Nov. 27, 1951 D. C. SMITH 2,576,648

DOOR LATCH MECHANISM

Filed Aug. 27, 1948

FIG. 1.

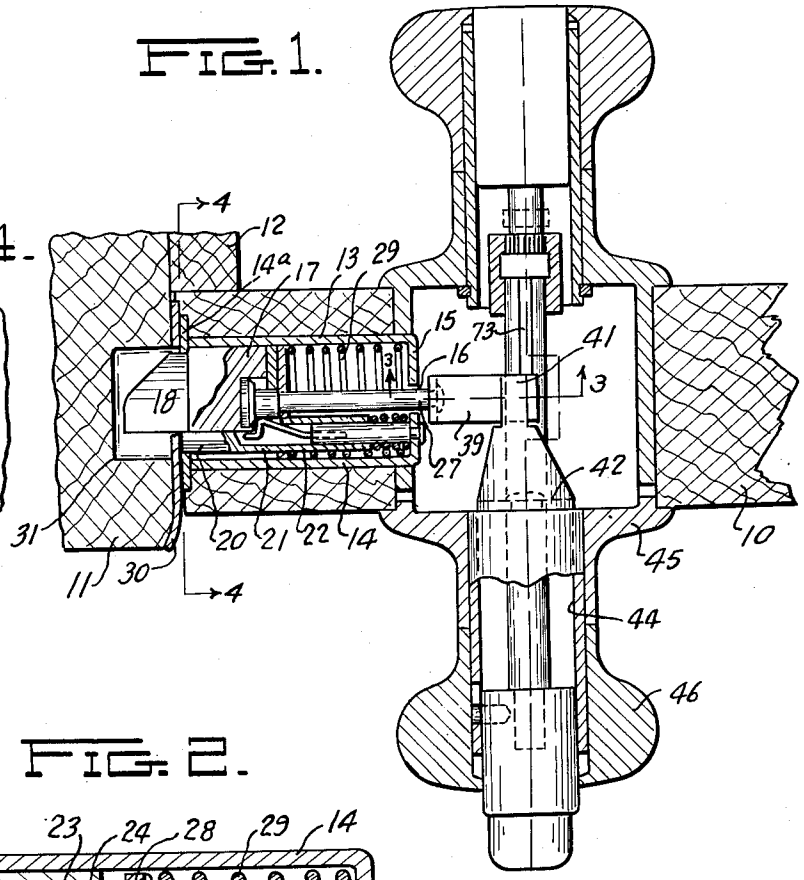


FIG. 4.

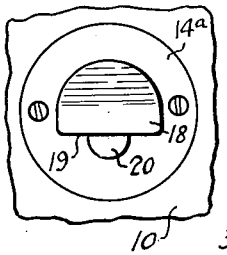


FIG. 2.

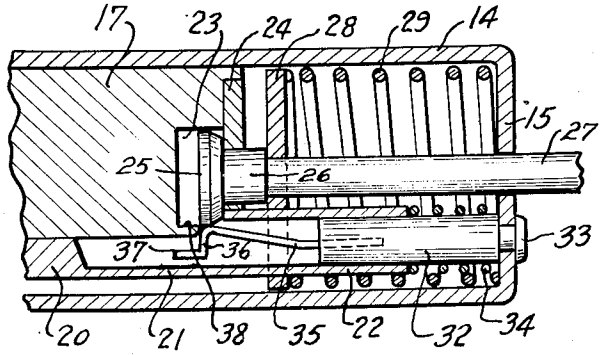
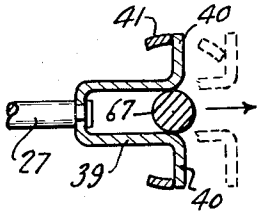


FIG. 3.



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DOOR LATCH MECHANISM

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1 Claim. (Cl. 292—169)

1

This invention relates to door latching mechanisms but more particularly to a house door latch of the type in which one of the bolt retracting elements can be rendered inoperative so that it can turn freely without retracting the bolt.

An object is to produce a new and improved door latching mechanism which is simple in construction, easy to assemble and efficient in operation.

Another object is to provide a door latching mechanism with means for positively preventing retraction of the latch bolt by prying the latch bolt in a retracting direction by a screwdriver or some similar sharp instrument when the door is in latched position.

A further object is to improve the construction and operation of door latch mechanism of the type having rotary retracting members such as knobs and in which the outside knob may be caused to spin freely thus to prevent its use for latch bolt retraction.

Other objects and advantages of the invention will hereinafter appear, and for purposes of illustration but not of limitation, embodiments of the invention are shown on the accompanying drawings, in which

Figure 1 is a transverse sectional view of a door latching mechanism showing the latch in latched position;

Figure 2 is an enlarged fragmentary sectional view showing the latch bolt blocking member retracted sufficiently so that upon further movement of the retracting element, the latch bolt will then be retracted or withdrawn from keeper engaging position;

Figure 3 is a sectional view substantially on the line 4—4 of Figure 1, showing the bolt retracting members; and

Figure 4 is a fragmentary elevation of the door edge showing the latch bolt nose and the locking slide for the latch bolt.

