

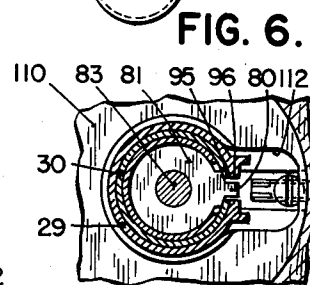
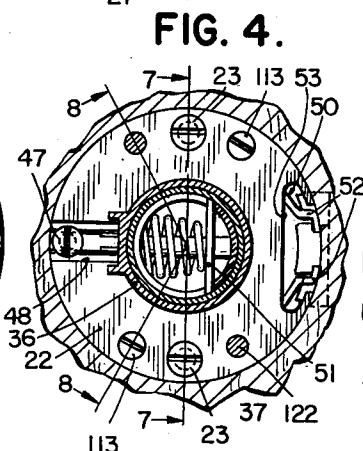
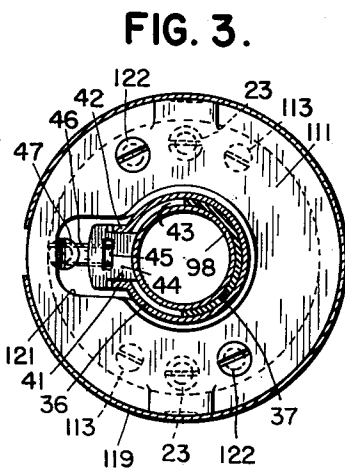
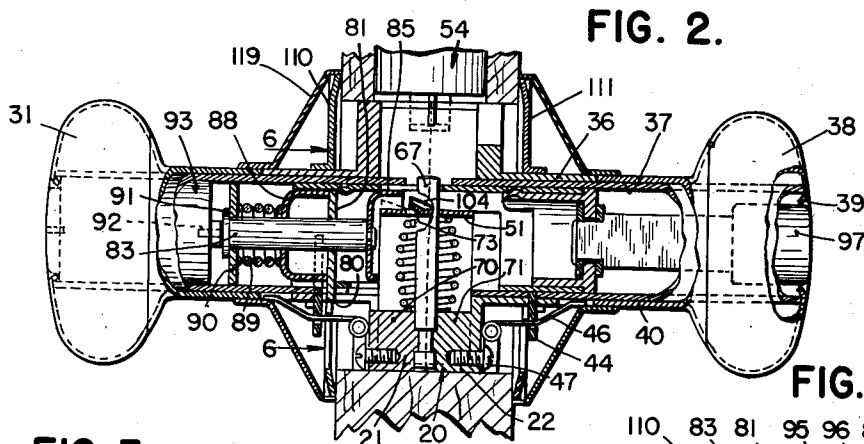
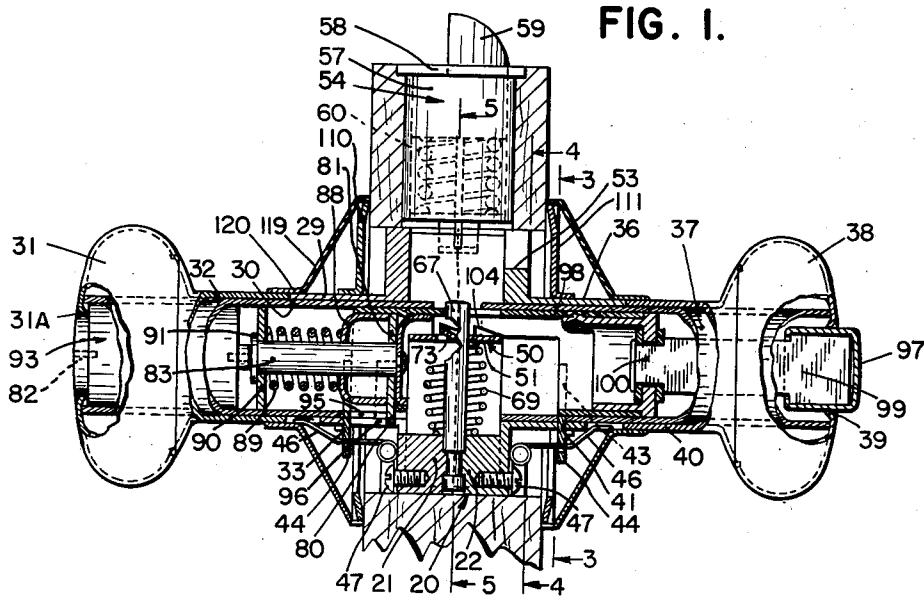
Sept. 23, 1952

