

No. 668,764.

Patented Feb. 26, 1901.

E. T. ZACK.
LOCK AND LATCH.

(Application filed Nov. 4, 1899.)

(No Model.)

Fig. 1.

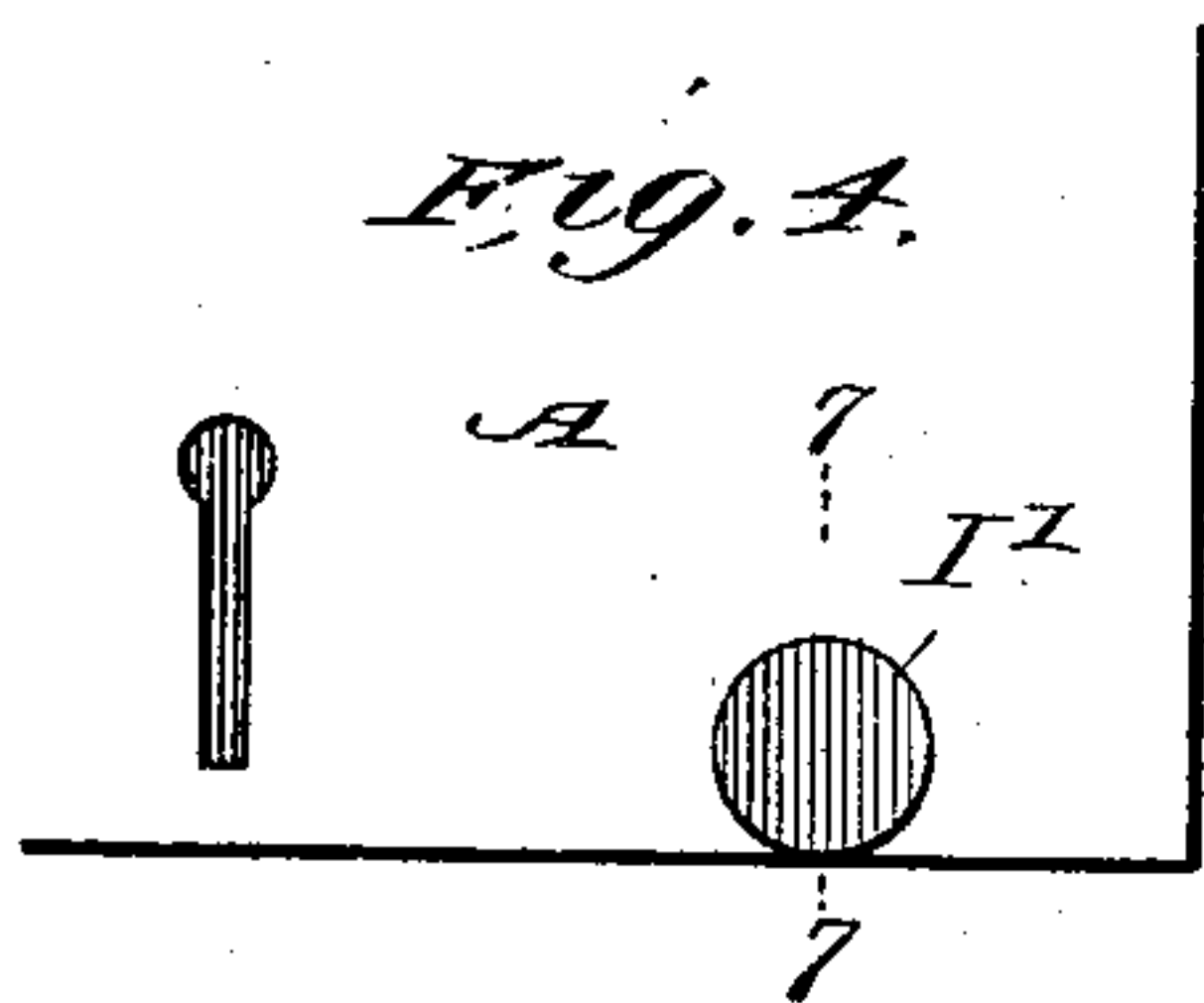
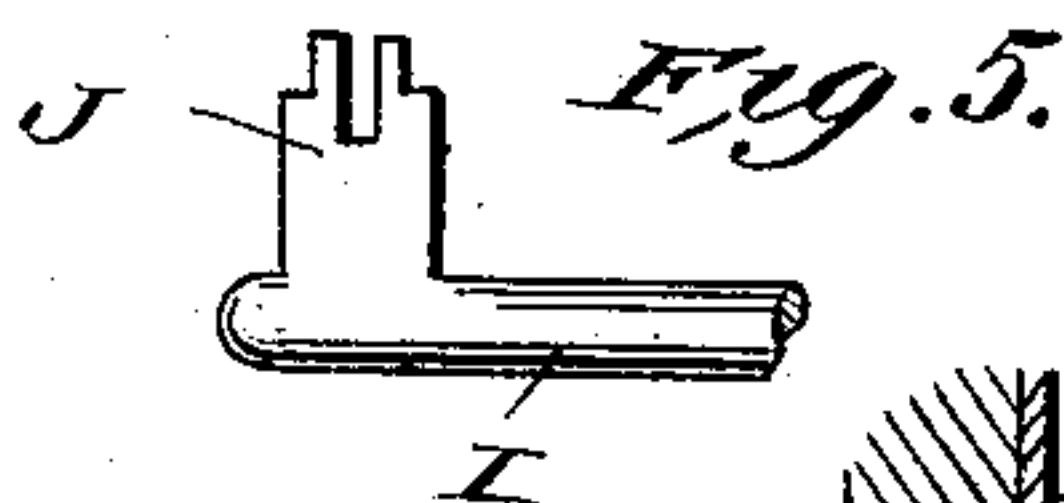
