

[54] **FLUSH TYPE DOOR LATCH**

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[51] Int. Cl. **E05b 5/00, E05b 65/02, E05c 1/14**

[58] Field of Search **70/146, 153, 208; 292/DIG. 31, 173**

[56] **References Cited**

UNITED STATES PATENTS

3,576,118	4/1971	Doerrfeld.....	70/146
3,259,411	7/1966	Griffiths.....	292/113
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FOREIGN PATENTS OR APPLICATIONS

6,801,119	8/1968	Netherlands.....	70/208
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Primary Examiner—Albert G. Craig, Jr.

Attorney—John A. Dienner et al.

[57]

ABSTRACT

A door latch embodying the principles of this invention is designed to be assembled in a conventional pan-shaped housing having a shallow depth and having a slot provided in the back wall. A guide member is supported on the outside surface of the back wall and open to the slot to slidably receive a lock bolt therein. A compression spring biases the bolt outwardly into the projected latching position. A latching member having a plate portion of a shape conforming to the outer dimensions of the open front face of the door latch housing is pivotally mounted between the opposite side walls of the housing and has a lever portion which projects through the back wall slot and into a recess formed in the lock bolt for retracting the lock bolt against the force of the compression spring. An eject member is also pivotally supported between the side wall housings and includes a push button member which projects through an opening provided in the latching member plate portion. The eject member also includes a nose portion which engages the under surface of the plate portion latching member adjacent its outer free end such that upon an inward force applied to the push button member causes the nose portion to swing outwardly and force the free end of the latching member away from the housing a sufficient distance to be gripped by the user.

