Dec. 8, 1953 N. A. WELCH ET AL 2,661,977

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Original Filed Sept. 14, 1945 2 Sheets-Sheet 1

Fig. 1.

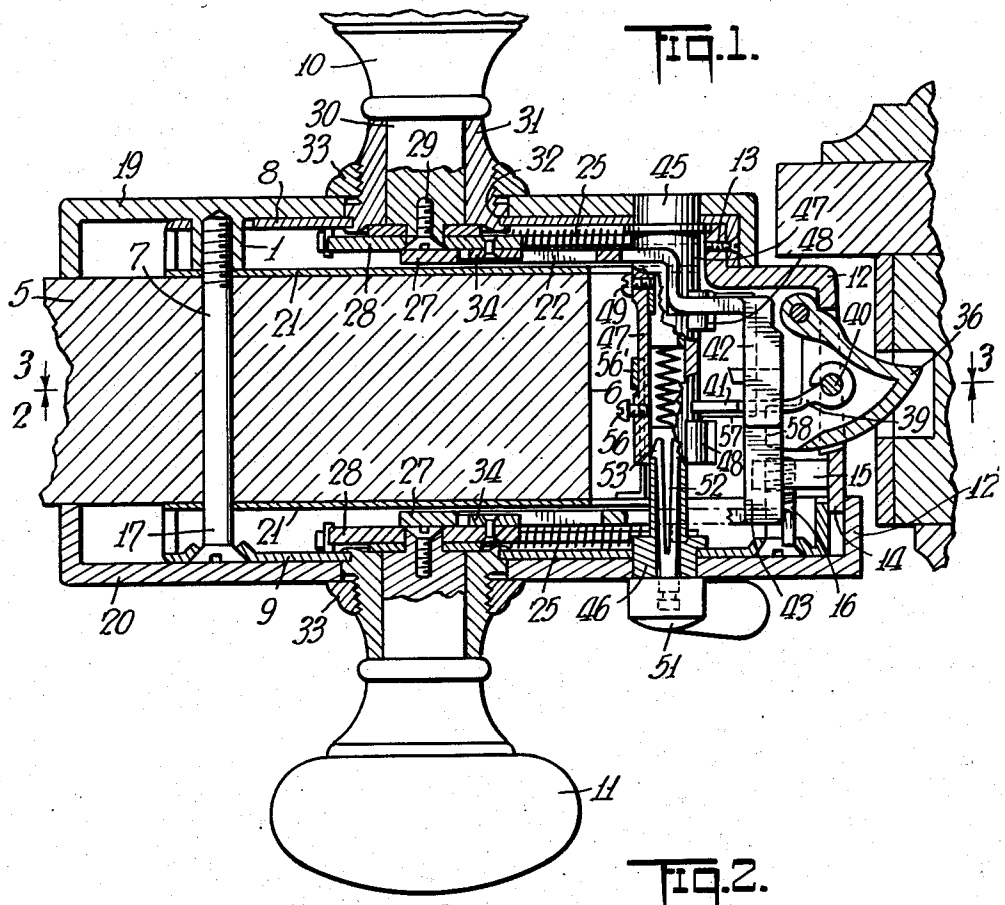
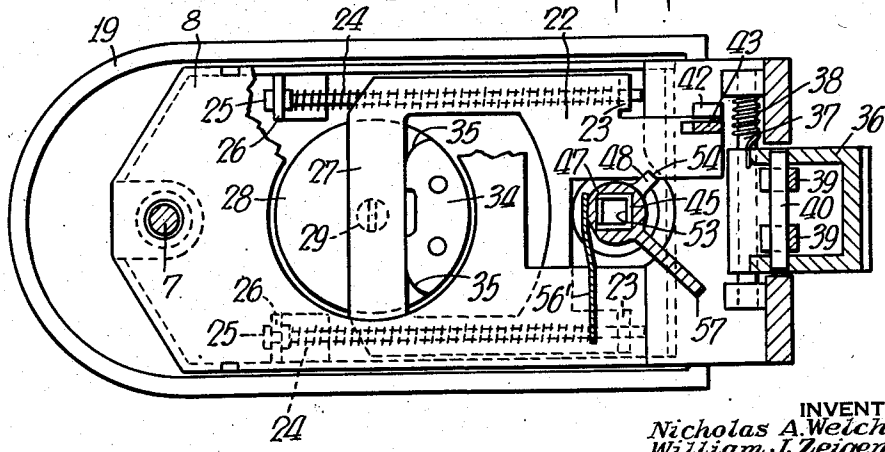


Fig. 2.



