Nov. 6, 1956

D. L. PETTIT

2,769,940

SWINGOUT PANEL CABINET

Filed March 2, 1953

2 Sheets-Sheet 1

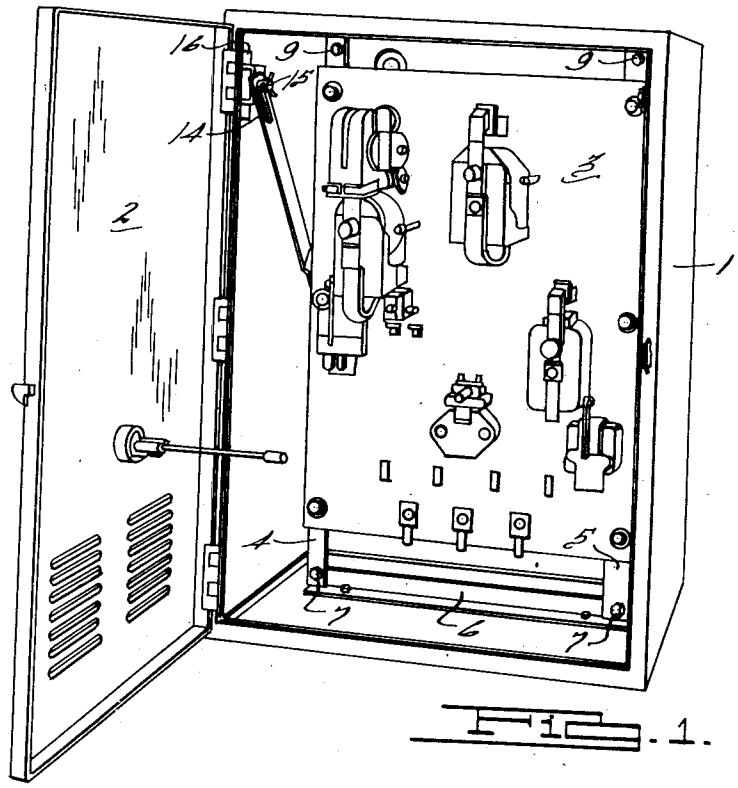


Fig. 1.

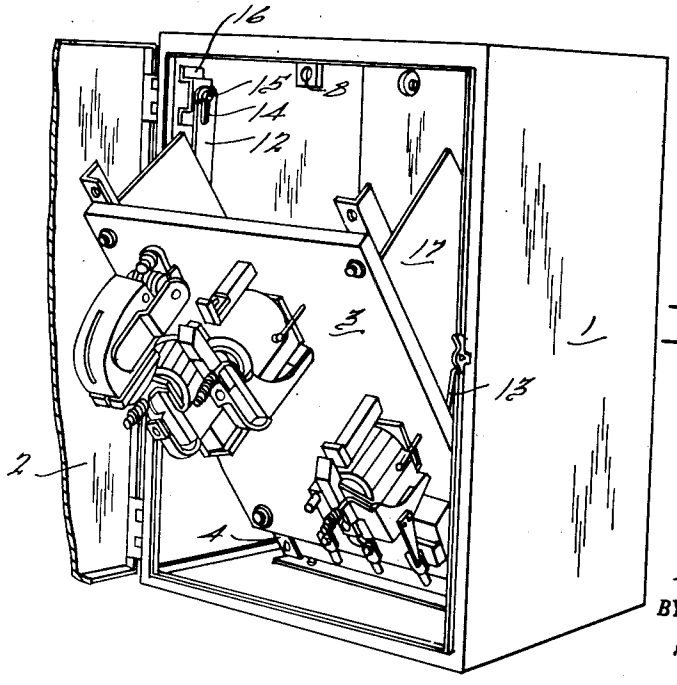


Fig. 2.

INVENTOR.
Dorr L. Pettit
BY Myron J. Zeibold
ATTORNEY.

