G. WELLER.

LOCK.

APPLICATION FILED NOV. 11, 1916.

1,290,439.

Patented Jan. 7, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

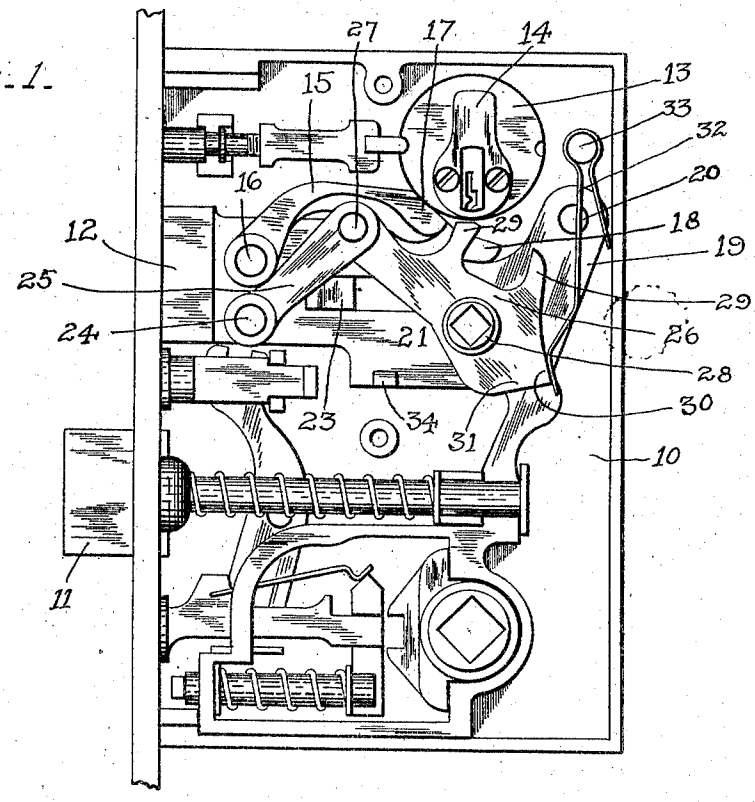
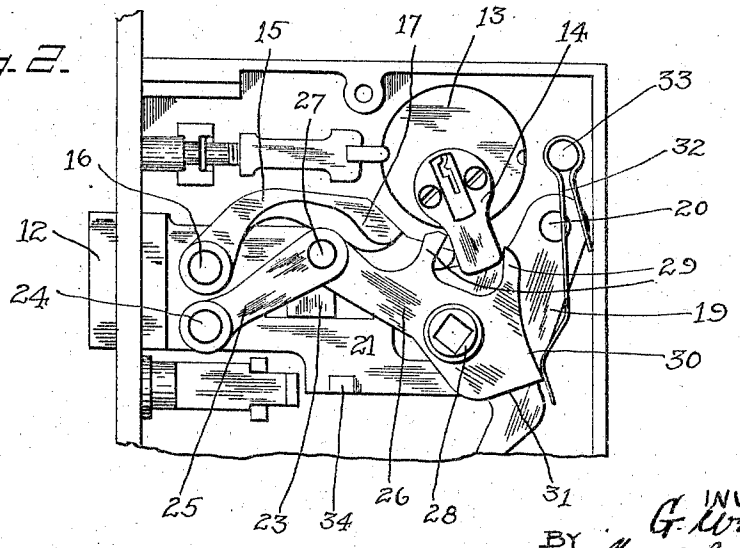


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

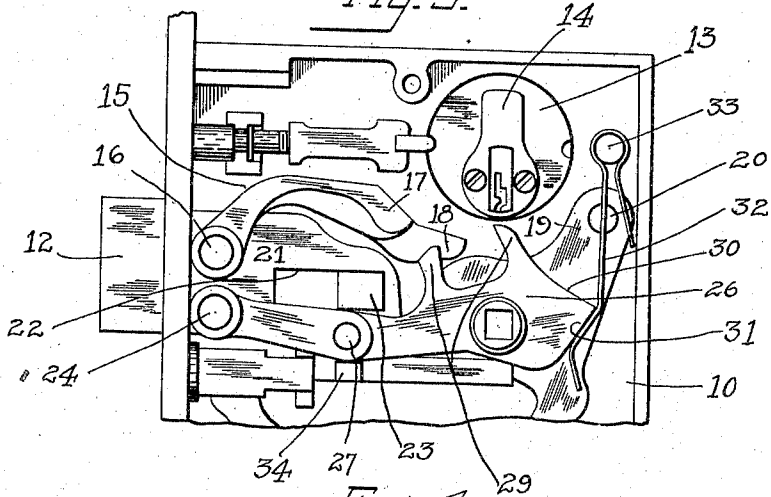


Fig. 4.

