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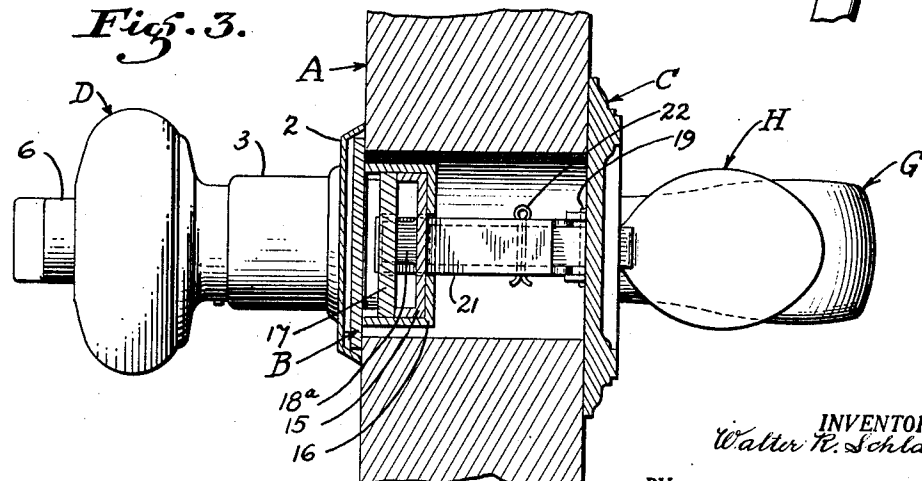
W. R. SCHLAGE

1,944,470

ENTRANCE DOORLOCK

Filed July 1, 1929

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Fig. 4.

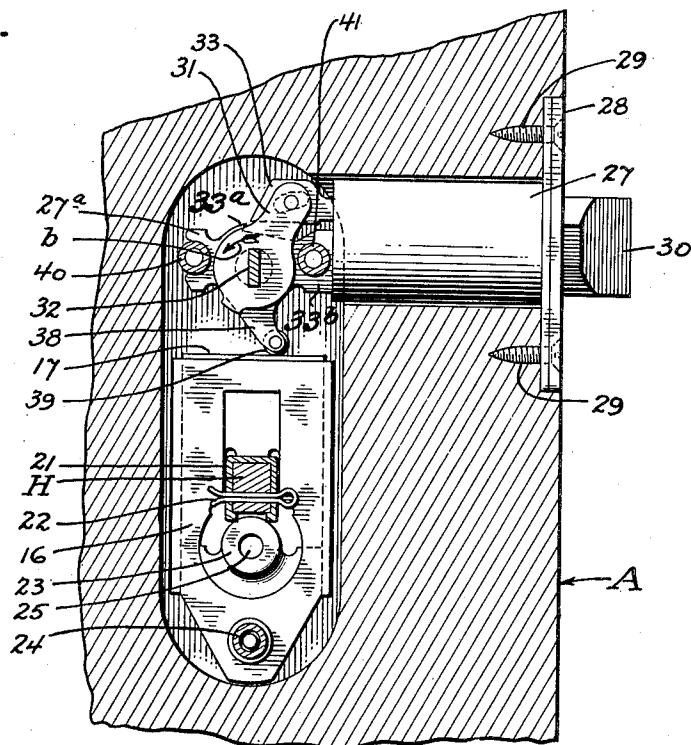
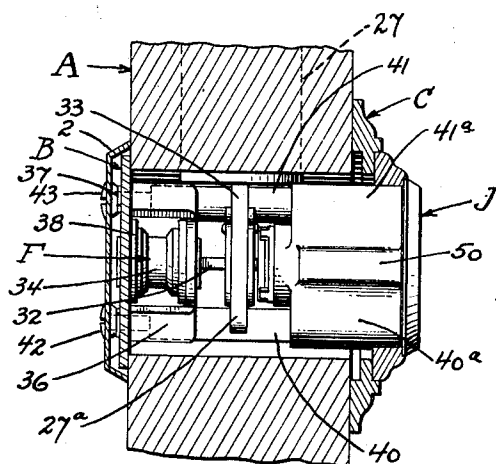


Fig. 5.



