(Model.) 2 Sheets—Sheet 1.

W. M. MORTON.

LOCK.

No. 331,153. Patented Nov. 24, 1885.

Fig. 1

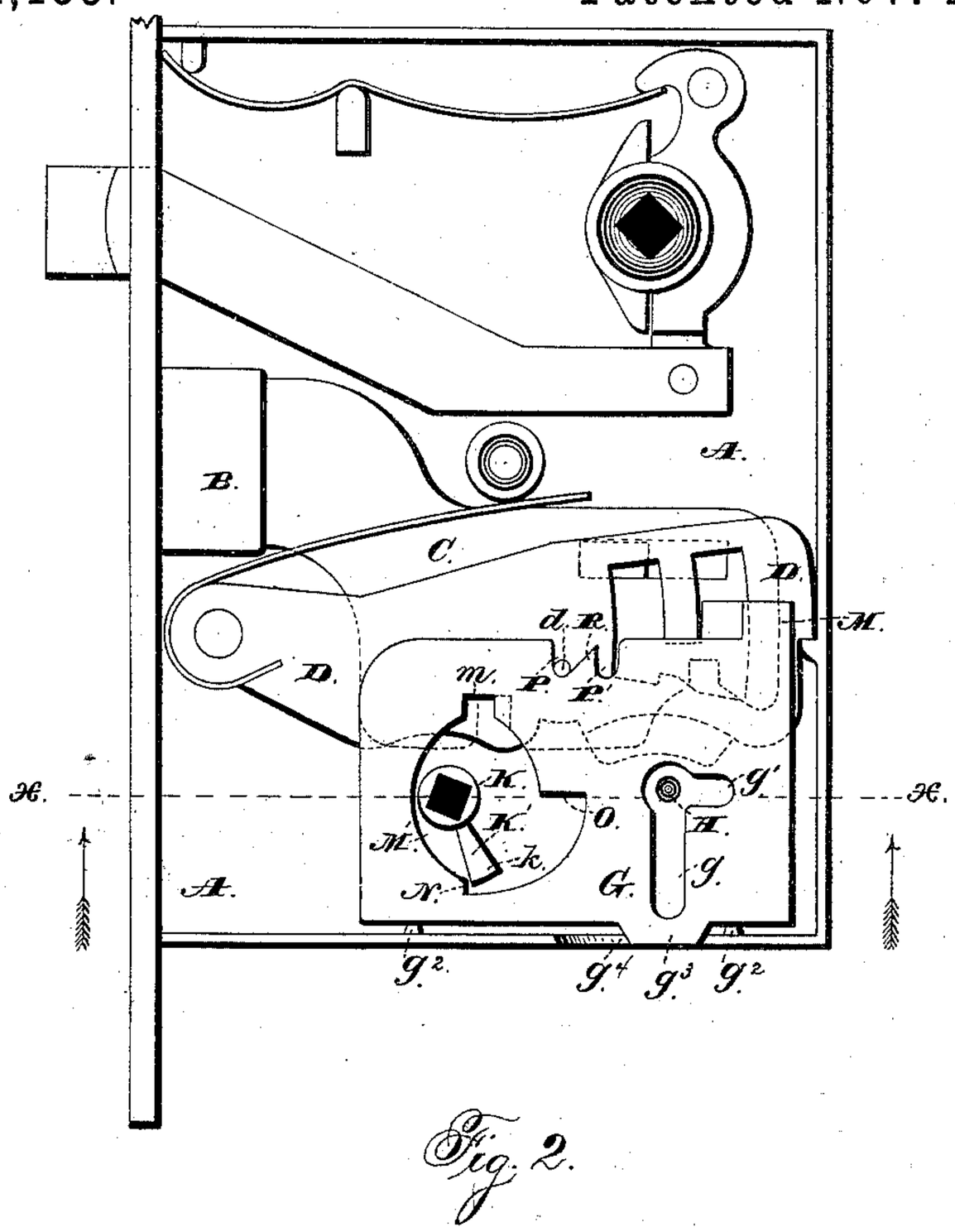
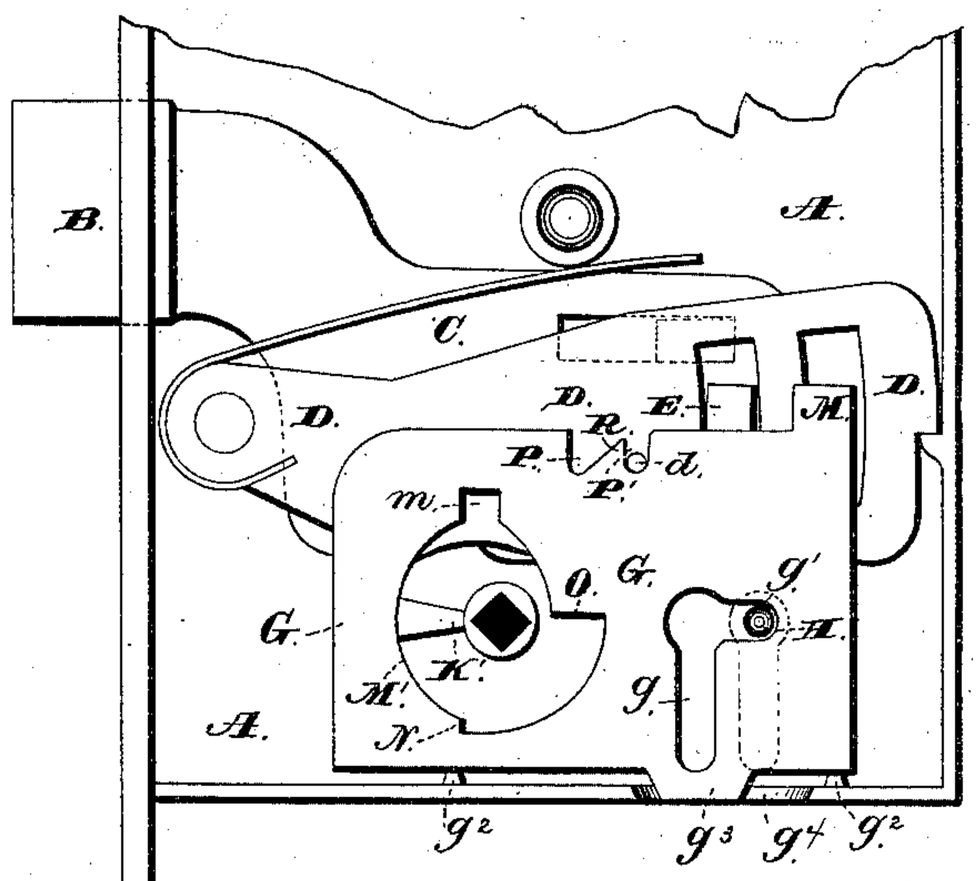


