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H. E. NORVIEL

1,801,611

ELECTRIC SWITCH

Filed April 6, 1928

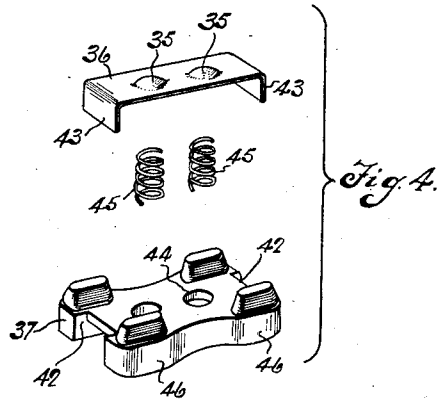


Fig. 4.

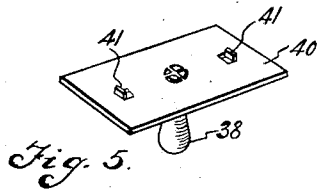


Fig. 5.

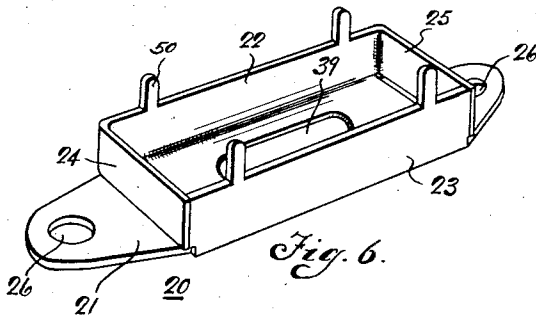


Fig. 6.

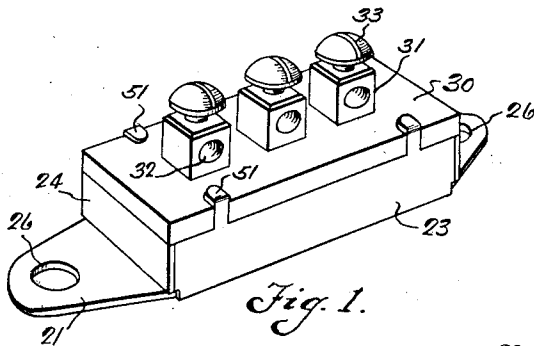


Fig. 1.

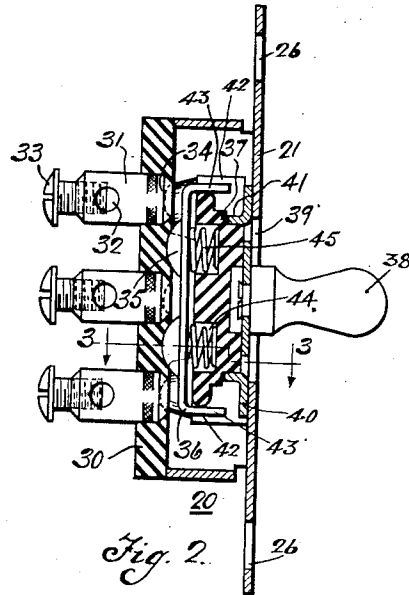


Fig. 2.

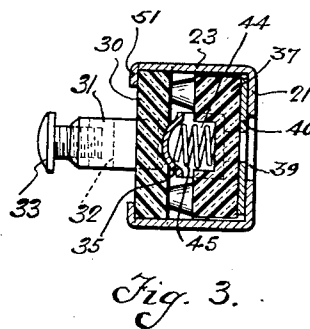


Fig. 3.

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UNITED STATES PATENT OFFICE

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ELECTRIC SWITCH

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This invention relates to electric switches and more particularly to the type of switch having a movable contact which is moved into various circuit controlling positions by the sidewise movement of an operating handle.

The present invention aims to produce a switch of this character which is rugged in construction and reliable in operation which may be produced at relatively low cost.

