

P. W. HALL.
Permutation-Locks.

No. 148,451.

Patented March 10, 1874.

Fig. 1.

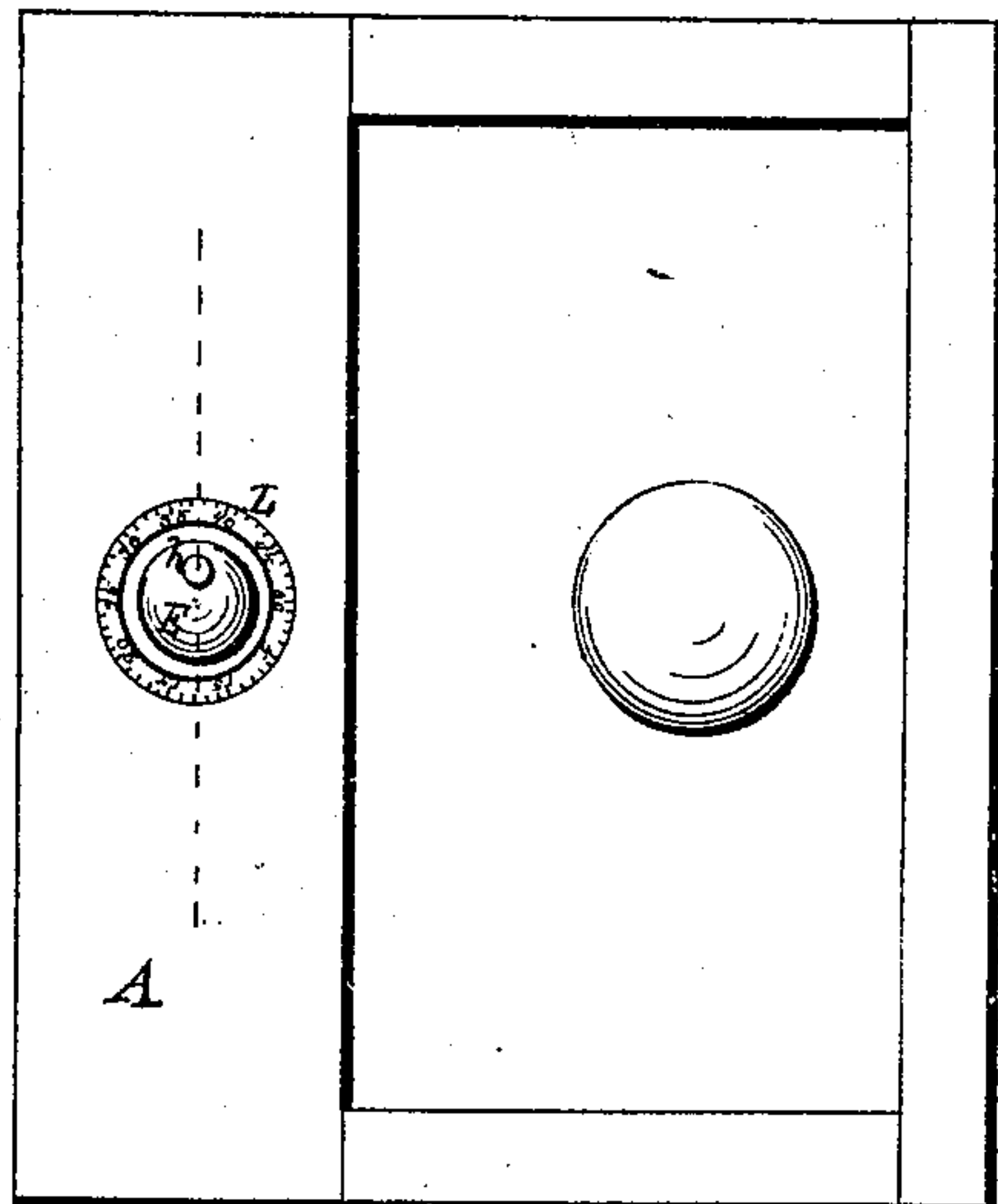


Fig. 3.

