Feb. 3, 1953 R. C. CERF, JR 2,627,436

DOORKNOB SPINDLE SECURING MEANS

Filed May 2, 1949 2 SHEETS--SHEET 1

FIG. 1.

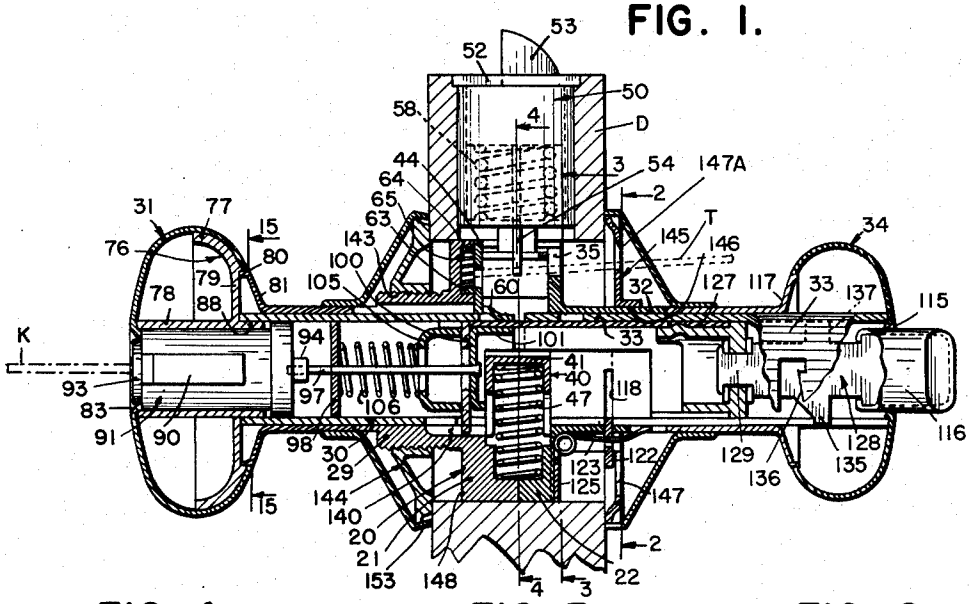


FIG. 4.

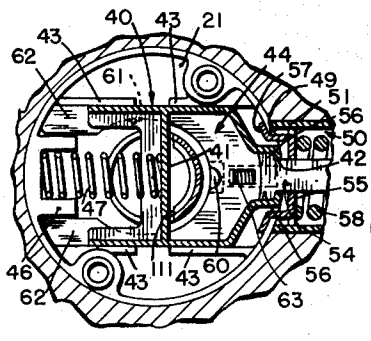


FIG. 3.

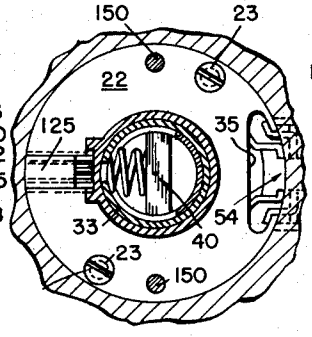


FIG. 2.

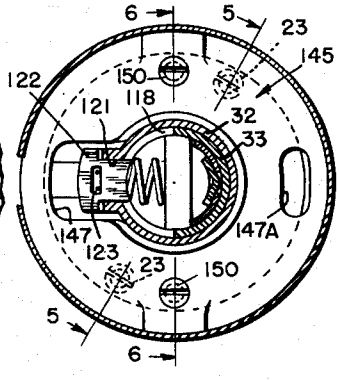


FIG. 12.

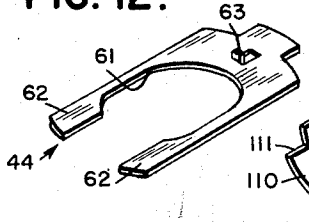


FIG. 13.

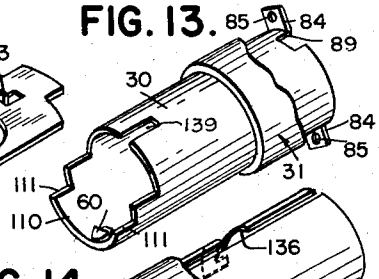
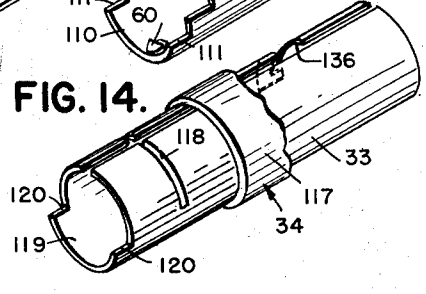


FIG. 14.



