April 8, 1930. H. E. NORVIEL 1,753,620

ELECTRIC SWITCH

Filed Jan. 28, 1928

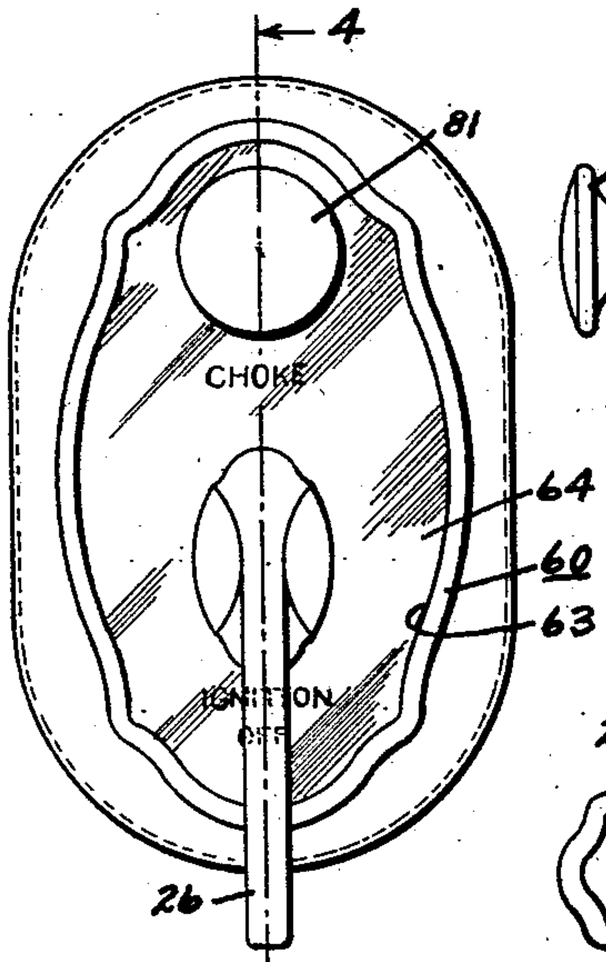


Fig. 1

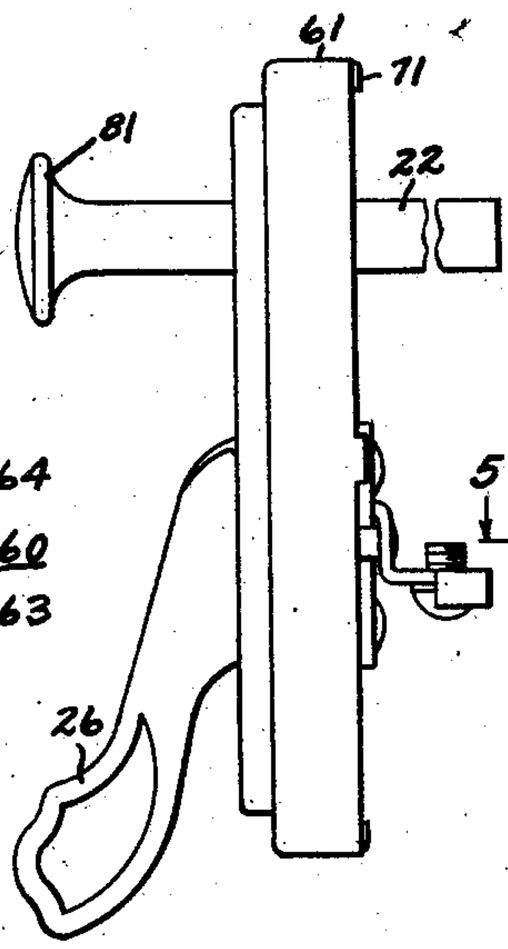


Fig. 2

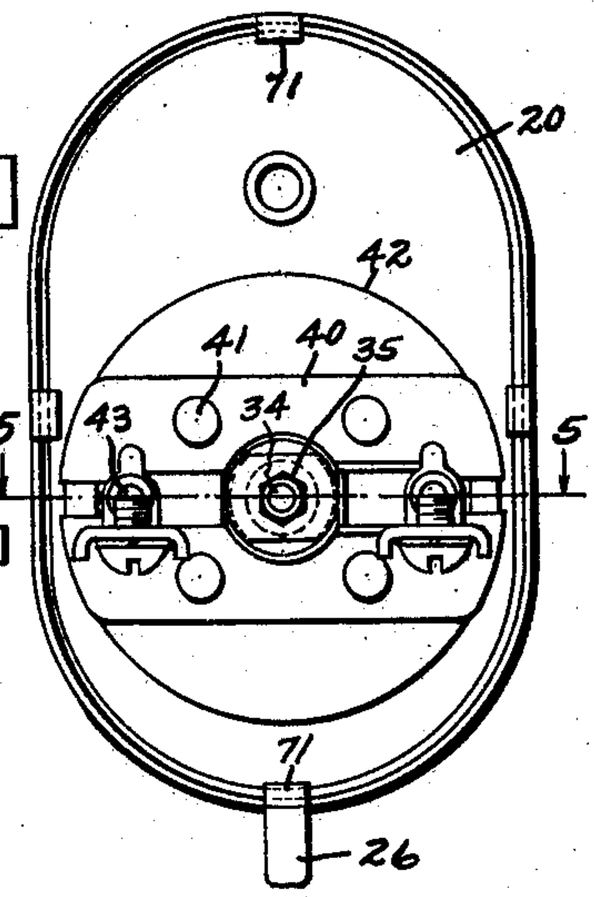


Fig. 3

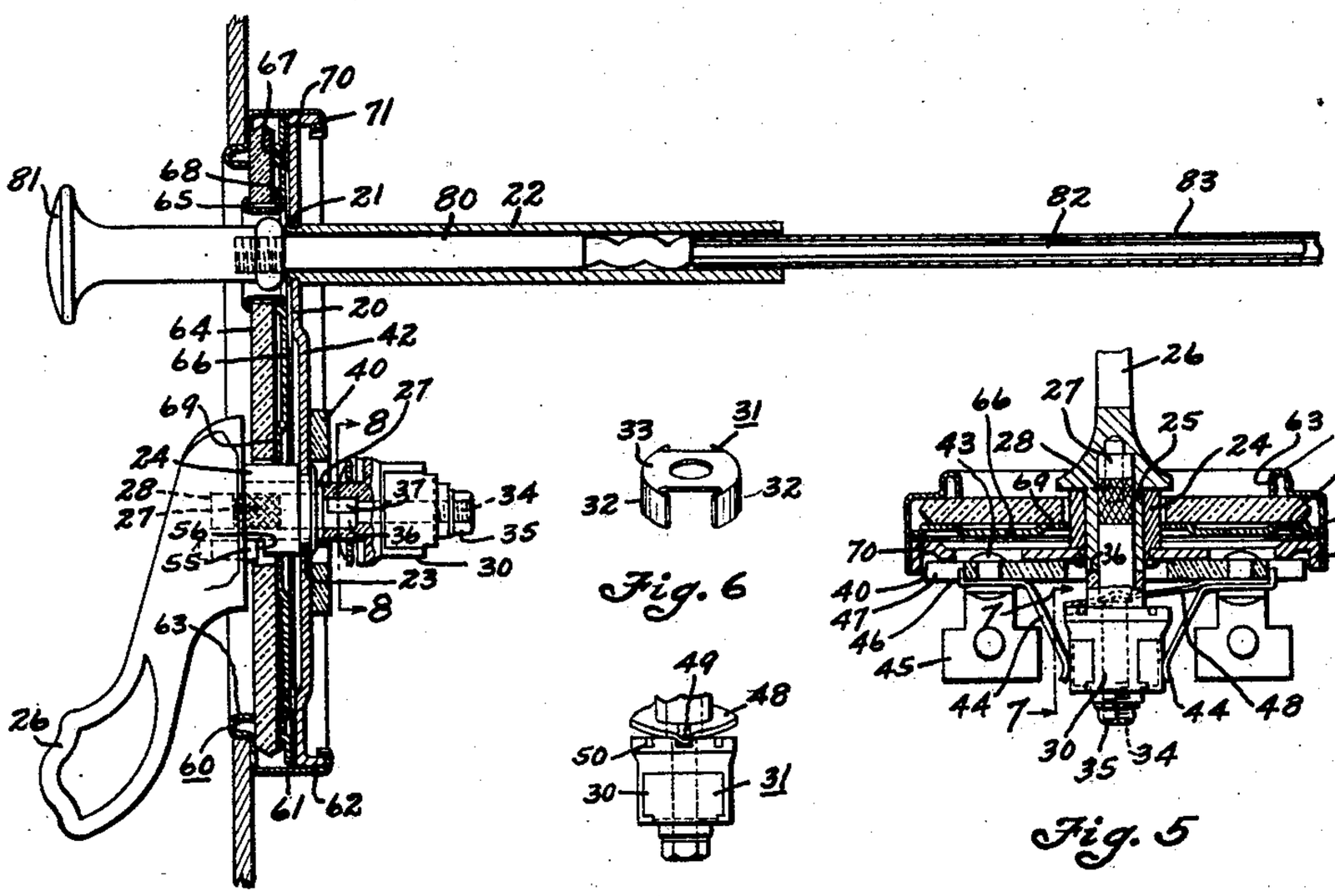


Fig. 4

Fig. 6

Fig. 7

Fig. 5

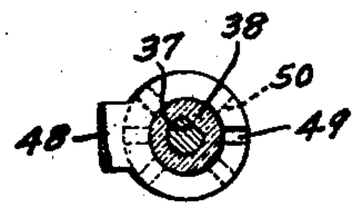


Fig. 8

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UNITED STATES PATENT OFFICE

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ELECTRIC SWITCH

Application filed January 28, 1928. Serial No. 250,103.

This invention relates to electrical switches for automobiles and particularly to switches which are adapted to be mounted upon an instrument panel and to be operated by a lever located in front of the panel and controlling switch contacts located in the rear of the panel.

The present invention has been developed with the aim of simplifying the construction and reducing the cost of manufacture of switches of this type. This aim is accomplished by a construction including a plate formed from sheet metal and provided with a bearing for a shaft extending through the plate and connected at one end with an operating handle and