

No. 803,064.

PATENTED OCT. 31, 1905.

J. E. LEMYRE.  
COMBINATION LOCK.  
APPLICATION FILED DEC. 17, 1904

2 SHEETS—SHEET 1.

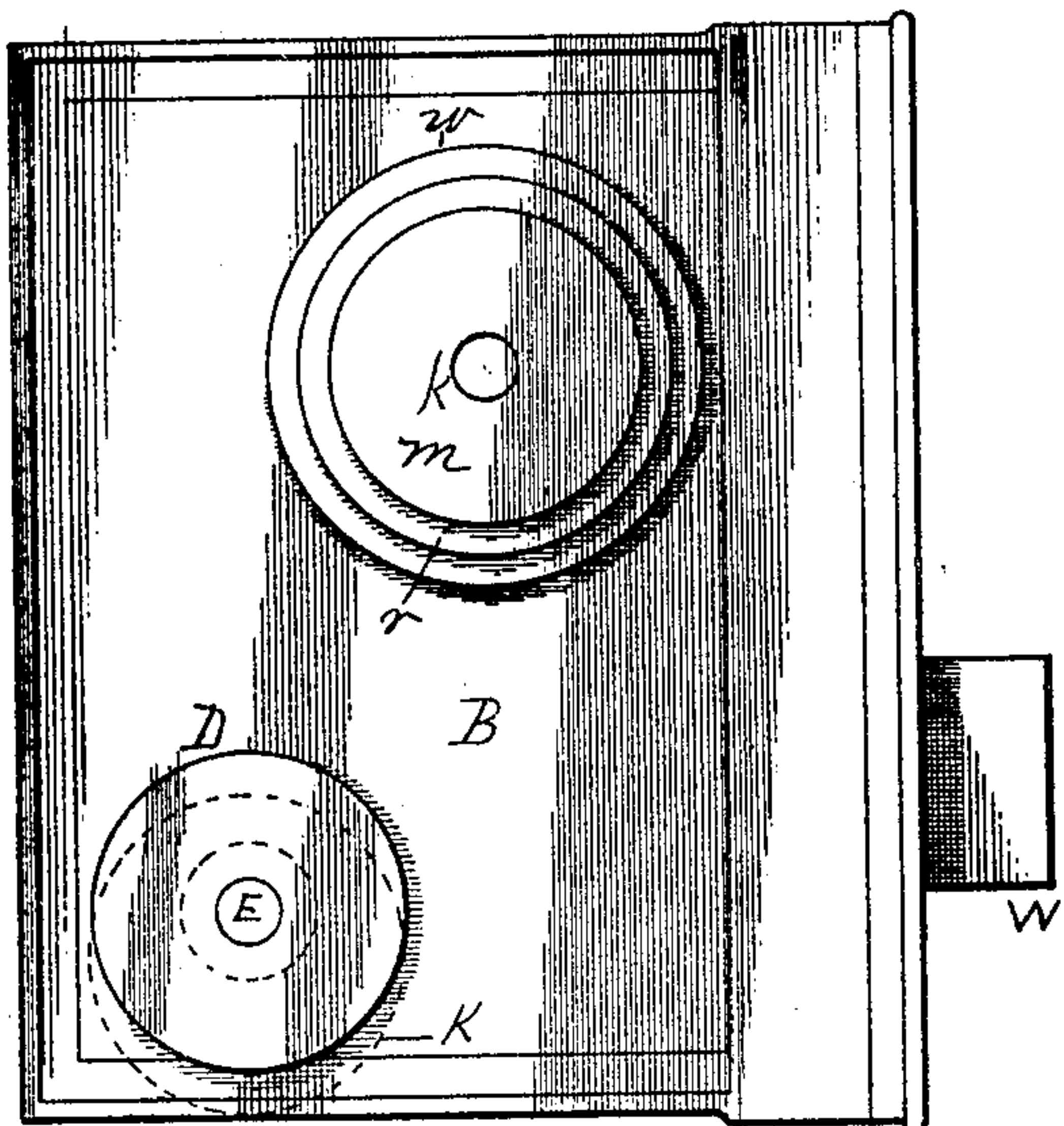


Fig. 1.