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FIG. 3.

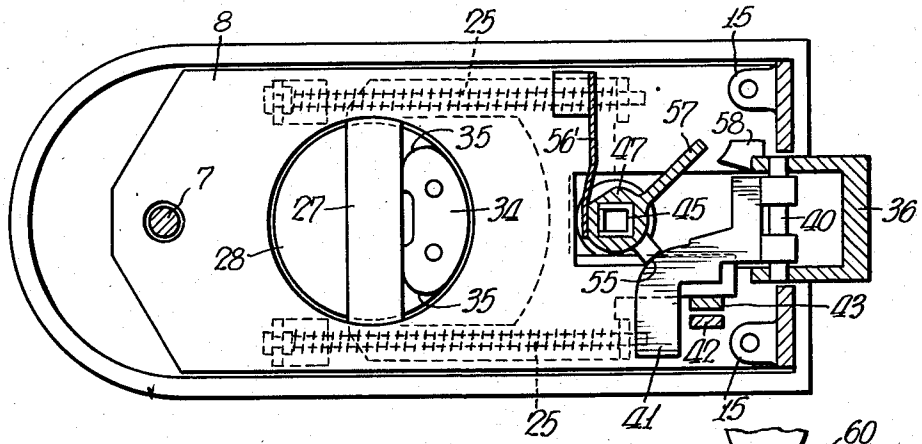


FIG. 4.

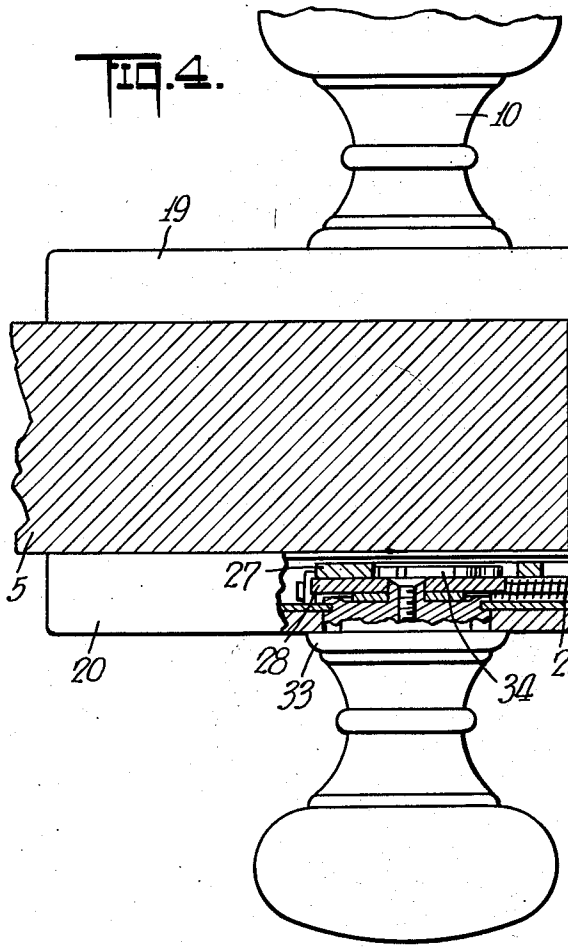
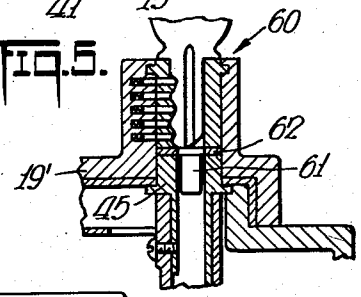


FIG. 5.



