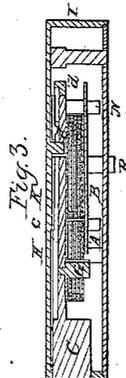
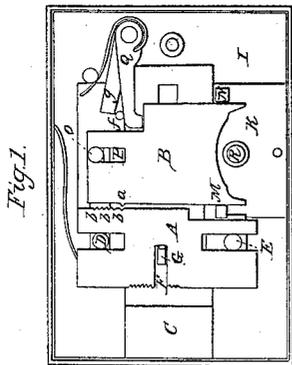
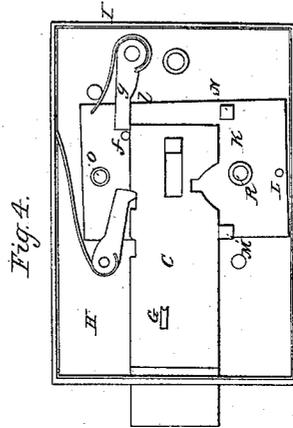
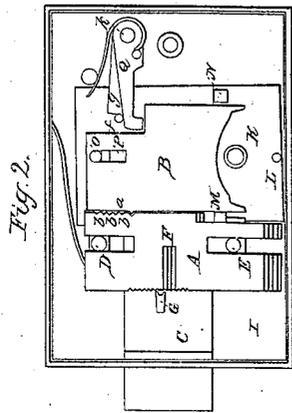


W. Hall,

Lock.

N<sup>o</sup> 4,236.

Patented Oct. 16, 1845.



# UNITED STATES PATENT OFFICE.

WILLIAM HALL, OF BOSTON, MASSACHUSETTS.

## LOCK FOR BANKS AND SAFES.

Specification of Letters Patent No. 4,236, dated October 16, 1845.

*To all whom it may concern:*

Be it known that I, WILLIAM HALL, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Locks for Safes, Banks, Vaults, &c.; and I do hereby declare that the nature of my invention and the manner in which the same operates are hereinafter described and represented in the following description and accompanying drawings, letters, figures, and references thereof.

Figure 1, of the aforementioned drawings, denotes a view of the interior of the lock case and main bolt, sliding tumblers or plates, and various other of the operating parts of the lock, as they appear when the bolt is retracted, or, as in common parlance we say, the lock "is unlocked". Fig. 2, represents the same, as they appear when the bolt is thrown forward, or "locked". Fig. 3 is a horizontal section of the lock, taken through the bolt stud, the lock being supposed to be in the position it is placed in, when applied to a vertical door. Fig. 4 exhibits the appearance of the interior of the lock, on removal of the two series of sliding tumblers or plates, and their springs.

A, B, (Figs. 1, 2, 3) denote two series of sliding plates or tumblers, such as are generally used in locks. They are arranged within the lock case I, and with respect to the main bolt C, as seen in the drawings. There should be the same number of plates, in each series, and each plate of the one, should be arranged so as to be in the plane of one of the plates of the other series produced. The front series should be sustained in position, and so as to move freely up and down, or in a direction at right angles to that in which the bolt moves, by projections D, E, of the lock case, and each plate of the said series of plates, should have a rectangular slot, opening or passage F, cut through it, from its front edge rearward, as seen in the drawings, the said slot being of sufficient size, to receive and admit the movements into and out from it of a solid stud G, inserted in, and projecting from the main bolt, and through the said series of plates.

In rear of the main bolt, or between it and the bottom H, of the box, or case I of the lock, is what I term the vibrating or movable lever plate K. This plate, disposed as seen in the drawings, is supported upon a pin or fulcrum at L, at or near the central part of

its lower end. It is not fixed to the lock case, so as to be stationary, but is to be made capable of being moved laterally, to a small extent, in one direction, and next in the opposite, or in other words, of vibrating upon the pin or fulcrum L.

The said plate, carries and sustains the rear series (B) of sliding plates or tumblers, which is arranged over it and the main bolt, and kept in position upon it, by means of three projections or studs, M, N, O, two of which, viz., M and N, being arranged on the outer vertical edges of the plates, and the other, or third, (viz. O), passing through a vertical slot or passage P, cut through the top part of each plate, as represented in the drawings. Each plate of the rear series (B) of the plates, has a spring lever Q, of the kind commonly used in locks, for the purpose of depressing the said plates, after the action of the key upon them has been, or while the same is being completed.

A small projecting tooth *a*, is formed or made, upon the front vertical edge of each of the plates, of the series B, and a series of indents or notches *b*, *b*, *b*, to correspond therewith, should likewise be made in the upper part of the rear vertical edge of each plate of the front series, A. Or, instead of making a tooth upon each plate of the rear series B, it may be made upon each plate of the front series A, and the notches be formed in each of the plates of the rear series.