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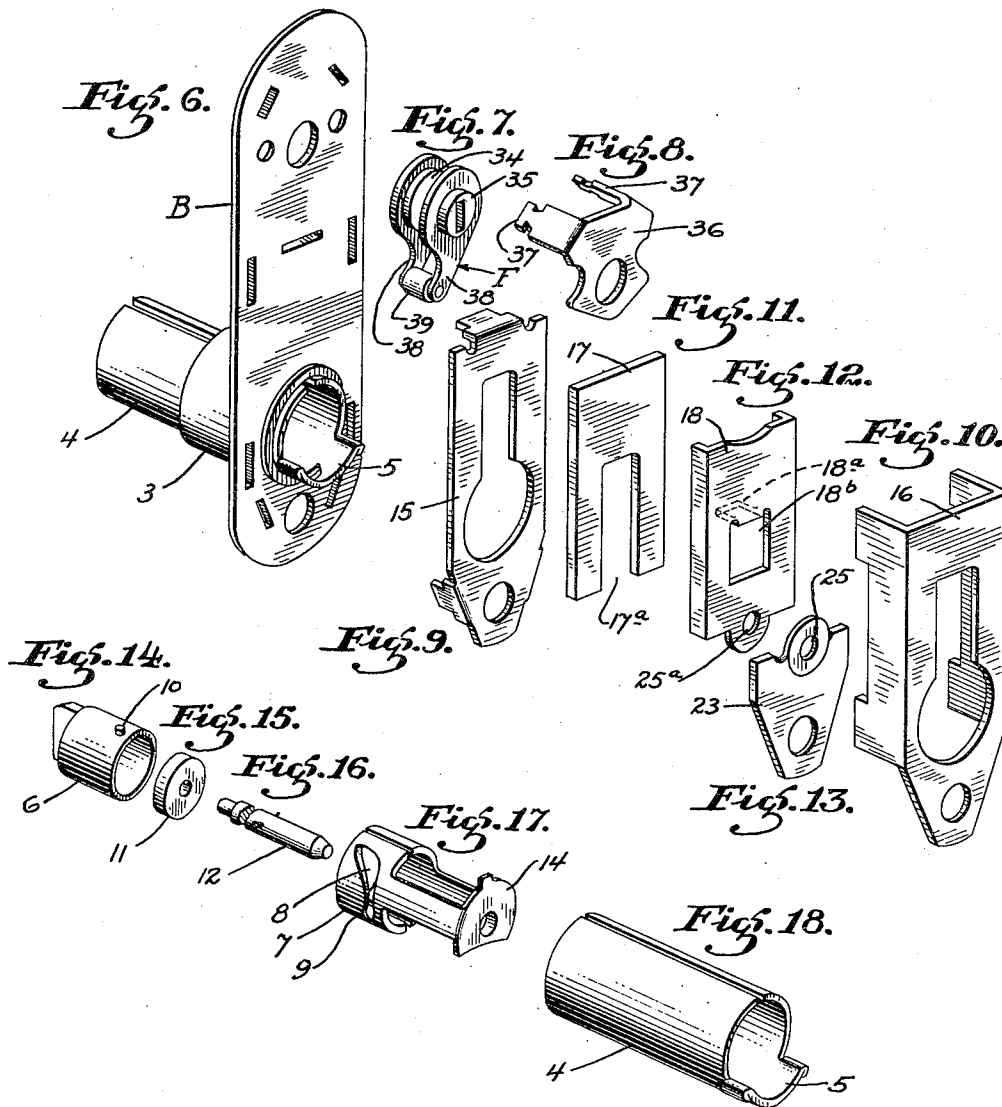
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UNITED STATES PATENT OFFICE

1,944,470

ENTRANCE DOORLOCK

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Application July 1, 1929. Serial No. 374,986

17 Claims. (Cl. 70—29)

This invention relates to an entrance or front door lock, and especially to a unit type of entrance door lock.

The object of the present invention is to generally improve and simplify the construction and operation of unit types of entrance door locks; to provide an entrance door lock having a knob on the inside whereby the door may be opened, and having a key actuated mechanism and a thumb actuated mechanism whereby the door may be opened from the outside; to provide an entrance door lock wherein the several mechanisms are positively connected, aligned and co-related when assembled in a door; to provide a lock mechanism which is readily reversed for right or left-hand door installation; to provide means on the inner knob whereby the thumb actuated mechanism may be dogged against operation; to provide a lock in which the several mechanisms are divided into two groups supported by inner and outer mounting or escutcheon plates; to so construct the several mechanisms that they will telescope and positively align when assembled in a door; to provide a lock mechanism which is adjustable laterally to permit installation in doors of different thickness; and further to provide a lock mechanism having a latch or bolt which is automatically dead-locked whenever the door is closed.

