March 21, 1944. R. POPP 2,344,788

ELECTRIC SWITCH

Filed Aug. 18, 1941

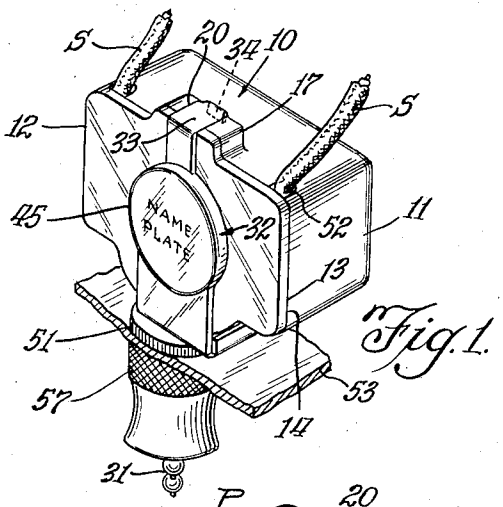


Fig. 1.

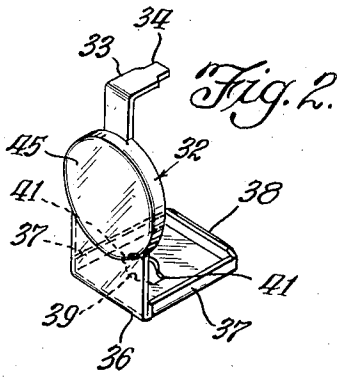


Fig. 2.

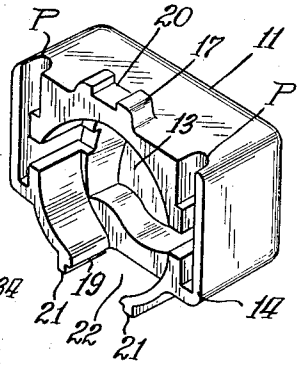


Fig. 3.

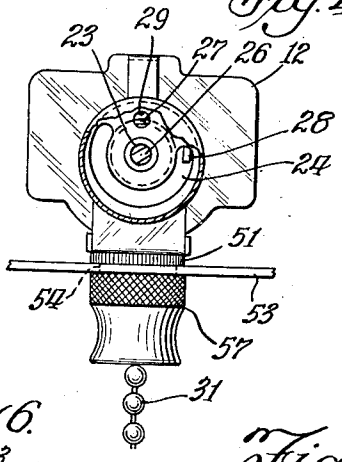


Fig. 4.

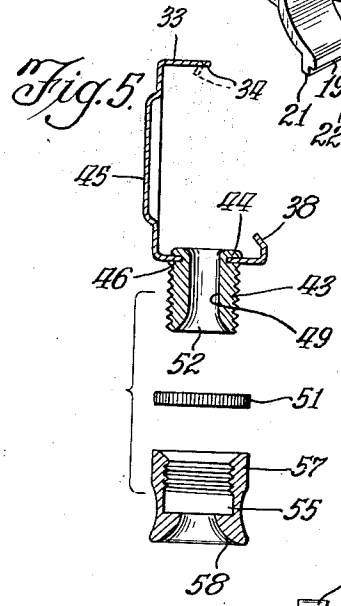


Fig. 5.

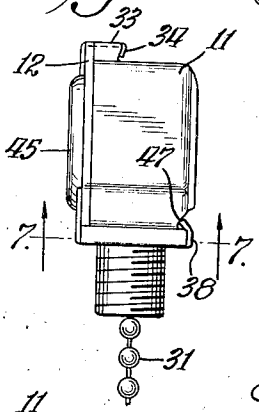


Fig. 6.

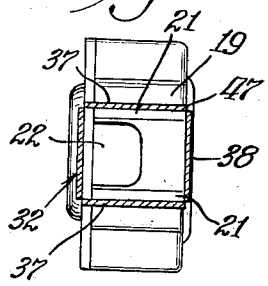


Fig. 7.

