July 16, 1963 R. T. CASEBOLT 3,097,873

REVERSIBLE LATCHING ASSEMBLY FOR SLIDING DOOR

Filed Nov. 10, 1960

Fig. 1.

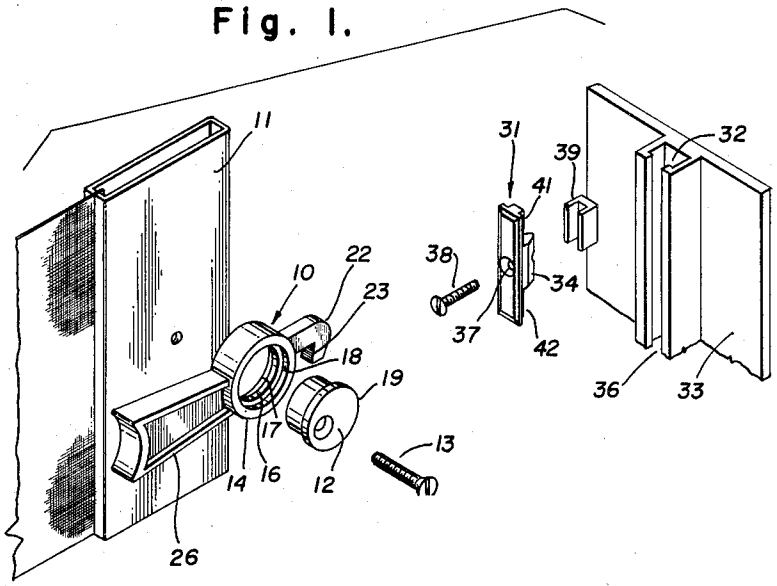


Fig. 2.

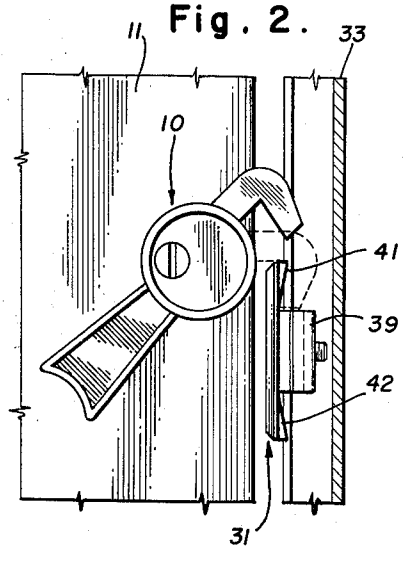
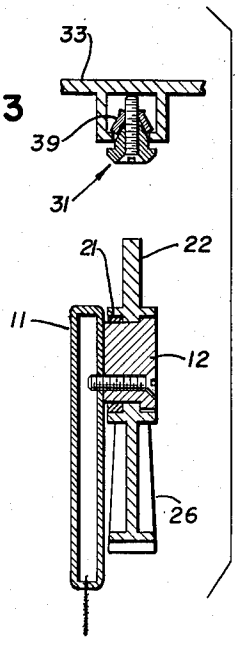


Fig. 3



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United States Patent Office 3,097,873 Patented July 16, 1963

3,097,873
REVERSIBLE LATCHING ASSEMBLY FOR SLIDING DOOR

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Filed Nov. 10, 1960, Ser. No. 63,489
10 Claims. (Cl. 292—244)

This invention relates to adjustable lock assemblies, and more particularly to reversible lock assemblies for use with sliding doors.

The versatility of sliding door assemblies in the building trades is largely dependent upon their adaptability to a variety of construction situations. In spite of the fact that sliding doors, particularly the so-called lanai doors, have become increasingly popular to the extent that distributors can economically justify carrying different sizes in stock, one way to substantially reduce the necessary inventories is to provide hardware which may be used on doors that slide to the left or right.

In order to design a versatile "reversible" sliding door assembly, the present invention affords a sliding door assembly in which the door jambs are reversible, depending upon the direction in which the door is to close, and which incorporates a number of other features designed to facilitate the use of a minimum number of basic components.

In furtherance of this object of minimizing the stock inventories, the present invention envisions a reversible lock assembly which in the exemplary embodiment is used on a screen door for a sliding door assembly but which is obviously adapted for use in any situation where it is desired to lock a sliding door to an adjacent door jamb.

The necessity for differently operated lock assemblies for doors, depending upon their direction of closure, arises because the latching member should move downwardly to engage the latch retaining means, irrespective of the direction of the door pull. Thus, if the sliding door is to move from left to right it is desirable to rotate the latch in a clockwise direction so that the latching member moves over and downward against a retaining member, whereas if the door is designed to be moved from right to left it is desirable to obtain the same inclined downward latching operation by rotating the latching member counterclockwise. This not only maintains the symmetry of latch operation for the convenience of users, but assures maintenance of vertical and translational locking of the door by the downward force of gravity.

