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DOOR HINGING ARRANGEMENT IN RAIN-TIGHT ENCLOSURES

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2 Sheets-Sheet 1

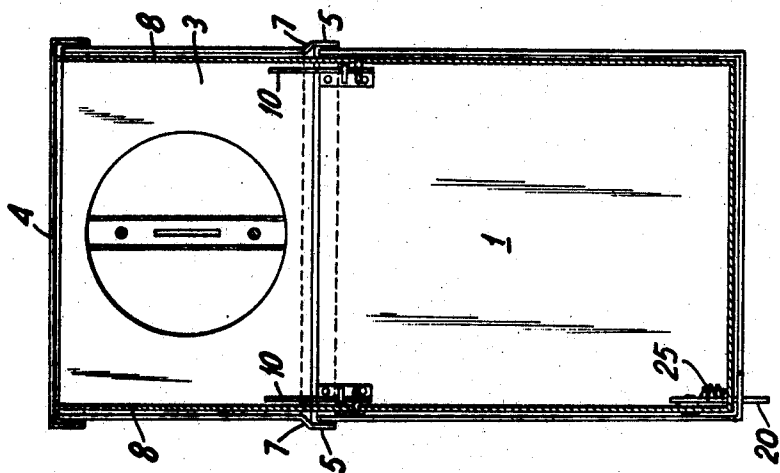


Fig. 6

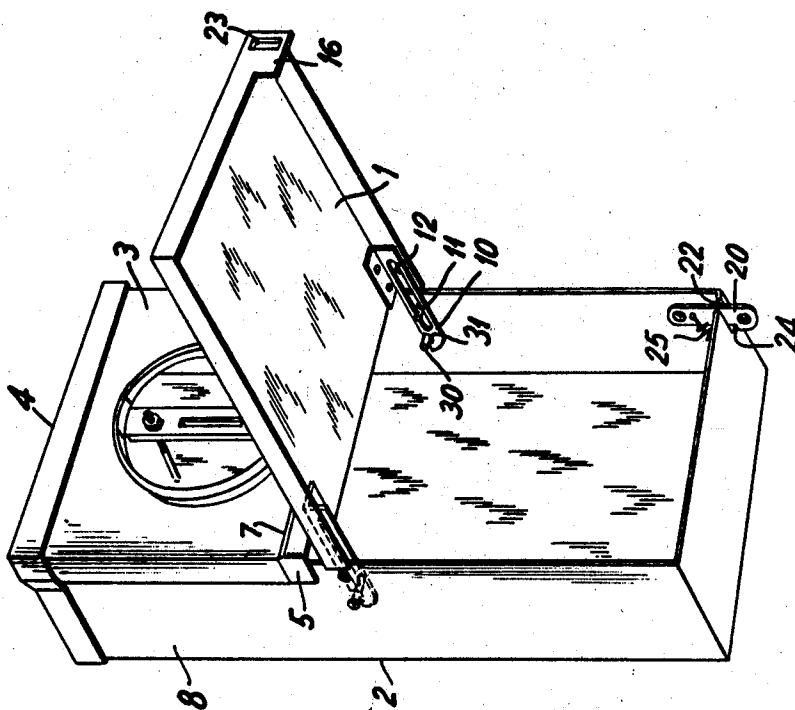


Fig. 1

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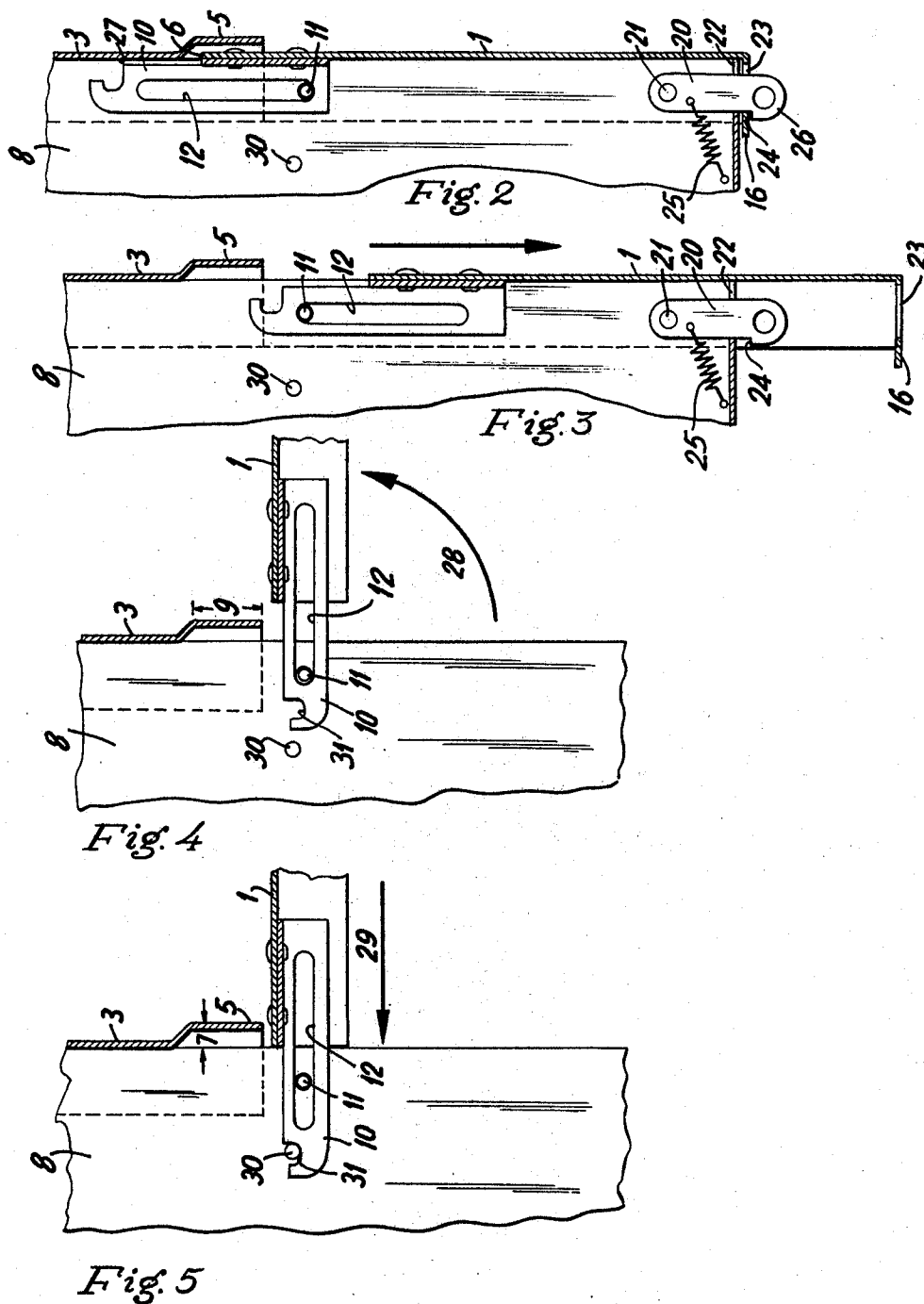
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1

2

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ABSTRACT OF THE DISCLOSURE

A vertically opening lower access door for a two-compartment raintight electrical distribution box. The door is attached to the sides of the enclosure in a manner permitting it to be slid up and under the upper cover panel of the box to the closed position. Slotted brackets mounted on the inside of the door cooperate with supporting pins extending from the sides of the box adjacent the door to permit the door to be pivoted vertically about an axis above the door, to a locked open position. A latch is provided to hold the door up under the lower edge of the upper cover panel in the closed position.

BACKGROUND

The invention relates to the structure of raintight outdoor enclosures for electrical equipment. More specifically, the invention deals with a hinging arrangement for a vertically opening lower door for a two-section enclosure, which provides the proper overlap of all mating surfaces required to render the enclosure raintight. It is frequently desirable that the enclosure of an electrical distribution center have two compartments. One compartment, usually the upper, houses the meter and its connections to the power supply. The lower compartment contains the power distribution panel. Two security interests are normally involved in such an installation. The power company desires exclusive access to the upper section to avoid possible by-pass of the meter, and controlled access to the lower section is desirable to the user.

Prior art enclosures of this variety have had two primary disadvantages. First, the lower access doors have been hinged to the upper section covering the meter and its connections so that removal of the upper cover necessitated removal of the lower door. Secondly, the lower door was hinged to the upper cover at a point below its upper edge. This method of hinging resulted in the upper edge of the door being rotated inwardly as the door was lifted. It was thus necessary to cut away portions of the side walls of the enclosure to provide for the passage of the top of the door when it was swung open.

