(No Model.)

J. J. DEAL.

COMBINATION LOCK.

No. 552,896. Patented Jan. 14, 1896.

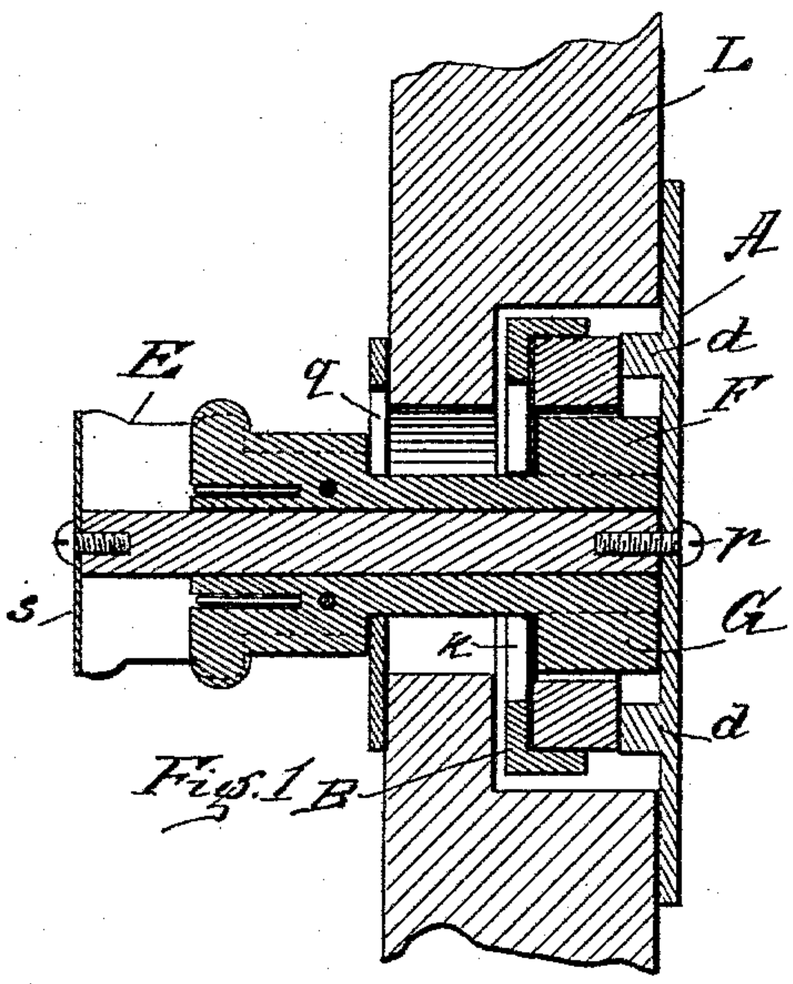

Fig. 1.

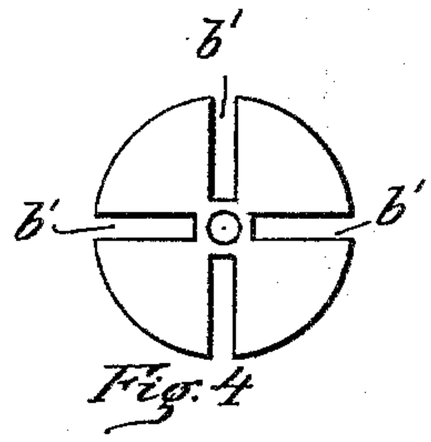

Fig. 4.

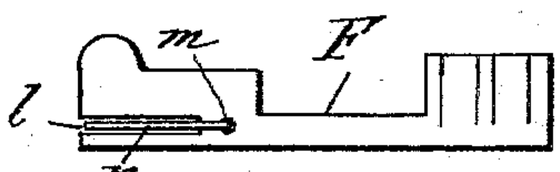

Fig. 6.

