Dec. 15, 1959 J. A. PODLESAK 2,916,905

FLUSH TYPE DOOR LOCK

Filed June 28, 1957 2 Sheets-Sheet 1

FIG_1

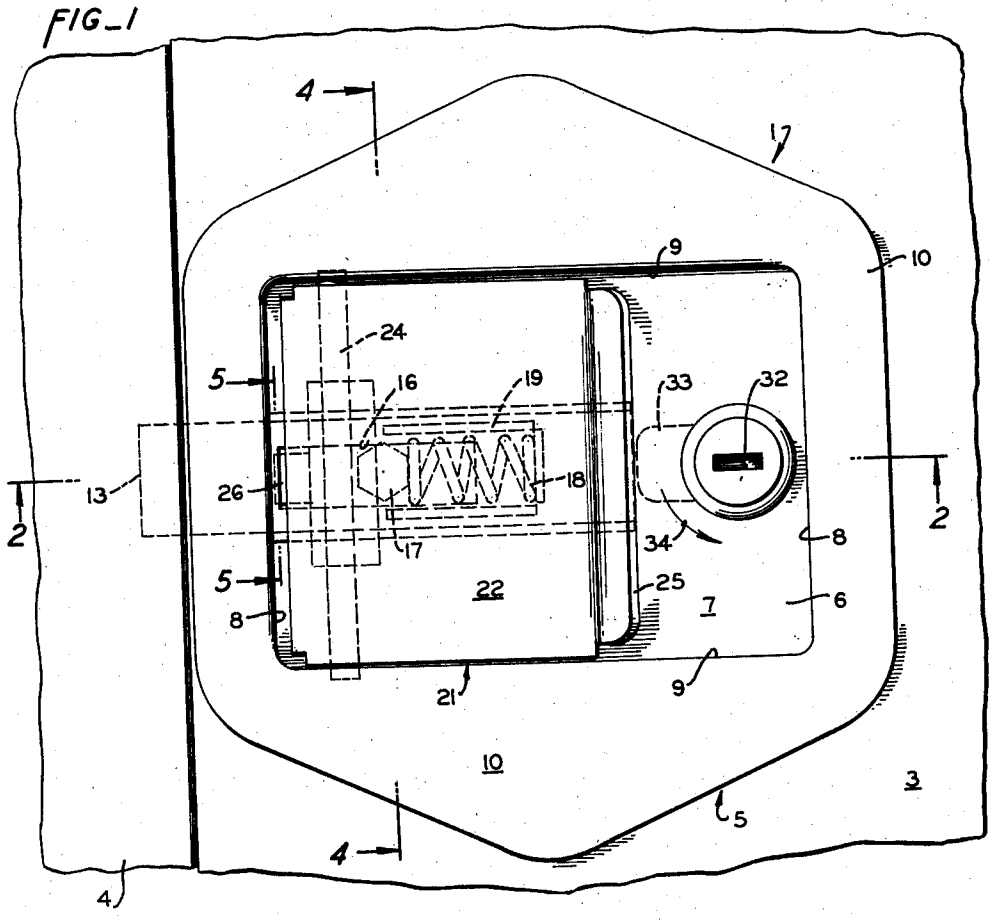
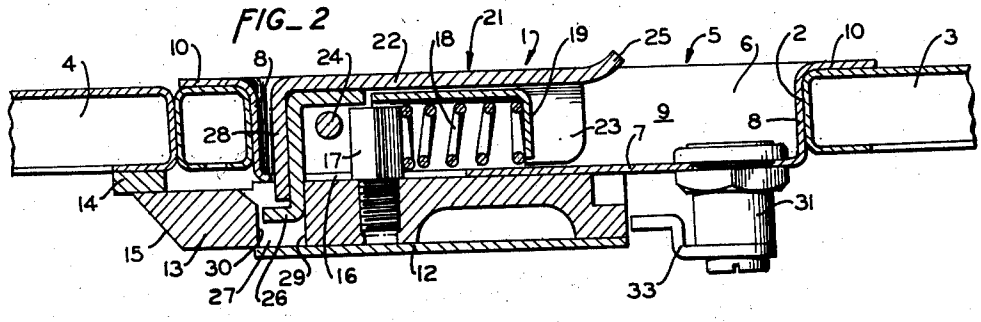


