

(No Model.)

E. P. CALDWELL.
COMBINATION PADLOCK.

No. 473,059.

Patented Apr. 19, 1892.

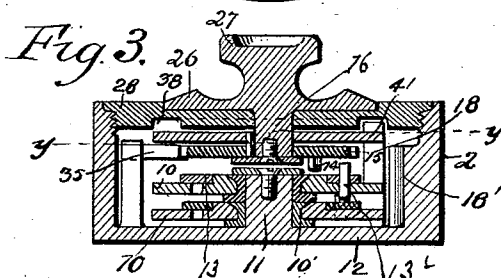
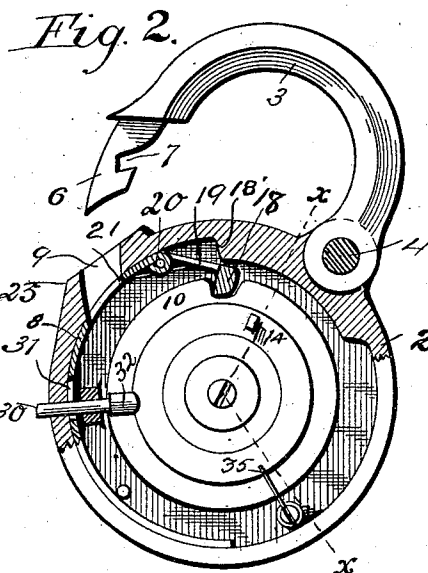
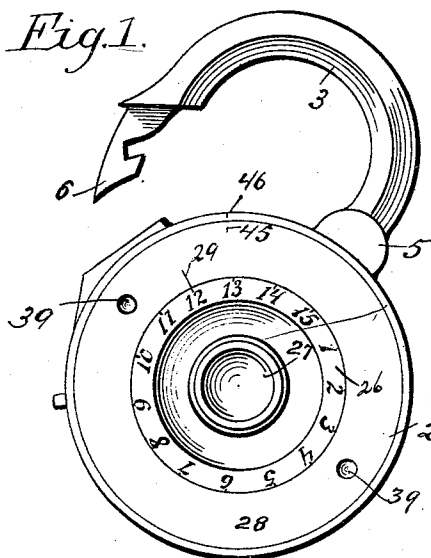


Fig. 5.

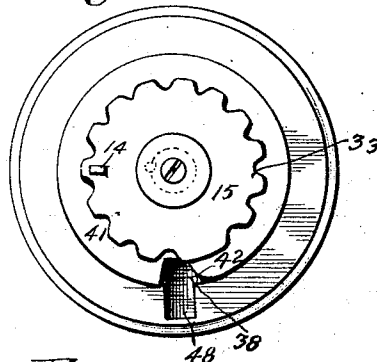


Fig. 4.

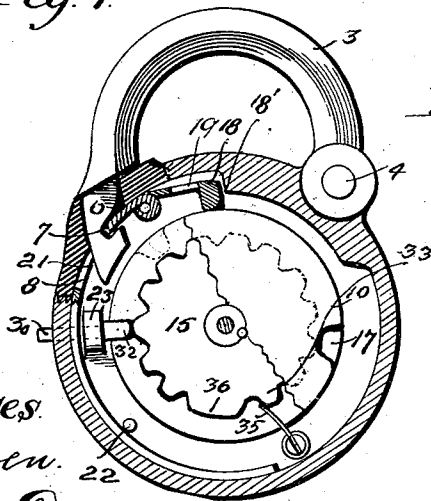
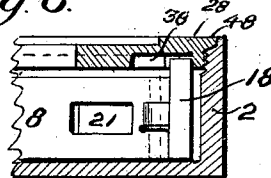


Fig. 6.



Witnesses.

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UNITED STATES PATENT OFFICE.

EDWARD P. CALDWELL, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR OF ONE-HALF TO EDWARD J. EDWARDS, OF SAME PLACE.

COMBINATION-PADLOCK.

SPECIFICATION forming part of Letters Patent No. 473,059, dated April 19, 1892.

