

(No Model.)

D. A. ROOT.
LOCK.

No. 543,404.

Patented July 23, 1895.

Fig. 1.

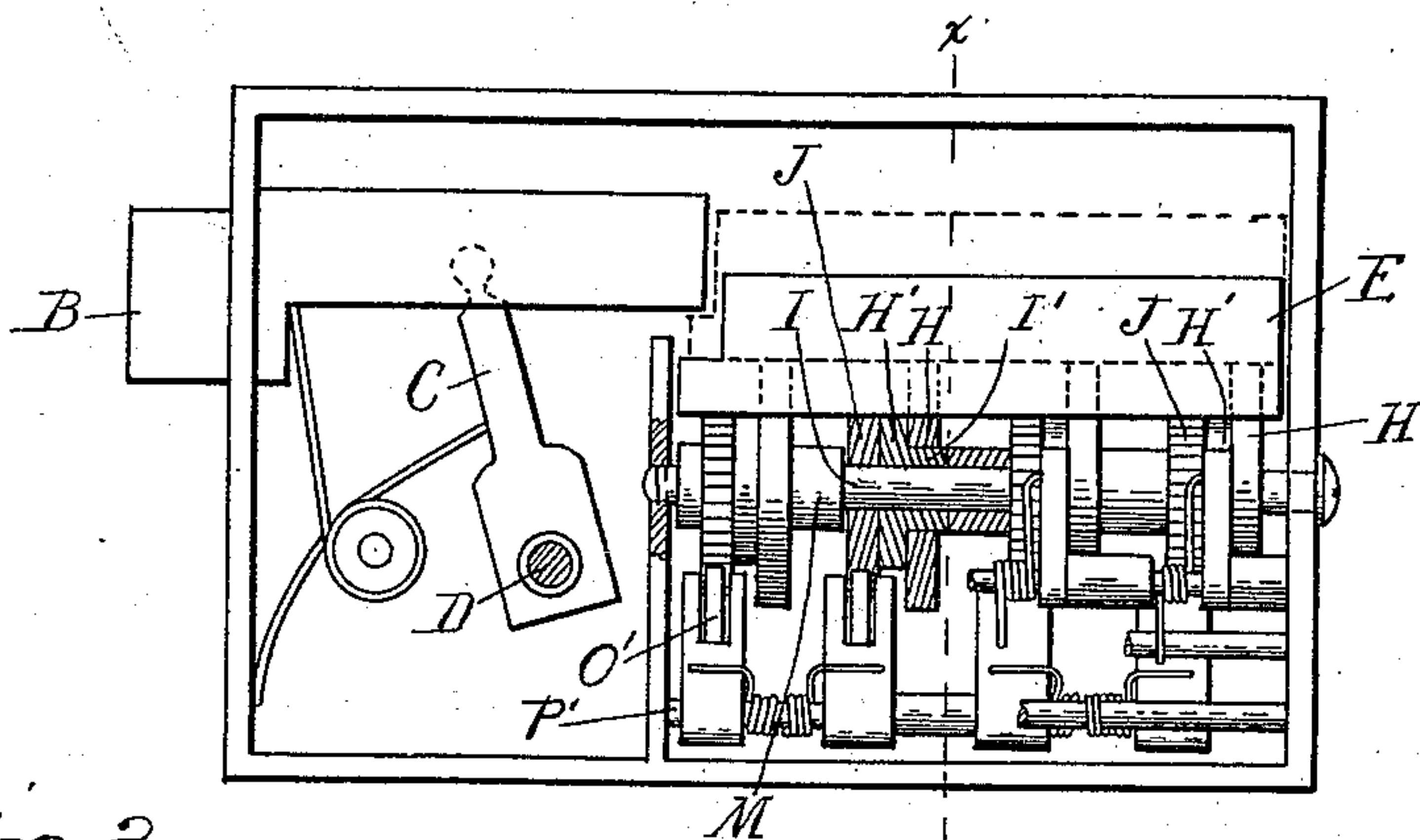


Fig. 2.

