

(Model.)

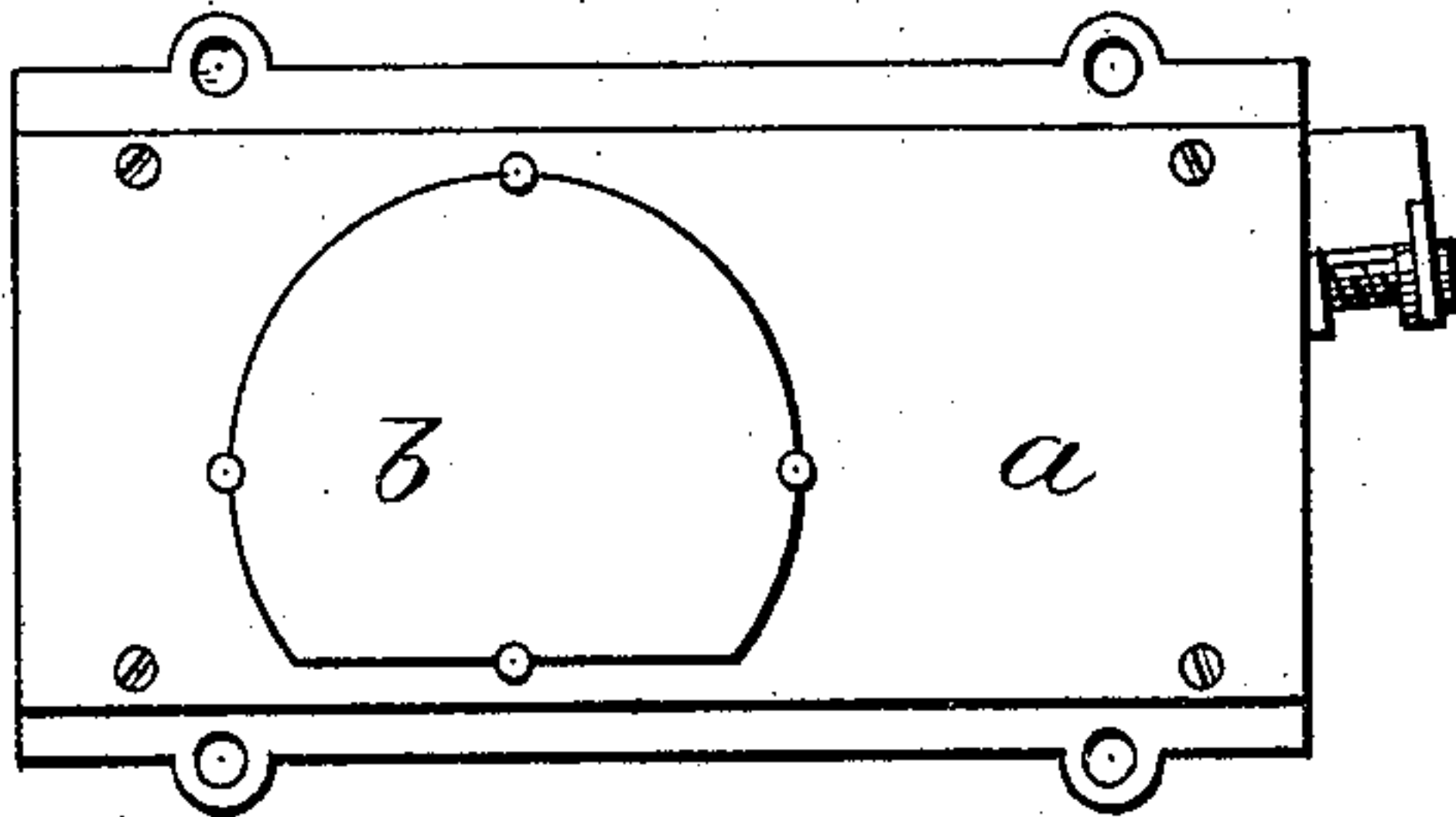
2 Sheets—Sheet 1.

