

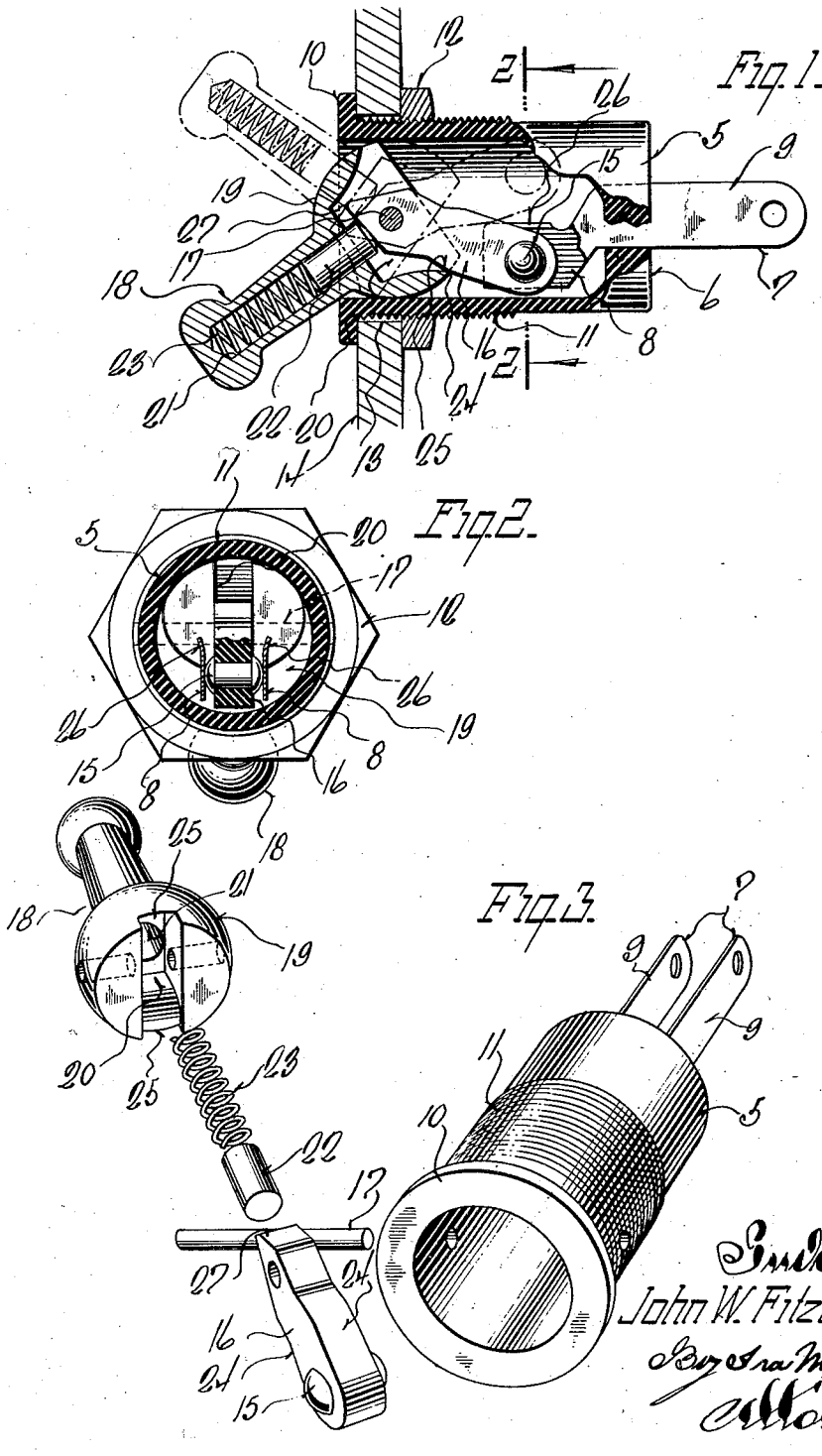
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SWITCH

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SWITCH

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This invention relates to certain new and useful improvements in electric switches and refers more particularly to small toggle type switches employed principally in connection with radio circuits and automotive lighting equipment.

It is an object of this invention to simplify and reduce the number of parts of a switch of this type.

10 Another object of this invention resides in the provision of a switch of the character described in which the usual spring for obtaining a quick make and break is mounted within the handle.

