

No. 663,043.

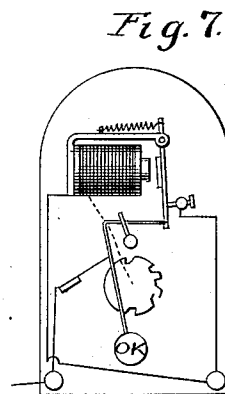
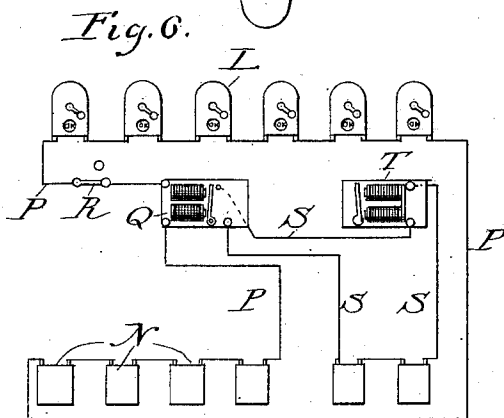
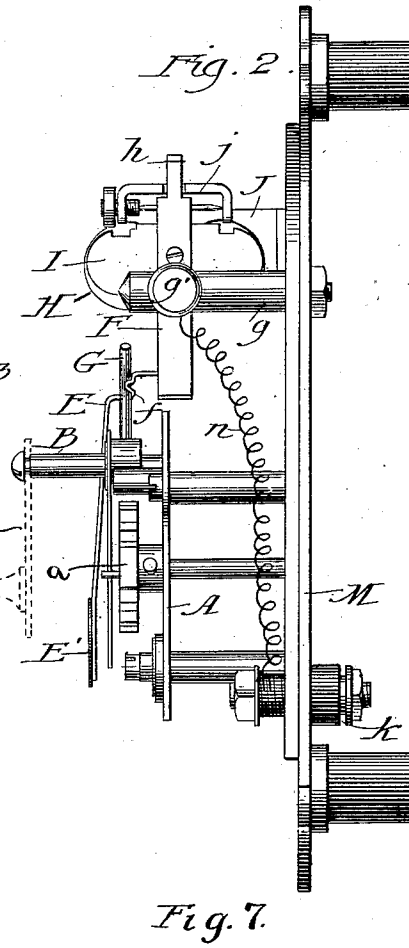
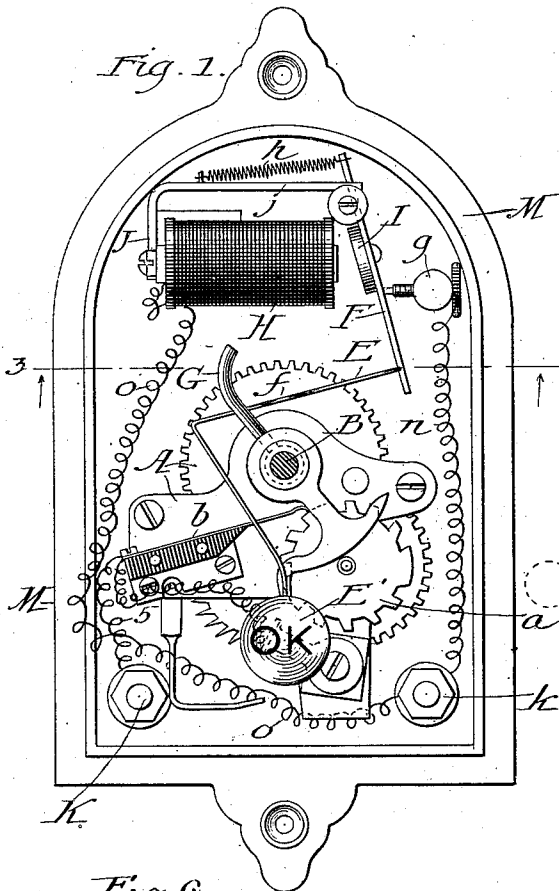
Patented Dec. 4, 1900.

