Aug. 15, 1939. W. R. SCHLAGE 2,169,743

DOOR LOCK

Filed Oct. 8, 1937

Fig. 1.

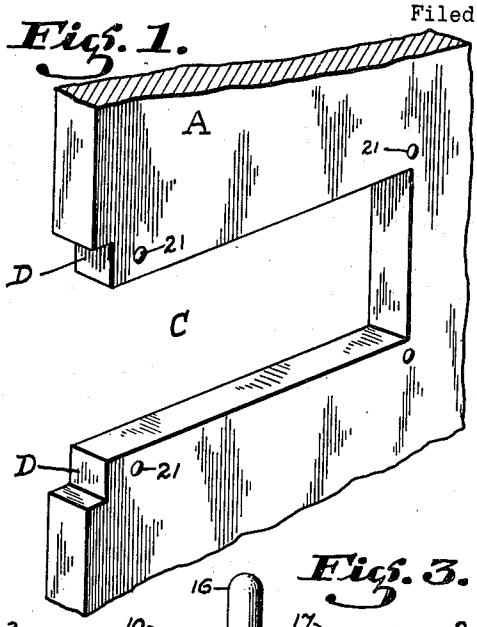


Fig. 2.

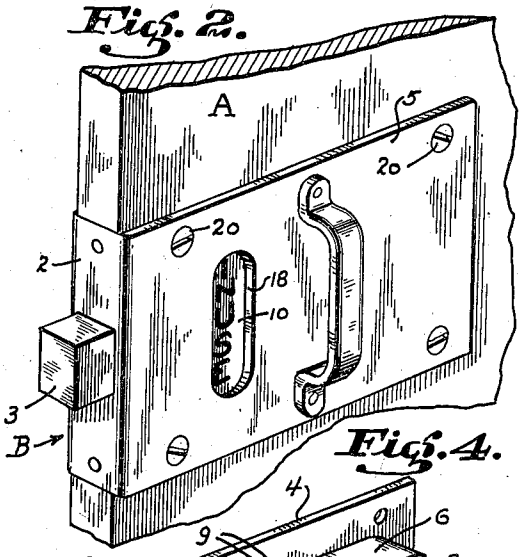


Fig. 3.

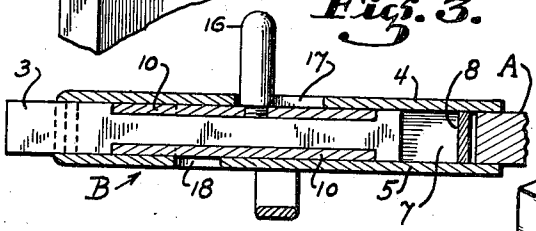


Fig. 4.

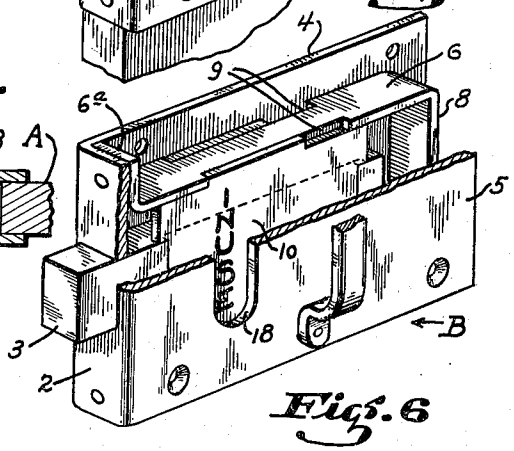


Fig. 5.

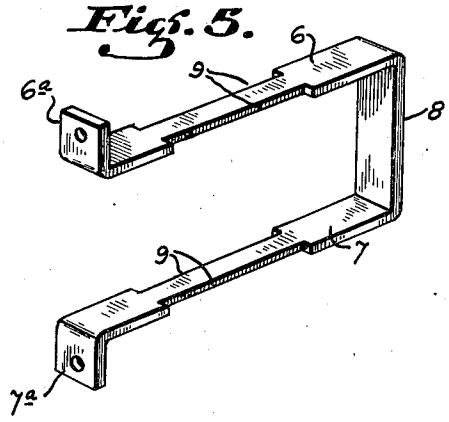


Fig. 6

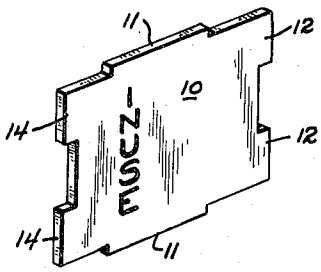
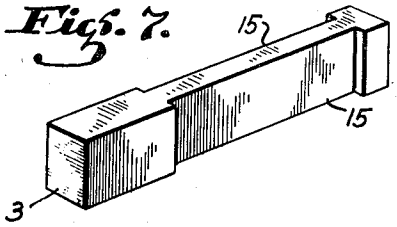


Fig. 7.