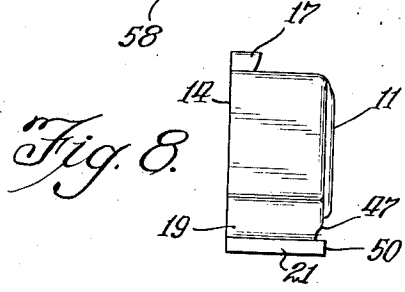


Fig. 8.

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ELECTRIC SWITCH

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Application August 18, 1941, Serial No. 407,260

5 Claims. (Cl. 200—168)

This invention relates generally to electric switches and in particular to an electric switch unit adapted for use in canopies or the like.

In some forms of the switches in the prior art adapted for use in canopies and including a non-metal casing composed of molded insulating material the casing, in the mounting of the switch unit, is drawn directly against the canopy wall or panel so as to be subjected to appreciable pressures on tightening of the holding means associated with the mounting nipples usually provided in switches of this type. Since the non-metal casings are relatively brittle and comprised of rather thin walls, these pressures often times crack or break the casing so as to either render the switch entirely useless or to greatly reduce its service life. Likewise, breakage occurs in the complete assembly of the switch.

In other forms of prior switches employing molded housings, particularly those which are pull-chain operated, metal portions are provided on the complete housings in an effort to provide greater sturdiness to the entire device, but the assembly of such switches has been clumsy and inefficient, and the final device has not been as compact and rigid throughout as it should be for maximum effectiveness. Furthermore, such devices have required guide means for the pull chain which is expensive.

It is an object of this invention, therefore, to provide an improved electric switch.

It is another object of this invention to provide an improved electric switch adapted for use in canopies or other like places.

Another object of this invention is to provide an electric switch adapted for use in canopies or the like, having a non-metal casing with metal means thereon arranged and constructed for rapid original assembly with the casing, acting to support the casing in the canopy entirely out of contact with the canopy wall and switch mounting means, and adapted to provide an efficient, inexpensive guide for a pull chain for the switch.

A further object of this invention is to provide a switch casing comprised of separable non-metal parts and a metal retaining bracket which are constructed for easy assembly and adapted to be retained in their relative assembly positions by simply bending over a portion of the metal bracket against a coacting portion of one of the non-metal separable parts.

Another feature of this invention is found in the provision of a switch for mounting on a panel having a separable non-metal casing held in assembly by a metal bracket which is connected directly to an exposed threaded mounting portion of the switch having a bell-mouth therefor for directly guiding a pull chain for the switch from any position. The metal bracket unit is quickly assembled into the casing and serves not only for a mounting and chain guide means for the switch, but also to retain the various parts of the switch in a rigid assembled condition.

Further objects, features and advantages of this invention will become apparent from the following description when taken in connection with the accompanying drawing in which:

Fig. 1 is a perspective view of the complete switch unit of this invention shown in a mounted position on a supporting panel;

Fig. 2 is a perspective view of the metal means for retaining the non-metal separable parts of the switch casing in an assembly relation;

Fig. 3 is a perspective view of one of the separable casing parts showing in particular the portions thereof adapted for coacting engagement with the metal retaining member;

Fig. 4 is an elevational view of the complete switch unit with parts thereof broken away to show the construction of the other separable casing member and its coacting assembly with a portion of the switch mechanism;

Fig. 5 is an exploded sectional view illustrating the assembly of the metal retaining member and the means for mounting the switch unit to a panel or canopy wall;

Fig. 6 is an end elevational view of the complete switch unit;

Fig. 7 is a sectional view taken along the line 7—7 in Fig. 6; and

Fig. 8 is an end view of the casing member shown in Fig. 3.

