

W. B. Dodds,
Permutation Lock.

N^o 53,959.

Patented Apr. 17, 1866.

Fig. 1.

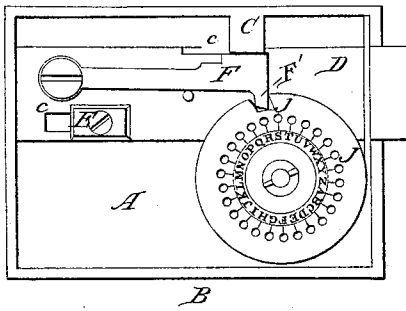


Fig. 2.

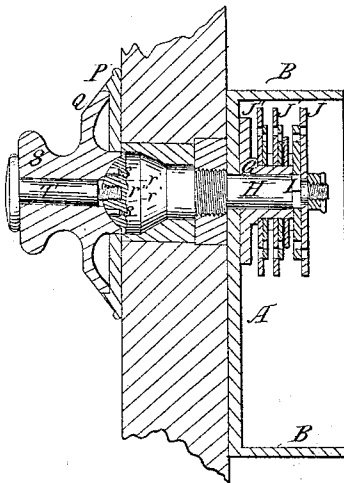
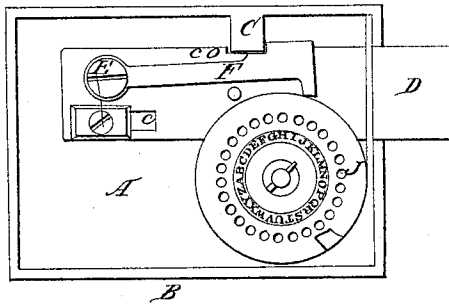
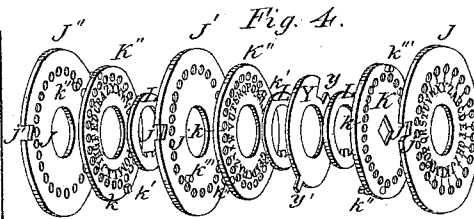


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

WILLIAM B. DODDS, OF CINCINNATI, OHIO.

IMPROVEMENT IN LOCKS.

Specification forming part of Letters Patent No. 53,959, dated April 17, 1866; antedated December 2, 1865.

To all whom it may concern:

Be it known that I, WILLIAM B. DODDS, of Cincinnati, Hamilton county, Ohio, have invented a new and useful Improvement in Locks; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

The subject of this invention is a permutation lock for the most part identical with that described in my patent of the 14th of March, 1865, and comprises a modification or improved construction of the operating and detaining tumblers for their more ready adjustment to any predetermined formula or word.

My invention also comprises a formation of the outer end of the arbor, which avoids all vulnerable projections, surfaces, or cavities subject to injury by external violence.

Figure 1 is an inner side elevation of a lock embodying my improvements, the bolts being shown retracted. Fig. 2 is the same with the bolt projected. Fig. 3 is an axial section through the operating arbor and tumblers. Fig. 4 is a perspective view of the tumblers and their apertures detached.

A B represent the case of the lock. C is a permanent stump attached thereto. D is the bolt, traversing a customary slot in the case, and which is otherwise sustained and limited in its motions by the stump C and a pin, E, which may occupy respectively a notch, *e*, and a slot, *e*, in the bolt.

F is a gravitating-dog, pivoted at one end to the bolt D, the other end being armed with a downwardly-projecting task, tooth, or bit, F', which, under suitable conditions, engages in notches *f'* in the tumblers.

G is a customary socket for the shaft or arbor H, by means of which the tumblers J J' J'' are set, and by which, also, they are operated for projecting and retracting the bolt.

The parts above described may be substantially the same as in my patent aforesaid; but in order to facilitate the setting of the permutating mechanism to any prescribed or selected word or series of letters, the annular plates described in the aforesaid patent are replaced by a series of disks, K K' K'', which are pierced by a circular series of equidistant apertures, *k*, corresponding in number to those of the tumblers. The said disks are also armed with pins *k'*, to be acted upon by pins *k''* on the

preceding disk, and by a notch, *y*, in the compensating-plate. Of these disks, the first in the series, or that most distant from the handle, occupies a square, I, upon the arbor, upon which my first or active tumbler, J, freely rotates, except as it is compelled to move with its disk K, instead of being itself firmly secured to the said square I, as in my patent aforesaid. This arrangement enables all of the tumblers, including the first, to be equally adjustable, so as to gate with any letter whatever.

My first tumbler and my second and following disks are marked or stamped opposite the apertures with the letters of the alphabet, the first disk having a stud, *k'''*, which can be made to enter an aperture in the first tumbler, J, corresponding to any given letter, and the secondary tumblers having each a similar stud, *k'''*, to enter in like manner either one of the series of apertures in the appropriate disk.

