July 30, 1963 D. F. WILLCOX 3,099,736

COVER RESET MECHANISM

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Fig. 1

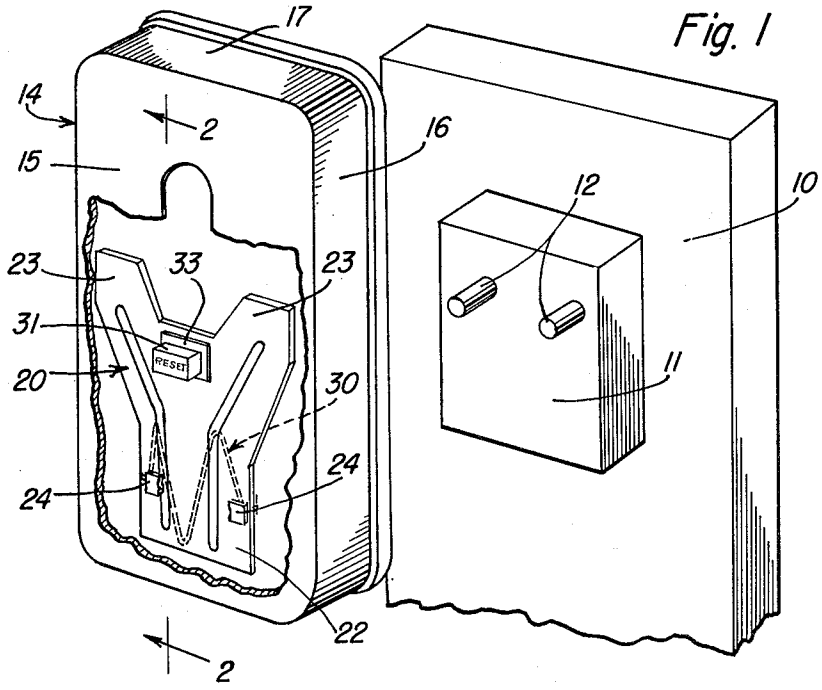


Fig. 2

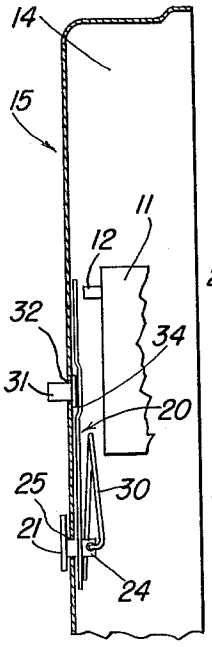


Fig. 3

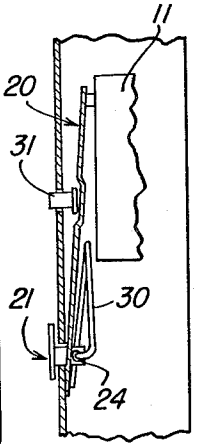
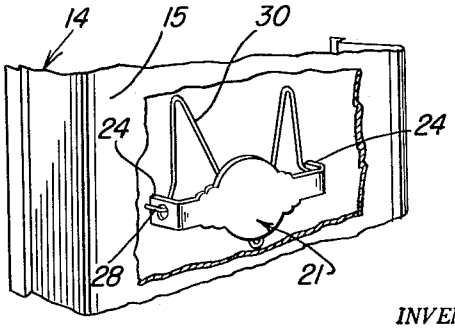


