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[56] **References Cited**

<b>UNITED STATES PATENTS</b>			
850,840	4/1907	Ledford.....	292/34 C
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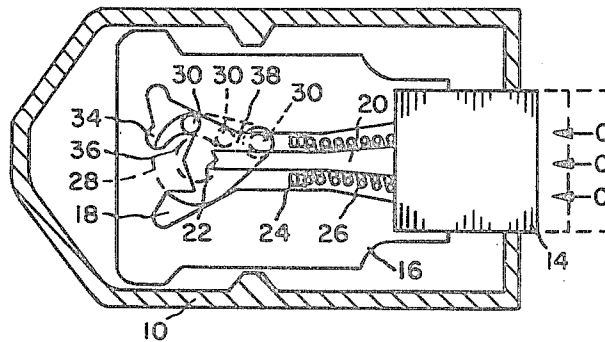
[54] **AUTOMATIC DEADLOCKING LATCHBOLT FOR A RIM LOCK**  
 6 Claims, 6 Drawing Figs.

[52] U.S. Cl. .... 292/169.15,  
 70/1.5, 292/346

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 419, 420, 1.5, 144-148; 292/163, 169, 346, DIG. 4

**ABSTRACT:** A rim lock provided with an automatic deadlocking feature made operational by either closing the door with the latchbolt fully extended or by the unauthorized prying or forcing of the extended latchbolt partially out of the strike in a closed door.