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FIG. 5.

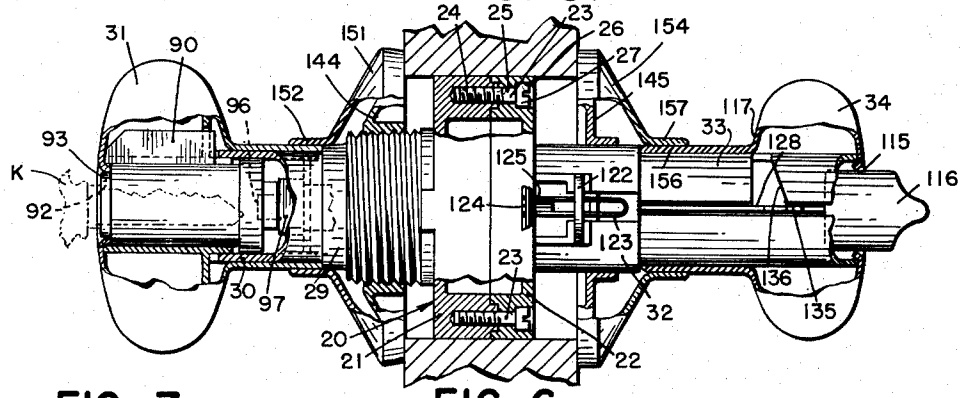


FIG. 7.

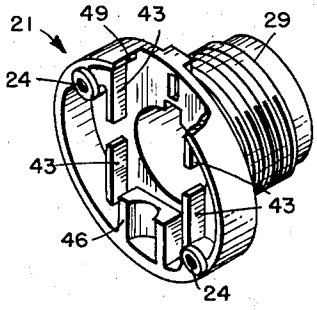


FIG. 8.

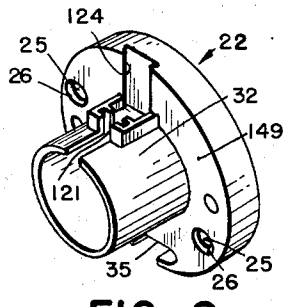


FIG. 9.

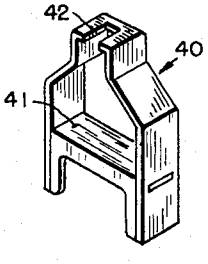


FIG. 6.

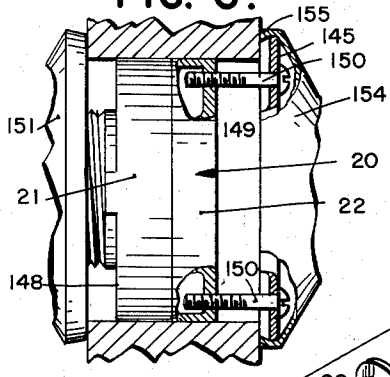


FIG. 10.

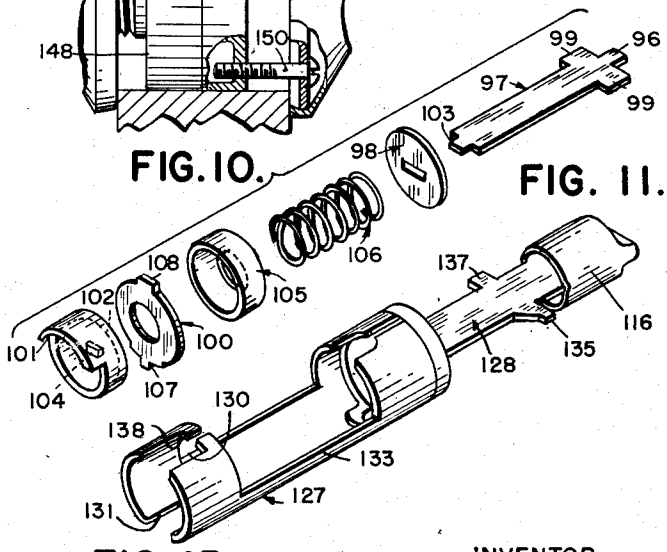
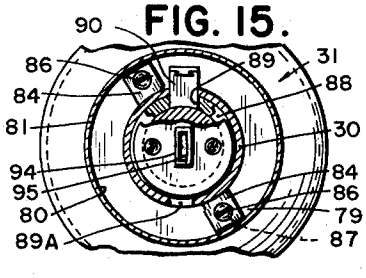


FIG. 11.

