(No Model.) 3 Sheets—Sheet 1.

C. F. DUNDERDALE.

TELEPHONE SWITCHBOARD APPARATUS.

No. 599,553. Patented Feb. 22, 1898.

Fig. 1.

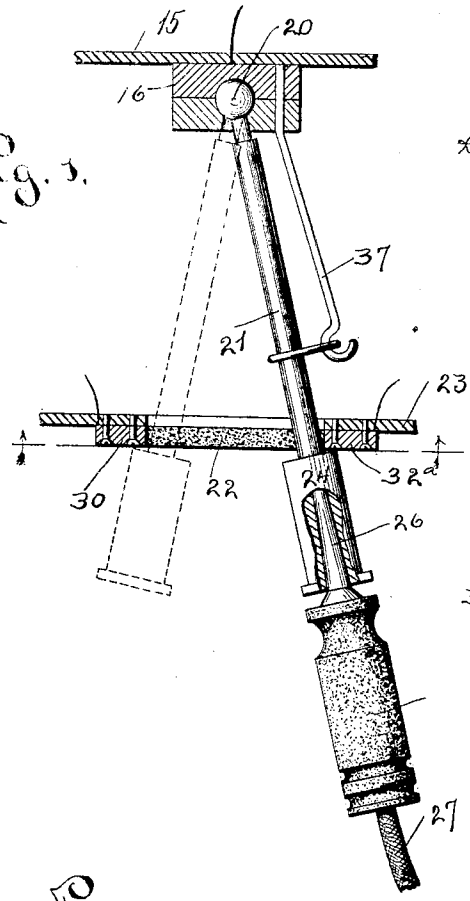


Fig. 3.

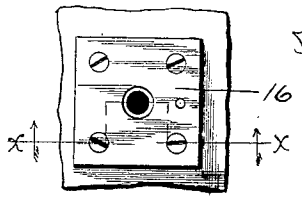


Fig. 2.

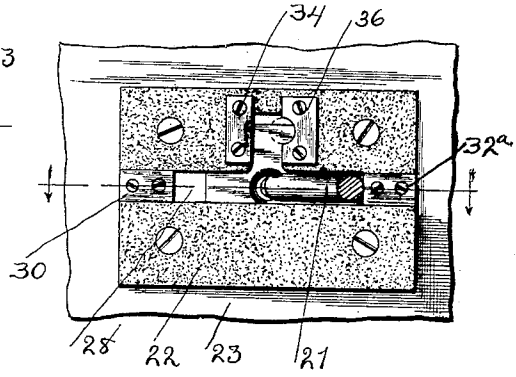


Fig. 4.

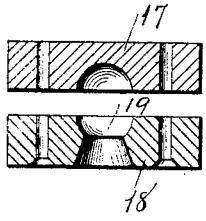


Fig. 5

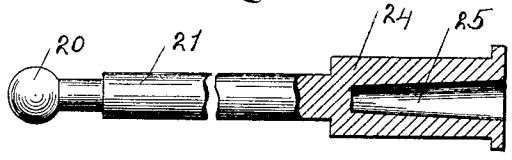
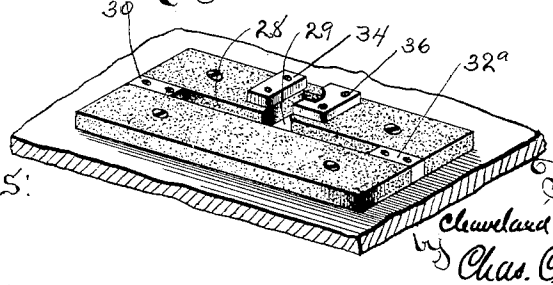


Fig. 6.



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C. F. DUNDERDALE.

TELEPHONE SWITCHBOARD APPARATUS.

No. 599,553. Patented Feb. 22, 1898.

