

(No Model.)

A. S., H. J. & W. M. COXE.
PERMUTATION PADLOCK.

No. 552,277.

Patented Dec. 31, 1895.

Fig. 1.

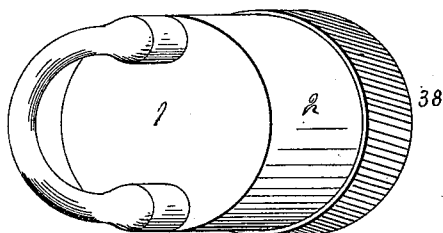


Fig. 2.

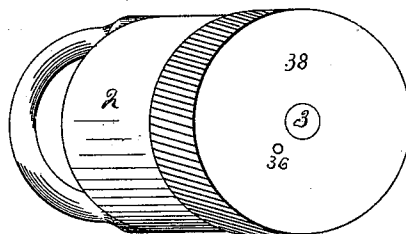


Fig. 3.

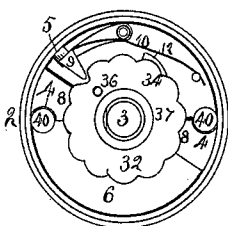


Fig. 4.

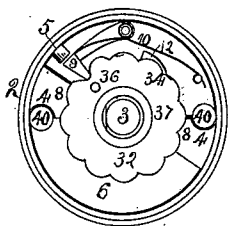


Fig. 5.

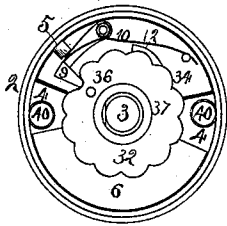


Fig. 6.

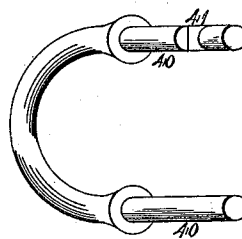


Fig. 7.

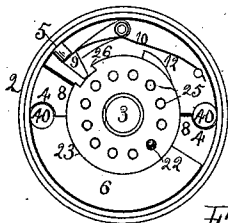


Fig. 8.

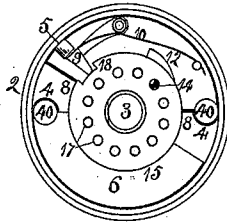


Fig. 9.

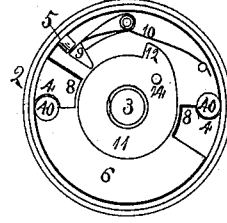


Fig. 10.

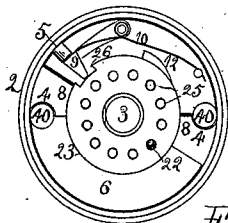


Fig. 11.

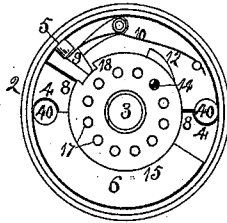


Fig. 12.

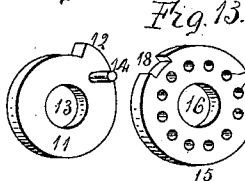


Fig. 13.

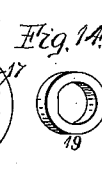


Fig. 14.

Fig. 15.

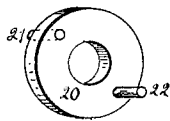


Fig. 16.

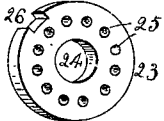


Fig. 17.

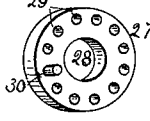


Fig. 18.



Fig. 19.

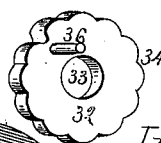


Fig. 20.



Fig. 21.

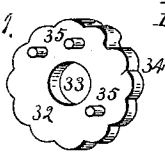
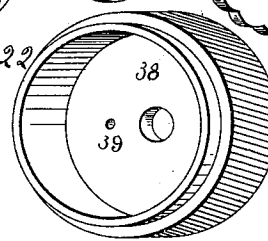


Fig. 22.



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UNITED STATES PATENT OFFICE.

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PERMUTATION-PADLOCK.

SPECIFICATION forming part of Letters Patent No. 552,277, dated December 31, 1895.

Application filed April 26, 1895. Serial No. 547,274. (No model.)