It is well known in the art of sliding glass doors that these doors move in longitudinal guideways between open and closed positions. Since these doors must be removable from the frame structure, it is necessary that they be locked against sliding movement as well as against removal. A lock which solely prevents the door from being moved in translation to an open position does not necessarily prevent the door from being moved vertically and completely detached from the sliding door frame assembly.

Another problem associated with door lock assemblies for such sliding doors is that of adjusting the latch and latch engaging members so that the two cooperate correctly. While this can be carefully preset during manufacture if every variety of door is preconstructed, it is obviously not feasible if multi-purpose components are utilized. Instead, it is mandatory to provide some simple and effective adjusting means that takes into account variations in manufacturing tolerances, and does not require expensive and time consuming changes in the field.

The principal object of this invention, therefore, is to provide a reversible lock assembly which is economical to manufacture, simple to install with a minimum of labor, easily adjustable, and which effectively locks the door.

A feature of the invention pertains to the means for obtaining a coarse adjustment of the point of engagement between the latching member and its retaining means by varying the vertical position of the retaining means and means for obtaining a fine adjustment of the point of engagement by changing the vertical point of support for the rotatable latching member.

Another feature of the invention pertains to complementary reverse angle engaging surfaces formed on the latch and retaining means so that the door, when locked adjacent a door jamb, is prevented from moving along the translational line of the door slide as well as vertically.

Yet another feature of the invention pertains to the use of a symmetrical latch engaging member which is adaptable for movement within a guideway formed in the extruded door jamb so that the latch engaging member may be utilized regardless of whether the door jamb is placed at the left or right hand side of the door, which placement depends upon the direction which will act to close the door.

Yet another feature of the invention pertains to eccentrically mounting a journal support for the latch member adjacent the edge of the door so that the vertical height of the hook on the latching member may be changed by eccentrically rotating the journal support with respect to the door.

Still another feature of the invention pertains to the use of a symmetrical latching member which may be supported by journal support adjacent either one of its sides in order to provide the necessary clockwise or counterclockwise rotation for movement over and down to engage cooperating retaining means.

Yet another feature of the invention pertains to the combination in an adjustable assembly for locking a door of means for supporting a latching member adjacent the leading edge of a door, a latch retaining member variably supported along the side of a cooperating door jamb, coarse adjustment means for positioning the latch retaining member along the extent of the jamb at a location approximately opposite the rotatably supported latching member, and fine adjustment means associated with the support means for the latching member to vary vertically the point of engagement between the latching member and the retaining member to assure a proper fit therebetween.

More specifically, a feature of this invention pertains to a reversible latching assembly including the combination of a journal affixed to the side of a door off-center and having a shoulder formed on its outer end, a latching hook having an internal bearing defined by recesses for rotatably supporting the latching hook on the journal so that the shoulder of the journal holds the latching hook thereon, a resilient O-ring disposed within the recess adjacent the door surface to provide resistance to the rotation of the latching member about the journal, latching retaining means affixed to the cooperating door jamb, and adjustment means to vary the point of engagement between the latching hook and the latch retaining means including means for selecting the vertical position of the retaining means and means for selecting the angular position of the journal about its off center point of support.

These and other objects and features of the present invention may be more fully understood when the following detailed description is read with reference to the drawings, in which:

FIG. 1 is an exploded perspective view of a latching member and latch retaining member and cooperating parts of a door stile and jamb;

FIG. 2 is an elevation view of the locking assembly showing the cooperation between a latching member and

latch retaining member, which members are supported on the side of a door and in the vertical guideway, respectively; and

FIG. 3 is a top cross section view of the latching member and latch retaining member positioned adjacent the edge of a door and along the vertical guideway, respectively.

Looking to the exploded view of FIG. 1, it can be seen that the latching member 10 is supported on an exemplary side of a door 11 by the journal member 12. More particularly, the journal 12 is held against the side of door 11 by an off-center screw 13. The latching member 10 has a center body portion 14 which is apertured to define a shoulder bearing 16. Symmetrical recesses 17 and 18 define the shoulder 16 and the outermost one, 18 in the exemplary latching member of FIG. 1, cooperates with the shoulder 19 on the journal 12 to hold the latching member 10 adjacent the door 11. Obviously, when the latching member 10 is reversed for rotation in a counterclockwise direction the shoulder 19 cooperates with the recess 17.

