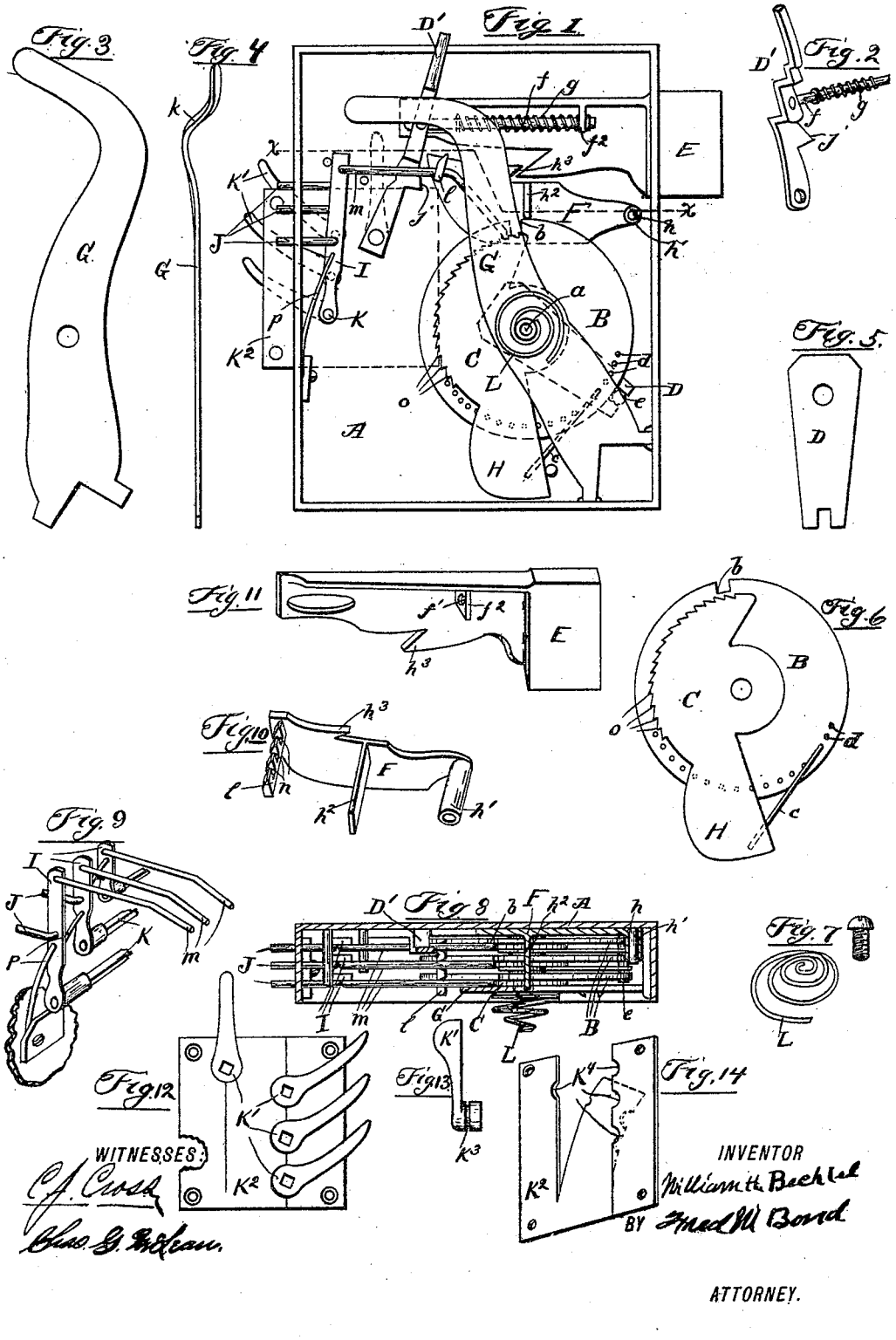
(Model.)

W. H. BECHTEL.

PERMUTATION LOCK.

No. 457,885. Patented Aug. 18, 1891.



UNITED STATES PATENT OFFICE.

WILLIAM H. BECHTEL, OF CANTON, OHIO.

PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 457,885, dated August 18, 1891.

Application filed November 24, 1890. Serial No. 372,406. (Model.)

