Jan. 18, 1944. W. R. SCHLAGE 2,339,725

DOOR LOCK

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Fig. 1.

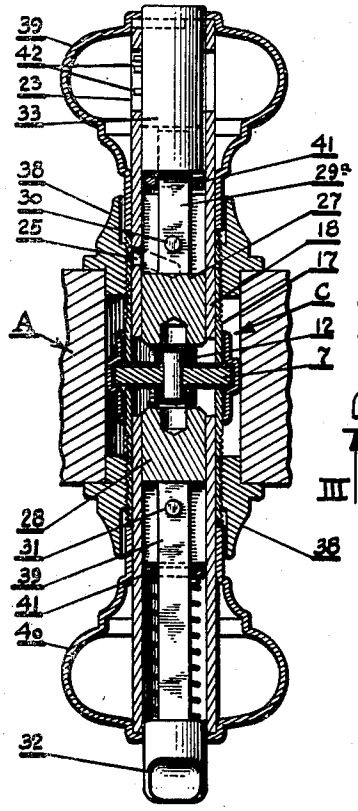



Fig. 2.

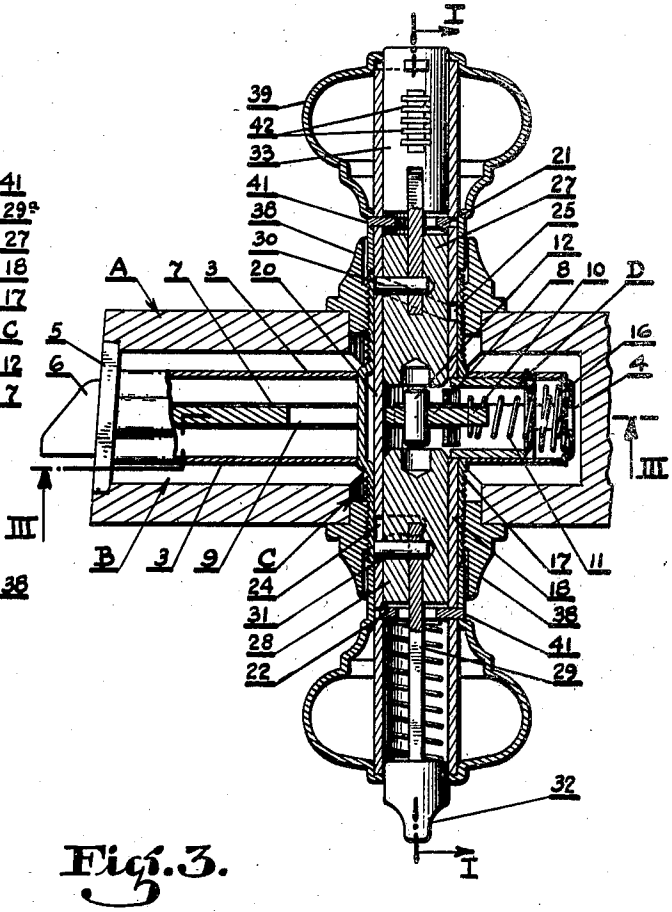
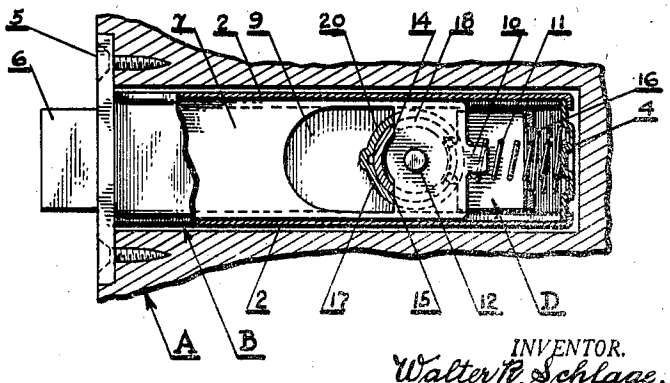



Fig. 3.




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Fig. 4.

