Dec. 8, 1953 W. R. SCHLAGE 2,661,972

REVERSIBLE DEAD LATCH

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Fig. 1.

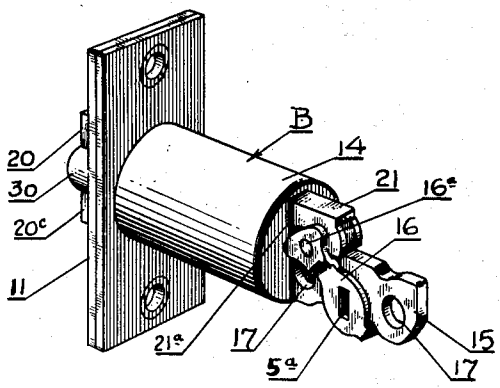



Fig. 2.

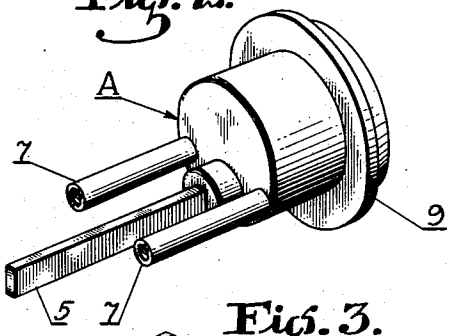



Fig. 3.

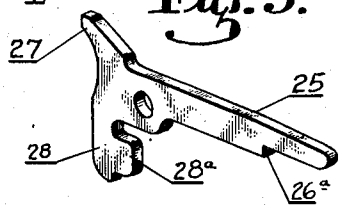



Fig. 4.

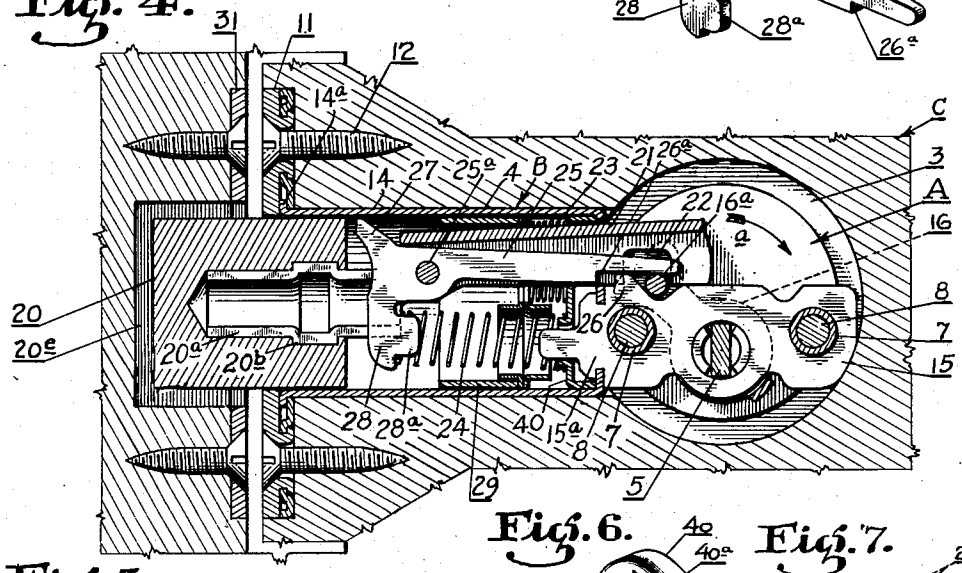



Fig. 5.

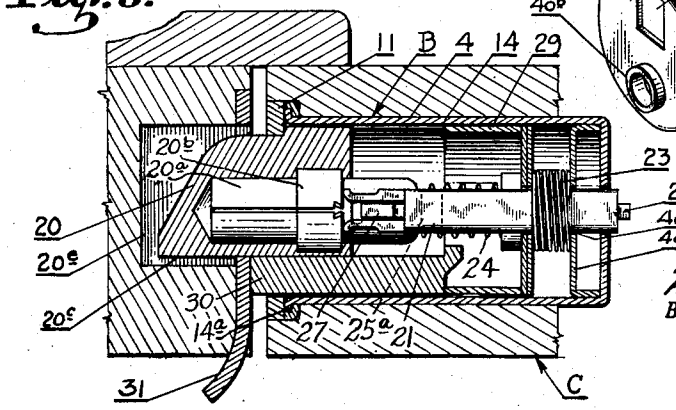



Fig. 6.

