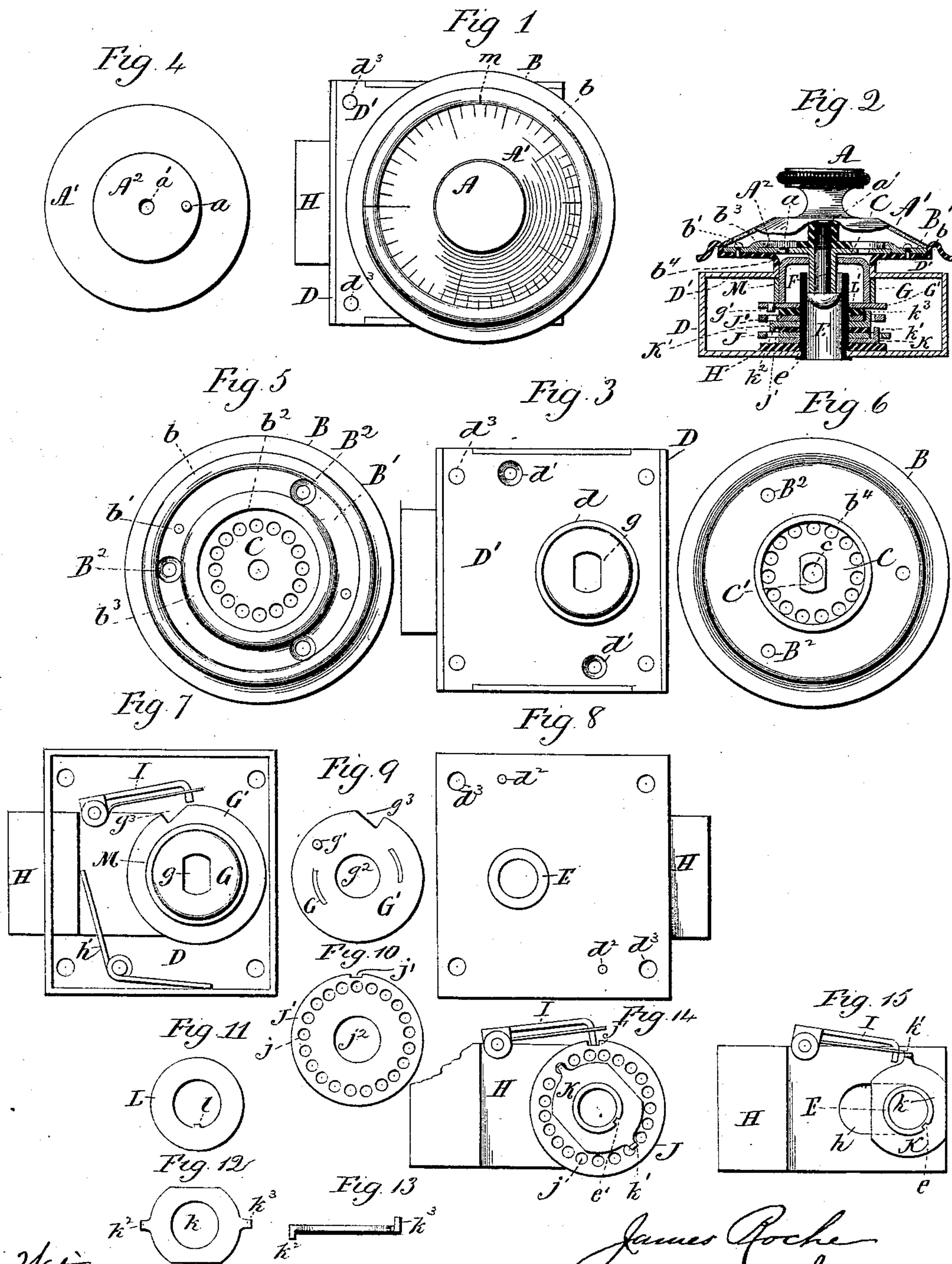


(No Model.)

J. ROCHE.
PERMUTATION LOCK.

No. 475,520.

Patented May 24, 1892.



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PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 475,520, dated May 24, 1892.

Application filed February 23, 1892. Serial No. 422,438. (No model.)

To all whom it may concern:

Be it known that I, JAMES ROCHE, of Terryville, in the county of Litchfield and State of Connecticut, have invented a new Improvement in Permutation-Locks; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a view in elevation of a lock constructed in accordance with my invention; Fig. 2, a sectional view thereof on the line *a* *b* of Fig. 1; Fig. 3, a view in elevation of the lock with the dial and dial-plate removed; Fig. 4, a detached reverse view of the dial; Fig. 5, a similar view in front elevation of the dial-plate; Fig. 6, a similar reverse view thereof; Fig. 7, a view of the lock mechanism with the cover of its case removed; Fig. 8, a reverse view of the lock-case, showing its tubular spindle; Fig. 9, a detached reverse plan view of the hollow roll-back or coupling-head; Fig. 10, a detached view of one of the perforated wheel-tumblers; Fig. 11, a similar view of one of the washers; Fig. 12, a similar view of one of the couplers; Fig. 13, an edge view of the same; Fig. 14, a detached broken view showing the bolt, its dog, the lower wheel-tumbler, and the upper coupler; Fig. 15, a similar view showing the bolt, its dog, and the lower coupler.