As is shown in Fig. 1 of the drawing the switch unit of this invention includes a non-metal casing or housing 10 composed of molded, or like composition material, and having a pair of separable parts or members 11 and 12. The member 11 (Fig. 3) is of hollow construction and of substantially rectangular block form, with the cavity 13 therein being open on the side 14 thereof. The top of the member 11, as viewed in Fig. 3 is integrally formed with an upwardly extending projection 17 at the open side 14 thereof which is provided with a groove 20 therein for a purpose to be later noted. The bottom of the member 11 (Figs. 3, 4 and 8) is integrally formed with a downwardly extending projection 19 which is arranged adjacent the open side 14 opposite the projection 17. As is clearly shown in Figs. 3 and 7, the projection 19 is

of substantially rectangular shape and is provided with a pair of parallel oppositely arranged flange or guide portions 21 having an opening 22 therebetween communicating with the cavity 13 in the member 11.

The second casing member 12, Fig. 1, is of substantially flat form and constitutes a cover for closing the open side 14 of the casing member 11. The member 12, when in assembly position, serves as a part of the supporting means for the switch mechanism located within the cavity 13 of the housing 10. Thus, as is shown in Fig. 4, the member 12 is formed substantially centrally thereof with an aperture 23 and an arcuate slot 24 concentric therewith. The aperture 23 rotatably supports one end of an axis 26 for the switch spring 27, the action of which is limited in one direction by the engagement of a spring stop portion 28 at one end of the slot 24. An aperture 29 adjacent the aperture 23 is adapted to receive one end of the spring 27 to provide for the winding thereof on pulling of the switch chain 31. When the chain 31 is manipulated to wind the spring the stop portion 28 is moved in a clockwise direction in the slot 24, as viewed in Fig. 4, until the switch is snapped, with the rest position of the switch being defined by the return of the portion 28 to its position also shown in Fig. 4.

The separable casing parts 11 and 12 are held together in an assembly relation by a metal strap or bracket member 32 of substantially U-shape (Fig. 2). The end portion 33 of the strap 32 is positioned in the groove 20 in the projection 17 on the casing member 11, while the reduced section 34 at the extreme end of the portion 33 is bent to an angle less than 90° with the portion 33 in final assembled condition to overhang the projection 17 for a purpose to be later noted. The original position of the portion 34 is shown in Figs. 2 and 5, with the changed, finally formed position in dotted lines in Fig. 5. The opposite end 36 of the strap 32 is of enlarged section and is integrally formed with a pair of laterally extending side flange portions 37 and a laterally extending end flange portion 38 with a fastening lip on the end thereof as shown in Figs. 5 and 6, particularly. An opening 39 is provided in the end portion 36 within the boundary of the flanges.

The opening 39 is formed with oppositely positioned peripheral recesses 41 and is adapted to receive therein one end of a tubular threaded mounting member or nipple 43. The end of the mounting member 43 fitting within the opening 39 is of a reduced section and is bent or peened back against the plate end 36 to form an annular shoulder 44, the plate end 36 being firmly clamped between this shoulder 44 and a shoulder 46 provided on the member 43, as is clearly shown in Fig. 5. During the peening of the bushing end, portions of the annular shoulder 44 are wedged within the offset peripheral recesses 41 of the aperture 39 in the end plate 36 to provide a rigid assembly and eliminate any later rotation of the member 43 relative to the plate 32. The peening provides a substantially bell shape for the bore 49 at that end to guide the movement of the chain 31 therein. By virtue of this construction and assembly of the members 32 and 43 it is evident that the member 43 is firmly secured at one end thereof solely to the metal strap 32.

In the assembly of the casing 10, and after the switch mechanism has been positioned therein, the casing member 12 is positioned over the open side 14 of the casing member 11 and in operative relation with the switch spring mechanism in the manner above described. With the casing members 11 and 12 thus relatively assembled, the lip of the flange 38 is hooked behind the flange 50 of the casing at the recess 47, and the strap as a whole is tipped toward the casing to a position with the flange portions 37 straddling the guide portions 21 (Fig. 7). The end portion 33 of the metal member 32 in the meantime has been pressed past the top of the casing so that it snaps into and lays in the groove 20 as shown in Fig. 1. The normal tension in the metal member 32 provides for the frictional engagement of the end portion 33 thereof with the projection 17 so as to hold the casing members in assembly relation while the end 34 is bent downwardly in clamping engagement over the projection 17 as is clearly shown in Figs. 1, 5 and 6, the full lines in Fig. 5 indicating the unbent position of the end 34, and the dotted lines the bent position thereof.

