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COVER RETAINING MEANS FOR ELECTRIC SWITCH HOUSINGS

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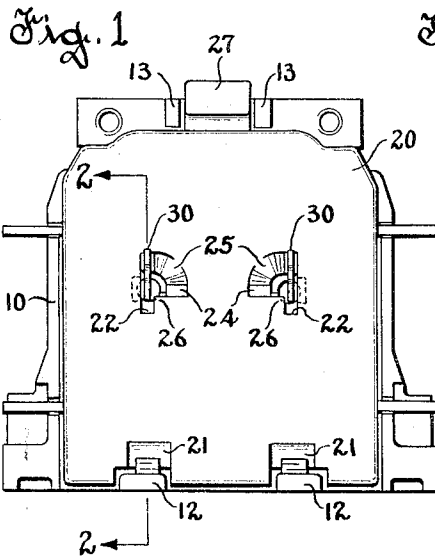
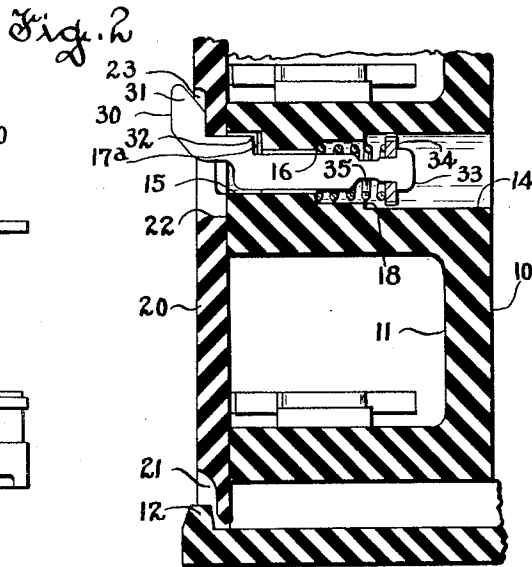


Fig. 3

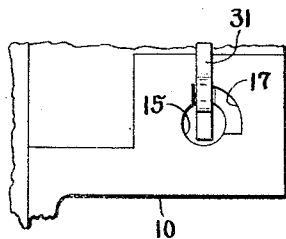


Fig. 4

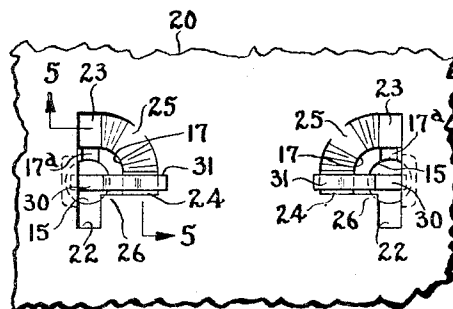


Fig. 5



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1

2,765,382

COVER RETAINING MEANS FOR ELECTRIC SWITCH HOUSINGS

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6 Claims. (Cl. 200-168)

This invention relates generally to electric switches and more particularly to improved means for retaining the covers on switch housings.

In U. S. Patent No. 2,672,536, granted March 16, 1954, and assigned to the same assignee as the instant application, there is shown and described an electric switch in which the contacts are enclosed in molded insulating housings having flat quick-detachable covers. Although these housings are entirely satisfactory for the purposes intended, I have found that the cover retaining arrangement may be improved in certain respects.

Accordingly it is an object of this invention to improve the cover retaining means for certain types of switch housings.

Another important object of the invention is to provide for a switch housing improved cover latching means which lock the cover against accidental disengagement from the housing.

Other objects and advantages of the invention will readily appear to those skilled in the art after study of the following detailed specification and claims.

In the drawings, Figure 1 is a view in elevation of a switch contact block incorporating the invention;

Fig. 2 is an enlarged sectional view of a portion of the contact block and cover assembly, showing some of the details of the cover latching and locking mechanism;

Fig. 3 is an enlarged fragmentary view of the contact block or housing, showing the cover latch bar in one of its two operating positions;

Fig. 4 is an enlarged fragmentary view of the housing cover shown in Fig. 1, illustrating the cover securing mechanism in the other of its two positions; and

Fig. 5 is a developed sectional view taken along the line 5-5 of Fig. 4.

