

R. RUSSELL.
LOCK.

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1,004,690.

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Fig. 1.

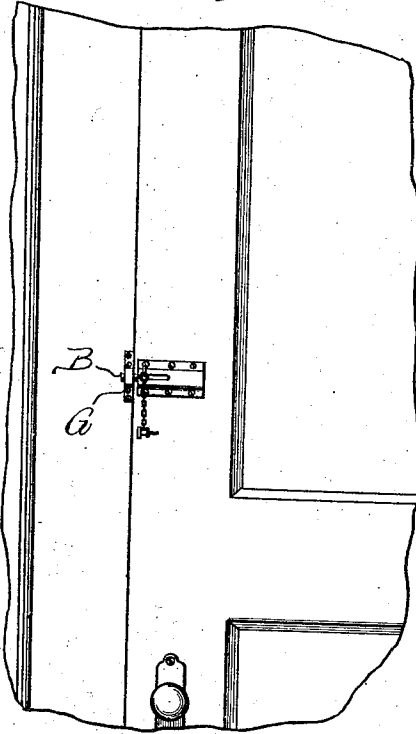


Fig. 2.

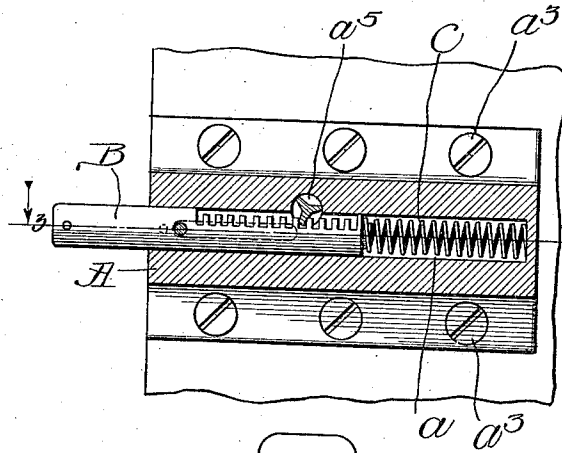


Fig. 3.

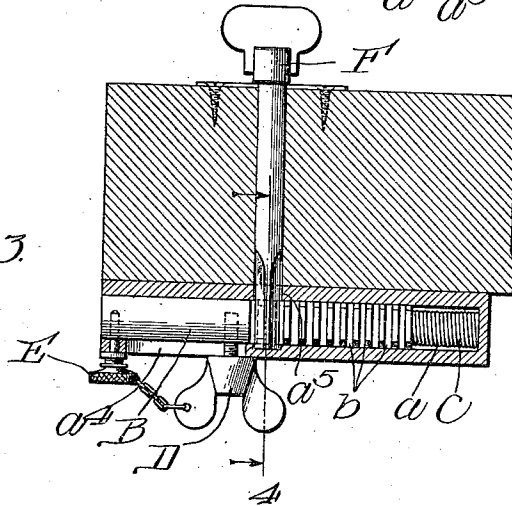


Fig. 4.

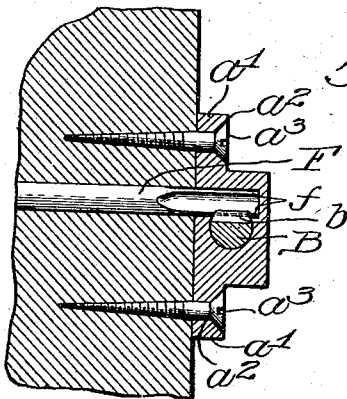


Fig. 5.

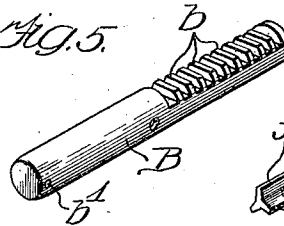
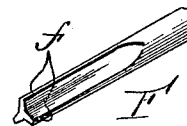


Fig. 6.



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UNITED STATES PATENT OFFICE.

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LOCK.

1,004,690.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ROBERT RUSSELL, a citizen of the United States of America, and resident of Salt Lake City, Salt Lake county, Utah, have invented a certain new and useful Improvement in Locks, of which the following is a specification.

