July 16, 1935. W. R. SCHLAGE 2,008,405

KEY SHUT-OUT MECHANISM FOR DOORLOCKS

Original Filed July 1, 1929 2 Sheets-Sheet 1

Fig. 1.

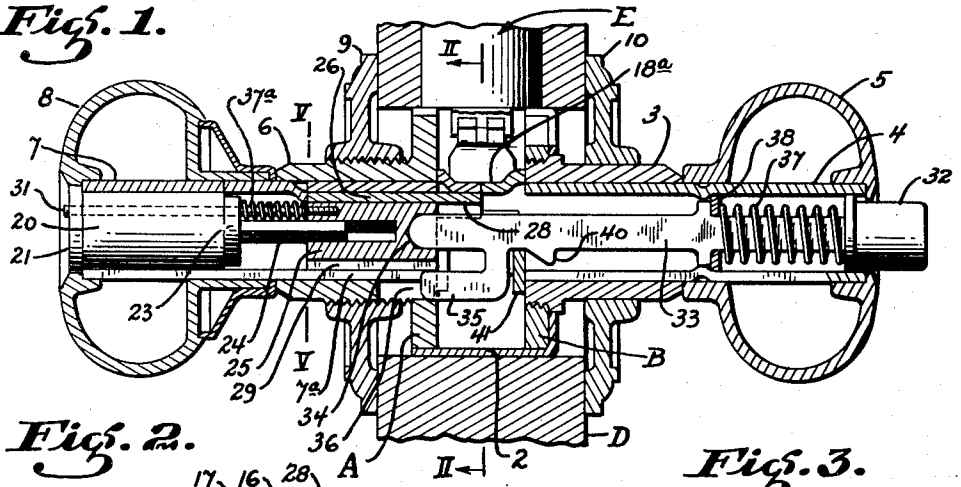

Fig. 2.

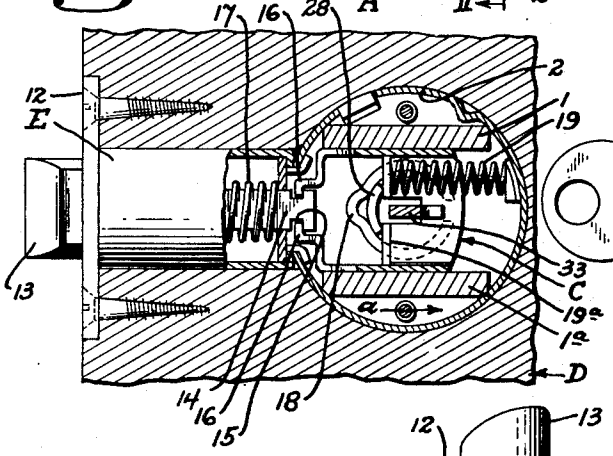

Fig. 3.

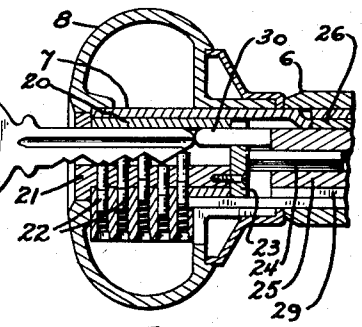

Fig. 5.

Fig. 4.

