

W. Hall,
Lock,

No. 3,221,

Patented Aug. 17, 1843

Fig. 2.

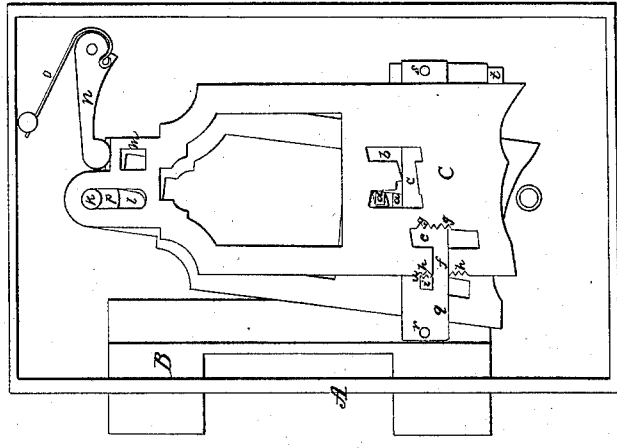


Fig. 3.

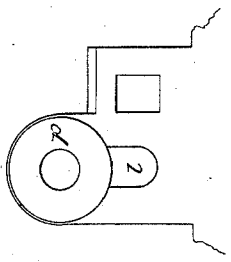


Fig. 4.

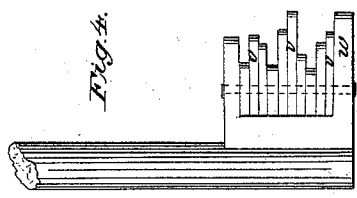
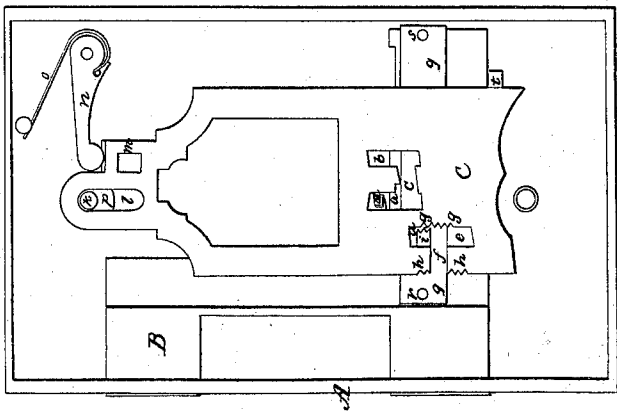


Fig. 1.



UNITED STATES PATENT OFFICE.

WM. HALL, OF CHELSEA, MASSACHUSETTS.

LOCK FOR SAFES, BANK-VAULTS, &c.

Specification of Letters Patent No. 3,221, dated August 17, 1843.

To all whom it may concern:

Be it known that I, WILLIAM HALL, of Chelsea, in the county of Suffolk and State of Massachusetts, have invented a certain new and useful Improvement in Locks for Safes, Bank-Vaults, &c., and that the following description, taken in connection with the accompanying drawings thereof, forms a full and exact specification of the same.

Figure 1, of the drawings above mentioned, represents the interior of a lock having its levers arranged to operate on my improved method, the bolt of the said lock being in this view thrown entirely back or within the lock case. Fig. 2 is a view of the position of the several parts of the interior of the lock when the bolt is thrown completely forward by the key.

A, Figs. 1, and 2, denotes the lock case, which is constructed in the ordinary manner and has a sliding bolt B, suitably adapted to it. The said bolt being combined with a series C, of levers or sliding plates, the particular arrangement of which I shall now proceed to describe. The number of levers composing the series may vary at pleasure. Each of them has two vertical and parallel slots *a*, *b*, formed through it, near its center, or in any other convenient part thereof; and which are connected together by a transverse and somewhat curved and inclined slot *c*. This slot operates upon a stud *d*, which is inserted firmly and immovably in the lock case and projects through the series of levers as seen in Figs. 1, and 2. In front of and somewhat below the slot *a*, each lever or sliding plate has a third vertical slot *e*, cut through it, from any suitable part of which a horizontal slot *f*, extends forward entirely through it to the front edge of the plate—as seen in the drawings. The rear side of the vertical slot *e*, has suitable angular notches *g*, *g*, *g*, cut in it, similar notches *h*, *h*, *h*, being also formed in the front edge of each of the levers—a short distance directly above and below the front extremity of the horizontal slot *f*. A stud *i*, projecting from the bolt, operates within the vertical and horizontal slots, *e*, *f*. Each lever or sliding plate of the series C, is sustained in position at its top part by means of a cylindrical stud or pin *k*, which projects from the lock case and passes through a vertical and elongated slot *l*, cut through the upper part of the lever. This slot is to be of sufficient length to admit of the free and requisite vertical