Fig. 4



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COVER RESET MECHANISM

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Fig. 5

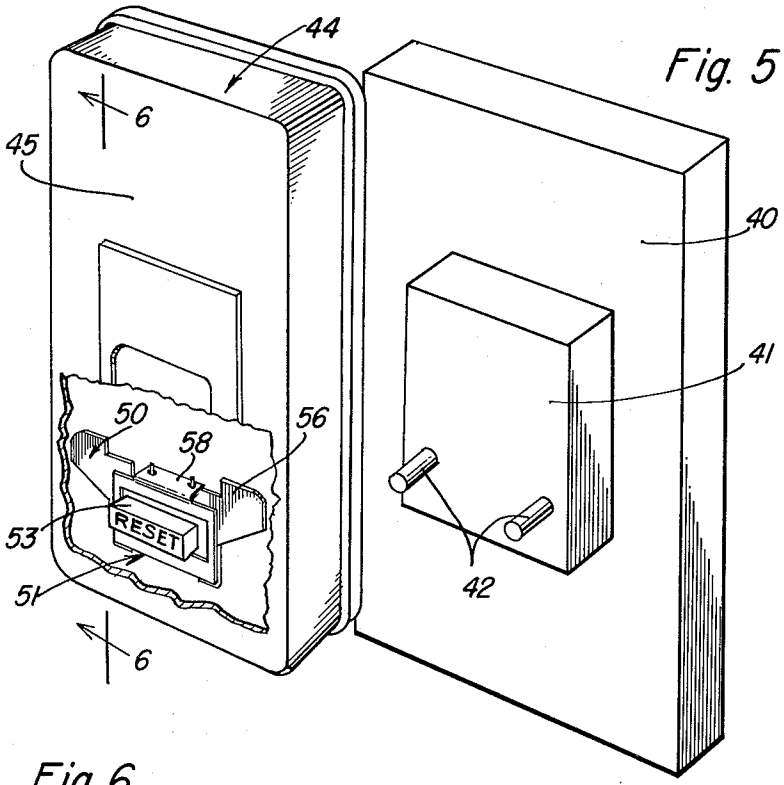


Fig. 6

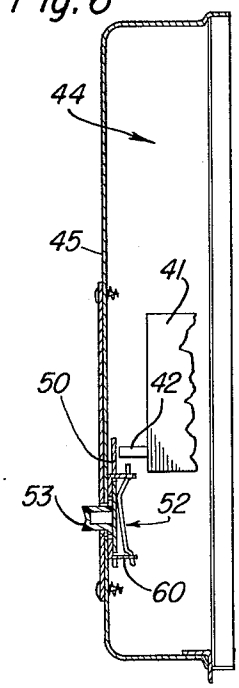


Fig. 7

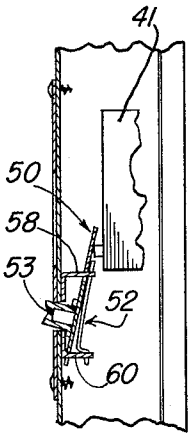
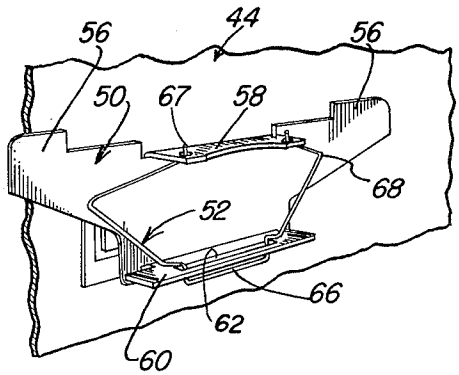


