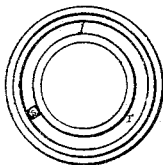
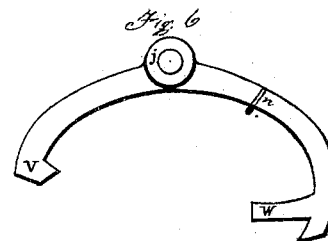
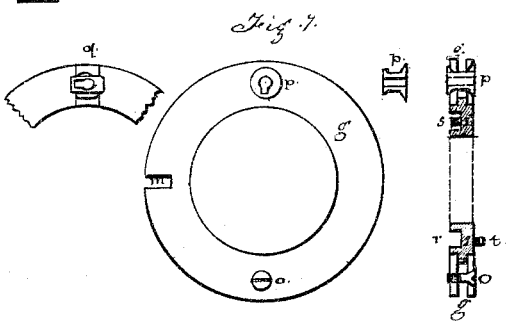
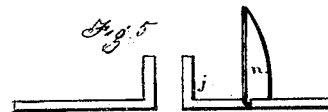
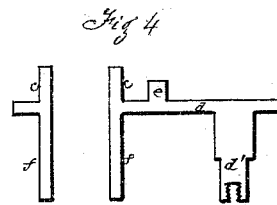
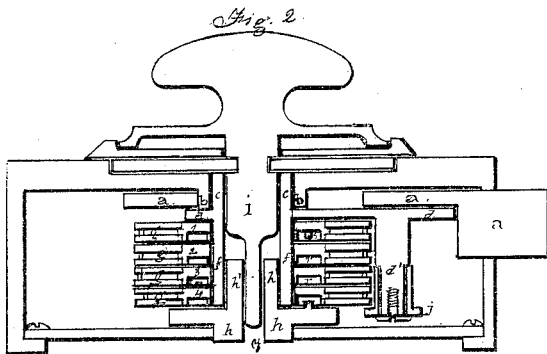
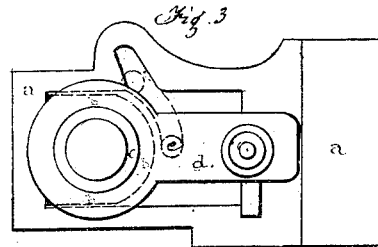
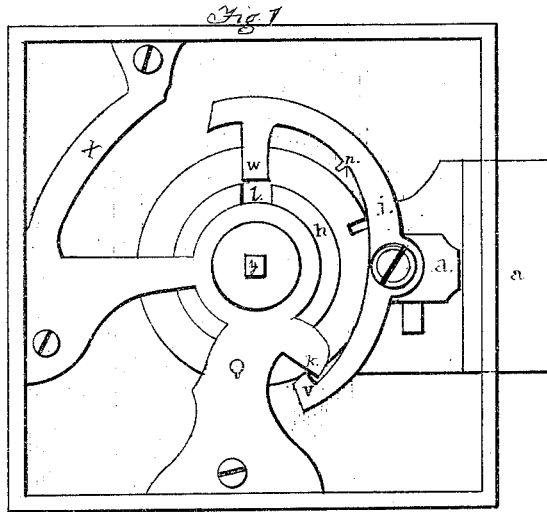


*E. W. Brettell,*

*Permutation Lock.*

*No. 108,561.*

*Patented Oct. 25. 1870.*



*W. M. Gooding } atty  
Edward Collier }*

*E. W. Brettell  
Inventor*

# United States Patent Office.

EDWARD W. BRETTELL, OF ELIZABETH, NEW JERSEY.

Letters Patent No. 108,561, dated October 25, 1870.

## IMPROVEMENT IN PERMUTATION-LOCKS.

The Schedule referred to in these Letters Patent and making part of the same

I, EDWARD W. BRETTELL, of the city of Elizabeth, State of New Jersey, have invented certain Improvements in Permutation Bank-Locks, of which the following is a specification.

The improvement consists in the adaptation and combination of a pallet, with the movements of a permutating bank-lock.

