(No Model.)

H. P. DODGE.

LOCK.

No. 582,185. Patented May 11, 1897.

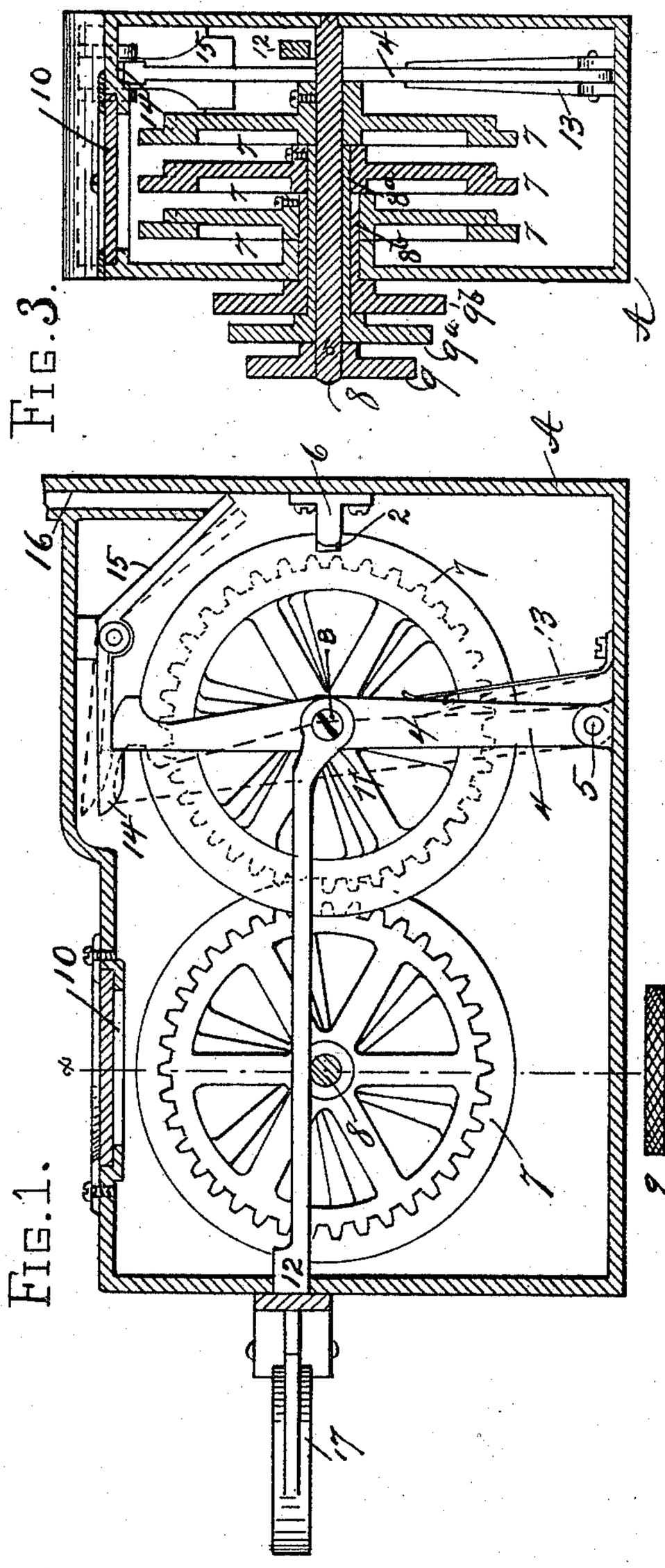

FIG. 1.

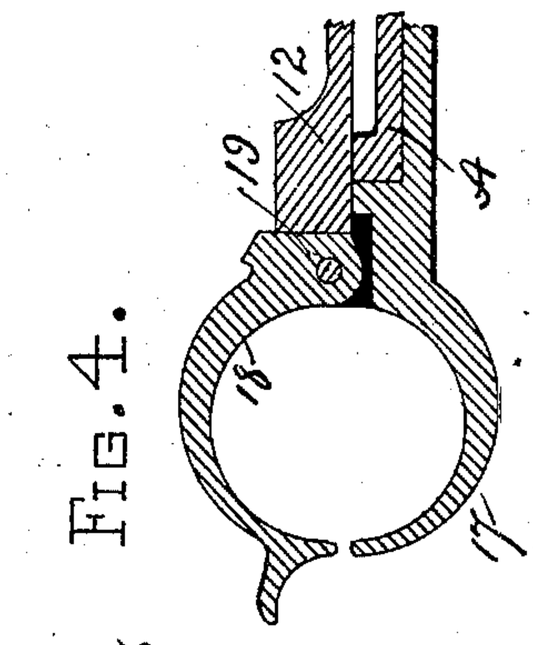

FIG. 4.

