

(Model.)

W. H. BECHTEL.  
PERMUTATION LOCK.

No. 426,427.

Patented Apr. 29, 1890.

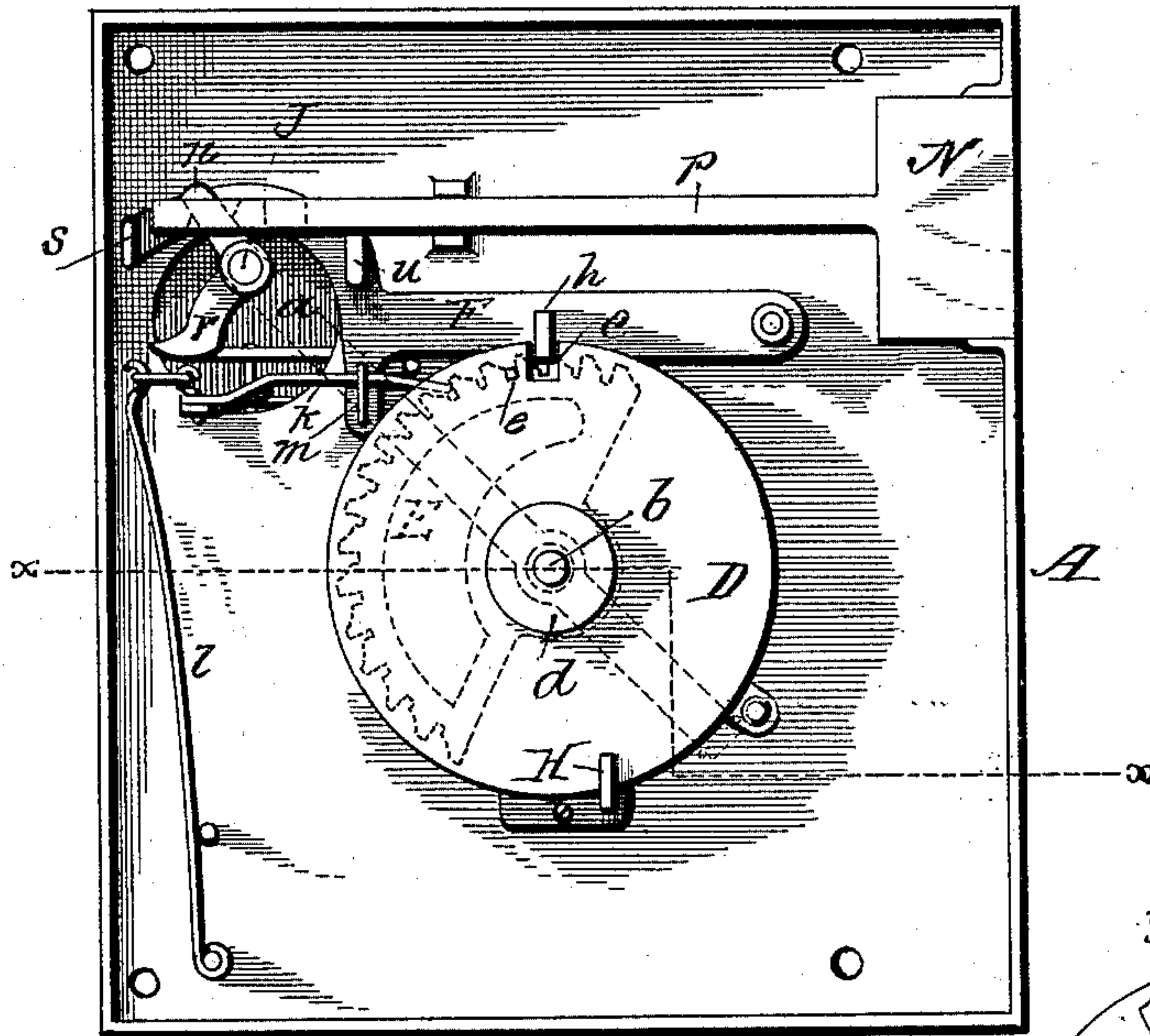


Fig. 1-

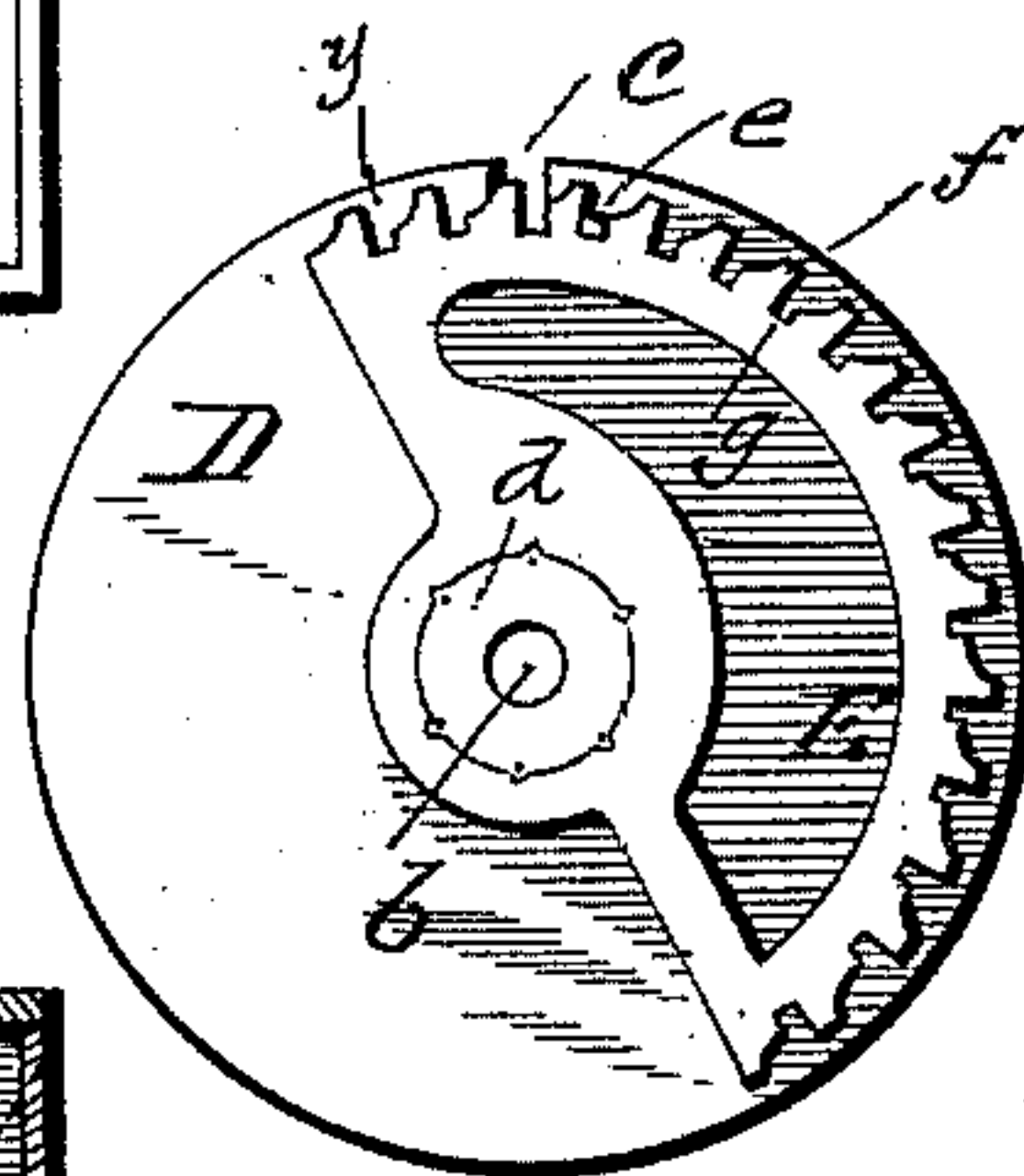


Fig. 2-

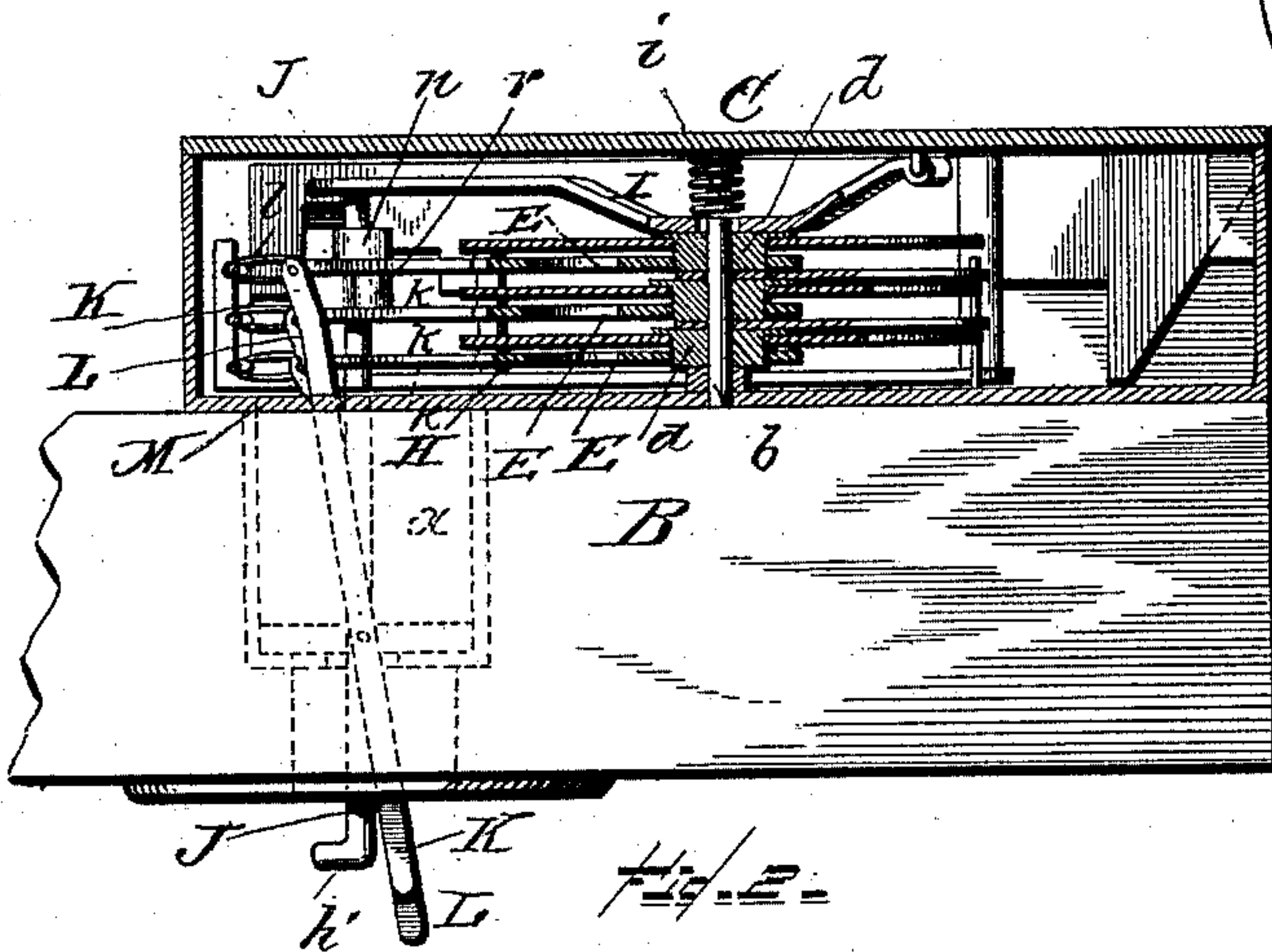


Fig. 3-

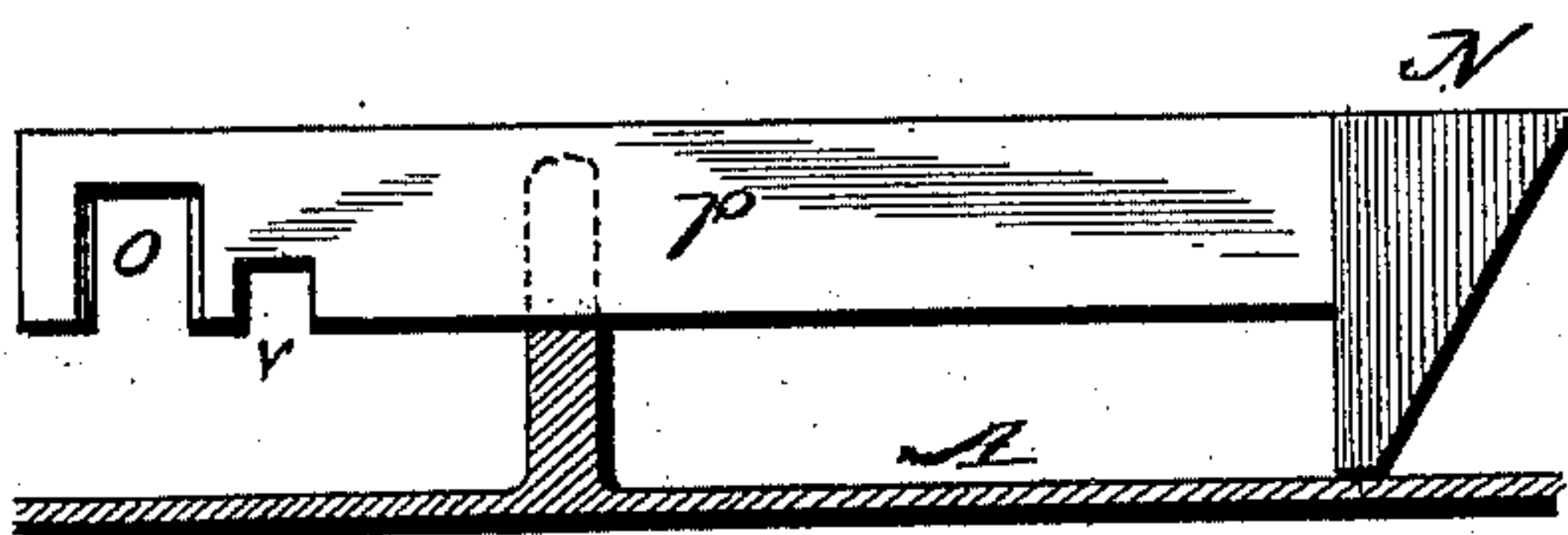


Fig. 4-

Witnesses

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# UNITED STATES PATENT OFFICE.

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## PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 426,427, dated April 29, 1890.

Application filed May 16, 1889. Serial No. 310,937. (Model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. BECHTEL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Locks; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters of reference marked thereon.