To all whom it may concern:

Be it known that we, AMASA S. COXE, HERBERT J. COXE, and WINFRED M. COXE, citizens of the United States, and residents of Belvidere, in the county of Boone and State of Illinois, have invented certain new and useful Improvements in Combination-Locks, of which the following is a specification.

The object of this invention is to construct a combination-lock in which one end of the case containing the operative mechanism forms the means for assembling the mechanism.

The further object of this invention is the construction of an inner plate projecting beyond the face of the tumblers, a portion of its periphery, and having an abrupt descent in order that a starting-point may be had to assemble the tumblers.

In the accompanying drawings, Figure 1 is an isometrical representation of the lock as seen from the end holding the shackle. Fig. 2 is an isometrical representation of the lock as seen from the movable end. Fig. 3 is a face view, the movable end being removed and the parts locked in their disarranged position. Fig. 4 is a face view, the movable end being removed and the parts being assembled. Fig. 5 is a face view, the movable end being removed and the parts in their unlocked position. Fig. 6 is an isometrical representation of the shackle. Fig. 7 is an inner view looking upon the center tumbler and being in its assembled position. Fig. 8 is an inner view looking upon the first tumbler and being in its assembled position. Fig. 9 is an inner view looking upon the cam-shaped plate and being in its assembled position. Fig. 10 is an isometrical representation of the open end of the casing, the shackle in position and the inner mechanism removed. Fig. 11 is an isometrical representation of the base or locking plate. Fig. 12 is an isometrical representation of the cam-shaped plate. Fig. 13 is an isometrical representation of the first tumbler. Fig. 14 is an isometrical representation of the first washer. Fig. 15 is an isometrical representation of the plain plate of the center tumbler. Fig. 16 is an isometrical representation of the notched section of the center tumbler. Fig. 17 is an isometrical

cal representation of the perforated plate of the center tumbler. Fig. 18 is an isometrical representation of the washer of the center tumbler. Fig. 19 is an isometrical representation of the last tumbler. Fig. 20 is an isometrical representation of the washer located over the last tumbler. Fig. 21 is an isometrical representation of the inner face of the last tumbler. Fig. 22 is an inner face view of the movable end.

Our improved lock is especially adapted as a padlock, and the drawings illustrate such construction; but it is evident that certain of these new features may be used in the construction of other locks—for instance, a bicycle-lock—without departing from our invention.

The casing consists of a shell composed of a top 1 and rim 2, the rim being of the proper depth to receive the operative parts, and from the center of the top extends a stud 3, having a flat face, and the top has two openings 4, arranged at opposite sides of the center, and from the rim on its inner face extends a pin 5 in a radial direction. Within the shell is located a base or locking-plate 6, having a central opening 7, of sufficient size to admit being placed on the stud, and its periphery has two notches 8, located opposite each other. To the face of this locking-plate is pivoted a dog 9, which is held in a yielding manner by a spring 10. This dog extends in the lengthwise direction of the casing and has its inner edge pointed. Upon the stud over the locking-plate is located a cam-shaped plate 11, having an enlarged portion 12, one end terminating abruptly to the smaller portion. A central opening 13 receives the stud. This plate has a pin 14 extending from its outer surface. Next to this plate is located the first tumbler 15, having a central opening 16 to receive the stud, and having a concentric series of perforations 17 and a notch 18 in its periphery. One of the perforations receives the pin 14 of the cam-shaped plate. Next upon the stud is placed a washer 19, having a flat face on its inner edge, which prevents it from rotating and separates the first tumbler from the center tumbler.

The center tumbler is composed of three sections or plates. The first plate 20 is shown at Fig. 15, having a central opening of a size to

receive the stud, and has a pin 21 extending from its inner face, also a pin 22 extending from its outer face. This plate is placed on the stud and the pin 21, facing the first tumbler, being of a length less than the thickness of the washer preceding it, in order that it may not rub in contact with the face of the first tumbler. The center section 23 (shown at Fig. 16) is similar to the first tumbler and has a central opening 24 to receive the stud, a concentric series of perforations 25, and its periphery provided with a notch 26. This section is placed upon the stud, the pin 22 of the plate 20 entering one of the perforations in the section and extending some distance beyond its face, thereby locking the sections together.

A perforated plate 27 has a central opening 28, a concentric series of perforations 29, and a pin 30 extending from its outer face. This plate is placed upon the stud, the pin 22 of the plate 20 entering one of the perforations, thereby locking the three sections together. A washer 31, (shown at Fig. 18,) being the same in construction as the washer shown at Fig. 14, is next placed upon the stud and separates the center tumbler from the last tumbler.