There should be a shoulder *c*, or other equivalent contrivance, formed or cut upon the rear face or side of the main bolt, and in front of the vibrating bar K. Another and similar shoulder *d* or other mechanical equivalent, should be arranged or formed upon the rear side, at, or near the end of the main bolt, and there should be a small pin, or stud, *e*, inserted in, and so as to project, a short distance from the vibrating plate, as seen in the drawings. Now, when the main bolt is thrown forward by the key, the shoulder *d* of it, will, at a proper time, strike against the pin or stud *e*, and by so doing, throw the vibrating plate and the series B, of slide plates forward, so as to cause each of the teeth *a* of the several plates of the said series, to enter within some one of the corresponding notches *b* of the plate in advance of it, according to the height to which the bit of the key elevates the slide plate, the several bits of the key, being regulated in

their lengths, so as to cause the tooth to always enter a notch of the plate in front of it—whatever one of the series of bits, may be used on either of the plates, for the purpose of elevating the same. The several plates of each series, being thus conjoined, will, as soon as the bolt is advanced far enough to throw the solid stud G, out of the several passages F, and as the key advances, fall, or be forced down by their spring levers, in a body together—thus causing the several passages or opening F, of the front plates, to shoot or pass by one another, and thereby prevent the recession of the main bolt, until they are again elevated to one common level.

The key fits and moves upon a round pin R, projecting from the bottom of the lock case, just beneath the rear series of tumblers, and passing through the vibrating plate; a hole being cut through the plate, of sufficient size to receive the round pins R, and at the same time admit of the vibration of the plate. On the key being applied to open the lock, or throw back the bolt, it elevates the rear series of slide plates, which carry up with them the front series, and when they (the rear series) have attained their respective heights, they will have carried up the plates of the series A, to such heights, as to bring their several passages F to one common level. The bolt is then to be caused to recede, and carry its solid stud G into the passages F, and after arriving nearly to its extreme limit of recession, to bring the shoulder *c* into contact with the front edge of the vibrating plate, and, as it (the bolt), continues to recede, to carry the vibrating plate with it, so as to throw the teeth *a*, of the series B of plates, out of the notches of the other series A, or thus unjoin or disconnect the plates. The rear series of plates, will then fall or be pressed downward, as the key descends, while the front series will rest upon the solid stud G of the main bolt, as seen in Fig. 1.

In order to prevent any improper recession of the vibrating plate, at any time, there should be a small pin or stud *f*, inserted in it, just above the main bolt, as seen in the drawings. There should also be a spring lever *g*, arranged upon the bottom of the lock case, and in rear of the said pin or stud *f*, the said lever turning on a fulcrum at *h*, and having an inclined plane, or cam *l*, formed on its lower edge, which is met by the right hand upper corner of the main bolt, where it is thrown back, and, in consequence thereof, the spring lever is raised, or thrown up above the pin or stud, *f*. When the bolt is thrown forward, the spring lever falls, so as to bring its front end just in rear of the stud *f*, and thereby

prevent any back movement of the vibrating plate.

From the above it will be seen, that any change which may be made in the bits of the series, applied to the key (that is to say, any disposition of the several bits with respect to each other), will not require a corresponding change of the slide plates, as in most other locks—as the slide plates of the rear series B, are all fully raised up before they are locked to, or engaged with those of the first series. The chief merit of my lock, consists in the adaptation of the parts, so as to operate with a solid stud G, applied to the main bolt; locks of the kind heretofore made, having no solid stud of the kind, but an expensive and intricate system of movable plates, in lieu thereof.

I do not claim two series of sliding plates or tumblers, arranged side by side, and the one series having recesses in each plate, and the other series having corresponding projections, to enter and move in the said recesses, and the one series being affixed to the main bolt, so as to move back and forth, as well as up and down with it, and having a corresponding series of notches or indents, in each of its plates, and one spring catch applied to, or affixed upon the main bolt, which spring is shown by a suitable projection from the lock case, into one of the notches of each of the several plates, whenever the bolt is shot forward by the key, and out of the same, by a similar contrivance, when the bolt is retracted (the projections of the front series of plates, being carried so far forward, or out of the recesses of the rear series, when the bolt is thrown forward or locked—as to permit of the fall or vertical depression of each of the plates of the rear series of plates), all of which will be found to exist in certain locks, heretofore patented or sold; but

What I do claim, is—

My specific improvement thereon; the same consisting in the combination with the main bolt and two series of sliding tumblers, constructed and acting together as above set forth, of a solid stud G (projecting from the bolt) the slots F (cut as above described, in the tumblers of the front series) and a vibrating or moving plate K, applied to the main bolt and rear series of tumblers as specified, the whole being arranged and operating together substantially as hereinbefore explained.

In testimony whereof, I have hereto set my signature, this ninth day of October, A. D. 1845.

WM. HALL.

Witnesses:

R. H. EDDY,  
CALEB EDDY.