Fig. 8



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COVER RESET MECHANISM

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Fig. 10

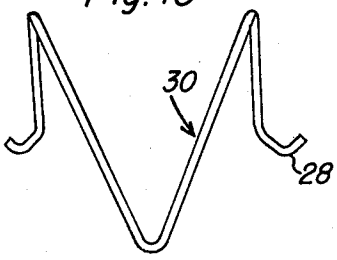


Fig. 9

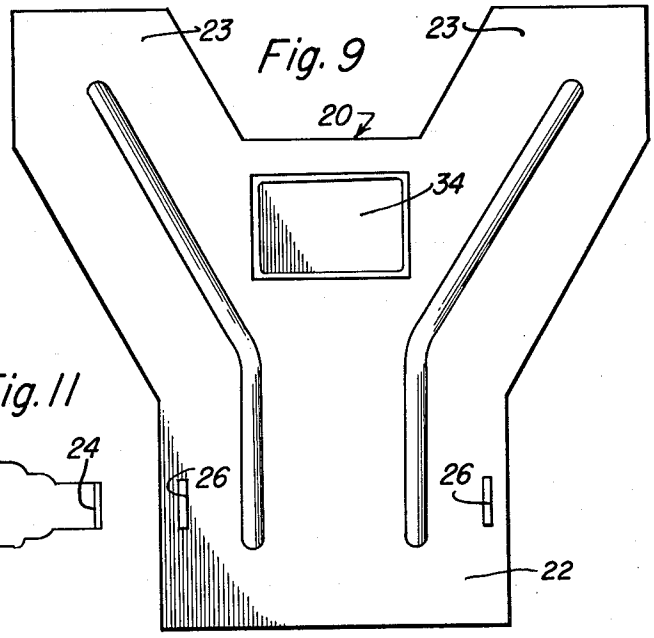


Fig. 12

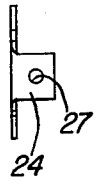


Fig. 11

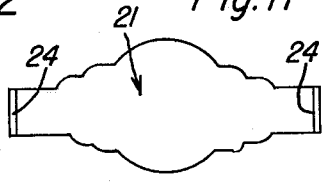


Fig. 15

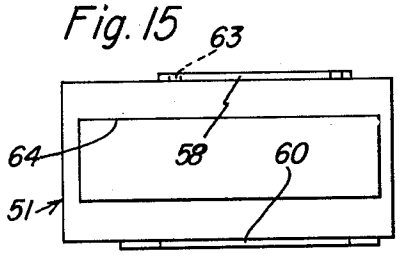


Fig. 14

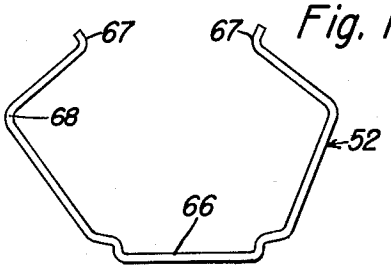
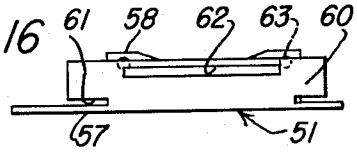


Fig. 16



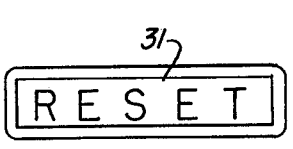
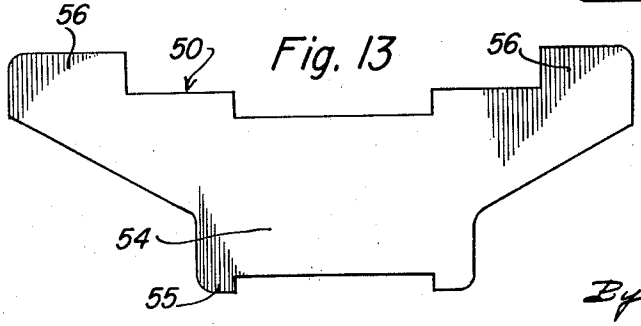




Fig. 17

Fig. 18

Fig. 13



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United States Patent Office 3,099,736 Patented July 30, 1963

3,099,736

COVER RESET MECHANISM

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Filed Sept. 24, 1959, Ser. No. 842,026
4 Claims. (Cl. 200—172)

The invention relates to reset mechanism for electric switches of the thermal overload type and has reference in particular to manual switch resetting means for actuation by the operator for resetting the switch structure in the event tripping should occur due to an overload on the power line or for other reasons.

An object of the invention is to provide relatively simple structure having a minimum of parts and which can be economically manufactured and readily associated with the housing cover for the switch structure and with the switch enclosed thereby so that the resetting plunger of the switch is depressed when the structure is actuated by the operator.

Another object of the invention is to provide a switch resetting device consisting essentially of a plate member in combination with resilient means, and which can be carried by the switch housing cover in line with the resetting plunger of the switch so as to depress the plunger and reset the switch when the plate member is actuated against the yielding force exerted by the resilient means.

Another object is to provide a resetting device for switches of the thermal overload type and which will essentially consist of a plate member in combination with resilient means and a reset button, and wherein the resilient means exerts a yielding force against the plate member to maintain the same in an inoperative position and also assists in pivotally mounting the plate member on the cover of the switch housing.

A further object is to provide a reset device as described which will be carried by the removable switch housing cover and which is maintained in assembled relation on the cover by the resilient spring means so that disassembly of the device for repair or replacement can be readily accomplished by the operator.

Another object resides in the provision of a resetting device wherein the reset button projects through an opening in the switch cover and is retained in place by the pivotally mounted plate member.

With these and various other objects in view, the invention may consist of certain novel features of construction and operation, as will be more fully described and particularly pointed out in the specification, drawings and claims appended thereto.

