Sept. 6, 1932. W. R. SCHLAGE 1,876,080

DOOR LATCH

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Fig. 1.

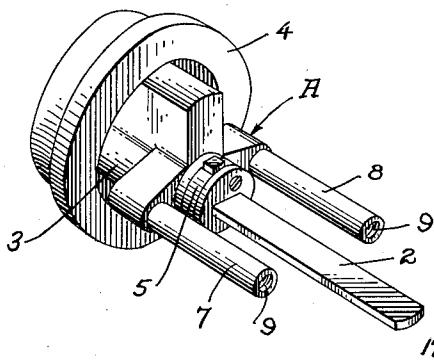


Fig. 2.

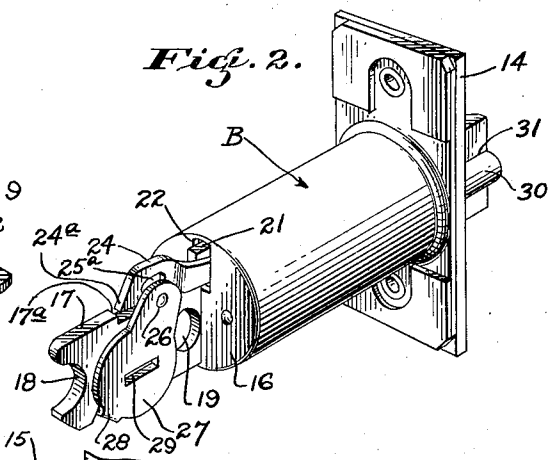


Fig. 3.

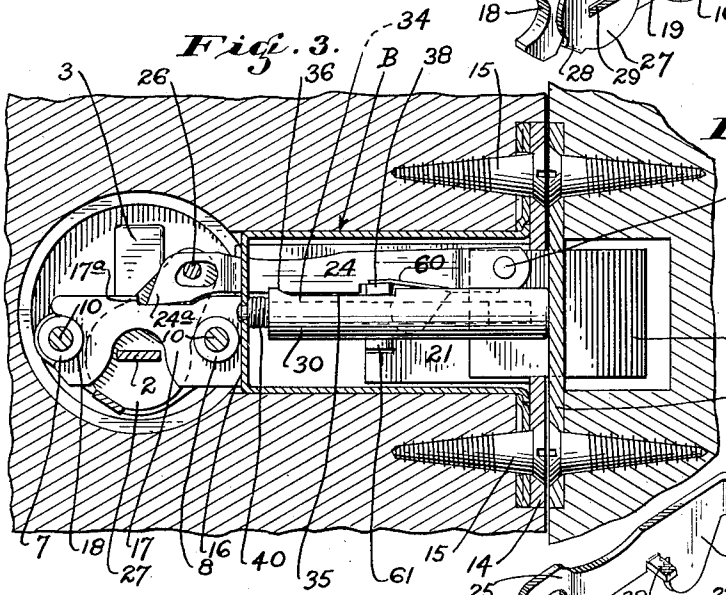


Fig. 4.

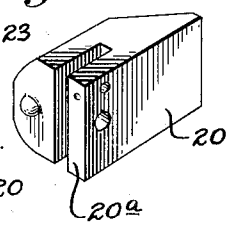


Fig. 5.

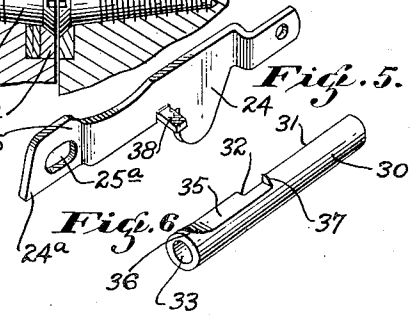


Fig. 6.

Fig. 7.

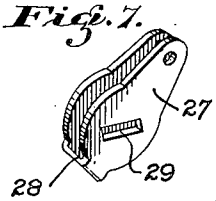
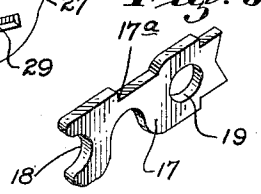


Fig. 8.



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Fig. 9.