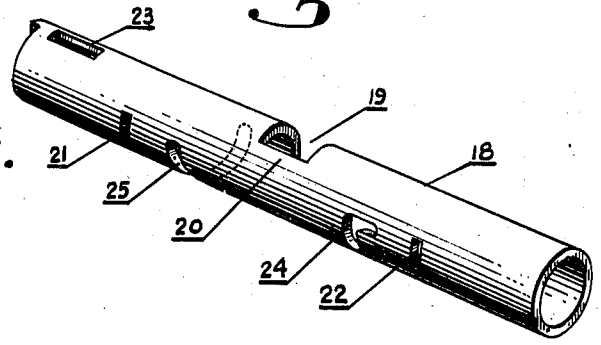



Fig. 5.

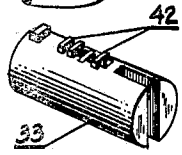



Fig. 6.

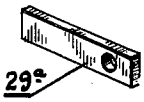



Fig. 9.

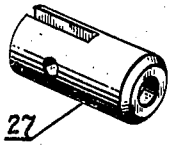



Fig. 8.

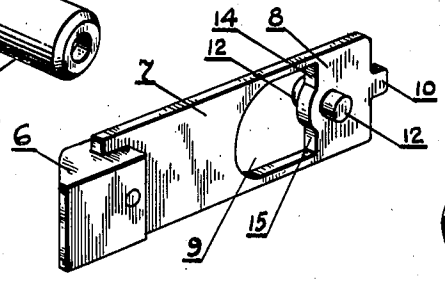



Fig. 7.

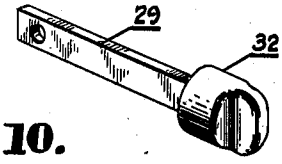



Fig. 10.

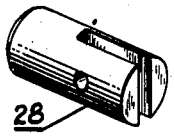



Fig. 11.

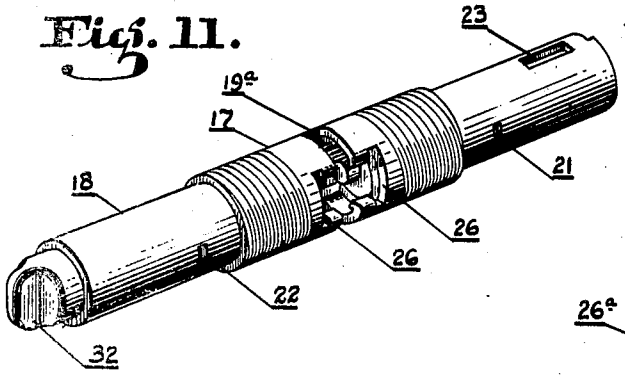
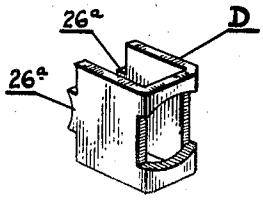



Fig. 12.




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# UNITED STATES PATENT OFFICE

2,339,725

## DOOR LOCK

Walter R. Schlage, Burlingame, Calif.

Application October 26, 1942, Serial No. 463,346

2 Claims. (Cl. 70—150)

This invention relates to door locks, and especially to a door lock of the inter-communicating type.

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 in which the latch bolt and the spindle whereby it is actuated may both be dead-locked against operation; to provide a door lock having a latch bolt and a tubular rotatable spindle whereby it is actuated, and a member within the spindle whereby the latch bolt may be dead-locked when projected and the spindle secured against rotation; and, further, to provide either key or manually operable means which are independently operable from either end of the spindle to actuate the member within the spindle so that the latch bolt may be dead-locked or released and the spindle rendered inoperative or operative either from one side or another of a door, or both.

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

Fig. 1 is a vertical, longitudinal section of the door lock taken on line I—I of Fig. 2;

Fig. 2 is a horizontal, longitudinal section of the door lock showing it installed in a door;

Fig. 3 is a vertical section of the door lock taken on line III—III of Fig. 2;

Fig. 4 is a perspective view of the tubular spindle;

Fig. 5 is a perspective view of the key-actuated pin tumbler plug;

Fig. 6 is a perspective view of a link which cooperates with the plug of Fig. 5;

Fig. 7 is a perspective view of the turn-button and the bar or link cooperating therewith;

Fig. 8 is a perspective view of the latch bolt and retractor plate;

Fig. 9 is a perspective view of one plunger;

Fig. 10 is a perspective view of the other plunger;

Fig. 11 is a perspective view of the spindle housing and spindle with associated mechanism assembled, and

Fig. 12 is a perspective view of the anchor member.

