Dec. 1, 1942. W. S. EDWARDS ET AL 2,303,624

DOOR LOCK

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Fig. 2.

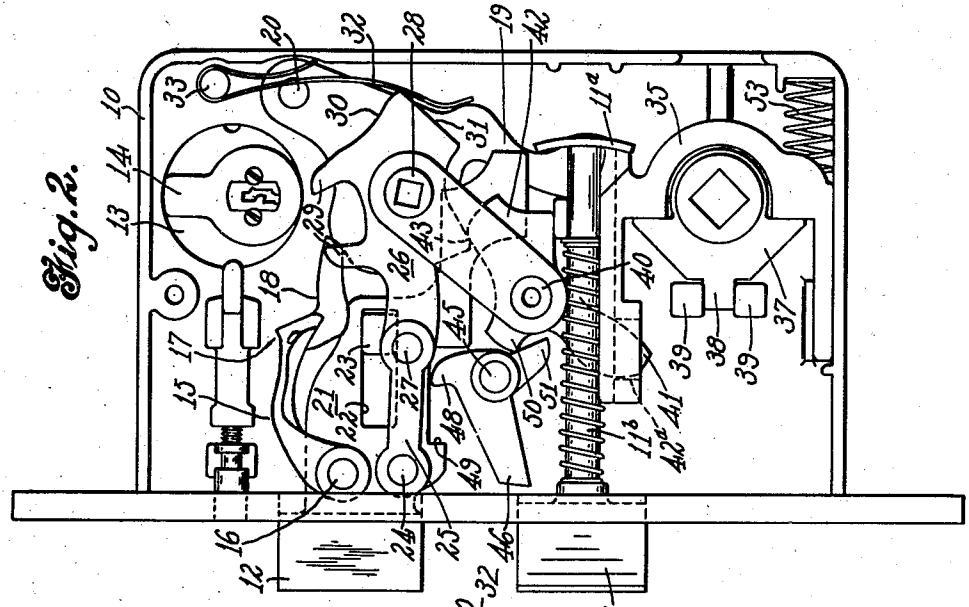
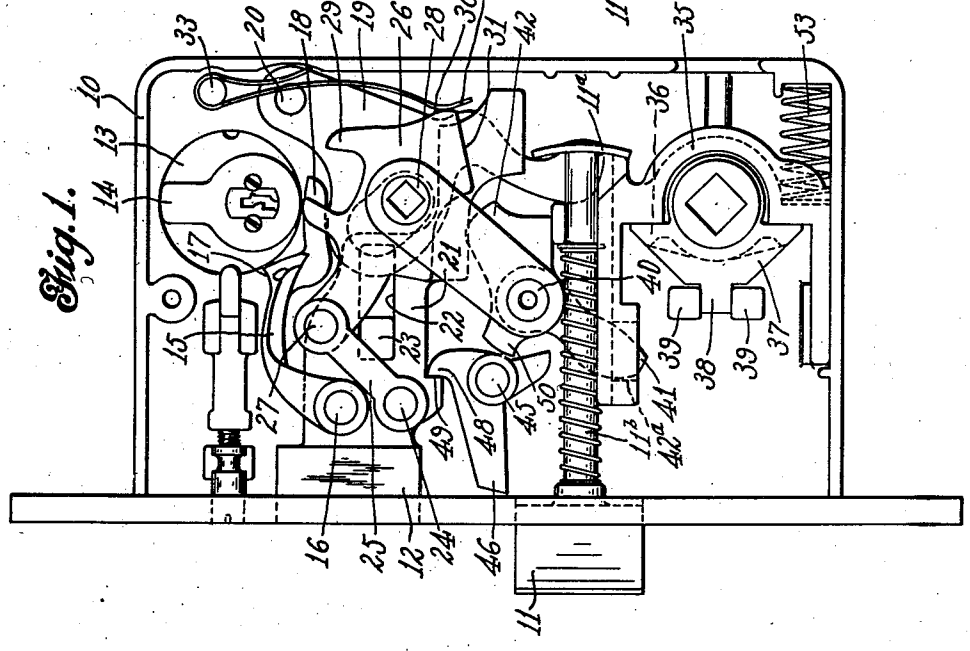


Fig. 1.



