

(No Model.)

C. E. SCRIBNER.

CIRCUIT FOR TEST BATTERIES AND CORDS OF MULTIPLE SWITCHBOARDS.

No. 476,492.

Patented June 7, 1892.

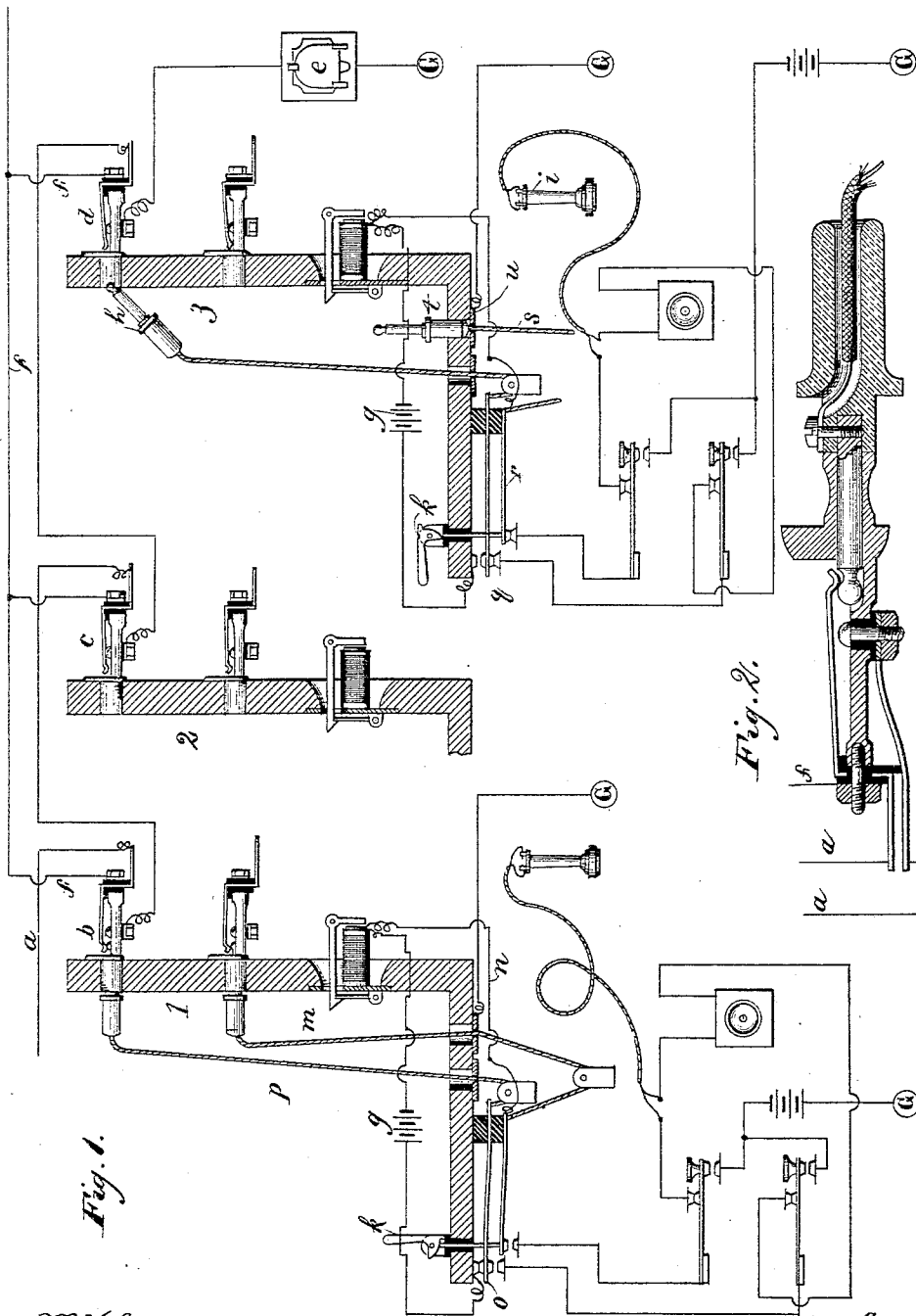


Fig. 1.

Fig. 2.

Witnesses
Saml B. Dover.
J. Roy T. Steward

Indenter
Charles C. Scribner.
By. George P. Barton.
Attorney

UNITED STATES PATENT OFFICE.

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

CIRCUIT FOR TEST-BATTERIES AND CORDS OF MULTIPLE SWITCHBOARDS.

SPECIFICATION forming part of Letters Patent No. 476,492, dated June 7, 1892.

