

# United States Patent [19]

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[54] DOOR LATCHING ASSEMBLY

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[51] Int. Cl. .... **E05c 1/08**

[58] Field of Search .... 292/254, 191, 192, 341.17, 292/227, 219, 220, DIG. 38

[56] References Cited

UNITED STATES PATENTS

30,594 11/1860 Slaight ..... 292/191

343,348	6/1886	Taylor.....	292/254
576,242	2/1897	Voight.....	292/192
3,073,640	1/1963	McBurnie.....	292/254

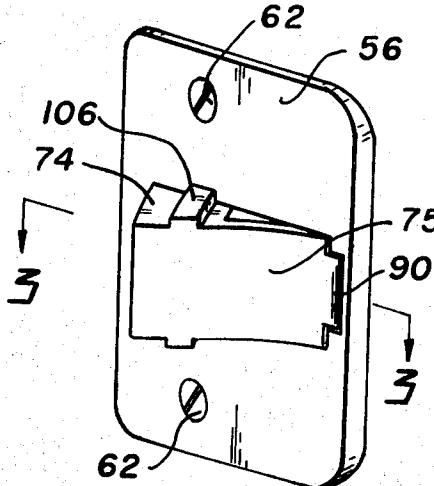
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[57]

## ABSTRACT

A latching assembly for attachment to a door frame and including a housing and a latch bolt. The bolt is connected at one end to a part of the housing to allow the bolt to swing in a horizontal plane between latched and unlatched positions. Additional reinforcing means is provided to resist forces tending to move the bolt across the door frame whereby the assembly can be lightly and inexpensively constructed.

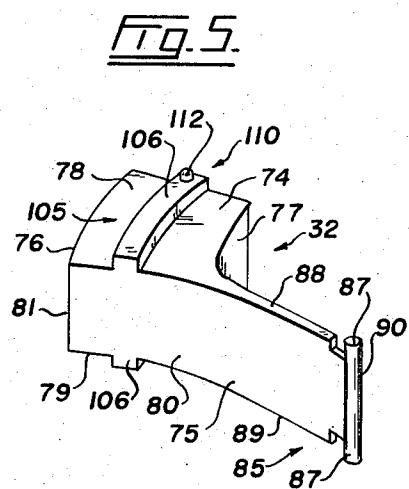
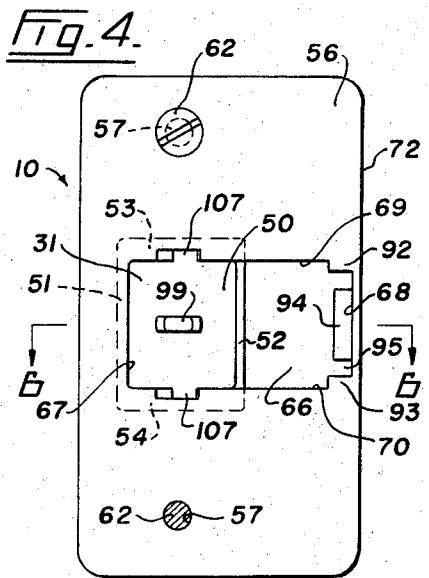
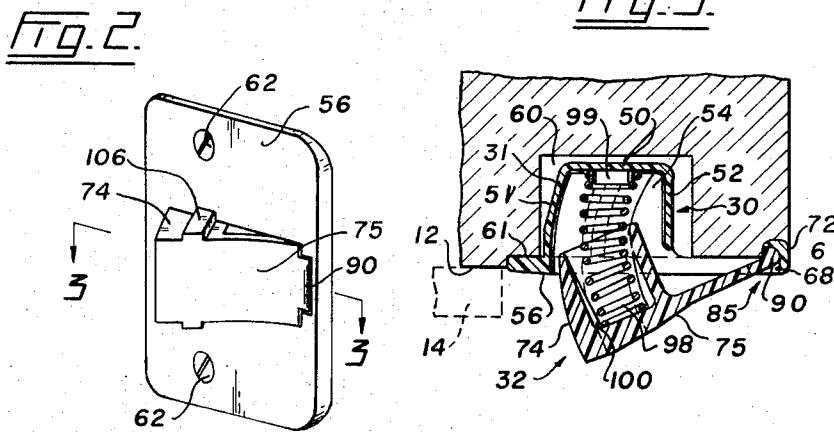
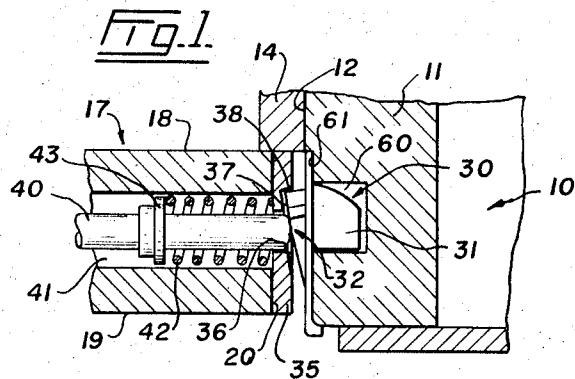
6 Claims, 8 Drawing Figures