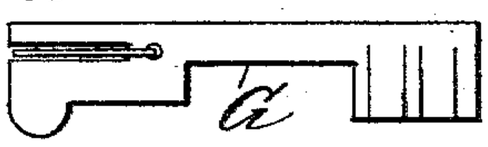

Fig. 7.

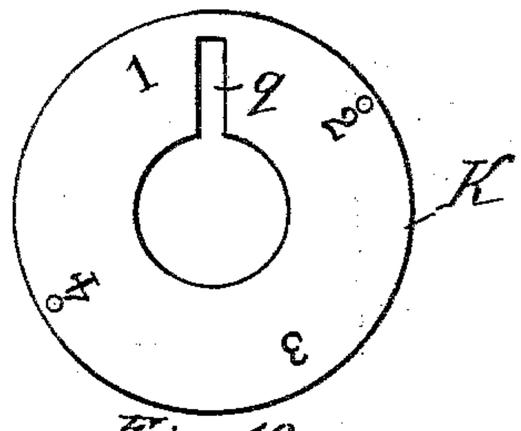

Fig. 10.

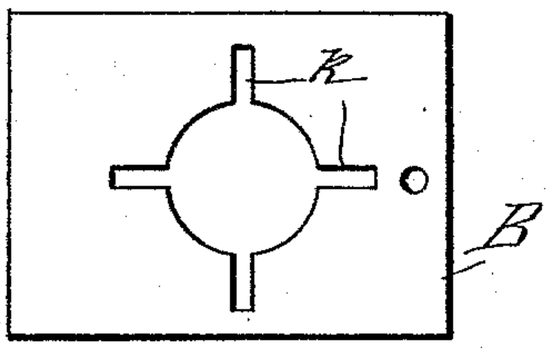

Fig. 5.

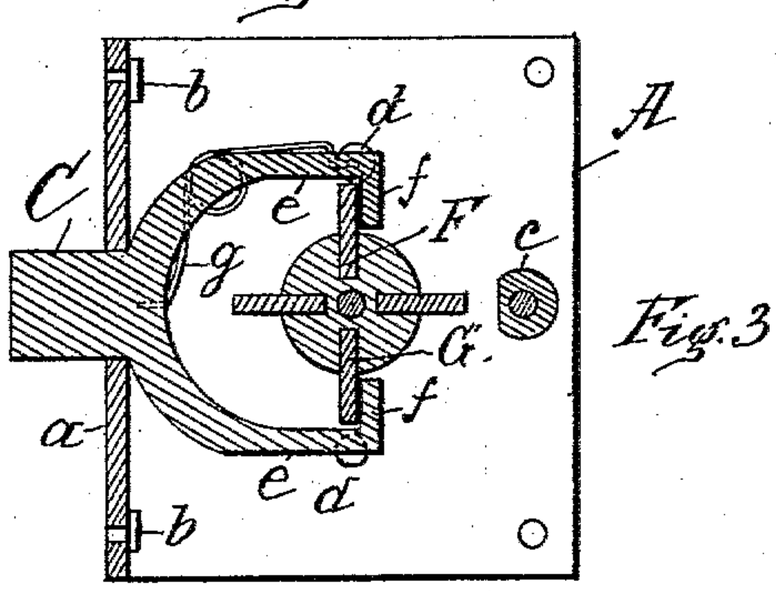

Fig. 3.

