Re. 24443

May 8, 1956 J. C. LABRIE 2,744,406

SLIDING DOOR LOCK

Filed March 27, 1953 2 Sheets-Sheet 1

Fig. 1

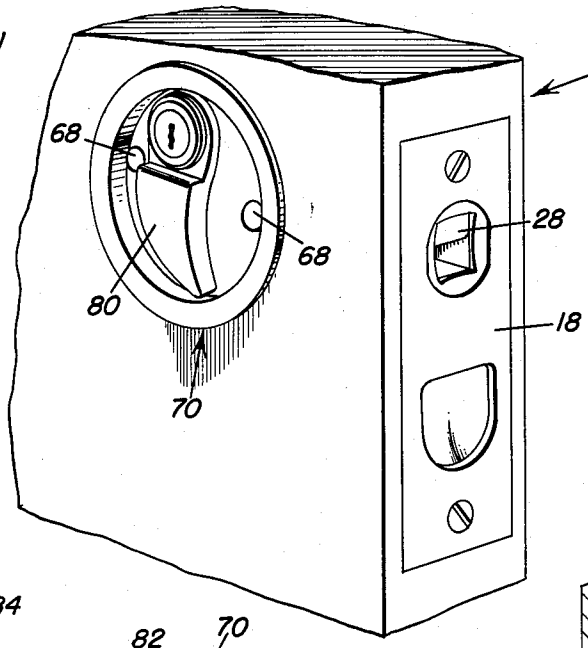


Fig. 5

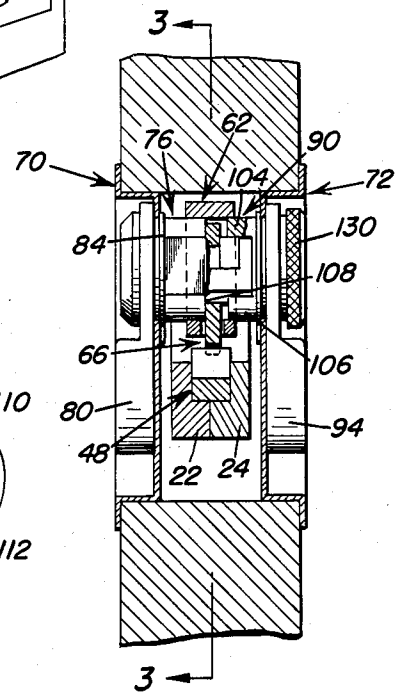
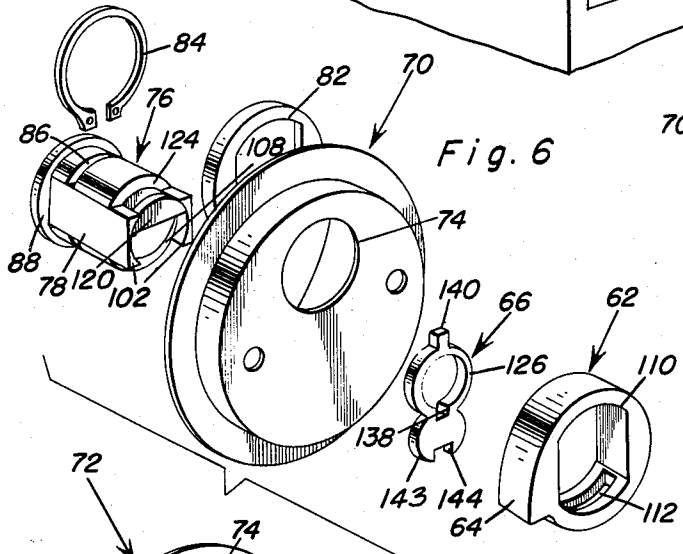