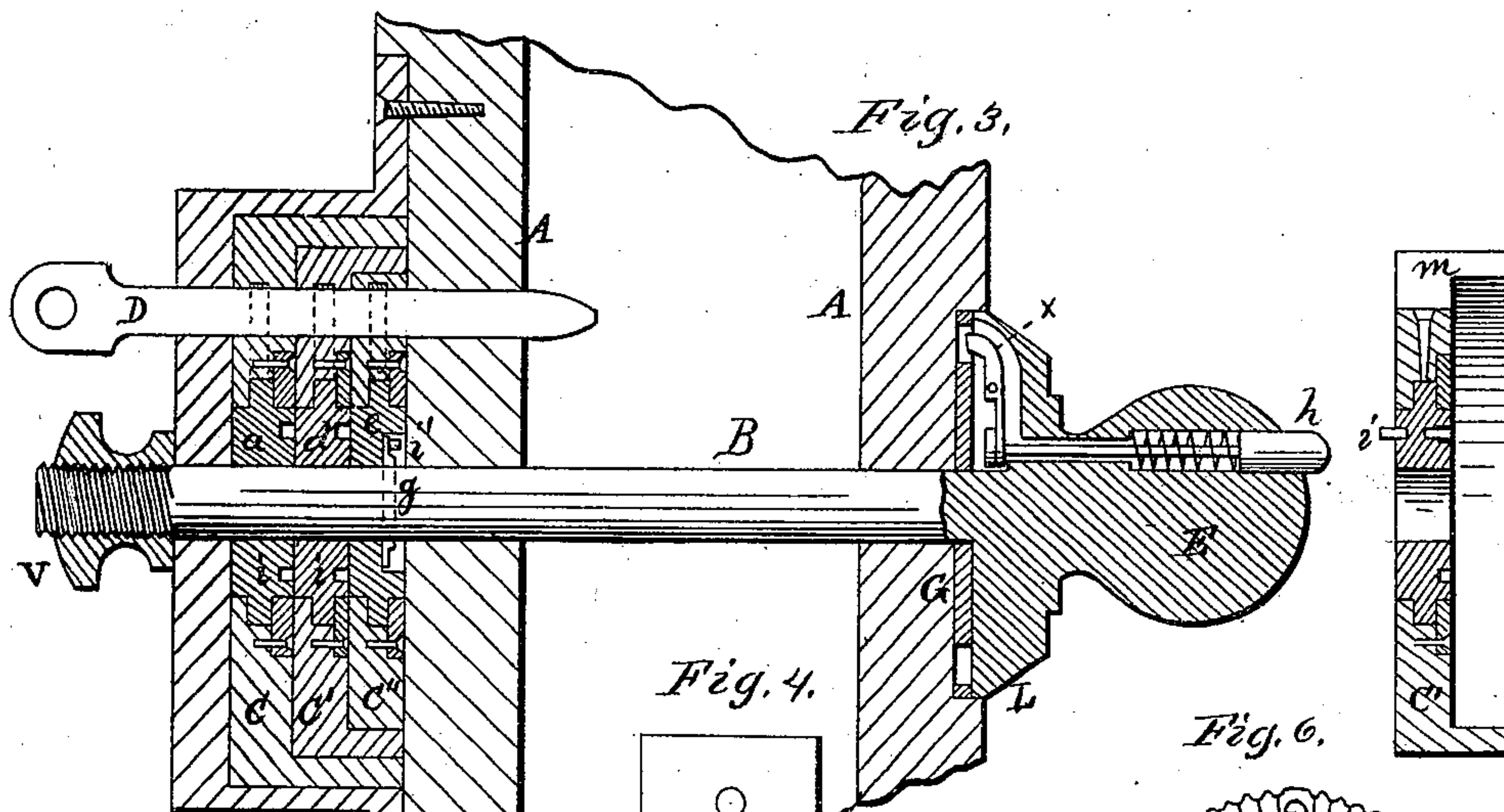


Fig. 4.

