

E. N. LORD.
Telephone-Switch.

No. 226,528.

Patented April 13, 1880.

Fig. 1.

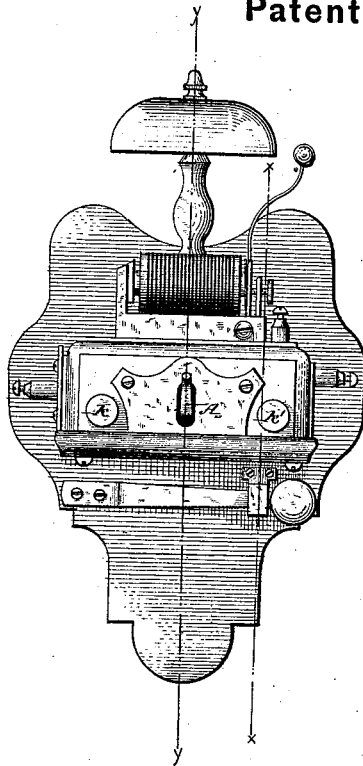


Fig. 2.

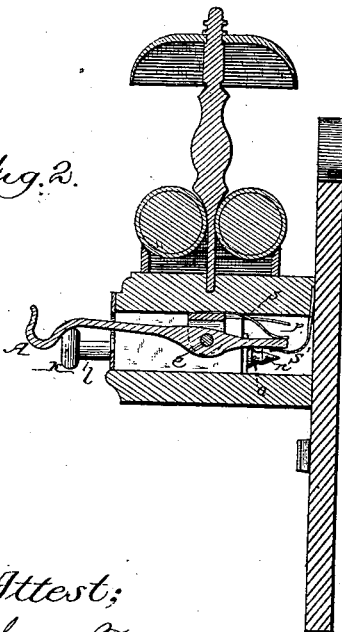
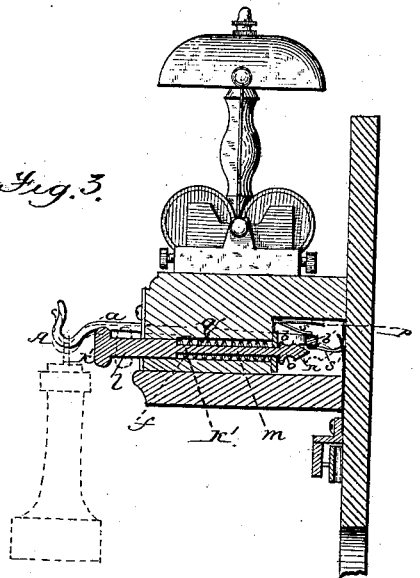


Fig. 3.



Attest;
T. Walter Fowler
W. Blackstock

Inventor
E. N. Lord
By. Wright & Brown

Attorneys

E. N. LORD.
Telephone-Switch.

No. 226,528.

Patented April 13, 1880.

Fig. 4.

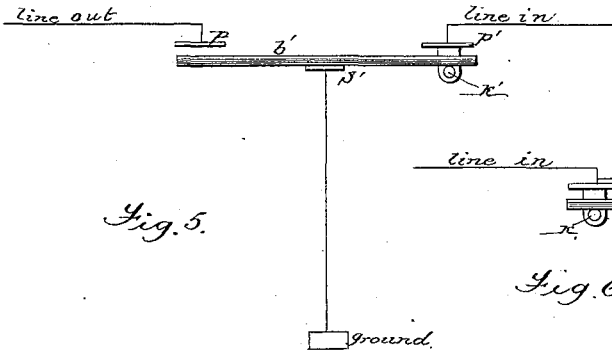
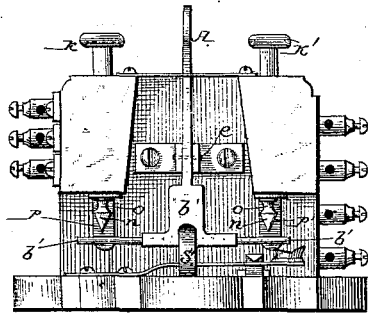


Fig. 5.

