ABSTRACT: A pushbutton for operating a lock bolt through a rack and pinion to provide a movement of the bolt greater than the movement of the pushbutton.
DOOR LOCKS AND HANDLES THEREFORE

This invention relates to improvements in door locks and handles therefore and is particularly applicable for use on caravans and other doors where a handle substantially flush with the outer surface of the door is required.

The object of the invention is the provision of a rotary or pushbutton-type handle which operates a rack to move the latch or bolt, the movement of the pushbutton being less than the movement of the latch or bolt.

According to the invention a spring-loaded rotary pushbutton barrel is mounted to move transversely of the door to engage a sliding rack engaging a pinion mounted on a spindle, rotation of the spindle causing a second pinion thereon to actuate a rack on the latch or bolt, a peg on the barrel being mounted eccentrically of the sliding rack whereby on rotation of a key the peg on the barrel is brought out of engagement with the sliding rack to prevent actuation of the latch or bolt.

The invention will be described with reference to the accompanying drawings:

FIG. 1 is a part elevation of a door with the lock in position thereon viewed from the outside of the door;
FIG. 2 is an elevation of same from the inside of the door;
FIG. 3 is an end view of a door with the lock in position thereon;
FIG. 4 is a transverse section through the door and lock;
FIG. 5 is a section at right angles to FIG. 4;
FIG. 6 is a detailed section on line 6–6 FIG. 2;
FIG. 7 is a plan view of the latch bolt; and
FIG. 8 is a plan of the inside casing from the underside with the base plate removed.

A door lock is formed in two parts, A' the part A being mounted on the inside of the door C and operated by a rotary handle a and the part A being mounted on the outside of the door C and operated by a key inserted in a pushbutton barrel F.

A latch bolt B slides longitudinally of the casing A. The bolt B (FIG. 7) is formed with a nose to engage a recess in the door post C' and with rack teeth b on both sides of a central recess b' and with lugs b at the end remote from the nose. The bolt B is also provided with longitudinal side flanges b' engaging slides a' on the casing. Casing A has further slides a' engaged by the faces of the lugs b'. The bolt is urged toward the position shown in FIG. 4 by a spring d' mounted on a pin a' having its head seated in a recess a' in the casing with the opposite end of the spring extending into a recess b' in the end of the bolt remote from the nose.

The bolt B is released against the spring d' by rotation of a spindle (FIG. 5) which are keyed pinions d' engaging the rack teeth b' on the bolt. A further pinion d' of less diameter than the pinions d is also keyed on the spindle and is engaged by rack teeth d' on a flanged slide D mounted between guiders a' on the casing A. Slide D moves at right angles to the direction of movement of latch bolt B, passing through opening b' of the latch bolt.

The bolt B is operated by the rotary handle a passing through the casing A and mounted on a spindle d' carrying a quadrant-shaped lever a' the ends of which engage the lugs b at the bolt. The bolt may be locked in the withdrawn position by a catch a' sliding transversely of the casing A to engage a stop b' on the bolt B. The bolt is held in position in the casing by a base plate a'.

The part A' of the lock in the form of a plate for the outside of the door A barrel F is rotatable in a housing a' rotated by a key inserted in the barrel and operated as a pushbutton latch against the action of a spring f mounted in a recess in the casing A'. The central part of the inner end of the barrel F is constructed with an eccentric peg f' extending through a hole or aperture in the casing A'. The housing of barrel F is mounted in a finger plate f' secured to the casing A' by a screw f'. The casing A' lies substantially flushed with outer surface of the door C with a recess f' formed in the casing beneath the finger grip f' which is employed for opening the door when a latch B is released.

The eccentric peg f' in one rotated position on the lock barrel F engages the head of a screw d'' or like adjustable member projecting from the end of the latch slide D whereby when the barrel F is moved inwards against the spring f peg f' abuts screw d'' and displaces the rack D to rotate the pinion d'. The resulting counterclockwise (FIG. 4) movement of the pinion d' rotates the pinions d in engagement with the rack teeth b on the bolt B thereby withdrawing the bolt into the casing A to release the door.

When the key is turned to rotate the central end part of barrel F, the peg f' is brought out of line with the head of the screw d'' and the rack slide D is not operated on depression of the barrel F and the bolt B cannot be withdrawn to release the door.

The casings A, A' are secured in position on the door by screws A extending from the part A and into the Part A'.

In order to accommodate the unit to doors C of varying thickness the rack D is provided with the adjusting screw d' to determine the position at which the rack B is engaged by the peg f'.

In operation the pushbutton barrel F is depressed to operate the latch bolt B through the racks and pinions and is returned to the normal position by the spring f. By rotating the central barrel part by the key, the barrel is rotated to bring the peg f' out of engagement with the screw d' thereby preventing pushbutton actuation thereof.

I claim:

1. A door lock assembly of the type adapted to be used on doors where an outside handle is substantially flush with the other surface of the door, comprising casing means secured in an opening in the door, a latch bolt slidably mounted in said casing means and having a latching portion for projecting out of one end of the casing, a first resilient means biasing said latch bolt toward latched position, a pushbutton operator slidably mounted in the outer sideway of the casing for movement in a direction at right angles to movement of the latch bolt, a second resilient means biasing said pushbutton operator outwardly toward retracted position, a slide member in said casing means mounted for movement parallel to said pushbutton operator, an eccentric internal projection on said pushbutton operator rotatable about an axis parallel to the direction of movement of said pushbutton operator, abutment means on said slide member adapted to be engaged by said projection during inward displacement of said pushbutton operator only in a predetermined rotate position of said projection, motion transmitting mechanism within the casing means interposed between said slide member and said latch bolt for translating inward displacement of said slide member by said pushbutton operator into amplified latch bolt retraction movement, and means extending through the inner side of said casing adapted to retract said latch bolt independently of operation of said button operator, said abutment means comprising a projection on said slide that is adjustable toward and away from the projection on said pushbutton to accommodate said assembly to doors of different thickness.

2. In the door lock assembly defined in claim 1, key operated means operable only from the outside of the door for rotating said projection.

3. In the door lock assembly defined in claim 1, means operable from the inside of said casing means for locking said latch bolt in unlatching position.

4. In the door lock assembly defined in claim 1, said motion transmitting mechanism comprising rack and pinion means providing amplified displacement of said lock bolt upon a given displacement of said pushbutton operator.

5. In the door lock assembly defined in claim 1, said casing means comprising an outer casing member mounting said pushbutton operator and an inner casing member mounting said latch bolt, and means rigidly connecting said casing members together and to the door at said opening.