Aug. 7, 1962 H. A. SCHIOWITZ 3,048,436

SNAP ACTION LOCKSET ASSEMBLIES

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Fig. 1.

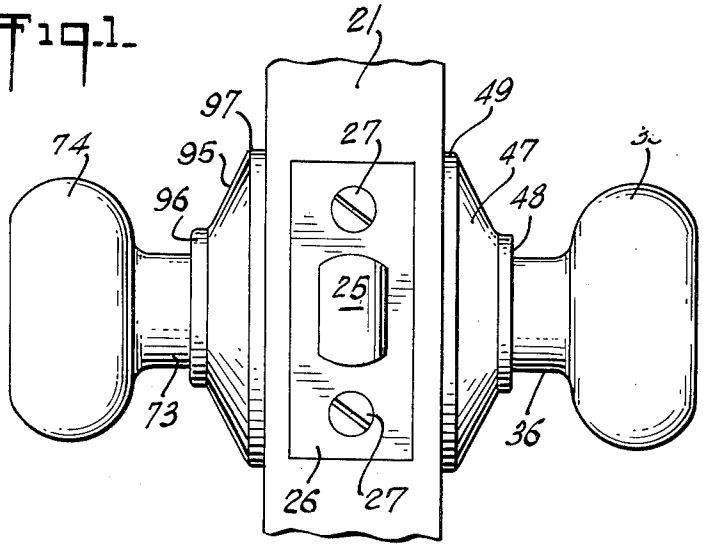
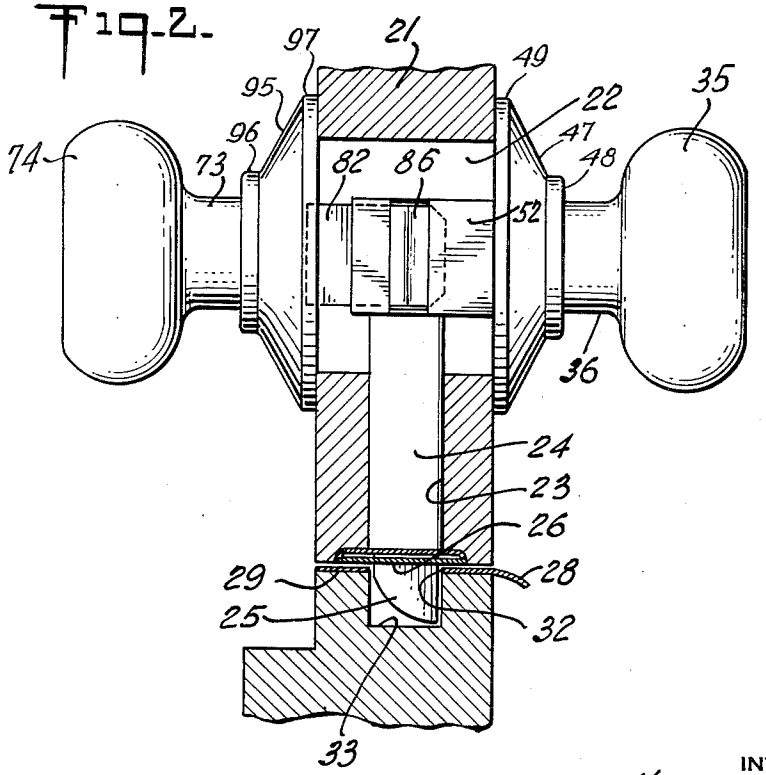


Fig. 2.

