Sept. 15, 1942. H. J. HAMMERLY 2,295,577

ELECTRIC SWITCH

Filed Nov. 29, 1940 3 Sheets-Sheet 1

Fig. 1.

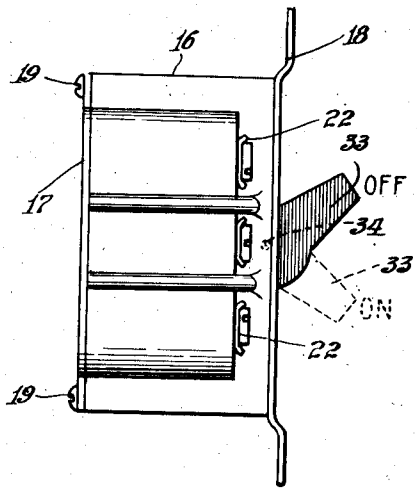

Fig. 2.

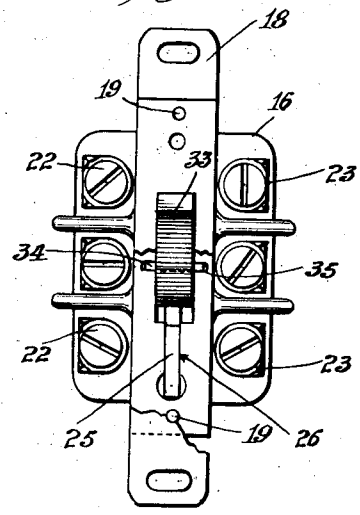

Fig. 3.

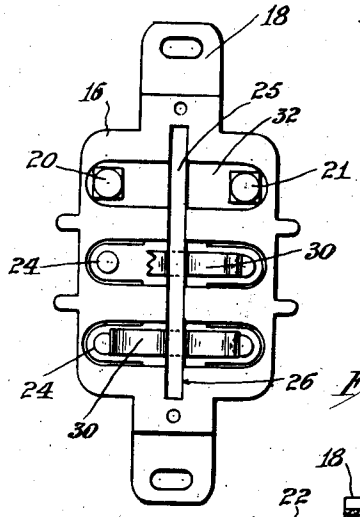

Fig. 4.

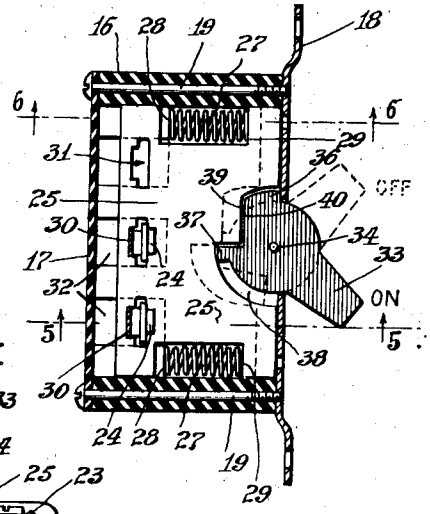

Fig. 5.

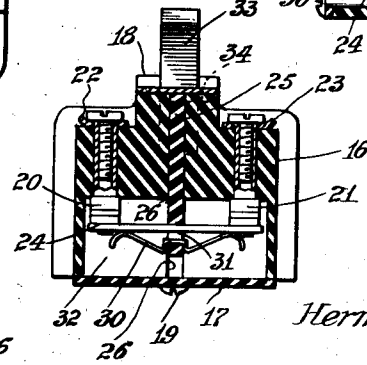

Fig. 6.

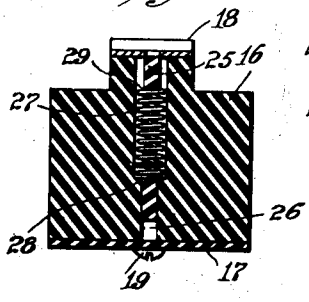

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Fig. 8.