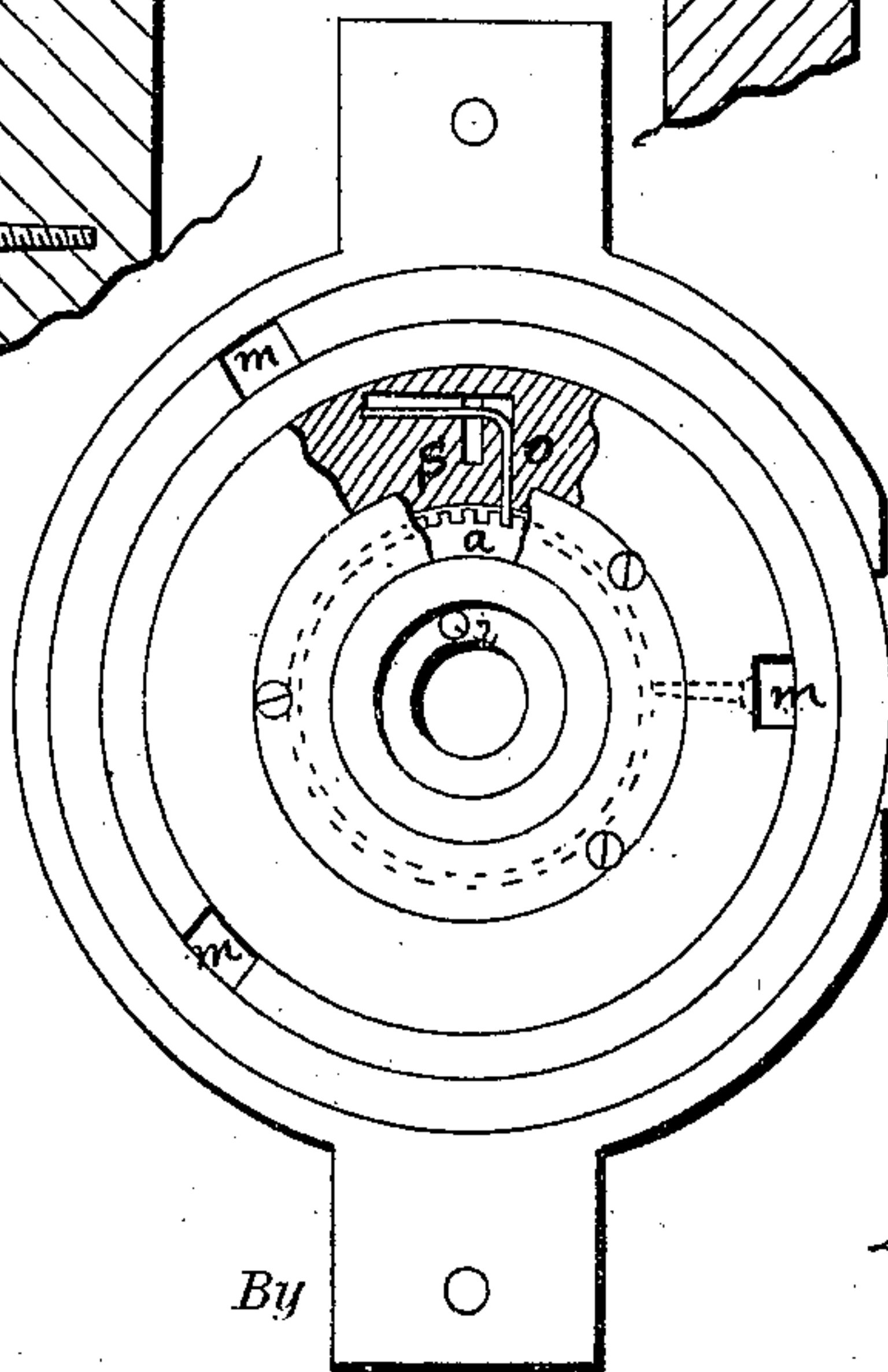


Fig. 6.