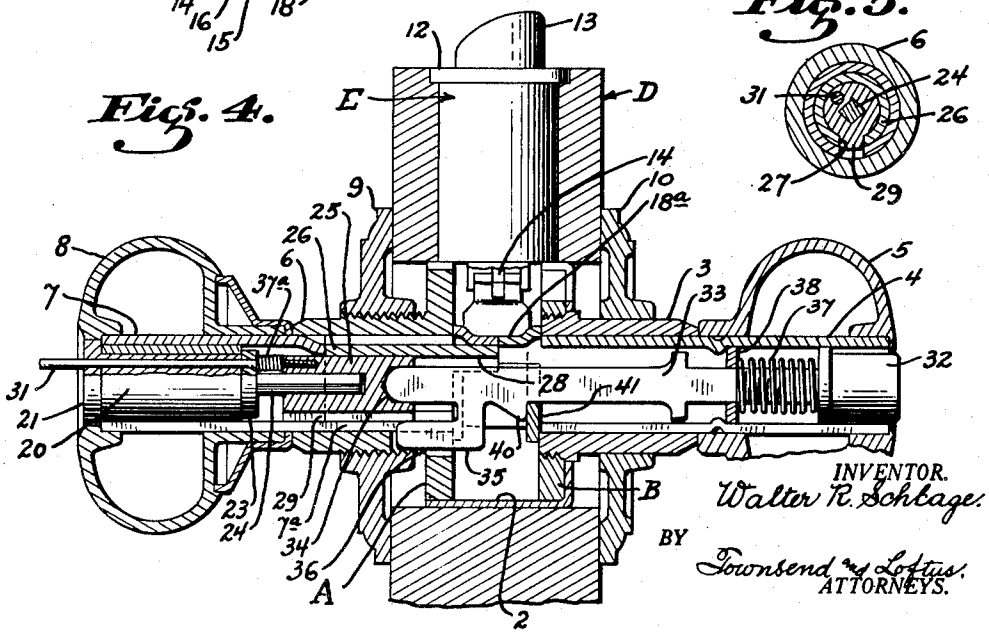

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Fig. 6.

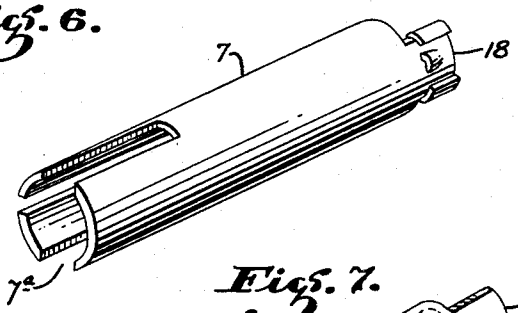


Fig. 7.

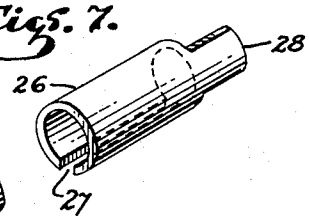


Fig. 8.

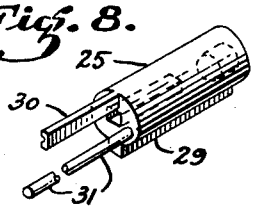


Fig. 9.

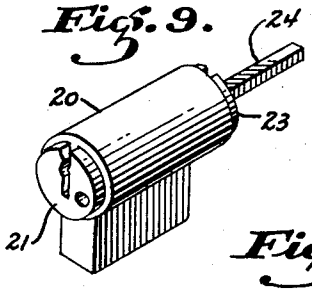


Fig. 10.

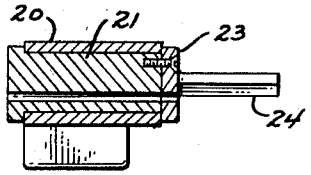


Fig. 11.

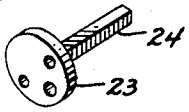


Fig. 13.

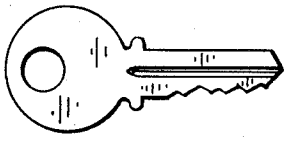
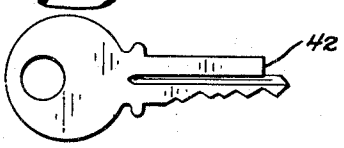


Fig. 12.



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2,008,405

KEY SHUT-OUT MECHANISM FOR DOORLOCKS

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Original application July 1, 1929, Serial No. 374,985. Divided and this application July 19, 1932, Serial No. 623,351

18 Claims. (Cl. 70—91)

This invention relates to a key shut-out mechanism for door locks and forms a division of my copending application entitled "Door lock indicator", filed July 1st, 1929, Serial Number 374,985.

The object of the present invention is to generally improve and simplify the construction and operation of door locks; to provide a door lock having an inner and an outer knob, and a key actuated cylinder lock in the outer knob whereby the door latch bolt may be retracted; to provide means on the inner knob or on the inside of the door for rendering the key mechanism inoperative; to provide means actuated by turning movement of the inner knob for automatically rendering the key mechanism operative; and further, to provide means whereby depression of the door latch bolt will be transmitted to automatically restore the key mechanism to operative condition.

