T. FOX.

Permutation Padlock.

No. 198,596. Patented Dec. 25, 1877.

Fig. 1.

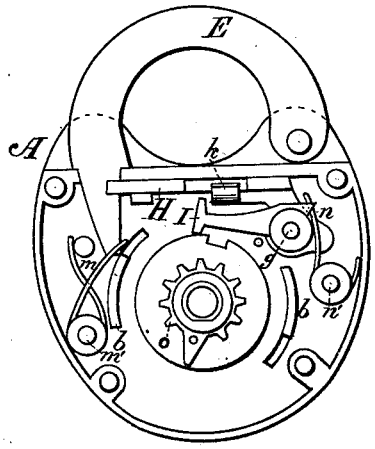

Fig. 2.

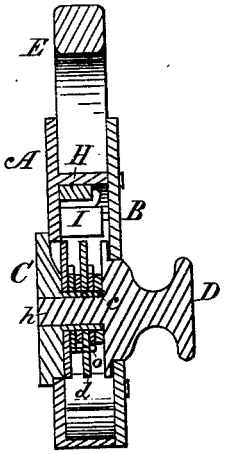

Fig. 3.

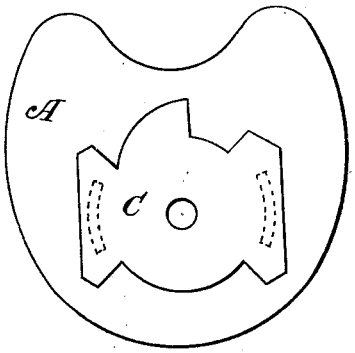

Fig. 4.

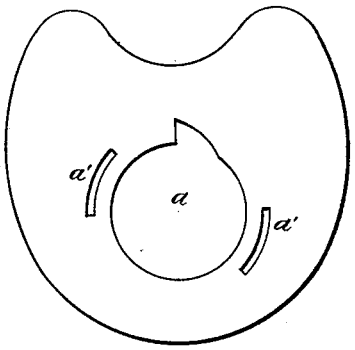

Fig. 5.

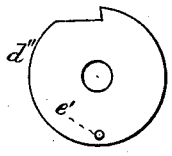

Fig. 6.

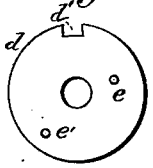

Fig. 7.

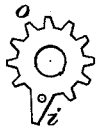

Fig. 8.

Attest:
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attys

UNITED STATES PATENT OFFICE.

THOMAS FOX, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR OF ONE-HALF HIS RIGHT TO JAMES JOSEPH FITZGERRELL.

IMPROVEMENT IN PERMUTATION-PADLOCKS.

Specification forming part of Letters Patent No. **198,596**, dated December 25, 1877; application filed November 6, 1877.

To all whom it may concern:

Be it known that I, THOMAS FOX, of New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Combination-Padlocks; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to that class of locks known to the trade as "combination padlocks," the object being to produce a perfect combination-lock, adapted by its peculiar construction and cheapness to be applied as the locking mechanism of a padlock; and the invention consists, first, in the means employed for securing the operating parts which form the combination to the case when the padlock is locked, and releasing them so that they may be removed when it is unlocked; and, secondly, in the construction of the change-wheels.

In the drawings, Figure 1 shows the interior of the lock, the front plate being removed. Fig. 2 is a longitudinal section through the hasp-bolt, operating-knob, its accompanying mechanism, and the case, showing the relative position of the various parts of the lock. Fig. 3 shows the back of the lock with the carrying-plate to which the rotating tumblers and change-wheels are attached. Fig. 4 exhibits the same part of the lock-case with the carrying-plate removed. Fig. 5 represents the drive-wheel attached to the spindle of the operating-knob. Fig. 6 is a side view of one of the rotating tumblers. Fig. 7 represents one of the change-wheels, and Fig. 8 shows one of the washers placed between each pair of change-wheels and rotating tumblers to prevent their impinging upon each other.