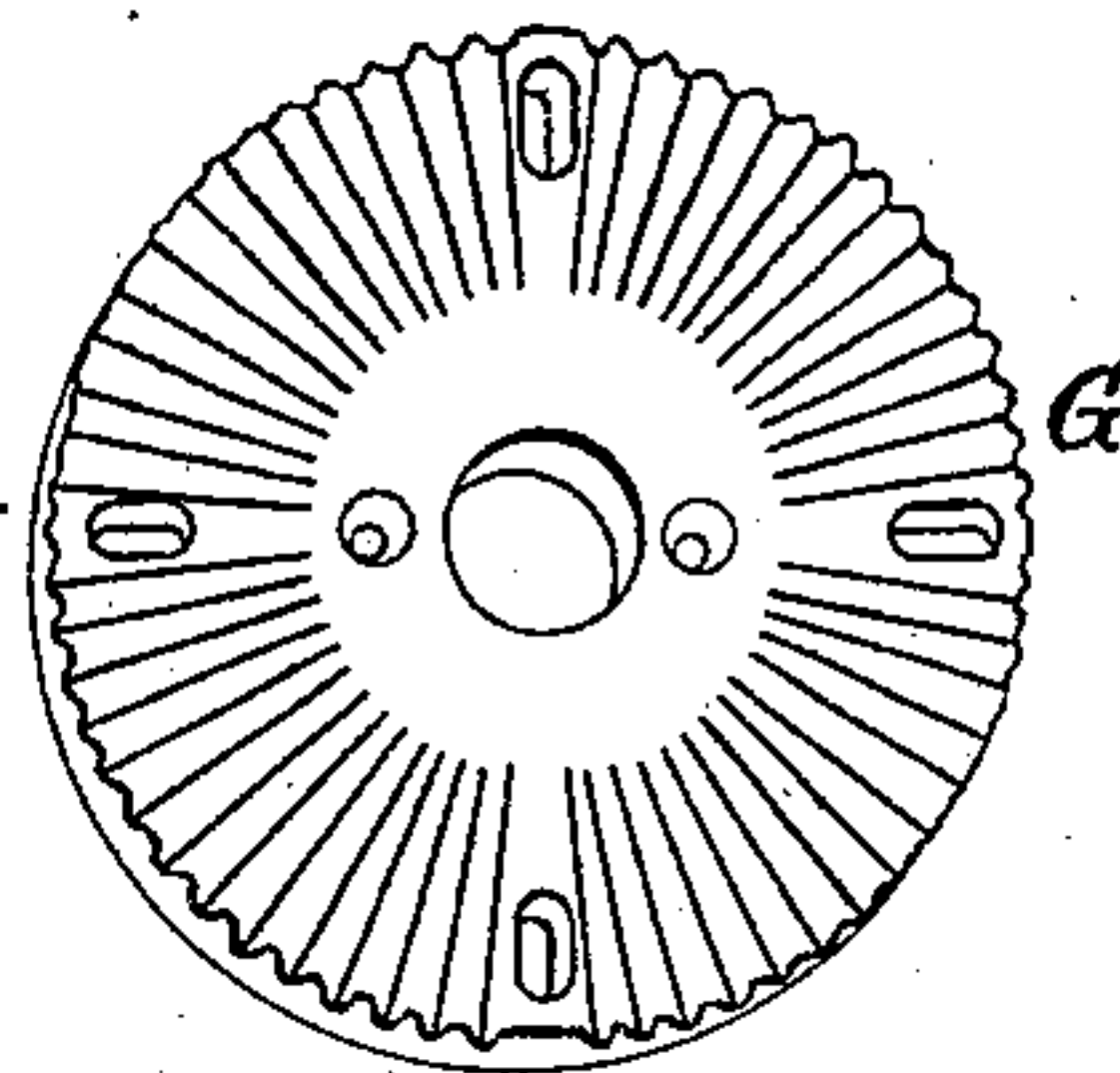
