

(No Model.)

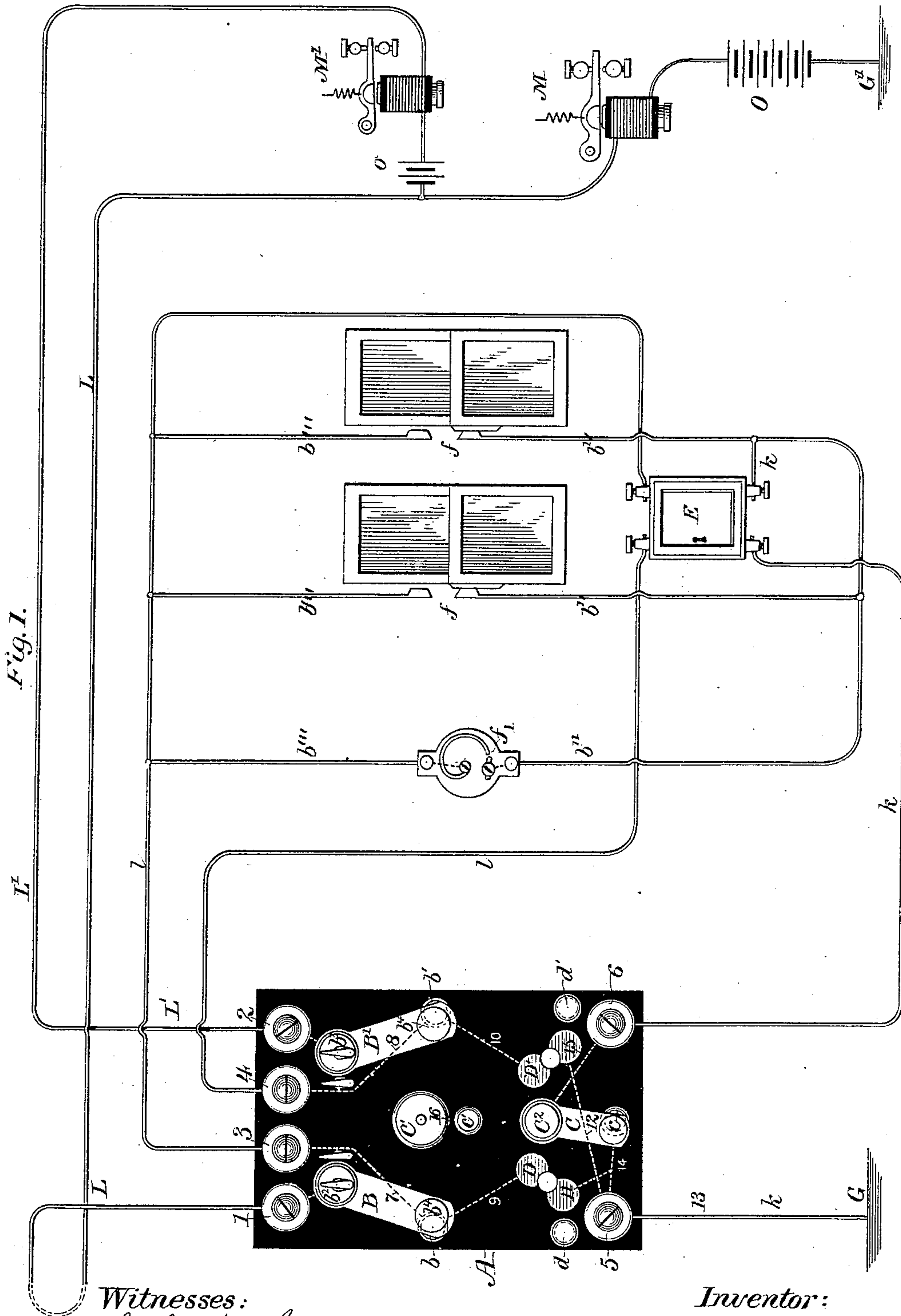
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G. F. BULEN.

STATION SWITCH FOR FIRE TELEGRAPHS.

No. 271,597.

Patented Feb. 6, 1883.



Witnesses:
L. S. McLean
Geo W. Breck.

Inventor:
George F. Bulen,
By his Attorneys
Pope, Edgcomb & Butler.

