Feb. 24, 1953 E. L. SCHLAGE 2,629,250

DOOR LOCK

Filed April 11, 1949 2 SHEETS—SHEET 1

FIG. 1.

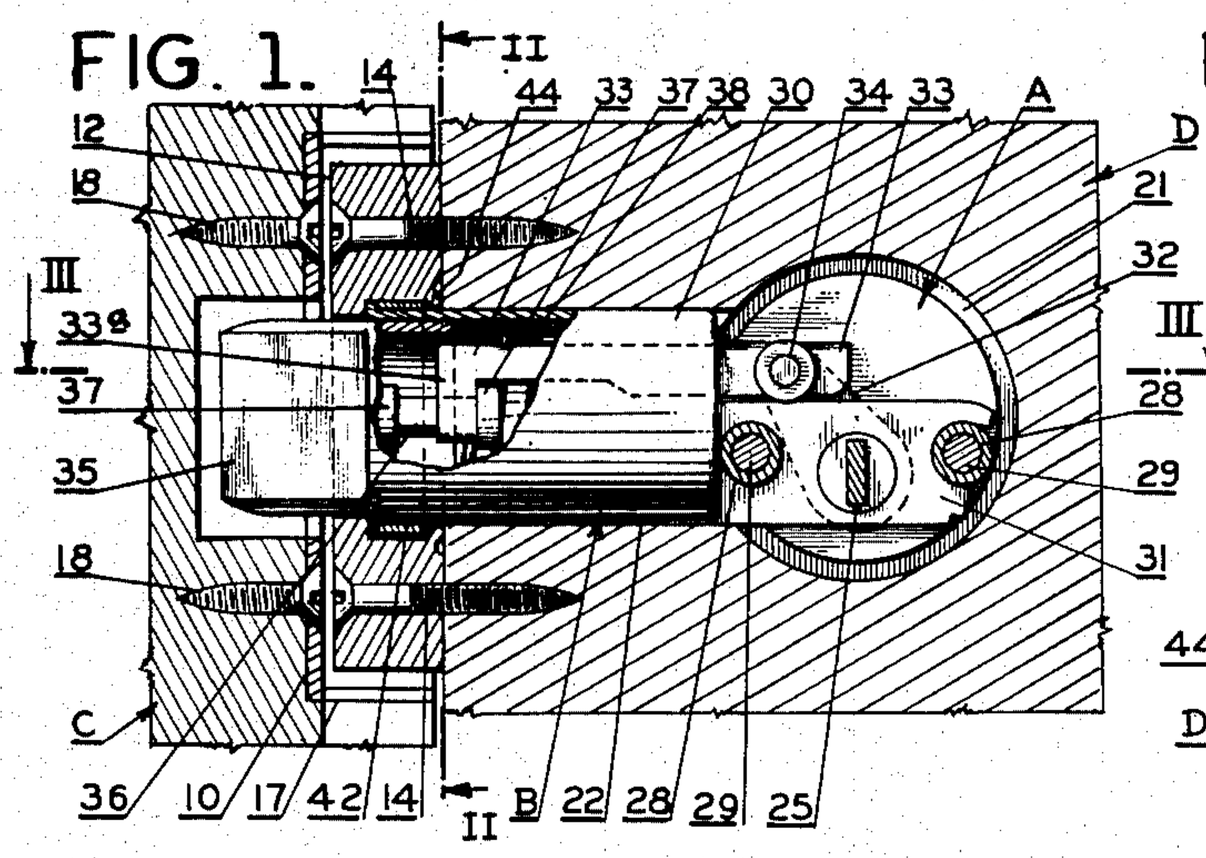

FIG. 2.