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

Fig. 1 is a central, vertical longitudinal section showing the lock installed in a door,

Fig. 2 is a cross section taken on line II—II Fig. 1,

Fig. 3 is a plan section taken on line III—III, Fig. 1,

Fig. 4 is a cross section taken on line IV—IV, Fig. 1,

Fig. 5 is a plan section taken on line V—V Fig. 1,

Fig. 6 is a perspective view of the inner mounting plate,

Fig. 7 is a perspective view of the roll-back member,

Fig. 8 is a perspective view of the rollback bearing plate,

Fig. 9 is a perspective view of the inner guide plate,

Fig. 10 is a perspective view of the outer guide plate,

Fig. 11 is a perspective view of the knob actuated sliding plate,

Fig. 12 is a perspective view of the thumb actuated sliding plate,

Fig. 13 is a perspective view of an auxiliary bearing plate which cooperates with the outer guide plate,

Fig. 14 is a perspective view of the turn button,

Fig. 15 is a perspective view of the head of the locking pin shown in Fig. 16,

Fig. 17 is the turn button retaining cage,

Fig. 18 is a perspective view of the door knob spindle.

Referring to the drawings in detail, particularly Fig. 1, A indicates a door, B an inner mounting plate and C an outer mounting plate. The outer mounting plate also functions as an escutcheon plate, while the inner mounting plate in actual practice will be covered by a cover or escutcheon plate, such as shown at 2.

The inner mounting plate supports three groups of mechanism:

First: A knob, generally indicated at D,

Secondly: A slide mechanism actuated thereby and generally indicated at E,

Third: A roll back mechanism generally indicated at F.

The outer mounting plate supports a handle G, a pivotally mounted thumb piece H and a key actuated locking mechanism, generally indicated at J.

The several mechanisms are, in other words, divided into two groups which are secured or carried by the respective mounting plates, but it will be noted and hereinafter explained that the mechanisms telescope and align with each other when the mounting plates are assembled in a door, thus insuring mechanical co-relation and cooperation between the several mechanisms.

Secured to the inner mounting plate, or formed integral therewith is a hub member 3, in which is journaled a spindle 4, this spindle being particularly shown in Fig. 18. Suitably secured on the outer end of the spindle is a door knob D, and formed on the inner end of the spindle is a retractor lug which is generally indicated at 5. Formed in the outer face of the knob is a central opening, and mounted therein is a button 6. The button is turnably and slidably mounted in the cage 7. This cage is secured within the spindle, and it is provided with an inclined slot 8, which terminates in a hook-shaped member 9. The button is provided with a pin 10 which projects into the slot so that when the button is pushed inwardly and at the same time turned, pin 10 will move from the up-

per end of the inclined slot to the hook-shaped end 9 of the slot where it will be retained.

Secured to the inner end of the button is a head member 11 (see Fig. 15) and secured to the head member is a dogging pin 12 (see Figs. 1 and 16). Surrounding the dogging pin is a spring 13, this spring being interposed between the head member 11 and a foot extension or plate 14 formed on the inner end of the cage 7.

10 The spring 13 merely serves the function of normally maintaining the button in the projected position shown in Fig. 1. The function of the locking or dogging pin 12 will hereinafter be described.

15 Secured on the inner face of the mounting plate B is a guide plate 15 (see Fig. 9). Secured exteriorly thereof is an outer guide plate 16 (see Fig. 10). Maintained in engagement with the inner guide plate is a sliding plate 17 (see Fig. 11) which will hereinafter be referred to as the knob actuated sliding plate, and maintained in engagement with the outer guide plate 16 is a sliding plate 18 (see Fig. 12) which will hereinafter be referred to as the thumb actuated sliding plate.

The lower end of the knob actuated sliding plate 17 is slotted, as shown at 17a, to make room for the inner end of the pivotally mounted thumb actuated member indicated at H, and also to make room for a right-angular lug 18a formed on the sliding plate 18.

