

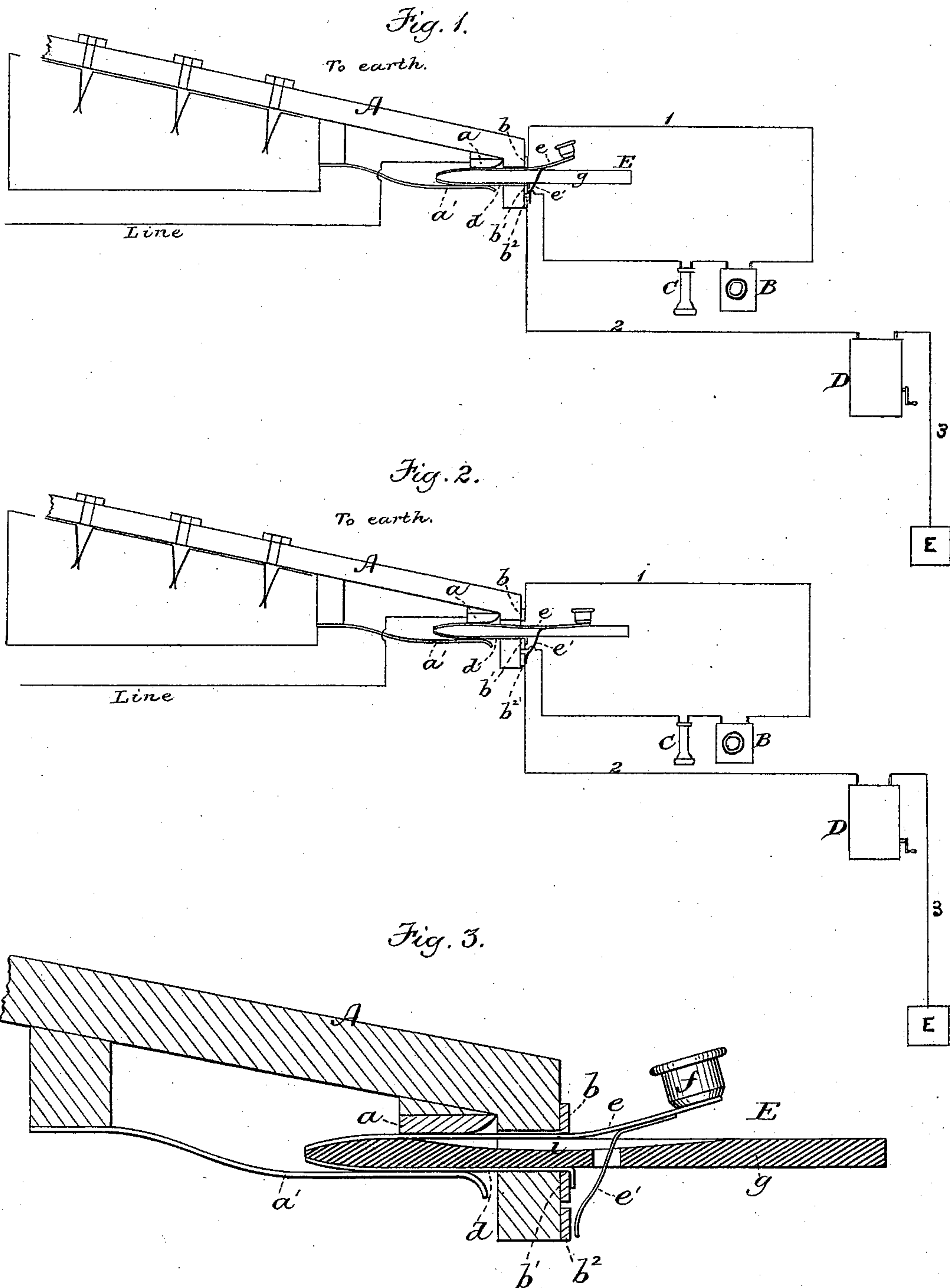
(No Model.)

T. W. LANE.

ELECTRIC SWITCH BOARD AND SIGNALING APPARATUS.

No. 287,300.

Patented Oct. 23, 1883.



Witnesses.
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UNITED STATES PATENT OFFICE.

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ELECTRIC SWITCH-BOARD AND SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 287,300, dated October 23, 1883.

Application filed June 26, 1883. (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 Improve-
5 ments in Electric Switch-Boards and Signaling Apparatus, of which the following is a specification.

This invention relates to telephonic switch-boards used in central offices, and employing
10 line-circuit strips adapted to be connected by plugs through connecting-strips, and is an improvement on the invention shown in Letters Patent No. 262,059, granted to myself and F. W. Harrington, August 1, 1882, said patented
15 invention consisting in an improved plug, and in an arrangement of circuits and apparatus whereby, when said plug is inserted into one of a series of line-strips, each capable of separation by said plugs, the operator's local circuit may be cut out and a signal sent to line,
20 or when two line-strips are connected together through the switch-board they may be temporarily separated from each other and a signal sent to either one of the two without disturbance or annoyance to the other.

My present invention consists in the provision of an additional metallic strip on the switch-board, connected with the generator and ground, and a contact-spring on the plug,
30 adapted to automatically make contact with said strip when the spring of said plug is moved to cut off the ground-connection and temporarily open or break the listening-circuit, thus enabling a signal to be sent to line
35 in one direction only by the generator to a party to be called without ringing into the ear of the calling party, the said strip and contact-spring being substituted for the switch described in the above-named patent, whereby
40 connection with the generator and ground is made and cut off. By this substitution I enable the operator to accomplish with one hand the results requiring the use of both hands with the apparatus described in said patent,
45 all of which I will now proceed to describe.