H. C. BROWN, Jr.  
COMBINATION LOCK.

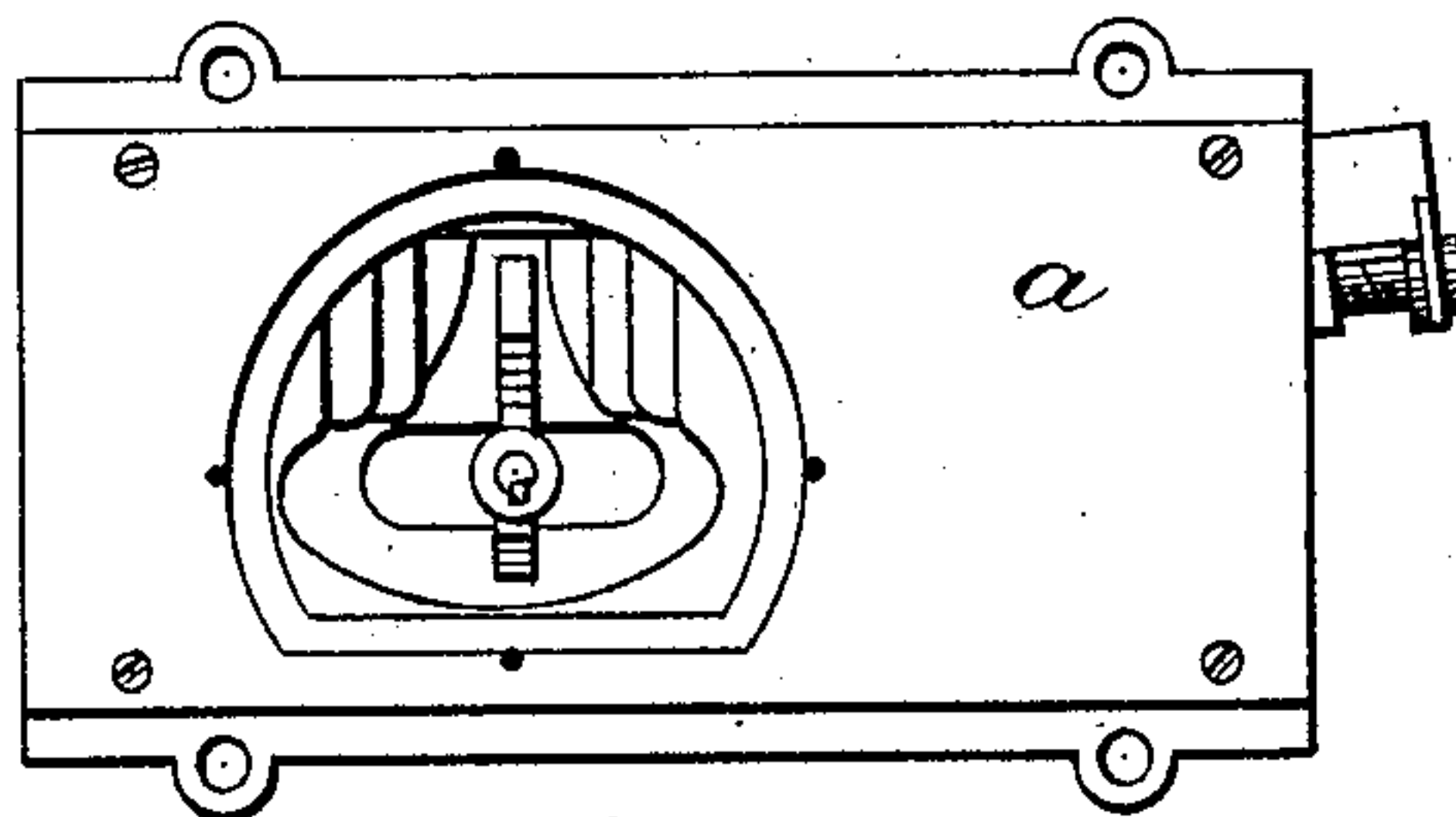
No. 397,893.