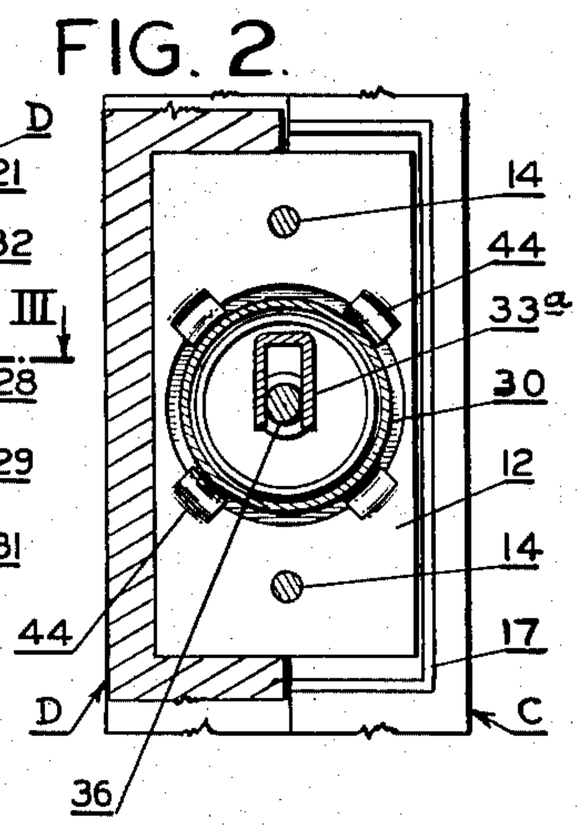

FIG. 3.

