Jan. 24, 1956 T. BARGMAN 2,731,822

ROTARY-BOLT LOCK

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FIG. 1

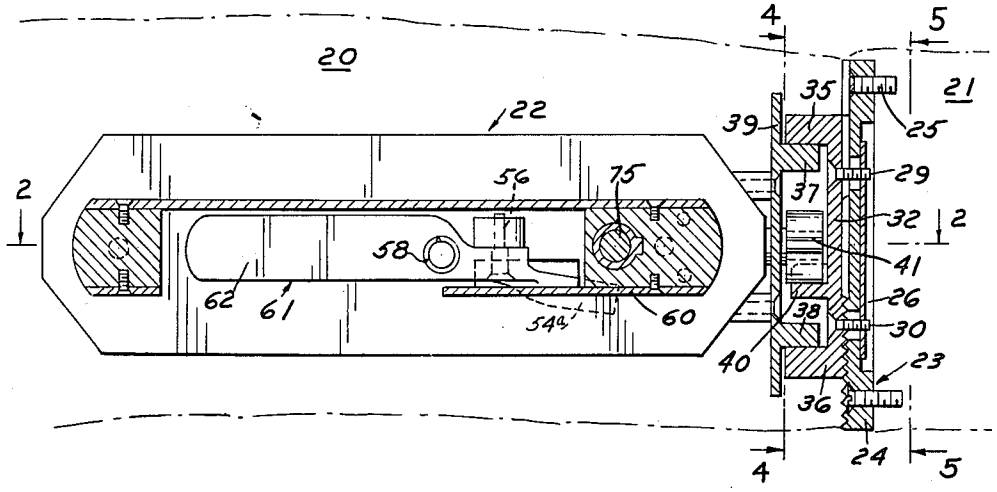


FIG. 2

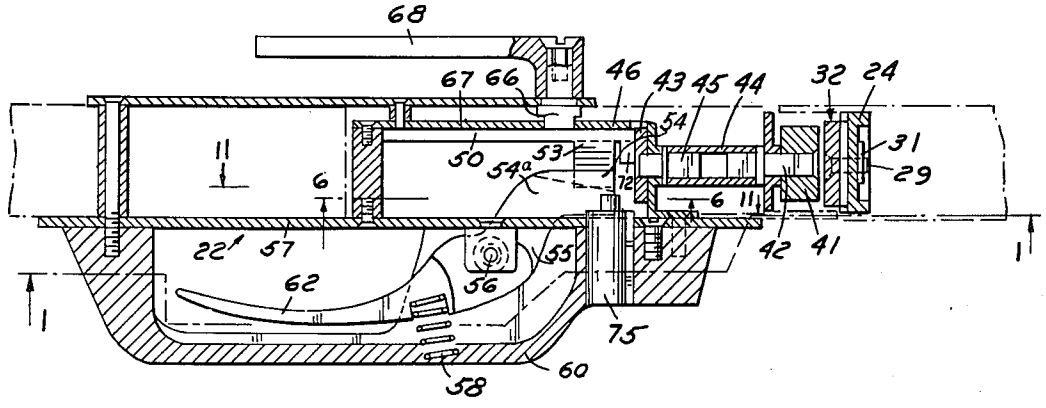
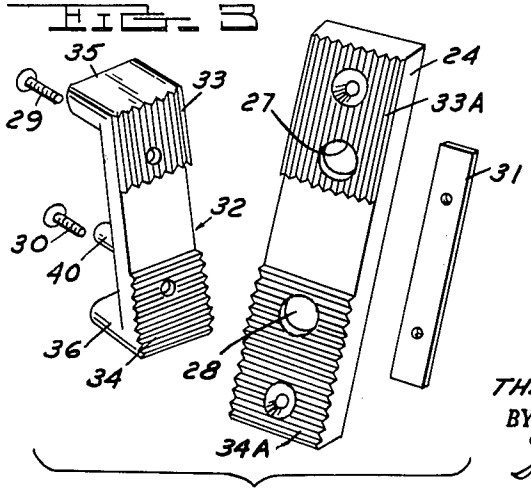


FIG. 3



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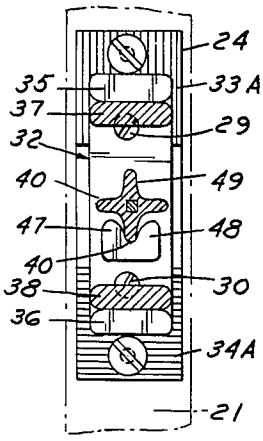