The aforementioned cutting away of the sides of the enclosure resulted in less than a half inch overlap between the door and the sides of the enclosure, degrading its raintight qualities.

SUMMARY

Briefly, the invention comprises a swing-up access door mounted to the inside of an enclosure. The door is supported by slotted brackets attached to the door, the slots of which extend above and below the top of the door, and are engaged by pins extending inwardly from the sides of the enclosure.

The upper cover panel of the enclosure is flared at the bottom to receive thereunder the upper edge of the door.

The slotted brackets permit the door to be slid in under the upper panel, and rotated about an axis above the top of the door to the open position. Locking pins are provided to engage the brackets when the door is in the open position and prevent downward rotation of the door.

A latch is provided to hold the door in the closed position up under the skirt of the upper portion of the enclosure.

The invention is an improvement over prior art in that it eliminates the necessity for cutting into the sides of the enclosure to provide room for passage of the top edge of the door when it is opened. This is accomplished basically by moving the rotational axis of the door to a point above its upper edge. Such an arrangement results in the door swinging through an arc entirely outside of the enclosure; this eliminates any interference between the door and the sides of the enclosure, and enables construction of an enclosure which meets current and projected demands for overlap between the components of the enclosure.

The hinging arrangement of the invention has the additional advantage of permitting individual access to either the upper or lower portions of the enclosure. The upper section may be removed, for example, to service the meter without disturbing the lower door. Similarly, the lower door can be opened and closed without disturbing the upper cover. This permits individual control of access to each section by means of separate locks, or the like.

Other objectives, advantages, and various further features of novelty and invention will be pointed out or will occur to those skilled in the art from a reading of the following specification in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIGURE 1 is a perspective view of a two-compartment electrical enclosure incorporating the door hinging arrangement of the invention;

FIGURES 2, 3, 4 and 5 are partial cut away side views of the access door and its supporting elements; and

FIGURE 6 is a view of the door hinging arrangement from the inside of the box.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to FIGURE 1, the lower door 1 of the invention is illustrated in the open position on enclosure 2. The upper cover panel 3 extends downwardly from under the top 4 of the enclosure 2, and overlaps the sides of the enclosure 2 by at least one half inch. The lower edge of this panel is offset 7 to form a skirt 5. Door 1 slides under skirt 5 to establish the required overlap with upper cover panel 3. The depth of the offset 7 is governed by the thickness of the door 1, and the height of the offset 9 by the extent of overlap desired between the door 1 and the upper panel 3.

Door 1 is held up under panel 3 by latch 20 as hereinafter described.

The door support mechanism comprises a slotted bracket 10 attached to the door 1 and extending perpendicular thereto in a vertical plane parallel to the side 8 of box 2. Retaining pins such as screws 11 are secured to the opposite sides 8, and extend into the interior of the enclosure and through the opposite slots 12 in the pair of brackets 10. The door is thus connected to the enclosure by the interaction of the slotted brackets 10 and screws 11.

FIGURE 2 illustrates the door 1 in the closed locked position with its upper edge 6 under the skirt 5 of the upper cover panel 3. Door 1 is retained in the locked position by a conventional latch 20.

Latch 20 is pivotally mounted to the side of the enclosure 2 by pivot pin 21. The body 20 of the latch rides through slot 22 in the bottom of the enclosure 2, and through slot 23 in the bottom of the door 1. A step 24 is cut in the inside lower edge of latch 20, which abuts the bottom edge 16 of door 1 after the door has been

3

lifted into the locked position. Tension spring 25, attached to the side enclosure 2, and to latch 20, urges the latch 20 into engagement with edge 16 when the door 1 is elevated to the fully closed position.

The lower end 26 of latch 20 is beveled so as to facilitate its entry into slot 23 of door 1 and its forward motion until the door 1 is fully closed, at which point step 24 clears edge 16 and snaps into the locked position.

A comparison of FIGURES 2 and 3 serves to illustrate the functional relationship between the slotted brackets 10, slots 12 and screws 11. The slots 12 are parallel to the surface of door 1, and bracket 10 is offset therefrom by a distance 27 sufficient to allow it to clear the inside surface of upper cover panel 3 as door 1 is raised into the fully closed position. Slot 12 must extend far enough above the top edge 6 of door 1 to permit door 1 to slide down and clear of cover panel 3 and latch 20, and far enough below to allow door 1 to be slid into the fully closed position, under skirt 5.