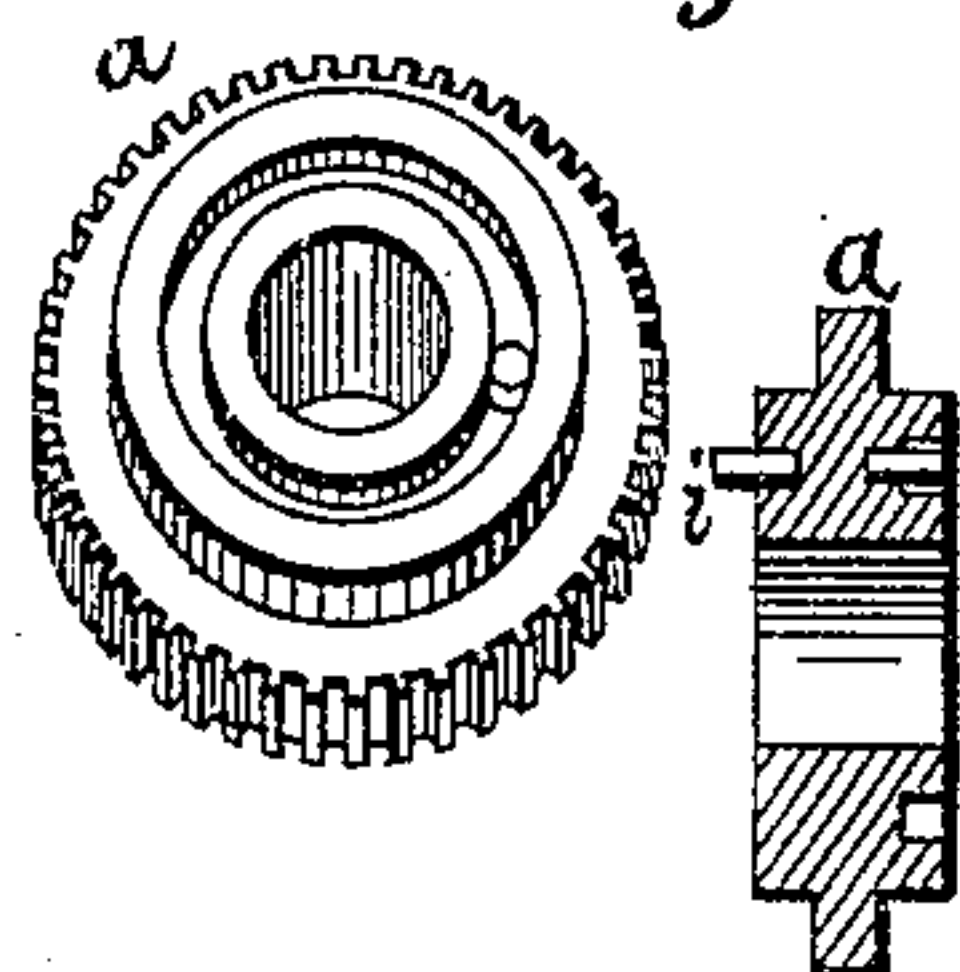


