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HOLDING DEVICE FOR A LOCKSET

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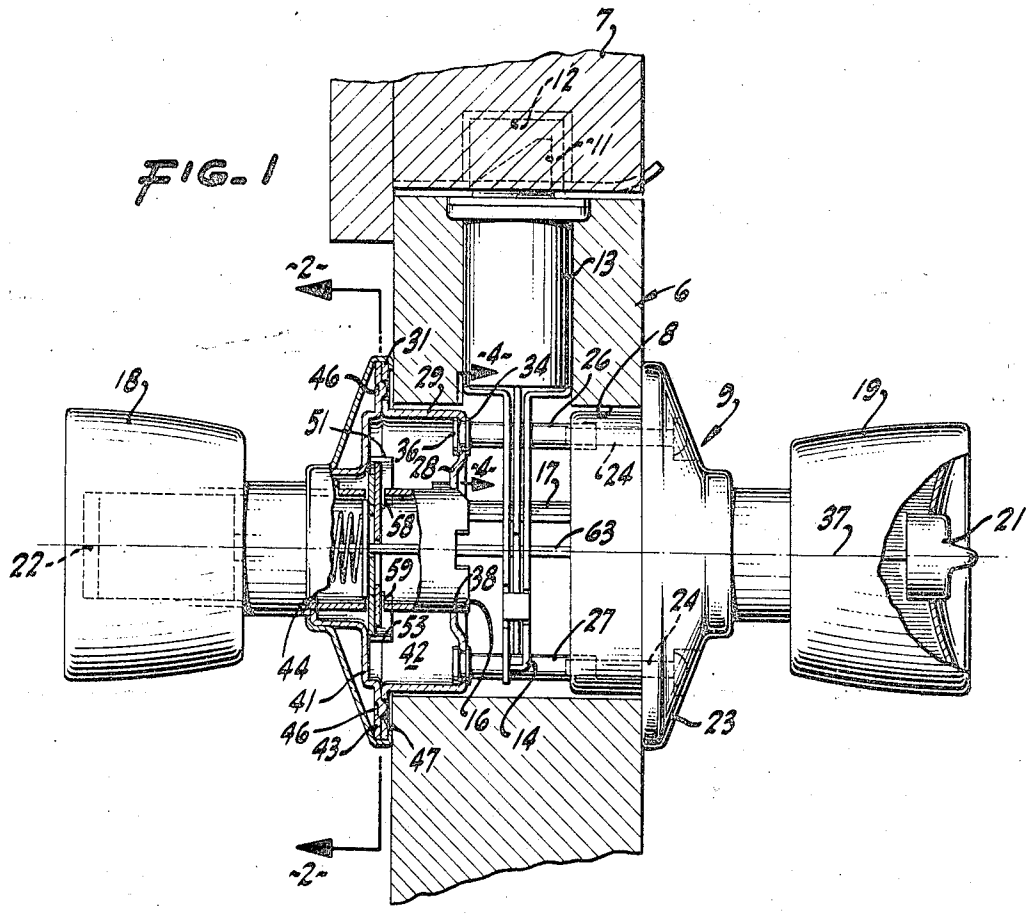


