

(No Model.)

W. H. BALL.
LOCK.

No. 580,921.

Patented Apr. 20, 1897.

Fig. 1.

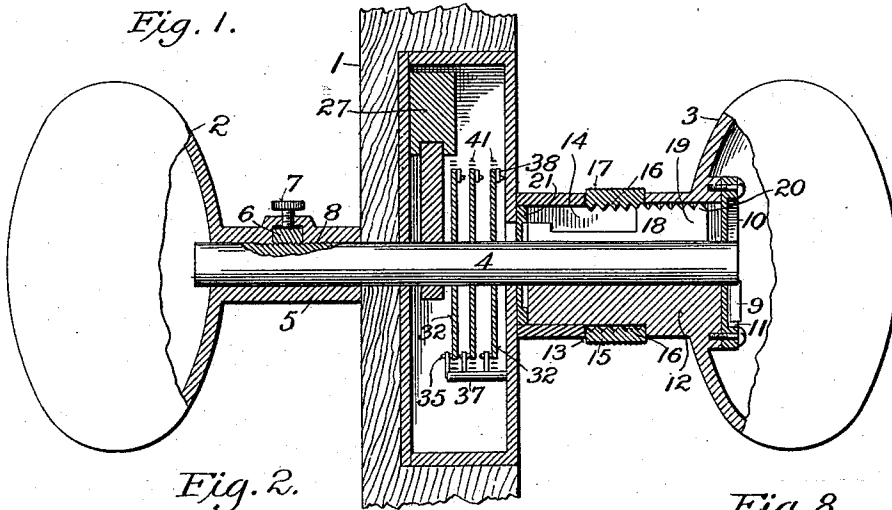


Fig. 2.

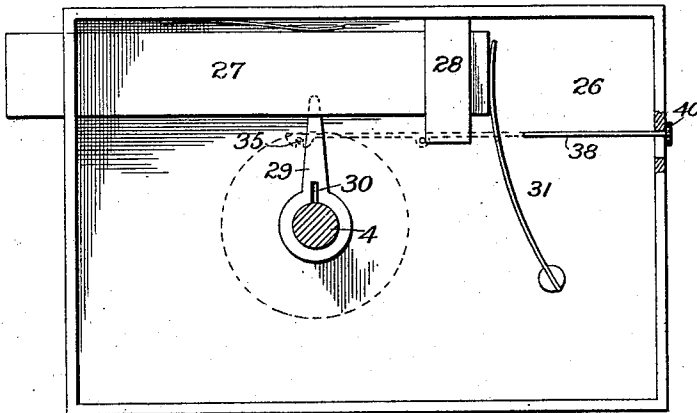


Fig. 8.

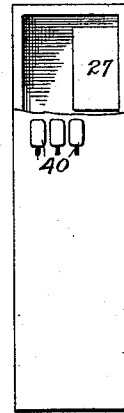


Fig. 3.

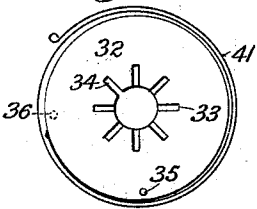


Fig. 4.

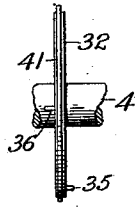


Fig. 5.

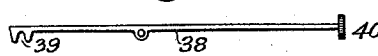


Fig. 6.

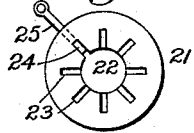
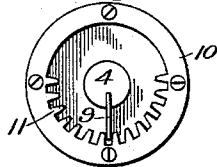


Fig. 7.



WITNESSES

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LOCK.

SPECIFICATION forming part of Letters Patent No. 580,921, dated April 20, 1897.

Application filed May 9, 1896. Serial No. 590,917. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HENRY BALL, a citizen of the United States, residing at Charlottesville, in the county of Albemarle and State of Virginia, have invented certain new and useful Improvements in Locks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to combination-locks.

My object is to provide a highly superior lock of the class described.

Having this object in view, the invention consists of an improved lock in which the key is concealed and can only be effectively operated by proper manipulation of the door-handle and cooperating mechanisms.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of my invention; Fig. 2, an inside view of the lock-casing; Figs. 3 and 4, detail views of a tumbler and its actuated spring; Fig. 5, a detail of a catch-lever; Fig. 6, a detail of the intercepting plate; Fig. 7, a like view of the click mechanism; and Fig. 8, an end view of the lock-casing, showing the buttons on the catch-levers.

In the drawings the numeral 1 designates a door, 2 and 3 door-knobs, and 4 a spindle. The inner door-knob 2 is provided with a sleeve 5, which has a cylindrical aperture, in which works a presser-foot 6, carried on the end of an adjusting-screw 7. This presser-foot is adapted for engagement with a rack 8 on the spindle, so that the door-knob can be adjusted thereon. A flat click-spring 9 is connected to the other end of the spindle. A click-wheel 10 is secured to the door-knob 3, and the free end of the click-spring is adapted to ride on the notches 11 of the wheel and indicate the movement of the knob. This knob has a sleeve 12, which is provided with a peripheral recess 13 and an inner longitudinal slot or keyway 14, which intersects said recess. A collar 15, having inner screw-threads 16 and an outer knurled surface 17, is located in said recess and adapted to slide around the sleeve. A key 18, having an upturned flange 19 and a screw-threaded portion 20, which engages with the screw-threads on the collar 15, is located in the keyway 14 and adapted

to be advanced and retreated by the movement of the collar.

