

Feb. 12, 1929.

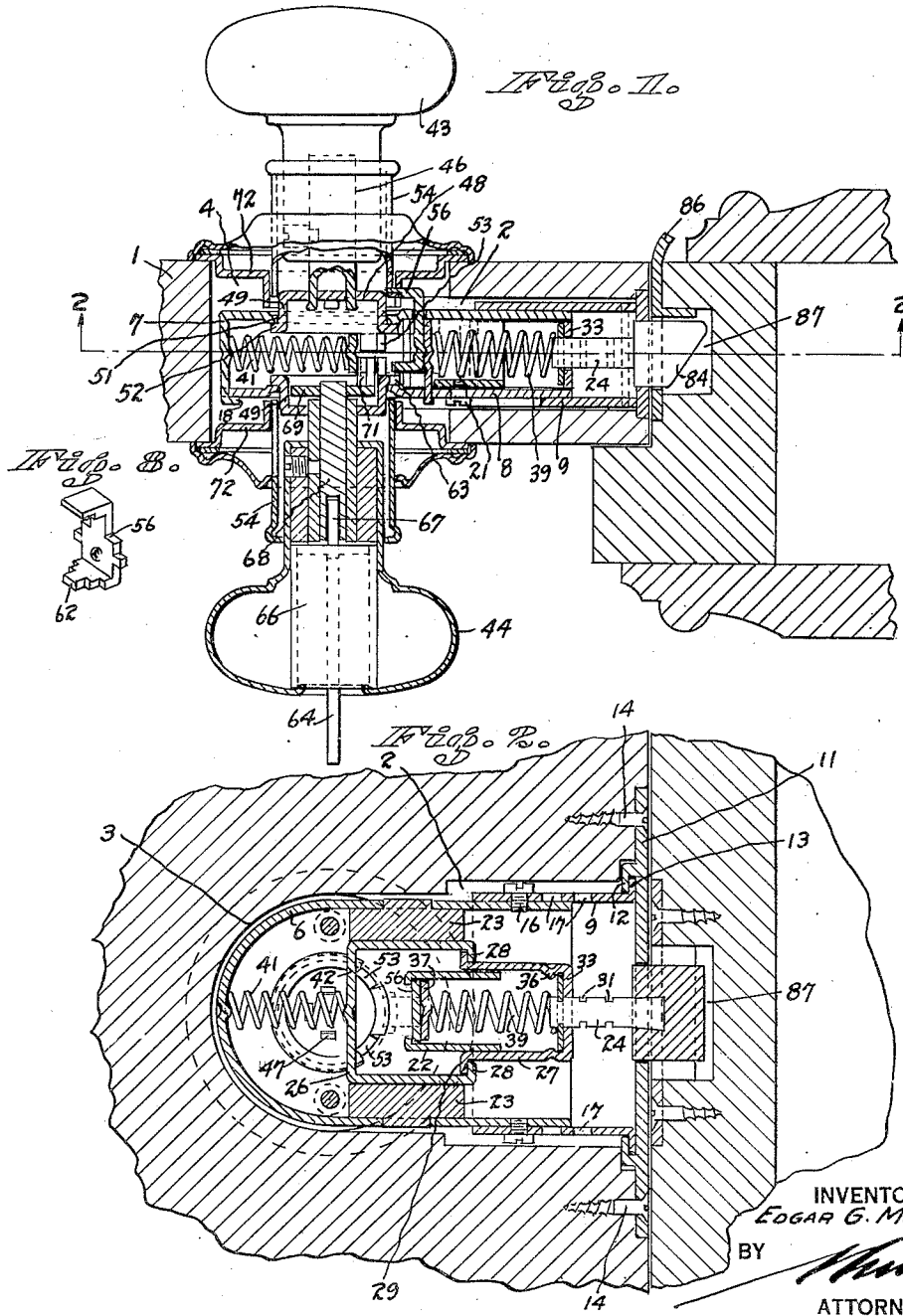
1,701,790

E. G. MORIN, JR

DOOR LOCK

Filed March 21, 1927

3 Sheets-Sheet 1



INVENTOR
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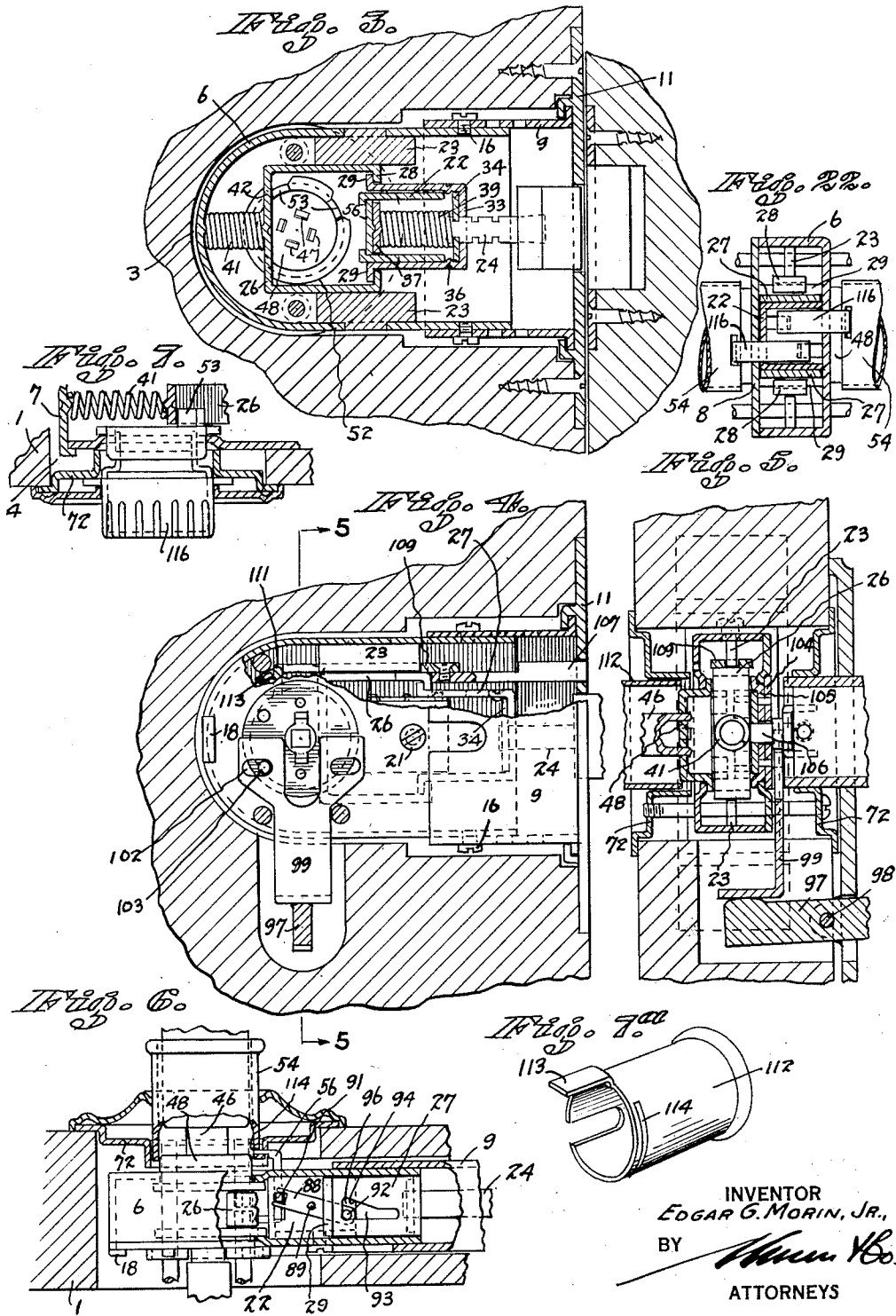
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3 Sheets—Sheet 2



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3 Sheets-Sheet 3

Fig. 9.

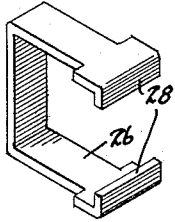


Fig. 10.

