

No. 823,221.

PATENTED JUNE 12, 1906

J. JORGENSEN.
LOCK.

APPLICATION FILED OCT. 12, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

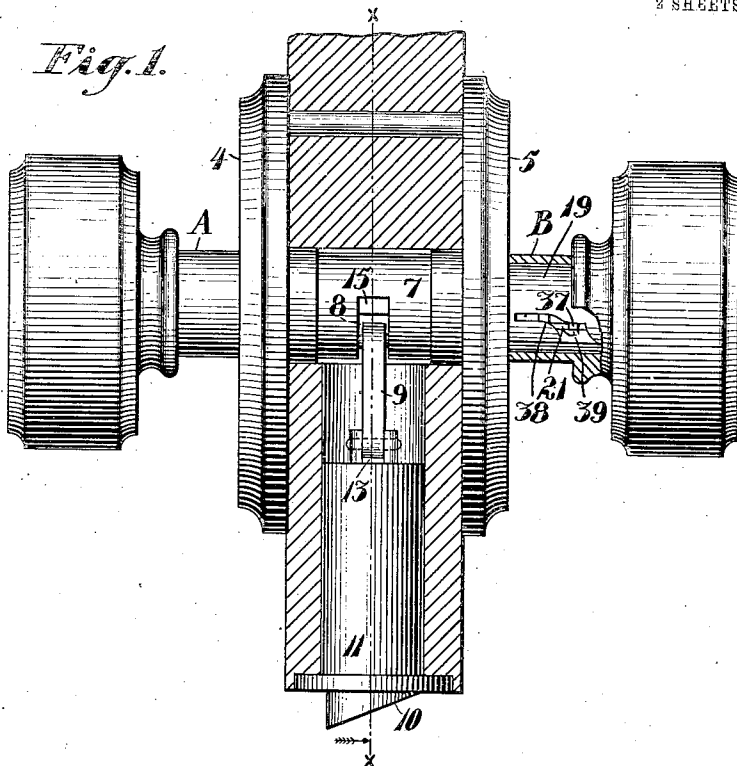
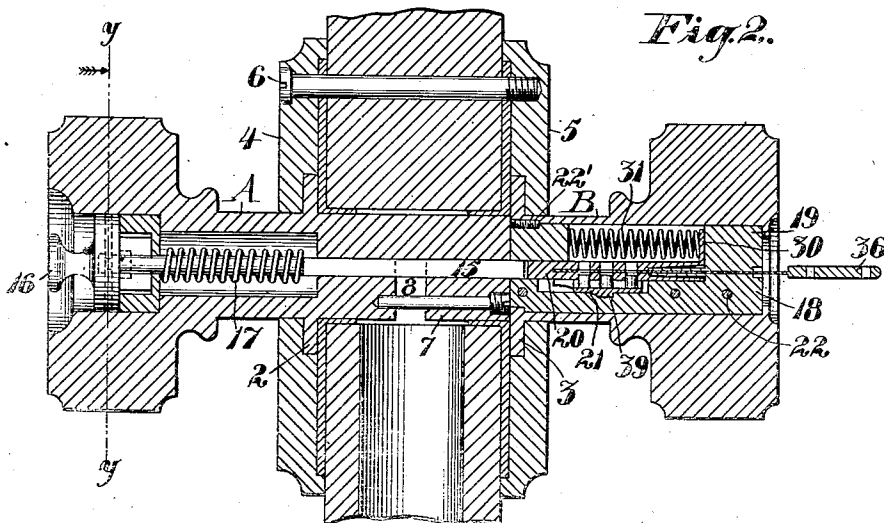


Fig. 2.



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2 SHEETS—SHEET 2.

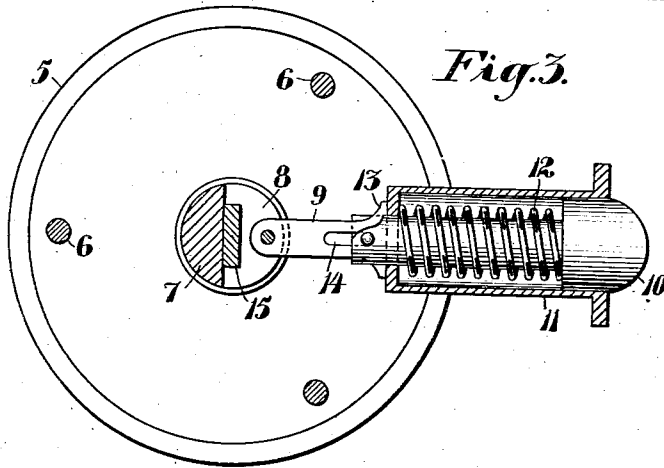


Fig. 3.