My invention relates to an improvement in permutation-locks, the object being to produce a simple, cheap, and durable lock of few parts and having a wide range of change.

With these ends in view my invention consists in a lock having certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

As herein shown, the dial of my improved lock comprises a knurled button or knob *A*, a beveled flange *A'*, graduated upon its outer face, a disk *A²*, located within and offsetting from the said flange, and a coupling-pin *a*, projecting from the inner face of the said disk near the edge thereof, a threaded opening *a'*, extending centrally through the disk and into the shank of the knob *A*. The circular dial-

plate *B* is struck up to form an annular shoulder *b*, adapted in size to permit the beveled flange of the dial to set within it. A circular plate *B'* fits within the said shoulder *b* and is secured to the dial-plate by rivets *b' b'*. This plate has a central opening *b²* just enough larger in diameter than the disk *A²* of the dial to receive and permit the same to freely rotate. The said plate is struck up around the said opening to form an offsetting-flange *b³*, making room for a perforated disk *C*, which is confined by its edges between the said flange and the plate *B* and with a capacity for free rotation. When the lock is assembled, the imperforated disk *A²* bears upon the perforate disk *C*, with which it is coupled by the entrance of its pin *a* into one of the perforations thereof. The said plate *B* also has a central opening, the edges of which are turned inward to form a neck *b⁴*, as seen in Fig. 2 of the drawings.

The plates *B* and *B'* are constructed with screw-holes *B²*, by means of which the dial-plate is secured in place. The perforated disk *C*, before mentioned, is provided upon its inner face with a coupling-bar *C'*, which has two flat faces located opposite each other, as herein shown, but which may be of any other irregular form in transverse section. This bar is constructed with a longitudinal opening *c* of smooth bore, the said opening also passing through the center of the disk.

The locking mechanism proper is inclosed in a case *D*, having a removable cover *D'* formed with an opening, which is surrounded by an outwardly-projecting ring *d*, corresponding in diameter to the ring *b⁴* of the plate *B*. The said cover is also provided with screw-holes *d'*, Fig. 3, receiving screws which enter corresponding holes *d² d²*, Fig. 8, whereby the cover is held in place. The cover and case are also provided with aligned holes *d³* (shown in Figs. 3 and 8) for receiving screws for the attachment of the case to the wood-work which it is applied. A tubular spindle *E*, located within the case, has its outer end reduced in diameter to form a neck *e*, which is set into an opening in the bottom of the case, as shown by Fig. 2 of the drawings, and then upset upon the outer face of the bottom of the case, as shown by Fig. 8, whereby the

spindle is rigidly secured in place with both ends open, its interior being accessible from the bottom of the case after the dial, dial-plate, and locking mechanism have been assembled for the insertion of the coupling-screw F, which may be thus passed through the smooth bore of the coupling-bar C' and the rotatable disk C into the threaded-opening a' of the dial, as shown by Fig. 2 of the drawings. The head of the screw engages with the end of the coupling-bar, whereby the dial is held in place on the dial-plate and the said parts prevented from being disconnected from the locking mechanism, for when the bar has been moved to its outward limit in the opening j , formed to receive it in the closed end of the cup-shaped body portion G of the hollow roll-back or coupling-head, the head of the screw engages with the inner face of the said end of the said part G, and thus prevents the dial from being disconnected from the locking mechanism, of which the roll-back is a member. It will be understood that the longitudinal movement of the bar in the roll-back within the limits of the length of the bar enables the lock to be accommodated to doors of different thickness. The said coupling-head also comprises a disk or circular plate G', constructed with a central opening G^2 (shown by Fig. 9 of the drawings) and just enough larger than the spindle E in diameter to permit the same to pass through it into the body portion G of the roll-back, which rotates on the said spindle. The said disk G', which is rigidly secured to the open end of the body portion G, is constructed with a notch g^3 in its edge and carries an eccentric-pin g' , of which more hereinafter.

