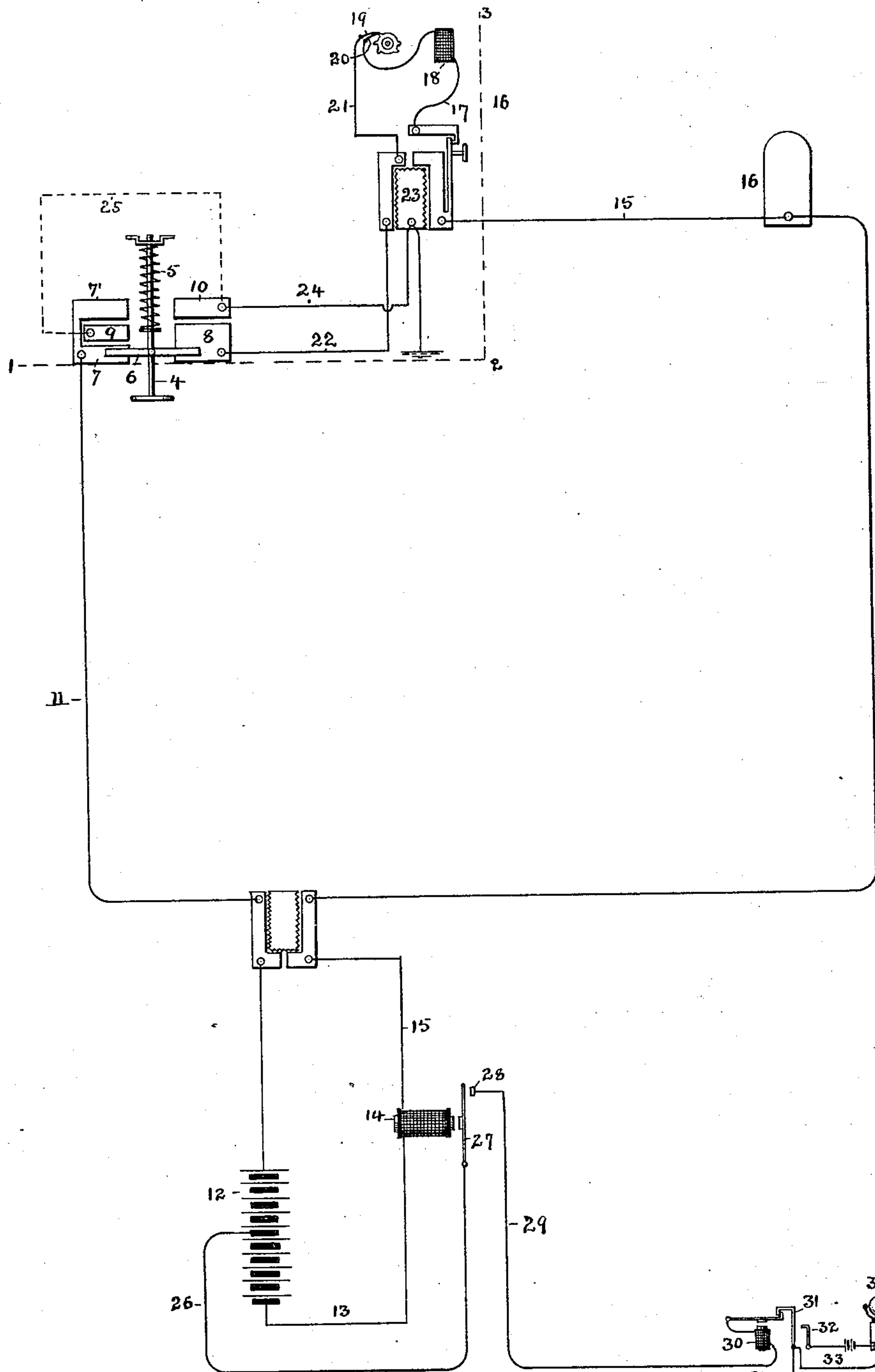


(No Model.)

