A. J. ROSS.

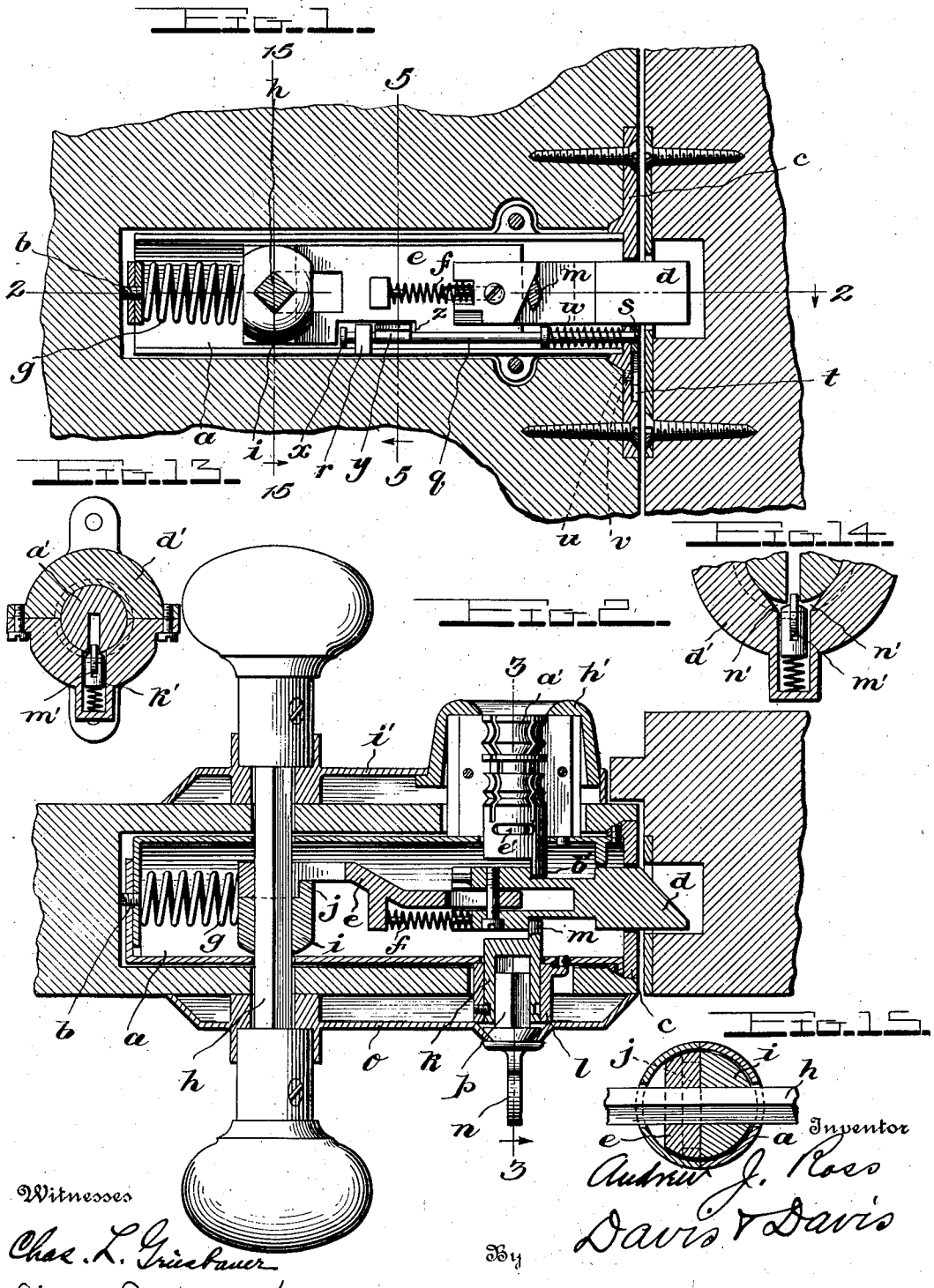
DOOR LOCK.

APPLICATION FILED JAN. 13, 1914.

1,114,186.

Patented Oct. 20, 1914.

2 SHEETS—SHEET 1.



A. J. ROSS.

DOOR LOCK.

APPLICATION FILED JAN. 13, 1914.

1,114,186.

Patented Oct. 20, 1914.

2 SHEETS—SHEET 2.

Fig. 3.