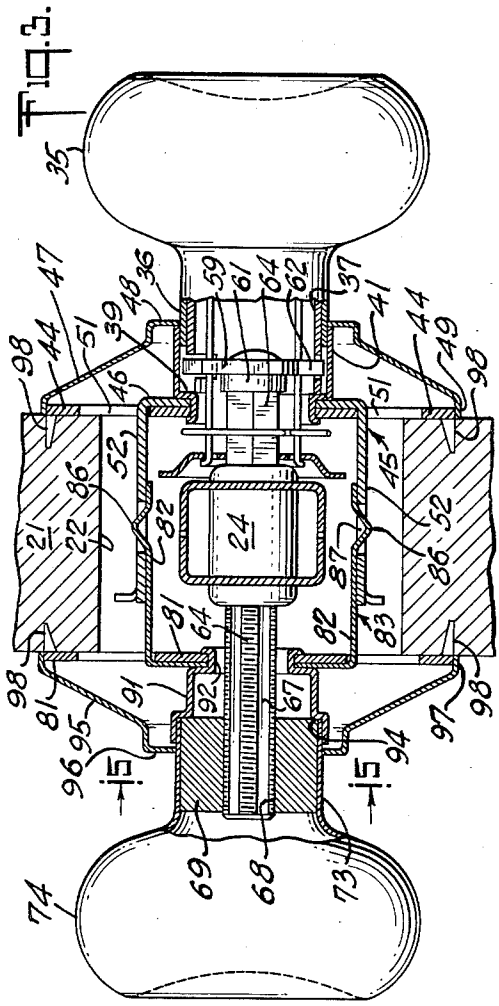


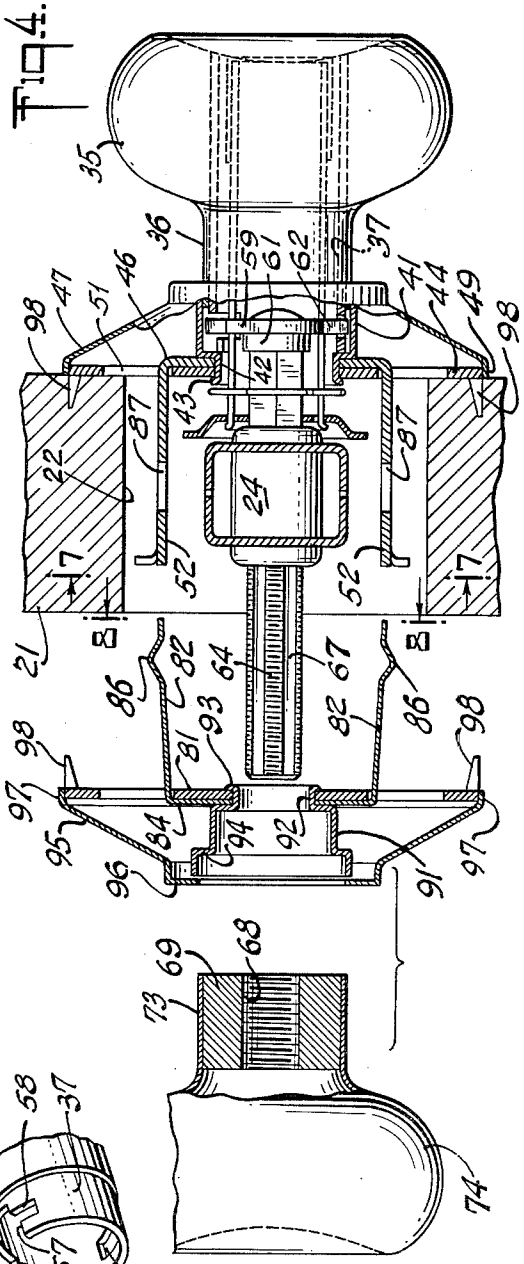
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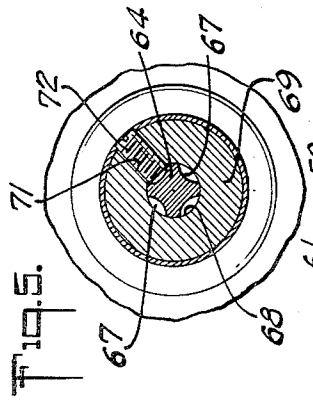
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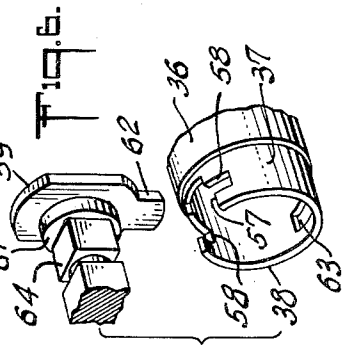
SNAP ACTION LOCKSET ASSEMBLIES

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SNAP ACTION LOCKSET ASSEMBLIES

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Fig. 8.

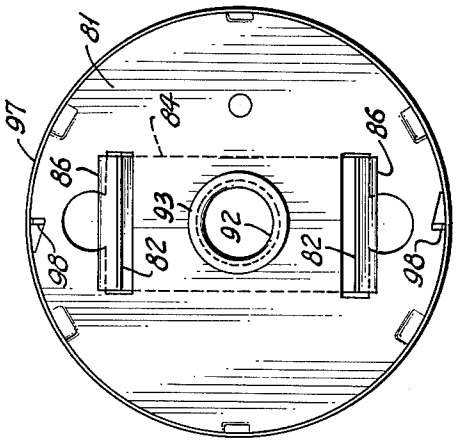


Fig. 7.