The numeral 21 designates an intercepting plate or disk which is provided with a central circular aperture 22, so it can loosely encircle the spindle, and has a series of radial blank slots 23, which do not extend entirely through it. This plate is also provided with a key-opening 24, through which the key may pass. A spring 25 has an end adapted to enter the key-opening and lock the plate in relation to the outer door-knob and sleeve 12 when said plate has been rotated to bring the opening into coincidence with the spring. It will thus be seen that the said plate 21 is free to turn by engagement of the key with the blank slots therein until the key-opening 24 comes in alinement with the spring 25, whereupon the spring enters the key-opening and the plate is locked. When the key has been turned to bring it in alinement with the key-opening, it can be fed through the plate. The intercepting plate is located inside the sleeve 12, and it serves to intercept or hinder the entrance of the key to the tumblers except when operated by the proper person.

The casing that incloses the lock proper is designated by the numeral 26. A bolt 27 works in a guide 28. An operating-finger 29 is secured on the spindle 4, being provided with a key-opening 30 and having its free end operating in a hole in the bolt. Hence when the key is inserted in the finger and turned the bolt will be retracted against the action of a presser-spring 31.

The three tumblers and springs now to be described are similar, and hence a description of one will suffice.

The numeral 32 designates a circular tumbler loose on spindle 4, being provided with a series of blank slots 33 and a key-opening 34. The periphery of the tumbler is provided with two studs or stops 35 and 36. A stop-finger 37 is adapted for engagement with all the stops 35 of the tumblers, while a catch-lever 38, which is pivoted to the lock-casing, has a notched end 39, adapted to receive stop 36, and is provided with a thumb-button 40 on its other end, which projects through the lock-casing and is adapted for movement in a slot therein. A spiral spring 41, having

one end connected to the tumbler and the other end connected to the lock-casing, serves to keep the stop 35 normally in engagement with stop-finger 37 and the key-opening in alinement therewith. The respective stops of the tumblers are so related to the stop-finger that the key-openings are not in alinement normally. The catch-levers and stops adapted to engage therewith are for the purpose of locking the tumblers in normal position, so that the lock cannot be opened from the outside in any event.

Assuming that the bolt is extended and it is desirable to retract the same, so that the door can be opened, this is accomplished in the following manner: The outer door-knob is turned until the spring snaps into the key-opening in the intercepting plate. When this occurs, the key can be withdrawn from engagement with the plate and turned until it may be advanced through the key-opening. The knob can then be turned until the click mechanism indicates that the key is in alinement with the key-opening in the first tumbler. The key can be again advanced and the knob turned until the click mechanism has tolled off the requisite number of clicks to indicate that the key is in alinement with the second tumbler, whereupon it may be again advanced. This operation is repeated for the third tumbler. The key may then be slid into the operating-finger and turned and the bolt retracted.

If it is desirable to lock the tumblers in normal position, this can be done from the inside of the door by moving the catch-levers into engagement with the stops of the tumblers. These levers are normally out of engagement with said stops.

It is to be understood that I do not limit myself to the precise construction herein shown and described, but consider myself entitled to all such variations as come within the spirit and scope of the invention.

Having thus described the invention, what is claimed as new is—

1. In a lock, the combination with locking mechanism, of a series of tumblers having key-openings normally out of alinement, a key rotatably mounted and adapted for entrance in the key-openings, and indicating

mechanism for determining the amount of rotation of said key, substantially as described.

2. In a lock, the combination with locking mechanism, of a series of tumblers having key-openings normally out of alinement, a rotatably-mounted key, click mechanism for indicating the necessary amount of rotation of the key to bring it in alinement with the key-openings in the respective tumblers, and means for advancing and retreating said key, whereby it can be slid through the key-openings, substantially as described.

3. In a lock, the combination with locking mechanism, of a series of tumblers located on a spindle and having key-openings normally out of alinement, a rotatable sleeve on said spindle, a key slidable in the sleeve and adapted to enter the key-openings, a screw-threaded rotatable collar encircling the sleeve and in operative engagement with the key, and click mechanism for indicating the rotation of the sleeve, substantially as described.

4. In a lock, the combination with locking mechanism, of a series of spring-retracted rotatable tumblers having key-openings normally kept out of alinement by the action of the springs, a rotatable key, and means for locking the tumblers in normal position, substantially as described.

5. In a lock, the combination with locking mechanism, of a series of tumblers located on a spindle and having key-openings normally out of alinement, a rotatable sleeve on said collar a key adapted for longitudinal movement in the sleeve, an intercepting plate loosely mounted on the spindle and provided with a key-opening, and a spring-pressed arm adapted to enter the key-opening in the intercepting plate when the latter is rotated to bring its key-opening into alinement with the key, and indicating mechanism, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

WILLIAM HENRY BALL.

Witnesses:

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R. K. FLANNAGAN.