FIG. 4

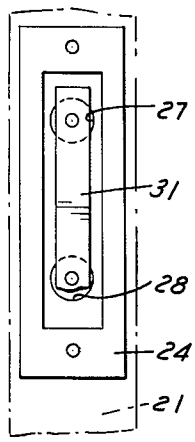


FIG. 5

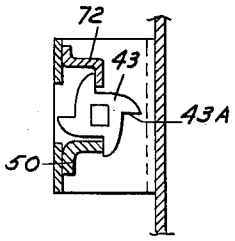


FIG. 9

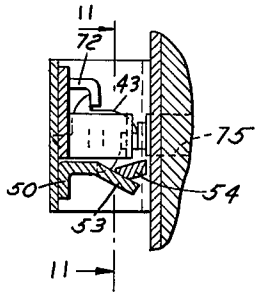


FIG. 10

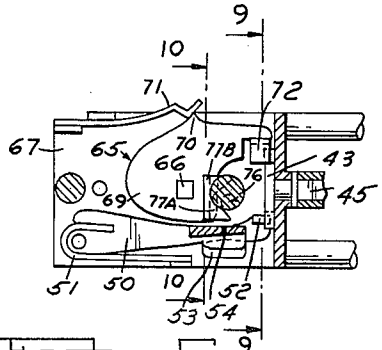


FIG. 6

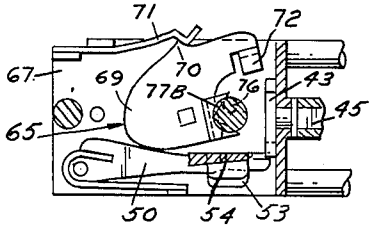


FIG. 7

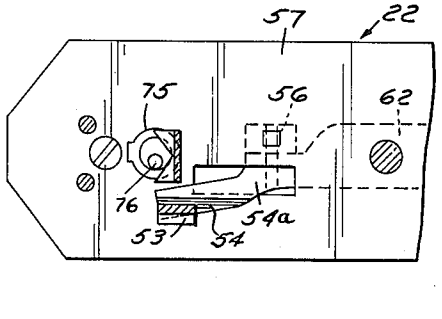


FIG. 11

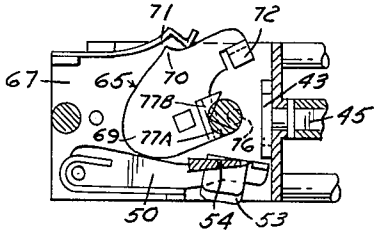


FIG. 8

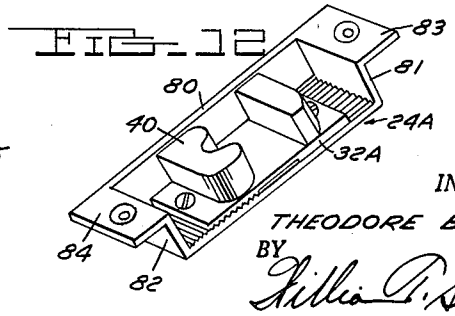


FIG. 12

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2,731,822

ROTARY-BOLT LOCK

Theodore Bargman, Detroit, Mich.

Application September 15, 1952, Serial No. 309,715

6 Claims. (Cl. 70—135)

This invention relates to rotary-bolt door-locks and in particular to such a lock embodying improvements in latching and locking mechanism, activating mechanism, and adjustment characteristics; this application constitutes a continuation-in-part of my pending application Serial No. 273,087, filed February 23, 1952.

It is a primary object of the invention to provide a simple actuating mechanism for rotary-bolt locks.

An object of the invention is to provide a novel outside handle and pull lever arrangement.

An object of the invention is to provide a housing concealing the pull lever and protecting same from the elements such as rain, snow, and ice.

An object of the invention is to provide improved keeper-to-bolt adjustment means which are easily located and adjustable as to height and depth.

An object of the invention is to provide a camming-end on the end of the pull lever to activate the lock mechanism.

An object of the invention is to provide a rotary-bolt lock which is easily mounted on a door and jamb as conventional locks or which is easily integrated with a door and jamb such as in automobiles.

An object of the invention is to provide simplified latching and locking means.

An object of the invention is to provide a lock mechanism which automatically unlocks upon closing and latching a door.

An object of the invention is to provide a lock mechanism which facilitates unidirectional motion of the inside handle to both unlock and unlatch the mechanism.

