(No Model.)

P. C. BROWN.

PERMUTATION LOCK.

No. 497,761. Patented May 23, 1893.

Fig. 1.

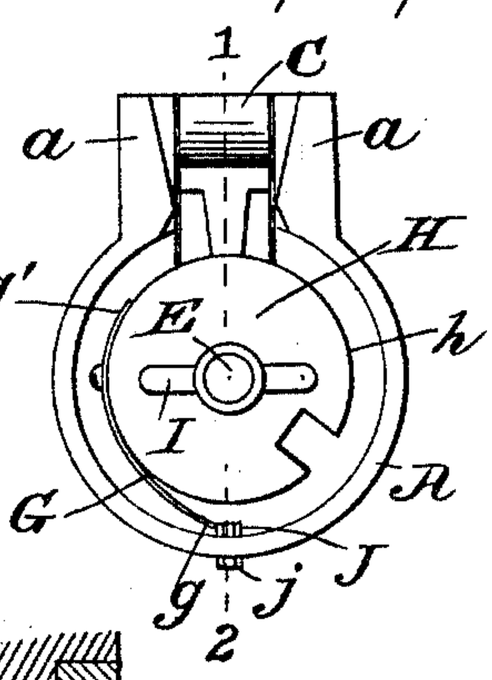


Fig. 2.

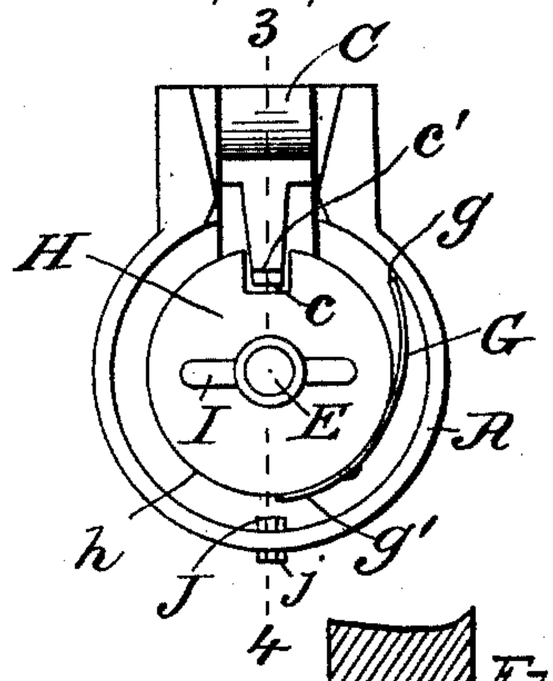


Fig. 3.

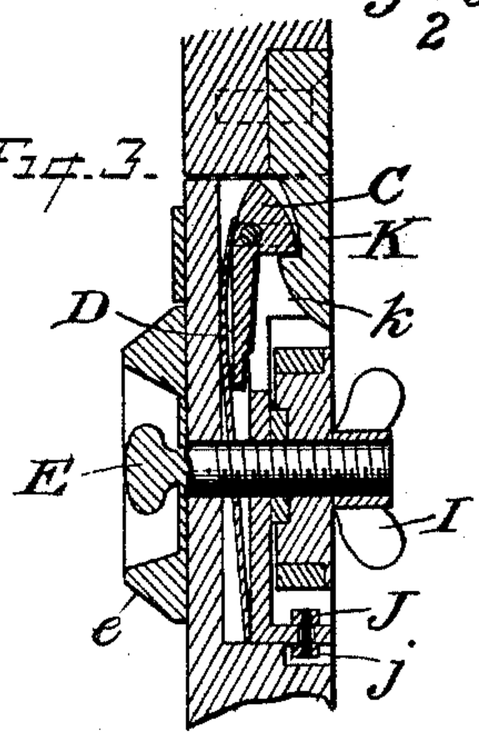


Fig. 5.

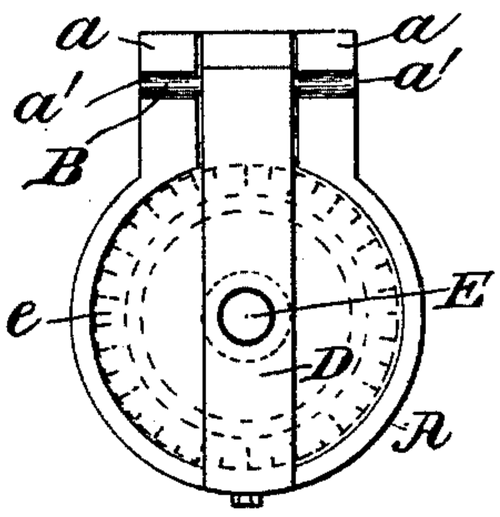


Fig. 4.

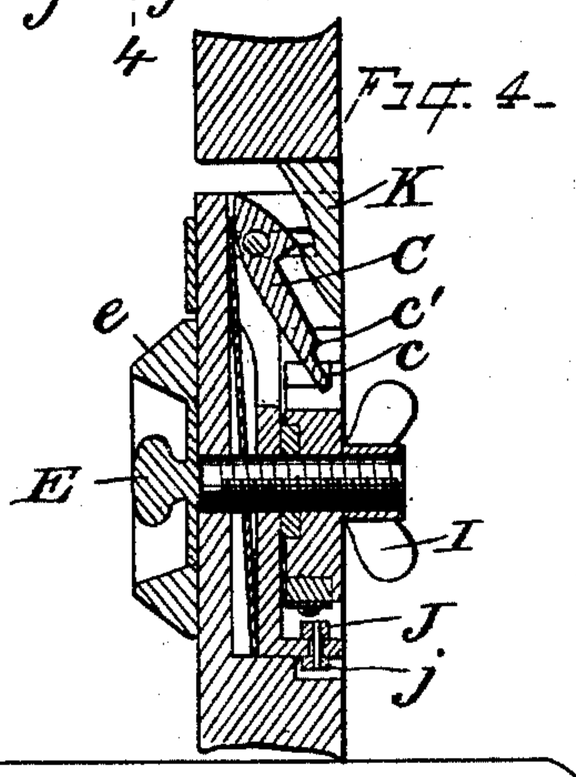


Fig. 7.

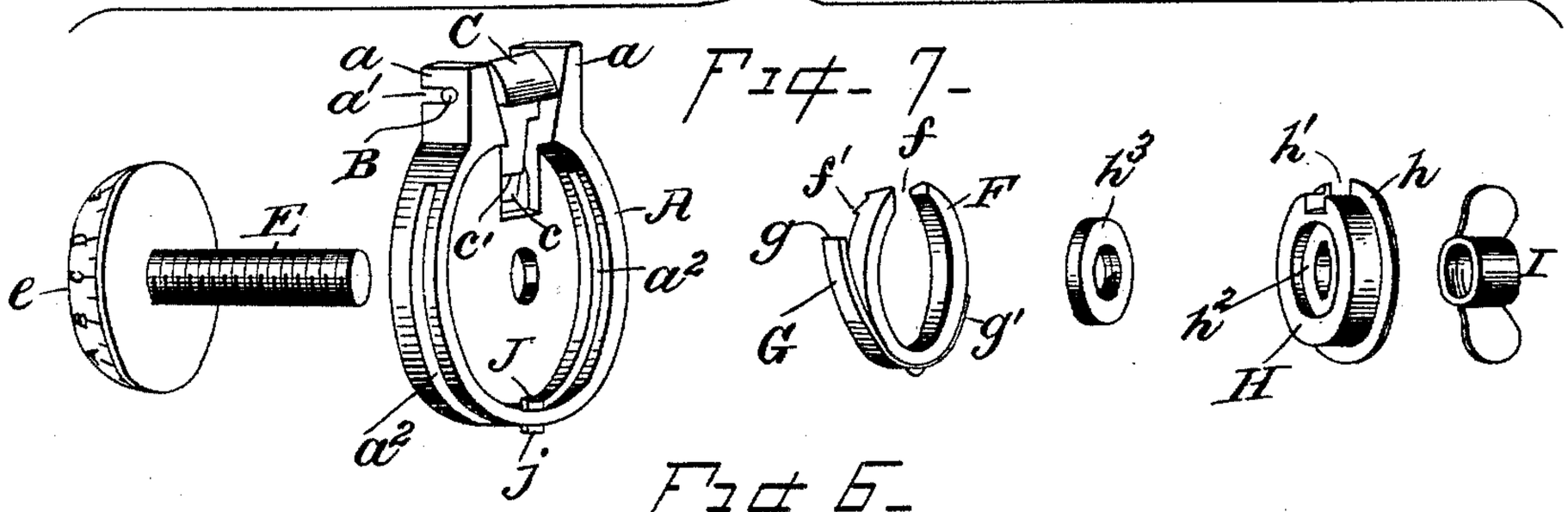


Fig. 6.

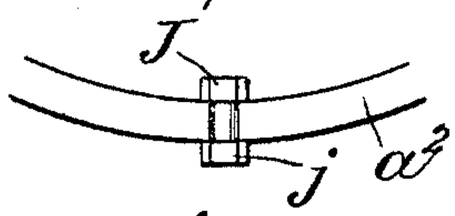
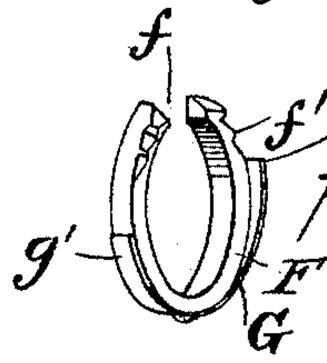


Fig. 8.



Attest:
A. A. Örb.
V. Stanley.

Inventor
Philip C. Brown
by Vinton Coombs,
his Atty.

UNITED STATES PATENT OFFICE.

PHILIP C. BROWN, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR OF ONE-HALF TO VERLING STANLEY, OF SAME PLACE.

PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 497,761, dated May 23, 1893.

Application filed January 25, 1893. Serial No. 459,732. (No model.)

To all whom it may concern:

Be it known that I, PHILIP C. BROWN, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Permutation-Locks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain new and useful improvements in permutation locks, and is in the nature of an improvement upon the lock for which I filed an application for Letters Patent on the 13th day of August, 1892, Serial No. 443,010, and it consists in the novel construction and arrangement of parts hereinafter fully described and afterward definitely pointed out in the claims, due reference being had to the accompanying drawings forming a part of this specification, wherein—

Figure 1 is a rear view of my improved lock, showing the tumblers turned to the first position to register each other; Fig. 2, a similar view, showing the tumblers turned to the second position to enable the latch to be released and opened; Fig. 3, a vertical, central section taken on the line 1—2, Fig. 1; Fig. 4, a similar view taken on the line 3—4, Fig. 2; Fig. 5, a front view of the lock, the dial being shown in dotted lines; Fig. 6, an enlarged detail view of the adjustable stop; Fig. 7, a perspective view of the different parts composing the lock; and Fig. 8, a perspective view of the tumbler F.

Referring to the drawings, the letter A indicates the lock-casing consisting of a substantially annular metallic casting recessed upon opposite sides and provided with two upwardly projecting ears a, a, which are each slotted, as at a', a', for the reception of a pivot pin B which passes through the upper end of a hooked latch C, the latch being held in position by means of a spring D which is secured at one end to the casing A, and at its free end bears against the upper end of the latch C and exerts a force to keep the toe c thereof constantly retracted from the tumblers, as will more fully hereinafter appear. The casing A is centrally apertured for the reception of the knob spindle E which has formed integrally therewith, a dial e bearing radial marks, letters, or numerals on its periphery in the usual manner. Loosely resting within the inner face of the casing A is a tumbler F consisting of an annulus cut or slotted as at f and having secured thereto a curved leaf spring G.

