HOOK TYPE ROTARY LATCH

Waldemar A. Endter, Long Beach, Calif.

Application August 31, 1940, Serial No. 355,059

5 Claims. (Cl. 298—214)

This invention relates to a rotary latch adapted to be used on various types of closures, and an object of my invention is to provide a novel rotary latch of the type in which the rotary bolt is retractable into the case, and is provided with one or more cam dogs which engage the rotary bolt to urge this bolt into latching position.

Another object of my invention is to provide a novel rotary latch in which the rotary bolt is multi-headed, the heads being so constructed that they hook into the keeper, and thus cannot be withdrawn until the cam dogs are released to allow free rotation of the rotor.

Still another object is to provide a novel rotary latch of the character stated, in which a control dog is provided for the purpose of tripping the rotor and urge this rotor in latching direction.

A feature of my invention resides in the novel construction of a multi-headed, revolving bolt, and a plurality of cam dogs, one dog acting in a groove and serving as a control member, and other cam dogs acting on the periphery of the revolving bolt and serving to cam the bolt in latching direction.

Other objects, advantages and features of invention may appear from the accompanying drawings, the subjoined detailed description, and the appended claims.

In the drawings:

Figure 1 is a fragmentary, transverse, sectional view of a door with my latch mounted therein, the latch being shown in transverse section.

Figure 2 is a fragmentary, transverse sectional view of the door and frame showing the latch as it first engages the keeper.

Figure 3 is a view similar to Figure 2 showing the rotary bolt entering the recess in the keeper.

Figure 4 is a transverse, sectional view of the lower part of my rotary latch, with the dogs and rotor in position free of the keeper.

Figure 5 is a transverse, sectional view of the lower part of my rotary latch, taken at right angles to Figure 4.

Figure 6 is a transverse, sectional view of the upper part of my rotary latch through which the cam spindle extends.

Figure 7 is a side elevation of one of the cam dogs.

Figure 8 is an end view of the same.

Figure 9 is a side elevation of another of the cam dogs.

Figure 10 is a side view of the same.

Figure 11 is a face view of the control dog.

Figure 12 is an end view of the same.

Figure 13 is an end view of a modified form of rotor.

Figure 14 is a side view of the same.

Figure 15 is an end view of another modified form of rotor.

Figure 16 is a side view of the same.

Figure 17 is a transverse, sectional view of a closure with a modified form of latch mounted therein.

Figure 18 is a transverse sectional view of a closure with still another modified form of latch mounted therein.

Referring more particularly to the drawings, the numeral 1 indicates a lock case, and in this case I mount a U-shaped yoke 2, which is slit-

able longitudinally in the case. The yoke 2 slides in recesses or grooveways 3—3, which are formed in the lock case. The yoke 2 is limited in its movement in the case by suitable means, such as engaging the face plate of the lock or by means of a pair of pins 4—4, which project from the yoke and extend into slots in the side of the case 1. A rotary bolt 5 is mounted in the outer end of the yoke 2 upon a pin 6, which is affixed or journaled in the yoke. The rotary bolt 5 is provided with a plurality of spaced heads 7, the outer surface of these heads being curved and concentric with the center of rotation of the bolt.

As shown in Figures 13 and 14, the heads 8 of the rotary bolt are provided with eccentric outer faces 9, the purpose of which will be further described.

The heads 1 are equidistantly spaced around the rotor, and each head is provided with a hook or projection 10 on the leading edge, which hooks into the keeper for the purpose of making the lock pick-proof, as will be further described. A groove is provided in the rotor and this groove is formed with the same number of dwells or heads 11, as provided on the rotor. The shape of the head 11 is somewhat different than the heads 1, the reason being to provide a means of tripping the bolt by an engaging cam dog, as will be further described.

A plurality of cam dogs 12 are pivotally mounted in the yoke 2 on a pin 13, which fits in the yoke. The pivot pin 13 of the cam dogs is arranged inwardly of the rotor 5, and one or more of the cam dogs 14 is adapted to engage the outer face of the head 1 of the rotary bolt, or the inwardly extending face 14' of a head for the purpose of camming the bolt in latching direction.

