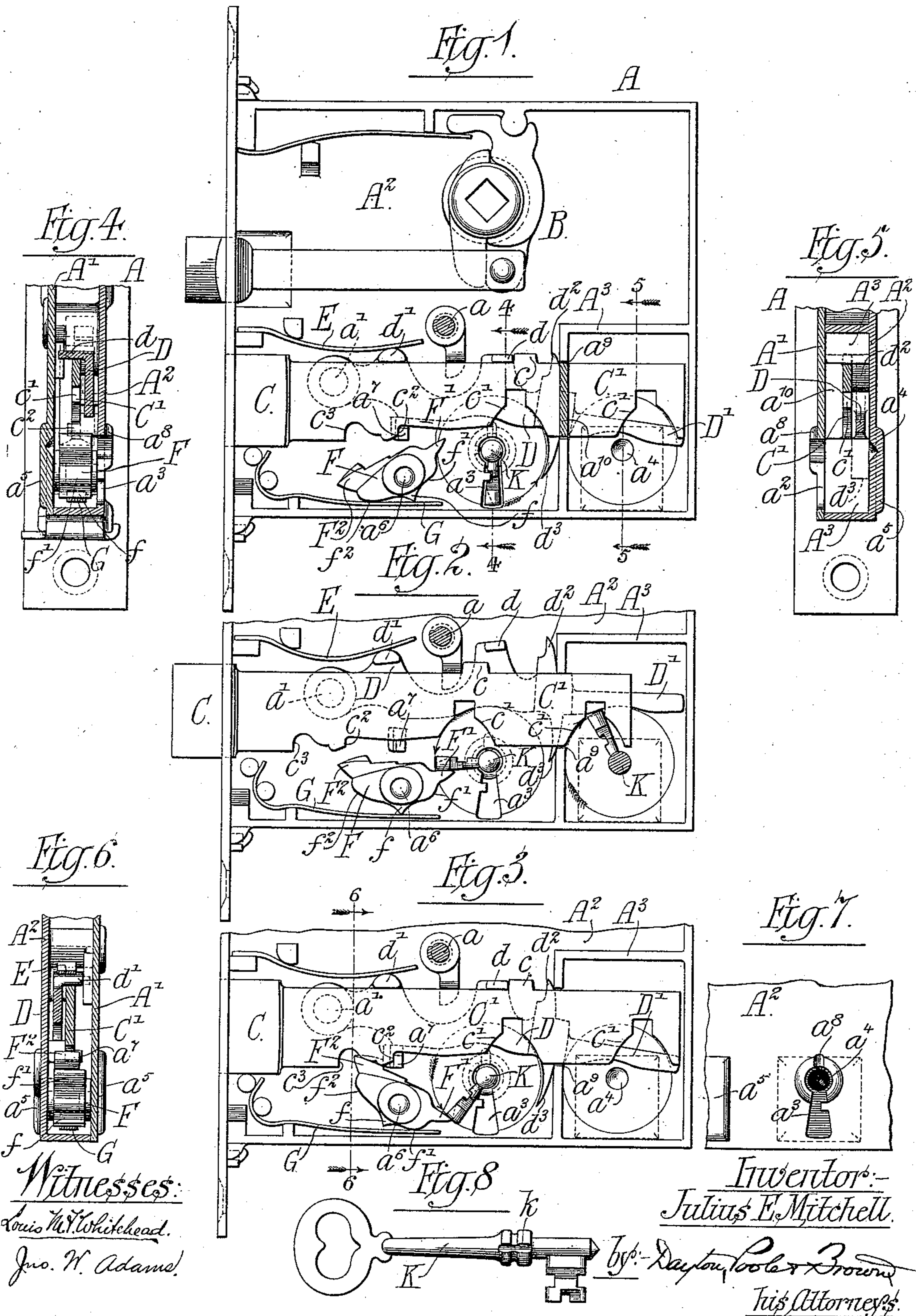


(No Model.)

J. E. MITCHELL.  
LOCK.

No. 532,893.