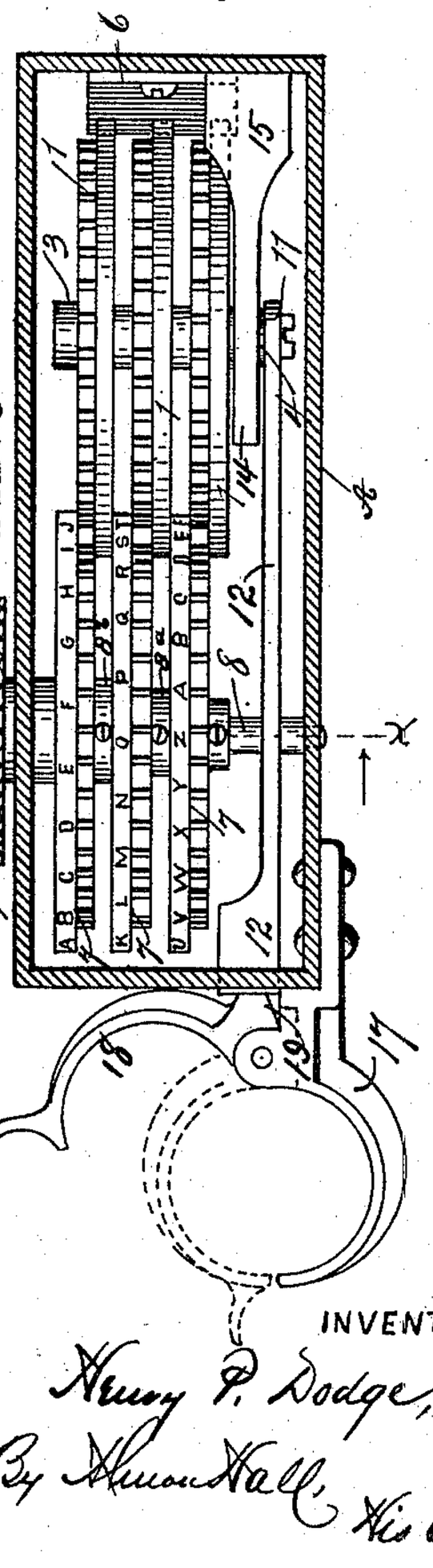

FIG. 2.

FIG. 3.

WITNESSES.

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LOCK.

SPECIFICATION forming part of Letters Patent No. 582,185, dated May 11, 1897.

Application filed December 11, 1896. Serial No. 615,377. (No model.)

To all whom it may concern:

Be it known that I, HENRY P. DODGE, a citizen of the United States, residing at Toledo, Lucas county, Ohio, have invented certain new and useful Improvements in Locks, of which the following is a specification.

My invention relates to and its object is to provide a lock for which the combination is determined and fixed at each operation of the lock and in which the permutation-disks are engaged with the locking mechanism by the same act which throws the bolt.

The further object of my invention is to provide means for fixing any desired combination before locking, and restoring the parts to that combination before unlocking, which shall be so easily and readily manipulated that the operation is the work of but a moment.

My invention also has for its object such arrangement of the permutation-disks as will expose them or their connections to view, whereby all of the letters or figures of the combination, arranged in their proper order, will simultaneously be in sight, thus preventing mistakes and unnecessary delay in the arrangement of the parts in relation to each other.

I find that my lock is particularly well adapted for use as a lock for bicycles, especially in connection with a coin-actuated mechanism controlling the use of such lock, and I have, therefore, in the following specification and the accompanying drawings, made part hereof, shown and described, by way of example, my device arranged as such bicycle-lock, not intending, however, to limit my invention to such use, as manifestly with slight obvious changes my lock may be modified for use upon doors, lids, and the like without departing from the spirit of my invention.

