March 17, 1959 H. H. KOBRYNER 2,877,919

ENCLOSURE

Filed Dec. 17, 1956

2 Sheets-Sheet 1

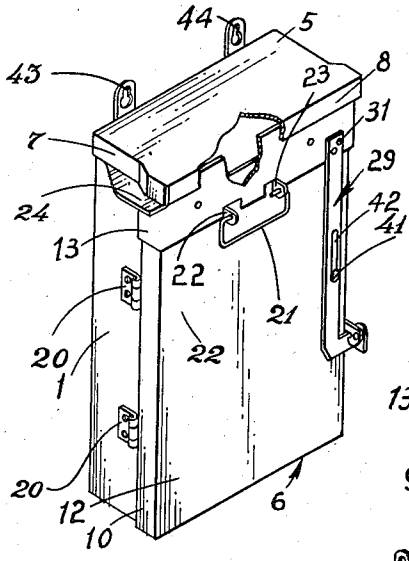


Fig. 1

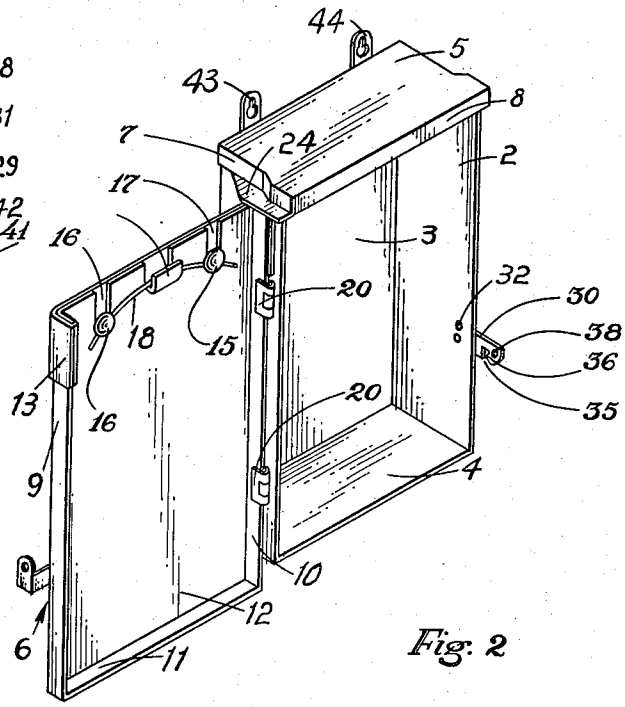


Fig. 2

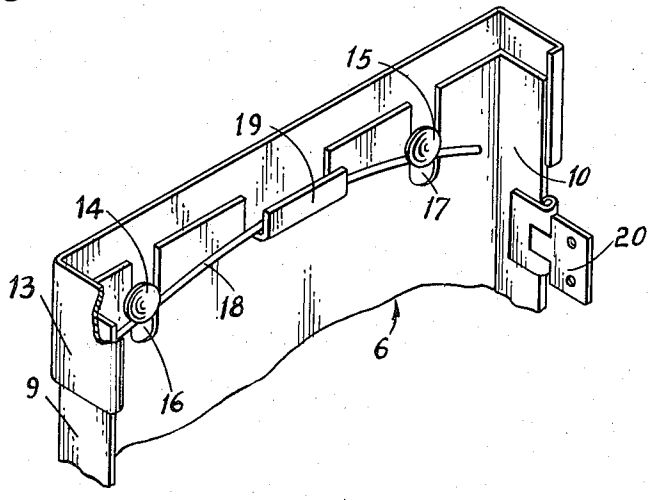


Fig. 4

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2 Sheets-Sheet 2

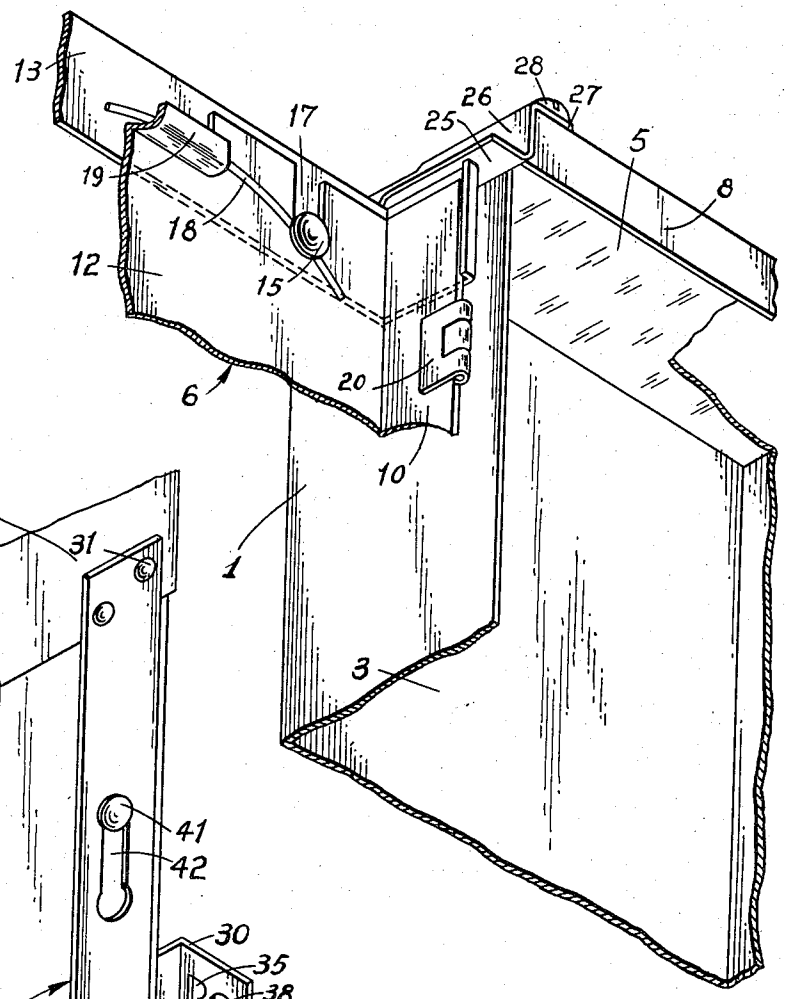


Fig. 5

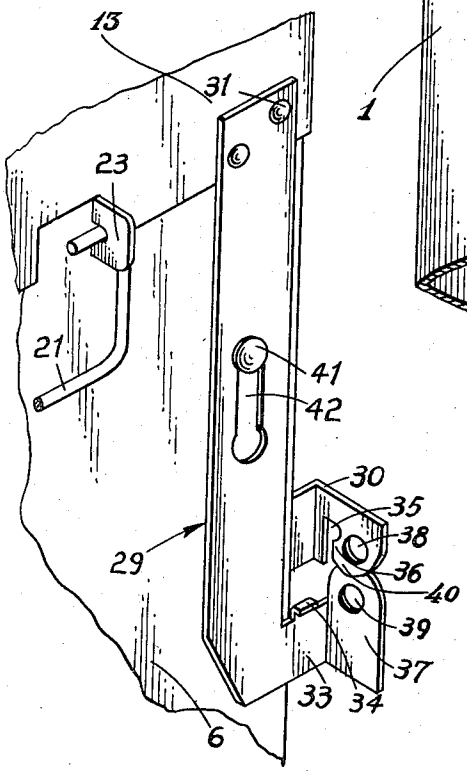


Fig. 3

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ENCLOSURE

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Application December 17, 1956, Serial No. 628,656

14 Claims. (Cl. 220—3.8)

This invention relates to an enclosure, preferably, although not necessarily, for electrical equipment, such as switches, fuses, etc., and particularly to an enclosure adapted to be mounted in a location where it is subjected to "outdoor" weather conditions.