Patented Jan. 22, 1895.



# UNITED STATES PATENT OFFICE.

JULIUS E. MITCHELL, OF ELGIN, ILLINOIS.

## LOCK.

SPECIFICATION forming part of Letters Patent No. 532,893, dated January 22, 1895.

Application filed January 8, 1894. Serial No. 496,072. (No model.)

*To all whom it may concern:*

Be it known that I, JULIUS E. MITCHELL, of Elgin, in the county of Kane and State of Illinois, have invented certain new and useful  
5 Improvements in Door-Locks; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form  
10 a part of this specification.

This invention relates to improvements in locks and more particularly in that class of locks especially designed for use on the doors of houses and other buildings and adapted to  
15 be reached with a key from both sides of the door.

The object of the invention is to provide an improved construction of lock such that while generally similar to the form now in common  
20 use, and while equally capable of performing satisfactorily all the functions thereof, the lock can be readily so adjusted as to render it practically impossible to unlock it from the outside either with a proper key or with any  
25 surreptitious instrument, except by entirely destroying the surrounding structure.

My invention will be fully understood from the following description taken in connection with the accompanying drawings, in which—  
30 Figure 1 is a side elevation, with parts in section, of a lock constructed in accordance with my invention, the outside wall of the casing being removed. Figs. 2 and 3 are similar views of the locking mechanism, showing  
35 the parts in different positions. Figs. 4 and 5 are cross-sections on lines 4—4 and 5—5 of Fig. 1. Fig. 6 is a similar view on line 6—6 of Fig. 3. Fig. 7 is a detail showing the exterior appearance of the inside key-hole. Fig.  
40 8 shows one of the lock keys.

A designates the case of the lock which, in this instance, is a mortise lock, adapted to be inserted in a suitable aperture in the door, after the usual manner. Said case is of substantially the ordinary construction, having  
45 a removable side wall A' adapted to be secured in place by a suitable screw  $\alpha$ , and in this instance shown as forming that side of the case designed to be placed adjacent to the  
50 outside of the door.

B designates the latching mechanism as a whole, the same being of any desired or suit-

able construction and forming no part of my invention.

As is usual in locks of this class, the locking bolt as shown comprises a heavy head or tongue C, reciprocating through a slot in the face of the case, and a thin shank C' rigidly secured to the head or tongue C and extending  
55 nearly the full length of the case. Between the shank C' of the bolt and the rigid side wall A<sup>2</sup> of the case, a tumbler D is pivoted upon a lug  $\alpha'$  projecting from said side wall A<sup>2</sup> near the front thereof. Said tumbler extends back  
60 nearly to the rear wall of the case and is provided about midway of its length with a lug  $\delta$  normally resting on the top of the bolt shank C' and adapted to engage either the front or rear edge of a lug c which projects  
65 upward from the edge of said bolt shank. A spring E pressing on a lug  $\delta'$  of the tumbler near the front end thereof serves to maintain the lug  $\delta$  in contact with the upper edge of the bolt, except at such times as the tumbler  
70 is raised by the key to permit the lug c to pass beneath the lug  $\delta$  in the locking and unlocking of the device.

Key-holes  $\alpha^2$  and  $\alpha^3$  are provided in the outer and inner side walls A' and A<sup>2</sup> respectively of the case, but instead of being placed  
80 opposite each other they are separated laterally by a considerable distance, the outside key-hole  $\alpha^2$  being in this instance located near the rear of the case, while the inside key-hole  $\alpha^3$  is located about midway of the length of  
85 the same. In order to support and afford a bearing for the point of the stem of the key a bearing aperture  $\alpha^4$  is provided in the wall of the case opposite each of said key-holes,  
90 said apertures being as herein shown extended only part way through the walls, which are thickened in their adjacent portions, as shown at  $\alpha^5$ . By this construction the inner end of the key shank is supported, while at the  
95 same time I avoid cutting through the side wall of the lock case, so that said inner end of the key shank never protrudes through the lock case. One advantage of this construction is the avoidance of an aperture at  
100 this point through which dust might work into the lock case from the mortise, and furthermore the key is entirely protected from manipulation by nippers even though the wood-work of the door be cut away as a solid

