No. 626,376. Patented June 6, 1899.

J. W. HAGLUND.

LOCK.

(Application filed Sept. 12, 1898.)

(No Model.)

Fig. 1.

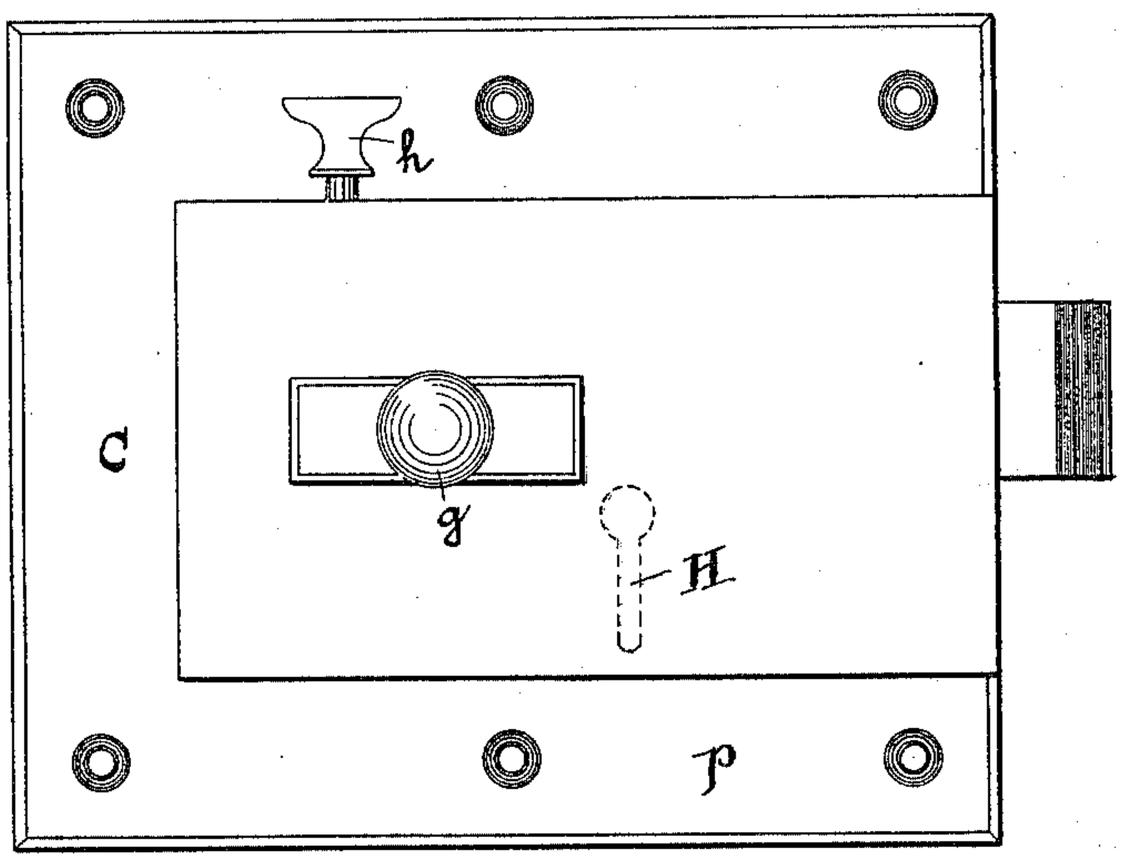


Fig. 2.

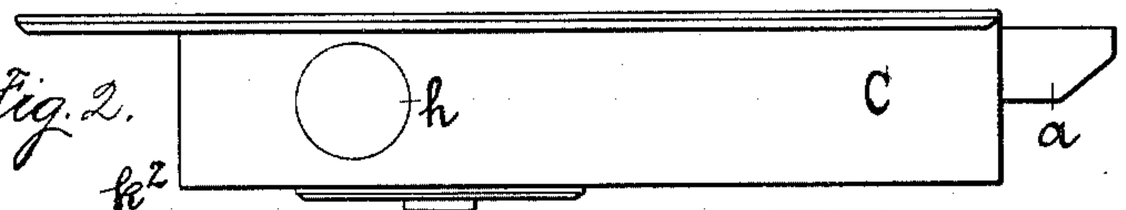


Fig. 8.