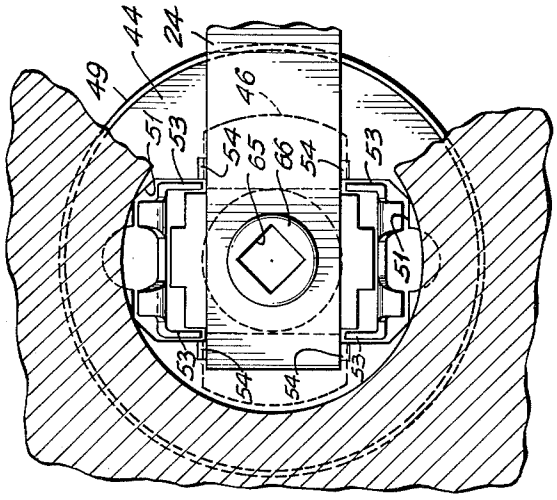


Fig. 9.

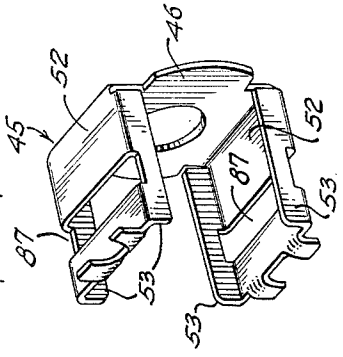
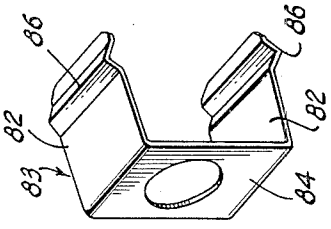


Fig. 10.



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SNAP ACTION LOCKSET ASSEMBLIES

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3 Claims. (Cl. 292—337)

This invention relates to door locks, and particularly to an improved lockset having inner and outer knob assemblies that are readily secured to each other and to the door by snap action means.

A salient feature of the present invention is the provision of a snap on lockset for doors whereby the latch bolt assembly and the latch bolt operating mechanism together with the inner and outer door knob assemblies may be applied to the door quickly and easily by snapping the inner knob and outer knob assemblies together within the accommodating opening previously drilled out in the door. By means of the improved structures of the present invention the use of screws or the like to mount the inner and outer door knob and rose plate assemblies upon the door is obviated, and instead, the two sub-assemblies are secured to each other and to the door by a snap action mechanism which also secures them firmly to the latch bolt operating mechanism.

The snap action arrangement of the present invention permits the two door knob and rose plate assemblies to be securely connected to each other and to be firmly mounted on the door whereby ordinary and even hard usage thereof will not loosen these elements from each other and from the door. The interlocking mechanism, however, is capable of being disengaged by a firm pulling action on either or both of the knob assemblies in order to remove them from the door for repair or replacement.

The present invention constitutes a pair of snap action mating elements to each of which is attached a subassembly including a door knob and rose plate for either side of the door together with other elements operatively connectible to the spring biased latch or lock bolt assembly.

Still other objects and advantages of the invention will be apparent from the specification.

The features of novelty which are believed to be characteristic of the invention are set forth herein and will best be understood, both as to their fundamental principles and as to their particular embodiments, by reference to the specification and accompanying drawings, in which:

FIGURE 1 is an edge view of the fragmentary portion of a door showing in elevation the inner and outer door knob and rose plate assemblies in position thereon, and including an elevation view of the face plate and latch bolt;

FIG. 2 is a top view, partly in central cross section, and parly in elevation, of the apparatus shown in FIG. 1;

FIG. 3 is an enlarged vertical, central partial section view, taken through the aligned axial centers of the two door knobs shown in FIG. 1, some parts being shown in elevation;

FIG. 4 is a partially exploded view of the apparatus shown in FIG. 3;

FIG. 5 is a view taken on line 5—5 of FIG. 3;

FIG. 6 is a fragmentary perspective view of the means

for joining one of the door knobs with the lock operating spindle;

FIG. 7 is a view taken on line 7—7 of FIG. 4, some parts being broken away, and some parts being shown in phantom outline;

FIG. 8 is a view taken on line 8—8 of FIG. 4;

FIG. 9 is an enlarged, perspective view of the alignment girder of the present invention; and

FIG. 10 is an enlarged perspective view of the spring element adapted to engage said alignment girder.

