(No Model.)

2 Sheets—Sheet 1.

J. F. HUNTER & S. H. LOUGH.

CIRCUIT CHANGER FOR ELECTRIC SIGNALING SYSTEMS.

No. 528,127. Patented Oct. 23, 1894.

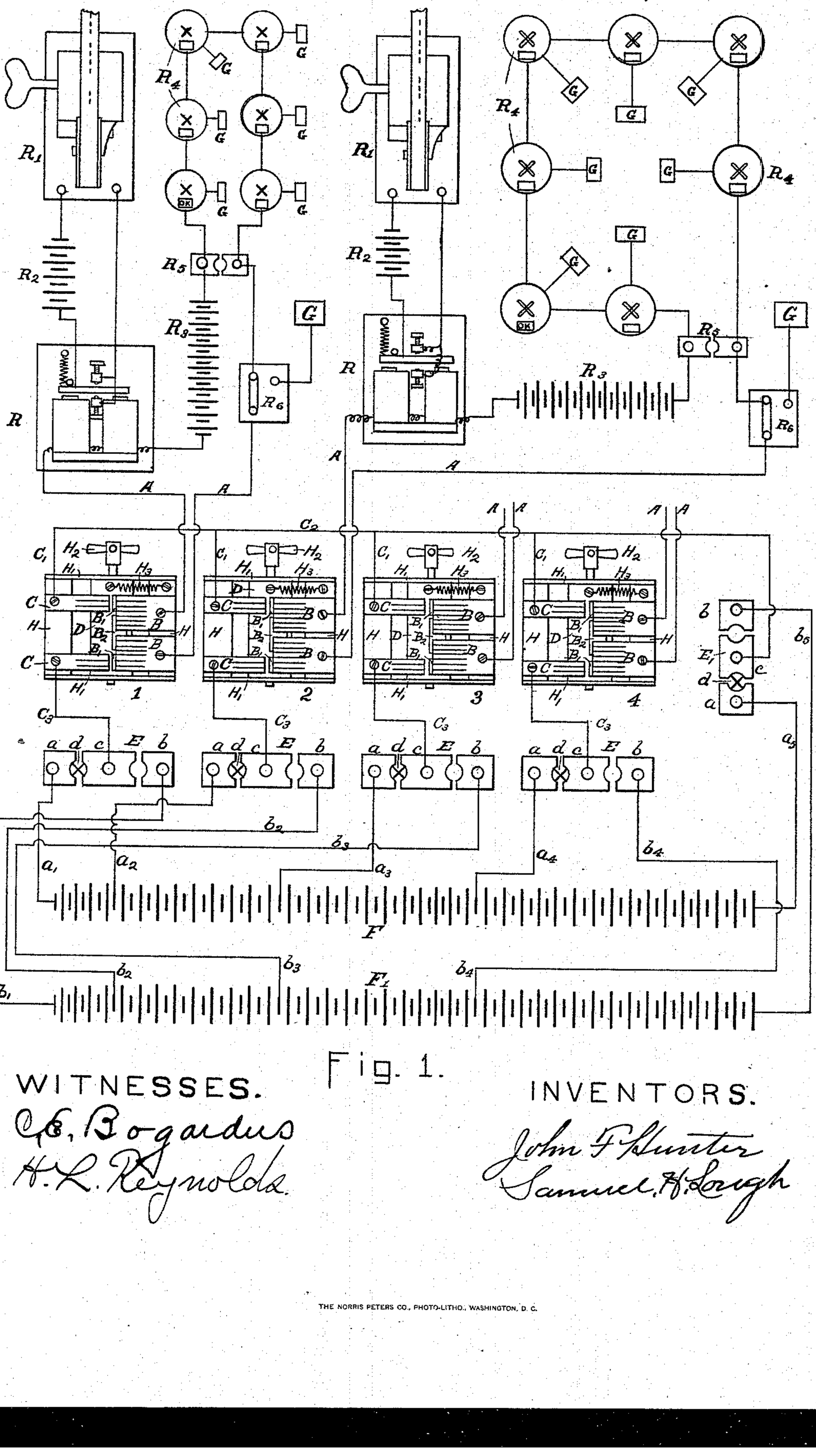

Fig. 1.

