

ELECTRIC SWITCH HOUSING

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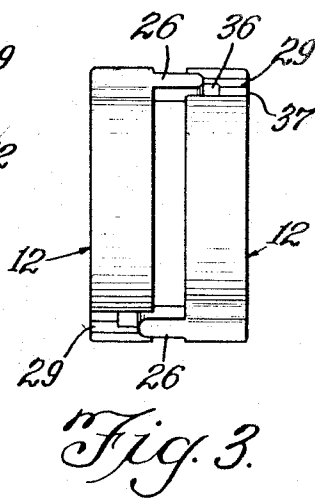
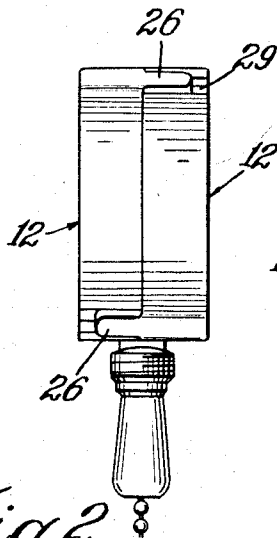
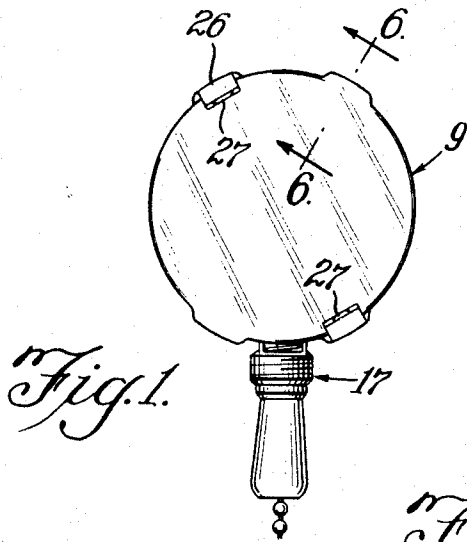


Fig. 2.

Fig. 3.

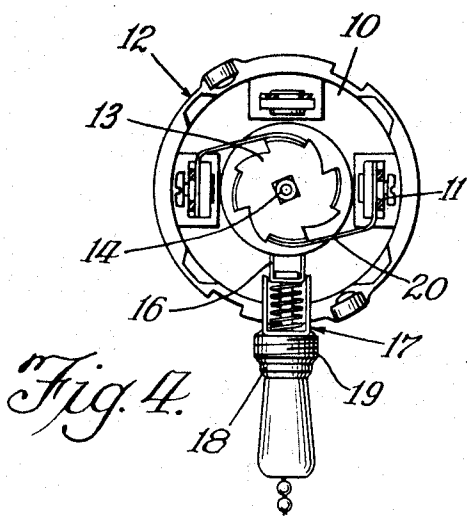


Fig. 4.

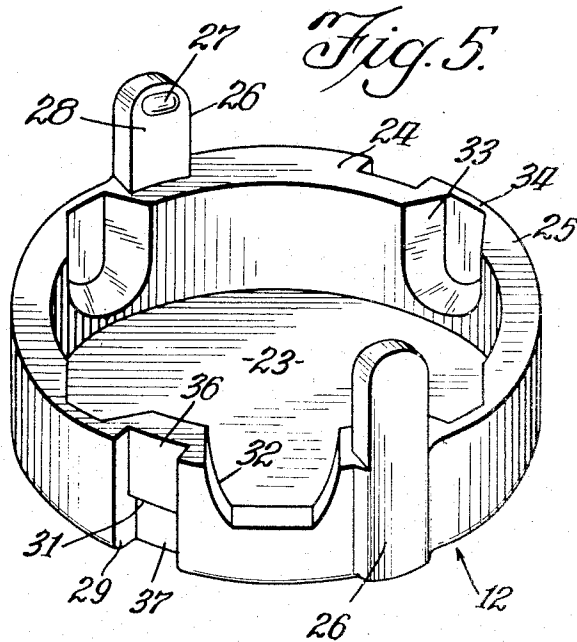


Fig. 5.

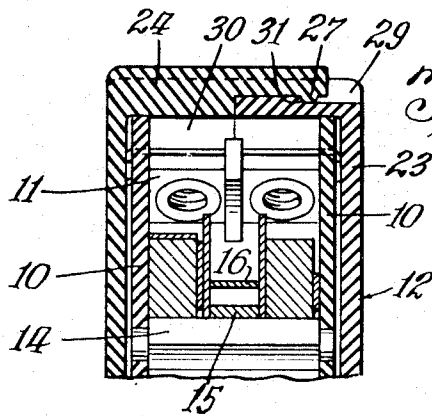


Fig. 6.