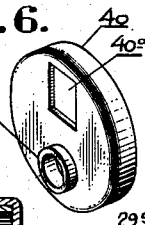
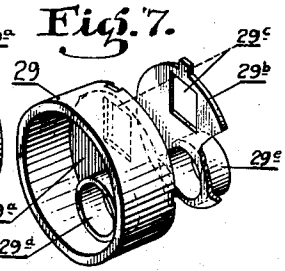



Fig. 7.




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Fig. 8.

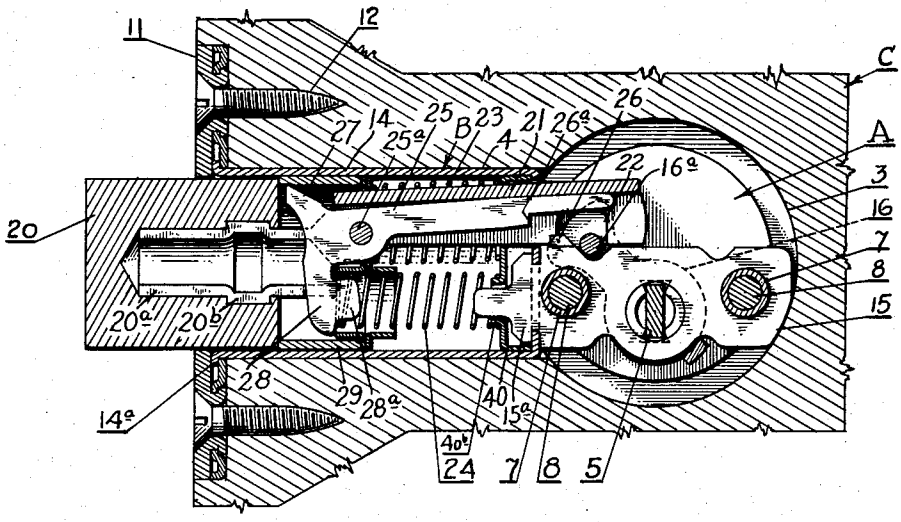



Fig. 9.

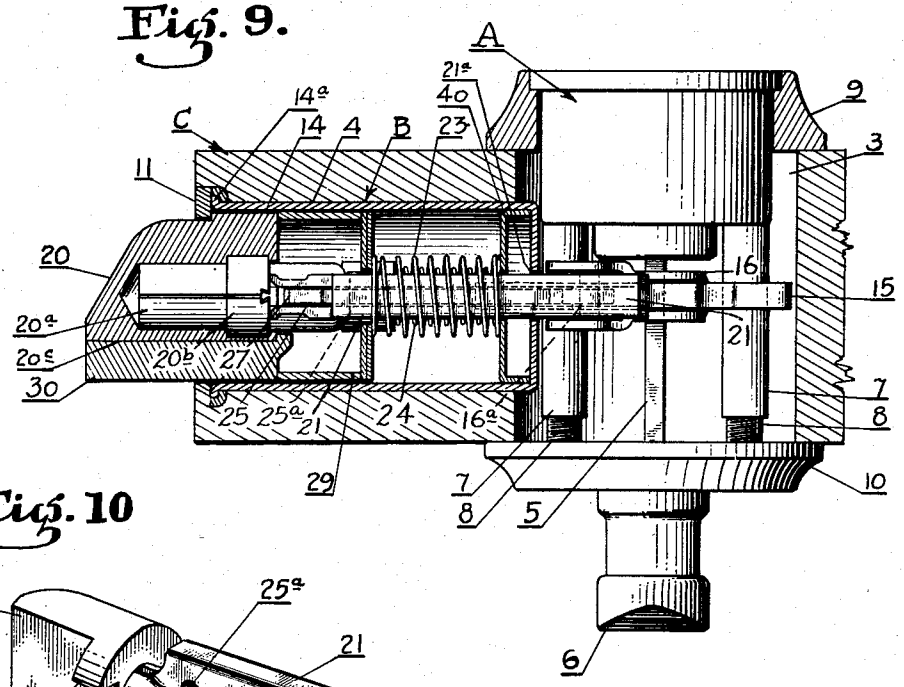
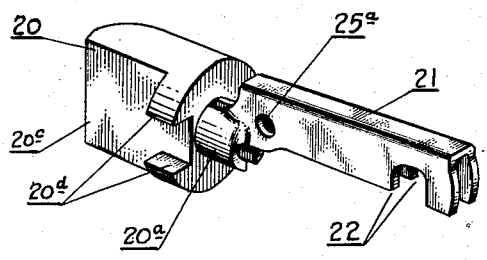