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

Fig. 1 is a central longitudinal horizontal section of the door lock showing the application of the invention.

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

Fig. 3 is a central vertical longitudinal section of the outer knob and the cylinder lock mounted therein.

Fig. 4 is a section similar to Fig. 1, said section showing the lock indicator in display position.

Fig. 5 is a cross section taken on line V—V of Fig. 1.

Fig. 6 is a perspective view of one of the spindles whereby one of the knobs is supported. The spindles being substantially identical in construction.

Fig. 7 is a perspective view of the spindle which is actuated by the cylinder lock.

Fig. 8 is a perspective view of the sliding plug whereby the locking display member is supported, and whereby the key-way blocking member is also supported.

Fig. 9 is a perspective view of the key actuated cylinder lock.

Fig. 10 is a longitudinal vertical section taken through one side of the key actuated cylinder.

Fig. 11 is a perspective view of the cylinder lock cam plate.

Fig. 12 is a side elevation showing an emergency key.

Fig. 13 is a side elevation showing a guest key.

Referring to the drawings in detail, particularly Figs. 1, 2 and 4, A and B indicate a pair of plates which are interspaced, as shown, to form a guideway for a retractor, generally indicated at C. The plates A and B are tied together by cross arms, indicated at 1 and 1*a*, and they are surrounded by a cup-shaped housing generally indicated at 2. The plates A and B, and the housing 2 form the main lock housing. The plate B is provided with a hub member 3, in which is journaled a spindle 4, said spindle being substantially identical to that shown in Fig. 6. The spindle 4 carries an inner knob 5. The plate A is also provided with a hub member, generally indicated at 6, and this hub supports a spindle 7 which carries an outer knob, generally indicated at 8.

The inner knob and spindle are free to rotate at all times, while the outer spindle 7 and knob 8 are locked against rotation at all times, as will hereinafter be described.

The lock as a whole is secured in a door, generally indicated at D, by means of a pair of escutcheon plates, such as shown at 9 and 10. The manner of securing these escutcheon plates is of no importance in the present instance, as several methods may be employed. The main lock housing, including the plates A and B, the housing 2 and the hub members 3 and 6, is secured in the door by means of the escutcheon plates, and they form what will hereinafter be referred to as the latch bolt actuating unit.

The latch bolt unit is best shown in Fig. 2. It consists of a cylindrical shaped housing, generally indicated at E, and a face plate 12. The latch bolt proper, indicated at 13, is reciprocally mounted in the housing and it is provided with an inwardly extending latch bar 14, the inner end of which is notched as shown at 15 to permit it to be engaged by a pair of fingers 16, forming a part of the retractor indicated at C. A spring 17 is interposed between the rear end of the latch housing and the latch bolt proper, and this spring normally maintains the latch bolt and the latch bar in the projected position shown in Figs. 2 and 4.

The inner end of the spindle 4 is provided with a roll-back member, generally indicated at 18*a*. This roll-back member is clearly shown in Figs. 1 and 4, and it will be noted that it engages a cross plate 19*a* forming a part of the retractor, hence if the inner knob 5 is rotated, the roll-back 18*a* will engage the cross plate and transmit movement to it in the direction of arrow *a*, see Fig. 2, and as the fingers 16 engage the latch bar 14 the latch bolt will be retracted. It will be noted that the spindle shown at 7 in Figs. 1 and

2 is provided with a rollback member which is indicated at 18. This rollback member is not utilized in the present lock as the outer spindle is dogged or locked against rotation at all times, but as the inner spindle 4 requires a rollback member substantially duplicate types of spindles are employed.

A spring 19 is interposed between the lock housing 2 and the cross plate 19a of the retractor. This spring is compressed when the latch bolt is retracted, and it accordingly serves the function of returning the retractor and the latch bolt to normal or projected position.

The structure shown in this application embodies several novel features:

First: A key actuated cylinder lock whereby the retractor may be actuated.

Secondly: A button actuated means in the inner knob for locking the door from the inside.