In the drawings which illustrate an embodiment of the device and wherein like reference characters are used to designate like parts—

FIGURE 1 is a view in perspective showing a switch housing cover equipped with a resetting device coming within the invention, parts of the housing cover being broken away to better illustrate the structural parts of the device;

FIGURE 2 is a longitudinal sectional view taken substantially on line 2—2 of FIGURE 1;

FIGURE 3 is a fragmentary longitudinal sectional view similar to FIGURE 2 but showing the resetting device in a depressed operative position;

FIGURE 4 is a fragmentary perspective view showing the retaining bracket of the resetting device, the same having the resilient means in connected relation therewith;

FIGURE 5 is a view in perspective showing a housing cover for switch mechanism and which is equipped with a modified form of switch resetting device coming within the invention, parts of the cover being broken away to better illustrate the structural details of the device;

FIGURE 6 is a longitudinal view taken substantially along line 6—6 of FIGURE 5;

FIGURE 7 is a fragmentary sectional view similar to FIGURE 6, but showing the resetting device in a depressed operative position;

FIGURE 8 is a fragmentary perspective view showing the retaining bracket for the device of FIGURE 5 with the resilient means in connected relation;

FIGURE 9 is a front elevational view of the plate member for the resetting device of FIGURE 1;

FIGURE 10 is a view showing the resilient spring means for the device of FIGURE 1;

FIGURES 11 and 12 are front and end views respectively, of the retaining bracket for the device of FIGURE 1;

FIGURE 13 is a front elevational view of the plate member for the resetting device of FIGURE 5;

FIGURE 14 is a view showing the resilient spring means for association with the plate member of FIGURE 13;

FIGURES 15 and 16 are front elevational and top plan views of the retaining bracket for the device of FIGURE 5; and

FIGURES 17 and 18 are front and end views of a reset button.

Referring to the switch resetting device of FIGURE 1, the numeral **10** indicates a backing or supporting board for the switch structure **11**. The said switch structure may comprise mechanism such as described and claimed in the Willcox et al. Patent 2,971,072, entitled "Thermal Overload and Reset Assembly." As disclosed in said patent the switch structure incorporates one or more resetting plungers **12** for resetting and closing the switch contacts in the event tripping and opening should occur by reason of an existing overload condition on the power line, or for other reasons. The housing for the switch structure essentially consists of a cover **14** approximately rectangular in shape and having a front wall **15**, side walls **16** and top and bottom end walls **17**. The cover **14** is adapted to be suitably fastened in position on the supporting board **10** so as to enclose and protect the switch structure **11**. Since the resetting plungers **12** are thus concealed and hidden from the operator, it is desirable that the switch housing cover be provided with switch resetting mechanism for convenient actuation by the operator.

In accordance with the invention a plate member **20** is pivotally mounted on the wall **15** of the housing cover **14** by means of the retaining bracket **21**. The plate member **20** has essentially the form of a yoke and includes a base portion **22** and spaced bifurcated arms **23**. The arms span a distance the same as that between the plungers **12**, and considering that the plate member **20** is positioned on the cover with particular reference to the switch structure **11**, it will be understood that the arms **23** are in line with the plungers **12** so as to actuate the plungers when the plate member is rocked on its pivot axis. The bracket **21** is particularly unique as regards the present combination, since it functions as a retaining member for the plate member **20** and also as a name plate or as a medallion for the housing cover.

The bracket **21** is located on the wall **15** of the cover on the outside of said wall and the bracket is loose with respect to the cover, since it is retained in place by the bent end flanges **24** which are best illustrated in FIGURES 11 and 12. The said end flanges are bent rearwardly at right angles with respect to the body portion of the bracket and the said flanges are inserted in spaced slots **25** provided in the wall **15** of the cover for this purpose. The end flanges **24** also extend through the aligned slots **26** in the plate member **20**, FIGURE 9, and each end is provided with an opening **27** for receiving the bent end **28** of the resilient spring means **30**. Accordingly it will

be understood that the plate member 20 is pivotally mounted on the switch housing cover 14 and which pivotal mounting allows limited rocking movement of the plate member for, in turn, actuating the resetting plungers 12. The actuation of the plate member 20 is conveniently effected by the operator by depressing the reset button 31. The reset button extends through an opening 32 located in the wall 15 of the housing cover 14 and the button is provided with an enlarged base portion 33 which is sufficiently larger than the opening 32 to prevent removal of the reset button from the front of the housing cover. The base 33 of the reset button rests against the plate member 20 which may be indented at 34 for accommodating the base portion. It will be understood that when the reset button 31 is depressed by the operator, the plate member 20 will be rocked on its pivot axis against the compressive force exerted by the resilient spring means 30, and thus the reset plungers 12 are also depressed to effect a resetting of the switch.

