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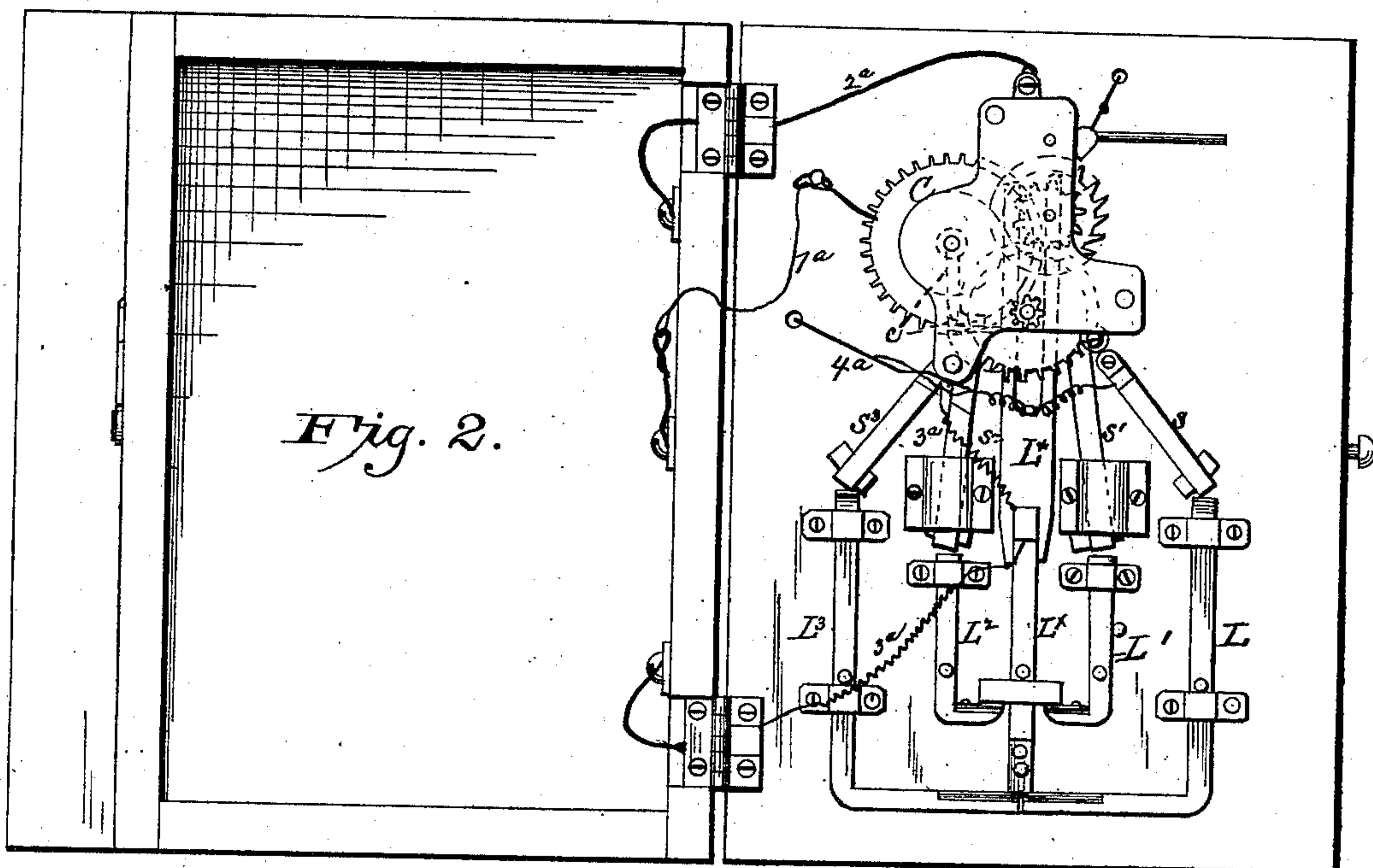