Fig. 6



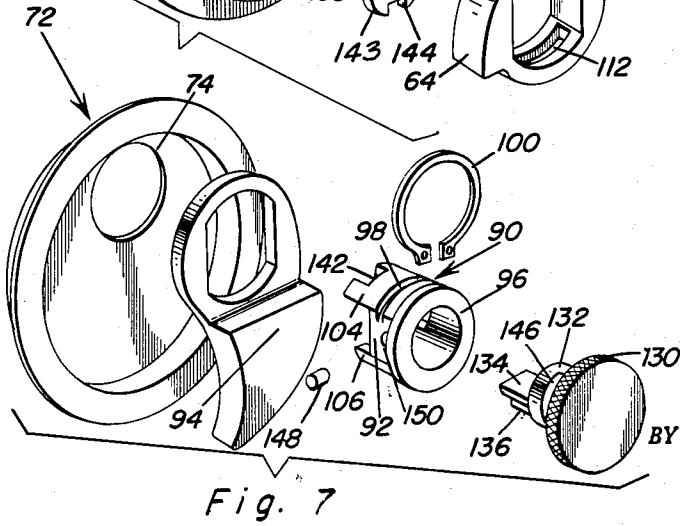


Fig. 7

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SLIDING DOOR LOCK

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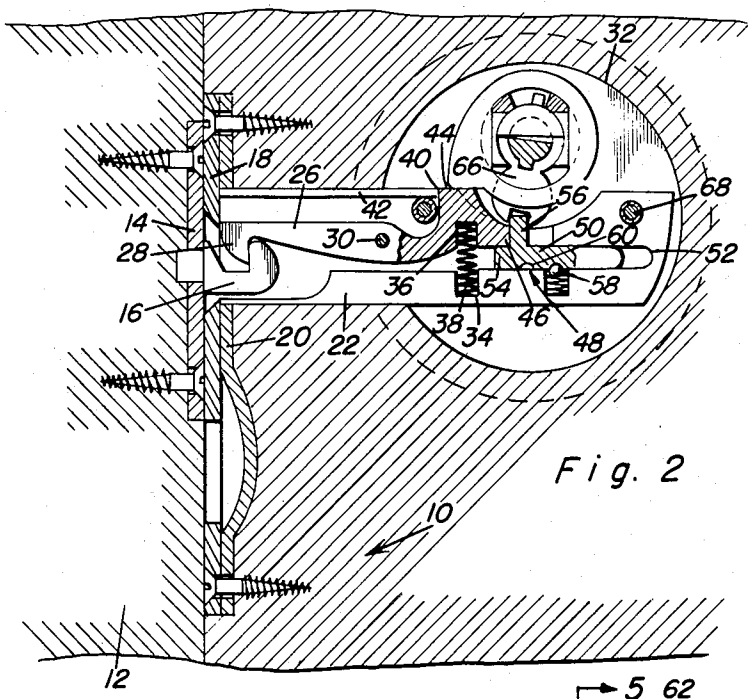


Fig. 2

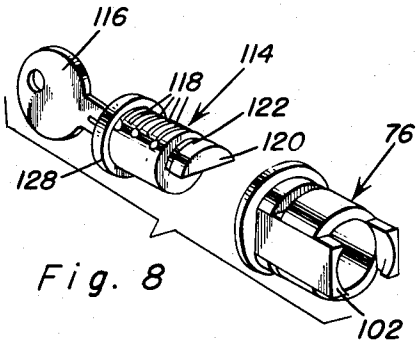


Fig. 8

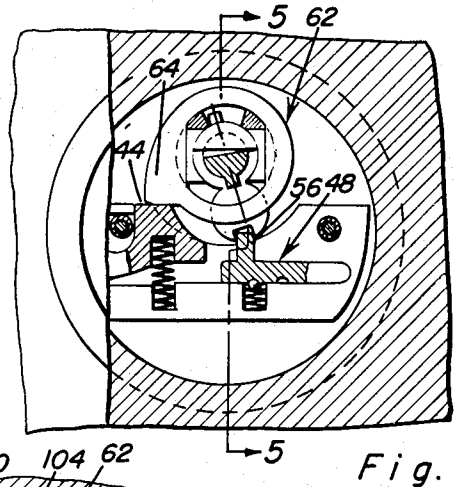


Fig. 3

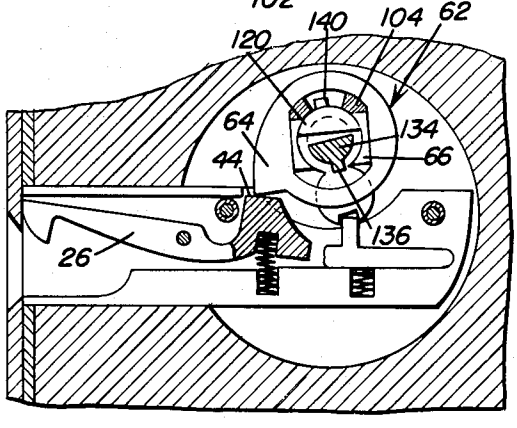


Fig. 4

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SLIDING DOOR LOCK

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Application March 27, 1953, Serial No. 345,075

2 Claims. (Cl. 70—96)

This invention relates generally to door lock mechanisms and pertains more particularly to an improved lock mechanism for sliding doors.

A primary object of this invention is to provide an improved form of lock construction for sliding doors which incorporates a plurality of interengaging and interlocking parts.

Another object of this invention is to provide an improved form of lock mechanism which incorporates both a key controlled and manually controlled locking assembly, each incorporating interengaging mechanism for cooperative actuation.

Another object of this invention is to provide a locking mechanism which includes a latching element which serves to maintain the key controlled lock in proper position.