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LOCK

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Original application September 14, 1945, Serial No. 616,354, now Patent No. 2,596,949, dated May 13, 1952. Divided and this application March 6, 1952, Serial No. 275,048

7 Claims. (Cl. 292—336.3)

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Our invention relates to a lock particularly adapted for use on interior doors. This application is a division of our U. S. Patent 2,596,949, issued May 13, 1952.

It is an object of the invention to provide an improved lock which is adaptable to doors in a wide range of thicknesses.

It is another object to provide a lock which may be applied to a door with a minimum of mutilation or weakening of the door.

Another object is to provide a lock in which a substantial part of the mechanism is positioned exteriorly of the door surface.

Still another object is to provide a lock in which the knobs will remain substantially free and be non-binding regardless of slight inaccuracies due to faulty installation.

Still another object is to provide a lock with no direct material connection between the knobs.

Another object is to provide an improved lock dogging means.

It is another object to provide improved dog means in a device of the character indicated, arranged to be thrown to inoperative position when the latch is moved to retracting position.

Still another object is to provide improved dogging means readily set so that the latch may be dogged from either side of the door.

Another object is to provide a roll-back of improved form so as to avoid binding of a slide.

Other objects and various features of novelty of invention will be hereinafter pointed out or will be apparent to those skilled in the art.

In the drawings which show, for illustrative purposes only, a preferred form of the invention:

Fig. 1 is a horizontal section through a lock illustrative of the invention and showing parts in operative position relatively to a door and door jamb.

Fig. 2 is a sectional view taken substantially in the plane of the line 2—2 of Fig. 1.

Fig. 3 is a sectional view taken substantially in the plane of the line 3—3 of Fig. 1.

Fig. 4 is a view similar to Fig. 1 but illustrating the latch in retracted position, the dogging means having been moved to inoperative position.

Fig. 5 is a fragmentary view in section illustrating how a cylinder or other lock may be employed at the outside of the door.

My improved lock is intended to be applied to a door 5 and a substantial part of the mechanism is on the outside of the door. The only necessary mutilation of the door is a shallow notch cut therein back to about the point 6. A single hole 7 may be bored through the door for receiving a clamp screw, as will be later described.

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The lock in the preferred form includes a pair of casings which fit against opposite sides of the door, and these casings each carry their own independent latch-slide or latch-actuating mechanisms, as well as outer and inner knobs 10—11. Each of the casings 8—9 includes or carries one of two closely offset but telescopically related latch-front parts 12—12', each projecting toward the other side of the door and so as to extend across the front of the door. In the form illustrated, the latch-front part 12 is secured to the case 8 as by means of screws 13 and is offset from the latch-front part 12' by an amount substantially equal to the thickness of the part 12' at the overlap of part 12' with the opposite side 14 of part 12. The said opposite side 14 of part 12 is slidable relatively to the casing 9 and to the escutcheon or trim plate, as will be clear from Figs. 1 and 4. In order to secure the lock to the door (after the latter has been notched back to about the line 6) we preferably connect the casing 9 to the front part 12. The latch front part 12 may have a pair of lugs 15 which may be threaded to receive securing screws 16, the heads of which may be countersunk in the casing 9, as will be seen in Fig. 1. When the lock is applied to a thick door, the latch front part 12 may be related to the inside case 9 about as shown in Fig. 1. When the lock is applied to a thinner door, the side 14 of the latch front part 12 will be telescoped relatively to the case 9 so that both cases 8—9 may firmly abut the door and be held or clamped in place by the screws 16. A clamp screw 17 may have its head seated in a counterbore in the case 9 and extend through the hole 7 in the door; screw 17 may be threaded into a boss 18 on the inside of the outer escutcheon or trim plate 19. The boss 18 may extend through a hole in the case 8 and may abut the cover cap of the case 8. Thus, when the screws 16 and 17 are drawn tightly, the lock as a whole will be firmly secured to the door. Furthermore, the screws 16 and 17 can be reached only from the inside of the door (when lock is applied as shown). As will be later described, the inner trim plate 20 may be loosened and swung around the knob so as to afford access to the screws 16 and 17.