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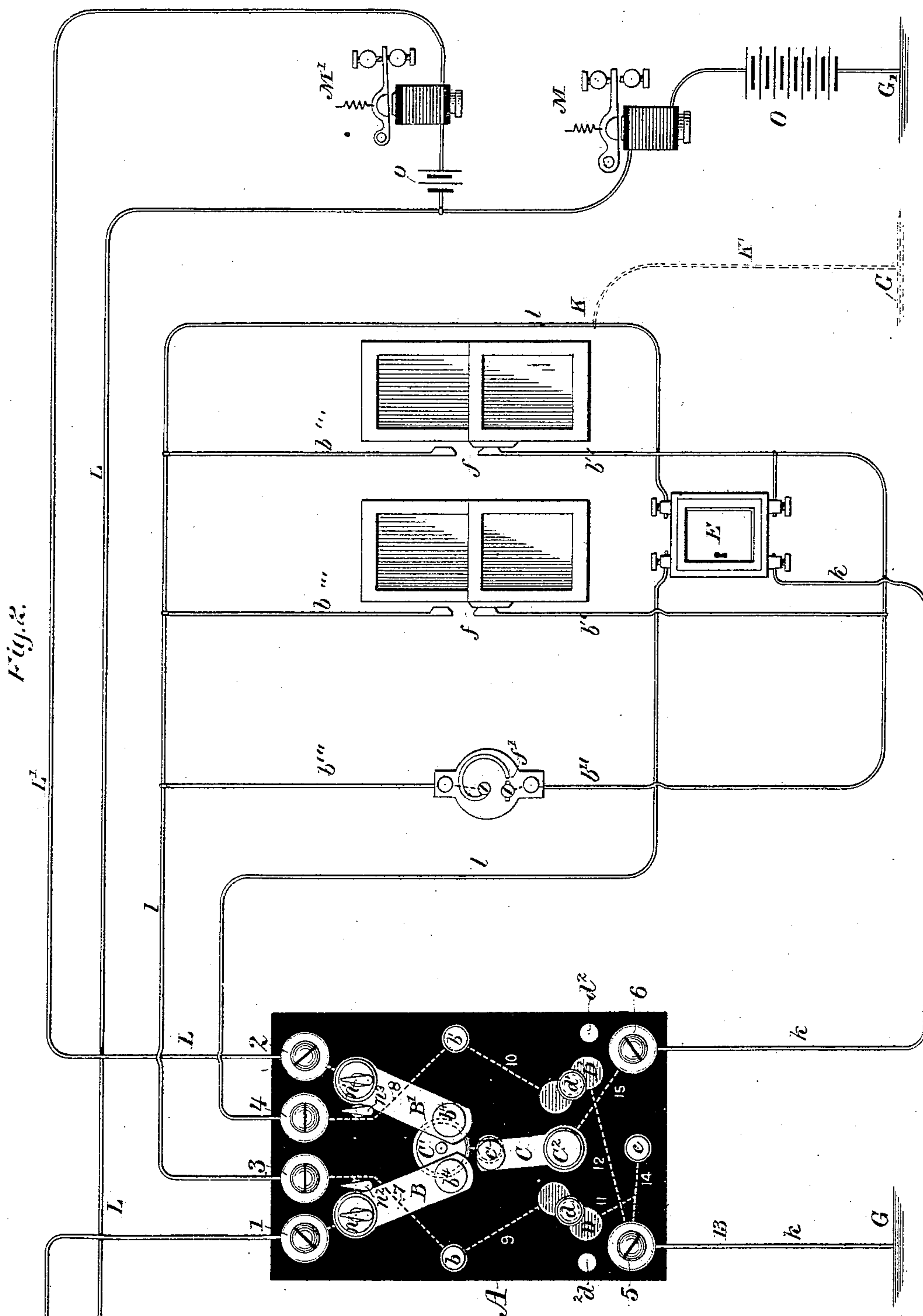
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UNITED STATES PATENT OFFICE.

GEORGE F. BULEN, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO THE WATKINS AUTOMATIC SIGNAL TELEGRAPH COMPANY, (LIMITED,) OF NEW YORK, N. Y.

STATION-SWITCH FOR FIRE-TELEGRAPHS.

SPECIFICATION forming part of Letters Patent No. 271,597, dated February 6, 1883.

Application filed June 23, 1882. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. BULEN, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Station-Switches and Circuits for Automatic Fire-Alarm Telegraphs, of which the following is a specification.

My invention relates to certain improvements in apparatus and circuits pertaining to automatic signaling-telegraphs of the class commonly employed in fire-alarm and other protective systems. In telegraphic systems of this description a local line traverses the building to be protected, and normally forms an interposed section of the main line. This is arranged to be instantly connected with a normally-open earth-circuit in the event of a fire or of an unauthorized attempt to enter the building, thereby causing a signaling device to be actuated. In case an accidental connection is established from the local protective circuit to the earth, or the conductor of the local circuit is interrupted, my invention provides a means whereby the connections may be temporarily interchanged with each other in such a manner that the defective local conductor will temporarily subserve the purposes of the normal earth-circuit, and the protective capacity of the main and local circuits still be maintained.

