June 5, 1928. 1,672,123

H. A. HARTRANFT

SWITCH MEMBER AND METHOD OF PRODUCING THE SAME

Filed March 6, 1925

Fig. 1.

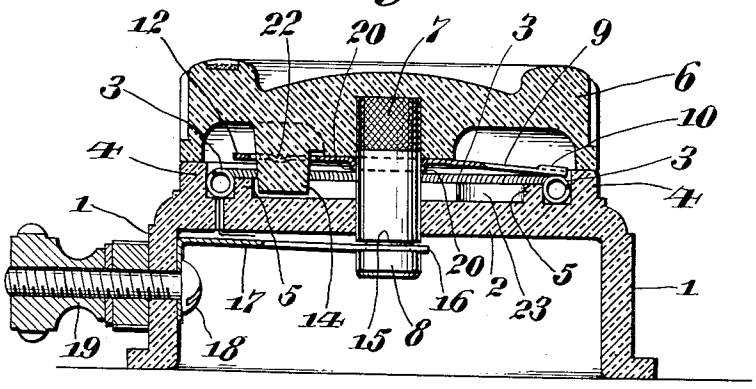


Fig. 2.

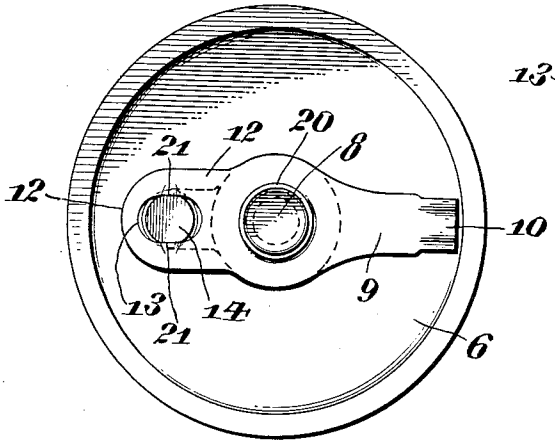


Fig. 3.

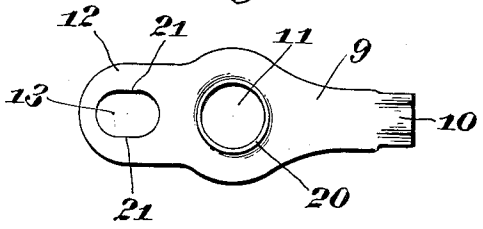


Fig. 4.

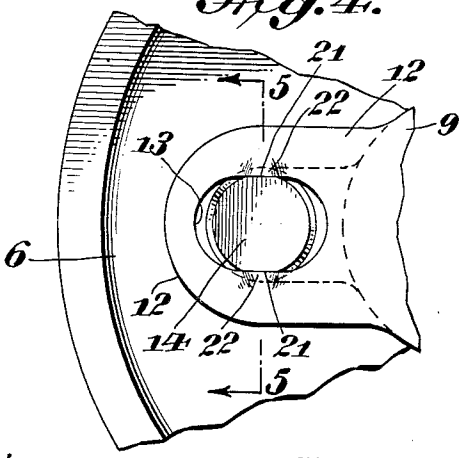
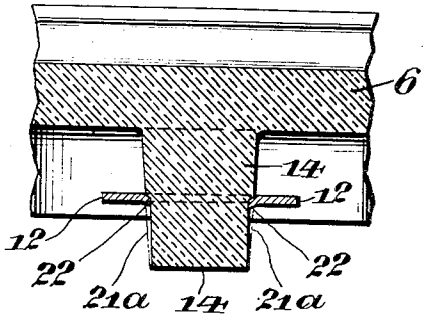


Fig. 5.



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UNITED STATES PATENT OFFICE.

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SWITCH MEMBER AND METHOD OF PRODUCING THE SAME.

Application filed March 6, 1925. Serial No. 13,558.

My invention relates to switch members, and more particularly to the movable or rotatable members of electric switches, rheostats and the like.