Third: Means for blocking the key-way when the door is locked so that the door cannot be opened by any key except an emergency key.

Fourth: Means are provided for releasing the key-way blocking member when the inner knob is rotated.

Fifth: Means are provided for automatically retracting said blocking member when the door latch bolt is depressed or the inner knob rotated.

A standard form of pin tumbler lock may be employed, such as shown in Figs. 1, 3 and 9. It is placed within the outer spindle, and the outer knob is provided with a central opening through which the key may be inserted to actuate the lock.

The lock consists of an ordinary cylinder, indicated at 20. Within this cylinder is mounted a plug 21, and cooperating therewith are tumbler pins 22. Secured to the inner end of the plug is a plate 23, and formed thereon is an extension 24 in the form of a rod, said rod being square in cross section, see Fig. 11.

When a key is inserted, as shown in Fig. 3, the pin tumblers are depressed and the plug 21 is rotated, and as plate 23 is secured thereto it will rotate and so will the rod 24. The rod 24 projects into a plug, generally indicated at 25. This plug is mounted within a secondary spindle, indicated at 26.

The secondary spindle is best shown in Fig. 7. By referring to this figure it will be noted that it is longitudinally slotted, as indicated at 27, and that it is provided with a roll-back member 28 on its outer end. This roll-back member also engages the cross plate 19a of the retractor C and the retractor may accordingly be actuated either by the secondary spindle, shown at 26, or by the inner spindle, indicated at 4.

The plug 25 is provided with a key or lug 29, which projects into the slot 27 of the secondary spindle. An interlock is thus formed between the plug 25 and the secondary spindle, and as the rod 24 projects into the secondary spindle rotary motion will be transmitted to rotate not only the plug 25 but also the secondary spindle 26. It is accordingly possible to actuate the retractor by means of a key.

The plug 25 performs the following main functions:

First, that of transmitting rotary motion from the key actuated cylinder lock to the secondary spindle 26 so that the latch bolt 13 may be retracted by operation of the key actuated cylinder lock.

Secondly, plug 25 carries a key-way blocking member indicated at 30, see Fig. 8.

The key-way blocking member is a flat bar, an it is moved into the key-way when it is desired to prevent opening of the door from the exterior by means of a key.

It was previously stated that the door may be locked from the interior. The mechanism employed is a push button, such as shown at 32. This button is secured to a bar 33. The inner end of the bar rests in a socket 34, formed in the inner end of the plug 25, thus permitting the plug to freely rotate with relation to the bar 33. The bar 33 is also provided with an extension, such as shown at 35. This extension enters a slot 36, formed in plate A, and it also enters a longitudinally extending slot 7a formed in the outer spindle 7. Plate 35 will, at all times, extend into the two slots, indicated at 36 and 7a, and as such lock the outer spindle and knob against rotation at all times.

A spring 37 is interposed between the button and a cross plate 38. This spring normally functions to maintain the button 2 in the extended position shown in Fig. 1. In this position of the button the door is unlocked and may be freely opened by an ordinary key from the outside, or by rotation of the knob 5 from the inside.

On the other hand, if button 32 is depressed to assume the position shown in Fig. 4, it will be held in the depressed position by means of a latch projection 40 which engages one of the side plates 41 of the retractor. When the button is depressed, as shown in Fig. 4, plug 25 is moved outwardly, and as it carries the key-way blocking member 30, this member will be moved into key blocking position. That is, the key-way blocking member 30 will project into the key-way, as shown in Fig. 3, and thereby prevent insertion of an ordinary key. Hence, if button 32 is depressed the door is locked. Also opening of the door from the exterior by an ordinary key is prevented, as the keyway is blocked.

If it is desired to open the door from the exterior under this condition, it can only be accomplished by using an emergency key, such as shown in Fig. 12. One end of this key is cut away, as shown at 42, hence circumventing the blocking member 30 and permitting a full insertion of the key to open the door. A guest key, or maid's key, such as shown in Fig. 13 will, however, prove useless as it cannot be fully inserted, hence the door is positively locked against being opened from the exterior, except by an emergency key.

