

(No Model.)

A. L. BECHT.

LOCK.

No. 317,076.

Patented May 5, 1885.

Fig. 1.

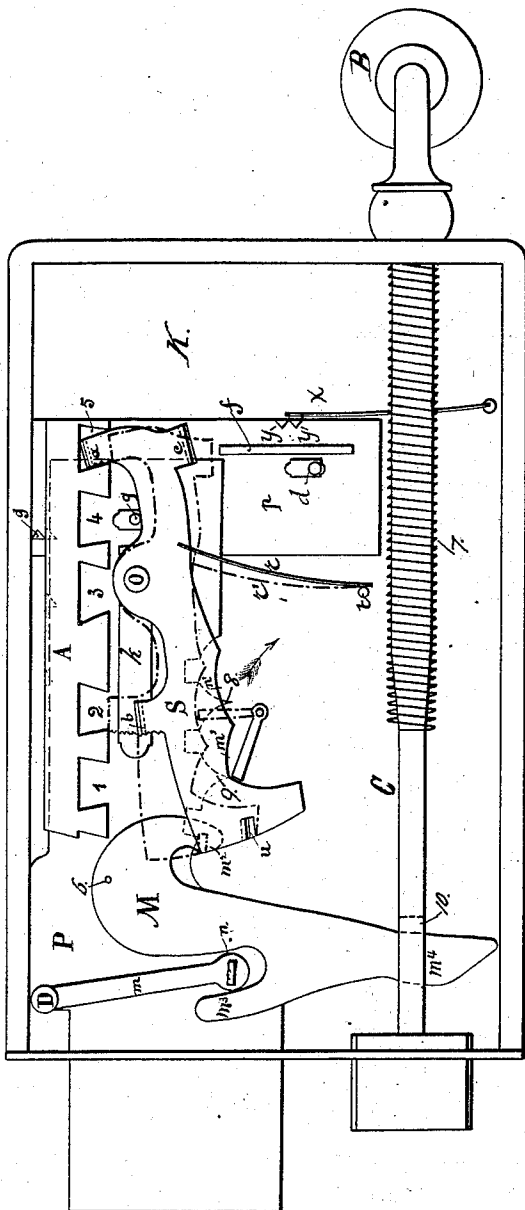


Fig. 3.

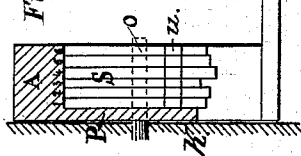
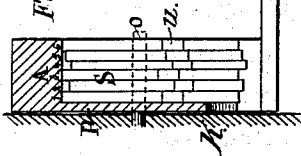


Fig. 2.



Witnesses.

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ALBERT LOUIS BECHT, OF PARIS, FRANCE.

LOCK.

SPECIFICATION forming part of Letters Patent No. 317,076, dated May 5, 1885.

Application filed August 21, 1884. (No model.)

To all whom it may concern:

Be it known that I, ALBERT LOUIS BECHT, a citizen of France, residing at Paris, in the Department of the Seine, have invented new and useful Improvements in Locks, of which

The present invention has for its object the construction of a lock provided with a series of tumblers so arranged that it will not be possible to take an impression in the ordinary way with a view to constructing a false key, and that picking of the lock will be impossible.

Referring to Figure 1 of the accompanying drawings, which shows in side elevation the interior of the lock, P is the bolt-carriage fastened to or made in one piece with a metal plate or bar, A, provided on its under side with notches 1 2 3 4 5 in the form of dovetails. Below this plate are a series of tumblers, S, oscillating on a fixed pin or arbor, *o*, when acted upon by the key at the same time that it throws the bolt. The pin or arbor *o* passes through the slot *k* in the bolt-carriage P, and is secured in the casing K of the lock. As shown in Fig. 1, the lock is supposed to be shut by a double turn of the key. In this position the projections *a* of the tumblers S all take into notch 5 of the plate or bar A, said tumblers being impelled by the action of springs *r*, fixed at one end to the tumblers S and bearing at the other against a fixed stud, *t*. A stop, *g*, limits the movement of the tumblers in this direction. The projections *a* and *b* of the tumblers are of different lengths.

On the under sides of the tumblers are the curved indentations *m' n'*. These are alike on all the tumblers, contrary to what is the case in the ordinary grooved locks. It is this arrangement which prevents the taking of an impression by means of a movable key, since the tumblers S do not present, one in respect to another, any difference capable of giving an impression.

To effect the opening of the lock, the key, being inserted, is turned to the right. Acting first on the curved faces *m' n'* of the tumblers, it raises these each a different distance sufficient to withdraw all the projections *a* from notch 5 and bring them to the same horizontal level. It is essential for opening the lock, not only that all the projections *a* be clear of the notch,