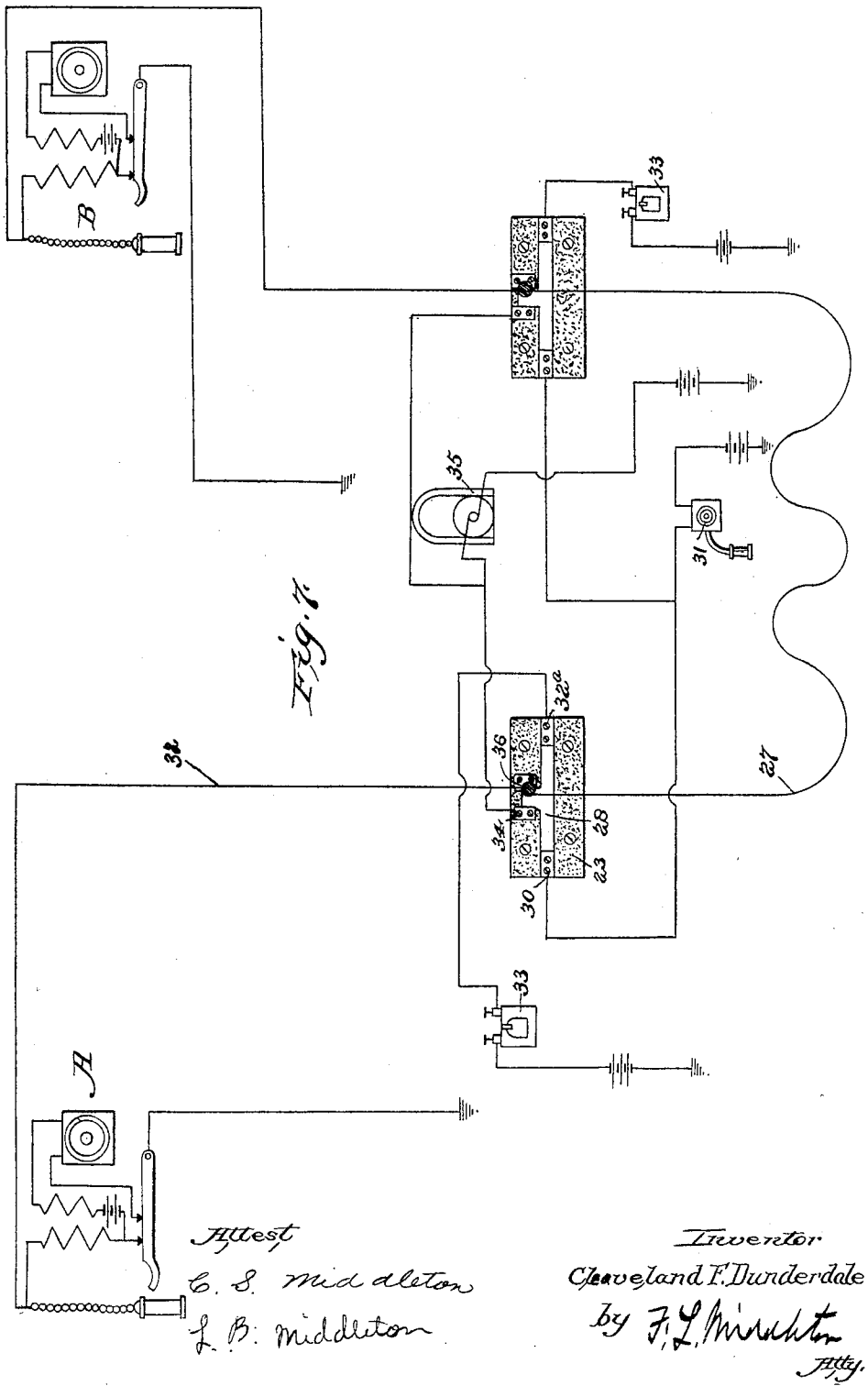


Fig. 1.

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(No Model.)

3 Sheets—Sheet 3.

C. F. DUNDERDALE.

TELEPHONE SWITCHBOARD APPARATUS.

No. 599,553. Patented Feb. 22, 1898.

Fig. 8.