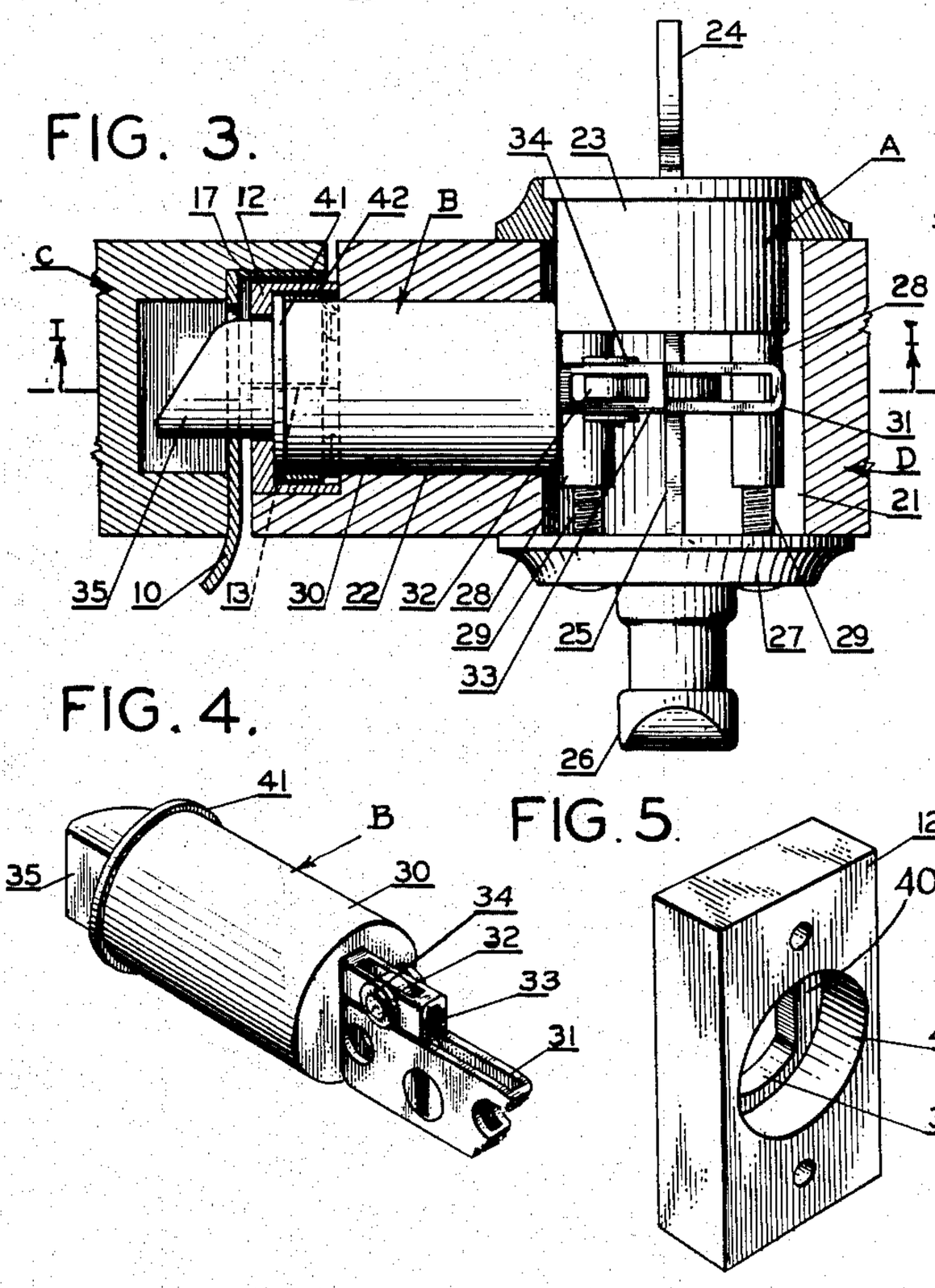

FIG. 7.

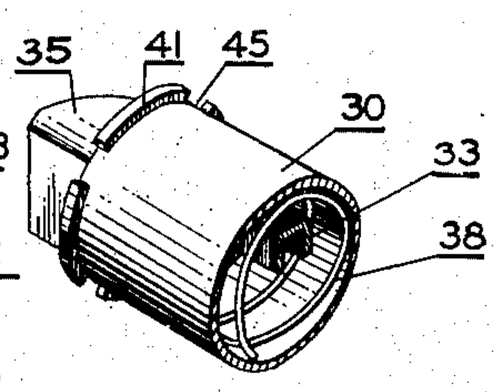

FIG. 4.

FIG. 5.

FIG. 8.

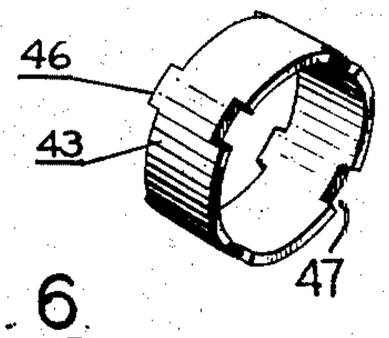

FIG. 6.

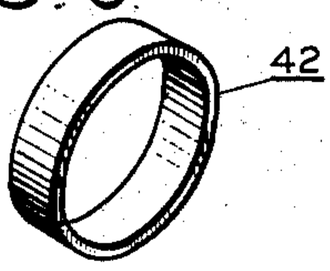

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FIG. 9.