J. S. & H. M. ROBINSON.
RETURN SIGNAL DEVICE FOR CALL BOXES.

(Application filed Feb. 12, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

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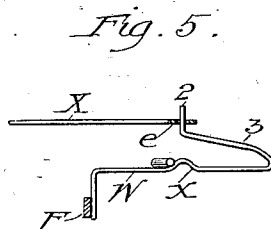
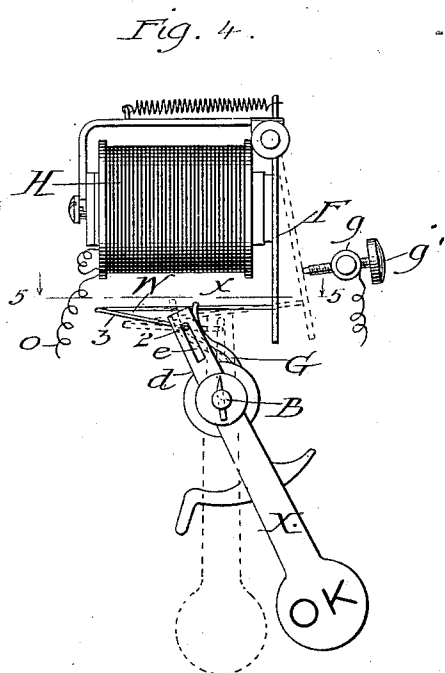
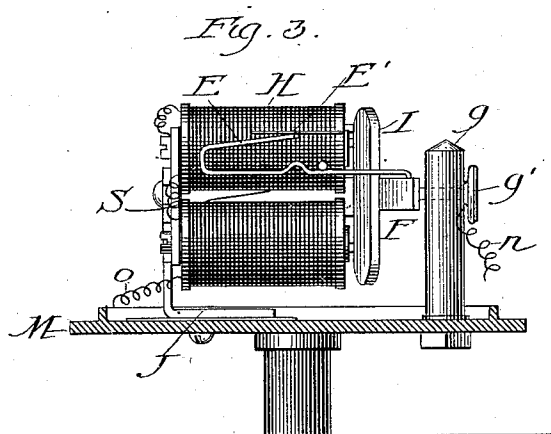
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

JOSEPH S. ROBINSON AND HENRY M. ROBINSON, OF CHICAGO, ILLINOIS.

RETURN-SIGNAL DEVICE FOR CALL-BOXES.

SPECIFICATION forming part of Letters Patent No. 663,043, dated December 4, 1900.

Application filed February 12, 1900. Serial No. 4,973. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH S. ROBINSON and HENRY M. ROBINSON, citizens of the United States, and residents of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Return-Signal Devices for Call-Boxes and Systems Therefor, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

Heretofore in order to inform the patrons of a call-box system that their call has been received at the central station it has been necessary for the operator to throw into the circuit an additional battery sufficient to overcome both the resistance of the relay and line and the resistance of the magnets in the call-boxes, and as it was necessary for such a system to be prepared for an emergency when several calls would engage the circuit at the same time it was necessary that the extra battery should be of sufficient potential to overcome any resistance that might during its use be thrown into the said circuit. The use of return signals in call-box systems also required the use of comparatively expensive mechanism, and in consequence of this and the expense of installing and maintaining an extra battery and the unsatisfactory operation of the same return-signal systems of call-boxes are not very numerous.

Our invention relates to comparatively inexpensive improvements to call-boxes, which, first, dispense with the necessity of an extra battery in the circuit; second, enable the operator to send the return signal over the same wire through which the call was received; third, permit the sending of this return signal without increasing the potential of the circuit; fourth, do not increase the resistance in the circuit until after the call has been sent to the receiving-station; fifth, reset the call-box immediately said return signal is sent or another box in the same system is put into operation; sixth, only the resistance of one call-box can be shunted into the circuit at a time; seventh, when the circuit is broken no additional resistance can be added to the circuit by the operation of any call-box which would affect the proper working of the circuit when it is again repaired,

and, eighth, when one or more call-boxes are shunted by two "grounds" no additional resistance can be added to the circuit by the operation of these shunted boxes which would affect the proper working of the circuit when it is again repaired. This we accomplish by the means hereinafter fully described and as particularly pointed out in the claims.

