  
125 spring *b'*; but when the teeth or raised portions of the wheel *b* come in contact with the spring *b'* the current will pass with full strength over the main line *L*. The box will consequently under these circumstances produce a series of  
130 reductions in the current strength corresponding to the notches of the wheel *b*, but will not totally break the circuit. When, however, the branch *n* is open at *n'*, as is the case when

any special signal, except the patrol-signal, is transmitted, the circuit will be broken and the current wholly interrupted whenever both springs  $c'$  and  $b'$  are at the same time out of contact with their corresponding wheels, and the special signal will thus be transmitted by that one of the springs  $C'$  and wheels  $C$  which may have been placed in circuit by the device  $d$  while the long notch of the wheel  $b$  is passing beneath the spring  $b'$ , and the number-signal will then be transmitted while the toothed portion of the wheel  $b$  is passing beneath the spring  $b'$ , the reduced portion of the wheels  $C$  then being opposite and out of contact with the corresponding spring  $C'$ .

The reductions in current strength or total interruptions of the current act on two relays  $R'$   $R^2$  in the main line  $L$  at the main station, the former relay having its retractor  $r'$  so adjusted that the armature-lever is released upon the reduction in current strength produced by bringing the resistance  $R$  into circuit, and being, for distinction, called the "weaker" relay, while the relay  $R^2$ , called the "stronger" relay, has its retractor  $r^2$  so adjusted that its armature will be released upon the total interruption of the current and not by the weakening produced by the resistance  $R$ .

The patrol-signal produced by the weakening of the current is received on the instrument  $R^3$ , which may be a self-starting register of usual construction, the local circuit  $L^2$  of which includes the armature-lever and front contact-stop  $o^2$  of the stronger relay  $R^2$ , and also the armature-lever and back-stop  $o'$  of the weaker relay  $R'$ , so that when the latter relay is operated, while the former is unaffected by the weakening of the current produced by the introduction of the resistance  $R$ , the local circuit  $L^2$  will be closed at the back-stop  $o'$ , and the magnet of the register  $R^3$ , which is normally in open circuit, will be energized, and will thus respond to the successive introductions of the resistance  $R$  into and its removal from the main circuit produced by the break-wheel  $b$  in co-operation with the spring  $n'$  and spring  $c'$  of the patrol-signal, as before described. When, however, both relays  $R'$   $R^2$  are affected simultaneously by the total interruption of the current, the local circuit  $L^2$  is broken by the relay  $R^2$ , so that no effect is produced upon the register  $R^3$  by the retraction of the armature of the relay  $R'$ , and consequently the box-number and special signals produce no effect on the register  $R^3$ . These latter signals, produced by the total interruption of the circuit, are received upon an instrument  $R^4$ , the local circuit  $L^3$  of which is controlled by the armature-lever of the relay  $R^2$  in the usual manner, and is consequently unaffected by the changes which take place in the relay  $R'$ .

The apparatus thus far described is substantially the same as in the former patent referred to, which contains, in addition to the appliances thus far described, multiple sig-

nalizing apparatus at the main station that might be set by the operator at said station in proper condition to transmit any desired signal, and would then automatically be set in operation to transmit such signal upon the receipt of the patrol-signal from the box or out-station.

In many cases it will not be necessary to transmit numerous-varied signals or directions from the main station, although it will always be extremely desirable to be able to summon an officer to the main station or to a point in telephonic communication there-with or to some other desired point; and the main object of the present invention is to provide means for thus summoning or signaling an officer without, however, employing a multiple signaling device for automatically transmitting varied information to him.

Such a summoning-signal may be transmitted from the main station to the box by means of the pole-changer  $P$  and received by the polarized signaling-instrument  $S$  at the box, and in order to make the transmission of such signal automatic, so that the attendant at the main office will not have to watch for the patrol-signal, so as to know when the officer is at the box ready to receive said signal, the magnet  $p^2$  of the pole-changer is placed in a local circuit  $L'$ , provided with a switch or key  $s$ , which may be opened or closed by the attendant at the main station to render the said circuit and pole-changer inoperative or operative, as may be desired, the said local circuit being also controlled directly or indirectly by the main circuit, so that if closed or made operative by the switch  $s$  the pole-changer will be operated when a signal is transmitted from the box to the main station, and will thus operate the signal  $S$  at the box if the switch  $s$  is closed, or will produce no effect thereon if the said switch is open.

