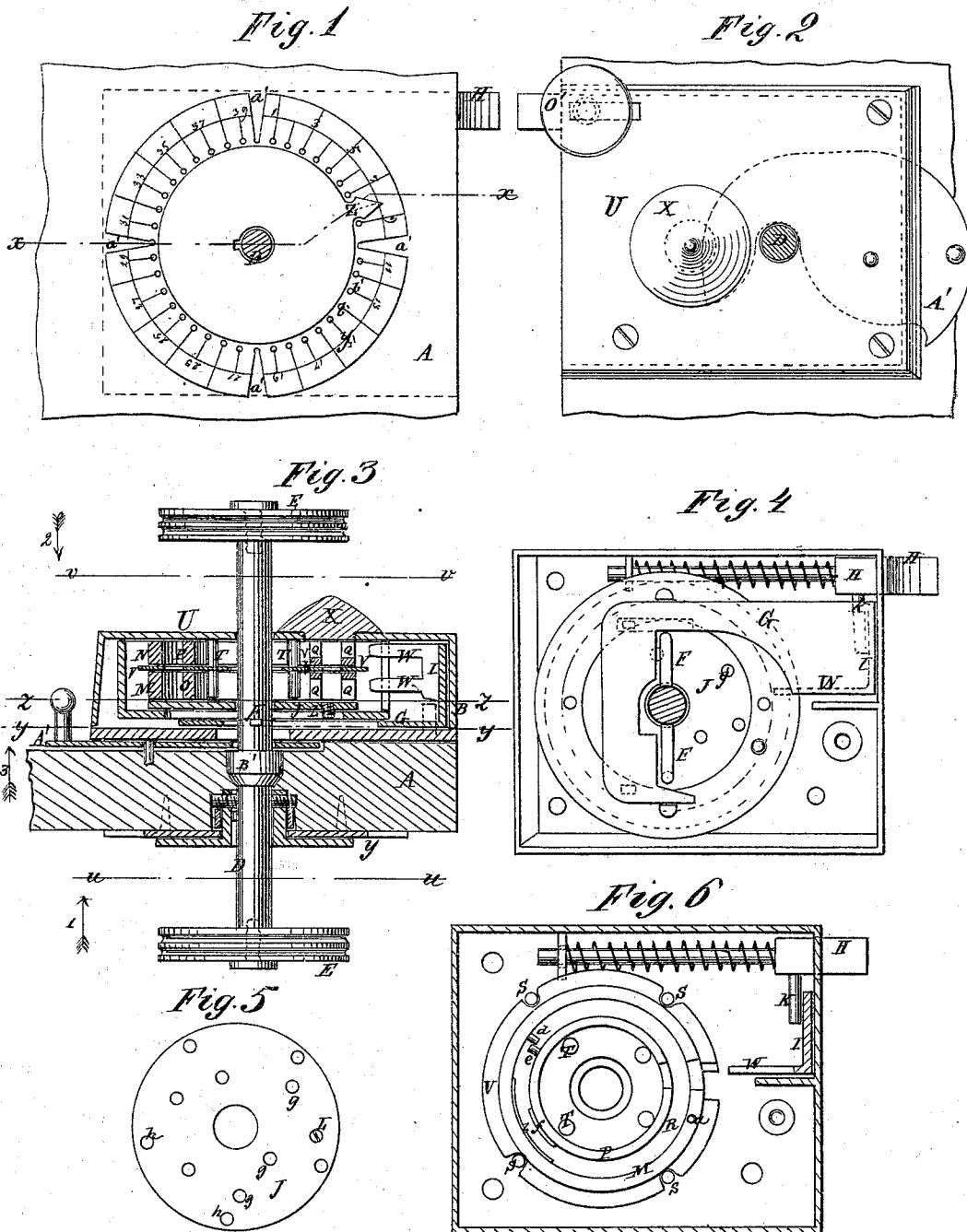


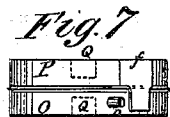
J. G. O'NEILL.
Permutation Locks.

No. 147,345.

Patented Feb. 10, 1874.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOSEPH G. O'NEILL, OF GRASS VALLEY, CALIFORNIA.

IMPROVEMENT IN PERMUTATION-LOCKS.

Specification forming part of Letters Patent No. 147,345, dated February 10, 1874; application filed June 14, 1873.

To all whom it may concern:

Be it known that I, JOSEPH G. O'NEILL, of Grass Valley, in the county of Nevada and State of California, have invented a new and Improved Combination-Lock, of which the following is a specification:

The invention will first be fully described, and then clearly pointed out in the claims.