An O-ring 21 (FIG. 3) is fitted in the exemplified inwardly disposed recess 17 and creates a resistive drag between the surface of journal 19 and that of the recess 17. Here again, if the latching member is reversed and recess 18 is the one adjacent the side of the door 11, it cooperates with the O-ring 21 to provide the necessary resistance.

A symmetrical latch retaining or engaging member 31 cooperates with a guideway 32 formed along the side of a door jamb 33. The latch retaining member 31 has a rearwardly extending triangular, cross-section guide shoe 34 which fits into the slot 36 of the guideway 32. The retaining member 31 has an aperture 37 formed therethrough so that a locking screw such as 38 may engage a U-shaped locking member 39 which is disposed interior of the guideway 32. More particularly, the screw 38 is disposed through the aperture 37 and threads into the bight of the U-shaped locking member 39, which has previously been moved interior of the guideway 32 to a position behind the guide shoe 34. When so positioned, tightening up the screw 38 causes the legs of member 39 to spread outwardly against the surfaces of the guide shoe 34 to a point of engagement against the lips defining guideway 32. This provides a simple and effective means for firmly locking the retaining member 31 at any point along the vertical guideway.

The retaining member 31 is substantially rectangularly shaped and has symmetrical upper and lower engaging surfaces 41, 42 formed on the door jamb or rear side adjacent the guide shoe 34. It will be observed that these surfaces 41, 42 have reverse angles formed thereon extending toward the center of the retaining member 31 (FIG. 3), which reverse angle surfaces cooperate with a surface on the hook on the latching member 10, as will be explained below.

Turning back to the latching member 10, extending from one side of the body 14 is a latching hook 22 which is roughly shaped in the form of an L with the inside or hook engaging surface 23 having a reverse angle formed thereon. The reverse angle surface 23 is complementary to surfaces 41 and 42 formed on the side surface of the retaining member 31 and, when engaging one of these surfaces, prevents the door from being moved upwardly with respect to the door assembly. Extending from the other side of the body 14 is a handle 26 for rotating the latch about the journal 19.

In operation, the retaining member 31 is positioned along guideway 32 at a position approximately opposite the support point for journal 19. The retaining member 31 is locked at this point by causing the locking member 39 to engage the lips on the guideway 32, as explained above. With this coarse adjustment made, it is possible to provide a slight vertical adjustment for the latching member 10 by loosening the screw 13 and rotating the journal 19 until the engaging surface 23 of the latching hook 22 engages the upper surface 41 on the retaining member 31, as shown by the dotted position of the hook 22 in FIG. 3. When this position is attained, the screw 13 is tightened which permits the latching member 10 to properly engage the retaining member 31 each time the door is closed and the latching member 10 rotated.

From the foregoing, it can be appreciated that the present invention provides a simple and effective means for locking a sliding door to a cooperating door jamb irrespective of the direction of closure of the door. Thus, builders may buy a minimum number of parts and still utilize them in a variety of building situations without loss of time and with a minimum amount of labor for installation and adjustment.

While the invention has been described with respect to a specific embodiment, it should be apparent to those skilled in the art that certain modifications of the basic concept may be envisioned without departing from the spirit and scope of the invention. For this reason, it is contemplated that the present invention should only be limited to the extent of the appended claims.

What is claimed is:

1. In an adjustable assembly for locking a door adjacent a cooperating jamb, a latching member, support means for rotatably supporting said latching member adjacent the leading edge of a door for rotation about an axis, a latch retaining member supportable along the side of a cooperating door jamb, coarse adjustment means for slidably positioning the latch retaining member along the extent of the jamb to a position approximately opposite the rotatably supported latching member, and fine adjustment means associated with said support means for variably fixedly positioning the axis, said fine adjustment means being operable to vary vertically the point of engagement between the latching member and the retaining member to assure a proper fit therebetween.

2. An adjustable locking assembly for locking a door adjacent a cooperating door jamb in accordance with claim 1 wherein said fine adjustment means is provided by fixedly connecting the support means for said latching member eccentrically adjacent the leading edge of the door so that rotation of the support means will act, in part, to vertically change the axis of rotation for the latching member.

3. An adjustable locking assembly for locking a door adjacent a cooperating door jamb in accordance with claim 1 wherein the latching member is symmetrically formed for rotation in clockwise and counterclockwise directions and the engaging parts of the latching and retaining members are complementary reverse angle surfaces which, in engagement, prevent the translational and vertical displacement of the door with respect to the jamb.