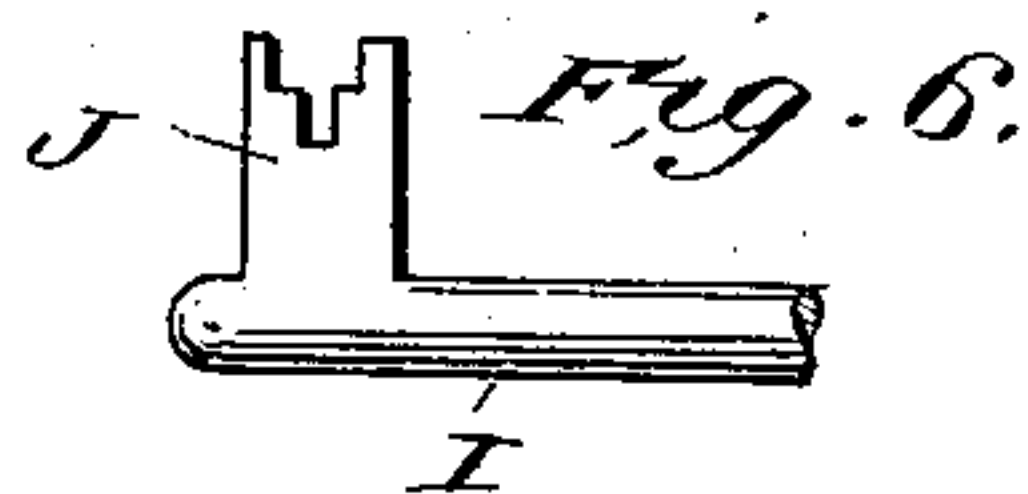
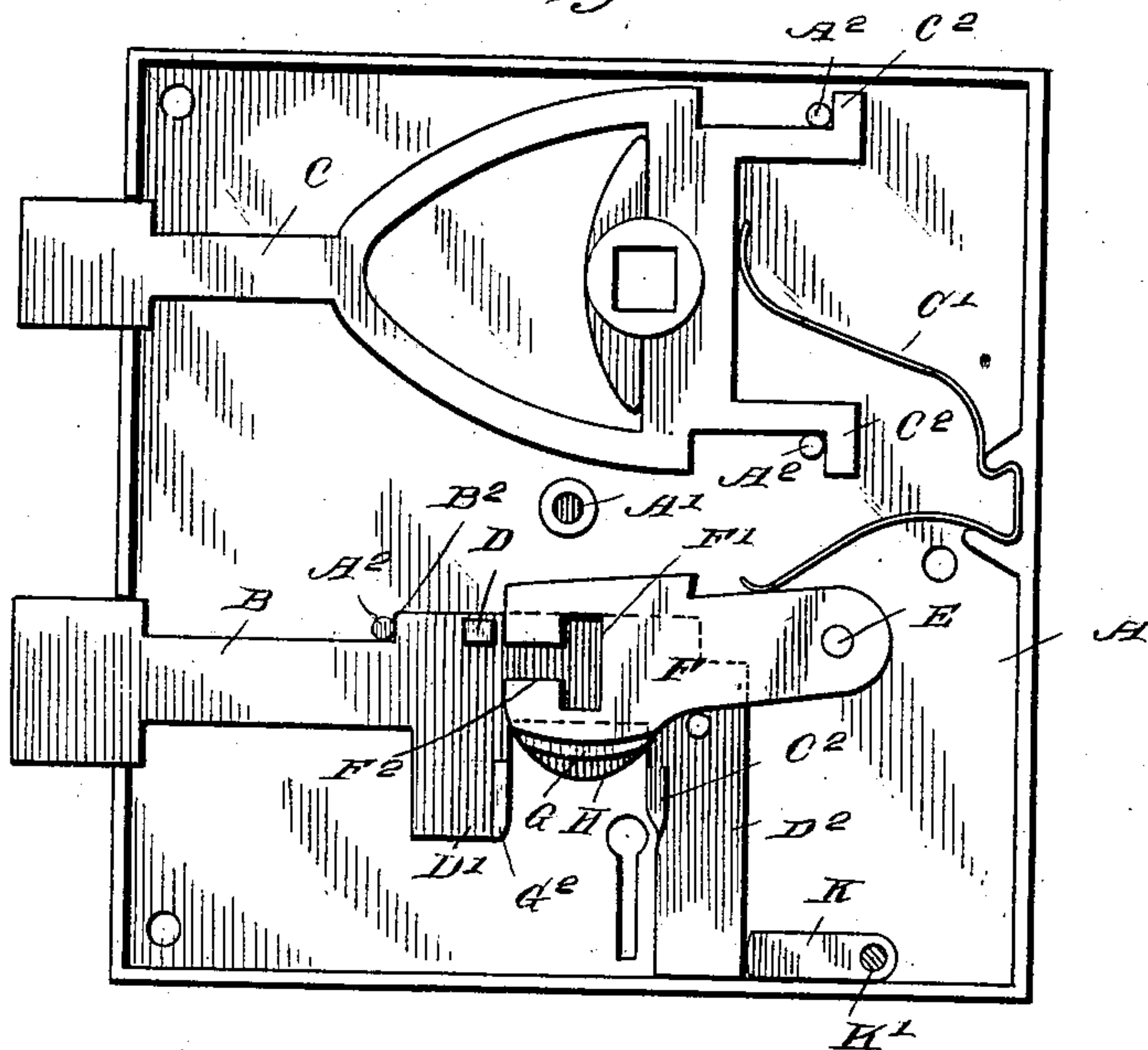