Another object of this invention is to provide a locking mechanism which includes a latching element and a bolt actuating cam, the element serving to maintain the cam in proper position on the lock mechanism.

Another object of this invention is to provide a locking mechanism for sliding doors which is of extremely compact and economical design.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a perspective of a portion of a sliding door incorporating the novel locking mechanism;

Figure 2 is a vertical section taken through the sliding door and its adjacent casing showing details of the mechanism in the locked position;

Figure 3 is a vertical section taken substantially along the plane of section line 3—3 of Figure 5 showing details of the assembly in the unlocked position;

Figure 4 is a vertical section similar to that of Figure 2 but showing the relationship of parts of the mechanism in the latch releasing position;

Figure 5 is a transverse vertical section taken substantially along the plane of section line 5—5 of Figure 3 showing details of the internal construction of the combined latching and locking mechanism;

Figure 6 is an exploded view of a portion of the assembly;

Figure 7 is another exploded view showing the remainder of the assembly; and

Figure 8 is an exploded perspective view of a portion of the assembly including the key controlled cylinder and valve mechanism.

Referring now more particularly to Figures 1 and 2, reference numeral 10 indicates generally a sliding door which is movable toward and away from the door casing 12 which is provided with a mounting plate 14 including the horizontally extending hook 16. The door carries a face plate 18 below which is disposed a guide plate 20 recessed into the edges of the door as shown and these

two plates are provided with registering apertures through which the hook 16 projects when the door is closed. A recess is provided in the door behind these plates and receives a pair of mating plates 22 and 24, see especially Figure 5, which are provided with cooperating recesses receiving the dog 26 terminating at one end in a hook portion 28 for engagement with the hook 16 and which is pivoted intermediate its length by means of the pin 30. The door is provided with a transverse opening 32 into which the rearward end of the plates 22 and 24 as well as the rearward end of the dog project and each of the latter are provided with corresponding depressions 34 and 36 receiving the opposite ends of a compression spring 38 serving to normally urge the dog to the position shown in Figure 2. The rear corner 40 of the dog abuts against the inwardly directed flanges 42 on the plates 22 and 24 to serve as a limit stop for the dog and the upper face 44 adjacent this corner constitutes a cam surface as will presently appear. Also, the extreme rear end 46 of the dog constitutes a locking shoulder for the same which is selectively engageable by the sliding locking member 48 which is projectable into and out of locking engagement with the dog by virtue of its extended guide portion 50 received within the corresponding recess 52 in the plates 22 and 24, the shoulder 54 being engageable under the rear end of the dog 46 and the member as a whole being moved as will presently appear by virtue of its ear 56 which also serves as a stop for limiting the projected position of this sliding member. The spring urged ball 58, of course, serves to maintain the sliding member in the desired position by virtue of its projection into one of the depressions 60.

As far as the operation of the above described assembly is concerned, the dog is moved from a latched to an unlatched position under action of the cam member 62 provided with the cam projection 64 engaging against the cam surface 44 of the dog, these two positions being shown most clearly in Figures 3 and 4. The sliding member 48 is movable between the locked and unlocked position as shown in Figures 2 and 3 respectively under engagement of its ear 56 with the oscillatable element 66.

Referring now more particularly to Figures 6 and 7, it will be seen that a pair of escutcheon plates, namely, an outer plate 70 and an inner plate 72 are provided on opposite sides of the door in covering relation to the opening therethrough and these escutcheons are provided with apertures 74 rotatably receiving the opposite ends of a combined unlatching and locking mechanism. These escutcheons are secured to plates 22 and 24 by means of suitable fasteners 68, those in the outer escutcheon being provided with smooth heads so that they cannot be removed from the outside of the door. This assembly includes a tubular outer member 76 of generally cylindrical configuration which is provided at diametrically opposed points with flats 78 which serve to feather an operating lever 80 thereon, the lever being provided with a similarly configurated aperture 82. In assembled operation, this member first receives the lever 80 and is then projected through the opening 74 on the escutcheon and a locking clip 84 is engaged within a peripheral slot or groove 86 in the member which, in cooperation with the radial flange 88 serve to maintain this member in proper position on the escutcheon.

A second tubular member 90 is provided with flats 92 similar to those on the first member for feathering the inner operating lever 94 thereon, this member being provided with a collar 96 and a groove 98 cooperating with the clip 100 in securing the member and lever 94 to the escutcheon 72 in a manner similar to the other member.