To all whom it may concern:

Be it known that I, WILLIAM H. BECHTEL, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Permutation-Locks; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification and to the letters of reference marked thereon, in which—

Figure 1 of the drawings is a side elevation of my improved lock with the cap-plate removed to show the interior construction. Fig. 2 is a detached view of the bolt-operating lever and its spring. Fig. 3 is a side view of the disk pressure-bar. Fig. 4 is an edge view of the disk pressure-bar. Fig. 5 is a detached view of one of the disk spacing-bars. Fig. 6 is a side view of one of the disks, showing its toothed segment attached thereto. Fig. 7 is a detached view of the disk pressure-bar spring and the retaining-screw. Fig. 8 is a horizontal section taken on line *x x*, Fig. 1. Fig. 9 is a view of the disk-operating levers and their bars or shafts. Fig. 10 is a detached view of the detent. Fig. 11 is a detached view of the sliding bolt. Fig. 12 is a view of the outer door-plate, showing the location of the outer disk-operating levers or bars and the sliding-bolt-operating lever. Fig. 13 is an edge view of one of the disk-operating levers or bars designed for the outer plate. Fig. 14 is a view of the outer plate, showing the same sprung to receive the outer sliding-bolt-operating lever.

The present invention has reference to that class of combination or permutation locks in which a series of notched disks are provided, operated by a corresponding number of toothed segments, levers, and bars, which, together with the disks, govern the action of the sliding bolt.

In the accompanying drawings, A represents the casing of the lock of the usual construction and connected by screws or other well-known means to a door, said casing being provided with an ordinary cap-plate, which is attached to the casing in the ordinary manner.

The casing A is provided with the post *a*, upon which are mounted the disks B, each of which is provided with the notch *b* in its periphery. To each of the disks B is attached or connected the toothed segment C, and for the purpose of adjusting the notches *b* with reference to the segments C said segments are journaled upon the disks. For the purpose of causing the disks B to rotate with the segments C said segments and disks are connected together by means of the wires *c* and the apertures *d*. For the purpose of providing a different adjustment of the notch *b* for each disk B a series of apertures *d* are provided in each of said disks, as illustrated in Figs. 1 and 6, and the wires *c* adjusted or attached to the desired aperture *d* to give the desired adjustment of the disks B. For the purpose of properly spacing the disks B, together with their segments C, the space-bars D are provided, one end of each of said space-bars being attached to the post *a* and the opposite end of each of said space-bars being attached to the post *e*. The object and purpose of spacing the disks B and the segments C is to cause each of said parts to move independent of each other. To the casing A is pivotally attached the bottom or lower end of the bolt-operating lever D′, which extends up and through the casing A, as illustrated in Fig. 1, and is for the purpose of operating the sliding bolt E. To the operating-lever D′ is pivotally attached the bar or rod *f*, which bar or rod extends through the aperture *f′* in the lug f^2, said lug f^2 being preferably formed integral with the sliding bolt E. For the purpose of causing the sliding bolt E to follow the movement of the operating-lever D′, when it is desired to force said sliding bolt outward, the helical spring *g* is provided, and, as shown, it is located around the bar or rod *f*. One end of the helical spring *g* is attached in any convenient and well-known manner to the bar or rod *f*, and its opposite end abuts against the lug f^2. For the purpose of allowing the operating-lever D′ to be moved toward the outer end of the sliding bolt E, after said sliding bolt has been fully extended, the bar or rod moves back and forth in the aperture *f′*, said movement being for the purpose hereinafter described.

The detent F is pivotally attached to the casing A by means of the post *h*, and for the purpose of holding said detent in a vertical

position and preventing it from tilting the thimble h' is provided, which thimble is formed integral with said detent. The detent is provided with the arm h^2, which arm is for the purpose of engaging the notches b, as hereinafter described. In use, when it is desired to release the sliding bolt E, the disks B are rotated until all of the notches b are brought directly under the arm h^2, at which time the detent F is free to fall, thereby disengaging the hooks h^3, at which time the sliding bolt E is free to be moved back and forth within the limits of its movements.

When it is desired to lock the sliding bolt E, the operating-lever D′ is forced toward the outer end of the sliding bolt E, thereby bringing the inclined shoulder j into contact with the free end of the detent upon its under edge and elevating the free end of said detent, which in turn disengages the arm from the notches b.

