Oct. 29, 1940. C. A. HILLGREN 2,219,740

DOOR LOCK

Filed May 8, 1939

Fig. 1.

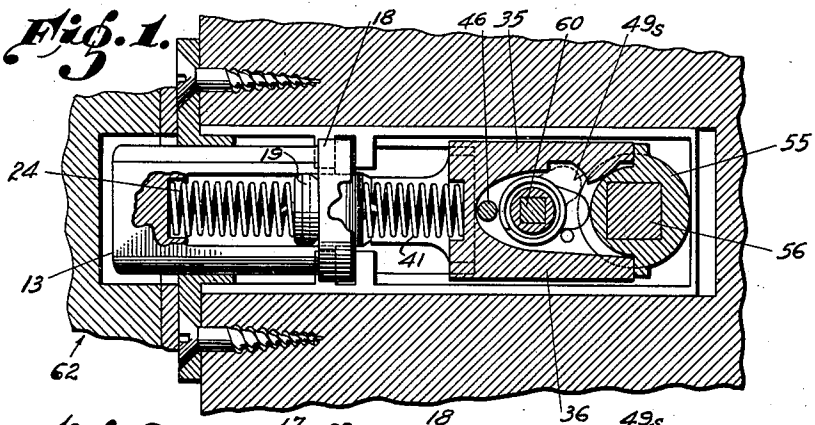


Fig. 2.

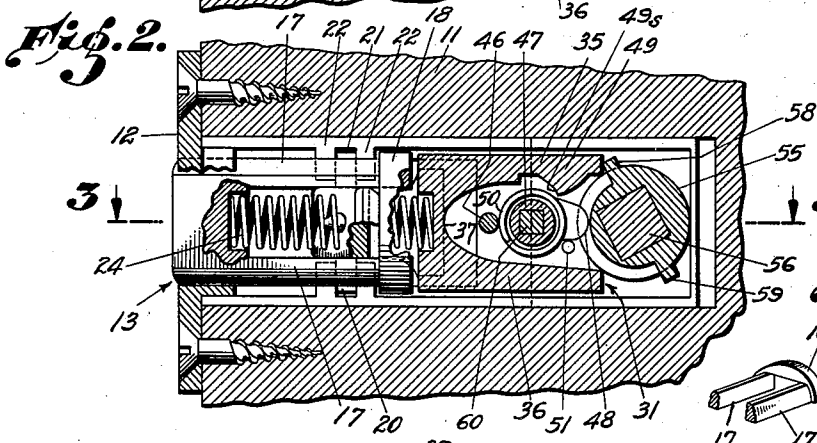


Fig. 5.

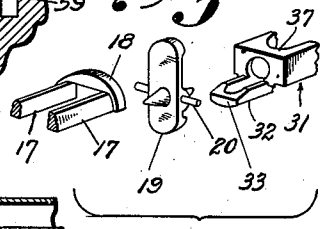


Fig. 3.

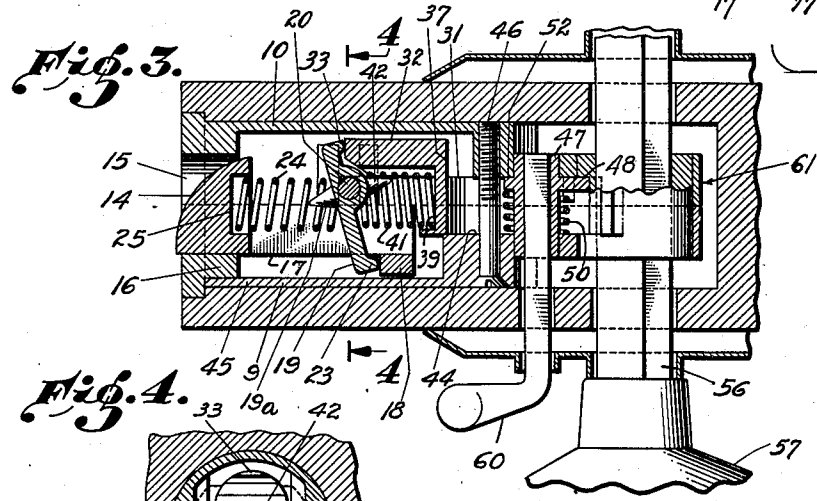
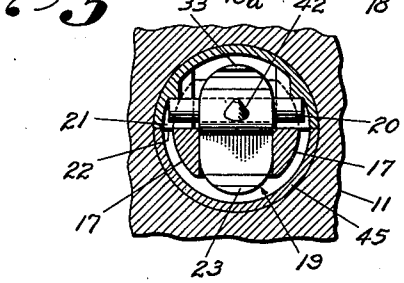


Fig. 4.