The two members are provided with interfitting or interlocking inner ends so that rotation of one member will effect rotation of the other and this interlocking en-

gagement is provided by a pair of diametrically opposed substantially rectangular extensions **102** on the front member **76** and a pair of circumferential extensions **104** and **106** on the second member **90**, these pairs of extensions being disposed in right angular relation to each other for interlocking engagement. In this respect, it will be noted that the extension **104** is longer than the extension **106** so that the latter is slightly spaced from the lower end face **108** on the first member **76** to provide therebetween an elongated slot, see especially Figure 5. The previously described cam element **62** is provided with a central aperture **110** conforming to the shape of the outer surface of the members so that the cam element is carried and rotated thereby and this cam element is provided along its undersurface with an elongated slot **112** which is positioned in register with the previously mentioned slot defined between the extension **106** and face **108** so that the previously described latch actuating element **66** which extends radially outwardly through these slots will properly position the cam element longitudinally of the member **76**.

The members **76** and **90** present a housing having a longitudinal circular bore therethrough which rotatably receives the locking mechanism which will now be described. The first member **76** receives a lock barrel **114** which is controlled by a key **116** in a well known manner to disengage the various tumblers **118** from corresponding recesses in the inner surface of the member **76**, as is well known, so as to allow relative rotational movement between the barrel **114** and the member **76**. The barrel is provided with an extension **120** having an arcuate groove **122** which projects beyond the upper end face **124** of member **76** between the extension **102** and the annular rim **126** of oscillatable element **66** is seated within this groove **122** serving to maintain the barrel in proper position with respect to the member **76**, the collar **128** of the barrel being removable to permit assembly.

The inner end of the lock assembly is provided with a manually actuated knob **130** and the cylindrical projection **132** on the knob is received within the bore of member **90** as is the semi-circular extension **134** which, when the device is assembled, overlaps the extension **120** on the lock barrel. It is to be noted that the two extensions **120** and **134** mate in such a manner as to allow a certain amount of lost motion between the lock barrel **114** and the knob **130**. The amount of lost motion provided is such as to permit the sliding locking member **48** to be moved between the locked and unlocked positions by manipulation of knob **130** without imparting any movement to the lock barrel. At the same time, when the sliding locking member **48** is moved to the locked position by actuation of the lock barrel, the lost motion will permit the lock barrel to be returned to the normal position, wherein removal of the key can be accomplished, without disturbing the then locked position of the element **66** and consequently the member **48**. Likewise, the same action takes place upon unlocking the assembly by means of the key **116**, the lost motion permitting the lock barrel to be rotated back from the unlocking to the normal position, wherein the key may be removed from the barrel, without disturbing the then unlocked position of member **48**. The extension **134** is provided with a depending key **136** which is received within the keyway **138** of the oscillatable element **66** so that rotation of this knob assembly will transmit oscillatory motion to the oscillatable element, it being noted that the radially projecting ear **140** on the oscillable element is disposed within a corresponding notch **142** on the upper extension **104** of the first member **90** to provide a stop limit for the oscillatory motion of the oscillatable element. The depending projection **143** extends outwardly through the previously mentioned slot between extension **106** and the face **108** and the slot **112** and its lower end is provided with a notch **144** which engages over the ear **56** of the sliding member **48**. To maintain the knob assembly in assembled relation with respect to the member **90**, the cylindrical portion **132** of the former is provided with an elongated slot **146** into which the pin **148** extending through aperture **150** in the member **90** projects, the pin being prevented from disengagement by virtue of its engagement with the inner surface of the aperture in the lever **94**.

The operation of the device will now be apparent inasmuch as actuation of either of the levers **80** or **94** will impart a rotational movement to the housing comprised of the members **76** and **90** which will, in turn, impart a rotational movement to the cam assembly **62** to pivot the dog **26** to unlatch the door assembly. When it is desired to lock the same, it is merely necessary to rotate either the manual knob **130** to impart rotary motion to the oscillatable element **66** or rotate the lock barrel **114** under action of the key **116** to accomplish the same result.

It will be noted that the locking device is extremely compact in design so that it may be easily incorporated in a door no matter how thin the latter may be constructed.

From the foregoing, the construction and operation of the device will be readily understood and further explanation is believed to be unnecessary. However, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the appended claims.

What is claimed as new is as follows:

1. A combined locking and actuating assembly comprising a pair of coaxial tubular members provided with interfitting adjacent ends presenting an elongated housing, means for rotating said housing, a bolt actuating cam carried by said housing provided with a circumferential slot, locking means received in said housing including an element projecting from the housing through the slot in said cam, said locking means including a key controlled barrel, said barrel having a groove within which said element is journalled, said locking means also including mechanism for imparting rotational movement of said barrel to said element.

2. Combined locking and actuating assembly as set forth in claim 1 wherein said means for rotating said housing includes actuating lever means operatively connected to opposite outer end portions of said tubular members and rotatable therewith for imparting rotational movement to the barrel and the element journaled therein.

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