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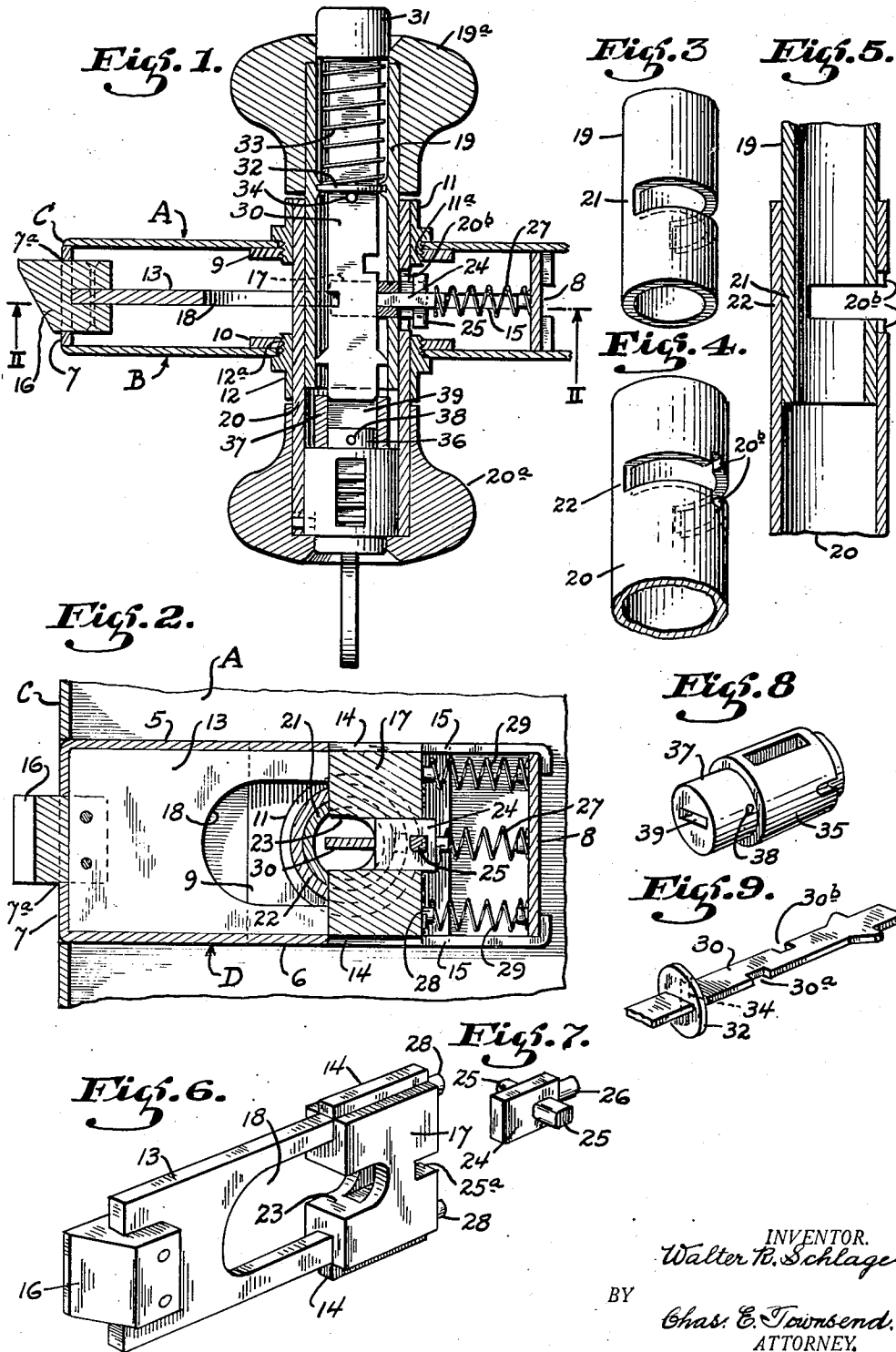
W. R. SCHLAGE

2,180,371

DOOR LOCK

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2 Sheets-Sheet 1



INVENTOR.
Walter R. Schlage.

BY
Chas. E. Townsend.
ATTORNEY.