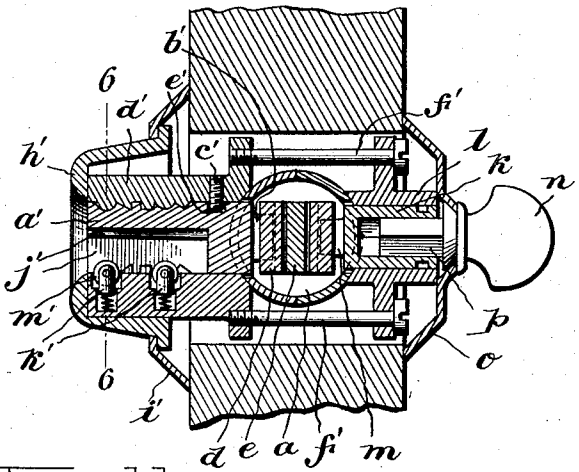


Fig. 4.

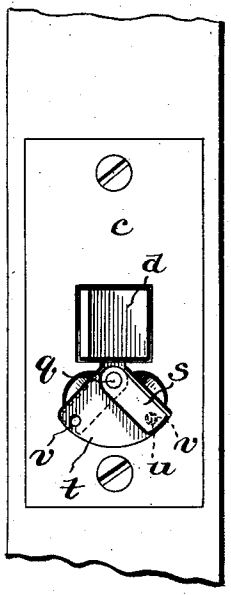


Fig. 11.

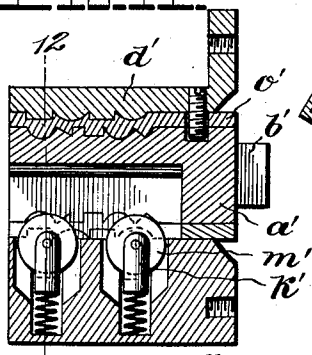


Fig. 12.

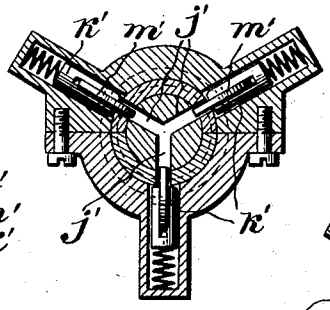


Fig. 6.

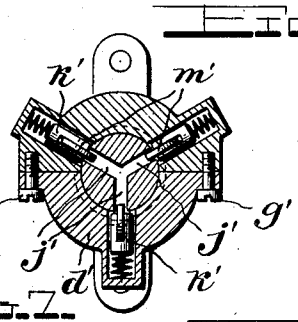


Fig. 5.

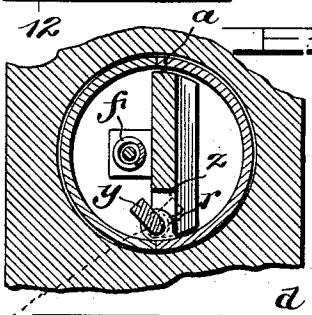


Fig. 7.

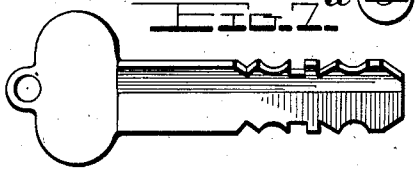


Fig. 8.

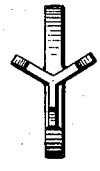


Fig. 10.

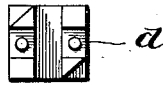
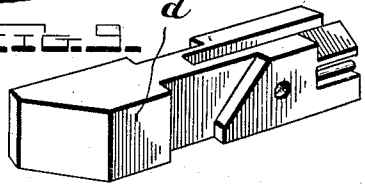


Fig. 9.



Witnesses

Chas. L. Griesbauer.

Lillie E. Herens.

Inventor

Andrew J. Ross

By Davis & Davis

Attorneys

UNITED STATES PATENT OFFICE.

ANDREW J. ROSS, OF OAKLAND, CALIFORNIA.

DOOR-LOCK.

1,114,186. Specification of Letters Patent. Patented Oct. 20, 1914.

Application filed January 13, 1914. Serial No. 811,806.

To all whom it may concern.