Fig. 2.



Witnesses:
Jas. E. Hutchinson.
Henry C. Hazard.

Inventor.
Wm M. Morton, by
Prindle and Russell his Attys

(Model.) 2 Sheets—Sheet 2.

W. M. MORTON.

LOCK.

No. 331,153. Patented Nov. 24, 1885.

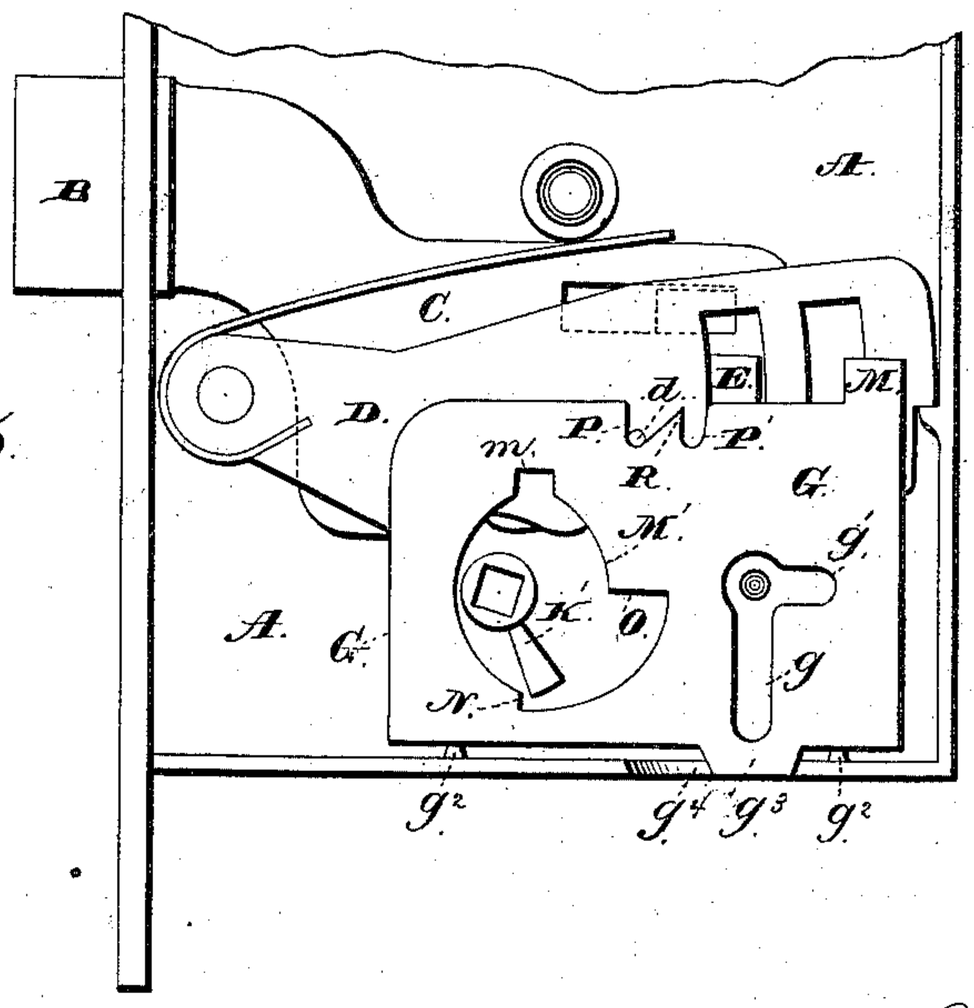


Fig. 5.

Fig. 4.

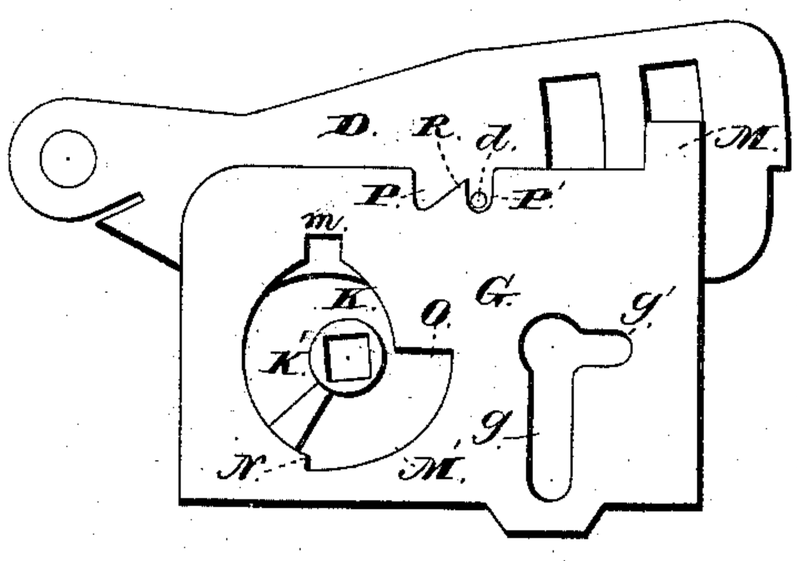


Fig. 5.