metal wall is interposed between the key and the exterior of the lock case. I am aware that it is not new to provide the wall of a lock case at a point opposite the key hole with a hole or opening extending through said wall forming a socket in which the inner end of a key shank may enter and be supported, and I therefore make no claim to such a construction. The bolt shank  $C'$  and tumbler  $D$  are designed to be operated in a usual manner by a key inserted at either key-hole and to this end said shank is provided at a point adjacent to each key hole with the usual V-shaped notch  $c'$  by engaging which the key acts to shift the bolt, while the tumbler  $D$  extends across said notches in position to be lifted by the key so as to disengage the lug  $d$  from the lug  $c$  and permit said bolt to be so shifted. At a point adjacent to the inside key-hole  $a^3$ , however, and in this instance just forward thereof, an oscillating pawl or catch  $F$  is pivotally mounted upon a stud  $a^6$  projecting from the inside of the wall  $A^2$  of the case. The rear end  $F'$  of the pawl normally stands within reach of the bit or web of the key inserted at  $a^3$ , so that by suitably turning the latter the pawl may be oscillated as desired. The forward end  $F^2$  of the pawl is adapted when thrown up to engage the lower edge of the bolt shank  $C'$  and the latter is provided with a rearwardly facing shoulder  $c^2$  behind which said end  $F^2$  of the pawl may rest when the bolt is thrown out and thereby prevent the return of the bolt until said pawl shall have been withdrawn by a key inserted at the inside key-hole  $a^3$ . Inasmuch as the end  $F^2$  of the pawl is liable to be raised when the bolt is drawn in, the lower edge of the shank  $C'$  is recessed at  $c^3$  just forward of the shoulder  $c^2$  to receive said pawl end (see Fig. 3), the exact shape of the recess being immaterial. A fixed stop  $a^7$  is herein shown as projecting from the wall  $A^2$  of the case in position to engage the shoulder  $c^2$  and limit the inward or rearward movement of the bolt, the lower edge of the shank at the rear of the shoulder being shown cut away to avoid interference with said stop during the forward movement of the bolt. By reason of the cut away portion interference with the rear end  $F'$  of the pawl  $F$  when lifted, as shown in Fig. 1, is also avoided.

The pawl  $F$  is normally held from movement by a suitable flat spring  $G$  which exerts a constant upward pressure on the under side of the pawl. Said under side of the pawl is shown formed with a central projection  $f$  and on opposite sides of the latter with shoulders  $f'$  and  $f^2$  located adjacent to the ends  $F'$  and  $F^2$  respectively. When the pawl is turned into a substantially horizontal position (as shown in Fig. 2) the line of pressure of the spring  $G$  on the point of the projection  $f$  lies directly through the center of the pivot  $a^6$  and the pawl is lightly held from movement in either direction. If however, the pawl is slightly moved from this horizontal or central

position, the pressure of the spring will continue to turn it in the direction in which it was started until one of the shoulders  $f'$  or  $f^2$  comes into contact with said spring, in which case one of the ends  $F^2$  or  $F'$  respectively will have reached its normal uppermost position while the other end of the pawl will have reached its lowermost position. In either position the rear end  $F'$  of the pawl is within range of the bit of the key so as to be moved by the same when approached from either above or below, the spring  $G$  yielding still further at each end of the throw of the pawl to permit the key to pass by its end  $F'$  (see Fig. 3) and then returning said end into position to be engaged by the key on its return.

