(No Model.) 2 Sheets—Sheet 1.

A. B. EWING.

LOCK.

No. 305,684. Patented Sept. 23, 1884.

Fig. 1.

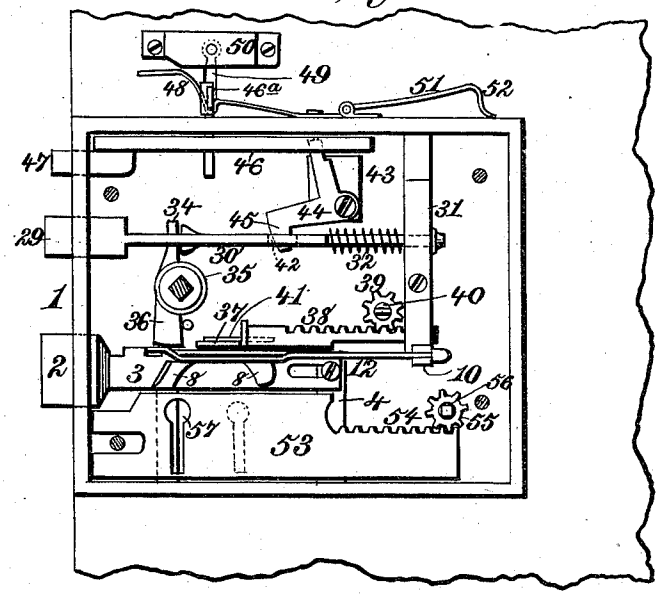


Fig. 2.

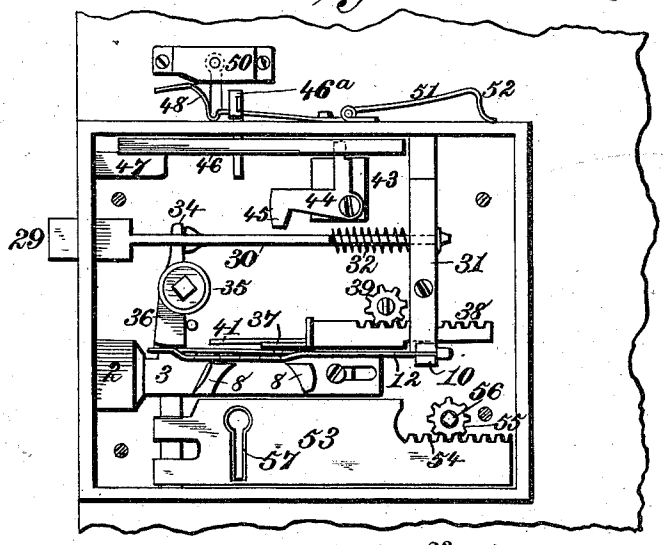
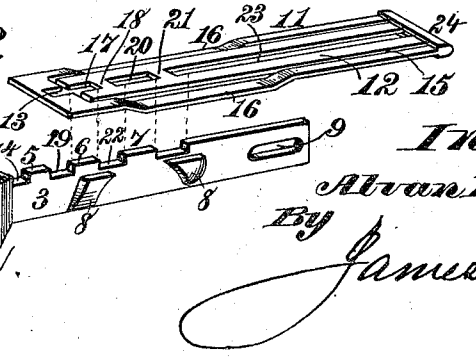


Fig. 3.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

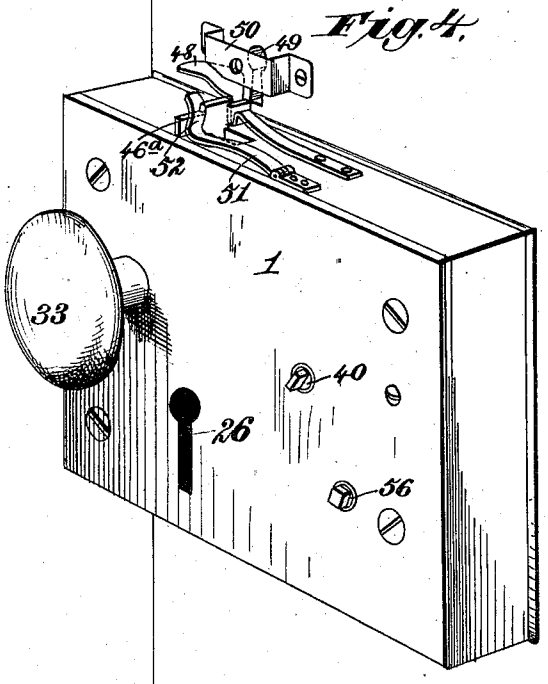


Fig. 6.