In accordance with my invention, a switch blade or contact of an electric switch, rheostat or the like, of conducting material, is provided with two perforations, one of which is forced over and along a stud, shaft or the like, thereby effecting frictional holding engagement therewith, and the other perforation is forced over a lug or boss, effecting frictional engagement therewith, to prevent the blade or contact member from moving or rotating with respect to the shaft or stud.

Further in accordance with my invention, the stud or shaft may be utilized for effecting electrical connection with the blade or contact, and may be molded in a knob or operating member, with which may be integrally molded the lug or boss.

My invention resides in the structure and method of the character hereinafter described and claimed.

For an understanding of my method, and for an illustration of one of the various forms my structure may take, reference is to be had to the accompanying drawing, in which:

Fig. 1 is a vertical cross sectional view of a rheostat embodying my invention.

Fig. 2 is a bottom plan view of the knob or cap with the parts carried thereby.

Fig. 3 is a plan view of the switch blade or contact.

Fig. 4 is a plan view, on larger scale, of a portion of Fig. 2.

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 4.

Referring to the drawing, 1 is a casing member integral with which is molded the base 2 of a phenol condensation product, condensite or the like upon which may be mounted switch contacts, or, as indicated, the resistance wire 3 of an adjustable resistance or rheostat disposed in any suitable form, as, for example, in the form of a helix, as indicated, lying in a channel between the flanges 4 and 5.

The knob or cap 6 of insulating material has molded therein the roughened end 7 of the stud or stub shaft 8 of conducting material and of substantially circular cross section. Carried by the cap is the switch blade or contact member 9, preferably of sheet metal, as phosphor bronze, spring brass or the like, and bearing at its outer end 10 upon a switch contact or, in the example illustrated, upon the resistance conductor 3. The member 9 has the perforation or hole 11, through which the shaft 8 extends, and the tail or extension 12 having the elongated hole or perforation 13 co-acting with the boss or lug 14 molded integral with the member 6.

The shaft 8 extends loosely through the base 2 and is provided near its lower end with the circumferential groove 15, in which engages the bifurcated end 16 of a resilient conducting member 17 secured by the binding post screw 18 and effecting electrical connection between the binding post 19 and the shaft 8 and through it with the contact member 9.

The initial or normal diameter of the hole 11 in the contact member 9 is somewhat smaller than the diameter of the stud or shaft 8. The member 9 is placed upon the free end of the shaft 8 with the aperture 11 in register with the shaft, and the member 9 is then forced downwardly along the shaft, causing the formation of a lip, flange or member 20, which frictionally holds the member 9 upon the shaft 8 and effects good electrical connection therewith.

The usual soldering of the member 9 to the stud 8 is dispensed with, for the electrical contact effected by the flange 20 forced upon the member 8 is good and of sufficiently low resistance without soldering. The soldering usually employed has had the effect of preventing the contact member from loosening and rotating upon the shaft. To prevent such loosening and rotation of the contact member with respect to the shaft 8, the extension 12 and its aperture 13 in co-action with the lug 14 are provided. With the extension 12 held by the lug 14, the member 9 cannot rotate upon or with respect to the shaft 8, but must faithfully follow the rotary movements of the shaft 8 and knob 6.

The radial length of the aperture 13 is preferably greater than the diameter of the tapering or tapered boss or lug 14 when the member 12 reaches the position shown in Figs. 1 and 5. The width of the aperture 13 between its sides 21, 21 is slightly less than the diameter of the boss or lug 14 at

its lower or free end, or in any event less than its diameter at that portion of its length occupied by the member 12 when in the position indicated in Figs. 1 and 5. The member 12 is forced along the lug 14, cutting or shaving material therefrom at and by the sides 21 of the slot 13, in effect flattening the sides of the lug 14, as shown in Figs. 2 and 4, reducing the width of the lug 14 from its normal diameter indicated by the broken lines 21a, Fig. 5. In so forcing the member 12 longitudinally of the lug 14, the sides of the aperture 13 at 21 are deflected or bent downwardly to form lips or members 22, which frictionally hold the member 12 in the position to which forced along the lug 14, and in effect bite into the material of the lug 14, thereby opposing loosening or removal of the extension 12 toward the free end of the boss 14.