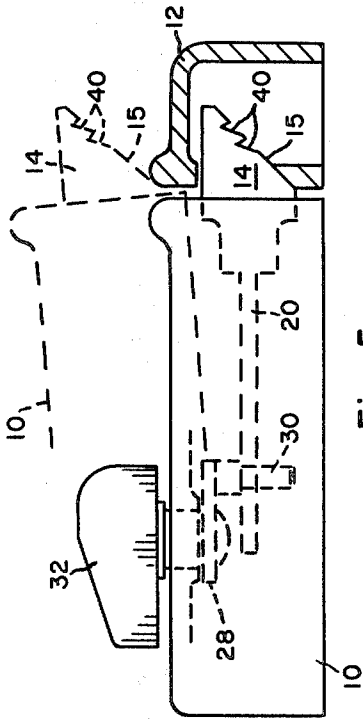


Fig. 5

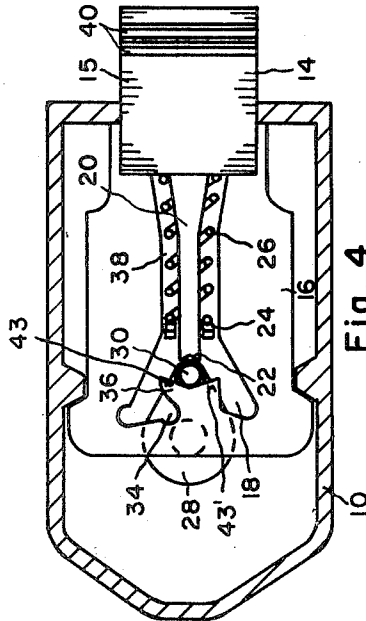


Fig. 4

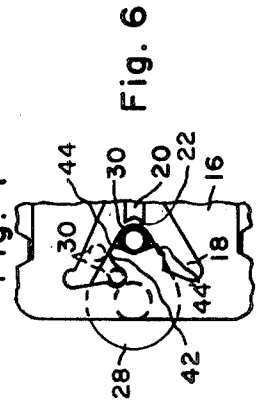


Fig. 6

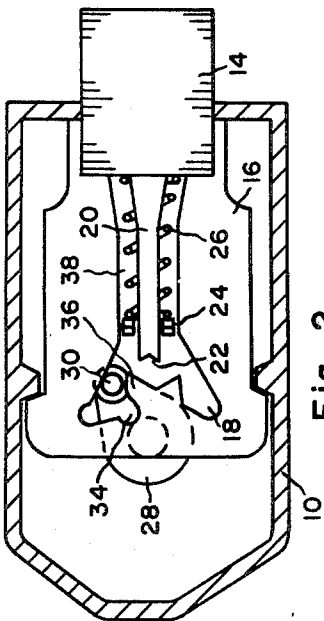


Fig. 2

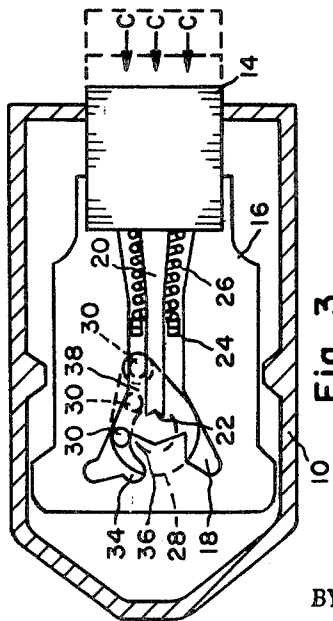


Fig. 3

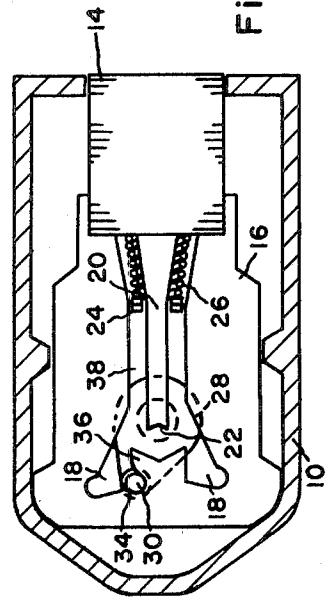


Fig. 1

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## AUTOMATIC DEADLOCKING LATCHBOLT FOR A RIM LOCK

This invention relates to a rim lock which is mounted on a door surface and is provided with an automatic deadlocking feature.

It is an object of the present invention to provide a rim lock which has a latchbolt holdback to permit free passage through a doorway, said rim lock also being automatically deadlocked when the door is moved to a closed position with the latchbolt extended.

Another object of the present invention is the provision of a rim lock having means on the angled surface of the latchbolt for foiling any attempts to fully retract the latchbolt out of the strike, and which at the same time automatically deadlocks the bolt if it has not been previously deadlocked in closing the door.

Prior art rim locks utilize a rather complex multiplicity of parts to achieve the principle feature of the present invention. Such a rim lock is shown in FIG. 6 of U.S. Pat. No. 3,235,298. These rim locks, besides being subject to a greater likelihood of mechanical failure after repeated use, are also more costly to make. Accordingly, a further object of the present invention is to construct a rim lock which has relatively few parts and hence is not dependent upon the proper working of a multiplicity of parts such as is the case in U.S. Pat. No. 3,235,298. The present construction, therefore, reliably performs operations and deadlocking effects that heretofore only expensive locks, relying on the proper workings of additional parts, were able to achieve.

The above and other features, objects and advantages of the present invention will be fully understood from the following description considered in connection with the accompanying illustrative drawings.

FIG. 1 is a diagrammatic view of my novel rim lock with the latchbolt in its fully retracted position.

FIG. 2 is a diagrammatic view of the aforesaid rim lock with the latchbolt in its fully extended position.

FIG. 3 is a diagrammatic view of the aforesaid rim lock with the latchbolt being partially retracted from its fully extended position.

FIG. 4 is a diagrammatic view of the aforesaid rim lock subsequent to the position shown in FIG. 3 when the latchbolt is again fully extended and the cam pin is in deadlocking condition.

FIG. 5 is a diagrammatic side view of the aforesaid rim lock showing the latchbolt fully extended into the strike located on the door frame.

FIG. 6 is a partial diagrammatic side view of an alternative embodiment of the present invention.

Referring to the drawings and especially to FIGS. 1-5 thereof, the present rim lock comprises a latch body 10 adapted to be mounted on the surface of a door, and a strike 12 adapted to be mounted on the adjacent door jamb. The rim lock further includes a movable bolt 14 having a bolt tail 16 with a cutout portion 18. Secured to the rear of bolt 14 is a bolt abutment or elongated leg 20 having a notch 22 at the free end thereof. Fixed to the latch body 10 is a collar 24 and captured between the collar 24 and the bolt 14 is an helical spring 26. A cam 28 is rotatably mounted in the latch body 10 and is provided with a cam pin 30. As seen in FIG. 5 an external operator for the cam 28 takes the form of a thumb turn 32 which is located outside of the latch body 10. The bolt 14 may be also operated from the other side of the latch body and the exterior of the door by means of a key-operated cylinder (not shown).