The cases 8 and 9 are substantially identical except that the case 9 is longer than the case 8. Each case consists of a cup-shaped or flanged-plate member and may be closed by cover cap 21. Within each case is a latch slide 22, which may be formed of sheet metal and may be provided near the front with downturned ears 23—23. These ears bear on compression springs 24—24 surrounding guide pins 25 carried by ears 26 in

the casings and serving as abutments for the compression springs 24. Thus the slides are urged forwardly. The ears 23 on the slides may ride along the bottom of the cases 8—9 so as to guide the forward ends of the slides. The rear ends or cross bars 27 of the slides rest on roll-back disks 28 and are slidably guided between those roll-back disks and the case covers 21.

The roll-back disks 28 are secured as by means of screws 29 to knob shanks 30. The knob shanks are freely rotatable in knob bushings 31 which may be riveted or otherwise secured to the casings, as indicated at 32. Bushing rings or nuts 33 threaded on the bushings 31 serve to hold the trim plate 19—20 in place over the casings, as will be clear. When the inner knob bushing ring 33 is backed off, the inner trim plate 20 may be moved outwardly relative to its knob shank and then swung about the knob shank 30 to give access to the heads of screws 16—17. The roll-back disks 28 carry roll-backs 34 riveted or otherwise secured thereto in position to engage the cross bars or rear ends of the slides 22 for retracting the slides by means of the knobs as will be clear. The operative portions 35 of the roll-backs are preferably of involute form so that during slide retraction the roll-backs move along the slide bars 27 with a maximum of rolling motion and a minimum of sliding motion so as to avoid cramping or cocking of the slides.

The latch 36 is illustrated as of the swinging type pivoted on a latch pin 37 held in lugs on the latch front and urged into outward or latching position by means of a coil spring 38 engaging the latch 36 and one of the lugs, as is common practice. The latch has a latch tail 39 carried by a latch tail pin 40. The latch tail 39 extends rearwardly and is provided with a transverse abutment arm 41 to be engaged by independent actuating means carried by the respective mechanisms of casings 8—9; the independent actuating means in each case includes members or latch-slide arms (42, for the outside latch mechanism; 43, for the inside latch mechanism) offset from one another in a sense transverse to the actuating movement of arms 42—43 and to an extent at least equal to the thickness of one of arms 42—43. These members or arms 42—43 preferably each extend toward the opposite side of the door and to an extent permitting telescopic overlap upon assembly to a door, regardless of door thickness. The arms 42—43 are shown formed of sheet material of width substantially exceeding thickness, and the thickness dimension is preferably oriented in general parallel alignment with the axes of movement of arms 42—43. It may be here stated that the slide casing caps 21—21 are provided with openings for the free passage and operation of the latch slide operating arms 42—43. Thus, when either knob is rotated one of the retracting arms will serve to retract the latch and, of course, when the door is slammed the latch will be retracted by its engagement with the strike plate, as is usual.

In order to dog the latch from the inside so as to prevent latch actuation by the outside knob, we have provided means such as a knob or thumb piece which is actuable from the inside of the door, and the dogging means may be provided with means for emergency actuation from the outside and, in fact, may be provided with a cylinder or other lock so that the dogging means may be moved to dogging position and locked in that position from the outside of the door. However, for ordinary use on a bathroom or chamber door the dogging means will be actuable only from the inside of the door except for emergency actuation from the outside of the door.

