June 10, 1930. E. J. BAUMÉ 1,762,499

LATCH BOLT STRUCTURE

Filed Dec. 14, 1927

Fig. 1.

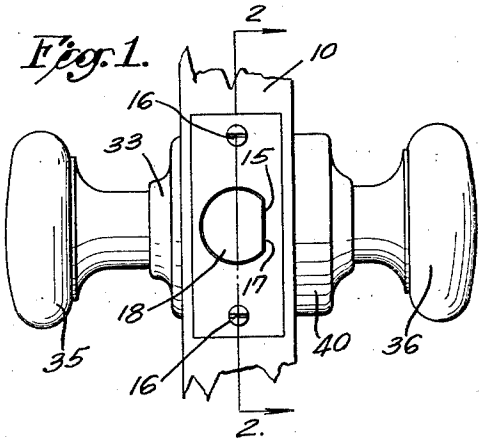



Fig. 5.

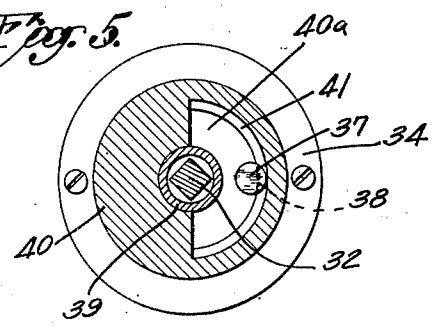



Fig. 2.

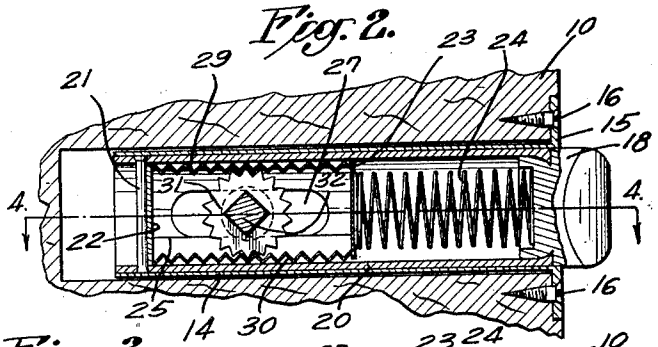



Fig. 6.

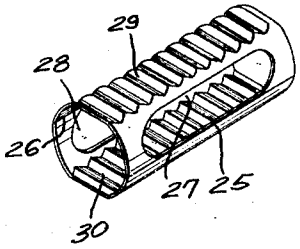



Fig. 3.

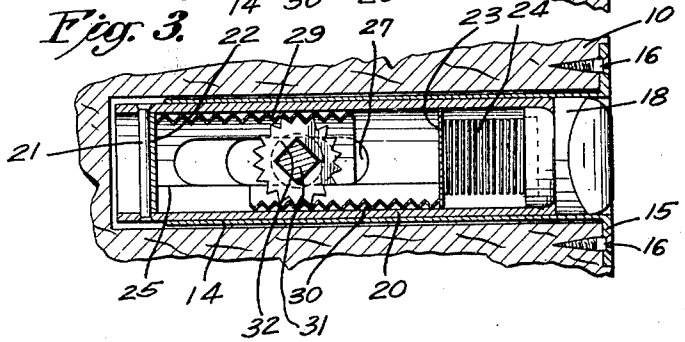
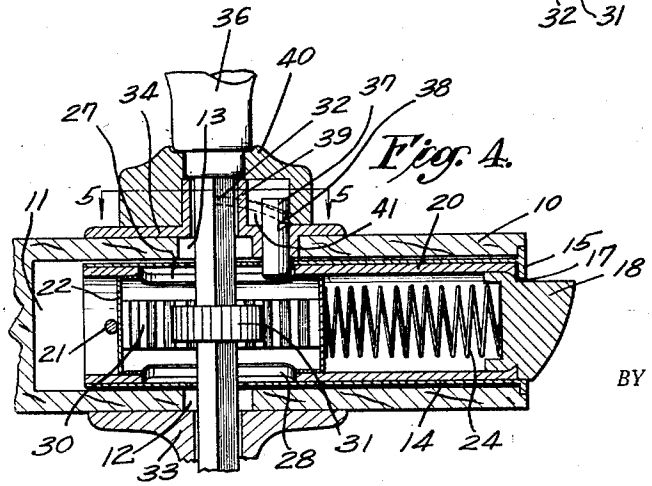



Fig. 4.