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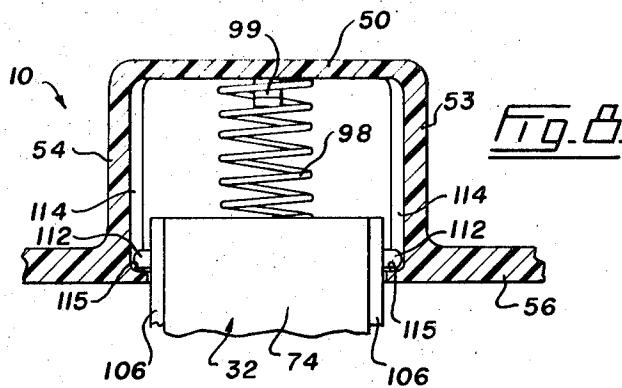
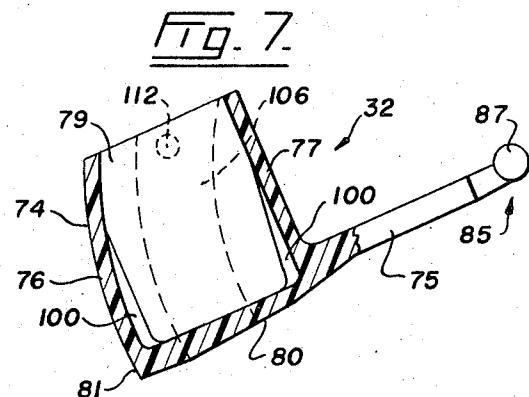
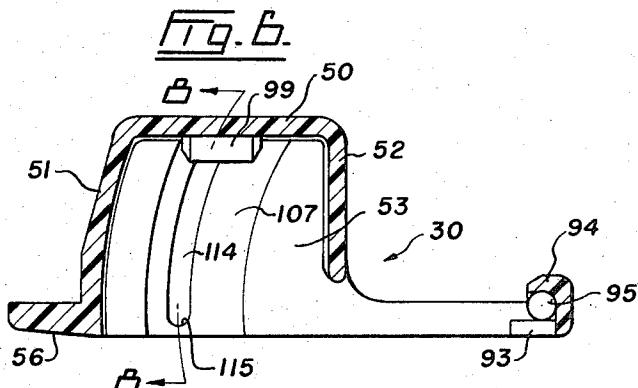
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## DOOR LATCHING ASSEMBLY

This invention relates to a latching assembly for the latch or lock sets of interior or exterior doors.

It has been suggested previously that latch bolts be mounted in door jambs rather than in the edges of the doors but this type of construction has a number of disadvantages which may explain why the arrangement has not found wider acceptance. For example, the bolt and housing therefor must be exceptionally strong otherwise it is not too difficult for a burglar to force open the door by applying his weight to the door or using a jimmy since it is the latch bolt itself which must take the major part of the stress involved.

