

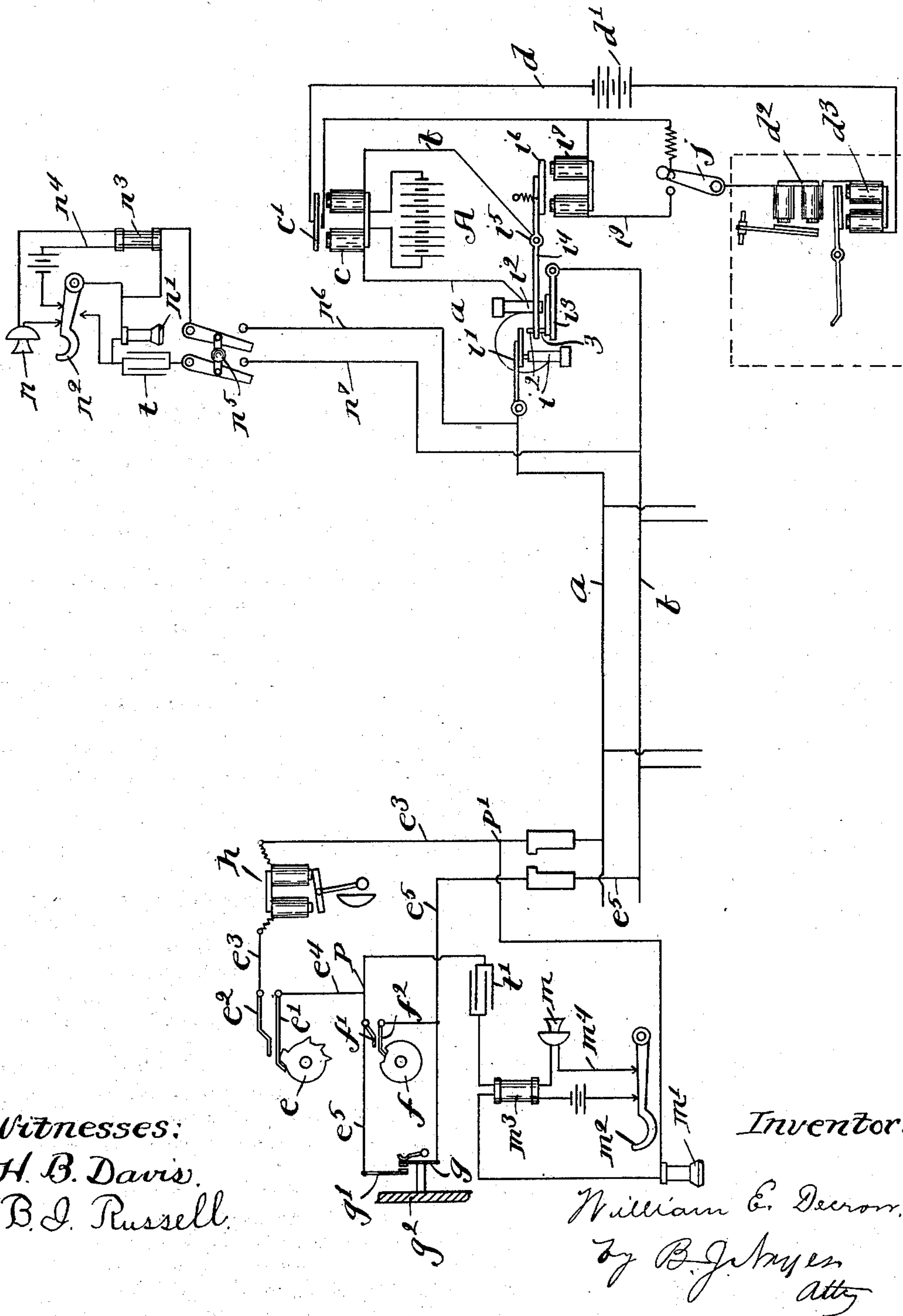
No. 750,268.

PATENTED JAN. 26, 1904.

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ELECTRIC SIGNALING APPARATUS.

APPLICATION FILED APR. 29, 1901.

NO MODEL.



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ELECTRIC SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 750,268, dated January 26, 1904.

Application filed April 29, 1901. Serial No. 57,959. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. DECROW, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Electric Signaling Apparatus, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawing representing like parts.

This invention has for its object to construct a normally open circuit police-signal system having all the usual capabilities of the closed-circuit system now in use—i. e., having means for transmitting signals from different boxes or signal-stations to a receiving or central station and means for automatically transmitting an answer-back signal from said receiving-station to the box and also having means for carrying on telephonic communication between any one of the boxes and the receiving-station.

In carrying out my invention a normally open circuit is provided comprising a battery and pair of normally open circuit-wires leading in parallelism from it, and a signal-receiving apparatus is connected with said circuit-wires at the signal-receiving station, which is adapted to be operated by the circuit, and for simplicity of construction and operation said signal-receiving apparatus comprises, essentially, a signal-receiving relay, a local circuit operated by it, and a register operated by said local circuit.