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# UNITED STATES PATENT OFFICE

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## LATCH-BOLT STRUCTURE

Application filed December 14, 1927. Serial No. 239,853.

This invention relates to improvements in door latches, and pertains particularly to a set having a latch operable from a turntable member such as a knob shaft or shank. The primary objects of this invention are first, to provide a novel roll-back mechanism; second, to provide a novel latch retainer mechanism to hold the latch bolt in protracted position and operable by a collar mounted to be rotated about the knob shank; third, to provide a bolt having a shank housing the roll-back mechanism; and fourth, to provide a bolt having a shank with slots therein communicating with a bore therein, in which bore is housed, a roll-back mechanism operable by a knob shaft extending through said slots.

It is desirable to have a unitary latch structure which may be embodied in mortise latches and be installed with a minimum of cutting of the door and fitting. A still further object of this invention is to provide a door latch which for installation of the door requires only boring a recess into the edge of the door for reception of the latch casing and a cross bore for the knob shaft.

Other objects and advantages will be made fully apparent from the following specification considered in connection with the accompanying drawings, in which:

Fig. 1 is an edge view of a fragment of a door showing my improved latch mounted therein; Fig. 2 is a section as seen upon the line 2—2 of Fig. 1 with the latch bolt in protracted position; Fig. 3 is a section similar to Fig. 2 showing the latch bolt retracted; Fig. 4 is a section as seen on the line 4—4 of Fig. 2; Fig. 5 is a section as seen on the line 5—5 of Fig. 4; and Fig. 6 is a perspective view of the roll-back cylinder.

Referring with more particularity to the drawing, a door is indicated by 10. The door is provided with a cylindrical bore which may be conveniently made by means of an auger. Extending transversely through the door and communicating with the bore 11 is a transverse bore 12 which may be made drilled by the same means. The bore 11 serves to receive the casing of the latch bolt and the bore 12 permits the passage therethrough of the knob shaft. Opposite to bore 12 is a bore 13 to receive a bushing holding the lock pin. The edge of the door is recessed to receive a selvage plate.

The latch bolt structure comprises a hollow cylindrical shell 14 having at the end thereof a selvage plate 15 with suitable holes for screws 16 to hold the casing in position. The selvage plate is provided with a flat side 17 for maintaining the latch bolt against turning and to provide a shoulder to limit the projection of the latch bolt. The latch bolt has a head 18 with the usual beveled outer face. The shank of the latch bolt is hollow providing a chamber to house the roll-back mechanism. The latch bolt is slidable within the casing shell and has at its outer end a transverse pin 21 serving as an abutment. Resting against the pin is a washer 22. Intermediate the ends of the chamber is a washer 23. Between the washer and the head of the latch bolt is a compression spring 24 resting at one end against the head and at the other end against the washer 23. Disposed within the chamber and the shank is a roll-back cylinder which is hollow and best shown in Fig. 5. This cylinder is split at diametrically opposite points along lines 25 and 26. Longitudinally extending slots 27 and 28 are provided in the cylinder at opposite sides. The cylinder may be made of sheet metal and indented to provide racks 29 and 30. The sections of the cylinder are such that they may be moved axially with respect to one another. Within the cylinder is a pinion 31 meshing with the racks. It is provided with a square bore through which extends a knob shaft 32. The knob shaft is mounted to be rotated in escutcheon plates 33 and 34 secured to opposite faces of the door, and mounted upon the shaft are knobs 35 and 36.