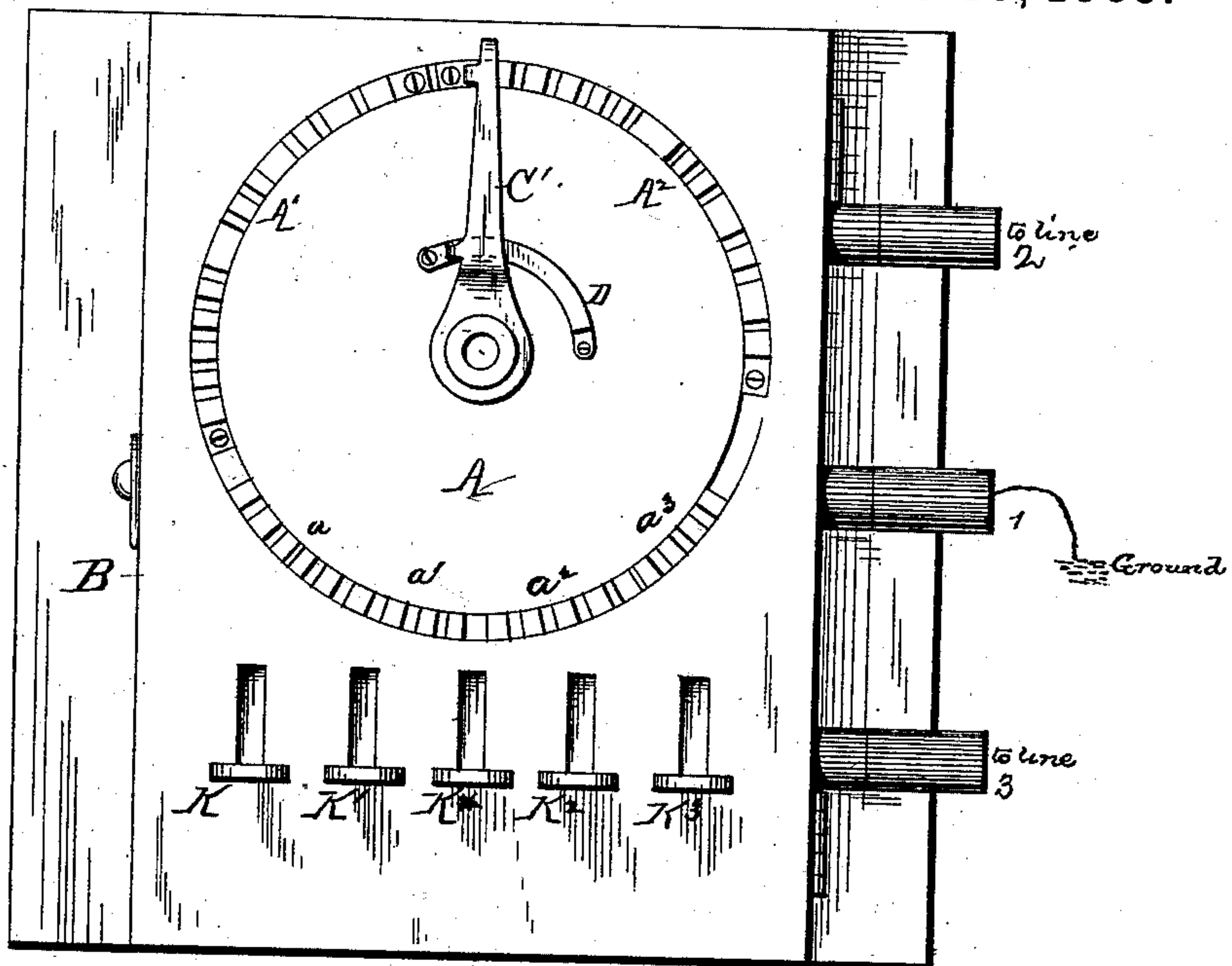
3 Sheets—Sheet 1.

