

(Model.)

S. SHAW.
LOCK.

No. 335,965.

Patented Feb. 9, 1886.

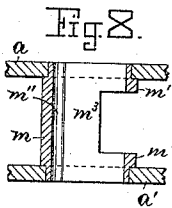
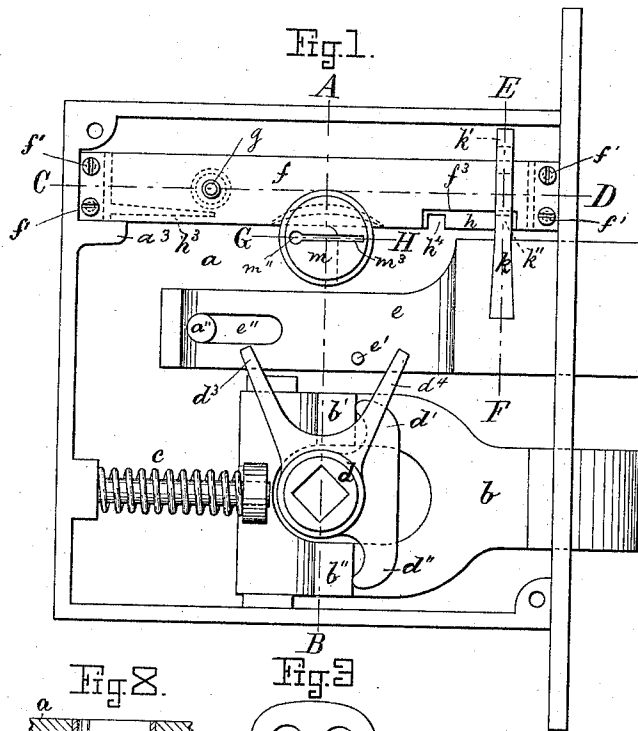


Fig. 3.

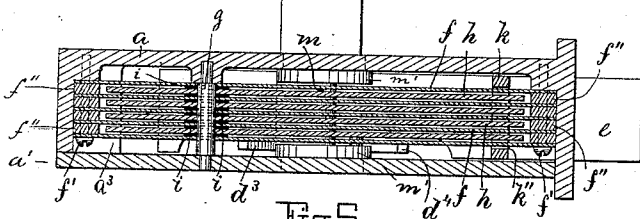
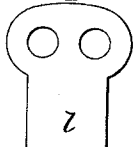


Fig. 5.

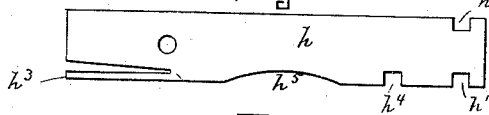


Fig. 6.

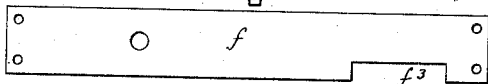
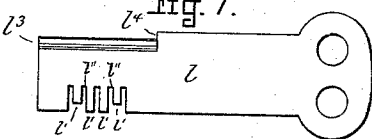


Fig. 7.



Witnesses
Henry Chadbourne.
Helen A. Curtis.

Fig. 2.

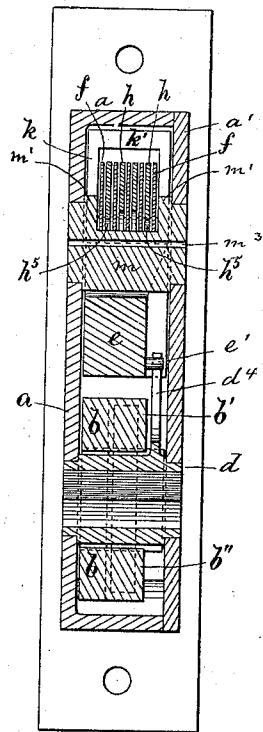
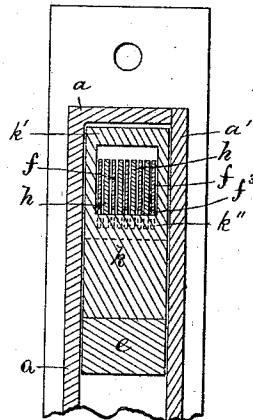


Fig. 4.



Inventor

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UNITED STATES PATENT OFFICE.

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LOCK.

SPECIFICATION forming part of Letters Patent No. 335,965, dated February 9, 1886.

Application filed March 14, 1885. Serial No. 153,814. (Model.)