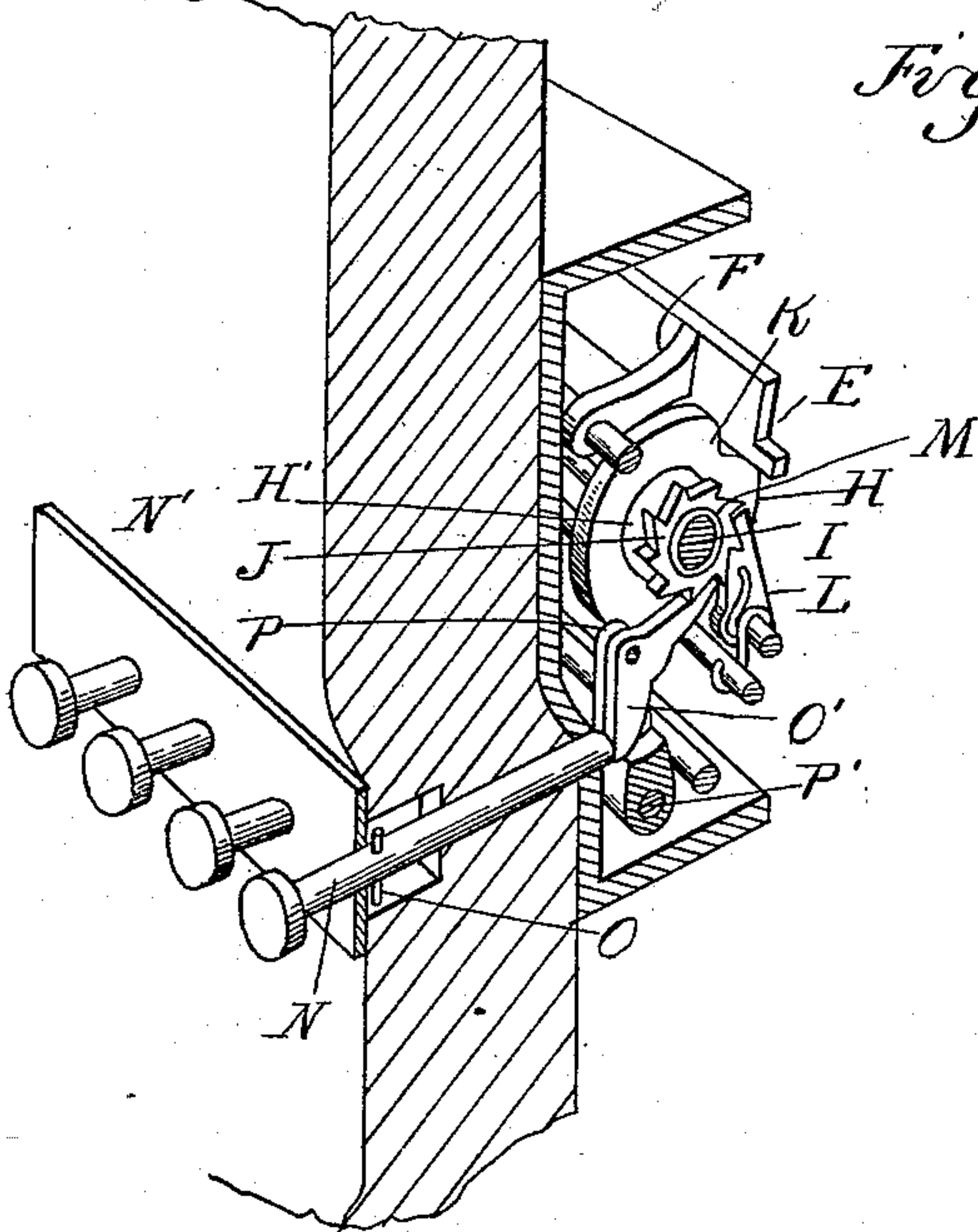


Fig. 3.