E. W. APPLGATE.

DISTRICT SIGNAL AND MESSENGER CALL BOX.

No. 279,629.

Patented June 19, 1883.



Witnesses:  
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(No Model.)

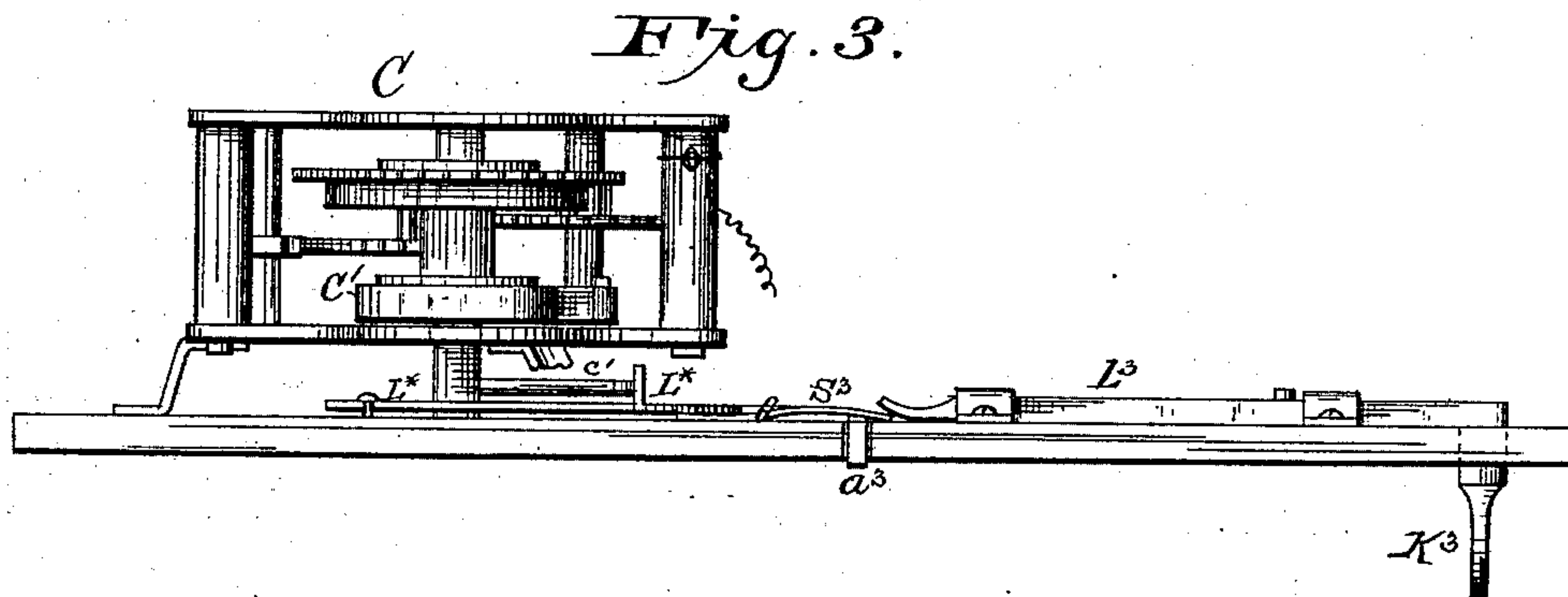
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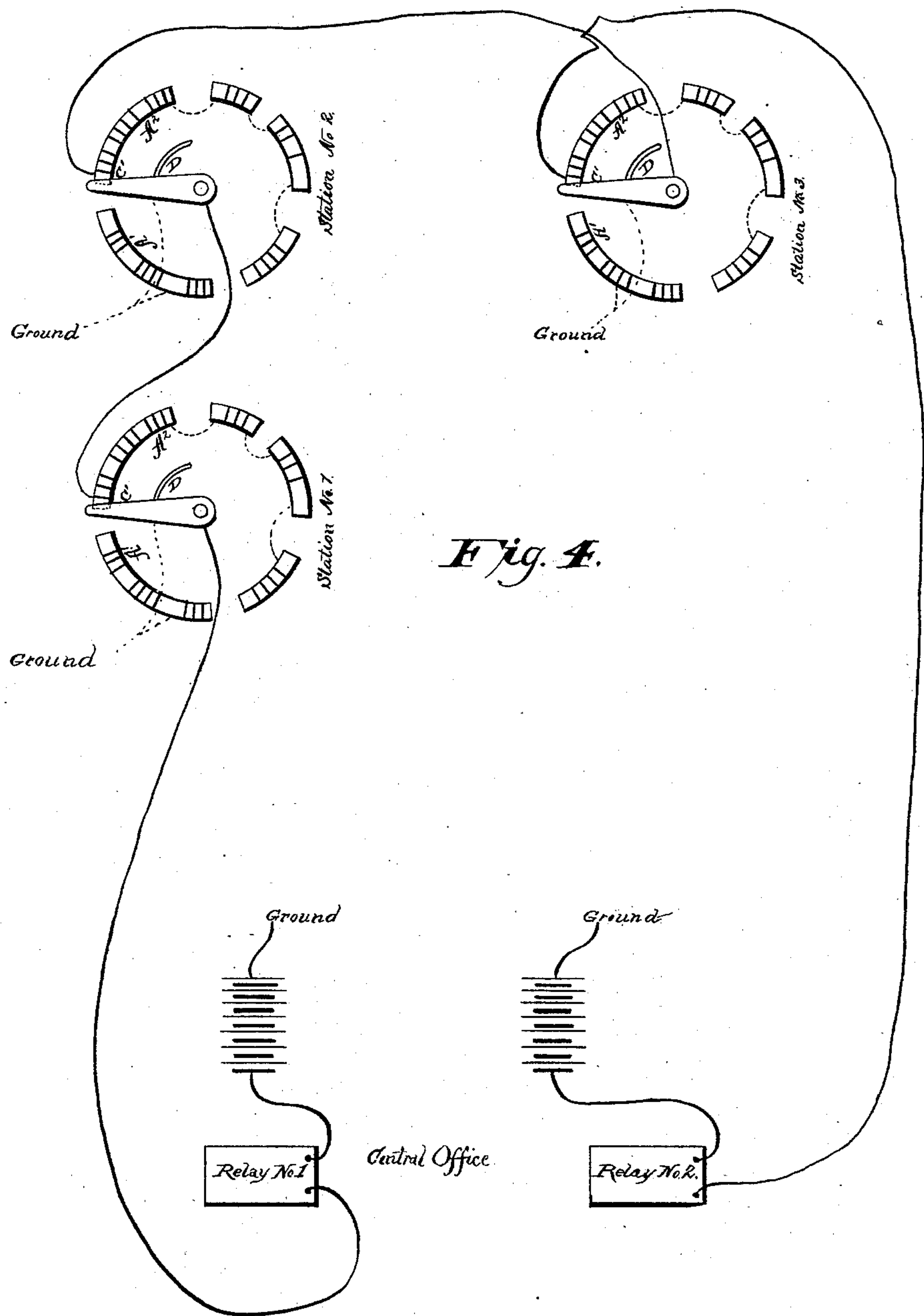
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(No Model.)