Fig. 4.

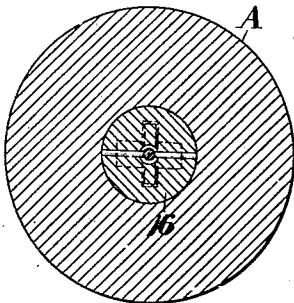


Fig. 5.

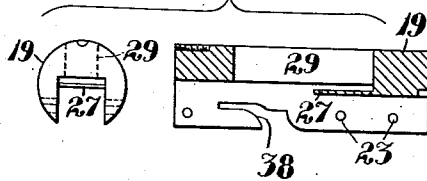


Fig. 7.

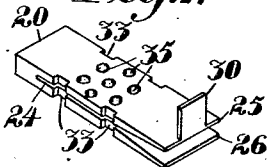


Fig. 6.

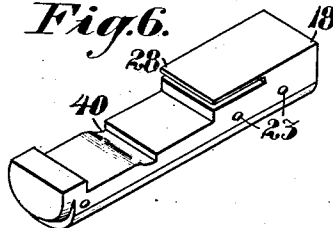


Fig. 8.

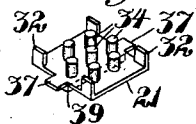
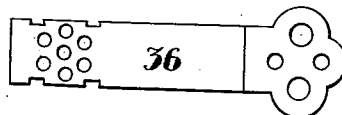


Fig. 9.



Witnesses:-

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UNITED STATES PATENT OFFICE.

JOHN JORGENSEN, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE
HALF TO AUGUSTUS QUADE, OF SAN FRANCISCO, CALIFORNIA.

LOCK.

No. 823,221.

Specification of Letters Patent.

Patented June 12, 1906.

Application filed October 12, 1904. Serial No. 228,097.

To all whom it may concern:

Be it known that I, JOHN JORGENSEN, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented new and useful Improvements in Locks, of which the following is a specification.

My invention relates to an improved lock and key.

The object of my invention is to provide a simple practical lock which is generally adapted for use in residences and other buildings, bank-vaults, safes, and wherever a lock is needed which cannot be opened unauthorized or by others than those possessing the necessary and exact unlocking instrument; also, to provide a lock which is capable of a wide capacity for action; also, to provide a lock which can when desired be instantly adjusted as an ordinary latch and operated independently of its locking mechanism.

The invention consists of the parts and the construction and combination of parts, as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a plan view of my lock in position in a door, showing part of outside knob-shank broken away to disclose the cam-groove for the tumbler-plate. Fig. 2 is a sectional view of the lock. Fig. 3 is a detail of the roll-back and bolt on line *x x*, Fig. 1. Fig. 4 is a section on line *y y* of Fig. 2. Fig. 5 is a section and end view of the upper guide-block. Fig. 6 is a perspective view of the lower guide-block. Fig. 7 is a perspective view of the latch-bolt. Fig. 8 is a similar view of the tumbler-plate. Fig. 9 is a plan of a key.

A and B represent inner and outer independently-rotatable knob-shanks secured in axial alinement on opposite sides of the door by the respective flanges 2 3, inclosed in suitable bearings in the plates 4 5, which latter are secured to the door by suitable bolts 6.

The inner shank A has a roll-back extension 7, which extends through the door flush or about flush with the inner surface of flange 3, which holds shank B in position. This roll-back has a radial slot 8, in which a link 9, connecting with the bolt 10, is pivoted.

The bolt 10 operates in a cylindrical flanged sleeve 11, set into the door, and is normally

projected outward into the path of the usual keeper on the door-jamb by means of a spring 12, incased within sleeve 11. The outward movement of the bolt is limited by means of a cross-head 13 on link 9, adapted to bear upon the end of the sleeve 11. The points of this cross-head also operate as fulcras, according as the roll-back 7 is turned in one direction or the other. The link is slotted, as at 14, to allow the bolt 10 to be retracted independent of any rotary movement of the roll-back 7.