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Fig. 2.

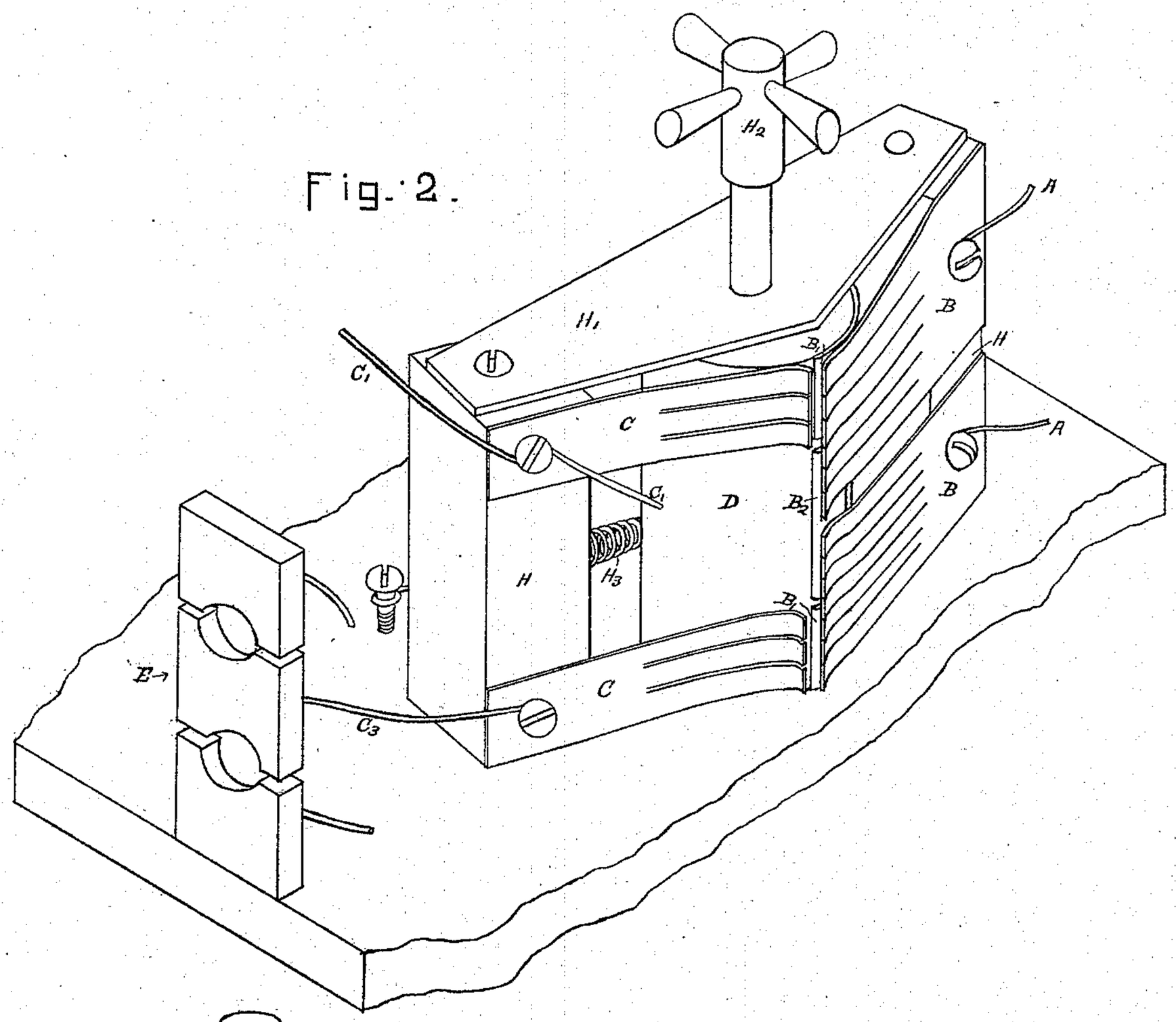


Fig. 3.

