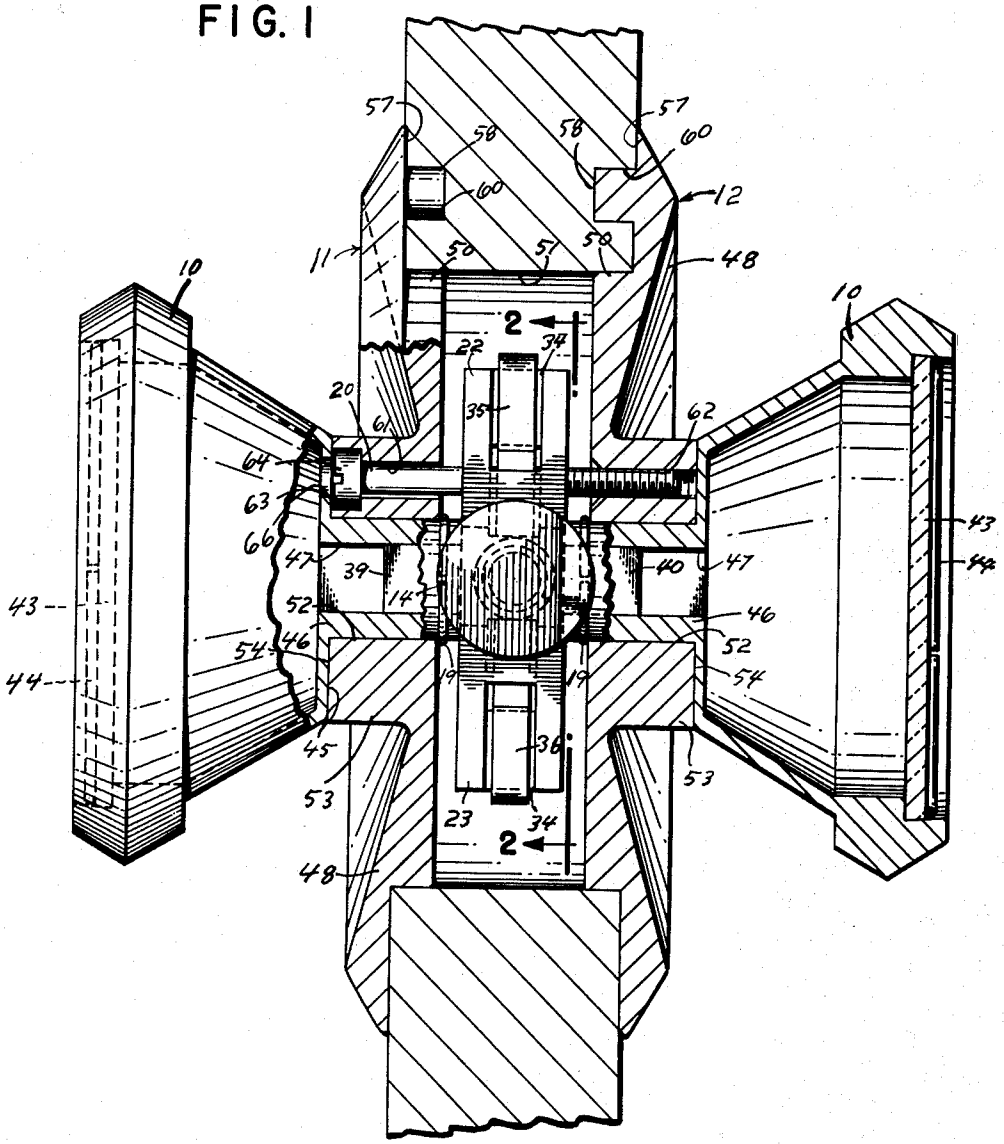
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DOOR LATCH