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UNITED STATES PATENT OFFICE

2,329,442

ELECTRIC SWITCH HOUSING

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4 Claims. (Cl. 200—168)

This invention relates generally to electric switches and in particular to a separable insulating housing for switch mechanism.

Housings of metal construction for switch mechanisms are well known in the prior art. The portions comprising the metal housings are generally made by drawing operations which appreciably increase the cost of the housings. Further, in order to eliminate any short circuit of the metal housing with the switch mechanism, it is necessary to provide insulating linings about the interior of the housing. Several different types of insulating linings are usually used in a particular switch unit, with each insulating lining requiring a separate stamping operation. The metal housing and the insulating linings therefor, thus result in a switch unit which is relatively costly to manufacture because of the expenses involved in the machining and in the assembling of its component parts. Also, the number of dies and machines required to make the housing portions and corresponding insulating linings, and the relatively large number of parts which have to be carried in stock for a particular switch unit, represent an appreciable overhead and maintenance investment.

It is an object of this invention, therefore, to provide an inexpensive insulating housing for a switch mechanism.

Another object of this invention is to provide an insulating housing comprised entirely of identical one-piece elements adapted to be releasably locked in mating assembly by the snap engagement of corresponding portions on each element.

Yet another object of this invention is to provide an insulating housing having a cavity therein for receiving switch mechanism, which is comprised solely of two cast parts of identical construction rigidly retained in a mating assembly by a snap engagement of corresponding portions thereon, and adapted for assembly with the switch mechanism by simply positioning the switch mechanism therebetween and then moving the housing parts toward each other.

A particular feature of this invention is found in the provision of an insulating housing for switch mechanism which is comprised of two cast parts identical in all respects so as to require only one mold for their making. Each housing part is of one-piece construction and includes portions thereon adapted to provide for a releasable locking of the housing parts in mating assembly concurrently with the positioning of the parts in such mating assembly.

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 side view showing the assembly of the insulating housing of this invention with the switch mechanism;

Fig. 2 is an end view of the assembly shown in Fig. 1;

Fig. 3 shows the position of the identical housing members comprising the housing for the switch mechanism in an initial assembly position;

Fig. 4 is a view illustrated similarly to Fig. 1 with one of the housing members removed to show the disposition of the switch mechanism within the other housing member prior to the assembly of the housing portions;

Fig. 5 is a plan perspective view of the one-piece housing element two of which comprise the housing of this invention; and

Fig. 6 is a fragmentary sectional view as seen along the line 6—6 in Fig. 1.

In the practice of this invention there is provided an insulating housing for switch mechanism comprised of two molded or die cast housing members of identical construction, adapted for mating assembly to form a cavity for receiving and substantially completely enclosing the switch mechanism. The housing members are so constructed that on their relative movement toward each other, corresponding portions thereon are snap connected to releasably lock the housing members in mating assembly. Since the switch mechanism, prior to the assembly of the housing members, is arranged within one thereof it is completely received within the housing cavity when such members are in mating assembly.

Referring to the drawing the insulating housing 9 of this invention is shown in combination with a switch mechanism of a type disclosed in applicant's Patent No. 2,209,104. The switch mechanism (Figs. 4 and 6) includes spaced side plates 10 having angularly spaced terminal units 11 disposed therebetween, with each terminal unit having a pair of contact arms 20. Corresponding contact arms 20 on the units 11 are operatively associated with a corresponding contact disc 13 carried near each end of a spindle 14 which is rotatably supported in the side plates 10. Intermediate the discs 13 and mounted on the spindle 14 is a ratchet wheel 15 operatively engageable with a pawl member 16 connected with pull chain actuating mechanism designated generally as 17, and including a mounting post 18 for the switch unit. The mounting post is carried by the side plates 10 and is provided with

a threaded portion 19 engageable with usual mounting nuts (not shown) for retaining the switch unit in a supported position on a canopy wall or the like.

The housing 9 is comprised of a pair of identical housing members 12 of molded one-piece construction and composed entirely of an insulating material. A housing member 12 (Fig. 5) is integrally formed with a flat wall portion 23 and an annular laterally extending rim portion 24. The rim portion 24 is provided with a pair of substantially diametrically positioned projections or snap portions 26, with each projection having a knob or catch portion 27 on the inner side 28 thereof. Intermediate the projections 26 and arranged substantially opposite each other are recesses or grooves 29 peripherally formed in the periphery of the rim portion 24 and extending axially thereof. The bottom of each recess 29 is formed with steps 36 and 37 to provide a lip or shoulder 31 for a purpose to be later noted. The end surface 25 of the annular rim portion 24 is of flat contour except for a recess 32 therein adapted to receive the actuating mechanism 17.

