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Spon

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[54] **UNIVERSAL KEY LOCK, PRIVACY LATCH AND DOORKNOB**

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[73] Assignee: **Keystone Consolidated Industries, Inc.**, Peoria, Ill.

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[52] **U.S. Cl.** **70/146**, 292/169.14, 292/359

[51] **Int. Cl.** **E05b 55/04**

[58] **Field of Search** 70/146, 147, 216; 292/359, 292/169.21, 169.18, 169.14, 169.15

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Attorney, Agent, or Firm—Molinare. Allegretti, Newitt & Witcoff

[57] **ABSTRACT**

An improved door latch set which may be converted from a basic latch set into a privacy latch set or into a key lock latch set. The set includes a latch assembly, an inside doorknob assembly and an outside doorknob assembly. The doorknob assemblies are interconnected by a spindle which fits through a cam of the latch assembly. Rotation of the doorknob drives the cam which, in turn, moves the bolt of the latch assembly into or out of engagement with a strike. The inside doorknob assembly may include a push button lock mechanism which locks the latch set upon depression of the push button. The locked latch set may be released by twisting the inside doorknob or by a key mechanism associated with the outside doorknob. That is, rotation of the key mechanism drives a latching bar connected with the push button mechanism and effects release of the push button mechanism.

20 Claims, 8 Drawing Figures

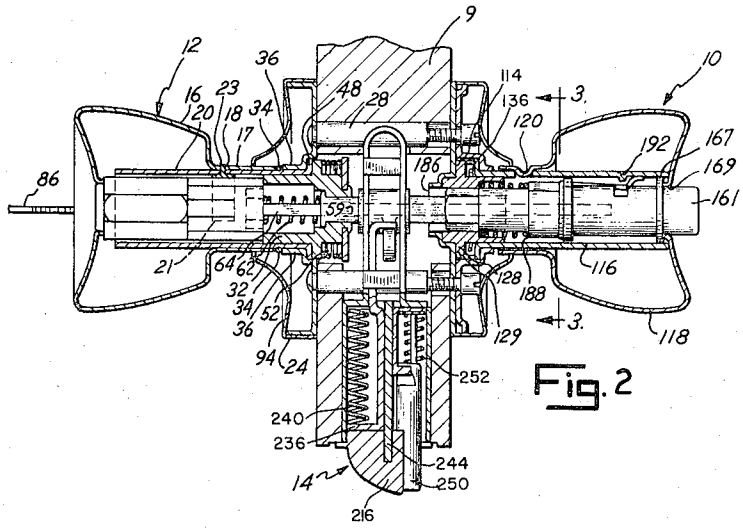


Fig. 2

Fig. 1

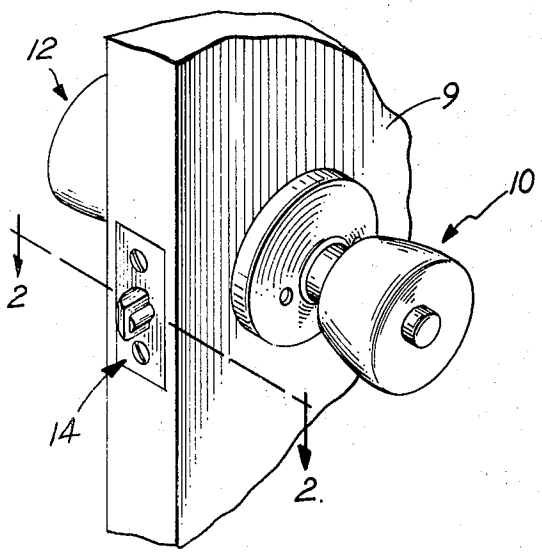
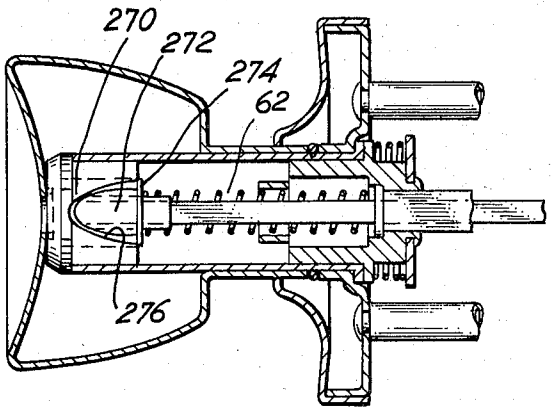