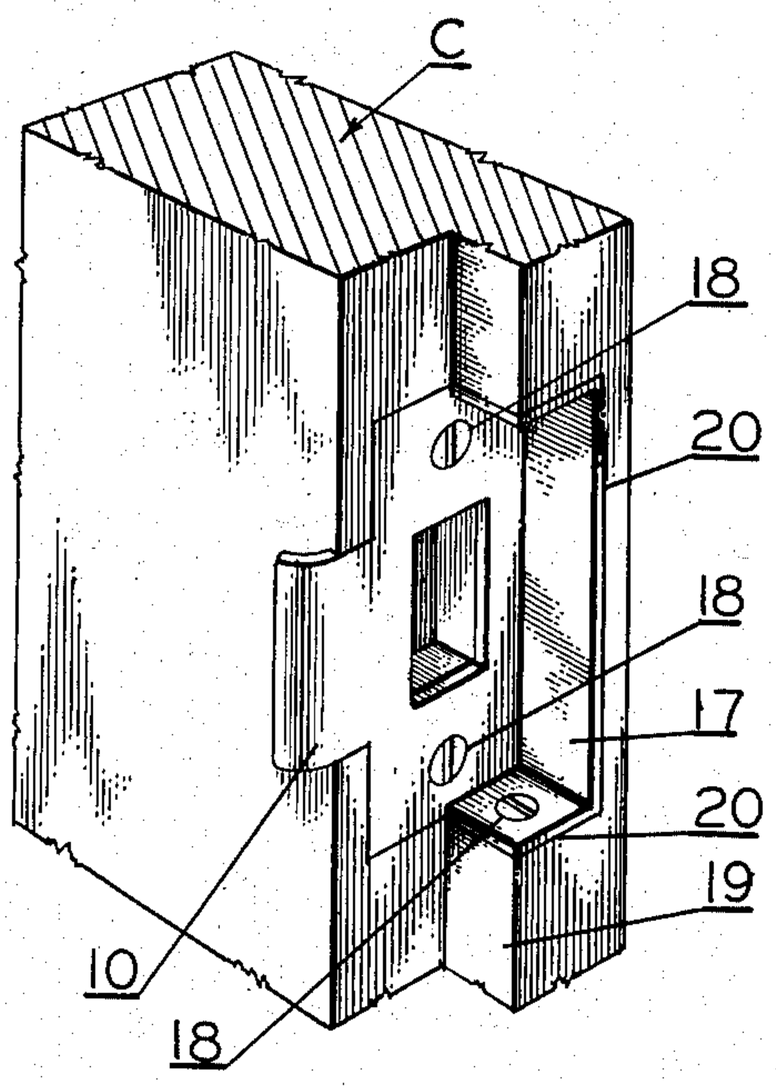


FIG. 10.