A control dog 15 acts on the head 11 and engages the head for the purpose of tripping the bolt, as will be subsequently described. I have
here shown a second cam dog 16, which also engages the outer surface of the head 7. The dog 16 is somewhat longer than the dog 14, and therefore these two dogs will act in succession, the shorter dog first engaging the rear end of one of the heads 7 to cam the bolt in latching direction, and as the bolt rotates further in latching direction, the dog 16 will engage the rear end of one of the heads 7 and continue to urge the bolt in latching direction.

The control dog 15 is provided with a pick-up lug 17, and the dog 14 is provided with a finger 18, and similarly the dog 16 is provided with a finger 19. The fingers 18 and 19 are bent substantially at right angles to the face of the dogs 14 and 16, and these fingers extend over the lug 17 so that when the control dog is retracted, the dogs 14 and 16 will each be picked up by the fingers 18 and 19 and moved away from the rotary bolt when the door is to be opened.

A retracting link 20 extends from the inner end of the case 1, and the outer end of this link is pivotally attached to the control dog 15, as shown at 21. A coil spring 22 surrounds the retracting link 20, and bears against the yoke 2 for the purpose of urging this yoke outwardly and also urging the rotary bolt 5 outwardly against the keeper 23. The keeper may be a flat plate in which an opening 24 is cut to receive one of the heads 7 of the rotary bolt. The hook part 20 of the bolt will fit into the keeper, as shown in Figure 3, when in locked position, and the cam dogs will hold the bolt in this position and constantly urge this bolt clockwise, thus pressing the door or other closure in a closing direction against its stop.

The means of actuating the retracting link 20 from a door handle is usual and well-known, and may consist of a drag yoke 25, which engages the inner end of the drag link 20. A spring 26 bears against the part 25, and a cam or finger 27 engages the drag yoke 25 for the purpose of moving the yoke 25 inwardly when the handle is rotated. The cam 27 is attached to or is a part of the spindle drum 28, and the handle spindle extends through this drum in the usual and well-known manner. The cam dogs 14, 15 and 16 are each engaged by a spring 29, which urges the dogs against the rotor.

As shown in Figure 1, the latch is in position ready to engage the keeper 23. In Figure 2, the door is partly closed and the bolt 5 is riding against the outer part of the keeper and the yoke 2 is partly retracted, compressing the spring 22. On further inward movement of the door, one of the heads 7 of the rotor will drop into the opening 24 of the keeper due to the tension of the spring 22. The control dog 15 now drops back of one of the high points in the groove 6, or heads 11, and this dog will continue to urge the rotor in a clockwise direction. The cam dog 14 has also dropped behind one of the heads of the rotor, and is also camming this rotor in latching direction. The main function of the control dog 15 is to trip the rotary bolt at a definite point while the dogs 14 and 16 are idle on the peripheral surface of one of the heads 7.

The cam dogs 14 and 16 will act successively against the rotor, continuing to cam it in latching direction after the control dog has tripped the rotor in latching direction, and will hold the door tightly against its stop. Since the dogs 14 and 16 hold the rotor substantially in the position shown in Figure 3, the hook part 10 on the head of the rotor fits into the recess 24 and, therefore, the door and the frame cannot be pried apart, thereby making a pick-proof latch.

In order to open the door, the retracting link 20 is moved inwardly by the door handle, all of which is usual and well-known, and this inward movement will bring all of the cam dogs inward and away from the rotary bolt. The bolt is now free to rotate either clockwise or counterclockwise, and the door can easily be pulled open. The inward movement of the retracting link 20 also pulls the yoke 2 inwardly and, therefore, the door is to be swung open without hindrance from the hook 10. When the handle is released, the latch again returns to its normal position, as shown in Figure 1. The heads 7 are identical, and any one of them is adapted to engage the keeper.

In Figures 15 and 16, I have disclosed a modified form of rotor 30, which consists of a plurality of spaced heads 31, these heads being also spaced transversely, leaving a groove 32. A plurality of pins 33 are mounted in the groove 32 between the heads 31, and there is one pin for each head. The pin is preferably positioned adjacent the peripheral of the head 31 and is engaged by the control dog 15 for the purpose of tripping the rotor in the same manner as previously described.