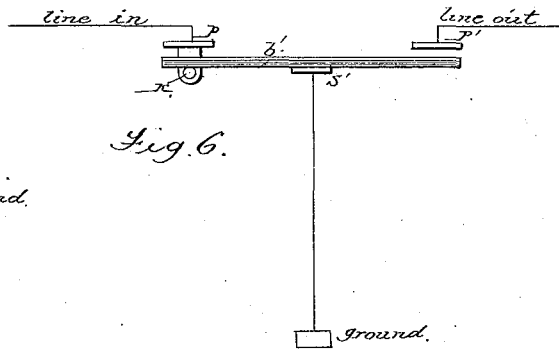


Fig. 6.

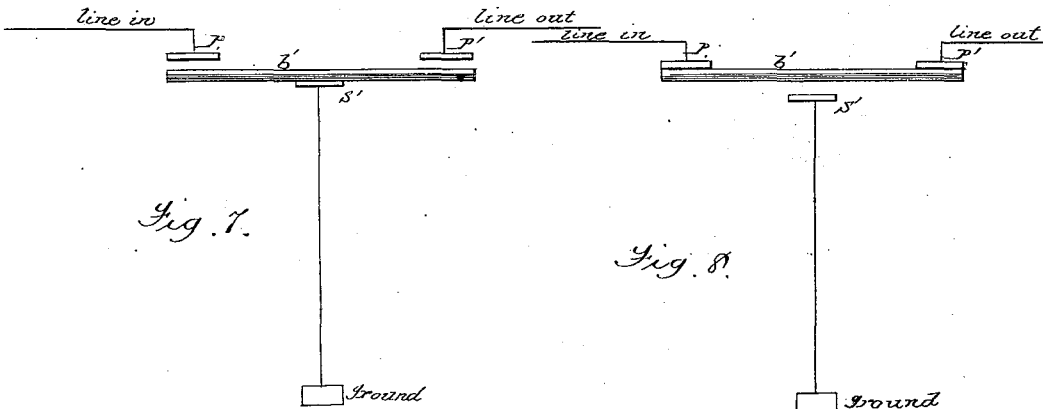


Fig. 7.

Fig. 8.

Attest;
T. Walter Fowler,
W. Blackstock.

Inventor
E. N. Lord
by: Wright & Brown

Attorneys

E. N. LORD.
Telephone-Switch.

No. 226,528.

Patented April 13, 1880.