but also that they should move no farther than just sufficient to release the bar A. Should any one of the tumblers move a greater distance its lower projection, *c*, would operate the locking-plate *p*, as hereinafter explained, while its projection *b* would enter notch 2 and prevent the movement of the bolt-carriage. When the key reaches the position shown in broken lines, Fig. 1, the tumblers are all brought to such a position that their projections *a* and *b* are all in the same horizontal line and just below the bar A. The last projection of the key now engages the face of projection 8 of the bolt-carriage P and withdraws the bolt half-way. As the key continues its revolution in the direction of the arrow the tumblers are released and are returned by springs *r* to their normal position, the projections *a* entering notch 4, which has by this time come above them. A further turn of the key lifts the tumblers as before and completely withdraws the bolt, the tumblers when returning entering the notch 3. The door to which the lock is applied will now be held only by the latch, which can be withdrawn by a half-turn of the key, as will now be explained. The flat plate M is pivoted to the bolt-carriage at 6 and moves with the latter. Said bolt-carriage also carries a shank, *m*, pivoted at D, the lower end of which projects into an indentation in the plate M. The tail *m⁴* of the plate M projects through a slot in the latch-bar C. When the bolt is withdrawn, the carriage P has been moved so far to the right that the projection *m²* of plate M is in position to be engaged by the key. In the front of the tumblers S are notches or grooves *u* at different relative heights, but adapted to be brought in line when the tumblers are lifted by the proper key, as shown in Fig. 3. The key being now given a half-turn to the right, it acts on the downward projection *m²* of plate M, turning the latter on its pivot 6. The tail *m⁴* then acts against the end 10 of the slot in the latch-bar C, moving the latter to the right. By the same movement of plate M the shank *m* is turned on its pivot by the part *m³*, and the plate or projection *n* enters the grooves *u* in the tumblers. It will be understood that unless the proper key is used, so that the tumblers are all raised the proper height, some

one or more of the grooves *u* will not be brought in line with the projection *n*, consequently the movement of the parts will be stopped.

The latch can be withdrawn from the inside by handle *B*. Spring 7 returns the latch and its operating mechanism to their normal position upon withdrawal of the key.

Fig. 2 shows the position of the key at the moment when it begins to act upon the tumblers *S*, and likewise shows the differential projections of these tumblers, as indicated at 1 2 3 4 5 6. In Fig. 3 the position of the tumblers *S* corresponds to that indicated by the broken line in Fig. 1, the projections being all brought to the same horizontal plane. The dotted line in Fig. 1 indicates the outline of the lower edge of the bolt-carriage *P*, showing the curved faces against which the key acts to throw the bolt.

As an additional security against tampering, it may be desirable to provide the lock with a detector or informer, to indicate an attempt to open the lock with any but the proper key. To this end a plate, *p*, is provided, which can slide up and down over pins *d g*, which pass through slots in said plate. At the top of plate *p* is an inclined projection or tooth, *g*, and the bar *A* is provided with notches of corresponding shape. The tumblers *S* are provided below with a series of projections, *e*, of different relative lengths. Should an attempt be made to open the lock with a wrong key, the tumblers *S*, or some one or more of them, are given a movement greater than that imparted by the true key, and consequently a projection, *e*, acting on lug *f*, forces plate *p* downward and causes projection *g* to enter the opposite notch, securely holding piece or bar *A*, and consequently the bolt in position. The movement of plate *p* is assisted by the inclined tooth on the end of spring *x* as soon as said tooth passes the point between the two inclined notches *y y'*. The spring then acts to keep the plate *p* in this position. Before the bolt can now be moved, even by the true key, it is necessary to first give the bolt (tumblers *S* being raised) a further movement from right to left sufficient to withdraw the projection or tooth *g* from its notch.

It will be understood that in carrying out my invention I do not confine myself to the arrangements, proportions, and other details herein set forth, since these could be modified in various ways without departing from the spirit of the invention. It is equally obvious that parts of the invention could be used without the others. For example, the system of differential tumblers could be used without the arrangement for controlling the latch and the detector, or either of them, and that either of these latter arrangements could be applied to locks different from that herein described.

Having now fully described my said invention and the manner in which the same is or may be carried into effect, what I claim is—

1. The combination, with the bolt and bolt bar or plate provided with notches, as indicated, of a series of tumblers having projections of different lengths which engage said notches, said projections being on the side of the tumblers away from that acted on by the key, substantially as described.

2. The combination, with the notched bolt bar or plate, of a series of differential tumblers so arranged that the faces acted upon by the key correspond each with the others, and provided on the opposite sides with projections of different lengths which engage the notches of the bolt bar or plate, substantially as described.

3. The combination, with the differential tumblers provided with grooves at different relative heights, but adapted to be brought into line by the proper key, of plate *M*, provided with the projection *m'*, and the pivoted shank or arm operated by said plate and having a projection adapted to enter said grooves when the tumblers are properly elevated, substantially as described.

4. The combination, with the tumblers, of the detector or locking-plate adapted to be moved to lock the bolt in position by projections on said tumblers when the latter are raised farther than they would be by the proper key, substantially as described.

5. The combination of the bolt-bar, the detector or locking-plate having a lug, and the tumblers having two sets of projections of different lengths, one set engaging with notches in the bolt-bar until withdrawn by the action of the proper key, the other operating the locking-plate when said tumblers or any of them are moved farther than they would be by the proper key, substantially as described.

6. The combination of the differential tumblers, the bolt-bar having notches for the engagement of said tumblers, the sliding plate having an inclined projection for engagement with an inclined notch on said bolt-bar, and a lug or projection on said plate adapted to be struck by the tumblers and thus cause the bolt-bar to be locked by said inclined tooth whenever said tumblers or any of them are raised farther than they would be by the proper key, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ALBERT LOUIS BECHT.

Witnesses:

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