FIG. 15.



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2,627,436

DOORKNOB SPINDLE SECURING MEANS

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Application May 2, 1949, Serial No. 90,942

2 Claims. (Cl. 292—352)

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This invention relates to a door knob lock and latch set with inside turn-button spindle-locking means for the outside knob and including key operable latch retraction means.

The general object of the invention is to provide an improved dook knob lock and latch set particularly adapted for outside doors in which the outside knob may be locked against turning by a turn button located in the inside knob which locking remains effective after subsequent turnings of the inside knob for retracting the latch and after retraction of the latch by means of a key operating in a cylinder lock in the outside knob. Another object is to provide in the lock set of the kind described means for easily removing the inside and outside knobs and spindles to facilitate the proper installation of the lock set on a door but which means, after the mounting of the set on the door, become inaccessible for removal of the outside knob and spindle except by access from the inside of the door. A further object is to provide in a door knob and lock set of the kind described, means for disconnecting the outside knob and spindle without removal of the body or latch unit from the door.

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

Figure 1 is a plan view partly in section of a preferred form of my lock and latch set as mounted on a door, with portions broken away to better show the structure;

Figure 2 is a cross-sectional view taken on the line 2—2 of Figure 1;

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 2;

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

Figure 7 is a perspective view of the outside half portion of the lock body;

Figure 8 is a perspective view of the inside half portion of the lock body;

Figure 9 is a perspective view of the retractor;

Figure 10 is a disassembly view of the key-actuated shaft and rollback together with the outside spindle locking means, the parts being shown in perspective;

Figure 11 is a perspective view of the turn button locking sleeve;

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Figure 12 is a perspective view of the retainer key plate used to rotatably hold the outside spindle in the body;

Figure 13 is a perspective view of the spindle for the outside knob;

Figure 14 is a partial view in perspective showing the inside knob assembly; and

Figure 15 is a partial cross-sectional view taken on the line 15—15 of Figure 1.

In the preferred form of my invention shown in the drawings, the lock and latch set consists of a body 20 which is generally cylindrical in shape and is assembled from die-cast metal half portions designated 21 for the outside half portion and 22 for the inside half portion, these half portions being assembled as a hollow unitary body 20 by means of the assembly screws 23 whose threaded ends engage threaded holes 24 in the outside half portion 21, the corresponding unthreaded holes 25 in the inside half portion 22 being countersunk at 26 to receive the heads 27 of the assembly screws 23. In the drawings, the left hand knob containing the key-actuated cylinder lock and the appurtenances thereto are referred to as "outside" and the right hand knob containing the turn button and the appurtenances thereto are referred to as "inside," this referring to the door mounting, for example, such as an entrance house door. The outside half portion 21 is provided with an outside threaded outwardly extending axial bearing sleeve 29 adapted for the mounting therein of the outside tubular spindle 30 upon the end of which the outside knob 31 is fastened. The inside half portion 22 is also provided with an elongated axial bearing sleeve 32 extending from the body 22, in which is mounted for rotation the inside tubular spindle 33 on the end of which is mounted the inside knob 34. A window 35 is provided to give access to the interior of the housing for purposes to be explained below.

The latch bolt retractor 40 consists of a generally rectangular frame having a thrust partition wall 41, and having the opposed sides taper to an end slot 42 at the end of the frame opposite said partition wall 41, said notch being adapted to engage the latch bar 54 by means of the end lugs on the end thereof. The retractor 40 is adapted to reciprocate within the hollow body 20, being provided with guide members 43 formed in the interior of the outside half portion 21. The retractor 40 is arranged to slide on the retainer key plate 44 which is disposed and adapted to slide between the guide members 43, the further structure and function of which

will be described below. A coil compression spring 47 is interposed between the bottom of the hole formed between the half bodies 21 and 22 in the bosses 46, and the underside of the thrust partition wall 41, of the retractor 40, thus normally forcing the portion of the retractor having the end slot 42 toward the window 49 in the body 20 at which position the latch bar unit 50 is attached, as will be described.