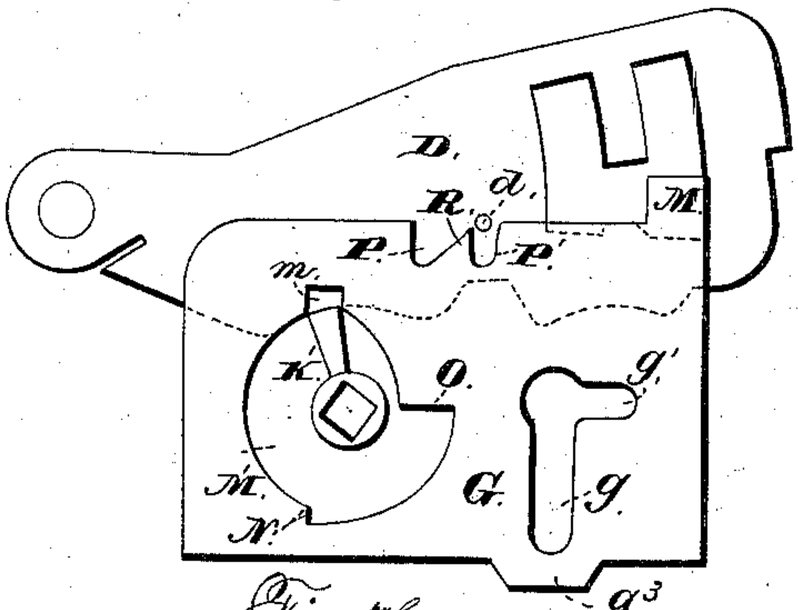


Fig. 6.

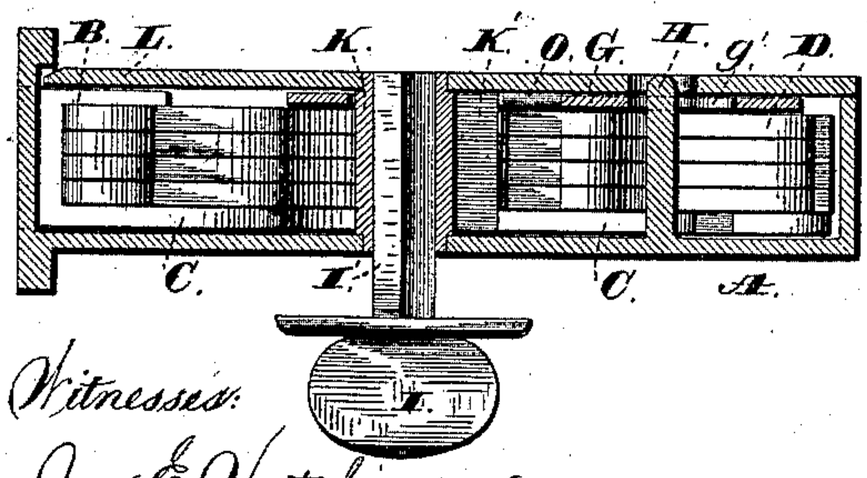
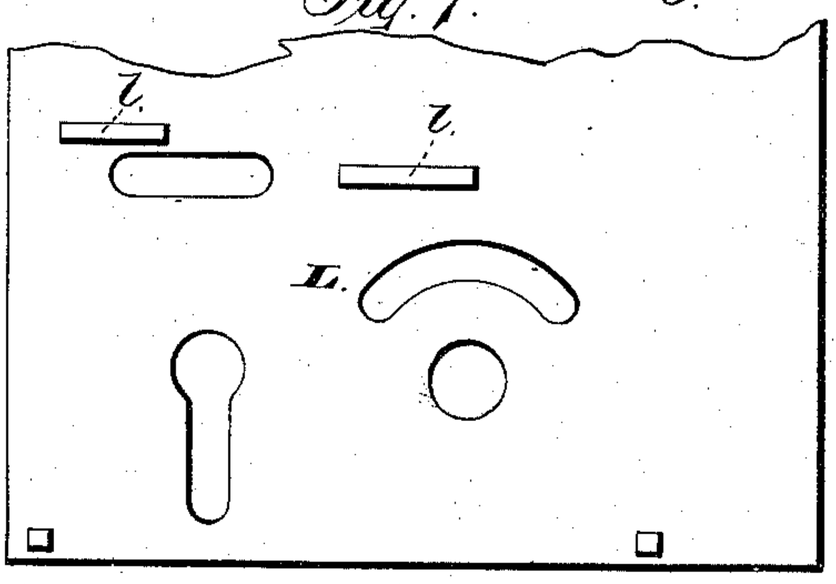


Fig. 7.