Patented Feb. 19, 1889.

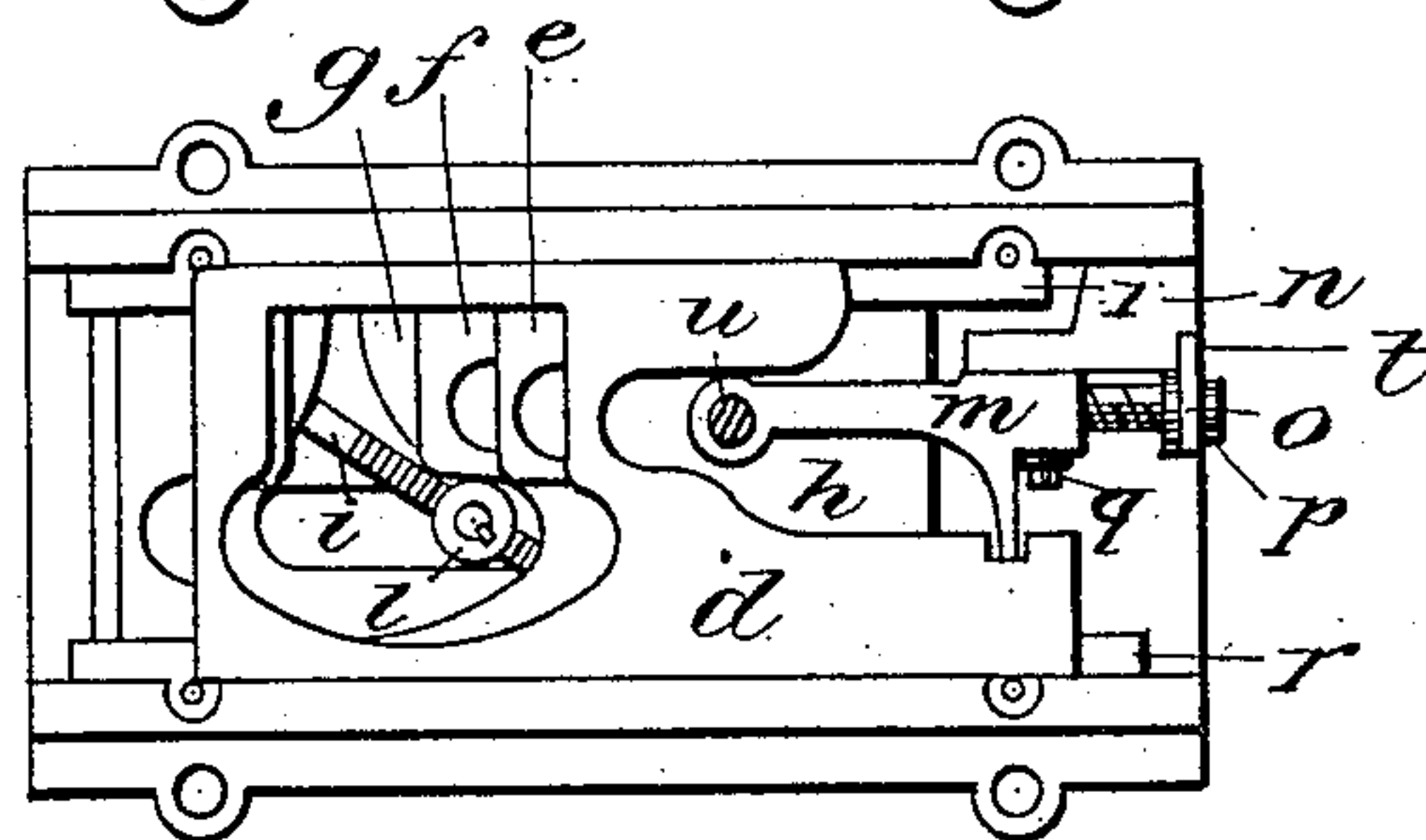
*Fig. 1*



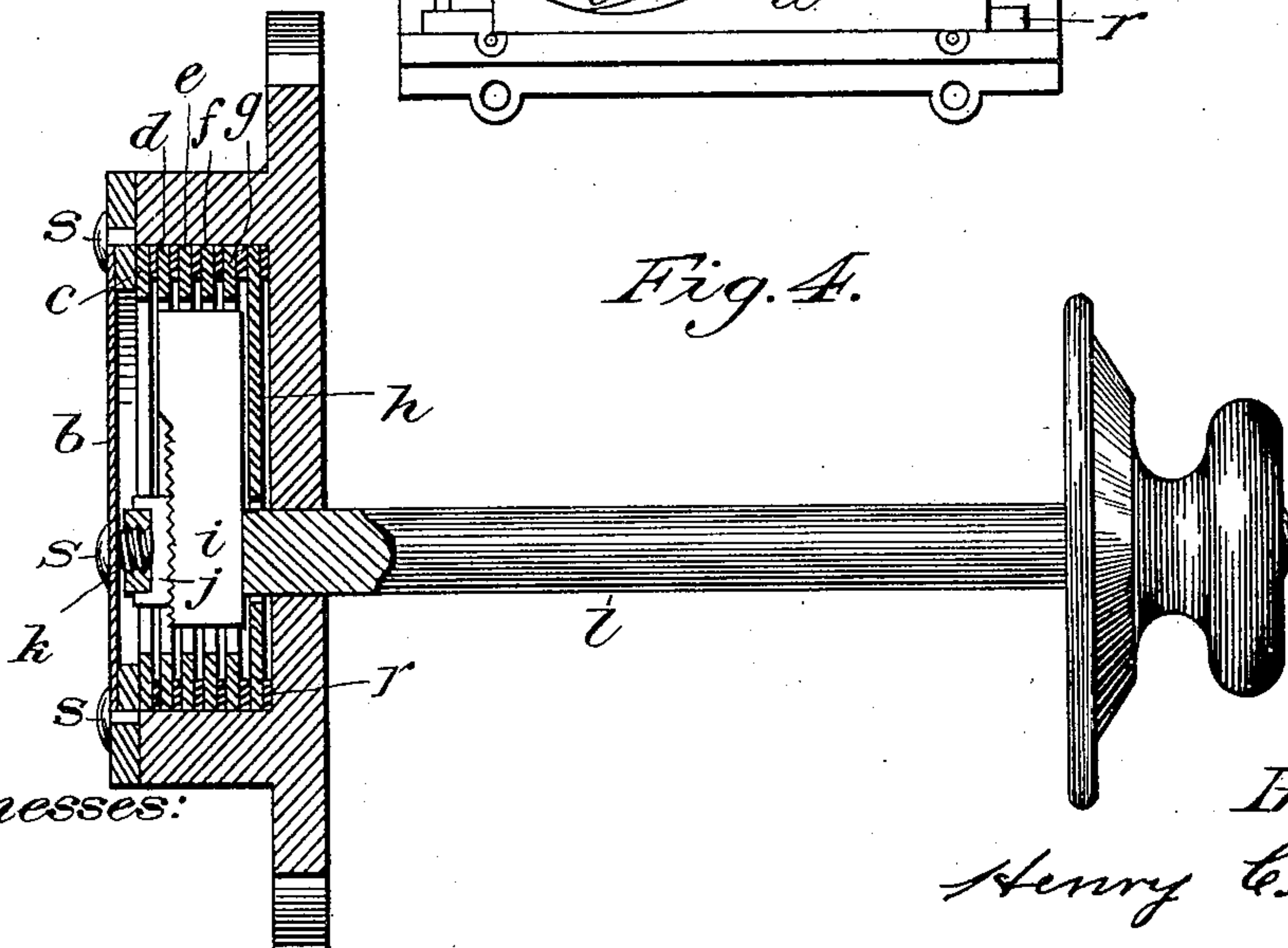
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



Witnesses:

Henry C. Brown.  
Walter S. Lyon.

