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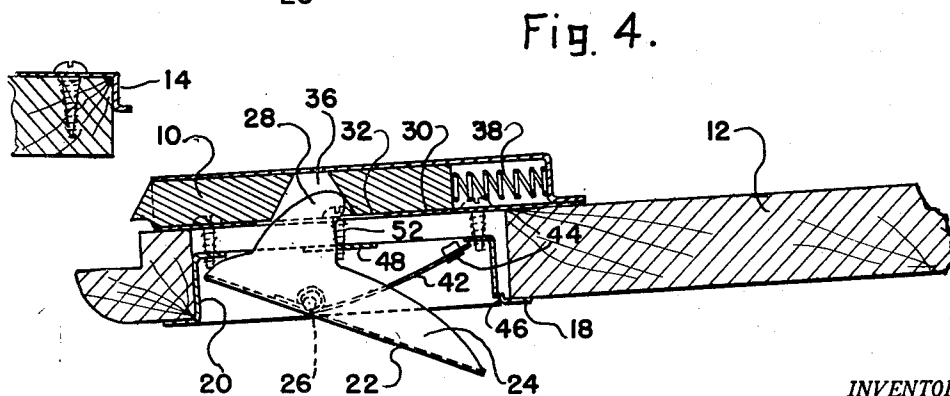
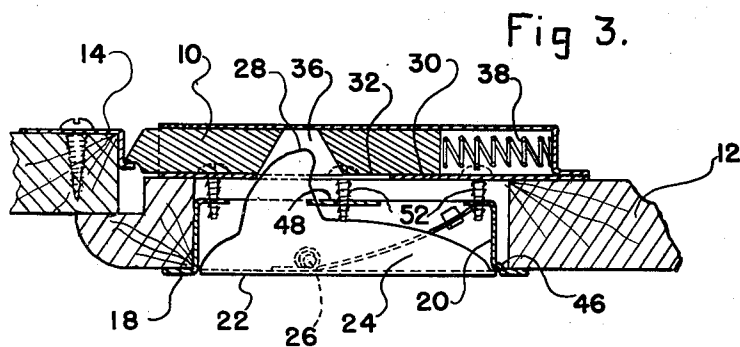
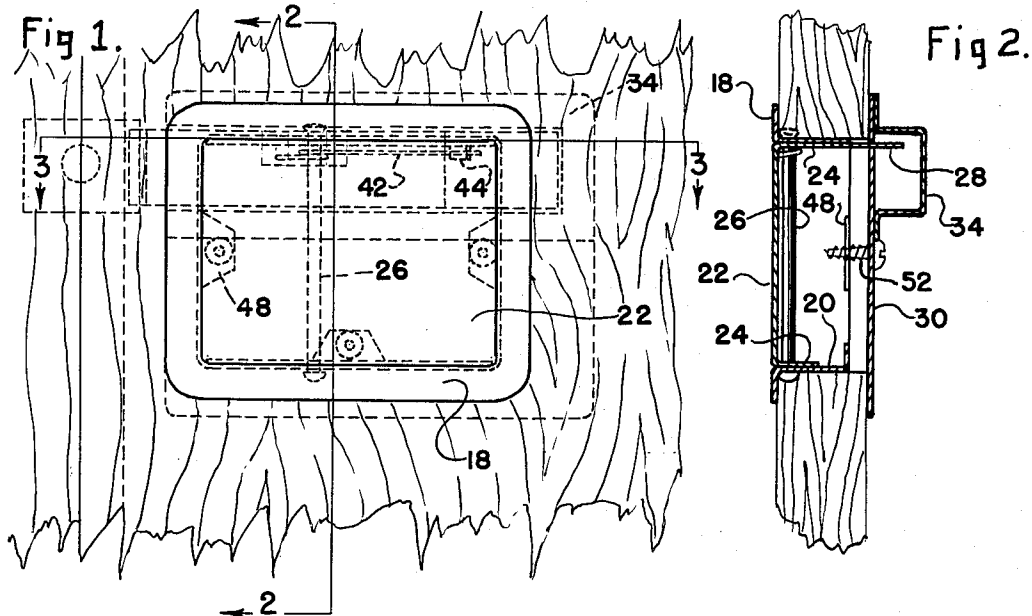
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2,649,322