An object of the invention is to provide a more efficient, less expensive, improved, simplified lock having fewer parts and which is more positive in action and more durable in use.

These and other objects of the invention will become apparent by reference to the following description of a rotary-bolt lock embodying the invention taken in connection with the accompanying drawings in which:

Fig. 1 is a cross-sectional view of Fig. 2 taken on the line 1—1 thereof showing the inventive lock installed on a door and jamb.

Fig. 2 is a cross-sectional view of Fig. 1 taken on the line 2—2 thereof.

Fig. 3 is an exploded perspective view of the parts constituting the jamb assembly.

Fig. 4 is a cross-sectional view of Fig. 1 taken on the line 4—4 thereof.

Fig. 5 is a cross-sectional view of Fig. 1 taken on the line 5—5 thereof.

Fig. 6 is a cross-sectional view of Fig. 2 taken on the line 6—6 thereof showing the mechanism in locked and latched condition.

Fig. 7 is a view similar to Fig. 6 showing the lock in latched condition.

Fig. 8 is a view similar to Figs. 6 and 7 showing the mechanism in unlatched and unlocked condition.

Fig. 9 is a cross-sectional view of Fig. 6 taken on the line 9—9 thereof.

Fig. 10 is a cross-sectional view of Fig. 6 taken on the line 10—10 thereof.

Fig. 11 is a view looking in the opposite direction of Figs. 6 to 8 taken on the line 11—11 of Fig. 2; and

Fig. 12 is a perspective view of a modified keeper particularly suitable for installation on wood jambs.

Referring now to the drawings wherein like numerals refer to like and corresponding parts throughout the several views, the rotary-bolt lock and associated parts disclosed therein to illustrate the invention comprise a door 20 and a jamb 21, a mechanism assembly 22 mounted on the door 20 and a jamb cooperating assembly 23 mounted on the jamb 21.

The jamb assembly 23 comprises a base-plate 24 or 24A screwed or bolted to the jamb by the bolts 25; the base-plate 24 and 24A has a relieved center portion 26 in the area surrounding and between the relatively large bolt receiving apertures 27 and 28 through which apertures the bolts 29 and 30 are disposed in threaded engagement with the compound strap nut 31 which lies in the relieved portion 26 of the base-plate 24 and it is obvious that the bolts 29 and 30 and compound nut 31 are free to move relative to the base-plates 24 and 24A within the limits of the relatively large apertures 27 and 28. The keeper-guide supporting face-plate 32 is fastened against the base-plate 24 by means of the bolts 29 and 30 threaded in the compound strap nut 31 and it is to be noted that the portions of the face-plates 32 and 24 have mating vertical serrations 33 and 33A to facilitate depth adjustment of the face-plate 32 and also mating horizontal serrations 34 and 34A for regulating height adjustment. It can now be seen that by loosening the screw 29 in the nut 31, the plate 32 may be universally adjusted for depth at a controlled height and that by loosening the screw 30 in the nut 31 the face-plate 32 may be universally adjusted for height at a controlled depth. It is to be also noted that the compound nut 31 is capable of blind tightening and loosening in that the opposite bolt 29 or 30 acts as a stop or wrench in conjunction with the tightening or loosening of the other bolt 29 or 30.

Fig. 12 shows the base-plate 24A equipped with a back wall 80, end walls 81 and 82, and mounting tabs 83 and 84 for use in creating a bolt 41 receiving cavity on a jamb when a bolt 41 is mounted in projecting relationship on a door.

The jamb face-plate 32 carries the upper and lower guides 35 and 36 which cooperate with the door plate 39 guides 37 and 38 to align the door mechanism with the jamb mechanism. The jamb face-plate 32 also carries keeper 40 which cooperates with the door rotary-bolt 41 which is fixed on the shaft 42 journaled in the door face-plate 39 to lock or latch the door. The shaft 42 is connected to the latching and locking rotor 43 for angular movement therewith via the sleeve 44 and shaft 45 on which the rotor 43 is fixed and which shaft 45 is journaled in the case 46. It can now be seen that if the rotor 43 is held against rotation, the bolt 41 and keeper 40 prevent the door opening relative to the jamb, and that, if the rotor 43 is free to rotate, the door can open and close relative to the jamb with the rotor 41 walking over the lobes 47 and 48 of the keeper 40 as the teeth 49 of the rotor 43 mesh with the lobes 47 and 48 of the keeper 40 analogously to a rack and pinion, Figs. 1, 2, and 4.