The case of this padlock is similar to those commonly used for this class of locks by manufacturers, consisting of a back case, having the sides and suitable studs cast thereon, to which the working parts of the lock, as well as the front plate, are attached. This case is represented in the drawings by the letter A, and is pierced with the large circular orifice *a*, for the passage of the operating parts attached to the carrying-plate C and concentric slots *a'*, through which the hooks *b*, by which the plate is secured to the case, pass. Projecting into the lock from the carrying-plate is a sleeve, *c*, upon which the rotating tumblers *d* revolve. These tumblers are circular in form and have a notch, *d'*, in their periphery for the reception of the bolt-carrying dog *i*. They are further provided with the pins *e* and *e'*, the first of which enters the space between the teeth of the change-wheels O, and the other acts as a driver by its contact with the tongue *i* of the change-wheel when the tumbler is rotated. These change-wheels O are of annular form, having a central orifice large enough to allow them to be slipped upon the sleeve *c*, and provided with teeth or cogs about their peripheries, between which the pin *e* of the tumblers passes. They have also an elongated tongue, *i*, against which the pin *e'* of the tumblers strikes when they are rotated.

In order to prevent one pair of tumblers and change-wheels from being turned by the friction of the adjacent pair when rotated, a washer, *s*, having a flat side or key way fitting to a corresponding flat side or key upon the sleeve *c*, is placed between them. Entering the sleeve from the front side of the lock is the spindle *h*, which projects from the operating-knob D, and forms the axis upon which the latter rotates. A driving-wheel, *d''*, is also attached to or formed upon the knob D, and rotates just within the front case B. It is provided with a driving-pin, *e*, which, as it is rotated, comes in contact with the tongue upon the first change-wheel of the series of change-wheels and tumblers which may be upon the sleeve, and the first tumbler communicates its motion to the second pair, and so on through as many pairs as may be employed in the lock.

Encircling the orifice in the front plate through which the operating-knob passes is the dial-plate, by which the movement of the knob is governed, as in the ordinary method employed in this class of locks.

Pivoted upon the standard *g*, which is attached to the sliding bolt H, is a dog, I, the front end of which is T-shaped, so that, when the bolt is pushed forward or locked, one part of the end shall pass behind the lug *k*, which

is fast to the case, and acts as a guide to the bolt, thus effectually preventing the pushing back of the bolt, while the opposite end of the T part of the dog rides upon the periphery of the rotating tumbler until the notches *d'* are all in juxtaposition, when it falls into them, thus withdrawing the opposite part of the dog from behind the lug *k*, and allowing the bolt to be withdrawn from its notch in the hasp by a further rotation of the knob. A spring, *m*, is coiled around the standard *m'*, one end of it being in such a position as to bear against the end of the hasp E when the latter is inserted in the lock, so as to throw it out the instant the bolt is withdrawn sufficiently to relieve it. Another spring, *n*, is coiled about the standard *n'*, and bears against the square rear end of the dog, causing the opposite end to bear steadily upon the periphery of the tumblers at all times, ready to fall into the notches the instant they are in line.

It will be observed that the lugs or projections *b* upon the carrying-plate C are hook-shaped, so that when the plate is in its proper position, and the hasp locked, the lugs will hook over the case A, and the end of the hasp will bear against one of the lugs *b*, so as to effectually prevent its retraction, thus securing all parts of the lock firmly in place, no matter what the position in which it may be turned.

The method of operating this lock is identical with that of others of its class, and therefore needs no detailed description; but its advantages may be summed up as follows: first, the method of attaching the change-wheels and tumblers to a removable plate, which can be readily taken out and the combination changed whenever it is unlocked; secondly, in securely fastening the removable plate and bolt whenever the locking has been accomplished; and, thirdly, in the construction of the change-wheels, which, while they retain their effectiveness, may be very cheaply produced by being cut with suitable dies from a sheet of metal of proper thickness.

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

1. The toothed change-wheel *o* herein described, provided with finger *i*, in combination with rotating tumblers provided with pins.

2. The removable plate C, provided with hooks *b*, in combination with the centrally-perforated and slotted case A and hasp E, all the parts being arranged so that in locking the hasp it shall bear directly upon the hook *b*, thereby preventing the rotation of the plate, substantially as and for the purpose specified.

In testimony whereof I have hereunto affixed my signature this 19th day of October, 1877, in presence of two witnesses.

THOMAS FOX.

Witnesses:
J. J. FITZGERRELL,
M. E. FITZGERRELL.