My invention contemplates a novel and improved lock for doors and other closures.

Objects of my invention are the provision of a lock of superior strength; the provision of a lock that requires several turns of the key to unlock; the provision of a lock having a bolt operated by a spring of such strength that the lock cannot be picked and cannot be opened except by means of a key of special shape and form; the provision of a lock of such character that it can be made so solid that it cannot be sprung or injured by attachment to a door; the provision of a lock that will not rattle and that will hold the door firmly closed; the provision of a lock that is so constructed that a wax impression thereof, for the purpose of making a key, would practically be impossible; the provision of a lock of such character that for a left hand lock the key must be turned to the right, and for a right hand lock the key must be turned to the left; and the provision of certain details and features tending to increase the general efficiency of a lock of this particular character.

To the foregoing and other useful ends, my invention consists in matters hereinafter set forth and claimed.

In the accompanying drawings:—Figure 1 shows a portion of a door equipped with a lock embodying the principles of my invention. Fig. 2 is an enlarged front elevation of the said lock, showing the casing thereof in section. Fig. 3 is a section on line 3—3 in Fig. 2, showing the bolt in locking position, and showing the key inserted. Fig. 4 is a cross section on line 4—4 in Fig. 3. Fig. 5 is a perspective of the locking bolt. Fig. 6 is a perspective of the operative end portion of the key.

Thus illustrated, my invention comprises a solid casing A made with a bore *a* and upper and lower flanges *a'*, which latter are provided with screw holes *a²* for attaching the lock to a door, as by screws *a³*. The cylindric bolt B slides in the base *a*, is pro-

vided with rack teeth *b* along its inner end portion, and with a hole *b'* in its outer end. It will be seen that the bore *a* is closed at its rear end to provide an abutment for the spring C by which the bolt is forced outwardly. A screw D is inserted in the bolt and works in the slot *a⁴* in the casing, thereby limiting the outward movement of the bolt. The screw E, carried on the chain *e* attached to the screw D, can be inserted in the hole *b'*, and through the casing, to hold the bolt in drawn position, as shown in Fig. 3. A key-hole *a⁵* is provided in the casing, as shown.

The key F has a shank provided with three ribs or teeth *f* adapted to engage the teeth *b* on the bolt. When the key is inserted in the key-hole *a⁵* the teeth *f* engage the teeth of the bolt, and a rotation of the key will move the same against the tension of the spring C to unlock the door. In this way the key and the bolt form a rack and pinion movement, and the door is unlocked by a continuous rotation of the key until the bolt is fully drawn.

It will be seen that the bolt C is adapted to engage a socket piece G on the frame of the door. To close the door, all that is necessary is to wind back the bolt and then withdraw the key, allowing the bolt to shoot into place under the pressure of the spring. From the inside of the door the bolt can be drawn by taking hold of the thumb screw D, and this screw can also be used for holding the bolt in locking position, as a slight turn of the screw will cause the shoulder thereof to bear on the casing. The entire lock can be made of solid tool steel.

Thus it will be seen that I provide a lock that is unusually strong, which is not liable to be picked or forced, and which is unlocked by a special key, but which is still simple and free from the complication ordinarily true of locks that make any pretense of being burglar proof.

Several turns of the key are necessary for unlocking the lock. For a left hand lock, such as shown, the key must be turned to the right to unlock. If of a right hand character, then the key turns to the left to unlock. This is unusual, and tends to make the lock more difficult to pick or operate by

unauthorized persons. The spring will shoot the bolt back to locking position, if the key slips or is withdrawn or released during unlocking. This renders the lock more difficult to pick or open by unauthorized persons. The bolt, of course, can not turn or rotate, as it is held against such rotation by the screw D. It can have only endwise motion.

One of the principal features of my invention is the one piece steel casing which incloses the one piece steel bolt, and the spring. The casing of my lock is all made in one piece, as distinguished from the ordinary lock in which the casing is made of several pieces. Furthermore, the steel bolt is made in one piece, and thus simplicity and cheapness of construction are obtained, in addition to a better locking action. A lock of this character, comprising a steel casing made only in one piece, and a steel bolt made only in one piece, is practically burglar proof and can not be tampered with as easily as a lock composed of several pieces.