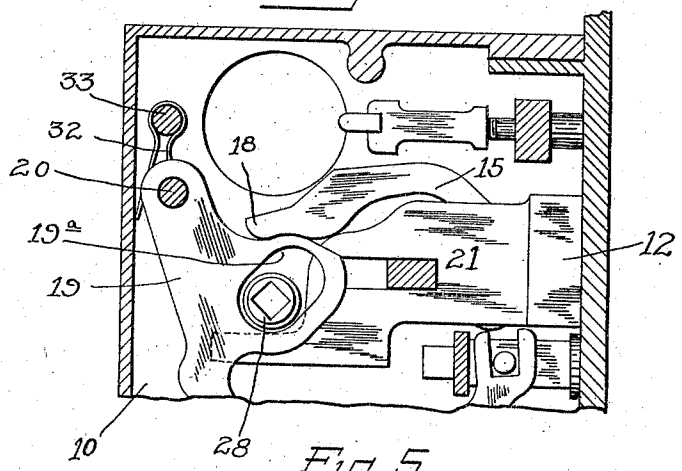
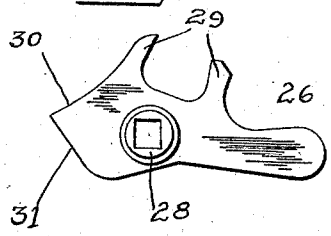


Fig. 5.



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UNITED STATES PATENT OFFICE.

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LOCK.

1,290,439. Specification of Letters Patent. Patented Jan. 7, 1919.

Application filed November 11, 1916. Serial No. 130,827.

To all whom it may concern:

Be it known that I, GEORGE WELLER, residing in the city and county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Locks, of which the following is a full, clear, and exact description.

This invention relates to locks, and it has special reference to door locks of the mortise type, in which a dead bolt may be operated from the outside of the door by suitable pin tumbler lock mechanism, and from the inside of the door by means of a thumb knob or the like. However, some features of my invention will be found advantageous in locks of other types.

One of the primary objects of the invention is the provision of improved, simplified means for throwing and withdrawing the bolt.

Another object of the invention is to furnish a simple form of toggle, which can be very directly and conveniently actuated by the cam of the cylinder lock and by the thumb piece or knob, for the purpose of actuating the bolt, the result being that the lock construction is very much simplified as compared to the ordinary construction in which a pivoted tumbler is employed.

Another object which I have in view is the provision of a bolt actuating toggle having talons, by means of which it can be directly actuated by the cam or rollback of the cylinder.

Still another object of the invention is the provision of bolt actuating mechanism including a toggle, one member of which is formed integral with a thumb turn hub, so that the mechanism may be directly and conveniently actuated by the thumb turn or knob.

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 drawing,

Figure 1 is an elevation of a lock embodying my improvements, with the cap plate removed, showing the dead bolt in the retracted position.

Fig. 2 is a fragmentary view of the upper portion of the lock showing the dead bolt partly protracted by the cam or rollback of the cylinder lock.

Fig. 3 is a view similar to Fig. 2 showing the bolt in the fully protracted position.

Fig. 4 is a reverse view of the upper portion of the lock with the parts in the position shown in Fig. 1, and

Fig. 5 is a detail of one of the toggle members.