FIG_2



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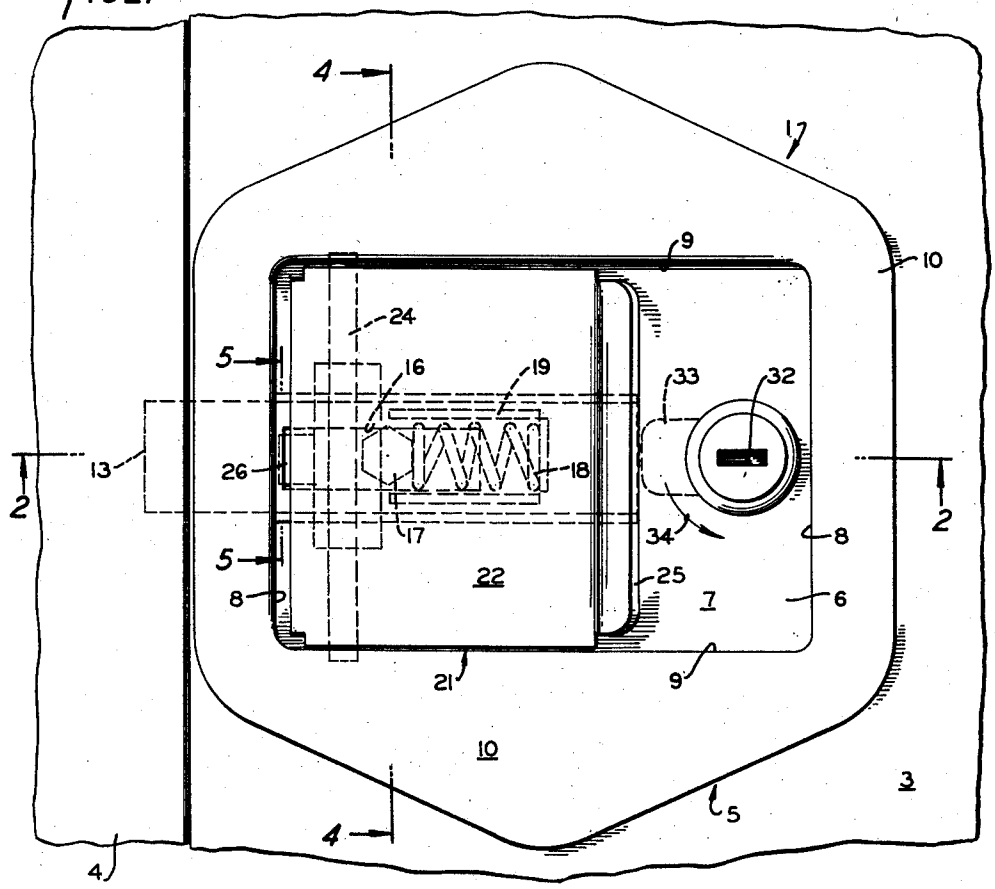
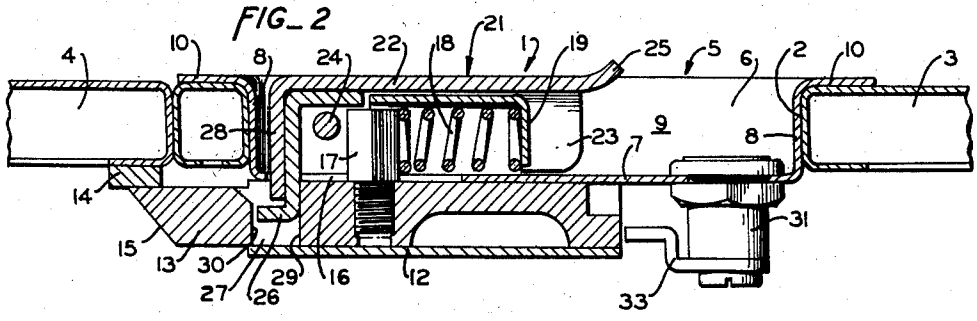