Inventor:  
Henry C. Brown Jr.

(Model.)

2 Sheets—Sheet 2.

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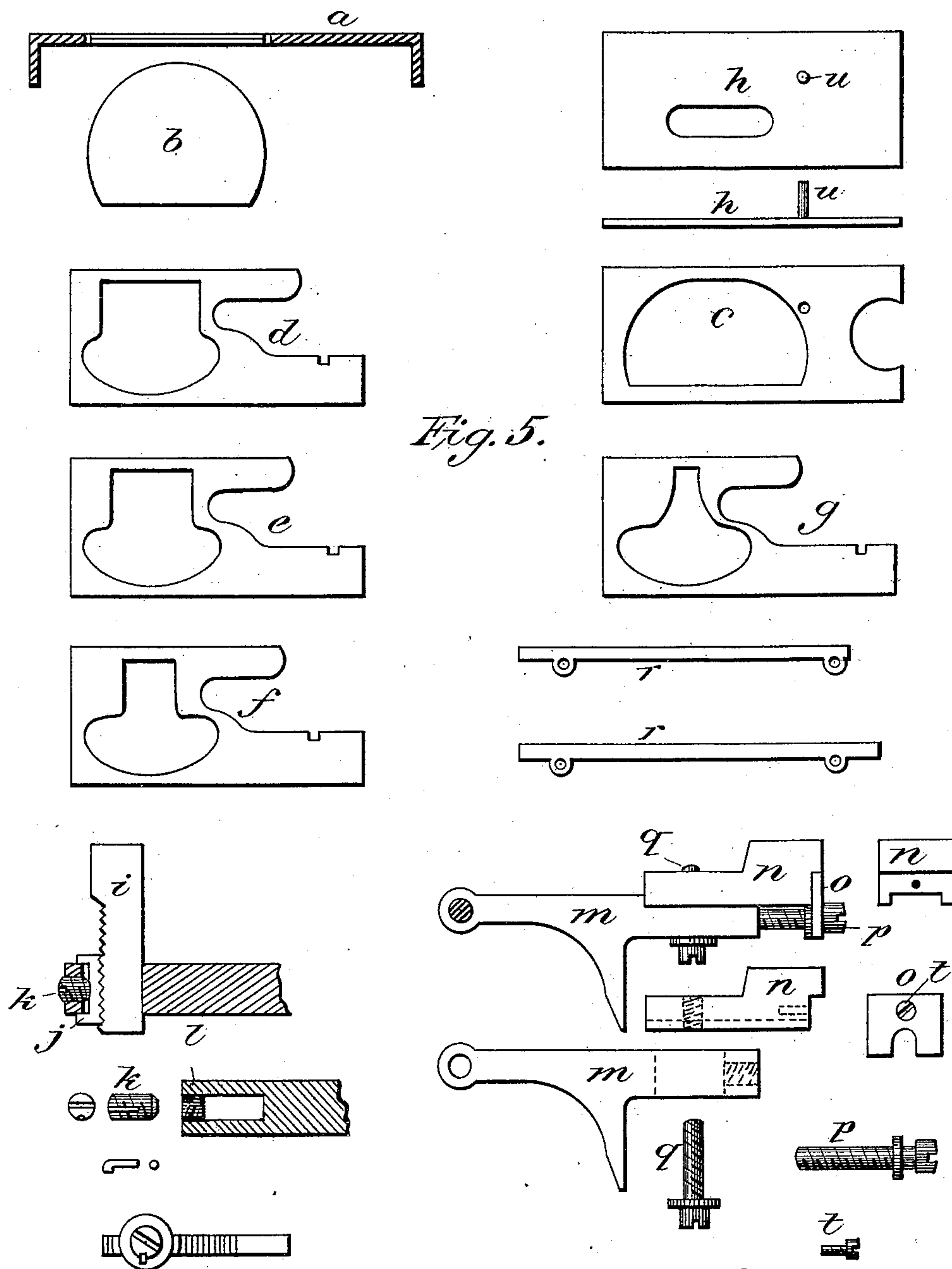