Figure 1 is an outside front elevation of the lock, looking in the direction indicated by arrow 1, and a section of the spindle on the line *u u* of Fig. 3. Fig. 2 is an inside elevation, looking in the direction indicated by arrow 2, and a section of the spindle on the line *U*. Fig. 3 is a horizontal section on the line *x x* of Fig. 1. Fig. 4 is a sectional elevation on the line *y y* of Fig. 3, looking in the direction indicated by arrow 3. Fig. 5 is a plan view of the disk by which the rings are turned. Fig. 6 is a sectional elevation on the line *z z*, also looking in the direction indicated by arrow 3; and Fig. 7 is a side elevation of a couple of the rings.

Similar letters of reference indicate corresponding parts.

A represents the door; B, the lock-case attached to the inside of the door; D, the spindle extending through the door and lock and projecting on each side, and having a knob or disk, E, at each end for turning it. This spindle has arms F inside of the lock-case for throwing back the plate G, which withdraws the spring-latch bolt H by its plate I at the end, engaging the pin K of the latch-bolt. The arms are also to turn the disk J by the pin L for shifting the combination-rings, which comprise a series of four, arranged in two pairs, M N and O P, the rings of each pair being arranged side by side, and the rings O P being within the others, and an annular space, R, between them. The outer rings are kept in place by the stud-pins S, and the inner ones by the pins T projecting from the lock-plate U. The rings N P rest at one side against the lock-plate U, while the rings M O rest against the disk J, and between the two rings of each pair is an annular corrugated spring, V, which presses them gently against the plate U and the disk, so as to keep them snugly in place and prevent any unnecessary looseness. All these rings have a notch, Q, and said notches

must be adjusted to coincide with the prongs W of the plate G, as shown in Fig. 3, to allow said plate to be withdrawn for pulling back the bolt H to unlock the lock. For turning these rings to adjust the notches, as above stated, one of the arms F bears against the stud-pin L of disk J and turns it. The disk is connected by a pin, *a*, with ring M, so that the disk turns it. This ring has a plate, B, on the inside, which projects across the inside of ring N, and turns it when moved against the stud-pin *d* projecting from said side, and this ring turns ring P by its stud-pin being moved against a stud-pin, *e*, projecting from the outside of P, and ring P turns ring O by its pin *e* being moved against a plate, *f*, on it. X is a conical cap screwed into a hole in plate U, through which the notches of the rings can be seen when in the right position for allowing the plate G to be pulled back. When this cap is removed the numbers on the dial-plate *y* and the number of turns and parts thereof, and the directions for turning the spindle to set the rings so as to ascertain the numbers for the combination, can be readily ascertained by turning the rings till the notches are seen through said opening, and noting the turns and the numbers whereat the pointer Z stands when the notches are seen. In making the adjustment, the ring O is first adjusted, next P, next N, and lastly ring M. The spindle D has a little endwise motion, and after adjusting the rings is moved outward sufficiently to carry the arms F out of range of the stud-pin L, and into the position for acting on the plate G to force it back, and a plate, A', is pivoted to the back of the lock, so as to swing around against the spindle behind the shoulder B', to hold said spindle in this position when it may be desired to not use the locking-rings. The spring-bolt H is provided with a knob, O', on the inside of the lock, by which to pull it back without the aid of the spindle and plate G. The combination may be changed by shifting the pin L in the disk J, for which a number of holes, *g*, are provided, or by shifting the disk relatively to pin *a* on ring M, for which the series of holes *h* are provided, and, if desired, it may also be changed by shifting the pins *d* *e* and plates *b* *f* of the rings. To open the lock at night, when the pointer and the figures

of the dial cannot be seen, I make, say four deep notches, *a'*, in the dial-plate equidistant from each other in the circumference, and a series of holes, *b'*, corresponding to the numbers on the dial. These are to guide a feeler to the hole for stopping the pointer at the right number by first placing the feeler in the notch *a'* nearest to the number where the pointer is to stop, the location of which will be so approximately known that it will be readily understood which notch is nearest to it, and then moving the pin or feeler along from one hole to another until the right one is reached, which will be known by counting from the notch beginning with the number of the hole at the notch. As the pointer will cover the hole whereat it is to stop, the feeler will be stopped

one number short of the number of the combination to which the pointer is to be adjusted.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination and arrangement of the pairs of notched rings M N and O P, plate G W, and plates *c d*, plates *b f*, and disk J, substantially as specified.

2. The notches *a'* and feeler-holes *b'*, arranged with the dial and pointer, substantially as and for the purpose specified.

JOSEPH G. O'NEILL.

Witnesses:

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