

Jan. 27, 1953

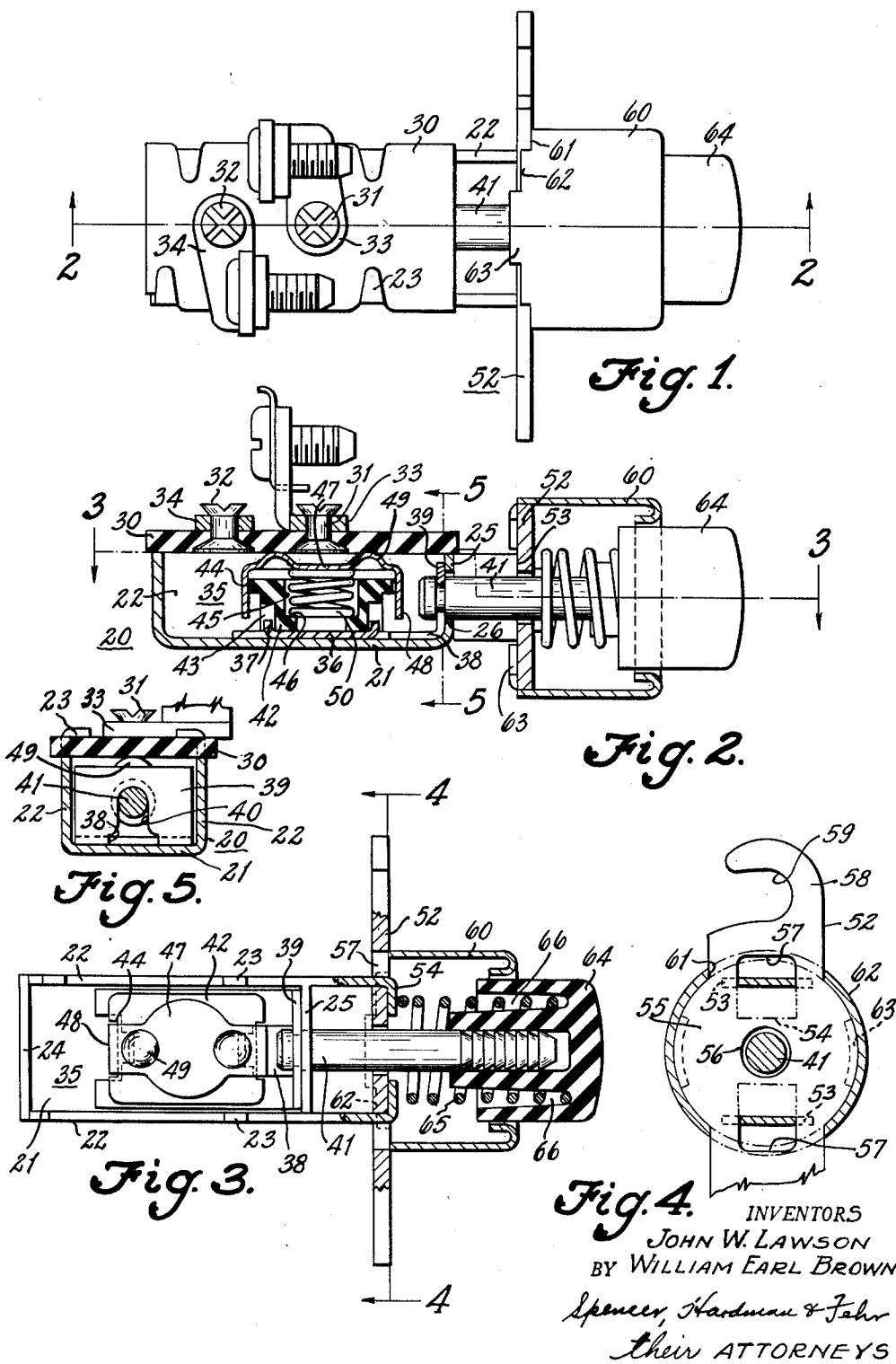
J. W. LAWSON ET AL.