J. W. STOVER.  
SIGNALING SWITCH AND CIRCUIT.

No. 461,194.

Patented Oct. 13, 1891.



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# UNITED STATES PATENT OFFICE.

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## SIGNALING SWITCH AND CIRCUIT.

SPECIFICATION forming part of Letters Patent No. 461,194, dated October 13, 1891.

Application filed May 29, 1891. Serial No. 394,493. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH W. STOVER, a citizen of the United States, residing at New York city, in the county and State of New York, have invented a certain new and useful Improvement in Signaling Switches and Circuits, of which the following is a specification.

The present invention relates to switches and circuits for signaling, and the improvements are designed more particularly for use in connection with a police or fire telegraph system, although it will be evident that they may be employed in other systems.

The main object of the invention is to provide means for signaling over circuits of the character indicated without the use of a circuit-making brake-wheel and springs or other individual signal-transmitters used in said systems, and to so arrange the signal-switches that they shall operate the call-bell or similar alarm at the central office, whether the main circuit of the system, which is preferably a closed metallic circuit, is in operative condition or not.

The invention consists in the several features and combinations hereinafter described.

The accompanying drawing is a diagram illustrating the improved switch and circuit connections. The circuit connections of one signal-box are indicated in the diagram between the lines 1 2 and 2 3. It is deemed unnecessary to show all the details of the signal-transmitter and motor mechanism, since these are of any well-known or suitable construction.

In each signal-box I place a switch, which I term a "signal" or "emergency" switch, and which is shown at the extreme left of the figure. The line 1 2 may represent the inner door of the signal-box, the handle 4 of the switch projecting forward through an opening in said door, and being normally pressed forward by the spiral spring 5, surrounding the handle.

6 is a switch-arm carried by the handle and normally held in the position to connect the contact-plate 7 with the contact-plate 8. The latter plate is as wide as the lower arm of plate 7 and the whole of plate 9, so that when the switch-arm is moved back it will rest on plate 9 before leaving plate 8. The plate 10 is in line with the upper limb 7' of the plate.

The plate 7 is connected by wire 11 to the battery 12 at the central office, thence by wire 13 to magnet 14 of the receiver or receiving-relay, thence by wire 15 to several signal-boxes 16 in series in the circuit. As shown, the wire 15 is connected in the signal-boxes to one of the plates of a lightning-arrester, and by wire 17 to magnet 18, which may be the ordinary non-interference magnet of the box, thence through the two springs 19 20 and the tooth of the signal-wheel, on which they normally rest, to wire 21, and the second plate of the lightning-arrester to wire 22 and to plate 8. The grounded plate 23 of the lightning-arrester is connected by wire 24 to plate 10, and also by wire 25 with plate 9. From a point between the two terminals of the main battery 12 extends a branch 26 to the armature 27 of the relay-magnet, which is normally attracted away from the back contact 28, thus holding the grounded wire 29 open. This wire includes the magnet 30, the armature of which normally retains the annunciator-drop 31 and holds it away from contact 32 of the local circuit 33. 34 is an alarm-bell or other signal in this local circuit.

I will now describe the use of the system and apparatus above set forth. When it is desired to send an ordinary police or fire telegraph signal, it is done by use of the break-wheel and springs 19 20 in a manner well understood in the art. At each make and break of the circuit the armature 27 is allowed to fall back and by any suitable means (not shown in the drawings) to record the signal, or the signal may be received directly by sound from the armature 27. Each movement of this armature closes the ground branch 26 29 at the point 28; but this will not energize the magnet 30, since there is no other ground connection if the metallic circuit is in proper condition. It sometimes happens, however, that the signal-box mechanism gets out of order, so that it cannot be used to transmit a signal, or the main-circuit wire becomes broken at some point, so that operation of the signal-box will not affect the receiver at the central office. In each of these cases, as well as in police or municipal systems employing telephones in addition to the signal-boxes, it is desirable to have means for getting the attention of the attendant at the



central office independently of the signal-transmitter. Such means are provided by my signal-switch.

