

(No Model.)

T. W. LANE.  
ELECTRICAL SWITCH BOARD.

No. 250,081.

Patented Nov. 29, 1881.

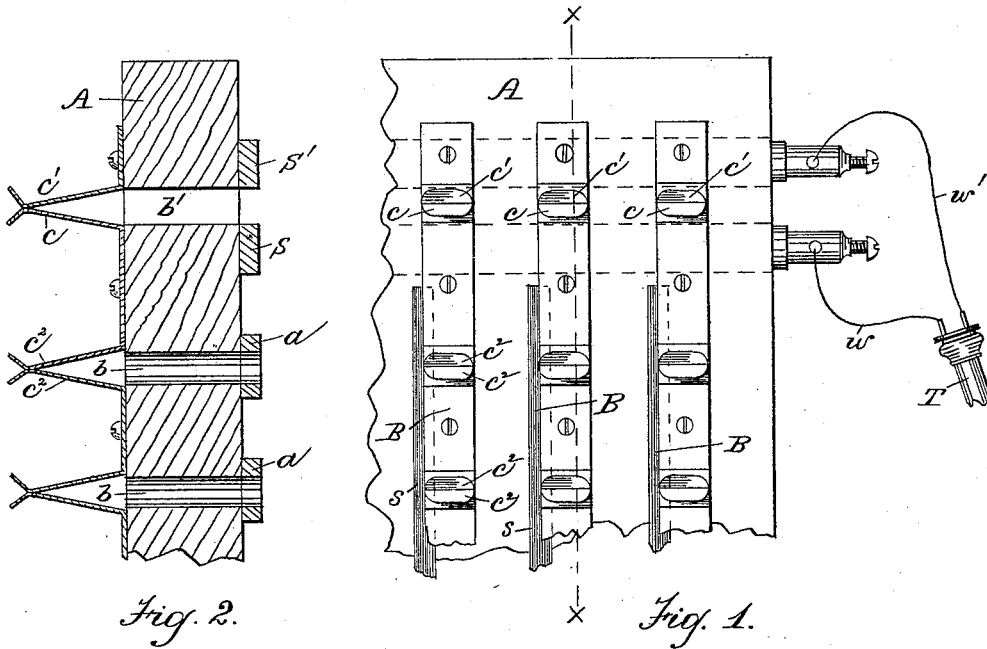


Fig. 2.

Fig. 1.

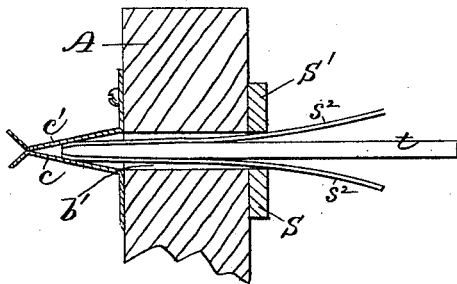


Fig. 3.

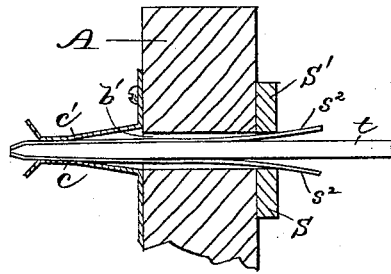


Fig. 4.

Witnesses:  
H. G. Madlin.  
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Inventor:  
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# UNITED STATES PATENT OFFICE.

THOMAS W. LANE, OF BOSTON, ASSIGNOR TO HIMSELF AND CHARLES WILLIAMS, JR., OF SOMERVILLE, MASSACHUSETTS.

## ELECTRICAL SWITCH-BOARD.

SPECIFICATION forming part of Letters Patent No. 250,081, dated November 29, 1881.

Application filed August 29, 1881. (No model.)

To all whom it may concern:

Be it known that I, THOMAS W. LANE, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Electrical Switch-Boards, of which the following is a specification.

This invention is an improvement on the invention described in the application of Williams, Lane, and Harrington for Letters Patent of the United States for improvements in electrical switch-boards, filed July 13, 1881, said invention consisting in a switch-board employing a series of line-circuit strips, each adapted to be separated into two parts at a given point, and means for connecting an operator's telephone to the separated parts of any strip or strips in the series, thereby causing the circuit to pass directly through the operator's telephone without being grounded.

The present invention relates to the means used for separating the line-circuits into two parts and for connecting the operator's telephone to the separated parts of any circuit; and the invention consists in an electrical switch-board having a series of line-circuit strips, each adapted to be separated into two parts at a given point by the insertion of a plug into an orifice of the board, a listening-circuit comprising two strips so arranged with relation to the orifices in which the separating-plugs are inserted that the opposite sides of the plug can make contact with the two strips, and a plug composed of two metallic springs supported and insulated from each other by a stock of insulating material, and adapted to separate one of the line-circuit strips into two, and to connect the strips of the listening-circuit with the separated parts of the line-circuit strip, as I will now proceed to describe and claim.