7 Claims, 7 Drawing Figures

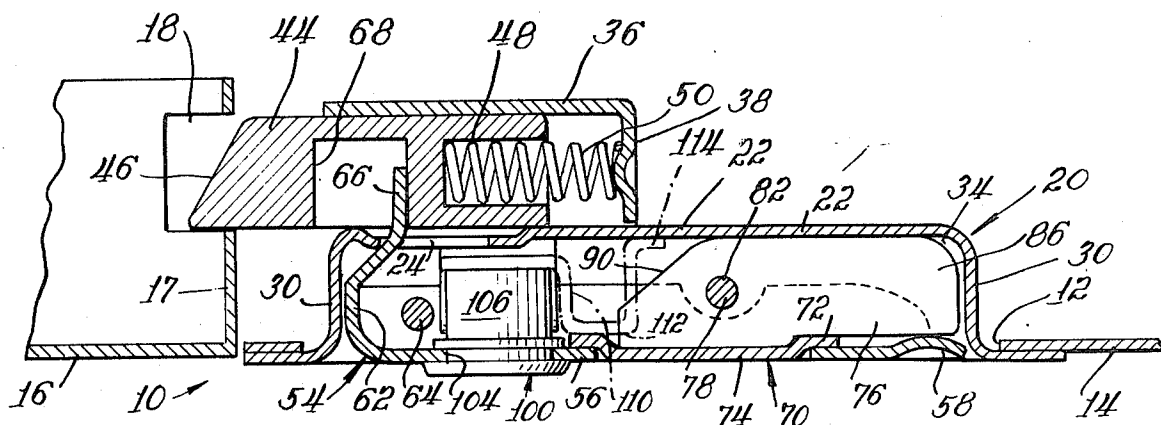


Fig. 1

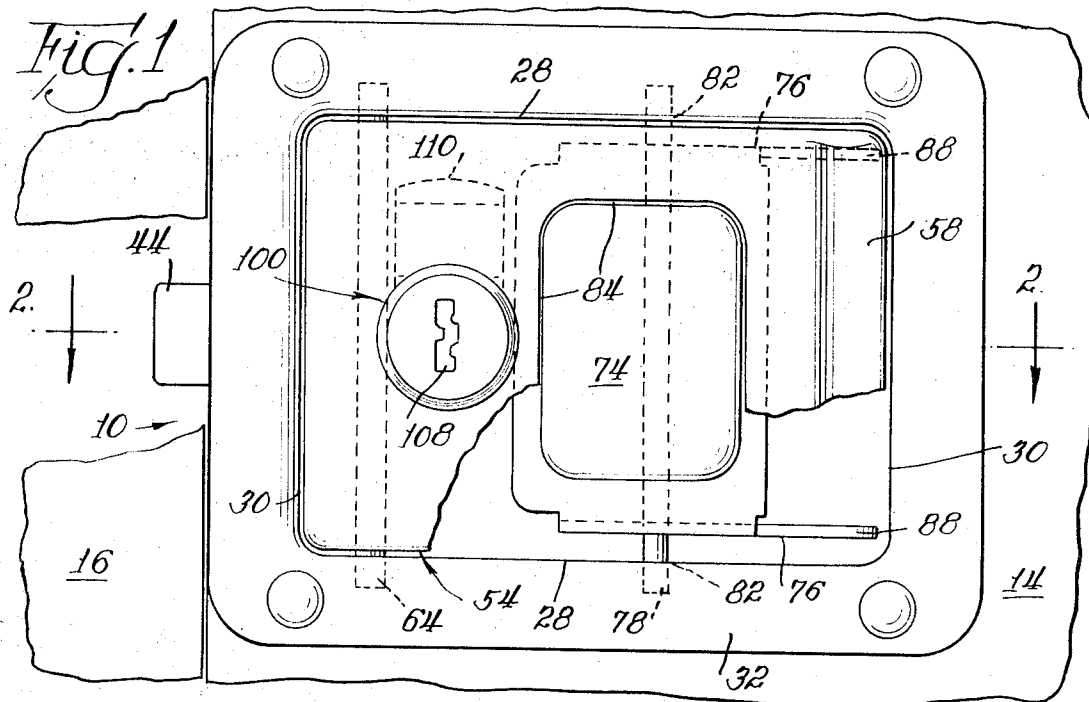


Fig. 2

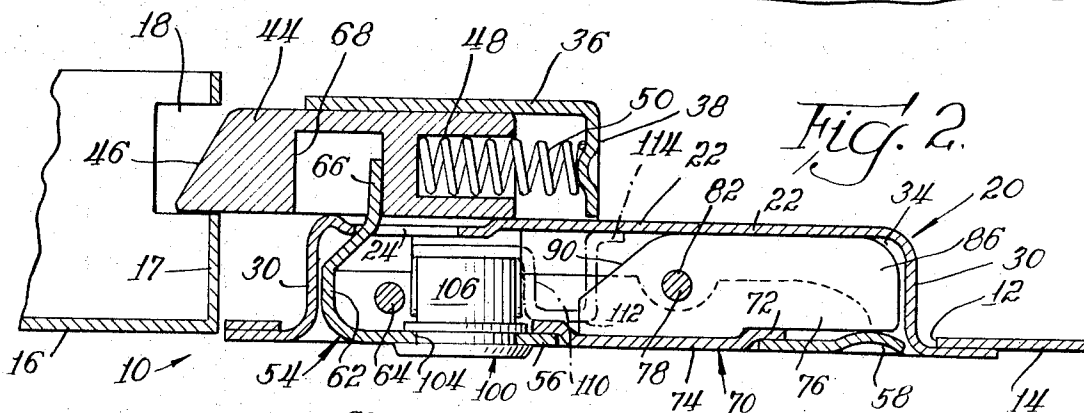


Fig. 3

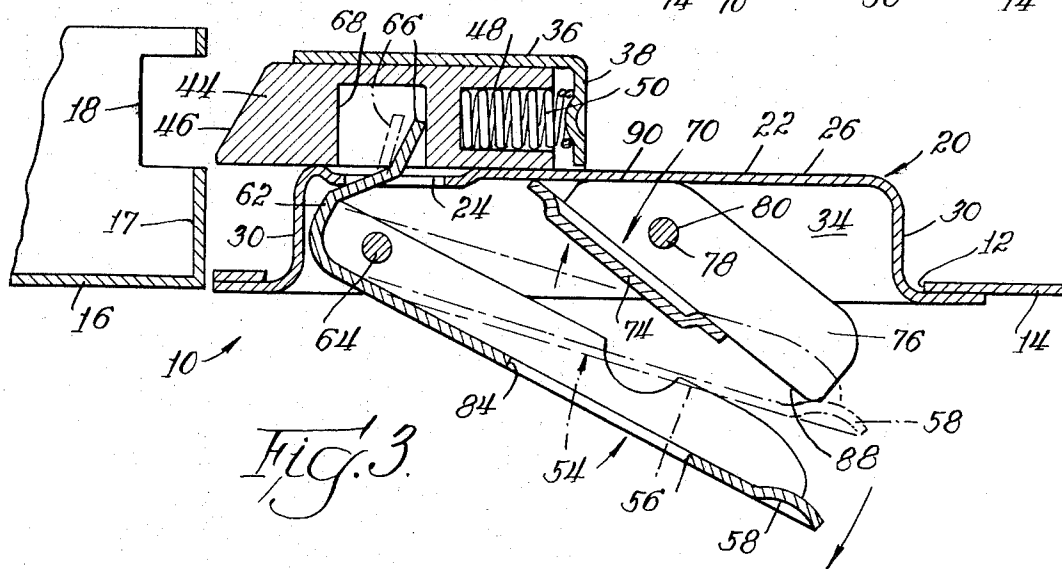


Fig. 4

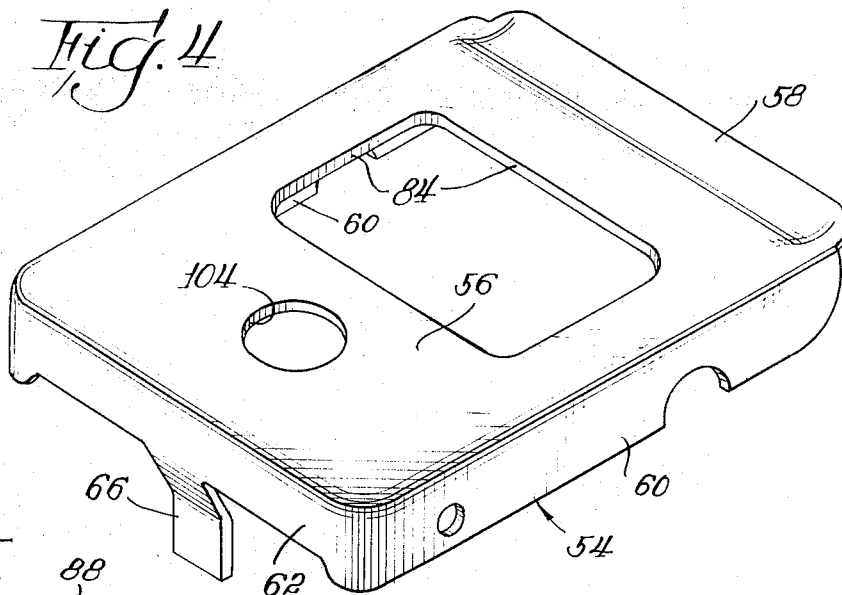


Fig. 5

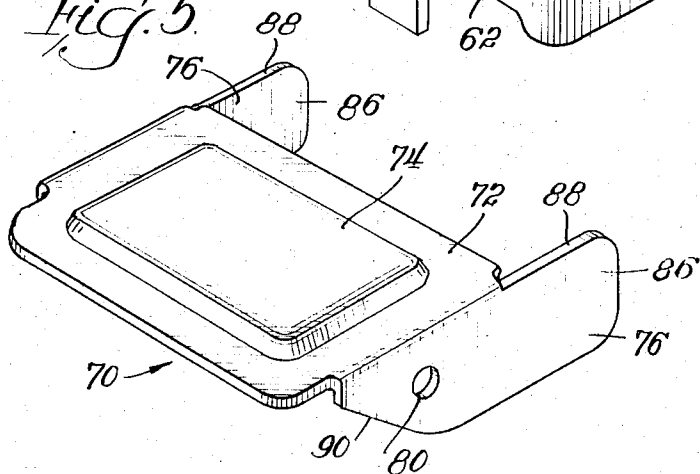


Fig. 7

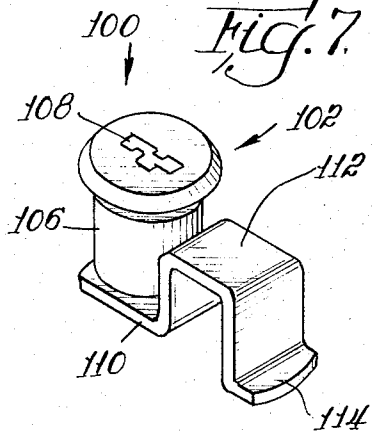
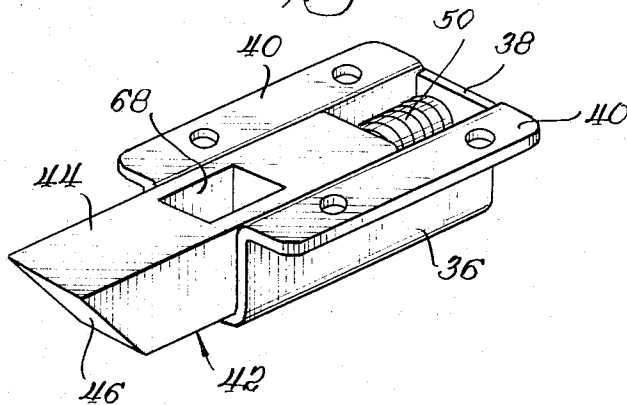


Fig. 6



FLUSH TYPE DOOR LATCH

BACKGROUND OF THE INVENTION

The present invention relates to a flush-type door latch adapted for use on the doors of vehicles such as recreational and commercial trailers.

Conventional flush-type door latches comprise a housing, a slidable lock bolt and an operating handle for retracting the lock bolt. One of the design objectives in this type of door latch is to have no exposed edges to prevent the handles from being pryed open and to prevent protruding surfaces for safety purposes.

There is disclosed in my U.S. Pat. No. 3,576,118 a very satisfactory design for a flush-type door latch meeting the above mentioned criteria. However, this design has one shortcoming which is particularly a disadvantage for recreational vehicles that are used by all members of a family. This shortcoming is that the operating handle has a rather short effective length requiring a considerable outward pull force by the operator to effect the unlatching operation.