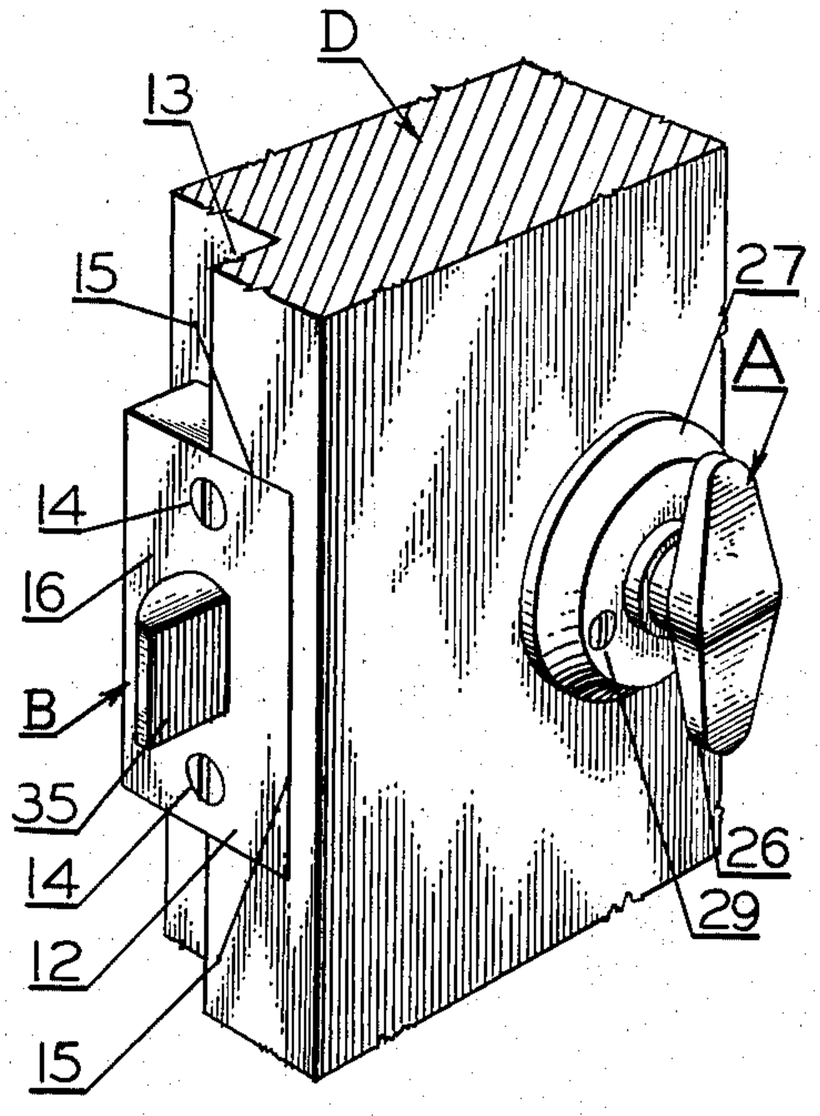


FIG. 11

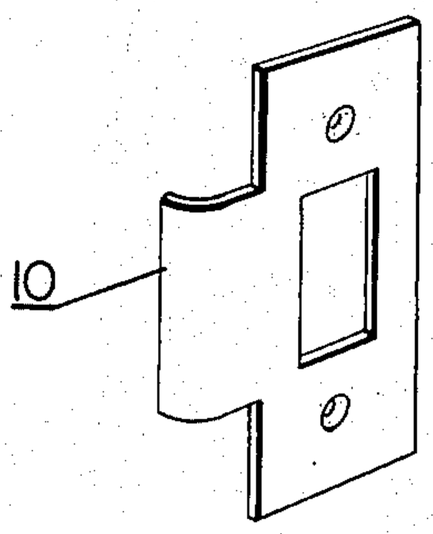
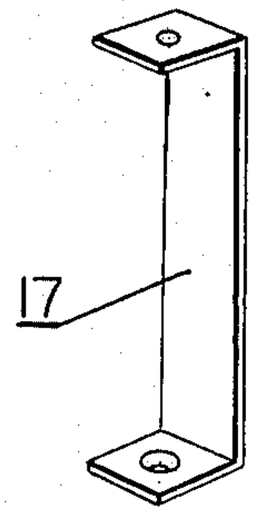


FIG. 12



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UNITED STATES PATENT OFFICE

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DOOR LOCK

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Application April 11, 1949, Serial No. 86,844

8 Claims. (Cl. 70—450)

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This invention relates to a door lock particularly intended for installation in rabbeted doors, such as French doors.

Rabbeted doors are arranged in pairs with the meeting rails of the doors channelled and mutually overlapped. One of the doors must be closed first and generally is provided with bolts at the top and bottom to secure the door when closed. The other door is thereafter closed and is locked to or with relation to the first door.

The object of the present invention is generally to improve and simplify the construction and operation of door locks of the character described; to provide a door lock which may be installed in a door with a minimum of skill and effort; to provide a door lock in which the latch bolt is reversible to take care of right and left-hand doors; and further, to provide a latch bolt that may be permanently secured in either a right or left-hand position.

The door lock is shown by way of illustration in the accompanying drawings in which

Figure 1 is a side view of the door lock partially broken away and partially in section.

Figure 2 is a cross section taken on line II—II of Figure 1.

Figure 3 is a horizontal view partially in section taken on line III—III of Figure 1.

Figure 4 is a perspective view of one form of latch bolt unit.

Figure 5 is a perspective view of the face plate.

Figure 6 is a perspective view of the spacing ring for a reversible latch bolt.

Figure 7 is a perspective view of another form of latch bolt unit partially broken away to show the spring and the retractor arm.

Figure 8 is a perspective view of a spacing ring for a non-reversible latch bolt.

Figure 9 is a perspective view of part of the door adapted to be first closed and bolted, said view showing the strike plate and guard and the general shape of the rabbet.

Figure 10 is a view, similar to Figure 9, of part of the second door with a door lock installed therein, said view also showing the general shape of the rabbet.

Figure 11 is a perspective view of the strike plate and

Figure 12 is a perspective view of the guard.

In the general installation, a door C is arranged to be closed first and bolted at the top and bottom by bolts, not shown, and has a strike plate and a guard mounted thereon. A door D is arranged to be closed second and to be secured by the latch bolt of a latch bolt unit B having

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an actuating unit A. The latch bolt unit B carries a face plate 12 which is made sufficiently thick to be of the same depth as the rabbeted edge 13 of the door D. The face plate is secured to and is held flush with the edge of the door by screws 14—14, and the rabbeted edge is mortised to provide a cut out 15 to receive half of the face plate, the other half 16 being left exposed.

Mounted in the first door C is a strike plate 10 and a latch guard 17, both being secured to the door by screws 18. The rabbeted edge 19 of this door is mortised to provide a cut out 20 to receive the guard and the strike plate.

The actuating unit A is insertable in an opening or hole 21 drilled transversely through the door D, and the latch bolt unit B is insertable in a hole 22 drilled through the edge of the door and at right angles to the hole 21. The actuating unit A has a cylindrical housing 23 which contains a pin tumbler lock actuated by a key 24 to rotate a flat spindle bar 25. The spindle bar extends into a knob or turn piece 26 carried by an escutcheon plate 27 and so may be rotated either by the key 24 or by the turn piece 26. Carried by the housing 23 is a pair of tubular posts 28—28 internally threaded to receive a pair of screws 29—29 carried by the escutcheon plate 27.