To all whom it may concern:

Be it known that I, SUMNER SHAW, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Locks; and I hereby declare that the same are fully described in the following specification and illustrated in the accompanying drawings, where—

This invention relates to improvements in locks; and it is carried out as follows, reference being had to the accompanying drawings, where—

Figure 1 represents a side view of the improved lock, showing its interior mechanism. Fig. 2 represents a vertical section on the line A B, shown in Fig. 1. Fig. 3 represents a horizontal section on the line C D, shown in Fig. 1. Fig. 4 represents a vertical section on the line E F, also shown in Fig. 1. Fig. 5 represents a side elevation of one of the tumblers. Fig. 6 represents a side elevation of one of the stationary partitions between the tumblers. Fig. 7 represents a side view of the key, and Fig. 8 represents a longitudinal section of the tumbler-cylinder on the line G H, shown in Fig. 1.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

a is the case with its detachable cover *a'*, as usual. In the lower part of the case is located the usual latch, *b*, normally held in the position shown in Fig. 1 by the influence of the coiled spring *c*, and moved backward against the influence of such spring by turning the cylinder *d* around its axis (by means of a spindle and handle, as usual) when one or the other of the projections *d'* *d''* is brought in contact with the respective projections *b'* *b''* on the latch *b*, as is common in the locks now in use. To the cylinder *d* is attached or made in one piece the upwardly-projecting arms *d'* *d''*, by means of which and a pin or side projection, *e'*, on the bolt *e* the latter may be reciprocated when released from the tumblers. The bolt *e* is guided in its rear end by having the stationary pin *a''* on the case *a* projecting in the slotted perforation *e''* in said bolt *e*, as shown in Fig. 1. Above the bolt *e* are secured a number of stationary plates or partitions, *f f f*,

by means of the fastening-screws *f' f'*, said partitions *f* being held at a proper distance apart by means of the interposed blocks or end projections, *f'' f''*, as shown in Fig. 3.

A pin, *g*, is secured to the lock-case *a a'*, such pin passing through the partitions *f f*, as well as through the tumblers *h h*, the latter being hinged loosely on said pin *g*, so as to swing thereon when raised by the key. The tumblers *h h* are located each between a pair of partitions, *f f*, as shown in Figs. 2, 3, and 4, the latter serving as guides for the tumblers, to prevent them from moving sidewise, as well as preventing the lock from being picked by inserting a tool through the key-hole.

i i are washers located on pin *g*, between the tumblers *h* and their partitions *f*, to insure a steady motion of the tumblers without rattling sidewise.

Each tumbler *h* is slitted in its rear end, as shown in Fig. 5, so as to leave a thin spring-bar *h'* in its rear end, to serve as a spring to return the tumbler to its normal horizontal position after the bolt is fully opened or closed, such spring-bars *h' h'* on the rear under side of the tumblers being made to rest against the inwardly-projecting rib *a'* on the case *a*, as shown in Figs. 1 and 3. To the bolt *e* is firmly secured the upwardly-projecting yoke *k*, having upper and lower locking-ribs, *k'* and *k''*, for the tumblers *h h*, the latter having corresponding locking-recesses *h'* and *h''*, as shown in Fig. 5.

On the under side of each tumbler *h*, back of the recess *h''*, is made another recess, *h'*, which serves to hold the bolt *e* in an unlocked position by dropping onto the lower locking-rib, *k''*, of the yoke *k*.

Each partition-plate *f* has on its under side an elongated notch, *f'*, (shown in Figs. 1 and 6,) to permit the yoke *k* and its lower locking-rib, *k''*, to move forward and back with the bolt *e* without interfering with the stationary partitions *f f*. It will thus be seen that the bolt *e* is only liberated from the tumblers *h h* when the latter are raised by the key just enough to disengage the lower locking-rib, *k''*, from the respective lower notches, *h''* and *h'*, and in case the bolt *e* is in its outer locked position, as shown in Fig. 1, to unlock it from its tumblers it is essential that the latter should

be raised by the key just enough to release the lower locking-rib, k'' , from the lower notches, h'' , on the tumblers, and if the latter should be raised a little too far by an improper key or a picking-tool, the upper notches, h' , on the tumblers h will catch on the upper locking-rib, k' , on the yoke k , and thus prevent the bolt e from being withdrawn. In fact, this arrangement of upper and lower locking-ribs, $k' k''$, on the yoke k , combined with upper and lower notches, h' and h'' , makes the lock perfectly burglar-proof, as it cannot be opened except by the key for which it is designed, it being impossible to introduce a picking-tool on account of the partitions $f f$ being located side by side and in very close proximity to the tumblers $h h$, as shown.

