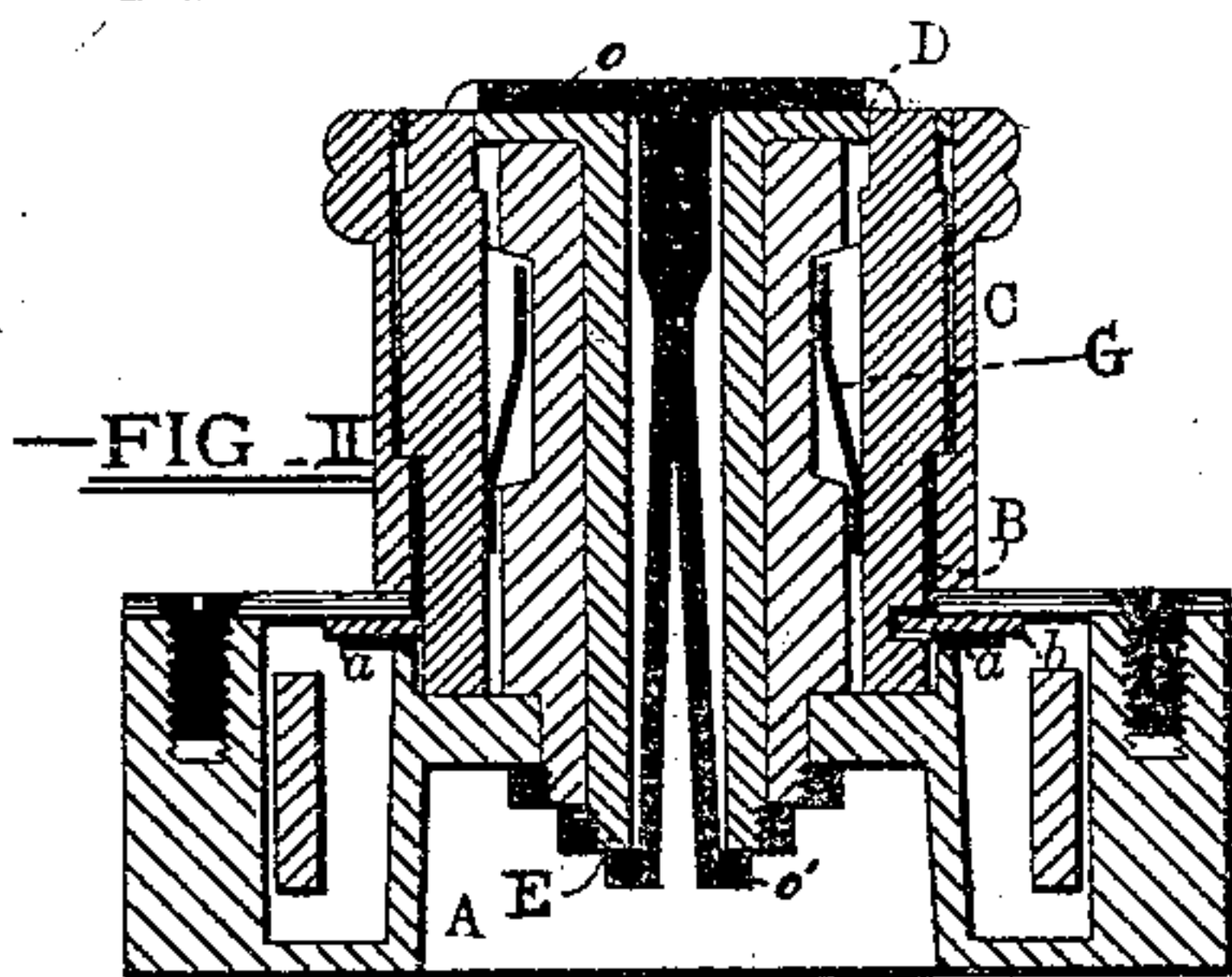