Inventor
William S. Edwards
and Henry G. Voight
By Rockwell & Barthold
Attorneys

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Fig. 4.

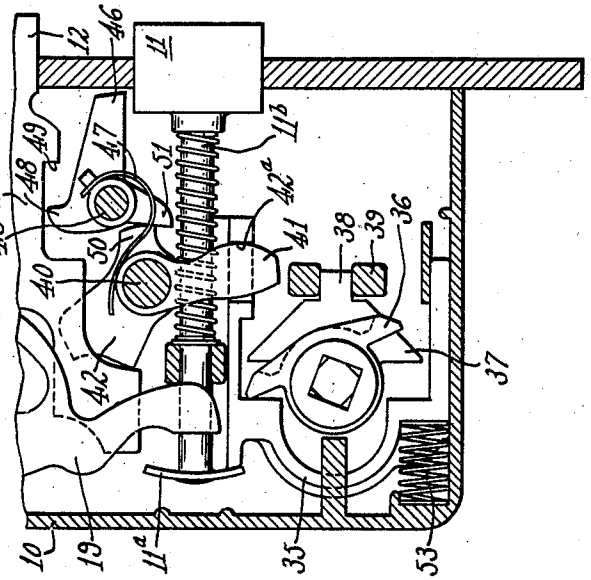
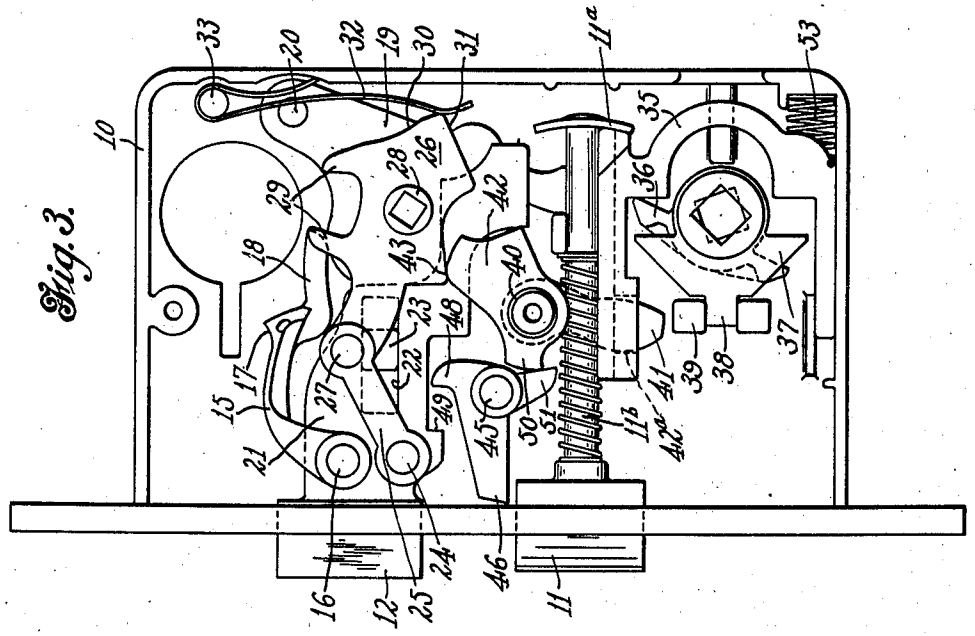


Fig. 3.



Inventor

William S. Edwards

and Henry G. Voight

By Rockwell & Rockwell

Attorneys

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UNITED STATES PATENT OFFICE

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DOOR LOCK

William S. Edwards, Hamden, and Henry G. Voight, New Haven, Conn., assignors to Sargent & Company, New Haven, Conn., a corporation of Connecticut

Application October 1, 1941, Serial No. 413,169

11 Claims. (Cl. 70—110)

This invention relates to locks, and more especially to a lock of the panic-proof type, in that the lock is provided with both dead bolt and latch bolt, and so arranged that an occupant of the room, by turning the inside knob, may open the door even though the dead bolt is thrown, the rotation of the knob effecting the retraction of both latch bolt and dead bolt.