R. C. CERF, JR
LATCH MECHANISM

2,611,635

Filed Dec. 30, 1948

2 SHEETS—SHEET 1



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2 SHEETS—SHEET 2

FIG. 5.

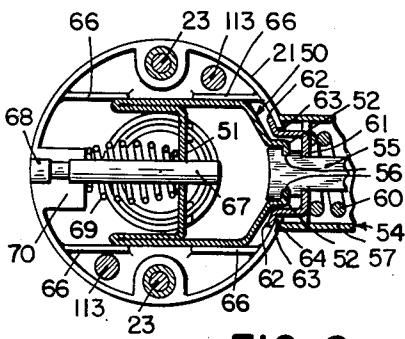


FIG. 7.

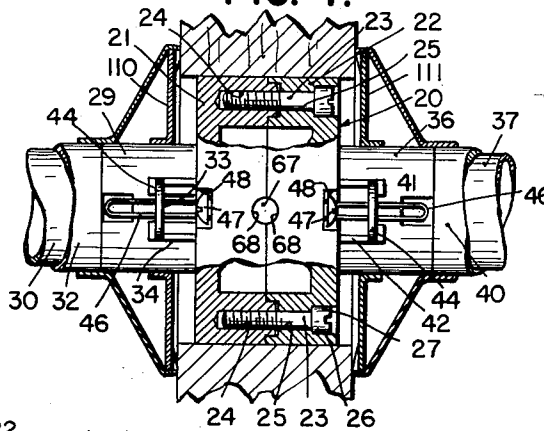


FIG. 8.

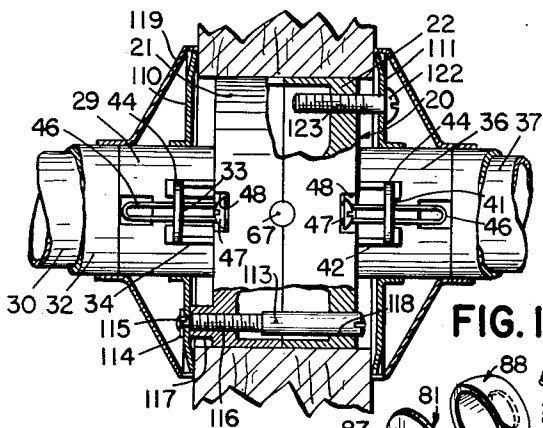


FIG. 9.

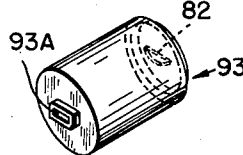


FIG. 10.

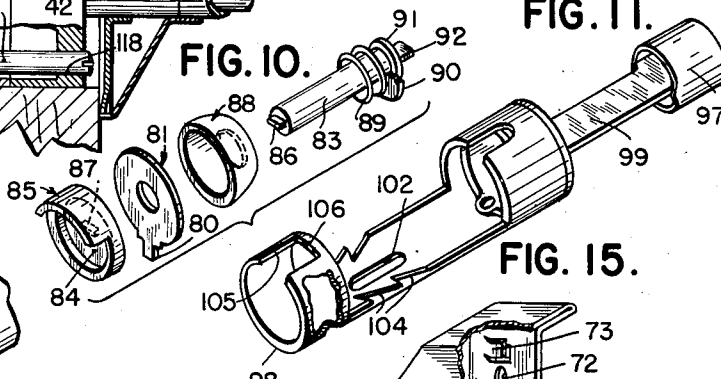


FIG. 11.

FIG. 12.

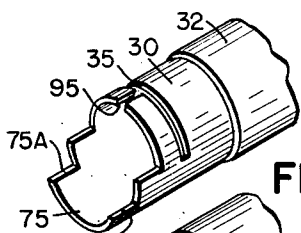


FIG. 13.