Fig. 7.

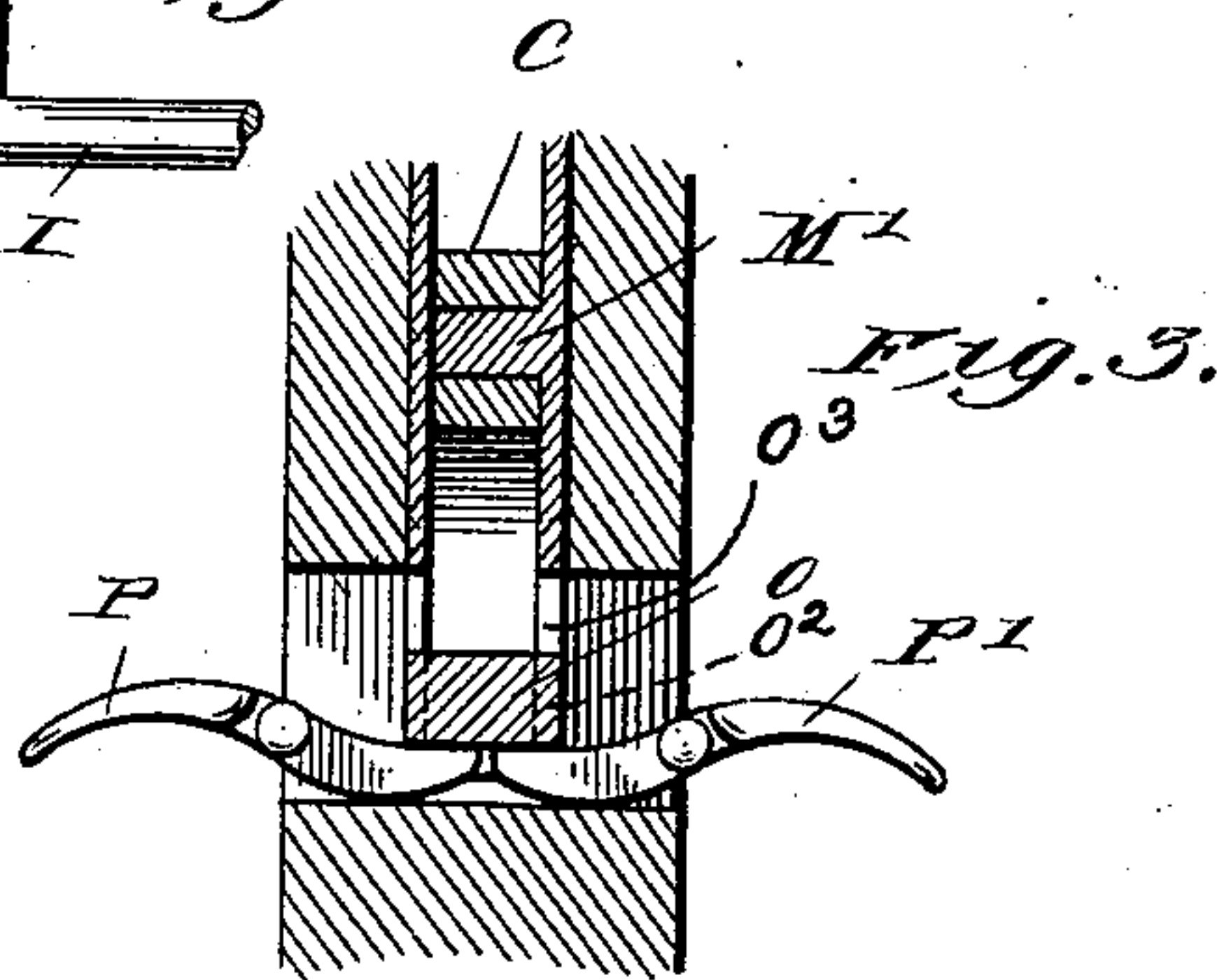