More specifically, this invention relates to a rain-tight enclosure; i. e., one which prevents the entry of rain or the like into its interior.

It is a requirement of the industry that enclosures for electrical switches, fuses and the like, be provided with a door which is hinged, slidably mounted, or similarly attached, so as to prevent its being removed. Generally, there are three types of door mountings which fulfill this requirement. The first type of mounting comprises a door hinged at its upper edge so that the door is swung in the vertical direction. This type of door mounting has several disadvantages, the chief being that if rust or ice is formed on the hinges, it is difficult to open the door without the aid of a tool, such as a crow-bar or screw driver. Further the cover in the raised position is hazardous to one working with the equipment contained within the enclosure. For example, the open end of the door may accidentally fall causing injury to the hands of the user. This problem is particularly acute when the door is of substantial weight. In the latter case, some means are usually provided to latch the door in the raised position to prevent accidental closing. However, such latches are usually expensive and are not always satisfactory for mechanical reasons. Moreover, it is difficult to design such means which permits convenient operation and yet resists the tendency to collapse if accidentally jarred by the electrician during the process of wiring.

The second type of door mounting is the type in which the door is swung up to approximately horizontal position and then pushed back along a slide or slots so provided that the door is prevented from swinging down until it is again pulled forward. This type of door suffers from all the disadvantages of the type discussed above.

Further, top-hinged covers are held in about a horizontal position when opened because wiring conduits, hinge and support designs interfere with full opening flat against the wall. In many cases the enclosure is mounted so close to the ceiling that such full opening of a top-hinged cover is impossible. It is obvious therefore, that large covers opened to the horizontal position are not only hazardous but also are in the electrician's way.

The third type of door mounting utilizes hinges mounted on a side of the door so that the door swings in a horizontal direction. This type of door mounting is eminently more satisfactory than either of the above arrangements. In opening the door the weight of the door is supported by the hinges and it is not required to lift this weight as it is in the other types of mountings. If rust or ice is formed on the hinges, the movement of the door is usually enough to overcome the frictional

forces produced thereby. However, in making such an enclosure rain-tight, special hinges are required which permit sliding the door upward under a cover flange after the door is closed. In such arrangements, a spring catch is required to latch the door in the raised position. Thus, the spring catch supports the entire weight of the door. This type of arrangement then, suffers many of the disadvantages associated with the vertically slidable door described hereinabove. Further, the sliding hinges which are required fail more frequently than the conventional hinge because the hinge pin is subjected to bending and shear strains, rather than to shear only, as in the conventional arrangement.

Accordingly, it is an object of this invention, to provide an enclosure, entirely free of hazards to the operator during opening, closing, wiring or fuse changing, requiring no special hinges, and which is effective in preventing rain or the like from entering the interior thereof.

It is a feature of this invention to provide a novel door construction which permits the upper edge thereof to be located, when closed, under a roof-like cover of the enclosure.

In accordance with an aspect of this invention, there is provided an enclosure in the form of a box having back, side and bottom walls, cover and door. The cover is equipped with flanges which overlie upper portions of the side walls and door, and the door is equipped with flanges which overlie forward portions of the side and bottom walls. The door comprises an upper member superposed over and slidable on a lower member, whereby when it is desired to open the door, the upper member is depressed relative to the lower member thereby reducing the overall height of the door until the upper edge thereof is below the lower edge of the cover. In this position, the door may be pivoted on its side hinges to an open position. Means are provided to maintain the upper member in its depressed position while the door is open and to permit the upper member to return to its normal position when the door is closed.

