

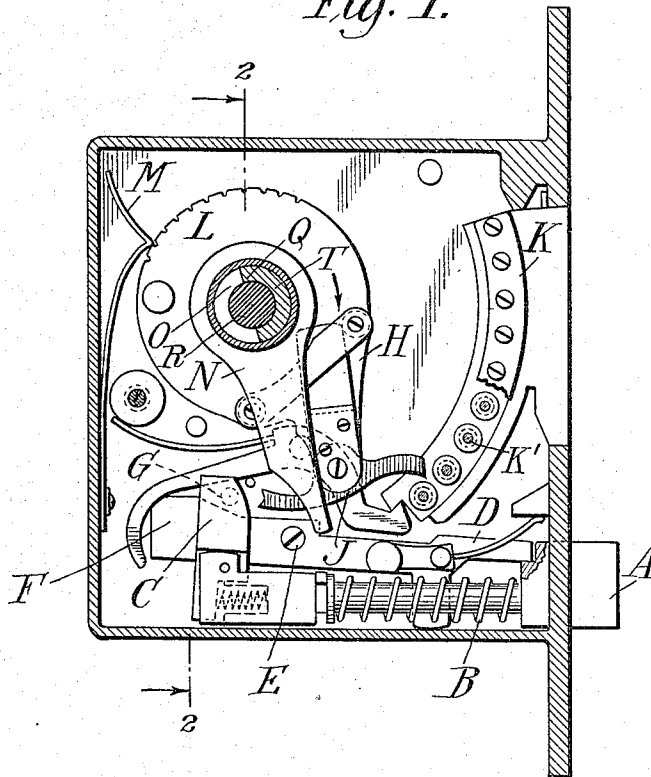
O. M. FARRAND.
KEYLESS LOCK.
APPLICATION FILED SEPT. 8, 1914.

1,173,256.

Patented Feb. 29, 1916.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 2.

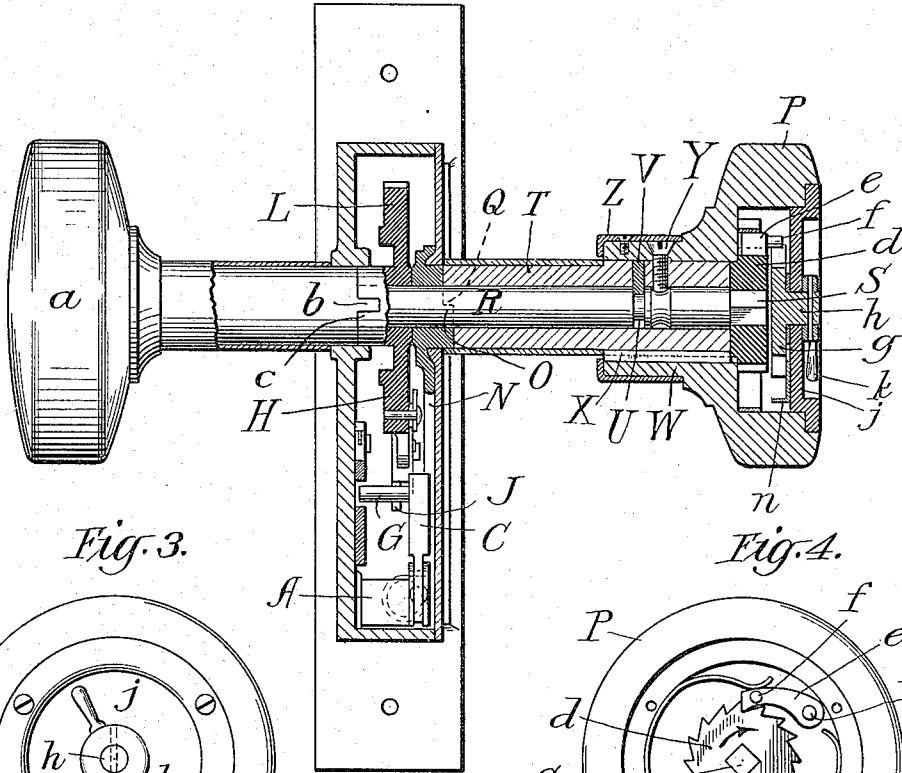


Fig. 3.

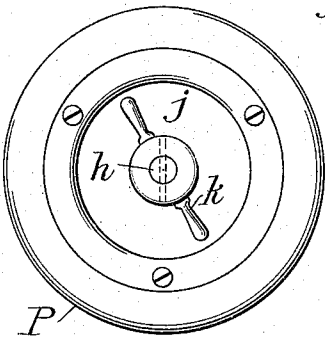


Fig. 4.