The present assembly is made, with the exception of the spring and the screws which secure the device to the door jamb, entirely of plastic so that it can be relatively inexpensively produced to operate quietly for years without the need for lubrication. It is an extremely simple matter to snap the latch bolt into its supporting housing and, once properly assembled, the pivoted end of the latch bolt is relieved of any need to resist forces tending to move the bolt towards the interior of the room. This reinforcing of the latch bolt is achieved by means of ribs and co-operating channels formed on the bolt and the housing respectively and both of which are curved to allow the latch bolt head to swing in an arcuate path.

In drawings which illustrate a preferred embodiment of the invention,

FIG. 1 is a horizontal section of a door and door jamb, showing in position of use, a door latching assembly in accordance with the present invention,

FIG. 2 is a perspective view of the assembly,

FIG. 3 is a horizontal section taken on the line 3—3 of FIG. 2,

FIG. 4 is a front elevation of a housing which forms part of the assembly,

FIG. 5 is a perspective view of a latch bolt also forming part of the assembly,

FIG. 6 is an enlarged horizontal section of the housing taken on the line 6—6 of FIG. 4,

FIG. 7 is an enlarged plan view of the latch bolt, with part broken away and shown in section, and

FIG. 8 is a fragmentary vertical section taken on the line 8—8 of FIG. 6.

Referring first to FIG. 1 of the drawings, the numeral 10 indicates generally a door frame which includes a jamb 11 having a side edge 12 which is fitted with an abutment strip 14. A door 17 is adapted to be hung in the frame 10 to close against the strip 14; the door having an outside face 18, an inside face 19, and a side edge 20 opposite the hinged edge (not shown) of the door.

The assembly for latching the door within the bordering frame 10, and which forms the basis of the present invention, is generally indicated by the numeral 30 and comprises a housing 31 for a spring-pressed latch bolt 32. The side edge 20 of the door is recessed to receive a suitably attached strike 35 having a hole 36 which is centered in a tapered recess 37 formed in the exposed face of the strike. The recess 37 provides a vertical stop 38 near the outside face 18 of the door, the stop being engaged by the latch bolt 32 whereby to hold the door latched. The door handles (not shown) are adapted to operate a latch bolt releasing plunger 40 which is mounted in the door to project through a hole 41 so

that the outer end of said plunger normally is enclosed by the hole 36. A spring 42 encloses a portion of the plunger 40 between a collar 43 and the strike 35 whereby to exert a resilient force normally holding said plunger in retracted position. Thus, the latch bolt 32 can be dislodged from latching engagement with the stop 38 by giving a partial turn to either handle knob so as to extend the plunger 40 and push said latch bolt out of the recess 37.

Generally speaking, the above described arrangement of parts can be found in other latch or lock sets but the present door latching assembly 30 has a number of features and advantages which make it unique and these will now be described. The housing 31 is formed of a tough plastic material such as nylon rather than the usual metal and this ensures a particularly smooth and quiet latching and unlatching action. As shown best in FIGS. 3 and 4, the substantially oblong housing 31 has an inner wall 50, sidewalls 51 and 52, as well as top and bottom walls 53 and 54. A flange-like face plate 56 is integrally formed with the four walls of the housing 31 and this plate is provided with vertically spaced holes 57 one of which is shown in FIG. 4. Frame 10 is assumed to be of wood construction but it should be noted the present assembly can be used equally as well on metal door frames. Assembly 30 is designed to fit into the standard size openings which are routed and/or stamped in conventional wood and metal frames. In order to fit the housing 31 to the jamb 11, an opening 60 and recess 61 (see FIG. 3) are cut in the side edge 12 to receive said housing and the face plate 56 respectively. Metal screws 62 (FIG. 4) are then entered through the holes 57 to secure the plastic housing 31 to the wood jamb 11.

The face plate 56, which preferably is rectangular as shown in FIG. 4 for wood door frames, is provided with a centrally disposed slot 66, see particularly FIG. 4. This rectangular slot 66 connects with the interior of the housing 31 and has side edges 67 and 68 as well as top and bottom edges 69 and 70. The spacing between edges 69 and 70 is the same as the spacing between the opposing inner surfaces of the housing walls 53 and 57. Edge 67 is a continuation of the inner surface of the wall 51. Side edge 68 is spaced a short distance from and extends parallel to inside edge 72 of the face plate 56.

