Oct. 20, 1942. W. R. SCHLAGE 2,299,180

DOOR LOCK

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Fig. 1.

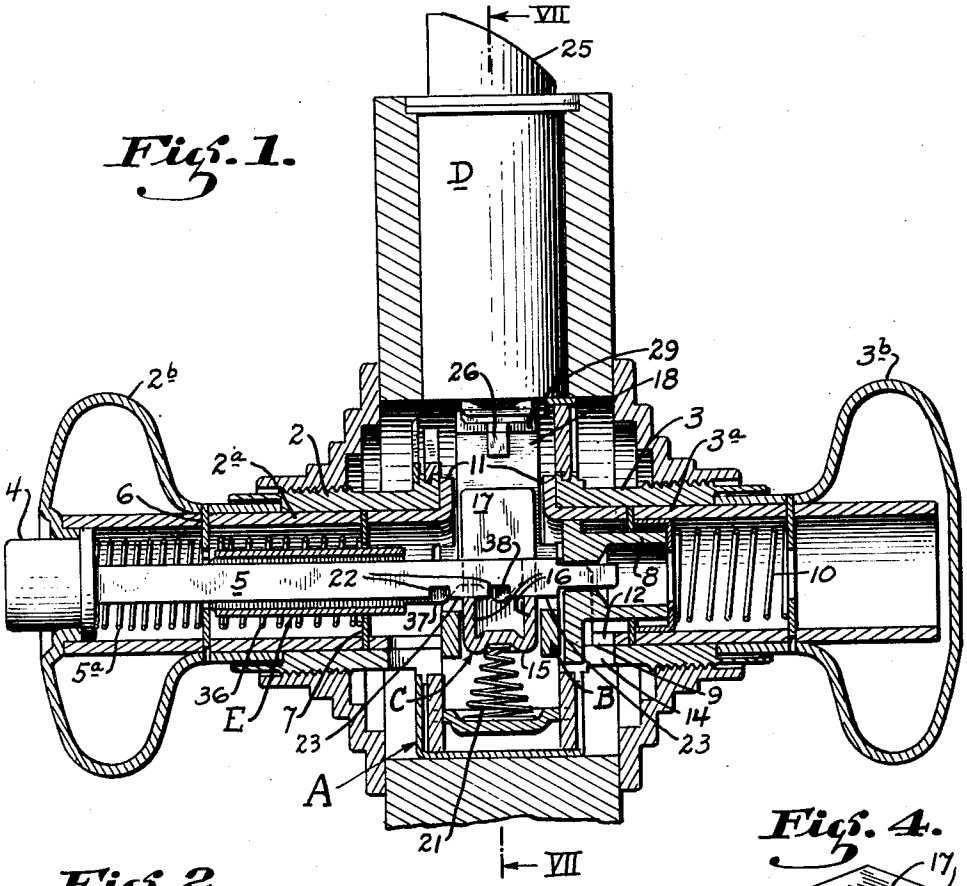


Fig. 2.

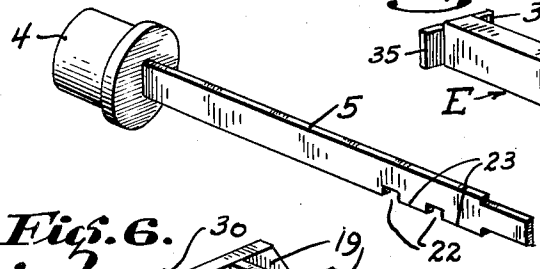


Fig. 3.

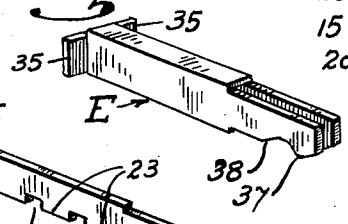


Fig. 4.

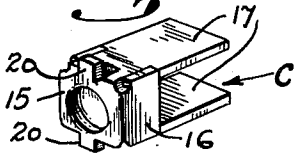


Fig. 5.

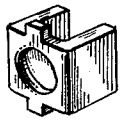
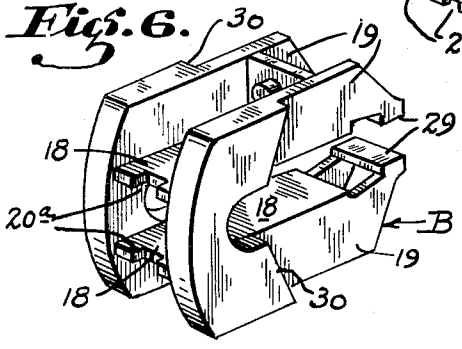


Fig. 6.



