May 7, 1929. E. H. JACOBS 1,711,501

SWITCH

Filed Dec. 4, 1925

Fig. 1.

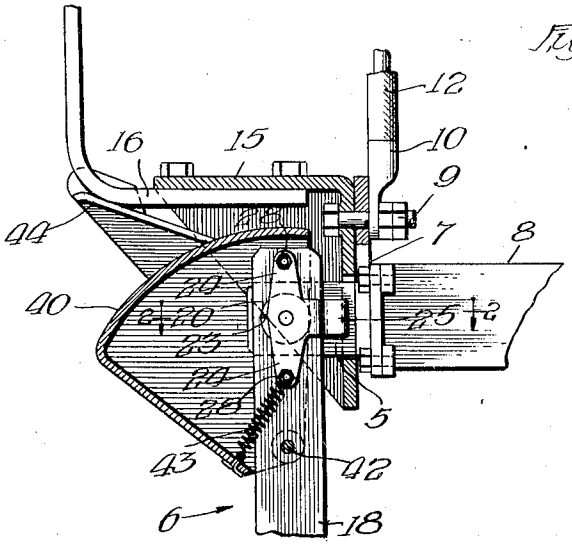
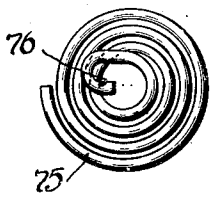


Fig. 4.



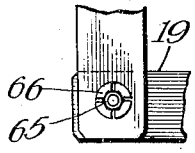


Fig. 3.

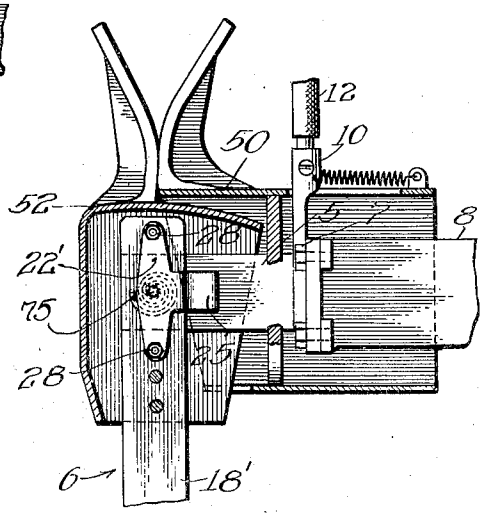


Fig. 2.

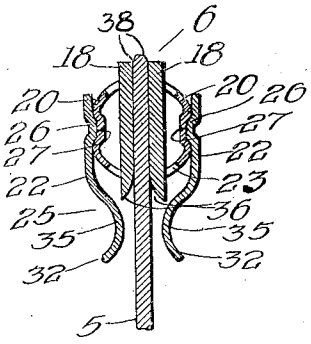
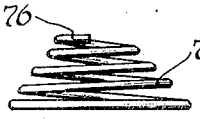


Fig. 5.



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UNITED STATES PATENT OFFICE.

ERNEST H. JACOBS, OF CHICAGO, ILLINOIS, ASSIGNOR TO ELECTRICAL ENGINEERS EQUIPMENT COMPANY, A CORPORATION OF ILLINOIS.

SWITCH.

Application filed December 4, 1925. Serial No. 73,112.

This invention relates to improvements in electric switches.

More particularly, the present invention is a continuation in part of my co-pending application Serial No. 381,234, filed May 14, 1920 and its object is the provision of a generally improved, simplified and inexpensive guide means for guiding the blade means into cooperation with the switch contact and an improved mounting and correlation between the guide means and the means for pressing the blade means against the switch contact and for tensioning or limiting the separation of the blade means.

To acquaint those skilled in the art with the manner of constructing and practicing the present invention, I shall now describe the same in connection with the accompanying drawings, in which,

Figure 1 is a fragmentary side elevational view of the contact terminal and cooperating blade means of the switch showing an embodiment of the present invention in connection therewith;

Figure 2 is a detail section through the means for guiding and pressing the blade means upon the switch contact taken on the line 2—2 of Figure 1;

Figure 3 is a view similar to Figure 1, showing a different protective hood arrangement for the contact terminal and blade means and another form of blade pressing spring, and

Figures 4 and 5 are end and side views respectively of the spring means shown in Figure 3.

The switch shown has a contact terminal 5 and cooperating blade means 6 movable into and out of engagement therewith.

The contact terminal 5 is mounted by means of its terminal base 7 upon a bracket 8 which may be supported upon the outer end of a suitable supporting insulator or otherwise as desired. The base 7 has a projecting portion to which is secured by bolt 9 a suitable terminal socket member 10. The conductor or circuit means 12 for the terminal 5 is suitably secured in the socket member 10 through which and the terminal base the terminal and conductor means are electrically connected. The bolt 9 may project through the terminal base 7 and rigidly secure thereto upon the opposite side a housing or hood member 15. Mounted on the underside of the top of the hood member 15 and projecting from the outer edges thereof is a suitable electrode arcing horn 16.

