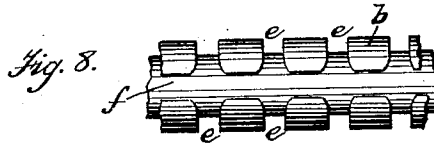
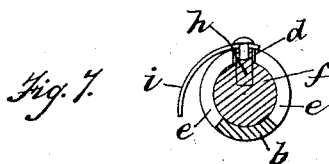
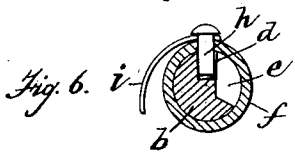
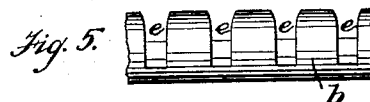
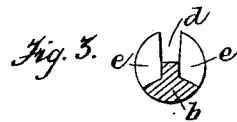
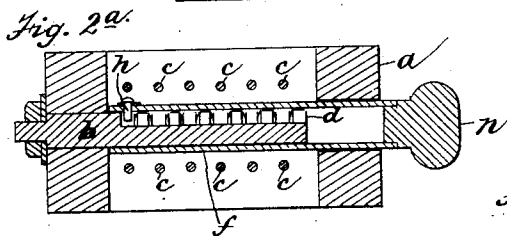
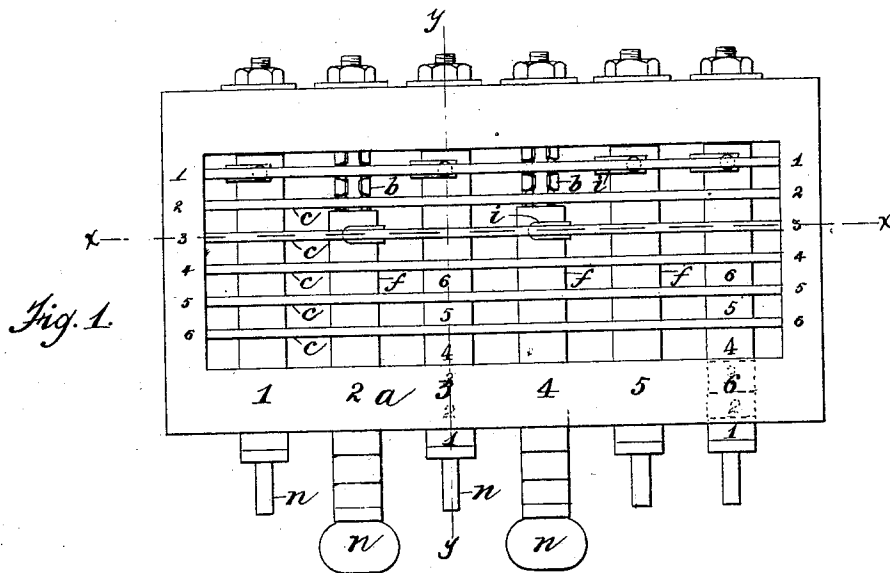


(Model.)

T. W. LANE.
Telephone Switch Board.

No. 243,274.

Patented June 21, 1881.



Witnesses:

H. Wadlin.
C. F. Brown

Inventor:

Thomas W. Lane

UNITED STATES PATENT OFFICE.

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

TELEPHONE SWITCH-BOARD.

SPECIFICATION forming part of Letters Patent No. 243,274, dated June 21, 1881.

Application filed March 18, 1881. (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 Telephone Switch-Boards, of which the following is a specification.

This invention relates to that class of switch-boards composed of a series of parallel metal strips, each connected with a line-circuit, a series of connecting-strips crossing the line-circuit strips at right angles and normally disconnected or insulated from the line-circuit strips, and movable devices, usually termed "slides," on the line-circuit strips, whereby the latter may be connected in pairs with either of the connecting-strips.

The object of my invention is to enable a switch-board of this class to be made in more compact form and to be more conveniently operated than heretofore; and to this end it consists in the hereinafter-described construction of the line-circuit strips and the slides thereon, whereby each slide is enabled to be partially rotated to make contact with one of the connecting-strips, is prevented from being moved longitudinally by accident when such contact is made, and is prevented from making contact with the connecting-strips when it is being moved longitudinally on its line-circuit strip to transfer its contact from one connecting-strip to another.

The invention also consists in the arrangement of the connecting-strips in two parallel series and interposing the line-circuit strips between the two series of connecting-strips, so that they each slide by a partial rotation, and without longitudinal movement can make contact with either of two connecting-strips, all of which I will now proceed to describe.