at the other with an insulating contact carrier carrying a movable bridging contact which cooperates with resilient spring blades insulatingly supported upon the side of the plate remote from the handle.

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 invention is clearly shown.

In the drawings:

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

Fig. 2 is a side view.

Fig. 3 is a rear view.

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 1.

Fig. 5 is a sectional view on the line 5—5 of Fig. 3.

Fig. 6 is a perspective view of a metallic insert which is supported by a rotatable non-conducting body or switch contact carrier.

Fig. 7 is a view taken approximately on the plane of the line 7—7 of Fig. 5.

Fig. 8 is a sectional view on the line 8—8 of Fig. 4.

Referring to the drawings, 20 designates the main frame plate of the switch. This plate is formed preferably from flat sheet metal. The plate 20 is provided with an opening 21 for receiving one end of a tube 22 which is attached to the plate and an opening at 23 for receiving a tubular bushing 24 also attached to the plate. The bushing 24 provides a bearing for a shaft 25 integral with the hub of an operating lever or handle 26. The handle 26 is formed preferably by a die casting operation in which the die casting mold is provided with an insert in the form of a rod 27 having a knurled portion 28 about which the material of the hub of the lever 26 contracts on cooling. Therefore for practical purposes the rod 27 may be considered as an extension of the shaft portion 25 of the lever. The rod 27 supports a cylindrical block 30 of non-conducting material in which is embedded, by a molding operation, a metallic insert 31 shown in perspective in Fig. 6. The insert 31 includes cylindrical flanges 32 and a web 33 joining the flanges. The block 30 is provided with a central aperture for receiving the rod 27 which is provided with a threaded end 34 which cooperates with a nut 35 to clamp the block 30 between the nut and the end 36 of the hub of the lever 26. The block 30 is drivingly connected with the lever 26 by providing the rod 27 with a flat 37 engaged by a flat surface provided by the wall portion 38 of the central recess within the block 30 which is provided for receiving the rod 27 as shown in Fig. 8. Therefore the bridging contact member 31 will be rotated by turning the handle 26.