Fig. 5.

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Inventor:

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# UNITED STATES PATENT OFFICE.

HENRY C. BROWN, JR., OF BROOKLYN, NEW YORK.

## COMBINATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 397,893, dated February 19, 1889.

Application filed January 6, 1888. Serial No. 260,018. (Model.)

*To all whom it may concern:*

Be it known that I, HENRY C. BROWN, Jr., of the city of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Combination-Locks; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, and to the letters of reference marked thereon, like letters indicating like parts wherever they occur.

My invention relates to combination-locks; and it consists in constructing the lock in such a manner that the tumblers have a backward and forward or lateral motion, and are projected forward and withdrawn by means of a tongue or arm attached to and fixed in a spindle connected with and turned by means of a thumb-piece or dial operating in unequal and irregular openings in the tumblers.

To enable others skilled in the art to construct and use my invention, the following description is given.

Figure 1 shows the lock with all its parts in their proper places. Fig. 2 shows the lock with the thin plate or cap *b* removed. Fig. 3 shows the lock with the cover *a* and guard-plate *c* removed and all its tumblers in their proper places when the dog *m* is drawn back. Fig. 4 shows a sectional view of the lock at a line drawn through the center of the spindle. Fig. 5 shows the various parts of the lock taken apart and disconnected.

The guard-plates *c* and *h* hold the dog *m* in position by means of the pivot or pin *u*. The pin *u* is fixed or fastened in the guard-plate *h* and passes through the end of the dog *m*, and the other end of the pin *u* is held in the guard-plate *c*, and *d e f g* are the tumblers, separated by the packing or washers, respectively marked *r*. The tumblers *d e f g* are projected and withdrawn by means of the arm *i*, attached to and passing through the spindle *l*, as shown in Fig. 4. The arm *i* is fastened in the spindle *l* by means of the keeper *j* and set-screw *k*. The arm and keeper are notched and interlock to prevent the arm *i* from slipping when set in the spindle *l*, as seen in Fig. 5. The thin plate *b* is held in position by the screws or rivets *s s*, as seen in Fig. 4. The tumblers

are arranged with apertures or openings through or near the center of each varying in size, as seen in Fig. 5, and so arranged that the aperture in tumbler *f* shall be larger than that in tumbler *g*, and the aperture in tumbler *e* shall be larger than that in tumbler *f*, and the aperture in tumbler *d* shall be larger than that in tumbler *e*. Through these openings the spindle *l* passes, holding the arm *i*. The arm *i* is of sufficient width, so as to cover the entire width of and engage all the tumblers, as may be desired, as seen in Figs. 3 and 4.

The dog *m*, as seen in Fig. 3, when thrown forward by the motion of the tumblers, so that the adjustable head *n* passes outside of the edge of the case or lug resting against the case, is forced upward and out of the slots in the tumblers, for the reason that the lug on the lower side of the dog *m* is slightly wedge-shaped and thinner at its extreme lower point than farther back on the dog, and so arranged at an angle as to give it a tendency to rise up and fly out of the notches in the tumblers when thrown forward, and then the combination is locked, as shown in Figs. 1 and 2, and the dog cannot again fall until all the slots in the tumblers are brought successively into line with each other and directly under the lug on the dog *m*, the width of which is sufficient to cover all the tumblers combined and resting upon them.