What I claim as my invention is:—

1. In a lock, a solid integral casing or body having a round bore therein, which bore is closed at one end, and having a cross-bore or round key-hole partially intersecting said round bore, a one-piece cylindrical bolt in said round bore, adapted to fit and slide endwise therein, a spring interposed between the closed end of the round bore and the inner end of said bolt, the said bolt having rack teeth formed a distance along one side thereof, a removable key rotatable in said cross-bore and formed with teeth to engage said rack teeth and thereby actuate the bolt against the tension of said spring, and means serving both to prevent rotation of said bolt and limit the outward movement thereof, whereby in unlocking it is necessary to open the door before withdrawing the key, and whereby to lock from the outside it is only necessary to withdraw the key.

2. In a lock, a solid integral casing or body having a round bore therein, which bore is closed at one end, and having a cross-bore or round key-hole partially intersecting said round bore, a one-piece cylindrical bolt in said round bore, adapted to fit and slide endwise therein, a spring interposed between the closed end of the round bore and the inner end of said bolt, the said bolt having rack teeth formed a distance along one side thereof, a removable key rotatable in said cross-bore and formed with teeth to engage said rack teeth and thereby actuate the bolt against the tension of said spring, and means serving both to prevent rotation of said bolt and limit the outward movement thereof, the teeth on said key being of the same diameter as the body of the

key and extending to the extreme end thereof, whereby the key is easily inserted in the rack teeth, whereby in unlocking it is necessary to open the door before withdrawing the key, and whereby to lock from the outside it is only necessary to withdraw the key.

3. In a lock, a solid integral casing or body having a round bore therein, which bore is closed at one end, and having a cross-bore or round key-hole partially intersecting said round bore, a one-piece cylindrical bolt in said round bore, adapted to fit and slide endwise therein, a spring interposed between the closed end of the round bore and the inner end of said bolt, the said bolt having rack teeth formed a distance along one side thereof, a removable key rotatable in said cross-bore and formed with teeth to engage said rack teeth and thereby actuate the bolt against the tension of said spring, and means serving both to prevent rotation of said bolt and limit the outward movement thereof, said means consisting of a thumb-screw removably inserted in the side of the bolt, and said casing or body having a straight slot in which said screw moves back and forth, whereby in unlocking it is necessary to open the door before withdrawing the key, and whereby to lock from the outside it is only necessary to withdraw the key.

4. In a lock, a solid integral casing or body having a round bore therein, which bore is closed at one end, and having a cross-bore or round key-hole partially intersecting said round bore, a one-piece cylindrical bolt in said round bore, adapted to fit and slide endwise therein, a spring interposed between the closed end of the round bore and the inner end of said bolt, the said bolt having rack teeth formed a distance along one side thereof, a removable key rotatable in said cross-bore and formed with teeth to engage said rack teeth and thereby actuate the bolt against the tension of said spring, and means serving both to prevent rotation of said bolt and limit the outward movement thereof, and means for locking the bolt in retracted position against the tension of said spring, whereby in unlocking it is necessary to open the door before withdrawing the key, and whereby to lock from the outside it is only necessary to withdraw the key.

5. In a lock, a solid integral casing or body having a round bore therein, which bore is closed at one end, and having a cross-bore or key-hole partially intersecting said round bore, a one-piece cylindrical bolt in said round bore, adapted to fit and slide endwise therein, a spring interposed between the closed end of the round bore and the inner end of said bolt, the said bolt having rack teeth formed a distance along one side there-

of, a removable key rotatable in said cross-bore and formed with teeth to engage said rack teeth and thereby actuate the bolt against the tension of said spring, and
5 means serving both to prevent rotation of said bolt and limit the outward movement thereof, said means comprising a thumb-screw, and there being a locking pin hung
on said screw, which pin is insertible in the lock to hold the bolt in retracted position. 10
Signed by me at Salt Lake City, Utah,
this 24th day of August 1908.
ROBERT RUSSELL.

Witnesses:

JOHN SNEDDON,
JAMES C. RUSSELL.

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