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DOOR LOCK

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Application October 8, 1937, Serial No. 167,993

2 Claims. (Cl. 292—145)

This invention relates to door locks, and especially to a frame and housing structure wherein the latch bolt and actuating mechanism are supported and enclosed.

The object of the present invention is generally to improve and simplify the construction and operation of door locks of the character described; to provide a door lock including a housing and frame, together with a latch bolt and actuating mechanism, which is adapted to be completely assembled, and in the assembled form to be applied to a door by merely cutting a rectangularly-shaped notch in the edge of the door, inserting the assembled door lock in the notched portion, and then securing it by screws or like means passing through the housing and the door; to provide a housing which also serves as escutcheon plates for the door, said plates extending over the edges of the notched portion of the door a sufficient distance to reenforce and strengthen the door and to receive the screws or other fastening means whereby the lock is secured in the door; to provide a housing and frame which serve as a closure and support for a pair of sliding plates which function as guides and supports for the latch bolt; to provide means for imparting a sliding movement to said plates and latch bolt to extend or retract the latch bolt; and further, to provide indicating means on one or both of the plates to display visually whether the latch bolt is retracted or projected.

The door lock is shown by way of illustration in the accompanying drawing, in which

Fig. 1 is a perspective view of a portion of a door, showing the manner in which it is cut out or notched to receive the door lock;

Fig. 2 is a similar view showing the door lock applied;

Fig. 3 is a horizontal section taken on line III—III of Fig. 2;

Fig. 4 is a perspective view of the door lock, said view being shown partially in section, and broken away to show the inner frame, the sliding plates, and the latch bolt supported thereby;

Fig. 5 is a perspective view of the frame;

Fig. 6 is a perspective view of one of the sliding plates, said view showing the latch bolt in dotted lines; and

Fig. 7 is a perspective view of the latch bolt.

Referring to the drawing in detail, and particularly to Figs. 2 to 7 inclusive, A indicates in general a door, and B a completely assembled door lock secured therein. The lock comprises a housing consisting of a face plate 2 having an opening formed therein through which projects a latch bolt 3, and a pair of side plates 4 and 5 which are connected with the face plate 2; the three plates forming an integral unit which is U-shaped in a horizontal plane.

Secured between the side plates 4 and 5 of the housing is a frame consisting of upper and lower spaced horizontally-disposed bars 6 and 7, connected by a vertical end-bar 8 which forms the inner end of the frame, the outer end being open as shown in Fig. 5, and the bars 6 and 7 terminating in lugs 6a and 7a which function as fastening means between the housing and the frame, as the lugs may be screwed, riveted or welded with relation to the inner surface of the face plate 2 of the housing. The frame and the housing, when secured with relation to each other, form an integral unit, and a channel is formed around this unit, the function of which will later be described.

By referring to Figs. 3, 4 and 5, it will be noted that the horizontal bars 6 and 7 are cut away on opposite sides, intermediate their ends, and that these cut-away portions form, with the housing plates 4 and 5, guideways as clearly shown at 9 in Fig. 4. Slidably mounted in these guideways are plates 10. Their upper and lower edges are provided with lugs 11 which project into the guideways and the ends of the plates are also provided with lugs as indicated at 12—12 and 14—14, which serve another function.

In Fig. 7 the latch bolt 3 is shown. The latch bolt is formed of a square or rectangularly-shaped bar of suitable length, and the sides thereof are cut away as indicated at 15—15 intermediate its ends, to receive the plates 10—10. The total length of the plates 10 is the same as the cut-away portions on the sides of the latch bolt, and interplay between the plates 10 and the latch bolt is thus prevented when the plates 10 are placed on opposite sides of the latch bolt. Vertical movement of the latch bolt with relation to the plates 10 is also prevented, as the lugs 12 and 14 will project over and under the top and bottom faces of the latch bolt, as clearly shown in Figs. 4 and 6. The plates thus form a support for the latch bolt, and as the plates are in turn supported by the frame and slidable in the guideways 9 formed between the frame and the housing plates 4 and 5, it will be possible to impart a sliding movement to the plates and the latch bolt in unison. This may be accomplished in varying ways, but is here illustrated by means of a pin 16 which is secured in one of the plates 10 and which extends through a slot 17 formed in the side plate 4 of the housing. The opposite

plate 10, or that which lies against the inner face of the housing plate 5, has the words "In use" printed or otherwise formed thereon. This indicates whether the bolt is projected or retracted, as the plate or the indication printed thereon is movable into and out of register with a vertically-disposed slot 18 formed in the plate 5.

