No. 724,207. PATENTED MAR. 31, 1903.

J. ROCHE.

PERMUTATION LOCK.

APPLICATION FILED DEC. 10, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1

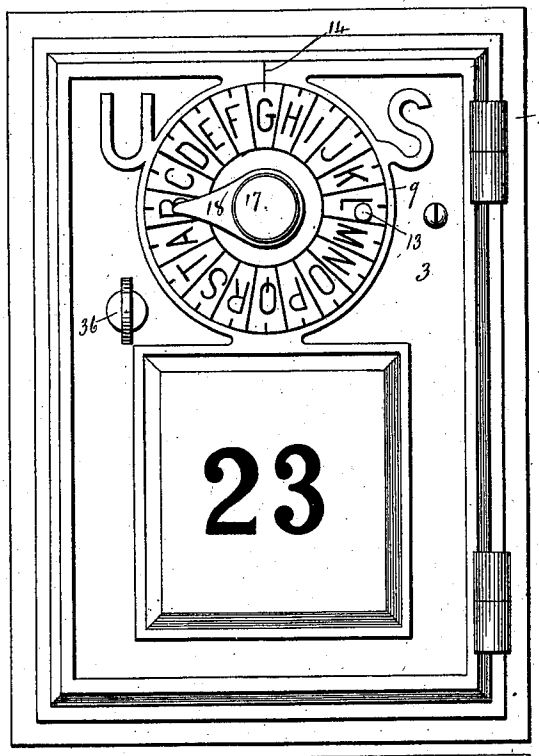
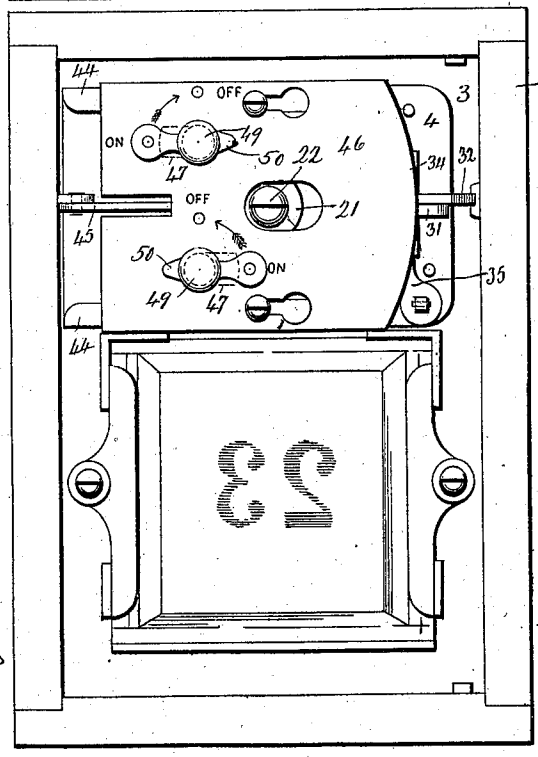