In the drawings, Figure 1 is a front view of a call-box embodying our invention. Fig. 2 is a side view of the same. Fig. 3 is a transverse vertical section taken on dotted line 3 3, Fig. 1, looking in the direction indicated by the arrows. Fig. 4 is a plan view of part of the mechanism of a call-box, showing a modified form of our improvements. Fig. 5 is a detail view of the detent of said modification. Fig. 6 is a diagrammatical view of the system of which our call-boxes form a part. Fig. 7 is a diagrammatical view of the call-box.

Our invention does not comprise the clock mechanism A, nor the usual circuit-breaking registering-disk *a* operated thereby, nor the brush *b* bearing against its recessed periphery to cause the necessary breaks in the circuit to indicate the number of the box at the receiving-station. These are well-known features of the call-boxes now in extensive use, and therefore no extended description thereof is herein offered.

The clock mechanism A has the usual actuating-spindle B, which extends out of the box and has a crank *c* thereon with which it is operated. Just inside the case of the box the spindle B has an upwardly-projecting arm G of suitable length which is adapted to engage the return-bend *f* of the transverse stretch of an L-shaped pawl E, which is secured to and projects from the adjacent free end of a shunt-bar F. This pawl is made of elastic steel wire, and the transverse stretch thereof extends from the shunt-bar to a point on the other side of the vertical plane of the spindle B of the clockwork, and is then bent forward at right angles to its transverse stretch a short distance, and then extends downward obliquely past spindle B to a point which when the pawl is in its normal position would be intersected by the vertical plane extending through said spindle. The lower

end of the oblique downward stretch of said pawl is provided with a circular or other shaped plate E', upon which the letters "O. K." or other suitable indicia are impressed, which when the return signal is given from the receiving-station to a call will appear back of the usual opening in the face of the case of the box and apprise the patron of the receipt of his call. The normal position of pawl E is that in which the plate E' on its lower end will be back of the opening in the face of the case. It is moved from this position to that shown in dotted lines in Fig. 1 of the drawings, however, by the arm G whenever the call-box is operated. The normal position of arm G is such that it bears back against the pawl at a point between the return-bend *f* thereof and the outward bend of the same. When, therefore, the spindle B is turned through the medium of the crank on its outer end and then released, arm G when returning to its original position engages said return-bend *f* and draws said pawl with it for a short distance until the shunt-arm has been moved out of contact with a post *g* and near enough to the core of magnets H for the armature I, carried by said shunt-bar, to be attracted and held thereby.

Shunt-bar F is pivoted at its upper end opposite that to which pawl E is secured in suitable manner to the pivotal lugs of the contiguous end of an L-shaped branch *j* of the magnet-supporting frame J, and its said upper end extends beyond its pivot and has attached thereto the contiguous end of a coil contraction-spring *h*, the other end of which latter is secured to the branch *j* of frame J in such manner as to keep the lower end of the shunt-bar normally in contact directly with post *g* or in contact with the adjacent end of a gage-screw *g'*, tapped diametrically through the outer end of said post, so as to engage the shunt.

The positive binding-post K of the box is tapped through and insulated from the metallic supporting-plate M of the same, say, in the lower left-hand corner, and the negative binding-post *k* is similarly passed through, say, the lower right-hand corner of said plate. Post K is connected by an insulated wire *5* with brush *b*. From thence the current flows through the registering-disk, then through the clockwork to the supporting-plate M, and from the latter to the magnet-supporting frame J. Following the lines of the least resistance the current passes through branch *j* of frame J and into the shunt-bar, when in its normal position against post *g*, and then flows through said post *g* to the negative binding-post through a connecting insulated wire *n*. When the shunt-bar is moved out of contact with post *g* by reason of the engagement of the pawl by the arm G, the current passes through the magnet-supporting frame J into the magnets H, which are electrically connected therewith, and from said magnets the current flows through an insulated wire *o* to

the negative binding-post *k*. Thus it will be observed that there is a normally-closed current passing through the box substantially all the time, except when the circuit is broken by the operator at the receiving-station to make the return-signal.