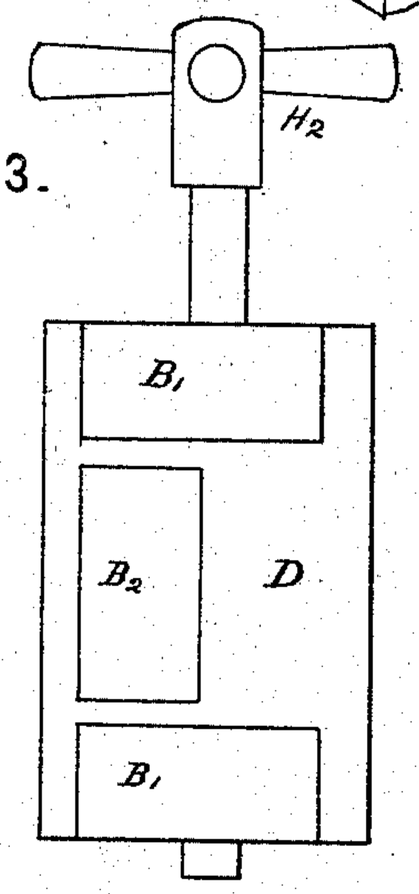
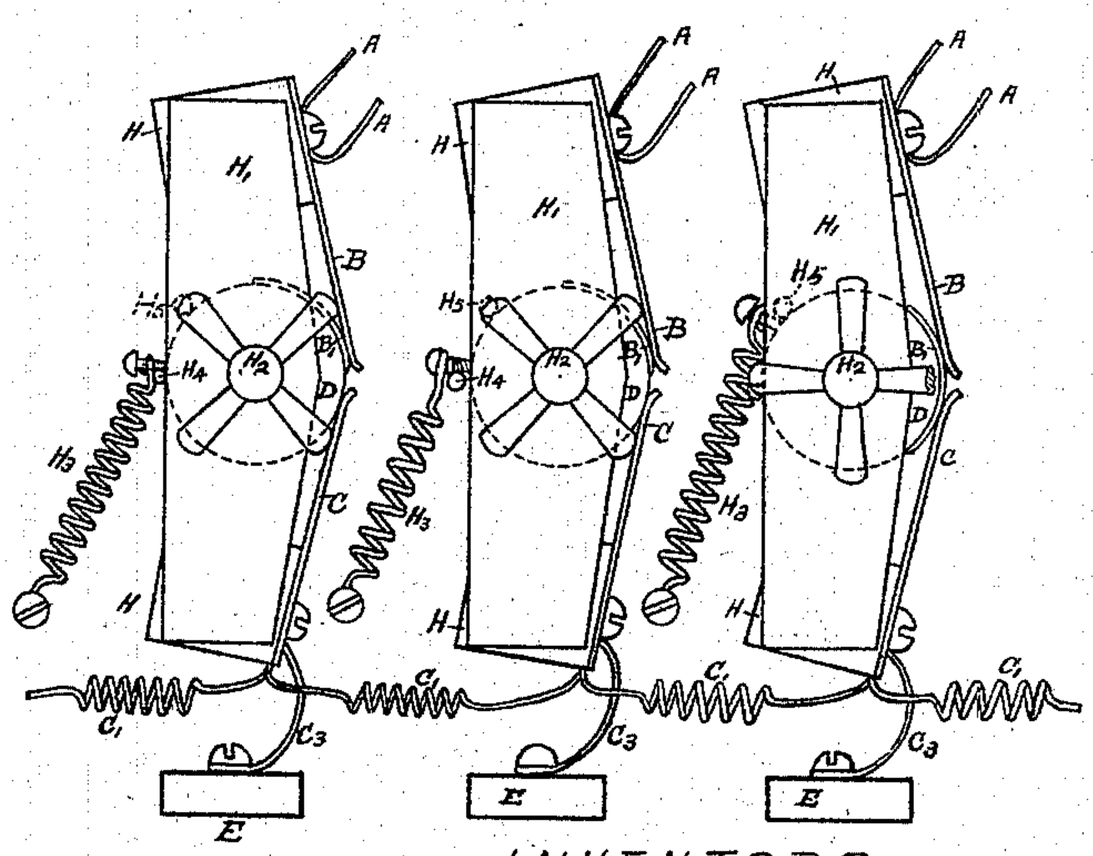


Fig. 4.



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UNITED STATES PATENT OFFICE.

