

July 13, 1937.

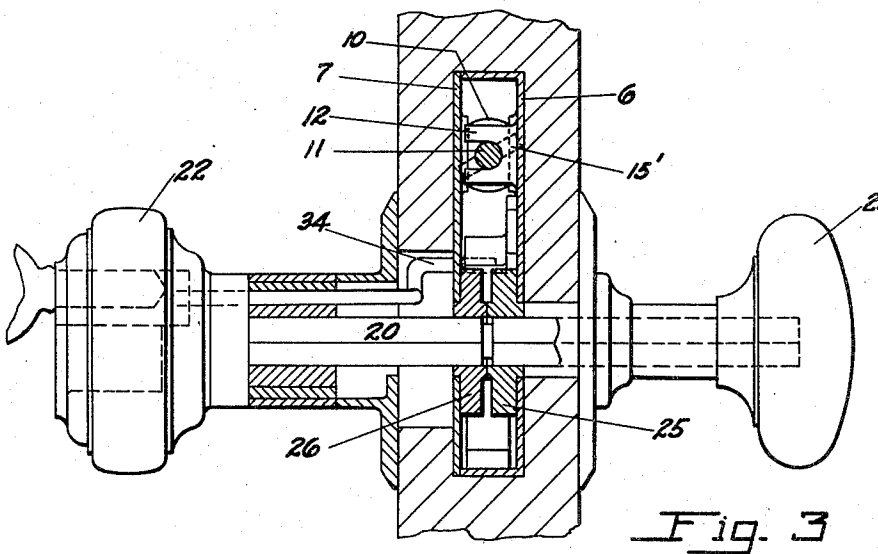
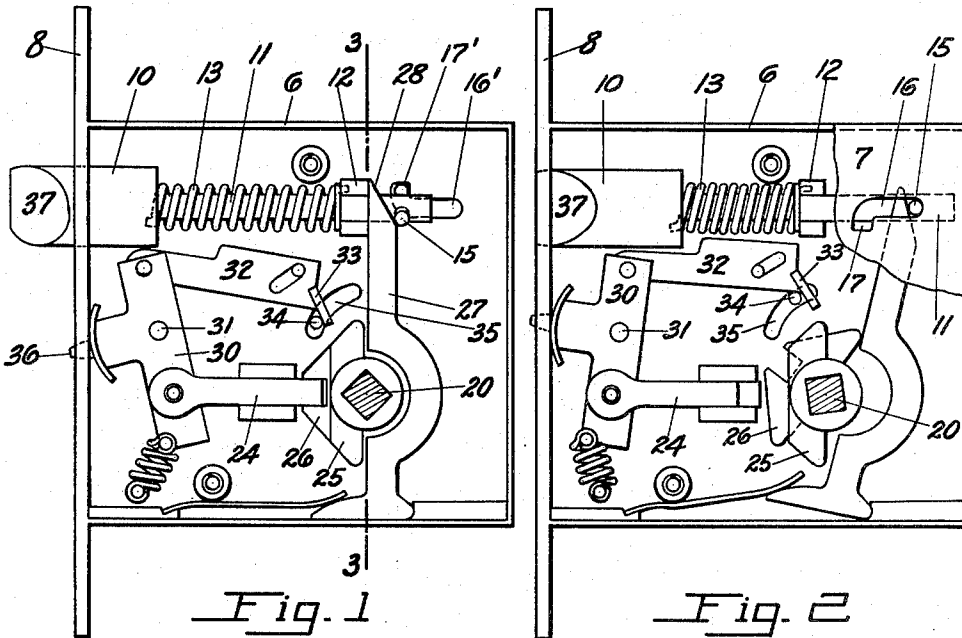
F. H. McCARTER

2,086,982

DOOR LOCK BOLT MECHANISM

Filed April 3, 1935

2 Sheets-Sheet 1



Frank H. McCarter.

INVENTOR

BY *W. E. D. Mearns*
ATTORNEYS

July 13, 1937.