Of the accompanying drawings, forming a part of this specification, Figure 1 is a diagram and sectional view, showing my invention with the plug inserted, forming a completed listen-

ing-circuit. Fig. 2 represents a similar view, 50 showing the said circuit broken. Fig. 3 represents an enlarged view of the spring-plug.

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

In the drawings, A is the lower portion of 55 the body of the switch-board, which has a vertical and an inclined section, the latter only being shown.

Upon the rear side of the board are secured the spring line-strips, composed of sections terminating in separable springs or metallic surfaces, which normally bear against each other 60 firmly by their own resilience and enable the line to be separated at the point of contact of said springs.

Upon the face of the board A, or on a shelf or offset projecting therefrom, are two horizontal metallic rods or strips, *b b'*, directly opposite the lower separable metallic surfaces of each line-strip, one of said surfaces being a 70 spring, *a'*, connected with the line-circuit strip above and with the line from the switch-board, and the other a fixed metallic shoe, *a*, connected with the line entering the switch-board. Between the strips *b b'* are orifices through the 75 board for the insertion of the plugs, hereinafter described.

To the rod *b* is connected a wire, 1, which, after passing through hand-telephone C and transmitter B, is attached to the rod *b'*. 80

b² represents a rod or strip attached to the board close to the strip *b*, but having no electrical connection therewith.

From the rod or strip *b²* a wire, 2, extends to a magneto or other generator, D, the latter 85 being connected to earth by wire 3.

E is the above-mentioned connecting-plug, formed of a stock, *g*, of insulating material, upon one face or side of which is a flat metal spring, *d*, permanently fixed at one end of the 90 plug, and so arranged as to normally spring away from the stock *g* at its free end. The free end is bent over at right angles, to form a stop, to limit its insertion into the switch-board, and to rest upon the strip *b'*. Upon the opposite 95 side of the stock *g* another spring, *e*, is arranged in a similar manner. Upon the free end of the spring *e* is a button or knob, *f*, of

insulating material. A portion of the surface of the stock *g* is cut away under the spring *e*, forming a recess, *i*, to allow the spring *e* to be moved from contact with strip *b* when inserted between said strips *b b'*, as hereinafter described.

e' represents a spring attached to the spring *e* and projecting through a slot in the stock *g*. When the spring *e* is in its normal position, the spring *e'* has no electrical contact; but when the spring *e* is pressed away from the strip *b* the spring *e'* at the same moment makes contact with the generator-strip *b²*, as shown in Fig. 2.

The operation is as follows: A call being received at the central office, the annunciator of the line-circuit on which the call is sent drops, the operator inserts a plug, *E*, as shown, into the line-strip, with the spring *e* next to the strip *b*, presses the knob *f*, causing the spring *e* to separate from the strip *b* and the spring *e'* to make contact with the generator-strip *b²*, thus cutting off the normal-line earth-contact and enabling a signal to be sent to the calling party by means of the generator *D*, a circuit being thus made from ground, through generator *D*, wire 2, strip *b²*, springs *e'* and *e*, and plate or shoe *a*, to line. By releasing the knob *f* the listening-circuit is made complete and the wants of the calling party ascertained. The desired line-strip having been plugged or connected with that of the calling party through a connecting-strip of the switch-board, the plug *E* is withdrawn from the calling-line and inserted into the desired line-circuit. By now pressing down the knob *f* of the plug *E*, as before, connection between the two lines is again temporarily broken, and a calling-signal can then be sent by means of the generator *D* to the desired party without ringing into the ear of the party first called. By releasing the knob the two lines are placed in circuit again, with the listening-telephones *C B* looped in and the generator disconnected.

It will be seen that by the use of the generator-strip *b²* and the spring *e'*, in connection with the improved plug, the switch described in the above-named patent is dispensed with,

and the operator is enabled, by the manipulation of the spring *e*, to simultaneously disconnect the listening-circuit from the line and connect the generator and ground therewith, and vice versa, only one hand being required for either operation. When the generator is connected with the portion of the line to which a call is to be sent, the other portion of the line is necessarily disconnected by the depression of the spring *e* required to connect the generator; hence it is impossible for the calling party to be annoyed by a peal from the magneto-bell while he is listening.

I claim—

1. The combination of a switch-board having a series of line-circuit strips, each adapted to be separated into two distinct parts at a given point, a circuit comprising two strips, *b b'*, arranged, as described, with relation to the points where the line-circuit strips are separable, a strip, *b²*, normally insulated, a magneto-generator or its equivalent connected with the strip *b²*, and a plug, constructed as described, adapted to separate any one of the line-circuit strips into two parts and connect the strips *b b'*, respectively, with the separated parts, or to connect one strip and disconnect the other, and provided with a spring, *e*, adapted, when a line-circuit strip is disconnected, to automatically make contact with the generator-strip, and thereby connect the generator with one part of the disconnected line-strip, as set forth.

2. The improved plug for an electrical switch-board, composed of a recessed stock or body, the springs *d e*, affixed to opposite sides of said body, and the spring *e'*, secured to the spring *e* and projecting therefrom beyond one side of the stock, substantially as and for the purpose specified.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 19th day of June, 1883.

THOMAS W. LANE.

Witnesses:

ADALBERT E. COLE,
C. F. BROWN.