Referring now to the drawings in detail, there is shown in FIGS. 1 and 2 a fragmentary portion of a door 21 having a transverse opening 22 that is intersected at a right angle by longitudinal opening 23. Positioned withing longitudinal opening 23 is a latch bolt assembly 24, containing a latch bolt 25, the end of which extends outwardly from the door through a suitable aperture in face plate 26 which covers opening 23 and is secured to the door by means of screws 27. Latch bolt 25, which is normally urged outwardly from assembly 24 by means of spring biasing, or the like, not shown, is adapted to cooperate with strike plate 28 secured to the inner face 29 of door jamb 31. Strike plate 28 has an aperture 32 which, together with coextensive aperture 32 in door jamb 31, accommodates the end of said latch bolt.

The snap action lockset herein comprises an inside door knob assembly and an outside door knob assembly, both of which are detachably secured to each other through transverse opening 22 in door 21.

The inside door knob assembly comprises a substantially circular knob 35 having a tubular shank 36 which is secured firmly by press fit or the like to tube 37. The inner end 38 of tube 37 rotatively abuts the annular shoulder 39 of inside bearing cup 41 which has an open bottom and whose walls are substantially coaxial with said tube.

The bottom of inner bearing cup 41 has an axially extending annular neck 42 of reduced diameter terminating in an outwardly extending annular flange 43. A substantially circular inside back plate 44 has a central circular aperture which interfits with the periphery of neck 42 while U-shaped alignment girder, generally designated 45, has a base plate 46 contiguous with said back plate and having a central circular aperture which also interfits with the periphery of neck 42. Said back plate 44 and base plate are secured rigidly between flange 43 and shoulder 39, as by pressing or spinning said flange against the inner surface of plate 44 by suitable means. The inner surface of the circular outer portion of inside back plate 44 is arranged to lie against the inside surface of door 21 while its peripheral edges extend some distance beyond the circular boundary of opening 22.

Positioned coaxially around cup 41 and tube 37 is a stationary circular inside rose plate 47 of somewhat truncated conical shape having a centrally apertured neck portion 48 within which shank 36 of knob 35 freely rotates. Rose plate 47 flares outwardly and terminates in a circular rim 49 which encloses the peripheral edge of inner back plate 44 to which it is detachably securable by suitable means, not shown.

Inside back plate 44 has a pair of spaced apart apertures 51 through which extend a pair of substantially parallel rigid legs 52 formed integrally with base plate 46 of alignment girder 45 and arrayed within opening 22 of door 21. Formed integrally on the longitudinal edges

of legs 52 are inwardly extending rails 53 (FIG. 7) between the respective pairs of which is supported the housing of latch bolt assembly 24. Latch bolt assembly 24 is aligned between rails 53 by upset ears 54 in the upper and lower walls of the assembly housing, said ears cooperating slidably and frictionally against the outer walls of the corresponding rails 53.

The inner end of tube 37, FIGS. 3 and 6, has a top opening 57 which has a pair of laterally extending slots 58, said slots removably accommodating lug 59 whose circular integral neck 61 is accommodated by opening 57. Lug 59 has a bottom tongue 62 which is accommodated by bottom slot 63 in tube 37 whereby rotation of said tube causes the rotation of lug 59 when knob 35 is rotated.

Connected rigidly to neck 61 of lug 59 is one end of lock operating spindle 64 of square cross-section, said spindle extending through and engaging square shaped opening 65 of hub 66 (FIG. 7) in latch bolt assembly 24. The rotation of spindle 64 causes the rotation of hub 66 which by suitable spring biased mechanisms, not shown, operates latch bolt 25 in the manner known in the art.

The other end of spindle 64 which is threaded and has a plurality of longitudinal grooves 67 extends through opening 22 in door 21 and protrudes on the outer side thereof to be threadably engaged by central aperture 68 of knob insert 69. Laterally intersecting aperture 68 is a threaded opening 71 which accommodates set screw 72, the inner end of which is adapted to engage any one of grooves 67 whereby rotation of insert 69 also produces the rotation of spindle 64 on its longitudinal axis.

Connected by force fit or the like to knob insert 69 is the tubular shank 73 of spherical outer knob 74, whereby rotation of said knob produces rotation of spindle 64. Shank 73 has a suitable aperture to provide access for set screw 72 to enter aperture 71 of knob insert 69.

Positionable on the outer surface of door 21 over opening 22 is a circular outer back plate 81 having a pair of spaced apart apertures through which there extends a pair of spring blades 82 of a U-shaped bracket, generally designated 83. Blades 82 are integral with opposite ends of flat bracket base 84 which is contiguous with a portion of back plate 81.