The thumb member H is pivoted, as at 19, to the inner face of the outer mounting plate C. The member H is provided with a number of perforations, such as shown at 20. Adjustably mounted on the perforated end of the member H is a telescoping member 21. This is also perforated and the members H and 21 are adjustably secured with relation to each other by the insertion of a cotter pin, such as shown at 22, see Fig. 3.

The perforated end of the member H and the member 21 are nothing more or less than an adjustable lever which may be lengthened or shortened. The outer end of the member 21 passes through a slot 18b in the sliding plate 18, and it also projects through the slot 17a of the sliding plate 17 and it engages the under face of the lug 18a, thereby providing an assembly which permits actuation of both sliding plates in unison, or independent operation of the sliding plate 17. If the thumb member is depressed both sliding plates will be raised in unison.

On the other hand, if the knob D is turned the inner sliding plate 17 alone will be actuated, as it is disposed above the lugs 18a, and for the further reason that it is actuated by the retractor lug 5 of the spindle. That is, rotation of the spindle by means of the knob will cause the retractor lug 5 to engage one leg or another at the lower end of the sliding plate 17, and thereby raise it or impart an upward sliding movement thereto. This upward movement of either sliding plate, or both in unison actuates or imparts a rocking movement to the roll back member indicated at F. This in turn is connected with a latch actuating unit, hereinafter to be described, and causes either retraction or projection of the latch. Hence, the latch may be retracted by turning the knob, or it may be retracted by actuation of the thumb piece indicated at H.

Means are, however, provided for locking or

dogging the thumb piece H against operation, the means provided being the dogging pin 12.

By referring to Figs. 1 and 13 it will be noted that a bearing plate 23 has been provided. This bearing plate is anchored or secured to the outer end of a bushing, indicated at 24. The upper end of the bearing plate is perforated as at 25, and the lower end of the sliding plate 18 is also perforated, as indicated at 25a. Hence if button 6 is depressed rod 12 is forced inwardly through the perforations 25 and 25a, thus locking or dogging the sliding plate 18 against sliding movement or operation through means of the thumb piece H. This mechanism is important, as it prevents opening of the door from the exterior by means of the thumb piece, but it does not interfere with the opening of the door from the inside as the sliding plate 17 may be operated at all times, whether the door is locked or not, by merely turning the knob D and the spindle to which it is secured.

The latch unit is best illustrated in Fig. 4. It consists of a cylindrical-shaped housing 27, which is secured in the face of the door by means of a face plate 28 and screws 29. A latch or bolt 30 is slidably mounted in the housing, and it is retracted by means of a crank arm 31, which is mounted on a flat spindle bar 32. That is, a link 33 is pivotally connected at one end to the latch 30 and at the opposite end to the crank arm 31. Hence, if the crank arm is swung in the direction of arrow b a pull will be exerted by the link 33, and the latch will be retracted. The crank arm is, in this instance, capable of being operated either by the key actuated cylinder lock indicated at J, or by means of the roll back member indicated at F. The roll back member is best illustrated in Figs. 1, 6, 7 and 8. It consists of a central bushing or sleeve 34, having hub extensions 35 which are journaled at one end in the plate B, and at the opposite end in a bearing bracket 36 which is secured to the mounting plate B, by means of lugs 37.

The hub member is provided with a pair of crank arms 38, and these carry a roller 39, said roller being engaged by the upper end of the sliding bar 17 whenever this is raised. When the roller 39 is engaged during upward movement of the sliding plate 17, the crank arms in the hub member 34 swing in one direction, and as the flat spindle bar 32 passes through the hub, movement will be imparted to the spindle bar and also to the crank arm 31 secured therein. This in turn transmits motion through the link 33 to retract the latch 30.

The key actuated cylinder lock, indicated at J, is a standard form of pin tumbler lock comprising a cylinder and a plug. When the proper key is inserted the plug is rotated. Secured on the inner end of the plug is a cam plate and the spindle bar 32 is secured thereto. Hence, when the plug is rotated, by means of a key, the spindle bar is also rotated and as the crank arm 31 is secured on the spindle bar latch 30 will be retracted. It is accordingly apparent that the spindle bar may be rotated or actuated either by key actuated mechanism or by the roll back F.

It should also be noted that the link 33 serves as a means for dead locking the latch 30 in its extended position. This is due to the fact that the inner end of the link 33 normally engages a shoulder 33a on an anchor plate 27a, this anchor plate being secured to the inner end of the latch housing 27.