The last tumbler 32 is shown at Figs. 19 and 21, having a central opening 33 to receive the stud, its periphery being provided with serrations 34, one of which is deeper than the others and has one face extending inward radially. From its inner face extends a concentric series of pins 35, being of less length than the thickness of the preceding washer, and from the outer face of the last tumbler extends a pin 36. A washer 37 (shown at Fig. 20) is next placed on the stud, and finally the cap 38 or movable end of the casing (shown at Fig. 22) is placed on the stud, in a manner free to rotate, the pin 36 of the last tumbler entering an opening 39 in the cap, thereby forming a connection between the cap and last tumbler. The cap is held in position by riveting the end of the stud projecting through the central opening of the cap.

A shackle shown at Fig. 6 is of U form, having its ends 40 provided with recesses 41, extending about one-half the thickness of the end, and of a length a little more than the thickness of the locking-plate 6. The diameter of the ends of the shackle is such as to enter the openings 4 in the bottom of the casing.

The pointed end of the dog rests in contact with the serrated periphery of the last tumbler, and its upper end rests behind the pin 5, extending from the inner face of the casing, and the edge of each of the notches 8 in the locking-plate will lie within the openings 41 in the ends of the shackle, and when the parts are in this position the shackle is prevented from being withdrawn. In order to release the shackle it is necessary to turn the cap or movable end of the casing in this instance to the right until the dog 9 drops off the end of the projection 12 of the plate 11, and by continuing the movement until the

notch 18 in the first tumbler has been brought into line with the dog a reverse movement of the cap the proper distance will bring the notch 26 of the center tumbler into line with the dog, and a movement to the right a proper distance will bring the deep notch of the last tumbler 32 into line with the dog, and as all of the notches of the three tumblers are in line with the dog, the dog will descend toward the center of the casing a sufficient distance to allow the upper end of the dog to pass the pin 5 in the casing. A connection is thus made between the locking-plate and the cap or movable end of the casing, and by reason of the last tumbler having the deep notch in its periphery the locking-plate through the dog is moved to the left hand until the locking-plate becomes disengaged from its connection with the shackle, when the shackle can be removed. In order to secure the shackle in position, it is placed within the casing and the cap turned to the right, which will bring the locking-plate into engagement with the shackle and move the dog beyond the pin 5, and a further movement will disarrange the tumblers.

The last tumbler has its periphery serrated, into which the dog descends during the movement of the tumbler. The notches being shallow the dog cannot descend far enough to become disengaged from the pin 5 until the deep notch is reached, and not then until the first and center tumblers have been assembled. The employment of the serrations answers the same purpose as the dial in a combination-lock, and enables the operator to bring all the tumblers into line with the dog, and this is accomplished by the pulsations imparted by the dog riding over the serrations; and by the employment of the cam-shaped plate the dog will be raised to a greater height than by the serrations, and in descending will impart a louder click, by reason of which a stationary point is had.

By the employment of the three-part center tumbler the parts may be adjusted with respect to each other and the combination changed, and the combination of the first tumbler may be changed by its connection with the cam-shaped plate; and by the employment of the series of pins in the under face of the last tumbler the combination of the last tumbler may be further changed by adjusting the pin 30 of the preceding tumbler to be operated upon by a different pin of the series.

So far as known to us we are the first to construct a lock having a casing one end of which is used to assemble and disarrange the tumblers.

We claim as our invention—

1. In a combination lock, a casing, a locking plate and tumblers arranged within the casing, the tumblers controlling the movement of the locking plate, and a cap mounted to rotate on the end of the casing and controlling the movements of the tumblers.

2. In a combination lock, a casing, a locking plate and tumblers arranged within the casing, means for operating the tumblers, and a plate located between the locking plate and tumblers having a cam-shaped projection extending beyond the face of the tumblers acting as a starting point to assemble the tumblers.

3. In a combination lock, the combination of a casing, having a lengthwise central stud, tumblers arranged within the casing and supported upon the stud, an intermediate tumbler composed of three sections adjustable in connection with each other, a locking plate controlled by the tumblers, and means for operating the tumblers.

4. In a combination lock, a casing, tumblers arranged within the casing and means for operating the tumblers, the last tumbler having a series of concentrically arranged pins on its inner face.

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