April 1, 1941. J. G. PETERSON 2,236,763

ELECTRIC SWITCH

Filed Oct. 22, 1938

Fig. 1.

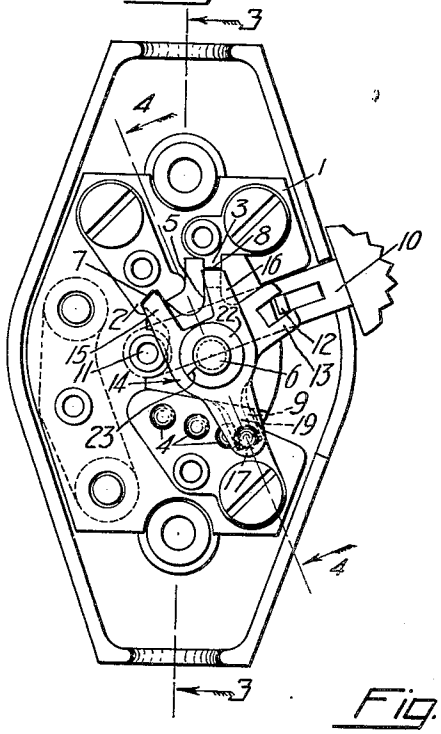


Fig. 2.

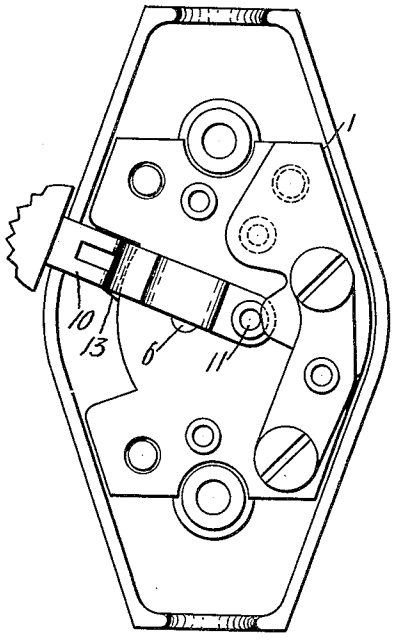


Fig. 3.

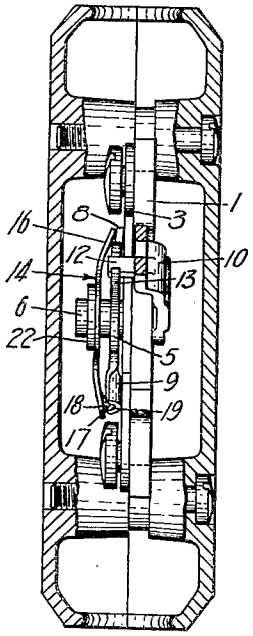
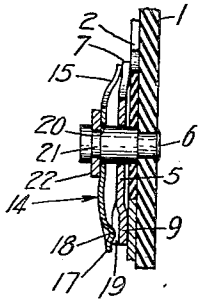


Fig. 4.



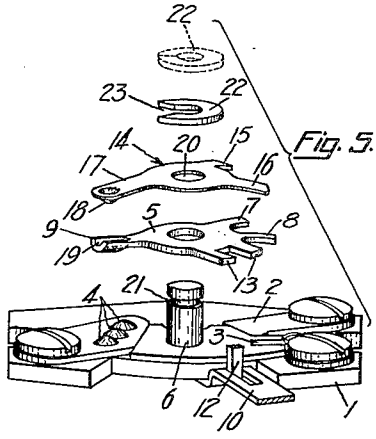


Fig. 5.

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2,236,763

ELECTRIC SWITCH

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Application October 22, 1938, Serial No. 236,499

2 Claims. (Cl. 200—154)

My invention relates to electric switches.

It has among its objects to provide an improved electric switch, and, more particularly, an improved switch of the type described and claimed in my copending application Serial No. 93,873, filed August 1, 1936, now Patent No. 2,163,626, issued June 27, 1939. A further object of my invention is to provide an improved tensioning means for the movable contacts of such a switch whereby the tension on the different contacts is maintained even. Another object of my invention is to provide improved tensioning means for the movable cam element of the switch whereby the action of the cam is controlled in an improved manner. Still another object of my invention is to provide improved combined tensioning means for both the movable contacts and movable cam element whereby the above results are obtained in an improved manner by a single improved spring member of the plate spring type. A still further object is to provide an improved connecting means for the tensioning means mentioned whereby these tensioning means may be more readily connected and removed and replaced when desired. These and other objects and advantages of my improved construction will, however, hereinafter more fully appear.

In the accompanying drawing, I have shown for purposes of illustration one embodiment which my invention may assume in practice.

In this drawing:

Figure 1 is a top plan view of a through switch constructed in accordance with my improvements, the upper cover being removed to facilitate illustration;

Fig. 2 is a bottom plan view of such a switch the bottom cover being removed for like purposes;

Fig. 3 is a sectional view on line 3—3 of Figure 1;

Fig. 4 is a detail sectional view on line 4—4 of Figure 1, and

Fig. 5 is a perspective exploded view of the various parts disposed above the base.