H indicates the other tumbler consisting of a disk adapted to loosely fit within the tumbler F and provided with a projecting flange h, which very slightly exceeds in diameter the tumbler F, and is slotted, as at h', for the purpose hereinafter described.

I indicates a butterfly nut adapted to be screwed over the inner end of the knob spindle E and secure the tumblers in position, the screw-threaded portion of said spindle passing through a central aperture in the tumbler H. The under side of the tumbler H is provided with a central annular recess h^2, which is adapted to fit over and upon a similarly shaped washer h^3, between which latter and the nut I the tumblers are adapted to be secured in place. The casing A is slotted, as at a^2, within which slot is fitted a threaded stop or lug J, provided with a nut j, whereby said lug or stop may be adjusted to any desired position relatively to the casing and secured at such point by means of the nut j. As before described, the tumbler F consists of an annulus slotted as at f loosely confined between the casing A and the tumbler H, the latter being also slotted as at h', the tumbler F having secured to its periphery a leaf spring G, one end of which, as g', bears upon the periphery of the flange h of the tumbler H, thus normally causing the one to turn with the other, while the other end g projects tangentially from the periphery of said tumbler in such manner as to engage the stop or lug J as it is rotated and thus arrest the rotation or movement of said tumbler F, when the end g of the spring G abuts thereagainst, while if the knob spindle be turned in the opposite direction, both tumblers revolve in unison, the end g' of the spring G bearing upon the periphery of the flange h of the tumbler H, and causing the tumbler F to revolve therewith, the end g of the spring G slipping idly over the stop or lug J. The remaining de-

tails of construction will be more readily understood by now describing the operation of the parts above described.

As illustrated, the lock is shown as applied to a box having a hinged cover, though it will be understood by any one skilled in the art that it may be applied equally as well to drawers, doors, and other devices to which combination locks are usually applied. The casing A is set within a mortise of the proper size and shape formed in the interior of one of the walls of the box, as shown, and the knob spindle passed therethrough from the outside, the washer, tumblers, and thumb-screw being secured to the inner end of the knob-spindle as previously described, and in the order shown in Fig. 7 of the drawings. To the lid of the box is secured a downwardly depending hooked catch K, beveled as at *k* so as to engage the hooked latch C. By pressing the lid of the box down, the fixed catch K presses back the latch C and locks the box. In order to open the box, the knob spindle E must be turned in a given direction, say to the left, for a given distance—which distance is determined by one of the letters or numerals on the indicating dial. In rotating said knob-spindle, the tumbler H is rotated therewith and by means of the spring G also rotates the tumbler F until the end *g* of said spring abuts against the stop J which arrests farther rotation of the tumbler F, while the tumbler H is continued in its rotation until the dial registers the proper letter. At this point, shown in Fig. 1, the two tumblers will be in position to cause the slots *f* and *h'* of the respective tumblers to register. The knob-spindle is now rotated in the opposite direction until the dial registers the proper letter or numeral to bring them into the position shown in Fig. 2, the two tumblers during this movement rotating in unison, as before described. At this point, the lock is in position for being opened, which is accomplished by lifting upon the lid, when the hooked catch K will partially rotate the latch C upon its pivot-pin B, the toe of the latch C passing through the slots *f* and *h'* of the two tumblers. After opening the lock, the combination may be destroyed by revolving the knob-spindle so as to throw the slots out of alignment, but the lock may at any time thereafter be locked by merely shutting the lid, the slotted bearings *a'*, *a'*, of the pivot-pin B allowing the latch C to be pushed back by the hooked catch K.

In order to prevent the lock from being "picked" by lifting upon the lid and turning the knob-spindle E at the same time, until the slots in the two tumblers come opposite the toe of the latch C, I provide the tumbler F with oppositely beveled notches or ratchet teeth *f'*, preferably arranged upon each side of the slot *f*, so that if the spindle be rotated while the latch-toe be pressed against the tumblers, said toe will engage one of said notches and arrest the rotation of the tumbler F before the slot *f* can be brought into alignment with the toe. For a similar purpose I bevel the inner edges of the slotted ends *f* of the tumbler F, so that if the two slots of the tumblers should be brought to register while the toe of the latch C is being pressed inward, said toe would engage one of said bevels and partially revolve the tumbler F so as to throw the tumblers out of alignment before the latch could be thrown. I have shown the toe *c* of the latch C provided with a shoulder *c'*, which renders the action just above described more positive in its operation. By making the stop or lug J adjustable, as before described, the combination can very quickly and easily be changed, while at the same time a very simple and ready means is afforded for adjusting the lock to the dial, when being applied. The combination can also be very easily and quickly changed and the direction of rotation necessary to unlock the lock reversed, by simply turning the spring G upon its securing screw or pin, so as to cause the end *g* to abut against the opposite side of stop J.

What I claim is—

1. In a permutation lock, the combination with the knob-spindle and dial-plate, of two concentric tumblers mounted on said spindle and slotted as shown, one of said tumblers being rigid with said spindle and the other loose thereon, a spring bearing upon said tumblers and causing them to move in unison when the knob-spindle is rotated in one direction, and a stop engaged by said spring and holding the loose tumbler stationary when the spindle is rotated in the opposite direction, and a latch interlocking with said tumblers, substantially as described.

2. In a permutation lock, the combination with the knob-spindle and dial-plate, of two concentric tumblers mounted on said spindle and slotted as shown, one of said tumblers being rigid with said spindle, and the other loose thereon, a spring bearing on the peripheries of said tumblers and causing them to move in unison when the knob-spindle is rotated in one direction, an adjustable stop engaged by said spring and holding the loose tumbler stationary when the spindle is rotated in the opposite direction, and a latch interlocking with said tumblers, substantially as described.

3. In a permutation lock, the combination with the knob spindle and dial-plate, of two concentric tumblers mounted on said spindle and slotted as shown, one of said tumblers being rigid with said spindle, and the other loose thereon, a reversible spring bearing on the peripheries of said tumblers, and causing them to move in unison when the knob-spindle is rotated in one direction, an adjustable stop engaged by said spring and holding the loose tumbler stationary when the spindle is

rotated in the opposite direction, and a latch interlocking with said tumblers, substantially as described.

4. In a permutation lock, the combination with the lock casing slotted as at a^2 and a stop J adjustably secured therein, of the knob-spindle having mounted thereon two slotted tumblers H, F, the tumbler H being rigid with said spindle and the tumbler F loose thereon, a spring G carried by the tumbler H and bearing at one end upon the tumbler F, and having its other end adapted to engage the stop J, substantially as described.

5. In a permutation lock, the combination with the lock casing and knob-spindle, of two concentric tumblers H, F, mounted on said spindle, the tumbler H being rigid therewith and the tumbler F loose thereon, and provided on its inner edge with beveled notches f', a spring G carried by the tumbler H and bearing at one end upon the tumbler F and having its other end adapted to engage a stop J, said stop J, and a pivoted latch adapted to engage said slotted tumblers, substantially as shown and described.

6. In a permutation lock, the combination with the lock-casing A and knob-spindle E, of the pivoted hooked latch C, the spring D actuating said latch, the concentric slotted tumblers H, F, mounted on said spindle as described, the spring G and stop J, and the hooked catch K, substantially as shown and described.

7. In a permutation lock, the combination with the lock-casing A provided with projecting slotted ears a, a, the latch C pivoted therein, the spring D secured to the casing and bearing against the upper portion of the latch C, the concentric slotted tumblers H, F, mounted on a knob-spindle E as described, the spring G and stop J, and the hooked catch K, substantially as shown and described.

8. In a permutation lock, the combination with the lock-casing A provided with projecting slotted ears a, a, the latch C pivoted therein, the spring D secured to the casing and bearing against the upper portion of the latch C, concentric slotted tumblers H, F, mounted on the knob-spindle E as described, the spring G and stop J, and the hooked catch K, the tail of the latch C being shouldered as at c', substantially as shown and described, and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

PHILIP C. BROWN.

Witnesses:
V. STANLEY,
CHAS. L. DU BOIS.