(No Model.)

D. A. ROOT.

PERMUTATION PADLOCK.

No. 561,524. Patented June 2, 1896.

Fig. 1.

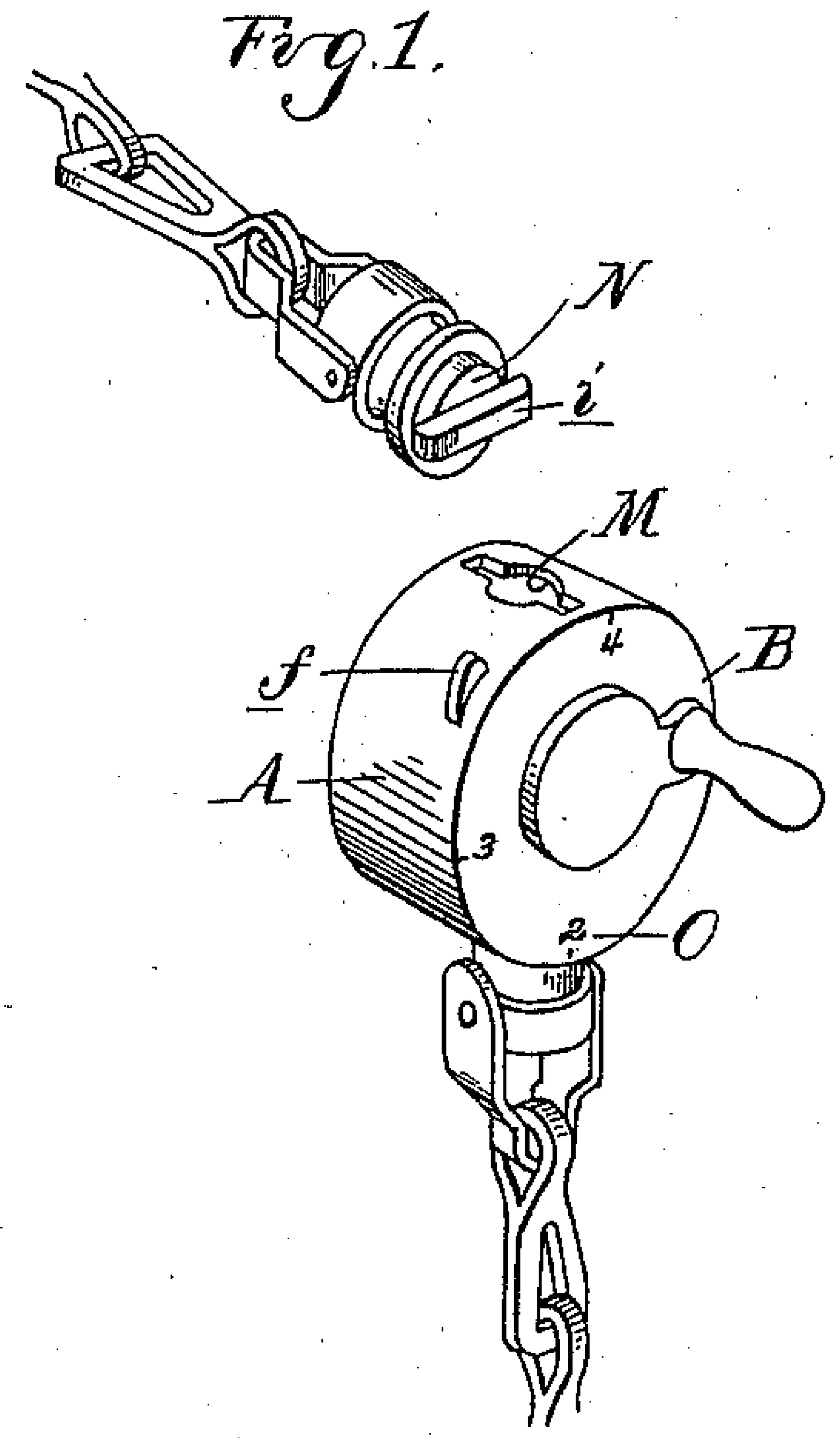


Fig. 2.