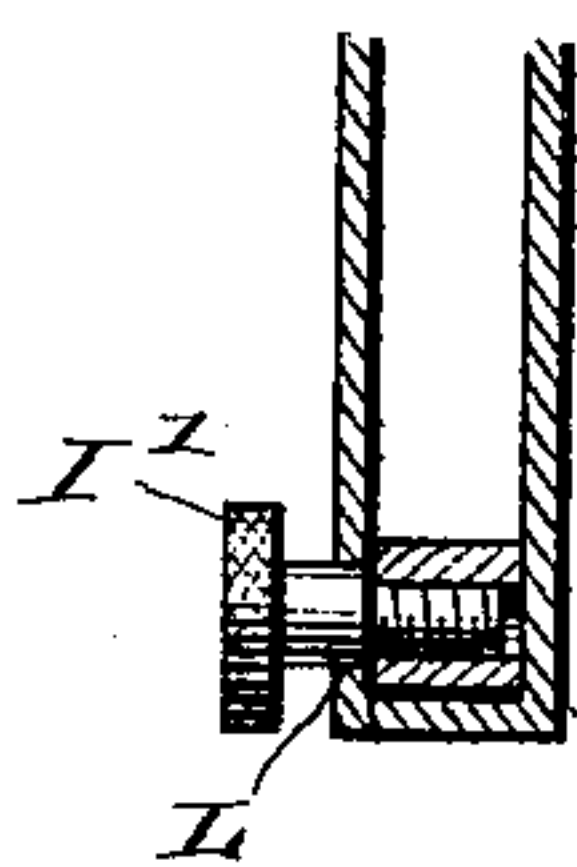
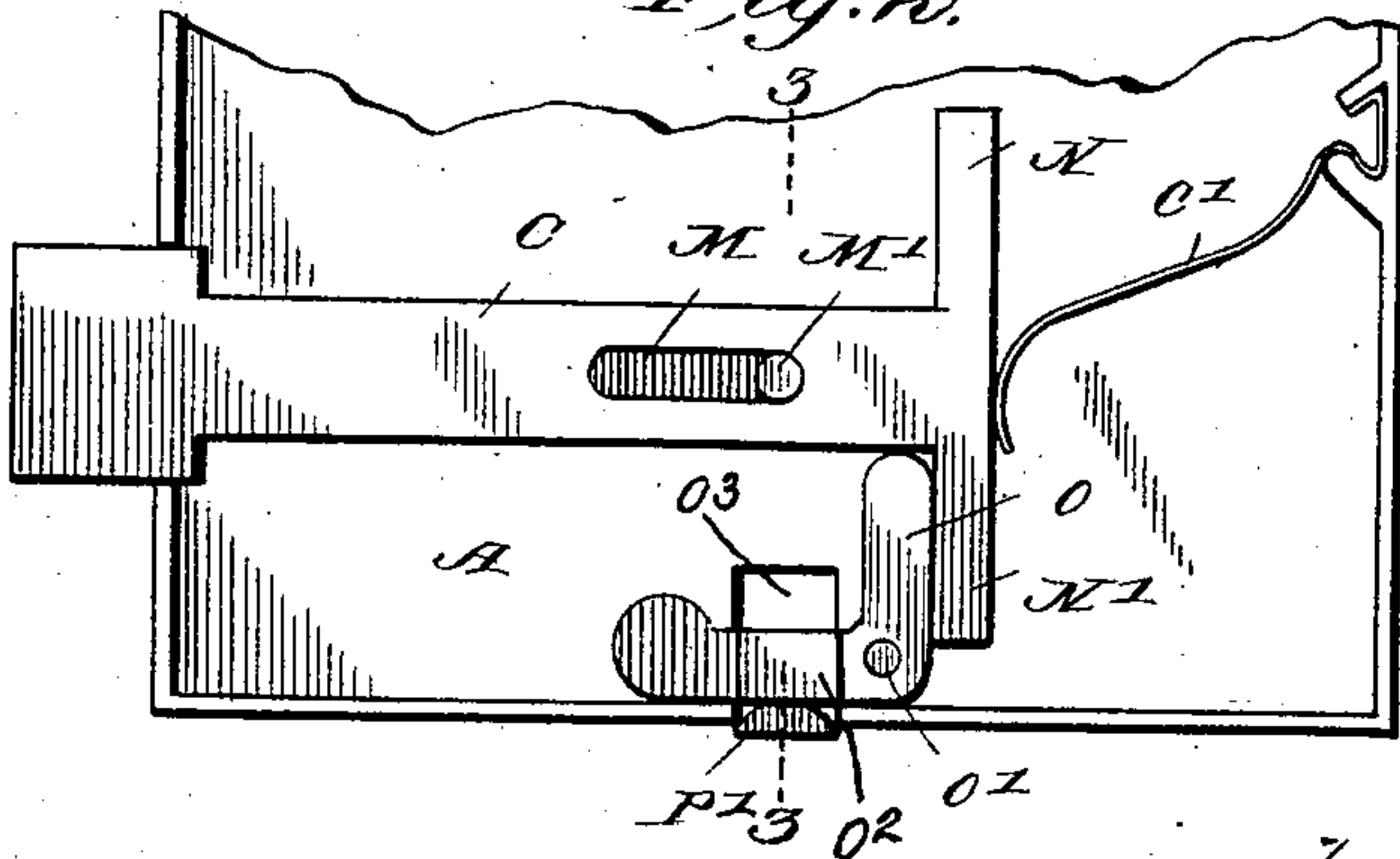


