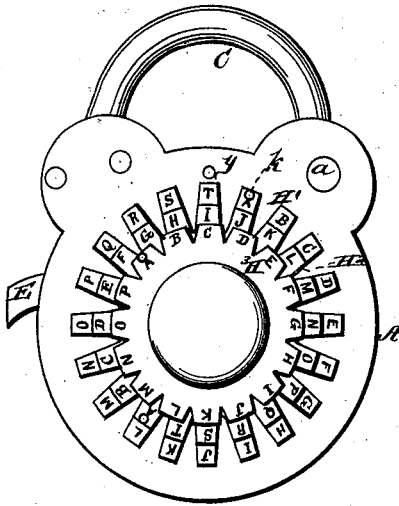


G. W. GROVE.  
Permutation Padlock.

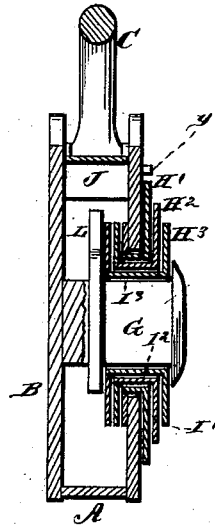
No. 202,022.

Patented April 2, 1878.

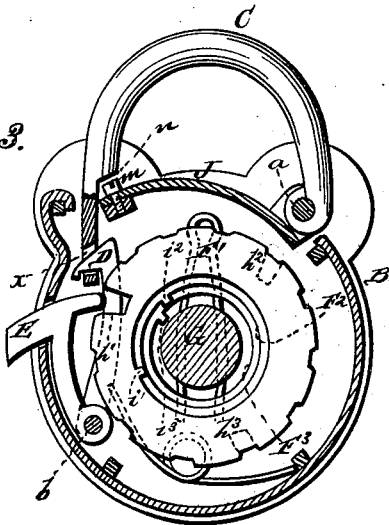
*Fig. 1.*



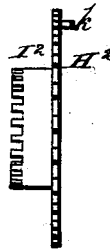
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



WITNESSES

*Robert Emmett,  
James J. Sheehy.*

INVENTOR,

*George W. Grove.  
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ATTORNEYS.

# UNITED STATES PATENT OFFICE.

GEORGE W. GROVE, OF LINNVILLE, OHIO.

## IMPROVEMENT IN PERMUTATION-PADLOCKS.

Specification forming part of Letters Patent No. 202,022, dated April 2, 1878; application filed March 9, 1878.

### *To all whom it may concern:*

Be it known that I, GEORGE W. GROVE, of Linnville, in the county of Licking and State of Ohio, have invented a new and valuable Improvement in Combination-Locks; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a front view of my combination-lock. Fig. 2 is a transverse vertical section. Fig. 3 is a vertical section, and Figs. 4 and 5 are detail views, thereof.

The nature of my invention consists in the construction and arrangement of a combination-lock, as will be hereinafter more fully set forth.

The annexed drawing, to which reference is made, illustrates my invention applied to a padlock.

A represents the body of the lock-case, with back-plate B riveted thereto. C is the shackle, which is pivoted at *a*, and its other end provided with a slot, *x*, to be caught by the spring-catch D within the lock-case when the shackle is closed. The spring-catch D is pivoted at *b*, and upon the same pivot is placed a thumb-piece, E, which projects through the side of the lock-case. This thumb-piece has within the case an arm, *d*, which lies in front of the spring-catch, so that by pressing inward on the thumb-piece the spring-catch will be pushed back and the shackle can be opened.

The back plate B of the case is provided with a central hub, G, which projects through an enlarged circular hole in the front of the lock-case.

On the hub G, within the lock-plate, is placed a series of tumblers, F<sup>1</sup> F<sup>2</sup> F<sup>3</sup>, made in the shape of annular rings or plates, of equal outside diameter; but their inside diameters are graduated, as shown. These annular tumblers are, respectively, provided with an inwardly-projecting tooth, *i*<sup>1</sup> *i*<sup>2</sup> *i*<sup>3</sup>, and in their outer edges with a slot, *h*<sup>1</sup> *h*<sup>2</sup> *h*<sup>3</sup>, as shown.

On the front of the lock-case are placed disks H<sup>1</sup> H<sup>2</sup> H<sup>3</sup>, provided, respectively, with

tubes I<sup>1</sup> I<sup>2</sup> I<sup>3</sup>, projecting around the hub G inward into the lock. These disks, with their tubes, are of different sizes, and said disks are, at their outer edges, formed in the shape of a series of radial arms, which are lettered A B C D, &c., and from each arm containing the letter A projects a pin, *k*.

The inner ends of the tubes I<sup>1</sup> I<sup>2</sup> I<sup>3</sup> are notched to correspond with the arms of their respective disks.

The tumblers F<sup>1</sup> F<sup>2</sup> F<sup>3</sup> are held against the inner side of the front of the lock-case by a spring-key, L, inserted either in grooves in or a slot through the hub G.

The notched tubes I<sup>1</sup> I<sup>2</sup> I<sup>3</sup> fit, respectively, on the teeth *i*<sup>1</sup> *i*<sup>2</sup> *i*<sup>3</sup> of the tumblers.

The combination being set to certain letters—for instance, H I P—the disks will be turned so as to bring said letters in a line with a pin or mark, *y*, on the lock-case, when the slots *h*<sup>1</sup> *h*<sup>2</sup> *h*<sup>3</sup> of the tumblers will be in such position that the arm *d* of the thumb-piece will enter the same and the lock can be opened; but if these letters are not in such position, one or more of the tumblers will present a solid edge to the arm *d*, and the thumb-piece cannot be pressed in to open the lock.

It will, however, be noticed that the spring-catch D works behind the tumblers; hence when the lock is open it can be closed and locked, no matter in what position the tumblers may be.

For the purpose of changing the combination the lock-case is provided between the two ends of the shackle with a plate, J, hinged at *a*, and closed at the other end by a screw, *m*, arranged at such a point that a shoulder, *n*, of the shackle will come on top thereof, and thus prevent the same from being removed when the lock is closed.

By removing the set-screw *m* the plate J can be opened, and the key L then withdrawn. The tumblers will then fall out of gear, and the lettered disks can be moved as desired, and the tumblers brought into gear again, and the spring-key inserted, and plate closed. A door-lock may be constructed on the same principle.

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

1. In a combination-lock, the combination,

with the case A B and shackle C, of the spring-latch D and thumb-piece E, with arm *d*, substantially as and for the purposes set forth.

2. In a combination-lock, the hinged plate or door J, with screw *m*, in combination with the lock-case A B and the shackle C, having shoulder *n*, substantially as and for the purposes set forth.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

GEORGE W. GROVE.

Witnesses:

J. W. SWITZER,  
FRANCIS M. LAYTON.