15 Another object of this invention resides in the provision of a novel construction for switches of the character described wherein the movable switch member and the handle are mounted for movement about a common axis by a single pivot pin.

20 And a further object of this invention resides in the provision of a switch of the character described wherein a slight initial movement is imparted to the movable switch member when in contact making position prior to its movement out of contact making position, to free the movable switch member from the stationary contacts in the event of mechanical freezing.

25 With the above and other objects in view which will appear as the description proceeds, my invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

30 In the accompanying drawings, I have illustrated one complete example of the physical embodiment of my invention constructed according to the best mode I have so far devised for the practical application of the principles thereof, and in which:

35 Figure 1 is a view partly in transverse section and partly in elevation of a switch structure embodying my invention;

40 Figure 2 is a cross sectional view taken

through Figure 1 on the plane of the line 2—2; and

Figure 3 is a perspective view illustrating the various elements of the switch disassembled and arranged in their proper order of assembly.

Referring now more particularly to the accompanying drawings, the numeral 5 represents the body or housing of the switch structure and which is preferably tubular and formed of molded insulating material. The inner end of the housing is closed by a wall 6 in which a pair of stationary switch contacts 7 are embedded at the time of molding, with their inner ends 8 projected into the interior of the body and their outer ends 9 extending rearwardly therefrom and adapted to have suitable conductors, not shown connected therewith.

The outer open end of the housing is provided with an annular flange 10 and the external surface rearwardly of the flange is threaded as at 11 to receive a clamping nut 12 whereby the switch may be secured in an opening 13 formed in a suitable supporting panel 14, the flange 10 engaging one surface of the panel and the clamping nut 12 the other. It is noted that the nut 12 is mounted behind the panel 14 and is therefore concealed to provide a neat external appearance.

The inner ends of the stationary switch contacts are offset with respect to the major portion of the contacts to be disposed on one side of the longitudinal axis of the housing and are separated a distance to snugly receive therebetween a movable bridging contactor 15. The contactor 15 may be a rivet passed through an aperture in a switch lever 16 formed of fibre or other insulating material, and having its end riveted over to secure the same in the aperture.

The switch lever 16 is pivotally mounted within the housing for movement to and from a position engaging the contactor 15 with the inner ends 8 of the stationary contacts, by a pivot pin 17 which passes diametrically through the sides of the housing and also pivotally mounts an actuating handle 18 by which the lever 16 may be moved to and from its two positions.

The handle 18 has its inner end provided with an enlargement 19 which is substantially semi-spherical and of a diameter approximately equal to the internal diameter of the housing, so that when in position it closes the open end of the housing. The semi-spherical enlargement 19 is provided with a diametrical recess 20 of approximately the width of the lever 16 so that the lever is held against all but pivotal movement about the axis of the pin 17.

Communicating with the recess 20 is a bore 21 formed in the handle per se and in which a plug 22 is slidably mounted to be normally yieldably urged outwardly of the bore by an expansive spring 23 confined between the inner end of the plug and the bottom of the bore. The plug 22 however is held against disengagement from the bore by the adjacent end portion of the lever 16 which, as best illustrated in Figure 1, is V shaped so that when the handle is moved to one of its limits of movement, which are defined by the engagement of the handle with the peripheral edge of the housing outer end, the action of the spring 23 causes the lever 16 to turn about the axis of the pin 17 in an opposite direction of rotation until its leading edge 24 abuts the adjacent edge 25 of the recess 20. With the handle and lever at their limits of movement illustrated in full lines in Figure 1, the contactor 15 is disposed between the inner ends 8 of the stationary contacts to electrically bridge the same, movement of the contactor to said position between the contacts being facilitated by the outwardly flared ends 26 of the contacts, see Figure 2.

It is noted that when the lever is at either limit of movement, its free end which carries the contactor is spaced a slight distance from the adjacent inner wall of the housing, the lever being held in said spaced relation by its engagement with one of the edges 25 of the handle recess 20 so that initial movement of the handle to move the lever to its opposite position, causes the lever to be moved a slight distance until its free end engages the adjacent inner wall of the housing. In producing this slight initial movement positive manual actuation of the handle combines with the action of the spring 23, in that both forces are applied to the lever in substantially the same direction; and as the spring is being compressed during this actuation of the handle it exerts its maximum energy, so that any tendency toward mechanical freezing when the lever is in contact making position, is effectually overcome and the initial movement of the lever to a position engaging the housing inner wall is assured.