The disposition of the radial slot 8 of the roll-back is such that the bolt can be retracted by turning the roll-back in either direction.

The inner knob-shank A and its roll-back extension 7 are chambered to receive a plunger 15, which is polygonal in cross-section and is reciprocated by means of a swiveled head or finger piece 16, operating in a recess in the inner knob.

A spring 17, incased in the knob-shank A, is to press the plunger 15 normally beyond the end of the roll-back into a corresponding recess in a part rigid with the outer knob-shank B. By taking hold of the thumb-piece and pulling it out and giving it a quarter-turn the plunger is retracted and held within the end of the roll-back, so that the latter and the inner knob may be turned quite independently of the outer knob and its shank. This plunger 15 forms a means of locking the inner and outer knob-shanks rigidly together, so that the bolt 10 may be retracted by turning either knob in either direction.

With the finger-piece drawn outward and turned as described to retract the plunger 15 the outer knob and its shank are normally inoperative, although freely turnable. Consequently to enable the door to be opened from the outside I have provided the following locking mechanism and key.

In construction the outer knob-shank B is made hollow to receive the two blocks 18 19, which form guideways and housings for the latch 20 and tumbler-plate 21.

The block 19 fits over block 18 and is secured rigidly thereto by suitable means, as rivets 22, Fig. 2, whose holes are shown at 23 in Figs. 5 and 6. The blocks are secured in the knob-shank by means of a screw 22'.

The latch-bolt 20 is polygonal, preferably

rectangular, in cross-section and is bifurcated to provide a narrow keyway 24, which is somewhat flared at the rear end of the latch-bolt to form the thin wedges 25 26, which operate above and below respective knife-edged projections 27 28 on the upper and lower blocks 19 18.

The upper block 19 is slotted, as at 29, and a projection 30 on latch-bolt 20 extends up into the slot 29 and is operated on by a spring 31 to retract the latch-bolt within its passage-way between blocks 19 18.

When the knob-shank, with its blocks 19 18 and latch-bolt 20 in position, is secured to the door, the passage-way in which the latch-bolt 20 is operatable is adapted to be brought into register with the passage-way in the roll-back 7, wherein plunger 15 operates, so that when the latch 20 is retracted the plunger 15 may be projected forward into the recess between blocks 19 18 thus vacated by the retracted latch-bolt 20, so that both the inner and outer knobs, controlled by means from the inside, would be operatable in unison, and, conversely, when the thumb-piece 16 was drawn out in turn, so as to retract the plunger 15 within the roll-back, the latch-bolt 20 could be projected forward into the recess in roll-back 7 formed when the plunger 15 was retracted, so that the roll-back 7 could be turned from the outside and independent of any means on the inside of the door.

When the blocks 19 18 are fitted together, a narrow space corresponding in width to and in the same plane with the keyway 24 is left between the adjacent surfaces at the rear end of these blocks and between the knife-edges 27 28 for the insertion of the key 36.

The chamber formed for the latch-bolt 20 between the two blocks is such as to allow the necessary reciprocation of the latch-bolt either to engage the roll-back 7 or to provide the necessary recess for the plunger 15, as above described.

Normally the latch-bolt 20 would be retracted through the agency of spring 31, and unless the plunger 15 was thrust forward the door could only be opened by the insertion of a thin instrument into the keyway to push the latch-bolt outward to engage the roll-back.

In order to guard against the picking of the lock, I provide the tumbler-plate 21, which constitutes one of the main features of my invention. This tumbler-plate is disposed in a recess in block 18 below the latch-bolt 20 and as here shown of rectangular shape; but it is obvious it can be made in any desired form corresponding to the space in which it is to operate. It has the four upwardly-extending projections 32, adapted to engage in corresponding lateral guide-slots 33 on the latch-bolt.

The upper surface of the tumbler-block is 65 studded with a plurality of pins 34, which

register with corresponding perforations 35, extending through the latch-bolt 20 above and below the keyway 24.

Normally or with the latch-bolt retracted the tumbler-plate will have its pins drop below the plane of the keyway 24, so that a key, as shown at 36, may be readily inserted into the keyway.