Fig. 4



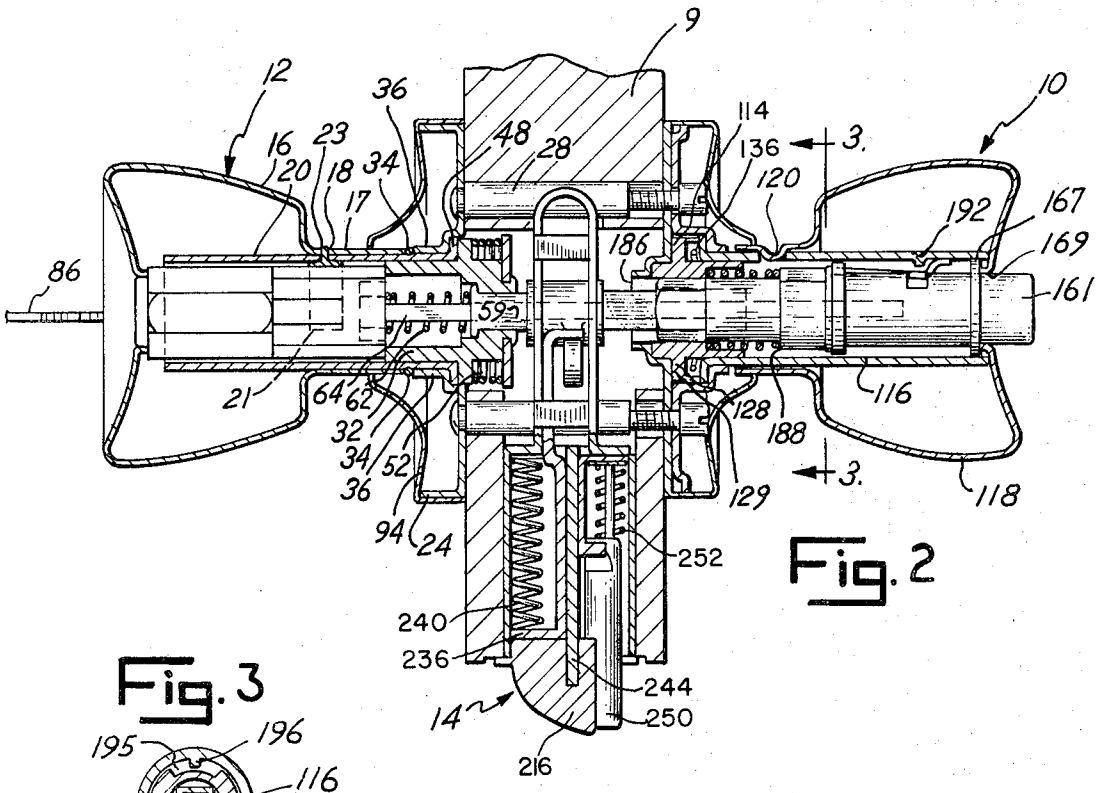


Fig. 2

Fig. 3

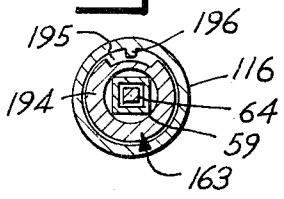


Fig. 5

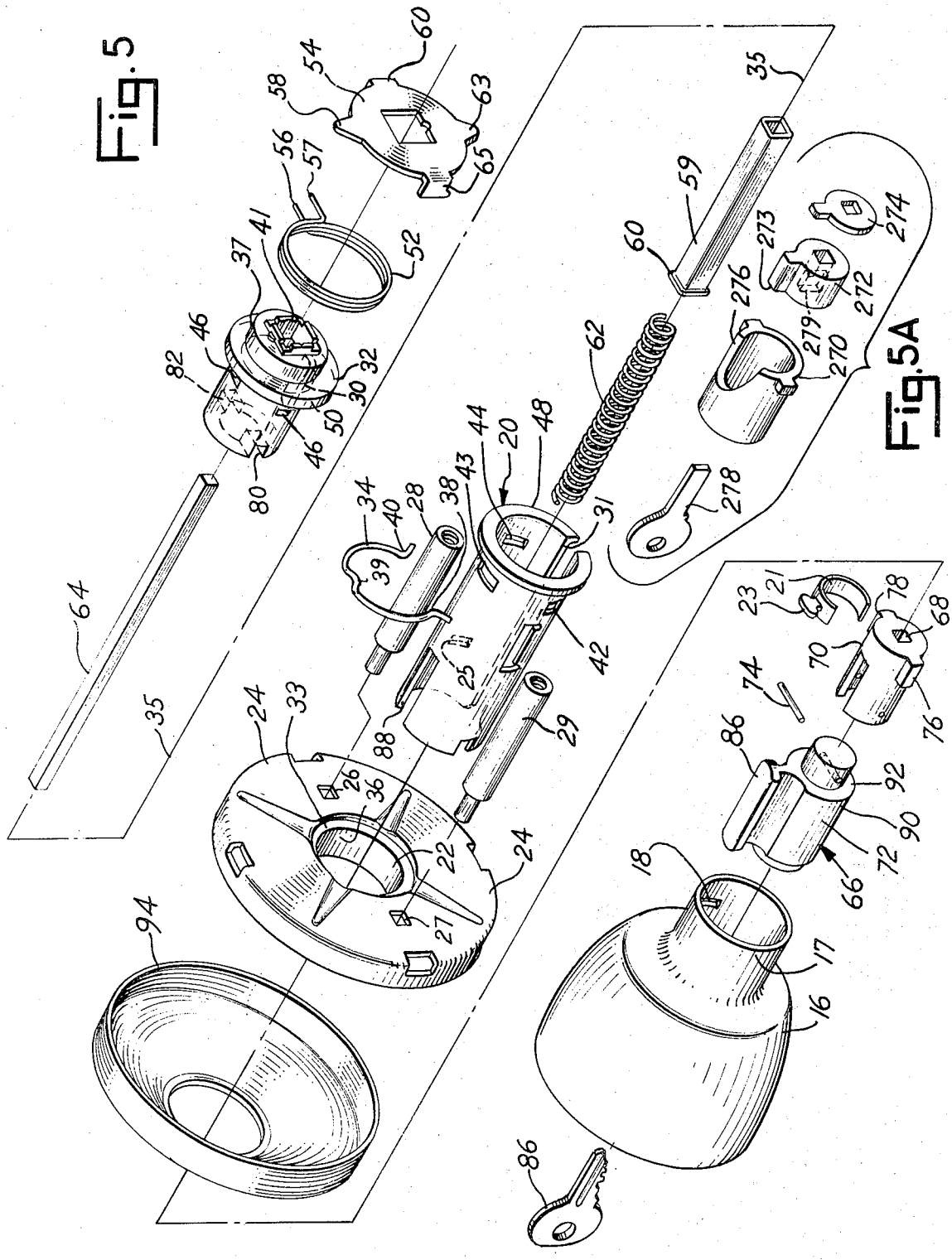


Fig. 5A

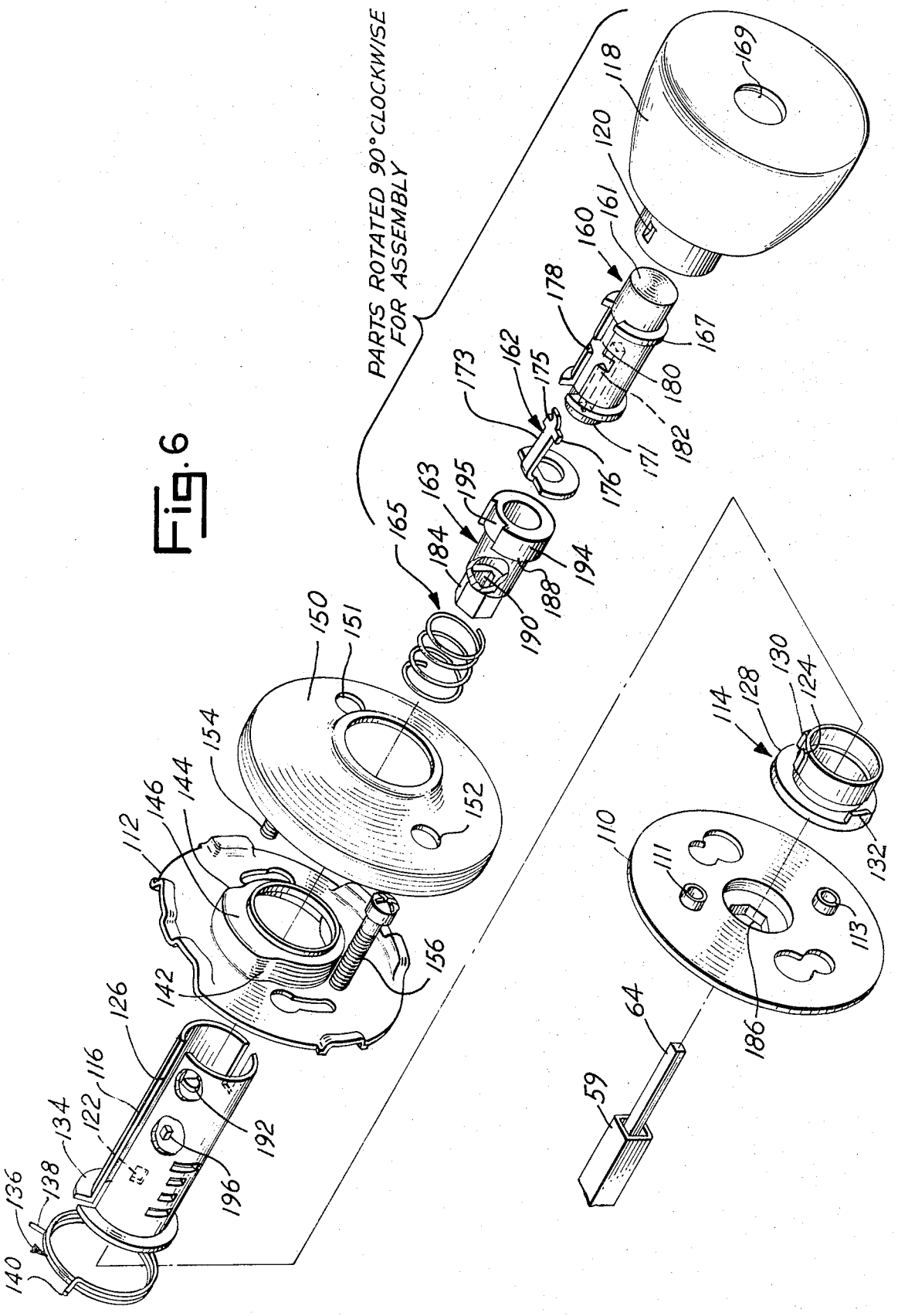

PARTS ROTATED 90° CLOCKWISE FOR ASSEMBLY
140
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138
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154
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186
64
59