The illustrated embodiment of the invention comprises a door 10 suitably mounted on hinges (not shown) for opening and closing movement relatively to a door frame 11 having a suitable jamb 12. Fitting in a hole 13 bored from the free edge of the door is a metallic cylindrical housing 14, the front end of which is opened and the rear end of which is closed by an integral wall 15 which has an aperture 16 therein. Slidable within the housing 14 is a latch bolt 17 which has a latching nose 18 with an inclined keeper engaging surface, one side of which is flat as indicated at 19. An apertured flat plate 14a is suitably secured to the face of the door, abuts against the

2

outer end of the housing 14, and provides a stop for limiting the outward movement of the bolt, the latter being shouldered adjacent the bolt nose 18.

Slidable along the flat surface 19 relatively to the bolt nose 18 is an arcuate slide 20 which has an extension 21 terminating in a tube 22. In the rear end portion of the bolt 17 is a socket 23, the open end of which is covered by a plate 24 suitably secured to the rear end of the bolt. A cylindrical cam 25, the rear edge portion of which is beveled, is movable within the socket 23. The cam 25 has a cylindrical extension 26 into which is fitted a rod 27 and abutting against the shoulder formed by the extension 26 is a disc 28. A helical coil spring 29 bears at one end against the disc 28 and at the opposite end against the housing wall 15. It will be manifest that the spring 29 tensions the latch bolt 17 and normally urges it to its latching position in which the nose 18 passes through the apertured keeper plate 30 and into a socket 31 in the door jamb 11.

The tubular extension 22 of the latch bolt locking slide 20 is guided by a pin 32 which is riveted at 33 to the casing wall 15 and surrounding the pin 32 is a helical coil spring 34 which bears at one end against the casing wall 15 and at the other end against a rear end of the tubular extension 22. Fixed at one end to the outer end portion of the pin 32 is a leaf spring 35 which is bent to provide a shoulder 36 and terminates in a substantially straight end portion 37. When the latch bolt 17 is in its advanced or latching position as shown in Figure 1, the shoulder 36 is disposed directly in rear of and in blocking relation to a wall 38 of the socket 23, the wall 38 having a rounded or curved surface as clearly shown on Figure 2. When the spring is in blocking position, it will be apparent that the latch bolt 17 can not be retracted by forcing a pointed instrument between the edge of the door and the frame to cam it rearwardly. In this manner, the latch bolt is positively blocked against retracting movement. However, upon movement of the rod 27 to the right of Figures 1 and 2, the cam 25 forces the shouldered portion 36 outwardly with respect to the wall 38 to such position that the rounded or curved surface of the wall 38 will further depress the spring 35 so that upon further movement of the rod 27, the latch bolt may be readily retracted and at the same time, the engagement of the end of the cam 25 and the adjacent edge of the tubular extension 22 causes the slide 20 to move to the right of the figure in a retracted direction.

As soon as the rod 27 is released, the springs 29 and 34 cause the bolt and the bolt blocking slide 20 to advance to operative or latching position. At that time, the spring 35 snaps out of engagement with the side wall of the bolt 17 so that the shoulder 36 is in abutting engagement with the wall portion 38, thereby positively holding the bolt in its latching position and militates against its retraction except by movement of the rod 27.

When the door is open, both the bolt 17 and slide 20 are in advanced position, the cam 25 being in its rearward position relative to the socket 23 holding the blocking spring 35 away from bolt blocking position. Therefore, in slamming the door, both the bolt and slide retract together, the blocking spring 35 then being slightly cammed inwardly by the rounded surface on the wall portion 38. Thus the slide functions to enable the bolt to retract in slamming the door. When the door is in latched position, the slide is held retracted and under tension by its engagement with the striker or keeper plate.

At its inner end, a substantially U-shaped actuator 39 is riveted in position, the actuator having wings 40 extending at substantially right angles to each arm of the U-shaped actuator. Engageable with the wings 40 are fingers 41 which are integral with a sleeve 42. Suitably fixed to the sleeve 42 is an elongate sleeve 44 which is rotatably mounted in an escutcheon 45 and suitably secured as by a set screw (not shown) to the outer end portion of the sleeve 44 is a knob 46. Manifestly, by turning the knob in one direction or the other, one of the fingers 41 will, upon engagement with its respective wing 40, roll back or retract the latch bolt mechanism as above described.

It is to be understood that numerous changes in details of construction, arrangement and operation may be effected without departing from the spirit of the invention especially as defined in the appended claim.

What I claim is:

A door latch comprising a latch bolt assembly for mounting in a socket in the door, comprising a cup-shaped casing open at the forward end, a spring-tensioned latch bolt slidable in said casing and having a latching nose projectable from said casing, a retracting rod, the closed end of said casing being apertured to accommodate said rod, a cam element on the inner end of said rod, said bolt being socketed at the inner end to receive said cam element and to afford limited movement therein, means closing the end of said socket, a shoulder on said bolt adjacent said socket, a leaf spring element carried by said casing and having a shouldered portion engaging said shoulder on said bolt thereby positively to block retraction of said bolt, said cam element being arranged to engage the shoulder of said spring element and force same away from blocking position during movement of said cam in said socket, a slide in said casing in engagement with a portion of said bolt and movable relatively thereto, a tubular extension on said slide enclosing said spring element and engageable by said cam for retracting the same, and spring means for tensioning said tubular extension.

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