In Figure 17, a modified form of latch is disclosed which is mounted in a closure 34, the closure operating in a housing 35. The latch consists of a yoke 36, which is pivotally mounted in the closure 34 on a pin 37. A multi-headed rotor 38 is journaled on the outer edge of the yoke 36, and the rotor cooperates with a keeper or keeper recess 39. A plurality of cam dogs 40 are also pivotally mounted on the pin 37, and these cam dogs cooperate with and engage the various heads of the rotor 38 for the purpose of camming this rotor into the keeper 39. One of the dogs is provided with an ear 41, to which a handle shaft 42 is pivotally attached. The handle shaft extends out of the closure and is manually operated to retract the cam dogs 40, and also to swing the yoke 36 inwardly on its pivot when the door is being opened. When the cam dogs 40 are retracted by the handle shaft 42, one of the dogs will engage a lug 43 on the yoke, thus causing the yoke to swing on its pivot after the dogs have been retracted from the rotor 38. An interengaging cam may also be provided on the cam dogs in substantially the same manner as previously described. A spring 44 may surround the shaft 42 and bear against the ear 41 for the purpose of swinging the dogs and the yoke into latching position.
In Figure 18, a yoke 45 is pivotally mounted on the pin 46 in the closure 47. A multi-headed rotary bolt 48 is journaled in the yoke 45, and cooperates with a keeper or keeper recess 49 to hold the closure in latched position. A dog 50 is journaled on a pin 51 in the yoke 45. The pin 51 is spaced from the pin 46, substantially as shown. A handle shaft 52 is pivotally attached to the outer end of the dog 50, and is actuated by a handle 53. A spring 54 engages the yoke 45, and urges this yoke into latching position. A second spring 55 engages the dog 50 and urges this dog into engagement with any of the heads of the rotor 48 for the purpose of camming this rotor into the keeper.

Having described my invention, I claim:

1. A rotary latch comprising a case, a yoke slidably mounted in said case, a rotary bolt journaled in the yoke, a plurality of heads on the rotary bolt, one or more cam dogs pivotally mounted in the yoke, means to retract said cam dogs, spring means bearing against said yoke, spring means bearing against the cam dogs, said rotary bolt having a slot cut therein, and said slot having a cam surface, one of said dogs entering the slot and engaging the cam surface therein.

2. A rotary latch comprising a case, a yoke slidably mounted in said case, a rotary bolt journaled in the yoke, a plurality of heads on the rotary bolt, one or more cam dogs pivotally mounted in the yoke, means to retract said cam dogs, spring means bearing against the cam dogs, said rotary bolt having a slot cut therein, and said slot having a cam surface, one of said dogs entering the slot and engaging the cam surface therein, each of the heads of the rotary bolt having a projection thereon adapted and arranged to hook into a keeper.

3. A rotary latch comprising a case, a yoke slidably mounted in said case, a rotary bolt journaled in the yoke, a plurality of identical heads on the rotary bolt, dogging means mounted on the yoke and engageable with the rotary bolt whereby said rotary bolt is held against reverse rotation, means to simultaneously retract the dogging means, spring means bearing against the yoke, spring means bearing against said dogging means, said rotary bolt having a slot formed therein, and a cam surface in the slot, one of said dogging means entering the slot and engaging the cam surface therein.

4. A rotary latch comprising a case, a yoke slidably mounted in said case, a rotary bolt journaled in the yoke, a plurality of identical heads on the rotary bolt, dogging means mounted on the yoke and engageable with the rotary bolt whereby said rotary bolt is held against reverse rotation, means to simultaneously retract the dogging means, spring means bearing against the yoke, spring means bearing against said dogging means, said rotary bolt having a slot formed therein, and a cam surface in the slot, one of said dogging means entering the slot and engaging the cam surface therein, each of the heads of the rotary bolt having a hook-like projection thereon engageable with a keeper.

5. A rotary latch comprising a case, a yoke in said case, a rotary bolt journaled in the yoke, a plurality of heads on the rotary bolt, one or more cam dogs pivotally mounted in the yoke, means to retract said cam dogs, spring means bearing against said yoke, spring means bearing against the cam dogs, said rotary bolt having a slot cut therein, and said slot having a cam surface, one of said dogs entering the slot and engaging the cam surface therein.