

Nov. 10, 1925.

H. L. JOYCE

1,560,580

ELECTRIC STARTING MOTOR SWITCH

Filed Feb. 14, 1925

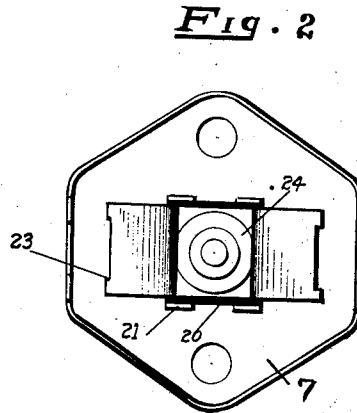
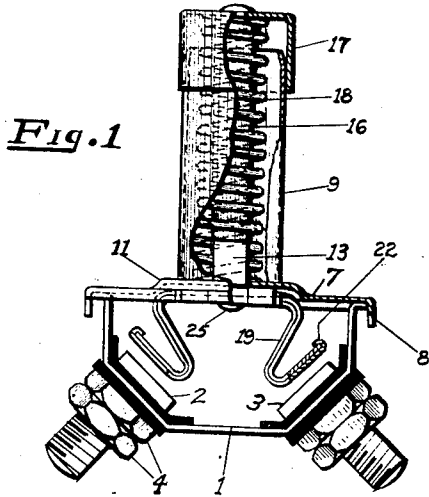


Fig. 3

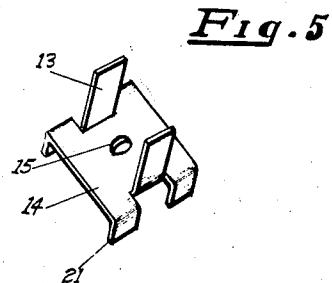
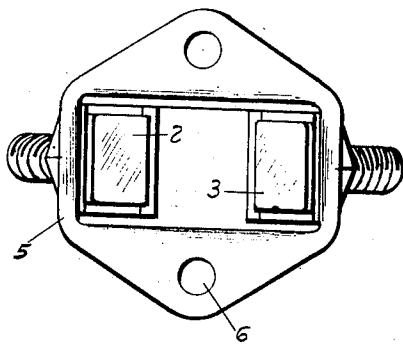
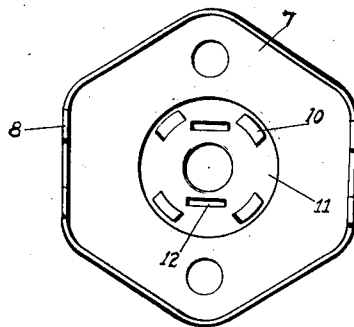


Fig. 4



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UNITED STATES PATENT OFFICE.

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ELECTRIC STARTING-MOTOR SWITCH.

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To all whom it may concern:

Be it known that I, HAROLD L. JOYCE, a citizen of the United States, residing at South Orange, in the county of Essex, State of New Jersey, have invented certain new and useful Improvements in Electric Starting-Motor Switches, of which the following is a description, reference being had to the accompanying drawing, and to the figures of reference marked thereon.

This invention relates to an electrical switch particularly adapted for use in connection with an electric starting motor used on internal combustion engines in automotive vehicles, although, it is to be understood that the switch is adapted for other uses where an electric circuit is to be controlled.

It is the principal object of my invention to provide a switch that will make and keep a large contact area and good electrical contact during the period of time that the electrical circuit is closed through the switch.

Another object of my invention is to provide a switch that is sturdy and rugged and one that will therefore, stand a lot of abuse at the same time.

A further object is to provide a switch that is cheap and economical to manufacture.

These and other objects will be apparent from a study of the drawing taken in connection with the specification in which

Figure 1 is an elevational view, partly in section, of the switch.

Figure 2 is a view of the bottom part of the cover showing the movable switch member in position.

Figure 3 is a plan view looking down on the box portion of the switch showing the stationary contacts in position.

Figure 4 is the bottom view of the cover, but with the movable switch member removed.

Figure 5 is a perspective view of the guiding member used in connection with the movable switch member.

Referring now to the details wherein like numbers refer to corresponding parts in the various views, 1 is the body or box portion of the switch having stationary contacts 2 and 3 mounted therein but insulated therefrom. The contacts 2 and 3 are preferably of copper and terminate in threaded ends on the exterior of the box; nuts 4 being provided for locking the terminals in position.

The outer of these nuts may also be used for clamping a wire or connector to these contacts.