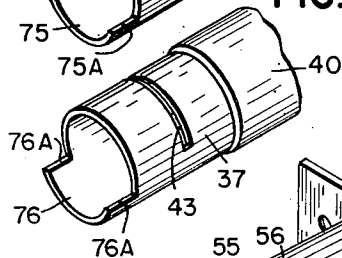


FIG. 14.

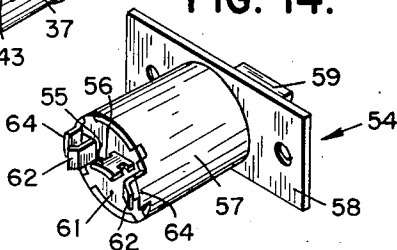
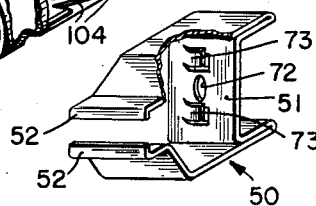


FIG. 15.



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LATCH MECHANISM

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Application December 30, 1948, Serial No. 68,214

3 Claims. (Cl. 292-169)

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This invention relates to a door knob latch set and in particular to a door knob latch set having a push button type spindle locking means for locking one knob against turning by a coaxial push button in the opposite knob.

The general object of this invention is to provide a door knob latch set in which one knob (for example, the outside knob) may be locked against rotation by means of a coaxial push button arranged in the opposite knob (on the inside of the door) which push button means is releasable from its pushed-in position by the turning of the inside knob. Another object is to provide, in addition, a door knob latch set in which the locking push button is also released (if locked) by pushing in the latch bolt, which movement would occur if the door were accidentally closed, when the latch bolt would be pushed inwardly upon striking the striker plate. A further object is to provide in a door knob latch set of the kind described, supplementary means for the release of the latch locking means from the outside in the event an emergency opening of the door is required.

This type door knob latch set is adapted particularly, for example, for use on a bathroom door which is to be locked from the inside and which may be unlocked from the inside by the turning of the inside knob.

These and other objects of my invention are attained by my invention which will be understood from the following description, reference being made to the accompanying drawings in which:

Figure 1 is a plan view partly in section and with portions broken away to better show the structure;

Figure 2 is a plan view partly in section and with portions broken away, this view being similar to that of Figure 1 except that the outside knob is shown in locked position due to the push button being pressed into the inside knob;

Figure 3 is a cross-sectional view taken on the line 3-3 of Figure 1;

Figure 4 is a cross-sectional view taken on the line 4-4 of Figure 1;

Figure 5 is a cross-sectional view taken on the line 5-5 of Figure 1;

Figure 6 is a fragmentary cross-sectional view taken on the line 6-6 of Figure 2;

Figure 7 is a cross-sectional view partly in elevation taken on the line 7-7 of Figure 4;

Figure 8 is a cross-sectional view partly in elevation taken on the line 8-8 of Figure 4;

Figure 9 is a perspective view of the emergency release plug;

Figure 10 is a perspective disassembly view

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showing the outside knob spindle locking means and the emergency release and bolt retraction means;

Figure 11 is a perspective view of the push button spindle locking sleeve assembly;

Figure 12 is a partial perspective view of the outside knob hub and outside knob spindle assembly;

Figure 13 is a partial perspective view of the inside knob hub and inside knob spindle assembly;

Figure 14 is a perspective view of a spring latch unit; and

Figure 15 is a perspective view with portions broken away showing the retractor.