The method of unlocking the combination or withdrawing the dog *m* is by turning the spindle *l*, which brings the arm *i* against and so that it engages the side of the opening in the tumbler *d*, as shown in Fig. 3, and throwing that tumbler forward or backward until the slot in tumbler *d* is drawn directly under the lug on the dog *m*, when the arm *i* is turned in the opposite direction, leaving the tumbler *d* in position, and the arm is brought in like manner in contact with the tumbler *e*, when that tumbler is thrown backward or forward until the slot in tumbler *e* is brought directly under the lug in the dog *m* and in line with the slot in the tumbler *d*. Then the arm *i* is again turned in the opposite direction, leaving the tumbler *e* in position, and is brought in like manner in contact with the tumbler *f*, and that tumbler is thrown forward or backward



until the slot in that tumbler is brought under the lug in the dog *m* and in line with the slots in the tumblers *d* and *e*, when again the arm is turned in the opposite direction, leaving tumbler *f* in position, and is brought in like manner in contact with tumbler *g*, and that tumbler is thrown forward or backward until the slot in that tumbler is brought under the lug in the dog *m* and in line with the slots in tumblers *d e f*, as shown in Fig. 3, when the lug in the dog *m* will drop into the slots in the tumblers *d e f g*, and the head *n* will fall below the line of the resisting case or lug, when the spindle is turned back against the tumblers, carrying with it the tumblers, the dog *m*, and the guard-plates *c* and *h*, and the head *n* is withdrawn into the case and the combination is unlocked and the bolt may be thrown back. It will be seen that by each motion of the arm *i* in bringing each tumbler into place to receive the lug all the other and unoccupied tumblers will be thrown backward or forward, as the case may be, until all the tumblers are brought successively into position.

In order to lock the combination, the arm *i* is turned forward by means of the spindle *l* engaging the sides of the tumblers or of one of the tumblers, and then all of the tumblers are thrown forward, carrying with them the dog *m*, the guard-plates *c* and *h*, and as soon as the head *n* passes outside of the case or the resisting-lug attached thereto the lug on the dog *m* is thrown up and out of the slots in the tumblers, as hereinbefore described, and the head rests upon and against the outside of the case or resisting-lug attached, as aforesaid, and the combination is locked and firm, as shown in Figs. 1 and 2.

The length of the dog *m*, in combination with the head *n*, may be adjusted, (lengthened or shortened,) as may be desired, by means of the set-screw *q* and carrying-screw *p*, as seen in Figs. 3 and 5.

The carrying-screw *p*, passing through the yoke *o*, carries the head *n* in grooves or slots upon the dog *m*, where it may be fastened by the set-screw *q*. The yoke *o* is attached and fastened to the head *n* by means of the screw *t*. The combination of this lock may be regulated and adjusted by means of sliding and adjusting the head *n* upon the dog *m* by the set-screw *q* and carrying-screw *p*, as may be desired.

The arm *i* may be lengthened or shortened by changing its position in the spindle *l* by means of the interlocking notches upon the arm *i* and keeper *j*, which is attached to the spindle *l* by the set-screw *k*. The arm is held in position by the set-screw *k* at any point desired, and by lengthening or shortening the arm, or moving it into different positions in the spindle by the means as hereinbefore described, as seen in Figs. 4 and 5, the combination of this lock may be changed and adjusted as may be desired. If desired, the keeper *j* may be dispensed with, and the