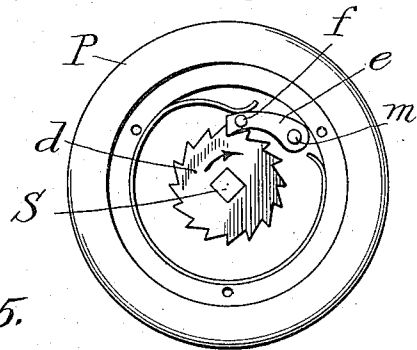
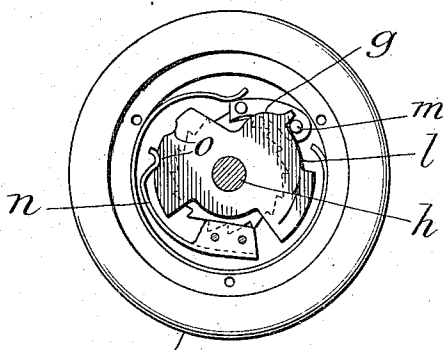


Fig. 5.



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KEYLESS LOCK.

1,173,256.

Specification of Letters Patent.

Patented Feb. 29, 1916.

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To all whom it may concern:

Be it known that I, OLIVER M. FARRAND, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Keyless Locks, of which the following is a specification.

My invention aims to provide an improved keyless or combination lock adapted for use in any situation, but especially for locks of the office door type, which can be set so as to be opened freely by persons on the outside, or can be locked against such opening, but left free to be opened from the inside.

The present improvements are shown in connection with a lock of the type described in detail in my Patent No. 1,028,868 of June 11, 1912, but may be applied to various other styles of lock.

The accompanying drawings illustrate an embodiment of the invention.

Figure 1 is an elevation from the inside, with the inside plate removed; Fig. 2 is a section of Fig. 1 on the line 2—2; Fig. 3 is an end view of the inside knob; Fig. 4 is a similar view of the same with the end plate, and parts carried thereby, removed; Fig. 5 is a similar view showing all the parts inclosed within this knob.

Referring to the embodiment of the invention illustrated, the usual or any suitable bolt A is pressed outward by means of a spring B. The bolt is provided at its inner end with an upwardly extending member C by which the bolt is withdrawn. The member C has a slight preliminary pivotal movement to the left for releasing a dead latch consisting of a member D pivoted at E and having at its rear end a cam or projecting portion F which is in the path of rearward motion of a pin G on the inner face of the member C.

A combination arm H is connected with the outer knob so as to be rocked thereby and carries, pivoted at its end, a lever J which, when the combination has been properly worked, will strike the pin G and draw the bolt; but which, when the combination has not been correctly worked, will pass the pin G without effect on the bolt. The position of the lever J which determines the operation or the failure of the lock to work is determined by its correct or incorrect passage over a series of stops carried in an arc-shaped plate or frame K. The arm H

is provided with a circular extension L having notches for engagement with a light spring M so that as the arm is turned a succession of clicks is caused by which the operator determines the position of the arm H and lever J relatively to the stops of the combination.

The combination is worked by turning the outside knob, and with it the arm H, in the direction of the arrow, counting the rotary steps by the clicking of the spring M, and shifting the knob and arm inward and outward alternately at points in the rotary movement in accordance with the combination. The stops K' are some in one plane and some in another, according to the combination, so that the end of the lever J can pass through the line of stops if the inward and outward shifts are performed at the proper intervals in the rotation of the handle but will strike one of said stops if the shift is not performed at the right times. If the rear end of the lever J strikes one of the stops, the forward end will be thrown outward so as to pass under the pin G without effect and the bolt will not be withdrawn. If, on the other hand, the rear end of the lever J clears all the stops K', the forward end of the lever will strike the pin G and draw the bolt. The construction and operation as described thus far is set out more fully in my patent above referred to.

In the present construction I have made an improvement in pivoting the lever J at about the middle of its length so that it will be evenly balanced, the rear end being of about the same length as the forward end. With these proportions the rear end of the lever, when it strikes one of the stops K', will be pressed inward with great ease, so that an authorized person will be unable to determine the location of the stops by turning the knob and feeling the points at which the rotary movement is obstructed by the striking of the lever against the stops; whereas in the construction shown in my patent the tail end of the lever has been made so short that there was a considerable resistance to its being pushed inward by the stops K' and an unauthorized person might, by feeling for this resistance, determine the location of the stops. The notches in the plate L are arranged to engage the spring M an instant before the tail of the lever J would engage the stop K' (if the combination were not correctly worked). In turn-

ing the knob the effort required to overcome the resistance of the spring M is sufficient to carry the tail of the lever J inward over the obstructing stop K'. By proportioning the opposite ends of the lever J and locating the notches in the plate L as described the effort of overcoming the spring M is greater than that required to operate the lever J and the latter effort is absorbed in the former so that it is impossible to distinguish, by the shocks upon the handle, the location of the stops.