The above objects and features will become more explicit when taken in conjunction with the accompanying drawing wherein:

Fig. 1 is a perspective view of the enclosure with the door closed;

Fig. 2 is a similar perspective view of the enclosure with the door open;

Fig. 3 is a perspective view of a locking means associated with the enclosure;

Fig. 4 is a perspective view of the interior of the door, showing in detail a mounting arrangement of the component parts thereof; and

Fig. 5 is a perspective view of an arrangement for maintaining the height of the door while the door is open.

Referring to Figs. 1 and 2, there is illustrated an enclosure, preferably, although not necessarily, for electrical equipment, such as switches or fuses, which is capable of preventing rain or the like from entering the interior thereof.

The enclosure, in the form of a box, comprises side walls 1, 2, back and bottom walls 3 and 4 respectively, top cover 5 and door 6. The cover 5 includes side and front flanges 7 and 8 respectively, formed preferably integral with the top portion of the cover 5. The flanges are of such length as to overlie the upper portions of the side walls and door while the door is in the closed position as shown in Fig. 1. The front portion of the cover 5 is slightly longer than the rear portion for reasons which will be obvious from the discussion which follows.

The door 6 includes side and bottom flanges 9, 10 and

11 overlying forward portions of the side walls 1, 2 and bottom wall 4 respectively.

The construction of the door 6, which is best seen in Fig. 4, consists essentially of two superposed members 12 and 13; the upper member 13 being superposed over the lower member. In accordance with an important aspect of this invention, the door 6 is adjustable in its overall height to permit the upper edge thereof to underlie the front flange 8 of cover 5 while the door is in its closed position (Fig. 1).

This adjustability is attained by slidably mounting the upper member 13 on the lower member 12 and urging the members in opposite directions so that the normal position of the door is one of maximum height. For this purpose, a pair of shouldered pins or rivets 14, 15 are rigidly attached to the upper member 13. Complementary vertical channel grooves 16 and 17 are formed in the upper portion of the lower member 12. The lateral dimension of the openings 16 and 17 is less than the diameter of the shoulders on pins 14, 15, in order to maintain a slidable, contiguous relationship between the members 12 and 13. The members 12 and 13, and therefore the door 6, are properly urged to the desirable height by means of a wire spring 18 centrally supported in a struck-out cradle portion 19 of member 12. The opposite ends of the spring 18 are deformed to bear against the lower portion of the pins 14 and 15 respectively, to exert thereon an upward force relative to the lower member 12.

The door 6 is hinged, as best seen in Fig. 1, at its flange 10, to the side wall 1 by means of hinges 20; the hinges being attached to the respective parts by any suitable means, such as screws or spot welding.

Thus, while the door 6 is in its closed position the upper member 13 is in its uppermost position relative to the lower member 12 due to the action of the spring 18, and its upper edge underlies the flanges 7 and 8 of the cover 5. In this position, the enclosure offers maximum protection against the admittance of rain because the roof-like cover 5 overlaps the upper portions of the side walls 1, 2 and door 6, the upper member 13 overlaps the lower member 12, and the door overlaps the forward portions of the side walls 1, 2 and bottom wall 4.

When it is desired to open the door 6, the upper member 13 is manually depressed relative to the lower member 12 until the upper edge of member 13 is below the lower edge of the cover flanges 7 and 8. The door is then pivoted on its hinges 20 to open the interior of the box as shown in Fig. 2. To facilitate lowering the upper member 13, a handle 21 is provided, mounted on the member 13. By way of example, the handle 21 is mounted in lugs 22, 23 which are struck-out of the member 13.

Referring now to Fig. 2, showing the door in its open position, the upper member 13 is prevented from assuming its normally urged position by action of a stop, bearing on the upper edge of member 13. The stop comprises a skirt 24, which extends perpendicularly from the side flange 7 of cover 5, and is positioned to bear on the upper edge of member 13 throughout the travel of the door when the door is open.

In Fig. 2, the skirt 24 is shown integral with the cover 5. However, as shown in Fig. 5, a skirt 25 may be part of a separate Z-shaped member 26. The oppositely disposed flange 27 of the Z-shaped member is rigidly attached to the cover 5 by any suitable means, such as bolts 28.