4. A reversible latch assembly for locking left and right sliding doors to an adjacent jamb comprising, in combination, a symmetrical retainer supportable at a selected point along the length of the adjacent door jamb and a symmetrical latching member supportable adjacent the leading edge of the door for rotation in one direction to engage an end of the retainer when the door is closed in one direction and for rotation in the other direction to engage an end of the retainer when the door is closed in the other direction, said latching member including a body having a bearing formed therethrough and having an actuating lever extending from one side and a retainer engaging hook extending from the other, journal means to support the latching member by said bearing for rotation in a desired direction, and means to eccentrically adjustably affix said journal means to the door adjacent the leading edge thereof.

5. A reversible latching assembly for engaging a retainer along the edge of a door jamb comprising, in combination, a hollow cylindrical bearing having an internal shoulder defined by recesses, a cylindrical bearing support member having a shoulder formed on one end and

attached to the door for rotatably supporting said bearing by said shoulder, the shoulder on said bearing support fitting interior of one of the recesses and abutting one side of the shoulder formed interior thereof, resilient means interposed in the other recess to frictionally resist rotation of said bearing on said bearing support, means extending outwardly from one side of said bearing to rotate it about said bearing support member and a hook projecting outwardly from the other side operable upon rotation of the bearing to engage a retainer associated with a cooperating door jamb, and means operable to eccentrically rotate said bearing support member with respect to said door to control the point of engagement between said hook and the retainer cooperating therewith.

6. A reversible latching assembly comprising, in combination, a latching member supportable adjacent one side for rotation in one direction and supportable adjacent the other side for rotation in the other direction, said latching member having a bearing formed therethrough, which bearing is defined by recesses adjacent the sides of the latching member, a journal member proportioned to support the latching member by the bearing surface and having a shoulder formed on its outer end adaptable to reside in one recess when the latching member is supported for rotation in one direction and in the opposite recess when the latching member is supported for rotation in the other direction, a resilient O-ring proportioned to reside in the instant unoccupied recess and to bear against the journal thereby to provide resistance to the rotation of said latching member with respect to said journal, retaining means associated with a door jamb, and means including an off-center aperture through the journal to affix the journal to the side of a door so that the rotational position of said journal may be varied to change the point of cooperation between the latching member and the retaining means.

7. In a reversible latching device for securing a door to a jamb, the combination of a journal affixed to a side of a door at a point off-center and having a shoulder formed on its outer end, a latching member having an internal bearing defined by recesses for rotatably supporting the latching member on said journal, said latching member having a hook extending from one side, said shoulder on said journal bearing against one side of the latching member bearing to maintain said latching member adjacent the door, a resilient O-ring disposed within the inwardly disposed recess of said latching member to resist the rotation of said latching member about said journal, latch retaining means affixed to a door jamb, and means to vary the point of engagement between said latching hook and the latch retaining means including coarse adjustment means for locating the retaining means along the door jamb at a position approximately opposite

the latching member, and fine adjustment means to rotate said journal about its eccentric support point to raise and lower the point of engagement of the retaining means by the latching hook.

8. A latching device for locking a sliding screen door adjacent a door jamb comprising, in combination, a vertically disposed guideway formed along the cooperating surface of the door jamb, a latch engaging member having a rearward extending guide shoe disposed within the guideway for movement along the extent of the guideway, said latch engaging member also having engaging surfaces formed on the upper and lower rearward surfaces transverse to the line of movement of the door, a U-shaped retaining member threadedly apertured for disposition in said channel, means including said guide shoe to engage said retaining member after it is disposed in said channel and flare the legs thereof outwardly as the retaining member is moved over the guide shoe of the engaging member whereby the retaining member engages the overhanging shoulders defining the guideway to lock the latch engaging member at a preselected height in said guideway, a latching member, a journal member upon which said latching member is rotatably supported, means for eccentrically mounting said journal member on the stile of the door adjacent the jamb, and means to rotate said latching member with respect to the journal member whereby the latching member engages the upper rear engaging surface formed on said latch engaging member to prevent movement of the door away from the door jamb.

9. A latching device for locking a sliding screen door adjacent a door jamb in accordance with claim 8 wherein the latch of said latching member is L-shaped and has a reverse angle surface formed on the inside of the engaging leg thereof and the engaging surfaces of said engaging member constitute reverse angle surfaces complementary to the slope of the inner surface on said latch member so that the latching of the door adjacent the jamb prevents movement of the door in a vertical direction as well as along the line of movement of the door.

10. A latching device for locking a sliding screen door adjacent a door jamb in accordance with claim 9 wherein the eccentrically supported journal member may be rotated with respect to the door stile to thereby adjust the rotational path of said latching end of said latching member with respect to the fixed location of the upper rear surface formed on said latch retaining member.

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