As the movement of the handle is continued, the lever 16 which now engages the inner wall of the housing at its free end, remains stationary so that the nose 27 of its

V shaped inner end forces the plug 22 into the handle bore against the action of the spring 23 until the longitudinal axis of the handle passes an imaginary line drawn through the axis of the pivot pin 17 and the nose 27 of the lever 16, at which time the stored energy of the spring is released to quickly move the lever 16 to its opposite position.

From the foregoing description taken in connection with the accompanying drawings, it will be readily apparent to those skilled in the art to which an invention of the character described appertains, that I provide a novel switch structure which is particularly adaptable for use with radio receivers and automotive lighting equipment and which is extremely compact in construction and simple in design, and wherein the mounting or clamping nut is concealed to provide a neat external appearance.

What I claim as my invention is:

1. In an electric switch of the character described, a stationary contact, a movable switch member engageable with the stationary contact, an actuating handle for said switch member, common means pivotally mounting the switch member and the actuating handle, spring means for moving the switch member upon movement of the actuating handle, and means whereby the initial manual actuation of the handle is combined with the actuation of the spring means to impart a slight movement to the switch member in one direction prior to its movement by the spring means in the opposite direction to insure its breaking free of the stationary contact.

2. In an electric switch of the character described, a bored housing having one end open, a stationary contact, a movable switch member engageable with the stationary contact, a handle for moving the switch member to and from contact making position pivotally mounted in the housing with a portion projected from the open end thereof, and a substantially globular enlargement of approximately the same diameter as the bore in the housing to substantially close its open end without interfering with its pivotal movement.

3. In an electric switch of the character described, a stationary contact, a movable switch member engageable with the stationary contact, a housing enclosing the stationary contact and movable switch member, an actuating handle for the switch member, common means pivotally mounting the switch member and the actuating handle in the housing, spring means carried by the handle and operable upon a predetermined movement of the handle about its pivotal mounting to move the switch member, and handle carried means for limiting the movement of the switch member by said spring

means at a position spaced from one wall of the housing, whereby the switch member is free to move a slight distance in one direction prior to its actuation by the spring means in an opposite direction, the direction of initial movement of the switch member being the same as that of the handle member to move the switch member to its opposite position, whereby the manual actuation of the handle combines with the action of the spring means to impart said initial movement to the switch member.

ing, a plunger slidably mounted in an axial bore in the handle, and spring means confined between the plunger and the bottom of the handle bore to yieldably urge the plunger to engagement with either side of the V shaped end of the switch member, whereby the switch member is moved with a quick snap action from one position to another as the handle is actuated past dead center.

In testimony whereof I have hereunto affixed my signature.

JOHN W. FITZGERALD.

4. In an electric switch of the character described, a tubular housing closed at one end and having a circular opening at its other end, a stationary contact embedded in the housing closed end with its inner end within the housing and offset to one side and its outer end forming a terminal, a movable switch member engageable with the stationary contact and positioned within the housing, a handle for the movable switch member, a pivot pin passed through the inner end of the handle and the outer end of the switch member and secured in the opposite walls of the tubular housing to provide a common pivotal mounting for the handle and switch member, means for moving the switch member to and from either position with a snap action upon actuation of the handle comprising a V shaped portion at the outer end of the switch member, and a spring urged plunger engageable therewith and mounted in a bore in the handle member, and a globular enlargement of substantially the same diameter as the circular opening in the housing at the inner end of the handle, received within the housing to close the circular opening at any position of the handle member.

5. In an electric switch of the character described, a tubular housing closed at one end and having a circular opening at its other end, a stationary contact embedded in the closed end of the housing, a movable switch member engageable with the stationary contact, a pivot pin carried entirely by the housing and pivotally mounting the switch member at its outer end adjacent the circular opening in the housing, the extreme outer end of the switch member being substantially V shaped with the apex of the V in axial alignment with the longitudinal axis of the switch member, a globular enlargement on the inner end of the handle of substantially the same diameter as the circular opening in the housing and received in the housing to at all times close said circular opening, the inner end of the housing being recessed to receive the adjacent V shaped end portion of the switch member, and the pivot pin passing diametrically through the globular enlargement of the handle member to pivotally mount the same, whereby the switch member and handle have a common pivotal mount-