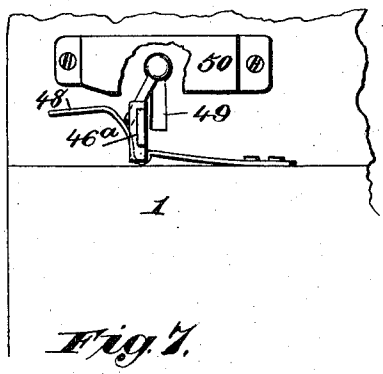


Fig. 5.

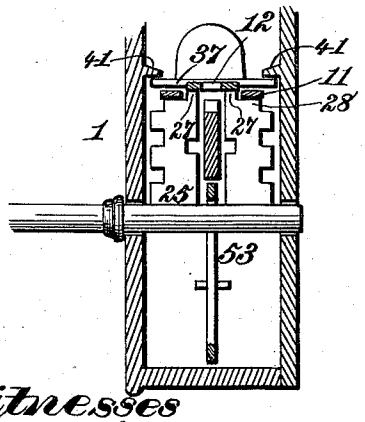
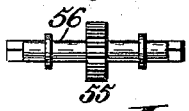


Fig. 7.



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UNITED STATES PATENT OFFICE.

ALVAN B. EWING, OF LEWISBURG, TENNESSEE.

LOCK.

SPECIFICATION forming part of Letters Patent No. 305,684, dated September 23, 1884.

Application filed April 16, 1884. (No model.)

To all whom it may concern:

Be it known that I, ALVAN B. EWING, a citizen of the United States, residing at Lewisburg, in the county of Marshall and State of Tennessee, have invented new and useful Improvements in Locks, of which the following is a specification.

My invention relates to locks for doors and various purposes, and has for its object to provide a simple and effective construction whereby more than one independent safeguard is provided against the picking of the lock or the unlawful operation of the bolt.

To this end my invention consists, first, in the combination, with the lock-bolt, of one or more spring-plates engaging with lugs upon the bolt, and held in engagement therewith by the flange of the knob-spindle, whereby the key cannot be operated to shoot the bolt without first raising the said flange off the detaining-springs; second, in the combination, with the lock-bolt having one or more spring-plates which engage with lugs formed thereon, of a flange or tumbler upon the knob-spindle, whereby the locking-plates are retained in engagement with the lock-bolt, and an independent slide-plate overlying said spring-plates and acting independently of the knob-tumbler, to effect the retention of said plates with the lugs upon the lock-bolt, and prevent shooting the latter by the key until both the slide-plate and the tumbler of the knob-spindle are removed from the spring-plates; third, in the combination, with the trigger-plate by which the spring-bolt is locked, of a hinged locking-plate by which the trigger may be permanently retained in its locking engagement.

Referring to the drawings, Figure 1 is a rear elevation of the lock, the back plate being removed to expose the interior parts. Fig. 2 is a similar view showing a different position of the operative parts. Fig. 3 is a detail perspective of the locking spring-plates and the lock-bolt with which they engage. Fig. 4 is a perspective of the complete lock in its place upon the door, the parts being all in place. Fig. 5 is a vertical transverse section of Fig. 2, taken in a plane passing through the key-hole and extending a little above the bolt which is thrown by said key. Fig. 6 is a rear elevation of a portion of the lock illustrated in Fig. 4. Fig. 7 is a view of the actuating-spindle, with its central gear and double end fitted to receive the key when applied from either side of the door.