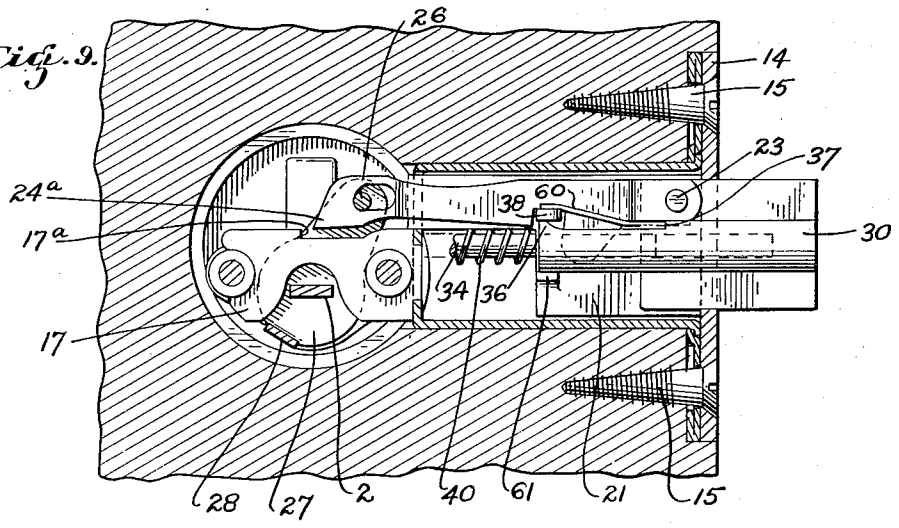


Fig. 10.

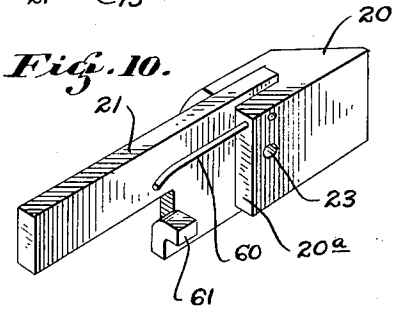


Fig. 11.

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UNITED STATES PATENT OFFICE

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DOOR LATCH

Application filed June 18, 1928. Serial No. 286,077.

This invention relates to door latches of the type illustrated in my co-pending application entitled "Door latch" filed April 18, 1928, Serial Number 270,815 and especially to a dead locking attachment therefor.

The object of the present invention is to generally improve and simplify the construction and operation of door latches of the character described, and especially to provide means for positively dead locking the latch bolt against forcible retraction by a tool entered between the inclined face of the latch bolt and the striker plate.

The invention is shown by way of illustration in the accompanying drawings, in which:

Fig. 1 is a perspective view of the latch bolt actuating unit,

Fig. 2 is a perspective view of the latch bolt unit,

Fig. 3 is a central vertical longitudinal section of the two units, said section also including a portion of the door and jamb, and showing the position of the striker plate,

Fig. 4 is a perspective view of the latch bolt,

Fig. 5 is a perspective view of the latch bolt link,

Fig. 6 is a perspective view of the dead locking bolt,

Fig. 7 is a perspective view of the retractor crank,

Fig. 8 is a perspective view of the anchor plate,

Fig. 9 is a section similar to Fig. 3, but showing the dead locking bolt extended,

Fig. 10 is a perspective view of the latch bolt and the latch plate,

Fig. 11 is a central horizontal section of the latch bolt unit and the latch bolt actuating unit, showing the manner of assembling the same in a door.

Referring to the drawings in detail, and particularly to Figs. 1, 2, 3 and 11, A indicates in general the latch bolt actuating unit and B the latch bolt unit. These units are assembled in a door as shown in Fig. 11 by drilling or boring two holes therein, one hole transversely through the door, as indicated at C, to receive the latch bolt actuating unit, and the second hole such as indicated at D, which is drilled through the edge of the door, to receive the latch bolt unit.

The latch bolt actuating unit is best illustrated in Figs. 1 and 11. The latch bolt actuating unit may be key or knob actuated, or both. It is provided with a flat spindle bar 2, which in this instance is connected to a key actuated unit as shown in Fig. 1 at one end, and by a knob 3 at the opposite end, into which it extends.

The key actuating unit consists of a cylinder 3, provided with an exterior escutcheon face plate 4. Mounted interior of the cylinder is the usual cylinder plug and tumblers, and secured to the outer end of the cylinder plug is a cam plate 5, which may be rotated when the key 6 is inserted, as shown in Fig. 11. The spindle bar 2 is connected with the cam plate, so that it will rotate in unison with the key and the cylinder plug. The manner of connecting the spindle bar 2 with the retractor, and the manner in which the retractor actuates the latch bolt will hereinafter be described.

