

Oct. 23, 1962

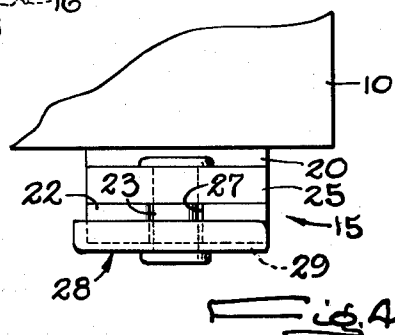
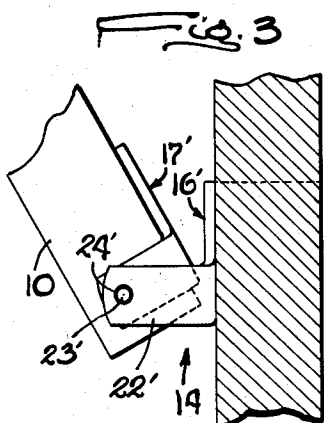
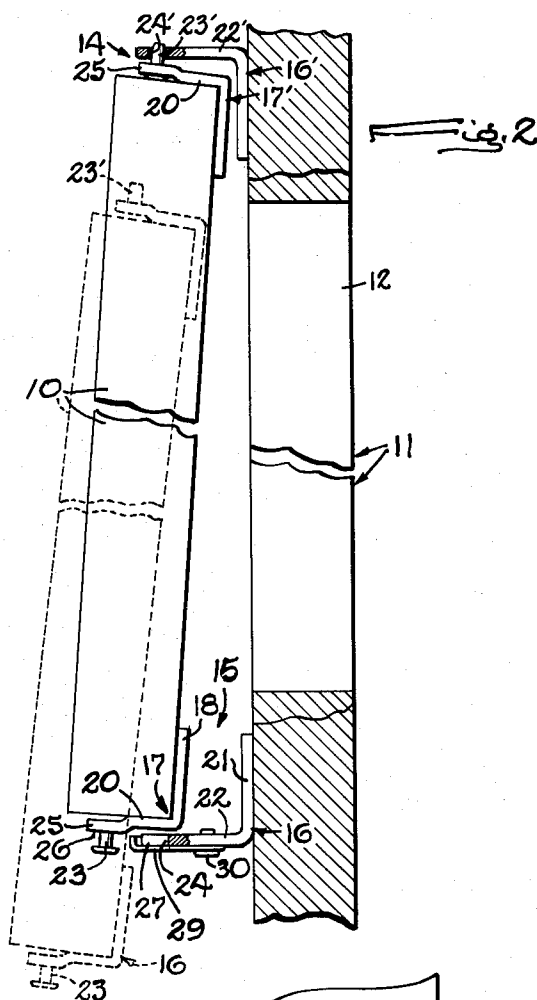
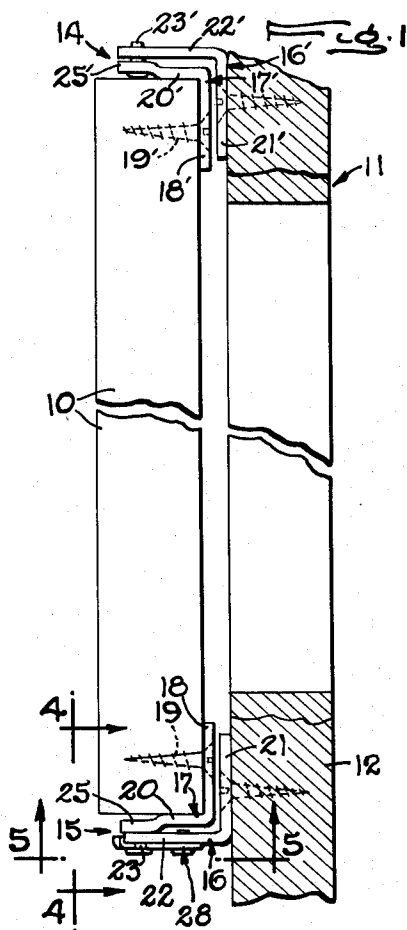
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3,059,271