2,627,006

SWITCH MOUNTING

Filed July 16, 1948

2 SHEETS—SHEET 1



Jan. 27, 1953

J. W. LAWSON ET AL

2,627,006

SWITCH MOUNTING

Filed July 16, 1948

2 SHEETS—SHEET 2

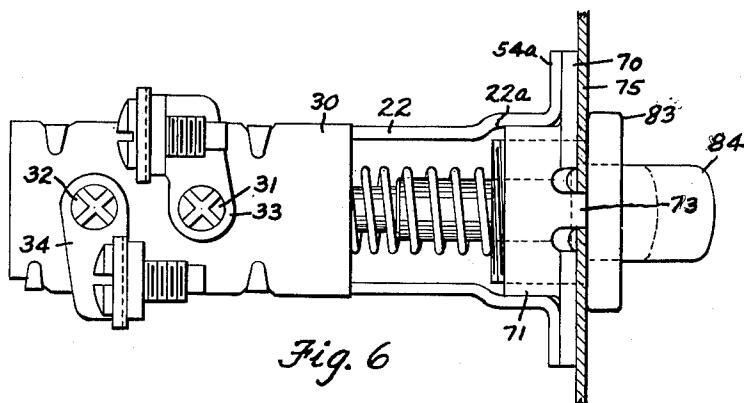


Fig. 6

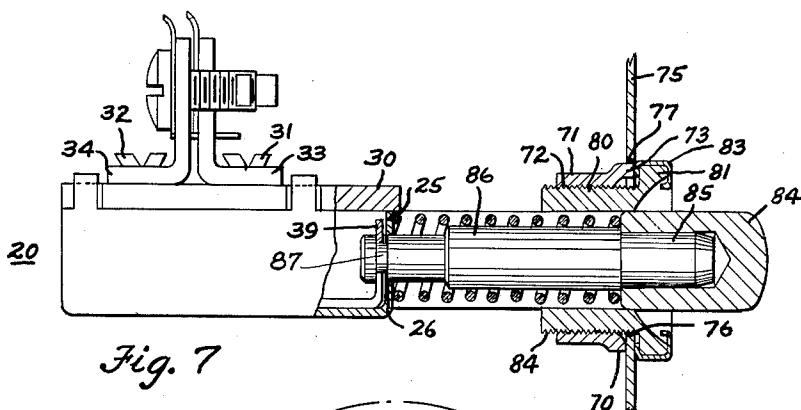


Fig. 7

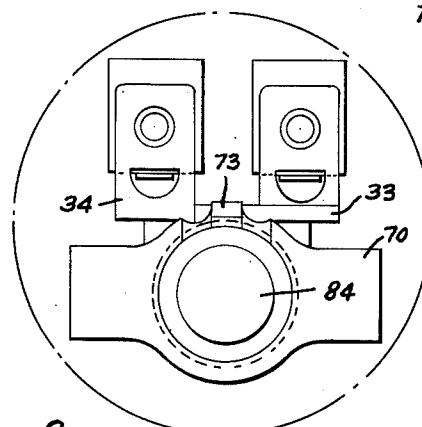


Fig. 8

INVENTORS

John W. Lawson &
BY William Earl Brown
Spencer, Hardman & Fehr
THEIR ATTORNEYS

UNITED STATES PATENT OFFICE

2,627,006

SWITCH MOUNTING

John W. Lawson and William Earl Brown, Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Application July 16, 1948, Serial No. 39,064

3 Claims. (Cl. 200—159)

1

This invention relates to mounting means and is more particularly concerned with means for mounting electrical units, such as switches for vehicles, the present application being a continuation-in-part of our now abandoned former application entitled Switch Mounting, and filed November 15, 1947, under Serial Number 786,288.

An object of the invention is the provision of mounting means for switches and the like in which the attachment of the part to be mounted can be done readily and quickly, yet the attachment is one without the use of screws.

Another object of the invention is the provision of mounting means in which the parts are so constructed by which assembly may be achieved by bending or welding operations.

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 the present invention is herein described.

In the drawings:

Fig. 1 is a plan view of the assembled switch construction.

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2.

Fig. 4 is a sectional view taken on line 4—4 of Fig. 3.

Fig. 5 is a sectional view taken on line 5—5 of Fig. 2.

Fig. 6 is a plan view of a modified form of switch casing and mounting therefore.

Fig. 7 is a side elevation partly in section of the switch casing and mounting shown in Fig. 6 and showing the manner of securing the casing to a support.

Fig. 8 is an end view looking in the direction of arrow 8 of Fig. 7, but indicating a fragment of the support by a dot-and-dash circle.

Referring to the drawing 20 designates a casing preferably stamped from sheet metal by simple punch press operations. The casing is first stamped out flat and then formed to provide a plane bottom wall 21, two spaced parallel side walls 22 carrying sets of spaced tongues or ears 23, and two end walls 24 and 25. When the end walls 24 and 25 are bent upwardly, as viewed in Fig. 2 the inner face of wall 24 will abut the left ends of the parallel side walls 22 and the wall 25 will be located between the side walls 22 which extend to the right a certain distance beyond the wall 25. The end wall 25 is provided with an opening 26. The edges of the walls 22, 24 and 25

2

form a rest for an insulating block or closure 30 having spaced notches on its sides to receive the ears 23. The ears are bent over the outer face of closure 30 to hold the latter in position.