Fig. 10




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# UNITED STATES PATENT OFFICE

2,661,972

## REVERSIBLE DEAD LATCH

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Application March 21, 1947, Serial No. 736,218

10 Claims. (Cl. 292—244)

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This invention relates to a door lock, and especially to a reversible dead latching mechanism therefor.

The object of the present invention is generally to improve and simplify the construction and operation of dead latching mechanisms, and especially to provide a latching mechanism including a main latch bolt and a cooperating dead latch bolt both of which are reversible as a unit to permit either right or left hand installation of the door lock.

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

Figure 1 is a perspective view of a reversible latch bolt unit;

Figure 2 is a perspective view of part of an actuating unit;

Figure 3 is a perspective view of a dead latching lever;

Figure 4 is a vertical longitudinal section showing a door lock including the latch bolt mechanism, mounted in a door;

Figure 5 is a view similar to and taken at right angles to Figure 4, portions of the mechanism being omitted;

Figure 6 is a perspective view of a spring supporting plate;

Figure 7 is a perspective view of a cup with one end plate assembled and another end plate in position for final assembly;

Figure 8 is a view similar to Figure 4 showing the parts in undogged position;

Figure 9 is a view similar to and taken at right angles to Figure 8; and

Figure 10 is a perspective view of a main latch bolt and an associated retractor bar.

A door latch actuating unit A is inserted in a hole 3 drilled transversely in a door C, and a latch bolt unit B is inserted in a hole 4 drilled at right angles to the hole 3 through the edge of the door. The unit A includes a flat spindle bar 5 which may be rotated by a key mechanism, not shown, operated from the outside of the door or by a knob or turnpiece 6 disposed on the inside of the door. The unit A also includes a pair of anchor posts 7, a pair of screws 8, and escutcheon plates 9 and 10. The posts 7 and the screws 8 secure all the parts of the unit A in the transverse opening 3 of the door.

The unit B comprises a face plate 11 secured to

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the edge of the door by screws 12. Connected to the face plate is a cylindrical latch bolt housing 14 from the rear end of which projects an anchor plate 15. A central opening in the anchor plate forms a journal for a double crank arm 16 actuated by the spindle bar 5 which extends therethrough. The anchor plate 15 at each end has an opening 17 to receive the anchor posts 7 of unit A.

When assembling the lock in a door, the unit B is first inserted in the opening 4 with the anchor plate 15 projecting into the transverse opening 3. The parts of the unit A are then inserted into the opening 3 with the posts 7 passing through the holes 17 in the anchor plate and the spindle bar 5 passing through a slot 5a in the crank arm 16. Then the screws 8 and the screws 12 are inserted and tightened. Thus both units A and B are secured in place and interlocked with each other.

The unit B carries a main latch bolt 20 at its inner end connected to a retractor bar 21 projecting through the inner end of the housing 14. The retractor bar is channel shaped in cross section and has a pair of side walls each provided with a notch 22. The crank arm 16 at its outer end carries a pin 16a engaging the notches 22. When the crank arm is swung by the spindle bar 5 in the direction of arrow a (see Figure 4), pin 16a retracts the bar together with the latch bolt 20. When the crank arm is released, the latch bolt 20 and the retractor bar 21 again assume their normal projected position as they are urged to do by a pair of springs 23 and 24.