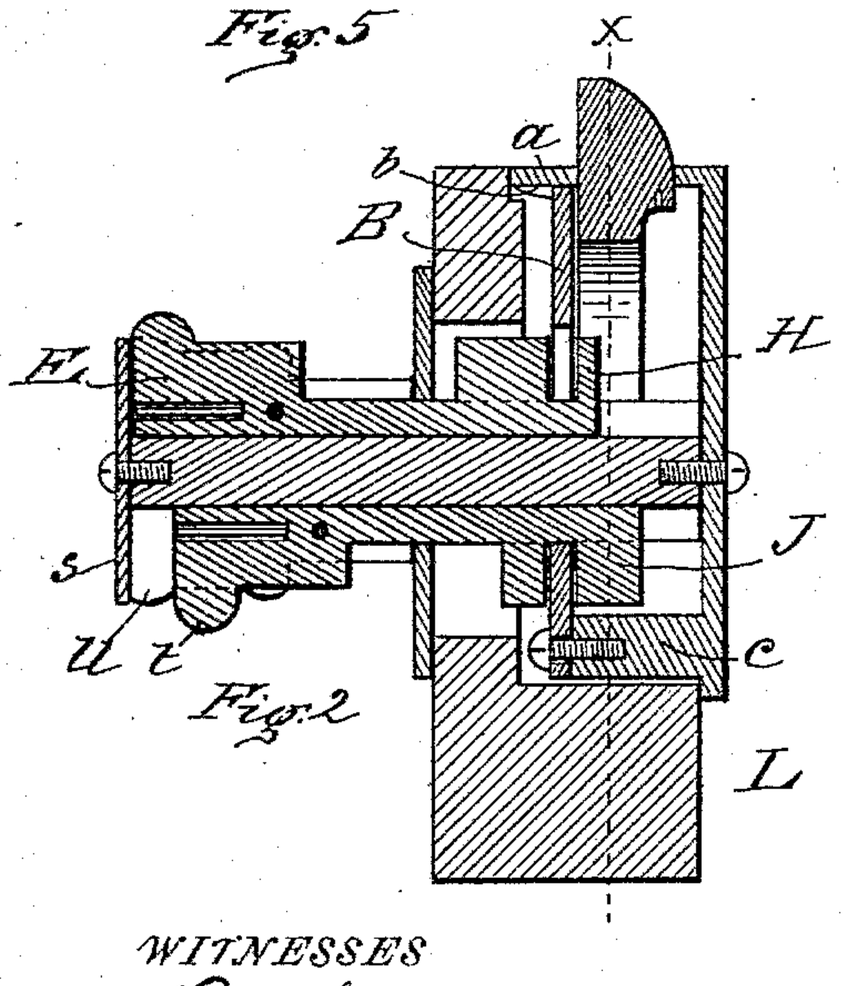

Fig. 2.

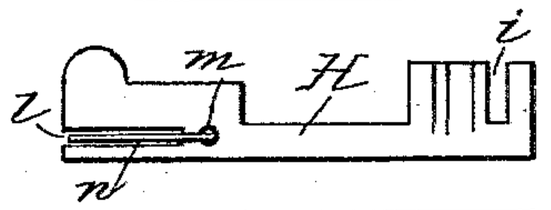

Fig. 8.

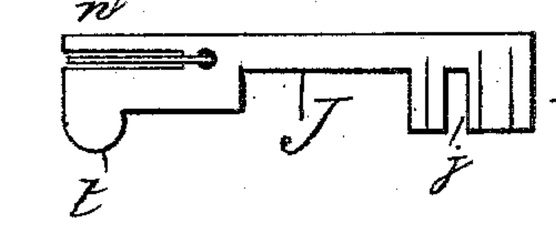

Fig. 9.

WITNESSES

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JOSIAH J. DEAL, OF CANTON, OHIO.

COMBINATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 552,896, dated January 14, 1896.

Application filed June 24, 1895. Serial No. 553,775. (No model.)

To all whom it may concern:

Be it known that I, JOSIAH J. DEAL, a citizen of the United States, and a resident of Canton, county of Stark, State of Ohio, have invented a new and useful Improvement in Combination-Locks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention relates to improvements in combination-locks; and it consists of certain features of construction and combination of parts, as will be hereinafter described and claimed.

Figure 1 of the drawings is a transverse or vertical section through the center of the lock. Fig. 2 is a longitudinal section through the center. Fig. 3 is a plan showing the inside face of the lock-plate, the bolt, the end, a section of the knob, and keys. Fig. 4 is a section of the knob. Fig. 5 is a plan of the ward-plate. Figs. 6 and 7 show a side view of the blank keys. Figs. 8 and 9 show a side view of the locking-keys.

