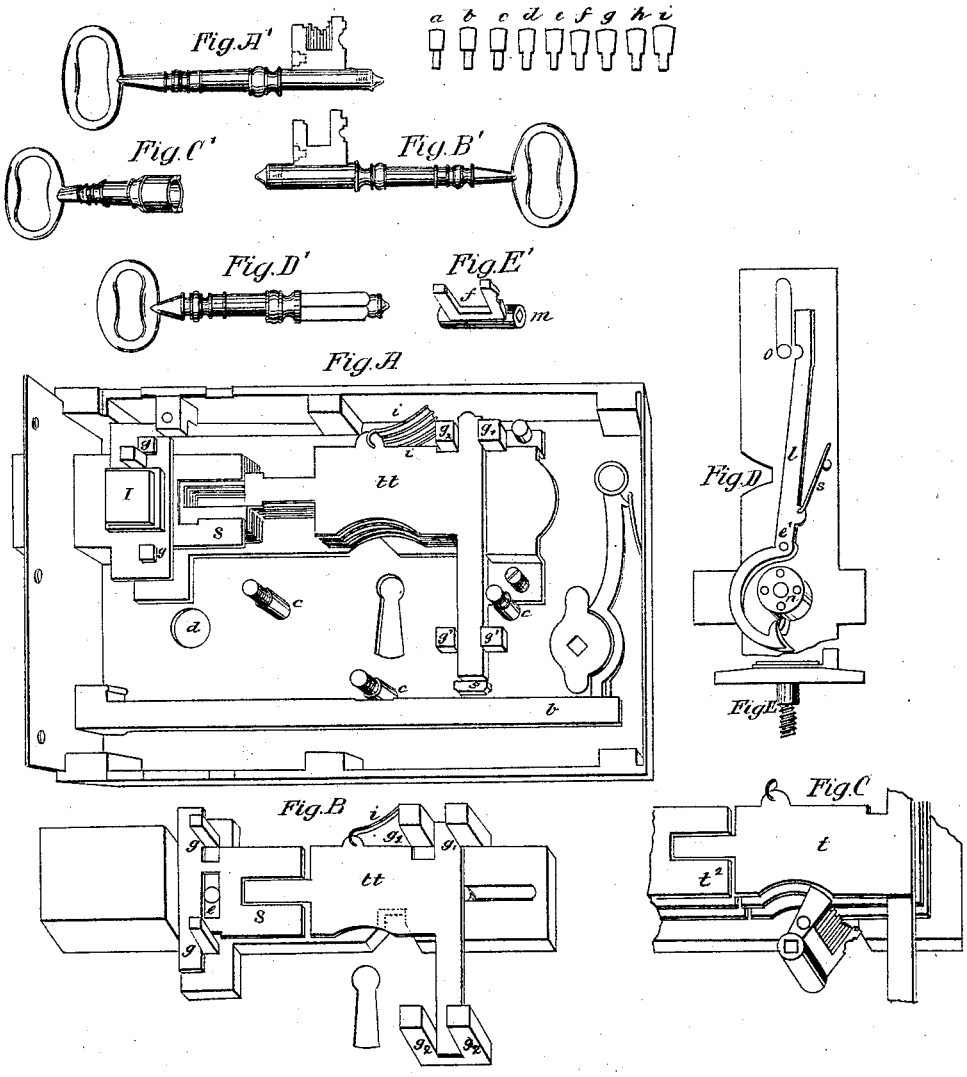
2 Sheets. Sheet 1.

R. Nevell,

Lock.

No. 944. Patented Sep. 25, 1838.



R. Newell,

2 Sheets. Sheet 2.

Lock.

No. 944.

Patented Sep. 25, 1838.

Fig. 1.