With such construction it is obvious that if the bolt is thrown out by means of an inside key and the latter turned to substantially the position shown in Fig. 3, the forward end  $F^2$  of the pawl will pass behind the shoulder  $c^2$  and absolutely prevent the bolt from being withdrawn by a key inserted in the outside key-hole. At the same time the action of the inside key will not be interfered with since the reverse movement necessary to withdraw the bolt will obviously raise the rear end of the pawl and simultaneously lower its front end from engagement with the shoulder  $c^2$ . If, however, it is desired to lock the door from the inside in such manner as to leave the lock in condition to be opened from without, as for example, by some member of the family or household who is to return later, it is only necessary to turn the key into the position shown in Fig. 2, which will bring the pawl into its middle or horizontal position free of engagement with the bolt. Obviously when the pawl is in this position the bolt may be withdrawn by a key inserted at either the inside or outside key-hole.

Any suitable key  $K$  (Fig. 8) may be employed in a lock of the character described and preferably, as herein shown, the same key will be used for the outside and inside key-hole, though obviously differently shaped keys might be employed if so desired. In order, however, to enable the position of the inside key necessary to bring the pawl into its middle or horizontal position, to be determined easily and accurately, I provide on the outer edge of the inside key-hole a groove or mark  $a^8$  and on that part of the stem of the key which will come adjacent to said key-hole when the key is inserted, a corresponding mark or groove  $k$ , said groove being so located as to stand exactly opposite each other when the key is in the position desired. Consequently in order to set the lock so as to permit of its being opened from without it is only necessary to turn the inside key until the grooves  $a^8$  and  $k$  coincide, when the parts within the lock will have been brought into the correct relation. Said groove  $a^8$  though herein shown for the purpose of illustration, will obviously be placed upon the case of the lock itself only

when the latter is a rim or face lock. If a mortise lock as in this instance, such groove will necessarily be placed upon the key-hole escutcheon or adjacent exposed part.

5 Obviously the distance from the outside key-hole to the pawl F would of itself render it extremely difficult to operate said pawl by means of a lock pick introduced through said key-hole. As a further improvement, how-  
 10 ever, and in order to render such operation absolutely impossible, that corner of the interior of the case in which the outside key-hole is located is herein shown separated from the rest of said interior by a partition  
 15 A<sup>3</sup> extending from the rear to the bottom wall of the case and integral therewith and with the rigid side wall A<sup>2</sup>. Said partition is apertured at a<sup>9</sup> for the passage of the bolt shank C' and tumbler D, that part of  
 20 the aperture between the shank C' and the outside wall A' being normally filled by a suitable rib a<sup>10</sup> projecting from said wall A'. The aperture a<sup>9</sup> is made just wide enough to receive the bolt shank C' and the tumbler D  
 25 is made sufficiently narrow at this point to be capable of its necessary oscillatory movement. The space above or below the tumbler in the various positions of the latter is, however, always closed by segmental spurs  
 30 d<sup>3</sup> d<sup>3</sup> projecting from the upper and lower edges of the tumbler adjacent to the partition A<sup>3</sup> and in front of the same. By this construction it is obvious that every aper-  
 35 ture through which a lock pick introduced at the outside key-hole might be attempted to be thrust in order to reach the pawl F is effectually closed at all times, no matter what the position of the locking mechanism,  
 40 so that when said pawl F is in position to lock the bolt it becomes absolutely impossible to withdraw the bolt except from the inside. The extreme end D' of the tumbler D or that  
 45 portion at the rear of the partition A<sup>3</sup>, is herein shown made of reduced width in order that breakage may occur back of said partition in case undue pressure is brought to bear upon the tumbler by an instrument inserted through the outside key-hole.

In Fig. 2 the pawl F is shown, and I have  
 50 hereinbefore described it as being, in a substantially horizontal position, but this is for convenience in drawing only, it being obvious that to throw or lock the bolt by the use of the inside key, and also leave the lock in  
 55 position to be unbolted by the outside key, the bit of the inside key (after performing its duty of throwing the bolt outward,) will rest between the lower edge of the shank C' and the rear end F' of the pawl, and that in prac-  
 60 tice this pawl will, by reason of the pressure of the spring G, assume the position shown in Fig. 1.

