

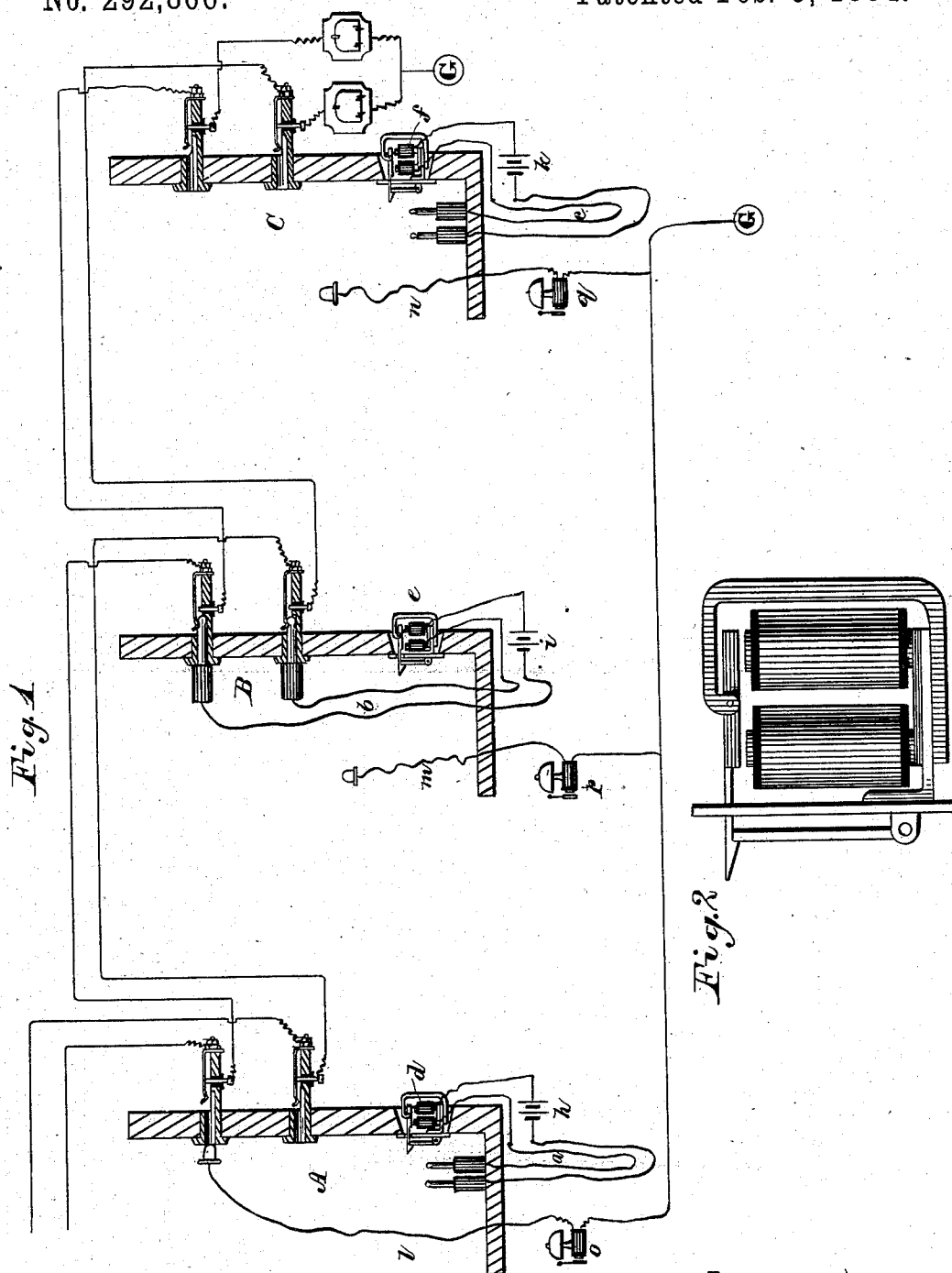
(No Model.)

C. E. SCRIBNER.

TESTING APPARATUS FOR MULTIPLE SWITCH BOARDS

No. 292,866.

