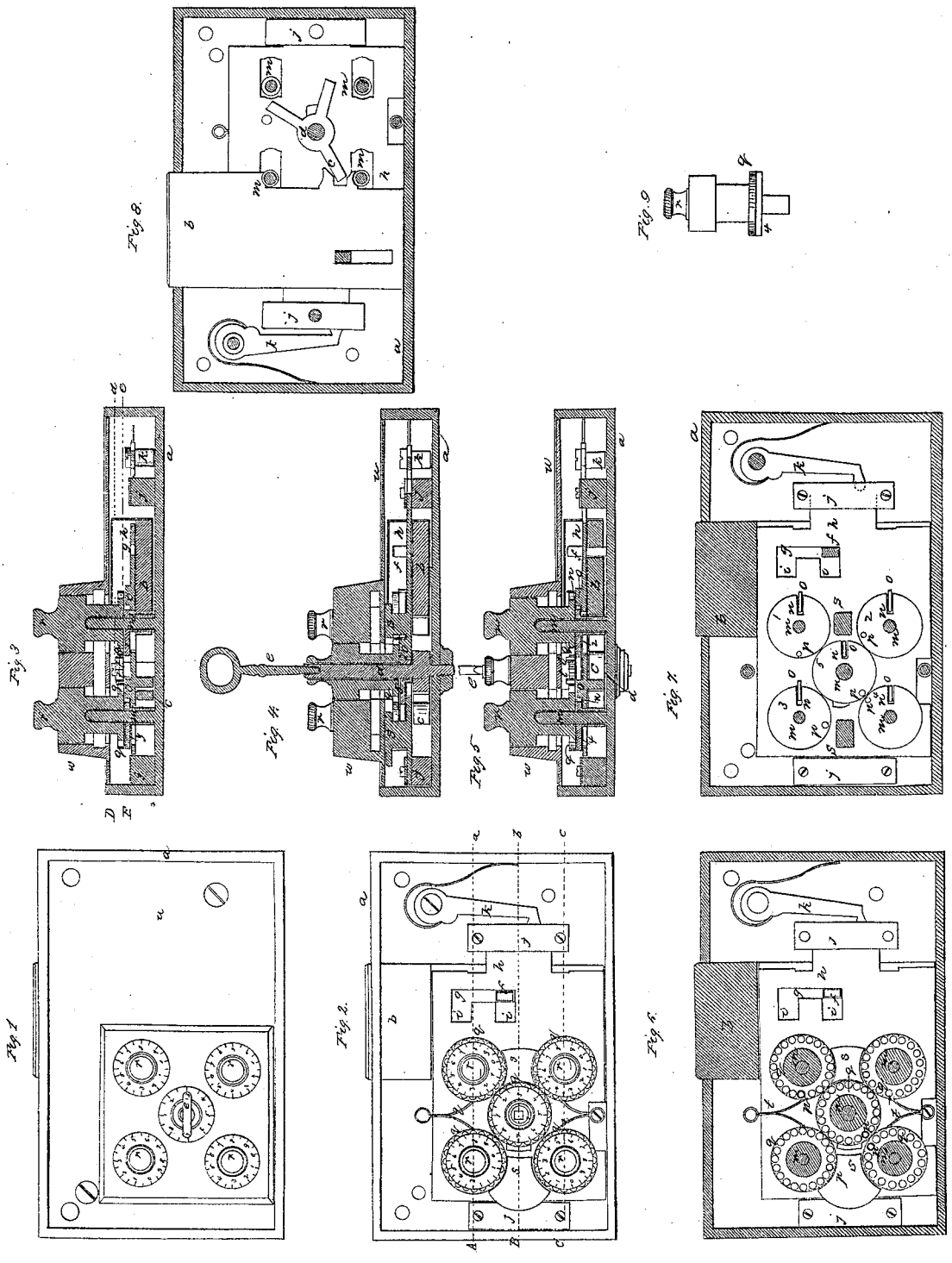
H. Ritchie,

Permutation Lock.

No. 6,555. Patented June 26, 1849.



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UNITED STATES PATENT OFFICE.

HENRY RITCHIE, OF NEWARK, NEW JERSEY, ASSIGNOR TO H. C. JONES, OF NEWARK, NEW JERSEY.

ROTATING PERMUTATION PLATE-LOCK.

Specification of Letters Patent No. 6,555, dated June 26, 1849.

To all whom it may concern:

Be it known that I, HENRY RITCHIE, of Newark, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Permutation-Locks for Banks, Vaults, and other Doors, and that the following is a full, clear, and exact description of the principle or character which distinguishes them from all other things before known and of the manner of making, constructing, and using the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1, is a face view of the lock; Fig. 2, the same view with the lock plate removed to exhibit the inside; Figs. 3, 4, and 5, longitudinal sections taken at the lines (A, *a*), (B, *b*) and (C, *c*) of Fig. 2; Figs. 6 and 7, sections taken at the lines (D, *d*,) and (E, *e*), of Fig. 5; Fig. 8, a reversed view of the tumbler and bolt bit; and Fig. 9 an elevation of one of the permutation plates and index.