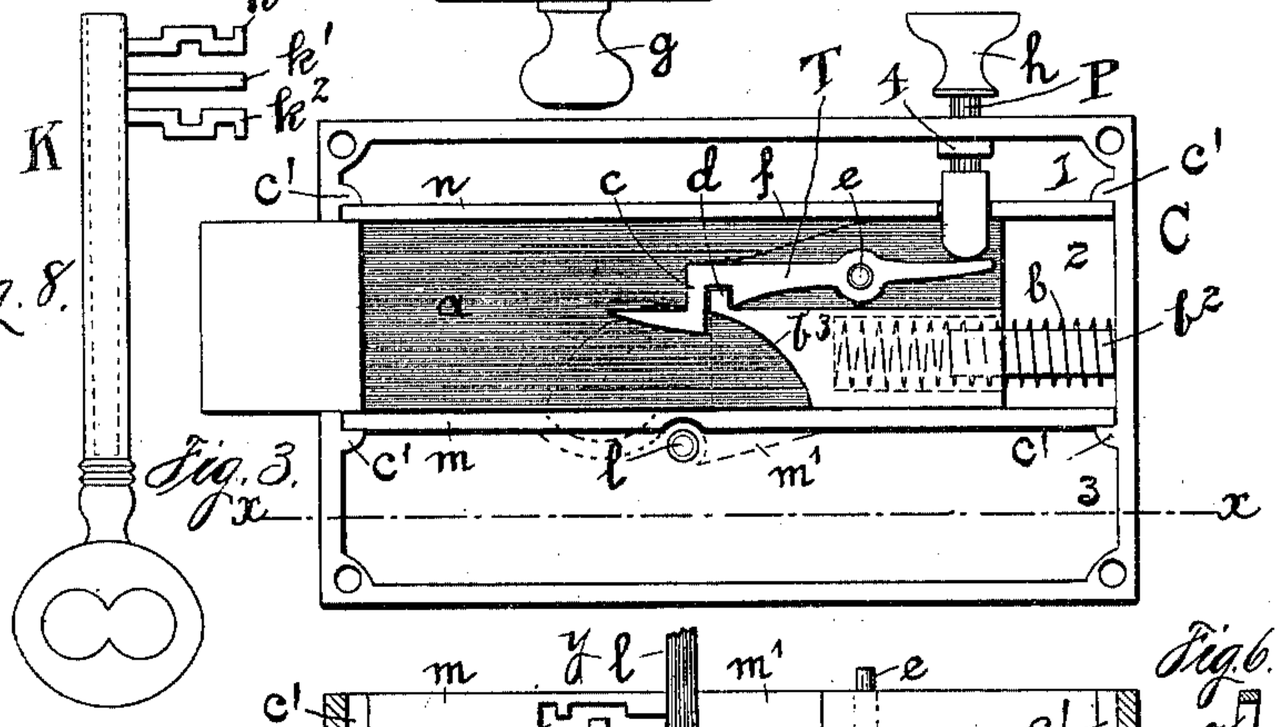


Fig. 3.

Fig. 4.

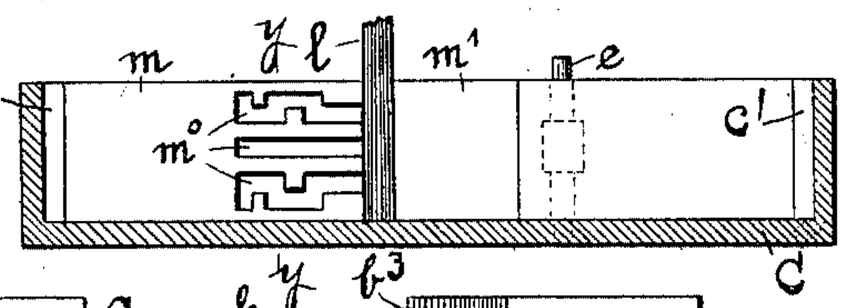
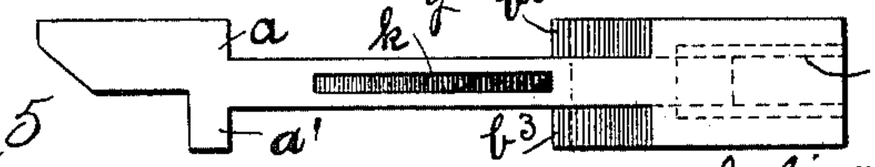


Fig. 6.

Fig. 7.