REMOVABLE HINGE

Filed April 28, 1960

2 Sheets-Sheet 1



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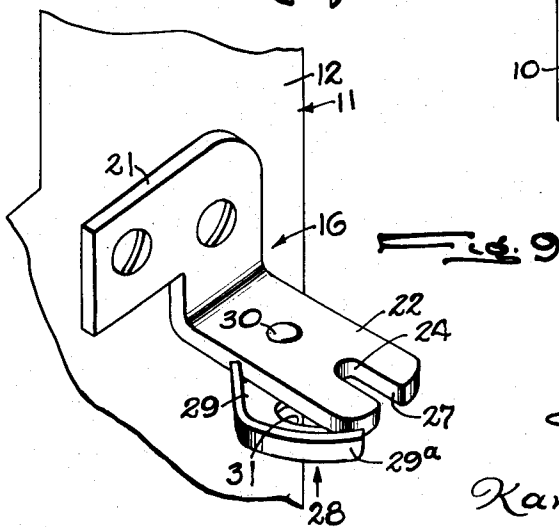
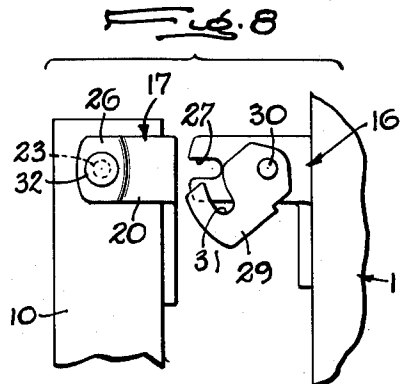
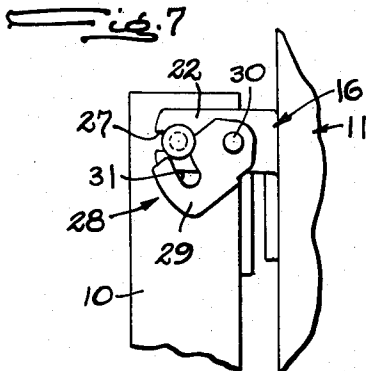
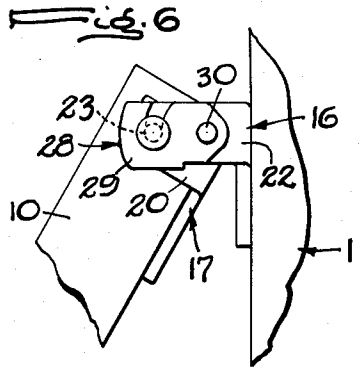
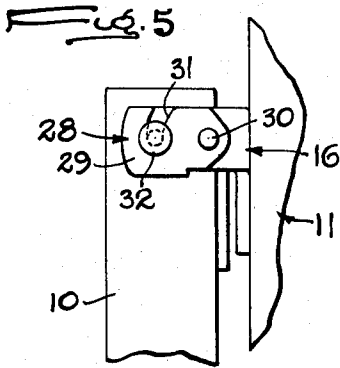
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3,059,271

REMOVABLE HINGE

Filed April 28, 1960

2 Sheets-Sheet 2



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3,059,271

REMOVABLE HINGE

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2 Claims. (Cl. 16-177)

This invention relates to hinges for supporting a door on a frame to swing about a fixed axis between an open and closed position and more particularly to semi-concealed hinges of the knife type having leaves pivotally joined together with one leaf adapted for attachment to the frame and the other to the door.

The primary object of the invention is to provide a hinge of the above character which is constructed in a novel manner to permit easy removal of the door from the frame.

Another object is to pivotally join the leaves in a releasable manner enabling them to be separated easily and replaced conveniently without removing the leaves from the frame or the door and to provide means for latching the leaves together for ordinary service use.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings, in which—

FIGURE 1 is a fragmentary side view of a door mounted on a frame by means of hinges embodying the novel features of the present invention, parts being broken away and shown in section.

FIG. 2 is a view similar to FIG. 1 but showing the door being removed from the frame.

FIG. 3 is a fragmentary top view of one of the hinges supporting the door on the frame.

FIG. 4 is a fragmentary view taken along line 4-4 in FIG. 1.

FIG. 5 is a fragmentary view taken along line 5-5 in FIG. 1.