F. H. McCARTER

2,086,982

DOOR LOCK BOLT MECHANISM

Filed April 3, 1935

2 Sheets-Sheet 2

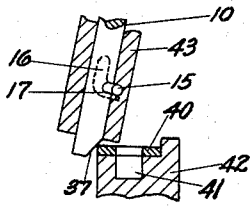


Fig. 5

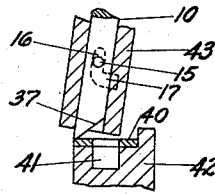


Fig. 7

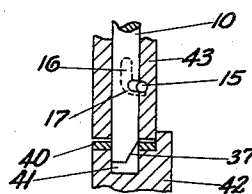


Fig. 9

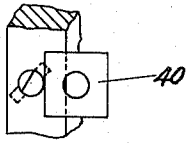


Fig. 4

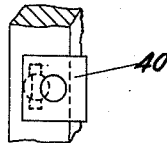


Fig. 6

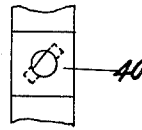


Fig. 8

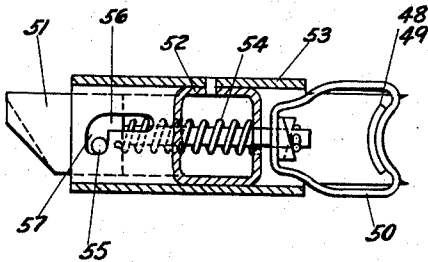


Fig. 10

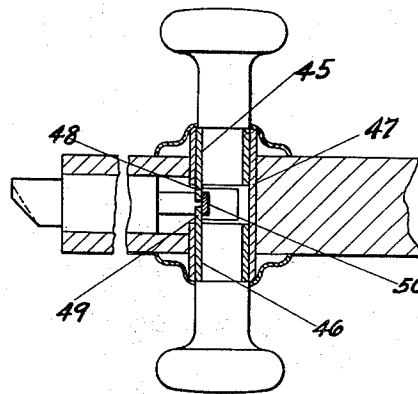


Fig. 11

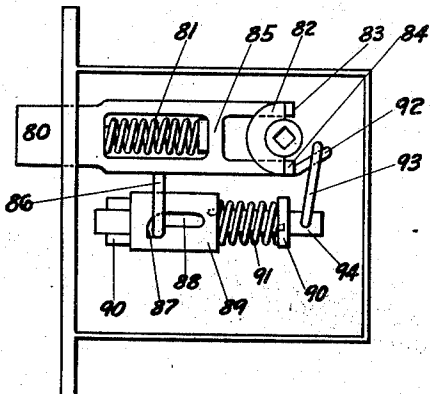


Fig. 14

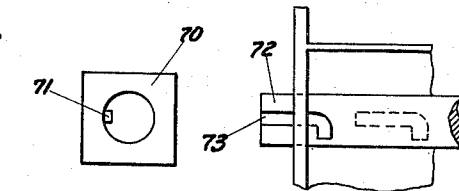


Fig. 12

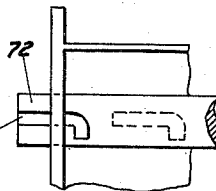


Fig. 13

Frank H. McCarter.
INVENTOR

BY *W. S. Macnamara*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,086,982

DOOR LOCK BOLT MECHANISM

Frank H. McCarter, Muhlenberg Township,
Berks County, Pa.

Application April 3, 1935, Serial No. 14,387

4 Claims. (Cl. 70-146)

My invention relates to locks for doors and the like, and more specifically to improvements of the movable bolt member and mechanism for projecting and retracting the same; my primary object being to securely lock the bolt when in fully projected position against any retractive movement except by means of a usual knob, key, or other like operative means provided for such purpose.

Another advantage is to provide in a single spring catch bolt lock all the safety against tampering heretofore secured by an added bolt and its operative mechanism.

Other advantages are simplification of the lock construction with the added feature of a safety lock for the projected bolt, and adaptability for additional uses not possible with the heretofore known locking bolts.