Be it known that I, ANDREW J. Ross, a citizen of the United States, and a resident of Oakland, county of Alameda, State of California, have invented certain new and useful Improvements in Door-Locks, of which the following is a full and clear specification, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical section of my improved lock, the adjacent parts of the door and the door jamb being shown; Fig. 2 is a horizontal sectional view on the line 2—2 of Fig. 1; Fig. 3 is a vertical sectional view on the line 3—3 of Fig. 2; Fig. 4 is a view of the front end of the lock; Fig. 5 is a transverse section on the line 5—5 of Fig. 1; Fig. 6 is a transverse section on the line 6—6 of Fig. 3; Figs. 7 and 8 are detail views of the preferred form of key; Figs. 9 and 10 are detail views of the reversible latch bolt; Figs. 11 and 12 are sectional views showing my lock adapted for use with a master key; Fig. 13 is a view similar to Fig. 6 of a modification of the key operated devices; Fig. 14 is an enlarged detail section of a part of the key operated devices; and Fig. 15 is a transverse section on the line 15—15 of Fig. 1.

This invention has relation to door locks and its object is not only to greatly simplify the construction, but also to so construct the key operated devices that it will be practically impossible for the lock to be picked either by the insertion of an implement other than the proper key or by first obtaining upon a blank key an impression of the key-operated devices, as more fully hereinafter set forth.

A further object is to so improve the night latch device that it will be impossible to unlock the same when the door is closed, as more fully hereinafter set forth.

The casing *a* of the lock is cylindrical and divided longitudinally into two semi-cylindrical sections, these sections being removably locked together at the inner end by means of the screw *b* and at their forward ends by means of an annular flange formed on the face plate *c*. Within the casing is adapted to reciprocate the usual latch bolt *d* which is connected by a suitable pin-and-slot connection to the usual bolt-actuating bar *e*, a spiral spring *f* being arranged between a lug on the bar *e* and the inner end of the bolt *d* to normally press said bolt *d* outwardly. The bar *e* is normally pressed outwardly by means of a coil spring *g* and is actuated in any suitable manner from the knob spindle *h*. The connection between the spindle *h* and the bar *e* is preferably by means of a collar *i* affixed to the spindle and provided with a lug *j* adapted to engage lateral lugs on the bar *e*, so that the turning of the spindle in either direction will draw back the bar *e* against the action of spring *g*. The latch bolt *d* is adapted to be reversed in the usual manner, it being detachably connected to the bar *e* for this purpose and the casing *a* being divided, as described, for convenience not only in reversing the bolt *d* but also for convenience in getting access to the other parts inclosed within the cylindrical casing *a*.

The bolt *d* is adapted to be independently withdrawn from the inside of the door by means of a rotary plug *k* mounted in a sleeve *l* and provided with an inwardly projecting lug *m* and adapted to engage a shoulder on the bolt. The plug *k* is adapted to be turned by means of a thumb-piece *n* journaled in the face plate *o* and having a squared shank *p* which is removably inserted in an axial squared hole in said plug *k*.

The night latch device consists of a rock shaft *q* at one end in the face plate *c* and at its other end in a lug *r* projecting inwardly from one side of the casing *a*, this rock shaft *q* lying within the casing *a* and parallel to the inner face of its wall. Affixed to the outer end of the rock shaft is a finger *s* which depends therefrom and works in an arcuate recess *t* formed in the face of the bolt plate *c*, this finger being provided on its inner face with a pin *u* which is adapted to enter either one of two recesses *v* arranged at opposite sides of the recess *t*. A coil spring *w* on the rock shaft *q* tends to force said rock shaft inwardly and thus hold the finger *s* against the bottom of the recess *t*, with its pin *u* in one of the recesses *v*. At the inner end of the shaft *q* it is provided with a stop *x* to limit its outward movement, and at a suitable point in its length said shaft *q* is provided with a radial lug *y* which when the shaft is turned is adapted to engage behind a shoulder *z* formed on the bar *e*, and thus lock the bar *e* against operation through the medium of the knob spindle *h*.

It will be observed that before the rock shaft *q* can be turned in either direction, the finger *s*, together with the rock shaft, must

be pulled outwardly far enough to release pin u from recess v, so that two movements are necessary before the night latch can be shifted to its inoperative position, namely, the position shown in full lines in Figs. 1, 4 and 5. It will thus be seen that it will be impossible to unlock the night latch device while the door is closed, since the close proximity of the face of the door jamb or the bolt plate thereon will prevent the shaft q being moved far enough longitudinally to release pin u from its recess v. It will be seen, therefore, that when the night latch is adjusted to locking position and the door is closed, it will be impossible to open the door except through the inside thumb-piece n or the outside key-operated devices hereinafter described.

