March 14, 1944. J. B. PARSONS 2,344,452

SWITCH

Filed Oct. 20, 1942

Fig. 1.

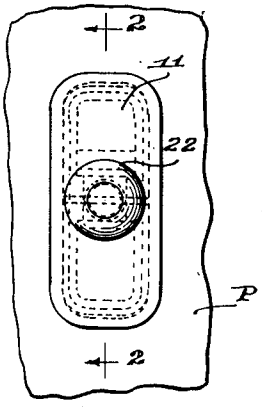


Fig. 3.

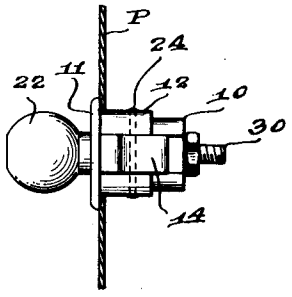


Fig. 4.

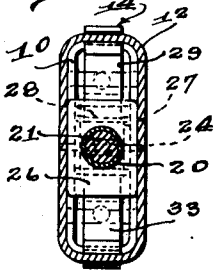


Fig. 2.

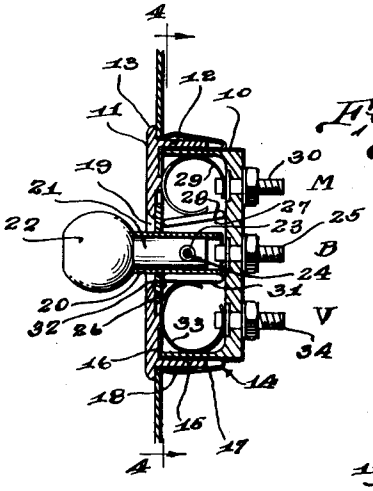


Fig. 5.

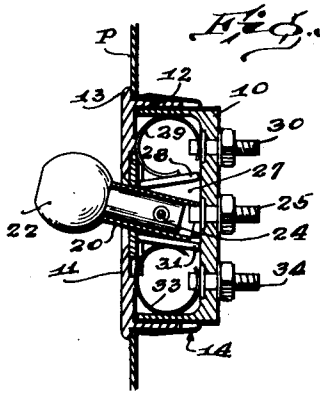
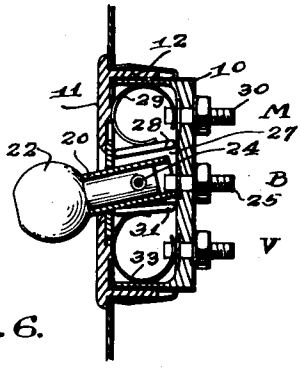


Fig. 6.



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2,344,452

SWITCH

John B. Parsons, Toledo, Ohio

Application October 20, 1942, Serial No. 462,675

4 Claims. (Cl. 200—6)

This invention relates to switch mechanisms and is concerned particularly with the design and construction of a switch which is adapted selectively to establish an electrical connection between the source of electrical energy and one binding post, or between the source and a pair of binding posts, thereby to energize as desired, one mechanism or two mechanisms.

An object is to produce a switch mechanism of the above character which is simple in construction, easy to assemble, reliable in operation and relatively inexpensive to manufacture.

Another object is to produce a switch mechanism of the above character which is particularly suited for controlling the operation of electrically operated vehicle window regulators, the arrangement being such that manipulation of the control member in one direction is adapted to establish operative connection for actuating the window in one direction and upon movement thereof in the opposite direction cause movement of the window in its opposite direction.

Other objects and advantages of the invention will hereinafter appear and for purposes of illustration but not of limitation, an embodiment of the invention is shown in the accompanying drawing in which

Figure 1 is a fragmentary side elevation of the switch mechanism mounted upon its supporting panel;

Figure 2 is a vertical sectional elevation substantially on the line 2—2 of Figure 1;

Figure 3 is an end elevation of the switch showing the supporting panel in section;

Figure 4 is a longitudinal sectional elevation substantially on the line 4—4 of Figure 2;

Figure 5 is a sectional view similar to Figure 2 but showing the control member moved upwardly to one of its operating positions; and

Figure 6 is a sectional view similar to Figure 2 but showing the control member rocked downwardly to its other operating position.