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FIG. 1



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FIG. 2

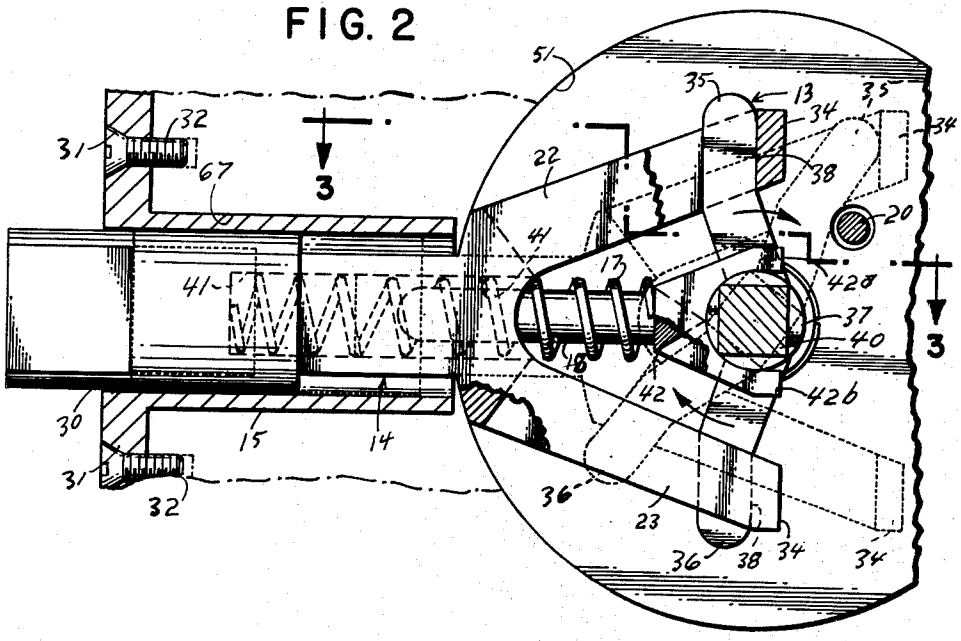
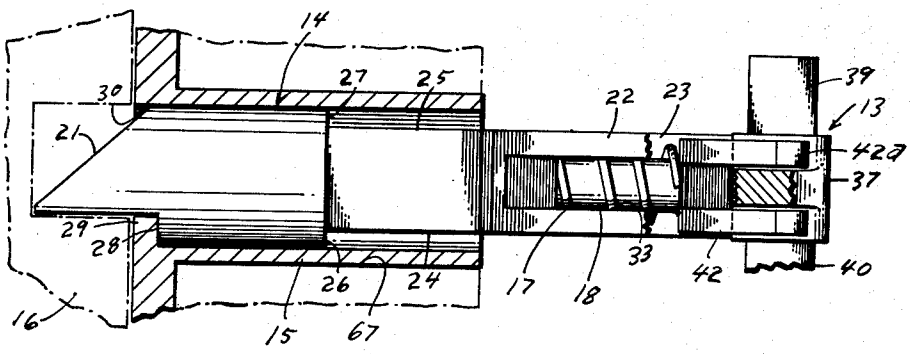


FIG. 3



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DOOR LATCH

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This invention relates to a door latch of the general type in which a bolt is retracted against spring pressure by action of rollbacks responsive to turning of a handle.

It is a general object of the invention to provide an improved such door latch, which is of particularly simple, economical and durable construction, and which has an unusually small number of parts which are peculiarly adapted to be preassembled into very few components which may then be quickly and easily assembled onto a door to form the completed latch.

Another object is to provide a door latch which requires a minimum of labor to prepare a door for the latch.

Other objects and advantages will appear and be understood in the course of the following description and claims, the invention consists in the novel construction and in the adaptation and combination of parts hereinafter described and claimed.

In the accompanying drawings:

FIGURE 1 is a fragmentary side elevational view partly in section of a door latch embodying preferred teachings of my invention.

FIG. 2 is a fragmentary front elevational view partly in section of a portion of the door latch, these same parts being indicated in broken lines to show their locations in retracted position.

FIG. 3 is a fragmentary top sectional view taken on line 3—3 of FIG. 2.

Referring to the drawings it is seen that my door latch has a pair of knob handles 10—10 journaled in escutcheons 11–12 to operate a retractor 13 for a sliding bolt 14. This bolt is projected in a latch case 15 toward a conventional strike plate 16 by a spring 17 which is compressed between the bolt and the retractor 13 and is sleeved on a guide 18. Snap rings 19 hold the handles within their journals in the respective escutcheons while the latter are tied together by a screw 20.