On the other hand, if the occupant of the room wishes to open the door he or she merely grasps the knob 5 and rotates it. By doing so rotary motion is transmitted to the spindle 4 and as this is provided with a roll-back member 18, the roll-back member will engage the cross plate 19 of the retractor, and depress the same. During the depression the latch bolt 13 is retracted and the latch projection 40 is disengaged, as the plate 41 of the retractor moves away from the latch. The moment the latch 40 is disengaged spring 37 returns the push button, and the bar 33 to normal position shown in Fig. 1. A spring 37a is interposed between plug 25 and the cylinder lock, and if the bar 33 is retracted plug 25 will also be retracted, and so is the key-way blocking member 30. In this manner the door may be unlocked and opened from the inside.

If the occupant of the room should depress the button after the door is opened it will be automatically released when the door is closed. This is due to the fact that when the door is closed latch bolt 13 will be depressed. The notch 15 on

the other end of the latch bar will then engage the fingers **16** of the retractor, and cause depression thereof, and when the retractor is depressed latch **40** on the bar **33** will be released and the button and the bar **33** will accordingly return to normal or unlocked position. Hence, the door may be unlocked by rotation of the inner knob, or it may be unlocked by depression of the latch bolt.

If the occupant of the room wishes to lock the door when leaving the room he has merely to close the door, as the latch bolt **13** will first be depressed during the closing of the door, and it will then be projected into the opening of the keeper plate.

In other words, the mere closing of the door causes locking thereof, as the door cannot be opened from the outside except by one in possession of a key, such as shown in Fig. 13, this being due to the fact that the outer knob and spindle are at all times secured against rotation, and the only method of opening the door under such conditions is that of inserting a key.

The lock shown in the present instance is particularly intended for hotel use and the like. It possesses a number of advantages:

First: If the occupant of the room depresses the button **32**, a blocking member is projected into the key-way preventing unauthorized persons from entering, even though in possession of a key. The only possible method of entering the room under these conditions would be by the use of an emergency key, such as shown in Fig. 12.

Second: It is impossible for the occupant of the room to lock himself out, as closing of the door will cause depression of the latch bolt and this in turn automatically releases the locking mechanism if the door has been locked.

Third: The occupant of the room is relieved of the necessity of locking the door when going out, as the door automatically locks itself when it is shut.

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 finish 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 a door lock an inner and an outer knob, a key actuated cylinder lock in the outer knob, means for obstructing the key passage in the cylinder lock to prevent unlocking of the door with any key except an emergency key, and means carried by the inner knob whereby said key obstructing means is actuated.

2. In a door lock having an inner and an outer knob, a key actuated mechanism in the outer knob, means for rendering said key actuated mechanism inoperative, and means carried by the inner knob for actuating said means, said last-named means being automatically released by turning movement of the inner knob.

3. In a door lock having an inner and an outer knob, a key actuated mechanism in the outer knob, means for retaining said key actuated mechanism inoperative, and means carried by the inner knob for actuating said means, said last-named means being automatically released by depression of a latch bolt actuated by the inner knob.

4. In a door lock, an actuator on one side of a door, a key mechanism on the opposite side of the door, means for obstructing the key-way, a latch bolt adapted to be retracted by either the actuator or the key mechanism, and means for automatically releasing the key obstructing means upon depression of the latch bolt.

5. The combination with a door and a lock mounted therein, of an inner knob, a latch bolt actuated thereby, a key actuated mechanism on the opposite side of the door, means for rendering the key actuated mechanism inoperative, and means actuated by depression of the latch bolt for releasing the mechanism which renders the key mechanism inoperative.

6. In a door lock, an inner knob, a latch bolt actuated thereby, a key mechanism for actuating the latch bolt, means movable into the key slot for obstructing the key slot, and means whereby said obstructing means is released upon turning of the inner knob.

7. In a lock of the character described, an inner and an outer knob, a key actuated mechanism in the outer knob for opening the lock, a depressible button in the inner knob and longitudinally movable therein, and means actuated by longitudinal movement of the button in one direction for rendering the key actuated mechanism inoperative.