Fig. 5



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UNITED STATES PATENT OFFICE.

JULIUS WALDEMAR HAGLUND, OF STOCKHOLM, SWEDEN.

LOCK.

SPECIFICATION forming part of Letters Patent No. 626,376, dated June 6, 1899.

Application filed September 12, 1898. Serial No. 690,786. (No model.)

To all whom it may concern:

Be it known that I, JULIUS WALDEMAR HAGLUND, a subject of the King of Sweden and Norway, residing at 78 Linnegatan, Stockholm, Sweden, have invented certain new and useful Improvements in Safety-Locks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters and figures of reference thereon, which form a part of this application.

This invention has relation to safety-locks; and it has for its object a construction whereby the unauthorized tampering with the lock is effectually guarded against.

In the accompanying drawings, Figure 1 is a rear view, and Fig. 2 a plan view, of a lock embodying my invention. Fig. 3 is a front view of the lock, the front plate of the lock-case being removed. Fig. 4 is a section on line $x\,x$ of Fig. 3 looking upward. Fig. 5 is an under side view of the bolt. Figs. 6 and 7 are sections of the lower guide-plate m m on line $y\,y$ of Fig. 4, illustrating two modes of displacing the ward-slots, so that the wards of the key-bit will not pass simultaneously through said slots; and Fig. 8 is an elevation of the key.

The lock-case C, which is of polygonal form, may be constructed in any well-known manner and has formed on its end walls two ledges or seats c', on which are seated two guide or guard plates m and n, which divide the lock-case C into three separate chambers 1, 2, and 3, the bolt a being contained in the intermediate chamber 2 between the plates m and n, while the key-spindle l is secured to the back plate p of the lock-case C and projects across the lower chamber 3 into the circular portion of the keyhole H (shown in dotted lines in Fig. 1) and formed in the front plate of said lock-case.

The lower half, or approximately the lower half, of the rear end of the lock-bolt B is of increased thickness and has formed therein a socket b', into which projects a pin b^2, secured to one of the end walls of the lock-case, and on said pin is coiled a spring b, that tends to throw the bolt outward. The forward face of each of the shoulders b^3, formed by the enlarged portion of the bolt, is curved or concave, the arc of the circle having for center the key-spindle l, and is of such radius that the wards of the key-bit will not engage said face of the shoulders when said key is turned to move the bolt inward or out of engagement with its keeper.

The bolt a is moved inwardly against the stress of its spring by a central member k' of the key-bit K, Fig. 8, engaging the vertical rear face of a recess k in the under side of the bolt, the remaining inner face of said recess being arcate, the arc having for center the axis of the key-spindle l, so that in moving the bolt back it is necessary to first partly turn the key on its spindle until the aforesaid center ward engages the said vertical rear face of the recess k.

At the upper forward end of each of the shoulders b^3, on the lock-bolt a, is formed an upwardly-projecting ridge d, adapted to be engaged by the tumblers T, of which there are supposed to be two, one on each side of the lock-bolt. These tumblers are loosely mounted on a pin e, connected in a suitable manner with the front and back plates of the lock-case and extending through a longitudinal slot in the lock-bolt B. The tumblers T are acted upon by springs f, that tend to move said tumblers toward the locking-ridges d of the bolt, or downwardly, and have a lock-notch adapted to engage the aforementioned ridges d on the shoulders b^3 of the lock-bolt, the forward end of the tumblers being dropped down into the path of the outer members k^2 of the key-bit, the under face of said forward end of the tumblers being suitably inclined, so that the said members will lift them out of engagement with the aforesaid ridges d and thus release the bolt a before the center member k^2 engages the rear vertical face of the recess k in the under face of the bolt.

Near its forward end the bolt a has a lateral projection a', that limits its movement out of the lock-case.

Each of the tumblers is provided with a rearward projection or tail which lies in the path of a forked pin P, that projects through the upper guide-plate *n* and through the upper wall of the lock-case and is provided with a knob *h*, and to the lock-bolt is secured a pin *g*, provided with a knob projecting through the rear plate *p* of the lock-case and having motion in a slot therein, so that by depressing the forked pin P the tumblers can be disengaged from the bolt *a* and the latter moved inward by the pin *g* for the purpose of opening the lock from the inside of a room without having to use a key.