Continuing to a more detailed description of the parts, and directing attention first to the bolt 14, it will be noted that such is beveled at its nose to provide a strike face 21 and is forked at its rear end to provide upper and lower fork arms 22–23. These arms have flat parallel outer faces 24–25 which continue along part of the otherwise cylindrical rear end portion of the shank of the bolt and terminate at rearwardly facing shoulders 26–27. From the latter the bolt shank continues forwardly as a cylinder to the strike face 21. At its nose the bolt shank also has a cutback diametrically opposite the strike face and coplanar with the face 24 to present a forwardly facing stop shoulder 28 for bearing against the back of a face plate 29 to limit projection of the bolt by the spring 17 through a central opening 30 in the face plate. This plate is integral with the latch case 15 and has vertically spaced chamfered holes 31 for receiving anchoring screws 32.

Returning to the fork arms 22–23, it will be noted that they are longitudinally slotted at 33 in the vertical direction providing abutments 34 at their rear ends. Nesting in the slots 33 are a pair of upper and lower rollbacks 35–36 which radiate from the hub 37 of the retractor 13 and provide diametrically alined cam faces 38 for bearing against the abutments 34. From the ends of the hub 37 project a pair of spindles 39–40 of square or other non-circular cross-section to interfit with the handles 10.

The bolt 14 also has a longitudinal center bore 41 which is exposed between the root ends of the fork arms and terminates short of the nose of the bolt to provide a seat for the forward end of the spring 17. At its other end the spring reacts against the guide 18, and more particularly, against a fork-head 42 at the tail of the guide. This head has a pair of laterally spaced forks 42*a*–42*b* fitting over the ends of the hub 37 at the sides of the base of the rollbacks 35–36 while the forward end portion of the guide 18 extends into the bore 41 together with the spring 17. However, the guide terminates rearward of the forward end of the bore 41 a sufficient distance to not only permit enough relative movement between the retractor and bolt for retraction thereof, but to permit initial assembly of the parts. In this latter regard, the spring and guide are first inserted into the bore 41 and the spring compressed until the guide seats at the forward end of the bore. Then, one of the rollbacks is placed in its slot and the retractor is cocked enough from its normal operating position to permit the other rollback to be moved into its slot, whereupon the retractor is centered and the guide released to interfit the retractor hub and the fork-head. The bolt, retractor, spring and guide will then remain preassembled as a unit for later insertion into a door.

Each knob 10 is hollow and has a removable front cover plate 43 which is secured to the knob by means of a snap ring 44. The back or inward facing portion of the knob presents a flat annular face 45, which is necked to provide a rearwardly extending cylindrical boss 46. This boss has a socket 47 at its outer end to mate with its related spindle 39 or 40, so as to secure the handle rotatably with respect to the retractor 13.

Each escutcheon 11 or 12 comprises a front plate 48 with a rearwardly extending annular disc-like protrusion 50 which is made integral with the front plate and which fits into one end of a relatively large cylindrical hole 51 bored through the width of the door. This protrusion has an axial through hole 52 which provides a journal mounting for the boss 46 of its related handle. The escutcheon also has a forwardly extending cylindrical portion 53 which presents a front annular face 54 to bear against the back face 45 of the knob. The boss 46 is so arranged that when the faces 45 and 54 are abutting, the boss 46 extends beyond the axial opening 52 of the escutcheon. This extension is circumferentially grooved to receive the snap ring 19. Thus, each handle 10 with its escutcheon 11 or 12 may be preassembled to provide a single component for later installation in a door.

Projecting inwardly from the back face 57 of each escutcheon plate 48 and spaced radially from the annular protrusion 50 is a dowel 58. This dowel mates with a related socket 60 bored in the face of the door to prevent turning of the escutcheon on the door.

Extending through the escutcheon 11–12 at the forwardly extending annular portions 53 thereof are two holes 61 and 62, which are arranged to register when the dowels 58 are alined. Hole 62 is threaded to engage the screw 20 while the hole 61 is counterbored at 63 to accommodate the head 64 of the screw. The back wall of the handle 10 adjacent the escutcheon 11 has an access opening 66 which is equidistant with the screw hole 61 from the journal axis of the handle so that this access opening can register with the hole 61. It should be noted that this opening is desirably smaller than the head 64 of the screw 20 so that when the handle 10 and escutcheon 11 are preassembled with the screw, the screw is imprisoned in the assembled component.