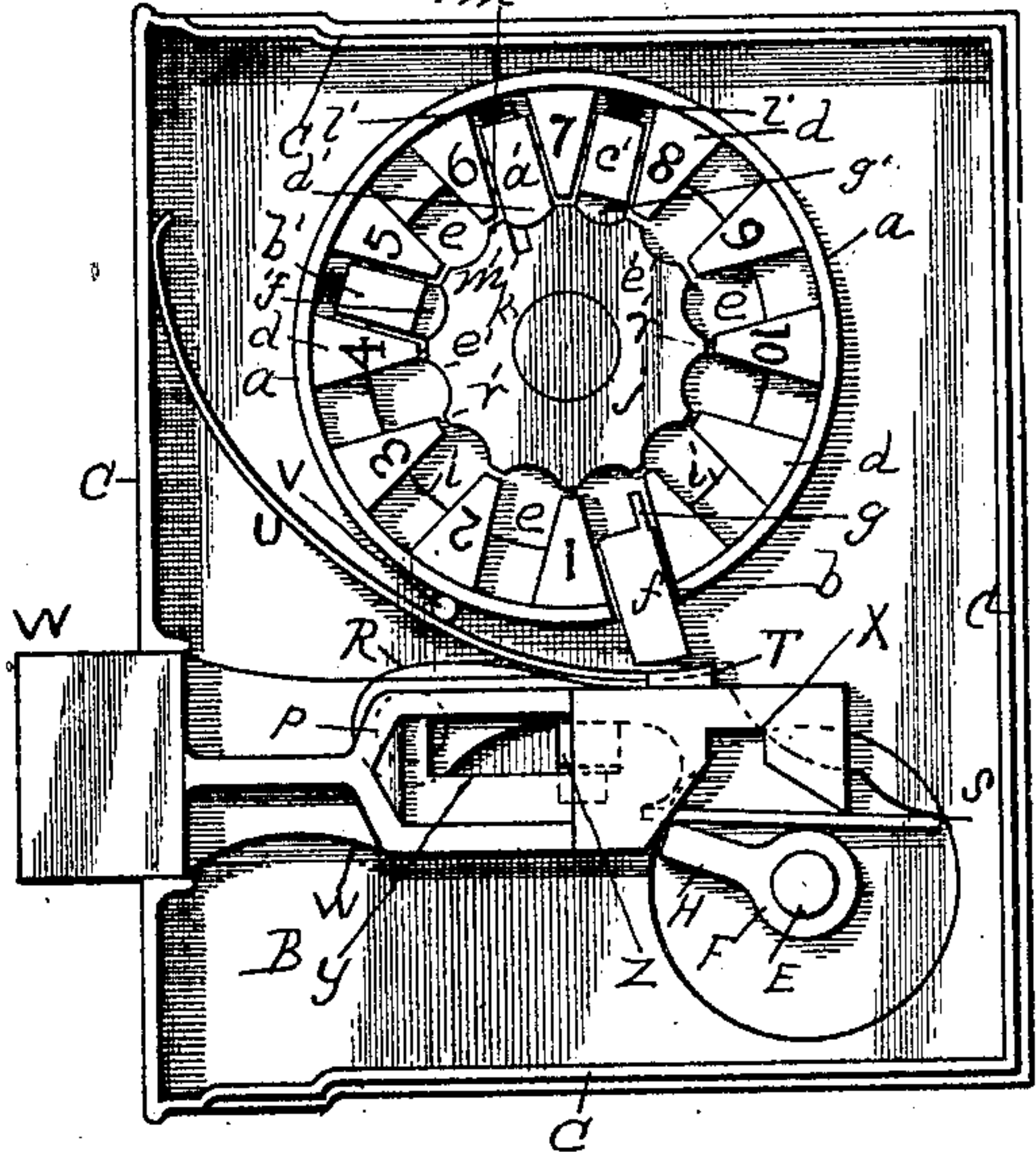


Fig. 2.

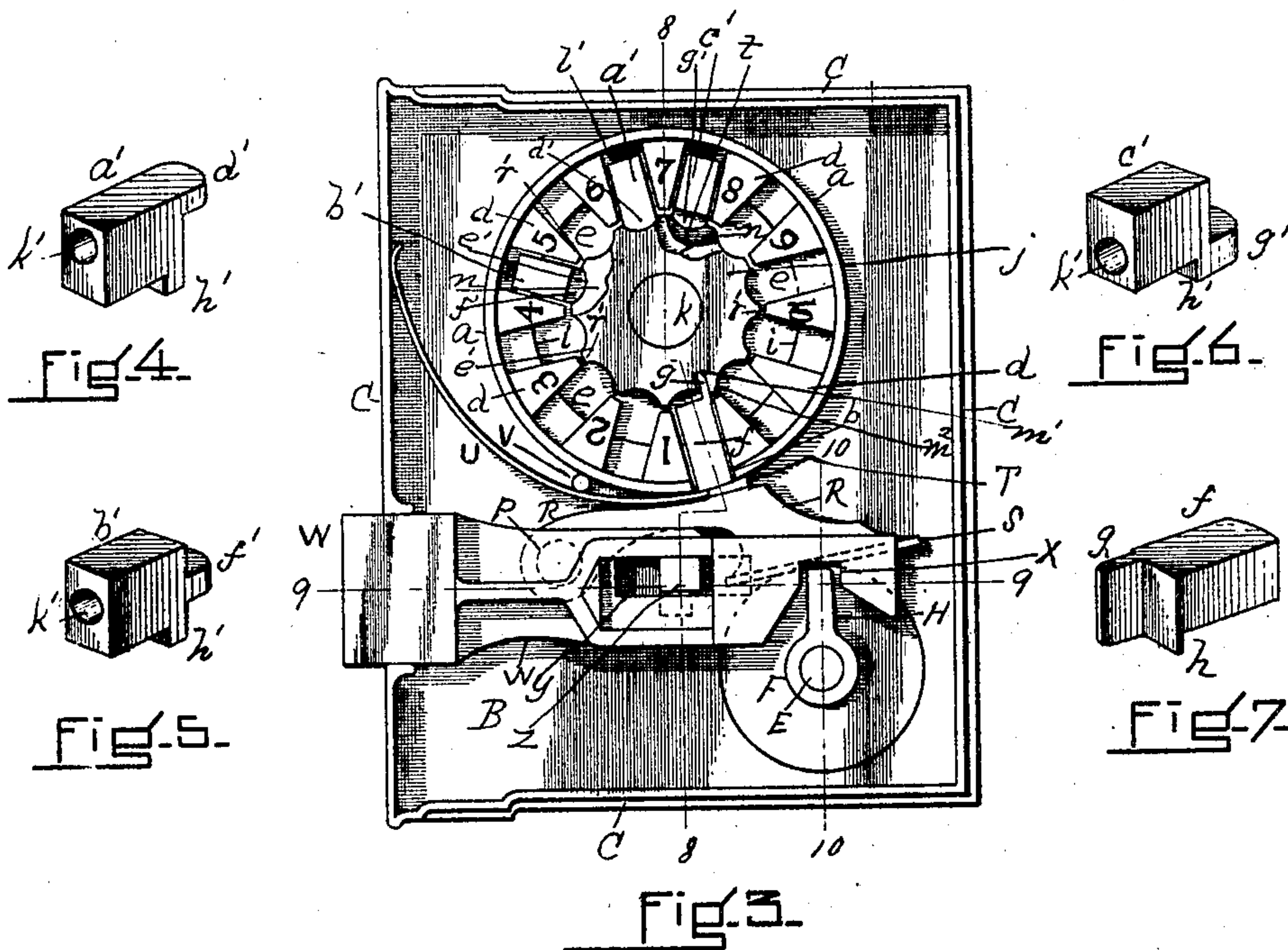


Fig. 3.