In the preferred form of my invention, shown in the drawings, a retractor body 20 generally cylindrical in shape is made up of an outside half portion 21 and an inside half portion 22, preferably made by accurate die-casting, these half portions being fitted and assembled as a hollow unitary body by means of the longitudinal assembly screws 23 whose threaded ends engage threaded holes 24 in the outside half portion 21, the corresponding non-threaded holes 25 in the inside half portion being countersunk at 26 to enclose the heads 27 of the assembly screws 23. In the drawings, the left hand knob is referred to as the "outside" and the right hand knob is referred to as the "inside," corresponding to the door arrangement, for example, as in a bathroom. The outside half portion 21 is provided with an outwardly extending axial bearing sleeve 29 adapted for the mounting therein of the tubular spindle 30, upon the end of which the outside knob 31 is fastened. The outside knob is provided with a finish hub 32 which telescopes over the outside spindle 30 and abuts at its end the unattached end of the bearing sleeve 29. A circumferential retaining key slot 33 is provided in the bearing sleeve 29 adjacent a retaining key boss 34 which is provided on the bearing sleeve 29 adjacent the end of the cylindrical outside half portion 21.

The inside half portion 22 of the retractor body 20 is also provided with an outwardly extending bearing sleeve 36 in which an inside tubular spindle 37 is adapted to be mounted for rotation. An inside knob 38 is attached to the end of the inside spindle 37, there being provided a coaxial opening 39 for a push button which extends from the outer face of the inside knob 38. The inside knob 38 is also provided on the opposite face with a finish hub 40 which extends over and covers a portion of the inside spindle 37, the end of said hub abutting the end of the inside bearing sleeve 36. The inside bearing sleeve 36 is also provided

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with a circumferential retaining key slot 41 which is arranged adjacent a retaining key boss 42 on the bearing sleeve 36 adjacent the end of the cylindrical outside half portion 22.

The outside spindle 30 and the inside spindle 37 are each removably held in their respective bearing sleeves 29 and 36 by the retaining keys 44 which are adapted to fit in the retaining key slots 33 and 41 respectively, and in the circumferential key slots 35 and 43 provided respectively in the spindles 30 and 37, the spindle slots being long enough (for example, about 180°) to permit the turning of the spindles for a sufficient amount to actuate the latch operating retractor 50. The retaining keys 44 are each provided with holes 45 through which is passed a hairpin spring 46 arranged to removably hold the keys in place in the slots, the fixed ends of the hairpin springs each being attached by a screw 47 in a groove 48 provided in the ends of the cylindrical half portions 21 and 22.

The cavity inside the retractor body is adapted to contain the retractor 50 which is a generally rectangular shaped frame, which is provided at its middle portion with a thrust plate partition 51, and at one end with opposed edges or fingers 52 which are arranged adjacent the window 53 in the cylindrical wall of the retractor body facing the spring latch unit 54. The fingers 52 are adapted to engage the latch bar 55 at the opposed notches 56.

The spring latch unit consists of a cylindrical housing 57 having a flush plate 58 at the outer end through which protrudes the latch bolt 59, with a coiled compression spring 60 between the inner end of the latch bolt 59 and the opposite end closure plate 61 of the housing 57, so that the latch bolt is normally thrust outwardly by the action of the spring. The spring latch unit is attached to the retractor body 20 adjacent the window 53 by the tabs 62 extending from the closure plate 61 and adapted to slide under the margins 63 of the window 53, the end 64 of the housing 57 abutting the outer faces of the margins 63 at the window. The latch bolt units 54 may thus be positioned, as required for alignment of the parts, along the window margins 63 and along the slot formed by the opposed edges or fingers.

The retractor 50 is mounted to slide between guides 66 on the inside end wall of the cavity, and also on the aligning pin 67 which is clamped in the half cylindrical grooves 68 in the aligning pin bosses 70 and 71 respectively in the outer half portion 21 and the inside half portion 22 of the retractor body 20. A coil compression spring 69 is arranged to abut the aligning pin bosses 70 and 71 at its other end and is pressed against the underside of the thrust plate partition 51 so that the retractor fingers 52 are normally extended outwardly toward the window 53. The thrust plate partition 51 is provided with two detent tabs 73 arranged on both sides of the hole 72 through which the aligning pin 67 passes. The purpose of these detent tabs will be later described.

The outside tubular spindle 30 and the inside tubular spindle 37 are each provided at its inner end with rollbacks 75 and 76 respectively. A rollback consists of the semi-cylindrical end portions of the tubular spindles, the longitudinal edges 75A and 76A of which are adapted to press alternatively upon the upper face of the thrust plate partition 51 of the retractor 50 so that said retractor is pressed against the spring 69 by a

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turn of either knob in either direction to thereby retract the retractor 50 and with it the latch bolt 59. The spring pressure causes the knob and spindle to return to the neutral position after each turning.