FIG. 6 is a view similar to FIG. 5 but showing the door partially open.

FIG. 7 is a view similar to FIG. 5 and showing the latching plate in the released position.

FIG. 8 is a view similar to FIG. 7 and showing the door removed from the frame.

FIG. 9 is a fragmentary perspective view of the frame leaf of one of the hinges utilized to mount the door.

For purposes of illustration, the present invention is shown in the drawings embodied in hinges for use in mounting a door 10 on a frame 11 such as the frame of a conventional cabinet structure. The door 10 is supported on an upright member 12 of the cabinet frame 11 to swing about a predetermined axis toward and away from the frame. Usually, the axis about which the door 10 turns is vertical and two hinges 14 and 15 spaced apart along the axis are employed to support the door. (FIGS. 1 and 2.) The hinges 14 and 15 each include two leaves, a frame leaf 16 and a door leaf 17, pinned together to turn relative to each other with the frame leaf 16 fixed to the upright 12 and the door leaf 17 attached to the inner face of the door 10 adjacent one edge thereof. Due to the similarity in the general construction of the two hinges 14 and 15, it will suffice to describe but one hinge in detail and to identify like parts by the same but primed reference numerals in the drawings.

In the present instance, the hinges supporting the door 10 are of the so-called knife type and are substantially concealed by the door when the latter is in the closed position. (FIG. 1.) The door leaf 17 includes a flat plate 18 adapted to be mounted against the inner face of the door 10 and to be attached thereto as by screws 19. A flange 20 formed integrally with the plate 18 projects lat-

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erally therefrom transversely to the axis about which the door 10 swings and toward the outer face of the door. While the door leaves 17 and 17' of the hinges could be mounted at various locations along the door, in the drawings they are shown disposed adjacent the top and bottom edges thereof with the flanges 20 and 20' extending across the edges and terminating inwardly of the plane of the outer face of the door.

The frame leaf 16 comprises a flat mounting portion 21 and a laterally projecting flange 22 formed thereon and extending outwardly of the frame 11 to lie along the corresponding flange 20 on the door leaf 17. Herein the frame leaves 16 and 16' of the hinges 14 and 15 are mounted so the flanges 20 and 20' on the door leaves 17 and 17' are received between the flanges 22 and 22' on the frame leaves. Thus, when mounted as described above, one of the flanges 22' overlies the flange 20' on the upper door leaf and the other underlies the flange 20 on the lower door leaf.

In order to pivotally join the door and frame leaves 16 and 17, a pin 23 formed on one of the leaves is journaled in a hole 24 formed in the opposite leaf. Herein, the pin 23 is fixed to the flange 20 on the door leaf 17 to project away from the door 10 along the vertical axis about which the latter swings and through the hole 24 formed concentric with the axis in the flange 22 on the frame leaf 16. To reduce friction between the leaves as the door is swung open and closed, the flange 20 on the door leaf 17 is offset as at 25 to form a bearing surface 26 surrounding the pin 23 which surface engages the flange 22 formed on the frame leaves 16.

In accordance with the present invention, the hinges supporting the door 10 are constructed in a novel manner permitting the door to be removed easily and replaced conveniently without detaching the hinges 14 and 15 from the door or the frame. To this end, a slot 27 is formed in at least one of the apertured flanges 22 or 22' and extends longitudinally of the flange between the hole 24 and the outer end of the flange. (FIG. 9.) In removing the door 10, the latter is moved outwardly away from the frame 11 whereby the pin 23 passes through the slot 27 thus disengaging the door leaf 17 from the frame leaf 16. Accidental removal of the door 10 during normal service use is prevented by a latching means 28 acting between the frame and door leaves to hold the pin 23 in the hole 24.

In order to hold the pin 23 in the proper position for normal service use of the door, the latching means 28 is mounted on the frame leaf 16 adjacent the slot 27 to engage the pin and hold it in the hole 24 so as to turn about its axis as the door is opened and closed. (FIGS. 5 and 6.) When the door 10 is removed, the latching means 28 is released permitting the pin 23 to move outwardly along the slot 27.