This invention overcomes the above mentioned shortcoming by providing an operating handle having substantially twice the effective lever action as disclosed in my prior patent and yet meeting the other design objectives of completely covering the front of the housing to present no exposed or protruding edges subject to prying or other tampering.

SUMMARY OF THE INVENTION

The flush-type door latch of the present invention is designed to be packaged in a conventional pan-shaped housing in which a guide member is supported on the back wall thereof for slidably receiving a lock bolt. A latching member having a plate portion conforming to the shape of the outer dimensions of the housing's open front face is pivotally supported at one end and has a lever portion adjacent this pivoted end which projects through a slot in the pan-shaped housing and into a recess in the lock bolt for retracting the lock bolt against the force of a spring, which urges the lock bolt into a projected latching position. An eject means is provided for selectively moving the free end of the plate portion of the latching member away from the open front face a sufficient distance to permit gripping of the free end. This eject means includes a button member disposed through an opening in the plate portion which is operatively connected to the latching member for effecting the outward movement of the plate portion in response to an inward pushing force by the user.

DESCRIPTION OF DRAWINGS

For a better understanding of this invention, reference may be made to the accompanying drawings, in which:

FIG. 1 is a partial front view of a door in which the door latch of the present invention is mounted and of a door jam adjoining the edge of the door;

FIG. 2 is a sectional view taken along the line 2—2 of FIG. 1 with the parts being shown in a locked position;

FIG. 3 is a sectional view corresponding generally to FIG. 2 with the parts being shown in an operating position and with the lock device removed for clarity;

FIG. 4 is a front perspective view of a latching member used in the embodiment of my invention;

FIG. 5 is a front perspective view of an eject means used in the embodiment of my invention;

FIG. 6 is a front perspective view of a lock bolt and associated guide member used in the embodiment of my invention; and

FIG. 7 is a front perspective view of a lock device used in the embodiment of my invention.