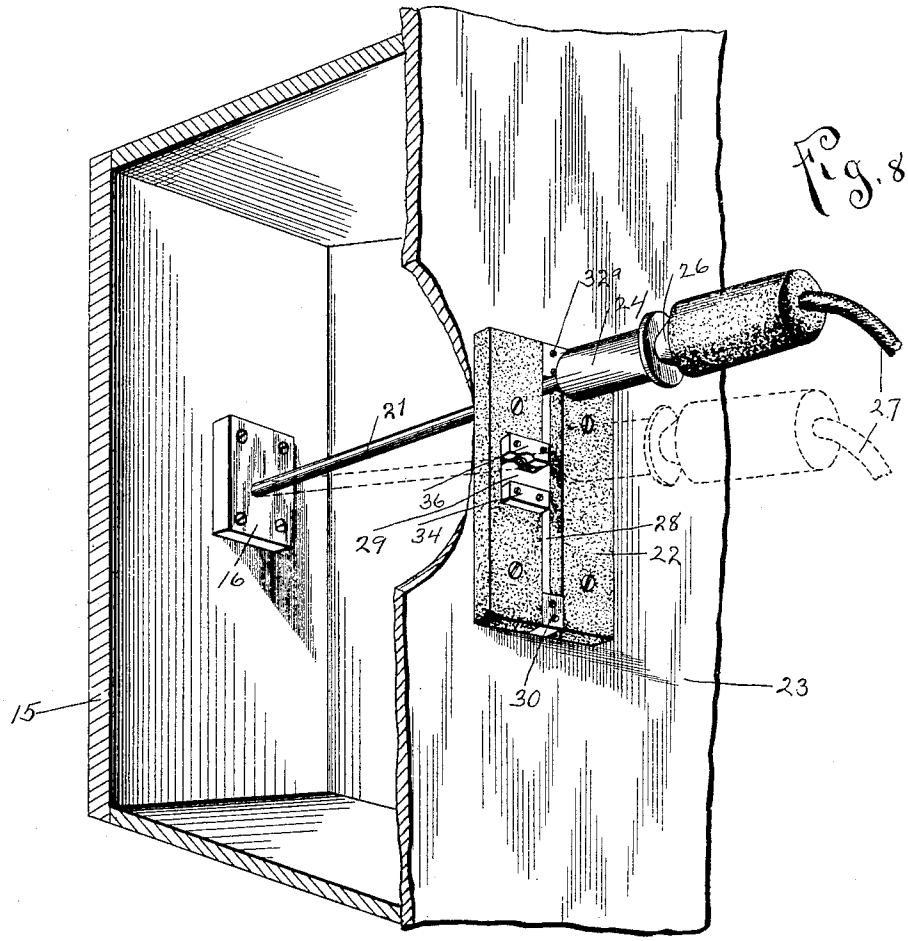
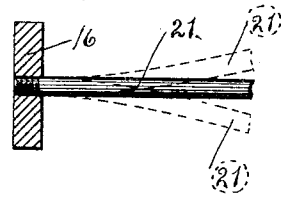


Fig. 9.



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UNITED STATES PATENT OFFICE.

CLEAVELAND F. DUNDERDALE, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO JOHN F. PERSHING, OF SAME PLACE.

TELEPHONE-SWITCHBOARD APPARATUS.

SPECIFICATION forming part of Letters Patent No. 599,553, dated February 22, 1898.

Application filed July 31, 1896. Serial No. 601,192. (No model.)

To all whom it may concern:

Be it known that I, CLEAVELAND F. DUNDERDALE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Telephone-Switchboard Apparatus, of which the following is a specification.

My invention relates to certain improvements in switchboards for telephone systems.

My invention has for its object the provision of means whereby with one instrumentality the various different local circuits may be established to include the operator's set of instruments or to include the signaling-generator and also to disestablish or break the annunciator-circuit, normally closed to line, my object also being to provide means whereby the foregoing single instrumentality may be entirely and completely isolated and held away from all circuit connections when the subscribers are connected for conversation or under other circumstances which may occur.

My invention has certain other objects in view; and it consists in certain features to be described, and pointed out in my claims, reference being now had to the accompanying drawings, in which—

Figure 1 is a sectional plan view of my device shown mounted in position upon a switchboard. Fig. 2 is a detail plan view of the contact-plate. Fig. 3 is a face view of the terminal connecting-lever plate. Fig. 4 is a cross-sectional view on the line *x x* of Fig. 3. Fig. 5 is a detail view of the terminal connecting-lever, partly in section. Fig. 6 is a perspective top view of the contact-plate. Fig. 7 is a diagrammatic view showing the circuit connections. Fig. 8 is a perspective view of a modified form, and Fig. 9 is a detail thereof.

In switchboard practice at central stations, as is well known, it is customary to provide a local circuit including a subscriber's drop or annunciator and to maintain the said circuit established, that the signal may be received at any moment. It is also necessary to provide another circuit including a set of operators' instruments which are not included in the line-circuit, and heretofore a separate instrumentality has been provided to include such instruments in the line. So, also, a separate instrumentality has been employed to connect the power or hand generator in line in order to extend a signal to the subscriber. With my improved apparatus I am able to accomplish all of these various results with one and the same instrumentality and also so position this single instrumentality when necessary that all of the circuits are entirely isolated and disconnected therefrom, thus avoiding any interference while the subscribers are coupled for conversation.

I will now describe my apparatus in detail.