To open the door, latch 20 is pulled toward door 1, moving the step 24 from under the bottom of door 1, and allowing the door to move downwardly relative to the enclosure until the top of slot 12 meets pin 11. Thus hinged, the door is free to swing out and away from the enclosure eliminating any interference between the top 6 of door 1 and the side walls 8.

FIGURES 4 and 5 illustrate the operation of the lock-open feature of the invention. From the unlocked (lowered) position illustrated by FIGURE 3, the door 1 is swung up, as indicated by arrow 28, and to a position perpendicular to the enclosure 2, and then pushed in as indicated by arrow 29. This action moves bracket 10 in under pin 30, which prevents downward rotation of the door and thus supports it in the open position.

A recess 31 is provided in the end of bracket 10 at the point of engagement with pin 30 to prevent inadvertent displacement and consequent loss of this uplock. The weight of the door acts to keep pin 30 in recess 31.

Hinge pin 11 should be placed far enough below the lower edge of skirt 5 to allow for the passage of door 1 below the skirt when it is pushed in to engage pin 30; and there should be enough clearance between the upper end of bracket 10 and pin 30, when pin 11 is at the top of slot 12, to allow door 1 to swing to the open position.

FIGURE 6 illustrates the relative position of the elements of the hinging arrangement when door 1 is closed. The top 6 of door 1 has been raised up under skirt 5 of upper panel 3 to achieve the required overlap for a raintight enclosure. Latch 20 is engaged holding door 1 in the closed position.

Brackets 10 lie closely adjacent the sides 8 minimizing their interference with the contents of the enclosure.

FIGURE 6 also illustrates the location of latch 20, alongside the inside surface of one side 8 of the enclosure. This location facilitates attachment of the latch body 20 and spring 25.

I claim:

1. A door hinging arrangement in a raintight enclosure comprising;

a vertically swinging door, support means for pivotally hanging said door comprised of;

horizontal pivot pins attached to the enclosure, and vertically slotted brackets attached to said door and cooperatively engaging said pins to pivotally attach said door to the enclosure in a manner permitting rotary and radial movement of said door with respect to said pins,

an upper panel attached to said enclosure above said door and covering an upper portion of said en-

4

closure, said upper cover panel having a lower edge which overlaps said door in the closed position, means to retain said door in the closed position, and said door having overlapping sides and bottom in contiguous relationship to portions of the enclosure.

2. The device of claim 1, wherein said pins extend inwardly from the sides of said enclosure and said slotted support means are mounted on the inside of said door.

3. The device of claim 2, further comprising; abutment means attached to said enclosure to engage said slotted brackets when horizontal and thereby hold said door in the open position.

4. The device of claim 3, wherein said pin means is comprised of;

a pair of pins extending respectively from the opposite sides of said enclosure, laterally and inwardly parallel to the surface of said door, and said slotted support means is comprised of;

a pair of brackets extending respectively from the opposite sides of and at right angles to said door with vertical slots therein parallel to the surface of said door and cooperatively engaging said pins.

5. A raintight enclosure for electrical equipment having a partially open front and an upper closure portion terminating in a rim offset outwardly from the opening and the sides of the enclosure,

a vertically swinging door covering the open portion of said front and having overlapping sides and bottom relative to said enclosure,

door hanging means to pivotally support said door comprised of slotted brackets attached to said door, and support pins attached to said enclosure engaging the slots in said brackets, wherein the engagement of said slots and said pins permits said door to pivot and slide upwardly under said offset rim.

6. The enclosure of claim 5, further comprising; means to retain said door in the closed position comprised of;

a notched arm pivotally attached to said enclosure engaging a bottom portion of said door, and spring means to urge said arm into said engaging position.

7. The enclosure of claim 6, wherein said door is comprised of;

a turned in bottom portion which underlies the bottom of the enclosure,

a passage through said underlying portion to accommodate said notched arm, so that said spring means urges said notched arm inwardly toward said enclosure, and

said notched arm engages the inner edge of said underlying portion bounding said passage.

8. The enclosure of claim 7, wherein said means to retain said door in the open position comprises;

abutment means attached to said enclosure inside and above said pin means, engaging said slotted brackets when said door has been opened and slid toward the enclosure, so that the inside upper ends of said brackets are positioned thereunder.

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U.S. Cl. X.R.

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