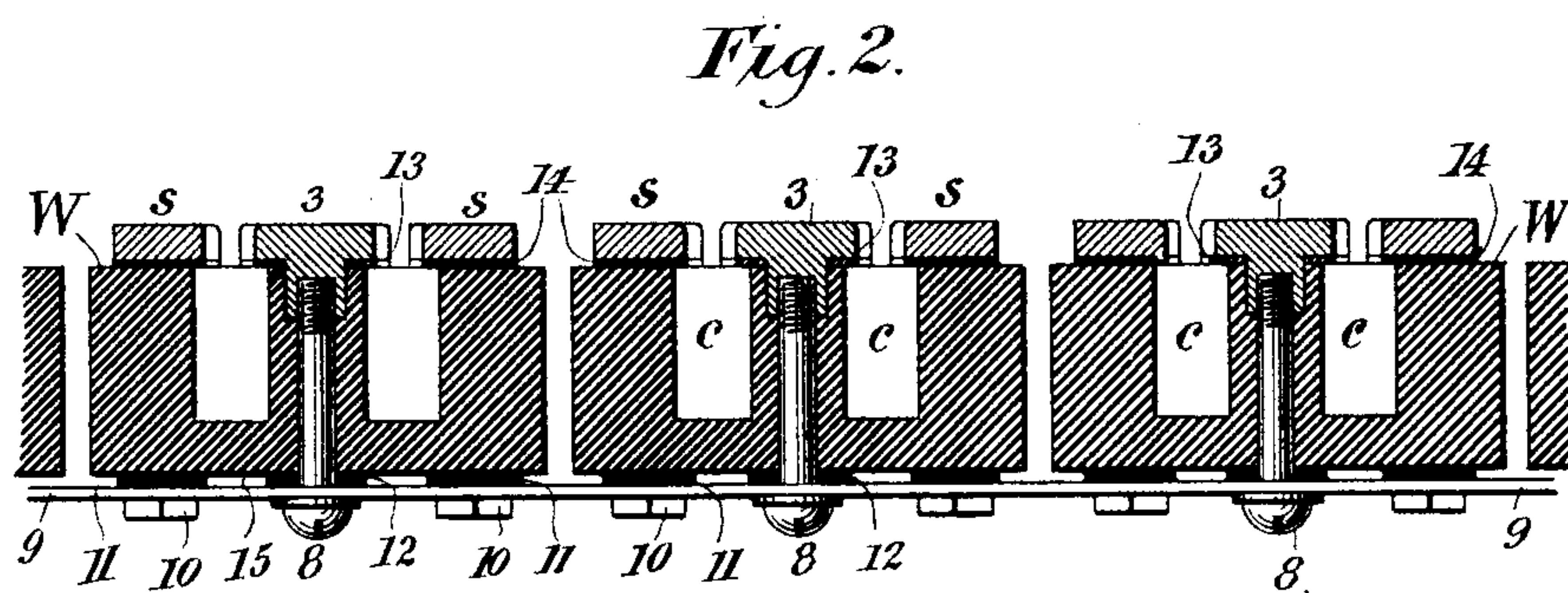
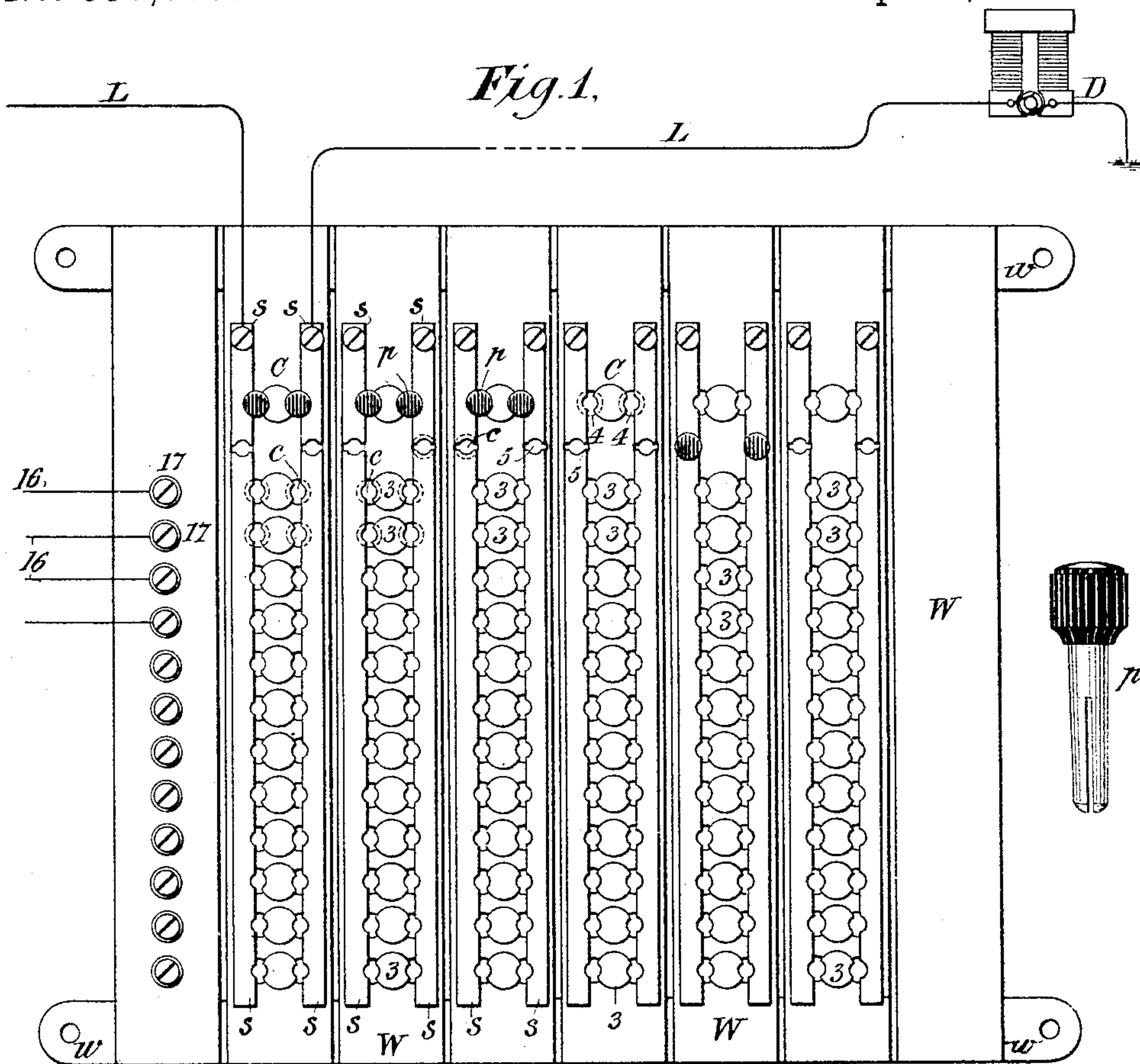