The spring latch unit 50 consists generally of a cylindrical housing 51 which is adapted to fit in a hole drilled from the edge of the door at right angles to the main body mounting hole in the door, the unit being held by the flush plate 52 which is countersunk and attached to the edge of the door by screws (not shown). The latch bolt 53 normally protrudes through an opening in the flush plate, the latch bolt being connected to the latch bar 54 which extends through the other or rear end closure 55. The latch bar 54 is provided with end lugs 56 which, as described above, are engaged by the slot 42 of the retractor. The attaching tabs 57 extending from the end closure 55 are formed to slide under the margins of the window 49 in the body 20, the edge of the cylindrical housing 51 of the latch unit being arranged to press on the opposite or outside surface of the margins of the window 49. The latch unit 50 is thus slidingly attached to the body 20 at the window so that its longitudinal position relative to the cylindrical main body may be adjusted by sliding it along the marginal edge of the window. The coil spring 58 is provided within the cylindrical housing 51 abutting the end closure 55 and the inside end of the latch bolt 53, thus normally tending to push the latch bolt outwardly.

The outside tubular spindle 30 is provided with an outwardly extending detent button 60 which is adapted to be engaged by the retainer key plate 44 which as previously stated is adapted to slide between the guide members 43. The plate 44 is provided with an elongated central opening 61 for the spindle which permits the plate to be shifted flatwise, the legs 62 fitting between the guides 43 and the spring boss 46. The plate is provided with a right angled lug 63 on its back side, which coacts with a small compression coil spring 64 which is seated in a groove 65 in the half body 21, to normally hold the key plate 44 in keying position behind the spring detent button 60. The outside knob spindle 30 is released by manually raising the key plate 44 with a pointed tool T through windows in the body and the inside clamping plate.

The outside knob 31 consists of a knob body 76 having a rim portion 77 and a coaxial hub 78 which is connected to the rim portion by the disk 79 disposed inwardly from the rear face of the knob, and is provided on its rear side with a rim 80 defining the large opening on the rear face of the knob which is closed by the closure shell member 81. The main portion of the knob is covered by a shell spun or otherwise formed over the knob body to form the usual ellipsoidal door knob whose front face is provided with an opening 83 coinciding with the opening of the hub 78 where it abuts the front inside face of the knob, the margin of the shell around the hole being turned in against the inside wall of said hub. The outside knob spindle 30 is attached to the face of the knob disk 79 by attaching ears 84 turned outwardly from the periphery of the spindle, holes 85 being provided therein for the screws 86 which are threaded into corresponding threaded holes 87 in the disk. The spindle is fitted over the extension 88 of the hub 78 and two slots 89 and 89A are provided 180 degrees apart to alternatively hold the pin chamber 90 of the pin tumbler lock 91. The slot 92 in the lock cylinder 93 for a removable cylinder operative key is exposed at the opening 83 on the front face of the outside knob 31. When it is desired to reverse the position of the key slot 92 so that the unnotched side of the key will be on the lower side, for example, the spindle 30 is disconnected from the disk 79 by removing the screws 86, following which the knob is turned through 180 degrees and again attached to the ears 84 of the spindle with the alternative slot 89A engaging the pin chamber and with the key slot in reversed position.

The inner end of the lock cylinder 93 is provided with a cap 94 which is provided with a non-circular hole 95 which makes operative connection through the tongue 96 with the turning bar 97 for the key-actuated semi-cylindrical rollback 101, the said bar being centered axially within the outside tubular spindle 30 by the washer 98, stop arms 99 adjacent the tongue 96, and by the locking tab disk 100 rotatably mounted upon the bar 97 adjacent the rollback 101, said rollback extending from the rollback disk 102 which is non-rotatably attached to the end of the bar 97, for example, by a tongue 103, which is held rigidly in the corresponding hole 104 in the rollback disk 102. A spacer member 105 is rotatably mounted on the bar 97 between the disk 100 and the washer 98, and a compression coil spring 106 is disposed around the bar between said washer 98 and spacer 105. The locking tab disk 100 is provided with a peripherally extending locking tab 107, and is conveniently provided with an aligning tab 108 for the purposes described below.