The door lock illustrated in this invention consists of two units, to wit—a latch bolt unit and a latch bolt actuating unit. The latch bolt unit (see Figs. 2 and 3) comprises an elongated housing having side walls 3—3, top and bottom walls 2—2, an inner end member or closure 4, and an outer face plate 5, in which is formed a central opening to provide a guide and support for the latch bolt 6. Suitably secured to the latch bolt is a retractor plate, generally indicated at 7 (see Figs. 2 and 8). This plate has a length approximately three-fourths of the length of the latch bolt housing, and the inner end thereof terminates in a head member 8, forward of which is formed a slot 9, and on the rear of which is formed a lug 10 which receives and retains a spring 11 whereby the latch bolt and retractor plate are normally held in a projected position. Formed on the head or secured thereto is a dead-locking pin 12, and formed on the head forward thereof are upper and lower shoulders 14 and 15 which are engaged by a rollback member, hereinafter to be described. An anchor member, generally indicated at D (see Figs. 2 and 12), together with a spring 16, is also mounted in the latch bolt housing and will later be described.

The latch bolt actuating unit comprising a tubular housing 17 (see Figs. 2 and 11) which is provided for the reception of a tubular spindle 18 (see Fig. 4). This spindle has a cross slot in it, as at 19, to form a rollback member 20. It is otherwise cross-slotted as at 21 and 22, and longitudinally slotted as at 23. Furthermore, it has an L-shaped slot 24 and a cam-shaped slot 25 formed therein. The spindle housing 17 also has a cross slot 19*a* which aligns with the cross slot 19 of the spindle, and on opposite sides of slot 19*a* are formed slots 26 which are provided for the purpose of receiving the inner ends 26*a* of the anchor member D, as will later be described.

Within the tubular spindle 18 are mounted two identical plungers 27 and 28. Each has a slot formed in its outer end to receive a link or bar 29, and each link is secured to its plunger by a pin. The pin securing the link and plunger 27 is shown at 30, and the pin securing the link to the plunger 28 is shown at 31. The outer end of the link which is secured to the plunger 28 is provided with a turn-button 32 which projects from the inner end of the spindle 18, and the link which is secured to plunger 27 extends into a slot formed at the inner end of a key-actuated pin tumbler plug 33 mounted in the outer end of the spindle. Pin 30 extends into the cam slot 25 formed in the spindle and pin 31 extends into the L-shaped slot of the spindle, and their function will hereinafter be described.

The door lock shown in this instance is installed in a door such as shown at A (see Fig. 2) by drilling or boring two holes therein, as shown

at B and C. The latch bolt housing containing the latch bolt and cooperating mechanism is inserted in the hole B and the spindle housing 17 containing the spindle and associated mechanism is then inserted in the hole C, and as such will extend through openings formed in the side walls 3—3 of the latch bolt housing. During this insertion the latch bolt and connected retractor plate must be depressed sufficiently to cause the inner end of the retractor or lug 10 to engage and force the anchor member D rearwardly toward the inner cover plate 4 of the latch bolt housing, as the spindle housing must not only pass through the slot 9 formed in the retractor plate, but must also clear the anchor plate; thus when the spindle housing is fully inserted and centered so that both ends thereof project uniformly from opposite faces of the door, the latch bolt will be released and when released the anchor member will be forced forwardly by its spring 16 to a position where its inner ends 26a will enter the slot 26 of the spindle housing, thereby finally centering the spindle housing and, at the same time, securing it against lateral or endwise removal. The head 8 of the retractor plate will at the same time enter slots 19 and 19a of the spindle housing and spindle, and as such will be brought into engagement with the rollback member 20 of the spindle. When this position is reached, the latch bolt will be fully projected and pin 12 carried by the retractor plate will align with the plungers 27 and 28 (see Fig. 2).

To complete installation of the lock, a pair of escutcheon plates 38 are applied to opposite ends of the spindle housing, this housing being threaded at each end to receive the escutcheon plates. When they are screwed up on the ends of the spindle housing into snug engagement with opposite faces of the door, the entire mechanism will be rigidly supported and secured. Thereafter the outer knob 39 may be applied and then the inner knob 40, both knobs being suitably secured when applied as, for instance, by latches 41 which project through the cross slots 21 and 22 of the spindle.

