

APPLICATION FILED AUG. 5, 1904.

2 SHEETS—SHEET 1.



Inventor
Theodore A. Hammond
By his Attorneys *Thos & Wm*

T. A. HAMMOND.
SWITCHBOARD CONSTRUCTION.
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955,263.

Patented Apr. 19, 1910.

2 SHEETS—SHEET 2.

Fig. 2.

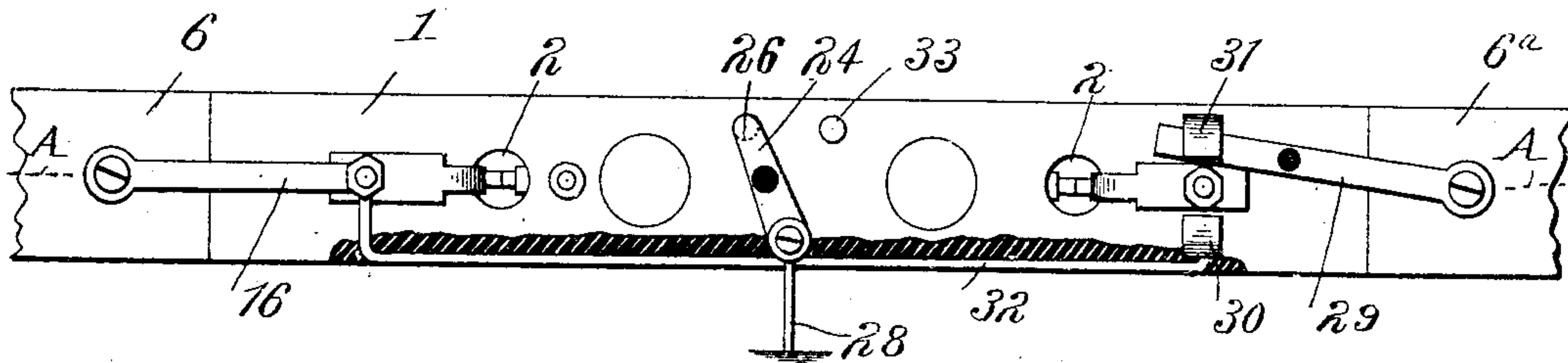


Fig. 3.