movements of the levers—and the top and bottom parts of it should each terminate or be cut out in a semicircle of the diameter of the stud *k*, the same being as represented in the drawings. Besides the above, every lever has a horizontal or other suitable shoulder *m*, formed in the rear of, or near the slot *l*, upon which (shoulder) the extremity of a lever *n*, rests and is forced thereupon by means of a bent spring *o*. A small washer, or thin circular plate, *p*, (see Figs. 1, 2, 3, the latter figure representing the washer as detached) is placed upon the center pin *k*, and between every two of the faces of the levers in apposition with each other, its object being to keep the surfaces of the levers a short distance apart. The said surfaces are also kept from contact near the lower end of the levers, by means of a thin elongated strip or plate *q* of metal similarly interspersed between them and sustained in the position (seen in the drawings) by being passed over the stud *i*, and two small cylindrical pins *r*, *s*, projecting from the bolt. From the peculiar arrangement of the plates *q*, it will be seen that they move forward and back with the bolt. The lower part of the rear edges of the lever plates when the said plates are not thrown forward rests against a fixed stud, *t*, inserted in and projecting from the lock case. The lower edge of the rear part of the bolt rests and moves upon the stud *t*. The stud *i*, which projects from the bolt and operates in the slots *e*, *f*, should have angular teeth formed in its rear side to correspond with the angular notches *g*, *g*, *h*, *h*, before mentioned. A side view of the key to this lock is represented in Fig. 4. It has two series of bits *v*, *v*, of unequal lengths adapted to it, there being the same number of movable bits inserted in the key—at one time—as there are lever plates in the lock. The stationary bit *w*, of the key is for the purpose of throwing the bolt back and forth. The movable bits of each series are formed of various lengths and are fitted to the key, and confined therein by a screw in the usual manner. The bits of one series are for the purpose of elevating the levers or sliding plates to the requisite heights to permit the passage of the stud *i*, through the horizontal slot *f*, while those of the other series are to elevate the levers to such heights as to bring the slots *c*, into the position to allow the stud *d*, to pass through them, or in other words to elevate the slots *c*,

of levers to the height of the stud *d*, in order to permit such levers as may be so actuated to be thrown forward by the bolt as seen in Fig. 2. Each of the levers being properly numbered and corresponding numbers or designating marks being engraved or stamped on their several bits of each series of bits, it will be seen that, if ten lever plates are used in the lock and we make up the key with five bits of each series—five of the levers will be thrown forward by the bolt while the other five will simply be raised and depressed vertically. Thus it will be seen that for any particular number of levers or sliding plates we are enabled by the above arrangement of their slots, to employ double the number of bits in effecting the changes of the key, that we can as these levers are usually arranged and operated. This multiplication of the bits in a two fold proportion so increases the number of changes of the key, as to render this an increased security against the attempt of picklocks. Again by having a set of bits separate from those in the key—should an impression of the key be taken—and a set of bits made corresponding to those in the key, a removal of two or three of the bits thereof, and a substitution of the same number of the other series of bits, will so effectually change the key as to prevent the opening of the lock by the duplicate bits made from the impression. In this consists the great security of this lock or its advantages over others. As soon as the cross slot *c*, of either of the levers has passed over the fixed stud of the bolt case, or in

other words, the bolt passed through the said slot, when the levers are thrown forward, or so as to bring the said stud into the vertical slot *b*, each of the said levers will drop downward until the top of the slot comes into contact with, or rests upon the top of the stud. This being accomplished, it will be impossible to retract the bolt while the said levers so remain. They must be elevated by their respective bits of the second series to the requisite height before the bolt will carry the lever back to a vertical position.

Having thus explained my improvement, I shall claim—

Constructing the levers or sliding plates with additional slots *a*, *b*, *c*, playing upon a fixed stud projecting through them and inserted in the lock case and operating or throwing forward (with the bolt) one or more of the said sliding plates, by a corresponding number of bits of a secondary or supplementary series of bits affixed to the key and in connection with those by which the remaining levers are elevated and actuated as set forth, the whole being arranged substantially in the manner and for the purpose as above specified.

In testimony that the above is a correct specification of my said improvement I have hereto set my signature this twenty seventh day of June in the year, A. D. 1843.

WM. HALL.

Witnesses:

R. H. EDDY,
JOHN NOBLE.