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DOOR LOCK

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4 Claims. (Cl. 70—150)

This invention relates to a door lock construction.

Speaking more specifically, the invention relates to an improved lock construction for preventing the operation of a door knob to retract a locking bolt.

By this invention an improved arrangement of cooperating locking lugs or projections is provided, one of said projections being carried by a reciprocatory part, normally operable by the door knob to retract the locking bolt, and the other of said projections being of a swingable type and operable by a key.

One object of the invention is to arrange in a more compact manner the required locking mechanism, in order that the device may be installed in a bore of less length than has heretofore been deemed necessary to provide room for locking devices designed for similar purposes.

Still other objects and advantages reside in an improved lock casing structure; in a simplified and more positively acting combination of key-operable and knob-operable devices, and in general simplification and improvement of details of locking mechanism of the kind to which the invention pertains.

Other objects, advantages and features of invention will hereinafter appear.

Referring to the accompanying drawing, which illustrates what is at present deemed to be a preferred embodiment of the invention,

Fig. 1 is a longitudinal section of the lock showing it installed in a door, a fragment of which is included in the view, the bolt of the lock being shown extended.

Fig. 2 is a section of the same character as Fig. 1, but shows the bolt retracted, the line of section passing between the casing body and its cover.

Fig. 3 is a horizontal section taken on line 3—3 of Fig. 2.

Fig. 4 is a cross section taken on line 4—4 of Fig. 3.

Fig. 5 is a perspective view of a series of three actuating parts, only fragments of the foremost and of the rearmost parts being shown. For clearness of illustration these parts are shown separated somewhat from each other, but the order in which they are assembled is maintained in the view.

Referring in detail to the drawing, the various parts of the lock are assembled within a suitable elongated casing 10, said casing being retained within a door 11 by means of a face plate 12 integral with said casing. The lock bolt 13 is furnished with a convexly beveled head 14 which has a working fit within a bolt passage 15 through an internal extension 16 with which said face plate 12 is provided. Said extension 16 is externally of a circular form, and is also internally circular except that it has flattened opposite sides to cause the passage 15 to receive the bolt head with a working fit. The front portion of the casing 10 is circular and of a slightly greater diameter than said extension 16. The front end of a casing cover 9, of a semi-cylindrical character, overlies one half of said extension 16, while the front end of the body portion of the casing 10 overlies the opposite half of said extension and may be secured thereto or formed integral therewith.

The head 14 of the lock bolt 13 is carried by two twin, parallel, rearwardly extending arms 17 having edges which are flattened to lie in the same horizontal plane as the flattened surface of said head. The rear ends of said arms are joined by an upwardly arched, substantially semicircular part 18 which will be termed the locking bolt yoke piece. What answers to the interior arch of this yoke piece is rectangularly shaped and its side portions aline with the flat inner sides of the arms 17 thus forming a guide way or working fit relation between the locking bolt and a pivoted lever 19, presently to be described.

Said lever 19 is pivotally supported nearest one end on trunnions 20 which are supported by the slot like seats 21 formed upon a pair of oppositely disposed lugs 22 located interiorly of the casing 10. At its lower end said lever is furnished with a backwardly directed toe 23 which at times engages the yoke piece 18 of the lock bolt to retract said bolt against the opposition of the spiral compression spring 24. Said spring has its front end seated within a circular recess 25 provided therefor on the inner side of the lock bolt head 14, its back end abutting against the lever 19 and being kept in place by a conical spur 19a formed on the front side of the lever.

The lever 19 is caused to retract the lock bolt 13 by being acted upon by a yoke shaped follower 31 which has at its front end a forward extension 32, the front extremity of which is abuttable against the lever 19 near the extremity of its shorter arm, said lever arm being provided with a backwardly directed rise 33 engageable by the part 32.

Describing further the yoke shaped follower 31, the yoke portion thereof is made up of the two backwardly extending arms 35 and 36 united at their front ends by a neck or narrow body

portion 37, the previously described yoke extension 32 being laterally offset from the space or plane occupied by said yoke arms. Said body portion 37 has a circular seat 39 formed in its front side which seats the back end of a spiral compression spring 41, the front end of said spring 41 abutting against the back side of the lever 19 and having kept in place by a rearwardly directed conical spur 42 projecting from said lever.

The upper and lower sides of the yoke arms 35 and 36 are flattened, their upper sides having a working relation to the top side of the casing 10 while their lower faces have a sliding engagement with a guide member 44 formed by impressing a portion of the casing cover wall, reference being made to the upper and lower portions of Fig. 3.