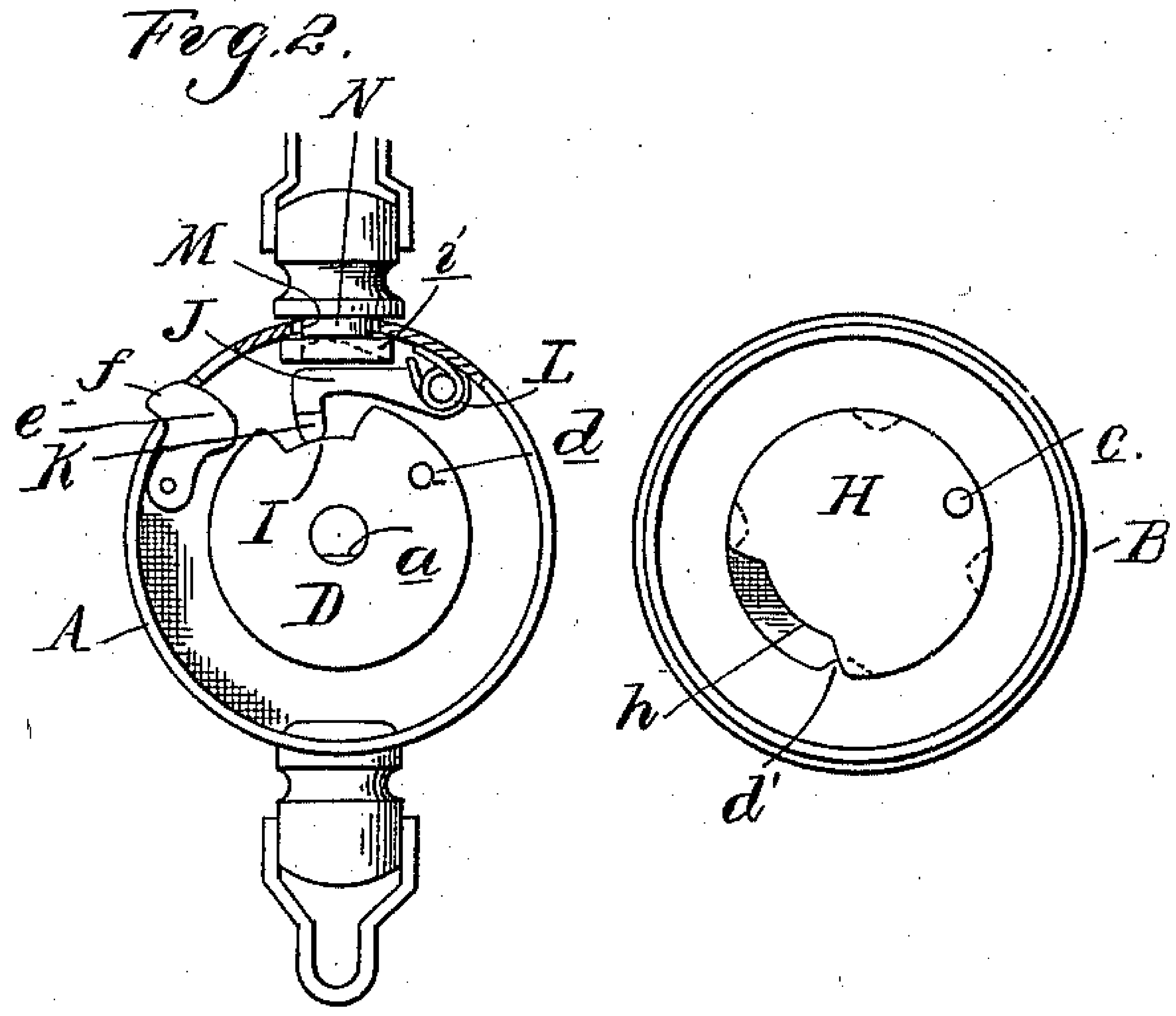


Fig. 3.