Fig. 5.



WITNESSES.

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Fig. 2.

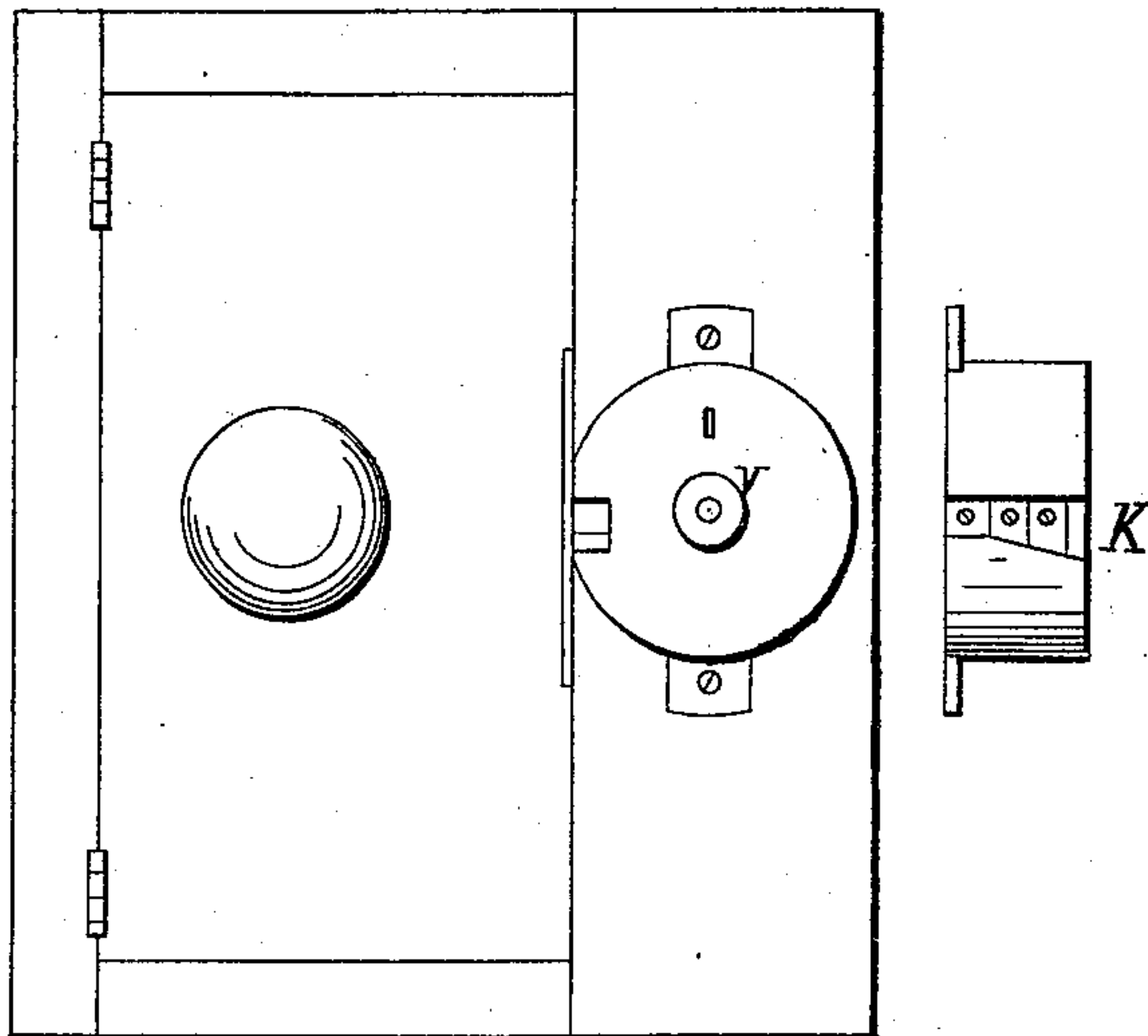


Fig. 8.