(No Model.)

F. W. JONES.  
ELECTRICAL SWITCHBOARD.

No. 536,809.

Patented Apr. 2, 1895.



Witnesses  
Edward Thorpe.  
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Inventor  
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# UNITED STATES PATENT OFFICE.

FRANCIS W. JONES, OF NEW YORK, N. Y.

## ELECTRICAL SWITCHBOARD.

SPECIFICATION forming part of Letters Patent No. 536,809, dated April 2, 1895.

Application filed January 22, 1895. Serial No. 535,762. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS W. JONES, a citizen of the United States, residing in the city of New York, county and State of New York, have made certain new and useful Improvements in Electrical Switchboards, of which the following is a specification.

The object of my invention is to improve and perfect the switch-board employed in telegraph offices in connection with main line wires supplied with current from a dynamo-electric machine, and to prevent the evil effects of the arc formed when a circuit is opened, as by removing a connecting plug. Formerly, when chemical generators such as primary batteries were employed, the supply of current was of insufficient force to cause injury or attract attention, and the well known form of pin switch, consisting of a foundation of varnished wood with vertical strips of metal for the line wires, and transverse rows of buttons or disks, arranged between the line wire strips, for the instrument connections, with pins to make electrical contact between the strips and disks, was found to answer all requirements; but the extensive use of dynamo currents has rendered necessary an improved form of this switch because when a dynamo current is broken, as by removing a plug, an arc always accompanies the break, and if a line becomes grounded or short circuited, all the electrical connections within the short circuit are likely to become greatly heated. My improvement remedies or obviates this difficulty, and consists in arranging the line contacts and the instrument connections at right angles to each other upon a frame or foundation of insulating material, rendered fire-proof by suitable treatment, and insulating the line connections and the instrument connections from the foundation frame by a suitable air space—a space greater than the arcing distance attainable by the electro-motive force employed. I employ fire and heat proof insulating material at points of contact where contact of a mechanical nature is necessary or unavoidable, and I locate the break points over spaces or cavities in the foundation formed by drilling or cutting away the foundation at the contact

or break points so that the arc formed cannot reach the material of the foundation.