The openings 22 and 39 and the bore 49 in the member 43 are all in alignment so that the switch chain 31 can be inserted therethrough for engagement with the switch mechanism within the housing 10. The switch leads S (Fig. 1) are extended into the casing 10 through slots P formed in the member 11. It is thus seen that the casing members 11 and 12 and metal bracket 32 are relatively constructed to provide for their easy assembly which is retained simply by bending the bracket portion 34 over the portion 17 of the casing member 11. The metal strap 32 completely supports the nipple, or tubular member 43 in a spaced relation with the casing 10. Mounting conditions vary widely for canopy type switches and in many installations a relatively thin mounting nut as 51 (Fig. 5) is sufficient. The nipple 43 is provided with a bell mouth 52 at its outer end to provide a smooth guideway for the chain 31 when operated from all directions. With the nipple rigidly secured to the bracket 32 all bearing pressure of the chain on the nipple is taken up by the metal.

An annular portion 45 on the metal member 32 intermediate the ends thereof fits over the openings 23, 24 and 29 in the casing member 11 to completely enclose the switch mechanism in the housing 10. As indicated in Fig. 1 the portion 45 may be conveniently used as a name plate.

Prior to the mounting of the switch unit on a canopy wall or like panel, indicated at 53, the relatively thin holding or locking nut 51 (Figs. 1, 4 and 5) is threaded on the nipple 43 and snugly against the end portion 36 of the metal bracket 32. The nipple 43 is then inserted through an opening 54 provided in the panel 53 so as to extend outwardly from the outer side thereof, with the remainder of the switch unit being positioned to the inner side of the panel. With the switch unit thus positioned a second holding or locking nut 57, which is considerably thicker than the nut 51 is threaded on the nipple 43 and against the panel 53 whereby the switch unit is firmly secured to the panel. The nut 57 has a bell-shaped end 58 for guiding the travel of the chain 31 into the casing 10, the bell-shape of the inner end of the nipple 43 guiding its travel outwardly therefrom.

The thin nut 51 functions in the mounting of Fig. 1 to reduce the length of the nipple 43 extending from the outer side of the panel 53, so that the shoulder 55 inwardly of the bell-shaped end 58 of the nut 57 is always retained out of

locking engagement with the outer end of the nipple 43. It is evident that any locking engagement would prevent the nut 57 from being snugly drawn against the panel 53. The nut 51 also prevents the nipple 43 from being pulled out of the bracket 32, since the pressure applied on the switch unit by the tightening of the nut 57 acts entirely on the nut 51. Thus the nut 51 in its initial assembly is drawn against the plate 32 and in mounting the switch unit on the panel 53, the nut 57 is drawn against the nut 51. The casing 10 is thus always freely supported on the bracket member 32 which takes all of the forces applied by either of the nuts 51 or 57. Any breaking or cracking of the casing 10 either in its assembly or in the mounting of the switch on the panel 53 is thus entirely eliminated.

From a consideration of the drawing and above description it is seen that the invention provides a switch unit adapted for use in canopies which is flexible in application to panels of varying thickness and which provides for the use of a molded or non-metal casing which is entirely out of contact with the panel and with the switch mounting means. It is seen further that the casing and its supporting means, which also provides a guide means for the switch chain are simple in design, rugged in construction, and adapted to be simply and economically assembled, the member 32 being performed relative to the casing parts 11 and 12 so as to be readily fitted into locking engagement therewith.