Fig. 2.



Witnesses
H. W. Riley,
Chas. E. Brock,

Inventor
E. T. Zack,
by O'Connell & Co.
Attorneys

UNITED STATES PATENT OFFICE.

EMANUEL THOMAS ZACK, OF CHICAGO, ILLINOIS.

LOCK AND LATCH.

SPECIFICATION forming part of Letters Patent No. 668,764, dated February 26, 1901.

Application filed November 4, 1899. Serial No. 735,817. (No model.)

To all whom it may concern:

Be it known that I, EMANUEL THOMAS ZACK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Lock and Latch, of which the following is a specification.

My invention relates to locks for doors, and has for one object to provide an improved door-lock of simple and economical construction which will be proof against opening by unauthorized persons from the outside, whether such persons are in possession of keys to fit the lock or not; and a further object is to provide means for accomplishing this result, which may be brought into action from the inside of the door or may be left out of action when desired.

My invention further consists in certain details of construction and combination of parts, as will be hereinafter fully described, set forth in the claim, and illustrated in the drawings, in which—

Figure 1 is a view of the lock and latch in elevation with the cover-plate removed. Fig. 2 is a similar view of part of a latch of slightly-modified construction. Fig. 3 is a sectional view on the plane indicated by the broken line 3 3 of Fig. 2. Fig. 4 is a view in elevation of part of the lock-case, showing the key-hole guard-slot and guard-knob. Figs. 5 and 6 are views of the ends of two of the many forms of keys for the combinations of which the lock is capable. Fig. 7 is a detail sectional view on the plane indicated by the broken line 7 7 of Fig. 4.

Like letters of reference mark the same parts wherever they occur in the several figures of the drawings.

Referring to the drawings by letters, A indicates the casing of the lock, which may be of ordinary construction and of any suitable material, being provided with the usual projection A', in which there is a threaded opening to receive the screw which secures the cover-plate, and projecting pins A'' to prevent the bolt B of the lock proper and the bolt C of the latch from being pressed too far outward by their springs B' and C', these bolts having projecting shoulders B'' and C'' to engage said pins at the end of their outward or locking stroke. The bolt B is also provided

with a lug D on its side and lugs D' D'' on its lower edge, the latter resting upon the bottom of the casing when the lock is properly set up in operative position.

Pivoted to the lock-casing on a pin E are three or more tumblers F G H, overhanging one side of bolt B and provided with slots consisting of inner vertical portions F' and outer horizontal portions F'', the slots being T-shaped, the portions F' representing the head of the T and the parts F'' the stem. Side extensions G' are provided on the bolt B to afford wider bearing-points for the key in moving the bolt out and in. These slots are of the same size and shape in all of the tumblers; but the tumblers are of different widths and shapes, and in order that the bolt may be moved in either direction by the key the tumblers must be raised to the proper height to cause the slots to coincide or register with each other. To accomplish this result, the wards of the key must be made to suit. I have illustrated two forms of keys in Figs. 5 and 6, the stem in each instance being marked I, and wards which raise the tumblers being marked, respectively, J. By arranging the tumblers in different order on their pivotal pin six different combinations may be made, which will require six different forms of keys. For illustration, the three tumblers may be arranged in the following different orders: F G H, F H G, G F H, G H F, H F G, and H G F. This will be of great benefit where a key is lost, for the reason that a new key and a corresponding new combination of tumblers is all that is necessary to avoid all danger of the person finding the key opening the door. If four tumblers were used, twenty-four combinations might be made, and with five one hundred and twenty, each of which would require a different key, so that with this system perfect safety is guaranteed.