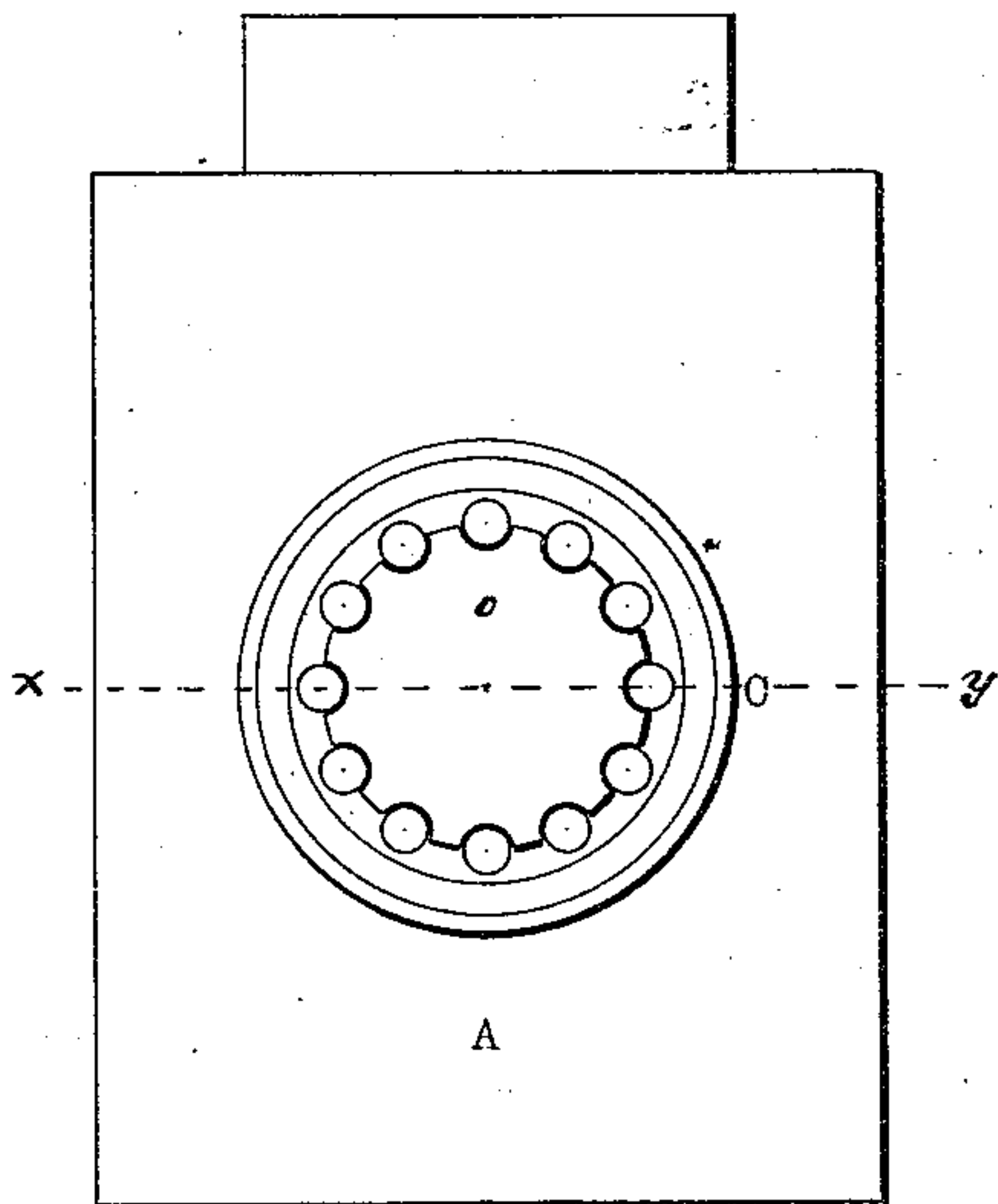