In the accompanying drawings, Figure 1 is a side elevation of my device with one side of the case removed. Fig. 2 is a plan view of the same with the top of the case removed. Fig. 3 is a sectional end elevation on line *x x*, Figs. 1 and 2; and Fig. 4 is an enlarged view in section showing details of construction of a bicycle-holder as employed in connection with my lock.

Like numerals and letters indicate like parts throughout the several views.

In the drawings, 1 indicates a series of disks or tumblers, each having two diameters and each having a similar notch 2 in the periphery of its greater diameter. These disks are mounted upon a spindle 3, which in locking or unlocking moves laterally, carrying with it the disks. To secure this lateral movement, the spindle 3 in the example shown is mounted upon upright arm 4, pivoted at bottom, as at 5. Secured to the case A is a fixed spur or stop 6, which, when the disks 1 are in unlocked position and when the peripheral notches on the disks are brought into line, receives and engages said notches, thus holding the disks against rotation. When the spindle and its disks are drawn away from the lug 6 and when one or more of the disks are thrown out of line with the lug or spur 6, the spindle and its disks cannot be moved laterally until the notches in the disks are again brought into proper alinement with the lug.

7 is another series of disks corresponding in number and size with the series 1, mounted in the same plane as the disk 1 upon shaft 8, journaled in the sides of case A. These disks 7 are also preferably of two diameters, as appears in Fig. 3. The smaller diameters of both series of disks or tumblers are toothed to form pinions, the greater overlapping diameters serving as guides to retain the toothed disks in proper relation with each other. The peripheries of the greater diameters of the series of disks 7 are lettered or numbered. (See Fig. 2.) Each of the disks 7 is mounted independently of the other disks of the same series, so that each of these disks may be manipulated separately. A convenient means for accomplishing this is illustrated in Figs. 2 and 3 of the drawings, in which the innermost disk is secured to the shaft 8, the next disk being secured to a hollow arbor 8^a, slipped over the shaft, and the next or outermost disk being secured to a hollow arbor 8^b, slipped over the hollow arbor first mentioned, thus forming three concentric shafts passing through a single opening in the case. Each of the shafts and tubular arbors is provided with a milled head, as at 9 9^a 9^b, on the exterior of the case.

In the top of the case over the series of disks 7 is a slot or opening 10, through which can be seen the peripheral characters on these disks.

Connected with the mechanism by means

of which the spindle 3 is moved laterally, as at 11, is a bolt 12, which is shot to and fro by the same act which moves the spindle and its disks.

The operation of my device thus far described is as follows: Assuming that the device is in unlocked position, the operator by means of milled heads 9 9^a 9^b and the rotation of the disks 7 brings into line under the opening 10 the letters or figures of the desired combination. Now by means of the mechanism hereinafter described or by any other suitable means the bolt 12 is projected into locked position, carrying with it upon its support the spindle 3 and its series of disks, drawing the notches 2 out of engagement with the spur 6. The toothed peripheries of the disks 1 are thus caused to engage the toothed peripheries of the corresponding disks 7, and hence the rotary movement of disks thus in engagement with each other must now be exactly alike. If one or more of the disks 7 be now turned to the right or left, the corresponding disk or disks 1 will be rotated in like manner, carrying the notch or notches 2 out of alinement. In this position the disks 1 and the spindle 3 cannot be moved laterally nor can the bolt be retracted, for the reason that the larger diameter or projecting flange of the disk 1 comes in contact with the spur or stop 6; but when the characters of the combination are again brought into line under the slot 10 the disks 1 are by the same operation rotated so that the notches 2 are again brought into alinement with the spur 6, thus permitting the lateral movement of the spindle and the retraction of the bolt.

It will thus be seen that the lock may readily be locked upon any desired combination and that the number of changes is only limited by the law of permutation as applied to the number of disks and the letters or figures on their peripheries.

The arm 4, which supports spindle 3 and disks 1 and is connected with the bolt 12, is pressed constantly forward toward normally-locked position by means of spring 13. A detent 14 is adapted to engage the arm 4 and hold it in retracted position against the pressure of spring 13. The detent is controlled by a coin-actuated mechanism indicated by the arm 15, extending into the path of such coin as may be dropped into the coin-slot 16.