5 The closure in this instance carries two contacts 31 and 32 with which terminal plates 33 and 34 are associated respectively. The contacts 31 and 32 are in the form of rivets, the heads of which are flush with the inner face of the closure.

10 Before the closure is fixed to the casing a movable switching unit 35 is disposed within the confines of the walls 22, 24 and 25 and comprises a metal slide 36 which is shiftably mounted for movement along the bottom wall 21 and guided by the side walls 22. This slide comprises a plate of sheet metal having upturned tongues 37. The slide has a slot 38 in its bottom surface and extending upwardly into an arm 39. The slot in arm 39 is reduced at 40 as clearly shown in Fig. 5. The slots receive the inner end of a rod 41. The width of the slot portion 38 is greater in cross dimension than the diameter of the rod while the width of the slot 40 corresponds to the diameter of the rod where an annular groove is cut. The arrangement is such that when the rod is inserted through the opening and into the casing the slide can be inserted in the casing 20 in such a manner that the end of the rod will pass through the slot 38 and the portion reduced in diameter by the groove will enter the slot 40 in the arm. In this position of the rod 41 the rod will be interlocked with the arm 39 and be capable of moving the slide 36 back and forth along the path of reciprocation within the casing 20.

15 Mounted on the slide 36 is a contact carrier or block 42, of nonconducting material having bottom notches 43 and upper notches 44 and a counterbored opening 45 to provide a shoulder 46. The lower notches 43 are spaced so that they will receive the tongues 37 whereby the block is arrested to move with the slide plate 36. The width of the block is such that it will slide freely between the side walls 22. A bridging member 47 is fitted on the upper face of the block and has end tongues 48 which are reciprocable in the upper notches 44. It will be observed that the bottoms of the notches 44 extend beyond the tongues 37 so that the inner faces of the tongues 48 of the bridging member will not engage the tongues 37 at any time. The upper surface of the bridging member 47 is provided with hemispherical portions 49. A compression spring 50 is disposed within the enlarged portion of the counterbored opening and bears downwardly at

20 25 30 35 40 45 50 55

its lower end against the shoulder 46 to urge the carrier 42 against the slide 36 and the slide against the bottom wall 21. The upper end of the spring bears against the intermediate area of the bridging member 47 to urge the portions 49 against the closure, or against the contact surfaces of rivets 31 and 32 when the rod is moved a certain distance to the left, as viewed in Fig. 2.

As mentioned heretofore the right ends of the side walls 22 project beyond the end wall 25. In this instance these ends are used to attach the casing 20 to a mounting bracket 52. The right ends of the side walls 22 are reduced to provide a shoulder 53 and lugs 54.

The mounting bracket 52 to which the casing 20 is attached has an enlarged central portion 55 having an aperture 56 through which the rod 41 passes and a pair of openings 57 through which project the lugs 54. The lugs are bent over and toward each other to secure the casing to the bracket. If desired the bent over lugs may be spot welded to the support 52. The bracket 52 also is provided with ears 58 having slots 59 which receive bolts extending from a support, not shown, whereby the bracket 52 may be securely fixed.

The mounting bracket 52 supports a ferrule 60. This ferrule has one end thereof notched at 61 to provide a pair of oppositely disposed flanges 62. The flanges are provided with tongues 63. When the ferrule is assembled with the mounting bracket the notched portion of the ferrule rests on the ears 58 and the flanges 62 will straddle the ears and encompass the central area 55 of the bracket. Thus the ferrule is prevented from turning relative to the bracket. The tongues 63 are bent under the bracket to clamp the ferrule to the bracket and to prevent axial movement of the former relative to the latter. The other end of the ferrule is bent inwardly and then downward to provide an internal flange to form a guide bearing for a knob 64 attached to the end of the rod 40.

The rod 64 has a series of sharp teeth formed thereon so that when the knob formed of a thermo plastic material, such as "Tenite" is forced onto the rod the teeth will bite into the material and prevent the knob from coming off the rod 40. A coiled compression spring 65 encircles the rod 41 one end bearing against the bent over lugs 54, while the other end of the spring fits into an annular recess 66 formed in the knob. The spring 65 acts to maintain the rod 41 normally in one of its extreme positions. The ferrule and knob when attached conceal the lugs 54 and the openings 57.