Each tumbler h has on its under side a curved recess, h^3 , each one different from the others, as shown in Fig. 5 and in dotted lines in Fig. 1, corresponding in depth to the different teeth l' on the key l , (shown in Fig. 7.) said key having recesses $l'' l''$ between the teeth l' , to enable the key to be turned without interfering with the stationary partitions $f f$. The key l is made of thin sheet metal and provided on its back part of the way from its lower end with a cylindrical guide projection, l^3 , at the termination of which is an offset, l^4 , to limit the insertion of the key into the perforation in the cylinder.

m in Fig. 2 is the main portion of the tumbler-cylinder, and $m' m'$ are its end ribs or flanges, said cylinder having its ends journaled in the case and cover $a a'$, as shown in Fig. 2, so as to enable it to be turned more or less on its axis by means of the key to raise the tumblers.

m'' is a cylindrical perforation passing from one end to the other of the whole cylinder, and it serves as a guide for the corresponding cylindrical projection l^3 on the key l , so as to cause the latter to be guided properly when inserted into the said cylinder. In addition to the cylindrical perforation m'' is made a slit, m^3 , through the cylinder, corresponding in size and shape to the body of the key, the end of such slit m^3 passing through the flanges $m' m'$ only of the cylinder m , the body of which is cut away at this place, as shown in Figs. 2 and 8, and in dotted lines in Fig. 1, to enable the key to raise the respective tumblers when said key is inserted within the cylinder m and turned a quarter of a revolution.

The operation of my improved lock is as follows: We will suppose the bolt e to be in its outer locked position, as shown in Fig. 1. To unlock it the key l is inserted into the slit in the cylinder m , and the latter is turned one-fourth of a revolution, by which the tumblers $h h$ are raised just enough to liberate the lower yoke-rib, k'' , from the notches $h'' h''$ on the under side of the tumblers $h h$. The bolt e is now moved inward by means of latch-cylinder d , and the arm d^3 thereon coming in contact with pin e' on the bolt e causes the latter to be pushed in until the end of slot e'' is brought against stationary pin a'' . If, when

the bolt e is in its unlocked position, the cylinder m is turned back to its original position, (shown in Fig. 1,) the tumblers $h h$ will then be released from the projections l' on the key l and caused to swing on the fulcrum-pin g , by their own gravity or by the influence of springs h^3 or similar springs, until the lower notches, $h^4 h^4$, embrace the lower yoke-rib, k'' . To move the bolt e outward it is only necessary to raise the tumblers by means of the key l , as before, and to turn the cylinder d to the right sufficiently to cause the arm d^3 thereon to act on the projection e' on the said bolt, by which the latter is moved outward until the end of slot e'' comes in contact with pin a'' , in which position of the bolt e its yoke k is brought directly in a line with the notches $h'' h''$ on the tumblers. If, now, the cylinder m is turned by means of its key l to the position shown in Fig. 1, the tumblers $h h$ will drop into the positions shown in said figure, and their lower notches, h'' , locked onto the lower yoke-rib, k'' , after which the key is withdrawn.

Having thus fully described the nature, construction, and operation of my invention, I wish to secure by Letters Patent, and claim—

1. In a tumbler-lock, the movable tumblers h , having upper notches, h' , and lower notches, $h'' h''$, and the intermediate stationary division-plates, f , having lower recesses, f^3 , as described, combined with the bolt e , its yoke k , and locking-ribs $k' k'$, as and for the purpose set forth.

2. In a tumbler-lock, the bolt e , with its yoke k , having upper and lower locking-ribs, k' and k'' , in combination with the movable tumblers $h h$ and their respective upper and lower locking-notches, h' and h'' , as and for the purpose set forth.

3. In a tumbler-lock, the tumbler-cylinder m and movable tumblers h , having locking-recesses $h' h'' h''$, in combination with the bolt e , having yoke k , and locking-ribs $k' k''$, the projection e' on said bolt e , and the latch-cylinder d , having arms $d^3 d^4$, for operating the bolt e after its yoke has been relieved from the locking-recesses in the tumblers, substantially as and for the purpose set forth.

4. In a tumbler-lock, the tumbler-cylinder having solid portion m , connecting the end ribs, $m' m'$, the perforation m'' , passing through the solid part m from end to end of said cylinder, and slit m^3 , made through the ribs $m' m'$, combined with the key l , having a flat body adapted to fit into the slit m^3 , and enlarged back l^3 , adapted to fit into the perforation m'' , and limited in its position therein by the stop projection or offset l^4 on the key l , as and for the purpose set forth and described.

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

SUMNER SHAW.

Witnesses:

ALBAN ANDRÉN,
HENRY CHADBURN.