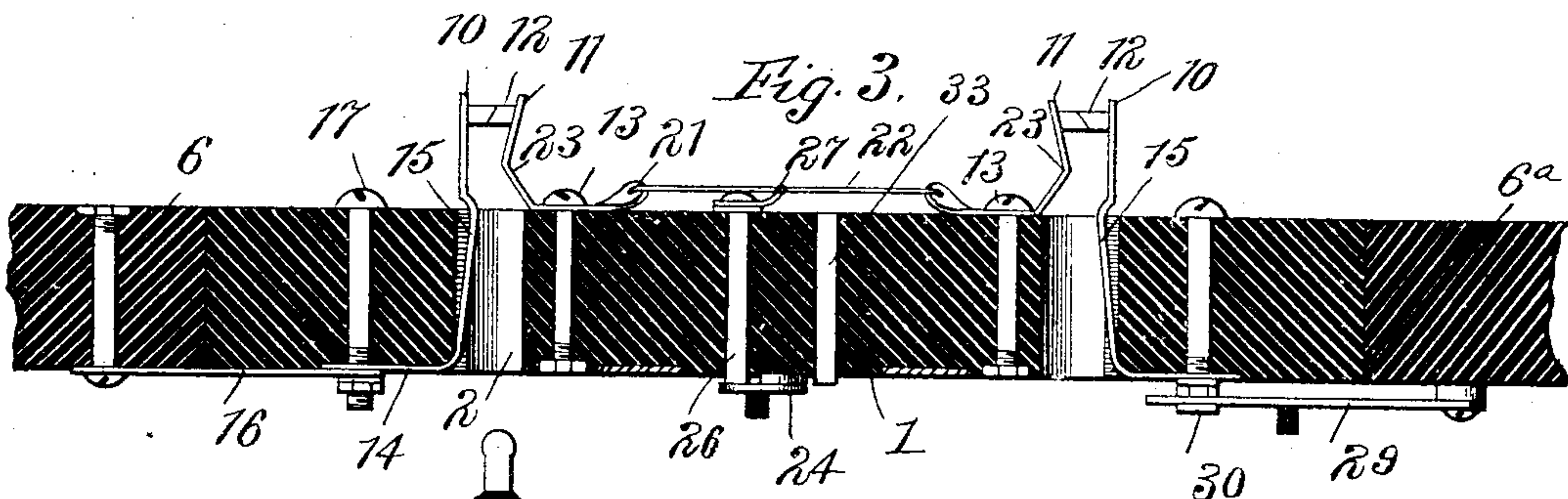
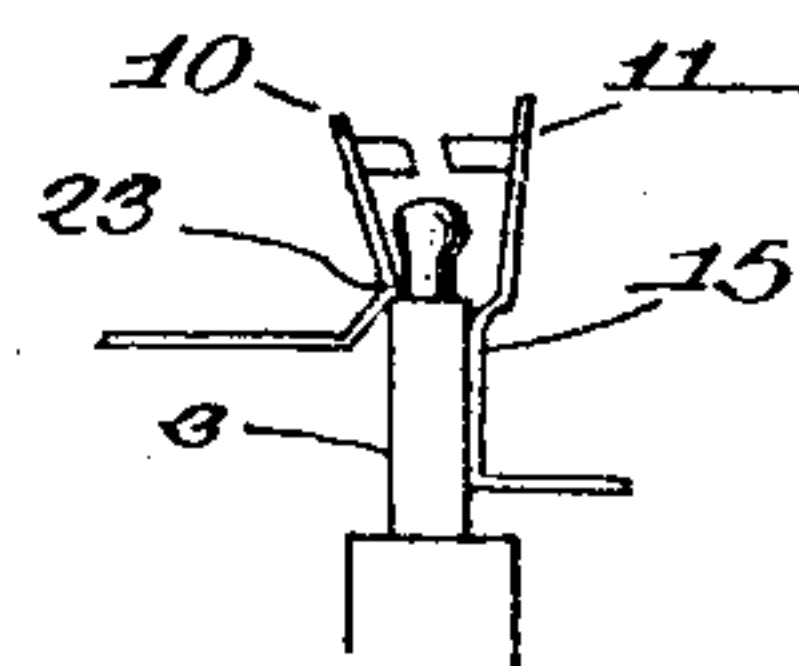


Fig. 4.



Witnesses
J. A. Hammond.
E. von Gruener.

Inventor
Theodore A. Hammond
By his Attorneys *Ames & Co.*

UNITED STATES PATENT OFFICE.

THEODORE A. HAMMOND, OF PASSAIC, NEW JERSEY.

SWITCHBOARD CONSTRUCTION.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, THEODORE A. HAMMOND, a citizen of the United States, residing at Passaic, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Switchboard Construction; and in order to enable those skilled in the art to understand, make, construct, and use the same I give the following description thereof.

The object of my invention is to simplify and improve the construction of switchboards, to greatly increase the number of connections which may be made from a switchboard of a given size as compared with switchboards at present in use, to provide a switchboard of sectional construction whereby new lines or connections may be readily added without disturbing the wiring system or to provide for the ready removal of a line or lines, to insure safety, simplicity, and facility of operation; and to prevent short circuiting and insure perfection of insulation. These and other objects of the invention are set forth and described in the following specification and more particularly pointed out in the claims.

The accompanying drawings illustrate an embodiment of my invention in which,

Figure 1 is a view showing a portion of a switchboard constructed according to my invention. Fig. 2 is a partial front view of one section or unit of my switchboard on a larger scale illustrating the jack terminals for one line. Fig. 3 is a horizontal sectional view taken on line A—A Fig. 1. Fig. 4 is a detail view illustrating a plug in position and its operation of the jack.