Application filed June 1, 1885. Serial No. 167,228. (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 Circuits of Test-Batteries and Cords of Multiple Switchboards, (Case No. 98,) 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-testing apparatus; and it consists of the battery placed in the different pairs of cords and testing apparatus, whereby it may be determined at any given board whether a line wanted at said board is connected or "busy" at any other board.

In my system I provide a cell of battery in each of the pairs of conducting-cords instead of placing battery in circuit with the telephone of the operator, thus enabling the operator at any given board to make the desired tests and listen out without notifying the connected subscriber thereof. This is desirable, since a busy subscriber acquainted with the system on finding out that his line was wanted might break off his conversation to inquire who had called for his line, thus causing unnecessary work.

In the drawings, which are illustrative of my invention, Figure 1 shows sectional views of three multiple switchboards and the circuits and testing apparatus connected therewith. Fig. 2 is a sectional view of a spring-jack switch and the connecting-plug provided with a flexible cord inserted therein.

The telephone-line *a* is connected in the usual way through spring-jack switches *b c d* through the annunciator *e* to ground. The insulated metallic frames or test-pieces of said spring-jacks are connected together by the test-wire *f*. All lines are thus connected with the different boards and provided with their test-circuits in the usual manner.

As shown more clearly in Fig. 2, it will be seen that when a plug is inserted in a spring-jack the telephone-line connected therewith is cut off from its normal ground and connected with the metallic point of the plug and

thence to the flexible cord, while at the same time a connection or "cross" is established between the frame of the said spring-jack and the said telephone-line through the medium of the tip or metallic shank of the plug, as it is described in my patent, No. 305,021, dated September 9, 1884.

It has been found desirable to loop the operator's telephone into the circuit instead of making the half-connection or "third-leg" connection shown in my said patent.

In order that I may loop the telephones into the circuit and make the necessary tests, I place a cell of battery *g* in the circuit of each pair of flexible cords, besides the usual clearing-out annunciators. As shown at the first board, the battery *g* is included in the circuit of the pair of cords connecting the spring-jack switches of two telephone-lines. As shown at board 3, a test may be made to determine whether line *a* is busy by touching plug *h* to the frame of spring-jack *d*, as shown, and at the same time listening at telephone *i*. It should be noted that the cam-lever *k* at board 3 is shown down, so as to bring telephone *i* into the circuit. When, therefore, plug *h* touches the frame of switch *d*, as shown, current will be sent from battery *g* at the first board through said telephone *i*, and the operator, listening at the telephone, will hear the usual sound which is made when battery is closed through the telephone, and the operator, hearing this sound, will know that the line is busy. On the contrary, if he should hear no sound he would know that the line was free.

The circuit of battery *g* through telephone *i* may be traced as follows: Beginning at cord *m* at the first board, from thence by wire *n* through the clearing-out shutter, through said battery *g*, thence to switch *o*, thence to cord *p*, and thence to the frame of switch *b*, thence by test-wire *f* to the frame of switch *d*, thence to plug *h* and switch-lever *g*, and thence, as shown, through the transmitter and telephone *i* to switch *r*, thence through the cord *s* to plug *t*, which is in electric connection with ground-plate *u*. When plug *t* is raised from the ground-plate, telephone *i* is looped into the circuit of the cords. On throwing up the cam-

lever, as shown at the first board, the battery *g* is looped into the circuit of the cords. Thus by means of the switching apparatus shown the operator's telephone and the battery *g* of
5 any pair of cords may be alternatively included in and disconnected from the circuit of said pair of cords. Thus the telephone and test-battery are never at the same time included in the same pair of cords.
10 Having thus described my invention, I claim as new and desire to secure by Letters Patent—
1. The combination, with the telephone-lines connected with spring-jack switches on
15 the different boards, of test-circuits, one for each telephone-line, pairs of cords at the different boards, a cell of battery *g* permanently included in circuit with the different clearing-out shutters, the operator's telephone at
20 each board, and switching apparatus whereby

the telephone and the battery *g* of any pair of cords may be alternatively included in and disconnected from the circuit of the cords.

2. Multiple switchboards provided with spring-jack switches, each of said switches being provided with a test-piece, in combination with pairs of plugs and cords at each of the boards for connecting any two of the switches together, the said cords being connected with a source of electricity and the operator's telephone, whereby on applying a plug to the test-piece of any switch it may be determined whether the telephone-line of said switch is in use at any other switchboard.

In witness whereof I hereunto subscribe my name this 26th day of May, A. D. 1885.

CHARLES E. SCRIBNER.

Witnesses:

F. H. McCULLOCH,
GEORGE P. BARTON.