As will be noted from FIG. 1, the cam pin 30 is moved into groove 34 in the cutout portion 18 in order to latch the bolt 14 into a holdback condition in which the bolt is withdrawn from the strike and free passage into and out of the room is afforded. The latch holdback condition is accomplished due to the obstruction 36 that prevents the pin 30 from moving out of the groove 34. However, rotation of the cam 28 clockwise by

means of the thumb turn 32, as shown by the arrows in FIG. 2, permits the pin 30 to ride out of groove 34 and release the latch bolt 14 to its extended position, and the cam pin 30 then assumes the position shown in FIG. 2. If the door is open in the position of the latchbolt bolt illustrated in FIG. 2, closing of the door will move the latchbolt 14 in the direction of the arrows C in FIG. 3. As the bolt 14 is retracted the pin 30 moves into the slot 38 between the bolt abutment or leg 20 and the bolt tail 16. As seen in FIG. 4, when the bolt 14 thereafter is projected to its extended position by means of spring 26, the pin 30 is directed into engagement with a camming surface 43 or 43' of obstruction 36 and is automatically placed in deadlocking position between the groove 22 of elongated leg 20 and the adjacent surface of the cutout portion 18. Thus, the pin 30 presents a barrier to the movement of the leg 20. Thereafter, rotation of the cam by the thumb turn 32 in either direction moves the cam pin out of deadlock position and permits retraction of the latchbolt 14.

If the door is closed and the latchbolt released from the position shown in FIG. 1, automatic deadlocking of the door will not occur. However, in order to provide pick resistance and deadlocking security from my rim lock, the angled, camming surface 15 of the latch bolt 14 is provided with grooves 40 which extend substantially transversely to the longitudinal axis of the bolt 14. Thus, any thin camming or picking tool, such as a shim, which may be inserted between the bolt 14 and the strike 12 will automatically be caught in one of the grooves 40 and the bolt 14 will only be forced back part of the way, but in no event will the bolt be retracted out of the strike. Accordingly, when the picking tool is then withdrawn to attempt another picking operation the cam pin 30 automatically moves into the deadlocking position when the spring-pressed bolt 14 moves to its fully extended position.

It should be apparent that the unauthorized person attempting to pick the present lock causes the unintentional deadlocking of the rim lock which in its previous condition was not deadlocked, but only latched. Accordingly, maximum security is provided by the present rim lock with a minimum of structural parts.

FIG. 6 illustrates an alternative embodiment of the present invention in which the obstruction 36 of the cutout portion 18 is eliminated and a beveled surface 44 or 44' is substituted therefor. Consequently the pin 30 can be moved directly by the thumb turn 32 from the dotted line position in the holdback condition to an intermediate dotted line position engaging the beveled surface 44 and thence to a deadlocking position. The deadlocking position of the pin 30 is shown in full lines. This arrangement is manual deadlocking and not automatic deadlocking as disclosed hereinabove.

I claim:

1. A rim lock comprising a latch body, a spring-loaded latchbolt having a bolt tail, said bolt tail being provided with a cutout portion, an externally operable movable projection in said cutout portion, said cutout portion having a groove and a camming surface, a bolt abutment in said bolt tail and located in said cutout portion, said projection in one position thereof being in the groove of said cutout portion in a latchbolt holdback condition and in another position thereof being directed into said camming surface of said cutout portion and captured between said bolt abutment and an adjacent part of said camming surface of said cutout portion to deadlock said latchbolt, and wherein before said latch is deadlocked, said bolt is moved inwardly in said latch body at least once, said movable projection being a pin, a cam mounting said pin, and finger-actuated means external of said latch body for operating said cam, wherein rotation of said cam moves said pin out of the holdback condition and permits said bolt to move to its fully extended position, said abutment being an elongated leg with a notch at one end, and said pin moving upon the outward movement of said bolt into a deadlocking position in the notch at the end of said elongated leg.

2. A rim lock as set forth in claim 1 further comprising a strike, said latchbolt having an angular camming surface, and

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at least one groove in said angular camming surface extending substantially transverse to the longitudinal axis of said latchbolt, said groove being so located on said latchbolt whereby when said bolt is in said strike any object wedged between said bolt and the strike will engage in said groove and only move said bolt partially out of said strike.

3. A rim lock as set forth in claim 1 wherein said movable projection is capable of assuming at least a holdback position, an intermediate position and a deadlock position.

4. A rim lock as set forth in claim 3 wherein said movable projection engages said camming surface when moving from

said intermediate position to said deadlock position to thereby automatically direct said movable projection to the deadlock position.

5. A rim lock as set forth in claim 2 wherein said bolt is retracted a predetermined distance in order to cause said movable projection to move into its deadlock position.

6. A rim lock as set forth in claim 1 wherein said movable projection is an integral arm, a cam mounting said arm, and a finger-actuated means external of said latch body for operating said cam.

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