DESCRIPTION OF PREFERRED EMBODIMENT

Referring now to the drawings, there is indicated generally by the reference numeral 10 a flush-type door latch embodying the principles of my invention. The door latch is adapted to be mounted in a recess 12 formed at the edge of a door 14 associated with a side door jam 16. Since the door 14 and door jam 16 do not form part of this invention, only fragmentary portions thereof are shown in the drawings. The door jam 16 is provided with a keeper plate 17 and keeper notch 18 which are arranged in a conventional manner for cooperation with a lock bolt.

The door latch 10, as shown in FIGS. 1-3, comprises a pan-shaped metal housing 20 having a back wall 22 with a slot 24 and flat section 26, opposed sidewalls 28, opposed end walls 30, and a peripheral flange 32 set flush with the front face of the door 14. The walls of the housing 20 define a recessed area 34. Extending along the exterior of the back wall 22, and overlying slot 24, is a generally U-shaped metal channel guide member 36 (FIG. 6). This channel member 36 has a closed end 38 and side flanges 40 secured, as by welding, to the back wall 22.

Slidably mounted in channel member 36 is a lock bolt 42 having a square elongated shape. Lock bolt 42 includes an outer head portion 44 presenting an inclined cam surface 46, and a rear cutout 48. Bolt 42 is biased outwardly of the channel member 36 by a compression spring 50 disposed between the channel member end 38 and rear cutout 48.

To control and retract the lock bolt 42, a paddle handle or latching member 54 (FIG. 4) is provided. As shown in FIGS. 2-4, latching member 54 has an elongated plate portion 56 having a concave arcuate portion 58 at one end and inwardly directed side flanges 60 interconnected by end flange 62. Plate portion 56 extends substantially the entire length and width of recess 34, and is pivotally mounted adjacent one end by a pivot pin 64 which projects through aligned apertures in the side flanges 60 and housing sidewalls 28 adjacent one end of housing 20. Latching member 54 further includes a narrow lever portion 66 projecting inwardly from end flange 62 at the pivotally connected end of latching member 54. The lever portion 66 extends through back wall slot 24 and projects into recess 68 formed along the intermediate portion of lock bolt 42. Lever portion 66 is engageable with the left hand edge of back wall slot 24 to prevent swinging or pivoting of the latching member 54 inwardly beyond the flush-line defined by housing flange 32 and to limit the outward axial movement of lock bolt 42.

By virtue of the fact that latching member extends the entire length of housing recess 34 and is pivotally mounted adjacent one end, it provides the greatest possible leverage advantage, which is a substantial improvement over prior art flush-type door locks that employ paddle handle having a length substantially shorter than their associated housing recess.

Because latching member 54 is designed to be flush with its housing, in the retracted or locked position, it is necessary to provide additional means to expose arcuate portion 58 at the free end of latching member 54 a sufficient amount to permit gripping it. Such means is provided by an eject member 70 (FIG. 5). Eject member 70 has a generally rectangular web portion 72 with a central rectangular raised section 74 and a pair of downwardly extending side flanges 76.

Eject member 70 is pivotally supported by a second pivot pin 78 which extends across access area 34 in a generally parallel direction to the first pivot pin 64 and extends through apertures 80 in side flanges 76 and aligned apertures 82 in housing side walls 28. The location of second pivot pin 78 is selected so that the rectangular raised section 74 in web portion 72 is disposed to rest in a rectangular opening 84 of conforming dimensions which is provided in the plate portion 56 of latching member 54 intermediate its ends. Side flanges 76 are each provided with a nose portion 86 that extends forwardly of the web portion 72 a sufficient distance to engage arcuate portion 58 of latching member 54. The engaging surface 88 of nose portion 86 is stepped from web portion 72 a distance equal to the depth of arcuate portion 58 to permit the raised section 74 to be flush with the plate portion 56 of latching member 54. The rear ends 90 of side flanges 76 are inwardly slanted to free the eject member to swing to the position of FIG. 3 without interference between the side flanges 76 and the back wall 22.

Cooperatively associated with the latching member 54 and eject member 70 is locking member 100, which comprises a key-actuated locking device 102 (FIG. 7) mounted through opening 104 of plate portion 56 of latching member 54. Key-actuated locking device 102 comprises a lock cylinder 106 having a key slot 108 and a rotatable lock arm 110. Lock arm 110 has an intermediate offset supporting section 112 and an outer end 114, and is rotatable by turning a key in lock cylinder 106 between two angular orientations. When turned to the position shown in FIG. 2, the offset supporting section 112 interlocks latching member 54 and eject member 70 to prevent any movement of either the latching member or eject member 70.