In the said drawings, the reference-number 1 indicates the lock-casing, which may be of the usual form. Within said casing is placed the lock-bolt 2, having a rearwardly-extending plate, 3, which has support upon a post or lug, 4, attached to the casing. This plate, which is shown in detail in Fig. 3, is provided upon its upper edge with lugs or detents 5, 6, and 7 for a purpose presently to be described, and has upon its vertical faces key-lugs 8, with which the key engages in shooting the bolt, and has a guide-slot, 9, by which the end of the plate is supported upon the post 4.

Upon the casing, and projecting from its inner face, is a rigid post, 10, upon which I mount two independent leaf spring plates, 11 and 12. Of these spring-plates the former, which is the broader, is provided with a narrow longitudinal slot, 13, extending nearly to its end, which lies in a notch, 14, in front of the lug 5 upon the bolt-plate. This slot 13 opens into a wide slot, 15, within which the second spring-plate, 12, lies, the latter being thus brought flush with the former. Upon each side of the inner plate, 12, the sides of the plate 11 are bent downward, as shown at 16, Fig. 3, for a purpose presently to be shown. The narrower and inner plate, 12, is notched at its end, giving an open slot, 17, which registers with the slot 13, and at the rear end of the slot 17 is a narrow strip, 18, which lies in a notch, 19, in the bolt-plate. Behind the transverse strip 18 is a second slot, 20, through which the lug or detent 6 passes, with a transverse piece, 21, lying in the notch 22, between the lugs 6 and 7, and behind said portion of the plate is a prolonged slot, 23. The two plates 11 and 12 are united at their rearward ends by a butt-strip, 24, and are so arranged with relation to the lock-bolt that they normally engage with the notched upper edge of the latter when retracted, in the manner described. The lock-bolt 3 is shot by a key, 25, (shown in Fig. 5,) inserted in a key-hole, 26. This key has a central slot, which straddles the lock-plate 3. Upon the ends of the webs, lying upon each side of the bridge-ward, are formed projections 27, which, as the key turns, engage

with and lift the inner spring-plate, 12, out of engagement with the notched bolt-plate, while outer projections, 28, engage at the same time with the depressed portions 16 of the outer spring-plate and lift it simultaneously. This permits the shooting of the bolt by the action of the webs or bits upon key-lugs 8. The spring-latch 29 is arranged above and parallel with the lock-bolt, and has a plate, 30, sliding in a supporting-post, 31, and thrown outward by a spiral spring, 32. This spring-bolt is retracted by a knob, 33, having a spindle of the usual form, which operates a tumbler, 34, engaging with said plate 30. Upon the sleeve 35, carrying this tumbler, is a lug, 36, which usually lies over and upon the ends of the spring-plates 11 and 12, as seen in Figs. 1 and 2, thereby preventing them from rising until the knob is operated to draw the spring-latch back. It is evident, therefore, that before the key can operate the bolt the knob must be turned far enough to withdraw the lug 36 from its engagement with the spring locking-plates 11 and 12.

As an additional and independent safeguard I mount above the said plates a horizontally-adjustable locking-plate, 37, having a rack-bar, 38, sliding in a suitable support, and meshing with a ratchet, 39, carried by a spindle, 40. This spindle has its ends projecting through the door and through the lock-casing, respectively, and said ends may be squared or otherwise formed to receive a key by which the ratchet 39 is operated. The plate 37 when thrown forward is held by guide-plates 41, which prevent it from rising, and in this position it possesses all the functions of the lug 36, with the additional advantage of being wholly independent in its action of every other portion of the lock mechanism.

In the plate 30 of the spring-latch is formed an aperture, 42, and upon a drop-bearing, 43, is pivoted a latch or trigger, 44, having an end, 45, which enters said opening in the manner seen in Fig. 1 and locks the spring-bolt against the action of the knob. This trigger is actuated by a slide-plate, 46, arranged within the lock-casing, and having a latch-bolt, 47, which may be used as an independent lock for either day or night. When thrown forward to shoot the latch-lock and engage the trigger, the cross-head 46^a, attached to the slide, rides over a spring-catch, 48, which automatically locks it against retrograde movement. This catch may be operated from within the door without using a key, and when access is desired from without the key is inserted at 49, a guard, 50, being placed to support the pin of the key. By turning the latter the spring-catch 48 is thrown down and the slide-plate retracted by the key, as seen in Fig. 6.