My improvements are applicable to any type of lock employing a slide bolt, and comprise my novel slide bolt, means for locking the bolt when fully projected, and projecting and retracting means for said bolt adapted to effect a partial turning movement of the bolt at the end of its projecting movement and at the beginning of its retractive movement whereby the bolt is locked when projected and unlocked before retraction.

My improvements will now be more fully described in connection with the accompanying drawings, and the novel features thereof set forth in the appended claims.

Fig. 1 is a plan view of a mortise lock embodying my improvements, the cover plate thereof being removed to clearly show the operative mechanism.

Fig. 2 is a view similar to Fig. 1, indicating the slide bolt fully retracted by the lock mechanism, and indicating a fragment of the cover plate in position.

Fig. 3 is a cross sectional view showing the lock mounted in the mortised recess of a door, the lock being shown in section substantially on the line 3-3 of Fig. 1, and with inner and outer door knobs for the operating lock spindles, the outer knob being shown with a cylinder lock mechanism controlling the operation of the slide bolt when dead-locked.

Figs. 4 to 9 show diagrammatically the action of a keeper on a spring latch bolt embodying my improvements: Fig. 4 being an end view and Fig. 5 a corresponding partial plan view, and indicating the keeper contacting the projected and locked bolt during a door closing movement; Figs. 6 and 7, are similar views, indicating locking releasing turning movement of the bolt effected

by the action of the keeper; and Figs. 8 and 9, also similar views, indicating the door closed and the bolt engaging the keeper and locked in projected position.

Figs. 10 and 11 are horizontal sections of my improvements embodied in a lock having a cylindrical casing for a special type of mortise lock.

Figs. 12 and 13 are horizontal sections of an embodiment of my bolt adapted to lock a sliding door.

Fig. 14 is a horizontal section of a modification embodying my invention.

Referring to the drawings, and particularly to the embodiment shown in Figs. 1, 2 and 3, a usual mortise lock casing 6 is indicated, having a removable cover plate 7, and an end plate 8 extended to secure the casing in the door mortised recess as heretofore.

The slide bolt indicated, embodies my improvements, and comprises, as shown, a cylindrical end portion 10 adapted to be projected and retracted through a suitable aperture in end plate 8; and a reduced cylindrical extension 11 having an intermediate mounting in a casing bearing 12. A coil spring 13 is shown strung upon extension 11 between the end 10 and bearing 12, and in the particular construction shown, is tensioned to normally project the bolt end 10 through end plate 8, and at the same time to exert a torsional or turning tension on said bolt. And to control and limit such turning tendency of the bolt 10, extension 11 is shown as having a transversely projecting pin 15 engaging in a slotted aperture 16 formed in the cover plate 7, said aperture 16 having at its forward end an angular recess or detent 17 into which the pin 15 is turned by torsional tension of spring 13 when the bolt 10 is fully projected. A similar pin 15' and slotted aperture 16' and detent 17' is indicated as formed in the casing plate and acting conjointly with the cover plate aperture and detent.

From the foregoing description it will be seen that the bolt 10 will thus normally move to projected position, and be then turned by its projecting spring so that pin 15 will engage in detent 17 to prevent any retractive movement of said bolt by end pressure thereon; any retractive movement first requiring a turning of said bolt reverse to the torsional tension of spring 13, so as to release pin 15 from detent 17, and positioning said pin for rearward movement in aperture 16.

The drawings indicate a preferred simple means for retracting the locked projected bolt

10 above described, such means employing a usual two part spindle 20, with independently operable inner door knob 21 and outer door knob 22, the latter shown as carrying a key-actuated
 5 cylinder lock of known construction adapted for operating the lock mechanism when its knob 22 is dead locked against turning by night latch plunger 24.

The spindle 20 is shown as carrying on opposite sides of its line of division, a roll-back 25 for the inner knob 21, and a similar roll back 26 for the outer knob 22, each capable of independent operation upon a lever arm 27, the upper end of which engages pin 15 to retract
 15 bolt 10. Retraction of projected bolt 10 however first requires release of pin 15 from detent 17, and to accomplish this I form the upper end of lever arm 27 with an angular face 28, as shown, the action of which when pressed
 20 against pin 15 is to turn bolt 10 reversely to the tension of spring 13, thus freeing said pin from its detent 17, and further movement of arm 27 then retracting the bolt against the projecting tension of said spring 13, and pin 15 during
 25 such retraction engaging in slotted aperture 16 to cause said bolt to slide rearward without further turning movement.