The modified form of the switch structure shown in Figs. 6, 7 and 8 is in certain instances the same as that shown in Figs. 1 to 5 inclusive. Where the parts are identical, such parts have been designated by corresponding numerals of reference and will not be described in further detail. The switch casing 20 is substantially the same as that disclosed for Fig. 1 with these exceptions, the arms 22 which extend beyond the end wall 25, are offset at 22a and the ends or extremities of the arms are bent outwardly, instead of inwardly, to provide flanges 54a. In Fig. 6, however, a plate or bracket 70 takes the place of bracket 52. Plate 70 is pierced and coined to provide a sleeve portion 71 which is later tapped to provide internal threads 72. The plate 70 is also formed with a projection or tang 73 which extends a short distance beyond the outer face of the plate, see Figs. 6 and 7. When

the casing is attached to the plate the offset portions 22a of the arms 22 will straddle the sleeve portion 71 and the flanges 54a will contact the inner face of the plate 70. The flanges 54a are connected to the plate 70 by any suitable connection, such as spot welding.

The bracket or plate 70 is detachably secured to the rear side of a support 75, which support may be an instrument board of an automobile vehicle. The support 75 is provided with an opening 76 having a notch 77 extending therefrom, said notch receiving the tongue 73, to prevent the plate from turning relative to the support when the plate is mounted to the support.

The plate is held in assembled relation with the support 75 by a bushing 80 having an outwardly extending flange 81 which will overlie the opening 76 and the notch 77 to conceal same from view.

Since the flange 81 of the bushing 80 is exposed to view and is usually a part of the decorative hardware on the instrument panel, a shroud 83 is provided to cover the flange 81. The bushing 80 is provided with external threads 84 which cooperate with threads 73 of the sleeve portion 71 to mount the plate 70 to the support 75. When the bushing 80 is threaded home the inner portion of the shroud will bear against the outer face of the support 75 and the outer face of the plate 70 will engage the inner face of the support.

The interior of the bushing 80 forms a guide for a knob 85. This knob has a recess 86 to receive the outer end of a rod or actuator 86, said end is preferably press fitted into the recess, the inner end of the rod is provided with an annular groove 87. When the inner end is passed through the aperture 26 in wall 25 the slot 40 will interengage with the annular groove 87 of the rod 86 to control the slide 36 in the manner described for rod 41 for the modification shown in Fig. 1 to Fig. 5 inclusive.

Before the rod 86 is assembled in position to actuate the slide 36 disposed within the casing 20, a compression spring 90 is placed around the rod 86 so that one end of the spring will engage the outer face of wall 25 and the other end of the spring will extend well within the bushing 80 and engage the inner end of the knob to urge the knob and rod in an outwardly direction. The inner face of the wall 25 acts as a stop for the slide 36, thus limiting the outward movement of the rod or actuator.

While the embodiments of the present invention as herein disclosed, constitute 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 adapted to be mounted in an opening in a panel, comprising a case having a bottom wall, side walls, a first end wall, and a second end wall, said first end wall providing a case closure adjacent to one edge each of the side walls, and said second end wall is between portions of the side walls, said portions of the side walls extending outwardly from the second end wall, a mounting plate connected with the extending portion of the side walls to support the case and adapted to be attached to the back of the panel, a case cover attached to the side walls, contacts supported by the cover, a movable contact for bridging the contacts on the cover, a contact carrier movable on the bottom wall of the case and having a part for engaging the second

end wall, a rod connected with the carrier and extending through the second end wall and the mounting plate, a knob attached to the rod, a spring between the knob and a casing part to urge the said contact carrier part against the 5 second end wall of the case.

2. The combination set forth in claim 1 where-
in the spring is between the knob and a portion
of a side wall of the casing.

3. The combination set forth in claim 1 where- 10
in the spring is between the knob and the second
mentioned casing end wall.

JOHN W. LAWSON.

WILLIAM EARL BROWN.

UNITED STATES PATENTS

Number	Name	Date
960,450	Van Valkenburg	June 7, 1910
1,527,026	Cadieux	Feb. 17, 1925
1,908,204	Winning	May 9, 1933
1,909,585	Jacobi	May 16, 1933
1,910,645	Soreng	May 23, 1933
1,992,924	Pinkus	Feb. 26, 1935
2,145,160	Douglas	Jan. 24, 1939
2,162,895	Mastney	June 20, 1939
2,177,126	Arisman	Oct. 24, 1939
2,193,268	Catron	Mar. 12, 1940
2,223,673	Catron et al.	Dec. 3, 1940
2,259,304	Foster	Oct. 14, 1941
15 2,321,212	Johnson	June 8, 1943

REFERENCES CITED

The following references are of record in the
file of this patent: