F. H. Brown,

Permutation Lock.

No. 108,964. Patented Nov. 8, 1870.

Fig. 1.

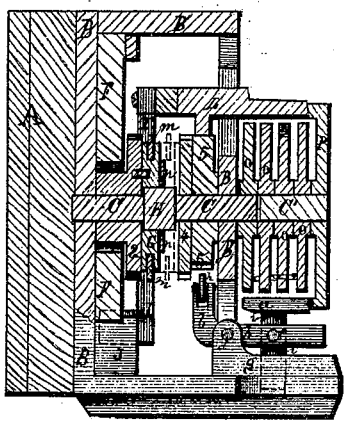


Fig. 2.

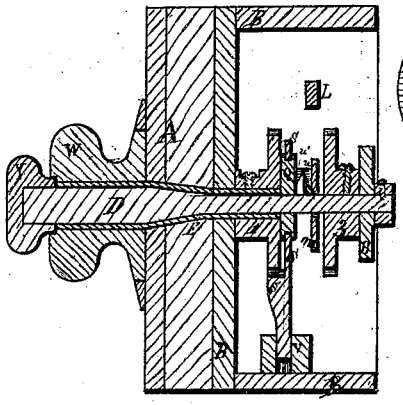


Fig. 4.

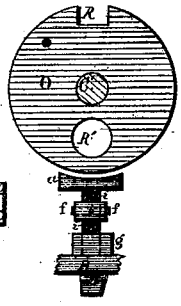


Fig. 3.

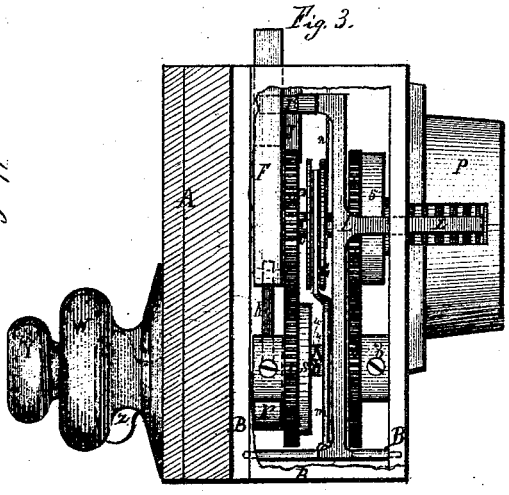


Fig. 6.

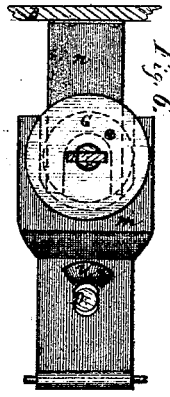


Fig. 5

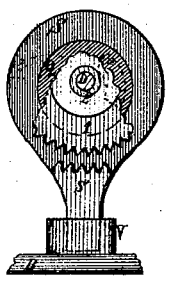
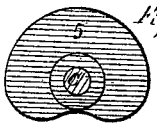


Fig. 7.



Witnesses

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UNITED STATES PATENT OFFICE.

FRANKLIN H. BROWN, OF CHICAGO, ILLINOIS, ASSIGNOR TO HIMSELF AND BENJAMIN B. WILEY, OF SAME PLACE.

IMPROVEMENT IN PERMUTATION-LOCKS.

Specification forming part of Letters Patent No. **108,964**, dated November 8, 1870; antedated November 5, 1870.

To whom this may concern:

Be it known that I, FRANKLIN H. BROWN, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improved Permutation-Lock; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing, and letters of reference marked thereon, making a part of this specification, in which—

Figure 1 represents a vertical section of my improved lock, taken through the center of the combination wheels or tumblers, and the shafts and other works being in line with the same. Fig. 2 is a vertical section of the lock, taken through the center of the dial-knob and the shafts and other works attached thereto. Fig. 3 is a top view of my lock, having the casing at the top broken away in order to present a clear view of the interior works of the lock. Fig. 4 is a side view of one of the tumblers or combination-wheels and a portion of brake *a*, which is made to press upon said tumblers at will, as hereinafter fully described. Fig. 5 is a view of an arrangement of parts designed at will to stop the movement of certain parts of the mechanism of the lock, as hereinafter described. Fig. 6 is a side view of certain parts of the lock, arranged so as to throw portions of the movements in and out of gear, as hereinafter described. Fig. 7 is a side view of a cam, 5.

My improved lock belongs to that class known as "permutation" or "combination" locks; and its nature consists in a certain novel arrangements of parts outside and inside of the lock, for raising and lowering the bar or fence and for stopping the movement of the tumblers and their relative parts just before and during the time that the bar or fence shall be made to touch said tumblers, and releasing said machinery and allowing it free action again directly after the bar shall have been raised from off the tumblers. The object of these arrangements of parts is to cut off all chances of ascertaining the position of the notches R in the tumblers by the sense of feeling, hearing, or otherwise.

Construction.

To enable others skilled in the art to make and use my invention, I will describe the method of construction and operation.

A represents a section of the door to which the lock may be attached. B is the casing or frame of the lock. C is a revolving shaft, to which several parts are attached. C′ is a stationary shaft, on which all except one of the tumblers are loosely hung.

The first tumbler is attached to shaft C, and communicates motion to the other tumblers, when shaft C is revolved, by means of pins in the side of each of the tumblers, which strike against each other.

A part of the office of cam 5 is to support the fence L above or clear from the tumblers O at all times when said tumblers are capable of being revolved, the object being to prevent any possibility of ascertaining the position of the notches R in tumblers O by the sense of sound, feeling, or otherwise, as may be done with those locks having the fence supported by the tumblers, by the notches in tumblers being passed under the fence or lever, giving a perceptible click or jar, and thus revealing one by one the figures or letters of the combination.

Gear-wheel 4 and cam 5 are fastened together and fitted loosely upon the shaft C.

To drop the fence upon the tumblers cam 5 must be turned part way around, which is effected by means of knob Y, through shaft or spindle D and gear-wheels 3 and 4.

L is the bar or fence, hinged to the frame B at one end, and having jointed at the opposite end the piece I, which hangs in a vertical position by the side of the bolt F. At the bottom of the piece I is an offset, passing underneath and into a notch in bolt F, as shown by dotted lines in Fig. 1.

Fence or bar L is supported above the tumblers by cam 5, as clearly shown in Fig. 1, and above specified. The bolt F is now locked. To drop the bar L upon the tumblers O, I turn the knob Y one-half around, which brings the lank or hollow side of cam 5 up, and allows bar L to fall by its own weight upon the tumblers O, or into notches R if they have been brought into line.

Gear-wheel 1 is fast to the sleeve E. The dial-knob W is also attached to sleeve E.

Gear-wheel 2 is loosely attached to shaft C,

having one projecting-pin, which connects with hole X in clutch-wheel G. Dog H in shaft C causes clutch-wheel G to revolve with shaft C, but allows it to be moved backward and forward on shaft C for the purpose of throwing the works in and out of gear, that part being shown in gear in Fig. 1 and out of gear in Fig. 3. When thrown out of gear, as shown, shaft C cannot be revolved, and therefore tumblers O will remain stationary.

The throwing the wheels in and out of gear is accomplished by means of yoke *m* and cams *n* and *n'*. One end of yoke *m* is forked and placed into a groove on the periphery of clutch-wheel G. There is an opening in clutch or yoke *m* to allow shaft D to pass through.

The cam or projection *n'* upon eccentric Q coming in contact with cam *n* upon yoke *m*, by turning knob Y, causes the yoke *m* to move back, carrying clutch-wheel G free from the pin in wheel 2, thus throwing it out of gear. Spring *u* presses clutch-wheel G back into its original place as soon as knob Y is turned back again.

Q is an eccentric fastened to shaft D. S is an eccentric-strap. S' is an offset upon strap S, having sharp-pointed teeth to fit into the gear-teeth in wheel 1. The lower ends of S and S' are extended down into an opening in block V to prevent lateral motion.

When knob Y is turned one-half around the teeth S' are carried up and locked into the gear of wheel 1, which makes it impossible to turn the dial-knob W while the knob Y is in said position. At this instant, and by the same turning of knob Y, the bar L has been let down upon the tumblers O. *a* is also a brake placed underneath tumblers O. It is pivoted at *f* to tilting bar *b*, which is also pivoted at *d* to the block *g*.

h is a friction-roller, which comes in contact with the full side of cam 5 when it is turned, causing the brake *a* to be raised up against the tumblers to prevent them from revolving while the bar L is upon them.

R is a notch cut into each tumbler O, into which the bar L must fall before it can be unlocked.

R' is an opening where a sufficient amount of metal has been cut out of the tumbler opposite of notch R to cause it to be evenly balanced, so that the notches R may not be brought up in line by knocking or jarring upon the outside of the lock or door.

Knob Z is connected to the bolt F by pitman K and wheel K', and is for the purpose of working the bolt.

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

1. Brake *a*, in combination with tilting bar *b*, cam 5, tumblers O, and fence L, or its equivalent, as and for the purposes specified.

2. The combination of wheel G, yoke *m*, cams *n* and *n'*, as and for the purposes specified.

3. Eccentric Q, strap S, teeth S', gear-wheel 1, and block V, combined, as and for the purposes specified.

FRANKLIN H. BROWN.

Witnesses:

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