Witnesses:
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Henry C. Hazard.

Inventor.
Wm. M. Morton, by
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UNITED STATES PATENT OFFICE.

WILLIAM M. MORTON, OF MINNEAPOLIS, MINNESOTA.

LOCK.

SPECIFICATION forming part of Letters Patent No. 331,153, dated November 24, 1885.

Application filed May 18, 1885. Serial No. 165,884. (Model.)

To all whom it may concern:

Be it known that I, WM. M. MORTON, of Minneapolis, in the county of Hennepin and in the State of Minnesota, have invented new and useful Improvements in Locks; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the acccompanying drawings, in which—

Figure 1 shows a view in side elevation of my lock with the side plate removed, the bolt being slid back. Fig. 2 shows a similar view of the lock when the bolt has been thrown forward by turn-button from the inside of the door; Fig. 3, a similar view of the lock, showing the position of the parts when the door has been locked by a key from the outside of the door; Fig. 4, a detail view showing the first action of arm or cam on the shaft or arbor of the turn-button as the door is being unlocked, after being locked by the key, as shown in Fig. 3; Fig. 5, a similar view showing the position of the plate and top tumbler as the turn-button or lock latch is turned farther; Fig. 6 a sectional view of the lock on line X X of Fig. 1; and Fig. 7 a detail view showing inner side of the removable side plate of the lock.

Letters of like name and kind refer to like parts in each of the figures.

The object of my invention is to provide an improved guard mechanism for locks; and to this end it consists in the construction, arrangement, and combination of parts, as hereinafter specified.

In the drawings, A designates the casing of the lock, which is preferably of the mortise kind, provided with the usual form of latch mechanism in the upper part of the casing. This lock is provided with the bolt B, attached to or cast in one piece with the bolt-plate C, of ordinary construction, guided in the well-known way in its reciprocations by means of a lug on the side plate of the casing projecting into a slot in the bolt-plate. Any desired number of spring-actuated tumblers, of which the outer or top one, D, only is shown in the drawings, can be used, engaging in the well-known way the lug or stud E, projecting from the bolt-plate C, and having any desired shape on their under edges or surfaces for the proper engagement of the key of the required form.

The lug or stud E in my lock extends beyond the face of the top tumbler, D, for the purpose to be hereinafter set forth. On this top tumbler is a pin, *d*, the purpose and function of which will also be set forth hereinafter.

On the outer or key-hole side of the lock, and sliding alongside the tumbler D, is the guard-plate G, having in it the opening *g*, for the passage of the key-stem as it is thrust into the lock over the key arbor or stud H. The upper enlarged portion of this key-opening in the guard-plate is extended out horizontally at the side toward the inner end of the lock. This offset or slot *g'* is of such size as to just fit over the key-arbor H as the plate is slid toward the front end of the lock. The key-hole in the lock will thus be effectually closed, as indicated in dotted lines in Fig. 2.

The lower edge of the bolt-plate C is provided with the usual form of notch for the proper engagement therewith of the key as the latter is turned in either direction to shoot the bolt in or out.

To enable the bolt to be operated from the inside of the door, a turn-piece, I, is provided, attached to the end of a squared shank, I', which fits into the squared axial opening through the hub K of the cam K'. The ends of this hub are, as shown in Fig. 6, journaled in the side plates of the lock. The cam K' has the radial plate or arm *k*, which is adapted to engage the tumblers to properly raise them to release the bolt-plate C, and to operate the bolt by engaging a notch in the plate similar in shape to that provided for the engagement of the key. The guard-plate G rests and slides at its lower edge upon suitable lugs, g^2 g^2, projecting upward from the bottom of the lock. From the lower edge of the plate is the projection g^3, extending down into and playing in the slot g^4 in the bottom of the lock-casing. The removable side plate, L, is on its inner side cast or otherwise formed with the projections or lugs *l l*, which project over the upper edge of the guard-plate, and with the lugs g^2 g^2, upon which the plate rests, serve to guide the plate in its reciprocations. As shown in the drawings, the upper rear corner of the plate is extended upward to form a lug, M, which engages the stud E, projecting from the bolt-plate through the tumblers, as described hereinbefore.