Fig. 6

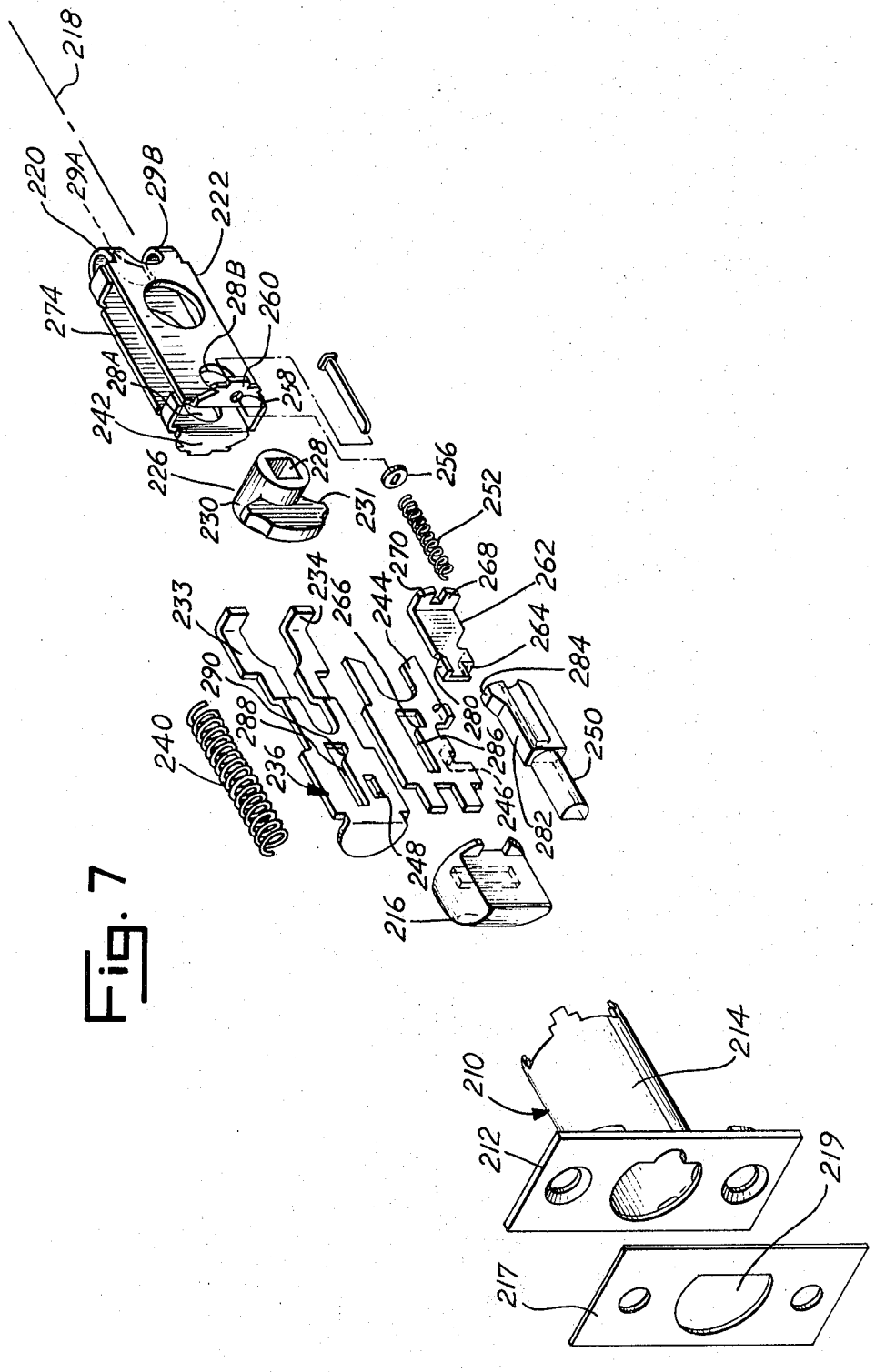

218
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248
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214
210
212
219
217

Fig. 7

UNIVERSAL KEY LOCK, PRIVACY LATCH AND DOORKNOB

BACKGROUND OF THE INVENTION

This invention relates to an improved door latch set and, more particularly, to a latch set which may be converted from a simple doorknob assembly into a privacy latch set or a key latch set by a minimum interchange of parts.

A simple latch set will generally include a latch assembly with a bolt for engaging a strike, an indoor knob assembly and an outdoor knob assembly. The knob assemblies are interconnected by a spindle which also connects with bolt driving means associated with the latch assembly. Turning of one knob or the other will cause the bolt to be removed from the associated strike.

An additional feature that may be incorporated in a latch set assembly is a key lock mechanism for locking the bolt and doorknobs in a closed position. Also a privacy latch may be provided. A privacy latch is generally a push button actuated mechanism which operates to lock a latch set in a closed position from the inside knob assembly. The privacy latch mechanism may or may not be incorporated with a key latch mechanism. Of course, for safety purposes it is most desirable to have a key operated safety release associated with the push button latch so that if a door with a privacy latch is closed when in the latched or locked position, it is possible to open the door from the outside.

While the above-described latch sets are available in various combinations, the inventors are not aware of any latch set wherein the parts of such an assembly are designed and constructed so that by the mere substitution of a few parts or addition of a few parts, a simple doorknob latch set can be converted into a complex privacy latch set and key lock latch set. It is a purpose of the present invention to provide such an improved latch set construction wherein a basic framework of parts can be supplemented by additional parts in order to convert a simple doorknob latch set into a key lock latch set.

SUMMARY OF THE INVENTION

In a principal aspect, the present invention comprises a latch set which includes a bolt that is normally biased into engagement with a strike. An inside and outside doorknob assembly are each comprised of knob means positioned to rotate in plate means. A spindle interconnects the knob means through the plate means and also engages the latch assembly so that upon rotation of the knob means, the bolt is removed from the strike. A plunger associated with a first one of the knob means may be made to move into and out of engagement with the non-circular opening in the plate means associated with the first knob means. In this manner, by appropriate positioning of the plunger, the latch set may be locked. The plunger may be disengaged from the non-circular opening by rotation of the first knob means or by actuation of a key mechanism associated with the other knob means. The key mechanism acts through a bar mechanism connected to a plunger release mechanism in the first knob means. A novel deadbolt mechanism is also provided.

It is the object of the present invention to provide an improved latch set wherein parts in the set may be substituted or supplemented in order to change the functions of the latch set.

It is another object of the present invention to provide a novel latch set having a push button type privacy latch which may be released by turning the knob associated with the push button.

Still another object of the present invention is to provide an improved latch set having a push button inside knob assembly and a key operated outside knob assembly.

One further object of the present invention is to provide a latch set with a latch assembly that includes a dead latch that prevents operation of the bolt except by appropriate rotation of knob means.

Still another object of the present invention is to provide a latch set assembly which can be easily attached to a door or the like and easily removed for repair, alteration, replacement or service.

One further object of the present invention is to provide a novel latch set with improved features not available in the prior art.

These and other objects, advantages and features of the invention will be set forth in the detailed description which follows.

BRIEF DESCRIPTION OF THE DRAWING

In the detailed description which follows, reference will be made to the drawing comprising of the follwoing FIGURES:

FIG. 1 is a perspective view of the key lock latch set of the invention as incorporated in a door;

FIG. 2 is a cross-sectional view of the latch set of FIG. 1 taken substantially along the line 2—2;

FIG. 3 is a cross-sectional view of the inside knob assembly of the push button locking mechanism of the improved latch set of the present invention taken substantially along the line 3—3 in FIG. 2;

FIG. 4 is a cross-sectional view of an alternative construction of an outside doorknob assembly which may be used in combination with the latch set of the present invention;

FIG. 5 is an exploded, perspective view of the outside doorknob assembly;

FIG. 5A is an exploded, perspective view of an alternative key lock mechanism for the outside doorknob assembly illustrated in FIG. 5;

FIG. 6 is an exploded, perspective view of the inside doorknob assembly including a push button release mechanism; and

FIG. 7 is an exploded, perspective view of the latch assembly including a bolt engageable with a strike and also including dead bolt means.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 depicts one embodiment of the invention incorporated with a door **9**. The mechanism shown in FIG. 1 is a key lock latch set. It includes a push button operated inside doorknob assembly **10**, a key operated outside doorknob assembly **12** and a latch bolt assembly **14**. The three assemblies **10**, **12** and **14** are interconnected in a manner to be described below. It is possible to substitute parts and supplement of the various assemblies **10**, **12** and **14** to provide a privacy lock latch set or a passage latch set. This will become more apparent in the detailed description which follows.

FIG. 2 is a cross-sectional view of the entrance key lock, pin tumbler security latch set illustrated in FIG. 1. The following description of the latch set outside doorknob assembly 12 shown in FIG. 2 should be considered with FIG. 5, an exploded, perspective view of the outside doorknob assembly. FIG. 6, an exploded, perspective view which illustrates the inside knob assembly 10, and FIG. 7, an exploded perspective view which illustrates the latch bolt assembly 14, are considered separately along with FIG. 2 in subsequent sections of this description. FIGS. 4 and 5A illustrate an alternative outside doorknob assembly 12 and will be discussed in detail following the discussion of the knob assemblies and latch bolt assembly as shown in the other figures.