The illustrated embodiment of the invention comprises a switch mechanism comprising a housing 10 which is elongate and which may be of any suitable material such as plastic. The housing 10 has a bottom and side walls but the outer end is open. Fitting over the outer end is a cover 11 provided with depending side walls 12 to overlap the adjacent walls of the housing 10. The cover 11 is formed with an outwardly extending flange 13 which projects outwardly beyond the depending walls 12.

A pair of spring metal fasteners 14 are clamped between the cover 11 and housing 10 and afford a convenient means for holding the switch mechanism within an opening provided therefor in a supporting panel P. Each fastener 14 is formed with a leg 15 which is disposed between the depending end wall of the cover 11 and the outer wall of the housing. The inner end of the leg 15 has a flange 16 which engages over the free end of the housing wall. Integral with the leg 15 and extending generally parallel thereto is an outer leg 17, the free end of which abuts against the under side of the flange 13. The leg 17 is formed with an outwardly extending or arched portion 18. These fasteners enable the switch mechanism as a unit to be slipped into the aperture 13 of the supporting panel P and the outwardly bent or arched portion 18 holds the unit in place and militates against the switch coming loose.

The cover 11 is formed with a centrally disposed opening 19 which is elongate in shape to enable rocking movement of the control member or button as will hereinafter appear. Mounted within the housing 10 is a tubular member 20 of suitable conducting material and mounted within the tube 20 is a shank 21 of the control member or knob 22, the latter preferably being of plastic material. The tube 20 and control member are mounted for rocking movement and for this purpose, a relatively small tube 23 passes through aligned apertures in the tube 20 and shank 21 extending from one side wall of the housing 10 to the other and passing through the mounting tube 23 is a pin 24 which passes through apertures in the side walls of the housing 10, the ends of the pin 24 being riveted to hold the parts in position. It will be noted that the shank 21 terminates short of the inner end of the tube 20 which extends to a point close to the bottom wall of the housing. Extending into the tube 20 is a center binding post 25, the arrangement being such that the control member or knob 22 can be rocked upwardly or downwardly so that one side or the other of the tube may contact the binding post 25. In the normal position of the tube 20, the same is free from contact with the binding post 25.

A plate 26 is apertured to receive the tube 20 and is disposed in position to cover the opening 19 formed in the cover 13. The plate 26 slides in response to the rocking movements of the knob 22 and bears at its opposite ends against ledges 27 integral with the housing 10 and disposed on opposite sides thereof. It will be observed that the dimensions of the plate 26 are sufficient at all times to cover the opening 19. Oppositely disposed ledges 27 are formed on the

inside of the housing 10 at the upper side of the tube 20, these ledges being inclined from the bottom of the housing inwardly toward the tube as indicated. Resting against these ledges is a contact plate 28 against which bears the free end of a substantially C-shaped spring 29, the opposite end of which is fixed to an upper binding post 30 which is spaced from the central binding post 25.

The contact plate 28 in the normal or central position of the knob 22 is free from engagement with the tube 20 and the inclination of the contact piece 28 is such that when the knob is swung downwardly to the position indicated in Figure 6, the tube 20 is not brought into contact with the contact piece so that no electrical connection is established. However, when the knob 22 is rocked upwardly or to the position shown in Figure 5, the contact piece 28 is engaged by the tube 22 slightly prior to the time that the tube is moved into engagement with the central binding post 25. This position of the parts is shown in Figure 5.