FIG. 1

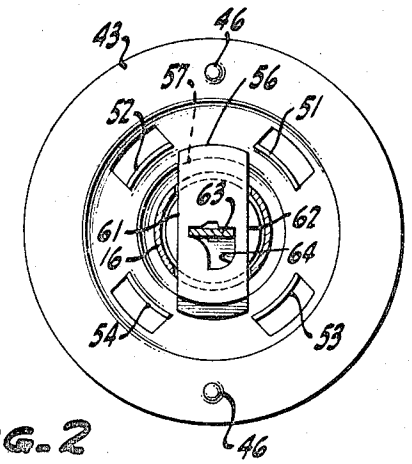


FIG. 2

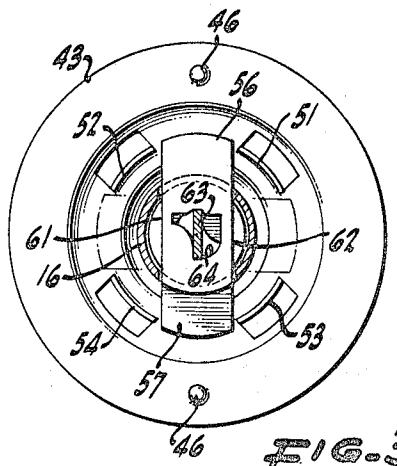


FIG. 3

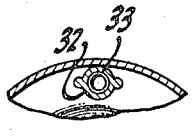


FIG. 4

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HOLDING DEVICE FOR A LOCKSET

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ABSTRACT OF THE DISCLOSURE

A holding device for a lockset has a housing made up of inner and outer cup members having flanges in abutment and centered and secured against relative rotation. The cup members are bearings for a rotatable hollow spindle carrying locking slides movable outwardly between a pair of lugs on the outer cup member to prevent spindle rotation and inwardly to permit spindle rotation, the locking slides being actuated by a bar within the spindle. Screw posts are fixed on the inner cup member and engage stationary parts of the lockset.

In the manufacture of relatively simple, medium duty locksets there is always a requirement for simplification of the structure and reduction in manufacturing cost, but without sacrifice in security of the lockset. One of the portions of the lockset which has heretofore been fairly complex to manufacture and has involved substantial cost is the portion which retains the rotatable spindle, on which the knobs are carried, from rotating with respect to the parts of the lockset held stationary by the mounting, such as a door panel.

It is therefore an object of the invention to provide a holding device for a lockset which greatly simplifies the construction over that heretofore used and does so without sacrificing security.

Another object of the invention is to provide a holding device for a lockset which will hold the normally extended latch bolt against retraction by the knobs or key and can also be utilized to hold the latch bolt retracted when desired.

Another object of the invention is to provide a holding device for a lockset in which the bearings for the rotatable spindle are easily fabricated, centered and held against relative rotation.

Another object of the invention is to provide a holding device for a lockset in which torque of or on the rotatable spindle is resisted by a well-connected series of easily fabricated economical parts.

Another object of the invention is to provide a holding device for a lockset that is an improvement over those heretofore available.

Other objects of the invention together with the foregoing are attained in the embodiment of the invention described in the accompanying description and illustrated in the accompanying drawings, in which:

FIG. 1 is for the most part a plan of a lockset installed in a door panel shown in closed position with respect to the door frame, certain portions of the door panel and frame being shown in cross-section on an axial horizontal plane and some parts of the lockset being broken away to disclose the interior construction substantially on the same plane;

FIG. 2 is a detailed cross-section, the plane of which is indicated by the line 2—2 of FIG. 1;

FIG. 3 is a view similar to FIG. 2 but showing the parts in a different relative position; and

FIG. 4 is a detailed cross-section, the plane of which is indicated by the line 4—4 of FIG. 1.

The holding device pursuant to the invention can be incorporated in many different styles of lockset, but has particularly been incorporated in the commercially available, Schlage "F" lockset. The usual installation is in a swinging door panel 6 movable with respect to a door frame 7. Mounted in the panel in a cross bore 8 is a lockset, generally designated 9, having a latch bolt 11 movable to and fro into and out of a strike box 12 in the door frame. The latch bolt 11 is normally spring pressed to projected position and slides within a housing 13 having an extended frame 14 interengaged with the remaining, stationary portions of the lockset 9.

The actuation of the latch bolt 11 is accomplished by the rotation of a spindle 16 having a tongue 17 extending to interconnect with a similar, aligned rotary spindle (not shown). Both of the rotary spindles 16 carry hand-actuated knobs 18 and 19. The knob 19 may be considered to be on the interior of the door and is provided with a control button 21, whereas the knob 18 may be considered to be on the exterior of the door and is provided with a locking unit 22 adapted to be actuated by a key. The knob 19 is associated with a rose 23 clamped to the door panel 6 by screws 24 entering into screw posts 26 and 27.