Suppose that it is desired to call the central office in the manner just indicated, and that the main circuit is closed and in normal condition. The switch-handle 4 is pressed in until the arm 6 connects the plates 8 and 9. This will close the following circuit: Beginning at ground at the central station through wire 29, wire 26, a portion of battery 12, wire 13, wire 15, the signal-box, wire 22, plates 8 and 9, wire 25, wire 24, to ground. Since the movement of the switch opened the main circuit through magnet 14, the ground-circuit will be closed between armature 27 and contact 28, and the closure of the circuit just described attracts the armature of magnet 30, allowing the annunciator 31 to fall, closing the local circuit and sounding the alarm 34. The alarm will continue to sound until the attendant resets the annunciator-drop. The person operating the switch can then transmit any desired information by use of the telephone, if such instruments are employed in the system, or otherwise. The operation of the alarm 34 of itself will indicate to the central operator that the line, or a signal-box on the line, is out of order.

Suppose now that the switch is used at a time when the main circuit is broken—for example, at the right of the switch shown. When the switch-arm 4 is pressed in far enough to bring the arm 6 onto 7' 10, the following circuit is completed: Beginning at ground at the central office by wires 29 26, part of battery 12, line 11 to plate 7, switch-arm 6, plate 10, wire 24 to ground. This also energizes magnet 30, as already described. Had the break been at the left of the switch the ground-circuit would have been complete when switch-arm 6 rested on contact 9. From this it will be seen that by the mere act of pushing in the handle 4 the circuit is connected to ground first on one side of the switch and then on the other side, and alarm 34 at the central office is operated, whether the main line is complete when the signal is to be sent or whether it is broken.

While I have described the use of the switch in connection with the closed circuit and in connection with circuit when broken as two separate uses of the switch, it will be understood that in practice whenever I use the switch I press it entirely in, so that the arm 6 will pass from the position shown to plate 9 and then to arm 7', since, of course, the person operating the switch does not always know whether the line is in normal condition or not.

What I claim is—

1. The combination, with a normally-closed

circuit, of one or more signal-transmitters and a signal-receiver in said circuit, an additional signaling switch mechanism having means for maintaining the circuit closed and for opening said circuit when operated, means for connecting the two sides of the normally-closed circuit to ground, a normally-open ground branch, a signal device in the ground branch, and a magnet in the closed circuit controlling said branch, substantially as described.

2. The combination, with a metallic circuit, including a suitable source of current, of a ground branch including means for operating a signal, and a switch interposed in the main circuit and normally holding the same closed and arranged to open the metallic circuit when operated, said switch having two contacts connected to ground, one of said contacts being in line with a contact connected to the main line on one side and the other of said contacts being in line with a contact connected with the other side of the main line, substantially as described.

3. The combination, with a metallic circuit including signal-transmitting boxes, of a signaling or emergency switch at each box, said switch having two main contacts normally connected by a switch-arm maintaining the circuit closed and two other contacts connected to ground, one of said latter contacts being so arranged that by operation of the switch it is connected to one main terminal and the other being so arranged that by operation of the switch it is connected to the other main terminal, and a ground branch at the central station including signal devices, substantially as described.

4. The combination, with a metallic circuit including signal-transmitters and a current-generator, of a ground branch taken from the circuit between the terminals of the generator, said ground branch containing the magnet of a drop or device serving as a circuit-closer and a signal operated by said circuit-closer, an emergency-switch at each signal-transmitter, said switches normally maintaining the circuit closed, but arranged to open the metallic circuit when operated, and each having ground-contacts, and means for connecting one of said contacts to one side of the main line and then for connecting the other contact to the other side of the main line, whereby a call will be given whatever the condition of the circuit, substantially as described.

This specification signed and witnessed this 26th day of May, 1891.

JOS. W. STOVER.

Witnesses:

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