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CIRCUIT-CHANGER FOR ELECTRIC SIGNALING SYSTEMS.

SPECIFICATION forming part of Letters Patent No. 528,127, dated October 23, 1894.

Application filed September 3, 1892. Serial No. 445,019. (No model.)

To all whom it may concern:

Be it known that we, JOHN F. HUNTER and SAMUEL H. LOUGH, citizens of the United States, residing at Seattle, in the county of King and State of Washington, have invented a new and useful Improvement in Circuit-Changers for Electric Signaling Systems, of which the following is a specification.

Our invention is a circuit changer box to be used in places where, as in district telegraph or messenger service, it is necessary at frequent intervals to momentarily throw extra battery force on any one of a number of circuits.

In district messenger service where certain forms of return call boxes are used in which the return signal is operated by throwing an extra battery on the circuit, it is the common practice to have a separate battery for each of these circuits.

The object of our invention is to provide means by which one battery may be used to work all the circuits.

In the drawings Figure 1 is a diagrammatic representation of our device showing two circuits in full and indicating where two more circuits would be connected. Fig. 2, is a detail perspective view of one section of our switch box. Fig. 3 is a detail view of the roller D. Fig. 4 is a plan view of three sections.

Figs. 2, 3, and 4, show an arrangement of the parts which is slightly different from that shown in Fig. 1, although the construction and operation of the parts are the same. The arrangement shown in Figs. 2 and 4 is preferred to that of Fig. 1, as being more compact. The arrangement of Fig. 1, however permits a clearer illustration than that of Figs. 2 and 4. In Fig. 1, the cylinder D, and the switch E are both shown placed horizontally while in the other figures they are vertical.

In Fig. 1, R, represents the relay in one of the circuits of a district messenger service, R, the register operated thereby and R^2 the local battery. R^3 is the main line battery for operating the relay and R^4 the messenger boxes upon the circuit. R^6 is a ground switch and R^5 a plug switch to be used when a break in the line makes it necessary to operate the circuit as an open circuit. The particular construction of these parts forms no part of our present invention and will not be particularly pointed out. They are introduced only to show their connection with our circuit changer and may be of any of the usual forms.

The construction of our circuit changer is as follows: A cylinder D, of wood or other insulating substance, is mounted upon its axis and has a handle H^2 by which it may be rotated. This is held against a stop H^4 by a spring H^3, which regulates its position ordinarily. Another stop H^5 limits the amount of its rotation in the other direction. Upon one side of this cylinder are placed three pieces of brass, B′, B^2, and B′. See Fig. 3. The pieces B′, at the ends of the cylinder extend over about half as much of the length of the cylinder as does the middle piece, B^2, but extend over about twice as much of the circumference. These pieces are all separated from each other.

On each side of the cylinder are blocks of wood, H, which support the plate H′, in which is the bearing for the axis of the cylinder, D. These blocks also carry the spring contact pieces C, C, and B, B. These are thin metal plates having their contact ends slotted so as to make a number of narrow tongues. The plates C, C, are of the same width as the plates B′, on the cylinder and are so placed that when the cylinder is rotated they will make contact within the plate B′, and not touch the plate B^2. The spring plates B, B, however are of such a width and so placed that when the cylinder is in its normal position they each cover one of the plates B′, and nearly half of the plate B^2.

One of the contact plates C, is connected by the wire C^3, with a switch E, and from that to the battery F. The other plate C, from each of the circuit changers is connected by a wire C′, to a common wire C^2 which runs to a switch E′, and from that to the other end of the battery F.

The spring plates B, B, are connected into the main line wire of one of the messenger box circuits as shown. This circuit is completed through the plate B^2, on the cylinder which is ordinarily in contact with both spring plates B, B.

When a call has been received from one of the boxes and it is desired to send a return

signal the handle H^2, is turned through a small arc so as to bring the plates B′, in contact with the spring plates C. The stop H^4 prevents rotation sufficient to break its connection with the spring plate B. At the same time the plate B^2, which ordinarily forms a part of the main line circuit, being narrow, is rotated from under the plates B, B, so that the current can no longer pass through it. The spring contact plates C, C, being the terminals of a circuit which is ordinarily open and which includes the battery F, this battery is thrown on the main line circuit thus increasing the current and operating the return call. The width of the plate B^2, is such that it is not taken out of the box or main line circuit until the circuit has been completed through the spring plates C, C, and the battery F. A spring H^3, returns the cylinder D, to its ordinary position as soon as it is released. As many of these circuit changers are provided as there are separate circuits, each circuit being led to its own switch.

