

(No Model.)

R. H. POLK.
BUSY TEST FOR MULTIPLE SWITCHBOARDS.

No. 527,393.

Patented Oct. 9, 1894.

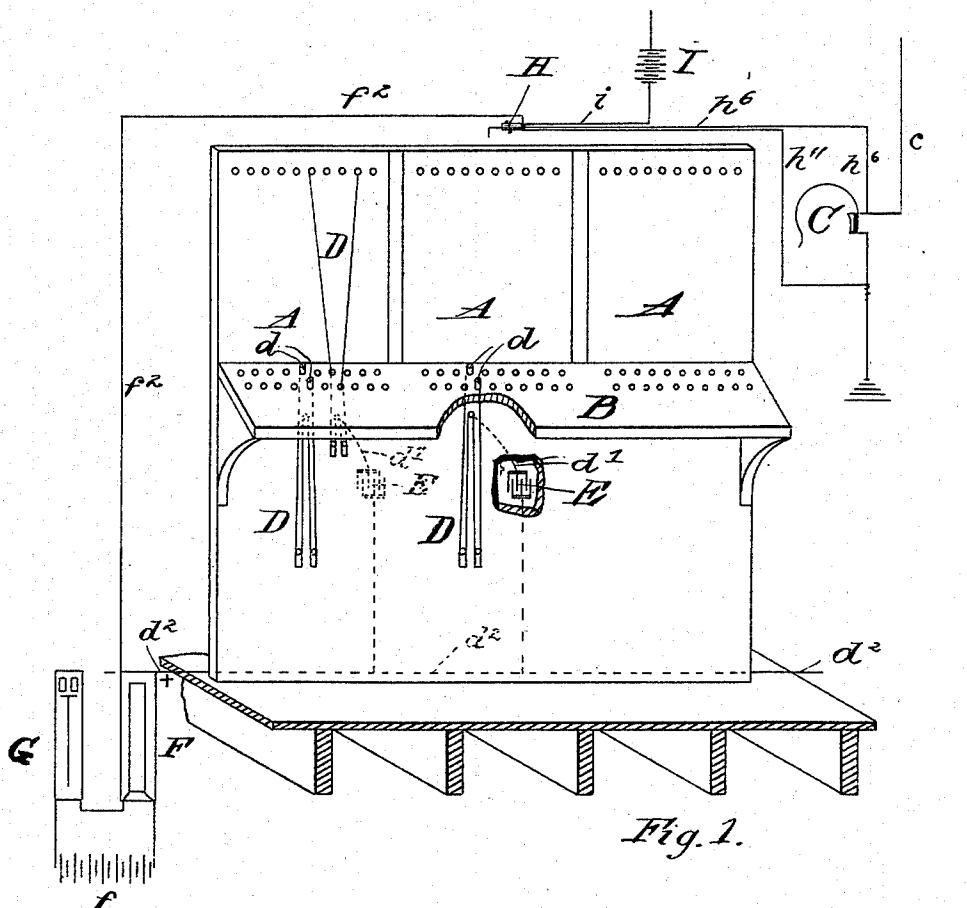


Fig. 1.

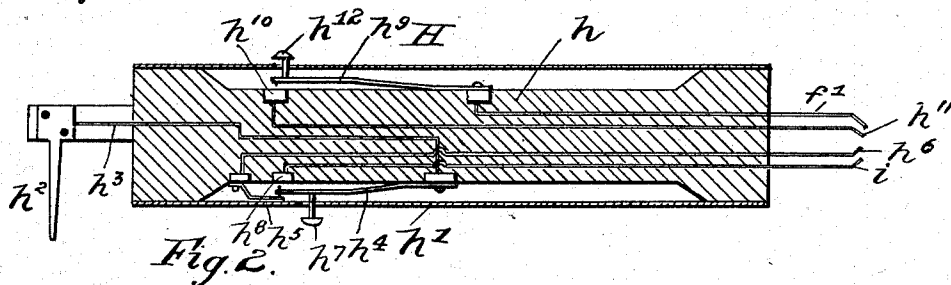


Fig. 2.

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BUSY-TEST FOR MULTIPLE SWITCHBOARDS.

SPECIFICATION forming part of Letters Patent No. 527,393, dated October 9, 1894.

Application filed April 20, 1894. Serial No. 508,357. (No model.)

To all whom it may concern:

Be it known that I, ROBERT H. POLK, a citizen of the United States, and a resident of Savannah, in the county of Chatham, State of Georgia, have invented certain new and useful Improvements in Busy-Tests for Multiple Switchboards; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The invention is illustrated in the accompanying drawings as follows:

Figure 1, is a view in perspective of several sections of the switch-board, showing the improvements attached. Fig. 2 is a detail in longitudinal section of the test-plug showing its connections.

In the figures like reference marks indicate corresponding parts in all the views.