In operation, the key-actuated locking device 102 must be first set so that the lock arm 110 is turned to the angular orientation 90 degrees from that shown in FIG. 2 in order that the latching member 54 and eject member 70 are free to operate. To obtain a gripping hold on the latching member 54, it is first necessary to push inwardly on the raised central portion 74 of eject member 70 which acts as a push button member.

This inward force causes the eject member 70 to pivot clockwise (as viewed in FIG. 2) about pivot pin 78, and the outward movement of its nose portion 76 pushes against the concave portion 58 of latching member 54 to raise the latching members outer end portion above the flush line of the housing 20 to the dotted line position of FIG. 3. The outer end of the latching member 54 is then exposed for the operator to grip it and pull it to the full line position of FIG. 3, and thereby cause the lock bolt 42 to retract to the position of FIG. 3. Upon release of the latching member 54, the compression spring 50 extends the latching member 42 to its lock position and simultaneously turns latching member 54 counterclockwise to its closed locked position. As the latching member 54 swings inwardly, it en-

gages the eject member 70 and swings it likewise counterclockwise to its closed position of FIG. 2.

I claim:

1. In a door latch having a housing with back and side walls presenting an open front face, said back wall having a slot therein, a guide member supported on the outside surface of said back wall and open to said slot, a bolt slidable in said guide member, spring means biasing said bolt into a projected latching position, an improvement comprising a latching member having a plate portion of a shape conforming to the outer dimensions of said open front face to fit therein and having a lever portion with one end projecting through said slot for retracting said bolt against the force of said spring means, first pivot means for rotatably supporting said latching member adjacent one end of said plate portion, and eject means for moving the opposite end of said plate portion to said one end outwardly of said open front face a sufficient distance to permit gripping therewith, said eject means including a button member disposed through an opening in said plate portion and operatively connected to said latching member to effect said outward movement of said plate portion in response to an inward pushing force.

2. The combination of claim 1, wherein said eject means comprises an eject member having a web portion and two side flanges and second pivot means, said second pivot means rotatably supporting said side flanges to turn about an axis parallel to the axis of said first pivot means, said side flanges having a forward nose portion in engagement with said opposite end of said plate portion, and wherein said button member comprises a central raised section on said web portion.

3. The combination of claim 1, further comprising lock means for selectively preventing outward movement of said latching member.

4. The combination of claim 3, wherein said lock means comprises a key-actuated device having a lock cylinder mounted through an aperture in said plate portion adjacent said eject means and having a locking arm rotatable between two angular orientations wherein one of said angular orientations said locking arm interlocks said latching member and said eject means to prevent any movement of either said latching member or said button member.

5. In a door latch having a generally rectangular housing with back and side walls presenting an open rectangular front face, said back wall having a slot therein, a guide member supported on the outside surface of said back wall and open to said slot, a bolt slidable in said guide member, spring means biasing said bolt into a projected latching position, an improvement comprising a latching member having a generally rectangular plate portion slightly smaller than the outer dimensions of said open front face with side flanges extending from its lateral edges and having a lever portion with one end projecting through said slot for retracting said bolt against the force of said spring means, first pivot pin extending between said housing side walls and through aligned openings in said side flanges adjacent one end of said plate portion, an eject member having a web portion and two side flanges, and second pivot pin extending between said housing side walls parallel to said first pivot pin and through aligned apertures in said eject member side flanges, said web portion having a raised central section extending into an opening in said plate portion, and said eject member side flanges

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having a nose portion forward of said second pivot pin in engagement with the under surface of the outer free end of said latching member plate portion.

6. The combination of claim 5, further comprising lock means for selectively preventing outward movement of said latching members.

7. The combination of claim 6, wherein said lock means comprises a key-actuated device having a lock

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cylinder mounted through an aperture in said plate portion adjacent said eject means and having a locking arm rotatable between two angular orientations wherein one of said angular orientations said locking arm interlocks said latching member and said eject member to prevent any movement of either said latching member or said eject member.

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