8. In a door lock having a latch bolt, manual means for retracting the latch bolt, key controlled means for actuating the latch bolt, means for rendering the key means inoperative, and means actuated by depression of the latch bolt for rendering the key mechanism operative.

9. In a door lock a housing, a rotatable cylinder plug mounted in the housing, said plug having a keyway formed therein for the reception of a key, a key shut-out member longitudinally movable to and away from the end of the keyway, and means for selectively positioning the key shut-out member either to prevent full insertion of the key or to permit full insertion of the key.

10. In a door lock a housing, a rotatable cylinder plug mounted in the housing, said plug having a keyway formed therein for the reception of an emergency key and a regular key, a key shut-out member longitudinally movable to and away from the end of the key-way, and means for selectively positioning the key shut-out member either to prevent full insertion of the regular key or to permit full insertion of the regular key, said shut-out mechanism in either position permitting full insertion of the emergency key.

11. In a door lock a housing, a rotatable cylinder plug mounted in the housing, said plug having a keyway formed therein for the reception of a long and a short key, a key shut-out member longitudinally movable to and away from the end of the keyway, and means for selectively positioning the key shut-out member either to shut out or permit full insertion of a long key, said shut-out member in either position permitting insertion of a short key.

12. In a lock of the character described, a key-actuated mechanism on one side of a door for opening the lock, a depressible button on the other side of the door, and means actuated by the depression of said button for placing an obstruction in the path of a key inserted in the key-actuated mechanism.

13. In a lock of the character described, a key-actuated mechanism on one side of a door for opening the lock, said key-actuated mechanism being operable by a plurality of keys, including an emergency key, a depressible button on the other side of the door, and means actuated by

depression of said button for placing an obstruction in the path of any key inserted in the key-actuated mechanism to render all keys, except an emergency key, inoperative.

14. In a door lock, a housing, a latch bolt, an inner and an outer latch bolt actuator whereby the latch bolt may be retracted, means for dogging the outer latch bolt actuator to prevent retraction of the latch bolt, a key mechanism cooperating with the outer latch bolt actuator for retracting the latch bolt, said key mechanism adapted to be operated by a plurality of keys, and means carried by the inner latch bolt actuator for rendering the key mechanism inoperative except by one of said keys.

15. In a door lock, a housing, a latch bolt, an inner and an outer latch bolt actuator whereby the latch bolt may be retracted, means for dogging the outer latch bolt actuator to prevent retraction of the latch bolt, a key mechanism cooperating with the outer latch bolt actuator for retracting the latch bolt, said key mechanism adapted to be operated by a plurality of keys, and means carried by the inner latch bolt actuator for rendering the key mechanism inoperative except by one of said keys, said means automatically releasing the dogging means and restoring the key mechanism to operative condition by all of the keys upon operation of the inner latch bolt actuator.

16. In a door lock, a housing, a latch bolt, an inner and an outer latch bolt actuator whereby the latch bolt may be retracted, means for dogging the outer latch bolt actuator to prevent retraction of the latch bolt, a key mechanism cooperating with the outer latch bolt actuator for retracting the latch bolt, said key mechanism adapted to be operated by a plurality of keys, a common means for moving the dogging member to dogging position and for rendering the key mechanism inoperative except by one of said keys, and means actuated by retraction of the latch bolt for rendering the key mechanism operative by all the keys.

17. In a door lock, a housing, a latch bolt, an inner and an outer latch bolt actuator whereby the latch bolt may be retracted, means for dogging the outer latch bolt actuator to prevent retraction of the latch bolt, a key mechanism cooperating with the outer latch bolt actuator for retracting the latch bolt, said key mechanism adapted to be operated by a plurality of keys, a common means for moving the dogging member to dogging position and for rendering the key mechanism inoperative except by one of said keys, and means actuated by depression of the latch bolt for rendering the key mechanism operative by all the keys but leaving the dogging member in dogging position.

18. In a lock of the character described, an inner and an outer knob, a key actuated mechanism in the outer knob for opening the lock, a depressible button mounted in the inner knob and longitudinally movable therein, means actuated by longitudinal movement of the button in one direction for rendering the key actuated mechanism inoperative, and means actuated by rotation of the inner knob for returning the button and for rendering the key mechanism operative.

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