The casing 10 is made with a cover plate 45, a screw 46 aiding in attaching said cover plate. This screw passes between the yoke arms 35 and 36, but is spaced well away from said arms in order to afford ample clearances for the operation of the yoke. A key operable barrel 47 also passes through the space between said yoke arms, said barrel having its bearings in opposite walls of the casing and being provided with a radially projecting locking projection 48 arranged to control the movement of the yoke shaped follower 31. This swingable locking projection 48 cooperates with a reciprocatory locking projection 49 extending from the inner side of the yoke arm 35. A stop pin 51 in the path of said projection 48 limits the clockwise turning of the barrel as viewed in Figs. 1 and 2. The locking projection 48 is formed as a part of a narrow collar or bead 52 that encircles the barrel 47, said bead aiding in forming an abutment for one end of a compression spring 50 loosely coiled around the barrel to frictionally hold it against undesired rotation. Said projection 49 has a distinct shoulder 49s to engage the locking lug 48 when the latter is turned to the locking position, shown in dotted lines in Fig. 1, by the key 60.

The barrel 55, which is turned by means of the shaft 56 of the door knob 57, is furnished with two diametrically opposite lugs 58 and 59 which act upon the ends, respectively, of the arms 35 and 36 of the yoke shaped follower 31, which, in turn, through its extension 32 acts upon the toe 23 at one end of the lever 19 thus causing the opposite end portion of said lever to retract the locking bolt 13.

The barrel 55 has its end portions journaled in the rear flattened portion 61 of the casing 10. The remainder of the casing is substantially circular in cross section.

The spring 41 may be termed a "booster" spring, for if it were not present, the front spring 24 would not move the follower 31 completely back in case the locking bolt happened to be held in the retracted position by reason of its head abutting against the door casing 62.

I claim:

1. In a device of the kind described, an elongated casing, a locking bolt slidably mounted therein for extension to and from a latching position, said bolt having a head of the beveled type to cause its automatic retraction by the closing movement of the door, said head being carried by front portions of two parallel spaced apart arms having back portions united by a yoke or cross piece, a lever pivotally mounted between its ends within said casing with one of its end portions positioned to engage said cross piece to retract said bolt, said lever in all its operative positions occupying space between said arms, knob operable means within the casing to move forwardly the opposite end portion of said lever to cause aforesaid retraction of said bolt, a spring within said casing, said spring having an apertured end portion engaging said bolt to extend it, the opposite end portion of said spring abutting against a side portion of said lever adjacent to its pivotal mounting, said lever having a tapered spur which projects into the abutting end portion of the spring to aid in keeping said spring in place during the operation of said lever.

2. The subject matter of claim 1 and, said spur being of a conical shape.

3. In a device of the kind described, an elongated casing, a latching bolt slidably mounted therein for extension to and from a latching position, said bolt having a head of the beveled type to cause it to be retracted by the closing movement of the door, the back end portion of said bolt being offset thus bringing it adjacent to one side of said casing, spring means tending to extend said bolt, a lever pivotally mounted between its end portions within said casing, one end portion of said lever being positioned to apply a retracting force to said offset part of said bolt, a follower mounted within said casing to slide longitudinally thereof, the front end portion of said follower having an offset part to engage the end portion of said lever which is farthest from said offset part of said bolt, to retract the latter, a knob operable barrel turnably mounted in said casing, said barrel having projections to operate said follower, a compression spring acting between the head of said bolt and the front side of said lever, and a booster spring acting between the back side of said lever and a part of said follower to move the latter backwardly in case the locking bolt head is held retracted by abutting against the door casing.

4. In a device of the kind described, an elongated casing, a locking bolt slidably mounted therein for extension to and from a latching position, said bolt having a head of the beveled type to cause its automatic retraction by the closing movement of the door, said head being carried by front portions of two parallel spaced apart arms having back portions united by a yoke or cross piece, a lever pivotally mounted between its ends within said casing with one of its end portions positioned to engage said cross piece to retract said bolt, a yoke shaped follower slidably mounted within said casing to engage the opposite end portion of said lever to cause aforesaid retraction of said bolt, and a knob operable barrel mounted within said casing, said barrel having diametrically opposite shoulders positioned to engage the extremities of said follower yoke arms to retract said bolt in whichever direction the knob is turned, one of said cooperating yoke arms having an internal locking extension and locking means to cooperate with said extension, said cooperating locking means including a key-operable barrel having a locking extension movable to a position to abut against the first recited locking extension to lock the bolt against retraction.

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