FIG_2



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FIG_3

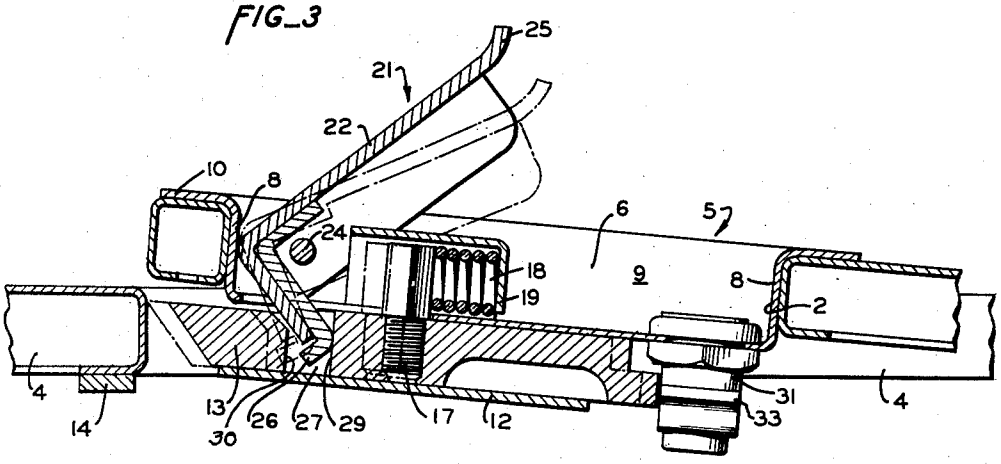


FIG_4

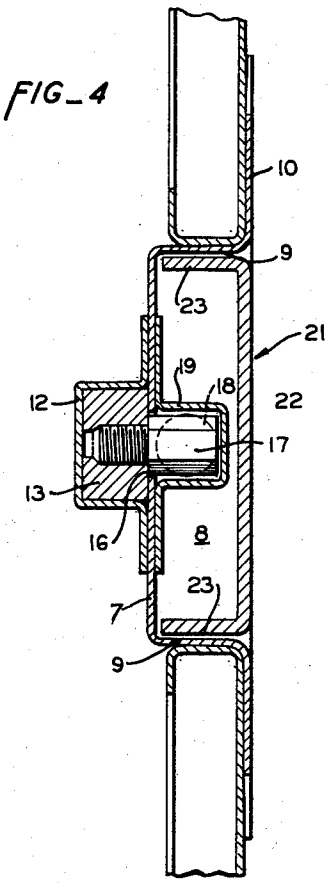
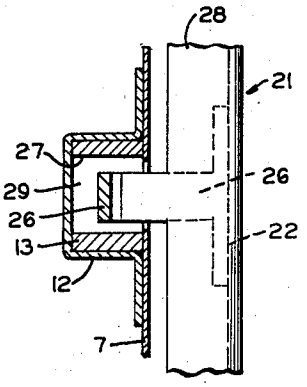


FIG_5



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United States Patent Office 2,916,905 Patented Dec. 15, 1959

2,916,905

FLUSH TYPE DOOR LOCK

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Application June 28, 1957, Serial No. 668,633

2 Claims. (Cl. 70—150)

This invention relates to door locks adapted to be mounted in a surface opening in a door without any substantial projection from said surface of the door.

Heretofore, door locks of this type, for use on utility vehicle bodies and the like, have been substantially more complicated than necessary. Both the manufacture of prior known locks and the installation thereof has been relatively complex and expensive.

Locks of this type are generally designed to eliminate any substantial projection of the lock from the door surface so as to prevent the protruding handle from catching on foreign objects such as trees, grass, buildings, etc. and being torn off. It has been found, however, that prior art locks make no provision for indication of the status of the latch bolt from outside the lock, and therefore the latch bolt may only be partially engaged with its associated keeper which renders it unsafe while traveling.

It is therefore an object of this invention to provide a flush type door lock wherein the external appearance of the lock indicates the position of the hidden latch bolt.

Another object of this invention is the provision of a flush type door lock in which a key operated locking means is provided recessed below the door surface in which the lock has been installed.

It is yet another object of this invention to provide a door lock for mounting in the surface opening in a door, in which there is no substantial projection from the door surface except under conditions such that the latch bolt is not in a completely projected position.

Other objects and advantages will become apparent from the following description taken in connetcion with the accompanying drawings in which:

Fig. 1 is a plan view of the door lock of this invention shown installed in a door with its associated frame;

Fig. 2 is a longitudinal sectional view taken substantially along line 2—2 of Fig. 1;

Fig. 3 is a longitudinal sectional view, similar to Fig. 2, but showing the door in a partially opened position;

Fig. 4 is a transverse sectional view taken generally along line 4—4 of Fig. 1; and,

Fig. 5 is a partial transverse sectional view taken generally along line 5—5 of Fig. 1.

In detail, the door lock of this invention, generally designated 1, is adapted to be mounted in a surface opening 2 (Fig. 2) in a door 3. Door 3 may be formed of sheet metal or the like with the opening comprising a portion of the surface sheet turned under as shown. The door is conventionally hinged in a frame 4 with the surface opening 2 and lock 1 situated opposite the hinges (not shown).