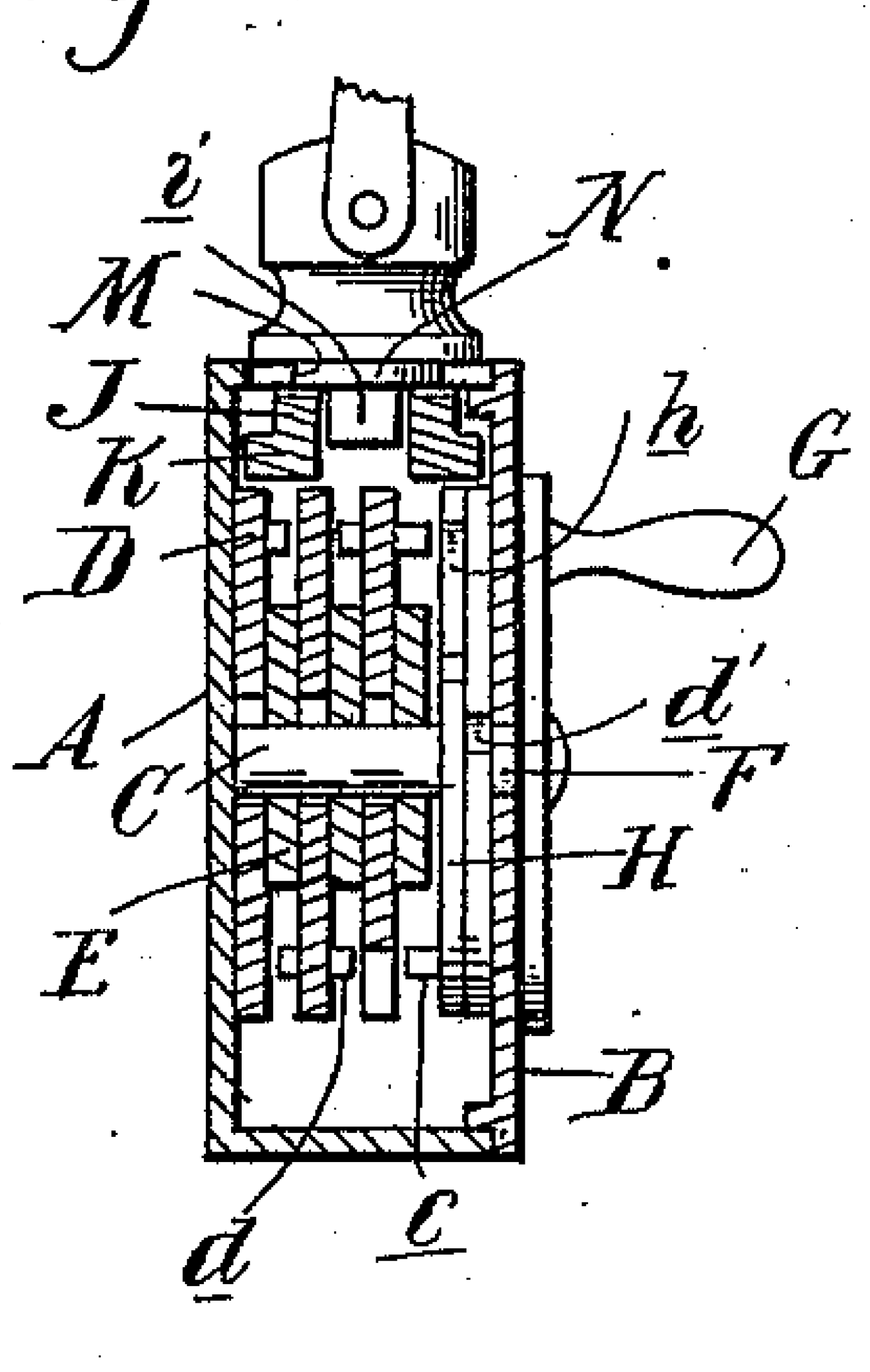


Fig. 4.