H. CLARKE.
Combination Seal-Lock.

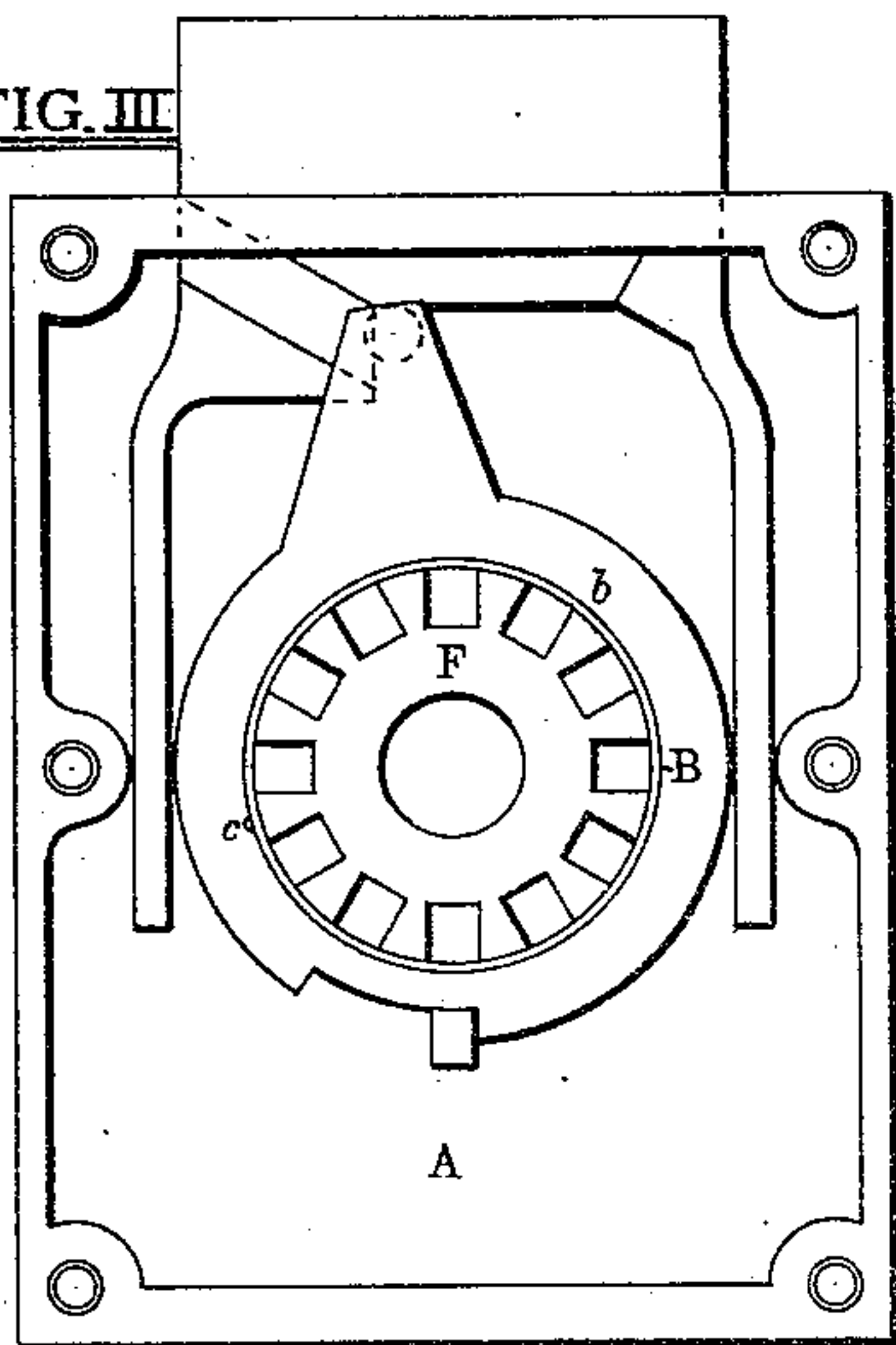
No. 164,522.

Patented June 15, 1875.