The motion of the positive disk K is transmitted to the next in the series through the medium of what I style the "compensating-plate" Y, whose notch *y* receives a pin, *k'*, projecting from the second disk, and whose arm *y'* engages a stud, *k''*, projecting from the first disk. The notch *y* is made wide enough to compensate for the aggregate thickness of the series of pins, which communicate motion from member to member of the permutating mechanism, so as to enable the same letter to be repeated consecutively or any successive letters to be employed.

L are stationary washers, interposed between the tumblers precisely as in my said previous patent.

The outside of the door is provided with customary index and alphabetical plates or dials P and Q.

In order to preserve the arbor from injury by accidental or other violence, I give its external end, R, the form of a spherical segment, adapted to glance the edge of any object which may happen to collide with it.

r r' are sockets for corresponding dowels *s s'* on the handle S. *r''* is a screw-hole to receive a screw, T, by which the handle is secured to the arbor. None of the perforations *r r' r''* penetrate as far as the base of the spherical end of the arbor, and they are consequently all of them outside of the plane of the door, and do not act to weaken the arbor proper.

The lock is set and operated as follows:

The bolt having been projected and a word selected having as many letters as there are tumblers, the latter are withdrawn from the arbor and replaced with the studs *w''* opposite their respective letters. The arbor is then rotated alternately to the left and to the right, in the customary manner, until the tusk *F'* of the dog *F* drops into the notches of the tumblers. The latter now become a part of the mechanism for throwing the bolt, as explained in my before-cited patent. The handle being turned backward, the front side of the notch in the outer tumbler, which has a positive motion from the arbor, pressing against the dog, operates and retracts the bolt. In the act of projecting the bolt the rear side of the notch in the tumbler *J* engages the slanting side of the tusk *F'* as the handle is turned so as to project the dog and bolt, the back of the dog sliding under and against the stump *C*, which prevents it being raised out of the notch until the point is reached where the shoulder *M* passes the stump. The limit of the throw being obtained, the further rotation of the positive tumbler, acting on the inclined side of the tusk, elevates the dog, throwing it out of the notch, so that the shoulder *M* locks against the stump and the point of the tusk rides upon the peripheries of the tumblers, which may then be rotated so as to throw them out of their order of combinations, thus preventing the retraction of the bolt.

The motion of the bolt is prevented at all times except when the tusk of the dog has fallen into the notches of the tumblers, the latter being the only means by which the bolt can be operated. When it is desired to unlock, the several tumblers are brought to the open or gated position by discretionary rotation to the left and to the right in connection with the index, in the manner well known to users of locks of this class.

The special advantage of the provision of a gravitating dog pivoted to the bolt and engaging in the notches of the tumblers is that both the motions of the bolt are accomplished by means of the simple rotation of the same handle and arbor by which the tumblers have been set.

The use and office of the tumblers heretofore has been merely to prevent the motion of the bolt until the proper adjustments have been arrived at, when the bolt has been made capable of being moved by means of special appliances adapted to that end.

In this lock the tumblers are the means of placing the requisite impediment in the way of the motions of the bolt until the conditions of its free reciprocation have been complied with; and, further, the prime-motor tumbler *K* is the direct, positive, and only means of moving the bolt.

I have selected for illustration the type or form preferred by me in actual use, but I do not desire to restrict the improvement to the precise form therein described, it being susceptible of various modifications. For example, an auxiliary dog or catch pivoted to the gravitating dog or to the bolt itself may take the place of the shoulder *M*, while various forms of tumblers may be employed.

I am aware that circular tumblers provided with alphabetical indexes have long been in use, and therefore make no claim to such broadly; nor do I claim, separately from the herein-specified combinations, the wide notch *y* to compensate for the thicknesses of the operating-pins; neither do I claim, broadly, the use of tumblers to both detain and operate the bolt.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. A dog connected to a sliding or other lock-bolt and engaging in the notched tumblers to communicate motion therefrom to the bolt.

2. A series of notched tumblers, *J*, and secondary wheels *K*, arranged in pairs, when either the tumbler or secondary wheel of each pair is marked with an index-scale, the secondary wheels being employed to communicate motion from one tumbler to another, and applied to the faces of their tumblers and adjustable thereupon by hand, substantially as herein described, for the purpose of setting up any desired combinations.

3. The combination, with the knob *S*, of the spherical-ended arbor *H R*, projecting beyond the face of the door, as herein represented, so as to avoid weakening the shaft within the door without affording a square external surface against which a direct blow may be struck.

In testimony of which invention I hereunto set my hand.

W. B. DODDS.

Witnesses:

GEO. H. KNIGHT,
JAMES H. LAYMAN.