

(No Model.)

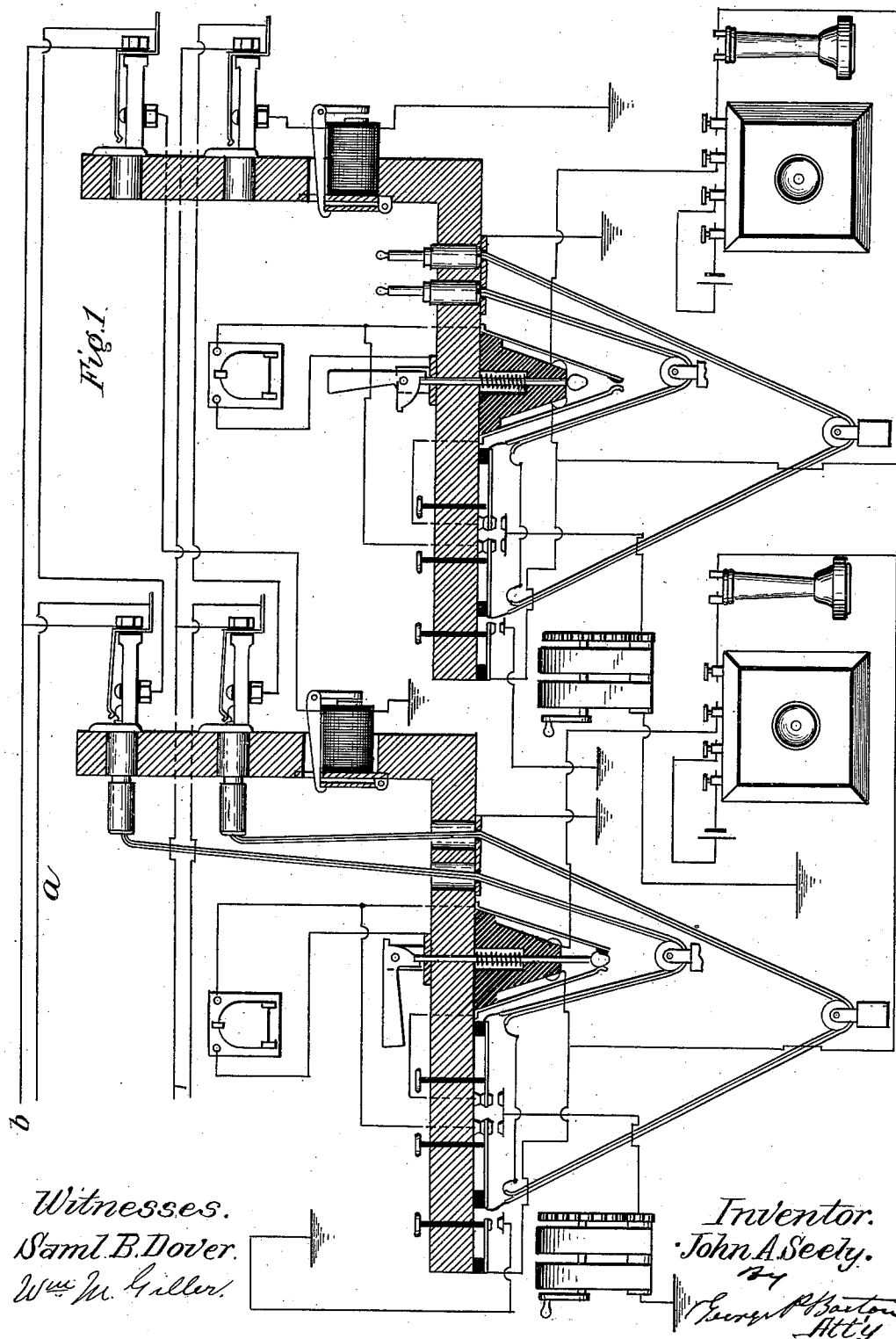
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J. A. SEELY.

LOCAL BATTERY CIRCUIT FOR MULTIPLE SWITCH BOARD SYSTEMS.

No. 357,540.

Patented Feb. 8, 1887.