An inside arm N, normally controlled only by the inside knob, is in the plane of the extension C of the bolt. Thus from the inside the bolt can always be withdrawn by turning the knob in the usual way without the necessity of working the combination. This arm has a hub which is journaled in the inner plate of the lock-casing, is hollow and is provided with a shoulder O. The spindle T of the inside knob P is hollow, and fits on the hub of the inside arm N and has a shoulder Q engaging the latter so as to provide a permanent operative connection. The outside knob has a spindle R projecting entirely through the hollow spindle of the inside knob and provided with a squared end S within the latter. Longitudinal connection between the hollow spindle T of the inside knob and the central spindle R of the outside knob is insured by means of a groove U extending around the latter and engaged by a key V resting in a suitable slot in the hollow inclosing spindle. The hub W of the outer knob has a groove engaging a longitudinal rib or feather X on the hollow spindle, and is fastened on such spindle by means of a screw Y, a covering plate Z being preferably used for preventing the accidental loss of the screw Y.

The outside knob *a* is mounted directly on the central spindle R and has a shoulder or projection *b* engaging a corresponding shoulder *c* on the hub of the arm H by which the combination is operated. Thus the turning of the outer knob *a* will ordinarily swing the combination arm, but will have no effect upon the inside arm N. The inside end of the central or outside spindle R is squared, as above explained, and provided with a ratchet wheel *d* which is permitted to turn in one direction freely, but is prevented from turning in the other direction by the spring pressed pawl *e*. The pawl *e* has an upwardly projecting pin *f* lying in the path of a cam *g* which is carried on a shaft *h* extending through the cover plate *j* of the inside knob and carrying on its outer end a handle *k*; the rocking movement of the cam being limited by the sides of a notch *l* which strike a pin *m* projecting upward into the path of the cam; the cam being held in its two desired positions by means of a spring *n* engaging either of the two notches *o* in the edge of the cam.

When the parts are in the position shown in Figs. 4 and 5 the turning of the outside knob and the central spindle with its squared head X in the direction of the arrow in Fig. 4 will also cause a turning of the inside knob and of the inside arm N of the lock so as to withdraw the bolt whether the combination is properly worked or not; and the turning of the outside knob and the ratchet in the opposite direction will release the inside knob and arm, whereupon the bolt will spring outward. Whatever the relative angular positions of the inside and outside knobs, the ratchet will bring the two into engagement and cause the withdrawal of the bolt by a very short movement of the outer knob, considerably less than that necessary when the combination has to be worked. If the cam is turned in the opposite position, however, by means of the handle *k* on the exposed face of the inside knob the pawl *e* will be thrown out of engagement with the ratchet *d* and the turning of the outer knob and of the ratchet *d* will be without effect upon the inside knob or the inside arm N of the lock and the bolt will not be withdrawn unless the combination is properly worked. The inside knob and connections are so arranged as to operate the inside arm and withdraw the bolt at all times. By a very simple operation, therefore, the combination mechanism is thrown off or rendered useless and by a reverse operation it is restored to usefulness; that is simply by connecting and disconnecting alternatively the outside and the inside knobs.

Though I have described with great particularity of detail a certain specific embodiment of my invention, yet it is not to be understood therefrom that the invention is restricted to the particular embodiments disclosed. Various modifications thereof in detail and in the arrangement and combination of the parts may be made by those skilled in the art without departure from the invention, as defined in the appended claims.

What I claim is—

1. A lock including an outer knob, a bolt, combination mechanism adapted to cause the drawing of the bolt by the turning of the outer knob in a determined manner, an inner knob adapted by a simple turning movement to withdraw the bolt, said inner knob having a hollow spindle, said outer knob having a spindle passing through that of the inner knob, a ratchet and pawl connection between said spindles adapted to transmit a turning movement of the outer knob in the unlocking direction to the inner knob so as to draw the bolt by a simple turning movement of either knob, and means for disengaging said ratchet and pawl.

2. A lock including an outer knob, a bolt, combination mechanism adapted to cause

the drawing of the bolt by the turning of the outer knob in a determined manner, an inner knob adapted by a simple turning movement to withdraw the bolt, said inner knob having a hollow spindle, said outer knob having a spindle passing through that of the inner knob, a ratchet and pawl connection between said spindles adapted to transmit a turning movement of the outer knob in the unlocking direction to the inner knob so as to draw the bolt by a simple turning movement of either knob, a cam carried by the inner knob and adapted to disconnect said ratchet and pawl and means on the exposed face of the inner knob for operating said cam. 15

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

OLIVER M. FARRAND.

Witnesses:
D. ANTHONY USINA,
LULU STUBENVOLL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."