OUTSIDE DOORKNOB ASSEMBLY

Referring therefore to FIGS. 2 and 5, the outside doorknob assembly 12 for the entrance key lock, pin tumbler security configuration of the present invention includes a door knob 16 of a conventional shape and size. The doorknob 16 includes a cylindrical forward post section 17 with a slot 18. The section 17 is adapted to slide over a tube 20.

The knob 16 is attached to the tube 20 by a snap spring 21 which includes a tab 23 projecting through an opening 25 in the tube 20 and the opening 18 in the knob 16. In this manner, the knob 16, tube 20 and a tube insert 32 may be made to rotate in unison.

The tube 20 fits through a central circular opening 22 in a clamp plate 24. A flange 48 of tube 20 fits against an annular bearing surface 33 of plate 24. A tube insert 32 is axially slidable into the tube 20 and includes a key 30 that fits into a slot 31 of tube 20 to insure proper relative orientation of the tube 20 and insert 32. The tube insert 32 includes a flange or collar 50 which is positioned against the flange 48 of the tube 20.

A retainer spring 34 for tube 20 is positioned adjacent a flange 36 associated with the opening 22 on the side of the flange 36 opposite surface 33. Spring 34 includes projections 38–40 which are received by slots 42–44 respectively in the tube 20 and depression 46 in the tube insert 32. In this manner, the outer circumferential flange 48 of the tube 20 in cooperation with the retainer spring 34 serves to maintain the tube 20 in a fixed position non-slidable relative to a center line axis 35 of the assembly. The tube 20 is, however, rotatable about the centerline axis 35 through opening 22 and for this reason a lubricant is preferably provided on the matching surface 33 of the tube 20 and the flange 48. The clamp plate 24 includes a pair of spaced apertures 26 and 27 into which threaded studs 28 and 29 respectively are fastened.

A knob return spring 52 is positioned about the outside end portion of tube insert 32 and maintained in that position by a spring plate 54 which is attached to a keyed end projection 41 of tube insert 32. The knob return spring 52 includes a first spring end 56 and a second spring end 57 which are positioned to cooperate with stud 28. Ends 56 and 57 are thus positioned on opposite sides of the stud 28. The spring plate 54, besides holding spring 52 in position, also includes tabs 60 and 65 which are engageable with the spring ends 56 and 57. Tab 60 and stud 28 in cooperation with ends 56 and 57 provide a biasing action which tends to center the knob 16 when knob 16 is manually rotated away from its normally unbiased or center position. Thus, the first spring end 56 will engage the stud 28 and the second spring end 57 will engage tab 60 of the spring plate 54 as the tube 20 and attached tube insert 32 are rotated in response to a manual activation of the knob 16 in the counterclockwise direction as illustrated in FIG. 5. Release of the knob 16 permits the spring 52 to bias the knob 16, tube 20, insert 32 and plate 54 back to the original center position. Projections or ears 58 and 63 spaced at 90° intervals intermediate the tabs 60 and 65 limit the possible rotation of the knob 16 to 90° in either direction by engaging the studs 28 or 29 as the case may be.

The tube insert 32 is provided with an axial passage which is shaped to receive a spindle 59. In this preferred embodiment, the spindle 59 has a square tubular shape with a flanged end 60. A spring 62 is guided on a bar 64 that slides within the spindle 59 and biases the spindle 59 into engagement with the tube insert 32 in the manner illustrated in FIG. 2.

The bar 64 is held in position by a cylinder and tumbler subassembly 66. That is, the bar fits into a shaped opening 68 of a coupler member 70. The bar 64 is compression fitted into the opening 68. The coupler member 70 is attached to a key actuated tumbler mechanism 72 by means of a pin 74. The member 70 includes side extensions 76 and 78 which are adapted to fit within oversized slots 80 and 82 in the tube insert 32. Thus, the tumbler assembly which may be rotated by operation of a key 86 will also rotate the member 70 and bar 68, however the amount of rotation is limited by the sides of slots 80 and 82 engaging with extensions 76 and 78.

The tumbler mechanism 72 includes an upwardly extending tumbler section 86 which is of conventional construction. Section 86 is positioned in a slot 88 in the tube 20. Thus, outer housing portion 90 of the tumbler mechanism 72 remains in a fixed position relative to the knob 16. Inner cylindrical portion 92 of the tumbler mechanism 72 may, however, be rotated in response to operation by key 86, thereby rotating the bar 64 as described above. The purpose and operation of the bar 64 will be set forth in greater detail below as will the purpose and operation of the spindle 59.

To complete the outside doorknob assembly 12, a cover plate 94 fits over and snaps onto the clamp plate 24.

INSIDE DOORKNOB ASSEMBLY

FIGS. 2 and 6 illustrate the inside koorknob assembly 10. The inside doorknob assembly includes a lower clamp plate 110 which is riveted by rivets 111 and 113 to an upper clamp plate 112. The lower clamp plate 110 and upper clamp plate 112 cooperate with a tube insert 114 and a tube 116 to provide a shaft upon which a knob 118 is rigidly mounted by means of a projection 120 of the knob 118 extending into a slot 122 in the tube 116.

The insert 114 includes an alignment lug 124 which fits in a longitudinal slot 126 running the length of the tube 116. This insures that the insert 114 and tube 116 will rotate in unison between the plates 110 and 112 and that the insert 114 and tube 116 are oriented properly with respect to one another. The insert 114 includes a circumferential flange 128 which engages against a surface 129 of the lower clamp plate 110 in the manner illustrated in FIG. 2.