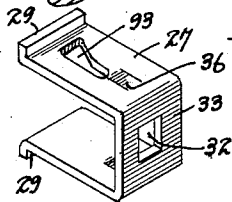


Fig. 11.



Fig. 12.

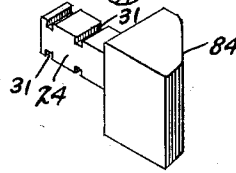


Fig. 13.

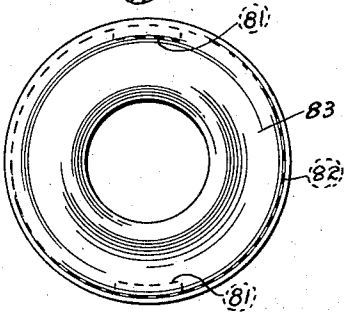


Fig. 14.

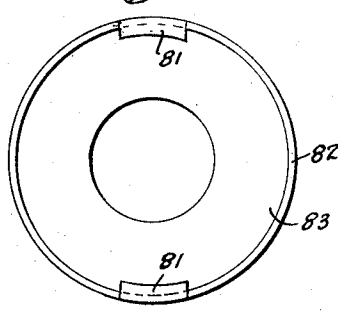


Fig. 17.

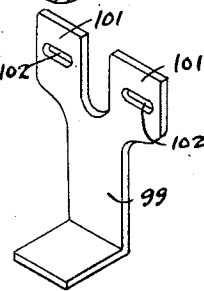


Fig. 15.

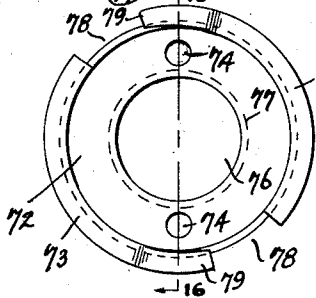


Fig. 18.

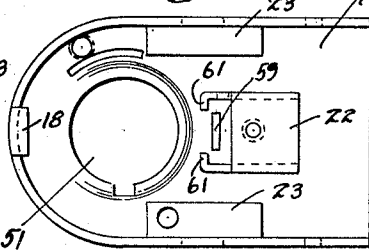


Fig. 19.

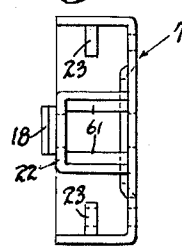


Fig. 16.

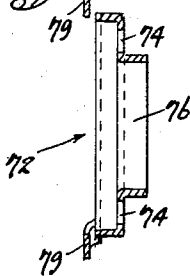


Fig. 20.

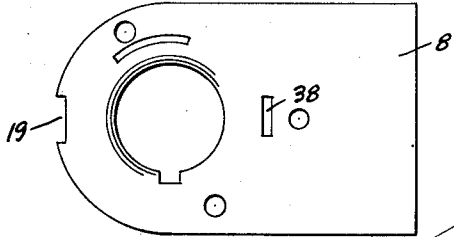
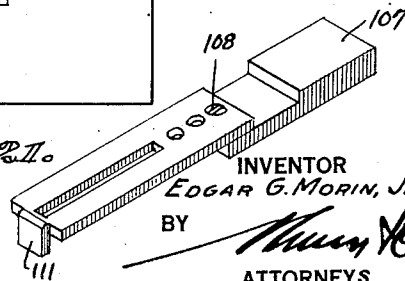


Fig. 21.



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Patented Feb. 12, 1929.

1,701,790

UNITED STATES PATENT OFFICE.

EDGAR G. MORIN, JR., OF SAN FRANCISCO, CALIFORNIA.

DOOR LOCK.

Application filed March 21, 1927. Serial No. 177,078.

The present invention relates to improvements in door locks, and its principal object is to provide a door lock affording numerous advantages in the construction thereof.

One of the objects of my invention is to provide a lock of the character described, in which the lock housing and the latch are extensible so that they may be used for different standards of doors.

Another object of the invention is to provide an operating means whereby an outer door knob may be locked against operation from the inside without necessitating the opening of the door.