The latch bolt unit B includes a cylindrical housing 30 open at its outer end and closed at its inner end. The closed end carries a folded anchor plate 31 having a pair of openings formed therein to permit the tubular posts 28—28 to extend therethrough. The anchor plate is also provided with a central opening to support a crank arm 32 which is slotted to receive the spindle bar 25. The closed end of the latch bolt housing has an opening formed therein just above the anchor plate and through this opening a retractor arm 33 fastened by a connection 34 to the crank arm 32. The outer or open end of the latch bolt housing carries a latch bolt 35 in part circular and in part non-circular in cross section. A post 36 is secured to the inner end of the latch bolt and has spaced collars 37 formed thereon. The forked end 33*a* of the retractor arm 33 straddles the post and engages the collars. The latch bolt is retracted by the retractor arm and it is projected and normally held in projected positon by a spring 38.

The face plate 12 is secured to the outer or rabbeted edge of the door D by the screws 14—14 and in addition thereto is also secured to the outer end of the latch bolt housing 30. The face plate

and the latch bolt housing may be secured together in such a manner that they are relatively rotatable when detached from a door so that they can then be set for either right-hand or left-hand installation and when mounted, are retained in either set position. Alternatively, the latch bolt housing and the face plate may be secured together in such a manner that they may be assembled at the factory for either right-hand or left-hand installation and are then permanently held in their originally assembled relationship. To this end, the face plate has two co-axial communicating openings 39 and 40 (see Figure 5) formed therein. The opening 39 is shaped to conform to the non-circular part of the cross sectional shape of the latch bolt and the opening 40 is circular in cross sectional shape and is enlarged to receive an annular flange 41 formed on the latch bolt housing. The opening 40 also receives one or another of alternatively used spacing rings 42 and 43 (see Figures 6 and 8). The openings 39 and 40, being of different shape and size, leave an abutment 40*a* between them within the face plate 12.

If it is desired to permit the face plate 12 and the latch bolt 35 to rotate with respect to the outer end of the latch bolt housing 30, the spacing ring 42 is slipped over the latch bolt housing and into engagement with the flange 41. The face plate 12 is then slipped over the outer end of the latch bolt housing and the assembled parts are placed in a die which forces portions of the metal of the face plate to form lugs 44 disposed inwardly and behind the spacing ring at four distinct points (see Figures 1 and 2). The lugs secure the face plate against removal from the latch bolt housing, but leave the face plate and latch bolt free to rotate with respect to the housing so that they can be turned to fit either a right or left-hand door. On the other hand, if it is desired permanently to secure the face plate to the outer end of the latch bolt housing, the spacing ring 43 shown in Figure 8 and the latch bolt unit shown in Figure 7 are employed. In this instance, the flange at the outer end of the latch bolt housing, although having the same envelope shape as before, is provided with notches 45. Interlocking lugs 46 are formed on one edge of the spacing ring 43 while appropriate notches 47 are formed in the other edge to receive the metal lugs 44 forced inwardly from the inner face of the face plate thus permanently and rigidly securing the face plate against both rotation or removal from the latch bolt housing.

In actual operation, the rabbeted edges of the doors are first mortised to receive the face plate, the strike plate and the guard. The strike plate and guard are fastened in place by the screws 18. The holes 21 and 22 are then drilled and the latch bolt unit B is inserted in the hole 22 and is secured by the screws 14—14. The housing 23 of the actuating unit A is next inserted in the opening 21 and when it is so inserted, the posts 28—28 pass through the openings in the anchor plate 31 and the spindle 25 passes through the crank arm 32. The escutcheon plate 27 with its turn piece 26 is next applied and finally the screws 29—29 are tightened in the tubular posts 28. This completes the installation.