The function of the projections 32 and of the guide-slots 33 is to allow of the necessary vertical adjustment of the tumbler-plate 21 to project the pins 34 across the keyway and to cause the tumbler-plate to be reciprocated in unison with the latch-bolt. Consequently I have shown the tumbler-plate as having lateral projections 37 adapted to travel in the cam-slots 38 in the dependent side portions of the block 19. Also the under side of the tumbler-plate has a cam projection 39 normally resting in the groove 40 in the block 18.

When the latch-bolt is thrust forward, the projections 37 and cam 39 ride upward on their respective guides and, in the absence of any obstruction to the passage of the pin 34 across keyway 24, the latch-bolt may be engaged with the roll-back 7 to operate the lock; but should a key not be perforated in exact correspondence with the perforations 35 the upward passage of the pins 34 would be blocked, and the inclines of the slots 38 and groove 40 would block the further forward movement of the latch-bolt and foil any attempt to open the lock.

The purpose of the knife-edges 27 28 is to shield the outer end of the latch-bolt so that nothing can be inserted behind the latter to push it forward. The only way to operate the latch-bolt is to insert an instrument clear to the back of the keyway 24; but inasmuch as the projections 34 are staggered so as to present a practically solid front to the entry of a key when the tumbler-plate is lifted it is seen that it would be impossible to pick the lock. This construction of lock permits of the use of a very thin key, since no turning is done by the key. The key is simply used to project the latch-bolt forward to engage the roll-back, while the actual turning of the roll-back to open the lock is done by the knob. The key therefore has only the tension of spring 31 to contend with.

It will thus be seen that the capacity for action of a lock constructed on this principle is very great and is, in effect, almost infinite, since the number and position of the tumbler-pins 34 and perforations 35 can be varied indefinitely.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a lock, the combination with a bolt, of a roll-back, a sleeve in which said bolt is movable, a spring normally operating to project the bolt outward beyond the sleeve, a link connected with the roll-back and with

the end of the bolt and having a cross-head portion bearing on the end of the sleeve to limit the outward movement of the bolt, and means to operate the roll-back.

2. In a lock, the combination of a bolt, a roll-back, a flanged sleeve in which the bolt is operatable, a spring in said sleeve adapted to project the bolt normally outward, a link pivotally connected to the roll-back and to the bolt and having a cross-head portion bearing on the inner end of the sleeve, said link having a longitudinal slot in which the bolt-pivot is movable to permit of the retraction of the bolt independently of the roll-back and means to operate the roll-back.

3. In a lock, the combination with a roll-back, a locking mechanism connected therewith, of means for actuating said roll-back, said means including a knob-shank normally rotatable independently of the roll-back, a perforated locking member carried by the knob-shank and adapted to be engaged with the roll-back, tumbler devices operatable in the line of the perforations of said locking member, and means for moving said tumbler devices synchronously with the movements of said locking member.

4. In a lock, the combination with a roll-back and locking mechanism connected therewith, of a knob-shank rotatable independently of the roll-back, a perforated locking member reciprocal in the knob-shank and adapted to engage with the roll-back and tumbler members engageable in the perforations of said locking member and movable in unison with the latter.

5. In a lock, the combination with a roll-back and locking mechanism connected therewith, of a knob-shank rotatable independently of the roll-back, a perforated locking member reciprocal in the knob-shank and adapted to engage with the roll-back, tumbler means engageable in the perforations of said locking member and movable in unison with the latter, and means including a key having perforations corresponding with the perforations in the locking member to reciprocate the latter.

6. In a lock, the combination with a roll-back and locking mechanism connected therewith, of a knob-shank rotatable independently of the roll-back, a perforated locking member reciprocal in said knob-shank, tumbler devices operatable transverse to the line of reciprocation of said locking member and engageable with the perforations in the locking member and means to reciprocate the latter.

7. In a lock, the combination with a roll-back and locking mechanism connected therewith, of a knob-shank rotatable independently of the roll-back, a perforated locking member reciprocal in said knob-shank, tumbler devices operatable transverse to the

line of reciprocation of said locking member and engageable with the perforations in the locking member, and means to reciprocate the latter, said last-named means including a key having perforations corresponding with the perforations in said locking member.

8. In a lock, the combination with a roll-back and locking mechanism operatable thereby, of a knob-shank rotatable independently of the roll-back, a perforated locking member reciprocal in the knob-shank and engageable with the roll-back, said locking member having a keyway intersecting the perforations therein, tumbler members engageable with said perforations and means to reciprocate the locking member.