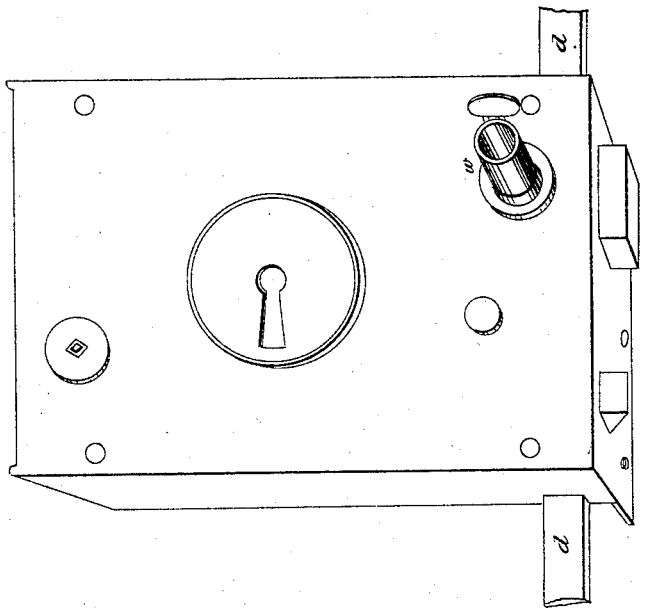
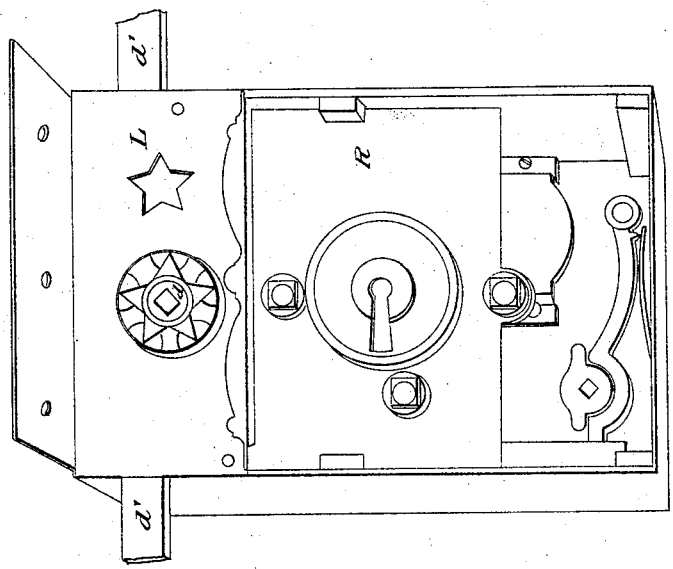


Fig. N.



UNITED STATES PATENT OFFICE.

ROBERT NEWELL, OF NEW YORK, N. Y.

MANIFOLD PERMUTATION-LOCK FOR DOORS, VAULTS, &c.

Specification forming part of Letters Patent No. 944, dated September 25, 1838; Reissued December 2, 1851, No. 208.

To all whom it may concern:

Be it known that I, ROBERT NEWELL, of New York, N. Y., have invented new and useful Improvements in Manifold Permutation-Locks for Doors, Vaults, &c., of which the following is a specification.

My invention in the manifold permutation lock is represented in the annexed drawings in connection with parts or principles ordinarily attached to other locks, constituting a combination of slides and tumblers operating together on the bolt in such manner that they can be transposed or set in any given position to which the key may be formed. The bit of the key being composed of as many separate or movable sections as there are slides in the lock, thereby rendering it in the power of its possessor at any time before projecting the bolt to effect with the aid of an auxiliary key or wrench any necessary permutation in the lock without removing the same or any part of it from the door.

