(No Model.)

C. E. SCRIBNER.

MULTIPLE SWITCH BOARD TEST SYSTEM.

No. 427,621. Patented May 13, 1890.

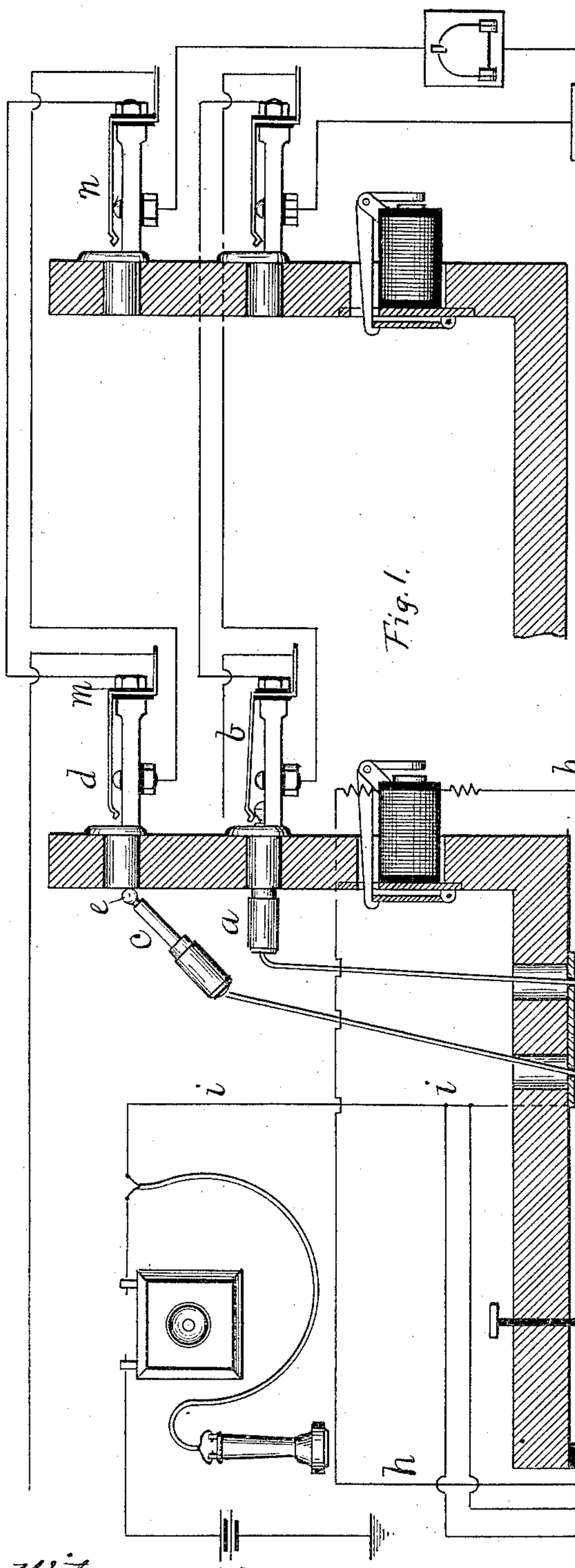

Fig. 1.

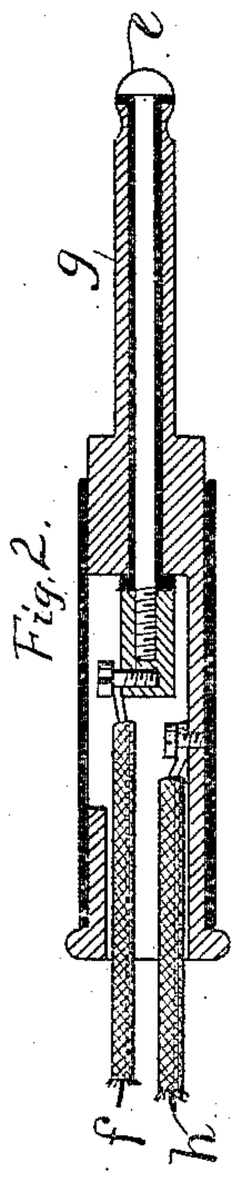

Fig. 2.

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UNITED STATES PATENT OFFICE.

CHARLES E. SCRIBNER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN ELECTRIC COMPANY, OF SAME PLACE.

MULTIPLE-SWITCH-BOARD TEST SYSTEM.

SPECIFICATION forming part of Letters Patent No. 427,621, dated May 13, 1890.

Application filed December 6, 1887. Serial No. 257,083. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. SCRIBNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Multiple-Switch-Board Test Systems, (Case 142,) 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, and its object is to enable the operator to readily make the connections and tests with the different telephone-lines.

My invention consists in the construction of the terminal plugs of the flexible cords and in the connections between the cords and the operator's telephone. An operator at one board is provided, for example, with twenty pairs of cords and plugs. The extreme tip of each plug is insulated from the shank, and all these tips are permanently connected by a strand of the cord with the operator's telephone. These tips are all normally open, being only closed when the operator applies the tip to the test-piece, as will be hereinafter described. The shank of the plug is metallic and connects with the other strand of the cord in the usual manner, the shank being extended far enough toward the tip, so that when the plug is inserted in a spring-jack the extreme tip will pass by the contact-spring of the spring-jack without remaining in contact therewith, so that the spring will be lifted and closed upon the sleeve or shank. When a pair of plugs are not in use, their metallic heels rest upon a metallic plate, which is closed through the operator's telephone to ground. The calling-key is arranged in the usual manner, so as to send current to the line of the subscriber wanted, and also over the calling subscriber's line, so that the calling subscriber may know that the operator is attending to the call.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a sectional view showing two multiple switch-boards and two telephone-lines with their test-circuits connected therewith in the ordinary manner. Fig. 2 is a detailed sectional view of the terminal plug which I have invented.