Referring now to Figs. 1, 2 and 3, positive locking means is shown to maintain the door 6 in its closed position. The locking means comprises an L-shaped latch 29, attached to the upper member 13, and a cooperating fixed post 30 attached to the side wall 2. The free end of the vertical leg of the latch 29 is fixedly attached to the member 13 by means of spot welding, indicated at 31, and similarly the post 30 is spot welded to the side

wall 2 as indicated at 32 (Fig. 2). The latch 29 substantially lies in a plane parallel to the plane of the door 6. The base portion thereof 33 projects beyond the side flange 9 of the door 6 and includes a lip portion 34 for engagement with a slot 35 formed in the post 30. There is sufficient flexibility in the latch 29 to permit the base portion 33, and thus lip 34, to follow the curved contour of the slot 35 during the upward movement of the member 13. The latch 29 is normally positioned relative to the post 30 so that the lip 34 slides in tension against the forward contour of the slot 35, and therefore is urged into the notch 36 provided at the end of the slot 35, to effect positive engagement between the latch 29 and the post 30.

The latch 29 is retained in generally fixed spaced relationship with respect to the door 6 and post 30 by means of a shouldered pin 41 fixedly attached to the door 6 riding in a vertically extending groove 42. The shoulder or head of pin 41 is of larger diameter than the width of the groove 42 thereby preventing the latch from being accidentally bent out of proper position with regard to the post 30.

If it is desired to lock the door 6 in the closed position, an apertured ear 37 is provided which is formed by bending the free end portion of the base perpendicularly to the plane thereof. Toward the forward end of the post 30, there is provided an aperture 38 which is aligned with the aperture 39 in ear 37, when the door 6 is closed and the upper member 13 is fully urged, as in its normal position. In this position a lock may be inserted in the aligned apertures 38, 39 to prevent unauthorized opening of the door.

To open the door, the latch 29 must be depressed so that the lip portion 34 lies below the lower edge 40 of the post 30. The length of the slot 35 is preferably approximately the same length as the overlap of the cover flanges 7, 8 over member 13, so that when the lip 34 clears the lower edge 40 of the post 30, the upper edge of member 13 clears the lower edge of the flanges 7 and 8.

If it is desired to bolt the enclosure to a wall, e. g., an external wall of a building, apertured mounting lugs 43 and 44 are provided attached to the back wall 3.

While there is described herein the principles of construction of the invention together with an embodiment thereof, it will be understood that the apparatus disclosed is only illustrative and that other means and apparatus may be employed without departing from the spirit and scope of the invention as defined by the appended claims.

What is claimed is:

1. An enclosure in the form of a box having back, side and bottom walls, top cover and door, said cover comprising side and front flanges overlying upper portions of said side walls and door, said door comprising upper and lower members and having flanges along the sides and bottom thereof overlying forward portions of said side and bottom walls, means slidably mounting said upper member over said lower member, the extent of slidable travel being such that at the uppermost position the upper edge of said upper member is overlapped by said cover flanges and at the lowermost position the upper edge of said upper member is below the lower side of said cover flanges, spring means tending normally to urge said upper member under said cover flanges, means hinging said door to one of said side walls, a latch, means attaching said latch to said upper slidable member, a post member for engaging said latch when said upper member is in its normally urged position, and means attaching said post to one of said side walls whereby when it is desired to open said door, the upper member is moved downwardly against the action of said spring means until the upper edge thereof lies below the lower edge of said cover flanges and the door is pivoted open on its hinges.

2. The enclosure according to claim 1, wherein said latch is in the form of an L and lies substantially in a

plane parallel to the plane of said door, the base of the L projecting beyond said door and including a lip formed on the upper edge thereof, said post member extending perpendicularly to the base of the L and including a slot having a configuration adapted to engage said lip when said upper member is in its normally urged position; and further comprising a handle attached to said upper member to facilitate movement thereof.