Referring to the latching mechanism for selectively permitting and prohibiting rotor 43 rotation, the arm 50 is spring-pressed via the torsion spring 51 so that the latch dog 52 on the arm 50 is urged into engagement with the projections 43A on the rotor 43 so as to prevent rotor rotation in a door opening direction

and to permit rotor 43 rotation by-passing in a door closing direction. Integral with the arm 50 is the flat cam 53 which coacts with the flat cam 54 on the hand lever 54*a* which is pivotally mounted at 56 on the escutcheon plate 57 and it is to be noted that the lever 55 is resiliently spring-pressed out of cam-engaging relationship by the spring 58. The shroud or housing 60 surrounds the top and sides of the lever 55 and has an opening 61 in the bottom thereof for inserting the operator's fingers to pull the handle portion 62 of the lever to move the cam portion 54 against the cam portion 53 to pivot the arm 50 to move the dog latch 52 out of engagement with the projections 43A to permit rotation of the rotor 43 to unlatch the rotor 43 from the outside. The inside unlatching mechanism includes the cam carrier 65 fixed on the shaft 66 which is journaled in the back plate 67 and operated by the inside handle 68 to pivot the carrier 65 to move the cam portion 69 downwardly against the latching lever 50 to drop the latch dog 52 out of engagement with the rotor 43 to unlatch the rotor 43.

Relative to the locking mechanism the cam carrier 65 is equipped with a tongue 70 which operates in conjunction with the leaf spring detent 71 to fix the carrier 65 in an optional relative rotational position or angular rotational position as seen in Figs. 6 and 7 both of which are short of unlatching the door in contra-distinction to Fig. 8 which shows the cam portion 69 moved past the positions of Figs. 6 and 7 depressing the lever 50 to unlatch the rotor 43. When the tongue 70 is at the right or on the outside of the spring 71 point of bearing, Fig. 6, the angular position of the carrier 65 is such that the locking dog 72 thereon is located in locking engagement with the projections 43A of the rotor 43, and, when the spring 71 point of bearing is on the opposite side of the tongue 70, Fig. 7, the locking dog 72 is located out of contact with the projections of the rotor 43. It can now be seen that the carrier 65 is operable to lock the rotor 43 by movement of the inside handle in a direction opposite to unlatching the mechanism, and, that the inside lever 68 via the cam portion 69 on the carrier 65 is capable of unlocking the mechanism by counter-clockwise movement as seen in the drawings from a position illustrated in Fig. 6 to the position seen in Fig. 7 and that further movement of the inside handle 68 in a counter-clockwise direction moves the cam portion 69 against the latching lever 50 to unlatch the rotor 43.

To lock and unlock the mechanism from the outside of the door a key cylinder 75 is pivotally disposed in the outside handle 69 and has an eccentric tip 76 cooperating with the projecting bifurcated ends 77A and 77B located on the carrier 65 to move the carrier 65 between the position seen in Figs. 6 and 7 to lock and unlock the locking dog 72 relative to the rotor 43. It is to be particularly noted that the eccentrically disposed tip 76 is normally in a neutral position out of engagement with the bifurcated ends 77A and 77B and only contacts the bifurcated ends 77 when selectively by-directionally moving the carrier 65 between the positions seen in Figs. 6 and 7 so that the inside handle can operate the mechanism without interference from the outside means of activating the locking mechanism.

The key cylinder 75 is preferably so set that the key, not shown, is insertable and extractable only when the tip 76 is in the neutral position as seen in Fig. 8 and the key cylinder is also so set that it is fixed in this neutral position when the key is not in the cylinder 75. Also, the key cylinder is preferably set to move 90 degrees in either direction from the neutral position seen in Fig. 8 to the positions seen in Fig. 6 and 7 to lock and unlock the rotor 43 respectively by moving in one direction and contacting the bifurcated end 77A on the carrier 65, Fig. 6, to pivot the carrier 65 to move the locking dog 72 on the carrier 65 into contact with the rotor 43 and by moving in the other direction and contacting the bifurcated end 77B to pivot the carrier 65, Fig. 7, to move the locking dog 72 on the carrier 65 out of contact with the rotor 43; the spring detent 71 holds the carrier 65 in the key-set position via the tongue 70. After the user on the outside so sets the carrier 65 in either position illustrated by Figs. 6 and 7, he turns the key to the position of Fig. 8 and extracts the key leaving the tip 76 in a neutral position relative to the bifurcated ends 77A and 77B so that a user on the inside can operate the mechanism via the inside handle 68 to lock, latch, unlock, and unlatch the mechanism as desired.