10 Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred embodiment of one form of the present inven-
15 tion is clearly shown.

In the drawings:

Fig. 1 is a perspective view of the switch embodying the present invention.

20 Figs. 2 and 3 are longitudinal and transverse sections thereof, the Fig. 3 being taken on the line 3—3 of Fig. 2.

Fig. 4 is a collective perspective view showing the switch movable contacts, the contact pressure springs and the non-conducting support for the movable contact.

25 Fig. 5 is a perspective view of the operating handle and a plate for operatively connecting the handle with the non-conducting support for the movable contact.

30 Fig. 6 is a perspective view of the switch case, the switch case cover being omitted.

The switch case is formed preferably from a blank of flat sheet metal designated in its entirety by the numeral 20, which is folded so that the front wall 21 of the switch case is directly integral with the two sides 22 and 23 and so that the ends 24 and 25 are directly integral with the side 22. The front 21 is provided with apertured ears 26 to facilitate mounting the switch upon a suitable support. The case shown in Fig. 6 receives a non-conducting cover or back plate 30 which insulatingly supports terminal members 31, each
45 having a hole 32 for receiving a conductor and each receiving a conductor clamping screw 33. The inner ends of the terminal members 31 are each provided with a convex face 34 in order to provide a stationary contact which is adapted to receive one of the
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spherical bosses 35 with which the movable contact 36 is provided.

The movable parts of the switch include the movable contact 36, a non-conducting contact support 37 and an operating handle 55 38. The handle 38 extends through an oblong hole 39 in the front wall 21 of the switch case 20 and is attached to a plate 40 adapted to bear against the interior surface of the wall 21. The plate 40 is operatively 60 connected with the contact carrier 37 by providing the plate with lugs 41 integral therewith and so spaced apart as to include a portion of the contact support 37 between them. The support 37 is provided with notches 42, 65 each for receiving one of the tangs 43 with which the contact 36 is provided. Thus the contact 36 and the support 37 are operatively connected so as to prevent relative movement between these parts in the direction to which 70 the support 37 is moved, but so as to permit relative movement between these parts at right angles to the direction of movement of the support 37. The support 37 is provided with recesses 44 each for receiving a spring 45 75 bearing at one end against the end wall of the recess and at the other end against the concave surface provided by the spherical boss 35. The springs 45 serve yieldingly to press the contact 36 toward the non-conducting 80 cover 30 and to press the support 37 against the plate 40, and the plate 40 against the inside wall of the switch case 20. Thus the springs assist in making good electrical contact between the contact bosses 35 and the 85 concave surfaces 34 of the terminal 31 when the switch is in a circuit making position and serve to yieldingly maintain the bosses 35 in engagement with concave depressions in the non-conducting cover or terminal block 30 90 when the switch is turned off as shown in Figs. 2 and 3. The springs therefore serve not only to make a good electrical contact between the stationary and movable contacts of the switch, but also assist in preventing 95 relative movement between the movable parts of the switch and the switch case, thereby minimizing noise due to the vibration of the switch. This feature is especially desirable where the switch is used on an automobile. 100

To assemble the switch the parts shown in Figs. 4, 5 and 6 are superposed in the order shown. The handle 37 is passed through the hole 39 so that the plate 40 may rest upon the front wall 21 of the switch case. Then the support 37 is assembled upon the plate 40, the springs 45 are placed within the spring sockets 44 and the contact 36 is placed upon the spring and its tangs 43 are passed into the notches 42 of the support 37. The switch case is closed by the cover or back plate 30 and the parts therein are maintained in assembled relation by the cover 30 which is attached to the switch case by means of tangs 50 integral with the side walls 22 and 23 of the switch case. These tangs pass through suitable notches in the edges of the cover 30 and are bent over as indicated by numeral 51 in Fig. 1 against the outer wall of the terminal block and cover member 30.

The block 37 is so shaped that its side portions 46 will be located relatively close to the side walls 22 and 23 of the switch case in order that the side walls of the case will serve as guides for limiting the movement of the contact carrier 37 to linear movement.