The outside spindle 30 is provided at its unattached end with a rollback 110 which is a semi-cylindrical end of the tubular spindle, the longitudinal edges 111 being adapted to press alternatively when the outside knob is turned, upon the thrust partition wall 41 of the retractor 40 to thereby move the retractor and the latch bolt which is operatively attached thereto. In order to permit the necessary rotation of the outside knob 31, a portion of the spindle 30 between the rollback 110 and the locking slot 139, approximately one-half the circumference, is cut away to avoid interference with the locking tab 107 when this tab is not being depressed by the turn button and its associated parts, that is, when the outside knob 31 is free to be turned to operate the latch.

The inside knob 34 is attached to the inside tubular spindle 33, the spindle extending through the knob to the front face thereof to define an opening 115 in which the turn button 116 is mounted. The knob is provided with a finish hub 117 extending toward the body 20 and telescoping over a portion of the spindle 33, the end abutting the end of the inside bearing sleeve 32. The spindle 33 is provided with a circumferential retainer key slot 118 which extends approximately one-half the circumference of the spindle to permit the turning of the spindle for a sufficient amount to fully move the retractor 40 by means of the rollback 119 at the end of the spindle 33. This rollback 119 at the end of the spindle 33 consists of a short segment of the tubular spindle with longitudinal edges 120 arranged to alter-

natively press upon the thrust partition wall 41 of the retractor 40, one edge being effective when the knob 34 is turned in one direction and the other edge when the knob is turned in the opposite direction, in either case to move the retractor and withdraw the latch bolt 53. The retainer key 122 fits in the retainer key slot 118 and in the retainer key slot 121 in the sleeve 32 of the body 20. The retainer key 122 is normally held down in place by a hairpin spring 123 which is attached at one end to the end of the cylindrical body 20 in the groove 124 by the dovetailed keeper 125.

The turn button 116 is connected to the spindle locking sleeve 127 by the bayonet bar 128 whose other end is swivel connected at 129 to the spindle locking sleeve 127. The spindle locking sleeve 127, in its mid-portion, is cut away leaving a segment 133 of about one-third of the cylinder to avoid interference with the reciprocatory movement of the retractor 40. The other end of the locking sleeve 127 is provided with a circumferential opening 130 on one side for the locking tab 107 and on the opposite side with a circumferential opening 131 for the aligning tab 108.

The bayonet bar 128 connecting the turn button 116 and the locking sleeve 127 is provided with a bayonet pin 135 extending outwardly from the bar and adapted to follow the bayonet groove 136, which is provided in the end of the inside tubular spindle 33 adjacent the turn button 116. An aligning tab 137 is provided opposite the bayonet pin tab 135 in order to hold the latter in the bayonet groove 136 when the turn button is pressed inwardly and turned to lock the button in its inward position. The longitudinal or inward movement of the button 116 moves the locking sleeve 127 so that the end 138 of the opening 130 presses the locking tab 107 into the locking slot 139 in the outside spindle 30, this locking slot being on the side of the cylinder opposite the rollback 110. The locking tab 107 also engages the groove 140 in the outside bearing sleeve 29, thus preventing rotation of the spindle 30 relative to the bearing sleeve 29. The turn button 116 is thus pressed inwardly and rotated in order to engage the bayonet pin tab 135 in the bayonet groove 136 and thereby hold the locking sleeve 127 against the locking tab 107, locking the outside knob against rotation. The inside knob, because of the swivel connection at 129, may be rotated without releasing the turn button 116, thus the retractor and the latch bolt may be operated from the inside knob without effecting the locked condition of the outside knob.

The latch may also be retracted by the use of the removable pocket key K which operates the lock cylinder 93, which in turn is operatively connected through the turning bar 97 to the rollback 101. This rollback 101 actuates the retractor 40 independently of the rollbacks 110 and 119 on the outside spindle 30 and the inside spindle 33, and irrespective of the position of the turn button 116, thus permitting the retraction of the latch bolt at any time by means of the key K.

The body 20 is arranged to be positioned centrally in the mounting hole in the door D by means of the threaded clamping disk 144 and the removable clamping disk 145 disposed respectively on the outside and inside of the door. An opening 146 is provided in the clamping disk 145 for the inside bearing sleeve 32 and two windows are provided at diametrically opposite positions, one window 147 being provided to give access to

the hairpin spring 123 holding the retainer key 122, and the other window, 147A coinciding with the window 35 in the inner half 22 of the body 20, through which a long pointed rod or pick T may be inserted to raise the retainer key plate 44 against the spring 64 over the detent button 60, and thereby release the outside knob 31 and its spindle 30. The threaded clamping disk 144 is also provided with an opening 143 for the outside bearing sleeve 29. The position of the threaded clamping disk 144 relative to the outside face 148 of the body 20 is adjustable by rotation on the threaded sleeve 29 to correspond to the thickness of the door on which the set is to be mounted either before or after the body 20 is placed in the hole, following which the removable clamp disk 145 is attached by two or more screws 150 threaded into the face 149 of the inside half body portion 22, the heads of the screws 150 holding the disk, thus clamping the marginal edges of the disks against the margins around the mounting hole in the door.