The latch bolt 32 carried by the housing 31 is formed of the same tough, glass-filled, plastic nylon and, as shown best in FIGS. 3 and 5 to 7, the bolt has a hollow head 74 and a shank 75 which are generally rectangular to closely fit the slot 66. The oblong head 74, which is substantially perpendicular to the shank 75, has sidewalls 76 and 77, as well as top and bottom walls 78 and 79. Outer face 80 of the latch bolt 32 is suitably shaped to provide a cam face for the end of the plunger 40 and the head has a flattened portion 81 normal to the longitudinal axis of the shank, which portion is adapted to abut the stop 38 on the strike to latch the door. The plastic bolt 32 is slightly resilient and the degree of resilience is increased by the shaping of the shank 75 particularly near the junction of the head 74 and said shank. In other words, the shank 75 is thinned down and offset slightly relative to the head 74 so that it or the head can flex slightly if necessary and in the plane of the longitudinal axis of said shank.

The latch bolt 32 is swingingly mounted on the housing 31 by pivot means generally indicated at 85, see

FIGS. 3 and 5 to 7. Means 85 is shown to comprise a pair of pintles 87 which are formed on top and bottom edges 88 and 89 of the shank 75 alongside end edge 90 thereof. The housing 31 portion of the pivot means 85 is shown best in FIGS. 4 and 6 to comprise an arrangement of flanges which are provided on the face plate 56 at side edge 68 of the housing slot 66. Upper and lower flanges 92 and 93 are formed in the corners of the slot 66 and these flanges are coplanar with the face plate 56. An intermediate flange 94 formed on the edge 68 is faced inwardly of the flanges 92 and 93 to provide a socket 95.

The pivot means 85 is particularly easy to assemble and this is done simply by entering end edge 90 of the shank 75 into the socket 95 from the face plate side of the housing 31. Pintles 87 are lodged behind the flanges 92 and 93 while the intermediate flange 94 forms a stop for the end edge 90 which holds said edge within the socket 95. When the head 74 is pushed into the interior of the housing 31, the latch bolt 32 cannot move so as to withdraw the edge 90 from the socket 95 and the bolt is pivotally mounted in the housing 31 so that it can swing from a latched to an unlatched position and return.

The door latching assembly 30 is provided with spring means intended to bias the latch bolt 32 towards the latched position and this means is shown in FIG. 3 to comprise a compression spring 98. One end of the coil spring 98 fits over a boss 99 formed on the wall 50 of the housing while the opposite end of said spring is lodged between inwardly directed flanges 100 formed on each of the four walls of the head 74. Thus, the spring 98 can curve about an arc centered on the axis of swing of the latch bolt 32 which, of course, coincides with the vertical axis of the pintles 87.

The lightly but sturdily constructed latch bolt 32 at times can be required to take a considerable amount of stress such as would occur if an attempt was made to force the door 17 open without operating the door handles or unlocking the set in a proper manner. Normally, the pivoted end of the latch bolt would have to be made heavy and therefor strong enough to take this stress but the present assembly 30 includes guide means 105 which support the latch bolt 32 as it swings about the pivot means 85 between its latched and unlatched positions. As shown in FIGS. 4 to 5 and in FIG. 8, the means 105 comprises a pair of arcuate ribs 106 which are integrally formed one on each of the top and bottom walls of the head 74. These ribs 106 are received within a pair of similarly curved channels 107 which are formed on the inner surfaces of the walls 53 and 54 of the housing. Thus, the latch bolt 32 is firmly supported within the slot 66 and the pivot means 85 is properly reinforced and is not required to take any amount of stress if the door is forced inwardly without turning the handles.

Incorporated into the guide means 105 is stop means 110 which limits outward swinging movement of the latch bolt. In FIGS. 5, 6 and 8, the stop means 105 is shown to comprise a pair of bosses 112 which are formed one on each of the ribs 106 near the inner end of the head. The bottoms of the channels 107 are deepened to provide slots 114 into which the bosses 112 project and these slots terminate at their outer ends in a shoulder 115. When the latch bolt 32 is swung outwardly, the bosses 112 engage the shoulders 115 to halt further outward movement.