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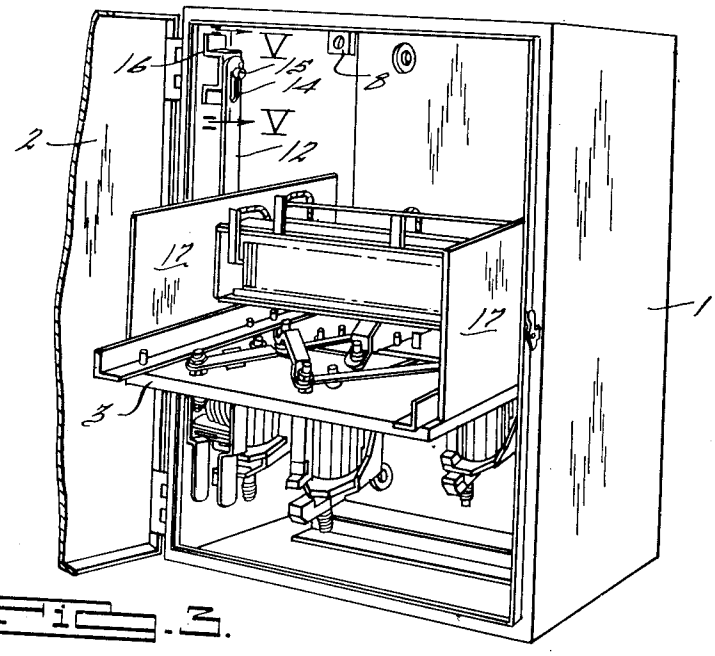
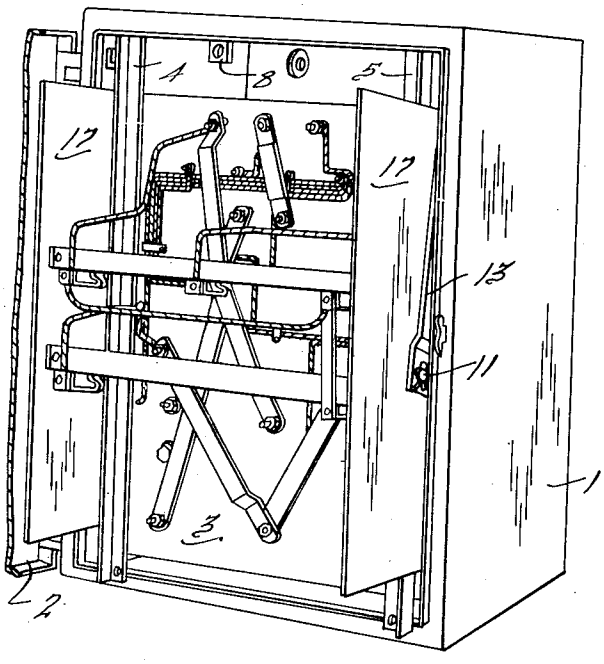


FIG. 3.

FIG. 4.



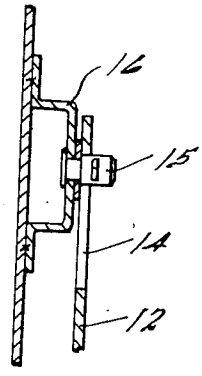


FIG. 5.

INVENTOR.
Dorr L. Pettit
BY
Myron J. Eibold
ATTORNEY.

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2,769,940

SWINGOUT PANEL CABINET

Dorn L. Pettit, Milwaukee, Wis., assignor to Square D Company, Detroit, Mich., a corporation of Michigan

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9 Claims. (Cl. 317—120)

This invention relates to a swingout mounting for a panel interior enclosed within an outer cabinet having an openable cover or door.

Cabinet interiors have been mounted in the past for swingout through the door opening while supported on the cabinet, but prior constructions have been subject to disadvantages including limited accessibility, unnecessary waste of dimensions, unbalanced masses subject to uncontrolled movement with consequent damage to equipment or personnel, and lack of rigidity of the support.

The object of this invention is to provide a swingout construction for the interiors of panel cabinets in which the weight of the panels and the elements mounted thereon is substantially balanced so that very little physical effort is necessary to utilize the swingout and in which the panel will not fall out of a selected position with the possibility of damage.

A further object of the invention is a swingout mounting for the interior panel cabinets in accordance with the preceding object in which various positions of accessibility are provided including complete accessibility to the rear of the panel at the exterior of the cabinet.

Other objects and features of the invention will be readily apparent to those skilled in the art from the specification and appended drawings illustrating certain preferred embodiments in which:

Figure 1 is a perspective view of a panel cabinet according to the present invention with the front door shown open.

Figure 2 is a perspective view of the panel cabinet with the interior disconnected from its rigid mounting and tilted forward about its lower edge.

Figure 3 is a view similar to Figure 1 with the panel rotated into a horizontal position with the back upward.

Figure 4 is a view similar to Figure 2 with the panel rotated through approximately 180° from its interior position to expose the entire back of the panel for access at the exterior of the enclosing cabinet.

Figure 5 is a detail view on the line V—V of Figure 3.

The swingout construction of the present invention is illustrated in the drawings as including an outer cabinet 1 having a side hinged front door 2 and mounting within the cabinet a panel interior shown as an insulating plate 3 carrying a plurality of circuit controlling elements on its front face specifically illustrated as comprising contactors and relays. On the back face of the plate 3 are mounted circuit connections and a pair of resistor units, the specific panel shown being designed to control the starting of direct current motors.