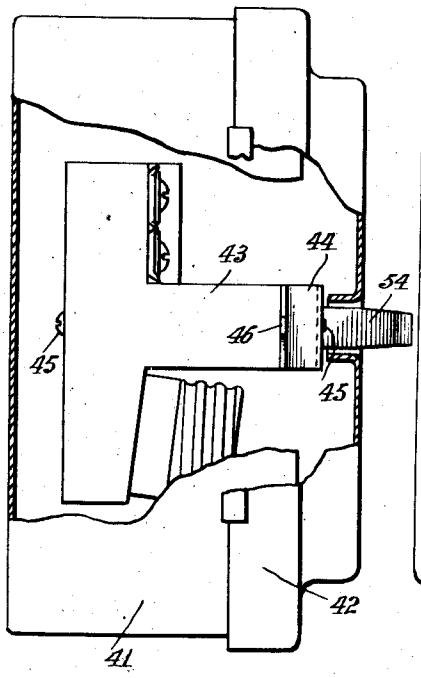

Fig. 7.

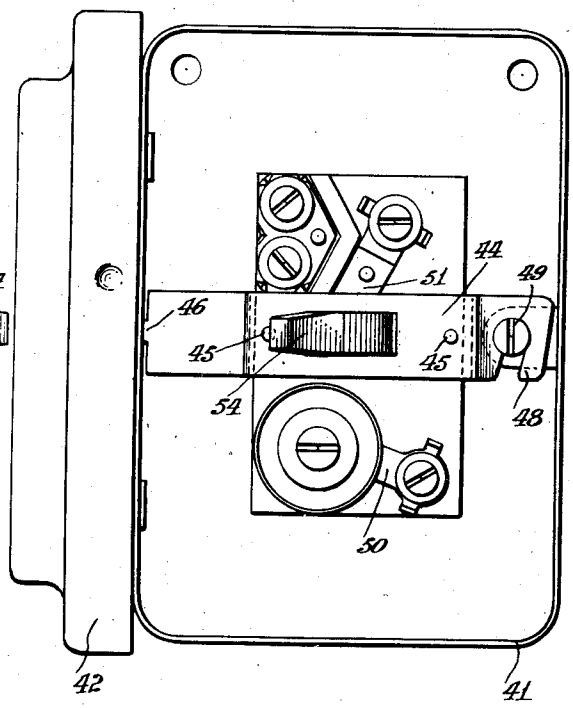

Fig. 10.

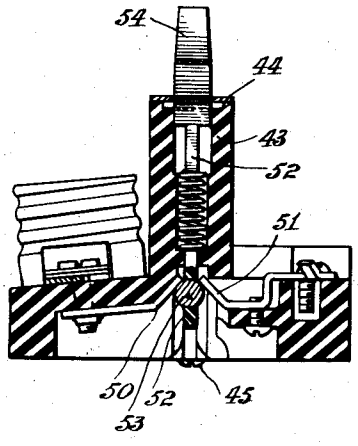

Fig. 9.

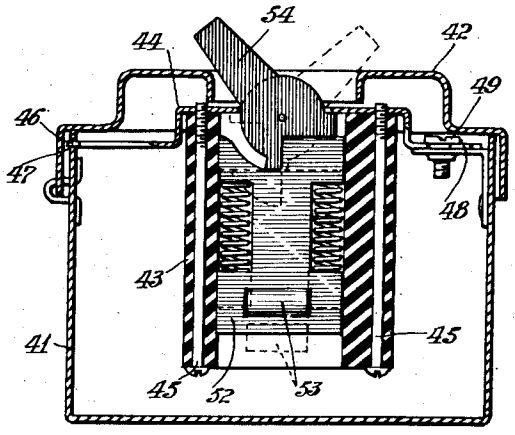

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Fig. 12.