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W. R. SCHLAGE

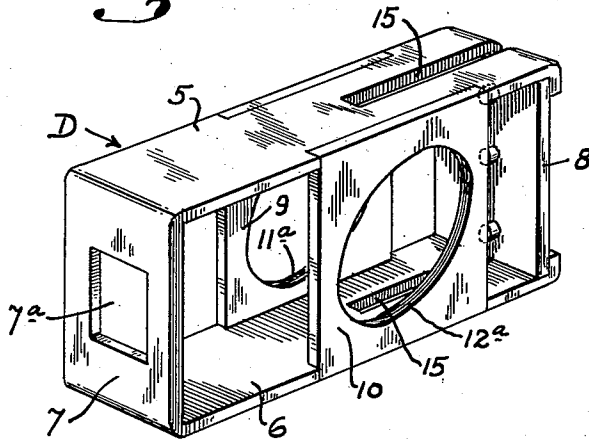
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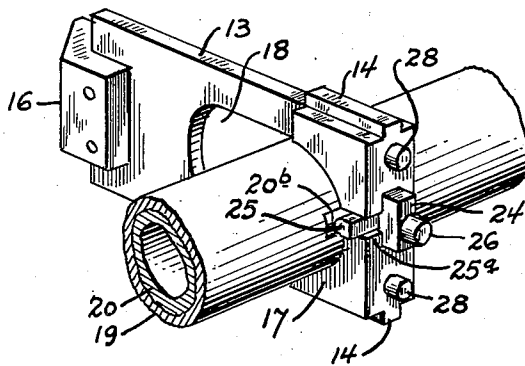
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Figs. 10.



Figs. 11.



UNITED STATES PATENT OFFICE

2,180,371

DOOR LOCK

Walter R. Schlage, San Francisco, Calif., assignor to Schlage Lock Company, San Francisco, Calif., a corporation of California

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21 Claims. (Cl. 70-146)

This invention relates to door locks of the type employing two independently operable spindles, and especially to means for dogging one of the spindles under certain operating conditions.

5 The object of the present invention is to generally improve and simplify the construction and operation of locks of the character described; to provide a lock having an inner and an outer spindle operable independently of each other with a pushbutton in the inner spindle and a key mechanism in the outer spindle; to connect the push button and the key mechanism with a bar to which longitudinal movement is imparted by the push button and rotary movement by the key mechanism; and further to provide a dogging mechanism which is actuated by the bar through the medium of the push button or the key, whereby the bar may be dogged against movement under certain conditions or the outer spindle dogged against rotation, or whereby both may be simultaneously dogged.

The invention is shown by way of illustration in the accompanying drawings, in which

Fig. 1 is a horizontal section of the lock, showing it mounted in a door;

Fig. 2 is a vertical section taken on line II-II of Fig. 1;

Figs. 3 and 4 are perspective views of the rollback portions of the respective spindles;

Fig. 5 is a longitudinal section showing the spindles telescoped;

Fig. 6 is a perspective view of the retractor plate and the latch bolt;

Fig. 7 is a perspective view of the dog, together with the dogging lugs carried thereby;

Fig. 8 is a perspective view of a standard form of cylinder lock;

Fig. 9 is a perspective view of the bar;

Fig. 10 is a perspective view of the lock housing;

Fig. 11 is a perspective view of the retractor plate and the spindles extending therethrough, said view showing the manner in which the dogging lugs engage and dog the outer spindle.

Referring to the drawings in detail, and particularly to Figs. 1 to 6, inclusive, A and B indicate the opposite faces of the stile of a hollow metal door, and C the front edge thereof. Formed in the faces A and B are openings which are provided for the reception of spindle bearings, as will hereinafter appear; and formed in the front edge C is an opening through which the lock housing generally indicated at D in Fig. 10 is adapted to be inserted.

The housing shown in Fig. 10 is rectangular in shape and consists of top and bottom plates 5 and

6 which are connected by front and rear end plates 7 and 8 and side plates 9 and 10 in which are formed screw-threaded openings.