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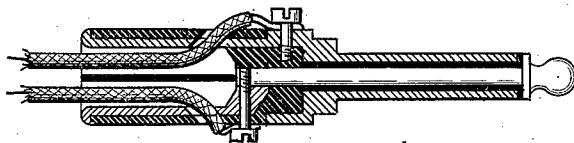
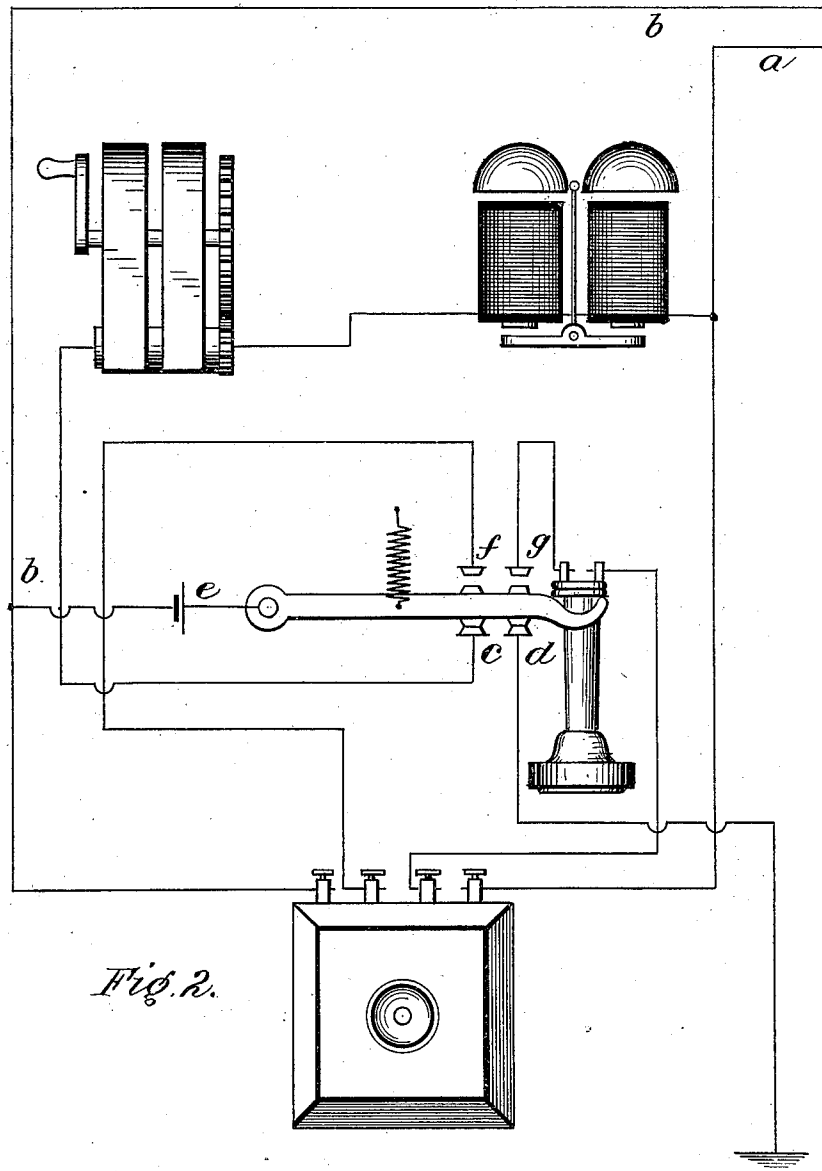
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J. A. SEELY.

## LOCAL BATTERY CIRCUIT FOR MULTIPLE SWITCH BOARD SYSTEMS.

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Patented Feb. 8, 1887.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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LOCAL BATTERY-CIRCUIT FOR MULTIPLE-SWITCH-BOARD SYSTEMS.

SPECIFICATION forming part of Letters Patent No. 357,540, dated February 8, 1887.

Application filed November 15, 1886. Serial No. 218,950. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN A. SEELY, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Local Battery-Circuits for Multiple-Switch-Board Systems, (Case 5.) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to multiple-switch-board systems of a telephone-exchange in which metallic circuits are employed.

The object of my invention is to provide circuits whereby the local batteries at the different subscribers' stations may be utilized as test-batteries when the subscribers' telephones are not in use.

My invention will be readily understood by reference to the accompanying drawings, in which—

Figure 1 is a drawing showing two metallic circuits connected with their switches, respectively, on two multiple switch-boards and the operator's telephone and switching apparatus at the different boards. Fig. 2 is a diagram illustrative of the circuits of a line at a subscriber's station. Fig. 3 is a sectional view of one of the loop-plugs and the connections of the two strands of the flexible cord with the point and insulated sleeve upon the shank thereof.

In the different figures like parts are indicated by the same letters of reference.

The connections at the central office and the apparatus may be the same as heretofore used, except that the test-battery is omitted from the circuits of the telephones at the different boards. Thus the circuit of line *a* may be traced through the spring-jack of each of the boards and through an annunciator to ground. The branch *b*, or other side of the metallic circuit, is connected with the insulated frame of said switches and is normally open. The loop-plugs and double-stranded cords are provided for connecting the different lines together.