A is the switch-board of any usual or desired form.

B is the inclined shelf usually employed in upright switch-boards, and C is the head-phone.

D are connecting cords of any desired construction and have plugs d on each end adapted to be inserted into the spring-jacks or line terminals of the switch-boards. Wires d' are connected to each of these cords D intermediately and each is led to a condenser E composed of (say) six sheets of tin-foil having tissue paper sheets interposed and the whole inclosed by stiff card-board or other insulation or stiffening. Alternate sheets of tin-foil of this pile are connected to a common conductor and one series thus made is connected to the wire d' aforesaid, while the other series or the other "end" of the condenser is connected to a wire d^2 common to all condensers in all sections of the switch-board and leading to one end of the secondary of the induction coil F. The primary of this induction coil is in the circuit of a local battery f , and also included in said circuit is a vibrator G.

The test plug H as shown in Fig. 2 consists of a handle h having a casing h' and a metallic contact point h^2 , which is connected by

a wire h^3 with the spring h^4 which normally bears against the terminal h^5 to which is connected the wire h^6 which leads to the call wire c . Said spring h^4 is depressible by means of a button h^7 extending through the casing h' to within convenient reach of the thumb of the operator. Seated in the handle h near the end of the spring h^4 and in a position to be contacted therewith is the terminal B^3 of the wire i leading to a local battery I. A spring h^9 connected to the wire f' extending to the secondary of the induction coil F and connecting with the side thereof opposite the wire d^2 , is also set within the handle and is provided with a button for depressing it with the fore finger of the operator. A terminal h^{10} is set in the handle h in a position to be contacted with by the spring h^9 and a wire h^{11} connects it to earth.

The condenser is made of so few sheets of foil that no current other than the high voltage induced current will pass through it and hence the main battery current will not pass through, and cross-talk through the condenser, will not occur.

The operation of this device is as follows:—When two subscribers are connected at one section of the switch board and a call is heard at another section thereof for one of the subscribers busy, the operator places the test-plug H, in connection with the line number wanted by contacting the point h^2 thereof with the spring-jack or line terminal bearing said number and presses the button h^{12} which gives her the tick (noting busy) in her head telephone through the wire h^3 , spring h^4 , terminal h^5 , wire h^6 and call wire c , the current for the tick coming, being the current induced in the secondary of the coil F by the vibrated primary current from the battery f , taken to the line through the wire d^2 , the condenser E and the wires d' and D, the latter being the loop connecting the subscriber's line wanted, to the subscriber's line busy, in the other section of the switch-board. Pressing the button h^{12} as just mentioned completes the secondary circuit by sending its minus to the earth through the wires f^2 and h^{11} , connected through the terminals h^9 and h^{10} in the plug H.

The test in this device produces a tick of absolutely the same loudness no matter how

long or short the line being tested and there is absolutely no retardation as nothing is inserted in the working circuits. It is obvious that the subscriber can only hear the tick 5 when it is made in testing his line, and this may be prevented effectually by duplicating the receiving instrument of the head telephone or by causing the test circuit to be entirely independent of the subscriber's line in 10 any manner. This system for busy-testing is applicable to both the magneto multiple and Law multiple systems of switch-boards.

Having thus described my invention, what I claim as new, and desire to secure by Letters 15 Patent of the United States, is—

1. In a busy-test for multiple switch-boards, a high tension current source, a connecting loop, and a condenser of such capacity that the talking current will not pass through it, 20 interposed in the wire connecting said source and loop, and a test-plug circuit, substantially as and for the purpose specified.

2. In a busy-test for multiple switch-boards, a local battery circuit including the primary 25 of an induction coil and a test-circuit including the secondary of said induction coil, the subscriber's line wire on the switch-board, a condenser through which the talking current cannot pass and an indicating device, 30 for the purposes set forth.

3. In a busy-test for multiple switch-boards, the subscriber's line on the switch-board, a

loop adapted to be inserted therein, a high-voltage circuit connected with said loop through a condenser having a high faradic 35 capacity, and through which the talking current cannot pass and an indicator adapted to be operated by the current sent through said condenser, and a switch included in the aforesaid circuit, for the purposes set forth. 40

4. In a busy-test for multiple switch-boards, the subscribers' lines connected thereto, a loop adapted to connect two of said subscribers' lines, a condenser through which the talking current cannot pass, a wire connecting 45 said condenser with said loop, a wire d^2 extending through the switch-board, a wire connecting the condensers to said wire d^2 and connected to the secondary of an induction coil, said induction coil, and a local battery 50 in the circuit of the primary thereof, a test-plug containing a switch and connected to an annunciator, a wire connecting the other side of the secondary of the induction coil to said switch and a wire extending from the other 55 side of said switch to earth, for the purposes set forth.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

ROBERT H. POLK.

Witnesses:

W. I. COCKCROFT,
D. COLLINS.