The door lock of this invention comprises a body member 5 which may be formed from sheet metal by drawing, stamping, or the like into a pan having a central, generally rectangular depression 6 therein. Depression 6 is bounded by a bottom wall 7 and opposed pairs of side walls 8, 9 projecting therefrom. On the upper edges of sidewalls 8, 9 a marginal flange 10 projects

outwardly from depression 6 in a plane generally parallel to bottom wall 7. Body member 5 is installed in surface opening 2 with flange 10 engaging the outer surface of the door 3 and the remainder of said body member extending inwardly of said surface.

On the under side of bottom wall 7 a generally U-shaped latch bolt guide 12 (Figs. 2, 4) is secured. Guide 12, in combination with bottom wall 7, provides means for supporting an elongated latch bolt 13 which means are in the form of a longitudinally extending passageway. Latch bolt 13 is supported for longitudinal movement from a projected position (Fig. 2) to a retracted position (Fig. 3).

In its projected position, with the door closed, latch bolt 13 engages a keeper 14 on the back side of frame 4 to hold the door in the closed position. The under side of the projecting end of latch bolt 13 is provided with an inclined surface 15 so the same may be cammed inwardly by striking frame 4 as the door is swung from the open position to the closed position shown in Fig. 2.

Bottom wall 7 of pan 5 is provided with an aperture 16 therethrough communicating between depression 6 and the passageway formed by bolt guide 12 in which latch bolt 13 slides. A pin 17 secured to latch bolt 13 projects upwardly therefrom through aperture 16 and into depression 6.

Pin 17 is engaged by a helical coil spring 18 which is enclosed in housing 19 secured to the uper surface of bottom wall 7. The forward end of housing 19 (in the direction of projection of latch bolt 13) is open whereas the rear end of said housing is closed and forms an abutment for one end of spring 19. Spring 18 therefore reacts between the closed end of housing 19 and pin 17 to yieldably urge latch bolt 13 toward the projected position at all times. Said latch bolt is retracted against the force of spring 18 and at the same time pin 17 moves rearwardly in aperture 16 and into housing 19.

Means for retracting latch bolt 13 are provided by a handle, generally designated 21. Handle 21 comprises a plate member 22 which extends over spring housing 19 and forms a partial cover for depression 6. Member 22 extends between opposed sidewalls 9 (Fig. 1) and is provided with a pair of down turned side flanges 23 (Figs. 2,4) adjacent said side walls. A pivot pin 24 extends through flanges 23 and sidewalls 9 so as to pivotally connect handle 21 thereto for swinging plate member 22 outwardly of depression 6. The majority of handle 21 is flush with the marginal flanges 10 of body member 5, with the exception of the end 25 of plate member 22 opposite pivot pin 24 which may be curved slightly outwardly, as shown, to aid in grasping by the fingers.

At the end near pivot pin 24 handle 21 is provided with a latch engaging finger 26 projecitng downwardly through aperture 16 (Fig. 2) and received in a recess 27 in latch bolt 13. Finger 26 may be formed from a piece of sheet metal or the like and secured to plate member 22 as by spot welding. To further aid in securing and strengthening finger 26 the forward end 28 of plate member 22 may be bent downwardly as shown to lie alongside and be secured to finger 26.

As seen in Fig. 3, swinging plate member 22 outwardly of body member 5 causes the lower end of finger 26 to swing rearwardly thereby engaging the rear shoulder or abutment 29 of recess 27 and retracting bolt 13. It will also be noted that upon the release of handle 21 spring 18 will act to urge latch bolt 13 to the projected position and, through finger 26, will urge handle 21 back to its inner position shown in Fig. 2.

The longitudinal extent of recess 27 is substantially the same as the longitudinal extent of the portion of finger 26 received therein so that, in effect, finger 26 is embraced between a pair of abutment means 29, 30 (Fig.

2). Finger 26 therefore follows latch bolt 13 through all its positions. In this manner, should latch bolt 13 be held against movement to its fully projected position (as shown by the dot-dash line, Fig. 3) plate member 22 of handle 21 will be held outwardly of body member 5 by the engagement of the forward end of finger 26 with abutment surface 30. The handle 21 always provides a visual indication from the outside the door of the position of the latch bolt 13, which is normally hidden from view, so that it may be easily determined whether the door is fully closed and latched.