Referring to Fig. 2, it will be seen that branch *a* is shown connected with the bell and generator to contact-point *c* of the subscriber's switch. The switch-lever, when the telephone is in place, is closed against said contact-point

*c* and against ground-contact point *d*. The subscriber's bell and generator are thus included in the circuit of the branch *a* when the telephone is hung up.

Branch *b* of the telephone-line is shown permanently connected with the switch-lever through the local battery *e*. As wire *b* is normally open at the central office, the battery *e* will not run down. Line or wire *b* may thus be traced normally from the insulated frames of its switches upon the switch-boards to the subscriber's station, and thence through a battery, *e*, and the switch-lever to ground through contact *d*, as shown.

Wire *a* may be traced from ground at the central office through an individual annunciator, a spring-jack switch on each of the switch-boards, and thence to the subscriber's station, thence through the bell and generator to the switch-lever, and thence to ground.

The subscriber, by means of his generator, throws down the individual annunciator at the central office in the usual manner to notify the operator of the call. The operator thereupon makes the necessary connection with a spring-jack of the line by inserting a plug in the spring-jack, as shown at the first board, Fig. 1. As the subscriber removes his telephone from the switch-lever the switch is separated from ground-contact *d* and the contact-point *c* of the branch of the wire *a* containing the bell and generator, and closes upon contact-point *f* of the local circuit and contact-point *g* of the branch of the line *a* containing the telephone and induction coil. Battery *e* is thus short-circuited by the local or transmitter circuit, and the wires *a* and *b* are united together at the subscriber's station in metallic circuit. This metallic circuit may be traced by line *a* through the telephone to point *g*, and thence through the battery *e* to wire *b*. The battery *e* being short-circuited, as before described, will not send any appreciable current over the subscriber's metallic circuit *a* and *b*. The battery *e* is thus used as a local battery when the telephone is removed from the switch, and when the telephone is upon the switch this battery is included in the open branch wire *b*.

Referring now to Fig. 1, it will be seen that wire *b* is permanently connected with the insulated frames of the switches of the line on the different boards. By closing a ground-

circuit at any switch-board to the frame or test-piece of the switch of any line it may be determined whether or not the subscriber's telephone is hung upon the switch-lever. If  
 5 hung upon the switch-lever, the local battery *e* will be included in the branch *b* of the line which is being tested, and current will thus be sent through the operator's telephone. If, however, the telephone is removed from the  
 10 subscriber's switch, the operator will get no current when he tests at one of the insulated plates or frames of the switch of the line. Thus if he hears a click in his telephone when he makes the test he will know that the line  
 15 is free, and if he hears no click he will infer that the line is busy.

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

1. In a metallic-circuit multiple-switch-  
 20 board system, a telephone-line one branch of which is connected through a switch on each of the switch-boards and annunciator to ground, and at the subscriber's station through a bell and generator to the telephone-switch  
 25 and to ground, the other branch of said line being connected with the insulated frames of said switches and thence to the subscriber's station and through a battery to the telephone-switch and to ground, in combination with  
 30 switching apparatus at the subscriber's station, whereby said battery may be included in a local circuit and said branches *a* and *b* united in metallic circuit, substantially as shown and described.

35 2. In a telephone-exchange system, a wire, *b*, connected with an insulated frame or test-

piece on each of two or more switch-boards and extending to a subscriber's station through a battery, *e*, and the telephone-switch to ground, in combination with a telephone in-  
 40 cluded in a normally-open ground-circuit at the subscriber's station, whereby on closing said circuit current will be sent from the battery through said telephone to indicate the position of the switch-lever at the subscriber's  
 45 station.

3. In a telephone-exchange system, a metallic circuit consisting of two branches, one of said branches, *a*, being normally connected from ground at the central office through an  
 50 annunciator and switch on each of two or more multiple switch-boards, said branch extending to the subscriber's station and being connected at the subscriber's station with a bell and generator and a telephone, the other branch, *b*,  
 55 of said line being connected normally at the central office with the insulated test plates or frames of said switches and extending to the subscriber's station, and through a battery, *e*, to the telephone-switch lever, in combination  
 60 with a ground-connection from said subscriber's switch-lever and the local circuit of the transmitter and switching apparatus, substantially as described.

In witness whereof I hereunto subscribe  
 65 my name this 6th day of November, A. D. 1886.

JOHN A. SEELY.

Witnesses:

H. B. THAYER,  
 A. L. SALT.