In the particular embodiment shown, the lock has a mortise case 10, with a latch bolt 11 in the lower part thereof, and a dead bolt 12 in the upper part thereof. The dead bolt can be retracted from the outside of the room by suitable key mechanism, which may comprise a pin tumbler cylinder lock 13 having a cam or rollback 14. The bolt can be operated from the inside of the room by a thumb turn or the like as hereinafter described. The latch bolt 11 may be retracted by the usual knob mechanism, which it is hardly necessary to describe, and in the particular form shown the latch bolt may be retracted by the key mechanism, for which purpose a lever 15 is pivoted on the dead bolt at 16, with a portion 17 of said lever in proximity to and adapted to be engaged by the cam or rollback 14. Another portion 18 of the lever 15 is adapted to engage and operate a latch bolt retracting lever 19 pivoted in the case at 20. When the dead bolt is projected, the lever 15 is moved forward out of coöperation with the lever 19, so that the latch bolt cannot be withdrawn by the key until the dead bolt is again retracted. This particular method of operating the latch bolt does not, however, form any part of the present invention.

Instead of having the dead bolt provided with special talons for engaging the usual cam arm and thumb turn hub, as customary where a pivoted tumbler is employed, I make the bolt 12 a very simple form, without any talons whatever. The bolt shank 21 is relatively short and it is guided on the case by the slot 22 fitting over a lug 23 cast on the back of the case. The pivot 16 for the latch retracting lever 15 is located at the upper forward part of the bolt shank. Beneath this pivot is located another pivot or post 24, on which is pivoted a toggle lever 25 extending rearwardly and pivoted at its rear end to the forward end of a second toggle lever 26. In the particular form shown, the forward end of the

toggle lever 26 is provided with a pin or post 27, and the rear end of the lever 25 is provided with an opening fitting over said pin or post 27 in such a manner as to permit the relative swinging movement of the two toggle levers. The lever 26 is formed integral with a thumb turn hub 28 having the usual square opening for engaging the customary thumb turn spindle. The thumb turn hub has bearings in the cap and back plate of the lock case and is adapted to oscillate therein. The latch retracting lever 19 is provided with an opening 19ª for clearing the thumb turn hub. This hub serves as a pivotal mounting for the toggle lever 26 whereby the latter is pivoted at a fixed point in the case, such fixed point being preferably below and in approximate vertical alinement with the axis of the cam arm 14 and also in horizontal alinement with the pivot 24 of the lever 25, as shown. The hub 28 not only serves as a mounting for the toggle lever 26 but also as a means for actuating the toggle mechanism by the usual thumb turn hub when the latter is turned in one or the other direction. I have not considered it necessary to illustrate the thumb turn or knob and the spindle thereof as such parts are well-known in the art.

At its upper part the toggle lever 26 is adapted to be engaged and actuated by the cam arm 14 of the cylinder lock 13. In the particular form shown, the lever 26 is provided with upwardly extending talons 29, between which the cam arm is adapted to engage. The arrangement is such that when the bolt is in the retracted position as shown in Fig. 1, the forward talon is close to and slightly beneath the axis of the cam arm; whereas, when the bolt is in the protracted position as shown in Fig. 3, the rear talon is close to and slightly beneath the axis of the cam arm.

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 the contact with a flat spring 32 mounted on a post 33.

The operation of the improved lock is as follows: When the dead bolt is in the retracted position shown in Fig. 1, the toggle levers 25, 26, are upwardly tilted. The lower extremity of the spring 32 rests against the surface 30 on toggle lever 26, and thereby holds the toggle levers at the limit of their upward swing. Suppose now that it is desired to protract the bolt from the outside of the door by means of the key mechanism, the cam arm 14 is rotated by the key in a clockwise direction (Fig. 2) and so engages the forward talon 29 as to swing it forward and downward, thereby straightening out the toggle connection and projecting the bolt by virtue of its connection with the lever 26 through the lever 25. Some time before the pivot 27 comes into horizontal alinement with the post 24 and thumb turn hub 28, the surface 30 on the rear end of the lever 26 passes out of engagement with the spring 32 and as the spring makes contact with the inclined surface 31, the toggle snaps into the extended position in which the bolt is locked in the projected position, as shown in Fig. 3. Just before the cam arm disengages the forward talon 29, it thrusts it in a downward direction to such an extent as to move the pivot 27 slightly below the dead center position shown in Fig. 3, so that there is no possibility of "breaking" the toggle by exerting pressure on the head of the bolt. While the center pivot 27 of the toggle is thus permitted to move below the dead center line, too much movement beyond such line is prevented by a suitable stop 34 on the lower part of the bolt shank.