The outside knob 31 and its spindle 30 are adapted to be locked against rotation by means of the locking tab 80 extending from the periphery of the locking tab disk 81 which is rotatably mounted on the emergency release shaft 83 which in turn is mounted within the outside tubular spindle 30. The disk 81 serves to centrally space the release shaft in the spindle 30. An emergency semi-cylindrical rollback 85 is attached to one end of the shaft 83 by means of the tongue 86 riveted in the hole 87 in the end 84 of the emergency rollback member 85. There is also mounted on the shaft 83 a spacer 88 which abuts one end of a coil spring 89, whose other end presses against a rotatable centering disk 90, which in turn abuts a collar 91 on the end of the shaft 83. The end of the shaft 83 adjacent the collar is provided with a coupling bar 92 which makes operative engagement with a corresponding hole 93A in the emergency release plug 93. The emergency release plug 93 is inconspicuously mounted for turning in a coaxial opening 31A in the knob 31, a slot 82 adapted to be engaged by a blade such as a screwdriver, or coin, being provided. The locking tab 80 on the disk 81 locks the rotation of the outside spindle when it is moved longitudinally into the locking groove 95 which is provided through the spindle 30 and in the coinciding groove 96 in the bearing sleeve 29. The locking tab 80 is moved longitudinally by means of the locking sleeve 98 which is operatively connected to the push button 97 by means of the connecting bar 99 which makes swivel connection at 100 with one end of the locking sleeve 98.

The locking sleeve 98 in its central portion is cut away in order to avoid interference with the reciprocatory operation of the retractor 50, and in the longitudinal edges of the segment of the cylinder remaining which is preferably less than one-half of the cylinder, there are provided detent teeth 104 which are adapted to engage the raised detent tabs 73 previously mentioned, provided on the thrust plate partition 51. An elongated hole 102 is provided through which the pin 67 passes to permit longitudinal movement of the locking sleeve. The inner end of the locking sleeve 98 slides over the emergency rollback. The inner end of the locking sleeve 98 is provided with an opening 105 which permits limited rotational movement of the locking tab 80 therein, the end 106 of the opening being adapted to press directly against the locking tab 80 against the spring 89 and thereby force the locking tab 80 into locking groove 95 in the spindle 30 and the corresponding groove 96 in the bearing sleeve 29.

The detent teeth 104 are held by the detent tabs 73 so long as the retractor 50 and its partition plate 51 are in the "out" position for the latch bolt 59. When the retractor 50 is moved from the position by the pressing in of the latch bolt 59, or by the turning of the outside knob rollback 75, or the inside knob rollback 76, or by the emergency rollback 85, the teeth 104 become disengaged from the tabs 73, and the locking sleeve 98, and its attached push button 97 are moved toward the inside knob under the pressure of the spring 89, restoring the push button to the unlocked position. The end 106 of the opening 105 in the locking sleeve 98 upon this backward movement of the locking sleeve 98, al-

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lows the locking tab 30 to become disengaged from the grooves 95 and 96, so that the outside spindle 30 and its knob 31 are again free to turn to operate the latch.

The cylindrical body 20 is attached to the door in which it is to be mounted by an attached clamping plate 110 on the outside, and a removable clamping plate 111 on the inside, these clamping plates being somewhat larger in diameter than the mounting hole in the door, so that the outer margins engage the faces of the door. The attached clamping plate 110 is provided with a central opening through which the bearing sleeve 29 extends, and is also provided with a window 112 through which the boss 34 for holding the hairpin spring 46 and retainer key 44 of the outside spindle 30 may pass. The clamping plate 110 is attached to the body 20 by two or more long-headed screws 113, whose ends are riveted over washers 114 on the outside of the clamping plate holes 115, the threads of the screws 113 engaged threaded holes 116 in the outside half portion 21 of the body, clamping plate screw bosses 117 being preferably provided on the end face of the outside body half portion 21. The elongated heads of the screws 113 extend through unthreaded holes 118 in the inside body half portion 22 being operable by the screw driver slot in their heads, accessible from the inside end face of the body. A rosette 119 is adapted to fit over the clamping plate 110 and frictionally engage it at the outer edges, the rosette having a finish hub 120 covering the joint between the outside knob finish hub 32 and the bearing sleeve 29.