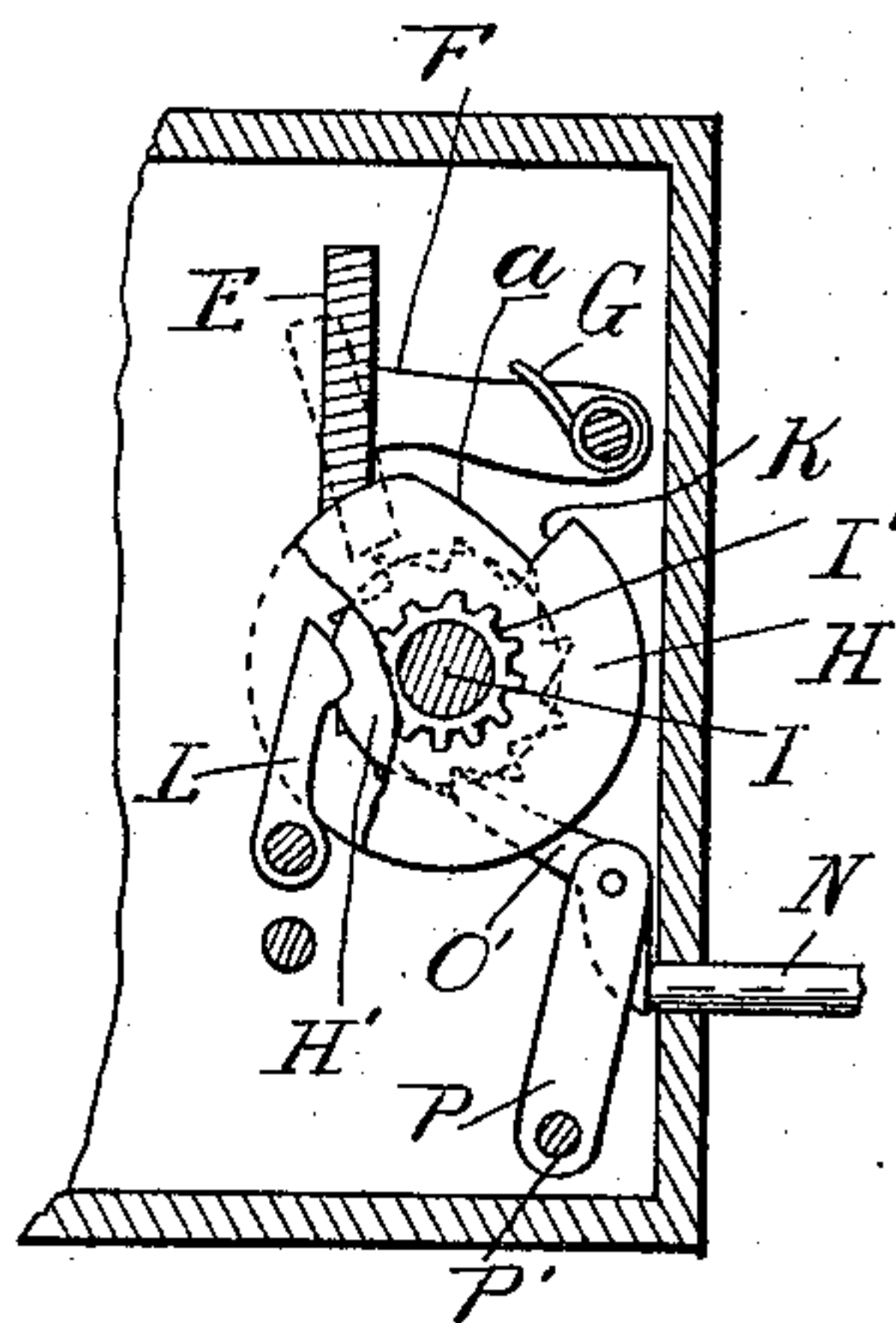
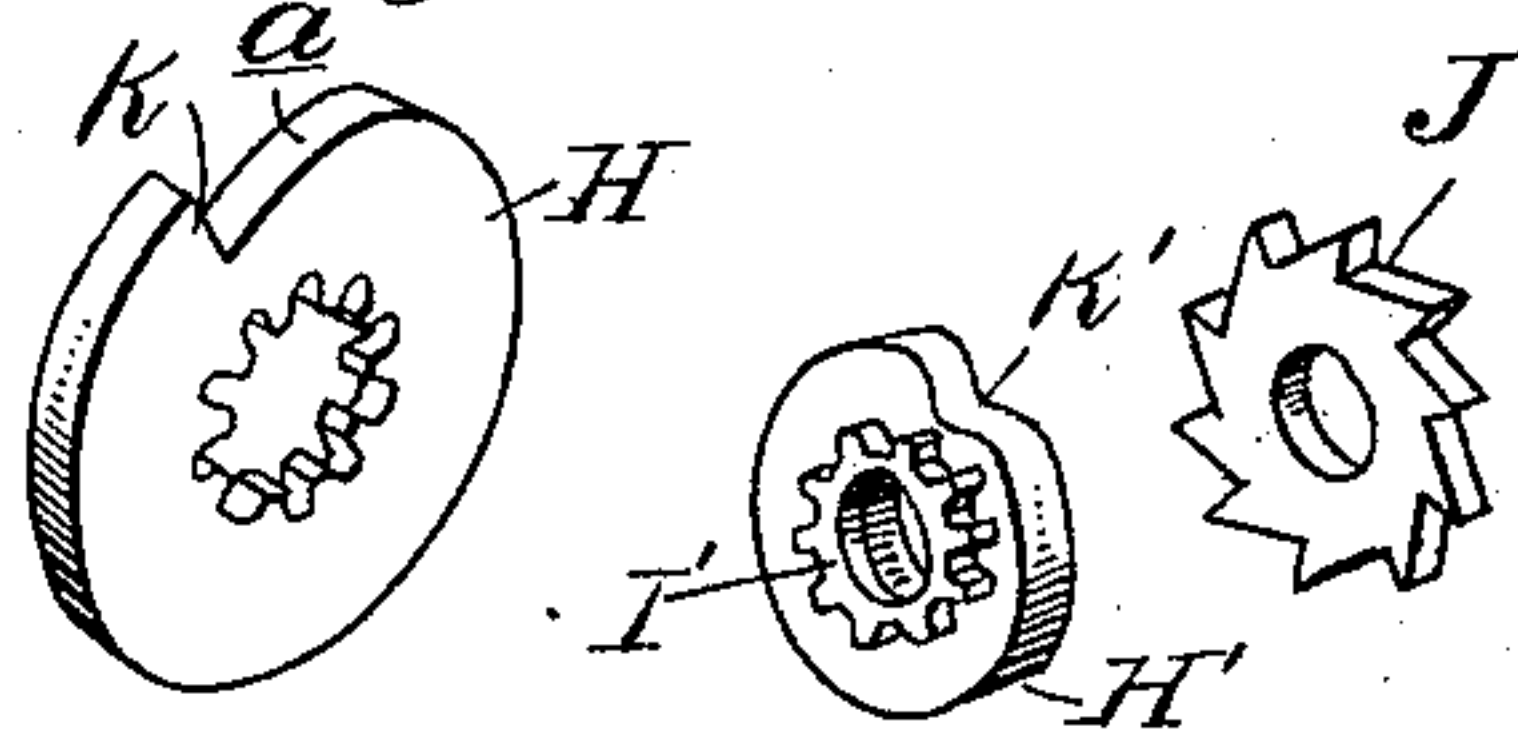


