

J. L. Hall,

Lock.

N^o 18,243.

Patented Sep. 22, 1857.

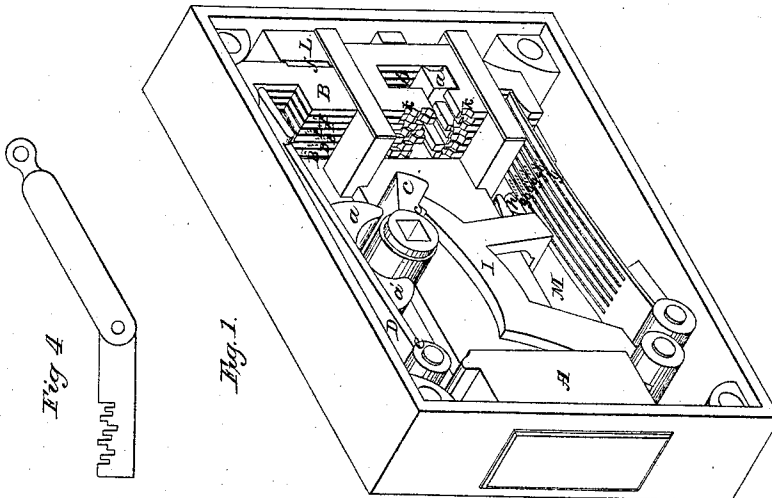
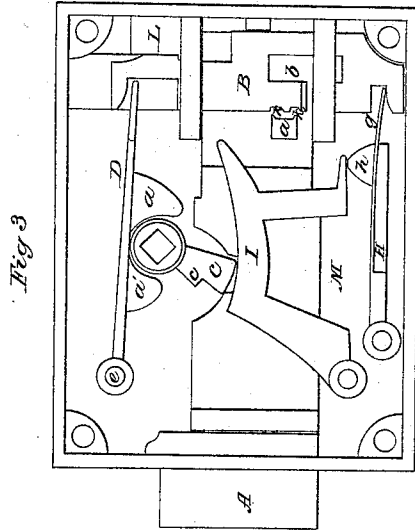
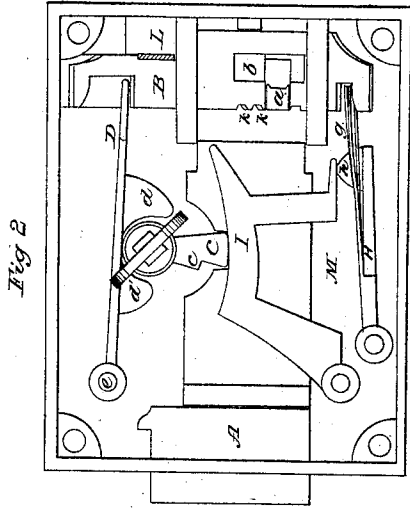


Fig 4

Fig 1

UNITED STATES PATENT OFFICE.

JOSEPH L. HALL, OF CINCINNATI, OHIO.

LOCK.

Specification of Letters Patent No. 18,243, dated September 22, 1857.

To all whom it may concern:

Be it known that I, JOSEPH L. HALL, of Cincinnati, Hamilton county, Ohio, have invented new and useful Improvements in Locks; and I hereby declare the following to be a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

My invention relates to a construction and arrangement of the parts whereby, 1stly, the tumblers are made to serve collectively as a screen between the keyhole and the more interior parts of the lock; 2ndly, the accidental rebound of the bolt at the instant of locking is prevented; 3rdly, the stress upon the tumbler springs is restricted to the period of throwing the bolt.

In the accompanying drawings, the lock is represented with the covering plate removed so as to show the interior mechanism.

Figure 1 is a perspective view, with the bolt unshot, the keyhole being open for the reception of the key. Fig. 2 is an elevation with the bolt partially shot. Fig. 3 is a similar view showing the bolt shot and the keyhole closed. Fig. 4 is a view of the key detached.

A, is the bolt, provided with a stump *a*. B, B', B'', &c., are a series of tumblers, restricted to a vertical sliding play, and while the bolt is unshot, confining the stump *a*, by means of a longitudinal slot *b*, until the passages or "gratings" in all the tumblers are brought into the requisite position, as in Fig. 2.