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Fig. 7.

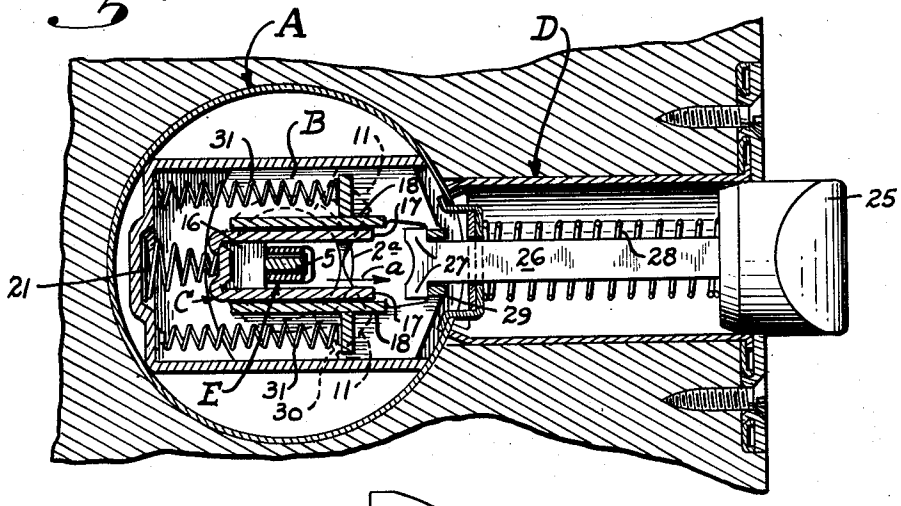


Fig. 9.

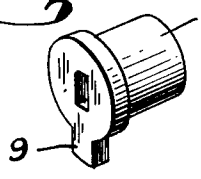


Fig. 10.

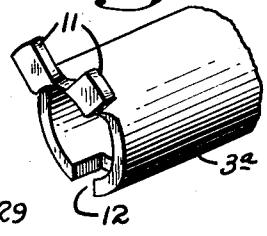


Fig. 8.

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UNITED STATES PATENT OFFICE

2,299,180

DOOR LOCK

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Application May 29, 1940, Serial No. 337,838

7 Claims. (Cl. 292—169)

This invention relates to a door lock having an inner and an outer spindle, and especially to an improved form of dog actuating mechanism for dogging or releasing the outer spindle of the lock.

In several patents heretofore issued to me (see for instance Patent No. 1,579,457, entitled "Door lock," issued April 6, 1926, Patent No. 1,691,528, entitled "Door lock," issued November 13, 1928, and other patents), I have disclosed a door lock in which there are inner and outer spindles with cooperating knobs and a latch bolt actuated by either spindle or knob. In conjunction therewith is shown a push button which is mounted in the inner knob, said button when depressed dogging or locking the outer spindle and knob against operation. In structures of this character, the button is secured to a bar which extends through a hollow spindle, and on the inner end of the bar is a latch or shoulder which engages one side wall of a retractor, said retractor retaining the button and bar in dogging position until they are released. Such release is accomplished either by rotation of one or another of the spindles which may be key or knob actuated, or by depression of the latch bolt, either of which operations causes movement of the retractor and release of the latch, with the result that the bar and button are restored to normal position and the outer spindle and knob released for normal operation.

In actual practice, this arrangement is perfectly satisfactory, but when the lock has been in operation for a number of years and wear begins to take place, play or lost motion between some of the parts develops, with the result that the button retaining latch may be accidentally released, thereby undogging or releasing the outer spindle and knob. Also there is a tendency if a door is slammed closed, as by a strong draft or a violent shove, for the button and connected bar to move by inertia to dogging position and thereby accidentally to dog or lock the door. This is obviously undesirable, for instance, if the occupant of the room is temporarily outside, as the room would then have to be entered from a window or the like in order to undog the lock.

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 latching mechanism for latching the button bar in depressed position, which latching mechanism is not affected by wear on the mechanism or several parts forming the lock, and which is operable independently of these parts; and further, to provide an inertia actuated release member which will release the button bar if it should accidentally be moved to assume a depressed or dogging position, as by the slamming of the door.