The latch bolt actuating unit is provided with two posts or extension rods 7 and 8, the outer ends of which are drilled and tapped, as indicated at 9, to receive securing screws 10, these screws passing through an inner escutcheon plate 11, in which the inner knob 3*a* is journalled, the shank of this knob being provided with a recess as previously described, to receive the inner end of the spindle 2, so that the spindle may be rotated by the key actuated mechanism or by the knob 3*a*.

The screws 10 secure the latch bolt actuating mechanism, to wit the cylinder 3 and the outer escutcheon plate 4, together with the inner escutcheon plate 11 and the knob 3*a* against removal, and it also secures the latch bolt unit against removal, as will hereinafter be described.

The latch bolt unit is best illustrated in Figs. 2, 3, 4, 5, 6, 7, 8, 10 and 11. It consists of a face or guide plate 14, which is secured to the outer edge of the door in the usual manner, as by screws 15. Suitably secured to the rear side of the guide plate 14 is an elongated cylindrical shaped housing B. The

inner end of the housing is closed by an end plate 16, and secured to this end plate is an anchor plate 17, see Figs. 2, 3, 8 and 11. This anchor plate is substantially centrally disposed with relation to the longitudinal axis of the housing B, and forms an extension thereof. It is provided with a notch 18, in its outer end and a perforation 19 in its inner end. The perforation 19 slips over the rod 8 when the two units are assembled in a door, while the notch 18 slides along the rod 7. An interlock is thus formed between the housing of the latch bolt unit and the latch bolt actuating unit, and this interlock also maintains a definite relation between the cooperating parts of the mechanism employed.

Slidably mounted in the outer end of the housing B and guided by the face plate 14 is the latch bolt proper. This is indicated at 20, and is best illustrated in Figs. 4 and 10. Secured to the inner end of the latch bolt is a latch bolt plate and guide 21. The inner end of this plate extends through an opening 22 formed in the end plate 16. This opening serves as a guide for the inner end of the latch bolt and the plate. Pivotally secured to one side of the latch bolt, at the point 23, is a latch link 24, which is best illustrated in Figs. 3, 5, and 11. This link lies parallel with the latch bolt plate 21, as shown in Fig. 11 and the inner end thereof is offset at the point 25, so as to overlay the anchor plate 17.

Formed in the upper face of the anchor plate 17 is a locking shoulder 17*a* and this shoulder is adapted to be engaged by the inner end 24*a* of the latch link 24. A latch perforation almost rectangular in shape is formed in the inner end of the latch link, as indicated at 25*a*. A pin 26 extends through this opening and this pin is secured in the upper end of a retractor crank 27, this crank being best illustrated in Figs. 2, 7 and 11. The crank consists of two parallel arms 27 as shown in Fig. 7, which are tied together at the lower end by a cross web 28. The lower ends of the crank arms have aligned rectangular slots 29 formed therein and these slots permit the spindle bar 2 to extend therethrough. That is, rotation of the spindle bar transmits a swinging movement to the crank arms 27, and the pin 26 carried by the upper end of the crank arms will thus engage the inner face of the enlarged opening 25 of the latch link, and thus pull the latch link together with the latch bolt rearwardly thus retracting the same when the door is to be opened, either by key actuated mechanism shown in Figs. 1 and 11, or by inner knob 3*a*, shown in Fig. 11.

The latch link and the latch bolt connected thereto by means of the pivot 23, can, however, only be retracted when the link assumes the raised position shown in Fig. 9. That is, when the inner end of the link is raised with relation to the locking shoulder 17*a*. On the other hand, when the link assumes its lowered position with relation to the shoulder 17*a*, see Fig. 3, retraction of the link and the latch bolt will be prevented, as the inner end 24*a* of the link will engage the shoulder 17*a*, thereby preventing retraction.

The latch link 24 is actuated not only by means of the retractor crank 27, shown in Figs. 7 and 11, but it is also actuated by a dead locking or auxiliary bolt generally indicated at 30, see Figs. 2, 3, 6 and 11. This dead locking bolt is nothing more or less than a round rod, the outer end of which is cut away to form a flat face 31, which rests against the flat face of the latch bolt, and to form a shoulder 32, the function of which will hereinafter be described. The inner end of the bolt is drilled out, as shown at 33, to permit it to telescope and to be guided by a pin 34, secured to the end plate 16 of the housing B. The upper face of the dead locking bolt is cut away, as at 35, to form a raised cam 36 at the inner end, and a shoulder 37 near the outer end. The position of the dead locking bolt is substantially on a line with the longitudinal axis of the cylinder B at a point just below the latch link 24. The latch link is provided with an outwardly projecting lug 38, which rests in the cut away portion 35 of the dead locking bolt.