Near the free end portion of each blade 82 there is formed a laterally outwardly extending V-shaped bight 86 which is adapted to cooperate with a corresponding slot 87 in respective legs 52 of alignment girder 45. As will be noted particularly from FIG. 4, spring blades 82 are normally flexed slightly away from each other when not engaged by the alignment girder 45 to ensure the firm engagement between bights 86 with respective slots 87 as shown in FIG. 3.

The spring tension of blades 82 is predetermined so that bights 86 strongly engage their respective slots 87 to secure alignment girder 45 and bracket 83 firmly together. This ensures that the various components attached to said girder and bracket, respectively, will be firmly secured in position relative to door 21. Upon applying a strong pulling force between girder 45 and bracket 83, or upon the respective components connected to these elements, bights 86 can be sprung loose from slots 87 in order to disassemble the door lock parts for repair or replacement. In other words, by urging base plate 46 and bracket base 84 apart from each other, bights 86 will become disengaged from their respective slots 87, thereby obviating the necessity for using special tools or equipments.

A tubular outside bearing cup 91 is provided with an inwardly extending neck 92 of reduced diameter which extends through and mates closely with coaxial apertures in the central portions of outside back plate 81 and bracket base 84. Neck 92 has an outwardly extending annular flange 93 which is pressed or spun over the

inner face of outside back plate 81 to secure both plate 81 and base 84 rigidly to outside bearing cup 91.

Outside bearing cup 91 has an interior annular shoulder 94 against which the inner ends of tubular shank 73 and of insert 69 bear when knob 74 is rotated threadably into position on spindle 64 and secured there by set screw 72. Positioned coaxially around cup 91 and shank 73 is a stationary circular outside rose plate 95 of somewhat truncated conical shape having a centrally apertured neck portion 96 within which shank 73 of knob 74 rotates freely. Rose plate 95 flares outwardly and terminates in a circular rim 97 which encloses the peripheral edge of outer back plate 81. Rose plate 95 is releasably secured firmly to outer back plate 81 by suitable means, not shown.

Inner back plate 44 and outer back plate 81 are both provided at their respective inner surfaces with at least a pair of perpendicularly extending sharp piercing prongs 98 struck up from said plates and adapted to sink into the wood or composition material of door 21 when said plates are urged toward each other as bights 86 are caused to enter slots 87 of alignment girder 45 to secure these elements in position on door 21. Prongs 98 ensure that their respective plates 44 and 81, girder 45 and spring blades 82 will not rotate when either of knobs 35 and 74 are rotated.

In some embodiments, legs 52 of alignment girder 45 may comprise separate elements rigidly connected by suitable means to inner back plate 44, while spring blades 82 may comprise separate elements suitably connected to outer back plate 81.

In the specification, there are explained the principles of the invention, and the best mode in which it is contemplated applying those principles, so as to distinguish the invention from other inventions; and there is particularly pointed out and distinctly claimed the part, mode or combination which is claimed as the invention or discovery.

While I have shown and described certain preferred embodiments of the invention, it will be understood that modifications and changes may be made without departing from the function and scope thereof, as will be clear to those skilled in the art.

It is claimed:

1. A lockset for a door having an opening to receive a lock bolt and a bolt operating spindle comprising a first back plate positionable over one end of said opening on one surface of said door, a second back plate positionable over the other end of said opening on the opposite surface of said door, a pair of spaced apart apertures in said first back plate, a pair of spaced apart apertures in said second back plate, a U-shaped girder mounted on said first back plate, spaced apart substantially parallel legs on said girder extending through the aperatures in said first back plate and inwardly into said opening, a transverse slot in each of said legs, a U-shaped spring member mounted on said second back plate, a pair of spaced apart blades on said spring member extending through the apertures of said second plate and inwardly into said opening, the free ends of said blades being biased outwardly from each other, a bight in each of said blades, said bights engaging respective slots in said girders by snap action when said two plates are moved toward each other securing them in their respective positions against said door, said bights becoming disengaged from their respective slots when said two plates are urged apart from each other.

2. A lockset according to claim 1, and further comprising a lock bolt secured between the legs of said girder and a bolt operating spindle extending through said lock bolt and through both of said back plates.

3. A lockset according to claim 1, and further comprising substantially central apertures in both said back plates, in said girder and in said spring member through which a bolt operating spindle may extend, a first bushing

mounted within the aperture of said first back plate and said girder and securing said elements firmly together, a second bushing mounted within the aperture of said second back plate and said spring member and securing said elements firmly together, a bolt operating spindle extending through said bushings and through said lockbolt, a first door knob releasably secured to one end of said spindle, the shank of said first door knob rotating within said first bushing, a second door knob detachably securable to the other end of said spindle, the shank of said second door knob being rotatable within said second bushing.

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