A pair of spaced lugs 130 and 132 project from the flange 128. The lugs 130 and 132 abut against an outer flange 134 of the tube 116 thereby spacing the flange 134 from the flange 128 so that a knob return spring 136 may be placed about the insert 114 and maintained between the flanges 134 and 128. The lugs 130 and 132 also engage the opposite ends 138 and 140 of the spring 136. That is, when the inside knob assembly is in an unrotated position, the spring ends 140 and 138 will rest respectively against the lugs 132 and 130 and also against sides 142 and 144 of a pocket 146 in the upper clamp plate 112. When the tube 116 and attached insert 114 are manually rotated by operation of the knob 118, for example, in the clockwise direction, the end 140 will be driven by the lug 132 in a clockwise direction. The side 144 will hold the other end 138 preventing rotation of the spring 136. After a rotation equal to the amount of separation between the lugs 130 and 132, the end 140 will also engage the side 144 along with the end 138. This will prevent further rotation of the knob 118 in the clockwise direction. Release of the knob 118 permits the spring 136 to recenter the assembly. Centering and limiting of rotation in the opposite direction is effected in a similar manner.

A cover plate 150 snaps onto the clamp plate 112 to provide aesthetic appearance for the inside doorknob assembly. Openings 151 and 152 are provided in the cover plate 150 for access to screws 154 and 156 which threadably engage the studs 28 and 29 respectively shown in FIG. 5. The screws 154 and 156 are screwed into the studs 28 and 29 in order to draw the doorknob assemblies 10 and 12 together and tightly fix them in a desired position on a door 9.

Positioned within the tube 116 is a push button assembly which includes a push button 160 and push button latch 162, a locking plunger 163 and a locking plunger spring 165. These components are arranged in the recited sequence within the tube 116 and are actually positioned at 90° in a clockwise sense from the position shown in FIG. 6. They are illustrated in this manner for clarity and completeness of description.

The push button 160 includes a flange 167 which engages a portion of knob 118 so that a manual push button portion 161 extends through an opening 169 in the knob 118. This flange 167 prevents movement of the push button 160 beyond the position shown in FIG. 2. The bar 64 discussed previously fits into a square shaped opening 182 in the push button 160 and is slidably received thereby.

The latch 162 fits over a keyed axial projection 171 of the push button 160. The latch 162 includes a spring arm 173 which biases outwardly against the inner surface of the tube 116. The spring arm 173 includes tabs 175 and 176 which fit into a transverse slot 178 defined in the push button 160. Spring arm 173 rides in an axial slot 180 in the push button 160.

The plunger 163 includes a shaped hexagonal end 184 which is adapted to fit into a shaped hexagonal opening 186 in the lower face plate 110. The hexagonal end 184 includes a square shaped inner opening 190 for receipt of the spindle 59. The bar 64 fits within the spindle 59 free to rotate therein and engages the opening 182 as described previously. The plunger 163 is continuously biased by the spring 165 into engagement with the push button 160. The spring 165 thus engages the insert 114 and a surface 188 of the plunger 163.

Depression of the push button 160 causes the plunger 163 and, in particular, the end thereof 184 to be engaged in the opening 186. The plunger 163 cannot then be rotated relative to the plate 110. Since the spindle 59 is keyed with the plunger 163, positioning the hexagonal end 184 in the opening 186 prevents rotation of the knob 16 of the outside knob assembly 12. It will be recalled that the spindle 59 is keyed to the knob 16 through insert 32 and tube 20.

The push button 160 holds the plunger 163 or is released in the following manner. The tube 116 includes an inwardly extending tab or projection 192. The arm 173 is positioned to be displaceable over the tab 192 so that the end of the arm 173 will be engaged by the tab 192 to hold the push button in a depressed position against the biasing force of the spring 165. To release the spring arm 173 from the tab 192, the knob 118 can be rotated. This also rotates the tube 116 while at the same time the spring arm 173 is maintained in a fixed position relative to the tab 192 by push button 160. Push button 160 is held by being keyed with bar 64 to knob 16 and does not rotate when the plunger end 184 is in opening 185. Thus, the projection or tab 192 becomes disengaged from the spring arm 173 as the knob 118 rotates, thereby releasing the push button 160.

Further turning of the knob 118 causes a tab 196 in FIG. 3 extending radially inward from the tube 116 to engage one of the edges of the slot 195 in a flange 194 of plunger 163. The edges of slot 195 are spaced so that disengagement of the arm 173 from projection 192 can take place upon rotation of the knob 118 from a centered position prior to engagement of one of the edges of slot 195 by tab 196. This insures a capability of "unlocking" the door by (1) rotation of bar 64 or (2) rotation of knob 118.

In addition to release of the push button 160 by means of rotation of the knob 118, it is also possible, as suggested above, to release the spring arm 173 and thus the push button 160 by rotation of the bar 64. Rotation of the bar 64 is effected by inserting key 86 in FIG. 5 to release the tumbler lock mechanism thereby permitting rotation of the key 86 and the attached bar 64. The bar 64 is freely rotatable within the spindle 59 at least so far as the stops comprising the sides of slots 80 and 82 in FIG. 5 will permit. Bar 64 rotates the push button 160 about the rotational axis of the knob assembly. As the push button 160 is rotated, the arm 173 is disengaged from the projection 192 permitting the push button 160 to snap back to its underpressed position thereby also removing the plunger 163 and in particular the end 184 from the opening 186. Removal of the key 86 will return the bar 64 to its original orientation though the door latch set will remain unlocked until the button 160 is again depressed.

LATCH BOLT ASSEMBLY

Reference is now directed to FIGS. 2 and 7 which illustrate the latch bolt assembly of the lock set of the present invention. The latch bolt assembly includes a housing 210 including a face plate 212 attached to a cylindrical housing member 214. A bolt 216 is positioned for slidable movement along a bolt axis 218 in the housing member 214. The housing member 214 is attached to a housing extension 220 comprised of a pair of parallel plate members 222 and 224.

Mounted within the extension 220 between the plate members 222 and 224 is a cam member 226 pivotable

about an axis transverse to the axis **218.** The cam member **226** includes a square cross-sectional passage **228** for receipt of the spindle **59.** The cam member **226** also includes a pair of cam surfaces **230** and **231** on opposite sides of the cam member **226.** The cam surfaces **230** and **231** are positioned for engagement with bifurcated arms **233** and **234** respectively of a bolt bracket member **236.**

The bolt bracket member **236** is biased into engagement with the bolt **216** by a spring **240** which has one end positioned against an outwardly flanged ear **242** of the extension **220.** Thus, the bolt **216** is normally biased outwardly by the spring **240** so that the bolt **216** will be engaged with a strike **217** mounted on a frame member.