The accompanying drawings illustrate my invention.

Figure 1 is a front view of the switch-board, and Fig. 2 is a transverse sectional view through the center of a row of buttons or disks.

In Fig. 1, *s, s,* are the vertical metallic conducting strips.

*3, 3,* are a series of disks or buttons arranged in transverse rows between pairs of vertical strips, *s*. The adjacent surfaces of strips *s*, and disks *3*, are notched in the form of the arc of a circle, so that a pin *p*, of metal may be inserted and held in position to form electrical contact.

*D* is a dynamo. A main conductor extends from the dynamo to one strip *s*, of a pair. The continuation of the divided conductor *L* extends to the next station. The buttons *3* in each transverse row are electrically united with each other and with a screw post *17*, and the terminals of the instrument wires *16* are connected with the screw posts *17*. To connect any instrument with any wire entering the switch, pins *p* are inserted between the vertical strip *s* of the desired line wire, and one disk *3* of a pair, and between the second strip *s* and the second disk *3* of said pair, all as well understood.

The vertical strips *s* are divided near the top, as at *5*, and by removing the pins from the junctions of the divided strips and placing said pins in the holes *4* between the strips *s* and a button *C*, which buttons *C* are insulated from each other, the line wire is "connected through," and disconnected from the remainder of the switch. When a pin *p* is removed, an arc follows the removal, and chars, or burns or ignites whatever it can attack. If a wooden frame is employed it will char it, and the resulting powder or dust is liable to form a leak or escape, and eventually a short circuit. To avoid this I arrange each and every break point over a cavity of extended diameter, *c*, Fig. 2, in the frame or foundation *W*, upon which the strips and disks are fixed. This cavity must be considerably larger in diameter than the diameter of the plug hole formed by the notched surfaces to



be connected. The frame or foundation W is constructed of prepared fire-proof wood, having electrical insulating properties, and formed of hard-wood strips arranged parallel with each other, separated by an air space, and united to cross strips of the same material, *w*. Two metal line strips *s* are placed upon each of these wooden strips, and mechanically united therewith at two or more points by screws 10. The strips *s* are elevated or separated from the wooden strips by small projections or buttons of insulating material 14, of sufficient height or thickness to separate the strips from the insulating foundation for a distance greater than the arcing distance of the current employed. The disks or buttons 3 are separated from the insulating foundation W by fire-proof insulating material such as mica, shown at 13 in Fig. 2. Each transverse row of disks 3, has its individual members electrically united to each other, and to a strip 9 located upon the opposite side of the foundation. The strip 9 is separated from the foundation by an air space 15, and is mechanically united with the foundation by screws 8, and insulating projections 12. The screws 8 form electrical connection between the disks 3 and the strip 9. The screws 10 and insulating projections 11, as seen in Fig. 2, are beyond the strip 9, and the screws 10 extend through the foundation W to the strips *s*, which are thereby held in position. The insulated projection 14 serves to separate said strip from the foundation W by an air space greater than the arcing distance of the current employed. The strips 9 and *s* are therefore separated from the foundation W in substantially the same way and to substantially the same extent, as shown in Fig. 2, and the provision of this air space between the strips and their foundation, and in the vicinity of each plug hole or break point, renders heating or ignition impossible, and obviates the deterioration and damage here-

tofore occasioned by the application of dynamo currents to switch boards of the character described.

The foundation or frame of wood W is rendered fire-proof by treating it with fire-proof paint such as asbestos paint, or in any other suitable manner.

What I claim, and desire to secure by Letters Patent, is—

1. In a switch board the combination of parallel metallic strips, a series of disks or buttons arranged in parallel rows between said strips, arc shaped notches in the adjacent surfaces of said strips and buttons, to receive a metal pin or plug, a foundation or frame of fire-proof insulating material, mica disks between said buttons and the foundation frame, and air spaces between said strips and the foundation frame, whereby insulation is increased and arcing is prevented, substantially as described.

2. The combination in a switch board of a series of parallel metallic strips fixed at two or more points upon a frame or foundation of insulating material and separated therefrom by an air space intermediate said points, a series of insulating disks between said strips and the foundation held in position by bolts or screws, a series of disks or buttons fixed to said frame in vertical and transverse rows, each vertical row intermediate two of said strips, fire-proof insulating material between said buttons and the foundation, connecting pins to electrically unite adjacent surfaces of the disks and strips, and a series of metal strips fixed to the opposite side of the foundation frame at separated points, each such strip electrically uniting the disks in a transverse row and being separated from the foundation by an air space, substantially as described.

FRANCIS W. JONES.

Witnesses:

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