—FIG. I—



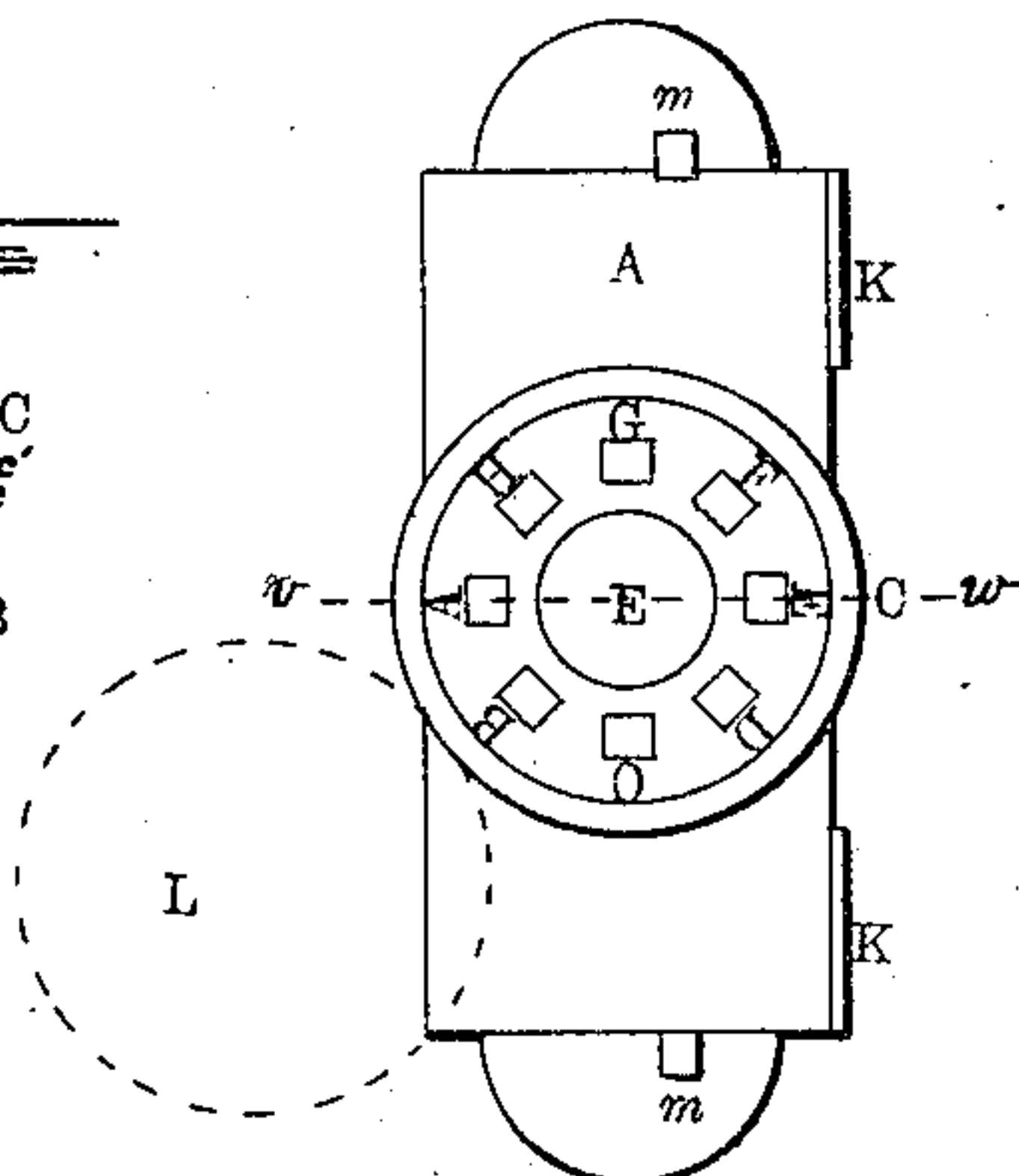
—FIG. III—



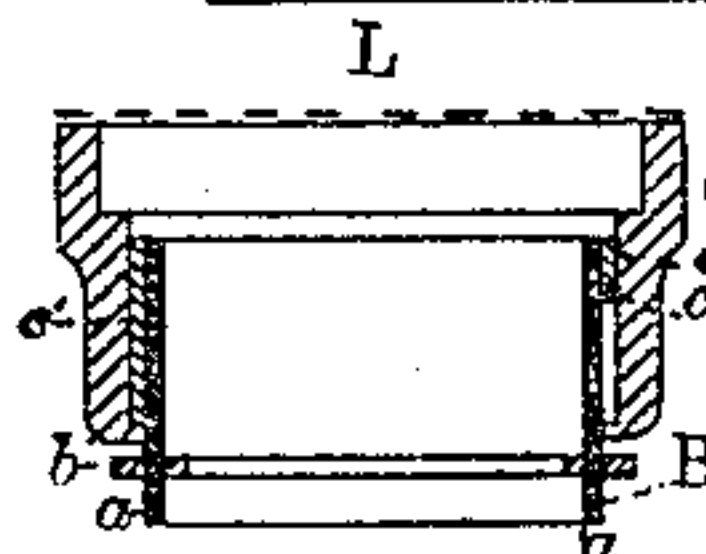
WITNESSES =

M. J. M. Howard
W. H. Wharton

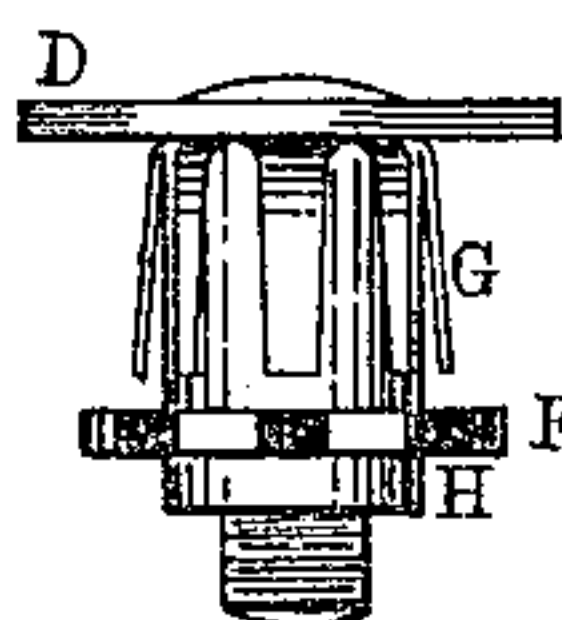
—FIG. IV—



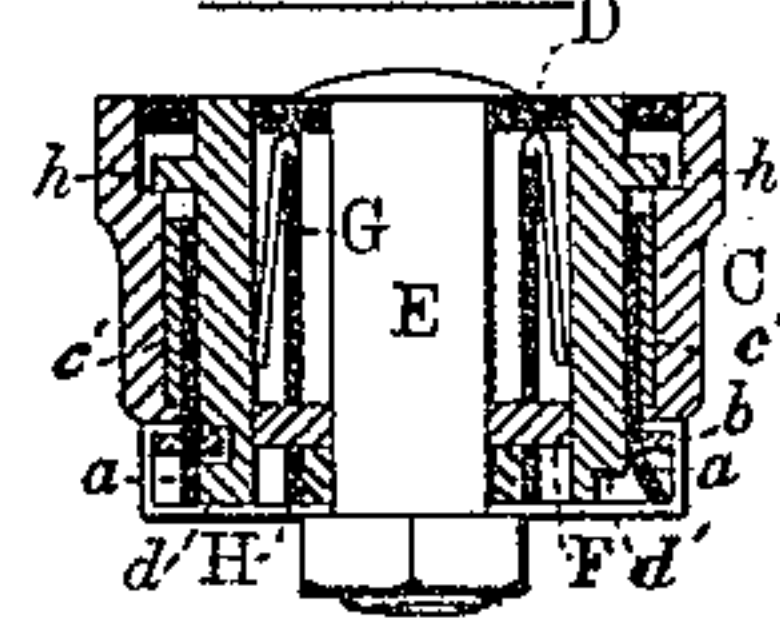
—FIG. VII—



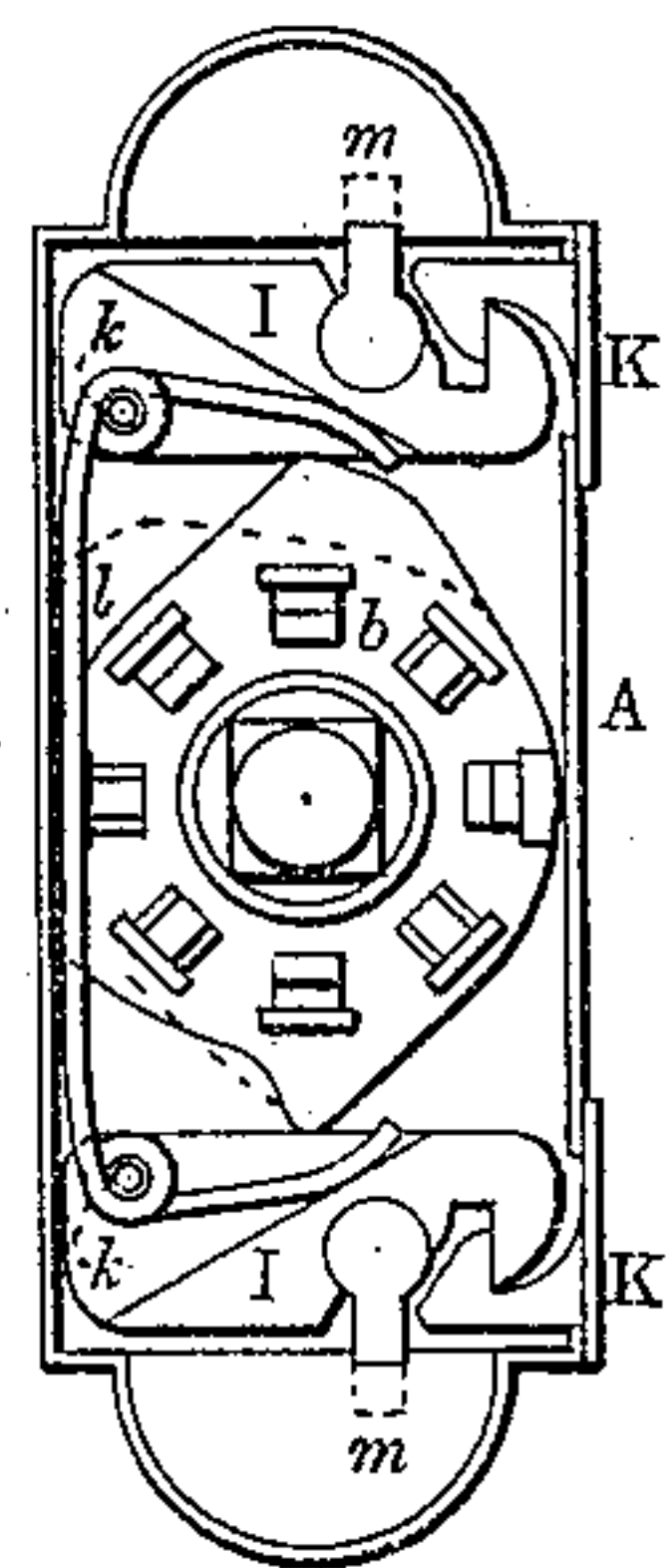
—FIG. VIII—



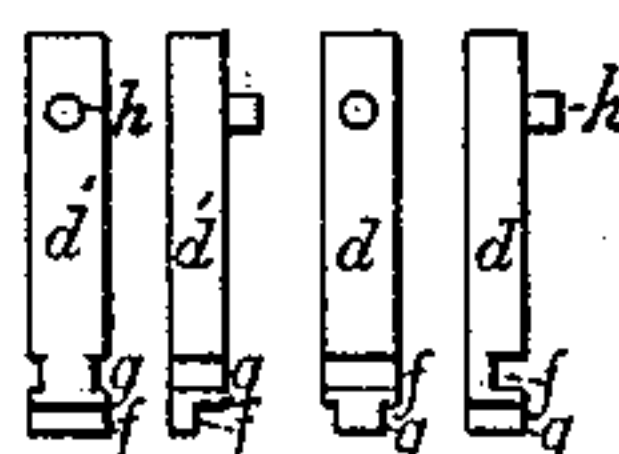
—FIG. V—



—FIG. VI—



—FIG. IX—



INVENTOR =

Henry Clarke
by G. H. W. J. Howard
his atty.

UNITED STATES PATENT OFFICE.

HENRY CLARKE, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN COMBINATION SEAL-LOCKS.

Specification forming part of Letters Patent No. **164,522**, dated June 15, 1875; application filed December 16, 1874.

CASE A.

To all whom it may concern:

Be it known that I, HENRY CLARKE, of the city of Baltimore, in the State of Maryland, have invented certain Improvements in Combination Locks, of which the following is a specification; and I do hereby declare that in the same is contained a full, clear, and exact description of my said invention, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