A rosette 151 having an outwardly extending finish hub 152 is preferably non-removably attached to the peripheral edge of the attached clamping disk 144 by crimped-over edges 153 as shown for example particularly in Figure 1. The hub 152 is adapted to cover the joint between the knob closure member 81 and the outside bearing sleeve 29, thus securely hiding all screws and retainer keys, so that the outside knob and spindle may not be tampered with.

An inside rosette 154 having a turned-over peripheral rim 155 is adapted to frictionally engage the peripheral edge of the removable clamping disk 145, the rosette being provided with a central opening 156 for the inside bearing sleeve 32, and having a finish hub 157 extending toward the inside knob 34 and covering the joint between the finish hub 117 of said inside knob 34 and the inside bearing sleeve 32.

The advantages of my invention will be apparent. The rigid die-cast body and the integral elongated bearing sleeves for the knob spindles provide a durable lock set in which the knobs and spindles do not become loose and wobbly after long use. The set is adapted to be used upon doors of slightly varying thicknesses, with the protrusion of the knobs being equalized on the two sides of the door. The latch bolt is independently retracted through a common retractor by the turning of either knob in either direction and also by means of a removable key turned in either direction. The outside knob may be fixed through the inside turn button against rotation so that entry may not be effected without the use of a proper key. This outside knob locking is unaffected by the subsequent use of the inside knob for retracting the bolt, and is also unaffected by the use of the removable key, the outside knob continuing to be locked against rotation after the key is removed. The outside knob is not released by pushing in the latch bolt, as in closing the door. The key slot for the removable key is easily reversible in position so that the lock may be properly positioned on either right or left hand doors and under the same circumstances the latch bolt unit may be reversed in position through its tongue and groove connection with the retractor. The outside knob and its attached spindle may be easily disconnected and removed for changing the key combination or for reversing the position of the key slot, by raising the retainer key plate by access with a pointed rod or tool through the provided windows in the body

and the inside clamping plate, without removing the latch or lock body from the door, it being only necessary to remove the rosette and inside knob. The labor required for installation adjustment and resetting of my lock and latch set is reduced to a minimum by the provision of the described cylindrical body mounted in a bored hole through the door, with the latch bolt unit being mounted in another hole drilled from the edge of the door at right angles to the main mounting hole.

I claim:

1. In a door knob lock and latch set having a hollow cylindrical retractor body adapted to be mounted in a bored hole in a door, said body having an elongated outside sleeve bearing for a tubular spindle extending into the cavity of said body and having a latch bolt retractor mounted for reciprocation within said body, said retractor having a thrust plate against which a rollback on the outside knob spindle presses to retract a spring latch bolt; means for rotatably holding said outside spindle in said outside sleeve bearing, said means for holding said outside spindle being releasably by means accessible from inside of the door after said body is mounted therein, said means including a retainer key plate slidable between the inside surface of said body and said retractor, and a detent button near the rollback end of said outside knob spindle, said retainer key plate being normally spring held adjacent said detent button.

2. In a door knob lock and latch set having an

outer knob with its attached tubular spindle mounted for rotation in a lock body independently of an inner knob with its spindle, means for releasably holding said outer knob spindle against removal from said body while permitting axial rotation, said means including a retainer key plate disposed around said spindle, said spindle being provided with an outwardly extending detent button abutting said retainer key plate, said retainer key plate being slidably movable inside said body at right angles to the spindle axis behind said detent button and means to hold said plate adjacent said spindle at said detent button, the opening in said plate being elongated to permit shifting of said plate to disengage said detent button and release said spindle.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
769,768	Phelps	Sept. 13, 1904
1,876,079	Schlage	Sept. 6, 1932
1,991,031	Schlage	Feb. 12, 1935
1,994,134	Henst	Mar. 12, 1935
2,046,342	Muck et al.	July 7, 1936
2,076,125	Grimsrud	Apr. 6, 1937
2,138,856	Harp	Dec. 6, 1938