Figure 1 of the drawings is a side elevation of my improved lock with the cap-plate removed to show the interior construction; Fig. 2, a horizontal section taken on line *xx* of Fig. 1, and showing the lock attached to a door; Fig. 3, a detail view of the bolt, and Fig. 4 a detail plan view of one of the disks with tooth-segment connection.

The present invention has reference to that class of combination or permutation locks in which a series of notched or toothed disks are provided, operated by a corresponding number of levers, dogs, and pawls, which, together with the disks, govern the action of the bolt. Heretofore these disks or wheels were provided with attachments that rendered the lock complicated, and consequently liable to get out of order, while the cost of manufacture was materially increased, thereby rendering such a lock objectionable and less salable than locks that are more simple in their construction.

It is the purpose of the present invention to provide the above-mentioned class of locks with simple and less complicated operating mechanism, easier operated, not so liable to get out of order, more positive in its action, greater security against the picking of the lock, and noiseless in its action, while its simplicity of construction renders the lock capable of being manufactured and placed in the market at a greatly-reduced price, so as to bring it within the reach of all requiring a lock of this character.

These several objects above enumerated I attain by the construction substantially as shown in the drawings, and hereinafter described and claimed.

In the accompanying drawings, A represents the casing of the lock of the usual construction and connected by screws or other

well-known means to the door B, said casing being provided with the usual cap-plate C, removably connected thereto in the ordinary manner. This casing A has a chamber *a* projecting out therefrom, and enters a correspondingly-formed opening in the door, as more clearly shown in Fig. 2.