The housing is inserted in the door through the opening formed in the front edge C, and when inserted is secured by a pair of spindle bearings 11 and 12 which are inserted through the openings formed in the opposite faces A and B of the stile. The spindle bearings are provided with threaded inner ends 11a and 12a which are screwed into the threaded openings formed in the side plates 9 and 10 of the housing and thus secures and supports the rear end of the housing with relation to the side wall, while the front end will be secured and supported in the opening through which it is inserted.

Slidably mounted for longitudinal movement within the housing is a retractor plate 13. This plate is guided at the inner end by lugs 14 extending into slots 15-15 formed in the top and bottom plates 5 and 6, while the front end is guided by a latch bolt 16 which is secured to the retractor plate and normally extends through an opening 17a formed in the front plate. On the rear end of the retractor plate is a cross bar 17 and formed in the front thereof is an opening 18 through which extend a pair of telescoping spindles 19 and 20 which are supported and journaled in the spindle bearings 11 and 12. Each spindle is provided with a knob, indicated at 19a and 20a, respectively, so that each spindle may be independently rotated; and each spindle is provided with a transverse slot to form rollback sections 21 and 22 which engage the front face of the cross bar 17 and impart reciprocal movement thereto when either spindle is rotated, and, as the cross bar is secured to, or forms a part of, the retractor plate, said plate together with the latch bolt will also be reciprocated.

Formed in the front face of the cross bar 17 is a recess 23, and formed rearwardly therein and extending through the cross bar is a passage in which is mounted a dogging member 24, said dogging member being provided with a pair of dogging lugs 25 and also with a pin 26 which serves as a support and guide for a spring 27 interposed between the dog 24 and the rear plate 8 of the housing. The cross bar 17 is provided with a pair of pins 28 which serve as supports and guides for a pair of springs 29 which are interposed between the cross plate and the rear plate 8 of the housing. The springs 29 normally function to maintain the retractor, the cross bar, and the latch bolt, in the extended position shown in Fig. 2, but they yield when either

spindle is rotated so as to permit retraction of the latch bolt when the door is to be opened. The spring 27 also aids the springs 29 in their function, but in addition thereto actuates the dogging member 24, that is, it tends to maintain the dogging member within the passage formed in the cross bar for its reception, the inward movement of the dogging member in this passage being limited by the dogging lugs 25, which enter recesses 25a formed in the rear face of the cross bar 17.

Extending through the spindles is a bar 30. Secured on the inner end of the bar is a push button 31. Secured within the spindle 19 is a washer 32 which is slotted to permit the bar 30 to pass therethrough, and interposed between the washer and the push button is a spring 33 which normally serves to maintain the push button in the extended position shown in Fig. 1, the distance to which the push button is extended being limited by a pin 34 securing the bar and engaging the washer 32. The bar has two movements, a longitudinal movement and also a rotary movement. It is accordingly essential that the washer 32 be free to rotate, but it must be secured against endwise movement within the spindle 15, and for this reason it is secured between lugs pressed inwardly from the inner surface of the spindle.

In the outer end of the outer spindle 16 is mounted and suitably secured a standard form of key-actuated cylinder lock, the housing of which is indicated at 35. The housing contains the usual form of cylinder which is provided for the reception of a key, and when the key is inserted the tumblers will be retracted and the cylinder may be rotated by means of the key. The cylinder extends a short distance beyond the inner end of the housing, as indicated at 36 in Fig. 1. This extension is in the present instance surrounded by a sleeve 37 which is pinned as shown at 38, or otherwise secured thereto, so as to rotate in unison with the cylinder when this is rotated by means of the key. The sleeve has a slot formed therein as shown at 39, and this slot receives and supports the outer end of the bar 30. Furthermore, the slot is of such a length that when longitudinal movement is imparted to the bar by means of the push button, as will hereinafter be described, such movement will be accommodated.

From the foregoing, it should be obvious that longitudinal movement is transmitted to the bar by means of the push button 31 and that rotary movement is transmitted to the bar by means of the key mechanism. These movements are depended upon to actuate the dogging member 24, which has two functions: first, that of dogging the outer spindle against rotation; and second, that of dogging the bar against longitudinal movement. The results obtained can best be stated by describing the operation of the lock.