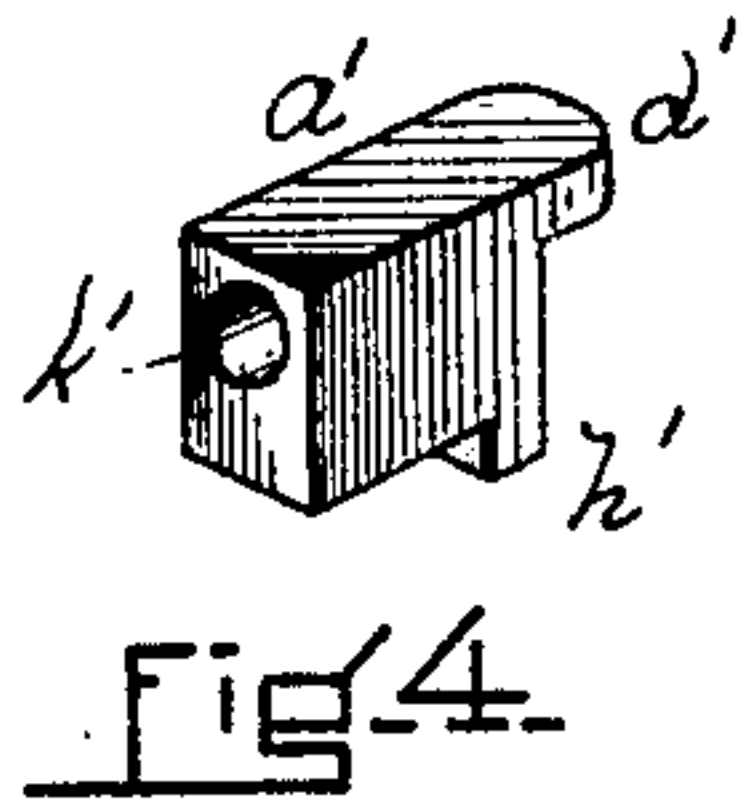


Fig. 4.

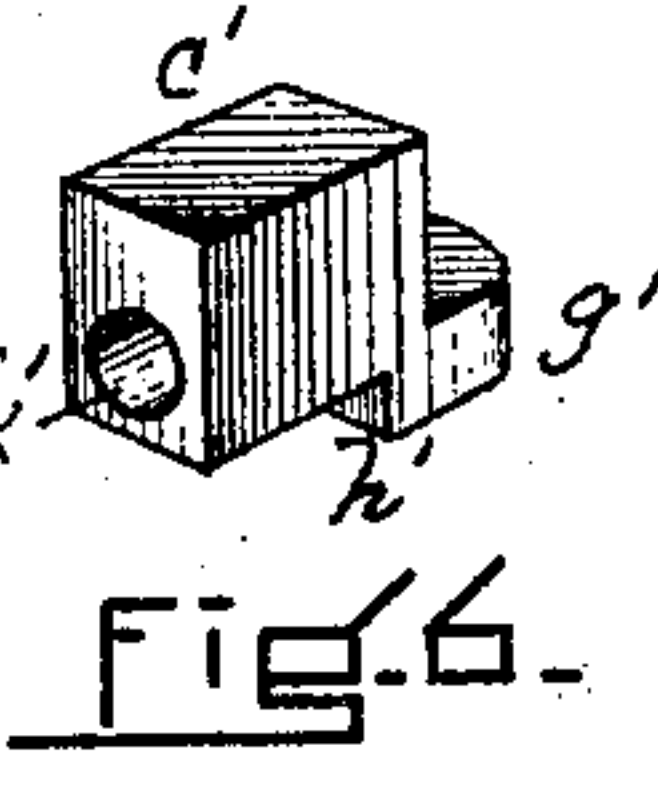


Fig. 6.

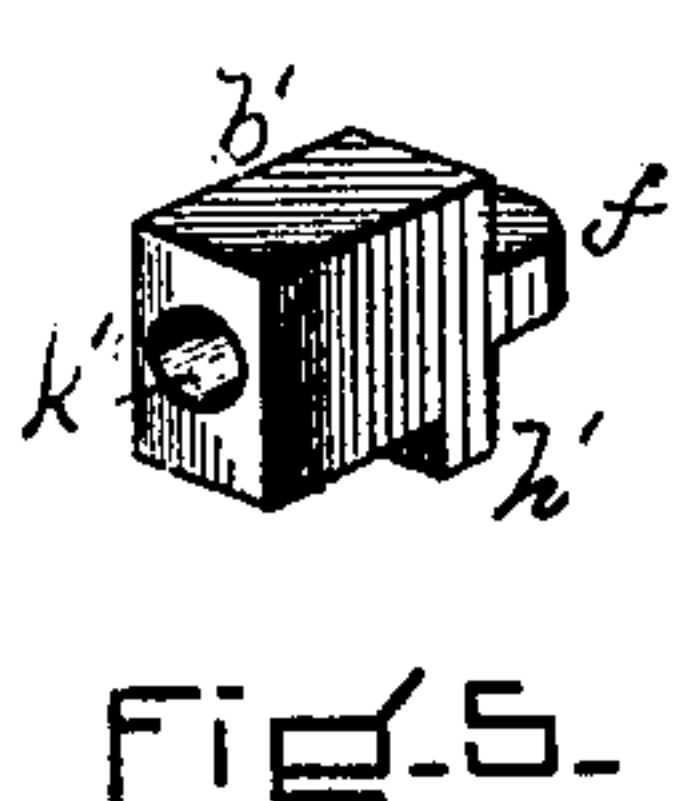


Fig. 5.