My present invention consists in certain improvements on Patent No. 135,523, granted to me February 4, 1873, which patent was reissued July 22, 1873.

For the better understanding of the improvements forming the invention herein claimed, I will describe the lock as originally patented by me, as aforesaid, and as also embodying my present invention, referring to the clauses of claim of invention, forming a part of this specification, for a recapitulation of such devices and combinations of the same as are herein claimed as my invention.

The lock is so constructed that a key is not necessary, and that certain parts must be placed in some relative position, or a combination formed of certain parts, to allow the movement of the devices by means of which the locking and unlocking are accomplished. The lock is provided with a seal in such manner that the preliminary steps toward unlocking the device will destroy or perforate the said seal, and thereby prevent secret examination of the lock with a view to discover the combination. The lock is keyless, having slotted tumblers, arranged in an annular inclosure, capable of only a sliding movement, and which are elevated by the pulling outward of an exterior band, certain of the tumblers constituting a known combination, being adapted to be pushed back by the fingers to their original position. They are thus brought to such position, with relation to an eccentrically-formed plate, that certain teeth thereon can pass through slots in the depressed tumblers, and allow of the movement of the said plate, and the shooting out or in of the bolt, or the releasing of the spring-catches. The movement of the eccentrically-formed plate is allowed, and the shooting out of the

bolt caused, or the releasing of the spring-catches made admissible by the rotary movement of the exterior band, consequent upon the relative arrangement of the tumblers and said plate.