These locks are particularly useful in connection with ship cabin doors in that the occupant of the room may throw the dead bolt so that the cabin door will be securely locked, and at the same time no greater effort will be required to open the door than the turning of the inside knob, which is the same effort as would be required if the dead bolt were not thrown and the retraction of the latch bolt only was necessary.

One of the objects of the invention is the provision of a simple form of lock having both latch bolt and dead bolt, and provision for retracting the dead bolt when the latch is retracted.

Another object of the invention is the provision of a door lock of the character described, which lock shall be of the mortise type, and which may be readily constructed by using many of the parts employed in other locks used at the present time.

A still further object of the invention is the provision of a lock of the character described having a dogging member for dogging the latch bolt in protracted position, the position of this dogging member being controlled by the dead bolt in such a manner that the dogging member is held in inoperative position when the dead bolt is retracted, and is permitted to move to operative position when the dead bolt is protracted.

A still further object of the invention is the provision of a lock having both dead bolt and latch bolt, and a connection between such bolts in the form of a pivoted operating member such that, while the dead bolt may be freely moved independently of the latch bolt, the retraction of the latter serves also to retract the dead bolt.

To these and other ends the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is an elevation of a lock embodying our improvements, with the outside cap plate removed to show the interior mechanism;

Fig. 2 is a view similar to Fig. 1 but showing the dead bolt in protracted position;

Fig. 3 is a view similar to Fig. 1 but showing the parts in position when the dead bolt is partially retracted; and

Fig. 4 is a view of certain of the operating mechanism from the side opposite to that shown in Figs. 1 to 3.

In the particular embodiment of our invention illustrated in the drawings, the lock is provided with a case 10 and latch bolt 11 in the lower part thereof, and a dead bolt 12 above the latch bolt. The dead bolt can be retracted from the outside of the room by suitable key mechanism, which may comprise a pin tumbler lock 13 having a cam or rollback 14, and may be operated from the inside of the room by a thumb turn, to be hereinafter described.

The latch bolt 11 may be retracted from the outside by the key mechanism, for which purpose a lever 15 is pivoted on the dead bolt at 16 with a portion 17 of the lever in proximity to and adapted to be engaged by the cam or rollback 14. Another portion 18 of this lever is adapted to engage and operate a latch-bolt-retracting lever 19 pivoted in the case at 20, the lower end of which lever may engage a crosshead 11a on the stem 11b of the latch bolt.

The stem of the dead bolt 12 is shown at 21 and is provided with a slot 22 fitting over a post 23 secured to the case so that the bolt will be properly guided in its reciprocating movement. On the stem or shank 21 of the bolt is provided a pivot or post 24 on which is pivoted a lever 25 extending rearwardly and pivoted at its rear end to the forward end of a second lever 26, the parts 25 and 26 forming a toggle at the point 27 at which they are pivoted together.

The lever 26 is formed integrally with a thumb-turn hub 28 having the usual square opening for engaging the customary thumb-turn spindle (not shown). This hub has bearings in the cap and back plate of the lock case and is adapted to oscillate therein in the usual manner, thus swinging the lever 26 about the axis of the hub, and arranging the lever 26 on a pivot at a fixed point in the case which is substantially in horizontal alignment with the pivot 24 of the lever 25.

The lever 26 is provided with upwardly extending talons 29 adapted to be engaged by the rollback or cam arm 14 of the cylinder lock 13. It will be apparent that when this cam arm engages the forward talon 29 when the parts are in the position shown in Fig. 1, the lever 26 will be rotated about the pivot of the thumb-turn hub 28, and thus straighten out the toggle levers 25 and 26 to protract the bolt. Likewise when the bolt is protracted, as shown in Fig. 2, the rollback will strike the rear talon 29 and break the toggle

by rotating the lever 26 in a clockwise direction and retract the bolt. It will be understood that when the dead bolt is in protracted position the pivot 27 will be slightly below dead center position, and will, therefore, prevent the retraction of the latch bolt by pressure thereupon. It will also be understood that when the dead bolt is in protracted position, as shown in Fig. 2, the portion 17 of the lever 15 will be moved forward to a position where it will not be engaged by the rollback 14, so that the latch-retracting lever 19 cannot be actuated by the key mechanism while the dead bolt is protracted.