3 Sheets—Sheet 3.

E. W. APPLEGATE.  
DISTRICT SIGNAL AND MESSENGER CALL BOX.  
No. 279,629. Patented June 19, 1883.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

EUGENE W. APPLGATE, OF WASHINGTON, DISTRICT OF COLUMBIA.

## DISTRICT SIGNAL AND MESSENGER CALL-BOX.

SPECIFICATION forming part of Letters Patent No. 279,629, dated June 19, 1883.

Application filed February 24, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, EUGENE W. APPLGATE, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in District Signal and Messenger Call-Boxes; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention has reference to signal-boxes used generally in what is known as "district service," where the wants are made known by certain conventional and predetermined signals. Part of the invention is however applicable to various electrical instruments where it is desired to automatically ground or deaden the line at a local office or point during certain portions of the time the instrument is being used, in order to ascertain with precision and certainty on which side of the instrument a break or interference comes, if any exist.

My instrument, in the ordinary operation, makes the connections so as to determine this fact with certainty and precision and without the interference of the operator. To effect this I have the device over which the hand travels to make the signal, which signifies any given office placed twice on the instrument of that office, to be acted upon by the circuit-breaker. One of the said devices I connect to the main line directly, and the other to ground, connecting the main line from the opposite direction to the circuit-breaker or hand. I further interpose a connection to ground between the two main-line connections—i. e., the hand and one of the devices—so that during a part of the revolution of the hand the two directions of main line will be separated by this interposed ground-connection. Thus it will be seen that the notation of the office itself is made twice, with an interval between the two, and that the main line is first automatically cut out in one direction and then in the other, so that it is easy to determine where to find a break, if any exist. In connection with the two devices over

which the hand moves to make the signals for the instrument or office itself, which devices usually are made by serrated metallic arcs, I use movable arcs, also serrated, and made capable of being raised or lowered into or out of the line of travel of the hand. These I mount with springs to keep them out of contact with the moving hand normally, and operate them from the exterior of the device by keys, which keys at the same time wind up a spring and start a clock mechanism or train of wheels which moves the hand around the face of the instrument. For this purpose I connect the keys with levers on the interior of the box, which act independently of each other, and each of which takes hold of and operates the lever which winds the spring and starts the train. This winding-lever is also provided with a key which stands in line with the keys heretofore described, and may be used in combination with any one of them to relieve the strain on that key. The movable arcs on the face of the instrument are all electrically connected with each other, and with the stationary arc which is connected to main line. The levers to which the keys are attached are insulated from the winding-lever, which is in the main-line circuit, on the side connected with the hand. The movable arcs represent the calls for different wants—such as messenger, police, fire, doctor, &c.—and the keys which respectively elevate them may be correspondingly lettered.

The accompanying drawings illustrate what I consider the best means of carrying out my invention.

Figure 1 is a front elevation of the device. Fig. 2 is an elevation of the same with the front swung open and the parts exposed. Fig. 3 is an edge view, showing certain parts. Fig. 4 is a diagram showing several instruments in circuit.

Similar letters of reference indicate corresponding parts in all the figures.

A is the face of the instrument.

B is the box.

A' is the serrated metallic arc representing the device into contact with which the circuit-breaker comes to make the signal for the office or instrument on which it is placed. This arc



is connected to ground through wire 1<sup>a</sup> and ground-post 1. A similar arc, A<sup>2</sup>, serrated like A', and for the same purpose, is connected to main line by wire 2<sup>a</sup> and post 2. C is the clock mechanism, and C' the hand. These are connected to main line by wire 3<sup>a</sup> and post 3. D is a ground-piece which is connected to the ground-post 1. This ground-piece D, as shown, is interposed between the arc A<sup>2</sup> and the center of the hand, and is electrically connected to the hand by a projection, c, on the hand as it passes over the said piece D. The hand presses upon the serrated arcs A<sup>2</sup> A' and upon the ground-piece D as it is impelled by the clock-work. As it passes over the arc A<sup>2</sup> it is connected to main line through said arc, wire 2<sup>a</sup>, and post 2, but is cut off from main line, by way of post 3, by the interposed ground-connection D. In passing over arc A' it is connected to ground through said arc, wire 1<sup>a</sup>, and post 1, and to main line by wire 3<sup>a</sup> and post 3, while the connection is broken with main line by way of post 2. Thus in traveling over one arc the main line in one direction is cut off, and when traveling over the other arc the main line in the other is cut off, and both are never joined when the instrument is in use, so that a break can be detected in the line, and it can readily be told on which side of the instrument it is. When the instrument is at rest with the hand on arc A<sup>2</sup>, but not quite touching the ground-piece D, the main line through the instrument is unbroken and ungrounded. As shown in Fig. 1, the ground-piece D extends only as far around as the arc A<sup>2</sup>. This insures that the number of the station will be sent in, even when the line is broken, and the call for a special purpose—as police, doctor, &c.—does not follow, so that a messenger will be sent to that office or station any way.

The ground-piece D can be extended as far around as to ground the line at one end until all the movable arcs are passed, which will throw the call in with the number of the box, in case the wire is broken on one side of the box only, or through the hand; but if the wire connecting with the arc A<sup>2</sup> be broken the call and number of the box on that side will not be sent in.

In Fig. 4 is shown the system by which the interference or trouble in the line is made known at the central office. The hand, passing over arc A<sup>2</sup>, gives a signal on relay No. 2, and at the same time cuts out wire running to relay No. 1 by grounding through ground-piece D. While the hand passes over arc A' the signal is given on relay No. 1 by way of hand C', and arc A' being aground the line to relay No. 2 is cut out.