When the door is opened and the latch bolt projected, as shown at Figs. 9 and 11, the dead locking bolt will also be projected, as shown in these figures, being projected in that case by a spring 40, which surrounds the guide pin 34, the latch bolt proper being projected under such conditions by means of a spring 41, see Fig. 11.

When both the latch bolt and the dead locking bolt are projected, lug 38 on the latch link engages the cam 36 of the dead locking bolt, see Fig. 9. The inner end of the latch link is thus maintained in a raised position with relation to the pin 26 of the retractor crank and the locking shoulder 17*a*. When so positioned, rotary movement may be imparted to the spindle bar 2 either by the key actuating mechanism or by the knob 3*a*. Such rotation causes the retractor cranks 27 to swing rearwardly, pin 26 will during this rearward movement engage the rear wall of the opening 25 formed in the inner end of the latch link, and the latch link, together with the latch bolt will accordingly be retracted as the inner point 24*a* of the latch link is then in a position to clear the locking shoulder 17*a*.

On the other hand, if the door is closed and the latch bolt is projected through the striker plate 50, see Fig. 3, the dead locking bolt will engage the striker plate, and as such will be held in the retracted position shown in this figure. The lug 38 of the latch link will then ride in the cut away portion 35 of the dead locking bolt until it engages the

shoulder 37. In other words, it rides off the cam 36 on the inner end of the dead locking bolt and drops into the cut away portion 35 of the dead locking bolt, thus lowering the inner end 24*a* of the latch link so that it lies directly behind the locking shoulder 17*a*. This is important, as the main latch bolt is now locked against retraction by unauthorized persons. For instance, if a jimmy or the like is inserted between the striker and the door against the inclined face of the main latch bolt, it will be impossible to force the latch bolt inwardly as the latch link 24 will engage the shoulder 17*a*, thereby preventing retraction of the latch bolt or jimmying of the door.

A dead locking bolt or plate, broadly speaking, is old, but as applied in this instance, where it can cooperate with the latch link 24, such as here shown, a new structural combination is brought about.

By referring to Figs. 3, 9 and 10 it will be noticed that the inner end of the latch bolt is provided with a wire spring 60. This spring is bent upwardly to engage the upper face of the lug 38 and as such serves the function of continuously exerting a downward pressure on the latch link, thereby maintaining engagement either with the dead locking bolt cam 36 or with the cut away depressed portion 35 formed thereon. The shoulder 32 formed on the inner face of the dead locking bolt engages the inner shoulder 20*a* of the latch bolt, and as such limits outward movement of the latch bolt dead locking bolt, outward movement of the main latch bolt 20 being limited by engagement of the inner end of the latch link with the retractor crank pin 26.

The dead locking bolt 30 has two main guides, first of all the guide pin 34. and secondly a guide lug 61, formed on the lower edge of the latch plate 21, see Figs. 9 and 10.

Reference to my co-pending application, entitled "Door latch" filed April 18, 1928, Serial Number 270,815 referred to in this application, will show that the general construction of the latch actuating unit and the latch unit per se is substantially identical to the mechanism illustrated in the present application, the only additional features illustrated in the present application being the dead locking bolt, and the mechanism actuated thereby.

It is this mechanism, in combination with the mechanism illustrated in my previous application which comprises the subject matter of the present application, and which is herein claimed.

Briefly, the general operation of the mechanism here illustrated will be as follows:

If a door containing a lock such as here shown is opened, both the main latch bolt and the dead locking bolt will be projected, as shown in Figs. 9 and 11. If the door is closed, the inclined face of the latch bolt will engage the striker plate 50, and as such will be gradually depressed. The dead locking bolt will at the same time be depressed in unison with the latch bolt, as the inner shoulder 20*a* of the latch bolt will engage the inner shoulder 32 of the dead locking bolt. The two bolts will accordingly move inwardly in unison until completely depressed. The moment, however, that the main latch bolt registers with the opening in the striker plate, it will be projected and the door will be locked. No opening is formed in the striker plate for the dead locking bolt so this will remain depressed as shown in Fig. 3, while the main latch bolt will be projected, as shown in the same figure. The depressed position assumed by the dead locking bolt, in that instance, will cause the lug 38 of the latch link to assume a depressed position. The inner end 24*a* of the latch link will thus lie behind the locking shoulder 17*a* and jimmying of the latch bolt is accordingly prevented. The latch bolt may, however, be retracted by rotating the spindle bar 2, either by the knob or the key actuated mechanism as the inner end 24*a* of the latch links lie sufficiently far forwardly of the locking shoulder 17*a* to permit the retractor pin 26 to lift the end 24*a* of the link clear of the shoulder, thus, while the latch bolt is locked against retraction by means of a jimmy, or the like, it is unlocked for legitimate opening, either by the knob, or by the key actuated mechanism.

While certain features of the present invention are more or less specifically described, I wish it understood that various changes may be resorted to within the scope of the appended claims, similarly that the materials and finishes of the several parts employed may be such as the manufacturer may decide, or varying conditions or uses may demand.

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

1. In a door latch of the character described, an elongated tubular housing, a main latch bolt and an auxiliary latch bolt mounted in said housing and normally projecting through one end thereof, said latches aligning and being operable on a common plane, an elongated dogging link mounted within the housing, a pivotal connection between one end of the link and the main latch bolt, a stop member which the opposite end of the dogging link is adapted to engage, means whereby the dogging link is maintained out of engagement with the stop member when the auxiliary latch bolt is extended, and means whereby engagement is made with the stop member when the auxiliary latch bolt is depressed.

2. In a door latch of the character described, an elongated tubular housing, a main

latch bolt and an auxiliary latch bolt mounted in said housing and normally projecting through one end thereof, said latches aligning and being operable on a common plane, a pivotally mounted dogging member, a stop member cooperating therewith, means whereby the dogging member is maintained out of engagement with the stop member when the auxiliary latch bolt is extended, and means whereby engagement is made with the stop member when the auxiliary latch bolt is depressed.

3. In a door latch of the character described, an elongated tubular housing, a main latch bolt and an auxiliary latch bolt mounted in said housing and normally projecting through one end thereof, said latches aligning and being operable on a common plane, a dogging member, means actuated by depression of the auxiliary latch bolt for moving the dogging member into dogging position to prevent depression of the main latch bolt when pressure is applied to the outer end thereof, a retractor, and means actuated by the retractor for releasing the dogging member and for retracting the main latch bolt.

4. In a door latch of the character described, an elongated tubular housing, a main latch bolt and an auxiliary latch bolt mounted in said housing and normally projecting through one end thereof, said latches aligning and being operable on a common plane, a pivotally mounted dogging member, a stop member cooperating therewith, means whereby the dogging member is maintained out of engagement with the stop member when the auxiliary latch bolt is extended, means whereby engagement is made with the stop member when the auxiliary latch bolt is depressed, a retractor positioned in the same plane as the latch bolt members, and means actuated by the retractor for releasing the dogging member and for retracting the main latch bolt.

5. In a door latch of the character described an elongated tubular latch bolt housing, a main and an auxiliary latch bolt mounted in the housing and normally projecting through the front end thereof, a dogging link mounted in the housing, the forward end of the link being pivotally connected to the main latch bolt and extending through the rear end of the housing, a stop member disposed behind the housing with which the rear end of the link is adapted to engage, a cam carried by the auxiliary latch bolt and engageable with the link to maintain the rear end of the link out of engagement with the stop member, said cam being operable only when the auxiliary latch bolt is extended, and a spring engaging the link and maintaining the rear end thereof in engagement with the stop member when the auxiliary latch bolt is depressed.

6. In a door latch of the character described an elongated tubular latch bolt housing, a main and an auxiliary latch bolt mounted in the housing and normally projecting through the front end thereof, a dogging link mounted in the housing, the forward end of the link being pivotally connected to the main latch bolt and extending through the rear end of the housing, a stop member disposed behind the housing with which the rear end of the link is adapted to engage, a cam carried by the auxiliary latch bolt and engageable with the link to maintain the rear end of the link out of engagement with the stop member, said cam being operable only when the auxiliary latch bolt is extended, a spring engaging the link and maintaining the rear end thereof in engagement with the stop member when the auxiliary latch bolt is depressed, and other means for raising the rear end of the link out of engagement with the stop member, said means also adapted to exert a pull on the link to retract the main latch bolt.

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