On the lower side of the tube 20 is a contact plate 31 which normally bears against ledges 32 formed in the housing on opposite sides thereof to hold the plate normally in position at substantially right angles to the bottom wall of the housing or in the position shown on Figure 2. A spring 33 similar to the spring 29 has its free end bearing against the contact plate 31 to urge it in a direction toward the tube 20 and normally hold the knob 22 in its central position out of electrical contact with the binding post 25. The opposite end of the spring 33 is anchored to a binding post 34 which is disposed below the central binding post 25.

Assuming that the central binding post 25 is connected to a source of electrical current, such as a battery, the lower binding post 34 is connected to a solenoid controlled valve and the binding post 30 is connected to a pump operating motor and the pump is connected by a tube to the valve, it will be apparent that when the knob 22 is moved downwardly, or to the position shown on Figure 6, an electrical connection will be established between the binding posts 25 and 34, thereby energizing the solenoid for opening the valve. However, when the knob 22 is moved upwardly or to the position shown in Figure 5, the binding post 25 is electrically connected not only to the binding post 34 but also to the binding post 30 so that not only will the solenoid operate to unseat the valve but also the motor will be energized to operate the pump and create a flow of liquid through the valve. In this connection, reference is made to the application of John B. Parsons and Burton S. Floraday, Serial No. 275,207, filed May 23, 1939, wherein a motor operated pump and solenoid controlled valve is shown as exemplifying one use to which this switch can be put. Detail description and illustration of such arrangement is not shown here because it forms no part of the present invention.

From the above description, it will be manifest that I have produced an extremely simple and efficient switch mechanism. The parts can be readily and conveniently assembled. After the contact plates and springs are in position, the slide plate 26 and cover 11 can be applied. Thereafter the tube 20, knob 22 with its shank 21 can be assembled in place and the parts held together by the rivet 24 which also provides a bearing on which the parts rock. An extremely satisfactory contact is established between the tube 20 and the "hot" binding post 25 which is entirely positive and militates against objections usually inherent in switches of this character. Furthermore, as above indicated, the switch assembly can be easily mounted in position of use, it being merely necessary to force it into the opening provided for it in the supporting panel, the fasteners 14 retaining the assembly in place against rattles due to vibration.

It is to be understood that numerous changes in details of construction, arrangement and operation may be effected without departing from the spirit of the invention especially as defined in the appended claims.

What I claim is:

1. Switch mechanism comprising a housing having three binding posts arranged in a row, a switch arm pivotally mounted intermediate its ends and having a portion loosely straddling the center binding post for engagement therewith upon rocking movement in one direction or the other, and means whereby rocking of the switch arm in one direction establishes an electrical connection between the center binding post and one of the end posts and whereby rocking of the switch arm in the opposite direction establishes an electrical connection between the center post and both end posts.

2. Switch mechanism as claimed in claim 1, in which the switch arm comprises a tubular member loosely fitting the center binding post to afford rocking movements, and spring means normally holding the switch arm in intermediate position out of contact with the center post.

3. Switch mechanism as claimed in claim 1, in which the electrical contact establishing means comprises a spring for holding the switch arm in normal position and an inclined contact piece on the other side of the arm inclined to such position that the switch arm must be rocked concomitantly to engage both the center binding post and the contact piece.

4. Switch mechanism comprising a housing having three laterally spaced binding posts, a switch arm pivotally mounted intermediate its ends in said housing in the region of the center binding post, a portion of the arm straddling the center binding post and being free therefrom when in normal upright position of the arm but engageable with the binding post upon rocking movement of the switch arm in one direction or the other, spring means for holding said arm in upright intermediate position and providing an electrical connection between an end binding post and said switch arm, a contact piece on the opposite side of the binding post, and an electrical connection between said piece and the other end binding post, said contact piece being inclined so that upon rocking said switch arm in the direction toward said contact piece, said contact piece is engaged by the switch arm concomitantly with the engagement of the switch arm with the central binding post.

JOHN B. PARSONS.