For the purpose of removing the pressure from the disks B and the segments C, and thereby release said disks and segments, the curved arm k is formed upon the top or upper end of the pressure-bar G, and is so adjusted that when the operating-lever D′ is moved toward the outer end of the sliding bolt E after said sliding bolt has been fully extended, said operating-lever D′ will force the pressure-bar G away and out of contact with the segment upon which said pressure-bar rests, thereby freeing said disks and segments. To the free end of the detent F is attached the toothed bar or arm l, which bar or arm is for the purpose of guiding the push-bars m by means of the notches n. When the free end of the detent F is elevated, it carries with it the push-bars m, thereby throwing said push-bars out of the notches o in the segments C, at which time said segments are free to be rotated by means of the weights H and carry with them the disks B by means of the wires c, which movement brings the notches b out of line and causes the arm h^2 to rest on the peripheries of the disks B.

To the casing A are pivotally attached the push-bar levers I, to the top or upper ends of which are pivotally attached the push-bars m. For the purpose of automatically bringing the push-bar levers I, together with the push-bars m, back to their normal positions after they have been forced forward to move the segments C and the disks B, the springs p are provided, which springs are fixed to the casing A or its equivalent, and the free ends of said springs p attached to the levers I, as illustrated in Fig. 9. For the purpose of operating the lock proper from the side of the door upon which the casing A is attached the pins J are provided, and, as illustrated in Fig. 1, said pins J extend a short distance through the casing A. For the purpose of providing a means of operating the levers I and the push-bars m from the opposite side of the door the shafts K are provided, and to which shafts the levers I are securely attached in any convenient and well-known manner. For the purpose of operating the shafts K the levers K′ are provided, and for the purpose of holding the levers K′ to the plate K^2 the grooves K^3 are provided. Said grooves receive the edges of the apertures K^4. The plate K^2 may be formed in sections cutting the apertures K^4, and the sections united together by solder after the levers K′ have been properly adjusted to the plate K^2, or said levers K′ may be pivotally attached to the plate K^2 in any other convenient and well-known manner. It will be understood that the plate K^2 is to be attached to the door in the ordinary manner. For the purpose of causing the pressure-bar G to be forced against the segment C next to said pressure-bar, the spring L is provided.

For the purpose of holding the detent up when the sliding bolt E is locked, the hooks h^3 are provided, which hooks engage each other, as illustrated in Fig. 1, thereby holding the arm h^2 out of contact with the disks B, which prevents any person not acquainted with the combination from locating the notches b. After the notches b are all brought directly under the arm h^2 the sliding bolt E is moved forward just far enough to disengage the hooks h^3 from each other, at which time the detent F is free to fall, and engage the arm h^2 with the notches b. It will be understood that the operating-lever D′ should not be forced forward, so as to engage the inclined shoulder j with the free end of the detent F, until it is desired to lift the arm h^2 out of the notches b, and release the disks B and segments C. It will be understood that any form of pressure-bar G may be used and the same result accomplished that is accomplished with the particular form of pressure-bar shown in the drawings.

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

1. The combination of the disks B, provided with the notches b and the apertures d, the connecting-wires c, the toothed segments C, provided with the weights H, and the detent F, provided with the arm h^2, substantially as and for the purpose specified.

2. The combination of the sliding bolt E, the detent F, the hooks h^3, and a series of notched disks and segments, substantially as and for the purpose specified.

3. The combination of the operating-lever D′, provided with the inclined shoulder j, the detent F, provided with the arm h^2, the disks B, provided with the notches b, the weighted segments C, the wires c, and the sliding bolt E, substantially as and for the purpose specified.

4. The combination of the disks B, the segments C, connected to said disks, the push-bars m, pivoted to the levers I, the levers I, provided with the pins J, the springs p, the detent F, provided with the toothed arm l,

and the shafts K, substantially as and for the purpose specified.

5. The combination of the disks B, the segments C, provided with the weights H, the pressure-bar G, provided with the curved arm *k*, the spring L, the operating-lever D′, and the sliding bolt E, substantially as and for the purpose specified.

6. The combination of the levers K′, provided with the grooves K^3, the plate K^2, and the shafts K, substantially as and for the purpose specified.

7. The sliding bar or bolt E, provided with the inclined notch h^3, the detent F, provided with the inclined notch h^3, in combination with and means for locking said sliding bolt E, substantially as and for the purpose set forth.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

WILLIAM H. BECHTEL.

Witnesses:
NAT. C. MCLEAN,
CHAS. G. MCLEAN.