At the opposite sides of the back face of the plate 3 are mounted a pair of angles 4 and 5 extending beyond the plate 3 at both the top and bottom thereof. On the bottom wall of the cabinet is mounted an angle 6, the upright leg of which has a width substantially the same as the space between the rearwardly directed legs of the angles 4 and 5, the lower ends of the angles 4 and 5 being bolted to the angle 6 by studs 7 and the upper end of the angles 4 and 5 being bolted to suitable brackets 8 on the top wall of the cabinet by studs 9.

Intermediate the ends of the angles 4 and 5 and on the rearwardly directed legs thereof are mounted pins 11, as more particularly shown in Figure 4. These pins 11 are riveted to the angles and a pair of straps 12 and 13 are connected at one of their ends to the pins by means of openings through which the pins extend to provide a pivotal mounting. The upper ends of the straps 12 and 13 are provided with slots 14 through which project pins 15 carried by brackets 16 rigidly mounted upon the opposite side walls of the cabinet and adjacent their upper front corners.

The rearwardly extending side plates 17 provide protective barriers.

As shown in Figure 1, the panel interior is rigidly mounted in place within the cabinet by the studs 7 and 9. Removal of these studs permits the panel to tilt forwardly about the engagement of the lower ends of the angles 5 with the angles 6, the slots 14 permitting this tilting until the pins 15 engage the upper ends of the slots. The position of Figure 2 is therefore a stable position. In this position, the lower part of the panel is prevented from moving backwardly by the engagement of angles 4 and 5 with the upstanding leg of the angle 6 and the engagment of the upstanding leg of angle 6 with the rearwardly extending legs of the angles 4 and 5 prevents sideways shifting of the panel.

From the position of Figure 2, a slight forward pressure will disengage the angles 4 and 5 from the angle 6 and the panel may be rotated about the engagement of the pins in the straps 12 and 13 into a position with the panel horizontal and its back directed upwardly as shown in Figure 3. With the proper selection of the location of the pins 11 with respect to the distributed weight of the panel and the elements mounted thereon so that the combined mass of the panel is substantially balanced about the access of rotation, Figure 3 is a stable position. To provide the complete access to the back of the panel it is rotated beyond the position of Figure 3 through 180° from its original position into the position of Figure 4 wherein the back of the panel is fully exposed and is disposed at the entrance to the cabinet for maximum accessibility. After the proper manipulations have been made at the rear of the panel, it will again be placed in the rigidly mounted position of Figure 1 by a reversal of the motions effecting its swingout.

It will be seen that the swingout construction of this invention provides full accessibility to the back of the panel and to the elements mounted thereon at the exterior or at the entrance of the cabinet. Because of the balanced construction provided by the intermediate hinging of the panel by the pins 11 and also by the mounting of straps 12 and 13 at the opposite sides of the panel, a sturdy and stable construction results requiring very little physical effort and preventing uncontrolled movements of the parts which might result in damage. The invention also provides varying degrees of accessibility in suitable positions, providing for the forward tilted position of Figure 2, the horizontal position of Figure 3 and the completely reversed position of Figure 4, this degree of accessibility being obtained without increase in height or depth of the cabinet and with only minor decrease in width.

While a certain preferred embodiment of the invention has been specifically disclosed, it is understood that the invention is not limited thereto, as many variations will be readily apparent to those skilled in the art and the invention is to be given its broadest possible interpretation within the terms of the following claim:

What is claimed is:

1. In a panel cabinet, an enclosure having an openable door, a panel within said enclosure, circuit controlling means mounted on said panel and including manipulable

elements at the back of the panel, means rigidly mounting said panel within the enclosure, means providing a rotatable axis transversely of said panel intermediate the top and bottom thereof, and means for automatically moving said axis providing means forwardly of the normal plane of the panel when the mounting means is released whereby to provide for rotation of said panel adjacent to the entrance to the enclosure.

2. In a panel cabinet, an enclosure having an openable door, a panel within said enclosure, circuit controlling means mounted on said panel and including manipulable elements at the back of the panel, means providing a rotatable axis transversely of said panel intermediate the top and bottom thereof, means rigidly mounting said panel within the enclosure independently of said axis providing means and releasable to provide for forward movement of said panel while supported by said mounting means, and means for supporting said axis providing means for rotation of said panel when the mounting means is released whereby to provide access to the manipulable elements at the back of the panel.