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 perspective view of the push button and the bar secured thereto;

Fig. 3 is a perspective view of the inertia actuated releasing sleeve;

Fig. 4 is a perspective view of one form of retaining latch;

Fig. 5 is a similar view of another form of retaining latch;

Fig. 6 is a perspective view of the retractor;

Fig. 7 is a vertical central section taken on line VII—VII of Fig. 1;

Fig. 8 is a section similar to Fig. 1, showing the push button, the retractor bar, and the dog in dogging position and retained by the latch;

Fig. 9 is a perspective view of the dogging member; and

Fig. 10 is a perspective view of the inner end of the outer spindle.

Referring to the drawings in detail, and particularly to Figs. 1, 6 and 7, A indicates in general a lock housing, in which is slidably mounted a retractor B. Forming a part of the housing are sleeve-like lateral extensions 2 and 3 which form bearings for a pair of spindles 2*a* and 3*a*. The spindle 2*a* will hereinafter be referred to as the inner spindle and the spindle 3*a* as the outer spindle. These spindles are provided with the usual form of knobs, indicated at 2*b* and 3*b*, and in addition thereto the inner spindle has a push button 4 mounted in its outer end which projects through the knob 2*b* so as to permit it to be manually pushed inwardly or depressed, as will hereinafter be described.

Also carried by the inner spindle (see Figs. 1 and 2) is a bar 5. It extends through the spindle and the retractor, and partially into the outer spindle, and is maintained in a central position with relation to both spindles by cross-plates 6 and 7. The outer end of the bar is secured to the button 4, while the inner end of the bar is reduced in size and extends into a central opening formed in a dogging member which consists of a short cylindrical section 8 having a radially projecting dog 9 formed at one end (see Fig. 9). This dogging member is supported in the inner end of the outer spindle 3*a*, and normally assumes the position shown in Fig. 1, as it is held

against the inner end of the bar 5 by a spring 10.

Both spindles are tubular in construction, and the inner ends of both spindles are provided with rollback lugs 11—11, as shown in Fig. 10. In fact, the only difference between the spindles is that the outer spindle has a slot 12 formed in its inner end to receive the dog 9. The bearing sleeve 3 has a similar slot 14 formed in its inner end, which aligns with the spindle slot 12; hence when the dog 9 assumes the position shown in Fig. 1, it is free to rotate with the outer spindle 3a, but if it assumes the position shown in Fig. 8, it enters the slots 12 and 14 and thus dogs or locks the outer spindle against rotation.

The dog is normally held in the undogged position shown in Fig. 1 by the spring 10, while the button 4 and the bar 5 are held in undogged or extended position by a spring 5a interposed between the inner end of the button 4 and the cross-plate 6. Hence to dog the outer spindle it is necessary to push the button and connected bar inwardly, as such movement is depended upon to move the dog into the slots 12 and 14, and it is further necessary to secure these members in dogging position, as the springs 10 and 5a would otherwise return them to normal or extended position.

To accomplish this a latching member C is employed (see Figs. 1, 4 and 7). This member consists of an end plate 15, upper and lower guide plates 17, and a pair of side plates 16 which will hereinafter be referred to as latching plates. This member is slidably mounted between plates 18—18 which connect side plates 19—19 of the retractor B (see Fig. 6), sliding movement of the latching member within the retractor in the direction of arrow a being limited by a pair of stop lugs 20—20 which engage seats 20a formed at the outer ends of the plates 18—18. The latching member is normally held in this position, that is, with the lugs 20 in engagement with the seats 20a, by a spring 21 (See Fig. 1).

The inner end of the button-actuated bar 5, as previously stated, extends through the retractor and into the central opening formed in the dogging member 9. In doing so, it also passes between the upper and lower guide plates 17 of the latching member. Also, it should be noted that two notches 22 are formed in the bar 5 with which the latching plates 16 cooperate. This is accomplished as follows: When the push button 4 and connected bar 5, together with the dogging member 9, assume the position shown in Fig. 1, the latching plates 16 will engage and ride on the edge 23 of the bar 5, but when the button and bar, together with the dogging member, are pushed inwardly, the notches 22 will align with the latching plates 16 and the latching member will thus move forwardly and enter said notches, thereby retaining the dog in dogging position within the slots 12 and 14, and at the same time latching or dogging the bar 5 and button 4 in depressed or dogging position. When dogging position is assumed the outer knob will be rendered inoperative, as the spindle on which it is secured is dogged against rotation.