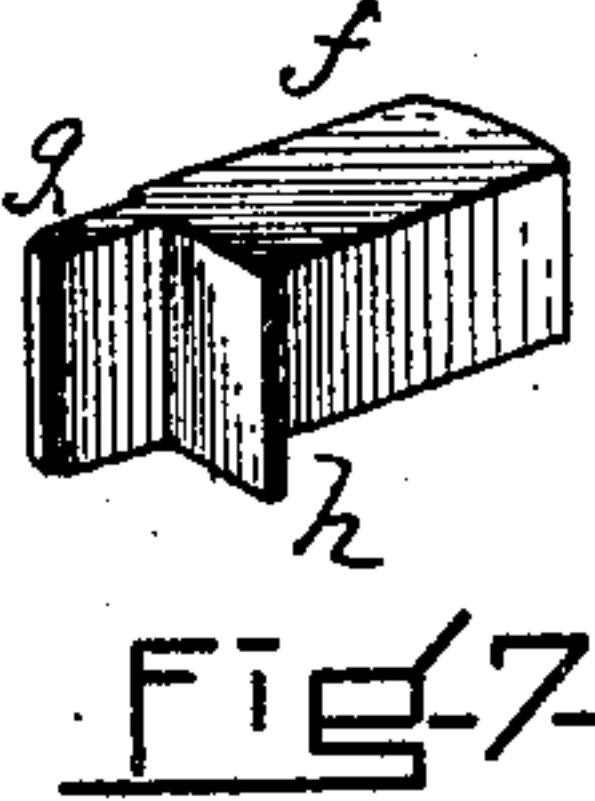


Fig. 7.

WITNESSES.  
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COMBINATION LOCK.

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2 SHEETS—SHEET 2.

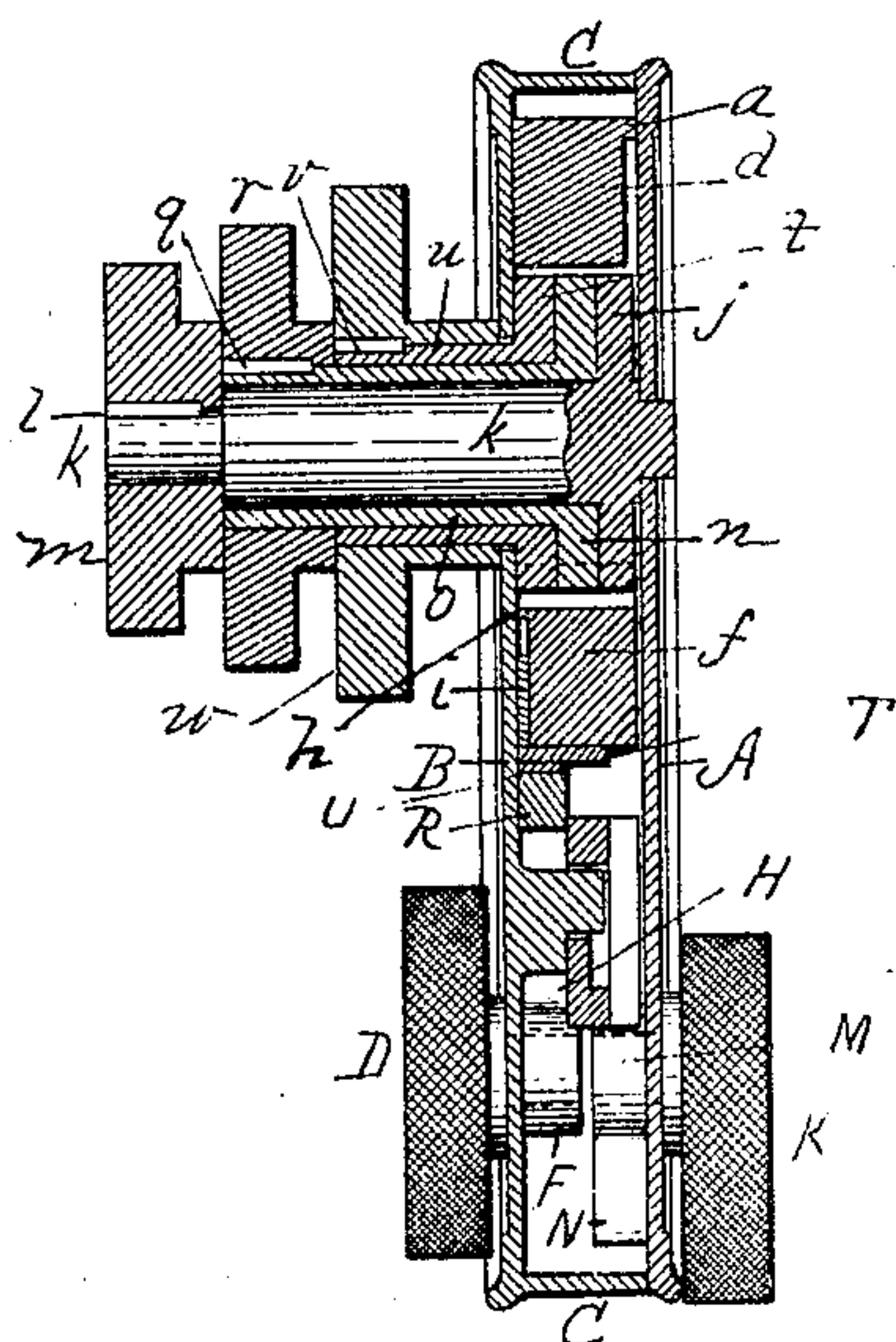


Fig. 8.