In actual operation it will be understood that this lock is particularly designed for installation in inter-communicating doors. If a person in one room desires to dead lock the latch bolt against operation so that the door may not be opened by a person in the adjoining room, the first person will, for instance, grasp the turn-button 32 and first push it inwardly and then give it a quarter turn so that pin 31 will enter the lateral portion of the L-shaped slot 24. In so doing, the plunger 28 is pushed inwardly, and as the inner end of the plunger telescopes over the pin 12, latch bolt 6 will be dead-locked and the spindle 18 will at the same time be dead-locked or secured against rotation as the rollback member will engage the shoulders 14 and 15 of the head of the retractor plate and as such cannot be rotated.

The plunger 27 is key-operated. By inserting a key in the plug 33, the pin or plate tumblers 42 carried thereby will be retracted from the slot 23 of the spindle, and the plug may then be rotated by means of the key. Such rotation is transmitted to the link or bar 29a which is connected with the plunger 27, and when the bar and plunger are rotated pin 30 will also rotate in unison therewith. As the pin projects into the cam-shaped slot 25 the plunger and bar will move inwardly and cause the inner end of the plunger to telescope over the pin 12, thus again dead-locking the latch bolt and, at the same time, dead-locking or securing the spindle against operation.

In view of the foregoing, it is apparent that the latch bolt may be dead-locked from either or both sides of a door, and similarly that the spindle may be dead-locked or secured against rotation from either or both sides of a door. A manual means, such as the turn-button 32, may be placed on opposite ends of the spindle, or key means may be placed on opposite ends of the spindle, or manual means may be placed on one end and key-actuated means on the opposite end, as shown in Fig. 2. The mechanism actuated either by the key or the turn-button is exceedingly simple, as all that is required is a plunger which moves longitudinally within the spindle and such movement may be imparted either by cam action and rotation, by the key mechanism, or by a straight push action as with the button 32. The pins 30 and 31 cannot be lost as they are at all times within the spindle housing. Furthermore, the pins 30 and 31 and all other mechanism are completely concealed. In Fig. 2 the plungers are shown in projected or released position. In this position the spindle may be rotated by either knob, but when either of the plungers is depressed or moved inwardly the latch bolt immediately becomes dead-locked and the spindle secured against rotation. Hence the door cannot be opened from either side except by manipulation of the key mechanism or manual operation of the button 32, and both plungers must be released before the spindle is again free for rotation.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the several parts without departing from the scope of my invention.

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

1. In a door lock, a latch bolt, an elongated plate-like member secured to the latch bolt and forming a retractor plate, a tubular spindle having a rollback member engageable with the retractor plate to retract the latch bolt, a dead-locking pin secured on the retractor plate normally aligning with a central longitudinal axis of the spindle, a plunger in the spindle having one end adapted to telescope over the deadlocking pin and thereby deadlock the latch bolt and at the same time secure the spindle against rotation, a slot formed in the opposite end of the plunger, a link bar having one end extending into said slot, an L-shaped slot formed in the spindle, a pin in the plunger extending through the link bar and into the L-shaped slot, and a button extending from one end of the spindle and secured to the opposite end of the link bar, said button when grasped and pushed inwardly causing the plunger to telescope over the dead-locking pin and said button when partially rotated after it has been pushed inwardly causing the pin which extends into the L-shaped slot to enter the lateral portion thereof and thereby secure the plunger in deadlocking position.

2. In a door lock, a latch bolt housing, a plate-like elongated member slidably mounted in the housing forming a retractor plate, a latch bolt secured to the retractor plate, a tubular spindle housing extending through the latch bolt housing, an elongated slot formed in the retractor plate, a single tubular spindle extending through

the spindle housing and the slot in the retractor plate, a deadlocking pin secured on the retractor plate normally aligning with a central longitudinal axis of the spindle, said pin extending laterally from opposite faces on the retractor plate, a pair of plungers slidably mounted in the spindle and disposed one on each side of the retractor plate, each plunger having a recess formed therein to permit each plunger to telescope over the deadlocking pin, and means for moving the plungers independently of each other into or out of telescoping engagement with the deadlocking pin.

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