3. The enclosure according to claim 1, wherein said means slidably mounting said upper member over said lower member comprises at least two pins attached to said upper member and slidable in respective vertical grooves formed in the upper portion of said lower member, the length of said grooves determining the extent of slidable travel, whereby the upper member is maintained in sliding contiguous relation with said lower member.

4. The enclosure according to claim 3, wherein said spring means comprises an elongated wire spring centrally mounted on said lower member at a level slightly above said pins when said upper member is in its normally urged position, the opposite ends of said spring bearing in flexure against the lower portions of said pins, thereby tending to urge said upper member upward relative to said lower member.

5. The enclosure according to claim 4, wherein said lower member comprises a cradle for supporting said spring, said cradle being located intermediate the grooves.

6. The enclosure according to claim 1, and further comprising a skirt flange extending from and perpendicularly to the plane of said side wall on which said door is hinged, said skirt flange extending slightly below the lower edge of the cover flanges, whereby when the upper member of said door is depressed and the door is pivoted away from the enclosure, the upper member is maintained in its depressed position by said skirt flange bearing against the upper edge of said upper member.

7. The enclosure according to claim 6, wherein said skirt flange is integral with said cover and extends from a side flange thereof.

8. The enclosure according to claim 6, wherein said skirt flange is part of a Z-shaped member and means fixedly attaching the oppositely disposed flange of said Z-shaped member to a top portion of said cover.

9. A rain-tight enclosure in the form of a box having back, side and bottom walls, top cover and door, said cover comprising side and front flanges overlying upper portions of said side walls and door, said door comprising upper and lower members and having flanges along the sides and bottom thereof overlying forward portions of said side and bottom walls; means slidably mounting said upper member over said lower member comprising a pair of spaced shouldered pins attached to said upper member and slidable in respective vertical grooves formed in the upper portion of said lower member, the width of each groove being less than the diameter of the associated shoulder, the length of said

grooves determining substantially the extent of slidable travel and being such that at the uppermost position the upper edge of said upper member is overlapped by said cover flanges and at the lowermost position the upper edge of said upper member is below the lower edge of said cover flanges; spring means tending normally to urge said upper member under said cover flanges comprising an elongated wire spring centrally mounted on said lower member at a level slightly above said pins when said upper member is in its normally urged position, the opposite ends of said spring bearing in tension against the lower portions of said pins; means hinging said door to one of said side walls; and a skirt flange extending from and perpendicularly to the plane of said side wall on which said door is hinged and extending slightly below the lower edge of the cover flanges, whereby when the upper member of said door is depressed to its lowermost position against the action of said spring and the door is pivoted away from the enclosure the upper member is maintained in its depressed position by said skirt flange bearing against the upper edge of said upper member.

10. The enclosure according to claim 9, and further comprising a latch, means rigidly attaching said latch to said upper slidable member, a post member for engaging said latch when said upper member is in its normally urged position, and means attaching said post to one of said side walls.

11. The enclosure according to claim 10, wherein said latch is in the form of an L and lies substantially in a plane parallel to the plane of said door, the base of the L projecting beyond said door and including a lip formed on the upper edge thereof, said post member extending perpendicularly to the base of the L and including a slot having a configuration adapted to engage said lip when said upper member is in its normally urged position; and further comprising a handle attached to said upper member to facilitate movement thereof.

12. The enclosure according to claim 9, wherein said lower member comprises a cradle for supporting said spring, said cradle being located intermediate the grooves.

13. The enclosure according to claim 9, wherein said skirt flange is integral with said cover and extends from a side flange thereof.

14. The enclosure according to claim 9, wherein said skirt flange is part of a Z-shaped member and means fixedly attaching the oppositely disposed flange of said Z-shaped member to a top portion of said cover.

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