In operating the lock the wards of the key raise the tumblers, so as to cause their slots to coincide, in which position the horizontal portions F' are opposite lug D, when the lug is no longer an impediment and the bolt may be thrown in either direction freely. When in the locked position, as in Fig. 1, the lug is in front of the tumblers, so that when the tumblers, or any one of them, is not at the

proper height the forward ends of the tumblers will prevent the withdrawal of the bolt. To permit of the bolt being thrown back to its unlocked position, the tumblers must be
 5 raised until the horizontal portions F^2 of the slots of the tumblers are in line with the lug D. This is accomplished by turning the key, the first result of such turning being to raise the tumblers and the next result, due to the
 10 pressure of the wards of the key laterally against the projection G'' , being the backward movement of the bolt, such movement being limited by the pin E, on which the tumblers are pivoted. The further result of this
 15 movement is to carry the wards of the key out from under the tumblers, which will permit them to drop to position to bring lug D into the upper ends of parts F' of the slots of the tumblers, in which position the lug will
 20 hold the bolt against movement in either direction until the tumblers are again raised by turning the key in the opposite direction. The tumblers are prevented from dropping too low by a projecting pin G'' of the bolt B.
 25 K indicates a guard-bar pivoted at K' to the casing and provided with a knob I', the stem of which projects through an opening L in the casing and is threaded into the guard-bar. When the bolt B is thrown to its locked
 30 position, the guard-bar K may be turned to the position indicated in Fig. 1, where it locks the bolt against being thrown back by a person on the outside, even with the proper key.
 The latch-bolt C may be constructed as
 35 shown in Fig. 1; but I prefer the construction illustrated in Figs. 2 and 3 for many purposes. In Fig. 1 the latch is thrown backward by a knob and forward by the spring C' ; but in the preferred construction the bolt is provided
 40 with a longitudinal slot M, fitting over a pin M' , projecting from the casing, and is provided with equal upper and lower projections $N N'$ to adapt the bolt to be reversed in position for right or left hand locks. An elbow-
 45 lever O is pivotally secured to a pin O' , and one arm contacts with one of the projections N or N' , as the case may be, while the other

rests upon the inner ends of levers $P P'$, pivoted to opposite door-plates and projecting inward and outward on opposite sides of the
 50 door, as seen in Fig. 3. The horizontal arm of this lever is formed with lateral enlargements O^2 , which move in slots O^3 , formed in the walls of the casing, when the thumb-levers are operated, so that the movement of the
 55 elbow-lever is limited by contact of said enlargements with the upper walls of the slots. By this means the latch-bolt may be thrown back by simply pressing downward with the thumb upon either of the thumb-levers $P P'$.
 60 When this pressure is released, the bolt will be thrown outward by the spring.

From the foregoing it will be seen that I have produced an improved lock which fully carries out the object of my invention. When
 65 locked and the guard-bar engaged, it will be impossible for a person on the outside of the door to open the door with the proper key or a lock-pick, nor can the key (left in the lock) be turned by nippers.
 70

Having thus fully described my invention, what I claim as new, and desire to obtain by Letters Patent of the United States, is—

In a lock, the combination with a bolt slidably mounted in the casing and formed with
 75 two arms depending from its lower edge and separated from each other, one of said arms moving on the lower wall of the casing, said bolt provided with a lug, of a plurality of tumblers of different widths, pivotally mounted
 80 at one end in rear of the bolt and at their opposite ends formed with open-ended T-shaped slots of the same size, said tumblers having portions depending in the space between the arms of the bolt, a spring for said tumblers,
 85 and a pin or projection carried by the bolt and engaging the lower edges of the tumblers and supporting the latter, substantially as described.

EMANUEL THOMAS ZACK.

Witnesses:

FRANK J. HAVLÁTKO,
 JOSEPH J. HOFFMAN.