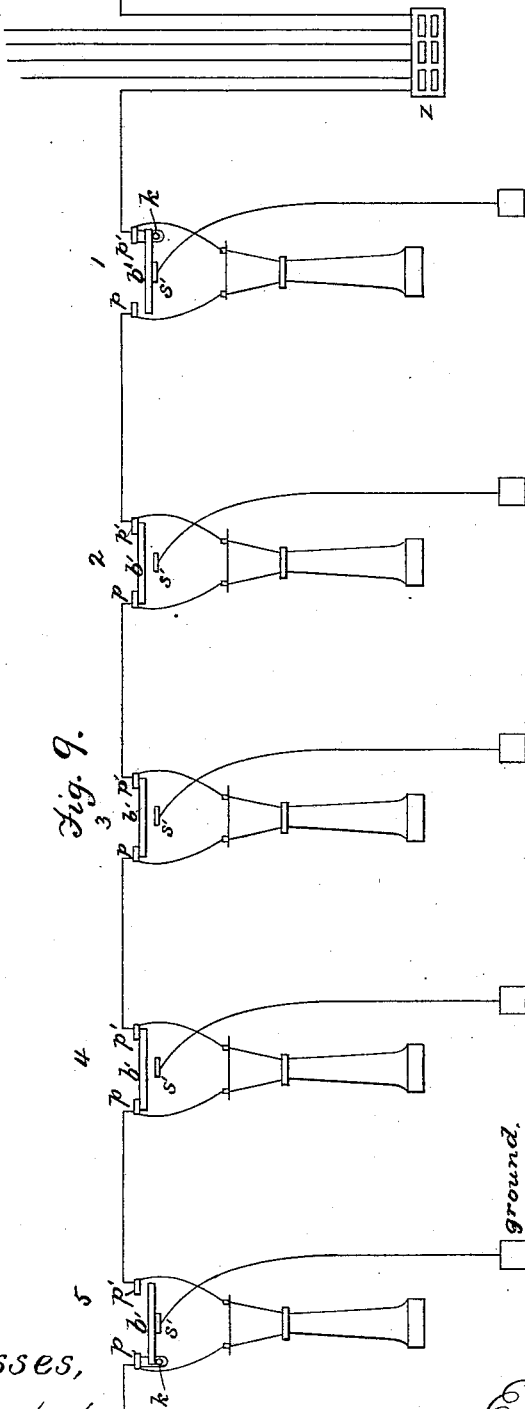


Fig. 9.

Witnesses,
W. C. Harper
H. O. Gurrick

Inventor,
E. N. Lord
by Wm. H. Finckel
Associate Atty.

UNITED STATES PATENT OFFICE.

EDWARD N. LORD, OF WAKEFIELD, ASSIGNOR OF ONE-HALF OF HIS RIGHT TO CHARLES WILLIAMS, JR., OF SOMERVILLE, MASSACHUSETTS.

TELEPHONE-SWITCH.

SPECIFICATION forming part of Letters Patent No. 226,528, dated April 13, 1880.

Application filed November 11, 1879.

To all whom it may concern:

Be it known that I, EDWARD N. LORD, of Wakefield, in the county of Middlesex and State of Massachusetts, have invented certain
5 Improvements in Telephone-Switches, of which the following is a specification.

My invention relates to certain improvements in the art of transmitting sound and messages by the use of the telephone.

10 It has for its object to render sound or messages sent through a wire between given points inaudible at any other than the initial and objective points; and it consists not only of a general system, involving a main office, wire-circuits, battery, and a code of signals, but also
15 of an improved instrument arranged in connection with the telephones along the line, whereby the telephones on any given circuit or circuits may be switched together and messages transmitted between any two, all the
20 balance being cut out and prevented from taking up the message or conversation, as will be hereinafter more fully explained.

25 In the use of the telephone system it is necessary that a message between any two stations should not be heard or picked up at any or all of the other stations.

30 My invention consists of improvements in devices to enable the telephones to be used in a district system with as much privacy as may be desired, for the reason that all stations outside of the two in use are cut out by the act of putting the said two in connection, and any
35 intermediate station attempting to get in on the line separates the said two.

40 My invention consists in the devices shown and claimed for making and breaking the circuit on either side of the station, and for cutting out the station or telephone and restoring the main line, all of which I will now proceed to describe.

45 Of the accompanying drawings, forming a part of this specification, Figure 1 is a front elevation of my apparatus. Fig. 2 is a central vertical section on line $y y$, Fig. 1, and Fig. 3 is a vertical section on line $x x$ of Fig. 1. Fig. 4 is a bottom view of my apparatus. Fig. 5 is a diagram showing the position of parts when connection is made to the right;

50 Fig. 6, a similar diagram for connection to the left; Fig. 7, a diagram showing the position of the parts when the telephone has been removed from the hook; Fig. 8, a diagram showing the parts when the main line is established, and Fig. 9 a diagram of a district apparatus, or my system.
55

Similar letters of reference indicate like parts in all the figures.

60 In the drawings, A represents a telephone-hook, arranged in the usual case and with the usual connections. The hook is pivoted at a , and has an arm, b , extending inwardly, said arm being provided with a cross-bar, b' , at its end. A spring, s , is arranged to keep the arm
65 b depressed, so that when the telephone is removed from the hook A the arm b will make contact with the spring s' connecting to ground. Above the bar b' , at each end thereof, are two contact-plates, $p p'$, which, when the bar b' is elevated (by the weight of the
70 telephone when hung upon the hook A) and is in contact therewith, will cut out the telephone and restore the main line.