The casing A has a stationary axle *b*, upon which are mounted a series of disks D, each of which has a notch *c* in its periphery, and provided with toothed segments E, loosely mounted on hubs *d*, projecting from the center of the disks. These toothed segments are adjustable on the hub with relation to the notches *c*, and are held in their adjusted position by the pin *e* upon the disk engaging with the notched or toothed segment E. As will be noticed, the segment E has both teeth *f* and notches *g*, the teeth serving as a means for turning the disk D when the segment is locked thereto, through the medium of suitable dogs which are brought against the teeth and the notches to form a seat for the pin *e* to hold the segment stationary upon the disk. The segment also acts as a weight to bring the disk back to its normal position when released by the catch *h*, this catch projecting from a pivoted lever F and engaging with the notches *c* when the several disks are turned to bring the notches thereon in line, the catch then falling in the channel formed by the several notches being in line, and thus allowing the bolt G to be drawn and the door unlocked.

The disks D pass through slots in a plate H, said plate acting as a guide therefor, and also as a stop for the end of the segment E to strike against to prevent the disk from going beyond a certain point when automatically falling to its normal position.

Hinged to the inner side of the cap-plate C is a pressure-plate I, said plate being hinged at one end and the opposite end resting upon the inner end of a rod J, which rod is provided at its outer end with a knob or handle *h* for operating it. This plate I has a spiral or other suitable spring *i* bearing thereon, to hold the disks D in position while they are being operated by means of the dogs *k*, pivoted or otherwise connected to levers K L M. Connected to each lever is a suitable spring *l*, to throw the levers and dogs back after the disks have been moved the distance of one tooth on the segment



to again engage with the next tooth. The dogs pass between guides *m* on the lever *F*, and the rod *J* has connected at its inner end a push-bar *n*, which engages with a slot or notch 5 *o* in the shank *p* of the bolt *N*, whereby said bolt is operated by the rod *J*. Upon the rod *J* is a dog *r*, so that when the rod is turned in the proper direction the dog will strike the end *s* of the pivoted lever *F* and raise or lift 10 the catch *h* out of the notches *c* by raising the lever, and thus allow the disks to resume their normal position.

In operation, to set the lock to any preferred combination, the disks are sprung out 15 from contact with the toothed segment sufficiently to allow the pin *e* to clear the notch with which it engages, thus allowing the segment to be moved the desired number of teeth, after which the pin will engage with 20 the notch which is on line therewith, the spring of the disks retaining the pin in engagement with the notch. All the disks are so adjusted after they have been removed from the axle *b*, after which they are replaced 25 thereon, when the weight of the toothed or notched segments *E* will by gravity cause the disks to be brought to the starting position, and counting from the first notch in each of the segments, as at *y*, Fig. 4, the distance to 30 which the disks must be turned to bring the several notches *c* in line under the catch *h* may be ascertained, and by means of the levers *K L M* the disks are moved the distance of the number of teeth and notches. When 35 this is done, the catch *h* upon the lever *F* drops into the channel formed by the notches *c* being in line with each other, and as the lever *F* drops the lug *u* thereon will be disengaged from the notch *v* of the bolt-shank *p* 40 and allow the bolt to be drawn. This is ac-

complished by turning the rod *J* in the proper direction, and by means of the push-bar *n*, which engages with the notch *o* in the bolt-shank *p*, the bolt will be moved back, as shown in Fig. 1. When the bolt is forced out 45 to lock the door, which is accomplished by turning the rod *J* in the opposite direction from that required to unlock the door, the dog *r* will strike the end *s* of the lever *F* and force it up, and with it the catch *h*, and when 50 out of the notches *c* the disks will fall by gravity to their normal position, and thus destroy the combination except those knowing it, who alone can open the door or draw the bolt. 55

It will be seen that a very simple and practical lock is provided, that will work perfectly and is positively secure against lock-picking, while it is comparatively simple in construction, and consequently capable of being man- 60 ufactured at a comparatively small cost.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the disk *D*, having hub *d*, notch *c*, and pin *e*, of the adjustable segment *E*, having teeth and notches, substantially as and for the purpose specified. 65

2. The combination, with the operating-rod *J*, carrying the push-bar *n* and dog *r*, of the 70 bolt-shank *p*, having notch *o*, and the pivoted lever *F*, having lug *u* and catch *h*, substantially as and for the purpose described.

In testimony that I claim the above I have hereunto subscribed my name in the presence 75 of two witnesses.

WILLIAM H. BECHTEL.

Witnesses:

JOSEPH FREASE,  
ALLEN COOK.