Extending through a hole formed in the casing a at a point directly opposite the shaft or plug k is a shaft or cylinder a' whose inner extremity is provided with a cam lug b' adapted to engage a shoulder on the adjacent face of the bolt d and thus withdraw said bolt when said cylinder a' is rotated in either direction. This cylinder d' is limited in the distance of its rotation by means of a pin c' mounted in a stationary cylinder d' and extending into an arcuate groove e' on the exterior of the said cylinder a'.

The stationary cylinder d' is clamped rigidly against the exterior of the casing a by means of a pair of bolts f' which connect said cylinder with a pair of lateral lugs carried by the sleeve or cylinder l at the opposite side of the casing a. The key cylinder a' is journaled within the cylinder d', so that by removing the bolts f' all the parts carried by the cylinder d' as well as the parts connected to the thumb-piece on the inside of the door may be readily detached from the casing a.

The cylinder d' is horizontally divided into two sections which are detachably connected together by screws g', and the outer end of this cylinder d' is inclosed within a key-hole cap or plate h', which cap or plate is held in position by means of the facing plate i' fastened to the exterior of the door.

The exterior of the key cylinder a' is provided with a series of alternating annular grooves and beads of any suitable shape or curvature in cross section, and the interior of the cylinder d' is provided with a series of alternating grooves and beads which exactly fit the grooves and beads of the exterior of the key cylinder. Extending endwisely into the key cylinder (in the embodiment of my invention shown in all the views except Fig. 13) is a series of three radial slots j' which are connected together at the axial center of the key cylinder and are open along the edge thereof, these slots connecting through the beads and grooves on the exterior of the key cylinder and extending endwisely into the cylinder to a point beyond the grooves and beads. The key for this type of lock is shown in Figs. 7 and 8, and it consists of a series of wings arranged radially with respect to each other so as to be capable of insertion in the three-way key slot j'. The outer edge of each of the wings on the key is serrated to exactly correspond with the beads and grooves formed in the cylinders a' and d', so that when the key is inserted its serrations will, when the key is turned, fit the beads and grooves in the interior of the cylinder d' and permit the key cylinder to be rotated independently thereof to withdraw the bolt d. To lock the key cylinder against turning until the key is inserted, I provide a series of spring-actuated pawls k' radially arranged in radial pockets in cylinder d' and normally pressed inwardly so that their inner ends will engage the several sections of the key slots j' and lie in the path of the serrated edges of the key wings. When the key is inserted, the serrated edges of the wings force these pawls outwardly far enough to unlock the key cylinder and permit the same to be rotated, provided the key be provided with a series of projections which exactly fit the beads and grooves in the cylinders. For anti-friction purposes, I prefer journaling in the inner end of each pawl a small steel roller or wheel m'. It will be observed that the shape and arrangement of the beads and grooves in the cylinders may be very greatly varied to thus permit an ample number of permutations. It will also be seen that the three-wing key, each edge of which must exactly correspond with the beads and grooves in the cylinder before the key cylinder can be turned, reduces the liability of the lock being picked to a minimum. To prevent a coated or blackened blank key being inserted and wiggled with a view of obtaining an impression of the arrangement of beads and grooves preparatory to making a false key, I have beveled off the corners of the beads and grooves of the cylinder d' at n' as shown in Fig. 14. With this construction it will be difficult to obtain an exact impression of the cross-sectional shape of the beads and grooves.

In Fig. 13 I have shown my invention adapted to a simple form of key, consisting of a single flat piece of metal, and in Figs. 11 and 12 I have shown my device adapted for use with a master key. To adapt it to this latter use, it is simply necessary to introduce another cylinder o' between the key cylinder a' and the stationary cylinder d', the interior of this cylinder o' being beaded and grooved to correspond to the exterior of the key cylinder and its outer surface being beaded and grooved to correspond with the beads and grooves formed in the cylinder d'.

In this construction the pawls k' will, of course, extend through slots in the cylinder o' far enough to engage the key cylinder a' and they will also have sufficient radial play to be pushed back by the master key far enough to release the cylinder o'. It will be understood that many other modifications of my invention may be made without departing from the spirit of my invention.

