

(No Model.)

D. DEWAR.

ELECTRIC SWITCH BOARD AND PLUG.

No. 258,561.

Patented May 30, 1882

FIG. 1.

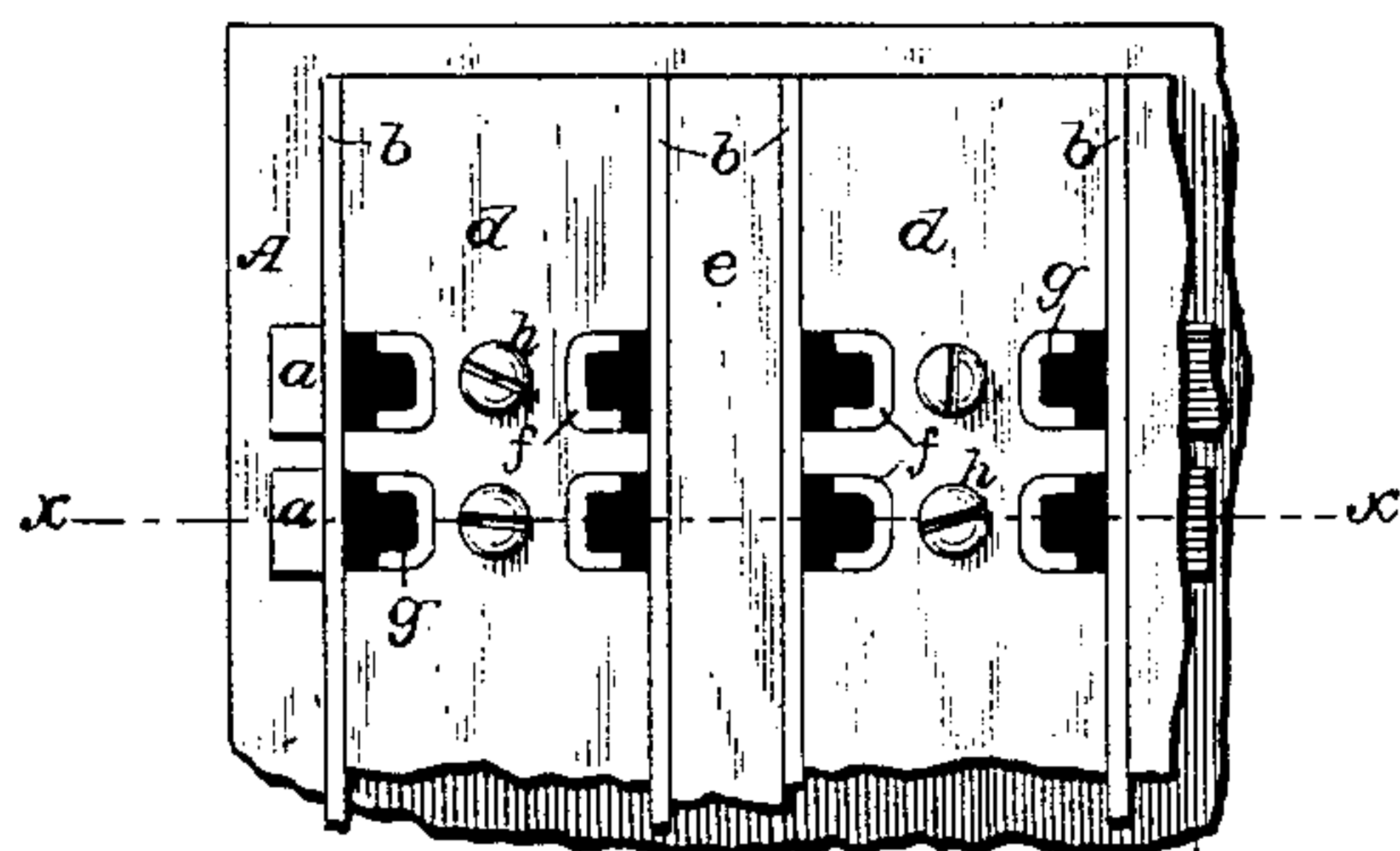


FIG. 2.