My invention consists in an organization of circuits and circuit-changers whereby the local line within the building may be normally included in the circuit of the main line, but when required a corresponding and normally-disconnected signaling-circuit, by means of which an earth-connection is made, and an alarm mechanism actuated whenever necessary for the protection of the building, may be so interchanged with the local line that in the event of the latter being interrupted, or of a connection being formed from any point thereof to the earth—as, for example, by an accidental contact with a water-pipe, gas-tube, or other conducting medium, thereby destroying the protective capacity of the circuits—the local line may be disconnected from the main line, and the connections of the latter be completed

independently of the local line. The signaling-circuit may also at the same time be disconnected from the earth and placed in connection with the main line, forming an incomplete or normally-open branch circuit. A circuit will be closed to the earth through this temporary line whenever the protection of the building may require, traversing the defective local wire, and any one or more of the circuit-closers interposed between the local and signaling circuits, which are designed to be operated by an unauthorized attempt to effect an entrance into the building, by the abnormal heat caused by a fire, or any agency whatever, which is brought into requisition for protective purposes. My improved station-switch is designed to be inclosed within a suitable protective case or box, which is placed in such a position as to be accessible by an inspector without entering the protected building. Thus, in case a fault or interruption occurs within such a building at a time when its interior is inaccessible—as during the night, or on Sundays or holidays—it will not be necessary to disconnect the system of circuits within the building from the main line, thus leaving the premises wholly unprotected, but the temporary connections will serve the purpose until such time as the inspector can gain access to the place where the fault is located and remove it.

In the accompanying drawings, which illustrate my invention, Figure 1 is a plan view of the station-switch, showing the circuit-connections in their normal relation; and Fig. 2, a like view, showing the circuit-connections as reorganized in the event of an accidental earth-connection having been made with the local line, or the local line having been interrupted.

I have illustrated my invention as applied to a telegraphic system employing a main line, L, which includes, at some convenient point, a main battery, O, and suitable electrical apparatus, M, for signaling and testing purposes. The said main line extends through a number of different stores, houses, &c., the local circuits within one of these protected buildings being represented in the figures. One pole of the main battery O is permanently

connected with the earth, as at G' , and the other with the main line L , which, after traversing the several buildings to be protected, is made continuous with a return-conductor, L' , which may include a second battery, o , and suitable signaling apparatus, M' . The circuits within each protected building consist of a local line, l , which traverses the exposed portions of the structure, and is normally included in the circuit of the main line $L L'$, together with a normally-disconnected earth-conductor, k , which traverses the building in proximity to the local circuit l , and includes a signal-transmitting mechanism, E , arranged to be operated whenever a connection is established between the two conductors. This is effected by means of the organization about to be described. The two conductors l and k are normally disconnected from each other, but are provided throughout the exposed portions of the building with circuit-closers f and f' , arranged to form, when actuated, an electrical connection between the two wires, and thus set in motion the signal-transmitting mechanism E , which is included in the circuit of the earth-conductor k between the circuit-closers and the earth, at such times as required for protective purposes.

The means which I employ for controlling the circuit-connections consist of suitable switches, B and B' , mounted upon a base, A , of non-conducting material, and consisting of swinging metallic arms pivoted respectively at b^2 and b^3 , and electrically connected with the binding-posts 1 and 2, to which binding-posts the incoming and outgoing sections of the main line are attached, as hereinafter explained. The free ends of the switch-arms are provided with suitable knobs or handles, b^4 , and are arranged in such a position that they may be turned horizontally from their respective contact-plates b and b' , and placed in contact with a common contact-plate, C' . The contact-plates b and b' are respectively connected with the two ends of the conductor l , forming the local line which traverses the building, extending through the exposed portions thereof, as circumstances may require. The contact-plates b and b' are also respectively connected with the terminals of two normally-open peg-switches, D and D' , the opposite terminals of which are in electrical connection with the earth at G , through wires 11 and 12, binding-post 5, and wire 13. A third switch, C , similar in construction to the switches B and B' , is pivoted at c^2 , and provided with two contact-plates, c and c' , with either of which it may be placed in connection at pleasure. The contact-post c is electrically connected by a wire, 14, with the binding-post 5, and the plate c' is connected through a wire, 16, with the common contact-point C' , hereinbefore referred to.