In the mating assembly of the housing members 12 the projecting portions 26 of one member 12 are initially positioned within the corresponding recesses 29 of the other housing member, as shown in Fig. 3. The housing members are then moved or pushed inwardly toward each other with the projections 26 guidably supported in corresponding recesses 29, this relative movement of the housing members continuing until the annular rim surfaces 25 are substantially against each other. As the members 12 approach their final assembly position, defined by the substantial abutment of the rim surfaces 25, the catch portions 27 on the projections 26 snap into engagement with corresponding lips 31 in the recesses 29 to releasably but rigidly retain the housing members in fixed relative positions. With the housing members 12 in mating assembly, a cavity 30 is formed within the base portions 23 and annular rim portions 24 which is adapted to receive therein the switch mechanism (Fig. 6).

The releasable locking engagement between corresponding catch portions 27 and lip portions 31 maintains the housing members 12 against any movement away from each other, a positive snapping connection being accomplished by virtue of the slight yieldability or resilience in the projections 26. In other words a projection 26 tends to be spread outwardly when the catch portion 27 thereon is in engagement with the first step 36 in a corresponding recess 29, with the catch portion 27 being snapped into releasable engagement with a corresponding lip 31 on passage of the catch portion 27 over the depressed or lower step 37. Relative rotary movement between the housing members 12 is completely eliminated by the guidable support of the projections 26 within the corresponding recesses 29. To disengage the housing members 12 the catch portions 27 are simply raised from their positions over the corresponding depressed steps 37 and into engagement with the upper step 36, the projections 26 being then slidably movable out of the recesses 29 by pulling the housing members 12 away from each other.

When the housing is assembled in combination with the switch mechanism, the mechanism is first disposed within the confines of the annular rim portion 24 of one of the housing members 12, with the mounting post 17 inserted within the

rim recess 32 for extension outwardly from the housing member as shown in Fig. 4. The other housing member 12 is then positioned, as previously described in connection with Fig. 3, with the recesses 32 in the housing members arranged opposite each other. On pushing of the housing members inwardly toward each other to their assembly position, the switch mechanism is enclosed by the housing members and received within the cavity 30 formed therebetween, with only the post 17 extending outwardly therefrom through the housing opening formed by the recesses 32.

In some instances a manufacturer may make a series of switch mechanisms having the same general over all dimensions yet requiring differently spaced inlets in the switch housing for lead wires. That is, one particular switch might require three or four leads while another switch of substantially the same dimensions might require six or more leads. If a separate housing was needed for each switch mechanism, it is readily apparent that the maintenance and stock costs for the housings would be appreciably increased. In order to provide a single housing structure which may be utilized with a plurality of switch mechanisms each requiring a different number of leads, the annular rim portion 24 of each housing member 12 is formed with angularly spaced axially extending recesses 33 on the inner periphery thereof. The bottoms 34 of the recesses 33 are relatively thin so as to be easily punctured or removed to extend the leads there-through. In the mating engagement of the two housing members 12 the recesses 32 and 33 are brought into positions opposite each other. It is evident that although only four recesses 33 are illustrated, any number may be provided depending upon the particular type of switch mechanisms which are to be used in conjunction with a particular housing structure. Thus the housing structure is adapted to accommodate a variable number of leads by simply knocking or punching out the thin portions 34 through which the leads are to be passed. As is evident from Fig. 5 the portions 34 are relatively thin compared to the remaining thickness of the angular rim 24 so as to be easily removable without any danger of damaging or cracking the remainder of the housing portion.

As was previously mentioned the housing members 12 are identical in construction and formed entirely of one piece which is composed of Bakelite or the like and formed by a die-casting process. The housing 9 for the switch mechanism is thus comprised of a plurality of single like elements. From a consideration of Fig. 5, it is seen that the projections 26, and recesses 29 and 32 for a housing member 12 all extend in a substantially parallel relation in a direction axially of the annular rim portion 24. By virtue of this construction, the mold portions or halves for forming the housing member 12 can be separated in one operation by simply pulling the mold portions directly away from one another in opposite directions, since there are no portions of the housing member extending at angles which would prevent such withdrawal of the parts or halves of the molds. It is apparent, of course, that the mold may be made up with one or many mold cavities depending upon the production desired, with all of the parts for providing a complete housing being produced from the output of a single mold. Overhead maintenance of molding parts, as well as the space required to carry

the housing parts in stock, is thus reduced to a minimum. Since the two single elements 12 which comprise the housing 9 are of identical construction, and completely assembled and rigidly retained in assembly by the cooperating action of corresponding portions integrally formed thereon, the need for individual locking means and the time and labor costs usually encountered when separate locking means are required, is completely eliminated.