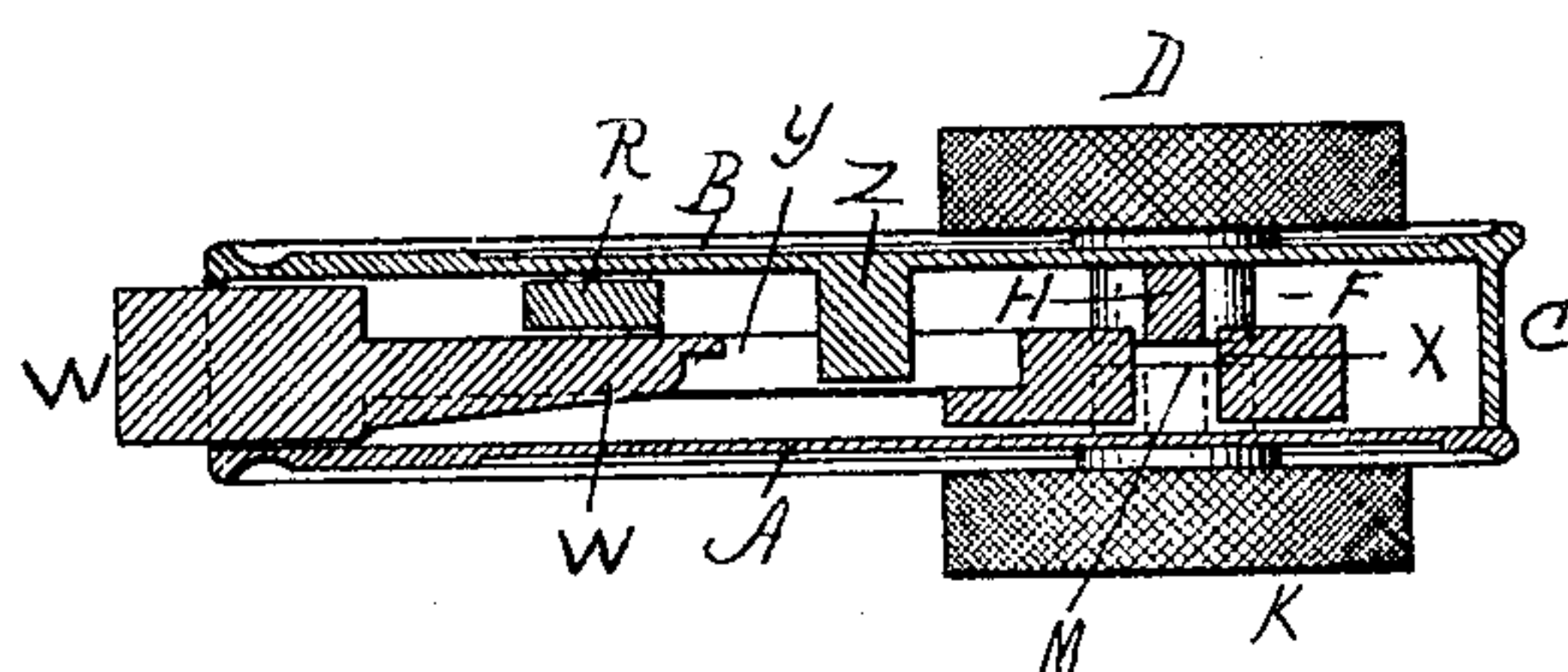


Fig. 9.