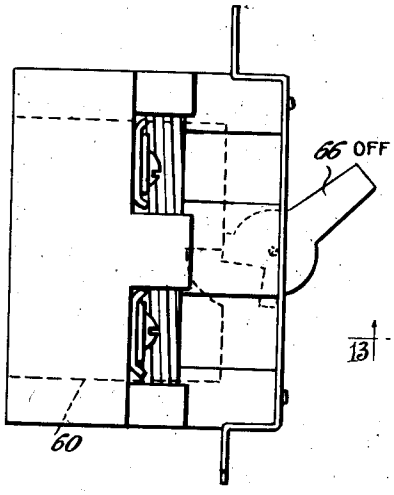
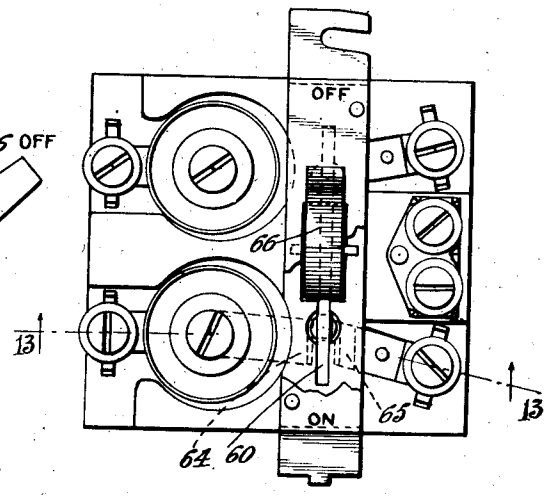


Fig. 11.



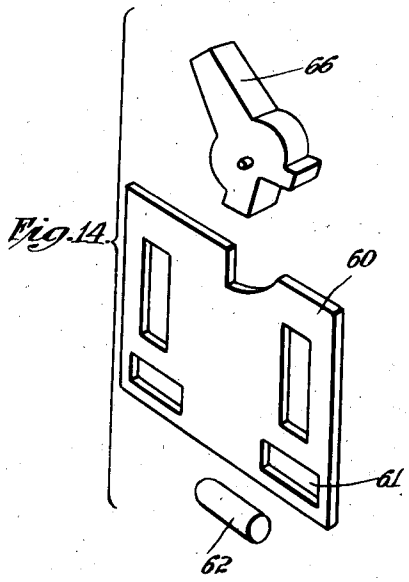
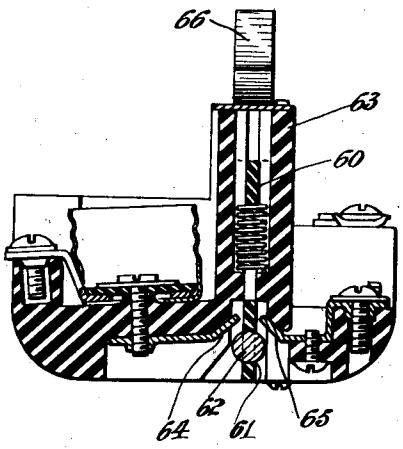


Fig. 13.



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Patented Sept. 15, 1942

2,295,577

UNITED STATES PATENT OFFICE

2,295,577

ELECTRIC SWITCH

Herman J. Hammerly, Plainville, Conn., assignor to The Trumbull Electric Manufacturing Company, Plainville, Conn., a corporation of Connecticut

Application November 29, 1940, Serial No. 367,694

7 Claims. (Cl. 200—165)

My invention relates particularly to means for actuating switches of the lever handle type.

One object is to provide a simple form of construction—of few parts and easy to assemble.

Another object is to avoid the use of metallic linkage.

Another object is to provide a simple form of connection between the finger piece or lever and the movable contact or switch member.

Another object is to provide a direct connection between the finger piece and the movable switch carrier.

In the drawings I have shown the invention as applied to three somewhat different forms.

Fig. 1 is a side view of one form involving a three pole tumbler type.

Fig. 2 is a front view of the same, part being broken away to show the mounting of the lever or finger piece and the movable switch contact carrier.

Fig. 3 is a rear view with parts removed.