The eccentrically-formed toothed plate is applied to the lock-case and secured to and at a right angle with a sleeve, within which the tumblers are placed, the said tumblers being supported by an upper disk or dial, through which they pass, and a lower annular plate, and operated by means of the movable band fitted to the exterior of the said sleeve, which band, when raised, elevates the tumblers. Upon the depression of certain of the tumblers to their original position, a combination is formed which bears such relation to the said eccentrically-formed plate that the plate at first locked by the tumblers is allowed to partially revolve, admitting of the disengagement of the fastening devices of the lock. The dial is steadily fastened to the lock-case, and a device or combination of devices used, causing the tumblers to be forced laterally against the inner surface of the sleeve aforementioned, the wear of the operative parts being thus provided for. An adjustable seal-plate is used to hold a paper or composition seal placed upon the face of the dial, and confined between the said dial and seal-plate, and covering the outer ends of the tumblers, the tumblers perforating the said seal as they are elevated by the pulling outward of the exterior band. I also use an arrangement of devices whereby certain spring-hooks, pivoted within the lock-case, and held by the eccentrically-formed plate, so as to interlock with catches separate from the lock, are adapted to be disengaged from the said catches, when, by means of the joint operation of the tumblers and the said eccentrically-formed plate, the latter is moved from contact with the said spring-hooks.

In the accompanying drawing forming a part of this specification, Figure 1 is a front or face view of my improved combination lock, adapted, in having a direct-moving bolt, to safes, desks, drawers, and the like. Fig. 2 is a cross-section of the same upon the line *x y*. Fig. 3 is a view of the upper face of the lock, certain exterior portions and the tumblers hav-

ing been removed. Fig. 4 is a face view of the lock adapted for attachment to satchels and valises. Fig. 5 is a cross-section of the same upon line *v w*. Fig. 6 is a view of the under side of the lock, the lower plate being removed, and Figs. 7, 8, and 9 are views of detached parts of the lock.

Similar letters of reference indicate similar parts of the invention in all the figures.

A represents the case or outside covering of the lock. B is a sleeve passing through the upper plate of the case. The lower edge of the sleeve is toothed, the teeth, represented by *a*, fitting within spaces existing between similar teeth formed within a horizontal plate, *b*, the office of which will be hereinafter fully described. One or more of the teeth on the sleeve are turned outwardly, where they project below the plate *b*, for the purpose of fastening the plate and sleeve together. C is an ornamental band placed upon the outside of the sleeve B, and is secured from turning upon the sleeve by means of the projecting stop *c* and the slots within which it is inserted. This stop, while preventing any lateral movement of the band independently of the sleeve, does not interfere with the longitudinal motion of the said band, as the slot in which the stop rests extends to the lower edge of the band. In some cases, in order to prevent the projecting stop *c* from being sheared off or otherwise injured by the edge of the slot in which it rests, as excessive strain is applied to the band C in a circumferential direction, I use a lining, *c'*, in the band, the slot being cut in the said lining instead of in the band. In the transmission of motion from the band C to the sleeve B friction between the band and the lining *c'* only is depended upon, and the friction is principally caused and compensation for wear provided for by the lining being formed slightly larger in diameter than the inner surface of the band, and, after being cut, sprung together or closed to the required diameter. D is the dial, situated within the band C, at the outer end of the same, and is provided with a suitable number of perforations, in which the tumblers *d* and *d'* rest. E is a shaft passing through the dial D, securing it to the back plate of the case A. In locks having the seal attachment the shaft E is hollow, and a part of the dial, to admit of the insertion of the seal-plate rod, as hereinafter described. The shaft E may be lengthened so as to form a convenient method of fastening the lock to the drawer or trunk. F is a circular plate or core placed upon the shaft E as a bearing for the ends of the tumblers *d d'*, and has notches in the edge for that purpose. G is a spring formed by cutting one end of a sheet-metal cylinder into tapering strips equal in number to that of the tumblers *d d'*, and bending the strips downward so as to bring their ends nearly to the circular plate or core F, or it may be formed as shown in Fig. 2. The purpose of this spring is to give sufficient friction to the tumblers *d d'*, to prevent their

too ready movement, and also to provide for any wear of the tumblers or adjacent parts. H is a washer occupying the space between the plate F and the back plate of the case A.