At its rear end the toggle lever 26 is provided with upper and lower surfaces 30 and 31 respectively, arranged at an angle to each other and adapted to make contact with a flat spring 32 mounted on a post 33. It will be seen that this spring tends to hold the bolt in either protracted or retracted position to which it is moved, and likewise when the spring passes the high point of the lever between the surfaces 30 and 31, the spring will tend to throw the bolt in the direction in which it is being moved. In other words, when the bolt is protracted, as shown in Fig. 2, it is only necessary to move the lever 26 to a sufficient extent to insure partial retraction of the bolt, and the spring 32 will serve to complete the movement.

The latch bolt may also be retracted by means of a knob-operated yoke 35 having a portion engaging the crosshead 11a of the bolt, this yoke being slidably mounted in the case and actuated by means of a rollback 36 rotatably mounted in the case and adapted to be operated by the inside knob in the usual manner. The outer rollback is shown at 37, which rollback, however, is adapted to be permanently dogged by the engagement of the lug 38 with posts 39 on the case, so that at the outside of the door latch bolt may only be withdrawn by the key-operated latch-retracting lever 19.

We have also arranged for the retraction of the dead bolt by the latch bolt retracting mechanism in the following manner: Pivoted to the case at 40 is a lever having a tail piece 41 adapted to be engaged in a slot or recess 42a in a part of the yoke 35, so that, as shown in Figs. 1 to 3, this lever is moved in a counter-clockwise direction when the yoke 35 is retracted or moved to the right. This lever also has an upper portion or arm 42, the upper portion of which is adapted to engage a shoulder 43 on the lever 26 when the dead bolt is protracted, and by which engagement the portion 42 may rotate the lever 26 in a clockwise direction to retract the dead bolt. It will be apparent from Fig. 1 that when the dead bolt is retracted the lever portion 42 does not engage the lever 26, and hence the dead bolt may be thrown or retracted by the thumb turn or key without movement of this connecting lever. However, if the dead bolt is protracted, retraction of the latch bolt by the inside knob through the actuation of the yoke 35 will swing the lever tail piece 41 about the pivot 40 and cause the upper arm 42 of the connecting lever to break the toggle between the levers 25 and 26, and effect retraction of the dead bolt.

Pivoted in the case at 45 is a dogging lever 46 urged by a spring 47 (Fig. 4) toward the position shown in Fig. 2, where the end of the lever 46 lies rearwardly of the head of the latch bolt and dogs the same in protracted position. The lever 46 has an upstanding shoulder 48 designed to be engaged by a shoulder 49 on the stem of the dead bolt when the latter is in retracted position, as shown in Fig. 1, so that in this position the dogging lever 46 will be held upwardly in inoperative position against the tension of the spring 47. When the dead bolt is protracted, as shown in Fig. 2, the shoulder 49 moves away from the part 48 and permits the spring 47 to throw the dogging lever 46 in the path of the latch bolt.

From the above it will be apparent that when the dead bolt is protracted the latch bolt is also dogged against retraction, and in order to retract the latter by the inside knob it is necessary to move the dogging member 46 to inoperative position. For this purpose the connecting lever is provided with a nose 50 adapted to engage a tail piece 51 on the lever 46, so when the connecting lever is swung by engagement of the slide 35 with the tail piece 41 of this lever, the dogging member will be swung upwardly against the tension of its spring, as shown in Fig. 3, this movement taking place prior to sufficient rearward movement of the latch bolt to cause the parts to bind.

It will thus be apparent that the rotation of the inside knob, even if the dead bolt has been thrown, will effect simultaneous retraction of the dead bolt and latch bolt. Also, it will be understood that the latch bolt, as well as the dead bolt, may be operated from the outside of the door by means of the proper key. The yoke 35 is held in its forward position by the spring 53, so that the rollback 36 and yoke 35 will be normally urged to the position shown in Figs. 1 and 2.