FLUSH DOOR LATCHING MECHANISM

Filed May 20, 1946

2 Sheets-Sheet 1



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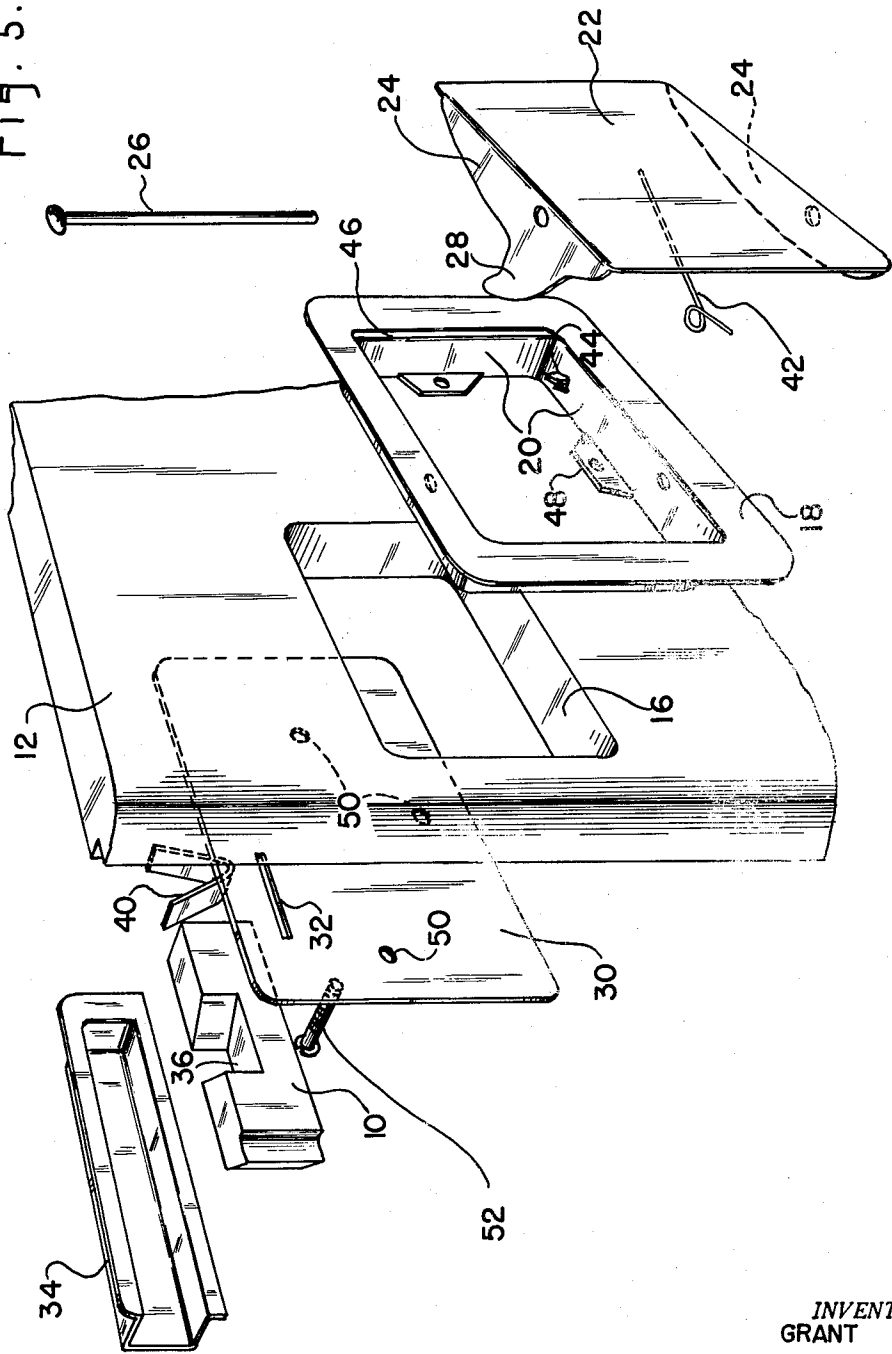
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Fig. 5.