Fig. 4.



Witnesses
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UNITED STATES PATENT OFFICE.

DEXTER A. ROOT, OF BAY CITY, MICHIGAN.

LOCK.

SPECIFICATION forming part of Letters Patent No. 543,404, dated July 23, 1895.

Application filed October 13, 1894. Serial No. 525,835. (No model.)

To all whom it may concern:

Be it known that I, DEXTER A. ROOT, a citizen of the United States, residing at Bay City, in the county of Bay and State of Michigan, have invented certain new and useful Improvements in Locks, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention consists in the peculiar construction of the tumblers, the tumbler-actuating devices, the setting mechanism, and the construction, arrangement, and combination of the various parts, all as more fully hereinafter described.

In the drawings, Figure 1 is a plan of my lock with one side of the casing removed, partly in section. Fig. 2 is a section through the lock near one end, showing the parts in perspective. Fig. 3 is a section through the lock on line $x x$. Fig. 4 shows in detached perspective the tumbler-disk, friction-disk, and ratchet-wheel specifically referred to.

I have shown my improvement applied to a keyless spring-latch lock, in which B is the spring-actuated latch-bolt.

C is the arm for actuating the latch when the tumblers are gated by turning the shaft D, which is provided with the usual head (not shown) on the exterior of the case.

E is the locking-bar secured to the ends of the rock-arms F, which at their inner ends have lateral trunnions journaled in the case and on which the locking-bar may be moved in and out of the path of the bolt B.

G is a spring acting with its tension to throw the locking-bar out of its locking position. This locking-bar is controlled by the tumblers H, which are in the shape of circular disks, as shown in Fig. 4, rotatorily adjustably secured on the hubs of the disks H', which are sleeved upon the arbor I, secured in the casing.