A pair of posts 40 and 41 pass through the an-

chor plate. These posts are secured to lugs 40a and 41a forming part of the cylinder J. A pair of screws 42 and 43, a part only of which are shown in Fig. 1, extend through the mounting plate B and have a threaded engagement with the posts 40 and 41. The cylinder lock is, in this manner, secured against removal with relation to the mounting plate C, and it will furthermore be noted that a telescoping interlocking engagement is made between the latching unit and the key actuating unit, and also with relation to the roll back member.

The drawings do not disclose the latch unit nor the key actuated mechanism in detail, as it is thought unnecessary, in view of the fact that this part of the mechanism is fully illustrated in my co-pending application entitled "Door latch" Filed June 18, 1928, Serial Number 286,079.

There is one feature in connection with the construction of the cylinder J and the mounting thereof, which is worth while mentioning, and that is that the mounting plate C is provided with an opening having a shape such as shown in Fig. 2. The cylinder proper has the two extending lugs formed thereon, indicated at 40a and 41a, and it has the extension 50 formed thereon which houses the pin tumblers. The opening in the mounting plate C is formed to surround the extension 50 and the lugs 40a and 41a. This is important as the mounting plate C in this manner serves the function of securing the cylinder J against rotation when a key is inserted and rotated.

It is of further importance as it relieves the posts 40 and 41 against twisting strains if an unauthorized person should attempt to force the lock.

The lock illustrated in the present instance is particularly intended for entrance or front door locks. The construction permits the door to be quickly and readily locked from the inside by merely depressing the button 6. Such depression of the button dogs the thumb member H against operation and thus prevents anyone from entering except such persons as are in possession of the proper key.

On the other hand, if the occupant of the house wishes to unlock the door he or she merely releases the button 6, thus permitting the door to be opened by a mere depression of the thumb member H. The lock is adjustable to doors of varying thickness, and it is rigidly secured when installed. First, the upper ends of the mounting plates are secured by the posts 40 and 41, and by the screws 42 and 43, and secondly they are secured at their lower ends by means of a post 60 and a screw 61.

The post 41 is secured or formed integral with the mounting plate C. Its inner end is threaded, to receive a handle G, and its outer end is threaded to receive the screw 61. The post 60 also functions as a bearing and a guide for the bushing 24. This bushing in turn anchors the bearing plate 23, and the lower ends of the guide plates 15 and 16. The posts 60 and screws 61, together with the posts 40 and 41, and screws 42 and 43, permit a wide range of adjustment where doors of varying thickness are encountered, and at the same time permit rigid attachment of the mounting plates to a door.

The thumb lever H is also adjustable, to take care of doors of varying thickness, and as the flat spindle bar 32 merely extends into the hub of the roll back member, it may slide in and out, to permit varying adjustments.

It should also be noted that the several mechanisms employed are divided into two groups.

One group is supported by the mounting plate B, and the other group is supported by the mounting plate C. Further, these groups telescope and align when the plates are applied to a door, thus eliminating any fitting or adjustment on the part of the carpenters or mechanics installing the locks and also insuring proper alignment and co-relation of the several mechanisms.

It should also be noted that the bearing member whereby the roll back is supported and secured with relation to the mounting plate B is removable. This is important as it permits reversal of the roll back member, thus permitting the lock to be installed both in right and left-hand doors.

While certain features of the present invention are more or less specifically described, I wish it understood that various changes may be resorted to within the scope of the appended claims, similarly that the materials and finishes of the several parts employed may be such as the manufacturer may decide, or varying conditions or uses may demand.

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

1. In an entrance door lock an outer and an inner mounting plate, a latch bolt, a knob actuated mechanism on the inner mounting plate whereby the latch bolt is actuated, a thumb actuated mechanism on the outer mounting plate whereby the latch bolt is actuated, said knob and thumb actuated mechanisms telescoping and positively aligning when the mounting plates are assembled in a door, and means carried by the knob for dogging the thumb actuated mechanism against operation.