Another object of the invention is to provide novel means for operating the door latch by means of a door knob.

Another object of the invention is to provide a latch arrangement consisting of a plurality of parts which are easily interchangeable.

Another object of the invention is to provide convenient means allowing a thumb latch to be substituted for the knob for operating the door latch.

Another object of the invention is to provide in combination with a door latch a night bolt and means utilizing the latch operating means for actuating the night bolt.

Another object of the invention is to provide means in connection with a bathroom door lock, or the like, allowing an outer operating element to be locked from the inside, but to be automatically unlocked by the normal operation of the inside operating member, so that it is impossible for the user to lock himself out.

Other objects and advantages of my invention will appear as the specification proceeds.

The preferred forms of my invention are illustrated in the accompanying drawings, in which

Figure 1 shows a horizontal section through my door lock;

Figure 2 is a vertical section through the same, taken along line 2—2 of Figure 1;

Figure 3 a vertical section corresponding to that of Figure 2, but showing the latch in a retracted position;

Figure 4 a similar vertical section through a modified form having a night bolt and a thumb latch associated with the door lock;

Figure 5 a section taken along line 5—5 of Figure 4;

Figure 6 a horizontal section through a modified form of door latch intended for use in a bathroom door, in which the locking means for an outside operating element is automatically unlocked by operation of an inside operating element precluding the possibility of locking one's self out;

Figure 7 a horizontal fragmentary section through a modified form intended for a closet door;

Figure 7^a a perspective detail view of a locking sleeve used in the form illustrated in Figure 4;

Figure 8 a perspective detail view of a locking member holding an outside knob against operative movement;

Figures 9 and 10 perspective detail views of interlocking latch elements;

Figure 11 a perspective detail view of a holding member for the latch bolt;

Figure 12 a perspective detail view of the latch bolt;

Figures 13 and 14 end views of face plates;

Figure 15 an end view of a holding plate;

Figure 16 a section taken along line 16—16 of Figure 15;

Figure 17 a perspective detail view of an operating member used in connection with a thumb latch;

Figure 18 is an inside view of the body section of a lock housing;

Figure 19 an end view thereof;

Figure 20 an outside view of a cover plate of the latch housing;

Figure 21 a perspective detail view of a night bolt used in the form shown in Figure 4; and

Figure 22 a detail view of a modified form adapted to be used for intercommunicating doors, in which means are provided in combination with each knob for rendering the other knob inoperative.

While I have shown only the preferred forms of the invention, it should be understood that various changes or modifications may be made within the scope of the claims hereto attached without departing from the spirit of the invention.

The door 1 is formed with a recess 2 of rectangular cross section in the front face thereof, the recess extending into the door to a depth sufficient to accommodate the door lock to be described hereinafter, and is rounded in the rear wall as shown at 3. A transverse hole 4, extending through the

door so as to traverse the rear end of the recess, is adapted to accommodate the operating members for the lock.

A lock housing 6, consisting of a body section 7, illustrated in detail in Figures 18 and 19, a cover plate 8 illustrated in Figure 20, and an extension piece 9, is adapted to be secured to the face plate 11 by means of interlocking lugs 12 and 13, and is accommodated within the recess 2, the housing being introduced through the end face of the door, and being held in place by means of screws 14 extending through the face plate into the door. The extension piece 9 is telescoped on the body portion of the housing, and fastened thereto by means of screws 16, a plurality of perforations 17 being provided in the extension piece so as to allow the same to be fastened in any one of several positions, whereby the over-all length of the housing may be adjusted to suit conditions.

The cover plate 8 of the lock housing is secured to the body section 7 by being slipped under a tongue 18 with the recessed end 19 thereof, and by being screwed as shown at 21 to a channel 22 rising centrally from the inside of the section 7. Two guide blocks 23 are secured in the body section 7 of the housing near the edges thereof, in parallel relation to the outer faces of the channel 22.