Referring to Fig. 1, it may be stated that the mechanism is shown in normal position, that is, the latch bolt 16 may be retracted by rotation of either knob. If a person is inside of a room and wishes to lock the door, or in other words render the outer knob inoperative, he or she will merely push the button 31 inwardly. In doing so, a notch 30a, formed in the bar, moves into alignment with the dogging member 24, and when it moves into alignment therewith, the dogging member can move inwardly a distance equal to the depth of the notch 30a. When the dog moves inwardly that distance, the dogging lugs 25 will

enter laterally extending slots 20b formed in the outer spindle, and will thus dog the outer spindle against rotation. In this position, no one can enter the room from the outside except an authorized individual with the proper key, as insertion of a key and rotation of the bar by means of the key a half revolution will force the dog outwardly and thereby lift the lugs 25 out of engagement with the slots 20b in the outer spindle. In that instance, the door may be opened from the outside by rotation of the outer knob, as the outer spindle has been released.

It is also possible for the person on the inside of the room to open the door whenever desired after the push button has been depressed, as mere rotation of the inner knob causes rotation of the inner spindle, which is always free to rotate. Such rotation causes the rollback portion 21 of the inner spindle to engage the face of the cross bar 17 and when such engagement takes place, an inward reciprocal movement is transmitted to the cross bar, the retractor plate and the latch bolt, and as the dog 24 is carried by the cross bar, it will move with the cross bar out of the notch 30a, thus releasing the bar 30 and permitting the spring 33 to return it to the normal extended position shown in Fig. 1. Thus under normal conditions rotation of the inner knob and spindle does not only permit retraction of the latch bolt, but it also automatically undogs the outer spindle, and at the same time permits the automatic return of the bar 30 to normal position. The dog may also be undogged by depression of the latch bolt, the bar being at the same time released and restored to normal extended position.

It is also possible to dog the outer spindle and knob against rotation, when leaving the room; that is, to lock the door from the outside. This is accomplished by merely inserting the key and rotating the bar a half revolution. In doing so, a second notch 30b is moved into alignment with the dog 24, and the dog is thus forced inwardly by the spring 27 and the lugs 25 carried thereby will enter the notches 20b and thereby dog the outer spindle against rotation. It should also be noted that the bar itself is dogged against longitudinal movement in this position, as it cannot be pushed inwardly by means of the push button 31. In fact, this feature is an advantage, as it serves as a means for determining whether the door has been locked from the outside or not, when leaving the room. That is, it is not necessary to open the door and then step outside to lock it from the outside. It may just as readily be locked before leaving the room; for instance, when a person desires to go out, he or she will open the door, insert the key, and rotate the bar a half revolution. To decide whether the door has been locked from the outside, he or she will attempt to depress the push button 31, but if it cannot be depressed, the person will know that the door has been locked from the outside and he or she may then merely step out and slam the door, and the door cannot again be opened from the outside until the proper key has been inserted, and the bar rotated to the normal position shown in Fig. 1. If a person should happen to be locked in the room by a person inserting a key from the outside and locking the door, such person will be able to get out, as the inner knob and spindle are always free for rotation to retract the latch bolt; but if such person leaves the room and shuts the door, the door will remain locked

from the outside and cannot be entered except by a person having the proper key.

Having thus more or less specifically described the various features of this invention, I wish it understood that changes may be resorted to within the scope of the appended claims, and that the materials and finish of the several parts employed may be such as the desire or experience of the manufacturer may dictate.

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

1. In a door lock having an inner and an outer independently operated spindle, a bar within the spindles, means for rotating the bar and for imparting longitudinal movement thereto, a spring actuated dog controlled by longitudinal movement of the bar for dogging the outer spindle against rotation, said dog leaving the inner spindle free to rotate, and means controlled by rotation of the bar for undogging the dog.

2. In a door lock, inner and outer independently operable spindles, a bar within the spindles, a dog operable by the bar to dog or undog the outer spindle, said dog leaving the inner spindle free to rotate, means in the inner spindle for imparting longitudinal movement to the bar, and means in the outer spindle for rotating the bar, and a spring actuated dog controlled by the bar to simultaneously dog the bar against longitudinal movement and the outer spindle against rotation.