At board *l*, I have shown terminal plug *a* of a pair inserted in spring-jack *b*, while the tip of the other plug *c* is applied to the test piece or frame of switch *d* of another line, as in the act of testing. As shown in Fig. 2, it will be seen that the extreme tip *e* of the plug is metallic and is connected with a strand *f*. The shank *g* is connected in the ordinary way with the other strand *h* of the cord. The cord *f*, as shown in Fig. 1, is permanently connected with the wire *i*, containing the operator's telephone. When plug *a* is inserted in a spring-jack and plug *c* is resting with its metallic heel on plate *k*, a circuit is formed from the spring of spring-jack *b* to the shank *g* of the plug, and thence through cord *h* to the heel of plug *c*, and thence to plate *k*, and thence through the operator's telephone to ground.

The operation of my system is briefly as follows: The operator seeing the shutter *l* fall at once inserts plug *a* in the spring-jack *b* of the line. The tip *e* of plug *a* (for detail see Fig. 2) passes by the spring of spring-jack *b*, and the spring is closed upon the shank *g*. The line connected with spring-jack *b* is thus closed through the operator's telephone by cord *h* to plug *c*, and from the heel of plug *c* to plate *k*, and thence by wire *i* through the telephone. The operator is thus, on inserting the plug *a* in the spring-jack of a calling line, at once in communication with the subscriber, and upon learning the number of the subscriber wanted he lifts plug *c* and touches the tip *e* to the test-piece of the line, as shown at spring-jack *b* in Fig. 1. Now if the line is free test-wire *m* will be open, and hence he will hear no click in his telephone. If, however, the line wanted should be in use at some other board—as, for example, at switch *n*—the line will be closed at said switch *n* with the test-circuit, in which case the operator on touching the tip of plug *c* to the test-piece of switch *d* on his board will hear a click in his telephone and know that the line is busy. If the operator finds that the line is free, he inserts the plug *c* into the spring-jack *b*, and the spring of said spring-jack closes upon the shank of plug *c*. The two telephone-lines are thus connected together and the tips *e* are

both open—that is to say, the cord *f* is open when both plugs are inserted. The operator, in order to listen out, may momentarily withdraw a plug and close the tip either to the spring or to the frame of one of the connected spring-jacks.

I have for convenience in some instances provided an extra terminal plug and cord connected with the operator's telephone. By touching the tip of this plug to the heel of either of the inserted plugs a branch connection is formed through the telephone, so that the operator may listen to determine whether the subscribers are through talking.

By the extreme tip of the plug I refer to the portion thereof which, when inserted in the spring-jack, first comes against the spring thereof, and afterward when the plug is in place passes under the spring and out of contact therewith. These extreme tips, it will be observed, are connected with the operator's telephone. The extreme tip of the plug and the sleeve are thus insulated from one another, thereby forming a double contact-plug.

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

1. The combination, with the spring-jack switch, of a double contact-plug inserted therein, one of the insulated contacts of said plug passing by the switch-lever and being entirely insulated therefrom when in place, and the lever of the switch being closed upon the insulated sleeve or shank of the plug, substantially as described.

2. The combination, with a spring-jack, of a double contact-plug inserted therein, the extreme insulated point of said plug passing by the switch-lever and being entirely insulated from the switch when in place, the lever of the switch being closed upon the insulated sleeve or shank of the plug, substantially as described.

3. The combination, with the pair of double-stranded flexible cords, of terminal plugs *a b*, one for each of said cords, said plugs being provided each with two insulated contact-pieces, and a telephone permanently connected with the strand of said cord terminating in a corresponding contact of each of said plugs, and spring-jack switches adapted to receive said plugs, substantially as and for the purpose specified.

4. In a multiple-switch-board system, telephone-lines connected with a switch on each of two or more boards and a test-wire for each line connected with the insulated frames or test-pieces of the lines respectively, in combination with a pair of double-stranded flexible cords, one strand of said cords being connected with a telephone and the other including a clearing-out annunciator, and the double-contact terminal plugs of said cords, the extreme tips or terminals of said plugs being connected with said strand which leads to the telephone, whereby the lines may be tested and connected together, substantially as described.

5. In a multiple-switch-board system, telephone-lines connected with a switch on each of two or more boards, and a test-wire for each line connected with the insulated frames or test-pieces of the lines respectively, and a pair of double-stranded flexible cords, one strand of said cords being connected with a telephone and the double-contact terminal plugs of said cords, the extreme tips or terminals of said plugs being connected with said strand which leads to the telephone, whereby the lines may be tested and connected together, substantially as described.

In witness whereof I hereunto subscribe my name this 17th day of October, A. D. 1887.

CHARLES E. SCRIBNER.

Witnesses:

WM. M. CARPENTER,

CHAS. C. WOODWORTH.