In order to undog the outer knob and spindle the latching member C must be moved rearwardly, or in a direction opposite to arrow a, in order that the bar and button may be returned to normal or extended position by the spring 5a, and the dog 9 returned to normal or undogged position by the spring 10. To accomplish this, reference will be made to Fig. 7. In this view, a latch bolt housing is generally indicated at D; a latch bolt 25 is slidably mounted therein and extends through the outer end of the housing. A retractor bar 26 is connected with the latch bolt and a pair of lugs 27 are formed at the inner end thereof. The latch bolt 25 is normally maintained in extended position by a spring 28, and it can be retracted or depressed by engagement with the striker plate of a door jamb, for instance when closing the door, or by retraction by means of the retractor B. The forward end of the retractor B (see Fig. 6) is provided with a pair of retractor jaws 29 which hook over and engage the lugs 27 of the retractor bar 26. On the side plates of the retractor B are formed shoulders 30—30. These shoulders are engaged by the rollback lugs 11—11 of the respective spindles; hence when either one spindle or the other is rotated, the lugs 11 thereof will engage one or another of the shoulders 30 on the retractor, and it will thus be forced rearwardly within the housing A against the tension of a pair of springs 31 (see Fig. 7). Thus during rearward movement of the retractor the jaws 29 which engage the lugs 27 of the retractor bar will cause said bar and the latch 25 to move inwardly in unison with the same, but when the spindle is released, springs 28 and 31 will return the retractor and the latch bolt to normal or extended position. During rearward movement caused by rotation of one or the other of the spindles, the latching member will move in unison with the retractor in the same direction, as the lugs 20 of the latching member will be engaged by the inner ends or seat members 20a of the retractor. Such rearward movement of the latching member pulls the latching plates 16 out of the notches 22 of the retractor bar, and when it is thus released it will instantly return to normal position, due to the action of spring 5a, and so will the button and the dogging member 9.

Another method of releasing the latching member is merely to depress the latch bolt 25, either manually or by causing it to be depressed by engagement with the striker plate of a door jamb when closing the door. During such movement the inclined face (see Fig. 1) of the latch bolt engages the striker plate and is thus forced inwardly. During such inward movement, bar 26 and lugs 27 also move inwardly, and as they do so they engage the forward ends of the guide plates 17, thus causing the latching member to move inwardly and out of engagement with the notches in the push button bar, thus releasing the same. Hence the latching member may be released independently of any movement of the retractor, and it may also be released when the retractor and the latching member move in unison.

By referring to Fig. 5, it will be noted that a modified form of latching member is shown. It is in reality identical with the member shown in Fig. 4, but it is merely made shorter, as the guide plates 17 are eliminated. This type of latching member is employed where the outer knob is provided with a key mechanism. That is, where a key mechanism is provided, it is desirable that the latching member shall not be released by depression of the latch bolt. Hence if the latching member is made short, as shown in Fig. 5, it will not release the button bar during inward movement of the latch bolt, the bar 26 and the lugs 27, and as such, they can only be released when the retractor and the latching member move in unison.

In actual practice it has been found that if a

door is violently closed, for instance by a strong draft or by giving it a quick shove or slam, the button 4 and bar 5 are liable to move inwardly by inertia to dogging position, even though such inward movement is opposed by the action of the springs 10 and 5a. Such accidental dogging of the lock is undesirable, as the occupant of a room may temporarily have left the room, and return to find that the door has been closed in such a manner. If a key mechanism is provided in the outer knob, the door could again be opened, but if no key mechanism is provided the only manner in which the door could be opened would be to enter the room through a window or the like, so as to permit undogging of the lock. To prevent such accidental dogging, an inertia-actuated member generally indicated at E (see Fig. 3) may be employed. This is nothing more nor less than the rectangularly shaped sleeve which is slidably mounted on the bar 5. The outer end of the sleeve has a pair of lugs 35 formed thereon which are engaged by a spring 36 interposed between said lugs and the cross-plate 7. That is, the inertia actuated member or sleeve E is normally held in the position shown in Fig. 1 by means of the spring 36. The inner end of the inertia actuated member has a pair of cam faces formed thereon, as indicated at 37 and 38. If the door is violently closed and the button and bar are moved inwardly by inertia, the member E will also move inwardly against the tension of the spring 36. The cams 37 and 38 will during such inward movement move across the notches 22 formed in the bar, and will at the same time engage the inner edges of the latching plate 16, thus preventing them from entering the notches 22. The inertia member and the bar and button will return in unison by spring action to normal position the moment the inertia movement has been overcome, and accidental dogging of the outer spindle is thus prevented.