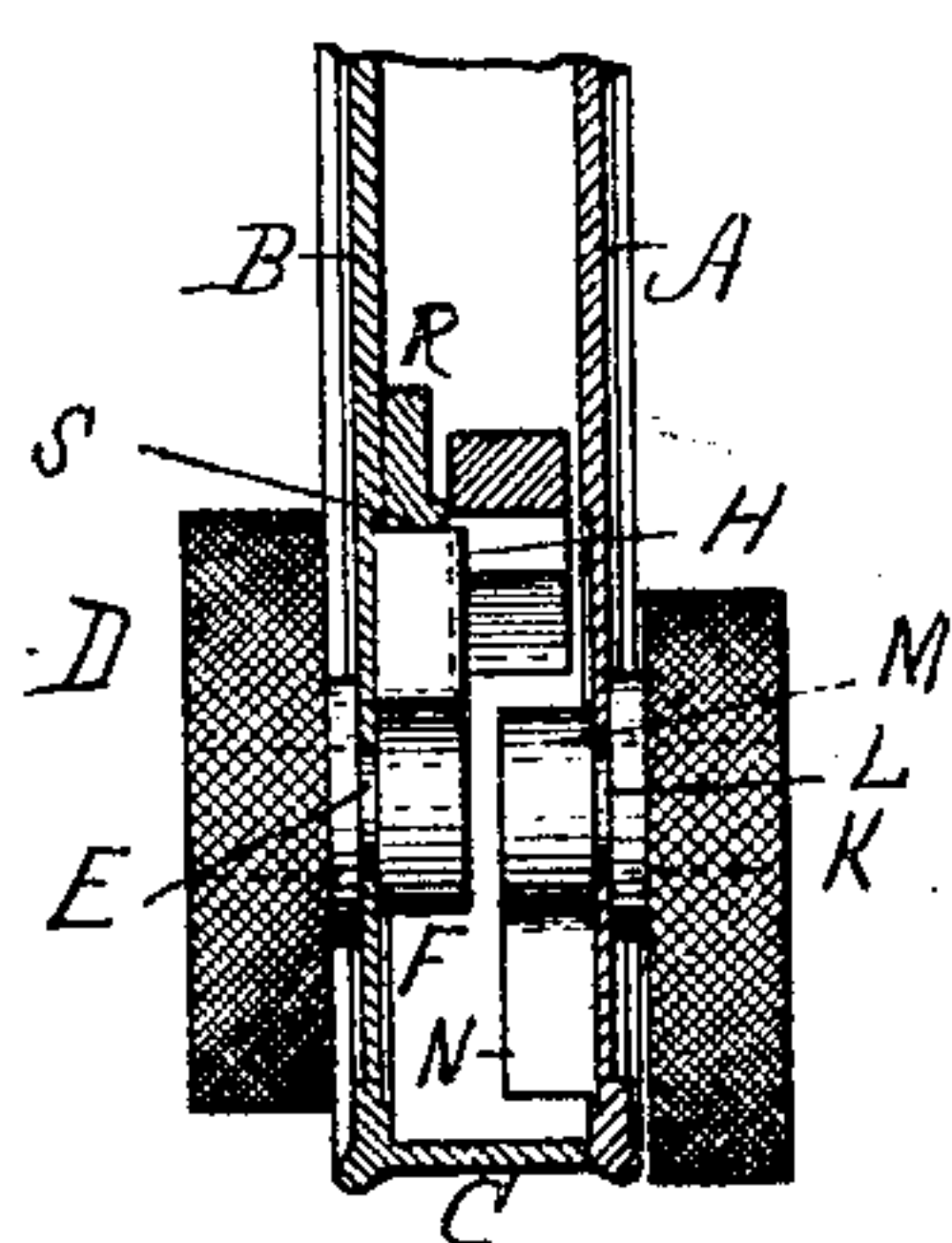


Fig. 10.

WITNESSES.

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# UNITED STATES PATENT OFFICE.

JOSEPH E. LEMYRE, OF MANCHESTER, NEW HAMPSHIRE.

## COMBINATION-LOCK.

No. 803,064.

Specification of Letters Patent.

Patented Oct. 31, 1905.

Application filed December 17, 1904, Serial No. 237,233.

*To all whom it may concern:*

Be it known that I, JOSEPH E. LEMYRE, a citizen of the United States, residing in Manchester, in the county of Hillsboro and State of New Hampshire, have invented certain new and useful Improvements in Combination-Locks, of which the following is a specification.

This invention relates to combination-locks adapted for safes, doors, receptacles for containing valuables, &c., and specifically to combination-locks in which there is a plurality of disks inside the lock and a plurality of corresponding disks on the outside which operate said inner disks, respectively, and thereby lock and unlock the receptacle to which the lock is applied.

The nature of the invention is fully described below and illustrated in the accompanying drawings, in which—

Figure 1 is a front or outside elevation of a lock embodying my invention, the dotted lines showing the position of a handle or knob on the rear side of the case, which would be available in case the lock should be applied to a door. Fig. 2 is a rear elevation of the front or outer plate of the case and of the mechanism of the lock, the inner or back plate having been removed and the parts being in a locked position. Fig. 3 is a similar elevation with the parts of the lock in the positions produced by turning the outer disks until the combination has been made, but before the handle or knob on the outside of the front plate has been turned sufficiently to unlock the lock, portions of the inner disks being represented as broken out. Figs. 4, 5, and 6 are perspective views of the three blocks which are adapted to engage with the three disks inside the lock removed. Fig. 7 is a perspective view of the bolt which engages with the said disks removed. Fig. 8 is a sectional view taken on line 8 8, Fig. 3. Fig. 9 is a sectional view taken on line 9 9, Fig. 3. Fig. 10 is a vertical sectional view taken on line 10 10, Fig. 3.

Similar characters of reference indicate corresponding parts.

A represents the back or inner plate of the case, and B the front plate.

C C represent the top, bottom, and side walls of the case.

D represents a handle or knob located outside and in front of the plate B and rigid on the spindle E, Figs. 1, 2, 3, and 10, extend-

ing through said plate, and rigid on the inner end of said spindle is a collar F, from which extends the actuating-arm H, said arm being inside the case.

K represents a handle or knob eccentrically set on the spindle L, which extends through the rear plate A, and M represents a collar on the inner end of said spindle within the case, from which extends the actuating-arm N. This handle or knob K is available for use on the inner side of a door to which the lock is applied and is illustrated in Figs. 8, 9, and 10 and in dotted lines in Fig. 1.

Pivoted at one end at P to the inner surface of the plate B is a vertically-swinging arm R, formed at its opposite end into a foot S, the bottom of which is flat, as indicated in Figs. 2 and 3. From the upper portion of this arm there extends horizontally a lip T. A spring U bears at one end against one of the side walls C and at the other end on the upper surface of the arm R, (see Figs. 2, 3, and 8,) being held down against said arm by the pin V, which extends horizontally inward from the plate B. This spring holds the foot S of the arm T down toward and preferably against the collar F when the parts are in the locked position, as indicated in Fig. 2, and in the path of the actuating-arm H.