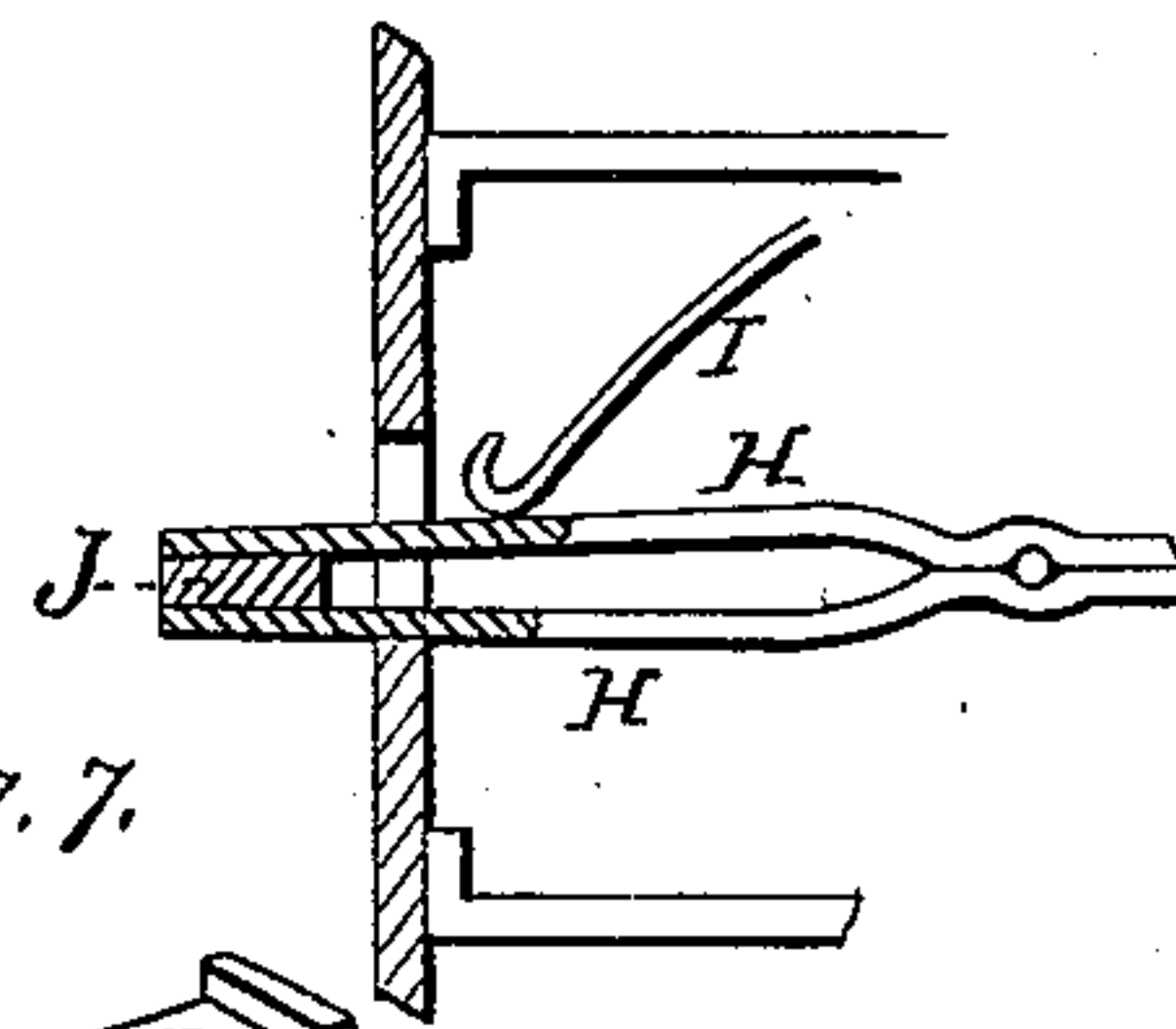
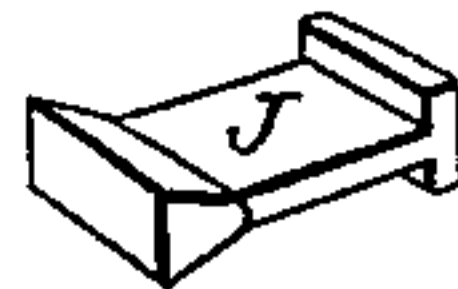


Fig. 7.



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UNITED STATES PATENT OFFICE.

PHIDELLO W. HALL, OF CALVERT, TEXAS.

IMPROVEMENT IN PERMUTATION-LOCKS.

Specification forming part of Letters Patent No. 148,451, dated March 10, 1874; application filed September 2, 1873.

To all whom it may concern:

Be it known that I, PHIDELLO W. HALL, of Calvert, in the county of Robertson and in the State of Texas, have invented certain new and useful Improvements in Rotary Combination-Lock; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon making a part of this specification.

The nature of my invention consists in the construction and arrangement of certain devices, which will be hereinafter described more fully, for the purpose of forming a combination-lock.

In the annexed drawings, Figure 1 represents a side view of a door and the door-casing, where the knobs or handles are seen on the outside. Fig. 2 is a side view of the door and casing and a portion of the lock, seen from the inside. Fig. 3 is a vertical cross-section, taken in the line of the knob-shaft. Fig. 4 is a plan view of the disks of the lock, one resting within the other. Fig. 5 is a view of one of the gear or toothed wheels, one of which is secured in each disk. Fig. 6 is a plan view of a corrugated plate which is secured upon the outside of the door-casing. Figs. 7 and 8 are views of the latch or bolt, showing its construction.