While we have shown and described a preferred embodiment of our invention, it will be understood that it is not to be limited to all the details shown, but is capable of modification and variation within the spirit of the invention and within the scope of the appended claims.

What we claim is:

1. A door lock comprising a case, a dead bolt and retracting means therefor, a latch bolt and a retracting slide for the latch bolt, a lever pivoted in the case between said means and slide and connected to both thereof whereby movement of said slide effects retraction of the dead bolt, said dead-bolt-retracting means comprising a toggle, and said lever having a part engaging the toggle.

2. A door lock comprising a case, a dead bolt, an operating toggle therefor, a latch bolt, an operating slide therefor, and means for retracting the dead bolt when said latch bolt is retracted comprising a lever pivoted in the case and having parts engaged with said slide and toggle.

3. A door lock comprising a case, a dead bolt, an operating toggle therefor, a latch bolt, an operating slide therefor, means for retracting the dead bolt when said latch bolt is retracted comprising a lever pivoted in the case and having parts engaged with said slide and toggle, a dogging member movable to position to dog the latch bolt, and means on said lever engaging said dogging member to move it to inoperative position.

4. In a door lock, a case, a dead bolt and actuating means therefor, a latch bolt, actuating means for the latch bolt, a lever pivoted in the case and connecting said actuating means whereby said dead bolt is retracted upon retraction of the latch bolt, a dogging member adapted to dog

the latch bolt, and means on said lever engaging said dog to move it to inoperative position.

5. In a door lock, a case, a dead bolt and actuating means therefor, a latch bolt, actuating means for the latch bolt, a lever pivoted in the case and connecting said actuating means whereby said dead bolt is retracted upon retraction of the latch bolt, a dogging member adapted to dog the latch bolt, means on said lever engaging said dog to move it to inoperative position, and means on said dead bolt to hold said dogging member in inoperative position when the dead bolt is in retracted position.

6. In a door lock, a case, a dead bolt and a latch bolt movably mounted in the case, a dogging member movable to position to dog the latch bolt, the position of said member being controlled by the position of the dead bolt, and latch-bolt-retracting means operatively connected to said dogging member to move it to inoperative position when the latch bolt is retracted by said means.

7. In a door lock, a case, a dead bolt and a latch bolt movably mounted therein, a dogging member pivoted in the case, spring means urging said dogging member to a position to dog the latch bolt, means on the dead bolt engaging said dogging member to hold the latter in inoperative position when the dead bolt is in retracted position, and latch-bolt-retracting means operatively connected to said dogging member to move it to inoperative position when the latch bolt is retracted by said means.

8. In a door lock, a case, a dead bolt and a latch bolt movably mounted therein, a dogging member pivoted in the case, spring means urging said dogging member to a position to dog the latch bolt, means on the dead bolt engaging said dogging member to hold the latter in inoperative position when the dead bolt is in retracted position, said means disengaging said dogging member when the dead bolt is protracted to permit said spring means to move the dogging member to operative position, and latch-bolt-retracting means operatively connected to said dogging member to move it to inoperative position when the latch bolt is retracted by said means.

9. In a door lock, a latch bolt, a dead bolt, a latch bolt dogging member, means to move said member to dogging position when the dead bolt is protracted, latch bolt retracting means, and means operatively connecting said retracting means to the dead bolt and to the dogging member to move both to inoperative position when the latch bolt is retracted.

10. In a door lock, a latch bolt, a dead bolt, means for actuating both said bolts to protract and retract the same, means connecting the latch bolt retracting means to the dead bolt to retract the latter when the latch bolt is retracted, a latch bolt dogging member, means on the dead bolt to engage and control the position of said dogging member, and means operatively connecting said latch bolt retracting means to the dogging member to move the latter to inoperative position upon retraction of the latch bolt.

11. In a door lock, a latch bolt, a dead bolt, means including a single knob at the inside of the door for simultaneously retracting both said bolts, and a latch bolt dogging member and means to move said dogging member to dogging position when the dead bolt is protracted.

WILLIAM S. EDWARDS.
HENRY G. VOIGHT.