Upon the back of the main frame plate 20 there is mounted a unitary sub-assembly structure which includes the stationary contacts of the switch and a device for yieldingly maintaining the bridging element 31 in either its on or its off position. This sub-assembly structure includes a non-conducting plate 40 which is secured by rivets 41 to a circular boss 42 provided by the plate 20. Rivets 43 secure the plate 40 to the ends of leaf spring conductors 44 and angle-shaped terminal brackets 45. The conductors 44 are prevented from turning about the rivets 43 which secure them by providing the conductors 44 each with a tang 46 which is received by a notch 47 in the plate 40. One of the rivets 43 also secures a detent spring 48 located between the block 40 and one of the conductors 44 as shown in Fig. 5. The free

end of the spring 48 is ring-shaped to permit the end of the spring 48 to surround the block 30 and thereby prevent the turning of the spring relative to the block 40 and also to permit the use of a relatively long spring within a limited space. The ring-shaped end portion of the spring 48 is provided with a projection 49 adapted to be received by any of the notches 50 provided by the block 30. When the handle 26 is turned, the spring 48 will yield and when any of the notches 50 is located in alignment with the projection 49, the projection will cooperate with the notch in order that the contact member 31 may be yieldingly maintained. It is apparent that the handle 26 may be turned in either direction from vertical off position to vertical on position. Rotation of the handle 26 in either direction is limited by providing the handle with a stop pin 55 which is received by an arcuate notch 56 in the bushing 24.

A bezel ring 60 is provided with a flange 61 interfitting with a flange 62 of the plate 20. The bezel ring 60 includes a bead 63 which bears against a sub-assembly structure including a glass dial cover 64 attached by a tubular rivet 65 to a dial 66, the glass cover 64 and the dial 66 having aligned openings for receiving respectively, the tubular rivet 65 and bushing 24. In order to exclude dirt and moisture from the space between the dial 66 and the cover 64, the dial is provided with a bead 67 for engaging the glass 64 near its edge and with annular beads 68 and 69 for engaging the glass near the holes provided therein. A paper gasket 70 is located between the plate 20 and the dial 66. The flange 61 of the bezel ring 60 is provided with tangs 71 which are bent around the flange 62 of the plate 20 in order to secure the bezel ring 60, glass cover 64, dial plate 66 and gasket 70 to the main frame plate 20.

The tube 22 supports a rod 80 having an operating handle 81 and connected with a Bowden wire 82 adapted to slide through a Bowden wire tube 83 attached to the tube 22.

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, in combination, a main supporting plate carrying a bearing, an operating shaft journaled in the bearing and having a handle located on one side of the plate, a non-conducting contact carrier supported by the shaft on the other side of the plate, a bridging conductor carried by the carrier and having contact elements extending along the sides of the carrier, and a sub-assembly structure attached to the plate and comprising a non-conducting plate carrying terminals connected with leaf spring conductors engageable with the contact elements of the bridging conductor.

2. An electric switch according to claim 1 in which the contact carrier is yieldingly maintained in different positions by a leaf spring attached at one end to the non-conducting plate of the sub-assembly and bearing against an end of the contact carrier, said leaf spring and carrier having cooperating projections and recess provisions.

3. An electric switch comprising, in combination, a main supporting plate carrying a bearing, an operating shaft journaled in the bearing and having a handle located on one side of the plate, a non-conducting contact carrier supported by the shaft on the other side of the plate, a bridging conductor carried by the carrier and having contact elements extending along the sides of the carrier, and a sub-assembly structure carried by the said plate and providing terminals connected with leaf spring conductors engageable with the contact elements of the bridging conductor.

4. An electric switch comprising, in combination, a main supporting plate carrying a bearing, an operating shaft journaled in the bearing and having a handle located on one side of the plate, a non-conducting contact carrier supported by the shaft on the other side of the plate, a bridging conductor carried by the carrier and having contact elements extending along the sides of the carrier, and a sub-assembly structure carried by the said plate and providing a leaf spring carried by said sub-assembly and bearing against an end of the contact carrier, said leaf spring and carrier having cooperating projections and recess provisions.

5. An electric switch comprising, in combination, a main supporting plate carrying a bearing, an operating shaft journaled in the bearing and having a handle located on one side of the plate, a non-conducting contact carrier supported by the shaft on the other side of the plate, a bridging conductor carried by the carrier and having contact elements extending along the sides of the carrier, a pair of leaf spring conductors insulatingly supported by said plate and engageable with the bridging contact, a leaf spring secured to the said plate and bearing against an end of the contact carrier, said leaf spring and carrier having cooperating projections and recess provisions.

In testimony whereof I hereto affix my signature.

HARRY E. NORVIEL.