The lock permits closing the door in all conditions as the rotor 43 can pass the latching dog and locking dog in rotational direction involved in a door-closing direction and it is to be further noted that the door cannot be closed in a locked condition as the rotor rotation in closing the door unlocks the device as the rotor 43 projections 43A cam the locking dog 72 to the position of Fig. 7.

Although the invention has been shown and described in detail, it is obvious that many changes may be made in the size, shape, detail and arrangements of the elements of the invention within the scope of the appended claims.

I claim:

1. A rotary-bolt lock comprising a rotary-bolt, a rotor connected to said bolt for rotation therewith, projections on said rotor, a spring-pressed latch lever constantly urged toward locking engagement with said rotor, a latch dog on said lever normally engaging said projections to prevent door opening direction rotation of said rotor to latch a door and to permit door closing rotational rotation of said rotor in closing a door, an outside pull lever having a hand portion, a flat lever cam on said pull lever, and a flat cam on said latch lever engageable by said pull lever flat cam to disengage said latch dog from said rotor projections to release said rotor for door opening directional rotation to permit opening of a door; and inside handle, a shaft pivotally supporting said handle for rotational movement therewith, a cam carrier fixed on said shaft for rotational movement therewith, and a cam lobe on said carrier adapted to engage said latch lever to depress said latch dog out of engagement with said rotor projections via pivoting said handle to permit said rotor turning in a door opening direction.

2. In a device as set forth in claim 1, a locking dog on said cam carrier adapted to selectively engage said rotor projections to prevent rotation of said rotor in a door opening rotational direction, a tongue on said cam carrier, and a spring-pressed detent adapted to selectively hold said cam carrier in and out of locking-dog rotor-projection engagement as positioned by manual pivoting of said handle.

3. In a device as set forth in claim 1 bifurcated ends on said cam carrier, a key cylinder, an eccentrically disposed tip on said cylinder adapted to engage said bifurcated ends to by-directionally pivot said cam carrier to move said locking dog into and out of engagement with said rotor projections, a tongue on said cam carrier, and a spring-pressed detent adapted to hold said cam carrier in locked or unlocked relationship.

4. A rotary-bolt lock comprising a rotary-bolt, a rotor connected to said bolt for rotation therewith, projections on said rotor, a spring-pressed latch lever, a latch dog on said lever adapted to engage said projections to prevent door opening directional rotation of said rotor to latch a door and to permit door closing directional rotation of said rotor to close a door, an outside pull lever a flat cam on said pull lever, and a flat cam on said latch lever adapted to be engaged by said pull lever flat cam to move said latch lever to disengage said latch dog from said rotor projections to release said rotor for door opening directional rotation to permit opening of a door; an inside

handle, a shaft pivotally supporting said handle for rotational movement therewith, a carrier fixed on said shaft for rotational movement therewith, and a lobe on said carrier adapted to engage said latch lever to depress said latch dog out of engagement with said rotor projections to permit said rotor turning in a door opening direction; a locking dog on said carrier adapted to selectively engage said rotor projections to prevent rotation of said rotor in a door opening rotational direction, a tongue on said carrier, and a spring-pressed detent adapted to selectively hold said carrier in and out of locking-dog rotor-projection engagement as set by manual pivoting of said handle; bifurcated ends on said carrier, a key cylinder, an eccentrically disposed tip on said cylinder adapted to engage said bifurcated ends to pivot said carrier to move said locking dog into and out of engagement with said rotor projections, a tongue on said carrier, and a spring-pressed detent adapted to engage said tongue to hold said carrier in locked or unlocked relationship relative to said rotor.

5. In a device as set forth in claim 4, said key cylinder being normally positioned with said tip in a neutral position relative to said bifurcated ends to eliminate interference with said inside handle operation.

6. In a device as set forth in claim 5, said cylinder being by-directionally operable by a key to selectively by-directionally pivot said carrier to move said locking dog into and out of engagement with said rotor.

References Cited in the file of this patent

UNITED STATES PATENTS

2,058,163	Malone	Oct. 20, 1936
2,270,559	Rolph et al.	Jan. 20, 1942
2,373,237	Endter	Apr. 10, 1945
2,476,332	Tierney et al.	July 19, 1949
2,552,815	Roethel	May 15, 1951
2,604,345	Roethel	July 22, 1952
2,673,757	Marple	Mar. 30, 1954