In actual practice, the assembly of the lock is exceedingly simple, as it is only necessary to place the latch bolt centrally between the upper and lower bars 6 and 7 of the frame, and then to apply the plates 10 so as to secure and support the bolt between them. The frame, together with the plates 10 and the latch bolt, is then inserted in the housing between the side plates 4 and 5 thereof, and the lugs 6a and 7a are then welded, riveted, or otherwise secured. This completes the assembly of the lock, as the only additional member required is the pin 16 which may be inserted at any time by merely screwing it into the plate 10 which lies adjacent the inner face of the side plate 4.

To install a lock of this character in a door, it is only necessary to cut a rectangularly-shaped notch in the edge of the door, as shown at C in Fig. 1, and to recess the outer edge of said notch as indicated at D—D to accommodate the thickness of the face plate 2 and the lugs 6a and 7a. After the door has been notched as shown, the lock in assembled form is slid into the notch, as shown in Fig. 2, and there secured by screws 20 or similar fastening means, which extend through the side plates 4 and 5 and the door proper. By referring to Figs. 1, 2 and 3, it will be noted that the side plates 4 and 5 of the lock housing are considerably wider and longer than the width and length of the notch C which is formed in the door; also that the side plates 4 and 5 are considerably wider and longer than the U-shaped frame (see Figs. 4 and 5) which is secured between the side plates 4 and 5. This enlargement of the plates, both in width and length, forms a channel around the frame, which passes above and below and rearwardly of the frame. This channel is of the same width as the thickness of the door, and as the frame exactly fits the notch in the door, flanges are formed above, below, and rearwardly of the frame, which guide the frame into the notch C. At the same time these flanges project over the edges of the notched portion of the door a sufficient distance to reenforce and strengthen the door and at the same time permit the fastening screws 20 employed to pass not only through the plates 4 and 5 but also through the door proper, the screw or bolt holes formed in the door for the reception of the screws being shown at 21 in Fig. 1.

The lock here illustrated is particularly intended for doors which are thin. Such doors are now coming into extensive use in airplanes, streamline trains, and in other places where reduction of weight is an important factor. The doors may be used between compartments, as toilet doors, or as swinging doors; and if a person desires to prevent anyone from opening the door while in a compartment, he merely projects the latch bolt by means of the pin 16, and when he does so, he also moves the plates 10 with it, and in so doing moves the indicating words, such as "Closed" or "In use", into alignment with the opening 18, thus visually showing that the room is occupied. In leaving the room, the bolt is naturally retracted, and it remains in this position until the door is again closed from the interior. The frame and housing in the lock give great strength to the lock structure, and in turn, to the door. The installation in the door is quickly and readily accomplished, and as the mechanism employed is exceedingly simple, the chance of any part of the lock becoming inoperative or out of order is remote.

While the pin 16 has been illustrated for projecting or retracting the latch bolt, a spindle with a rollback member could obviously be employed, and while certain other features of the invention have been more or less specifically described and illustrated, I nevertheless wish it understood that changes may be resorted to within the scope of the appended claims, and that the materials and finish of the lock may be such as the manufacturer desires or varying uses and conditions dictate.

Having thus described and illustrated my invention, what I claim and desire to secure by Letters Patent is:

1. In a latch mechanism of the character described a housing composed of a front and a pair of connected side plates, a frame disposed between the side plates of the housing, said frame including upper and lower arms and said arms being recessed on opposite sides to form upper and lower pairs of guideways, a pair of sliding plates disposed between the arms within the housing, each plate having upper and lower lugs projecting into the guideways to limit sliding movement of the plates, a latch bolt having a recess formed on each side to receive a portion of each sliding plate, pairs of lugs on each end of each sliding plate engaging upper and lower faces of the latch bolt and supporting the latch bolt between the sliding plates, and means projecting through the housing for imparting a sliding movement to the plates and the latch bolt carried thereby.

2. In a latch mechanism of the character described a housing, a latch bolt mounted therein, said latch bolt being rectangular in cross-section to present upper and lower surfaces and a pair of sides, said latch bolt having its sides transversely recessed for the greater portion of its length, a pair of plates disposed one on each side of the latch bolt, each plate having a portion extending into the adjacent recess, a pair of lugs on each end of each plate, said lugs engaging the upper and lower faces of the latch bolt and supporting the latch bolt between the plates, and the portions of the plate extending into the recesses of the latch bolt securing the latch bolt against endwise movement with relation to the plates, guideways formed in the housing, lugs formed on the upper and lower edges of the plates extending into the guideways to permit sliding movement of the plates and the latch bolt and to limit said sliding movement, and means for imparting a sliding movement to the plates and the latch bolt carried thereby, to retract or project the latch bolt from the housing.

WALTER R. SCHLAGE.