The switch illustrated is of the feed through type and of the construction described and claimed in my application mentioned, including an insulating base 1 carrying on one face thereof spaced stationary contacts 2 and 3 and a series of stationary cams 4, and having a movable contact member 5 pivoted at 6 between said contacts and cams and having movable contacts 7 and 8 on one end cooperating with said stationary contacts 2 and 3 and an oppositely projecting resilient mounted movable cam 9 on its opposite end cooperating with the stationary cams 4 to produce a snap action; the movable contact member 5 and cam 9 being actuated by a swinging actuating member 10 on the opposite face of the base and pivoted thereon at 11 at one side of the pivot 6 and this actuating member 10 swinging the movable contact member 5 through an upstanding actuating portion 12 on the actuating member 10 extending between laterally projecting lugs 13 between the ends of the movable contact member 5.

In my improved construction, as distinguished from a coiled spring, as in my previous construction, acting only around the pivot of the movable contact member to press the latter downward, I provide an improved plate spring, generally indicated at 14, which herein acts to tension both the movable contacts 7 and 8 and the movable cam member 9. More particularly, it will be noted that the plate spring 14 is normally bowed, as illustrated, and engages these elements at its opposite ends to tension the same. Thus, one end of the spring 14 is provided with like laterally spaced longitudinal extensions 15 and 16 overlying the movable contacts 7 and 8 and having depending extremities engaging the extremities of said movable contacts. The opposite end of said spring 14 is, however, provided with a single extension 17, herein having a depression in its extremity forming a depending ball 18 which is seated and movable longitudinally in a groove 19 in the top of the movable cam 9. Further, it will be noted that the plate spring is provided with an aperture 20 between its ends receiving the lower portion of the pivot 6, herein in the form of a stud. Also, an annular groove 21 is provided near the top of this stud and a spring annulus or clip 22, forming an abutment for the middle portion of the plate spring, is disposed in this groove, this spring clip having a cut or slit 23 in its periphery and having its adjacent ends pressed together as shown.

In the operation of my improved construction, it will be observed that the movable contacts 7 and 8 are kept under even tension by the extensions 15 and 16 on the spring 14, each extension acting to press down the movable contact which it overlies, by a direct downward pressure applied at the extremity of the contact, all in such manner as to insure effective cooperation with the stationary contacts 2 and 3. Further, it will be noted that the plate spring 14 at the same time acts to maintain the movable cam 9 in depressed position in such man-

ner as to enable it to cooperate effectively with the stationary cams 4 to produce the desired snap action, the ball 18 moving as necessary in the groove on the upper face of the movable cam 9. Obviously, the spring clip 22 during operation of the switch will also provide an effective abutment for the intermediate portion of the plate spring 14, while enabling the movable contact member 5 to be raised as the movable cam 9 moves over the stationary cams 4.

As a result of my improved construction, it is also possible to provide my improved tensioning member in the form of a single, simple and inexpensively produced plate member which, if desired, may be produced in a single stamping operation. Further, it will be noted that through the use of the spring clip it is made possible to assemble the parts quickly and inexpensively, the clip first being readily applied while open and then bent closed while in the groove 21. Further, the clip is adapted to be opened readily, if desired, as by inserting a tool in the slit 23, to enable the removal of the clip and replacement of the plate spring 14.

While I have herein specifically described one form which my invention may assume in practice, it will be understood that this form of the same is shown for purposes of illustration, and that the same may be modified and embodied in other forms without departing from its spirit or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. In an electric switch, an insulating base having an upstanding pivot, spaced stationary contacts on said base at one side of said pivot, stationary cam means on said base at the opposite side of said pivot, a movable switch member rotatable on said pivot and having a radially projecting arm terminating in a cam member adapted to cooperate with said stationary cam means and also having two radially projecting arms on the other side of said pivot disposed on opposite sides of the center line including said cam carrying arm and terminating in spaced contact members adapted to cooperate with said stationary contact members, a plate spring rotatably mounted on said pivot above said switch member having projecting arms overlying the arms of said movable switch member and engaging the same adjacent the terminal cam and contact members thereon and equalizing the tension on said contact members as said cam member moves over said cam means, abutment means on said pivot for holding said spring in vertically compressed relation against said movable switch member, switch operating means for moving said movable switch member about its pivot, and cooperating means on said movable switch member and spring for effecting movement of the latter about said pivot in unison with said movable switch member while permitting relative vertical movement therebetween due to movement of said movable cam member as the latter rides over said stationary cam means.

2. In an electric switch, an insulating base having an upstanding pivot, spaced stationary contacts on said base at one side of said pivot, stationary cams on said base at the opposite side of said pivot, a movable switch member rotatable on said pivot having a radially projecting arm terminating in a cam member adapted to cooperate with said stationary cams and also having two radially projecting arms on the other side of said pivot disposed on opposite sides of the center line including said cam carrying arm and terminating in spaced contact members adapted to cooperate with said stationary contact members, a plate spring rotatable on said pivot above said switch member having projections resiliently engaging said movable contact members and said movable cam member and equalizing the tension on said contact members as said cam member moves over said stationary cams, abutment means on said pivot for holding said spring in vertically compressed relation against said movable switch member, a manual switch operating member for moving said movable switch member about its pivot, and cooperating means on the confronting faces of said movable cam member and the corresponding resilient projection on said spring for effecting movement of the latter about said pivot in unison with said movable switch member including a radial groove in said cam and a projection on said spring seated in said groove and slidable therein as said movable cam member moves over said stationary cams.

JOHANN G. PETERSON.