The movable part or blade means of the switch comprises a pair of floating blades 18, 18 which may be formed of flat bars of metal and may also be trussed or as more fully disclosed in the application of which this is a continuation in part. At one end the blade members 18, 18 may be pivotally mounted upon the opposite sides of a pivot contact 19 by a bolt 65 and their free or contact ends are adapted to be swung into and out of engagement with the contacts 5.

The blades 18 are yieldingly held against the sides of the pivot contact 19 by spring washers 66 which may be provided on the bolt 65 and held against the outer sides of the blades 18 by the head of the bolt at one end and the nut on the bolt at the opposite end.

The free or outer ends of the blade members 18, 18 are yieldingly held against the opposite sides of the contact member 5 by spring washers 20 which may be disposed substantially centrally of the contact areas between the blades 18, 18 and the sides of the contact 5. Each washer 20 is held in place by a yoke or clamping member 22 between which and the adjacent blade member it is interposed and the pressure margins of the washers 20 are made yieldable by radial cuts 23.

The yokes or clamping members 22 are of generally T-formation, having apertured legs 24 extending parallel to the blade members 18, 18 and integral contact receiving and guiding jaws 25 extending laterally from one edge of each substantially centrally between the opposite ends of the legs 24. Each of the clamping members 22 has an inwardly projecting aligning stud 26 pressed or otherwise, formed thereon, these studs engaging in recesses 27 provided substantially axially in the spring washers 20. The spring washers 20 are thereby held properly positioned against the blades and against accidental displacement. The clamping members 22 are mounted upon bolts 28 which pass through the blade members 18, 18 on opposite sides of the terminal lug 5, the shanks of the bolts 28 being spaced sufficiently to permit the free end of the contact 5 to extend and be withdrawn from between them in opening and closing the switch. The clamping members 22 and the bolts 28 together form a frame between which the spring washers 20 force the blades

18, 18 towards each other and into firm, uniform and maximum contact with the opposite sides of the contact terminal 5 when the switch is closed. The bolts 28 constitute the tension means for the frame thus formed and limit the separation or spread of the blade members. The blades 18, 18 are yieldingly drawn together through the spring washers 20 and a floating action is provided between the blades which allows the blades to yield and properly accommodate themselves to the opposite sides of the contact terminal.

The outer ends of the jaws 25 are flared out at 32 to provide a relatively wide or large opening so that even with considerable disalignment between the terminal contact or tongue 5 and the contact receiving space between the blade members 18, 18, the flared ends of the jaws 25 will engage over the contact 5 in the closing movement of the blade members. In the closing movement of the blade members 18, 18 into cooperation or engagement with the contact 5, the guide jaws 25 move over the contact 5 ahead of the blade members and guide the blade members properly over the contact. Between the flared outer ends of the guide jaws 25 and the adjacent edges of the blade members 18, 18, the jaws 25 are preferably curved in or contracted at 35 so that as the contact 5 is received between the flared ends of the jaws, continued closing movement of the blade members will guide them properly over the contact 5. Thus, the flared ends 32 will receive the switch contact over a range of disalignment and the restricted portion will guide the contact properly between the blades.

The formation of the clamping or yoke members 22 and the guide jaws 25 as integral units not only simplifies and decreases the cost of manufacture and assemblying, but being in one piece or at least carried one by the other or relatively rigid with respect to each other, when either jaw operates to overcome its disalignment, the corresponding yoke or clamping member will tend to relieve the tension or pressure on that side of the blade to facilitate bringing of the blade means into proper engagement with the contact. Then, as soon as the blade means moves over the contact, the tension on the blade means will be equalized to uniformly press both blade members into firm contact with the opposite sides of the terminal over the entire contact area.

The spring washers and the yoke means provide maximum contact between the floating blades 18 and the contact 5 and the blades are held firmly and uniformly against the opposite sides of the contact 5. The uniform spring pressure exerted over substantially the entire contact area is adjustable by means of the bolts 28. This spring pressure is distributed substantially uniformly over the contact surfaces because it is applied substantially centrally of the contact areas and no appreciable bending stresses on the blade members results.

The guide jaws 25 being carried by the yoke or clamping member 22 are thus mounted upon the tension bolts 28 for tensioning and limiting the spread of the blades and in this manner a floating mounting of the guide means on the outer sides of the blade members is provided. The yoke members 22 clamp the spring washers 20 upon the blade members and by the simple expedient of the lateral extensions or tongues 25 form guide means for guiding the blades upon the switch contact. The mounting of the guide jaws on the tension bolts 28 provides a balanced mounting for the guide jaws on opposite sides of the switch contact.

The inner corners of the blade edges presented to the contact 5, at least over the contact area, may be removed or rounded at 36 and the outer corners of the contact 5 may be removed at 38 to assure proper movement of the guided blades over the contact member.

In the embodiment of Figure 1, the blade means is covered by a hood 40 pivoted at 42 thereon. The hood 40 is urged to covering position by a spring 43 and it carries on arcing horn 44 cooperable with the horn 16, the blade means being adapted to move toward uncovered position from the hood 40 as the horns 44 and 16 engage and the blade means moves into the hood 15.