The floor and rear wall of the keyhole are formed by a fixed block or stump L, which may form a part of or project from the case, the front wall and top of the keyhole being formed by the collective edges of the tumblers when elevated; so that the back plate M, and block L, in conjunction with the tumblers B, B', B'', &c., completely close in the key hole on every side but that by which the key is inserted.

C, is the stationary bit, having on one side a tusk *c*, as represented for purposes hereafter explained.

D, is a lever, turning on a fulcrum at *e*, and furnished on its lower side with protuberances *d*, *d'*, by means of which the revolution of the bit elevates the free end of the lever which is confined in a notch in the tumblers near their upper end, thereby

raising the tumblers and opening the keyhole *f*, for the reception of the key.

g, *g'*, *g''* &c., are a series of springs, operating distinctly, each on one of the tumblers B, but connected at their base from which also proceeds a short, stiff arm H, (in the same plane with the springs) provided at its end with a prominence *h*, which being pressed upon by the dog I, as the bit C, revolves, tightens the springs during the operation of locking and unlocking. At all other times the springs are lax.

The key (Fig. 4) is formed with steps as represented each adapted to limit the depression of its corresponding tumbler to the needful extent to bring their gatings to the proper position to admit of the passage of the stump *a*, of the bolt.

The operation is as follows: The bolt being unshot and the tumblers in their lowest position, the bit *c*, is rotated by means of a knob or whench-key so as to raise the tumblers by means of the lever D (see Fig. 1) thereby opening the keyhole *f*. The key (Fig. 4) is then inserted with its steps presenting upward, and the bit C, rotated in the other direction, depressing the dog I, by means of which the springs are tightened on the tumblers, depressing each as far as the steps on the key will allow which brings all the gatings in the tumblers, simultaneously opposite the stump *a*, of the bolt thus permitting the continued rotation of the bit to shoot the bolt. Instantaneously on the bolt being shot, the tusk *c*, on the bit comes in contact with the protuberance *d'* on the lever D, raising all the tumblers, thereby preventing the rebound of the bolt at the instant of locking and also releasing the key. A common difficulty with bank locks, namely the bolt flying back without the knowledge of the operator, before the gating in the tumbler has time to close is entirely obviated by the above arrangement and also from the fact that the bit does not pass sufficiently far to release the bolt after shooting it. The key being withdrawn the tumblers fall by their own gravity, thereby closing the keyhole and bringing the parts into the position shown in Fig. 3. On any backward pressure being applied to the bolt without the tumblers being previously adjusted by the proper key, the projections on the back of the stump *a* are received by notches *k*, in the edge of the tumblers,

which not only prevent the retraction of the bolt but preclude the possibility of separately adjusting the tumblers by means of a pick. To unshoot the bolt it is necessary to again rotate the bit to raise the tumblers by means of the protuberance *d'* on the lever. This opens the keyhole, and the key being inserted, and an inverse rotation imparted to the bit, the several motions go on as before.

It will be observed that the key can never be withdrawn while the tumblers are in position to permit the motion of the bolt, this together with the small dimensions of the keyhole (less than $\frac{1}{12}$ of an inch in width) renders it impossible to take an observation from the outside, of the relative positions of the tumblers.

While the lock is at rest, the position of the tumblers entirely closes the keyhole but if the keyhole be opened by the rotation of the bit, the tumblers fitting closely together and against the surrounding parts precludes the possibility of any gunpowder or other explosive material introduced into the keyhole penetrating farther into the lock, so

that when fired it would blow out harmlessly through the same channel by which it entered.

I claim as new and of my invention here- 30
in—

1. The construction and arrangement of tumblers B, B', B'', &c., in the described connection with the block L, and back plate M; the whole serving as a screen or curtain, 35
between the keyhole and the more interior parts.

2. The described construction and arrangement of bit C *c*, lever D *d d'*, and tumblers B, B', B'', &c.; whereby the bolt is 40
held securely to its locked position until the withdrawal of the key.

3. The described arrangement and combination of the bit C *c*, dog I, and arm H *h*, 45
for the purpose of tightening the springs, in the manner set forth.

In testimony of which invention I here-
unto set my hand.

JOSEPH L. HALL.

Attest:

OCT. KNIGHT,
JAS. H. GRIDLEY.