It will be noted that, in order to insert the head 74 into the housing 31, the bosses 112 must be sprung over the shoulders 115. This can only be done after the pivot means has been assembled as previously described since only then are the bosses 112 properly aligned with the slots 114. Some force is required to snap the bosses 112 over the shoulders 115 and, at the same time, to partially compress the spring 98 which must be installed first but, once the assembly has been made, there is little likelihood of the latch bolt 32 being accidentally disengaged from the housing 31.

As mentioned previously, the latching assembly 30 can be used on factory prepared wood or metal door frames the tolerances of which may vary slightly from one installation to the next. At times when a door is hung, it will be found that it is a very tight fit within the frame which might not leave sufficient clearance between side edge 20 of the door and the adjacent side edge 12 of the frame for a conventional latch set or the like to operate properly. The latch bolt 32 will compensate for this tight fit to some extent at least by virtue of its slight resilience and the shape given to the shank 75. The strike 35 may press the bolt 32 further into the housing 31 than usual in the case of a tight fit but the angular relationship between the head and shank of the bolt allows the flattened portion 81 to project outwardly far enough to enter the recess 37 and engage the stop 38. Normal turning pressure applied to either door handle knob will project the plunger 40 to spring the bolt 32 out of latching engagement with the strike 35 and the shank 75 may be flexed slightly near the head 74 as this unlatching action takes place. Thus, the assembly 30 will function properly if clearance between the door and jamb is less than desired and, of course, the spring 98 will fully extend the latch bolt to ensure proper operation if the clearance is greater than normal.

From the foregoing, it will be apparent there is provided a door latching assembly which is relatively inexpensive to manufacture and which can readily be assembled by almost anyone without the use of special tools. The guide means for the latch bolt strengthens the assembly where reinforcement is needed and relieves the pivot means of a major portion of any load tending to move the latch bolt transversely of the face plate.

We claim:

1. A door latching assembly comprising a housing adapted to be mounted within an opening formed in a side edge of a door jamb, said housing having a face plate securable to the side edge, said face plate having a transversely extending slot communicating with the interior of the housing, a latch bolt mounted in the slot and having a head at one end thereof movable within the housing, pivot means connecting an end edge of the latch bolt remote from the head to the face plate whereby said latch bolt can swing between a latched and an unlatched position, spring means biasing the latch bolt outwardly of the housing, stop means limiting outward swinging movement of the latch bolt, and guide means between the head and adjacent edges of the slot for relieving the pivot means of a major portion of any load tending to move the latch bolt transversely of the face plate.

2. A door latching assembly as claimed in claim 1, in which said housing and said head have opposing side walls, said guide means comprising a rib on one of the side walls and a channel on the other of said side walls

in which said rib is slidably received, said rib and channel being curved about an arc having a centre coinciding with the axis of swing provided by the pivot means.

3. A door latching assembly as claimed in claim 2, in which said stop means comprises a boss on the rib and a co-operating shoulder at the end of the channel adjacent the face plate.

4. A door latching assembly as claimed in claim 1, in which said pivot means comprises oppositely directed pintles on the end edge of the latch bolt, said face plate having a socket to receive the end edge, said socket being partly defined by opposing flanges and an intermediate flange, said opposing flanges engaging the pintles and said intermediate flange engaging an opposite side of the end edge.

5. A door latching assembly comprising a housing adapted to be mounted within an opening formed in a side edge of a door jamb, said housing having a face plate securable to the side edge, said face plate having

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a transversely extending slot communicating with the interior of the housing, a latch bolt mounted in the slot and having a head at one end thereof movable within the housing, pivot means connecting an end edge of the latch bolt remote from the head to the face plate whereby said latch bolt can swing between a latched and unlatched position, spring means biasing the latch bolt towards the latched position, said housing and said head having opposing side walls, a rib on one of the side walls and a channel on the other of said side walls in which said rib is slidably received, said rib and channel being curved about an arc having a center coinciding with the axis of swing provided by the pivot means, a boss on the rib and a co-operating shoulder at the end of the channel adjacent the face plate.

6. A door latching assembly as claimed in claim 5, in which the housing and the latch bolt are made of plastic.

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