2. In an entrance door lock an outer and an inner mounting plate, a latch bolt, a knob actuated mechanism on the inner mounting plate whereby the latch bolt is actuated, a thumb actuated mechanism on the outer mounting plate whereby the latch bolt is actuated, a roll back mechanism carried by the inner mounting plate, said roll back mechanism adapted to be actuated by the knob and the thumb actuated mechanism, a connection between the roll back and the latch bolt whereby the latch bolt is actuated, and means whereby the several mechanisms telescope and align when the mounting plates are assembled in a door.

3. In an entrance door lock an outer and an inner mounting plate, a latch bolt, a knob actuated mechanism on the inner mounting plate whereby the latch bolt is actuated, a thumb actuated mechanism on the outer mounting plate whereby the latch bolt is actuated, a roll back mechanism carried by the inner mounting plate, said roll back mechanism adapted to be actuated by the knob and the thumb actuated mechanism, a connection between the roll back and the latch bolt whereby the latch is actuated, means whereby the several mechanisms telescope and align when the mounting plates are assembled in a door, and means on the inner mounting plate whereby the thumb actuated mechanism is dogged against operation.

4. In an entrance door lock an outer and an inner mounting plate, a latch bolt, a knob actuated mechanism on the inner mounting plate whereby the latch bolt is actuated, a thumb actuated mechanism on the outer mounting plate whereby the latch bolt is actuated, a roll back mechanism carried by the inner mounting plate,

said roll back mechanism adapted to be actuated by the knob and the thumb actuated mechanism, a connection between the roll back and the latch bolt whereby the latch bolt is actuated, means whereby the several mechanisms telescope and align when the mounting plates are assembled in a door, and means carried by the knob whereby the thumb actuated mechanism is dogged against operation.

5. In an entrance door lock an outer and an inner mounting plate, a latch bolt, a knob actuated mechanism on the inner mounting plate whereby the latch bolt is actuated, a thumb actuated mechanism on the outer mounting plate whereby the latch bolt is actuated, a roll back mechanism carried by the inner mounting plate, said roll back mechanism adapted to be actuated by the knob and the thumb actuated mechanism, a connection between the roll back and the latch bolt whereby the latch bolt is actuated, means whereby the several mechanisms telescope and align when the mounting plates are assembled in a door, means carried by the knob whereby the thumb actuated mechanism is dogged against operation, said means leaving the knob free to actuate the roll back and the connected latch bolt, and a key actuated mechanism carried by the outer mounting plate whereby the latch bolt may be actuated independently of the knob or the thumb actuated mechanism.

6. In an entrance door lock a latch bolt, a roll back member whereby the latch bolt is actuated, a mounting plate, a spindle journaled therein, a knob on the spindle, a plate whereby the roll back is actuated, said plate being slidably mounted on the mounting plate, means whereby sliding movement is transmitted to the sliding plate when the spindle is rotated, a second sliding plate whereby the roll back is actuated, and a thumb actuated mechanism whereby sliding movement is transmitted to the second sliding plate to actuate the roll back and the latch bolt.

7. In an entrance door lock a latch bolt, a roll back member whereby the latch bolt is actuated, a mounting plate, a spindle journaled therein, a knob on the spindle, a plate whereby the roll back is actuated, said plate being slidably mounted on the mounting plate, means whereby sliding movement is transmitted to the sliding plate when the spindle is rotated, a second sliding plate whereby the roll back is actuated, a thumb actuated mechanism whereby sliding movement is transmitted to the second sliding plate to actuate the roll back and the latch bolt, and means for dogging the second sliding plate and the thumb actuated mechanism against operation.

8. In an entrance door lock a latch bolt, a roll back member whereby the latch bolt is actuated, a mounting plate, a spindle journaled therein, a knob on the spindle, a plate whereby the roll back is actuated, said plate being slidably mounted on the mounting plate, means whereby sliding movement is transmitted to the sliding plate when the spindle is rotated, a second sliding plate whereby the roll back is actuated, a thumb actuated mechanism whereby sliding movement is transmitted to the second sliding plate to actuate the roll back and the latch bolt, means for dogging the second sliding plate and the thumb actuated mechanism against operation, said means leaving the knob and the first-named sliding plate free to actuate the latch bolt.