With the exception of the reset button, the structure of FIGURE 1 consists of only three parts, namely the plate member 20, the retaining bracket 21 and the resilient spring means 30. The body portion of the retaining bracket 21 has a location on the outside of the wall 15 of the cover, whereas the bent flanges 24 extend through the openings 25 in a direction rearwardly of the cover. These end flanges are employed as supporting means for the plate member 20. For this purpose the end flanges extend through the slots 26 and the pivotally mounted plate member is retained on the bracket by the resilient spring means 30. The resilient spring 30 accordingly performs a dual function, since it additionally exerts a compressive force against the plate member 20 to maintain the same in a parallel inoperative position in contact with the cover wall 15. The resilient spring means 30 also functions to limit the degree of rocking movement which can be imparted to the plate member by depressing the button 31. This is the case since the plate in the vicinity of the slots 26 will engage the bent ends 28 of the resilient spring means should the plate member be depressed to this extent. Of course, the parts are so proportioned that the plate member has adequate pivotal movement for depressing the resetting plungers to the extent necessary for resetting the switch.

The parts of the switch resetting mechanism as shown in FIGURE 1 can be easily disassembled by removal of the resilient spring means 30 which is only releasably retained by the flanges 24. Also the parts can be just as easily assembled which requires that the end flanges 24 of the retaining bracket 21 be first inserted in openings 25 in the cover with the plate member 20 being then associated therewith. However, before mounting the plate member on the bracket, it is necessary to insert the reset button through its opening 32 from the rear side of the wall 15, and following this all the parts of the device are retained and rendered operative by the resilient spring means 30, the bent ends 28 of which are inserted through the openings 27 for releasably attaching the resilient means to the retaining bracket.

In the modified form of the invention shown in FIGURE 5 the backing and supporting board 40 has suitably affixed thereto the switch structure 41. As previously described said structure is of the thermal overload type, being characterized by one or more resetting plungers 42. In such a switch, should overload conditions exist in the power line, the switch contacts will be caused to open. For closing the said contacts and to thus reset the switch for operation, it is necessary to depress the plungers 42. As described with respect to the modification of FIGURE 1, the switch resetting mechanism as shown in FIGURE 5 consists of four parts, namely, the plate member 50, the retaining bracket 51, the resilient spring means 52 and the reset button 53. Referring again to the plate member which is best shown in FIGURE 13, it will be seen that the same is substantially in the form of a yoke having a

base portion 54 providing spaced bifurcated lugs 55 and having spaced arms 56. The arms span a distance which is the same as that between the resetting plungers 42 so that with the plate member 50 properly aligned, it will be understood that the arms will contact the plungers for actuating them when the plate member is rocked. Mounting of the plate member on the housing cover 44 is effected by the retaining bracket 51, best shown in FIGURE 16, and which is suitably fixed to the inside surface of the wall 45 of the cover. The bracket essentially consists of a body portion 57 having rearwardly directed top and bottom flanges 58 and 60, respectively. Flange 60 provides the slots 61 at respective ends and also a longitudinal opening 62 is formed in said flange. The two openings such as 63 are formed in the top flange 58. A rectangular opening such as 64 is formed in the body portion 57 of the bracket and this opening accommodates the reset button 53 which projects through the opening to the front of the cover 44. The resilient spring means 52 has a special shape which is required for this modification of the resetting device. The mid-portion 66 of the spring means is bent so as to depend downwardly, FIGURE 14, whereas the terminal ends of the spring means are bent outwardly at 67.

In assembling the parts it will be understood that the retaining bracket 51 is first fixedly secured to the inside surface of wall 45 of the housing cover with the flanges 58 and 60 extending inwardly of the cover. The plate member 50 is then mounted on the bracket by inserting the spaced depending lugs 55 in the slots 61. The slots are sufficiently large with respect to the lugs so as to allow limited rocking movement of the plate member on the bracket. These two parts, together with the reset button 53 are then retained in place by the resilient spring means 52. The said resilient spring is affixed to the retaining bracket by locating the depending portion 66 within the longitudinal opening 62 and by locating the bent terminal ends 67 in the openings 63. Accordingly, in this modification the spring 52 is retained at the top thereof and also at the bottom by the respective flanges of the retaining bracket. The resilient compressive force is applied by the spring at points 68 to the plate member 50 and which points comprise the elbows of this specally bent element.