In order therefore to give a plain and lucid exposition of the drawings accompanying this specification it may be well to refer to each section as represented thereon and state the application or design of such in their several positions instead of resorting to mere nominal references. In the first place the bolt is furnished with any number of permutation tumblers, or as in the present example with nine, which move one upon the other and between themselves in a perpendicular line on the face or surface of the bolt, as shown at *t*, *t*, (Figure A) being there secured and kept in their places by two guides, which are firmly attached to the lock plate one above and the other below the bolt designated by *g'*, *g'*, *g'*, *g'*, through which the tumblers operate by the action of the key. The tumblers are continually forced toward and stop against the stud *s*, when disconnected from the slides by means of the springs *i i*, which are separately attached to each tumbler. Directly in front and in a horizontal line with the tumblers are a corresponding number of slides, which are attached to and operate in like manner upon the face of the bolt, being kept in their proper places there by two guides *g*, *g*, which are firmly secured on the face of the bolt near the top and bottom edge of the same, forming a space between them and the head of the bolt for the slides to operate through to rise and fall in conjunction with the tumblers. The slides and tumblers being of an equal thickness are united together before projecting the bolt by means of the narrow projections on the ends of the tumblers which fit accurately and pass into the grooves of the slides as represented on the face of the bolt disconnected from the lock at (Fig. B) *t*, *t*, being the tumbler and S, the slide, in this position the slides and tumblers become as it were one and the same piece alike subject to the action of the key, both are raised up as one together until they attain the elevattion given by the key when the slides are secured in a stationary position for the action of the bolt. The slides are secured in any given position by means of the cramp and nut. The top of the cramp is shown at 1, (Fig. A) accurately fitted on the two guides, *g*, *g*, and also disconnected from the same at (Fig. E) where it is represented with the screw on the bottom side of the same, which passes through the aperture, *e*, as represented in the slide S, at (Fig. B) and also through the bolt, which is for the purpose of receiving the nut, *n*, as exhibited on the back or underside of the bolt, which lies next the plate of the lock at (Fig. D). The slides therefore being between the cramp and the bolt may be secured in any given position by tightening the nut. The lever, *l*, which is also shown on the back of the bolt at (Fig. D) is for the purpose of keeping the bolt from being projected, when the slides are not secured in some fixed position by the cramp, a permutation being always effected in the lock when the bolt is back gives rise to the necessity of securing the same until the necessary arrangement of securing the slides again to some fixed position is completed, the bolt consequently can never be projected while the cramp remains slack. The lever, *l*, above alluded to is secured to the bolt by the screw, *e'*, and acts thereon, being pressed down by the spring, *s*, causing it to catch on the stud, O, when the nut *n*, is slacked thereby securing the bolt from moving until the lever is again raised clear of the stud, which is accomplished by a projection on the side of the nut, meeting in contact with a like projection on the end of the lever, when in the act of tightening the slides in some given position. The stud, O, mentioned here is firmly

attached to the plate of the lock passing through a groove or slot in the bolt, forming both guide and stop for the same in its passage back and forth. It is shown at, O, (Fig. B) in the position which it stands in the lock. The key of the lock being next in order is composed of two distinct parts, the shank and the bit. The shank is represented on the drawing at (Fig. D′) and the bit disconnected from the same at (Fig. E′). The shank and the bit are connected together by means of square perforation through the barrel or pin of the bit, which is shown at *m*, (Fig. E′) and the square on the end of the shank as seen at (Fig. D′). They are secured together by means of the tip or nut, which is screwed on the end of the shank, against the barrel or pin of the bit and uniting them together as represented at (Fig. B′). The key is designed in this particular for the purpose of inverting the bit on the shank, in order that it may be used on either or both sides of the lock, when the sections of the bit are placed in an irregular position as shown at (Fig. A′). The key being there represented in one of its forms for use, *a*, *b*, *c*, *d*, *e*, *f*, *g*, *h*, *i*, represent the sections separately disconnected from the bit, exhibiting their various proportions. They are attached to the bit by means of their tenons entering a mortise in the same at *f*, (Fig. E′) and secured therein by virtue of a screw pressing against them as represented by the dotted lines in the side of the bit at (Fig. B′). The bit may be furnished with any number of sections, which may be shifted or altered at pleasure and be used in any of the different permutations or combinations which that number will admit of. A key with nine sections like that represented in the drawing is calculated to give three hundred sixty-two thousand eight hundred and eighty different changes or permutations.