It is obvious that upon turning the knob, the pinion 31 will be rotated causing the racks to be moved axially of the shank in relation to one another. This will cause expansion or contraction of the roll-back cylinder. Upon expansion of the roll-back cylinder, one rack presses against the washer and abutment at the inner end, and the other rack presses against the washer at the opposite end, thereby retracting the bolt. At the same time,

compression spring 24 will be compressed as shown in Fig. 3. There is a double action against the compression spring, that of the bolt head and the abutment moving toward each other. It is apparent that a large compression spring having a large amplitude of movement may be employed. Heretofore, a difficulty experienced in latch bolts has been that of obtaining an operating spring of sufficient strength and size to adequately operate the latch. Upon releasing the knob, the compression spring will expand and project the latch bolt, restoring the parts to the position shown in Fig. 2. The bolt may be retracted without turning of the knob by pressure inwardly on the bolt head. This occurs when the door is closed, the keeper engaging the bevel face of the bolt head and pushing the bolt inwardly against the action of the compression spring.

For the purpose of locking the latch bolt in protracted position, a pin 37 is provided. This pin is mounted in the body of the escutcheon plate portion 34, and is projectable into the slot 27 of the roll-back cylinder and a corresponding slot in the shank of the bolt. A slot 38 extends along a portion of the periphery of the pin and is engaged by a rib. The escutcheon plate 34 has a hub 39 and rotatably mounted on the hub is a collar 40. In the collar is a semi-cylindrical chamber 40ª having a rib 41 inclined to the axis of the knob shaft and engaging the slot 38 in pin 37. The pin 37 will be retracted or projected upon rotation of the collar. It is obvious that by rotating the collar to a predetermined position, pin 37 will be projected into a slot of the bolt shank to hold the latter against movement. The collar upon rotation in the opposite direction will retract the pin and free the bolt. It will also be apparent that a similar collar and pin may be mounted upon the other side of the door. Thus, the latch may be locked from either side of the door. Such double locking is desirable in hotels, offices and other places.

What I claim is:—

1. In a door latch structure, the combination of a casing, a protractable latch bolt having a carrying frame at its inner end, oppositely disposed abutment members, one being fixed to said frame and the other slidable therein, a spring intermediate the slidable abutment and the head of said bolt tending to separate them; a roll-back actuator expansible axially to press against said abutments and move the latter to and from each other, and means to operate said actuator.

2. In a door latch structure, the combination of a casing, a protractable latch bolt, a carrying frame at its inner end, oppositely disposed abutment members, one being fixed to said frame and the other slidable therein, a spring intermediate the slidable abutment and the head of said bolt tending to separate them; a roll-back comprising a pair of racks and a pinion meshing with said racks whereby upon rotation of said pinion to move said racks outwardly in relation to one another, one of said racks will press against one of said abutments to move the abutments to and from each other.

3. In a door latch structure, the combination of a casing, a protractable latch bolt, a carrying frame at its inner end, oppositely disposed abutments, one being fixed to said frame and the other slidable therein, a spring intermediate the slidable abutment and the head of said bolt tending to separate them; a roll-back comprising a longitudinally split tube, each section of said tube having a rack, said racks being oppositely disposed to one another, a pinion between and in mesh with said racks, and means to rotate said pinion.

4. In a door latch structure, a combination of a casing having a bore, a latch bolt having a tubular shank, there being oppositely disposed longitudinally extending slots in said shank, a knob shaft extending transversely through said shank and slot, a roll-back within said shank operable by said shaft to protract and retract said bolt, a lock pin projectable into one of said slots transversely of said bolt to hold said bolt against retraction, a collar rotatable about said shaft, and an axially inclined rib and slot connecting said pin and collar whereby rotation of said collar will effect projection and retraction of said pin.

5. In a door latch structure, the combination of a casing having a bore, a latch bolt having a head and a tubular shank slidable in the bore of said casing, there being oppositely disposed longitudinally extending slots in said shank, oppositely disposed abutments, one being fixed to said shank at its inner end and the other slidable in the bore of said shank, a compression spring intermediate the head of said bolt and the slidable abutment tending to separate them; a roll-back comprising a longitudinally split tube disposed within said shank, each section of said tube having a rack, the racks being oppositely disposed to one another, a pinion between and in mesh with said racks, a knob shaft extending transversely through said shank and said slot; a lock pin projectable into one of said slots transversely of said bolt to hold said bolt against retraction, a collar rotatable about said shaft, and an axially inclined rib and slot connection between said pin and collar whereby rotation of said collar will effect projection and retraction of said pin.

In witness that I claim the foregoing I have hereunto subscribed my name this 25th day of November, 1927.

EDWALL JAMES BAUMÉ.