The latch accommodated in this housing comprises a latch bolt 24 and a casing consisting of the two sections 26 and 27, illustrated in detail in Figures 9 and 10. The section 26 is of larger cross section than the section 27, and is formed with inwardly projecting flanges 28 adapted to ride on the section 27, the sections being held against disengagement by outwardly projecting flanges 29 of the section 27. The bolt 24 is formed with a series of sets of registering grooves 31, and is adapted for introduction into the section 27 through a perforation 32 in the front wall 33 thereof, the bolt being held in place by a transverse clip 34 formed to engage opposing grooves of the bolt and held against endwise motion in the section 27 by the front wall 33 thereof, and by small indentations 36 in the top and bottom of the section 27 back of the clip 34. It will be seen that in this manner the over-all length of the latch may be adjusted to correspond to the over-all length of the lock housing.

The section 27 of the latch is guided by the outer face of the channel 22 and the section 27 is guided by the inner face of the blocks 23.

A partition 37 is anchored in the cover plate 8 which for this purpose is formed with a slot 38 and extends transversely through the housing to form an abutment for a spring 39 bearing, through the clip 34,

on the front wall 33 of the section 27 so as to urge the bolt 24 into advanced position. A second spring 41 seated against the rear wall of the housing bears on the rear wall 42 of the section 26 and urges the same forward so that normally under the influence of the two springs 39 and 41 the latch bolt is forced into locking position as illustrated in Figures 1 and 2 while the bolt may be retracted through actuation of the section 26 or may withdraw from locking position under the impact of the closing door in the usual manner without affecting the section 26.

The latch may be operated in the form shown in Figures 1 and 2 by either of the knobs 43 and 44, the former being on the inside of the door, and the latter on the outside. The knobs may be of usual construction, including a shank, and from the shank extends inwardly a tubular member 46 terminating in prongs 47 adapted for introduction into registering perforations of a disk 48 presenting an all-around flange 49 revolvably mounted in an aperture 51 in the lock housing. The extreme margin of the flange 49 is turned over as shown at 52 to prevent the flange 49 from being withdrawn from the housing. The latter flange is formed with projecting lugs 53 bearing against the rear wall of the latch section 26 in such a manner that on revolving motion of the door knob in either direction one of the lugs 53 will retract the section 26.

A sleeve 54 is slidably mounted on the shank of each knob so as to telescope on the flange 49 when slid inwardly, and this sleeve has secured to the inner end thereof a locking member 56 illustrated in detail in Figure 8, the locking member extending through a slot 59 in the housing section 7 so as to be guided between the partition 37 and prongs 61 extending inwardly from the walls of the channel 22. The member 56 is formed with a laterally projecting tooth 62 adapted for engagement with a registering recess 63 in the turned-over portion of the flange 49 on the opposing side, whereby the latter flange is prevented from turning and from operating the latch. The member 56 and the partition 37 which are arranged in adjacent relation are kinked as shown in Figure 1 to offer yielding resistance to movement in either direction of the member 56.

When the knob 44 on the outside of the door is held against rotary motion the door lock may be opened from the outside by means of the key 64 entering through a slot 66 in the door knob into a recess 67 in a shaft 68 revolvable relative to the door knob and terminating interiorly in a disc 69 carrying a lug 71 bearing on the rear wall 42 of the latch section 26 for operating the latter when the key is turned, the movement of

the lug 71 being concentric to that of the lug 53 operated by the door knob.

The knobs or the sleeves slidable thereon find bearing surfaces in the holding plates 72 illustrated in Figures 15 and 16, the said holding plates comprising recessed discs adapted to be seated in the opening 4 on opposite sides of the door in such a manner that flanges 73 rest on the door faces while the plates are clamped upon the door surfaces by means of bolts passing through apertures 74 in the holding plates. The latter plates are perforated interiorly as shown at 76 to receive the sleeves 54 and are formed with annular flanges 77 forming a bearing surface for the sleeves.

The flange 73 of each holding plate has opposing sections cut away as shown at 78 and has sections 79 adjacent the cut away sections bent out of the plane of the flange to form tongues adapted for interlocking engagement with lugs 81 extending inwardly from the rim 82 of a face plate 83.