In the accompanying drawing—

Figure 1 is a view of the inside of the lock;

Figure 2 is a transverse horizontal section of the lock and of its parts;

Figure 3 is a view of the vibrating arm and the bolt;

Figure 4 is an edge sectional view of the vibrating arm;

Figure 5 is an edge sectional view of the pallet;

Figure 6 is a top view of the same; and

Figure 7 shows the parts of one of the disk-tumblers.

The bolt *a* slides on the projection *b* of the case of the lock.

The socket *c* of the vibrating arm *d* enters and turns in the projection *b*.

Upon the back of the arm *d* is a pin, *e*, which engages in a slot in the bolt, and by which the bolt is moved, the end of the arm abutting against the bolt-head, and backing it up by direct resistance, when the bolt is thrown out.

Upon the socket *f* of the arm *d* are placed four (more or less) disk-tumblers.

The revolving wheel *h* has a projection, *k*, which enters and turns in the end of the socket *f*.

In the center of this wheel is a square hole, *g*, which admits the small inner end of knob-shaft *i*, by which the locking and unlocking is effected.

Upon the arm *d* is a stud, *d'*, on the end of which the socket of the pallet *j* fits and vibrates.

One end of the pallet has a catch, *v*, which catches under the stop *k*, and the other end has a projection, *w*, which, when at liberty to do so, descends into the recess *l* in the driving-wheel *h*, thus connecting the movable parts of the lock with the knob, and releasing the catch *v* of the pallet from the stop *k*, when, by turning the knob, the arm *d* and the pallet *j* are lifted away from behind the bolt, and, at the same time, withdrawing the bolt.

In the edge of the four disk-tumblers is a recess, *m*, and, there being attached to the pallet *j* the edge bar *n*, the recesses of all the tumblers must be brought into a line, under the bar *n*, before the arm *w* of the pallet can descend into the recess *l* in the driving-wheel *h*.

The proper position of the tumblers is indicated by numbers or letters on the dial-plate, as in all permutating-locks.

The disk-tumbler, shown in fig. 7, is constructed of two flat rims of sheet metal, *g*, and one disk, *l*.

The periphery of the disk has a lip extending between the rings, the inner edges of the rings fitting around a shoulder provided on each side of the disk, to keep the disk central yet free to turn.

It is of the greatest importance that these disks should not be liable to shift their position, while, at the same time, they should be easily released and shifted when desired, for, by shifting the relative position to each other of the pins *s*, the combination numbers of the lock can be varied a great number of times, at the option of the operator.

The two rings *g* are connected by the screw *o*, and by the turn-button *p*, the pressure of the inner edges of the rings on the lip of the disk being graduated by the screw, and is made to bear equally all round by the turn-button, said button being introduced through an oblong hole in both rings, and, by turning it a quarter turn, it brings its inclined edges at the end across the hole, drawing the edges tight together.

A slight roughness on the sides of the rings, or on the sides of the lip of the disk, adds to the friction depended upon to insure rings and disk against slipping when locked by the turn-button.

When the recesses *m* in the rings are on a line, so that the edge bar can enter and hold them, the turn-buttons are all on a line also, and a key, consisting of a long stem with a very small feather upon it, is introduced into the key-hole, shown in the button, by which the rings are released from pressure upon the disks, while the operator, by means of the knob and driving-wheel, shifts the relative positions of the pins *s* to vary the combination, as desired.

The key is so made that it cannot relieve one of the tumblers without releasing all the others, nor can it be withdrawn without locking them all.

This object is accomplished by having the feather just the length of the thickness of the set of tumblers, when upon the socket on which they all turn.

In each disk is a recess, *r*, in which is a stud or pin, *s*, and there is also a pin, *t*, on the back of each disk.

There is also a pin in the driving-wheel *h*, to impinge against the pin in the disk next to it, and moves all the rings when pin touches pin in all the recesses.

What I claim, and desire to secure by Letters Patent, is—

The pallet *j*, having catch *v* at one end and projection *w* at the other end, and pivoted near its center to the vibrating arm *d*, in combination with the stop *k*, driving-wheel *h*, and bolt *a*, substantially as and for the purpose set forth.

E. W. BRETTELL.

Witnesses:

W. M. GOODING,  
EDWARD COLLIER.