The circle of which the arcs A' A<sup>2</sup> form a part is completed by a series of arcs independently movable, and which normally lie below level of the moving hand, but which may be elevated into line and be touched thereby. These arcs a a', &c., are serrated in

such a way as to each indicate a different signal or call when brought into line to be touched by the moving hand C'. They are connected to springs s s' s<sup>2</sup> s<sup>3</sup>, respectively, which keep them depressed, except when properly manipulated to be elevated. The arcs a a' a<sup>2</sup> a<sup>3</sup> are electrically connected through the springs and short wires, and are connected to main line through wire 4<sup>a</sup>, arc A<sup>2</sup>, &c.

To throw the arcs a a', &c., out into line the levers L L' L<sup>2</sup> L<sup>3</sup> are pushed up and their chamfered ends bear down the springs. The levers are provided with keys or finger-pieces K K' K<sup>2</sup> and K<sup>3</sup>, respectively, which project through the front of the box, and by which the levers and movable arcs are operated. In addition to the work which these levers do in elevating the movable arcs, they engage, when moved up, with the winding-lever L\* and force it up. This winding-lever L\* engages with an arm, c', on the winding-post C<sup>2</sup>, and as it is pushed up it winds up the spring C<sup>3</sup>. This arm c' also forms a stop for the clock-work when the lever L\* is forced back to its lowest position. The lever L\* has attached to it a key, K\*, which stands in line with the keys K K', &c., and may be pushed up alone, or in conjunction with any of said keys. The lever L\* is in the main line with the hand C' and post 3, and the levers L L' L<sup>2</sup> L<sup>3</sup> are insulated therefrom at the contact-points, as shown, and are in circuit with the main line through arc A<sup>2</sup> and post 2.

When any one of the movable arcs is elevated and the winding-lever elevated, which is done simultaneously and by the same operation as described, the hand will be moved over the face of the instrument, touching the two permanent arcs A<sup>2</sup> (and ground-piece D) and A', and between the two will touch the elevated movable arc, so that the signal it indicates will be sent, and the number of the office twice, as already explained. Two or more of the movable arcs, or all of them, may be elevated at one time, if desired.

The number of movable arcs and their operating means may be varied as occasion or pleasure suggest. The construction of spring for holding them depressed may be changed. The arrangement and construction of levers may be altered and many minor changes made in various parts without departing from the principle or detracting from the efficacy of my device.

The stationary and movable arcs may either or both be formed with insulated portions instead of the serrations, as these answer the same purpose.

Having thus described my invention, what I desire to claim and secure by Letters Patent, is—

1. In an electric signal, the combination, with the arm or hand for making the signal, of two devices formed to indicate two signals for the office, and means, substantially as described, for automatically cutting off the main



line in one direction when traversing one of said devices, and in the other direction when traversing the other device.

5 2. In an electric signaling device, the combination, with the circuit-breaker connected to the main line in one direction, of a device for indicating the signal for the office, connected to the main line in the other direction, a ground-piece to cut out the main line through  
10 the circuit-breaker when it is traversing this main-line device for indicating the office signal, and a second device for indicating the office signal connected to the ground, as set forth.

15 3. The combination, with a hand and means for operating it, of a movable arc, or series thereof, set in a stationary circle traveled by the hand, and having a spring or springs secured thereto for keeping said arc or arcs out  
20 of level of the hand's movement, and a lever or levers for throwing said arc or arcs into line for the hand, substantially as herein set forth.

4. In an electric signaling apparatus, the combination, with the circuit-breaking hand 25 and the movable arcs and spring to which they are secured, and by which they are held normally depressed, of levers having chamfered ends adapted to be pressed upon the springs, thus elevating the arcs, and keys or finger- 30 pieces projecting through the front of the signal-box, by which the levers are operated, substantially as set forth.

5. The combination, with the hand and its operating-train, the movable arcs, and operat- 35 ing-levers, of a winding-lever for winding up the spring of the train, operated simultaneously with and by the same manipulation as the movable arcs, as herein set forth.

In testimony whereof I affix my signature in 40 presence of two witnesses.

EUGENE W. APPLGATE.

Witnesses:

I. N. KALB,  
H. A. HALL.