Pivotally mounted on a pin 25a spanning the side walls of the retractor bar 21 is a lever 25 formed with a shoulder 26a. This shoulder, under certain conditions, engages a dog 26 formed at the inner end of the anchor plate 15, to dead lock the main latch bolt 20. The lever 25 has two extensions 27 and 28. A cup 29 is slidably mounted within the latch bolt housing 14. This cup is normally pressed forwardly against the latch bolt 20 by a spring 23 and in that position cams over or engages the lever extension 27 thereby swinging the lever 25 to lift the shoulder 26a out of dogging engagement with the dog 26. In this undogged position of the lever 25, the main latch bolt is also undogged and may be depressed at will. When the cup 29 is moved out of engagement with the extension 27 of the lever 25, the spring 24, in engagement with the extension 28

of the lever, swings the lever 25 into engagement with the dog 26, and so dogs the latch bolt 20 against depression.

The cup 29 is actuated by two different members, the spring 23 and a dead latching bolt 30. The spring 23 surrounds the retractor bar 21 and the lever 25 is mounted between the side walls thereof. The dead latching bolt 30 has a hook in the path of the latch bolt 20 and so is depressed in unison with the main latch bolt when the main latch bolt engages a striker plate 31 in closing movement of the door. The bolt 30 stays depressed as long as the door is closed as there is no opening in the striker plate for the dead latching bolt 30 to extend into like the opening 20e provided for the latch bolt 20. After both bolts are depressed during door closure only the main bolt 20 again projects through the registering opening 20e in the striker plate. The dead latching bolt 30 abuts the striker plate 31 and is held depressed. As the bolt 31 abuts the cup 29, it retains the cup 29 in innermost position out of engagement with the lever 25. The spring 24 is thus free to hold the lever 25 in dogging position so as to maintain the main latch bolt 20 deadlocked when the door is closed.

When the door is opened either by the key mechanism or the turnpiece 6, a rotary movement is imparted to the spindle bar 5 to swing the crank arm 16 in the direction of the arrow *a*. The crank pin 16*a* engages and lifts the inner end of the lever 25 free of the dog 26. Further movement of the pin 16*a* causes it to engage in the notch 22 and pull the retractor bar and the main latch bolt inwardly free of the striker plate. When the key mechanism and the turnpiece 6 are released, the springs 23 and 24 restore all parts to normal position and project both the main latch bolt and the dead locking bolt.

The general idea of providing a dead locking bolt for the purpose of dogging the main latch bolt of a door lock against depression when the door is closed is old (see for instance my former Patent Number 2,250,727, issued July 29, 1941, and entitled "Door Latch"). However, a structure which permits reversal of the main latch bolt together with the dead latching bolt so that a lock of this type may be installed in right or left hand hung doors is new and forms the main subject matter of the present application. To permit such reversal the face plate 11 of the latch bolt housing is rotatably mounted about the outer flanged end 14*a* of the latch bolt housing 14, being retained by an inner plate 11*a*, while the main latch bolt 20 together with the dead latching bolt 30 are rotatably mounted within the outer end of the latch bolt housing 14.

The anchor plate 15 is rigidly secured to the inner end of the housing 14 by a projection 15*a*, and the retractor bar 21 extends through a rectangular opening 21*a* formed in the inner end of the housing 14, and are consequently non-rotatable. The main latch bolt 20 and the dead latching bolt 30 are made rotatable with relation to the anchor plate 15, the retractor 21, and the cup 29. The cup is reciprocably mounted within the latch bolt housing but is not rotatable therein. The cup 29 includes two end plates 29*a* and 29*b* having rectangular openings 29*c* therein through which the retractor bar 21 operates. While the cup 29 may move back and forth within the latch bolt housing, it cannot rotate because the retractor bar extends through it.

The retractor bar 21 terminates at its outer end in a split sleeve 29*a* extending into and rotatably engaging the main latch bolt 20. An internally expanded collar 20*b* formed on the sleeve secures the main latch bolt against endwise movement on the retractor bar.