The device thus far described operates as follows: When the door is closed the front edge of the latch bolt, which is tapered as shown at 84, strikes a metal plate 86 fastened relative to the door jamb and retracts under the force of the impact, compressing the spring 39 and forcing the section 27 inwardly. When the point of the bolt passes the obstruction it projects again under the influence of the spring 39 to come to rest in the recess 87 in the door jamb. To open the door from the inside it is only necessary to turn the knob 43 which causes one of the lugs 53 to bear on the rear edge of the section 26, for retracting the latter. This latter motion is communicated through the section 27 to the latch bolt. In the same manner may the latch bolt be operated by the other knob 44 under normal conditions, but if the operator pushes the sleeve 54 associated with the inside knob 43 inwardly so that the member 56 enters into the recess 63 in the turned-over portion of the flange 49, the latter, and thereby the knob 44, is held against rotation so that now the latch may not be operated by manipulation of the outside knob 44. In this latter case the latch may be manipulated from the outside by means of a key 64 which revolves the shaft 68 and with it the lug 71, with the same effect as if the knob itself had been rotated. It will thus be seen that inward movement of the sleeve 54 prevents use of the outside knob.

Where the lock is to be used for a bathroom door or a similar situation where the occupant of the room does not wish the same to be accessible to anyone, even by use of a key, I preferably use the form illustrated in Figure 6. In this form no means is provided for opening the door from the outside when the occupant on the inside has

pushed the sleeve 54 inwardly, and in this case the danger of a person locking himself out has to be provided for, since if the occupant should push the sleeve 54 inwardly, and thereupon open the door to leave the bathroom, and close the same behind him, there would be no way of opening the door from the outside. For this reason I supply automatic means for unlocking the outside operating element whenever the inside operating element is manipulated for the purpose of opening the door. This means comprises a short lever 88 pivoted in the housing as shown at 89, and engaging with one arm thereof a pin 91 rising from the member 56. The other arm of the lever has a pin 92 extending therefrom, adapted to ride in a slot 93 in the latch section 27, the wall of the slot tapering as shown at 94 to provide an acute angle 96. It will be noted, referring to Figure 6, that when the sleeve 54 is pushed inwardly and the element 56 engaged with the latch operating element on the opposite side, for locking the same, the lever 88 is swung on its pivot so that the pin 92 moves into the corner of the slot forming the acute angle 96. The lock is now secured against opening from the outside. But when the occupant of the room turns the inside knob and thereby retracts the section 27 of the latch, the pin 92 rides along the slanting edge 94 of the slot 93 and thereby moves the locking member 56 back to its non-locking position. It thus appears that whenever the occupant opens the door from the inside the locking means for the outside knob is rendered inoperative so that there is no possibility of the occupant locking himself out when leaving the bathroom.

In the form shown in Figures 4 and 5, which is principally intended for the front door of a house or for an office door leading to the hallway, a thumb latch 97 is pivoted to the door plate as shown at 98 and operates a vertical member 99 illustrated in detail in Figure 17, presenting at its upper end two branches 101 formed with slots 102 adapted to receive a pin 103 extending from the face of a disc 104 which is secured to a second disc 105, corresponding in its function to the disc 48 previously described with reference to the form shown in Figures 1 and 2. Lifting of the member 99 by means of the thumb latch 97 causes the disc 104 to revolve for operation of the latch element 26 in the manner previously described. A key operated shaft 106 may also be used to operate the latch section 26 in the manner previously described.

Above the latch there is provided, in the form shown in Figures 4 and 5, a night bolt 107 shown in detail in Figure 21, the night bolt being made extensible by the provision of two sections joined by a screw 108 which may pass through one of several holes

provided for the same. The bolt slides between the latch section 28 and the guide 23 which is suitably grooved as shown at 109. When the night bolt is retracted to be flush with the front face of the door, the rear end of its front section bears against the front edge of the latch section 28 while a rear lug 111, extending downwardly from the rear end of the night bolt, is spaced from the rear edge of the section 28 when the latter is in its advance position. The sleeve 112, used in connection with the inside knob in this particular form, distinguishes from the sleeve 54 previously described by presenting a projection 113 (see Figure 7^a and Figure 4) disposed to engage with the rear face of the lug 111 of the night bolt, so that when the sleeve is turned in the proper direction the night bolt is advanced. To allow of the turning of the sleeve without interfering with the operation of the locking member 56, the latter is slidably held in a slot 114 of the sleeve.