Application filed December 27, 1890. Serial No. 375,931. (No model.)

To all whom it may concern:

Be it known that I, EDWARD P. CALDWELL, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain Improvements in Combination-Locks, of which the following is a specification.

My invention relates to combination-locks, and particularly to those made in the form of a padlock having a pivoted staple and especially adapted for use on car-doors or mail-boxes.

The object of the invention is to provide a combination-lock which may be opened by the manipulation of a suitable knob controlling the combination wheels or tumblers, and the action of which may be noted by the observance of marks upon the knob-dial, by the movements of a certain indicating figure that may be seen or the movements of which may be felt, or by the observance of sounds or clicks made by the lock mechanism as the knob is turned step by step.

The invention consists generally in a lock provided with a movable pin or other device that moves in and out as the knob is turned, thereby enabling the movement of the tumblers to be determined by counting the movement of the pin, and the movement of the pin being noted either by feeling the pin as it moves out and in or by seeing and counting its movements.

Further, my invention consists in means whereby a removable side or face of the lock-case is secured in position, so as to render its removal impossible while the bolt is locked.

My invention consists, further, in various details of construction and in combinations hereinafter described, and particularly pointed out in the claims.

My invention will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a face elevation of a combination-lock embodying my invention. Fig. 2 is a transverse section thereof on the line $y y$ of Fig. 3. Fig. 3 is a sectional view on the line $x x$ of Fig. 2. Fig. 4 is a transverse section showing the staple-bolt locked in the case. Figs. 5 and 6 are details showing the means employed for locking the removable side or face of the lock-case in position.

In the drawings, 2 represents the main casing, which is preferably formed as a circular casting having an open front in which is secured a plate 28, which forms the front of the casing and makes a water-tight joint therewith. The plate 28 is preferably provided with recesses 39, into which a suitable instrument may be inserted for the purpose of turning the plate. A shackle 3 is pivoted on the casing by means of a pin 4 and lugs 5. The free end 6 of the shackle is provided with a notch 7, into which the sliding inner locking plate or bolt 8 is adapted to enter when the end of the shackle enters the case. The locking plate or bolt 8 is arranged to slide within the inner wall of the casing. The locking-plate 8 is preferably extended around the inner wall of the casing and is provided with an opening 21, through which the end of the shackle extends when it is inserted into the case. The locking plate or bolt 8 is preferably held in position by means of a pin 22 and the lug 23.

Arranged within the case 2, and preferably in a central position therein, is a stud or projection 11, secured to or formed integrally with the back plate 12 of the casing. Any suitable series of combination wheels or tumblers 10 may be used. I have shown two such wheels mounted on the stud 11 and provided with rings 13, having lugs or pins 13'. These pins project through the wheels or tumblers 10 and are adapted to engage one another, and by changing the position of these rings the combination is changed in the usual manner. The wheels 10 are separated by means of suitable collars 10', and the wheels are capable of turning independently of each other. Each wheel 10 is provided with a notch 17 in its edge. Hinged to the locking-plate 8 is a spring-dog 19, having a lug 18 on its end. A projection 18' is formed on or secured to the inner surface of the case, and when the bolt or plate 8 is in position for locking the shackle the dog 19 lies against the inner wall of the casing and abuts against the projection 18' and cannot be moved. When the wheels 10 are brought into position with the notches 17 opposite the dog 19, the dog is thrown forward and the lug 18 enters the notches 17. A further movement of the wheels 10 draws

oak the bolt or locking-plate 8 and carries the end of the dog 19 inside of the projection 18', and when the locking-plate is in this position the shackle may be withdrawn.

- 5 A suitable knob or handle 27 is arranged upon the outside of the face-plate 28 and is provided with the usual graduated disk or dial 26, having figures, letters, or characters marked thereon, and the plate 28 is provided
10 with the mark or point 29 in the usual manner.

Secured upon the knob-post 16, inside of the face-plate 28, is a disk or secondary plate 41, having a notch 42 in its edge. One side of
15 this notch is rounded off for a purpose hereinafter explained. The under or inner surface of the plate 28 is provided with a groove 38, and the notch 42 is at all times directly under or inside some part of this groove.