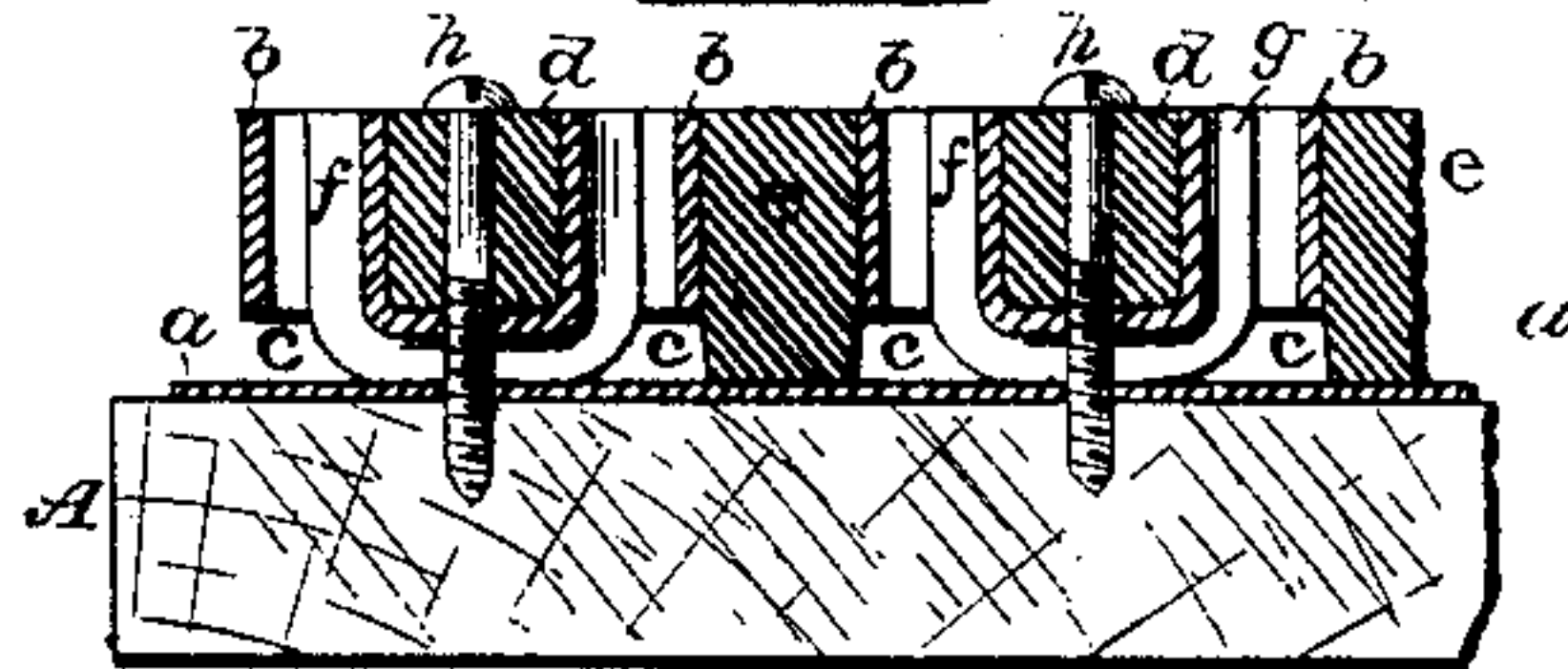


FIG. 3.

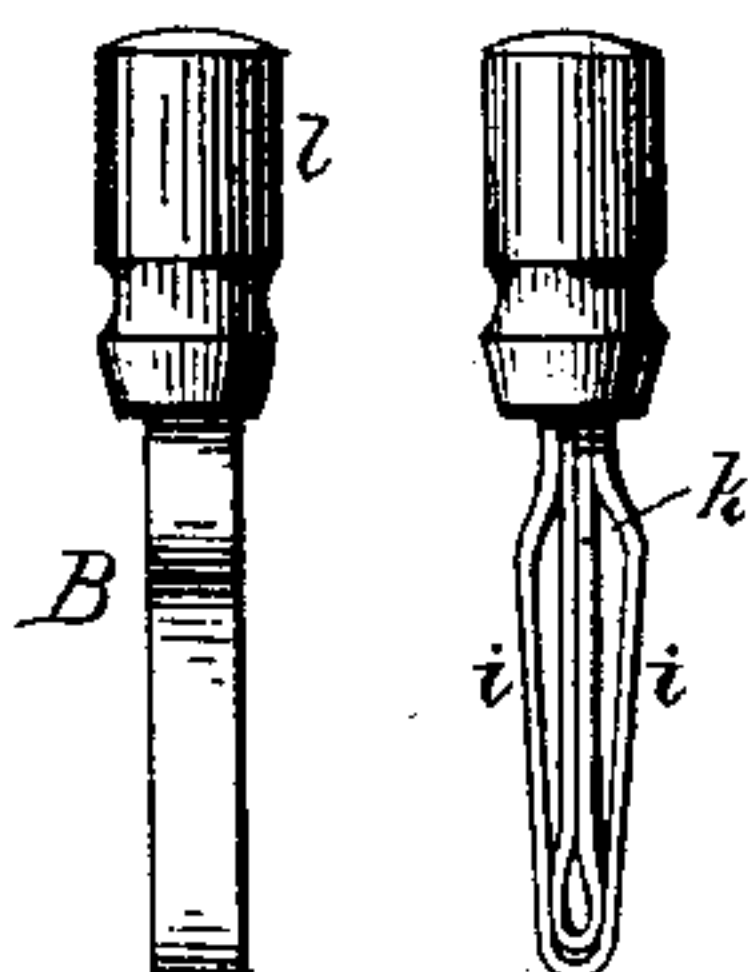


FIG. 5.