The operation of the form shown in Figures 4 and 5 is as follows: Normally, when the thumb latch 97 is depressed the element 99 is raised and causes the disc 104 to revolve and to operate the latch in the fashion previously described. If the operator from the inside decides to lock the door he pushes the sleeve 112 forward for engaging the locking member 56 with the member 105 so as to prevent revolving motion of the latter member and operation of the locks from the outside, except by use of a key. The operator may at the same time turn the sleeve 112, which through the advancing operation has moved into operative relation relative to the night bolt, so that turning motion will lock the latter bolt. When the operator turns the inside knob for the purpose of opening the door, the rearward motion of the section 28 causes the night bolt to be retracted into inactive position, and the operator may release the locking means for the outside knob or thumb latch by pulling the sleeve 112 outwardly.

A simplified form is shown in Figure 7, in which a simple button is substituted for the knob and operates the section 26 over the latch in substantially the same manner as previously described with reference to the other door knobs.

In the form shown in Figure 22 each knob is provided means for rendering the other knob inoperative, a combination desired for intercommunicating doors between offices or the like, in which the occupant of each room wishes to be able to lock the door against the occupant of the adjoining room. In this form two locking members 116 are provided, one fixed relative to each sleeve 54 and the two working substantially within the space used by the sole locking member 56. The mode of operation of either

locking member does not differ from that previously described relative to the locking member 56.

I claim:

1. In a door lock of the character described, a latch comprising a latch bolt, a casing extending rearwardly therefrom, a second casing extending rearwardly from the first casing and slidable relative thereto, resilient means urging the second casing forwardly and resilient means anchored in the second casing urging the first casing forwardly.

2. In a device as defined in claim 1, a stop limiting the rearward motion of the second element relative to the first element and an operating element entering the second casing and retracting the same when manually operated.

3. In a door lock of the character described, an extensible latch comprising a latch bolt formed with registering sets of grooves in opposite faces thereof, a casing slidable on the bolt and a locking element guided transversely in the casing and adapted to enter any one of the sets of grooves for locking the bolt to the casing.

4. In a door lock of the character described, recessed bearing elements adapted for insertion into an aperture in the door from opposite sides, threaded means engaging both elements for clamping the same upon the door faces, cover plates for the elements and prongs extending from the elements and the cover plates, allowing the same to interlockingly engage on a turning motion of the cover plates.

5. In a door lock of the character described, a lock housing, a latch slidable therein presenting a rear wall, a manually actuated operating element for the latch having a revoluble lug engaging the rear wall for retracting the latter on a revolving motion and a key-actuated operating element for the latch having a lug revoluble concentrically relative to the former lug for retracting the rear wall on a revolving motion.

6. In a door lock of the character described, a slidable latch, a revoluble member adapted for engagement with the same for retracting it, a pin extending from the face thereof, a vertically guided member engaging the pin for operating the revoluble member when moved vertically and a thumb latch operating the vertically guided member.

7. A door lock as defined in claim 6, in which the vertically guided member has prongs extending on opposite sides of the center of the revoluble element, allowing either prong to be used for operating the pin.

8. In a door lock of the character described a latch slidable within the door,

operating elements on opposite sides of the door operatively associated with the latch for retracting the same, a night bolt slidable in the door and means associated with one of the operating elements for rendering the other element inoperative, having means thereon for simultaneously rendering the first element active relative to the night bolt.

9. In a door lock of the character described a latch slidable within the door, operating elements on opposite sides of the door operatively associated with the latch for retracting the same, a night bolt slidable in the door, and a sleeve slidable on one of the operating elements having a member extending therefrom adapted to engage the other operating element for rendering the same inoperative on a forward movement, and having a second member extending therefrom adapted to advance into operative relation to the night bolt on the same forward movement.

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