Patented Feb. 5, 1884.



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UNITED STATES PATENT OFFICE.

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TESTING APPARATUS FOR MULTIPLE SWITCH-BOARDS.

SPECIFICATION forming part of Letters Patent No. 292,866, dated February 5, 1884.

Application filed June 11, 1883. (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 Testing Apparatus for Multiple Switch-Boards, 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 testing apparatus at the central office of a telephone-exchange where multiple switch-boards are employed, and is designed to enable the operator at one board to readily determine whether the line of a subscriber called for is in use at any other switch-board. The telephone-lines may be run from the different subscribers' stations and connected each with a single switch upon each of the multiple boards, and from the last board through an annunciator to ground in the usual manner. I prefer to use the spring-jack switch as improved by James C. Warner. I provide in the circuit of each pair of connecting-cords a polarized clearing-out annunciator and a battery. I also provide at each board a normally-open ground-circuit including a signaling-instrument, preferably a bell. This open ground-circuit is provided with a contact-point or connection adapted to be closed to the frame of any of the spring-jack switches of the board to which it belongs, at the will of the operator. The operator at a given switch-board is thus enabled to make a preliminary test to ascertain whether the line of a subscriber called for at his board is in use or connected for conversation at any of the boards succeeding his own. If so connected, when the ground-circuit is closed to the switch, current will be sent through the bell to ground from the battery of the cords connecting the line with any other line at a succeeding board. I also provide the usual operator's telephone outfit and calling apparatus at each of the multiple boards. As two lines connected at one board are cut off from the succeeding boards, it follows that at the last board it is not necessary to make a preliminary test. The connection may be made at once with any line called for. If in use at a preceding board,

it will be found open when it is attempted to send current to line.

My invention is illustrated in the accompanying drawings, in which Figure 1 shows two telephone-lines connected across three multiple switch-boards through annunciators to ground, in the usual manner. A pair of cords and plugs, with polarized annunciator and battery, and a normally-open ground-circuit including a bell, are shown at each board. The operator's telephone outfit and calling apparatus are not shown, since they are common and well known. Fig. 2 is an enlarged view of the polarized annunciator.

As many switch-boards A B C may be used as desired. It is usual to add a switch-board for, say, every fifty new subscribers. Any two telephone-lines may be connected together upon either of the multiple boards. About five pairs of connecting-cords are required for every fifty lines at each of the boards.

I have included in the circuits of the connecting-cords *a b c* the polarized annunciators *d e f* and the batteries *h i k*. I have also provided the normally-open earth-circuits *l m n*, including the signaling-instruments *o p q*, respectively, as shown. The lines are shown connected for conversation at board B. They are therefore disconnected from board C.

Suppose the operator at board A wishes to determine whether line 1 is in use at any other board. By closing the earth-circuit to the switch, as shown, this preliminary test may be made. Current will thus be directed from the battery *i* through bell *o*, which, ringing, will inform the operator at board A that line 1 is in use at one of the succeeding boards. The subscriber asking for the line may then be informed of the fact and told to wait. If line 1 should be wanted at board C—the last board—the operator would at once make the connection desired; but on throwing his generator or battery (not shown in the drawings) to line 1, the operator will at once discover that the line is open. This will be notice to the operator at board C that the line is connected at either board B or board A—that is, at some one of the preceding boards.

Since the clearing-out annunciator is polar-

ized, it will not be thrown down when a test is made at one of the boards preceding the one where the lines are connected, since the battery is reversed to the polarity of the annunciator.

5 I claim—

The combination, with multiple switch-boards, of pairs of conducting-cords, each pair including a polarized annunciator and
10 battery, and a normally-open earth-circuit at

different boards, whereby current may be directed through a signal-instrument from the battery in the pair of cords connecting two lines, substantially as specified.

In witness whereof I hereunto subscribe my name this 7th day of June, A. D. 1883.

CHARLES E. SCRIBNER.

Witnesses:

PAUL A. STALEY,
G. P. BARTON.