The construction I have shown by which the adjustment is effected between the disk H and disk H' is through a notched central aperture in the disk, engaging a notched hub I' on the disk H'. Secured to or integral with the disk H' is the ratchet-wheel J.

K is a gate or notch in the disk H, and K' is a detent in the disk H', in which the spring-pawl L is adapted to engage and act as a friction-brake, the head of the pawl having inclined faces and the notch having inclined

walls for this purpose. Thus the relation between the notches or gates K and the notches K' may be adjusted, the adjustment corresponding to the notches in the ratchet-wheel J. The various tumblers are spaced on the arbor by the sleeves M.

N are setting push-pins, which I have shown as applied to a door, sliding in apertures in a plate N' and stopped from disengagement therefrom by pins O. The inner end of the push-pins enter the casing and abut against the bell-crank-shaped spring-pawls O', pivoted in the end of the rock-arms P, journaled on the shaft P' at one side of the casing.

The parts being thus constructed, their operation is as follows: The manufacturer or the operator sets the tumblers by arranging the disks H upon the hubs I' of the disks H'. The combination is effected by the relation between the gates K in the disk H and the notches K' in the disk H'. For instance, if the tumbler at the right hand of the lock, Fig. 1, is to be set at 2—that is, so it will be gated with the locking-bar after two depressions of the push-bar N—the gate K is arranged in such relation to the notch K' that after the pawl L has engaged that notch it will require two depressions of the push-pin to engage the gate K with the locking-bar. The object of the pawl L and the notch K' is to indicate to the operator, by the increased power required to operate the push-pin, the points from which the combination is set. All of the tumblers being set on the desired combination and arranged with their gates beside the locking-bar, the spring G will force the locking-bar into the gates and out of the path of the bolt B, so that bolt may be operated freely, either by the rock-shaft D or by means of the key guarded by the usual tumblers in the usual manner. To set the combination the operator may depress all of the push-pins shown in Fig. 2, which will rotate the disk H a portion of its revolution, the inclined bearing a of the gate forcing the locking-bar backward and causing it to engage upon the periphery of the disk. The locking-bar in this position will be directly behind the latch-bolt, and thus lock it from movement. Now, to unlock, the operator depresses each push-pin until he finds by the power required to push the pin that the pawls

L have engaged with the notches K' in the disk H', or until, in other words, the friction-brake has been applied. He then may further operate the push-pins according to the combination upon which they are set, which will gate the tumblers, when the spring G will move the lock-bar in the manner described to release the latch-bolts.

If it is desired, the lock may be set with but a single tumbler, any one of which will throw the lock-bar by depressing its push-pin, and then to unlock all that is required is to depress that push-pin until the friction-brake is applied and then continue depressing it until its combination-number has been given. This is especially desirable for house-locks, or for locks on devices which are frequently used, where the operator does not desire to operate the entire combination each time and yet may obtain perfect security by changing the push-pin, which he depresses for this single-locking.

All that is required to change the combination is to change the relation between the gate K and the notch K'.

Having thus described my invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a permutation lock, the combination with the casing, the bolt and the locking bar therefor, of a disk-shaped tumbler H having a gate therein, a disk H', a toothed or notched hub thereon with which the disk is adapted to

detachably engage, an actuating ratchet and pawl device for the tumbler, and a friction brake for the disk H' adapted to be applied at one point only to indicate the starting point of the combination, substantially as described.

2. In a permutation lock, the combination with the casing, the bolt and locking bar therefor, of a spring push pin, a ratchet and pawl device operated by the push pin, a disk H' to which the ratchet is secured having a depression in its edge, a gated disk-shaped tumbler, and a spring pawl adapted to engage in a depression in the disk H' substantially as and for the purpose described.

3. In a permutation lock, the combination with the casing, the bolt and locking bar therefor, of a series of spring push pins, pawls adapted to be actuated thereby, ratchet wheels with which the pawls engage sleeved upon a common shaft, friction brake disks secured to the ratchet wheels having one point at which the brake is applied, a toothed hub on the side of the friction disk and a corresponding notched gated tumbler disk adapted to detachably engage with the hub, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

DEXTER A. ROOT.

Witnesses:

M. B. O'DOHERTY,
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