3. In a door lock, an inner and an outer spindle, a bar within the spindles, a push button on the bar and normally projecting beyond the inner end of the inner spindle, a spring maintaining the bar and button in the projected position, said button adapted to impart longitudinal movement to the bar to cause the button to assume a depressed position, means in the outer spindle for rotating the bar, and a spring actuated dog controlled by the bar to dog the button and bar in depressed position and the outer spindle against rotation, said dog being undogged to release the button, the bar and the outer spindle upon rotation of the bar.

4. In a door lock having inner and outer independently operable spindles, a bar within the spindles, a push button on the bar and normally projecting beyond the inner end of the inner spindle, a spring maintaining the bar and button in a projected position, said button adapted to impart longitudinal movement to the bar to cause the button to assume a depressed position, means in the outer spindle for rotating the bar, and a spring actuated dog controlled by the bar, said bar being selectively operable to assume different positions and in one position permitting the dog to dog the outer spindle against rotation and the bar against longitudinal movement so as to prevent depression of the button, and in another position adapted to simultaneously undog the outer spindle and the bar and button.

5. In a door lock having inner and outer independently operable spindles, a bar within the spindles, a dog operable by the bar to dog or undog the outer spindle, said dog leaving the inner spindle free to rotate, a spring actuated dog controlled thereby, means in the inner spindle for imparting longitudinal movement to the bar, said movement permitting the dog to dog the outer spindle against rotation, and key actuated means in the outer spindle for rotating the bar, said rotation of the bar causing undogging of the outer spindle.

6. In a door lock, a housing, an inner and an

outer spindle entering the housing from opposite sides, a retractor plate slidably mounted in the housing, a cross-bar on the inner end of the retractor plate entering a transverse slot formed in the outer spindle, a dog mounted in the cross-bar and slidable therein, a pair of dogging lugs on the dog, said outer spindle having recesses formed therein for the reception of said lugs, a spring engaging the dog to normally maintain the dogging lugs in the recesses of the spindle, a bar within the spindles and movable into or out of engagement with the dog to move it to a position where the lugs will either clear or enter the recesses, and means for actuating the bar to control the position of the dog and its cooperating lugs.

7. In a door lock, a housing, an inner and an outer spindle entering the housing from opposite sides, a retractor plate slidably mounted in the housing, a cross-bar on the inner end of the retractor plate entering a transverse slot formed in the outer spindle, a dog mounted in the cross-bar and slidable therein, a pair of dogging lugs on the dog, said outer spindle having recesses formed therein for the reception of said lugs, a spring engaging the dog to normally maintain the dogging lugs in the recesses of the spindle, a bar within the spindles and movable into or out of engagement with the dog to move it to a position where the lugs will either clear or enter the recesses, and button controlled means in the inner spindle for actuating the bar to control the position of the dog and its cooperating lugs.

8. In a door lock, a housing, an inner and an outer spindle entering the housing from opposite sides, a retractor plate slidably mounted in the housing, a cross-bar on the inner end of the retractor plate entering a transverse slot formed in the outer spindle, a dog mounted in the cross-bar and slidable therein, a pair of dogging lugs on the dog, said outer spindle having recesses formed therein for the reception of said lugs, a spring engaging the dog to normally maintain the dogging lugs in the recesses of the spindle, a bar within the spindles and movable into or out of engagement with the dog to move it to a position where the lugs will either clear or enter the recesses, and key controlled means in the outer spindle actuating the bar to control the position of the dog and its cooperating lugs.

9. In a door dock, a housing, an inner and an outer spindle entering the housing from opposite sides, a retractor plate slidably mounted in the housing, a cross-bar on the inner end of the retractor plate entering a transverse slot formed in the outer spindle, a dog mounted in the cross-bar and slidable therein, a pair of dogging lugs on the dog, said outer spindle having recesses formed therein for the reception of said lugs, a spring engaging the dog to normally maintain the dogging lugs in the recesses of the spindle, a bar within the spindles and movable into or out of engagement with the dog to move it to a position where the lugs will either clear or enter the recesses, button controlled means in the inner spindle to actuate the bar, and key actuated means in the outer spindle to actuate the bar, said key actuated means together with the dog being also adapted to render the button controlled means inoperative.