Of the accompanying drawings, forming part of this specification, Figure 1 represents a front elevation of a portion of a switch-board embodying my invention. Fig. 2 represents a section on line *x x*, Fig. 1. Fig. 3 represents a similar section, showing the line-circuit-separating and listening-circuit-connecting plug partially inserted. Fig. 4 represents a similar section, showing said plug entirely inserted.

The same letters refer to the same parts in all the figures.

In the drawings, A represents a board or backing of suitable insulating material, arranged upon the front of which are the usual horizontal insulated metallic connecting-strips, *a*, adapted to be connected by means of plugs or other suitable devices with the line-circuit strips B, which cross the board at right angles to the strips *a*, and are in this instance arranged on the opposite side of the board from the last-named strips. The line-circuit strips, the connecting-strips, and the devices for connecting them may be of any suitable construction, so far as relates to their joint operation. In this case the line-circuit strips are shown as composed of springs *c*<sup>2</sup> *c*<sup>2</sup>, arranged in pairs, attached at their bases to the board A, and pressed together normally at their outer ends, and continuous metal strips *s*, extending along the bases of the springs, as shown in Letters Patent of the United States issued to me August 9, 1881, No. 245,515, the connecting-strips being provided with holes *b*, coinciding with the meeting faces of the springs *c*<sup>2</sup> *c*<sup>2</sup>, and receiving plugs adapted to be inserted between the springs of each pair to connect the line-circuit strips with the connecting-strips, as shown in said Letters Patent.

In carrying out my invention, I make each line-circuit strip capable of separation into two distinct parts at a given point, and this is preferably accomplished by means of two springs, *e e'*, in each strip, said springs forming a part of the strip, and being attached to the board A and normally pressed together at their outer ends like the springs *c*<sup>2</sup> *c*<sup>2</sup>; but, unlike the last-named springs, they are entirely disconnected or insulated from each other at their bases, so that when separated and insulated at their outer ends they convert the strip to which they belong into two distinct parts, having no electrical connection.

T represents the listening-telephone, which is included in a listening-circuit composed of wires or cords *w w'*, and two strips, S S', located at opposite sides of the series of orifices *b'* in the board A, which coincide with the meeting points of the springs *e e'*, and in such

proximity to said orifices that a plug, constructed as hereinafter described, inserted in either of said orifices, can bear simultaneously upon both strips S S', as shown in Fig. 4.

5 To separate any line-circuit strip into two parts, and at the same time connect the listening-circuit to said parts, I employ a plug, which is composed of two springs,  $s^2 s^2$ , attached to and projecting outwardly from opposite sides of a stock,  $t$ , of insulating material, said stock  
10 insulating the springs  $s^2 s^2$  from each other. When the plug is inserted into one of the orifices  $b'$  the rear and outwardly projecting ends of its springs bear against and are pressed inwardly by contact with the proximate edges of the strips S S', while the outer and non-yielding ends of said springs bear against and separate the springs  $c c'$  of one of the line-circuit strips B, as shown in Fig. 4. It will be seen,  
15 therefore, that the listening-strip S and the spring  $c$  of the line-circuit are connected by one of the springs  $s^2$ , and the strip S' and spring  $c'$  by the other spring  $s^2$ , the listening-telephone T being thereby looped in and the  
25 entire current caused to pass around through the listening-circuit in passing through the line-circuit strip with which said circuit is connected.

It will be seen by reference to Fig. 3 that  
30 in inserting the plug into one of the orifices  $b'$  the springs  $s^2 s^2$  come in contact with the strips S S' before the springs  $c c'$  are separated, so that a clicking noise in the line-circuit tele-  
35 phones is avoided when the listening-telephone is looped in. The same end is attained in withdrawing the plug to cut out the listening-telephone, the springs  $s^2 s^2$  remaining in contact with the strips S S' after the springs  $c c'$  have  
40 come together. By the described improvements great simplicity and economy of construction are secured together with positiveness and certainty of operation.

Having thus described my invention, I claim—

1. An electrical switch-board having a series of line-circuit strips, each adapted to be separated into two distinct parts at a given point, and a listening-circuit comprising two strips, S S', arranged as described with relation to the points where the line-circuit strips are separable, whereby said strips are adapted to be connected, respectively, with the two parts of any line-circuit by the insertion of a suitable plug into one of the orifices between the strips, as set forth.

2. The improved plug for an electrical switch-board, having the stock or body  $t$  of insulating material, and the outwardly-projecting springs  $s^2 s^2$  attached to and insulated from each other by said stock or body, substantially as and for the purpose set forth.

3. An electrical switch-board having a series of line-circuit strips, each adapted to be separated into two parts at a given point, a listening-circuit comprising two strips, S S', arranged as described with relation to the points where the line-circuit strips are separable, and a plug composed of two metallic springs,  $s^2 s^2$ , supported and insulated from each other by a stock of insulating material, and adapted to separate one of the line-circuit strips into two parts, and to connect the strips S S', respectively, with the separated parts of such strip, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 25th day of August, A. D. 1881.

THOMAS W. LANE.

Witnesses:

H. G. WADLIN,  
D. B. MORRISON.