The system in which our improved call-boxes L are connected has, as shown in Fig. 6 of the drawings, a main single-wire circuit, consisting of the battery N, the main wire P, having a series of call-boxes, constructed as hereinbefore described, normally electrically closed to it and having a relay Q closed thereto. The circuit may be grounded after it leaves the relay or may have a metallic connection with the negative electrode of the battery. In either event said circuit is provided with a suitable circuit-breaker R, with which the operator opens the circuit when he desires to give the return signal to a call, and thereby drops the signal to its original position and at the same time resets the last-operated call-box for its next message. This same result, however, could be accomplished, providing the operator neglected his duty, by the operation of any other call-box on the system.

The relay Q is adapted to close a normally open circuit S, and thereby operate the registering instrument T connected with said circuit every time the brush of a call-box in the main circuit passes over the recesses in the circumference of the registering-disks of the same.

We do not desire to be confined to the use of a signal-pawl as hereinbefore described, as it is obvious that by the use of the mechanism shown in Figs. 4 and 5 a signaling-arm similar to that used in call-boxes now in limited use can be employed in connection with our improvements. In this case such an arm X is loosely pivoted to spindle between arm G and the case and has the "O. K." or other suitable indicia suitably impressed on its lower end, and has its upper end *d* extended past its pivot and provided with a longitudinal slot *e*, that is engaged by the outwardly-turned end 2 of a spring-wire detent W, that holds said signal-arm stationary while the call is being given and then causes said arm to move until its lower end is out from under the exposure-opening of the case, where it is detained until the receiving-operator gives the return signal, whereupon it causes said arm to return to its original position back of the said exposure-opening, and thereby inform the patron of the receipt of his call. This detent W is so constructed that it makes a lateral detour 3 from its outwardly-extended end 2 and then extends in a transverse direction to and is connected with the adjacent end portion of a shunt-arm F. At a point approximately back of the extension *d* of arm X when in its normal position the rearwardmost transverse stretch of the detent has a short outward return-bend *x*, and projecting upward from the spindle in such a vertical plane as to nor-

5 mally bear back against the detent is the arm G. The relative position of arm G to the return-bend x of the detent is the same as it is to the return-bend f of the pawl. Thus when the call is operated arm G during its return movement comes in contact with return-bend x and draws the detent with it for a short distance until the shunt-bar is out of contact with the post g and is attached by the magnets, whereupon the operation of the circuit is the same as hereinbefore described.

10 We do not desire to be confined to the exact mechanism hereinbefore described for moving the shunt-arm toward the magnets, because other mechanism put in operation, in the first instance, by the turning of the spindle might be employed. Any construction which will during or after the call has been sent switch the circuit through the magnets, and through the medium of such energized magnets prevent the return-signal devices in the box from operating until the circuit is opened, we consider as coming within the scope of our invention.

25 What we claim as new is—

1. In an electric call-box, the combination with the call mechanism, of an electromagnet, an armature therefor normally held out of engagement with said magnet, a wire connected to said armature having a return-bend therein, and a bar sliding upon said wire, actuated by the call mechanism and arranged to engage the return-bend in the said wire during its movement to move the armature into engagement with the poles of the electromagnet.

2. In an electric call-box, the combination with an automatically-returnable revoluble spindle, and arm projecting therefrom, of signaling devices which include a transverse

stretch of wire having a suitable return-bend made therein engageable by said arm, a shunt-bar to which said wire is attached at one end, and a normally-demagnetized magnet which is magnetized when said shunt-bar is moved and holds the same and said signaling devices out of their normal positions until said circuit is opened.

3. In an electric call-box the combination with an automatically-returnable revoluble spindle, and arm projecting therefrom, of a pawl having a horizontal stretch having a suitable return-bend made therein, and extending downward from said transverse stretch a suitable distance and carrying suitable registering indicia thereon, a shunt-bar to which one end of the transverse stretch of said wire is secured, and a normally-depolarized magnet which is magnetized when said shunt-bar is moved and holds the same and said signaling devices out of their normal positions until said circuit is opened.

4. In an electric call-box, the combination with the call mechanism, of an electromagnet, an armature therefor, an electrically-connected stop-post, a spring for normally holding the armature in contact with said stop-post, a wire connected to said armature having a return-bend therein, and carrying signaling devices on its free end, and means actuated by the call mechanism for moving said wire to actuate the signaling devices, and move the armature out of contact with the stop-post and into the field of the electromagnet.

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