The removable clamping plate 111 is also provided with a central opening through which the inside bearing sleeve 36 extends, and is also provided with a window 121 through which the boss 42 for the retainer key 44 and its spring 46 may pass. The removable clamping plate 111 is attached to the face of the inside body half portion 22 by the screws 122 in the threaded holes 123, the heads of the screws holding the plate against the face of the door around the mounting hole. This arrangement of an adjustable attached clamping plate 110 and a removable clamping plate 111 each independently attached to the body 20 permits the equalization of the spindle lengths on the two sides of the door. The adjustment for different door thickness is made at the time of installation.

The advantages of my improved bathroom door knob latch set have been indicated in the foregoing description. The rigid body and long bearing sleeves for the knob spindles provide a long-lived reliable locking and latching knob set, in which the knobs do not become loose and wobble. The locked latch bolt is released simply by turning the inside knob in either direction. The door cannot be accidentally locked by unexpected closing. The emergency release from the outside is readily available, especially to release imprisoned children and others who are unable or unwilling to unlatch the lock.

I claim:

1. In a lock having an inner and an outer knob each having a separate tubular spindle with a rollback arranged to reciprocate a latch retractor by the turning of either knob, said inner knob having a push button, means actuatable by said push button for dogging the outer knob against rotation, said means comprising a locking sleeve attached to said push button, said sleeve being disposed in both of said spindles and closely fitting the inside walls of said spindles, said lock-

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ing sleeve being longitudinally movable by said push button for dogging said outer spindle, said sleeve being cut away to a cylindrical segment in the portion adjacent said retractor and being provided with detent teeth adapted to releasably engage said latch retractor, whereby said locking sleeve is released by latch-retracting movement of said retractor and a lock tab disposed at the inner end of said sleeve adapted to be moved into position to dog said outside knob spindle when said sleeve is pushed inwardly by said push button.

2. In a lock having an inner and an outer knob each having a separate tubular spindle with a rollback arranged to reciprocate a latch retractor by the turning of either knob, said inner knob having an axial push button, means actuatable by said push button for dogging the outer knob against rotation, said means comprising a locking sleeve rotatably attached to said push button, said sleeve being non-rotatably disposed in both of said spindles and closely fitting the inside walls of said spindles, said locking sleeve being longitudinally movable by said push button, said sleeve being cut away to a cylindrical segment in the portion adjacent said retractor and being provided with segment edges with detent teeth adapted to releasably engage said latch retractor, said retractor being provided with detent bosses co-acting with said teeth, whereby said locking sleeve is released by latch-retracting movement of said retractor and a lock tab disposed at the inner end of said sleeve adapted to be moved into position to dog said outside knob spindle when said sleeve is pushed inwardly by said push button.

3. In a lock having an inner and an outer knob each having a separate tubular spindle with a rollback arranged to reciprocate a latch retractor by the turning of either knob, said inner knob having a push button, means actuatable by said push button for dogging the outer knob against rotation, said means comprising a locking sleeve attached to said push button, said sleeve being disposed in both of said spindles and closely fitting the inside walls of said spindles, said locking sleeve being longitudinally movable by said push button for dogging said outer spindle, said sleeve being cut away to a cylindrical segment in the portion adjacent said retractor and being provided with detent teeth adapted to releasably engage said latch retractor, whereby said locking sleeve is released by latch retracting movement of said retractor; a lock tab disposed at the inner end of said sleeve adapted to be moved into position to dog said outside knob spindle when said sleeve is pushed inwardly by said push button; and emergency releasing means in said outer knob comprising a blade-operable emergency turn button mounted in said outside knob spindle, and an emergency release shaft having a rollback at its end adjacent said retractor and said cut away portion of said locking sleeve, said release shaft being disposed inside said locking sleeve.

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