While the form of embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. An electric switch comprising a contact carrier, a switch case receiving the carrier and guiding it for bodily movement, an actuating plate within the case and connected with the carrier, an operating member attached to the plate and extending through a wall of the case, stationary contacts supported by the case, a switch movable contact operated by the carrier, and a spring for urging the movable contact toward the stationary contacts and the carrier toward the operating plate for the purpose specified.

2. An electric switch comprising a contact carrier, a switch case receiving the carrier and guiding it for bodily movement, an actuating plate within the case and connected with the carrier and slidable along the interior surface of a wall of the case, an operating member attached to the plate and extending through said wall of the case, stationary contacts supported by the case, a switch movable contact operatively connected with the carrier and movable relative thereto in a direction at right angles to the direction of movement of the carrier, and a spring for urging the movable contact toward the stationary contacts and the carrier against the operating plate and the operating plate against the adjacent wall of the case for the purpose specified.

3. An electric switch comprising a case having a front wall and side and end walls extending rearwardly therefrom, a remov-

able back wall and stationary contacts insulatingly supported thereby, a carrier guided for linear movement between the side walls of the case, a driving plate located between the carrier and front wall, a movable contact located between the carrier and back wall, a driving connection between the driving plate and carrier and between the carrier and movable contact and providing for separation of these parts by relative movement between them transverse to their normal movement, the front and back walls of the case cooperating to maintain these parts in assemblage; and manually operable means attached to the plate and extending through the case front wall.

4. A switch according to claim 3 in which a spring located between the carrier and movable contact urges the movable contact toward the stationary contacts and the carrier and plate toward the front wall of the switch for the purpose specified.

5. An electric switch comprising a contact carrier, a switch case receiving the carrier and guiding it for bodily movement, an actuating plate within the case and connected with the carrier, an operating member attached to the plate and extending through a wall of the case, stationary contacts supported by the case, a switch movable contact operated by the carrier, and a spring disposed between the movable contact and contact carrier for urging the movable contact toward the stationary contacts and the carrier toward the operating plate for the purpose specified.

6. An electric switch comprising a contact carrier, a switch case receiving the carrier and guiding it for bodily movement, an actuating plate within the case and connected with the carrier, an operating member attached to the plate and extending through a wall of the case, stationary contacts supported by the case, a switch movable contact operated by the carrier, and a spring engaging said movable contact and carrier disposed between the movable contact and contact carrier for urging the movable contact toward the stationary contacts and the carrier toward the operating plate for the purpose specified.

7. An electric switch comprising a contact carrier, a switch case receiving the carrier and guiding it for bodily movement, an actuating plate within the case and connected with the carrier, an operating member attached to the plate and extending through a wall of the case, stationary contacts supported by the case, a switch movable contact operated by the carrier, and transversely movable relative thereto, and a spring between the movable contact and carrier for urging the movable contact toward the stationary contacts and the carrier toward the operating plate for the purpose specified.

8. An electric switch comprising a contact carrier, a switch case receiving the carrier, said carrier guided for linear movement between the side walls of the case, a driving plate located between the carrier and front wall, a movable contact located between the carrier and back wall, driving connections between the plate and movable contact including said carrier, and providing for separation of these parts by relative movement between them transverse to their normal movement, the front and back walls of the case cooperating to maintain these parts in assemblage; and manually operable means attached to the plate and extending through the case front wall.

9. An electric switch comprising a contact carrier, a switch case receiving the carrier and guiding it for bodily movement, an actuating plate within the case and connected with the carrier, a reciprocable operating member attached to the plate and extending through a wall of the case, stationary contacts supported by the case, a switch movable contact operated by the carrier, and a spring for urging the movable contact toward the stationary contacts and the carrier toward the operating plate for the purpose specified.

In testimony whereof I hereto affix my signature.

HARRY E. NORVIEL.

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