Fig. 2



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3

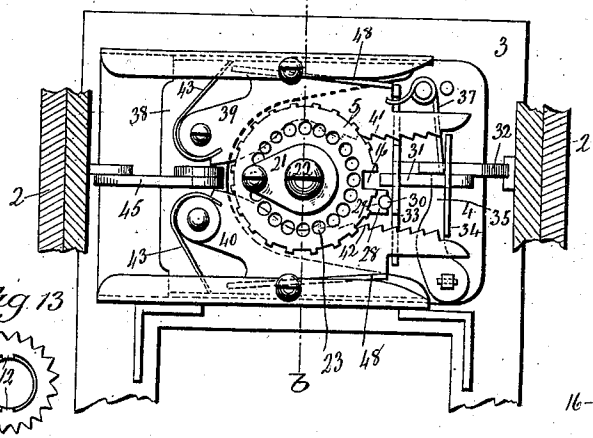


Fig. 12

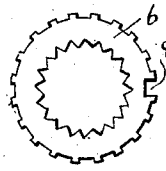


Fig. 13

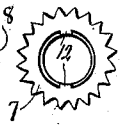


Fig. 6. Fig. 7

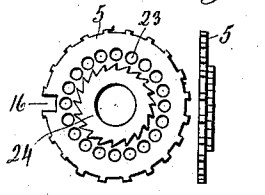


Fig. 4

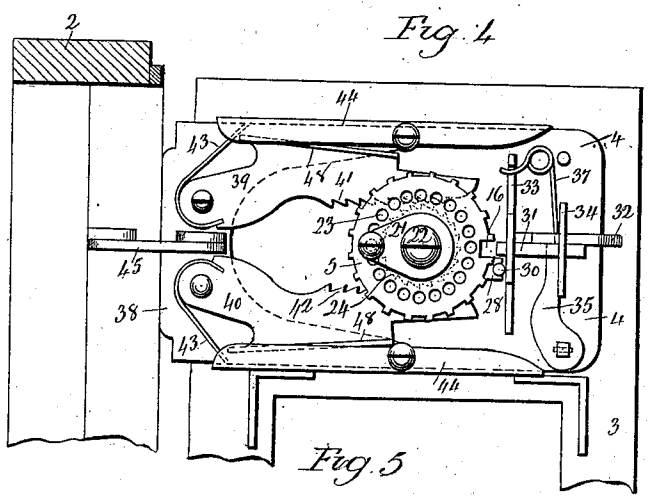


Fig. 5

Fig. 8. Fig. 9

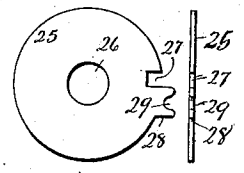


Fig. 10. Fig. 11

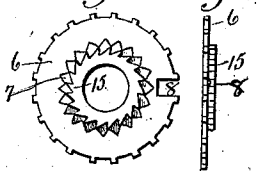


Fig. 16

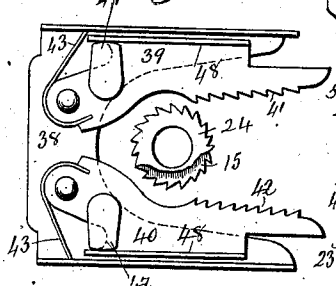


Fig. 15

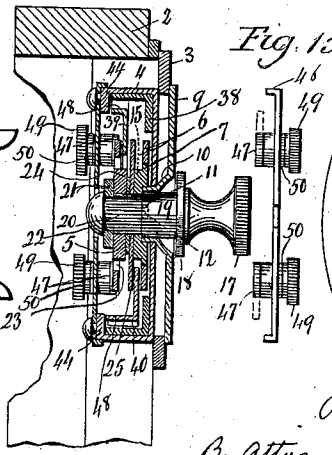
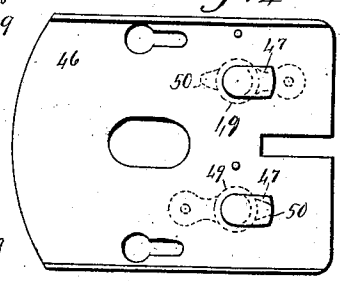


Fig. 14



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UNITED STATES PATENT OFFICE.

JAMES ROCHE, OF TERRYVILLE, CONNECTICUT, ASSIGNOR TO EAGLE LOCK CO., OF TERRYVILLE, CONNECTICUT, A CORPORATION.

PERMUTATION-LOCK.

SPECIFICATION forming part of Letters Patent No. 724,207, dated March 31, 1903.

Application filed December 10, 1902. Serial No. 134,722. (No model.)

To all whom it may concern:

Be it known that I, JAMES ROCHE, of Terryville, in the county of Litchfield and State of Connecticut, have invented a new and useful Improvement in Permutation-Locks; and I do hereby declare the following, when taken in connection with the accompanying drawings and the numerals of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a face view of a post-office-box door having my improved lock applied thereto; Fig. 2, an inside view thereof; Fig. 3, an inside view of my improved lock with the top or cap plate removed, the parts being in a closed position; Fig. 4, a similar view with the door in its open position; Fig. 5, a sectional view on the line *a b* of Fig. 3; Fig. 6, a plan view of one of the wheel-tumblers; Fig. 7, an edge view thereof; Fig. 8, a plan view of the intermediate disk; Fig. 9, an edge view thereof; Fig. 10, a top or plan view of a second wheel-tumbler; Fig. 11, an edge view thereof; Fig. 12, a plan view of the tumbler shown in Fig. 10 with the central portion removed; Fig. 13, a plan view of the central portion detached; Fig. 14, an inside view of the top or cap plate removed; Fig. 15, an edge view of the same; Fig. 16, a broken view indicating the racks as lifted out of engagement with the ratchets by the turn-buttons.

This invention relates to an improvement in permutation-locks, the object being to provide means to automatically turn the tumblers into a locked position when the door is being closed, and is an improvement on the invention set forth in United States Patent No. 555,336, granted February 25, 1896. Locks of this character, while applicable for many purposes, are intended and are largely used for post-office locks; but with locks like that shown in said patent if the user did not turn the tumblers the door was left in condition to be unlocked. To prevent this, I provide the tumblers with teeth, which engage with racks moved by the closing of the door, and so that as the door is closed the tumblers are turned to a locked position; and the invention also consists in certain details of construction and combinations of parts, as will be hereinafter described, and particularly recited in the claims.

As in my previous patent, I have shown my lock as applied to the front of a post-office box, which comprises a frame 2 and door 3 hinged thereto, and, as in the previous patent, the lock comprises a plate 4, which is secured to the inner face of the door 3. Upon the plate wheel-tumblers 5 and 6 are mounted, the tumbler 6 having a star-shaped removable center 7 and an unlocking-notch 8 in its outer edge. This tumbler is rotated through a dial 9 upon the face of the door, the dial being constructed with a central inwardly-projecting hollow hub 10, having notches 11 to engage with inwardly-projecting lugs 12 in the removable center 7, the dial being provided on its face with an operating-pin 13 and divided into sections, which are lettered or numbered to register with the index-mark 14 on the face of the door. The removable center 7 is made thicker than the outer portion of the tumbler 6, and a portion of the removable center projecting beyond the face of the tumbler 6 is formed with ratchet-teeth 15.