It will of course be understood that for convenience in assembling the parts as well as to  
 65 lessen the cost of the lock as a whole, certain fixed sizes or standards are in common use in the trade. In this instance the lock case shown

is of greater interior thickness than the tumbler, and hence that part of the aperture in the partition A which is between the shank 70 and the removable part of the lock case is shown as being filled by the projecting lug, but obviously it may be closed by a thickening of the shank or tumbler at this point, or in any other suitable manner.

I claim as my invention—

1. An improved lock, comprising an outer case provided in its opposite sides with laterally separated key-holes, of a bolt mechanism adapted to be operated by a key inserted 80 at either key-hole, and mechanism operated by a key inserted at one key-hole only, adapted to lock the bolt mechanism against withdrawal by a key or instrument inserted at the other key-hole, substantially as described. 85

2. An improved lock, comprising a case provided with a key-hole on its inner side and a second key-hole on its outside, said key-holes being laterally separated, of a sliding bolt adapted to be actuated by a key inserted at 90 either key-hole, and a pivoted pawl adapted to be moved by the inside key into engagement with the bolt, whereby the latter is held from withdrawal by an outside key, substantially as set forth. 95

3. An improved lock comprising a case provided with a key-hole on its inside, a second key-hole on its outside laterally separated from the first key-hole, a bolt mechanism normally adapted for operation from either key- 100 hole, a pivoted pawl near the inside key-hole, adapted for oscillation by the inside key to engage or disengage the bolt, and corresponding parts or grooves on the key and adjacent portion of the case or escutcheon, whereby the 105 position of the pawl may be determined by the coincidence of the grooves, substantially as described.

4. A lock comprising a case provided in its inner side with a key-hole and in its outer 110 side with a second key-hole, said key-holes being out of line with each other, a bolt mechanism adapted for operation from either key-hole, a pawl operated by the inside key for locking the bolt when thrown against opera- 115 tion by the outside key, a partition dividing the interior of the case between the key-holes, said partition being apertured only for the passage of the bolt mechanism, whereby access to the pawl through the outside key-hole is en- 120 tirely prevented, substantially as described.

5. A lock comprising a case provided in its inner side with a key-hole and in its outer side with a second key-hole out of line with the inside key-hole, a bolt mechanism nor- 125 mally adapted for operation from either key-hole, a pawl operated by the inside key for locking the bolt mechanism when the latter is thrown against actuation by the outside key, and a spring for holding the pawl either 130 at its extreme or intermediate positions, substantially as described.

6. A lock comprising a case provided on its opposite sides with key-holes out of line with

each other, a bolt mechanism adapted for operation from either key-hole, comprising a reciprocatory bolt extending past both key-holes and an oscillatory tumbler also extending past  
5 both key-holes between the bolt and one side of the casing, a pivoted pawl operated by the inside key for locking the bolt when thrown against actuation by the outside key, a partition dividing the interior of the case between  
10 the key-holes and apertured only for the passage of the bolt and tumbler, and segmental spurs on said tumbler adjacent to said partition, whereby access to the pawl through the outside key-hole is entirely prevented, sub-  
15 stantially as described.

7. A lock having an inside compartment into which the rear end of the bolt and tumbler project through a suitable slot in the front wall of said compartment, arms upon the upper and under side of said tumbler, projecting respectively above and below the ends of the said slot, whereby access to the interior of the lock through said compartment is prevented, substantially as described.

25 8. In a lock having a bolt and a tumbler, the

combination of two key-holes in opposite sides thereof and out of alignment with each other, a spring pressed pivoted pawl in juxtaposition to the inside key hole and to the bolt, whereby said pawl may be actuated by the  
30 key inserted through the inside key-hole to engage a suitable shoulder in the bolt and prevent retraction of the latter by a key inserted through the outside key-hole, substantially as described.

9. In a lock case having a key-hole in one side, a relatively thick portion on the side of the case opposite said key-hole, and a recess on the inside of said thickened portion adapted to support the end of the key when the latter is  
40 inserted in the key-hole, substantially as described.

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

JULIUS E. MITCHELL.

Witnesses:

TAYLOR E. BROWN,  
ALBERT H. GRAVES.