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FLUSH DOOR LATCHING MECHANISM

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6 Claims. (Cl. 292-173)

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This invention relates to door latching mechanism, and particularly to a flush type of door latch.

Heretofore in door latches of this character, many operating parts were required which were of such a design as to be costly to manufacture and assemble. Between the latching bolt member and the operating member, various elements were installed for operatively connecting the two members together. This entailed considerable expense in the manufacture of parts and the labor to assemble and install the latching mechanism in a door. As a result, door latches of the flush type were too costly to complete with the knob type of latch or other similar devices of that character.

An important object of this invention is to provide a flush type door latch which is made of few parts so designed and constructed that it may be manufactured and assembled at lost cost. Another object of this invention is to provide a latch of this character which is made almost entirely of metal stampings of such a design that it may be produced at low cost and assembled without difficulty. A further object of this invention is to provide in such a latching mechanism a novel operating member which extends flush with the door in its inoperative position and is so designed and shaped that it directly operates the latching bolt without the necessity of any intermediary elements heretofore required. A meritorious feature of the invention is the provision whereby the latching mechanism can be applied to doors of varying thicknesses.

Various other objects, advantages, and meritorious features of the invention will become more fully apparent from the following specification, appended claims and accompanying drawings wherein:

Figure 1 is a view in elevation of a door and jamb in which a door latching mechanism of this invention is installed.

Figure 2 is a vertical sectional view along line 2-2 of Figure 1 with the latching bolt omitted for the purpose of clarity.

Figure 3 is a horizontal sectional view through the mechanism along the line 3-3 of Figure 1.

Figure 4 is a view similar to Figure 3 showing the door in partially opened position, and

Figure 5 is an exploded perspective view of the parts of the mechanism in the order of their assembly.

The invention is particularly adapted to cabinet and cupboard doors made either of wood or metal but is also applicable to other installations such as vehicle doors and doors of refrigerators

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and like appliances. The invention as illustrated herein is applied to a wooden cupboard door.

Referring specifically to the drawings, the latching bolt is indicated at 10 and as customary, this latching bolt is mounted for reciprocable movement in a door such as that indicated at 12 and is yieldingly urged to a projecting position beyond the edge of the door for engagement with a stepped plate 14 carried on the door jamb as shown in Figure 3.

The bolt is preferably mounted on the backside of the door. The latter is provided with an opening or aperture 16 therethrough which in the present instance is rectangular in shape but may be of any other suitable shape if desired. A metal border frame or flashing 18 conforming to the formation of the aperture 16 extends around the aperture on the front side of the door and is provided with inturned flanges 20 which enter and bear upon the side walls of the aperture. The flanges 20 project inwardly on all four sides of the flashing 18 and preferably join with one another at the corners as shown to form a sleeve-like portion which has a length less than the thickness of the door 12. Mounted in the aperture 16 of the door and extending in inoperative position flush with the front side thereof is operating member 22. The operating member is provided with top and bottom flanges 24-24 which enter the aperture and are spaced apart to fit between flanges 20 of the flashing with just sufficient clearance for operation. The operating member is pivotally mounted about an axis for a swinging movement from its flush position to various angular positions with respect to the plane of the door. This is accomplished in the illustrated embodiment of the invention by providing vertical pin 26 which extends through the top and bottom flanges 24-24 of the operating member and the in-turned top and bottom flanges 20 of the flashing. The vertical axis of rotation furnished by this pin extends approximately across the center of the operating member but closer to the end thereof nearer to the door jamb than to the other end. The operating member has such an area that in normal inoperative position it completely covers the opening in the flashing 18 and extends flush therewith. In place of a single pin 26 two small pins may be provided to pivotally secure the operating member in position.