A denotes the lock-plate, having a flanged-up front edge *a*, on the inner face of which are provided lugs *b*, at the opposite side, a stud *c* to support the ward-plate B, and studs *d*, that serve to support the prongs *e* of the bolt C. In Fig. 3 the bit portions of the keys D and E are shown resting against the turned-in end portion *f* of prongs *e*. By rocking the knob E the bolt will be moved in, and when the knob is released the bolt will be thrown out by the spring *g*.

The knob E is formed substantially as shown, having two diameters, having a knob at one end and a shank portion at the other. Grooves *b'* are formed in the knob and shank diametrically opposite, as shown in Fig. 4, adapted to receive the back of the keys and in which the keys are supported and may be moved longitudinally, as will be hereinafter mentioned. In Fig. 1 the keys F and G are shown in opposite grooves, and in Fig. 2 the keys H and J are shown in grooves longitudinally opposite, the last-mentioned keys having slots *i* and *j* in the bit to receive the ward-plate B to allow the keys to be turned in the lock. The blank keys F and G have no ward-slots, as shown, in keys H and J, and in operation the bit of said keys is passed into the lock between the ward-plate B and the lock-plate A. In the ward-plate B are provided slots *k* to receive the bit portion of the key. At the outer end portion of the key are provided a slot *l* and a perforation *m*. A piece of spring-wire, as *n*, is passed through the perforation and bent together in the slot, thus forming a spring, the sides of which will rest against the sides of the grooves *b'* in the knob to hold the key in desired adjustment in the lock.

To assemble the parts the bolt C is placed on the lock-plate, as shown, the prongs resting on the studs *d*, the spring *g* adjusted, as shown, with one end resting against the stud *d*, the other against the bolt. The ward-plate is placed over the bolt, the front edge under the lugs *b*, the other side secured to the stud *c*. The sides of the ward-plate are bent at right angles, as shown in Fig. 1, thus providing a guide for the pronged portion of the bolt. The door L, being mortised to receive the lock-plate A, is secured to the inside face, as shown, the number-plate or escutcheon K is placed on the outside, and the shank portion of the knob is passed through the last-mentioned plate and loosely secured to the lock-plate A by the screw *p*, which forms a pivotal connection between the plate and the knob. The keys are passed into the slots *b'* in the knob and through the slot *q* in the plate K and into the lock, and secured in the grooves by the end plate *s*.

The lock represented in the drawings is set on figures 1 2 3, that is the combination. The keys are designated by letters. Keys F and G are pushed into the lock, as shown in Fig. 1, the bits of the key resting on the portion *f* of the bolt, as shown in Fig. 3; key J pushed part way in the lock, the rib portion *t*, that corresponds with the rib *u* on the outer end of the knob, to stop midway between the knob-ribs *u* and *v*, as shown in Fig. 2. Key H, that corresponds with figure 4 on the dial, remains out, as shown in Fig. 2. This movement of the keys brings the slots in the keys H and J into position to pass onto the ward-plate B to allow the knob to be rotated. The keys F and G, resting against the end of the bolt, will draw the bolt back, and when the knob is released the spring will throw the bolt out.

To change the combination, remove the cap *s*, draw out the keys and place them differ-

ently in the grooves, making such transposition as may be desired.

Having thus fully described the nature and object of my invention, what I claim is—

The combination in a lock, of the lock plate A, ward plate B and bolt C, of the knob E, having therein, a plurality of longitudinal grooves, keys adapted to move longitudinally in said grooves, having at their inner ends a bit portion to engage and throw the bolt, and slots to receive the ward plate, and at their outer end a slot *l* and a spring *n* to hold the keys in desired adjustment in the grooves. substantially as set forth.

In testimony whereof I have hereunto set my hand this 29th day of May, A. D. 1895.

JOSIAH J. DEAL.

Witnesses:

W. K. MILLER,

CHAS. R. MILLER.