In the form illustrated, the cases 8—9 are provided with rotatable hubs or bushings 45—46 which extend inwardly between the lock casings, and a dogging means including a sleeve 47 is slidably mounted on the two hub ends. The hub ends are preferably angular in section, as shown in Figs. 2 and 3, and the sleeve 47 is of similar internal section so that the sleeve may be slid along the hubs and may at all times be effectively locked against rotation relatively thereto. The sleeve 47 carries a dogging member or members 48, so positioned that when moved to proper position said member or members may dog either the inside or the outside slide depending upon the use and position of the lock as a whole. In the position illustrated in Fig. 1, the sleeve 47 is moved to its operative position in the direction of the outside latch slide and is secured in that position as by means of a screw 49 threaded into the end of the bushing 45. The bushing 46 has a corresponding threaded opening for receiving another screw 56 carried by the slide 47, so that when desired the sleeve 47 may be slid along and screwed directly to the hub 46.

A dogging knob or thumb piece 51 may have an angular extension 52 which may fit into the angular bore 53 of either of the hubs 45—46 whereby the latter may be turned by the dogging knob or thumb piece. In the form illustrated, the dogging knob extension 52 is split so as to be resilient and a shouldered end 53 may slip behind the bottom end of a slot or cut off portion of the hub extension 45 or 46, as will be clear from Fig. 1. Thus, when the thumb piece 51 is turned to the position shown in Figs. 1 and 2, the dogging member 48 is moved into an angular notch 54 in the slide 22 so that the slide cannot be retracted by the outside knob 10. If the sleeve 47 carrying dog lug 48 is rotated clockwise, as viewed in Fig. 2, the dog lug 48 is moved out of the notch 54, and the latch 36 may be freely retracted by the outside knob 10 and at all times by the inside knob 11.

When the sleeve 47 is moved to its other operative position close to the inside case 9 and secured in that position by means of the screw 56, the inside knob will be dogged by the dogging lug 48 or a similar lug properly positioned for engagement within an angular notch 55 of the inside slide 21, as will be clear from Fig. 3. The sleeve 47 may be resiliently held in either of its two operative positions as by means of a plate spring 56' which engages flats on the sleeve 47, as will be clear from the drawings.

Means have been provided for moving the dogging mechanism to inoperative position when the latch is retracted as by slamming of the door. Thus, it will be impossible for a person to lock himself out even though the dogging means may have been moved to dogging position when the door is open. Such a safety means may consist of an arm or plate 57 carried by the sleeve 47 and in position to be engaged by the rear end 58 of the latch 36. Thus, when the latch is retracted as by slamming the door, the arm or plate 57 will be moved clockwise as viewed in Fig. 2 and counter-clockwise as viewed in Fig. 3, so as to retract the dogging member 48 or the equivalent dogging member for the opposite slide.

The improved lock, as described, may be readily applied to either right or left hand doors

by merely swinging the entire assembly about the knob as axis; that is to say, on both right and left hand doors the outside of the door is the same and the inside of the door is the same. For a reverse-bevel door, the entire lock assembly is turned over so that what is now the inside knob will become the outside knob, and the sleeve 47 will be shifted and the dogging knob 51 engaged with the hub 45 instead of with the hub 46.

It will be obvious that in cases of emergency, a square tool could be inserted in the hub 45 or 46 from the outside of the door so as to throw the latch dogging mechanism into inoperative position to permit entry into the room. In cases where it is desirable to lock a door from the outside, we may employ a cylinder lock as shown in Fig. 5. In that slight modification the outside trim plate would be modified so as to carry a cylinder lock 60. The key-operated plug of the lock may have a loose extension 61 to fit the angular bore in the hub 45. This extension 61 may be resiliently secured to the plug of the cylinder lock by means of a spring or lost-motion connection 62 of well-known construction. Thus, if the outside slide is dogged by the cylinder lock while the door is open, the dogging means could still be thrown off automatically by the slamming of the door.

In the preferred form illustrated, the latch front part 12 is substantially flush with the outside of the door, as shown in Fig. 1, and is flush with the front edge of the door. The inside trim plate 20, on which front part 12' is formed, overlaps the front edge of the door slightly, and case parts 12'—14 telescope conveniently for a wide range of possible door thicknesses. Likewise, the telescopic overlap of latch-actuating members 42—43 and of dogging members 45—47—51 permits ready achievement of all latch functions for the same range of door thicknesses. The strike on the door jamb may be of more or less usual form but may be set back so as to clear the front edge of part 12' on trim plate 20.