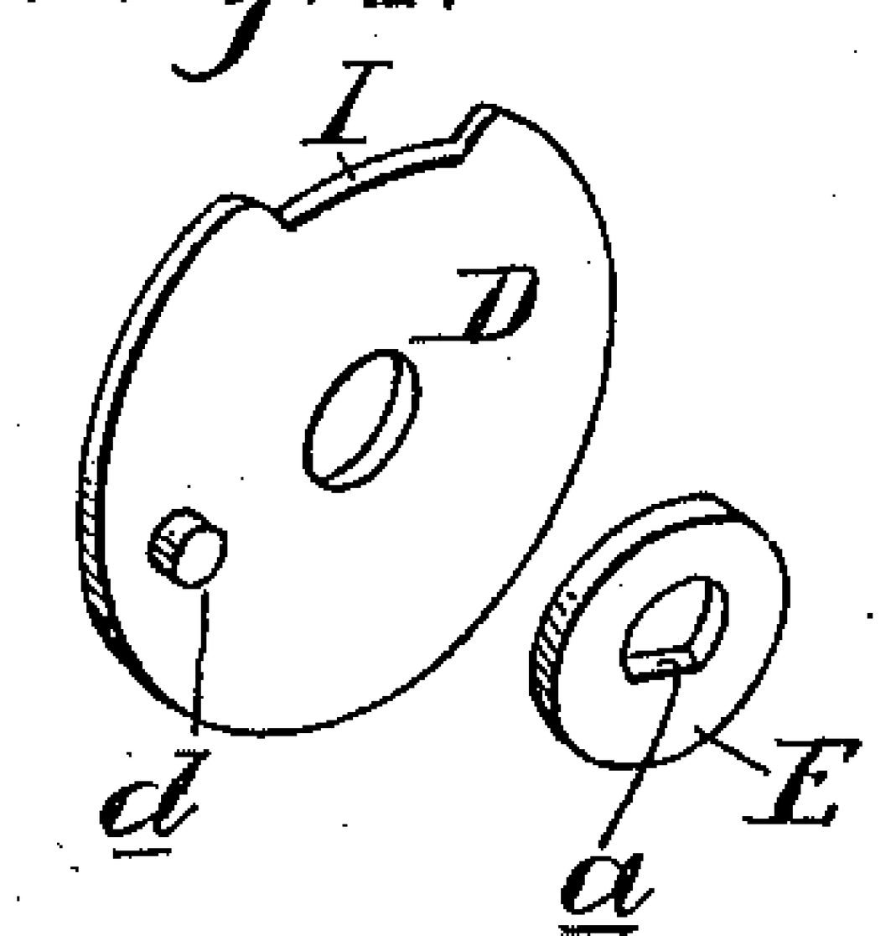
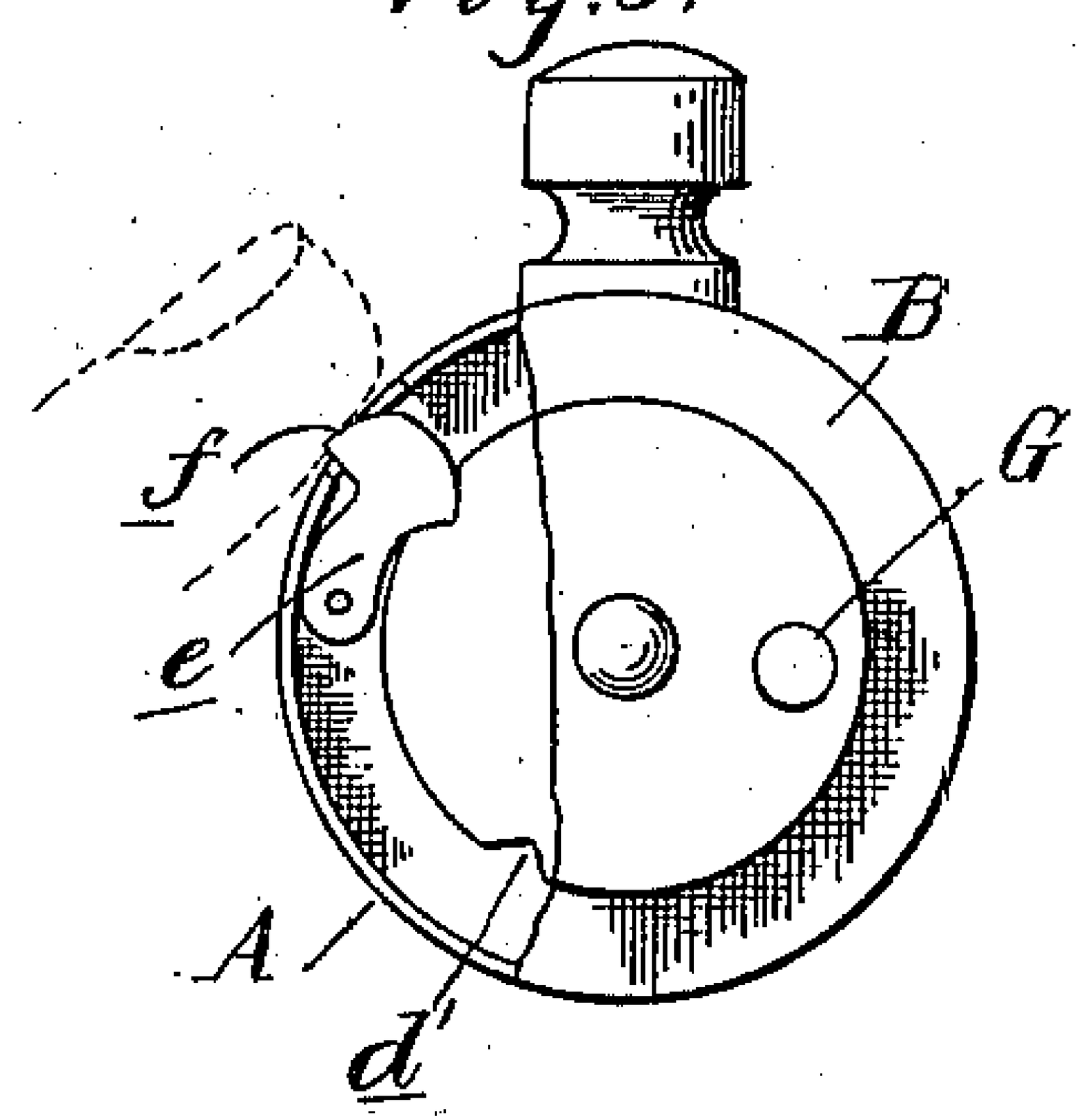