In order to show the action of this lock and the manner of effecting a permutation in the same I will first state that the nut, *n*, as seen at (Fig. D) is presented in the lock through an orifice or barrel on the back side of the same as seen on Plate No. 2 (Fig. L) for the purpose of receiving the key or wrench which is exhibited on Plate No. 1 at (Fig. C′) having two tips on its end, which are adapted to the holes on the top of the nut, by which means the nut is slackened or made tight. I will now suppose the nut to be slackened, which is always the case when the slides are to be set in any given form with the key. The key is therefore inserted in the key hole of the lock and turned as in the act of projecting the bolt until it comes in contact with one side of the mesh in the same causing it to stop in the position as shown at (Fig. C). The key in its action to said position raises the tumblers, which carry the slides up with them to the different elevations given by the sections of the key bit, the slides being now arranged after the manner of the key. The wrench is inserted in the barrels or orifice represented at *w* on Plate No. 2 (Fig. L) until it becomes connected with the nut *n*, which must be turned sufficiently to cause the lever *l* to rise clear of the stud O, which is signified by the nut stopping against the projection on the end of the lever as before described. The operation of raising the lever also secures the slides. The nut being screwed firmly against the bolt draws the cramp tight upon the face of the slides thereby compressing them together in a fixed permanent position. The bolt may now be projected, which when done carries the slides out with it, causing them and the tumblers to become separated in consequence of their projections becoming relieved from the grooves in the slides. The tumblers now drop down below said grooves and stop against the stud *s*. The projections on the ends of the tumblers passing close against the ends of the slides forms a stay for the bolt, which cannot be returned again until the tumblers are raised up to a sufficient height by the key to bring their projections in a line of intersection with the grooves in the slides, when the bolt may be returned again free and unobstructed.

I will now refer to a few sections as represented on the drawing, which have not been mentioned as they are common to other locks. *b* at (Fig. A) is the spring latch. *c*, *c*, *c*, are three studs for receiving the cap, which confines the various sections to the lock plate. The cap is seen on Plate No. 3 at R (Fig. N). *d* is an aperture for receiving the arbor of the pinion, which moves or carries the cross or perpendicular bolts. These bolts are seen connected with the lock at *d′ d′* (Fig. N) confined in their places by the cap L. All the rest of the sections being of minor consideration and plainly exhibited on the drawings and known to all persons acquainted with the construction of locks renders it unnecessary to enter further into detail. The different sections *a*, *b*, *c*, *d*, *e*, *f*, *g*, *h*, *i*, are secured in the bit of the key by passing their lower ends, or what may be called their tenons, into a mortise formed in the said bit, for the purpose of receiving them and then pressing them together by means of the screw *u* (Fig. B′).

Having thus fully described the construction of my manifold permutation lock, and the manner in which the same operates, in doing which I have necessarily referred to many parts which are common to permutation locks, and which I do not intend, therefore, to claim as of my invention, I do not, for example claim to be the inventor of permutation tumblers and slides, or of change-

able sections in the bit of the key adapting thereto. These having been before used, but constructed and operating in a manner different from that which I have devised and adopted; but

I do claim—

1. The manner in which I have constructed the vertically sliding tumblers and connected and combined them with the slides and the bolt, in the particular mode herein set forth.

2. I also claim, in combination, the manner in which a permutation is effected in them, and the slides secured to any given elevation of the key, by means of the cramp, the nut and the wrench, as described.

3. I claim likewise the particular manner in which the different sections are secured in the bit of the key, by means of their tenons and a tightening screw.

ROBERT NEWELL.

Witnesses:

SAMUEL S. DAY,

WILLIAM DAY.

[FIRST PRINTED 1914.]