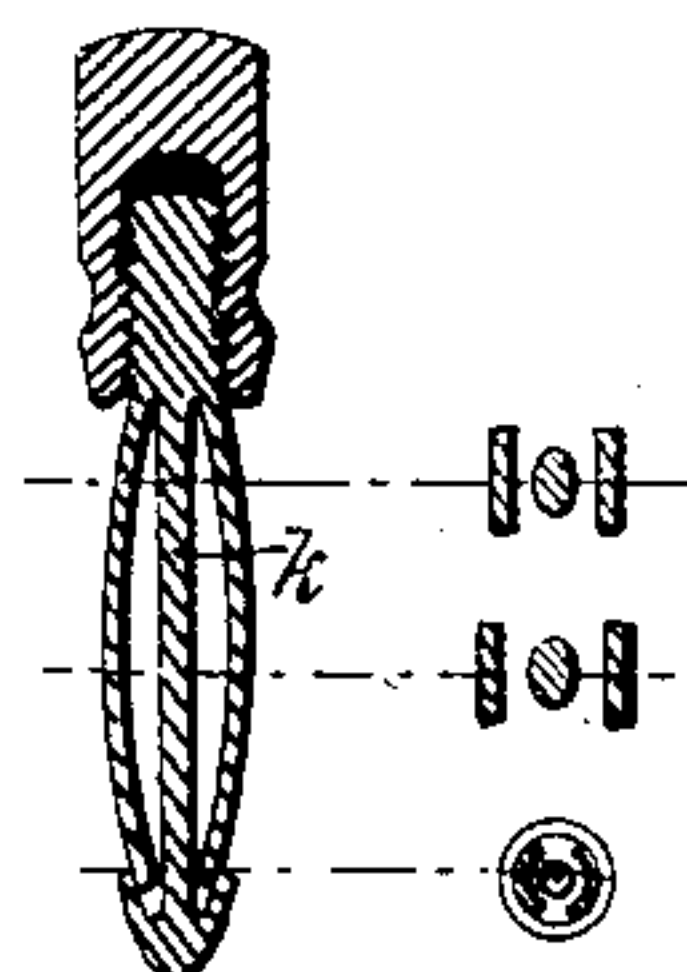


FIG. 4.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

DUNCAN DEWAR, OF INDIANAPOLIS, INDIANA.

## ELECTRIC SWITCH BOARD AND PLUG.

SPECIFICATION forming part of Letters Patent No. 258,561, dated May 30, 1882.

Application filed October 3, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, DUNCAN DEWAR, of Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Electric Switch Boards and Plugs; and I do hereby declare that the following specification, taken in connection with the drawings furnished and forming a part of the same, is a clear, true, and complete description of my invention.

The main object of my improvement in switch-boards is to obviate the well-known liability of derangement of the complex permanent metallic electric connections incident to the warping and twisting of the wooden portions of the switch-boards; and as to plugs, I have sought to so improve their construction as to render them less liable to injury in handling, and consequently more durable, more convenient, and better fitted to serve the general purposes intended, than prior plugs of which I have cognizance.

The several features of my invention will be specifically designated in the several claims hereunto annexed.

Referring to the drawings, Figure 1 is a plan view of a portion of a switch-board embodying my improvement. Fig. 2 is a sectional view of the same on line *x*, Fig. 1. Fig. 3 contains a side and an edge view of a complete switch-plug embodying my invention. Fig. 4 is an edge view of the same plug detached from its handle. Fig. 5 contains several sectional views of a modification of my plug embodying the main feature of my invention.

In Figs. 1 and 2, *A* denotes the usual wooden base-board foundation or back for the switch-board, upon which are secured the usual conducting-bars, *a*. These conducting-bars are quite thin, and are placed upon the base-board at right angles to the natural grain of said board, and therefore the bending of the latter by warping will correspondingly bend said bars. I also employ, as heretofore, the bars *b*, rectangularly arranged above the bars *a* and normally insulated therefrom by an intervening space, as at *c*. These bars *b* are insulated from each other by strips of wood *d* and *e*, the latter being merely held in place by friction or otherwise, as may be desired.