The bolt H of the locking mechanism is constructed with an elongated opening h , which receives the hollow spindle E, before mentioned, the longitudinal movement of the bolt being limited by the length of the said slot. A spring h' , located within the case D, is combined with the bolt, so as to exert a constant tendency to project it. A spring-actuated dog I, carried by the bolt, to which it is pivotally secured, has its inner end turned inward for engagement with the perforated wheel-tumblers and the edge of the disk G' of the roll-back. As herein shown, the lock is provided with two of the said wheel-tumblers, which for convenience of description I will designate by J and J', although they are exactly alike, each of the same being constructed with a circular series of perforations j and a peripheral notch j' . It will be understood, of course, that the number of these tumblers may be increased, as desired. They are mounted to rotate upon the spindle E, before mentioned, and thereto each is provided with a central perforation j^2 a little larger than the same in diameter. In combination with these wheel-tumblers I employ two or more couplers for connecting them together in different relations on the well-known principle on which locks of this class are based. The lock

herein shown employs two of these couplers, which, being slightly different in construction, I shall designate by K and K'. They are made of sheet metal and each has a central opening k , adapting it to fit over the hollow spindle E. The coupler K, which is placed directly upon the inner end of the bolt H, over the elongated slot h thereof, has an upwardly-turned finger k' , which stands at a right angle to it. This finger is adapted in width to fit into any one of the perforations j in the wheel-tumbler J, which is placed upon the said coupler and in length to extend sufficiently beyond the opposite face of the said tumbler to be engaged by the corresponding short finger k^2 of the coupler K', which is interposed between the said tumblers J and J'. A small washer L, (shown by Fig. 11 of the drawings,) having an inwardly-projecting lug l , which fits into a longitudinal groove e' , formed in the spindle, is interposed between the wheel-tumbler J and coupler K' and prevents the short finger k^2 of the latter from entering the perforations in the wheel-tumbler J. The said coupler K' is also provided with a finger k^3 , corresponding in width to the diameter of the perforations in the tumbler J' and adapted in length to extend through one of the perforations therein and beyond the opposite face thereof for a sufficient distance to be engaged by the pin g' (see Fig. 9) of the roll-back. A washer L', (see Fig. 2,) corresponding to the washer L, is interposed between the wheel-tumbler J' and the disk G' of the roll-back to prevent the pin g' , carried by the said flange, from entering the perforations in the said tumbler. A ring M, Fig. 2, interposed between the tumbler J' and the cover D' of the lock-case D, holds the tumblers, couplers, and washers from displacement on the spindle.

When the parts of my improved lock are assembled, the pin a , carried by the disk A² of the dial, enters one of the perforations in the disk C, mounted in the dial-plate and carrying the coupling-bar C', which is entered into the opening g in the roll-back or coupling-head, the pin g' whereof engages, when the roll-back is suitably rotated, with the projecting end of the finger k^3 of the coupler K', the shorter finger k^2 whereof engages, when the said coupler is properly rotated, with the finger k' of the coupler K. By shifting the dial with reference to the rotatable perforated disk C and by shifting the couplers with reference to the perforated wheel-tumblers the manipulations of the dial, in order to bring the notches j in the tumblers and the notch g^3 in the roll-back together under the bent end of the dog I of the bolt H, may be greatly varied.

By constructing the lock with a hollow spindle open at both ends to permit the dial, dial-plate, and locking mechanism to be connected together through the lock-case the lock is adapted to be readily accommodated to doors of different thicknesses without danger of disconnecting the bar from the roll-back, that be-

ing prevented by the engagement of the head of the screw with the inner face of the closed end of the cup-shaped body portion of the roll-back.

5 Inasmuch as my improved lock operates on the same principle as other permutation-locks having wheel-tumblers, I need not particularly describe the operation of my improvement more than to say that the lock having been set
10 the dial is rotated one way or the other to bring certain points upon its graduated flange A' into line with the index-point *m* on the dial-plate.

15 I would have it understood that I do not limit myself to the exact construction herein shown and described, but hold myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

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

25 1. In a permutation-lock, the combination, with a dial provided upon its inner face with a disk carrying an eccentric-pin and constructed with a centrally-threaded opening entering the inner face of the said disk, of a dial-plate furnished with a perforated rotatable disk carrying an inwardly-projecting longitudinally-
30 perforated coupling-bar, a locking mechanism having a hollow spindle open at both ends, wheel-tumblers mounted thereon, couplers between said tumblers, a bolt connected with the said tumblers, and a roll-back or coupling-

head adapted at one end to receive the said 35 post and at its other end to receive the coupling-bar, and a coupling-screw entered through the outer end of the said spindle into the roll-back, its shank passing through the coupling-
40 bar into the dial, whereby the dial and dial-plate are coupled together and prevented from being disconnected from the locking mechanism, substantially as set forth.

2. In a permutation-lock, the combination, with a bolt carrying a pivotal spring-actuated 45 dog, of a hollow spindle, two or more perforated rotatable wheel-tumblers mounted thereon, each having its edge notched, one or more couplers combined with the said tumblers, each having one or more fingers bent 50 at a right angle to it, washers combined with the said tumblers and couplers, as shown, a coupling-head fitting over the said spindle and co-operating with the said tumblers, a rotatable dial, and a dial-plate carrying a coup- 55 ling-bar adapted to enter the said coupling-head and constructed to be coupled with the said dial, whereby the rotation of the same turns the coupling-bar, and hence the coupling-head and tumblers, substantially as de- 60 scribed.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JAMES ROCHE.

Witnesses:

GEO. W. CROSLEY,
C. W. HUMPHREY.