In locks heretofore described and manufactured by me, and particularly the structures disclosed in the patents previously referred to, one side wall of the retractor was depended upon as a latching member. In this instance the latching member forms a separate part of the retractor, and it may be moved independently of the retractor, or in unison with the same. This form of latching member is found to be a great improvement, as play due to wear between the several connected parts will in no way affect its latching action with relation to the bar 5. Furthermore, accidental dogging due to jar or otherwise is positively overcome by employing the type of inertia actuated member disclosed.

While certain features of my invention have been more or less specifically described and illustrated, I nevertheless wish it understood that changes may be resorted to within the scope of the appended claims, and that the materials and finish of the various parts employed may be in accordance with the wishes of the manufacturer or the demands of specific conditions of use.

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

1. In a door lock, a retractor, an inner and an outer spindle for independently actuating the retractor, a bar extending through the retractor and adapted to assume either a dogging position or a releasing position, a latch engageable with the bar to secure it in dogging position, said latch being movable independently of the retractor to release the bar from dogging position, and inertia-actuated means to prevent engagement of the latch with the bar when the bar is moved to dogging position by the force of inertia.

2. In a door lock, a retractor, an inner and an outer spindle for independently actuating the retractor, a dogging member for dogging the outer spindle against operation, a bar extending through the retractor and adapted to assume either an inner or an outer position, said bar being connected with the dogging member and moving it to dogging position when assuming the inner position, a latch carried by the retractor and engageable with the bar to secure it in the inner position, and inertia-actuated means to prevent engagement of the latch with the bar when the bar is moved to dogging position by the force of inertia.

3. In a door lock, a retractor, an inner and an outer spindle for independently actuating the retractor, a bar extending through the retractor and adapted to assume either a dogging position or a releasing position, a latch engageable with the bar to secure it in dogging position, said latch being movable independently of the retractor to release the bar from dogging position, a latch bolt, means actuated by depression of the latch bolt for imparting movement to the latch independently of the retractor to release the bar from dogging position, other means for moving the retractor and latch in unison to release the bar from dogging position, and intertia-actuated means to prevent engagement of the latch with the bar when the bar is moved to dogging position by the force of inertia.

4. In a door lock, a retractor, an inner and an outer spindle for independently actuating the retractor, a push button mounted in the inner spindle, a bar secured thereto and extending through said spindle and the retractor, a dog connected with the bar and movable into and out of engagement with the outer spindle to dog or release the same, a spring normally maintaining the button, the bar and the dog in released position, said button adapted to be manually depressed to move the bar and dog into dogging position, a latch carried by the retractor and engageable with the bar to secure the bar and dog in dogging position, and means for moving the latch independently and longitudinally of the retractor to release the button, the bar and the dog from dogging position.

5. In a door lock, a retractor, an inner and an outer spindle for independently actuating the retractor, a push button mounted in the inner spindle, a bar secured thereto and extending through said spindle and the retractor, a dog connected with the bar and movable into and out of engagement with the outer spindle to dog or release the same, a spring normally maintaining the button, the bar and the dog in released position, said button adapted to be manually depressed to move the bar and dog into dogging position, a latch carried by the retractor and engageable with the bar to secure the bar and dog in dogging position, and inertia-actuated means to prevent engagement of the latch with the bar when the bar is moved to dogging position by the force of inertia.

6. In a door lock, a retractor, an inner and an outer spindle for independently actuating the retractor, a push button mounted in the inner spindle, a bar secured thereto and extending through said spindle and the retractor, a dog connected with the bar and movable into and out of engagement with the outer spindle to dog or release the

same, a spring normally maintaining the button, the bar and the dog in released position, said button adapted to be manually depressed to move the bar and dog into dogging position, a latch carried by the retractor and engageable with the bar to secure the bar and dog in dogging position, a latch bolt, and means actuated by depression of the latch bolt for moving the latch longitudinally and independently of the retractor to release the button, the bar and the dog from dogging position.

7. In a door lock, a retractor, an inner and an outer spindle for independently actuating the retractor, a push button mounted in the inner spindle, a bar secured thereto and extending through said spindle and the retractor, a dog connected with the bar and movable into and out of engagement with the outer spindle to dog or release the same, a spring normally maintaining the button, the bar and the dog in released position, said button adapted to be manually depressed to move the bar and dog into dogging position, a latch carried by the retractor and engageable with the bar to secure the bar and dog in dogging position, and an inertia-actuated sleeve slidably mounted on the bar, to prevent engagement of the latch with the bar when the bar is moved to dogging position by the force of inertia.

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