It will be noted from the structure thus far described, that mounting the spring in the depression 6 of pan member 5 reduces the thickness of the lock and yet the spring 18 is in a protected position shielded by housing 19 and handle 21. This simplified structure also eliminates an overly long bolt guide 12 which is necessary in locks of the type in which the spring engages the rear end of the latch bolt.

Locking means in the form of the conventional key operated cylinder lock 31 is mounted through the bottom wall 7 of the body member 5 so that the key way 32 is accessible from the outside the door. Lock 31 is mounted at the end of latch bolt 13 and in the area of the depression 6 spaced rearwardly from handle 21. A key actuated dog 33 is provided projecting from lock 31 on the under side of bottom wall 7 in a position to be engaged by the rear end of latch bolt 13. Dog 33 is connected to the movable cylinder in lock 31 so as to be rotated in a conventional manner in a direction indicated by arrow 34 (Fig. 1) and vice versa.

In the position shown in Figs. 1 and 2, dog 33 prevents retraction of latch bolt 13 by engagement with the rear end thereof. When rotated by a key in the direction of arrow 34 to the position shown in Fig. 3, dog 33 is moved out of engagement with latch bolt 13 to permit retraction of the same by handle 21.

It will be noted that the positioning of locking means 31 in the bottom recess of 6 provides a protection for said locking means from damage. By virtue of the fact that spring 18 is mounted in depression 6 rather than at the end latch bolt 13 it is possible to achieve this advantageous placement of the locking means.

The lock structure of this invention may be economically formed substantially from sheet metal parts which may be stamped and spot welded together. Assembly and installation of the lock of this invention are greatly simplified by the structure herein described. In addition this door lock is especially suitable for use in the bodies of the utility trucks and the like where it is desirable that no portion of the structure projects from the surface of the body to injure personnel or to be damaged by outside forces.

The most important function of the feature of having the handle tied to the lock bolt is to indicate the position of the lock bolt. This indicates to the user the position of the hidden lock bolt, and thus warns him when the lock bolt is not securely engaged. A visible means is thus provided indicating that the door is securely closed or not. The user may consequently avoid having doors come open while his vehicle is in travel, which might cause subsequent damage.

Although the invention has been described and illustrated in detail it is obvious that modifications could be made therein without departing from spirit and scope of the appended claims.

I claim:

1. In a door having a surface opening therein, a flush type door lock comprising: a depressed pan disposed in said opening with the bottom wall of said pan below said surface, an elongated latch bolt, means mounting said latch bolt on the underside of said bottom wall for longitudinal movement from a projected position to a retracted position and vice versa, a handle pivoted to said pan for swinging from an inner position received substantially wholly within said pan to an outer position projecting from said pan, a recess provided in said bolt, an aperture provided in said bottom wall communicating with said recess, a latch bolt actuating finger rigid with and projecting from said handle through said aperture and received in said recess, a housing mounted on the upper side of said bottom wall under said handle and having an open end adjacent said finger and a closed end remote therefrom, a spring enclosed in said housing extending generally parallel to said latch bolt between said ends of said housing, and an element projecting from said latch bolt through said aperture and into engagement with said spring whereby said spring yieldably urges said latch bolt to said projected position.

2. In a door lock having a surface opening therein, a flush type door lock comprising: a depressed pan disposed in said opening with the bottom wall of said pan below said surface, an elongated latchbolt, means mounting said latchbolt on the under side of said bottom wall for longitudinal movement from a projected position with one end of said latchbolt projecting from one end of said pan to a retracted position and vice versa, a handle pivoted to said pan for swinging from an inner position received substantially wholly within said pan and extending over a covered portion of said bottom wall adjacent said one end of said pan to an outer position projecting from said pan, a recess provided in said bolt, an aperture provided in said bottom wall communicating with said recess, a latchbolt actuating finger rigid with and projecting from said handle through said aperture and received in said recess, a housing mounted on the upper side of said bottom wall under said handle and having an open end adjacent said finger and an abutment member at the end remote from said open end, a spring enclosed in said housing extending generally parallel to said latchbolt and engaging said abutment member, an element projecting from said latchbolt through said aperture and into engagement with said spring whereby said spring yieldably urges said latchbolt to said projected position, and locking means mounted on an uncovered portion of said bottom wall adjacent the other end of said pan and provided with a locking dog on said under side of said bottom wall swingable to a position engageable by the other end of said latchbolt for preventing retraction thereof.

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