A wall 28 carries the screw posts and forms the bottom of an inner cup member 29 preferably of stamped metal and having a peripheral flange 31. The wall 28 has non-circular openings 32 therein (see FIG. 4) into which the originally circular shanks 33 of the parallel screw posts 26 and 27 are inserted. Each screw post originally has an outer flange 36 adapted to abut the wall 28. The screw post is then deformed to provide an inner enlargement 34 and to displace post material to fill the non-circular opening 32. The screw posts are thus non-rotatably fixed and held against axial movement within the inner cup 29, making virtually an integral construction. The screw posts are thus always accurately held with their longitudinal axes parallel to the central axis 37 about which the spindle 16 turns. The inner cup 29 is pierced concentrically with the axis 37 to provide a central aperture 38, the margin of which forms a rotary bearing for the spindle 16.

The inner cup member 29 is complemented by an outer cup member 41, the cup members together constituting a housing enclosing a chamber 42. The outer cup member 41 has a peripheral flange 43 designed to abut the flange 31 and likewise has a central aperture 44 the margin of which serves as an outer bearing for the spindle 16. The outer cup member is prevented from rotating with respect to the inner cup member 29 by lugs 46 which are offset to extend into receiving holes 47 in the inner cup 29. Also, the projections or lugs 46 are sufficiently close fits within the holes 47 so that the inner and outer cups are centered or held in alignment with the margins 38 and 44 concentric with regard to the axis 37, so that the spindle is properly supported.

Since it is desired to keep the spindle 16 from rotating when the lock unit is to be locked, we preferably provide on the outer cup member 41 a pair of lugs 51 and 52 preferably deformed from the material of the outer cup member and extending in an arcuate fashion and in an axial direction to surround the spindle 16 but with a space therebetween. Preferably the lugs 51 and 52 are duplicated by similar lugs 53 and 54 diametrically opposite them.

To cooperate with the lugs, the spindle 16 carries locksing slides 56 and 57. These slides are substantially identical and are arranged to extend transversely of the spindle 16, being translatable with respect thereto through openings 58 and 59 in the wall of the hollow spindle. Each of the plates is approximately rectangular, having a pair of side walls 61 and 62 spaced apart a

distance approximately equal to the space between the adjacent portions of the lugs **51** and **52**.

The locking slides are both pierced by a flat actuating bar **63** extending from the actuating button **21** through the spindle to the lock mechanism **22**. The actuating bar, as shown in the figures, is considerably wider than it is thick; that is to say, it is a narrow rectangle in cross-section. When the actuating bar lies horizontally as seen in FIG. 2, it occupies a certain position within irregular cam apertures **64** within each of the slides **56** and **57**, so that the slides are held in a retracted or nested position. When the spindle **16** revolves them, their retracted ends freely clear the arcuate lugs **51** and **52** (and **53** and **54**) and afford no obstruction to rotation of the spindle. When the actuating bar **63** is rotated, usually through about ninety degrees, the sides of the actuating bar cam against the defining surfaces of the locking slides **56** and **57** and move them in a radial direction, but in the opposite sense, from their nested position into an extended position.

In the extended position the sides of the locking slides are in or near abutment with the adjacent surfaces of the lugs **51** and **52** as well as the lugs **53** and **54**. Then, if an attempt is made to rotate the spindle, the lug and slide interfit entirely blocks or substantially limits the intended rotation. Any possible movement is not nearly sufficient for the spindle tongue **17** to actuate the latch bolt **11**. Thus the latch bolt cannot be materially retracted and the lockset is held in its locked condition.

When, either by manipulation of the button **21** or actuation of the key unit **22**, the actuating bar **63** is again revolved from its position as shown in FIG. 3 to its position as shown in FIG. 2, the locking slides **56** and **57** are drawn toward each other in a radial direction and are again nested. When rotated they do not engage the lugs **51** and **52** nor the lugs **53** and **54**. The lockset is then restored to its unlocked condition and either of the knobs can actuate the latch bolt to withdrawn position.