3. In a panel cabinet, an enclosure having an openable door, a panel within said enclosure, circuit controlling means mounted on said panel and including manipulable elements at the back of the panel, means rigidly mounting said panel within the enclosure, means providing a rotatable axis transversely of said panel passing substantially through the center of mass of said panel and the means mounted thereon, said axis providing means being independent of said mounting means, and means for bodily moving said axis forwardly of its rigid mounting when the mounting means is released whereby to provide for rotation of the panel about said rotatable axis forwardly of the normal mounting position to provide ready access to the manipulable elements at the back of the panel.

4. In a panel cabinet, an enclosure having an openable door, a panel within said enclosure, circuit controlling means mounted on said panel and including manipulable elements at the back of the panel, means providing a rotatable axis transversely of said panel intermediate the top and bottom thereof, means rigidly mounting said panel within the enclosure independently of said axis providing means, means connected to said axis providing means and providing for limited forward tilting movement of the panel about substantially the bottom thereof and for rotatable movement thereafter about the axis providing means to expose the back of the panel at the front of the enclosure.

5. In a panel cabinet, an enclosure having an openable door, a panel within said enclosure, circuit controlling means mounted on said panel and including manipulable elements at the back of the panel, a pair of arms at the opposite sides of the panel connected at one of their ends adjacent to the top of the enclosure and at the other of their ends to the opposite sides of the panel intermediate the top and bottom thereof, all of said connections providing for rotary movement between the arm ends and the connected part, means rigidly mounting said panel within the enclosure independently of said arms and releasable to provide for forward movement of said panel while supported by said arms and for rotation of the panel thereafter about its pivotal engagement with said other ends of the arms whereby to expose the back of the panel for access at the front of the enclosure.

6. In a panel cabinet, an enclosure having an openable door, a panel within said enclosure, circuit controlling means mounted on said panel and including manipulable elements at the back of the panel, a pair of arms at the opposite sides of the panel connected at one of their ends adjacent to the top of the enclosure and at the other of their ends to the opposite sides of the panel intermediate the top and bottom thereof, all of said connections providing for rotary movement between the arm ends and the connected part, at least one set of said connections providing for lost motion between the arms and the connected part, means rigidly mounting said panel within the enclosure independently of said arms and releasable to provide for forward movement of said panel while supported by said arms and for rotation of the panel thereafter about its pivotal engagement with said other ends of the arms whereby to expose the back of the panel for access at the front of the enclosure.

7. In a panel cabinet, an enclosure having an openable door, a panel within said enclosure, circuit controlling means mounted on said panel and including manipulable elements at the back of the panel, a pair of pins mounted on the panel at opposite sides and intermediate the top and bottom thereof, a pair of arms mounted at opposite sides of the panel with the lower ends of the arms rotatably engaging said pins, means rotatably mounting the upper ends of the arms to the enclosure at the opposite sides of and toward the front thereof, means rigidly mounting said panel within the enclosure and releasable to permit movement of said panel forwardly until limited by said arms and for rotation of said panel about said pin and arm mounting while supported by said arms to provide access to the back of the panel at the front of the enclosure.

8. In a panel cabinet, an enclosure having an openable door, a panel within said enclosure, circuit controlling means mounted on said panel and including manipulable elements at the back of the panel, a pair of angles mounted at the opposite sides of the panel, means at the top and bottom of the enclosure for rigidly mounting said angles, means providing a rotatable axis transversely of said panel and intermediate the top and bottom thereof and means providing for limiting tilting movement of the panel about the engagement of the angles with the bottom of the enclosure when the angles are released, said last mentioned means supporting the panel at the rotatable axis when in its tilted position and providing for further rotation of the panel about said rotatable axis to further uncover the back of the panel for manipulation at the front of the enclosure.

9. In a panel cabinet, an enclosure having an openable door, a panel within said enclosure, circuit controlling means mounted on said panel and including manipulable elements at the back of the panel, a pair of mounting angles disposed at the opposite sides of the panel, means at the top and bottom of the enclosure for rigidly mounting said angles therein, said last mentioned means including an angle at the bottom of the enclosure having an upstanding leg engaging the legs of the mounting angles to prevent rearward and sideways movement of the bottom of the panel, a pair of arms at opposite sides of the panel, said arms being connected to the enclosure at opposite sides of and toward the front thereof and to the panel at its opposite sides and intermediate the top and bottom thereof, said arm connections being rotatable and providing for limited lost motion connection to at least one of the enclosure and panel, said panel tilting forwardly about the engagement of the mounting angles and the bottom angle when the mounting angles are released, with the forward tilting movement limited by said arms, said panel being thereafter rotatable about the engagement of the panel with the lower ends of said arms whereby to expose the back of the panel to access at the front of the enclosure.

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