As will be seen in Fig. 1, the contacts 2 and 3 are set on an angle to each other for a purpose which will be more clearly understood on reading the description of the movable contact member. The box 1 has a flange 5 with mounting holes 6 therein. Fitted to the flange 5 is a cover 7 having a plurality of ears or projections 8, four being indicated, which are adapted to be bent over the flange 5 to hold the cover in position on the box portion of the switch. To the cover 7 is attached a stem 9, the same being held thereto by a plurality of fingers 10 which are riveted or clenched over within a slightly upward depressed portion 11 in the cover. The cover is also provided with a pair of slots 12 that open through the cover within the interior of the stem 9. These slots 12 are for the purpose of receiving the fingers 13 on the guide member 14 which has a hole 15 to receive preferably a shouldered end of the plunger 16 carried within the stem 9 and provided with a cap 17 which is preferably fastened securely to the upper end of the plunger. A spring 18 serves to hold the plunger in retracted position as shown in Fig. 1. Positioned on the inner end of the plunger and adjacent the guide member 14, is a spring contact member 19. A suitable insulator or insulator 20 acts to insulate the spring contact member 19 from the guide member 14 and the plunger 16. The insulators are also constructed so that the projections 21 of the guide member will not come in contact with the sides of the spring member 19, but engage the insulator 20 so as to prevent the spring contact member 19 from turning on the plunger 16 and the plunger itself is prevented from turning through the cooperation of the fingers 13 and the slots 12. The spring member 19 is preferably constructed of a plurality of leaves which may be of different material. However, the leaf that engages the contacts 2 and 3 I preferably make of copper and attach the extreme end thereof to the other leaf or leaves by bending the end 22 over the other leaf or leaves, preferably in a slot 23 provided in the other leaf or leaves. The contact member 19 has a straight portion as shown in Fig. 1 against which, the insulator 24 rests on one side and the insulator 20 and

guide member 14 on the other; the end of the plunger 16 being preferably riveted over as at 25 thereby holding the spring member 19 securely to the plunger. The member 19 has both ends formed in a reversed curve as is clearly shown in Fig. 1. So that the ends of the member 19 may lie substantially parallel to the faces of the contacts 2 and 3 when pressure is applied to the plunger, pushing the same downward, the reversed curves in the member 19, produce a result such that the ends of the springs do not tilt on the contact members 2 and 3, but retain their full contact area. This I consider to be a unique feature in my switch construction since the contact resistance is reduced to a minimum and by arranging the cooperating contacts, as shown, a wiping action is obtained thereby insuring clean contacts without any cutting action as is present in many types of switches. The switch herein described is made almost entirely of punched members which adds to the lightness of the switch, at the same time giving a switch which is rugged and substantial.

While I have shown a preferred form of my invention, it will be readily observed that various details may be modified without departing from the spirit of the invention or the scope of the appended claims.

Having thus described my invention what I claim is:

1. In a switch of the class described, a movable contact member comprising; a resilient spring having a straight portion terminating in ends formed in reverse curves, the end beyond the second reverse curve having a substantial length for engaging a contact, a plunger having said spring attached to it on said straight portion, a guide member fastened to the plunger and having projections for preventing the spring turning on the plunger, a cover and stem for supporting the plunger, the fingers on said guide member extending through the cover at points spaced from said plunger opening into the stem for preventing the plunger from turning, a box to which said cover is attached and a pair of contacts positioned in the box so the contact engaging part of said spring may make substantial parallel contact therewith.

2. In a switch of the class described, a box member having a pair of contacts set at an angle to each other in the wall of the box

but insulated therefrom, a cover for the box, a stem extending from said cover, a plunger positioned within the stem and having a cap extending over the end of the stem, and a spring within the stem to return the plunger after actuation; a multiple leaf contact member having a flat portion and its ends formed in reverse curves with means for fastening the leaves together at their tip ends, means for maintaining said contact member in proper angular relationship to said box contacts and means for attaching the contact member and said maintaining means to the plunger.

3. In a switch of the class described, a movable contact member comprising; a resilient spring having a straight portion terminating in ends formed in reverse curves, a plunger having said spring attached to it on said straight portion, means for preventing the plunger from turning and the spring turning on the plunger, a cover and stem for supporting the plunger, a box to which said cover is attached, a pair of contacts mounted on the wall of the box so that their faces are inclined in opposite direction and substantially parallel to the engagement portions of said spring.

4. In a switch of the class described, including a box, cover, stem, cap and return spring within the stem; a pair of contacts positioned within the box so their faces are oppositely inclined to each other, a spring contact member and a guide member carried on the end of the plunger, the contact member being insulated, said contact member having its ends formed in reverse curves so as to insure a wiping and full area engagement with said box contacts.

5. In a switch, a pair of stationary contacts positioned so their faces are oppositely inclined to each other, a movable switch member for bridging said contacts comprising; a resilient metallic member having a flat portion terminating in parts inclined toward each other, said parts terminating in ends bent away from each other and substantially parallel to said stationary contact faces whereby a smooth wiping, full area, non-wedging contact is obtained and means for actuating the switch member attached to said flat portion.

In testimony whereof, I affix my signature.

HAROLD L. JOYCE.