One or more box-number circuit-operating devices are provided, each arranged in a normally open set of connecting-wires between said main circuit-wires, and consequently in multiple arc, and any one of said circuit-operating devices is adapted to operate the circuit, and thereby operate said signal-receiving apparatus, and a switch is provided for closing each set of connecting-wires, which is preferably adapted to be operated automatically. For certain reasons it is preferable to employ two switches, either one of which will accomplish the desired end, one of which is adapted to be operated by the door of the box and the other by the signal-transmitting train in running. An answer-back bell is included in each set of connecting-wires, which is adapted to

be operated by means provided at the signal-receiving station to indicate that the signal has been received; yet the means for operating said answer-back bell may be so arranged as to be under the control of the attendant at the receiving-station, so that he can set the apparatus in condition to operate said answer-back bell or not, as desired.

Also in carrying out my invention suitable telephonic instruments and a condenser are provided at the receiving-station and also at each box, and said telephonic instruments and condenser are connected in parallel with the box-number circuit-operating device in each set of connecting-wires between the main circuit-wires, and consequently the same switch or switches which close said set of connecting-wires with the main circuit-wires may be employed for controlling both the transmission of the signal and also the establishment of the telephonic circuit.

The drawing shows in diagram a normally open circuit electric signal system embodying this invention.

A represents the main battery at the signal-receiving station, and from it lead two main circuit-wires *a b*.

c represents a signal-receiving relay, the coils of which are included in circuit with the battery A, and its armature *c'*, which is normally retracted, operates a local circuit *d*, including a battery *d'* and also the starting-magnet *d''* and pen-magnet *d'''* of a register of any usual or suitable construction. These parts, as herein shown, constitute the signal-receiving apparatus; yet so far as my invention is concerned any other suitable form or construction of signal-receiving apparatus may be employed.

The signal-transmitter contained in the box at the signal-transmitting station consists of a train (not shown) and one or more box-number circuit-operating devices, although one only is herein shown for the sake of clearness.

The box-number circuit-operating device is herein shown as a wheel *e*, provided with projections adapted to engage the contact-pen *e'* and close it against the contact-pen *e''* to there-

by close the circuit. The contact-pen e^2 is connected by a wire e^3 with one of the main circuit-wires—as a , for instance—and the contact-pen e' is connected by a wire e^4 to a wire e^5 , which is connected to the other main circuit-wire, as b . Hence it will be seen that said box-number circuit-operating device is connected in multiple arc between said main circuit-wires. The set of connecting-wires $e^3 e^4 e^5$ is also normally open at other points than at the box-number circuit-operating device and is adapted to be closed at said other points by suitable switches provided for the purpose, and whenever said set of connecting-wires is closed by said switches or either one of them, as will be described, and the box-number circuit-operating device operated the signal will be transmitted, which will be received at the signal-receiving station. Two switches are herein provided for the purpose of closing the set of connecting-wires $e^3 e^4 e^5$, either one of which will effectually accomplish the result, but both are provided for reasons to be hereinafter described. One of said switches consists of a wheel f , operated by a signal-train, and a pair of contact-pens $f' f^2$, adapted to be closed together by said wheel when said train is running, so that during the entire operation of the train said set of connecting-wires will be closed by the switch at such point. The other switch consists of a pair of contact-pens $g g'$, adapted to be held open by the door g' of the box when the latter is closed, but to close together by a spring or otherwise whenever said door g^2 is opened. Thus upon opening the door of the box to transmit a signal the switch $g g'$ will be closed, and as soon as the signaling-train is operated the switch $f' f^2$ will also be closed, and if for any reason the box-door should be closed before the signaling-train has ceased operating and the switch $g g'$ thereby opened it will be seen that said set of connecting-wires will remain closed by the switch $f' f^2$ until the signal has been transmitted; hence the importance of providing the switch $f' f^2$.

The answer-back bell h is included in the wire e^3 and is herein shown as a polarized bell of ordinary construction, and at the signal-receiving station a pole-changing device is provided for operating said polarized bell.

The pole-changing device is also of ordinary construction so far as this invention is concerned and consists, essentially, of two pairs of contact-pens $i i'$ and $i^2 i^3$, the pens of each pair being adapted to cooperate together, and an arm i^4 , pivoted at i^5 , bearing two contacts 2 3, which are adapted to engage either one of the contact-pens i' or i^3 and move it away from engagement with the contact-pens i or i^2 ; but, as before stated, this pole-changing device itself is well known in the art. The pivoted arm i^4 is extended beyond the pivot i^5 and bears the armature i^6 of an electromagnet i^7 , which is included in a branch wire i^9 of

the local circuit d , so that whenever said branch wire is closed or connected with said local circuit the electromagnet i^7 will be energized and the pole-changing device operated. A switch j is provided for connecting said branch wire i^9 with the local circuit d , which may be operated manually whenever desired, and whenever said switch j is operated and the branch wire thus closed the electromagnet i^7 will respond to the movement of the armature of the signal-receiving relay, and the signal which is received at the receiving-station will be automatically answered back to the box which is being operated. Thus whenever it is desired the switch j may be properly set, and any signal which is received during such time will be answered back to the box transmitting the signal, and the answer-back bell will in such event audibly repeat the box-number.