It will be seen that we have provided an exceedingly simple lock which may be applied to doors of various thicknesses. The door is mutilated to the minimum extent and there is no through spindle to contribute to the sticking of knobs in case of slight inaccuracies during installation. The lock is adaptable to right-hand, left-hand, and reverse-bevel doors. The latching member may be securely dogged from the inside and may be undogged in emergency from the outside. The dogging means is thrown to inoperative position by the slamming of the door.

While the invention has been described in considerable detail and a preferred form illustrated, it is to be understood that many changes and modifications may be made within the scope of the invention as defined in the appended claims.

We claim:

1. In a lock, a pair of latch-case means to fit on opposite sides of a door, telescoping latch-front parts carried by said case means, whereby doors of different widths may be accommodated between said latch-case means, outer trim-plate means covering the outer of said latch-case means, securing means including a screw seated on the inner of said latch-case means and extending into concealed threaded engagement with said outer trim-plate means, said screw being accessible for actuation when the inner of said latch-case means is exposed, inner trim-plate means covering said inner case means and therefore the exposed part of said screw, knob means for said inner case means and journalled in said inner trim-plate means, and means for removably securing said inner trim-plate means to said inner case means.

2. In a lock, a pair of latch-case means to fit on opposite sides of a door, telescoping latch-front parts carried by said case means, whereby doors of different widths may be accommodated between said latch-case means, outer trim-plate means covering the outer of said latch-case means, securing means including a screw seated on the inner of said latch-case means and extending into concealed threaded engagement with said outer trim-plate means, said screw being accessible for actuation when the inner of said latch-case means is exposed, inner trim-plate means covering said inner case means and therefore the exposed part of said screw, knob means carried by said inner case means and extending through said inner trim-plate means, and externally accessible removable retaining means carried by said knob means and overlapping parts of said inner trim-plate means for retaining said inner trim-plate means against said inner case means.

3. A lock according to claim 2, in which said retaining means includes a nut threaded on the shank of said knob means; whereby, upon backing off said nut, said nut may release said inner trim-plate means for rotation about the axis of said knob means to permit access to said screw while retaining said inner trim-plate means on said knob.

4. In a lock, a pair of latch-case means to fit on opposite sides of a door, telescoping latch-front parts carried by said case means, whereby doors of different width may be accommodated between said latch-case means, first securing means extending between said case means for adjustably securing said case means to each other in telescoped relation, whereby said case means may be preliminarily assembled to a door to expose actuating means contained therein for servicing access without removal from the door, trim-plate means covering the outer of said latch-case means, and second securing means including a screw seated on the inner of said latch-case means and extending into concealed threaded engagement with said trim-plate means, whereby said outer latch-case means will be fully protected and yet said lock may be secured to the door while exposing said inner latch-case means for service from the inner side of the door.

5. A lock according to claim 4, in which each of said case means contains its own independent latch - retraction mechanism with projecting latch-actuating parts telescoping with each other for actuation of a latch.

6. In a lock, inner and outer latch-case means to fit on opposite sides of a door, inner and outer knobs and telescoping latch-front parts carried by said case means, inner and outer trim-plate means each in free-swivelling relation with one of said knobs, first securing means extending between said case means for adjustably securing said case means to each other in telescoped relation, and second securing means including a screw seated on the inner side of the door and extending into concealed threaded engagement with said outer trim-plate means.

7. In a lock, inner and outer latch-case means to fit on opposite sides of a door, inner and outer knobs journalled in said case means, telescoping latch-front parts carried by said case means, in-

ner and outer trim-plate means in free-swivelling relation with one of said knobs, securing means including a screw seated on the inner side of the door and extending into concealed threaded engagement with said outer trim-plate mans, and axial-retaining means on each of said knobs in axial-retaining relation with said respective trim-plate means.

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