notches in the arm *i* may be made to interlock with like notches in the spindle *l*, and may be held in position by means of a set-screw. The spindle and the tumblers in this lock are separate and detached from each other—that is, the spindle is detached from the tumblers and the tumblers are detached from each other—that is, not connected by means of pin, slot, dog, or otherwise—so that the spindle may be driven in and through the lock without displacing any of the tumblers or releasing the dog *m*; and the tumblers being independent of each other, and the arm *i* acting upon each tumbler directly, separately, and independently, any one or more of the tumblers (one alone remaining) may be displaced—by any explosion or otherwise—without releasing the bolt. It would be next to impossible to bring the tumblers into position so as to release the bolt by means of a pick from the outside in case the spindle should be driven in, and impossible to release the bolt by operating upon one or more of the tumblers by means of a pick through the spindle-hole. As the tumblers are detached and not connected with or dependent upon each other, the moving of one tumbler would in no way disturb or affect any of the others. The lug on the under side of the dog *m* is wide enough to extend across and engage all the tumblers at once in such a manner that it cannot fall unless all the notches in all the tumblers are brought into line and directly under the lug on the dog *m*.

Frequently ordinary combination-locks with rotary tumblers and those with sliding tumblers connected and dependent upon each other by means of a pin or otherwise are destroyed and the bolt released by driving in the spindle. The driving in of the spindle, in case the tumblers are connected with and dependent on each other, necessarily carries with it the tumblers, and consequently releases the bolt; but when the spindle is detached from the tumblers, and the tumblers are detached from each other, and the spindle acting upon each independently and directly, the spindle may be driven in, and the dog and bolt will remain fixed in the same position as before, as is shown in this lock.

This lock is constructed with a thin plate or cap, *b*, as seen in Fig. 1, so that in case the spindle *l* should be driven in this cap or thin plate will be easily removed and driven in without tearing away the inside of the case of the lock, or displacing the tumblers, or doing any other injury to the lock or case. This lock is more simple and composed of less number of pieces or parts than the ordinary combination-lock with rotary or sliding and connected tumblers, and this lock is much less expensive than any other combination-lock now in use.

This lock may be constructed with as many tumblers as may be desired.

By detached spindle and arm and independent tumblers I mean that neither the



arm nor spindle is connected with or fixed in the tumblers, but are held in place by and fixed in the door or case to which the lock is attached or fastened, and that the tumblers  
 5 are not connected with or dependent upon each other for their motion, but are acted upon independently of each other, and directly by the arm, which is fixed in the spindle, but not connected with either tumbler.

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

1. A combination-lock having a combination of independent tumblers with unequal  
 15 and irregular openings or apertures within or near their centers, through which openings a detached and independent spindle passes and operates upon the tumblers within the openings by means of an adjustable arm attached to the spindle, substantially as herein  
 20 shown and described.

2. A combination-lock having tumblers operating independently of each other, which tumblers are operated upon and adjusted individually by means of an arm connected  
 25 with a spindle and acting upon each tumbler directly and independently, substantially as herein shown and described.

3. A combination-lock having a thin plate  
 30 or cap, *b*, in combination with the independent spindle *l*, adjustable arm *i*, independent tumblers *d e f g*, and dog *m*, the thin

plate or cap being arranged and adjusted upon the back of the case of the lock, as described, whereby the spindle *l* and arm *i* may  
 35 be driven in, removing the thin plate or cap without destroying or injuring the other parts of the lock or case or displacing the tumblers, substantially as herein shown and described.

4. A combination-lock having an independent spindle, *l*, and arm *i*, held in position by means of the set-screw *k*, and keeper *j*, having a ratchet or teeth interlocking with  
 40 like teeth in the arm *i*, arranged as described, whereby the combination of the lock may be changed and regulated by shortening or extending the arm *i* in the spindle *l*, in combination with the independent tumblers *d e f g*  
 45 and dog *m*, substantially as herein shown and described.

5. A combination-lock having a dog, *m*, and head *n*, carrying-screw *p*, and set-screw *q*, as described, whereby the combination of the lock may be changed by extending or  
 50 drawing back the head *n* upon the dog *m* by means of the carrying-screw *p* and set-screw *q*, in combination with the sliding tumblers *d e f g*, spindle *l*, and arm *i*, substantially  
 55 as herein shown and described.

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