It is to be specially noted that the operating member 22 is formed of a single piece of sheet metal or other material stamped in channel formation to provide the top and bottom flanges 24-24. Of special significance is the provision

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of an extension on one of the flanges in the form of a tongue or dog 28 which projects toward and into engagement with the latching bolt. This extension forms an integral part of the operating member and is stamped and shaped at the same time the flanges 24—24 are formed. The backside of the door is provided with a flat cover plate 30 having a horizontally elongated opening 32 therein. The latching bolt 10 is mounted for reciprocable movement in a channel shaped member 34 welded or otherwise secured to the flat cover plate. The member 34 is formed from flat shaped stock into its channel formation by a simple stamping operation. In line with the opening 32 the bolt 10 is provided with a slot 36 into which the tongue 28 extends.

It is obvious from the nature of the parts that the rotation of the operating member will cause the tongue 28 to move into slot 36 and upon abutting one end thereof to retract the bolt. Suitable spring means is used to urge the bolt to its projected position. A coiled spring 38 is illustrated in Figs. 3 and 4 and a leaf spring 40 is illustrated in Fig. 5 for accomplishing this purpose and the movement of the bolt by the tongue is yieldingly resisted by the spring. Encircling the journal pin 26 is a coiled wire spring 42 having one end abutting the inside surface of the operating member and the other end fixed in any suitable manner such as the engagement with a small tang 44 struck out of the bottom flange 20 of the flashing. This provision as is evident yieldingly urges the operating member to its normal flush position. Suitable stop means is provided for limiting the return rotation of the operating member so that it will not rotate any further than its flush position in the flashing, such as the vertical shoulder 46 formed on the inner side of the flashing at the juncture of the side flange 20 thereto.

The parts of the door latching mechanism hereinabove described are mounted within the opening 16 of the door. It is to be noted that no securing means is used in the embodiment of the invention illustrated herein which extends into or enters the door member 12. The cover plate 30 is laid flat against the back side of the door over the opening and its lateral dimensions are such that it laps over upon the portions of the door surrounding the opening. Certain of the in-turned flanges 20 of the flashing 18 are provided with apertured ears 48 which extend inwardly and parallel to the front face of the flashing. The cover plate is provided with apertures 50 which when the parts are properly assembled align with the apertures in the ears 48. Screw members 52 are provided which extend through the apertures 50 and into the apertures of the ears to secure the cover plate to the flashing. Upon tightening these screw members, the cover plate and flashing are drawn together and clamped to the door on opposite sides of the opening 16. This manner of securement enables the latching member to accommodate itself to doors of different thicknesses.

The tongue or dog 28 of the operating member and the slot 36 in the latching bolt are shaped so that regardless of the thickness of the door within limits the tongue will operate to retract the bolt. As shown the tongue is provided with a slight projection to the right in Figs. 3 and 4 and the bolt slot 36 in which it operates tapers to a smaller width rearwardly to accomplish this purpose.

With the exception of the latch bolt 10 and

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the accessories such as the pin 26, springs 38 and 42 and the screws 52, all the members of the device are formed from sheet metal stock stamped in the desired formation. The operating member 22 is stamped to the formation illustrated and one of the flanges 24 thereof is shaped in the stamping operation with a tongue 28 for retracting the latch bolt. Thus this flange has the double function of assisting in supporting the operating member for pivotal movement and of aiding in the unlatching operation. The in-turned flanges 20 and the ears 48 of the flashing are formed in a metal stamping operation from flat sheet stock. The channel-shaped guide 34 for the latch bolt is similarly shaped in a stamping operation. The shaping of the major parts of the device in this manner provides a considerable saving in the cost of manufacture. The interfitting relation of the parts to one another provides a considerable saving in the time and labor of assembling the device upon a door. The exterior parts are polished or chrome finished and when installed provide a very pleasing appearance.

The operating member 22 is shown with a rectangular formation. It may be formed with an oval or other rounded configuration. The same applies to the flashing 18.

What I claim is:

1. A door latch comprising an outer plate for seating against the outer face of a door, the central portion of said plate being indented to occupy an opening of the door, an inner plate adapted to engage the inner face of the door in spaced relation to said indented portion, a bolt slidable on the inner plate, an actuator proportioned to substantially fit within said indented portion in a flush relation to the outer plate, means pivoting said actuator upon said indented portion to turn about an axis unequally distant from opposite ends of the actuator, and a tongue fixed on the actuator and extending through said indented portion for a camming reaction with the bolt to retract the bolt.