10. In a lock having a rotatable outer and inner knob, a longitudinally movable bar within the inner knob, and a dog controlled by said bar for rendering the outer knob inoperative, said

dog also adapted to dog the bar against longitudinal movement.

11. In a lock having a rotatable outer and inner knob, a depressible bar within the spindles, a dog controlled by the bar to dog or undog the outer knob, and key operated means in the outer knob cooperating with the dog for moving the bar to a position where it will be dogged by the dog and held against depression.

12. In a lock having independently rotatable outer and inner spindles, a longitudinally movable bar within the inner spindle, a dog controlled by the bar for rendering the outer spindle inoperative, and means whereby rotation of the bar will restore the outer spindle to operation.

13. In a lock, a latchbolt, a rotatable outer and inner knob for actuating the latchbolt, a depressible bar in the inner knob, a dog controlled by said bar for rendering the outer knob inoperative, but leaving the inner knob free to actuate the latchbolt, a key mechanism in the outer knob, and a connection between the key mechanism and bar, whereby the bar is rotated, said rotation of the bar selectively controlling either dogging or undogging of the outer knob.

14. In a lock, a latchbolt, a retractor slide connected with the latchbolt and mounted for reciprocal movement, spindle dogging means carried by the retractor slide, outer and inner independently operable spindles to actuate the retractor, a bar within the inner spindle, and means whereby inward movement of the bar will control the spindle dogging means to render the outer knob inoperative.

15. In a lock, a latchbolt, a retractor slide connected with the latchbolt and mounted for reciprocal movement, spindle dogging means carried by the retractor slide, a spindle to actuate the retractor slide, and longitudinally movable means within the spindle controlling the dogging means to selectively engage or disengage the spindle.

16. In a lock, a latchbolt, a retractor mounted for reciprocal movement to retract the latchbolt, a spindle dogging latch carried by the retractor, an outer and inner spindle to actuate the retractor, a spring actuated depressible bar within the inner spindle, means for securing the bar in its depressed position, means on the bar whereby depression of the bar will control the spindle dogging latch and dog the outer spindle against rotation, and means whereby inward movement of the retractor will automatically release the bar and permit its spring to restore it to normal outward position.

17. In a lock, a latchbolt, a retractor slide con-

nected with the latchbolt and mounted for reciprocal movement, a spindle dogging member carried by the retractor slide, outer and inner independently operable spindles adapted to actuate the retractor slide, a push button in the inner spindle, and means whereby depression of the push button will control the dogging member on the retractor to render the outer spindle inoperative.

18. In a lock, a latchbolt, a retractor slide connected with the latchbolt and mounted for reciprocal movement, a spindle dogging member carried by the retractor slide, an outer and inner spindle adapted to actuate the retractor slide, a push button in the inner spindle, means whereby depression of the push button will control the dogging member on the retractor slide and thereby render the outer spindle inoperative, and means whereby inward movement of the retractor slide will control the dogging member to restore the outer spindle to operation.

19. In a lock, a latchbolt, an outer and inner actuator to independently operate the latchbolt, a bar within the inner actuator, a dog controlled by the bar to dog or undog the outer actuator, said dog leaving the inner actuator free to rotate, and said dog being controlled by longitudinal movement of the bar to dog the outer actuator against operation, and key actuated means in the outer actuator to rotate the bar, said rotation of the bar causing undogging of the outer actuator.

20. In a door lock having inner and outer independently operated spindles, a bar within the spindles, a dog movable by spring action into dogging engagement with the outer spindle to render it inoperative, and means in the outer spindle for rotating the bar in one direction or another, said bar when rotated in one direction engaging the dog and forcing it out of dogging engagement and when rotated in the other direction moving out of engagement with the dog and permitting the dog to move into dogging engagement with the outer spindle.

21. In a lock, a latchbolt, a retractor, a retractor slide connected with the latchbolt and mounted for reciprocal movement, an inner and outer spindle mounted for independent rotatable movement and adapted to actuate the retractor slide, a dogging latch carried by the retractor and engageable with the outer spindle to dog the same, and a longitudinally movable bar in the inner spindle controlling the dogging latch either to dog or undog the outer spindle.

WALTER R. SCHLAGE. 55