As shown in Fig. 3, the pin P carries a collar 4, which limits its upward motion, while the knob *h* limits its downward motion, and in its normal position said pin holds the tumblers in their normal operative position to be engaged by the wards of the key-bit. Hence the pin P serves also as an abutment against which the tail of the tumblers have bearing to prevent the tumbler-springs from tilting the tumblers out of their operative positions.

From what has been said it will be seen that the lock mechanism is contained in the intermediate chamber 2 of the lock-case, so that access to the lock-bolt from without is rendered more difficult.

To guard against the picking of the lock, the lower ward-plate *m* is provided with ward-slots which in form correspond to the members of the key-bit, it being obvious that with an ordinary pick or skeleton key the bolt *a* could not be thrown back, and to make it practically impossible to obtain an impression of these slots I so arrange them relatively to the plane of rotation of the members on the key-bit that said members will not simultaneously pass through their respective ward-slots m^{o}. This may be done in various ways—for instance, by arranging the plate *m* in a plane inclined to the axis of the key-spindle *l* or from the front plate to the rear plate of the lock-case, Fig. 6, or vice versa, in which case the members of the key-bit will pass successively through their respective slots m^{o}, or by giving the plate *m* a concavo-convex form in cross-section, Fig. 7, with its convex face as a bearing for the lock-bolt, or by making that portion of the plate *m* in which the ward-slots m^{o} are formed concavo-convex, with the concave side facing the lock-bolt, as shown in dotted lines in Fig. 3, in which case the center member *k'* on the key-bit will pass through its slot after the outer members have passed through theirs.

With a view to giving the bolt a greater range of motion the plate *m* on the rear or inner side of the key-spindle *l* (right-hand side of Fig. 3) may be recessed, as shown in dotted lines at *m'*, so that when the key is turned to throw the bolt its bit will lie in said recess, or the bit may have such angular relation to the stem of the key as that when the latter is turned in the lock to its full extent the bit will lie approximately flat upon the lower plate *m*.

I have shown a chambered lock-case. It is obvious, however, that the dimensions thereof may be reduced, the upper and lower chambers can be dispensed with, and a small chamber formed below plate *m*, inclosing its slotted portion and having the keyhole.

Instead of one slotted plate *m* several may be used arranged one above the other.

As shown, the key-spindle *l* is located below plate *m*, and the spring that actuates the bolt is so arranged that the power of the bit is applied to the bolt in the plane in which the power of the spring is exerted, thereby avoiding all tendency of the bolt to tilt and its binding on or in the parts that guide it. It is, furthermore, obvious that instead of providing one tumbler on each side of the bolt several such tumblers may be provided on each side.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. A lock comprising a bolt-chamber, a spring-actuated lock-bolt, means for locking the same against motion, the bottom plate of said chamber provided with ward-slots lying in different horizontal planes and so arranged relatively to the axis of rotation of the key that the parts of the key-bit which release and move the bolt against the stress of its spring will not simultaneously pass through said slots, for the purpose set forth.

2. A lock comprising a bolt-chamber, a spring-actuated bolt having endwise motion in said chamber and provided on opposite faces with a locking-ridge, and with an arcuate recess *k* having a rear vertical face, tumblers arranged on opposite sides of the bolt and engaging the ridges thereon, the lower or bottom plate of the chamber provided with ward-slots lying in different horizontal planes and so arranged relatively to the axis of rotation of the key that its bit parts which engage the rear face of the recess in the bolt and the tumblers will not simultaneously pass through their respective slots, substantially as and for the purpose set forth.

3. A lock comprising a bolt-chamber, a spring-actuated bolt having endwise motion in said chamber and provided on opposite faces with locking-ridges, spring-actuated tumblers pivoted in said chamber arranged on opposite sides of the bolt and adapted to engage said ridges, a vertically-movable abutment adapted to be manipulated from without the lock to operate the tumblers, provided with means for limiting its motion in either direction and on which abutment the tail of the tumblers have bearing, and means for moving the bolt against the stress of its spring independently of the key, for the purpose set forth.

4. A lock comprising a bolt-chamber, a spring-actuated bolt having motion on the

bottom plate of the chamber and provided in its under face with a recess *k* and tumblers on opposite sides of and engaging the bolt, said bottom plate provided with ward-slots of irregular form on opposite sides of a longitudinal slot in register with the aforementioned recess, for the purpose set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

JULIUS WALDEMAR HAGLUND.

Witnesses:
CARL P. GERELL,
LARS ROMELL.