At the signal-receiving station a complete telephonic equipment is provided for carrying on telephonic communication with any one of the boxes, and, as herein shown, said telephonic equipment comprises, essentially, the transmitter n , receiver n' , gravity switch-arm n^2 for said receiver, condenser t , and induction-coil n^3 , one of the coils of which is included in the local-battery circuit n^4 , and the usual circuits for said telephonic equipment are adapted to be connected by the switch n^5 with the wires $n^6 n^7$, one of which leads to the main circuit-wire a and the other to the main circuit-wire b , so that said telephonic equipment is connected in multiple arc with said main circuit-wires. The switch n^5 is adapted to be operated manually whenever desired.

At each box a corresponding telephonic equipment is provided comprising, essentially, a transmitter m , receiver m' , gravity switch-arm m^2 , condenser t' , and induction-coil m^3 , one of the coils of which is included in the local battery-circuit m^4 , and the circuit-wire, including such telephonic equipment, is connected at p to the wire e^5 and at p' to the wire e^3 , so that said telephonic equipment is connected to the set of connecting-wires $e^3 e^4 e^5$ in parallel with the box-number signal-transmitter, and being thus connected it will be seen that the switch $g g'$ will control the circuit. Whenever the box-door is open, the telephonic equipment will be connected in circuit, so that the receiver m' is responsive, although the telephonic transmitter m will not be operative until the gravity switch-arm m^2 has closed the local circuit m^3 ; hence the necessity of the switch $g g'$.

By arranging the circuit-wires of the telephonic equipment at the box in this manner it will be seen that the telephonic receiver m' is capable of responding at all times whenever the door of the box is open.

I claim—

1. In an electric signaling system, the combination of a battery and two main circuit-

wires *a*, *b*, leading from the opposite poles thereof, constituting a normally open circuit, signal-receiving apparatus adapted to be operated by said circuit, a plurality of box-number circuit-operating devices, a plurality of sets of connecting-wires between said main circuit-wires *a*, *b*, including said box-number circuit-operating devices, a switch for each set of connecting-wires for opening and closing it, means for operating said switch, an answer-back bell included in series with the box-number circuit-operating device in each set of connecting-wires, and means for operating said bell which is operated by the signal-receiving apparatus, substantially as described.

2. In an electric signaling system, the combination of a battery and two main circuit-wires *a*, *b*, leading from the opposite poles thereof, constituting a normally open circuit, signal-receiving apparatus adapted to be operated by said circuit, a plurality of box-number circuit-operating devices, a plurality of sets of connecting-wires between said main circuit-wires *a*, *b* including said box-number circuit-operating devices, a switch for each set of connecting-wires for opening and closing it, means for operating said switch, an answer-back bell included in series with the box-number circuit-operating device in each set of connecting-wires, and an operating device for said answer-back bell connected with the circuit of and operated by the signal-receiving apparatus, substantially as described.

3. In an electric signaling system, the combination of a battery and two main circuit-wires *a*, *b*, leading from the opposite poles thereof, constituting a normally open circuit, signal-receiving apparatus adapted to be operated by said circuit, a plurality of box-number circuit-operating devices, a plurality of

sets of connecting-wires between said main circuit-wires *a*, *b*, including said box-number circuit-operating devices, a switch for each set of connecting-wires for opening and closing it, means for operating said switch, a polarized bell included in series with the box-number circuit-operating device in each set of connecting-wires, and a pole-changing device for operating it which is adapted to be operated by the signal-receiving apparatus, substantially as described.

4. In an electric signaling system, the combination of a battery and two main circuit-wires *a*, *b*, leading from the opposite poles thereof, constituting a normally open circuit, signal-receiving apparatus adapted to be operated by said circuit comprising a signal-receiving relay, a local circuit operated by it and a register operated by said local circuit, a plurality of box-number circuit-operating devices, a plurality of sets of connecting-wires between said main circuit-wires *a*, *b*, including said box-number circuit-operating devices, a switch for each set of connecting-wires for opening and closing it, means for operating said switch, a polarized bell included in series with the box-number circuit-operating device, in each set of connecting-wires, a pole-changing device for operating said bell, an electromagnet for operating said pole-changing device, and means for including said electromagnet in the circuit of the signal-receiving apparatus, substantially as described.

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

WILLIAM E. DECROW.

Witnesses:

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H. B. DAVIS.