The switch C is itself united by a wire, 15, to the binding-post 6, with which the signaling-circuit k is likewise connected.

It will be understood from the foregoing description that the incomplete circuit of the

battery O is normally through the main line L to binding-post 1, switch B , wire 7, binding-post 3, local line l , binding-post 4, and line L' . If, however, any one of the circuit-closers f and f' be caused to form a connection between the wires b'' and b''' , a circuit will be completed from the main battery O through line-wire L , binding-post 1, switch B , wire 7, binding-post 3, and local line l , thence through the circuit-closer f or f' to line k , and signal-transmitting mechanism E to binding-post 6, and through wire 15, switch C , contact-plate c , (with which the switch is normally in contact,) wire 14, binding-post 5, and wire 13, to the earth at G , thence returning to the other pole of the battery O through G' . If from any accidental cause a connection should be established from the wire l directly to the earth—as, for example, at K , Fig. 2—the circuit of the battery O will be completed through that point, thus short-circuiting the signaling-circuit k and signal-transmitting mechanism E , and thereby rendering the protective apparatus of no avail. In order to remove this disability it is only necessary to move the switches B and B' from the contact-plates b and b' to the common contact-plate C' , and also the switch C from the contact-plate c to the contact-plate c' , and finally to transfer the pegs d and d' from the holes d^2 , in which, for convenience, they are ordinarily placed, to the peg-holes in D and D' , respectively, thus placing both ends of the local line l in direct connection with the earth. The circuit of the main line will then be complete directly through the switches B and B' by means of the contact-plate C' , and the local wire l will be entirely disconnected therefrom. The signaling-circuit k , however, is connected with the main line through the binding-post 6, wire 15, switch C , wire 16, and contact-plate C' , forming a normally-open branch circuit. If, therefore, any one of the circuit-closers f or f' be closed, a circuit will be completed from the main line through the wire k and signaling device E to the wire l , and thence to the earth by way of the point K and the conductor represented at K' . Should the connection formed at the point have become severed after the switch has been placed in the position represented in Fig. 2, an earth-connection will still exist by way of the binding-posts 3 and 4, which are respectively connected with the binding-post 5, and hence with the earth, by means of the wires 7 and 9, peg-switch D , and wire 11, and by wires 8 and 10, peg-switch D' , and wire 12. By thus employing two independent earth-connections—one at each end of the local line l —a circuit may be completed in either direction from any point, K , in case the line should accidentally become broken at that point, and a signal will be given by the transmitter E , which will be received at the central station when any one of the circuit-closers upon either side of the break is closed.

It is designed to maintain the temporary organization of connections shown in Fig. 2 only

for such a length of time as may be necessary in order to discover and repair the accidental fault in the local line, after which the switches are again placed in the normal position, as shown in Fig. 1.

For convenience in testing the main and local circuits, I provide small metallic hooks n , n' , n^2 , and n^3 , connected respectively with the switches D and D' and the binding-posts 3 and 4. By means of these hooks any required receiving and transmitting instruments are temporarily connected with the respective lines.

I claim as my invention—

1. The combination, substantially as hereinbefore set forth, of the main line, the local line normally interposed in the circuit of the main line, a normally-open earth-circuit, in which is included a signal-transmitting mechanism, circuit-closers for connecting said local line with the earth-circuit, means, substantially such as described, for disconnecting the local circuit from the main line and closing the main-line circuit independently of the local circuit, and means for disconnecting the signaling-circuit from the earth and connecting it to the main line.

2. In an automatic signal telegraph system, the combination, substantially as hereinbefore set forth, of a main line, a local conductor normally interposed in the circuit of the main line, a normally-open earth-circuit, a signal-trans-

mitting instrument included in said earth-circuit, circuit-closers adapted to establish a connection between the respective conductors forming said local and earth circuits, means, substantially such as described, for closing said main-line circuit independently of the local conductor, and means for disconnecting the conductor comprising said earth-circuit from the earth and connecting it with the main line.

3. The combination, substantially as hereinbefore set forth, of two switch-arms connected respectively with the incoming and outgoing sections of a main line, a contact-plate for each of said switches, connected respectively with the terminals of a local line, a normally-disconnected earth-conductor extending from each of said contact-plates, a conductor including a signal-transmitting apparatus, a switch connected therewith, a contact-plate for said switch, connected to the earth, and a common contact-plate, with which each of said switches may be placed in electrical connection when removed from their special contact-plates.

In testimony whereof I have hereunto subscribed my name this 26th day of June, A. D. 1882.

GEORGE F. BULEN.

Witnesses:

FRANK L. POPE,
DANIEL W. EDGEComb.