The dead latching bolt 30 is disposed adjacent a flat side 20*c* of the main latch bolt 20 and is guided with relation thereto by a pair of lugs 29*d* formed on the main latch bolt. The deadlatching bolt is thus constrained to rotate in unison with the main latch bolt with respect to and about the axis of the housing 14. The main latch bolt and the dead latching bolt are rotatable as a unit about the split sleeve 29*a* and the bolt 30 swings along the rim of the cup 29 when it is necessary to change the position of the bolts to fit a right or left hand door installation.

The plate 40 has a rectangular opening 40*a* formed therein to permit the retractor bar to extend therethrough. The plate is also provided with a hub 40*b* surrounding the nose 15*a* formed on the inner end of the anchor plate 15. The plate 40 has the function of forming a seat for one end of the springs 23 and 24. The two end plates 29*a* and 29*b* carry hub members 29*d* and 29*e* surrounding the spring 24. The cup 29 serves two functions first that of controlling the position of the dogging lever 25 or of rendering said dogging lever operative or inoperative, and second that of guiding the spring 24 as said spring extends through the hub members 29*d* and 29*e*. The hub 40*b* of plate 40 forms a guide for one end of the spring 24 while a lug 28*a* on the lever extension 28 forms a guide for the opposite end of the spring so that the spring is positioned normally to urge the dogging lever shoulder 28*a* to engage the dog 26.

Having thus described the invention, what is claimed and desired to secure by Letters Patent is:

1. A lock structure comprising a housing, a face plate, means for mounting said face plate on said housing for rotation relative to said housing about an axis passing through said housing, said face plate having an opening therein, a main latch bolt passing through said opening in said face plate, means for mounting said main latch bolt for reciprocation in said housing along said axis, a retractor bar, means for mounting said retractor bar against rotation in said housing about said axis and for movement in a predetermined path, a rotatable connection between said main latch bolt and said retractor bar, a dogging lever, means for mounting said dogging lever in said housing for movement between one position blocking said movement of said retractor bar in said predetermined path and another position permitting said movement of said retractor bar in said predetermined path, a cup in said housing having a rim concentric with said axis, means mounting said cup for reciprocation in said housing in moving contact with said dogging lever, a dead latching bolt passing through said opening in said face plate, and means for mounting said dead latching bolt for reciprocation in said housing parallel to said axis and for rotation about said axis in abutment with said rim of said cup.

2. In a door lock, a housing having an axis, a face plate mounted on the outer end of the housing for rotation about said axis, a main latch bolt disposed in the housing for rotation about said axis and extending through the face plate for movement in a predetermined path, a dead latching bolt disposed in the housing for rotation about said axis and also extending through the face plate for movement in a predetermined path,

means rotatably connected to the main latch bolt for retracting said main latch bolt along said path, means for dogging the retracting means against retraction of the main latch bolt along said path, and an abutment within said housing and disposed in said path of said dead latching bolt in any rotated position thereof for actuating said dogging means.

3. In a door lock, a housing having an axis, a face plate mounted on the outer end of the housing for rotation about said axis, a main latch bolt disposed in the housing for rotation about said axis and extending through the face plate for retractive movement relative thereto, a dead latching bolt disposed in the housing for rotation about said axis and also extending through the face plate for retractive movement relative thereto, a retractor bar, a rotatable connection between said bar and said main latch bolt, a dog fixed with respect to said housing, a dogging member connected to said retractor bar and movable into and out of engagement with the dog, and a cup movable within the housing for moving the dogging member with relation to the dog, the rim of said cup being disposed in the path of the dead latching bolt.

4. In a lock structure, a housing, a main latch bolt, a dead latching bolt, means for mounting said main latch bolt and said dead latching bolt on said housing for reciprocation with respect to said housing and to rotate as a unit about an axis passing through said housing, means for dogging the main latch bolt against said reciprocation, a first pair of surfaces respectively on said main latch bolt and said dogging means and rotatable relative to each other about said axis but constrained against reciprocation relative to each other, means for actuating said dogging means, and a second pair of surfaces respectively on said dead latching bolt and said actuating means and rotatable relative to each other about said axis but constrained against reciprocation relative to each other.

