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SELF-LOCKING CONCEALED HINGE

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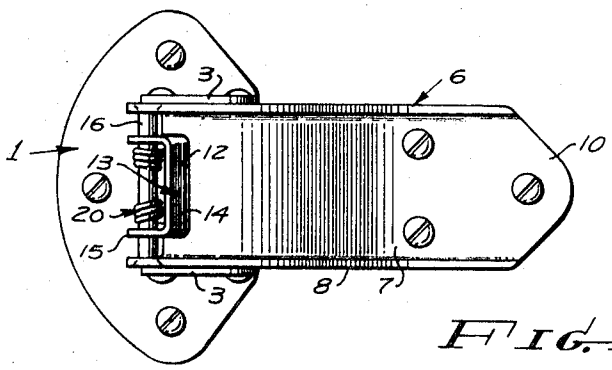


FIG. 1

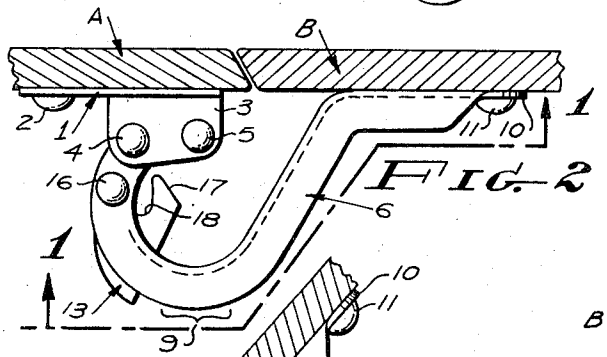


FIG. 2

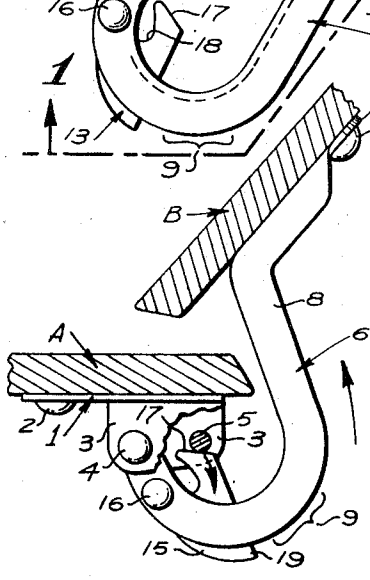


FIG. 3

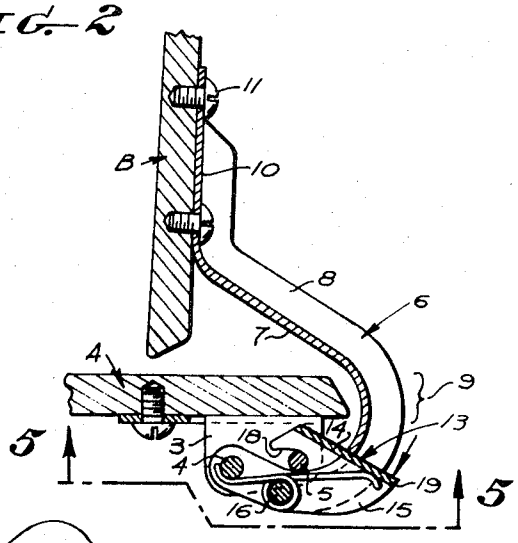


FIG. 4

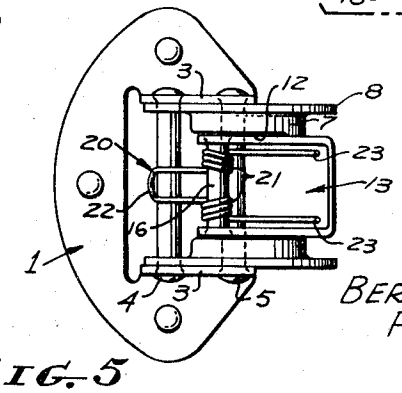


FIG. 5

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SELF-LOCKING CONCEALED HINGE

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U.S. Cl. 16—145 4 Claims

ABSTRACT OF THE DISCLOSURE

A concealed hinge having a fixed mounting plate fastened inside a door frame and carrying a hinge pin and a keeper bar, and a movable hinge member in the form of an open loop, one end of which is joined to the hinge pin and the other end of which is attached to a mating door; the open loop pivotally supporting a latch lever for operative engagement with the keeper bar to hold the door in an open position, the latch lever being manually releasable.