The back board of the switchboard is designated at 15, having secured on its face a terminal lever-plate 16, made in two parts (Fig. 4) 17 and 18. A socket 19 is formed in the plate 16 for holding the ball or ball-head 20 of the terminal connecting-lever 21, the shank of which latter projects, in a manner to be described, through the contact-holding plate 22. The terminal connecting-lever 21 is thus mounted and held on the back board 15 of the switchboard and projects or stands out, therefore, at substantially a right angle and also from the front board 23, on the face of which the contact-holding plate 22 is secured. The handle 24 of the terminal connecting-lever 21 is formed with a socket 25 to receive the plug 26 of the flexible conductor 27.

It will be observed that the terminal lever 21 is held in position by a universal ball-and-socket connection and is capable of a movement freely in all directions.

The contact-holding plate has a main slideway or slot 28 longitudinally thereof and a transverse side slideway or slot 29 opening off from the main slideway. The terminal lever 21 passes through these slideways and is capable of movement freely in the same. The contact-plate 22 is made principally of insulating material and has secured thereto the contact-terminal 30 of the operator's set 31, Fig. 7, the line 32 being connected with the terminal plate 16, Fig. 1, whereby the current from line is conducted to the terminal connecting-lever 21. Also secured to the contact-holding plate 22 is a contact-terminal 32 for the annunciator-circuit, including the annunciator 33, and a contact-terminal 34 is connected with the circuit, including the gen-

erator 35. Also secured to the contact-holding plate 22 is a dead-point 36, which is completely isolated from all circuits by reason of the insulating material of which the contact-plate is composed. This dead-point 36 may also be termed a "lever-holder," since the lever 21 is adapted to be engaged and held by said dead-point.

I will now describe the operation of my device: When a current impulse from subscriber's station at A traverses the line 32, it first passes therefrom through the terminal plate 16 to the terminal connecting or circuit-changing lever 21. As the said lever is held against the contact-terminal 32 by a spring 37 the local circuit and its annunciator 33 of that subscriber on the switchboard is thus connected with the line, so that the current passes through the terminal lever to and through said local circuit, thus extending a signal to the operator, who thereupon seizes the lever 21 of that subscriber and, against the resistance of spring 37, moves it through the slideway 28 until it bears against the contact-terminal 30, thereby connecting the line of that subscriber with the operator's set through said lever 21. After having ascertained the subscriber desired, the operator then brings the lever 21 of the calling subscriber into the side slideway 29 and against the dead-point 36, and then by moving the terminal lever 21 of the subscriber to be called into the side slideway 29 and touching it against the contact-terminal 34 connects the circuit of the generator 35 with the line of that subscriber, as at B, through the lever 21, thereby extending a call to such subscriber. When the signal is extended, the operator then brings the lever 21 against the dead-point 36, where it is held by the spring 37. The operator connects the subscribers for conversation by inserting the plugs 26, connected by the flexible conductor 27, into the sockets 25 of the lever 21 of each subscriber, and as said levers now both rest and are held upon the dead-point 36 by the upward pull of the spring the line connection is thus completely isolated from all the auxiliary circuits and terminal contacts.

It will therefore be apparent that I provide a simple and complete device which is self-contained and which provides a means whereby all of these various circuits, both line and auxiliary, may be interchangeably connected by the movement of one lever or a single instrumentality, thus dispensing with the various separate circuit-makers, which have been heretofore used to accomplish the like results.

It is evident that the foregoing results may be accomplished by means of a lever consisting of a piece of spring-wire or other suitable material, which in this case is fixed rigidly to the back board and therefore has no hinge, the lever having a movement in different directions by a torsional yielding or retractive effect of the lever when so moved, this torsional or retractive effect acting to return the lever into contact with the annunciator-circuit or to hold it in its isolated position when released by the hand.

It will be observed from the foregoing description that the hinged lever has movement both vertically and laterally.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. A switchboard comprising a hinged lever connected with the subscriber's line and constituting a line-terminal, which lever has a movement in more than one direction and terminals for auxiliary circuits adjacent to the lever, together with a spring normally holding the lever in a position against one of said terminals.

2. A switchboard comprising a hinged lever connected with the subscriber's line and constituting a line-terminal which lever is capable of vertical and lateral movement, terminals for auxiliary circuits adjacent to the lever and means for holding said lever out of use.

3. A switchboard comprising a hinged lever connected with the subscriber's line and constituting a line-terminal, a contact-holding plate surrounding said lever, contacts mounted thereon connected with the auxiliary circuits, means for shifting said lever and a lever-holder mounted on said plate which isolates the lever from all the circuits when it bears against the same.

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

CLEAVELAND F. DUNDERDALE.

Witnesses:
CHAS. C. BULKLEY,
L. M. BULKLEY.