The tumbler 5, which is formed with an unlocking-notch 16, is operated by a knob 17, projecting through the dial 9 and carrying an index-finger 18, the outer end 19 of the knob-stem 20 being made angular to receive an arm 21, which is coupled to the tumbler 5 by means of a screw 22 in the end of the arm entering one of a series of holes 23 in the tumbler, this connection between the knob and the tumbler and the removable center 7 of the tumbler 6 permitting the combination to be changed. On one side of the tumbler 5 is a ratchet 24. Between the tumblers a disk 25 is arranged, having a central opening 26, through which the knob-stem passes, and formed in its outer edge with an unlocking-notch 27 and with an outward projection 28, having a notch 29 for engagement with a pin 30, mounted on the plate 4 and by which it is held against rotation, the notches 8, 16, and 27 adapted when in line to permit the entrance of the tail 31 of a latch-bolt 32, which is mounted for movement between guides 33 34,

mounted on the plate 4, and adapted to be thrown by a lever 35, mounted on the inner end of a key 36, which projects outward from the face of the door, the latch-bolt being normally thrown outward by a spring 37.

With the exception of the ratchets 15 and 24 the construction of the lock is like my previous one; but in order to positively turn the tumblers as the door is being closed I arrange a slide 38 upon the plate 4, and on this slide I mount racks 39 40, the rack 39 having teeth 41, which engage with the teeth 24 of the tumbler 5, while the rack 40 is provided with teeth 42, adapted to engage with the teeth 15 of the tumbler 6, the teeth of the racks and the ratchet being so cut that the teeth in the racks will move over the ratchets in one direction without operating them, but engage to positively operate them when moved in the other direction, the racks being normally held in engagement with the ratchets by springs 43. These racks are guided by flanges 44, turned over from the sides of the plate. The slide 38 is connected by a bowed link 45 with the frame 2 of the door and so that as the door is opened the slide will be moved rearward. As the slide moves rearward or as the plate is moved forward by the opening of the door, the teeth 41 42 ride freely over the ratchets 15 and 24; but as the door is closed the teeth 41 42 positively engage with the ratchets 15 and 24, and consequently rotate the tumblers and throw the locking-notches 8 and 16 out of line with the tail of the bolt, and this turning of the tumblers takes place every time the door is closed, so that it is necessary to set the combination, which is indicated by means of a dial and pointer, before the door can again be opened. By varying the teeth in the respective racks and tumblers the extent of movement caused by the closing of the door will be varied.

It will be evident without illustration that by reversing the inclination of the teeth of the racks and ratchets the tumblers may be turned by the opening movement of a door.

In some cases it may be desirable to relieve the lock of this automatic action, and for this purpose I mount in the top plate or cover 46 turn-buttons 47, adapted to engage with flanges 48 on the racks 39 40, and so that either one or both of the racks may be lifted out of engagement with the ratchets 15 and 24. These turn-buttons are provided with operating-knobs 49 and indicating-pointers 50, carried thereby, which show whether or not the racks are in engagement with the ratchets.

The operation of the lock will be clearly apparent from the foregoing description, and it will be understood that various changes may be made in the detailed construction of the lock without departing from my invention. I therefore do not wish to be understood as limiting myself to the exact details of construction shown, but hold myself at liberty to make such changes and variations therein as fairly fall within the spirit and scope of my invention.

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

1. In a permutation-lock, the combination with the tumblers thereof, of ratchets carried thereby, racks adapted to engage with said ratchets, and means connected with the door-frame for moving said racks, substantially as described.

2. A permutation-lock having a wheel-tumbler and a locking-notch therein, a ratchet carried by said tumbler, a rack having teeth adapted to engage with said ratchet, and connections between the rack and door-frame whereby said rack is adapted to be moved by the opening or closing of the door, substantially as described.

3. In a permutation-lock, the combination with the tumblers thereof, of ratchets carried thereby, a slide carrying racks having teeth adapted to engage with said ratchets, and connection between said slide and the door-frame, substantially as described.

4. In a permutation-lock, the combination with the case-plate, of tumblers mounted thereon, said tumblers having ratchets connected therewith, a slide in said case-plate, racks pivoted to said slide and provided with teeth for engagement with said ratchets, said slide connected with the door-frame, whereby it will be moved with relation to the case-plate upon the opening and closing of the door, substantially as described.

5. In a permutation-lock, the combination with the tumblers thereof, of the ratchets carried thereby, racks having teeth engaging with said ratchets, connection between said racks and the door-casing, whereby the racks will be moved by the opening and closing of the door, and means for throwing the racks out of engagement with said ratchets, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JAMES ROCHE.

Witnesses:
R. J. PLUMB,
OTIS B. HOUGH.