The plate G is provided with the opening M′, through which passes the hub of cam K′, with its arm or radial plate *k*. This opening is at its upper end formed with the offset or notch *m*, with the sides of which the arm or plate *k* engages as cam K′ is revolved in either direction. From the lower corners or edges of this notch the sides of the opening M′ are curved away in opposite directions, so as to admit of the proper revolution of the cam, with its plate or arm *k*. They are curved on arcs of circles described from the centers of the cam-hub when the plate G is at opposite ends of its play. These curves, as shown, if continued upward, would intersect the opposite sides of the notch. With this construction, if the cam be turned upward and over, it will always engage one side of the notch, and will reciprocate the plate in the same way that it moves the bolt-plate. The lower and forward side of the opening below the plane of the cam-hub is curved, so that the cam-arm can be turned freely up or down past it when the plate is slid forward, as when in position to close the key-hole. At the lower end of this curved side of the opening is the shoulder N, corresponding to one of the sides of the notch or offset at the upper end of opening M′. From this shoulder the lower and inner side of opening M′ is curved backward and upward on a circle having a radius equal to that of the cam, and described from the cam arbor center when the plate is in its forward position. This curve is continued upward to a point on a plane with such center, and is there joined with the lower end of the curved upper and inner side by a straight line to form a shoulder, O. The upper edge of plate G is provided with the two notches P P′, separated by the lug or projection R, which is inclined or sloping on its forward side and abrupt on the outer or rear side. The pin *d* on the top tumbler engages these notches, as hereinafter to be described.

In the guard-plate lock patented November 7, 1871, No. 120,704, when the door had been locked, by means of the key, from the outside of the door, it was not only impossible to slide the guard-plate over the key-hole by means of the knob or turn-piece on the inside of the door, but it was impossible to unlock the door at all, except from the outside and with the key. My present guard-plate lock is designed to avoid these very great objections to the patented lock. If the bolt of my lock is shot from the outside by a key, the guard-plate G is left in the position shown in Fig. 3. The occupant of the room can then from the inside, by turning the knob or thumb-piece, turn the cam so that its arm or plate will strike the shoulder N and carry the plate G forward, so that the key-opening in it will be out of line with the key-hole of the lock, as indicated in Fig. 2, and said key-hole will be closed. During the movement of the plate the pin *d* on the tumbler rides up the inclined sides of the forward notch, P, in the upper edge of the plate, and drops into the rear one, P′, thus locking the plate. If, now, it be desired to unlock the door, the cam is turned farther upward and backward until it engages the tumblers and lifts them in the usual way, thereby raising pin *d* out of notch P′ to release the plate, and then engages the recesses or notches in the bolt and guard-plates, respectively, and moves said plates both back to unlock the door and open the key-hole. The pin *d* on the top tumbler then drops into notch P. While the bolt and plate are both slid back, as shown in Fig. 1, if the thumb-piece and cam be turned upward and forward, the arm or plate of the cam will pass up along the curved upper end of the opening M′ until it strikes the side of the notch or offset, and will then carry the guard-plate forward. As in the ordinary locks, it meantime raises the tumblers to release the bolt-plate and slides said plate out. When the tumblers are allowed to drop again by the cam, the pin on the top tumbler then drops into notch P′ and locks the guard-plate. Said plate can also, further, be locked by turning the cam K′ so that its plate or arm is horizontal and toward the outer or forward end of the lock, as shown in Fig. 2. The plate could not then be slid inward, as the side of the opening would strike this cam-arm. As the lug on the upper inner corner of the guard-plate rests against or engages the rear side of the stud on the bolt-plate, as described and shown, the guard-plate cannot be slid forward to close the key-hole without a movement of the bolt-plate to shoot the bolt; but the bolt can be forced forward and out by a key independently of any movement of the guard-plate.