Secured to the lock-case is a pair of jaws, one part 17 being fixed and the other part 18 being pivoted. The interior contour of the jaws adapts them to receive and hold, when closed, a bicycle rim and tire. The part 18 has a shoulder 19 near its pivot, against which shoulder the outer extremity of bolt 12 abuts when projected, thus holding the jaw against opening when the lock is set. (See Fig. 4.)

My device as applied to a bicycle-lock is operated as follows: The bicycle rim and tire are placed within the jaws 17 18. The desired combination is set to appear through the slot 10, as above described, and a coin is dropped into the coin-slot of the coin-actuated detent. The supporting mechanism for the disks 1 and spindle 3 being now released, the spring 13 forces the bolt 12 against the shoulder 19 of the movable jaw 18, and if the notches 2 in the disks 1 be now thrown out of alinement, as above described, the bolt cannot be retracted nor can the jaw 18 be opened until the disks 1 are again placed in position for unlocking, when a pull on the pivoted jaw 18 will cause the shoulder 19 to press the bolt back into unlocked position, overcoming the pressure of the spring 13, throwing the movable support of the disk 1 into engagement with detent 14. The parts are now ready for a repetition of the operation here described.

It will be understood without further illustration that the letters or other characters used for the combinations may be placed upon the knobs 9 9^a 9^b or such other means as may be employed to independently operate the permutation-disks 7. It will also be clear to those skilled in the art without further illustration that a variety of modifications of the jaws 17 18 or their equivalents will readily suggest themselves, and I do not therefore limit my invention to the particular form of retaining device here illustrated.

What I claim, and desire to secure by Letters Patent, is—

1. In a lock, a series of revoluble disks, a series of permutation-disks corresponding with the series of disks first mentioned, means for operating and setting said permutation-disks, and means for throwing said two series of disks into and out of connection with each other.

2. In a lock, a series of revoluble disks, each disk having a notch in its edge, a spur adapted to engage said notches, a series of permutation-disks corresponding with the series of disks first mentioned, means for operating each of said permutation-disks independently of the others, means for throwing said two series of disks into and out of engagement with each other, a bolt, and connections intermediate said bolt and said means for throwing said two sets of disks into and out of connection with each other.

3. In a lock, a series of revoluble disks, each disk being of two diameters, each disk having a notch in its greater diameter and having its lesser diameter toothed, as a pinion, a spur adapted to engage said notches, another series of disks and means for throwing said two series of disks into and out of engagement with each other.

4. A permutation-lock and a coin-actuated mechanism controlling said lock, in combination with a pair of jaws or holding mechanism controlled by the bolt of said lock, substantially as and for the purpose specified.

5. In a lock, a bolt, a detent adapted to hold said bolt retracted, a spring adapted to project said bolt, a coin-actuated mechanism adapted to release said detent, and a pair of

jaws adapted to be held in closed position by said bolt and to retract said bolt when opened, substantially as and for the purpose specified.

6. A lock comprising a laterally-movable spindle, a series of disks journaled thereon, each having a notch in its periphery, a spur adapted to engage said notches, a series of permutation-disks, means for controlling and setting each of said permutation-disks independently of the others, a bolt, connections between said bolt and said laterally-movable spindle, a detent adapted to hold said bolt in its retracted position, a spring adapted to project said bolt and to throw said two series of disks into engagement with each other, a coin-actuated mechanism adapted to release said detent, and a pair of jaws adapted to be held in closed position by said bolt and to retract said bolt when opened, substantially as and for the purpose specified.

7. In a lock, a laterally-movable spindle, a series of toothed disks journaled thereon, a projecting flange on each of said disks, a set of permutation-disks journaled in proximity to said first-mentioned series of disks and toothed in the same manner as said first-mentioned series of disks, projecting flanges on said permutation-disks, and means for throwing the teeth of said two series into engagement with each other, the arrangement of the flanges of said two series being such that the flanges of one set will overlap the flanges of the other set when the teeth of the two sets are thrown into engagement.

8. In combination with a lock of the character above specified, a pair of jaws, one of said jaws being rigidly secured to the case, the other of said jaws being pivoted, a shoulder on said latter jaw adapted to contact with the bolt of said lock when in projected position, two series of revoluble disks, means for operating and setting said disks, and means for simultaneously throwing said two series of disks into and out of connection with each other and actuating said bolt, substantially as and for the purpose specified.

HENRY P. DODGE.

In presence of—
FORDYCE BELFORD,
L. E. BROWN.