This invention relates to self-locking concealed hinges and included in the objects of this invention are:

First, to provide a concealed hinge which incorporates a latch adapted to lock a door carried on the hinge in its fully open position or other predetermined open position and is adapted to be released by manual engagement when it is desired to close the door.

Second, to provide a hinge of this type which involves a plate, adapted to be secured to the back side of a door hinge; a gooseneck member pivoted to the plate and adapted to be secured to the back side of a door fitting the door frame; and a pivoted latch member carried by the gooseneck member adjacent the plate and arranged to latch a keeper bar carried by the plate when the gooseneck member and door has pivoted through a predetermined angle; the latch member projecting from the gooseneck member so as to be readily engageable for manual release and permit closing the door.

With the above and other objects in view as may appear hereinafter reference is directed to the accompanying drawings in which:

FIGURE 1 is a side view of the self-locking concealed hinge taken from 1—1 of FIGURE 2, that is, from within the cabinet on which the hinge is adapted to be mounted. Illustration of the cabinet, however, being omitted.

FIGURE 2 is an end view of the hinge shown attached to the frame end door of a cabinet and shown in its closed position. The frame end door being shown fragmentarily and in section.

FIGURE 3 is a similar view of the hinge shown in a mid position wherein the latch is in initial engagement with the keeper.

FIGURE 4 is a second similar view of the hinge, the hinge however being shown in longitudinal section and in its fully opened position in which the latch and the keeper are interlocked to secure the hinge and the door in an open position.

FIGURE 5 is an end view of the hinge shown in its fully opened position and taken from 5—5 of FIGURE 4.

The self-locking concealed hinge includes a fixed hinge plate 1 adapted to be secured by screws 2 or other means to the inside of a door frame A. Folded inwardly or away from the door frame are two parallel flanges 3 which are integral with the plate 1. The flanges are connected by a pivot pin 4 and a keeper pin 5 disposed in parallel relation, the keeper pin being closer to the door opening formed by the door frame A.

A movable hinge member 6 is provided which is channel shaped in cross section and includes a web 7 of uniform width boardered by flanges 8. The major portion of the movable hinge member forms a gooseneck or open loop 9. At one end the flanges 8 extend beyond the web 7 and are journaled on the pivot pin 4. At the other end of the opened loop there is formed a flat lateral extension 10 which is adapted to be secured by screws or other fastening means 11 to a door B dimensioned to fit within the door frame A.

Near its journaled end the web 7 of the hinge member is provided with a latch receiving slot 12. A latch member 13 of channeled shaped cross section fits within the slot 12. The latch member includes a web 14 and side flanges 15. The side flanges 15 are joined by a pivot pin 16 to the flanges 8 of the hinge member 6 at a point near the pivot pin 4. One extermity of each side flange 15 forms a cam edge 17 adapted to engage the keeper pin 5 between the cam edge 17 and the pivot pin 16 each a side flange is provided with a latching notch 18. The extremity of the latch member 13 opposite from the cam edges 17 extend through the web 7 of the movable hinge member 6 and forms a handle portion 19.

A spring 20 urges the latch member 13 in a counterclockwise direction as viewed in FIGURES 2, 3 and 4. The spring includes coils 21 wrapped about the pivot pin 16 a mid portion 22 bearing against the pivot pin 4 and extremity 23 bearing against the web 14.

Operation of the self-locking concealed hinge is as follows:

When the door B is in its closed position, the latch member 13 is clear of the keeper pin 5 and the movable hinge member 6 as well as the door B are free to swing in a counterclockwise direction as viewed in FIGURES 2, 3 and 4. Movement of the door to a mid open position brings the cam edges 17 of the latch member 13 into engagement with the keeper pin 5 as shown in FIGURE 3.