Having fully set forth the nature and object of my invention, what I claim is—

1. In a lock adapted to be operated by a key on one side and a cam turned by a suitable thumb-piece or knob on the other side, the guard-plate for covering the key-hole, adapted to be moved by the cam to close the key-hole after the bolt has been shot by the key, substantially as shown and described.

2. In a lock, in combination with the bolt mechanism adapted to be operated by a key from the outside of the door, and means for operating the said bolt from the inside of the door, the guard-plate for covering the key-hole, adapted to allow such bolt to be shot by the key, and adapted to be moved by the means for operating the bolt from the inside, so that it shall cover the key-hole after the key is withdrawn, substantially as and for the purpose described.

3. In combination with the bolt-plate provided with a stud, the tumblers having slots through which extends said stud, the guard-plate for closing the key-hole, provided with a lug adapted to engage the rear side of the bolt-plate stud, and means, operated from the inner side of the lock, adapted to actuate the bolt to lock or unlock the door, and at the

same time to move the guard-plate to close or unclose the key-hole, substantially as and for the purpose described.

4. In a lock adapted to be operated by a key on one side, the bolt-plate having a stud, and the tumblers having slots through which extends said stud, in combination with the guard-plate for closing the key-hole, provided with a lug engaging the rear side of the bolt-plate stud, when the plate and bolt are slid back, so that the bolt can be moved out by the key independently of the guard-plate, but the latter cannot be moved forward to close the key-hole without the bolt-plate and bolt being moved forward, substantially as and for the purpose set forth.

5. In a lock adapted to be operated from one side by a key and on the other by suitable means independent of such key, the bolt-plate and tumblers adapted to be operated by such means, and by the key, as desired, and the guard-plate for closing the key-hole, sliding on the outside of the series of tumblers, and provided in its upper edge with the two notches, the forward one of which has its rear side inclined backward, in combination with the pin on the outer tumbler adapted to engage these notches, and the means for operating the lock independently of the key, adapted also to reciprocate the plate, substantially as shown and described.

6. In a lock, in combination with the bolt-plate and tumblers adapted to be operated by a key from the outer side of the lock, the key-hole-guard plate provided in its upper edge with two notches, of which the forward one has its rear side inclined rearwardly, and the rear one has abrupt sides, the pin on the outer tumbler adapted to engage these notches, and means adapted to slide the bolt and guard-plate forward and back together in locking and unlocking the door, and move the guard-plate forward independently of the bolt when the said bolt has been shot by the key, substantially as shown and described.

7. The sliding guard-plate for the key-hole of a lock, provided on its upper edge with two notches, the forward one of which has its rear side inclined, and the other abrupt sides, in combination with a pin on the tumbler next the plate, adapted to engage such notches, substantially as and for the purpose described.

8. In combination with the sliding guard-plate for closing the key-hole of a lock, the cam for operating the tumblers and bolt, extending through and revolving in an opening in the plate, said opening being formed above the cam, so that as said cam is turned to throw the bolt in either direction it will also move the plate, and below with a shoulder against which the cam can be turned to throw the plate forward to close the key-hole, substantially as and for the purpose described.

9. In combination with the sliding guard-plate and means for automatically locking it when in position to close the key-hole, the cam for operating the tumblers and sliding the bolt independently of the action of a key extending through and revolving in an opening in the plate so formed above the cam that as the cam is turned to throw the bolt in either direction it will also move the plate, and below the cam formed with a shoulder against which the cam can be turned to throw the plate forward to close the key-hole when the bolt has been thrown forward by the key, substantially as and for the purpose described.

In testimony that I claim the foregoing I have hereunto set my hand this 25th day of August, 1884.

W. M. MORTON.

Witnesses:
LUCIAN SWIFT, Jr.,
J. FRED SMITH.