Fig. 5.



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UNITED STATES PATENT OFFICE.

DEXTER A. ROOT, OF BAY CITY, MICHIGAN.

PERMUTATION-PADLOCK.

SPECIFICATION forming part of Letters Patent No. 561,524, dated June 2, 1896.

Application filed April 11, 1895. Serial No. 545,332. (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 Permutation-Locks, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to the novel construction of, and arrangement of the parts of, a permutation-lock, as hereinafter fully described, and definitely pointed out in the claims; further, in the construction, arrangement, and combination of the various parts, all as more fully hereinafter described.

In the drawings, Figure 1 is a perspective view of my improved lock, showing the end of the chain detached. Fig. 2 is a plan view of the lock, partly in section, showing the cap or side of the casing removed. Fig. 3 is a vertical central section through the lock, showing the parts in their locked position. Fig. 4 is a perspective view of one of the tumblers and spacing-washers; and Fig. 5 is a sectional elevation of the lock, illustrating the operation of the indicating-pawl.

A is the casing, preferably cylindrical, as shown, and B is the face-plate secured at one end thereof and acting to close that end. Within the casing centrally is a pin or shaft C, upon which are secured a series of tumblers D, which are separated by means of the spacing-washers E, which are prevented from turning on the shaft by means of the squared or flattened portion *a* and engaging a corresponding flattened portion on the shaft or pin. Passing through the plate B is an actuating-pin F, to the outer end of which is secured a crank-handle G, and on the inner face is an actuating-disk H, which is adapted to be rotated by turning the crank.