Referring first to Fig. 1 of the drawings, it will be seen that the contact block used to illustrate a preferred embodiment of my invention comprises a molded insulating housing or base 10 and a flat molded insulating cover plate 20. The housing has formed therein a plurality of contact receiving cavities 11 (see Fig. 2) the open side of which is adapted to be closed by the cover plate 20. It also contains a pair of rigid catches 12, a pair of rigid upstanding keepers 13, and a pair of cavities 14 for receiving movable latching and locking bars 30. Depressions 21 and openings 22 are provided in the cover plate for cooperating respectively with said catches 12 and said latch bars 30. The cover is also provided with a handle portion 27 molded integrally therewith at its upper end.

The latch bars 30 are preferably stamped from metal or other durable material. They have at one end a hook-shaped latch portion 31 for engaging and holding the cover plate 20, and a shoulder portion 32 which is adapted to abut against a part of the base 10 to limit movement of the member 30 through opening 15 into the cavity 14.

The other end of the latch bar is provided with a T-shaped portion 33 which is adapted to receive and retain

2

a slotted disk 34. A coil spring 35 is held in compression between said disk and the shouldered portion 16 in the cavity 14 to bias the latch portion 31 toward the housing 10.

Referring to Fig. 3, it will be seen that the opening 15 has contiguous thereto a shallow arcuate extension 17 for receiving the latch bar shoulder portion 32. This extension is of just sufficient depth to permit it to be free of the shoulder portion 32 when the hook portion 31 is holding the cover 20 in place. This insures that the cover will be held in place by the full force of spring 35. The extension 17 is limited to an arc of 90° to provide stops for positively limiting movement of said latch bar.

A depression or slot 17^a is provided in the lower face of the extension 17, as best illustrated in Figs. 2-4. When the cover plate 20 is removed, the latch bar shoulder portion 32 will move into said slot 17^a. This locks the latch bar 30 against rotation and insures that it will be properly aligned for cover plate replacement.

It should be noted that the cover plate openings 22 are elongated to permit insertion therethrough of the latch hooks 31 when said hooks are in the position shown in Figs. 1-3. Molded into the cover plate 20 adjacent each of said openings is a cam surface which cooperates with the latch bar hook portions 31 to retain said latch bar in one or the other of two operating positions. This cam surface is shown in projection in Fig. 5. It comprises two depressed portions 23, 24 and a central elevated portion 25.

When the cover plate 20 is in place on the housing 10 the hook portion 31 will normally remain in one or the other of said depressed portions under the bias afforded by the spring 35. However, by manually rotating the latch bar it may be readily cammed up over the projection 25 against said bias to be moved from one operating position to the other.

In Figs. 1-3 the latch bar is shown in its first or normal operating position. In this position the cover plate is quickly attachable to the housing by placing it loosely on the housing with the latch bars projecting through the openings 22 and then sliding the cover along the housing to cam the latch hooks up into the depressions 23, at the same time slipping the depressions 21 under the catches 12. The upper edge of the cover plate will at the same time be moved over the keepers 13. This will permit the cover plate to move in against the housing where it will be retained by the combined action of the catches 12, the keepers 13 and the spring-biased latch bars 30 unless a severe external shock should jar it loose.

While the latch hooks 31 continue to rest in the cam depressions 23 the cover plate is quickly detachable from the housing. By grasping the handle portion 27 and pulling outwardly the latch bars 30 will be moved against their bias to permit the upper end of the cover to be moved outwardly away from the keepers 13. The cover can then be moved in a generally upward direction to lift it clear of the latch hooks 31 and the catches 12.

The instant invention also provides for locking the cover plate against quick detachment as above-described. By rotating the latch bars 30 to the positions thereof shown in Fig. 4 the cover plate 20 can no longer be removed by a mere outward or sidewise pull upon its handle 27, nor by shock. When the latch hooks 31 are positioned in the cam depressions 24 (Figs. 1 and 4) removal of the cover plate is positively prevented by interference between the cover plate and the latch bars. Although the cover plate 20 continues to be movable outwardly until the discs 34 engage the recess shoulders 18, upward movement of the cover plate 20 free of the catches 12 is blocked by engagement of the cover plate portions 26 with the respective shank portions of the latch hooks

31. At the same time the aforementioned elevated cam portion 25 in combination with the downward bias afforded by the spring 35 will prevent the latch bars 30 from returning to the normal or disengageable position shown in Figs. 1, 2 and 3.