The tumblers *d* are provided with grooves *f*, which are of such depth and at such distance from the dial D as to allow the teeth in the plate *b* to pass without coming in contact with said tumblers when in their lowest position. The tumblers *d'* have the grooves *f* at a greater distance from the dial, thereby requiring the tumblers to be raised a certain height to bring the grooves in a line with the horizontal plate *b*, and allow the passage of the teeth on the plate past the tumblers through their respective grooves. The tumblers are each provided with false notches *g*. The purpose of these notches is to mislead any one endeavoring to discover the relative positions to which the tumblers *d* and *d'* must be brought to admit of the rotary motion of the plate *b*, sleeve B, and band C. The tumblers *d d'* are provided with the pins *h*, which engage a projecting portion of the interior of the band C. These pins serve as means by which the tumblers are moved as the band C is raised above the dial D. In the lock, as shown in Figs. 1, 2, and 3, the pins are merely elongated projections on the outer face of the tumblers. I I are hooks pivoted at *k*, and furnished with the spring *l* and thumb-pieces *m*. K K are catches secured to the lid or door of the trunk or other object to which this locking device is applied. The catches pass through openings in the case A, and are caught by the hooks I. The plate *b* has projections *b'* on the sides next to the hooks I, which projections, when in the positions shown in Fig. 6 of the drawing, come in contact with the hooks, keeping them from a too-far-backward movement, by reason of which their disengagement from the catches might occur. To provide sufficient space for the movement of the hooks I the plate must be moved into the position shown by the dotted lines. The movement of the plate *b* is checked by its coming in contact with the sides of the case A.

The seal-holding device hereinbefore mentioned consists in a plate, *o*, of a diameter about equal to the distance between the centers of two opposite tumblers, and notched to allow of their elevation. This plate has a rod, *o'*, which passes through the hollow shaft E, and is held in place by projections on the side of the rod, which is split and formed into a spring. The case at this point is recessed at the back to prevent tampering with the lock, and to shorten the parts requiring nuts to keep them in position.

Supposing the device to be locked, and it is desired to unlock it, the operation is as follows: The band C is raised above the dial D, carrying the ends of the tumblers *d* and *d'* through the register. The band is then replaced, leaving the tumblers protruding. The tumblers *d*, which are also represented in Fig. 4 by the letters A, D, F, and H, are then forced into

their original positions, bringing the grooves *f* opposite the teeth on the plate *b*, the grooves in the tumblers *d'*, represented by B, C, E, and G, being already in that position. The band C, with the connecting parts, is now free to turn until the plate *b* is brought to the position indicated in Fig. 6 by the dotted lines. The projection *b'* upon the plate *b* is thus removed from contact with the surfaces of the hooks I I, which can now be moved by the pressure of the thumb upon the pieces *m*, so as to release the catches K K. A lid, L, is arranged, as shown by dotted lines in Figs. 4 and 7, to cover the dial D and ornamental band C, and to slide back upon a pivot, after the manner of the ordinary sliding cover to some key-holes.

In Fig. 7 the cover is shown slipped over the band C. The use of either lid is to protect the parts of the lock covered from damage by blows, and to keep them clean and free from dust.

In the lock shown in Figs. 1, 2, and 3 the movement of the band C is transmitted directly to the bolt by means of a pin on the eccentrically-formed plate, which pin traverses a slot in the bolt.

A person unacquainted with the combination of tumblers necessary to be forced to their original positions after the entire number have been raised would be unable to unlock the device.

Having thus described my invention, what

I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The seal-holding plate *o*, having its circumferential limit indented for the entrance of a portion of each tumbler, as shown, thus enabling the said plate to hold down the seal while it is being punctured by the tumblers, in combination with the dial D, perforated for the occupancy and movement therein of the said tumblers, the said plate and dial being incorporated in a seal-lock, substantially in the manner herein specified.

2. The indented seal-holding plate and bolt *o o'*, in combination with the dial D, perforated for the tumblers, said dial having as a part thereof the hollow bolt E, relatively arranged as parts of a seal-lock, substantially as and for the purposes herein specified.

3. The combination of the band C, compensating lining *c'*, slotted as set forth, and sleeve B, provided with the projecting stop *c*, relatively arranged within the lock, substantially as and for the purpose specified.

4. The lock-case recessed at the back, as shown, in combination with the dial-bolt E, said bolt tying or holding together the lock-case and dial, substantially as specified.

In testimony whereof I have hereunto subscribed my name this 30th day of November, A. D. 1874.

Witnesses: HENRY CLARKE.

WM. S. MURPHY,

R. V. BYRNE.