In the construction of a switchboard according to my invention the lines entering the board are connected respectively with the terminal blocks 1. These blocks are each provided with jack sockets 2, 2, to receive the plugs 3 by means of which the connections are made. It will be understood that these plugs have connected to them a flexible conducting cord 4, in the usual manner, a plug 3 or similar contact terminal being provided at each end of the flexible cord.

Owing to the special construction of my terminal blocks and the particular form of connecting plug to be used therewith I am enabled to greatly reduce the number of jacks necessary for making the desired con-

nections. Two jacks are all that are required for each terminal block and any desired connection or connections, whether patching, looping or grounding, or a continuation or multiplication of these, may be made from one or other of these jacks without the necessity of employing additional or special jacks for making particular kinds of connections. These terminal blocks are made of some suitable insulating material, such as porcelain, vulcanite or the like.

Each terminal block or unit is arranged between other blocks or units 6, 6^a, which carry the fuses 7, and lightning arresters 8. A series of these terminal blocks with these blocks for the fuses and lightning arresters are supported in a suitable frame work F, the whole forming the switchboard. The blocks which carry the fuses and lightning arresters do not form any part of the present invention; it is therefore not deemed necessary to describe the same in detail, it being understood that the several lines are connected in any suitable and convenient manner through the fuses and lightning arresters and thence to the terminal or jack blocks.

The terminal blocks 1 are bored at 2 to form sockets to receive the plugs 3. In each socket 2 is mounted a jack consisting of two spring members 10 and 11, each provided with a contact piece 12. Spring member 11 is secured to the block by means of a bolt or screw 13; and spring member 10 has its ends seated in depression 14 in the face of the block and is bent approximately at right angles to pass through the socket 2. These sockets are provided with recesses or seats 15 in which said spring members 10 are seated, so that when the plugs 3 are inserted in the sockets 2 for making a connection, the spring member 10 of the jack is pressed back by the body portion of the plug into the recess 15. Normally spring member 10 projects into the circular or body portion of the recess with its contact piece 12 touching or engaging the contact 12 of the other spring member 11; so that when a plug is inserted the spring members 10 and 11 are pressed apart and the circuit through the line is opened at 12 as shown in Fig. 4. Each spring member 10 is in electrical contact with a connecting piece 16 secured at one end to the block by bolt or screw 17, and at its other end this piece 16 is connected to

the line through the lightning arrester and fuse. The spring member 11 is secured at the back of the terminal block by means of the bolt or screw 13, as shown, the spring member having one end 21 formed to be suitably connected by soldering or otherwise with a connection 22 which is connected in a similar manner with the other spring member 11 of the other jack. These spring members 11 are so bent as at 23 as to lie in the path of the pin portion of the plugs 3 and to be engaged thereby and deflected to open the circuit at 12. The spring member 11 by this arrangement is much shorter than the spring member 10 thereby having a shorter radius of swing the spring member 10 being engaged by the plug before the spring member 11 is first deflected and its movement is followed by spring member 11, at least for a portion thereof, then the plug engages spring member 11 and deflects it. By this construction a sliding or wiping contact is produced between the contacts 12 of the spring members 10 and 11 of the jack. This is a feature of considerable importance since it insures automatically clean contacts. Since each jack is of similar construction the above description applies to all of them.

From the above it will be seen that the circuit passes from the lines in either direction through the jacks, (when no plugs are inserted) to make connections from one line to another. It will be understood that when a plug 3 is inserted in either of the jacks the circuit is opened at 12 and the circuit then passes from the spring member 10 or 11 (as the case may be) to either the body or pin portion of the plug 3 and through the flexible conducting cord 4 to the other jacks when a patch connection is made; or through the instrument or other device when a loop connection is to be made.

The plugs referred to are specifically described and claimed in a pending application filed August 6, 1907, Serial Number 387,343.