It has been found that the mechanism above described performs exceptionally well the dual function of providing a quick-attachable and quick-detachable fastening means and a locking means for the cover plates of electric switch blocks, and although only one embodiment of the invention has been illustrated and described it is to be understood that the invention includes such other embodiments as come within the spirit and scope of the appended claims.

I claim:

1. In an electric switch housing wherein a molded contact receiving base is adapted to be closed by a flat cover plate, means providing for quick attachment, detachment and locking of said cover plate with respect to said base comprising, a latch bar movably mounted on said base within the area occupied by said cover plate and biased in a direction for holding said plate in engagement with said base, said latch bar including a hooked portion which in one position of said latch bar is adapted to slidably engage and disengage a portion of said cover plate when said plate is moved along said base into and out of closing position, and said hooked portion after engagement with said cover being movable to another position in which it is adapted to engage another portion of said cover for locking said cover against disengagement therefrom.

2. In an electric switch housing, a contact receiving base; a flat cover plate adapted for closing an open side of said base; projecting members on said base for preventing sliding movement of said plate when in position on said base; and means cooperable with said projecting members for effecting quick-attachment, quick-detachment or locking of said cover plate with respect to said base, said means comprising, a latch bar movably mounted on said base within the area occupied by said cover plate and biased in a direction for holding said plate in engagement with said base, said latch bar including a hooked portion which in one position of said latch bar is adapted to slidably engage and disengage a portion of said cover plate when said plate is moved along said base into and out of closing position, and said hooked portion after engagement with said cover being movable to another position in which it is adapted to engage another portion of said cover for locking said cover against disengagement therefrom.

3. In an electric switch, in combination, a contact block; a quick-attachable and quick-detachable cover plate for said block, said block and said plate having interlocking portions for preventing relative sliding movement when said plate is in position on said block; and latch bar means on said block within the area occupied by said cover plate, said means in one position thereof being slidably engageable and disengageable with said cover plate to effect quick retention and release thereof, said latch

bar after engagement with said cover plate being movable to another position in which disengagement of said cover plate is prevented.

4. In an electric switch, in combination, a contact block; a quick-attachable and quick-detachable cover plate for said block, said block and said plate having interlocking portions for preventing relative sliding movement when said plate is in position on said block; and latch bar means on said block within the area occupied by said cover plate for holding said cover plate in engagement therewith, said latch bar means being rotatable between two positions of rest and including a hooked portion which is biased toward said block, said hooked portion in one of said positions being slidably engageable with said cover to effect retention thereof on said block while permitting quick release thereof by outward sliding movement of said cover, and in the other of said positions being rendered effective to lock said cover against release from said block.

5. In an electric switch, in combination, a base; a quick-attachable and quick-detachable cover plate for said base; and latch bar means on said base located within the area occupied by said cover plate and adapted for biasing said plate against said base, said latch bar being movable to a first position in which it is slidably engageable with and disengageable from said cover plate and after engagement with said cover plate being movable to a second position which does not permit disengagement of said plate.

6. In an electric switch, in combination, a flat cover plate; a base having an opening to be closed by said plate; catch members on said base at one side of said opening for cooperation with one edge of said plate to limit movement thereof to a given direction; keeper members on said base at the other side of said opening for preventing movement of the plate in said given direction when said plate is in engagement with said base between said catch and keeper members; and a pair of spring-biased latch bars mounted on said base between said catch members and said keeper members, said latch bars having hooked portions for holding said plate against said base between said members, said hooked portions when extending in the direction of said keeper members being slidably engageable with portions of said cover plate to effect retention thereof between said catch and keeper members until said plate is lifted clear of said keeper members, and at least one of said hooked portions after engagement with said cover plate being rotatable to another position which does not permit release of said plate upon its being lifted clear of said keeper members.

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