- 20 The plate 28 is also provided with a notch or recess 48, that is formed as an offset from the groove 38. The lug 18 on the dog 19 projects above the upper edge of the locking-plate 8. When the plate 28 is screwed into
25 place, the lug 18 must be in the notches 17 in the wheels 10. The end of this lug will then enter the notch 42 in the disk 41 and project into the groove 38 in the plate 28.

While screwing in the plate 28 the lug 18 will
30 remain in the notch 42 and hold the knob stationary. When the plate 28 has been screwed home, the recess 48 will be opposite the end of the projection 18'. Then by turning the knob the abrupt side of the notch 42

- 35 will force the bolt or plate 8 into locking position. A reverse movement of the knob will cause the rounded side of the notch 42 to force the lug 18 and dog 19 out against the wall of the casing and into position where
40 the end of the dog 19 will lie against the projection 18'. The upper end of the lug 18 will then be in the notch or recess 48, and it will thus lock the plate 28 in position and prevent its being removed until both disk
45 41 and the tumblers or wheels 10 have been brought into position to bring their notches opposite the lug 18. When this is done, the dog 18 will be thrown forward by its spring-

bringing the lug 18 into the notches, and by
50 turning the disk 41 and the wheels 10 together the locking bolt or plate 8 may be withdrawn. Secured to the knob-spindle is a disk 15, having a pin or lug 14, that is adapted to engage the pin of the upper combination

- 55 wheel or tumbler, and by means of this disk the wheels or tumblers are turned in either direction by turning the knob or handle. This disk may, if preferred, be adjustably secured upon the knob-spindle or the pin or lug
60 14 may be adjustably secured upon the disk 15.

It is oftentimes desirable to open a combination-lock in the dark, and especially is this desirable where the lock is used upon cardoors or mail-boxes, and I provide means by
65 which one knowing the combination may open the lock without seeing the marks upon the dial. As it is also possible for some persons

who do not know the combination to open combination-locks by hearing the sound that is made by the pins on the tumblers or wheels
70 coming in contact with each other, and thus determining the position of the wheels, I provide means for preventing this by causing a regular succession of sounds as the knob is turned in either direction, thus obscuring or
75 covering up the sound made by the contact of the pins or lugs on the combination-wheels. To accomplish these ends I provide within the casing a clicking or sounding device that produces sounds at regular intervals as the
80 operating knob or handle is turned in either direction. This device may be of any suitable construction and arranged in any suitable manner. I have shown the disk 15 provided upon its edge with a series of teeth 33,
85 preferably rounded in form, and I arrange a spring 35 within the case and in position to engage the notched or serrated edge of the disk 15. As the knob is turned in either direction the spring 35, riding over the disk, produces a sharp clicking sound, which may be
90 heard by the person moving the knob.

In order that it may be known at what point to begin to count the clicks, I provide one long space 36 between two of the notches
95 in the disk 15, thus giving one long interval between two clicks. This will determine the point from which to begin to count the sounds. As it is sometimes desirable to open the lock by feeling the parts, (without reference to the
100 sound,) I prefer to provide means by which, as the knob is turned in either direction, its movement may be noted by merely feeling the lock. For this purpose I provide a movable part that, as the knob is turned, moves
105 out and in at regular intervals or "pulsates," and by placing the hand in position to feel these movements or pulsations they may be counted, and thus the lock be operated. Any suitable device may be used for this purpose. I prefer to provide a pin 30, that I call
110 a "touch-pin" and that is arranged to project through an opening in the wall of the casing and through a slot 31 in the plate 8. The head 32 of this pin bears against the serrated
115 edge of the disk 15, and as the disk is turned the pin is forced out against a thumb or finger placed over its end, the pressure on the end of the pin forcing it back after passing each other. The one long space on the disk
120 gives one long interval between two movements of the pin and this denotes the movement from which to begin to count to open the lock on any combination for which it may be set.