I have provided an additional safeguard, which may be used or not, as desired. A hinged stop, 51, is mounted upon the lock-casing, having a shoulder, 52, which, by throwing said stop over toward the cross-head 46^a, is brought against the latter, preventing the withdrawal of the bolt 47, the unlocking of the trigger 44, the retraction of the spring-latch 30, and, consequently, also causing the lug 36 to hold the spring locking-plates in place and rendering the key inoperative. The hinged stop 51, it is needless to say, is operated wholly from within.

In the lower portion of the lock-casing may be arranged a plate, 53, which is provided with a rack, 54, and reciprocated by a pinion, 55, centrally mounted upon a key-spindle, 56, set in the walls of the casing, and having its ends projecting through the same, and adapted to be operated by a key.

In the plate 53 I form an opening, 57, which is of suitable size and form, and so situated that when the plate is thrown backward to its limit of movement said opening 57 will register with the key-hole in the lock-casing or in the door, as the case may be. On the other hand, when not in such position the bolt-key cannot be inserted, as the solid portions of said plate lie in the way. It will thus be seen that by my invention I provide a lock consisting of few and simple parts, having a series of safeguards against the operations of a pick-lock, of which part, or the whole number, may be used simultaneously. For example, I may use the key-plate 53 alone or in combination with the other devices, and the same may be said of the locking-plate 37. I may also employ the lug 36 separately when using the latch-bolt 47. However, it is always in connection with the locking-lug 36. It will be seen that as the bolt 3 is shot the spring-plates 11 and 12 will again fall into place, engaging with the lugs and notches in rear of their former engagement and securely holding the bolt in its new position.

Instead of cutting the main or "bridge ward" of the key so that it may turn into contact with the lower edge of the bolt-plate, it may be made shorter, and adapted to engage with a notch cut in the under side of said plate, and thereby shoot the bolt. In this form of construction the key-lugs 8 may be omitted.

I am aware that locks have been constructed having detent-notches in the bolt-plate, and provided with tumblers which are actuated by springs, and drop into notches when the bolt is shot and prevent its retraction, said tumblers being lifted out of their locking-engagement by means of the key which throws the bolt.

In my invention I employ slotted elastic plates, one lying within and flush with the other, one of said plates having depressed lateral portions with which the key engages, to lift said plate out of engagement with the bolt; and I make no claim to a bolt locked by spring-actuated tumblers, as mentioned above.

Having thus described my invention, what I claim is—

1. The combination, with the lock-bolt, of slotted elastic locking-plates lying upon the bolt-plate and engaging with lugs or detents formed thereon, substantially as described.

2. The combination, with the lock-bolt having a plate provided with lugs or detents, of independent slotted elastic plates, one lying within and flush with the other, and operating conjointly to prevent the shooting of the bolt without raising said plate, substantially as described.

3. The combination, with a lock-bolt having lugs or detents, of slotted spring-plates normally engaging therewith, and a lug upon the knob-spindle, said lug normally lying over and upon the ends of said plates, and preventing them from rising without operating the knob, substantially as described.

4. The combination, with a lock-bolt having detents, of slotted spring-plates engaging therewith and locking the bolt, and a plate adjustable horizontally upon said plates by means of a key-spindle, and adapted to lock them from being raised out of engagement with the detents of the bolt, substantially as described.

5. The combination, with the lock-bolt having detents, as described, of the spring-plates engaging therewith, the knob-spindle having a locking-lug overlying said plates, the spring-latch actuated by a dog upon said spindle, a trigger engaging with said latch-plate, and means for operating said trigger, substantially as described.

6. The combination, with the lock-bolt having the detents or lugs, as set forth, of the independent spring-plates 11 and 12, the latter lying within and flush with the former, and the former having lateral depressed portions 16, substantially as described.

7. The combination, with the slide-plate actuating the pivoted trigger, of the cross-head projecting above the casing, and the hinged stop mounted upon said casing, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

A. B. EWING.

Witnesses:
JAMES L. NORRIS,
JOS. L. COOMBS.