The interchangeable electric connections between bars *a* and *b* are effected by switch-plugs

by way of the metallic coupling-saddles *f*, which are preferably composed of sheet-copper, and are bow-shaped longitudinally and bent or flanged at each edge, so as to form recesses, as at *g*, one wall of each recess being the inner or coincident face of the adjacent bar *b*, said bars and the flanges at the ends of the saddles being insulated from each other by an intervening space; but the saddles and bars are so near to each other that electric connection may be readily made by the insertion of a suitable switch-plug. These coupling-saddles are separately mounted upon the wooden bars *d*, which are properly mortised to receive them, and said bars and saddles are as a whole securely mounted upon the wooden back *A* by the screws *h*, which pass through the center of the bars, through the lower side of each saddle, and through the conducting-bars *a* into the wooden back, so that when thus firmly secured each saddle will be forced into good electric contact with its proper conducting-bar, both of the flanges on the under side of the saddle having, as shown, an extensive longitudinal contact with said bar. These saddles being parallel with the conducting-bars *a* and resting thereon enables said saddles to maintain substantially the same relation with said bars, and also with the bars *b*, whether the base-board be perfectly flat or concave or convex on its upper surface.

In its operation and mode of use my switch-board is not unlike others well known; but it will be seen that, as the grain of the wood of the base-board *A* is at right angles to the conducting-bars *a*, no warping of the base-board can derange any of the permanent electric conducting portions. The wooden insulating and securing strips *d* and *e* are arranged so that their grain is parallel with that of the base-board, and consequently with the saddles secured and arranged as described the independent warping of any or all of the wooden portions cannot unduly affect the metallic electric connections, or so far change the form of the plug-holes as to impair their capacity to properly receive the plugs, nor the capacity of the plugs to afford good switch-connections.

I do not limit myself to the arrangement of the several parts with particular reference to the natural grain of the base-board, although it is the prime object of my invention to ob-



viate that derangement of the permanent electrical connections which is incident to the warping or twisting of said board, it being obvious that the combination of the upper and lower conducting-bars and the saddles separately secured to the lower bars and base-board has value however said parts may be arranged with reference to the natural grain of the base-board.

10 The switch-plug B is novel in several respects. It has two bow-shaped flexible contact-springs, *i*, preferably of one piece of metal, as indicated in Figs. 3 and 4, so bent that its ends may be joined to aid in forming a suitable stem. It has a central supporting-bar, *k*, sufficiently rigid to relieve the spring from endwise pressure during the insertion of the plug, thus permitting these springs to be made light and delicate, and well fitted to properly occupy recesses considerably varied in dimensions, and nevertheless afford a good electric connection. Without the supporting-bar such springs are easily injured and ruined by bending, even if the metal of the spring be made so heavy as to really impair their usefulness on a switch-board. The inner end of this central bar being interposed between the ends of the spring, they are first well cleaned, then clamped together within a screw-threaded mold and united by molten metal, (lead or solder,) which, when cooled and removed from the mold, is practically integral with the spring and bar, and forms a threaded stem for convenient and secure attachment to a round handle, *l*, (composed of wood, bone, hard rubber, or other suitable material,) which is axially bored and threaded to receive said stem. As shown in Fig. 5, the bar *k* is similarly united to the springs at the stem; but it has at its outer end a cup-shaped annular recess, into which the outer ends of the two separate springs are loosely housed. When thus constructed the outer ends of the springs are narrowed to a slightly-rounded condition, and also bent laterally so as to be slightly concavo-

convex, and to be therefore well seated in the annular recess of the bar. In this case, as before, the bar is rigid enough to not only successfully withstand the thrusting strains on the plug, but it also at its annular recess abuts against the outer ends of the spring during their withdrawal from a plug-hole in the switch-board. The round handle used by me is preferable for convenience to the usual flat handle commonly used with this general class of switch-plugs, which usually embody two flat springs riveted to a flat handle.

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

1. The combination, in an electric switch-board, with the base-board, the electric conducting-bars thereon, and the upper conducting-bars, of the coupling-saddles secured individually to the base-board in electric contact with the conducting-bars thereon, and separated at each end from the upper bars by spaces or recesses fitted to receive switch-plugs, substantially as described.

2. The combination, with the handle and the central rigid bar, of the two bow-shaped springs united to the bar near the handle, substantially as described.

3. The switch-plug having a central rigid bar and a spring or springs, and a stem formed by a union of the springs and said bar, substantially as described.

4. A spring switch-plug embodying a threaded stem comprising the ends of the spring or springs, which are united by soft cast metal, substantially as described.

5. The switch-plug having springs composed of a doubled piece of spring metal, and a central bar united at one end with the ends of the spring by means of threaded soft metal to provide a stem for entering a handle, substantially as described.

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Witnesses:

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