Knob 22 may be deadlocked as stated by movement of plunger 24 into locking engagement with
 30 roll back 26 as shown in Fig. 1, such movement being effected by a finger set lever 30 to which plunger 24 is pivotally connected. Lever 30 is intermediately pivoted to the casing at 31 and actuates a pivotally connected slide plate 32
 35 having a stop 33 lying in the path of swing of the crank-bent end of a key-operated rod 34 projected into the lock casing 6 through a suitable slotted aperture 35. Action of the key swinging the cranked end of rod 34 operates
 40 to engage the latter against stop 33 and move said plate to swing said lever 30 to the reverse position shown in Fig. 2, such movement of lever
 45 30 withdrawing plunger 24 from locking engagement with roll-back 26, freeing the latter for turning movement by the handle 22. Lever 30 may be set by its finger-engaging extension 36
 projecting through end plate 8, as shown.

The simple lock construction above described provides for the usual desired knob operation,
 50 with provision for dead locking the outer knob, requiring a key to release the same; and it further provides for positively locking the bolt in projected position giving added safety by preventing release by a prying end pressure against
 55 said bolt. A lock of this nature has the safety provisions of the usual added dead bolt with simplified mechanism and cheaper cost.

The bolt shown in Figs. 1 and 2 is indicated as a usual spring latch, provided with an angular face 37 adapted in known manner to retract
 60 the bolt when closing the door by cam action of the keeper on said angular face.

Such usual cam action with my improved bolt as described, must first turn the bolt to release
 65 pin 15 from detent 17 before it can retract said bolt. In diagrammatic Figs. 4 to 9 such turning action is clearly shown, 40 indicating a keeper plate covering a bolt recess 41 in a door frame 42, and 43 indicating the swinging door carrying
 70 the bolt 10 projected and locked by its pin 15 engaging in detent 17 of slot 16. The angular face 37 of bolt 10 is cut to extend in a vertical plane when pin 15 is engaged in slot 16, but such face is canted or turned when pin 15 en-
 75 gages in detent 17. In Figs. 4 and 5, an edge

view and sectional plan are shown indicating the locked projected bolt moving to its seat in the door frame. It will be seen that the leading edge of the canted angular face 37 first engages
 5 against keeper plate 40, such action turning bolt 10 to free pin 15 from detent 17, as shown in Figs. 6 and 7, when face 37 will act as heretofore to retract bolt 10 so the door may fully close, when the bolt 10 will spring outward into
 10 projected engagement with the frame, and at the same time turn to again engage pin 15 in detent 17 to lock it against retraction, as shown in Figs. 8 and 9.

Figs. 4 to 9 further indicate that the pin 15 may be placed anywhere in the length of bolt
 15 10 or its extension, and slotted aperture 16 and detent 17 placed accordingly, with any suitable provision for turning said bolt at the beginning of its retractive movement.

As indicating another application of my im-
 20 proved latch bolt I have shown in Figs. 10 and 11 a type of mortise lock having a cylindrical bolt casing arranged to be engaged and operated by inner and outer knob tubes 45 and 46 respec-
 25 tively, said tubes 45 and 46 extending into a door engaged tube 47 and having end extensions 48 and 49 respectively adapted to engage a strap extension 50 of the latch bolt 51. Bolt 51 is
 30 rotatably and slidably mounted in a tubular casing 52 which is engaged and enclosed by a casing 53 mounted in the door in a suitable round aperture formed in the edge of the latter, and
 35 a spring 54 tensions said bolt to normally project the same and to torsionally tension the bolt so that pin 55 on the latter sliding in slot 56
 40 in casing 52 will turn to engage detent 57. This type of lock is adapted for certain uses, and the knob rotated tubes 45 and 46 may have dead bolt and key-actuated locking means controlling
 45 their turning movements, which mechanism forming no part of the present invention, is not shown.