As the bolt reaches the fully protracted position the cam arm disengages the toggle lever 26 and the rotation of the cam arm can then be continued until it reaches the starting point, whereupon the key may be withdrawn. When it is desired to retract the bolt, the cam arm may be rotated in the reverse direction so as to engage the rear talon 29 and thrust it rearwardly and downwardly until the spring 32 engages the upper inclined surface 30 on the toggle lever 26. The operation of the parts in the retraction of the bolt will be more or less obvious, and it will also be apparent how the toggle mechanism is actuated by the thumb turn.

Various changes may be made in the details of the construction without departing from the scope of the invention as defined in the claims.

What I claim is:

1. In a lock, a case, a bolt, an operating toggle for said bolt, comprising a lever pivoted to the bolt and a connected lever pivoted to the case, one of said levers having talons, and a cylinder lock having a cam pivotally mounted out of axial alinement with the axes of said toggle to engage said talons; substantially as described.

2. In a lock, a mortise case, a bolt in said case, an operating toggle for said bolt having a member pivoted to the bolt and a member pivoted to the case, and a cylinder lock positioned laterally to one side of said toggle adapted to operate said toggle by engagement with said last-named member.

3. In a lock, a bolt, an operating toggle therefor, a hub integral with one member of said toggle; talons integral with one member of said toggle, and key mechanism positioned laterally to one side of said toggle to coöperate with said talons; substantially as described.

4. In a lock, a mortise case, a bolt therein,

an operating toggle for said bolt having one member pivoted to the bolt and one member pivoted to the case, talons projecting from said last-named member, and a cylinder lock having a cam to engage said talons and thereby protract and retract said bolt.

5. In a lock, a mortise case, a bolt therein, an operating toggle for said bolt having a member pivoted to the bolt and a second member pivoted to the case, said second member being pivoted to the case by a thumb turn hub integral with said member, and a cylinder lock having a cam to operate said bolt by engagement with said second toggle member.

6. In a lock, a case of the mortise type, a bolt therein, an operating toggle for said bolt, comprising two pivoted levers, one of said levers pivoted to said bolt, a hub on the other lever by means of which said toggle is operated and by means of which said last-named lever is pivotally mounted between the walls of said case; said hub-operated lever having an extension formed thereupon, and a resilient means coöperating with said extension for retaining said lever in either one of two positions; substantially as described.

7. In a lock, a case of the mortise type, a bolt therein, a toggle for operating said bolt having a hub journaled between the case walls and provided with an opening to engage a thumb turn spindle, said toggle having talons, and a cylinder lock secured to the case to coöperate with said talons; substantially as described.

8. In a lock, a mortise case, a bolt therein, an operating toggle for said bolt having a member pivoted to the bolt and a second member pivoted to the case, said second member pivoted to the case by a thumb turn hub integral with said member, a cylinder lock having a cam, and talons on said second member coöperating with said cam.

9. In a lock, a case, a bolt therein, an operating toggle for said bolt, comprising two pivoted levers, one of said levers pivoted to said bolt and the other pivoted to said case, one of said levers having spaced talons, and a cylinder lock having a rollback positioned to be moved into and out of the space between said talons to operatively engage said talons; substantially as described.

10. In a lock, a bolt, an operating toggle therefor, spaced talons formed upon one of the levers of said toggle and positioned to extend outward in the operating plane of said toggle, and a key controlled lock having a single operating member movable into and out of engagement with either of said talons to operate said toggle.

11. In a lock, a case, a bolt, an operating toggle for said bolt, comprising a lever pivoted to the bolt and a connecting lever pivoted to the case, one of the levers having spaced talons, and a key controlled member positioned laterally to one side of said toggle and movable into and out of engagement with either of said talons to operate said toggle.

12. In a lock, a case, a bolt, an operating toggle for said bolt, comprising a lever pivoted to the bolt and a connecting lever pivoted to the case, one of the levers having spaced talons, and a key controlled member positioned to extend into the space between said talons to engage one talon to operate the toggle in one direction and to engage the other talon to operate the toggle in the opposite direction.

In witness whereof, I have hereunto set my hand on the 9 day of Nov., 1916.

GEORGE WELLER.