A bolt carriage plate **244** is positioned parallel to the bracket member **236** and includes a tab **246** extending into an opening **248** in the bolt bracket member **236.** The plate **244** is rigidly attached to the bolt **216.** Thus, when the cam member **236** is pivoted about its pivot axis by operation of the spindle **59,** the bolt bracket member **236** and thus the bolt carriage plate **244** are transported to cause disengagement of the bolt **216** from the strike **217** opposite the face plate **212.** Rotation of the cam member **236** in either direction will so transport the bolt **216.**

A dead bolt locking mechanism is also provided. It consists of a dead bolt **250,** which when engaged by the strike **217** is caused to be pushed inward flush with the face plate **212.** The bolt **216** simultaneously passes through an appropriate opening **219** in the strike **217.** When the dead bolt **250** is positioned flush against plate **212,** it compresses a spring **252** guided by a pin **254** against a washer **256.** The pin **254** is positioned through an opening **258** in ear **260** of the extension **222.** As the dead bolt **250** is moved to its rearward position just described, a locking pawl **262** drops into position so that a locking tab **264** on the pawl **262** will engage locking surface **266** of the plate **244.**

That is, the locking pawl **262** includes a pair of bifurcated arms **268** and **270** which fit about the pin **254** and maintain the locking pawl **262** in the desired position relative to the dead bolt **250.** The locking pawl **262** may pivot or move in a plane parallel to the plane of the plate **244.** The locking pawl **262** includes a follower **280** which follows a cam surface **282** on a dead bolt **250.** When the dead bolt **250** is in the rearward position, the locking pawl **262** will be rotated downwardly in a counterclockwise direction as shown in FIG. **7** so that the tab **264** engages the surface **266** in the manner previously described.

When the dead bolt **250** is in the forward position, the upwardly projecting land **284** of dead bolt **250** engages the follower **280** so that the tab **264** will slide up into a slot **286** of the plate **244** and **288** of the bracket member **236.** Inclined surface **290** of bracket member **236** assists the release of the locking pawl **262** whenever the dead bolt **250** is moved to the forward position as illustrated in FIG. **7.**

During assembly of the entire structure, the studs **28** and **29** fit through appropriate openings **28A, 28B, 29A** and **29B** of the extension **220.** In this manner, a correct positional relationship of the latch bolt assembly **14** and the knob assemblies **10** and **12** previously described is maintained.

SAFETY RELEASE MECHANISM

Reference is now directed to FIGS. **4** and **5A** which show an alternative to the tumbler key lock construction for the outside knob assembly **12** previously discussed. A cam shifter **270,** release bar cam **272** and stop washer **274** have been substituted for the tumbler key lock assembly **66** previously described with regard to FIGS. **2** and **5.** The shifter **270** is fixed or attached to the tube **20.** The shifter **270** includes an inner cam surface **276** which engages with a cam projection **173** of cam **272** that is attached to the bar **64.** The washer **274** serves to maintain the appropriate connection between the parts and serves as a back stop for the spring **62.**

To release a locked door wherein a push button has been depressed to engage the end **184** of plunger **163** in the opening **186,** a release key **278** is positioned through an appropriate opening **279** in the shifter **270** to engage the cam **272.** The cam **272** is rotated thereby driving projection **273** along the surface **276** and also causing the cam **272** to twist the bar **64** which releases the spring arm **173** from the projection **192** in the manner previously described. Because of the shape of the surface **276,** release of the key **278** will cause projection **273** to follow the surface **276** back to a neutral or center position. This is due to the force of the spring **62.**

While two types of key mechanisms in combination with the push button latch assembly have been described, there are numerous other possibilities, and the invention is not to be considered limited by the particular key mechanism utilized in combination therewith. Also, as can be appreciated by an examination of the specification and drawings, it is possible to eliminate the key release mechanisms and push button mechanisms and merely include tubes and tube inserts and an interconnecting spindle between clamp plates of the type as shown at **24** to provide a passage latch with two interconnecting doorknobs. Thus, it is possible with the present invention to have a passage latch with two interconnected doorknobs.

It is further possible using the mechanism of FIGS. **5A** and **6** to provide a privacy lock wherein a push button actuator is utilized to lock a door from the inside for example. An application of such a doorknob assembly would be for bedrooms, bathrooms, and the like. Typically, with such an application, a release key mechanism as described above would be utilized for emergency release situations.

It is also possible to have a more sophisticated entrance key lock, pin tumbler assembly as shown in FIG. **5** for releasing the push button assembly. Typically, the front and back door of a home would utilize such a lock assembly. It is possible to utilize any of these combinations of knob assemblies with a latch bolt assembly of the type discussed and shown in FIG. **7.** Of course, it is also possible to provide a latch bolt assembly wherein the dead bolt mechanism is not included in the assembly. This would call for the removal of the dead bolt **250,** pin **254,** spring **252,** washer **256,** and pawl **262.**

As can be seen, the latch assembly of the present invention can be utilized in numerous ways to provide any desired type of latch set arrangements. By utilizing a standard tube, tube insert, locking spring, centering spring, plate and door knob, as the starting components, it is possible to add additional components and

provide any desired latch set assembly. Thus, the scope of the invention should be limited only by the following claims and their equivalents.

What is claimed is:

1. An improved lockset comprising, in combination:

a latch assembly including a housing, bolt means slidable in said housing, means normally biasing said bolt means outwardly from said housing toward a strike;

an inside knob assembly, including knob means, plate means, and means rotatably attaching said knob means to said plate means;

an outside knob assembly including knob means, plate means, and means rotatably attaching said knob means to said plate means;

spindle means interconnecting said knob assemblies and rotatable in unison with one of said knob means, said spindle means also operable to transport said bolt means in said housing against the force of said biasing means;

the other of said knob means including a slidable plunger keyed on said spindle means, said plate means associated with said other knob means including a non-circular opening for receipt of said plunger;

push button means in said other knob means for translating said plunger axially into said opening to a locking position to prevent manual rotation of said one knob means by holding the plunger and keyed spindle means in a non-rotatable position; and

first and second locking projections extending respectively from said push button and said other knob means, said projections movable axially with respect to one another to engage and maintain the push button and plunger in the locking position over a selected range of rotation of the other knob means relative to the push button.

