J. H. Crygier,

Permutation Lock.

No. 10,265. Patented Nov. 22, 1853.

Fig. 1

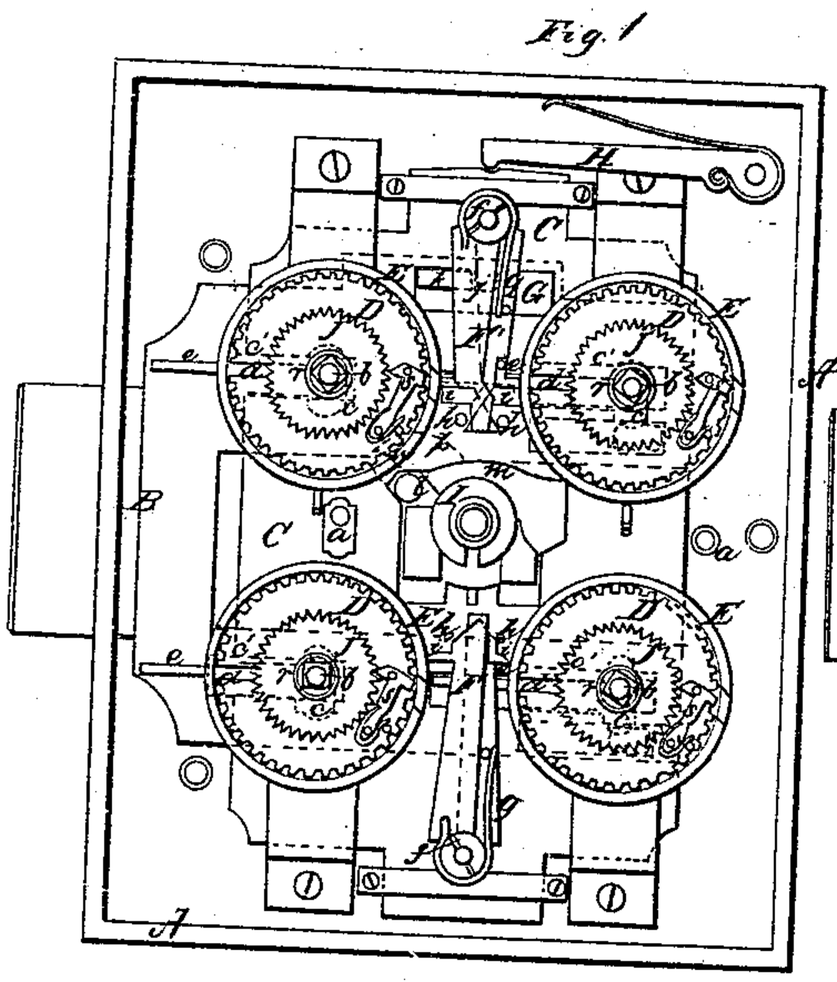


Fig. 2

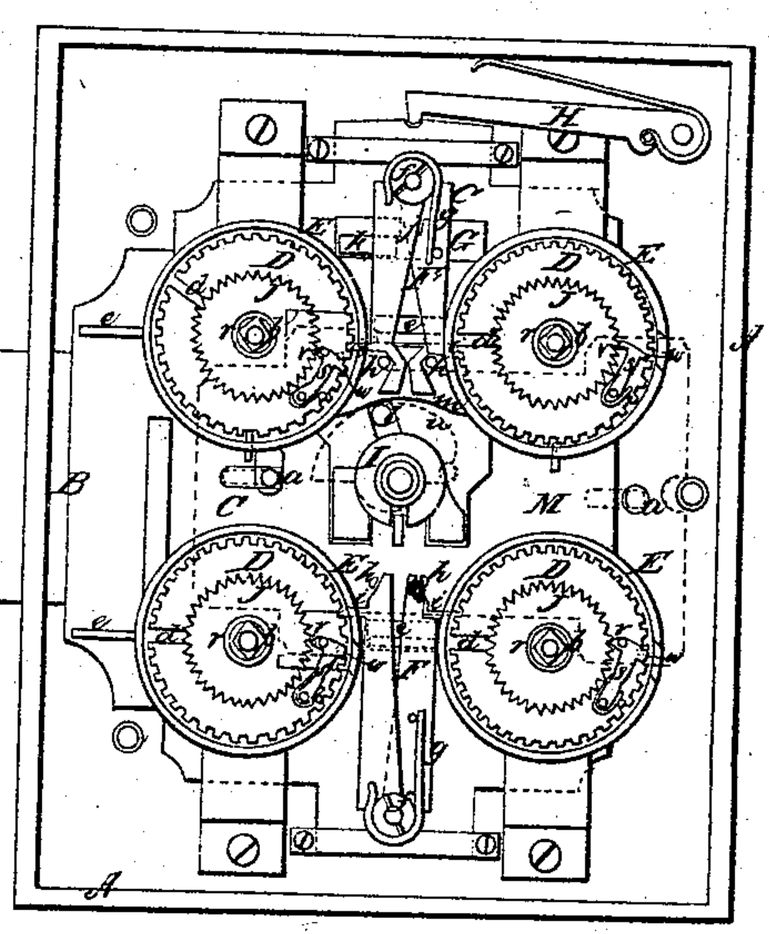
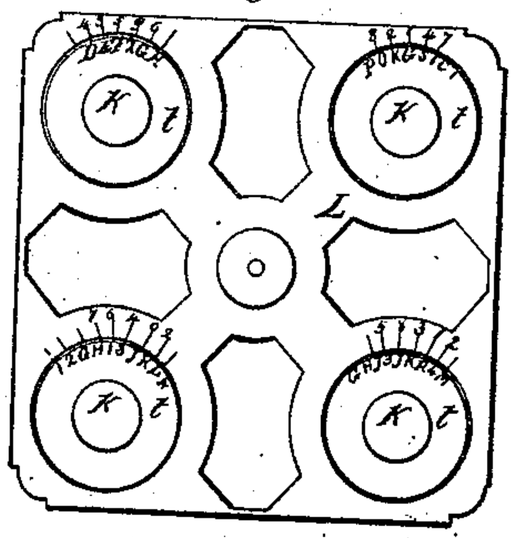