It will be understood that the contact member 9 may be forced to the position indicated in Figs. 1, 2, 4 and 5 by placing it upon the outer or free end of the shaft 8 in such position that the aperture 13 comes later into register and engagement with the lug 14, whereby the final portion of the movement of the member 9 along the shaft 8 is simultaneous with the movement of its extension 12 over and along the lug 14, suitable holding or press structure being provided for so applying the member 9 to the cap or knob structure.

Accordingly, the member 9, without soldering or equivalent, effects good electrical connection with the shaft 8, is frictionally held thereon by the lip or flange 20, and is prevented from rotating upon or with respect to the shaft 8 by the lug 14, which holds the member 9 firmly in the desired position indicated in Figs. 1, 2, 4 and 5.

The radial elongation of the aperture 13 serves to permit small variations in the distance between the lug 14 and the center of the shaft 8, as may readily occur in the usual molding operations; and further serves to localize the engagement of the edge of the aperture 13 with and upon the lug 14.

Upon the upper side of the base 2 may be molded integral therewith the boss or projection 23 disposed in the circular path of travel of the lug 14, to serve as a stop to limit the extent of rotation of the handle or cap 6.

In consequence, the lug 14 in the example illustrated and described serves the dual purpose of a limiting stop and also to hold and prevent rotation of the contact member 9.

What I claim is:

1. In the art of producing contact members, the method which comprises providing a lug on the support for the contact member, and forcing the lug through an aperture in the contact member to remove material of the lug and effect a biting engagement between the wall of the aperture and said lug.

2. In the art of producing contact members, the method which comprises providing a lug on the support for the contact member, and forcing the lug through an elongated aperture in the contact member to remove material of the lug and effect a biting engagement between the lug and said contact member at side walls of the narrow portion of said aperture.

3. In the art of producing contact members, the method which comprises providing a lug on the support for the contact member, and forcing the lug through an aperture in the contact member to remove material of the lug and materially deform the wall of the aperture to effect biting engagement between the contact member and said lug.

4. In the art of producing contact members, the method which comprises providing a lug on the support for the contact member, and forcing the lug through an elongated aperture in the contact member to remove material of the lug and materially deform the walls of the aperture at its narrow portion to effect biting engagement between said contact member and said lug.

5. In the art of producing contact members, the method which comprises providing the support for the contact member with a stud and a lug spaced from each other, and forcing said stud and lug through apertures in the contact member to effect frictional holding engagement between said contact member and said stud and lug.

6. A contact member having a support, a stud and a lug carried thereby and spaced from each other, said contact member having apertures through which said stud and lug extend and by which it is frictionally held against movement with respect to said support.

7. A contact member having a support, a stud and a lug carried thereby and spaced from each other, said contact member having apertures through which said stud and lug extend and at which said contact member has a flange and a lip engaging, respectively, said stud and said lug.

8. A contact member comprising a support of insulating material, a stud molded therein, a lug molded integral with said support, and a contact arm having apertures through which said stud and lug extend and at which said contact arm is frictionally held by said stud and lug.

9. A contact member comprising a support of insulating material, a conducting stud molded therein, a lug molded integral with said support, and a contact arm having an aperture through which said stud extends and at which said contact arm is frictionally held in current-conducting relation with said stud, said contact arm having

a second aperture through which said lug extends and at which the wall of said aperture has biting engagement with said lug.

10. A contact member comprising a support of insulating material, a conducting stud molded therein, a tapered lug molded integral with said support, and a contact arm having an aperture through which said stud extends and at which said contact arm is held in current-conducting relation with said stud, said contact arm having a second elongated aperture through which said lug extends and at which the opposite side walls at the narrow portion of said aperture have lips having frictional biting engagement with said lug.

11. Contacting mechanism comprising a base, a support, a stud and a lug carried by said support and spaced from each other, a contact arm having apertures through which said stud and lug extend and at which said contact arm is frictionally held to said stud and lug, a conducting member on said base with which said contact arm co-acts, and a member on said base disposed in the path of travel of said lug.

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