Fig. 4 is a longitudinal section and side view of the same.

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

Fig. 6 is a sectional view on the plane of the line 6—6 of Fig. 4.

Fig. 7 is a front view of a single pole type mounted in a box with the cover open.

Fig. 8 is a side view of the same with the cover closed and part of the side of the box broken away to show the interior.

Fig. 9 is a transverse sectional view of the device of Figs. 7 and 8.

Fig. 10 is a sectional view of the switching device of Figs. 7 to 9.

Fig 11 is a front view of a double pole switch of the fusible type.

Fig. 12 is a side view of the same.

Fig. 13 is a sectional view on the plane of the line 13—13 of Fig. 11.

Fig. 14 is an exploded perspective view of the movable switch contact carrier and the actuating lever or finger piece.

In the first form of sheet 1 the conducting parts are all carried by or contained in an insulating body 16 having a back plate 17 and a mounting strap 18 secured together by screws 19 as is common.

The three sets of stationary contacts 20 and 21 are housed in the body and have external terminals 22 and 23 respectively. A movable switch contact bar 24 is loosely carried by the insulating plate 25 which slides in a slot 26 in the body. Springs 27, 27 located in recesses or slots in the edges of the carrier plate 25 abut against the abutment shoulders 28 in the body and against the shoulders 29 in the carrier plate so that the springs press the carrier plate toward the front of the body. A bow equalizing spring 30 backs up each contact bar 24, each spring 30 and bar 24 being loosely mounted in a slot 31 in the plate 25 and guided in a recess 32 in the body.

The actuating lever 33 has a pivot pin 34 mounted in a notch 35 in the face of the body and is held in place by the strap 18. The throw of the lever is limited by the projections 36 and 37 which abut against the back of the strap 18 when the lever is actuated. The carrier plate 25 is cut away at 38 to allow for the movement of projection 37 and has an abutment 39 adapted to be engaged by the shoulder 40 of the lever 33 when the lever is moved from the "on" position shown in full lines in Fig. 4 to the "off" position indicated by dotted lines. When the lever is moved from the full to the dotted line position of Fig. 4 the switch carrier plate 25 is pressed backward and the circuit broken.

When the strap 18 is removed the lever 33 is free to be removed. By pushing in on the carrier slide or plate 25 (the back plate 17 being removed) the switch bars 24 and springs 30 may be readily removed from the recesses 32. After removal of the switch bars and their supporting springs, the slide 25 and its springs 27 can be slidably removed from the front of the block. It will thus be seen that the only elements required for holding the movable parts together are the two screws 19 which connect the back plate to the front strap.

The springs 30, together with the loose mounting of each of the contact bars 24 in the slots 31 of the carrier plate, allow individual spring pressure alignment of each of the contact bars with its corresponding stationary contacts 20 and 21. Some mounting of this character is desirable when the poles of the switch are greater than two in number.

In the form shown in sheet two the switch is mounted in a box 41 having a cover 42. The insulating body 43 is secured to a cross bar 44 by screws 45. This cross bar is detachably mounted in the box by means of a projection 46 which fits in a recess 47 in one side of the box and a hook 48 which engages beneath a screw 49 mounted in the other side of the box.

The stationary contacts 50 and 51 are mounted beneath the body 43, and the carrier 52 for the movable switch contact 53 slides in the body in the same manner as carrier 25 in Figs. 1 to 6.

The lever 54 corresponds with lever 33 and the action of making and breaking the circuit is the same as above described.

In the form shown on sheet three, the insulating carrier 60 has slots 61 for the contact rollers 62 and slides in a groove in the body 63 between the contacts 64 and 65. The operating lever 66 and its coaction with the other parts are the same as those previously mentioned and need not be again described.

In each form it will be seen that the springs are mounted in recesses or notches either in the edges or intermediate portions of the insulating carrier plate so that the plate can be inserted with the springs in place into the groove in the insulating body. The plate is then pushed in against the resistance of the springs until the contact passages are exposed at the rear of the body.