W is the bolt of the lock, which is adapted to slide horizontally through a suitable opening in one of the side walls C, said bolt being formed near its inner end on the under side with a flaring notch X, adapted to receive the actuating-arm H and provided centrally with a slot Y, through which the supporting or guiding bracket Z extends from the plate B.

Supported rigidly in the case by the plate B and practically filling the space between the two plates is the circular flange or ring *a*, constituting the case or box for the battery. The under side of this ring is provided with a passage *b*, located opposite and above the lip T. Extending inward radially from this ring-shaped flange and rigid therewith are a plurality of teeth *d* or substantially V-shaped partitions, twelve being shown in the drawings and ten being numbered. The number of these teeth may be varied as desired or as many of them may be numbered and utilized as desired. Between the numbered teeth are spaces *e*, each said space being considered as corresponding in its designating number with the tooth behind it—that is,



the space which corresponds with the tooth 1 is between the teeth 1 and 2, and so on. Before the tooth 1—that is, between that tooth and the unnumbered tooth *d* next to it—is a radial space for the accommodation of a dog *f*, provided with a projecting finger *g*, the object of which is below described. This dog, the shape of which is indicated in Fig. 7, is furthermore provided with a shoulder *h*, which extends down beyond or inside of the inner edge of the annular ledge *i*, extending inward from the lower portion of the ring *a*. By this means the dog is held in position in its space *e* while it is being operated.

Centrally located within the circular flange or case *a* are three toothed disks corresponding in shape and size, the ends of the teeth on the several disks being preferably flat and lettered *r'* and the spaces or recesses between said teeth being curved. The inner disk *j* is next the plate A, Figs. 3 and 8, and is integral with the spindle *k*, which extends horizontally through the plate B and has bearings in the plate A, said spindle having keyed on its outer end at *l* the outer actuating-disk *m*. The middle inner disk *n* is next the disk *j* and has integral with it a sleeve *o*, which surrounds the spindle *k* and has keyed to its outer end at *q* the outer or actuating disk *r*. The third inner disk *t* has integral with it a sleeve *u*, which surrounds the sleeve *o* and has keyed to it at *v* the outer or actuating disk *w*.

*a'*, *b'*, and *c'* are blocks adapted to be inserted in the spaces or recesses which are at the right of or next beyond the teeth or partitions *d*, which are numbered in accordance with the combination selected. The block *a'* is provided with a curved projection *d'*, flush with the upper surface of the block and adapted to extend into one of the curved spaces *e'* in the disk *j*. The block *b'* is provided with a curved projection *f'*, which is of such a height as to engage with one of the curved spaces *e'* on the periphery of the middle inner disk *n*. The block *c'* is provided with a still lower projection *g'*, adapted to engage in one of the curved spaces *e'* in the periphery of the inner disk *t*. All the said blocks are provided on their lower front edges with shoulders *h'*, the object of which is the same as the shoulder *h* on the dog *f*. Each of the three blocks *a'*, *b'*, and *c'* has a socket *k'* at its rear end for the reception of a spring *l'*, whereby the said blocks are held normally in engagement with the curved recesses *e*.

The several inner disks *j*, *n*, and *t* are provided with similar notches *m'*, substantially radial and of size and shape to receive the finger *g* on the dog *f*. Each of these notches is located next one edge of one of the curved recesses *e'* in the inner disk, whereby the inner edge of each notch produces a shoulder *m<sup>2</sup>*, which being next the adjacent tooth *r'* is

necessarily higher than the opposite edge of the notch which is in the depressed portion of the recess or curvature *e'*.

In the drawings, Fig. 2 shows the device locked on the number "746." The bolt W is extended to its fullest extent. The swinging arm R, which is entirely independent of the bolt W, has its foot S at its lowest point and bearing against the collar F on the spindle E of the handle D, the actuating-arm H being approximately in position within the flared portion of the notch X. The dog *f* is dropped by gravity until it is supported in such dropped position by the ledge *i*, against which the shoulder *h* rests. The block *c'* is in the space *e* which is at the right of the tooth numbered 7, the spring *l'* holding the projection *g'* on said block in a curved space or recess *e'* on the periphery of the disk *t*. The block *b'* is in the space *e* which is at the right of the tooth numbered 4, the spring *l'* holding the projection *f'* on said block in a curved space or recess *e'* in the periphery of the disk *n*. The block *a'* is in the space *e* which is at the right of the tooth numbered 6, the spring *l'* holding the projection *d'* on said block in a curved space or recess *e'* on the periphery of the disk *j*. The recess *e'* into which the projections *d'*, *f'*, and *g'* extend are the only recesses on their respective disks *t*, *n*, and *j* which contain the radial notches *m'*, the shoulder *m<sup>2</sup>* of each of the notches being next the tooth *r'* which is at the left side of the notch and abutting against the left edges of the projections *g'*, *f'*, and *d'* on the blocks *c'*, *b'*, and *a'*. Thus none of the disks *j*, *n*, or *t* can be rotated toward the right while the device is locked. It will be noticed that the finger *g* on the dog *f* projects from the corresponding edge of said dog. In case an attempt is made to unlock the lock by turning the handle or knob D such an attempt will be unsuccessful, as whichever way the handle is turned the arm H simply lifts the foot S sufficiently to bring the lip T against the outer end of the dog *f*, and thus force the outer end of the finger *g* against the end of the flat tooth *r'* which is opposite said finger.