In locked condition of the lockset, any torque on the spindle **16** tending to rotate it is transferred t the locking slides **56** and **57** by the edges of the apertures **58** and **59** in the spindle **16** and from the edges **61** and **62** of the locking bars is transmitted to the lugs **51** and **52** and to the lugs **53** and **54**. These lugs are part of the outer cup member **41**, which is precluded from rotation by interengagement of the projections **46** with the walls of the opening **47** in the inner cup member **29**. This inner cup member is fixed to the screw posts **26** and **27**, which are interrelated with the member **14** and are held also by the screws **24**. The torque on the spindle **16** is thus resisted by the stationarily held parts of the lockset.

While the mechanism as described forms an inexpensive, effective and secure holding device for the lockset, it can readily achieve another function. The rotation of the spindle **16** between a projected position of the latch bolt **11** and a retracted position thereof normally requires a rotation of the order of ninety degrees. The actual rotation in practice may be something less than ninety degrees or something more but approximates that value. If the lugs **51** and **53** are spaced apart a distance to receive the side edges **61** and **62** of the locking slides **56** and **57**, and if the lugs **52** and **54** are similarly spaced apart, then a user may rotate either of the knobs **18** or **19** to retract the latch bolt **11** and to rotate the locking slides **56** and **57** into the dotted line position, as illustrated in FIG. 3. If then the actuator **21** is manipulated and the locking slides **56** and **57** are projected in the same rotated position, they are then confined between the lugs **51** and **53** on the one hand and the lugs **52** and **54** on the other. Rotation of the spindle **16** is precluded with the latch bolt **11** in its retracted position. In this way a hold-back function is readily attained. If no hold-back is desired, the spacing of the lugs **51** and **53** or that of the lugs **52** and **54**, or both, can be made so close as to preclude entry of the locking slides **56** and **57** when they are in a rotated position or can be dimensioned to preclude the projection of the locking slides whenever the spindle **16** is not in its central locking position.

What is claimed is:

1. A holding device for a lockset comprising an inner cup member having an end wall with a first bearing aperture therein and having an out-turned peripheral flange, an outer cup member adapted to span said inner cup member and having a peripheral flange abutting said out-turned flange of said inner cup member and having a second bearing aperture, means for preventing relative rotation of said inner cup member and said outer cup member, said inner cup member and said outer cup member between them enclosing a chamber, a hollow spindle passing through said chamber and rotatable in said first and second bearing apertures, a locking slide extending radially across said spindle and through a slot in the side thereof into said chamber, means within said spindle for moving said slide radially of said spindle between a retracted position and a projected position, and lug means struck inwardly from said outer cup member extending into said chamber and disposed in the path of rotary movement of said slide when in projected position and disposed out of the path of rotary movement of said slide when in retracted position.

2. A holding device as in claim **1** in which said lug means include a lug integral with and adapted to extend into said chamber from said outer cup member.

3. A holding device as in claim **2** in which said lug means includes two lugs spaced apart to receive said locking slide between them when said locking slide is in said projected position.

4. A holding device as in claim **1** in which said lug means are positioned to be engaged by said locking slide in both of two rotated positions of said spindle relative to said housing.

5. A holding device as in claim **1** in which said end wall has a pair of openings therethrough and in which there is a pair of screw posts extending away from said chamber parallel to said spindle, each of said screw posts having a head at one end passing through said openings and tightly engaging opposite sides of said end wall.

6. A holding device as in claim **5** in which said end wall non-circular opening therein and said screw posts have displaced material filling said opening and forming an enlargement on the other side of said end wall.

7. A holding device as in claim **5** in which means are provided for transmitting torque on said spindle to said locking slide, from said locking slide to said lug means, from said lug means to said outer cup member, from said outer cup member to said inner cup member, and from said inner cup member to said screw posts.

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