5. A lock structure comprising a housing, a face plate having an opening therein, means for mounting said face plate on said housing for rotation about an axis, a main latch bolt passing through said opening in said face plate, means for mounting said main latch bolt for reciprocation in said housing and for rotation about said axis, a retractor bar within said housing, means holding said retractor bar non-rotatable relative to said housing about said axis, a first pair of surfaces respectively on said main latch bolt and said retractor bar and rotatable relative to each other about said axis but constrained against reciprocation relative to each other, a dead latching bolt passing through said opening in said face plate, means for mounting said dead latching bolt for reciprocation in said housing and for rotation about said axis, a dogging mechanism for said retractor bar within said housing, means holding said dogging mechanism non-rotatable about said axis relative to said housing, and a second pair of surfaces respectively on said dead latching bolt and said dogging mechanism and rotatable relative to each other about said axis but constrained against reciprocation relative to each other, one of said second pair of surfaces being arcuate about said axis and being in position to be abutted by the other one of said second pair of surfaces during reciprocation of said dead latching bolt.

6. A lock structure comprising a housing, a main latch bolt mounted for reciprocation in said



housing along an axis and for rotation about said axis, a dogging mechanism for preventing reciprocation of said main latch bolt to a depressed position in said housing, means constraining said dogging mechanism against rotation relative to said housing about said axis, a dead latching bolt, means mounting said dead latching bolt for reciprocation relatve to said housing in a direction parallel to said axis and for motion in an arc about said axis, and means for transmitting motion between said dead latching bolt and said dogging mechanism for actuating the latter to dog said main latch bolt against reciprocation only when said dead latching bolt is depressed in said housing, said motion transmitting means and said dead latching bolt having parts rotatable relative to each other about said axis for transmitting reciprocation of said dead latching bolt to said dogging mechanism.

7. A lock structure comprising a housing, a main latch bolt, means for mounting said main latch bolt for reciprocation in said housing along an axis and for rotation about said axis, a dead latching bolt, means for mounting said dead latching bolt for reciprocation in said housing parallel to said axis, and said dead latching bolt being mounted for rotary movement about said axis to occupy either one of two positions alongside of said axis, and a dogging mechanism in said housing for preventing said reciprocation of said main latch bolt, said dogging mechanism including an abutting part disposed in the path of reciprocation of said dead latching bolt in either one of said two positions thereof.

8. In a lock structure, a housing having an axis, a main latch bolt movable with respect to said housing in the direction of said axis and mounted for rotation about said axis, a dead latching bolt mounted on said housing to move in an arcuate path around said axis and to move with respect to said housing in the direction of said axis, and mechanism for dogging the main latch bolt against movement with respect to said housing in the direction of said axis, said mechanism including a member arcuate about said axis and disposed in the path of movement of the dead latching bolt in the direction of said axis for all positions of said dead latching bolt in said arcuate path.

9. In a lock structure, a housing having an axis, a main latch bolt movable with respect to said housing in the direction of said axis and mounted for rotation about said axis, a dead latching bolt mounted on said housing to move in an arcuate path around said axis and to move with respect to said housing in the direction of said axis, means for moving said main latch bolt with respect to said housing in the direction of said axis, means carried by said moving means for dogging the main latch bolt against movement with respect to said housing in the direction of said axis, and means in said housing and non-rotatable about said axis for actuating said dogging means, said actuating means having a surface engageable by said dead latching bolt in all positions of said dead latching bolt in said arcuate path.

10. A lock structure comprising a housing, a main latch bolt, means mounting said main latch bolt for reciprocation along an axis in said housing and for rotation about said axis, a retractor within said housing, a connection between said retractor and said main latch bolt, a dead latching bolt, means mounting said dead latching bolt for reciprocation with respect to

said housing and for rotation with respect to said housing about said axis, a dogging mechanism for preventing said reciprocation of said main latch bolt, means for constraining said dogging mechanism against rotation with respect to said housing about said axis, and surfaces respectively on said dogging mechanism and said dead latching bolt disposed in abutting relationship in all rotated positions of said dead latching bolt relative to said housing about said axis for transmitting operating motion from said dead latching bolt to said dogging mechanism.

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*Executrix of the estate of Walter R. Schlage, deceased.*



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