To move the parts into the positions indicated in Fig. 3 for the purpose of unlocking the lock, first, the disk *t* is rotated toward the left (the shoulder *m<sup>2</sup>* preventing rotation toward the right) until seven teeth *r'* have passed under the block *c'*, which yields by reason of the spring *l'*, thus bringing the notch *m'* opposite the end of the finger *g*; second, the disk *n* is rotated toward the left until four teeth have passed by the block *b'*, bringing the notch *m'* in said disk opposite the finger *g*, and, third, the disk *j* is rotated toward the left until six teeth have passed by the block *a'*, bringing the notch *m'* in said disk opposite the finger *g*, such rotation of the disks *j*, *n*, and *t* being produced by rotating the outer or actuating disks *w*, *r*, and *m*.



Thus the notches  $m'$  in the three disks are brought into line. By turning the knob D the arm H is swung up against the foot S, swinging the arm R up against the power of the spring U and lifting the dog  $f$ , thus inserting the finger  $g$  in the three notches  $m'$ , as illustrated in Fig. 3. Further rotation of the knob or handle D completes the inward movement of the bolt W. The same effect can be produced by operating the knob K and arm N from the inner side of a door.

To lock the mechanism on the combination "746," insert the three blocks in the spaces  $e$  at the left of these three figures, as shown in Fig. 2, and then turn the three disks  $j$ ,  $n$ , and  $t$  toward the right until the shoulders  $m^2$  on said disks bring up against the said three blocks. Then shoot out the bolt W, and the device will be in the position indicated in Fig. 3. It is evident that the disks can be rotated in the opposite direction by reversing them and doing the same with the dog  $f$ .

As the disks are independent of each other, they may be rotated in any order, and if an error is made in rotating a disk it can be moved back to its starting-point and rotated again without doing the same with the other disks.

The bolt W and arm R are absolutely independent of each other, there being no engagement of the two parts. For this reason if an expert endeavors to detect the combination by holding the knob in an operative position he brings the finger  $g$  on the dog against the end of a tooth  $r'$  instead of between them, and as the teeth  $d$  are also opposite the teeth  $r'$  instead of between them he acquires no knowledge or inkling, either by sound or feeling, of the conditions in the lock.

Of course the number of blocks and disks may be increased as desired, and the same is true of the teeth  $d$  and the recesses  $e'$  and teeth  $r'$  on said disks.

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

1. In a combination-lock of the character described, a battery comprising a plurality of disks on the inner end of a spindle, said disks being formed with peripheral teeth, and each disk being provided with a notch  $m'$  having on one side thereof a shoulder  $m^2$ , a substantially circular case  $a$  provided with inwardly-extending radial teeth  $d$  corresponding in number and location with the teeth on the disks in the battery; a dog extending substantially radially through said case and provided with a finger pointing toward the disks in the battery and adapted to enter the notches  $m'$  when said notches are brought into line with each other; blocks corresponding in number with the disks and adapted to be inserted in the spaces between said teeth  $d$  and to be held normally in the recesses be-

tween the teeth on the disks, each block being adapted to be in engagement with one disk; disks on the outer end of said spindle for actuating the battery-disks; and mechanism for lifting the dog into engagement with the said notches  $m'$  when they have been brought into line by the actuating-disks, substantially as set forth.

2. In a combination-lock of the character described, a battery comprising a plurality of disks on the inner end of a spindle, said disks being formed with peripheral teeth, a substantially circular case provided with inwardly-extending radial teeth  $d$  opposite the teeth on the battery-disks, and blocks  $a'$ ,  $b'$ ,  $c'$  provided with projections  $d'$ ,  $f'$ ,  $g'$  respectively, said projections being at points to correspond with and engage in the spaces between the teeth in the several battery-disks; mechanism on the battery-disks for preventing rotation in one direction beyond the blocks adapted to engage therewith; mechanism adapted to engage the said disks simultaneously when they have been rotated to the desired point for making the combination; and mechanism connected with the actuating knob or handle for forcing said engaging mechanism toward said disks, substantially as set forth.

3. In a combination-lock of the character described, a battery comprising a plurality of disks adapted to be separately operated by corresponding actuating-disks on the outside, said battery-disks being formed with peripheral teeth, a substantially circular case provided with inwardly-extending radial teeth  $d$  opposite the teeth on the battery-disks, and blocks  $a'$ ,  $b'$ ,  $c'$  provided with projections  $d'$ ,  $f'$ ,  $g'$  respectively, said projections being at points to correspond with and engage in the spaces between the teeth in the several battery-disks; mechanism on the battery-disks for preventing rotation in one direction beyond the blocks adapted to engage therewith; mechanism adapted to engage the said disks simultaneously when they have been rotated to the desired point for making the combination; the locking-bolt and handle for actuating the same; and an arm or lever independent of said locking-bolt and adapted to be operated by the knob or handle and thereby actuate the mechanism for engaging the said disks simultaneously after they have been rotated to the desired point to make the combination, substantially as set forth.

4. In a combination-lock of the character described, a battery comprising a plurality of disks adapted to be rotated by corresponding disks on the outside, radial teeth surrounding said battery and blocks adapted to be placed in the spaces between said teeth and separately engage the battery-disks to the extent of preventing rotation in but one direction; mechanism for engaging simultaneously all the said disks after they have been rotated to

the desired point for making the combination; a locking-bolt adapted to be operated by a knob or handle; and an arm or lever intermediate of the knob or handle and the  
5 mechanism for simultaneously engaging the battery-disks, said arm or lever being independent of the bolt, for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH E. LEMYRE.

Witnesses:

J. A. BOIVIN,

V. L. JANELLE.