As there will generally be no occasion for sending a signal out from the main office except when a patrol-signal is sent in, the local circuit  $L'$  will preferably be controlled by the receiving-instrument  $R^3$  for the patrol-signals, the said instrument being provided with a device which may be the brake or stopping device of the self-starting register to produce one or more breaks in the local circuit  $L'$  when the said register is set in operation.

As herein shown, one of the wheels  $t$ , which actuates the recording strip of paper in the register  $R^3$ , is provided with a series of projections  $t'$ , which in the movement of the said wheel operate a circuit-closer  $t^2$  in the local circuit  $L'$ , intermittingly pressing a spring member of the said circuit-closer against the co-operating member and then permitting it to move away therefrom.

The projections  $t'$  are so placed with relation to the wheel that one or more of them pass and operate the circuit-closer during the smallest movement of the register that takes

place when it is started by the action of its magnet, thus causing the signal S to sound one or more taps whenever the patrol-signal is sent while the switch *s* is closed. If preferred, however, the local circuit *L'* might be controlled by the armatures of both relays *R'* *R*<sup>2</sup> in precisely the same manner as the local circuit *L*<sup>2</sup>, or it might be controlled by the relay *R*<sup>2</sup>, in which case the pole-changer will be operated whenever a signal of any kind was received, but would produce no effect when the shunt of the signal S was closed at *e*.

In operation the switch *s* would normally be open, and the officer, upon transmitting a signal, would hear no sound from the signal S, and consequently would understand that nothing was needed and would proceed in the regular course of his duty. If, however, the attendant at the main office desired to communicate with the officer, he would close the switch *s*, and then, without further attention on his part, the signal S would be automatically sounded the next time an officer sent a signal from any box on the circuit, and the officer upon hearing such signal would understand that he was to proceed at once to or place himself in communication with the main office.

I claim—

1. In a municipal signal apparatus comprising a main station and one or more sub-stations connected by an electric circuit, a multiple signal-transmitting apparatus and a signal-receiving instrument at the sub-station, and a signal-receiving instrument and a signal-transmitting apparatus at the main station, combined with an electro-magnet for effecting the operation of said signal-transmitting apparatus at the main station, a circuit-wheel, as *t*, for changing the condition of the circuit of said electro-magnet, and a cir-

cuit-controlling switch also included in said circuit, substantially as described.

2. In a municipal signal apparatus comprising a main station and one or more sub-stations connected by an electric circuit, a multiple signal-transmitting apparatus and a signal-receiving instrument at the sub-station, and a signal-receiving instrument and a signal-transmitting apparatus at the main station, combined with an electro-magnet for effecting the operation of said signal-transmitting apparatus at the main station, a circuit-wheel, as *t*, for changing the condition of the circuit of said electro-magnet, motor mechanism for revolving said circuit-wheel set in operation by the magnet of the signal-receiving instrument at the main station, and a circuit-controlling switch also included in said circuit, substantially as described.

3. In a municipal signal apparatus comprising a main station and one or more sub-stations connected by an electric circuit, a multiple signal-transmitting apparatus and a polarized signal-receiving instrument at the sub-station, and a signal-receiving instrument, as a register, and pole-changing key at the main station, combined with an electro-magnet for operating said pole-changing key, a circuit-wheel, as *t*, for changing the condition of the circuit of said electro-magnet, said circuit-wheel being mounted on one of the shafts of the said signal-receiving instrument at the main station to be rotated thereby, substantially as described.

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

JOHN C. WILSON.

Witnesses:

G. W. GREGORY,  
B. J. NOYES.