Of the accompanying drawings, forming part of this specification, Figure 1 represents a plan view of a switch-board embodying my invention. Fig. 2 represents a section on line *x x*, Fig. 1. Fig. 2^a represents a section on line *y y*, Fig. 1. Figs. 3, 4, and 5 represent, respectively, an enlarged transverse section, a top view, and a side view of one of the line-circuit strips with the slide removed. Fig. 6 represents a transverse section of a line-circuit strip and its slide, showing a modification in

the construction of the former. Fig. 7 represents a similar section, showing another modification. Fig. 8 represents a top view of the modification shown in Fig. 7.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents a suitable rectangular wooden frame supporting the metallic line-circuit strips *b* and the connecting-strips *c*, the former being suitably connected to different line-circuits, as usual, and the latter being normally disconnected from the line-circuit strips and arranged at right angles thereto. The connecting-strips are arranged in two parallel series, between which the line-circuit strips are interposed, as shown in Figs. 2 and 2^a. Each line-circuit strip is substantially cylindrical and provided with a longitudinal guide-groove, *d*, and a series of lateral guide-grooves, *e*, communicating with the groove *d*, and extending from both sides of the latter partly around the strip *b*.

f f represent the slides upon the line-circuit strips. The slides are preferably tubular, and are adapted to move longitudinally and to rotate on their strips *b*. Each slide has an inwardly-projecting pin, *h*, secured to it, adapted to enter the longitudinal groove *d*, or either of the lateral grooves *e* of the strip *b*, on which it is located. When the pin *h* is in the longitudinal groove *d* the slide is adapted to be moved lengthwise on the strip *b*, and when said pin coincides with one of the lateral grooves *e* the slide may be rotated until the pin enters such groove and abuts against one end thereof, as shown in Fig. 2. Each slide has a contact spring or arm, *i*, adapted to make contact with either of the connecting-strips, as hereinafter described. The spring or arm *i* is so arranged relatively to the pin *h* that when said pin is in the longitudinal groove *d* said arm or spring will be separated from the connecting-strips, as shown in Fig. 2, and when the pin is turned into one of the lateral grooves *e* said arm or spring will be in contact with one of the connecting-strips, as shown in Fig. 2. The number of the lateral grooves *e* in each line-circuit strip corresponds with the number in each series of connecting-strips.

It will be seen, therefore, that when the op-

erator desires to connect any line-circuit strip with any connecting-strip the pin *h* of the slide to be operated being in the longitudinal groove *d* of its strip, he moves the slide until the pin *h* coincides with the lateral groove corresponding with the connecting-strip with which contact is to be made, and then rotates the slide until the pin enters the lateral groove and the arm or spring makes contact with the connecting-strip. When contact is made the sides of the lateral groove prevent the slide from being moved longitudinally, so that the contact cannot be broken without first rotating the slide until its pin enters the groove *d*. There is, therefore, no danger of the accidental breaking of the connections. When the slide is being moved longitudinally the contact arm or spring does not touch the connecting-strips; hence there is no rattling or clicking caused by the last-named movement of the slide.

The arrangement of the connecting-strips in two series, one on either side of the series of line-circuit strips, enables each slide to make contact with either of two connecting-strips by rotating it in one direction to make contact with a strip of one series, and in the opposite direction to make contact with a strip of the other series.

By the described construction and arrangement a switch-board capable of being conveniently operated and of making a large number of connections is produced in an exceedingly compact form.

The line-circuit strips are preferably arranged horizontally, and each slide projects through the frame *a*, and has upon its projecting end an operating knob or handle, *n*. The line-circuit strips, when constructed as shown in Figs. 2, 3, 4, and 5, are attached to the frame *a* only at one end, the other end of each strip being necessarily separated from the frame in order that the slide may project through the frame, as shown. Each slide should be provided with marks or graduations to indicate the position required to enable the contact arm or spring to be turned into contact with any given connecting-strip.

If desired, the lateral grooves *e* may extend only from one side of the longitudinal groove *d*, as seen in the modification shown in Fig. 6. In this case the contact-arm can make contact only with the connecting-strips of one series, and the other series of connecting-strips may be omitted, or every alternate line-circuit strip may be formed to permit its slide to make contact only with the connecting-strips of one series, the other line-circuit strips being formed to permit their slides to make contact with the connecting-strips of the other series.

A modification is shown in Fig. 7, in which the line-circuit strips are made in tubular form, and provided with the longitudinal and lateral grooves, and the slide is made in the form of a rod inclosed in the tubular strip, its contact arm or spring projecting through the grooves in the strip. In this construction the line-circuit strip will be attached at both ends to the frame *a*.

Having thus described my invention, what I claim is—

1. In a switch-board of the class herein described, the combination of a series of connecting-strips, a series of line-circuit strips, and a series of slides, adapted both to move longitudinally and to rotate on the line-circuit strips, substantially as and for the purposes specified.

2. In a switch-board of the class herein described, the combination of two series of connecting-strips, a series of line-circuit strips interposed between the two series of connecting-strips, and a series of slides, adapted both to move longitudinally and to rotate on the line-circuit strips, substantially as and for the purpose set forth.

3. In a switch-board of the class herein described, the combination of the line-circuit strips, the slides, and the connecting-strips, the line-circuit strips and slides being formed, substantially as described, to permit the slides to make contact with the connecting-strips by a rotary movement of the slides, to prevent the slides from being moved longitudinally while in contact with the connecting-strips, and to prevent the slides from coming in contact with the connecting-strips when moving longitudinally, as set forth.

4. In a switch-board of the class herein described, the combination of a series of connecting-strips, a series of line-circuit strips each having a longitudinal guide-groove and a series of lateral guide-grooves, and a series of slides on said line-circuit strips each having a contact arm or spring, and a pin adapted to move in the longitudinal groove, or in either of the lateral grooves of its line-circuit strip, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 15th day of March, A. D. 1881.

THOMAS W. LANE.

Witnesses:

H. G. WADIN,
C. F. BROWN.