Continued outward movement of the door and the movable hinge member causes the latch member 13 to move clockwise with respect to the movable hinge member until the cam edges 17 clear the keeper pin 5 whereupon the spring 20 rotates the latch member 13 counterclockwise causing the keeper pin 13 to engage in the latching notches 18 as shown in FIGURE 4.

It will be noted that when the keeper pin 5 and the notches 18 are interengaged, a plane through the keeper pin 5 and the pivot pin 16 is approximately at right angles to the plane between the pivot pin 16 and the pivot pin 4. As a consequence, any attempt to rotate the movable hinge member 6 and the door B in a clockwise direction is resisted, but not necessarily prevented, by the latch member 13. Also, the slope of the notches 18 may be varied to provide the desired degree of resistance.

When it is desired to close the door, the handle portion 19 is pressed in a clockwise direction as viewed in FIGURE 4 and indicated by an arrow until the latch member 13 clears the keeper pin. The door may then be freely closed.

While a specific embodiment of this invention has been shown and described, it is not intended to limit the same to the exact details of the construction set forth, and it embraces such changes, modifications and equivalents of the parts and their formation and arrangement as come within the purview of the invention.

We claim:

1. A self-locking concealed hinge, comprising:

(a) a fixed plate adapted for attachment to the concealed side of a door frame adjacent a door opening, said plate having a hinge pin and an adjacent keeper bar located between the hinge pin and the adjacent margin of the door opening;

(b) a movable member including an open loop portion joined at one end to said hinge pin, and curving therefrom toward said door opening for movement through the door opening in spaced relation to the adjacent margin thereof, said movable element terminating in a mounting end extending essentially radially from said hinge pin and adapted for attachment to the backside of a door fitting said door opening;

(c) and a latch lever pivotally connected to said movable member adjacent said hinge pin and having a cam face engageable with said keeper bar after predetermined opening movement of said door and an adjacent hook operable, on predetermined pivotal movement of said latch lever, to engage said keeper bar, thereby resisting movement of said door of its open position, said latch lever being manually engageable to free said door.

2. A hinge, as defined in claim 1, wherein:

(a) said movable member is channel shaped in cross section and includes a pair of spaced flanges receiving said hinge pin and pivotally supporting said latch lever, and a connecting web notched to clear said latch lever.

3. A self-locking concealed hinge for a door frame and a door adapted to set flush therein, said hinge comprising:

(a) a fixed fitting adapted to be secured to a margin of said door frame at the backside thereof;

(b) a movable fitting adapted to be secured to an adjacent margin of said door at the backside thereof, said fittings being in coplanar relation when said door is disposed flush in said door frame;

(c) an open loop extending from said movable fitting to said fixed fitting;

(d) a journal pin connecting the extended end of the open loop to said fixed fitting for movement of said door between a flush position and an angular position relative to said door frame;

(e) a keeper lever pivotally mounted on said open loop adjacent said journal pin and having an end directed toward said fixed fitting between said journal pin and the adjacent edge of said door frame;

(f) and a keeper bar carried by said fixed fitting between said journal pin and the adjacent edge of said door frame and engageable by said keeper lever when said door is moved to a predetermined angular open position.

4. A hinge, as defined in claim 3, wherein:

(a) a cam is formed at the end of said keeper lever engaging said keeper bar and tending on engagement therewith to rotate said keeper lever to deflect said keeper lever to one side of said keeper bar;

(b) a keeper notch is formed at one extremity of said cam for engagement with said keeper bar when said keeper bar moves past said cam;

(c) and a spring applies a biasing force counter to the direction of rotation in response to engagement of said keeper lever with said keeper bar to cause yieldable retention of said keeper bar in said notch upon movement of said keeper bar past said cam.

References Cited

UNITED STATES PATENTS

2,277,035	11/1955	Johnson	16—146
3,203,031	8/1965	Youngdale et al.	16—145

FOREIGN PATENTS

211,355	10/1955	Australia.
641,931	1/1963	Belgium.

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