When the reset button 53 is depressed by the operator it will be clearly apparent that the plate member 50 will be rocked on its pivot axis against the compressive force exerted by the resilient spring means 52. The pivotal movement of the plate member 50 in a direction towards the switch will cause the arms 56 of the plate member to contact the resetting plungers 42 and actuate the same. The reset device of this modification is also releasably carried by the switch housing cover and the same is maintained in assembled relation on the cover by the resilient spring means which accordingly performs a dual function with respect thereto.

What is claimed is:

1. In switch resetting mechanism, the combination with a cover for a switch housing and wherein the switch within the housing has a resetting plunger, of a retaining bracket providing a pair of spaced flanges, said bracket being releasably carried by the cover by having the body portion of the bracket in contact with the outside surface of the cover and with the flanges extending through openings in the cover, whereby the flanges project inwardly toward the switch within the housing, a flat plate member supported by the flanges of the retaining bracket in a manner permitting limited pivotal movement of the plate member about an axis transversely of the plate member and adjacent the lower end thereof, an arm provided by the plate member at the upper end thereof and which is aligned with the resetting plunger, resilient spring means releasably fixed to and carried by the said inwardly projecting flanges at locations inwardly beyond the pivot axis, whereby the resilient means applies a resilient com-

pressive force against the plate member to yieldingly hold the plate member in flat contact with the inside surface of the cover, and actuating means extending exteriorly through an opening in the cover for effecting pivotal movement of the plate member whereby to actuate the resetting plunger.

2. In switch resetting mechanism, the combination with a cover for a switch housing and wherein the switch within the housing has a resetting plunger, of a retaining bracket carried by the cover and providing a pair of spaced flanges which project from the inside surface of the cover towards the said switch, a flat plate member pivotally supported by the one of said flanges which is farthest removed from the resetting plunger, whereby the plate member may have limited pivotal movement about an axis transversely of the plate member and adjacent the lower end thereof, an arm provided by the plate member at the upper end thereof and which is aligned with the resetting plunger, resilient spring means releasably fixed to and carried by the said flanges at locations inwardly beyond the pivot axis, whereby the resilient means applies a resilient compressive force against the plate member to yieldingly hold the plate member in flat contact with the inside surface of the cover, and actuating means for effecting pivotal movement of the plate member whereby to actuate the plunger, said means including an exterior reset button extending through an opening in the cover and having a base part confined between the cover and the plate member.

3. In switch resetting mechanism, the combination with a cover for housing a switch, of a retaining bracket providing a pair of spaced flanges each having an opening therein, said bracket being carried by the cover with the flanges projecting inwardly, a flat plate member located adjacent the inside surface of the cover and being releasably supported by the flanges of the retaining bracket in a manner permitting limited pivotal movement of the plate member about an axis transversely of the plate member, resilient spring means engageable in said openings and thus being releasably fixed to said flanges at locations inwardly beyond the said pivot axis, whereby the

resilient means applies a resilient compressive force against the plate member to yieldingly hold the plate member in flat contact with the cover, and actuating means for effecting pivotal movement of the plate member including a reset button extending through an opening in the cover and having a base part of larger size than the opening and which is confined between the cover and the plate member.

4. In switch resetting mechanism, the combination with a cover for housing a switch having a resetting plunger, of a retaining bracket providing a pair of spaced flanges each having an opening therein, said bracket being carried by the cover with the flanges projecting inwardly, a flat plate member located adjacent the inside surface of the cover and being releasably supported by the flanges of the retaining bracket in a manner permitting limited pivotal movement of the plate member about an axis transversely of the plate member and adjacent the lower end thereof, an arm provided by the plate member at the upper end thereof and which is aligned with the resetting plunger, resilient spring means engageable in said openings and thus being releasably fixed to and carried by the said flanges at locations inwardly beyond the pivot axis, whereby the resilient means applies a resilient compressive force against the plate member to yieldingly hold the plate member in flat contact with the cover, and actuating means for effecting pivotal movement of the plate member to actuate the resetting plunger, said means including a reset button extending through an opening in the cover and having a base part of larger size than the opening and which is confined between the cover and the plate member.

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