This door latch is characterized in that it peculiarly adapts itself to be partially preassembled into four separate components; the first being the afore-described bolt, retractor, spring and guide assembly; the second being the integral latch case and face plate member 15 and 29;

and the third and fourth being the two escutcheon handle members 10–11 and 10–12, respectively.

In preparation for installation of the door latch it is necessary to bore the aforementioned hole 51 through the thickness of the door, and to bore the dowel holes 60 and the latch hole 67, the latter being bored from the outer facing edge of the door with its axis perpendicular thereto and radial with respect to the axis of the hole 51. The dowel holes 60 are easiest provided by boring a single hole through the door so that alinement of the dowel holes is assured.

After preparation of the door, the bolt, retractor, spring and guide component is inserted into the hole 51 with the bolt 14 projecting from the hole 67. Since the bolt 14 must be inserted part of the way into the hole 67 at an angle to the axis of the hole before the back end of this component can be located in the larger hole 51, there must be enough clearance between the hole 57 and the bolt 16 to allow for some misalignment therebetween. This clearance is provided by the allowance for the thickness of the latch case 15. The latch case, face plate piece 15 and 19 can then be secured by screws 32 with the latch case 15 sleeved on the bolt 14 to provide a slide mounting therefor. Following this step the two handle escutcheon components 10–11 and 10–12, are slipped onto their related spindles 39–40 and the dowels 58 are seated in the alined holes 60 to prevent the escutcheons from turning and to aline the holes 61–62. A screw driver is then inserted through the access opening 66 into engagement with the screw head 64 to thread the screw 20 into hole 62 so as to draw the two escutcheon handle components together. Installation is completed by securing the two cover plates 43 onto the handles by the snap rings 44.

The latch is disengaged by turning either handle 10 in a clockwise or counter-clockwise direction, causing respectively either the upper or lower rollback 35 or 35 to push against its related abutment 34 so as to retract the bolt 14 against the pressure of the spring 17. When the handle is released, the spring 17 acts to project the bolt 14 through the face plate opening 30 until the forwardly facing stop shoulder 28 engages the back of the face plate 29. As is conventional, coaction of the strike face 21 of the bolt and the strike plate 16 during closing of the door causes automatic retraction of the bolt followed by engagement upon closure.

Though a variety of materials could be used in the construction of this latch, it peculiarly adapts itself to having all the parts (except the spring 17) cast of translucent plastic such as nylon. It can be seen first that the arrangement of the latch does not stress any of the parts to any great degree, thus allowing the use of such low-stress material. Further, there is the consideration that often a person who is grasping a handle has previously generated a certain amount of static electricity on his body by walking on a rug. The use of a plastic material prevents the sparking or shock otherwise experienced when the person grasps a metallic handle. For marine use, the corrosive-resistant nature of plastic is especially advantageous, as is the light weight of such material for use in aircraft. With regard to its use in a public conveyance, when used as a latch on a lavatory door, it is possible for a passenger to ascertain whether the lavatory is occupied, by observing the presence or absence of light shining through the latch.

It should also be pointed out that the manner in which this latch is spring loaded acts to eliminate rattle and wear in the lock.

It is my intention that no limitations be implied and that the hereto annexed claims be given the broadest interpretation to which the employed language fairly admits.

What I claim, is:

1. In a door latch, an escutcheon having a central through opening, a knob having a back wall seated against said escutcheon and being necked behind said back wall to provide a boss journaled to turn within said central opening, keeper means for retaining said boss in said opening, said escutcheon and back wall having screw and access holes, respectively, therethrough which are offset an equal amount from the journal axis of said boss.

2. The structure of claim 1 in which the back face of said back wall of the knob and the opposing front face of the escutcheon are flat annular faces.

3. The structure of claim 1 in which said keeper means comprises a snap ring on said boss behind said escutcheon.

4. In a door latch, an escutcheon having a central through opening, a hollow knob having a back wall seated against said escutcheon opening, said knob having a front cover plate hiding said back wall, said escutcheon and back wall having screw and access holes, respectively, therethrough which are offset an equal amount from the journal axis of said boss.

5. The structure of claim 4 in which said cover plate is removable and is retained by a snap ring fitting within said knob.

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