9. In a lock, the combination with a roll-back and locking mechanism operatable thereby, of a knob-shank rotatable independently of the roll-back, a perforated locking member reciprocal in the knob-shank and engageable with the roll-back, said locking member having a keyway intersecting the perforations therein, tumbler members engageable with said perforations and means to reciprocate the locking member, said last-named means including a perforated key.

10. In a lock, the combination with a roll-back and locking mechanism operatable thereby, a knob-shank rotatable independently of the roll-back, a locking member reciprocal in the knob-shank and engageable with the roll-back, said locking member having a keyway and having perforations intersecting said keyway, tumbler members operatable in the line of said perforations, and means including a perforated key to operate said locking member.

11. In a lock, the combination with a locking mechanism including a roll-back, of a knob-shank rotatable independently of the roll-back, a reciprocating perforated member carried by the knob-shank and engageable with the roll-back, a perforated key having its perforations registrable with the perforations in the locking member, and tumbler members interposable in the path of the key and engageable with the perforations therein.

12. In a lock, the combination with a locking mechanism including a rotatable member, of a knob-shank rotatable independently of said member, a reciprocating perforated locking member carried by the knob-shank and engageable with the said rotatable member, a perforated key to operate said reciprocating member and having its perforations registrable with the perforations in the locking member, tumbler members interposable in the path of the key and engageable with the perforations therein, said key and locking member having lateral notches in addition to their perforations, and

corresponding tumbler members engaging said notches.

13. In a lock, the combination of locking mechanism including a roll-back, an independently-rotatable knob-shank, a reciprocating locking member carried by the shank and provided with perforations, a perforated key to operate the reciprocating member said key having perforations registrable with the perforations in said member, and a plate supported independently of the locking member and having tumbler members interposable in the path of the key and engageable with the perforations therein.

14. In a lock, the combination of locking mechanism including a rotatable part, an independently-rotatable knob-shank, a reciprocating perforated locking member carried by the latter engageable with the said rotatable part, means for reciprocating said locking member, including a perforated key to project the member forward to engage the rotatable part, and tumbler members supported independently of the locking member and engageable with the perforations in the latter and in the key and having a limited movement in unison with the locking member.

15. In a lock, the combination with locking mechanism including a rotatable part, of an independently-rotatable member, a normally retracted latch-bolt carried by said member and engageable with the rotatable part, said latch-bolt having a keyway and perforations intersecting the keyway, a perforated key and tumbler members supported independent of the latch-bolt but engageable in the perforations therein and in the perforations in the key.

16. In a lock, the combination with locking mechanism including a rotatable part, of an independently-rotatable knob-shank, a bifurcated latch-bolt carried by the knob-shank and engageable with the said rotatable part, a keyway fitting the bifurcation in said bolt, stop means interposable in the path of the key and operatable transverse to the line

of reciprocation of the bolt and protective means for the ends of the forks of said bolt.

17. In a lock, the combination with locking mechanism including a rotatable part, of an independently-rotatable knob-shank, a latch-bolt reciprocal therein and engageable with the said rotatable part, said latch-bolt having a keyway and perforations intersecting said keyway, a tumbler-plate reciprocal in unison with the latch-bolt and having projections interposable in the perforations in the bolt, means for reciprocating the bolt and means for giving the tumbler-plate a movement transverse to the line of reciprocation of said bolt to cause said projections to be projected across the keyway.

18. In a lock, the combination with a sliding latch-bolt provided with a keyway and having perforations intersecting said keyway, of a tumbler member supported independently of but movable with the bolt, said member operable across the keyway and having pins to engage said perforations.

19. In a lock, the combination with a sliding latch-bolt provided with a keyway and having perforations intersecting said keyway of a tumbler-plate supported independent of and movable transverse to the bolt and provided with projections registrable with the perforations in the bolt.

20. In a lock, the combination with a sliding latch-bolt provided with lateral notches and a keyway and having perforations intersecting the keyway, of a tumbler-plate provided with projections to engage said perforations and having other projections engaging the lateral notches in the bolt, and a key perforated and notched correspondingly with the projections on the tumbler-plate.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN JORGENSEN.

Witnesses:

S. H. NOURSE,
HARRY J. LASK.