The tumblers are provided with pins *d* and the actuating-disk with the corresponding pin *c*, the tumblers being provided at suitable points with the gates I, these parts being so arranged that by rotation of the crank the pin *c* will strike the pin on the first tumbler, and the pin on that tumbler will strike the pin on the succeeding tumbler, and so on, so that the tumblers may be set by a proper number of turns in one or both directions of the actuating-disk.

The outer face of the actuating-disk is provided with a series of indents or shoulders *d'*, and beside this disk is pivoted the indicating-pawl *e*, which has an arm or extension *f* projecting through an aperture in the side of the casing. On the inner face of the disk is the cam-bearing *h*. For convenience in manufacturing the disk H can be made of two thin disks, secured side by side, one disk having cut in its periphery the indents *d'*, and the cam-bearing *h* being formed in the periphery of the other.

J is the locking-lever, having a cross-bar K, adapted to ride on the face of the actuating-disk and the tumblers, which bar is adapted, when the tumblers are set with the gates in line, to engage in the gates, as shown in Fig. 2. In this position a spring L moves the cross-bar into the gates and unlocks the lock. This lever I have shown as bifurcated and arranged opposite an elongated aperture M in the side of the casing. Upon the opposite end of the chain is a locking-head N, the transverse elongated bar *i* of which is adapted to be entered through the aperture M, and when turned a quarter-turn will be arranged in line with the opening between the bifurcations of the lever J, so that when the actuating-disk is turned, the parts being in the position shown in Fig. 2, the cam-bearing *h*, striking the cross-bar K, will move out the lever J beside the bar *i* and prevent its rotation, which is necessary in order to effect its withdrawal. While I have shown this bifurcated lever and deem this the preferable form in which to construct it, it is evident that the bar *i* could not be turned if it were arranged opposite a single lever, and thus would effectually lock it.

The actuating-disk having been thrown, as described, to lock the bar J against movement the operator may place his finger upon the extension *f* of the indicating-pawl, as shown in Fig. 5, and hold it thereon with slight pressure, so that he will feel the inward and outward movement of that pawl as it enters the indents in the actuating-disk while that disk is being rotated, and thus can have an indication of the movement of the actuating-disk, so as to enable him to turn it the desired num-

ber of times for setting the tumblers to unlock the lock. This indicating-pawl also serves to hold the parts, so that the operator may be sure that the tumblers are in exactly the right relation for unlocking. Thus the operator can unlock the lock as well at night as in the daytime.

If desired, the indicating-marks O may be entirely omitted and the operator at all times rely upon the indicating-pawl to set the tumblers.

I deem the construction of locking it especially desirable for the reason that the locking portion thereof is entirely within the casing and when in position leaves no opening whatever through which tools can be inserted or moisture find access to the interior works of the lock.

What I claim as my invention is—

1. In a lock, the combination with the casing, the shaft therein, the rotary tumblers loosely mounted on said shaft, the separting-washers rigidly mounted on said shaft, and the spring-actuated locking-lever controlled by the tumblers, of a rotatable actuating-disk for the tumblers, exterior means for operating the same, a series of shoulders on one side of the periphery of the disk, a cam-bearing *h* on the other side of the disk-periphery, and an indicating-pawl in line with and adapted to engage said shoulders and projecting through the casing, substantially as described.

2. In a lock, the combination of the lock-casing having an elongated aperture therein, a chain secured to the opposite side of the casing, a locking-head having a plane face secured on the opposite end of the chain, and adapted to engage into the said aperture and be held therein after a partial rotation, a locking-lever for engaging said plane face and locking the head against rotation, and tumblers controlling the locking-lever, substantially as described.

3. In a lock, the combination of the lock-casing having a slot therein, a rotatable locking-head provided with a plane face and adapted to enter said slot, a device within the casing for engaging the plane face of said head and preventing its rotation, and means for operating said device to move it into engagement with the locking-head, substantially as described.

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

DEXTER A. ROOT.

Witnesses:
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