2. The improved lockset of claim 1 including biasing means for normally maintaining one of said knob means in an unrotated position.

3. The improved lockset of claim 2 wherein said biasing means comprise a coil spring having its opposite ends engaging respectively against said knob means and said plate means.

4. The improved lockset of claim 1 including means connected to said one knob means for disengaging said plunger from said opening.

5. The improved lockset of claim 4 wherein said means for disengaging include key operated means.

6. The improved lockset of claim 1 including means for limiting the amount of rotation of at least one of said knob means.

7. The lockset of claim 1 including biasing means for normally biasing said plunger out of engagement with said opening.

8. The lockset of claim 1 wherein at least one of said projections comprises an arcuate section engageable with the other projection, the span of the arcuate section defining the range of rotation of engagement of the projections.

9. The lockset of claim 1 wherein one of said projections is comprised of a spring member biased toward the other projection to insure engagement of the projection.

10. The lockset of claim 1 wherein said other knob means includes an axial tube rotatable therewith, said push button being coaxially received in said tube, said tube including an inwardly extending tab comprising one of said projections and said push button including an outwardly extending member comprising the other projection.

11. The lockset of claim 1 wherein said push button and said plunger are independently rotatable and including a longitudinal member keyed to an unlocking assembly in said one knob means and to said push button whereby said unlocking assembly rotates with said push button.

12. The lockset of claim 1 wherein said spindle is hollow and including a longitudinal member extending through said spindle and keyed simultaneously to an unlocking assembly in said one knob means and said push button.

13. The lockset of claim 11 wherein said unlocking assembly is key operated.

14. The lockset of claim 11 wherein said unlocking assembly includes a centering cam attached to the longitudinal member biased to engage a cam way fixed to the one knob means, said cam and cam way cooperative to maintain relative rotational alignment of said member, the one knob means and the push button.

15. The lockset of claim 14 wherein said other knob means includes a lost motion drive on said plunger by said other knob means whereby said plunger is rotatably driven by said other knob means whenever the projections are rotated out of position for relative engagement with each other.

16. The lockset of claim 1 wherein said bolt means includes a bolt normally biased for engagement with a strike, a bracket member connected to said bolt, a cam drive member keyed to said spindle means, and engageable with the bracket member to drive said bolt in response to rotation of the spindle means, a dead bolt, a locking pawl including a locking tab cooperative with said bracket member to lock said bracket member and thus said bolt in an extended position whenever the dead bolt is in a retracted position, said dead bolt including a camming surface disengaging said locking pawl tab from said bracket whenever said bolt and dead bolt are extended together.

17. An improved lockset comprising, in combination:

a latch assembly including a housing, bolt means for engaging a strike, said bolt means slidable in said housing, means normally biasing said bolt means outwardly toward the strike;

an inside knob assembly including plate means, knob means mounted for rotation on plate means;

an outside knob assembly including separate plate means, second knob means mounted for rotation on said separate plate means;

a spindle connected to one of said knob means for coincident rotation therewith, said spindle also connected to said bolt means for driving said bolt means against the force of said means for biasing;

plunger means mounted in the other knob means, said spindle means being connected to said plunger means, said plunger means having lost motion connecting means with said other knob means, said lost motion connecting means comprising a projection from said other knob means positioned in a

partial circumferential slot of said plunger, said slot having side engagement portions for engaging said projection as either of said knob means are rotated to thereby rotate first one of and then both of said knob means and the spindle in unison in one rotational sense or the other.

18. An improved lockset comprising, in combination:

an outside knob assembly including an outside knob mounted for rotation on an outside mounting plate;

an inside knob assembly including an inside knob mounted for rotation on an inside mounting plate, said plates including opposed openings;

a spindle keyed to said outside knob and extending through said openings to the inside knob assembly;

a plunger keyed to said spindle and movable axially on said spindle to cooperatively engage the opening of said inside plate for retention of said plunger in a relatively non-rotatable position;

a push button in said inside knob assembly axially translatable between a depressed and non-depressed position, said push button cooperatively engaging the plunger to axially translate the plunger into the inside plate opening when said push button is in the depressed position; and

cooperative latching means on said push button and said inside knob, said latching means being engaged by axial movement of said push button to maintain the push button and plunger in a depressed position.

19. An improved lockset comprising, in combination:

an outside knob assembly including an outside mounting plate for attachment to a door and an outside knob rotatably mounted in the outside plate;

an inside knob assembly including an inside mounting plate for attachment to the door, an inside knob rotatably mounted in the inside plate, and a plunger axially movable to cooperate with a shaped opening in the inside plate to prevent rotation of the plunger relative to the inside plate;

a bolt assembly including a bolt;

a hollow spindle keyed to said outside knob and said bolt assembly to drive said bolt in response to rotation of said knob, said spindle also being keyed to said plunger;

means in said inside knob assembly for axially transporting and maintaining the plunger in the shaped opening; and

a longitudinal member extending through said hollow spindle, said member being keyed at one end to said means for axially transporting and maintaining and being attached at its opposite end to means in the outside knob assembly for moving said member so as to disengage the means for axially transporting and maintaining the plunger and release the plunger from the shaped opening.

20. An improved lockset comprising, in combination:

first and second opposed knob assemblies attached to opposite sides of a door and connected by a spindle;

a bolt assembly including a bolt normally biased for engagement with a strike, a bracket member connected to said bolt, a cam drive member keyed to said spindle, and engageable with the bracket member to drive said bolt in response to rotation of the spindle, a dead bolt, a locking pawl including a locking tab cooperative with said bracket member to lock said bracket member and thus said bolt in an extended position whenever the dead bolt is in a retracted position, said dead bolt including a camming surface disengaging said locking pawl tab from said bracket whenever said bolt and dead bolt are extended together.

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