As the different circuits upon which these changers are placed are apt to be of varying resistance, not all of them will require the same battery power to operate them. In fact they will be operated more satisfactorily if the battery power is correctly proportioned to the resistance. To accomplish this the wires from one of the spring plates C, from each changer, are led to a common wire C^2, which is connected to one end of the battery. The wires from the other spring plate C, on the different changers are led to the battery independently and are connected to it at such a point from the end where the common wire C^2 is connected as will give the proper battery power. The battery is made of such a size that the circuit having the greatest resistance will be properly worked thereby when its two wires lead to the extremities of the battery. Those circuits which have less resistance are connected at intermediate points. Two circuits of the same resistance would of course be connected at the same point.

The plug switches E, E, and E′, are provided so that a change may be readily made from one battery to another when one gets weak. These switches are simply three pieces of metal so arranged that the center piece may be connected to either end piece at will by inserting a plug between them. As shown in Fig. 1 the battery F is in use. The wires leading from the spring contact plates C, C, are connected to the central piece and the end pieces of each are connected to corresponding places in the two batteries. When the battery F, gets weak the plugs are drawn from the position shown and inserted in the other hole so as to connect up the battery F′.

The wires A, A, leading from the circuit changers numbered 3 and 4, are shown, indicating where the corresponding box circuits would be attached. It is evident that any number of circuits could be accommodated in one box by putting in a sufficient number of sections or circuit changers.

We claim—

1. In a system for transmitting signals, the combination with a plurality of normally closed electrical circuits with signal transmitting and receiving instruments included in each, of a battery, a plurality of normally open circuits including said battery in whole or in part as desired, and means for breaking each of the normally closed signal circuits and connecting it to its respective open battery circuit making a closed circuit through the battery and the signal transmitting and receiving instrument; substantially as described.

2. In a system for transmitting signals, the combination with a plurality of normally closed electrical circuits with signal transmitting and receiving instruments included in each and a battery for operating them, of an extra battery, a plurality of normally open circuits including said battery, a circuit changer in each closed circuit, and electrical connections therefrom to the open circuits respectively whereby any one of the signal circuits may be made to include the said extra battery; substantially as described.

3. In a system for transmitting signals the following instrumentalities, viz: two or more electrical circuits, each containing signal transmitting and receiving instruments and a battery for working the same, in combination with a circuit changing switch in each circuit, an extra battery, a common connection from one side of each circuit changer to one end of said extra battery, independent connections from the other side of said circuit changers to the other end of the battery or to such intermediate points as may be necessary to secure the right amount of current, and devices contained in each of said circuit changers for throwing into its circuit said extra battery or that portion of it contained between its two points of connection therewith, substantially as shown and described.

4. In a system for transmitting signals, the following instrumentalities, viz: two or more circuits, each containing signal transmitting and receiving instruments and a battery, in combination with a circuit changing switch, inserted in each circuit, two extra batteries, a three part plug switch for each circuit, connections from one side of each circuit changing switch to the center piece of its plug switch and from each end piece to corresponding places in the extra batteries, an extra three part plug switch, a common connection from the other side of the circuit changing switches to the center piece of the last plug switch and from the end pieces to one end of their respective batteries, substantially as shown and described.

5. In a system for transmitting signals, two or more main line circuits with signal trans-

mitting instruments comprising return call devices, receiving instruments in each circuit, an extra battery and circuit normally disconnected from the main line circuits, and a circuit changer in each main line circuit for connecting the extra battery circuit with the main line; substantially as described.

6. In a system for transmitting signals, two or more main line circuits including signal-transmitting and receiving instruments and a battery for each circuit constantly in said circuit, an extra battery and circuit normally disconnected from the main line circuits, and a circuit changer in each main line circuit with electrical connections from each circuit changer to the extra battery so that the extra battery may be placed in any one of the main line circuits; substantially as described.

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