From a consideration of the above description and drawing, it is seen that the invention provides for an insulating housing for a switch mechanism which is comprised of a plurality of identical housing members which are of a construction such that the switch mechanism is completely received in a cavity formed therebetween by simply positioning a housing member to each side of the switch mechanism and then pushing such housing members inwardly toward each other. The housing members are automatically releasably locked in mating assembly by the snap engagement of cooperating portions integrally formed thereon.

Although the invention has been described with reference to a specific embodiment thereof, it is to be understood that changes can be made therein which are within the full intended scope of this invention as defined by the appended claims.

I claim:

1. A housing having a cavity therein for receiving switch mechanism comprised entirely of identical one-piece insulating housing elements, a pair of which are releasably locked in oppositely disposed mating assembly about the switch mechanism to substantially completely enclose the same, with each housing element having a flat wall portion and an annular rim portion projecting laterally therefrom defining a cavity therein, an extension extending axially outwardly from said annular rim portion having a snap portion on its inside face, and a recess in the outer periphery of said annular rim portion angularly spaced from said extension, with said recess being of a size corresponding to said extension and having a snap-catch portion on a wall thereof adjacent the cavity of the element, said pair of housing elements being assembled by the positioning of an extension of one thereof into a corresponding recess of the other and then moving said housing elements toward each other, with said snap portion releasably engaging said snap-catch portion when the annular rim portion of one housing element is against the annular rim portion of the other housing element and said cavities face one another.

2. In a switch having preassembled switch mechanism, a molded insulating housing for said switch mechanism including a pair of like one-piece housing members assembled in oppositely disposed engagement to provide a cavity for receiving said switch mechanism therein, with each of said housing members having a wall portion integrally formed with a laterally extending annular rim portion, said annular rim portion having axially extending projections and axially extending peripheral recesses, a catch portion on each of said extensions on the inside face thereof, a corresponding catch portion in each of said

recesses on a wall adjacent said cavity but on the outside face thereof, with a recess in one of said housing members being adapted to receive therein a corresponding extension on the other of said housing members, with said housing members being positioned in mating assembly by relative movement toward each other, said mating assembly being releasably retained by the snap connection of a catch portion on an extension with a catch portion in a corresponding recess, with said extensions extending in opposite directions when assembled and said cavity being defined by said annular rim and wall portions.

3. A switch mechanism housing having a cavity therein for receiving a switch mechanism, said housing including a pair of housing members of one-piece cast construction and composed entirely of an insulating material, each of said housing members having a flat wall portion with a laterally extending annular rim portion, with the rim portion of one of said housing members having projections extending axially therefrom, and the rim portion of the other of said housing members having recesses therein corresponding to said axial projections and adapted to receive the same, with each of said projections having a catch portion on the inside face thereon, and each of said recesses having a lip portion therein adjacent said cavity but extending outwardly toward an inside face of a corresponding projection, said housing members on positioning of said projections in corresponding recesses being relatively movable toward each other, with a lip portion releasably engaging a corresponding catch portion when said annular rim portions are adjacent each other with said engagement occurring at a point intermediate the cavity and an outside face of each projection, said cavity being defined by said annular rim and wall portions, and said annular rim having a plurality of portions of reduced thickness adapted to be cut away for access to a switch mechanism within the housing.

4. In an electric switch having an operating part and terminal means, a housing for such switch including two identical cup-shaped members releasably secured together with the cup portions on the inside oppositely disposed and facing one another to provide a switch-mechanism-receiving cavity therein, each member having an annular rim and each rim having a plurality of shoulders in the body thereof, and having a corresponding plurality of extensions each with a projection thereon facing inwardly toward the cavity and mating with a corresponding shoulder on the other member extending outwardly toward the mated projection to releasably connect said members, with each connecting point for the assembled members being intermediate the cavity and the outside face of an extension, each member rim having an opening therein which openings in said two members together form an aperture for the switch operating part, and with each annular rim having a removable portion therein adapted to be positioned adjacent switch terminal means for receiving wire for such terminal means in the opening resulting when the portion is removed.

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