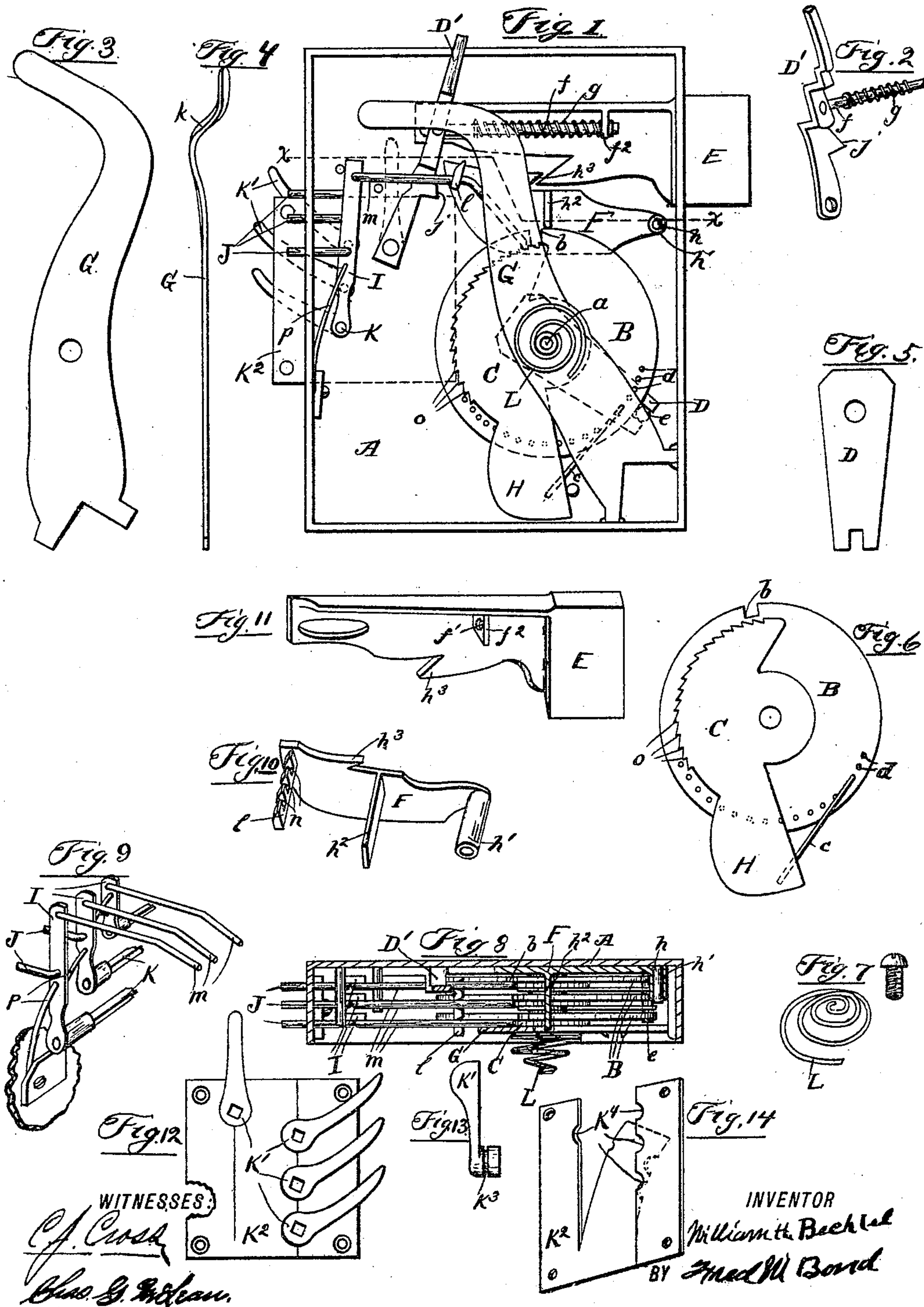


(Model.)

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  
 5 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  
 10 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  
 15 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 de-  
 20 tent, 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  
 25 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  
 30 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 seg-  
 35 ments. 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  
 40 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  
 45 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  
 50 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  
 55 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  
 60 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  
 65 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 at-  
 tached in any convenient and well-known  
 manner. For the purpose of operating the  
 70 shafts K the levers K' are provided, and for the purpose of holding the levers K' to the plate K<sup>2</sup> the grooves K<sup>3</sup> are provided. Said grooves receive the edges of the apertures K<sup>4</sup>. The plate K<sup>2</sup> may be formed in sections cut-  
 75 ting the apertures K<sup>4</sup>, and the sections united together by solder after the levers K' have been properly adjusted to the plate K<sup>2</sup>, or said levers K' may be pivotally attached to the plate K<sup>2</sup> in any other convenient and  
 80 well-known manner. It will be understood that the plate K<sup>2</sup> 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  
 85 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 hold-  
 90 ing 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 slid-  
 95 ing 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'   
 100 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 under-  
 105 stood 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  
 110 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,  
 115 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  
 120 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  
 125 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 seg-  
 130 ments 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 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.

10 6. The combination of the levers K', provided with the grooves K<sup>3</sup>, the plate K<sup>2</sup>, 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 15 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 20 of two witnesses.

WILLIAM H. BECHTEL.

Witnesses:

NAT. C. MCLEAN,

CHAS. G. MCLEAN.