In the embodiment of Figure 3, the hood 50 moves out of covering position and the hood 52 is fixed relative the blade means 18′ and covers the contact ends of the blades 18′ and the uncovered portion of the contacts 5 when the switch is closed.

The spring means between the members 22′ and the blade members 18′ are shown in the embodiment of Figure 3 in the form of coiled springs 75 instead of in the form of radially slotted spring washers, as in the preceding embodiment.

The springs 75 are preferably of tapering or conical formation with their reduced ends formed at 76 for centering or aligning cooperation with the aligning means on the members 22′. The tapering formation of these coiled springs 75 centers them and through their larger ends a uniform spring pressure is exerted over substantially the entire contact areas of the blades, to press the blades firmly and uniformly against the opposite sides of the contact. The aligning means engaging ends 76 of the springs 75 may be turned back to form relatively long looped portions as shown for strengthening these ends and assuring proper cooperation with the aligning means.

I do not intend to be limited to the precise details shown or described.

I claim:—

1. In combination, a contact member, a pair

of floating blades, movable into and out of engagement therewith, tension means for said blades, said tension means including a pair of tension bolts passing through said blades, and guide means carried by said tension means and forming a part thereof for guiding said blades into engagement with said contact member.

2. In combination, a contact member, a switch member movable into and out of engagement therewith, tension means for pressing said movable switch member into contact with said contact member, and means carried by said tension means and movable with the movable switch member for guiding said switch member into engagement with said contact member.

3. In combination, a contact member, a switch member movable into and out of cooperation with said contact member, and guide means carried by the movable switch member for guiding said member into cooperation with said contact member, said guide means extending ahead of said switch member in the direction of closing movement thereof.

4. In combination, floating blades, tension bolts passing through said blades and guide means carried by said bolts.

5. In combination, a pair of floating switch blades, a contact cooperable therewith, and guide means carried by the blades and mounted equally on opposite sides of the contact receiving portion thereof for guiding the blades into engagement with the contact.

6. In combination, a contact member, a switch member movable into and out of cooperation with said contact member and guide means for guiding said switch member into cooperation with said contact member, said guide means moving into cooperation with the contact member ahead of the movable switch member and the mounting of said guide means being positioned along the edge of the contact when the switch is closed.

7. In combination, a contact member, floating blades cooperable therewith, and means having floating mounting for guiding said blades into cooperation with said contact member.

8. In a switch, a pair of blades adapted to embrace a contact between them, a bolt passing through said blades on each side of said contact, yoke members having their ends engaged by said bolts, means centrally of said yoke members for pressing the blades upon the contact and means on said yokes for guiding the blades into cooperation with the contact.

9. In a switch, a pair of blades adapted to embrace a contact between them, means for pressing the blades upon the contact, said means comprising yoke means, and means carried by said yoke means for guiding the blades into cooperation with the contact.

10. In combination, a pair of blades adapted to embrace a contact between them, a bolt passing through the blades on each side of said contact, yokes having their ends engaged by said bolts for pressing the blades against the contact, said yokes having inwardly projecting studs with spring washers held by said studs against the blades within the area of engagement of the blades with the contact, and means on said yokes for guiding the blades into cooperation with the contact.

11. In combination, a pair of terminal contacts, one forming a pivot contact and the other forming a free contact, a pair of floating blades pivoted on said pivot contact, the free ends of said blades being adapted to engage the free contact, and spring pressing the blades flat against the free contact, said spring means comprising a spring washer lying between said blade and a clip member, said clip member having a projecting lug for guiding the blades upon said free contact.

12. A switch blade yoke and guide comprising a pair of apertured legs extending longitudinally of the blade, and a guide leg extending laterally therefrom between said first legs.

13. In combination, a contact member, a switch member movable into and out of engagement therewith, a guide support positioned proximate, said contact member in the closed position of said switch member, and guide members mounted upon said support for movement toward and away from each other to take up wear and for guiding said switch member into engagement with said contact member.

14. In combination, a contact member, a pair of blades mounted for movement toward and away from each other to take up wear and movable into and out of contact with said contact member, and means other than said blades for guiding said blades in their closing movement.

15. In combination, a contact member, a pair of blades mounted for movement toward and away from each other to take up wear and movable into and out of contact with said contact member, and means other than said blades for guiding said floating blades in their closing movement, said guide means being positioned adjacent said contact member in the closed position of said blades.

16. In combination, a contact member, a pair of blade members mounted for movement toward and away from each other to take up wear and movable into and out of engagement with said contact member, tension means for said blades, said tension means including a pair of tension bolts passing through said blades, and guide means carried by said tension means and forming a part thereof for guiding said blades into engagement with said contact member.

17. In combination, a pair of blade members mounted for movement toward and away from each other to take up wear, a contact cooperable therewith and guide means carried by the blade members and mounted equally on opposite sides of the contact receiving portions thereof for guiding the blades into engagement with the contact.

18. In combination, a contact member, a pair of blade members mounted for movement toward and away from each other to take up wear and cooperable with said contact member, and means comprising a pair of guide members mounted for movement toward and away from each other for guiding said blade members into cooperation with said contact member.

In witness whereof, I hereunto subscribe my name this 1st day of Dec., 1925.

ERNEST H. JACOBS.