Although the invention has been described with reference to a specific embodiment thereof, it is to be understood that it is not to be so limited since modifications and alterations therein can be made which are within the full intended scope of the invention, as defined by the appended claims.

I claim:

1. In an electric switch unit including a non-metal casing having a pair of separable members, with one of said separable members having an opening in one side thereof, and the other separable member constituting a cover for said open side, said one separable member having a pair of sides each one of which is integrally formed with a projection extending transversely outwardly therefrom, a metal member of substantially U-shape for holding said two separable members in assembly relation having one end thereof provided with a flange portion adapted for releasable connection with one of said projections, said releasable connection permitting an opposite end of said metal member to be pivotally moved relative to said housing and to a position overlying the other of said projections, said opposite end having a lug portion thereon for locking engagement with other projection to retain said metal member fixed on said housing, with the intermediate portion of said metal member extending about said other separable member, a side portion of said one member and one leg of said metal member having registering openings therein, and a switch mechanism supported within the cavity of said one member and provided with an operating element which extends through said openings.

2. In an electric switch unit having a non-metal casing comprised of a pair of separable members, with one of said members having a cavity in one side thereof and the other of said members constituting a cover for said cavity, projections on said one member extending oppositely from each other at said one side, a metal member of substantially U-shape for holding said separable members in assembly position having one leg with a peripheral rim portion adapted to receive therein one of said projections in a releasable connection, and retaining said connection while permitting movement of the other leg to a position adjacent the other of said projections, with the intermediate portion of said metal member being extended across said other separable member, said other leg having a hook portion for locking engagement with said other projection, a side portion of said one member and one leg of said metal member having registering openings therein, a switch mechanism supported within said cavity and provided with an operating element which extends through said openings, and means including said metal member for mounting said unit upon a supporting panel.

3. An electric switch unit for mounting on a panel having a non-metal casing comprised of a pair of separable members, one of said members having a cavity in one side thereof, and the other of said members constituting a cover for said cavity, a pair of oppositely arranged projections on said one member at said open side, one of said projections having a lip portion thereon and an opening therein communicating with said cavity, a metal member for holding said two separable members in assembly position having one end with a hook portion thereon adapted to releasably connect the lip portion on said one projection, with said connection providing a pivotal support for said metal member and permitting movement of the opposite end of the metal member toward the other of said projections, said opposite end having a lug portion thereon adapted for locking engagement with said other projection, with the intermediate portion of said metal member extending across said other separable member, and means for mounting said electric switch unit on said panel including a tubular member supported in the one end of said metal member at the opening in said one projection, and means coacting with said tubular member for drawing said metal member against said panel.

4. In an electric switch unit having a non-metal housing comprised of a pair of separable members, with one of said members being of hollow construction and open on one side, and the other of said members constituting a cover for said open side, said one member having oppositely arranged projections at said open side, a metal strap for holding said separable members in assembly position having one end with a hook portion thereon for releasably engaging a corresponding catch portion on one of said projections, while permitting movement of an opposite end thereof into an engaging position with the other of said projections, the intermediate portion of said metal strap extending about said other separable member, said one member and said strap having registering openings therein, and a switch mechanism supported within the hollow of said one member and provided with an operating element which extends through said openings.

5. In an electric switch unit having a housing comprised of a pair of separable members adapted for mating assembly, one of said separable members having a cavity therein and oppositely extending projections thereon, with one of said projections having a lip portion, a member for holding said separable members in assembly posi-

tion having a hook portion at one end adapted for releasable connection with said lip portion, said connection being retained on movement of an opposite end portion of said holding member relative to said housing to a position adjacent said other projection, and a lug portion at said opposite end of said holding member for engaging said other projection to lock said holding member on said housing, with the intermediate portion of said holding member being extended about said other separable member, said one member and said holding member having registering openings therein, a switch mechanism supported within said cavity and provided with an operating element which extends through said openings, and means including said holding member for supporting said unit upon a supporting panel.

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