Herein, the latching means 28 comprises a plate 29 pivoted as at 30 to the flange 22 of the frame leaf 16 to turn between a latched position wherein the plate 29 is axially aligned with the flange 22 (FIGS. 5 and 6) and an unlatched position wherein the plate extends transversely of the flange. (FIGS. 7 and 8.) An arcuate slot 31 is formed in one side of the plate 29 so as to extend transversely of the slot 27 in the flange 22 when the plate is in the latched position with the intersection of the slots 27 and 31 defining the hole 24 concentric with the axis about which the door 10 swings. To properly align the plate 29 with the flange 22 when the former is in the latched position, an inturned flange 29^a is formed along one side and across the outer end of the plate 29 to engage the edge of the flange 22. As the plate 29 is pivoted toward or away from the pin 23, the sides of the slot pass on opposite sides of the pin. When the plate 29 is swung relative to the flange 22 to the unlatched or released position, the slot 31 on the plate 28 does not communicate

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with the slot 27 on the flange 22 and thus the corresponding pin may be moved freely into and out of the latter slot.

Herein, the hinges 14 and 15 are illustrated supporting an overlapping type door 10, that is a door which abuts the outer face of the frame 11. With this type of installation the leaves 16 and 17 of the hinges are constructed so that one end of the door 10 may be moved outwardly away from the frame 11 to clear the flange 22 on one of the frame leaves 16 permitting the door to be moved along the frame and the pin 23 on the opposite door leaf 17 to be moved endwise out of the hole 24 in the opposite frame leaf. This manner of removing the door is shown in FIG. 2 wherein the removed door is shown in phantom.

In order to remove the door as described above, one of the hinges, the lower hinge 15 in the present instance, has the slot 27 formed therein through which slot the corresponding pin 23 passes as the lower end of the door 10 is moved away from the frame 11. The pin 23' on the door leaf 17' of the upper hinge 14 is loosely received in the hole 24' formed in the frame leaf. After the lower end of the door 10 is drawn away from the face of the frame 11 to clear the flange 22 on the lower leaf, the door is moved downwardly relative to the frame dropping the upper pin out of the hole and freeing the door.

To prevent the door from shifting along the axis of the hinge relative to the frame, a head 32 is formed on the pin 23 to coact with latching means 28. The latching plate 29 moves under the head 32 of the pin 23 engaging the latter and preventing endwise movement of the pin in the hole 24. With this construction it is not necessary that the frame leaves be mounted so as to closely engage the bearing surfaces formed on the door leaves.

It will be apparent that the present invention permits mounting a door on a frame through the medium of semi-concealed type hinges while, at the same time, enabling the door to be removed and replaced without detaching the members of the hinges from the door or the frame. In addition, the hinges are simple in construction and easy to attach to the cabinet.

I claim as my invention:

1. For use in supporting a door on a frame to swing about a vertical axis between an open position and a closed position, the combination of, upper and lower hinges

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spaced apart along said axis, each of said hinges having a frame leaf adapted for mounting on the frame and a door leaf adapted for mounting on said door, each of said door leaves having a portion integral therewith and lying in a transaxial plane, flanges formed on each of said frame leaves lying in transaxial planes and overlapping said portions, pins fixed to said portions to project toward said flanges and into holes formed in the flanges concentric with said axis, the lower one of said flanges having a laterally opening slot formed therein to extend between an edge thereof and said hole thereby to permit said pin on the corresponding portion to be inserted in and removed from said hole by swinging said door about the upper pin and hole and swinging the lower pin through said slot, and latching means on said lower flange for closing said slot to hold said pin in said hole.

2. For use in supporting a door on a frame to swing about a vertical axis between open and closed positions, the combination of, upper and lower hinges spaced apart along said axis and each having a leaf adapted to be mounted on the frame and a leaf adapted to be mounted on the door, said leaves of each hinge overlapping each other and lying in transaxial planes, a pin fixed to one leaf in each hinge and projecting along said axis into a hole in the other leaf in each hinge, said other leaf in said lower hinge being formed with a slot extending from an edge of the leaf and opening into said hole to define a passage through said other leaf into said hole and extending transversely of said axis whereby said pin is insertable in said hole by swinging said door about said upper hinge, and latching means on said lower hinge to retain said pin in said hole.

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