Fig. 3.



UNITED STATES PATENT OFFICE.

JAMES H. CRYGIER, OF NEW YORK, N. Y.

BANK-LOCK.

Specification of Letters Patent No. 10,265, dated November 22, 1853.

To all whom it may concern:

Be it known that I, JAMES H. CRYGIER, of the city, county, and State of New York, have invented certain new and useful Improvements in Locks for Banks, Safes, &c.; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1, is an interior view of my improved lock, the index plate and tumbler for effecting the changes being removed. Fig. 2, is also an interior view of my lock, showing the manner in which the guards are operated by the bolt tumbler, as said tumbler is raised by the key. Fig. 3 is a face view of the index plate.

Similar letters of reference indicate corresponding parts in each of the several figures.

This invention relates to certain new and useful improvements in locks for banks, safes, &c.; and it consists:—First, in the employment or use of lever guards, so arranged as to be thrown into circular toothed disks when the bolt tumbler is raised by the key, said lever guards being operated by the bolt tumbler, instead of being directly operated upon by the key. By means of the lever guards, thus arranged, the lock cannot be picked by obtaining a pressure upon the bolt, as will be hereinafter shown.

Second, my invention consists in a peculiar manner of effecting the changes, or of altering the positions of the indexes, whereby said changes may be made with the greatest facility as will be hereinafter explained.

To enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

A, represents the case of the lock; and B, is the bolt, which rests or bears against the back of the lock, and is made to work or slide truly, by means of stumps, in the usual manner.

C, is the bolt tumbler, placed over the bolt, and also made to slide or work truly, by means of stumps, two of which, (*a*), (*a*), are shown in Figs. 1 and 2.

D, D, D, D, are circular toothed disks, placed in annular guards, E; said disks are on the upper surface of the bolt tumbler, C, and they work on pins, (*b*), which are secured to the back plate of the lock, said pins passing through oblong slots, (*c*), (*c'*), in the bolt tumbler and bolt, as seen in the dotted red and black lines in Fig. 1, the dotted red lines indicating the slots in the bolt. Each disk, D, is provided with a radial slot, (*d*); and there are four ledges or projections, (*e*), (*e*), (*e*), (*e*), on the bolt, B. When the slots, (*d*), in the circular toothed disks, D, are in line with the ledges or projections, (*e*), on the bolt, as shown in Fig. 1, the bolt, by using the key, may be withdrawn or shoved into the lock, because the ledges or projections may pass into the slots. But if either of the slots, (*d*), is out of line with either of the ledges or projections, (*e*), as shown in Fig. 2, the bolt cannot be shoved back. When therefore the bolt, B, is shoved outward, and the door, to which the lock is applied, is in a locked state, the circular toothed disks, D, are turned, so that the slots, (*d*), will be out of line with the ledges or projections, (*e*); and a person desiring to withdraw the bolt, must first turn the disks, D, and bring the several slots, (*d*), in line with the ledges or projections, (*e*).

F, F', are lever guards attached by pivots, (*f*), to the back plate of the lock. Each guard is formed of two levers secured by one pivot, and (*g*), (*g*), are springs which keep the outer ends of each pair of guards expanded or forced outward from each other when not prevented by pins, (*h*), (*h*), which are secured to the bolt tumbler. The outer ends of one pair of guards, F, are of taper form; and the other pair of guards, F', are beveled a certain distance from their outer ends inward, as shown in Figs. 1 and 2. Each lever is provided with a projection (*i*), which, when the guards are expanded, fits between the teeth of the disks, D, as shown in Fig. 2.