2. A door latch as set forth in claim 1, said tongue extending from the actuator in a substantially radial relation to the pivotal axis of the actuator.

3. A door latching mechanism comprising, in combination, an outer plate for seating against the outer face of a door, the central portion of said plate being indented to provide perpendicularly bent portions for entering the door and to further provide rebent portions extending inwardly of the door opening and parallel to the plane of the plate, an inner plate adapted to engage the inner face of the door in spaced parallel relation to the outer plate, a bolt member, means on said inner plate for guiding the bolt member in a substantially rectilinear travel, a flat plate actuating member proportioned to substantially fit within said indented central portion in a flush relation to the outer plate, means pivoting said actuating member upon said perpendicularly bent portions of the outer plate to turn about an axis extending parallel to the plane thereof, an element fixed on one of said members and extending toward and engaging the other of said members and operable upon pivotal movement of the actuating member from its flush position to retract the bolt member, and means interconnecting the inner plate with said rebent portions of the outer plate and operable to draw the two plates toward one another into clamping engagement with the inner and outer faces of the door.

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4. A door latch comprising an outer plate for seating against the outer face of a door, the central portion of said plate being indented to occupy an opening of the door, an inner plate adapted to engage the inner face of the door in spaced relation to said indented portion, a bolt slidable on the inner plate, an actuator proportioned to substantially fit within said indented portion in a flush relation to the outer plate, means pivoting said actuator upon said indented portion to turn about an axis unequally distant from opposite ends of the actuator, a tongue fixed on the actuator and extending through said indented portion for a camming reaction with the bolt to retract the bolt, said tongue extending from the actuator in a substantially radial relation to the pivoted axis of the actuator, and a fastening set into and interconnecting said inner plate and the indented portion of the outer plate, whereby said plates are secured to the door.

5. A door latch comprising, in combination, an outer plate for seating against the outer face of a door, the central portion of said plate being indented to provide inturned wall portions extending perpendicularly to the plane of the plate to occupy an opening of the door and terminating in rebent portions extending inwardly of the opening and parallel to the plane of the plate, an inner plate adapted to engage the inner face of the door in spaced parallel relation to the outer plate, a bolt, means on said inner plate for guiding the bolt in a substantially rectilinear travel, a flat plate actuator proportioned to substantially fit within said indented portion in a flush relation to said outer plate, means pivoting said actuator upon said inturned wall portions of said outer plate, a tongue fixed on the actuator and extending toward the bolt and having a camming reaction with the bolt to retract the same, and threaded fastening means connecting the inner plate to said rebent portions of the outer plate and operable to draw the plates into clamping engagement with the opposite faces of the door.

6. In a latching mechanism for a closure member having an opening therethrough from one side of the member to the other side thereof, a backing plate for the inner side of the closure member adapted to extend across the opening

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thereof and about the marginal portions of the closure member around the opening, a latch bolt, means mounting said latch bolt on said backing plate for rectilinear travel, means yieldingly biasing the bolt toward one position of its movement, a border frame for the outer side of the closure member adapted to abut the marginal portions of the closure member around the opening thereof, said border frame being provided on its inner margin with inturned walls on all four sides thereof extending substantially perpendicular to the plane of the border frame and shaped to substantially fit the opening of the closure member to hold the border frame from sidewise movement relative to the closure member, apertured rebent portions integrally connected to the inner ends of said walls and extending parallel to the border frame and inwardly thereof, an operating member for the latch bolt having a flat expanse so proportioned as to substantially fit between said inturned walls of the border frame, means pivoting the operating member to said inturned walls of the border frame such that in one position of its movement the flat expanse of the member extends flush with the outer face of the border frame, means operatively coupling said operating member with said latch bolt and adapted upon swinging movement of the member from its flush position to retract the bolt against said yielding means, and screws extending through the backing plate and threadedly engaging in the apertures of said rebent portions to draw the border frame and the backing plate into clamping engagement with the opposite sides of the closure member.

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