If it is desired to open the door, the latch bolt may be retracted either by the key actuated mechanism or the turn piece as either will rotate the spindle bar and thereby cause the crank arm to retract the retractor arm and the latch bolt connected therewith against the pressure of the spring 38. When not mounted on a door, and if the unit employs the ring 42, the latch bolt is free to rotate within the latch bolt housing as the envelope shape of the latch bolt is cylindrical. The latch bolt is also then free to rotate with relation to the forked end of the retractor arm as the post on the inner end of the latch bolt is round in cross section. The face plate 12 is also free to rotate about the latch bolt housing if the spacing ring 42 shown in Figure 6 is employed. Hence, before the screws 14—14 are applied it is possible to position the latch bolt and the face plate to fit either a right- or left-hand door. When the spacing ring 43 shown in Figure 8 is employed with a flange having notches 45 (Figure 7), the face plate and the latch bolt become permanently secured against rotation and therefore are positioned for a right- or left-hand installation before leaving the factory. The lock when installed in rabbeted doors of the character here shown requires only a minimum removal of wood from the rabbeted edges, and as these edges are reinforced by the guard plate and the face plate itself, the door structure is weakened little, if any.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a lock, a cylindrical housing having an outwardly projecting flange at one end, a latch bolt disposed within said housing and projecting from said end thereof, a face plate having a pair of communicating openings therein, the first having the cross sectional shape of the latch bolt and the second being circular and having the envelope shape of the cross section of the flange, there being an abutment in said face plate between said openings and engageable by said flange, a circular spacing ring surrounding the housing and engageable with the circular flange within said circular housing, and a member on the face plate extending into said second opening in the path of the spacing ring.

2. In a lock, a cylindrical housing having an outwardly projecting flange at one end, a latch bolt rotatably disposed within said housing and projecting from said end thereof, a face plate having a pair of communicating openings therein, the first for the latch bolt and the second for the flange, said openings being different in cross section to leave an abutment between them in said face plate, a spacing ring surrounding the housing and engaging the flange, and a lug on the face plate engaging the spacing ring.

3. In a lock, a cylindrical housing having an outwardly projecting flange at one end, a latch bolt disposed within said housing and projecting from said end thereof, a face plate having a pair of communicating openings therein, the first for the latch bolt and the second for the flange, said openings being different in cross section to leave an abutment between them in said face plate, a spacing ring surrounding the housing adjacent the flange, means interengaging the spacing ring and the annular flange, and means for securing the spacing ring to the face plate against endwise removal and rotation.

4. In a lock, a cylindrical housing having an outwardly projecting flange at one end, said flange having notches therein, a latch bolt disposed within said housing and projecting from said end thereof, a face plate having a pair of communicating openings therein, the first for the latch bolt and the second for the flange, the openings being different in cross section to leave an abutment between them in the face plate, a

spacing ring surrounding the housing, said ring having lugs on one edge to engage the notches in the flange and having notches in its opposite edge, and lugs on the face plate engaging the notches in the spacing ring.

5. In a lock, a face plate having a front face and a rear face, there being a first non-circular opening through said front face and a second circular opening through said rear face, said openings communicating with each other and leaving an abutment within said face plate available through said rear face, a housing extending into said second opening, a flange having a circular envelope on said housing and disposed against said abutment, a latch bolt having a non-circular portion movable through said first opening and a circular portion movable through said housing, and a projection on said rear face overlying said second opening in the path of said flange and separated a substantial distance from said flange when said flange is disposed against said abutment.

6. In a lock, a face plate having communicating openings therein, one opening having a circular cross section and the other opening having a non-circular cross section, an abutment in said face plate between said openings, a housing of circular cross section disposed within said one opening, a latch bolt disposed in said housing and having a part extending through said other opening, said latch bolt part having a cross section fitting said non-circular cross section, a flange extending outwardly from said housing, said flange having peripheral notches therein, a ring on said housing, lugs on said ring disposed in said peripheral notches, said ring having edge notches therein, and lugs integral with said face plate disposed in said edge notches.

7. In a lock, a face plate having communicating openings therein, one opening having a circular cylindrical wall, a circular cylindrical housing disposed in said opening, the body of said housing being smaller than and spaced from said wall, a flange extending outwardly from said housing substantially into contact with said wall, and lugs integral with said face plate extending behind and separated a substantial distance from said flange and extending substantially into contact with said housing.

8. In a lock, a face plate having communicating openings therein and an intervening abutment, one of said openings having a bearing wall, a housing disposed in said opening against said abutment, the body of said housing being small enough to leave a space between it and said wall, a flange extending outwardly from said housing substantially into contact with said bearing wall, a ring in said space behind said flange, and lugs integral with said face plate extending behind said ring.

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