The locking turning movement of my improved bolt may be employed to lock a sliding
 50 door, as indicated in Figs. 12 and 13 which merely show the keeper 70 provided with a bayonet lock pin 71. The bolt 72 is shown with a bayonet slot 73 adapted to engage and lock
 55 with keeper pin 71 when the bolt is projected and turned at the end of its projected movement. If desired the bolt may have in addition the pin and bolt above described to retain the bolt
 60 in projected position. The projecting movement of the bolt in this case may be a knob or key actuated lever adapted to turn said bolt at the
 65 end of its projecting movement and at the beginning of its retractive movement.

It is not essential that my bolt be of the spring latch type, and it may be a simple slide bolt with
 70 positive means for reversely moving the same adapted however for turning the bolt to lock the same when fully projected. Also it is obvious that the mortise lock shown in Figs. 1, 2 and 3, may be simply modified for use as a usual rim
 75 lock.

As indicating that turning movement to lock the bolt in projected movement may be relative,
 80 I have shown in Fig. 14 a simple rim lock with cover removed disclosing a slide bolt 80 of usual rectangular non-rotatable shape, projected by
 85 spring 81, and retracted by roll back 82 engaging the forked ends 83, 84 of a bolt extension 85. A pin 86 is shown in this case engaging a detent 87 in a slot 88 formed in a roller 89 mounted to partially
 90 turn in bearings 90, 90, and torsionally ten-

sioned by a spring 91. Bolt extension forked end 84 is shown with an angular finger 92 adapted to engage a pin 93 on the shaft extension 94 of roller 89 to turn the same reversely to the tension of spring 91 so as to free pin 86 from its detent 87 and cause it to slide rearward in slot 88 as roll back 82 acts to retract bolt 80.

The above described embodiments are believed to fully disclose the nature of my improvements and their adaptability for various types of known lock structure, and I do not desire to limit myself to the specific constructions shown and described, as other constructions and modifications may be devised within the spirit of my invention as set forth in the following claims.

What I claim is:

1. A lock mechanism comprising, a spring projected bolt tensioned to turn partially on its longitudinal axis, means for locking said bolt in fully projected position adapted to be engaged by said bolt turning movement, retractive means adapted to disengagingly turn said bolt at the beginning of each retractive movement, and a keeper-engageable cam face on said bolt end adapted to disengagingly turn and repress said bolt.

2. In a door lock mechanism comprising, a casing, a bolt mounted to slide therein, means for reversely sliding said bolt to project and retract an end thereof through said casing wall, and means for locking said bolt in fully projected position comprising a locking pin carried by said bolt, a roller mounted in said casing, tensioned to turn in one direction and having a slide way for said locking pin provided with a detent portion adapted to engage said pin by turning movement of said roller when said bolt

is projected, an arm on said roller adapted for turning the latter reversely to its tensioned turning movement, and a bolt carried operating lever for said arm adapted to reversely turn said roller preliminary to retractive movement of said reversely sliding means for said bolt.

3. In combination, a door lock mechanism comprising a spring projected slide bolt tensioned to turn partially on its longitudinal axis; means for locking said bolt in fully projected position comprising a pin and slideway therefor having a pin-engaging detent adapted to be engaged by said partial bolt turning movement; a keeper-engageable cam face on said bolt end adapted to releasably turn and repress said bolt; bolt retractive means comprising a plurality of roll-backs and means operated by any roll back to turn said bolt reversely to its tensioned turning movement preliminary to slidably retracting the same; and dead latch locking means comprising a detent for one roll-back, and key-operated mechanism for retracting said detent for said roll back engagement.

4. A lock mechanism comprising, a spring projected bolt tensioned to turn partially on its longitudinal axis, means for locking said bolt in fully projected position comprising a bolt-carried pin and a fixed slide-way therefor having an angular pin-locking end engageable by said pin in said partial bolt turning movement, and a keeper-engageable cam on said bolt end and bolt roll-back mechanism independently operative to disengageably turn said bolt to free said pin from said angular slide-way end preliminary to retractively moving said bolt.

FRANK H. McCARTER.