75 On each side of the hook A, and parallel with it, are knobs $k k'$, so arranged by means of springs f that when in their normal position they are pressed outwardly by said springs. Each knob is composed of the outer part, l , which is attached to a spindle, m , (smaller in diameter than the part l), which has an enlarged end, n . The knobs are arranged in
80 sockets q . A part of the projection p forms a stop for the beveled end n and keeps the knob in position. The springs f are placed around the spindles m of each knob, and, with plates
85 $p p'$ for abutments, force the knobs outwardly. The inner ends, n , of these knobs are beveled, as shown, and each has a score, o , upon its periphery.

90 When the telephone is hung upon its hook it depresses one end, a , and elevates the other, b , until said end b touches or makes contact with the projections p , and so completes the main line and cuts the telephone from the
95 line.

Whenever it is desired to communicate with a station on either side the telephone is taken from its hook, which, being relieved of the

weight of the telephone, is thrown up at end *a* and depressed at end *b* by the spring *s* until the end *b* strikes the spring *s'*, which conducts to ground, thus breaking the main line. Then, if the operator desires to communicate to the right side, he pushes the knob *k*, which, by the beveled end *n* striking the bar *b'*, slightly elevates the bar *b'* until said bar reaches the score or depression *o*, when it is forced into said score with sufficient force to overcome the resistance of the knob-spring *f*, and holds said knob, thus making contact and connection with stations on the right side, the spring *s'* still making contact with the cross-bar *b'* for ground-connection.

The signal being now sent to the station it is desired to communicate with, and the operator at said station having broken the main line and made connection to the left in the same manner as described, the two are placed in position to communicate secretly.

The same operation on the part of the first operator would be necessary if he desired to communicate with stations to his left, only he would push in knob *k'* instead of the knob *k*.

If it is desired to communicate to any of the stations to the left immediately after communicating to the right, and without hanging the telephone upon the hook, the operator presses in the knob *k'*, and when its beveled end *n* strikes the bar *b'* it elevates said bar sufficiently to release the end of the opposite knob *k*, which returns to its normal position, thus breaking all connection with the stations to the right and making connection with the stations on the left.

When conversation has ceased between the operators, each hanging his telephone upon its hook causes the end *a* to be depressed and the opposite end *b*, with the cross-bar *b'*, to be elevated sufficiently to lift the bar out from the score *o*, when the knob *k'* immediately returns to its normal position. The cross-bar continues to be elevated by the weight of the telephone until said bar is stopped by striking the contact-plates *p p'*, thus restoring the main line and cutting out the telephone.

In Fig. 9 I have shown a diagram of a system of telephones, *Z* being an annunciator in the central office, with lines therefrom, and 1, 2, 3, 4, and 5 are stations, Nos. 1 and 5 being in connection and the others shut out.

I do not confine myself to the exact form of parts shown, as they may be varied in regard to position and form without departing from the spirit of my invention.

Heretofore it has been proposed to employ in a district-telephone system a series of switches, normally constituting portions of the main line, and adapted to serve the main line and complete a circuit from the earth at any station through either fragment of the broken line on either side of said station.

I claim—

1. The hook *A*, formed as described, spring *s*, knobs *k' k*, formed as described, projections or springs *p p'*, and spring *s'*, forming connection to ground, all arranged and operating as set forth.

2. A hook to receive a telephone, adapted to automatically establish the earth-connection upon the removal of the telephone, in combination with a right and a left side-station-connecting knob, operated manually to disconnect each the other to establish a circuit to the right or left, substantially as described.

3. The combination of a telephone-hook, its cross-bar, ground-connections, and scored push-knobs, operated manually to establish a circuit to the right or left, substantially as specified.

4. The combination of a telephone-hook, its cross-bar, and operating push-knobs, with contact-plates, substantially as described, for the purpose of cutting out the telephone and restoring the main line.

5. The combination of a telephone-hook, its cross-bar, a depressing and a ground-connection spring, and scored knobs operated manually to establish a circuit to the right or left, substantially as specified.

6. In a telephone-switch, an operating-knob provided with a scored and beveled head or point, in combination with a telephone-hook to engage therewith, and a depressing-spring, 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.

EDWARD N. LORD.

Witnesses:

J. T. COLLINS,
GEO. W. PIERCE.