The upper part of the bolt tumbler, C, has a slot G, through it; and at the center of the slot, there is a stop, (*j*), which extends half way across it. See Figs. 1 and 2. On the bolt, B, there is a ledge or projection (*k*), which fits in the slot G.

H, is a spring lever, which acts upon the bolt tumbler.

When the bolt, B, is shoved outward, and the bolt-tubler, C, is down, as shown in Fig. 1, the bolt can not be shoved back, even if the slots, (*d*), in the disks are in line with the ledges or projections, (*e*), because the stop, (*j*), in the slot, G, of the bolt tumbler

will not allow the projection, *k*, on the bolt to pass. The disks, D, when the bolt tumbler is down, may be turned around, and are perfectly free from any obstruction. In order to throw back the bolt, the bolt-tumbler is raised, as the key, I, is turned, a pin, (*l*), on the key bearing against a curve, (*m*), in the bolt-tumbler. The tumbler is raised sufficiently to allow the projection, (*k*), to be on a line below the stop, (*j*), as seen in Fig. 2; and as the key is turned, its extreme end (*n*), see Fig. 1, throws back the bolt, said end, (*n*), working in a curve, (*p*), in the bolt, as shown by the red lines in Fig. 1. When the bolt tumbler, C, is raised, the pins, (*h*), (*h*), occupy the position as shown in Fig. 2, and the springs, (*g*), (*g*), expand, or force outward from each other, each lever of the two guards, F, F′, and the projections, (*i*), on the levers, are forced between the teeth of the disks, D; and consequently the disks are prevented from being turned, as seen in Fig. 2.

From the above description, it will be seen that the lock can not be picked, or the position of the slotted disks, D, ascertained by the sense of feeling, or by obtaining a pressure of the ledges or projections, (*e*), on the bolt, B, against the disks, D, because when the bolt can be thrown back by raising the bolt tumbler, as in Fig. 2, the disks are immovable, and when the bolt tumbler is down, and the disks free to move, as in Fig. 1, the bolt is immovable.

J, J, J, J, are ratchets, which are placed on the pins, (*b*), of the disks, D, the ratchets resting on or against the disks, D. The ratchets are secured to hollow arms or shafts (*r*), which fit over the pins, (*b*). Pawls, (*s*), secured to the disks, D, catch into the ratchets, and connect the ratchets and disks, so that by turning the arms, (*r*), the disks, D, will also turn.

K, in Fig. 3, are knobs, which screw into the arms, (*r*). These arms, (*r*), pass through an index plate, L, on the front of the lock case. Each arm, (*r*), is provided with a circular plate, (*t*), having letters or figures upon it, as shown in Fig. 3, and the index plate, L, is also provided with letters or figures, so that a person may turn the slotted disks properly in order to bring the slots, (*d*), in line with the ledges or projections, (*e*), on the bolt. The circular plates when the disks are correctly turned, form some word which the person desirous of opening the lock must retain in his memory, or communicate to any one who is required to perform that operation. It is necessary that the chosen words be occasionally changed, to insure perfect safety. In order to do this, the circular plates, (*t*), are turned, independently of the disks, D. I accomplish this by means of a tumbler, M, (see red lines in Fig. 2,) which works on the stumps, (*a*), (*a*), and is turned by the pin, (*l*), on the key, I. By turning the key around a little more than is necessary to throw back the bolt, B, the pin, (*l*), will act against the right side of a curve, (*n*), and move the tumbler, M, to the right. Small ledges, (*v*), on the under side of the tumbler, M, act upon the pawls, (*s*), and throw them free from the ratchets, J, which may then be turned independently of the disks, D. After the change is effected, the tumbler, M, is moved back to its original position by turning the key in the opposite direction, and ledges, (*w*), on the under side of the tumbler throw the pawls into the ratchets, D. Thus the several pawls are operated simultaneously. There may be some other device used for throwing the pawls free from the ratchets, such as levers, &c., and I do not confine myself, exclusively, to the use of the tumbler, M.

I do not claim the slotted disks, D, neither do I claim the index-plate, nor the manner of adjusting the slotted disks, so that the slots, (*d*), in the disks may be placed in line with the ledges, (*e*), in the bolt, B, for circular plates, having letters or characters upon them, arranged with an index plate, have been previously used. Neither do I claim the lever guards, irrespective of the arrangement herein shown and described; but

Having fully described my invention, what I claim as new, and desire to secure by Letters-Patent, is,

1. The employment or use of the lever guards, F, F′, constructed substantially as shown, and arranged so as to operate against the disks, D, and prevent them from turning, as the bolt tumbler, C, is raised, as shown and described in the body of the specification.

2. I claim, connecting the ratchets, J, to the circular toothed disks, D, by means of pawls, (*s*), and operating said pawls by means of the tumbler, M, or its equivalent, whereby the ratchets may be connected and disconnected from the several disks, D, simultaneously, and the changes effected with the greatest facility.

JAMES H. CRYGIER.

Witnesses:
O. D. MUNN,
H. COHEN.