The same letters indicate like parts in all the figures.

My improvements relate to that class of permutation locks in which the tumbler, which secures the bolt when thrown out, is permitted to move by projections thereon which enter slots in a series of rotating permutation plates, a shifting index being connected with each of the permutation plates for the purpose of changing the permutations, and the tumbler being made to move at right angles with the line of motion of the bolt.

The first part of my invention consists of flanches or plates attached to the tumbler, which, when the tumbler is permitted to fall by the permutation plates, pass over the plates of the permutation indices to lock them to the permutation plates to prevent the changing of the permutation while the bolt is locked.

In the accompanying drawings (*a*) represents the lock case, and (*b*) the bolt which may be of any desired construction. The bolt is thrown in and out by a bit or lever (*c*) on a spindle (*d*) the outer end of which spindle is adapted to receive a key (*e*). This bolt has a spare pin (*f*) projecting from it which plays freely in a large slot (*g*) in the tumbler (*h*), and this slot at each end is cut down, as at (*i*, *i*,) to permit the tumbler to rise when the bolt is thrown either in or out. The tumbler (*h*) slides in mountings (*j j*) at right angles to the motion of the bolt so that any pressure made on the bolt to throw it in, instead of having the effect to make the tumbler press on the permutation plates, will instead, have the effect to prevent any motion of the tumbler. This tumbler is pressed down by a spring lever (*k*) and it has five slots in it (not shown in the drawing) through which pass the bolt bit spindle (*d*) and four other spindles (*m*) on which the permutation plates turn, the slots being of sufficient length to permit the tumbler to have the required play. On each of the five spindles there is a circular plate numbered in succession 1, 2, 3, 4, 5, denominated permutation plates. They are fitted to turn freely but accurately on the spindles, and in each there is a radial slot (*n*), which, when in the proper position receives a tongue (*o*) projecting from the face of the tumbler, so that when all the permutation plates are in the proper position the tumbler is free to descend that the bolt may be thrown in or out, but when the tumbler is up and any one of the permutation plates is turned from that position the tongue rests on its periphery and cannot descend and the bolt is therefore locked and cannot be moved.

On each of the permutation plates there is a round pin (*p*) which fits any one of a series of holes near the periphery of a shifting plate (*q*) attached to the lower end of the permutation index (*r*) the lower end of which is bored to fit into the spindle of the permutation plate, so that when one of these is slipped on to each of the permutation plates, there are five index plates each with a division and numbers as shown in the drawings. And by reason of the holes in the lower plates and the pin on each of the permutation plates the position of the slot in the permutation plates can be shifted to correspond with any of the divisions on the index plates, and in this way the combination may be varied at pleasure.

When the tumbler is let down and the bolt is free to be thrown in and out, the indices can be disconnected from the permutation plates; but when the tumbler has been thrown up to lock the bolt there are two flanch plates (*s*, *s*,) attached to the tumbler which pass over the perforated plates (*q*) on the indices and then lock them to the

permutation plates to prevent the changing of the combination after the bolt has been locked.

As the tumbler rests on the periphery of all the permutation plates, a delicate and experienced hand might by turning the permutation plates in succession feel the slots and by degrees get them all in their proper places and thus unlock the bolt. To prevent this, the periphery of each of the perforated plates (*q*) is formed with a series of notches as shown in the drawing, and springs (*t t*) are made to bear thereon with greater force than the tumbler can press on the permutation plates so that the most delicate hand cannot by any possibility determine when the slots of the permutation plates are in the proper position.

The whole of the works of the lock are inclosed by the lock plate (*u*) except the faces of the indices and a head projecting from each by which they are turned. The index plates pass through and turn freely but accurately in a projection (*w*) of the lock plate the whole of which is made of chilled, cast, or case hardened iron or steel to prevent access to the inside of the lock. In this way it will be seen that there is no means even of introducing gunpowder into the lock for the purpose of exploding it.

From the foregoing it will be seen that the number of permutation plates and corresponding index plates can be increased at pleasure to increase the permutation, and that in like manner the combination may be increased at pleasure, by increasing the divisions on each index, provided that the number of perforations in the plates (*q*) attached to each be increased to the same number, for there must be one hole for each division of the index. And it will also be obvious the number of flanches on the tumbler for locking each index to its appropriate permutation plate may be variously arranged and increased in number so long as they effect the purpose contemplated.

What I claim as my invention and desire to secure by Letters Patent is—

Locking the indices to the permutation plates when the tumbler is thrown up to lock the bolt by means of the flanches or other equivalent on the tumbler, substantially as herein described, to prevent the possibility of changing the permutation after the bolt has been locked as described, when the lock is so arranged that the relation between the dials and permutation plates may be changed without opening the lock case, as described.

HENRY RITCHIE.

Witnesses:

THOS. SLAIGHT,

STEPHEN WHITE.