In connection with the above described switchboard construction may be provided means for cutting out or grounding either side of the line. For this purpose a switch device and connections are provided comprising a switch blade 24 pivotally mounted upon the front of each block and arranged to engage a contact 26. This contact may be formed conveniently by the end of a bolt or pin which passes through the block from the rear and is in electrical connection with the wire or strip 22 between the jacks, the connection being shown at 27. The blade 24 has a ground connection 28. Another switch may also be provided consisting of a blade 29 pivotally mounted upon the fuse block 6^a and having connection with the line from the fuse and arrester. This switch blade is arranged to engage contacts 30 and

31. Contact 30 is connected with a shunt 32 and contact 31 is connected with the spring member 10 of the adjacent jack. The function of the switch devices is to cut out or ground one or both of the jacks.

By my invention it will be seen that I have devised a switchboard of great simplicity and economy of construction and have obviated the presence of any insulating material in the construction of the switchboard jacks. This latter is an important feature of advantage for the reason that in use such insulating material tends to become carbonized when high tension currents pass through the board and thereby its insulating properties are destroyed. I have further provided automatic means for keeping the contact pieces of the jacks clean without attention on the part of inspectors or repairers, thereby insuring always a good circuit.

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

1. A jack for switchboards, said jack comprising a pair of spring members normally in electrical contact at the rear of the board, one of said members secured to the rear of the board and the other of said members secured to the front of the board, the latter member adapted to be engaged by the plug before the former member, substantially as and for the purpose described.

2. In a switchboard construction, the combination of a plurality of sockets for receiving connecting plugs, jacks in juxtaposition to said sockets, said jacks comprising two spring members normally in electrical contact, one of said members secured to the rear of the board and projecting into the axial line of the socket and the other of said members extending through said socket and secured at the front of the board whereby both members of a jack may be engaged by the plug, one member being engaged thereby before the other, substantially as and for the purpose described.

3. A switchboard comprising a plurality of strips or blocks of insulating material, each block provided with plug sockets and having mounted thereon jacks of uniform construction, each jack comprising two independently mounted spring members, one of said members being secured to the front of the block or strip and extending into and through the socket, the other of said members secured to the rear of the block or strip and projecting into the axial line of the socket, and both members normally in electrical contact one with the other at the rear of the board, in combination with a plug provided with two terminal portions insulated one from the other, each portion adapted to engage and deflect separately and successively one of the spring members of a jack when inserted in a plug socket to pro-

duce a wiping contact between the spring members, substantially as and for the purpose described.

4. A unit for switchboard construction 5 comprising a block or strip of insulating material, an aperture therein to receive a plug, a jack consisting of two spring members normally in contact one with the other, one of said members secured to the front of 10 the board and passing through the aperture to the rear thereof, the other member secured to the rear of the board, in combination with a plug for said jack having electrically separate portions, each of the jack 15 members adapted to separately and successively contact with different electrically separate portions of the plug and to be deflected and moved out of electrical contact one with the other by said plug.

20 5. A unit for switchboard constructions, comprising a block or strip of insulating material, apertures in said block to receive plugs, jacks arranged adjacent said apertures comprising two spring members nor- 25 mally in electrical contact, one of said members passing through the aperture from front to rear, and the other of said members secured to the rear of the board, in combina-

tion with a plug having a pin portion and a body portion insulated one from the other, 30 the first named spring member adapted to be deflected by the body portion of a plug, and the second spring member adapted to be deflected by the insulated pin portion of said plug. 35

6. A unit for switchboard construction, comprising a block or strip of insulating material, apertures in the strip to receive 40 plugs, jacks secured to said strip and comprising a pair of spring members normally in electrical contact in the circuit of a line wire, one spring member passing through 45 the aperture, and the other spring member secured at the rear of the block in combination with a plug comprising two electrically separate portions for coöperating with said 50 jacks, each separate portion of a plug adapted to successively engage and deflect a spring member when inserted in the aperture, the contact between said members being broken by said plug.

T. A. HAMMOND.

Witnesses:

WILLIAM P. HAMMOND,
HENRY C. WORKMAN.