9. In an entrance door lock a latch bolt, a roll back member whereby the latch bolt is actuated, a mounting plate, a spindle journaled therein,

a knob on the spindle, a plate whereby the roll back is actuated, said plate being slidably mounted on the mounting plate, means whereby sliding movement is transmitted to the sliding plate when the spindle is rotated, a second sliding plate whereby the roll back is actuated, a thumb actuated mechanism whereby sliding movement is transmitted to the second sliding plate to actuate the roll back and the latch bolt, means for dogging the second sliding plate and the thumb actuated mechanism against operation, a second mounting plate whereby the thumb actuated mechanism is supported, and means whereby the knob and the thumb actuated mechanism telescope and align when the mounting plates are assembled in a door.

10. In a lock of the character described an outer and an inner mounting plate, a latch bolt unit, an anchor member thereon, anchor means connecting and aligning the lower ends of the mounting plates, and anchor means connecting and aligning the upper ends of the mounting plates, said last named anchor means interlocking with the latch bolt unit anchor and anchoring the latch bolt unit to the mounting plates.

11. In a lock of the character described an outer and an inner mounting plate, a latch bolt unit, an anchor member thereon, anchor means connecting and aligning the lower ends of the mounting plates, anchor means connecting and aligning the upper ends of the mounting plates, said last named anchor means interlocking with the latch bolt unit anchor and anchoring the latch bolt unit to the mounting plates, a latch bolt in the latch bolt unit adapted to be retracted or extended, manually operated means on the outer mounting plate whereby the latch bolt may be retracted, manually operated means on the inner mounting plate whereby the latch bolt may be retracted, and key actuated means on the outer mounting plate whereby the latch bolt may be retracted.

12. In a lock of the character described an outer and an inner mounting plate, a latch bolt unit, an anchor member thereon, anchor means connecting and aligning the lower ends of the mounting plates, anchor means connecting and aligning the upper ends of the mounting plates, said last named anchor means interlocking with the latch bolt unit anchor and anchoring the latch bolt unit to the mounting plates, a latch bolt in the latch bolt unit adapted to be retracted or extended, manually operated means on the outer mounting plate whereby the latch bolt may be retracted, manually operated means on the inner mounting plate whereby the latch bolt may be retracted, key actuated means on the outer mounting plate whereby the latch bolt may be retracted, and means cooperating with the manually actuated means on the inner mounting plate for rendering the manually operated means on the outer mounting plate inoperable.

13. In an entrance door lock, an inner and an outer mounting plate, an adjustable connection whereby the spacing between the plates may be increased or decreased, a latch bolt, a knob actuated mechanism on the inner mounting plate whereby the latch bolt is actuated, a thumb actuated lever carried by the outer mounting plate whereby the latch bolt is actuated, and an adjustable extension on the thumb actuated lever to allow for adjustment between the mounting plates.

14. In a door lock of the character described,

a latch bolt, a knob actuated mechanism on the inner side of the door, a thumb actuated lever on the outside of the door, a sliding plate actuated either by the knob or the thumb actuated lever, means whereby sliding movement of said plate is transmitted to retract the latch bolt, and means for dogging the thumb actuated lever against operation.

15. In a door lock of the character described, a latch bolt, a knob actuated mechanism on the inner side of the door, a thumb actuated lever on the outside of the door, a sliding plate actuated either by the knob or the thumb actuated lever, means whereby sliding movement of said plate is transmitted to retract the latch bolt, and means carried by the knob for dogging the thumb actuated lever against operation, said means leaving the knob free to retract the latch bolt.

16. In a door lock of the character described, a latch bolt, an outer and an inner latch bolt manipulator, a sliding plate actuated by the inner manipulator, a second sliding plate actuated by the outer manipulator, means on said second sliding plate and engageable with the first-named

sliding plate whereby sliding movement imparted to the second-named sliding plate by the outer manipulator is transmitted to the first-named sliding plate, means whereby sliding movement of the first-named sliding plate is transmitted to retract the latch bolt, and means for dogging the second-named sliding plate and outer manipulator against operation.

17. In a door lock of the character described, a latch bolt, a knob actuating mechanism on the inner side of the door, a thumb actuated lever on the outside of the door, a sliding plate actuated by the knob, a second sliding plate actuated by the thumb lever, means on said last-named sliding plate engageable with the knob actuated sliding plate whereby sliding movement of the thumb actuated sliding plate will impart movement to the knob actuated sliding plate, means whereby sliding movement of the knob actuated sliding plate is transmitted to retract the latch bolt, and means for dogging the thumb lever actuated sliding plate and the thumb actuated lever against operation.

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