In the drawings, A represents the door-casing, which in this instance serves to hold the lock. A shaft, B, passes through the casing and through the lock, and serves to operate the same. E represents a knob on the outer end of shaft B, which has formed upon it a collar, L, and upon this collar are figures or numbers, such as are formed upon the collars of lock-knobs now in use. C C' C'' represent disks or cups having flanges extending around them and at right angles to their faces. These cups are concentric, one being placed within the other and the edges of their flanges being flush with each other. A suitable cap covers these disks or cups, and is secured to the door-casing on the inside. *a*, *d*, and *e* represent three wheels, which are provided upon their peripheries with cogs or teeth. These wheels are let into the bottoms of the disks or cups, and covered and held in place by suitable plates. They are provided upon their faces

with grooves, as seen in Fig. 5, which grooves pass almost entirely around, being stopped or closed at one point. On the back of each wheel is a pin, *i*, which is intended to fit and play in the groove in the face of the wheel next to it. *i'* represents a pin on the face of wheel *e*, which is operated upon by a pin, *g*, which passes through the shaft B. Each of the disks has a slot cut through its periphery, as seen at K, Fig. 2. These slots are for the purpose of allowing the door-latch to pass through the lock inward or outward. The several disks must, of course, be placed in just such a position that the slots will all be together before the latch can pass in or out. The moment one of the disks is moved, so that its slot is out of line with the other two, then the latch is prevented from either passing in or out, and the door can neither be opened nor closed. It will readily be seen that the disks are moved by the shaft B, its pin *g* acting upon the pin *i'* of the wheel *e*, and the other pins *i i* acting upon the wheels *a* and *d*. The shaft operates upon one wheel, and then the wheels move or operate upon each other by means of their grooves and pins. Each of the wheels *a d e* has as many teeth upon its periphery as there are numbers upon the collar L of the shaft B, and the various combinations of this lock are formed by the changes effected by moving the wheels. These wheels are held in place and prevented from moving in the disks by means of small bent springs *o*, one end of which enters between the teeth. In place of the spring I may use a set-screw. In order to move the wheels, I use a key which I insert in an opening or slot, S, Fig. 4, which raises the springs out of the teeth and allows said wheels to revolve, thus changing the relative position of the pins on the back of the wheels to the slots in the periphery of the disks or cups. One or more of the wheels can be changed, and thus the combination varied almost indefinitely. Upon the outside of the door-casing is secured a corrugated plate, G, which has as many corrugations as the collar L has numbers upon it. The shaft B passes through this plate, and the collar L covers it up from view. Passing through the knob E is a spring-rod, *h*, which operates upon a pawl or detent, *x*. This pawl works against the corrugated plate G. There are four openings in

this plate, equidistant apart, into which the pawl can enter and stop it entirely. It passes over or slides on the corrugations, making an audible click as it leaves each one. The object of this arrangement is that one on the outside of the door, and in the dark, can discover his combination. In doing so, he turns the handle until the pawl falls into one of the openings. He then knows where to commence counting, and, as he turns the handle slowly, he counts each click of the pawl until he reaches the numbers of his combination. By turning the knob partially around backward and forward, as is customary in combination-locks, the slots in the periphery of the cups or disks are brought together or in line, so that the latch can pass in or out. The latch is composed of two metallic springs, H H, which close at their outer ends upon a plug, J, which has two shoulders at one end and is wedge-shaped at the other. The object of this plug is that when one is trying to unlock the door who has not the combination, and presses the door to detect the slots in the disks or cups, the wedge end of the plug strikes against one of the disks or cups and expands the springs H H, so that the slots in the disks cannot be detected. On the end of the shaft B is a thumb-screw, V, the

object of which is to prevent said shaft from turning when desirable that it should not. By tightening this thumb-screw on the inside, a person on the outside will be unable to turn the knob, and thus it answers as a dead-lock.

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

1. The combination of the flanged disks or cups C C' C'', placed one within the other, the interior cogged and grooved wheels *a d e*, pins *i* and *i'*, spring *o*, and shaft B, with pin *g*, all substantially as and for the purposes herein set forth.

2. The corrugated plate G, in combination with the knob E and spring-rod and detent, as and for the purpose specified.

3. The latch H, composed of two spring-bars and used in combination with the plug J, as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 2d day of September, 1873.

PHIDELLO W. HALL.

Witnesses:

A. N. MARR,
J. M. MASON.