I have illustrated what I consider to be the best construction of parts for carrying out my invention; but I am not to be understood as limiting myself to such details, as it is obvious that the mind of a mechanic will suggest many equivalents of the touch-pin and of the serrated disk and of other parts which would be embraced within my invention. For instance, the serrations on the disk constitute
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a series of teeth, which may be of any well-known construction.

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

1. The combination, in a lock, with a bolt and bolt-locking mechanism and operating means therefor, of a pulsating device establishing communication between the exterior and the interior of the lock and an irregular-surfaced member inside the lock and in operative connection with said pulsating device, whereby as the locking mechanism is operated a series of successive pulsations are imparted to said pulsated device to transmit them to an object on the outside and in contact with said device for indicating the movements of the locking mechanism, substantially as described.

2. The combination, in a permutation-lock, with the operating mechanism, of means provided in connection therewith for indicating the positions of the locking devices by one series of indications that can be seen, another that can be heard, and another that can be felt, the last indicator being a pulsating member establishing communication between the interior and the exterior of the lock and pulsated successively as the locking mechanism is operated, substantially as described.

3. The combination, in a lock, of tumblers or combination-wheels arranged to be operated by the movement of a suitable knob provided on the outside of the lock, with a serrated disk upon the inside of the lock in connection with said knob, and a touch-pin extending through the casing of the lock and engaging the serrated portion of the disk, substantially as described.

4. In a lock, the combination, with a suitable casing, of an operating knob or handle and a movable piece adapted to be moved in and out through the lock-casing at regular intervals as the knob is turned in either direction, substantially as described.

5. In a lock, the combination, with handle or knob, of the disk 15, secured upon the knob-spindle and provided with a series of serrations, with a long space between two of said serrations, and the "touch-pin" engaging said disk and extending through the wall of the casing.

6. In a lock, the combination, with casing 2, provided with the open face, the face-plate 28, adapted to be screwed into said casing, and means located entirely within the casing and engaging said face from inside the casing for locking said plate when the device is locked and releasing it when unlocked.

7. In a lock, the combination, with the casing 2, of the screw-threaded front plate 28,

provided with the groove 38 and the recess 48, the locking-bolt 8, provided with the dog 19, having the lug 18, the knob, and the disk 41, screwed to the knob-spindle and provided with the notch 42, all substantially as described.

8. In a lock, the combination, with a suitable casing, of a series of combination-wheels, a sliding locking plate or bolt extended along the inner curved wall of the casing and formed with an opening for the shackle to pass through, and a dog pivoted to said plate and engaging said wheels, substantially as described.

9. The combination, in a lock, with a suitable casing, of a series of combination-wheels, each provided with a notch in its periphery, an operating knob or handle, a disk secured thereto and provided with a notch in its periphery, a sliding locking plate or bolt, and a pawl or dog pivoted to said plate and engaging the periphery of said disk and wheels and having its end extended to lie in a recess formed in the face of the casing, whereby when the notches upon said wheel and disk are brought into line with each other beneath the end of said dog said dog will engage therewith and the locking-plate may be removed by turning the disk, and when the pawl is out of said notches it will lock the face of the casing in place, substantially as described.

10. The combination, with the casing 2, of the series of combination-wheels arranged therein, each provided with a notch upon its periphery, the operating-handle, the disk secured to said handle within said casing and provided with a notch upon its periphery, one wall of which slot is angular and the other curved, the pivoted shackle, the sliding plate arranged to engage said shackle and provided with a pivoted dog having a projecting end or lug that bears upon the periphery of said wheel, substantially as described.

11. The combination, with the casing 2, provided upon its inner surface with a lug or projection, of the shackle secured to said casing, the sliding plate extended along the inner curved wall of the casing, arranged to engage said shackle, and the spring-dog pivoted on said plate to the rear thereof and between it and said projection on the casing and provided with a projection adapted to engage the notches in said wheels, substantially as described.

In testimony whereof I have hereunto set my hand this 20th day of December, 1890.

EDWARD P. CALDWELL.

In presence of—

A. C. PAUL,

C. G. HAWLEY.