It will be observed that the outer surface of the collar i is rounded off, that is, convexed, to a curvature approximating that of the interior of the cylindrical casing a and that this convexed surface, bearing against the interior of the cylinder, holds the collar in proper position on the spindle to cause its lug j to engage the shoulder of the bolt plate e without interfering with the proper rotation of the collar within the cylinder. It will be observed also that the opposite sides or edges of the bolt plate e, at the rear or inner portion thereof, are also rounded to fit, or approximately fit, the interior of the cylinder, so that the cylinder itself forms a guide to insure the proper reciprocation of the bolt plate e, and to hold this plate e in proper relation with the operating collar i. With this construction, it will be seen that the parts will be held in proper relation to each other without any fastening devices, and with this construction it will be observed that it is essential that the cam lug j shall not only stand eccentric to the axis of the spindle, but shall not extend laterally beyond the circumferential edge of the collar i.

Having thus described my invention, what I claim is:

1. A cylindrical lock casing inclosing a latch bolt and a bolt plate and provided with holes at opposite sides, a key-operated device for shifting the latch bolt entering one of said holes, a manually-operable device for shifting the latch bolt entering the other hole, a cylinder inclosing each of said devices and a pair of bolts clamping said cylinders against the opposite sides of the cylindrical lock casing.

2. In combination, a lock casing and face-plate, a latch bolt and a bolt plate and spindle devices for operating the bolt plate, said bolt plate being movably connected to the latch bolt, means for operating the latch bolt independently of the bolt plate, and a night latch means consisting of an endwisely movable rock shaft carrying a device for locking the bolt plate and extending to the face of the face-plate and provided with means for rotating as well as endwisely shifting the rock shaft, for the purpose set forth.

3. In combination, a lock casing and face-plate, a latch bolt and a bolt plate and spindle devices for operating the bolt plate, said bolt plate being movably connected to the latch bolt, means for operating the latch bolt independently of the bolt plate, and a night latch means comprising a finger-piece recessed into the face of the face-plate and having a lateral motion therein as well as a bodily movement into and out of the recess, and means connected to the finger-piece for locking the bolt plate against movement when the finger-piece is shifted laterally, and means for locking the finger-piece in either of its lateral positions in said recess.

4. In combination, a lock casing and face-plate, a latch bolt and a bolt plate and spindle devices for operating the bolt plate, said bolt plate being movably connected to the latch bolt, means for operating the latch bolt independently of the bolt plate, and a night latch means comprising a laterally swinging finger-piece mounted in a recess in the face-plate, means for locking the finger-piece in its shifted positions, a rock shaft connected to the finger-piece and provided with means adapted to engage the bolt plate, and spring means for normally holding the finger-piece in either of its locked positions, said finger-piece and rock shaft being capable of bodily movement to unlock the finger-piece preliminarily to shifting it.

5. In combination with a lock casing, a latch bolt and key-operable devices for shifting said latch bolt consisting of a stationary cylinder provided internally with annular beads and grooves, a key cylinder mounted to rotate therein and provided externally with a corresponding series of beads and grooves, said key cylinder being endwisely slotted for the insertion of a key, and locking means mounted in the stationary cylinder and entering the key-slot in the pathway of the key.

6. In combination with a lock casing, a latch bolt and key-operable devices for shifting said latch bolt consisting of a stationary cylinder provided internally with annular beads and grooves, a key cylinder mounted to rotate therein and provided externally with a corresponding series of beads and grooves, said key cylinder being endwisely slotted for the insertion of a key, and a spring-actuated pawl or pawls mounted in the stationary cylinder and entering the key-slot to lock the key cylinder to the stationary cylinder, said pawl or pawls lying in the pathway of the key.

7. In combination with a lock casing, a latch bolt and key-operable devices for shifting said latch bolt consisting of a stationary cylinder provided internally with annular beads and grooves, a key cylinder mounted to rotate therein and provided externally with a corresponding series of beads and grooves, said key cylinder being provided with a series of radial slots for the insertion of a key, a locking means mounted in the stationary cylinder and entering the.

key-slot in the pathway of the key, and a key having a plurality of wings, the edges of which are serrated to correspond with the beads and grooves of said cylinders.

8. In a lock, a casing, a latch bolt and key-operated devices for shifting the lock bolt, said devices consisting of a rotatable key-operated cylinder externally beaded and grooved, a stationary cylinder inclosing said key cylinder, and an intermediate master-key-cylinder, this master-key-cylinder being internally beaded and grooved to correspond with the key cylinder and externally beaded and grooved to correspond with the stationary cylinder.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

ANDREW J. ROSS.

Witnesses:
CHARLES D. DAVIS,
LILLIE E. HERCUS.