Each contact is then inserted into its opening in the plate and the pressure is released, thus securing the plate with the contacts in place in the body—the contacts being in the recesses in the rear of the body. The lever is then inserted into the recess in the front and the face plate or mounting strap is affixed so as to hold the actuating lever in place.

I claim:

1. An electric switch construction including an insulating body having a central slot and a rear recess, spaced stationary contacts extending from the front of the body to the rear recess thereof, a slide guided in said slot and having a transverse slot at its rear, a movable switch contact loosely carried in the latter slot of said slide and adapted to be moved into and out of engagement with said stationary contacts and a spring member supported by said slide in its transverse slot in continuous engagement with said movable switch contact to align and press yieldingly said movable contact against the stationary contacts.

2. An electric switch construction including an insulating body having a longitudinal slot extending from the front to the rear and an abutment shoulder adjacent each end of said slot near the rear of the body, stationary contacts mounted at the rear of the body on opposite sides of said slot, a slide guided in said slot and having recesses in its opposite ends adjacent said abutment shoulders, a spring mounted in each recess and coacting with one of said shoulders to press said slide toward the front of the body and removable with the slide, a switch contact carried by the slide and coacting with said stationary contacts to hold the slide in said slot and an actuating lever hinged in the front of the body and coacting with said slide to move the same in opposition to said springs.

3. An electric switch construction including an insulating body having a central slot and a rear recess, a pair of stationary contacts in the rear recess, one on each side of the slot, a slide guided in said slot and having a slot in the rear portion thereof, a movable plate loosely mounted in said latter slot for movement into and out of engagement with the respective stationary contacts and a bowed spring in said latter slot in continuous engagement with the movable plate in said latter slot for yieldingly pressing said plate against the respective stationary contacts.

4. In an electric switch, an insulating body having a slot extending from front to rear and having two abutments spaced apart from each other near the bottom of the slot, an insulating plate slidable into said slot between said abutments, a stationary contact at the rear of said slot, a movable contact carried by said plate, springs in said slot pressing against the respective abutments, said plate having a shoulder overstanding each spring so that the springs press the plate toward the front of the slot, a lever having a cam part coacting with said plate to permit the plate to be moved against the pressure of the springs and means for holding the lever in the body.

5. An electric switch having an insulating body with a longitudinal slot extending from front to rear thereof, a stationary contact in the rear of the body, a flat insulating plate guided to slide in said slot from front to rear thereof, said plate having two spaced recesses, a compression spring mounted in each recess, each spring being compressed in its recess in assembling the slide and springs in the slot, said body having abutments near the rear of said slot against which said springs are compressed, a movable contact carried by the inner end of said slide to engage the stationary contact in the rear of the body when the springs are expanded and an actuating lever pivoted at the front of the body and coacting with the slide to compress the springs and separate the movable contact from the stationary contact.

6. An electric switch having a body with a slot extending from front to rear, a recess at the front, a recess in the rear and abutments near the rear of said slot, a stationary contact secured in the rear recess, an actuating lever pivoted in the front recess, an insulating plate slidable in said slot and actuated in one direction by said lever, a spring mounted in each end of the slot and coacting with the plate and said abutments to press the plate toward said lever, a movable contact carried by said plate for engaging said stationary contact when said springs are expanded, a front plate for holding said lever in place at the front of said body and screws connecting said front plate to said body.

7. In an electric switch, an insulating body having a slot extending through it from front to rear, an insulating plate slidably guided in said slot, spring means for moving the plate in one direction, a pivoted lever for moving the plate in the opposite direction, contacts mounted at the rear of said body, said plate having a transverse slot, a cross bar extending loosely through said transverse slot to engage said contacts, a bowed spring loosely positioned in said transverse slot and having its ends pressing against said bar whereby said bar is permitted to tilt with respect to said plate so that its ends may engage said contacts.

HERMAN J. HAMMERLY.