

J. J. MURPHY.
 PERMUTATION POST OFFICE LOCK.
 APPLICATION FILED JAN. 15, 1910.

988,649.

Patented Apr. 4, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

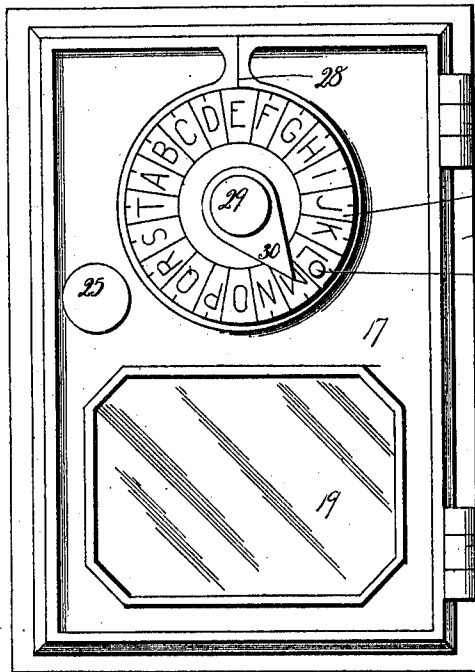


Fig. 5.

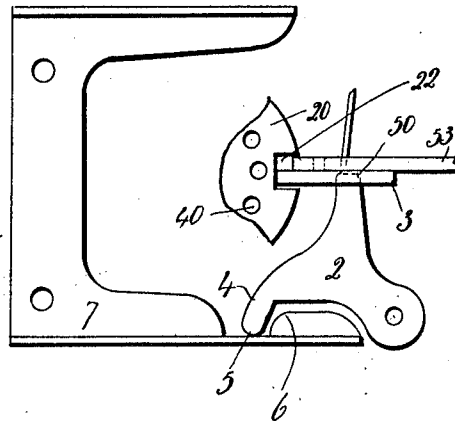
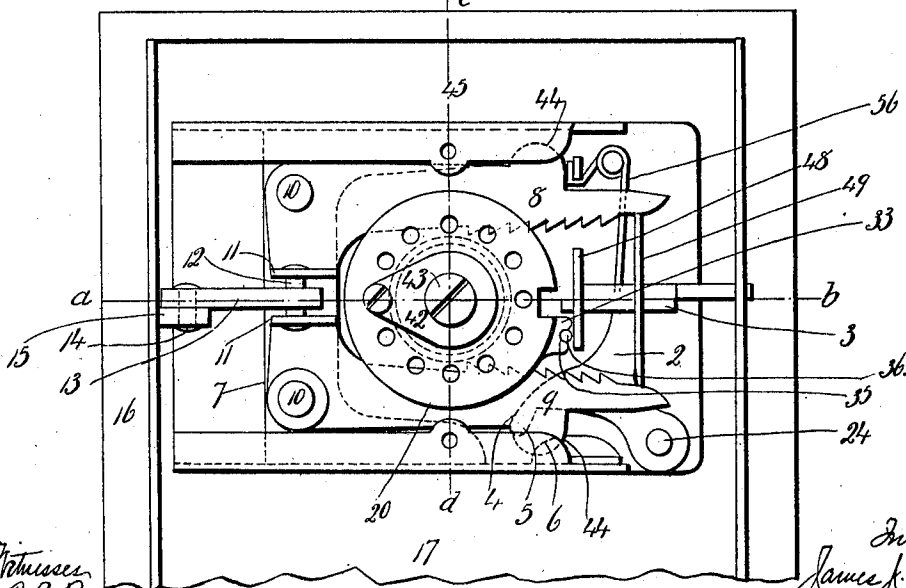


Fig. 2.



Witness
 C. J. Reed.
 C. L. Reed

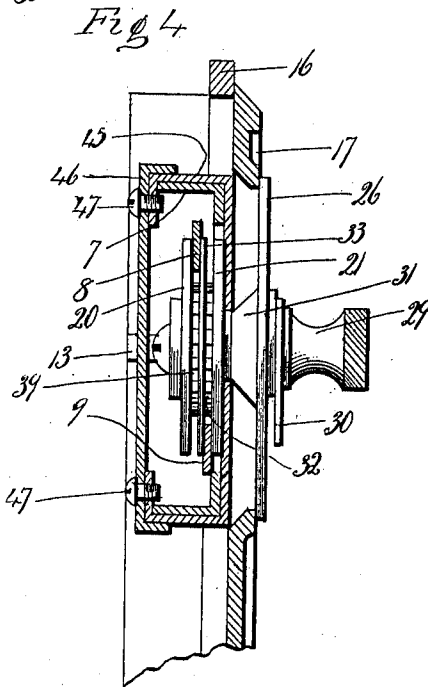
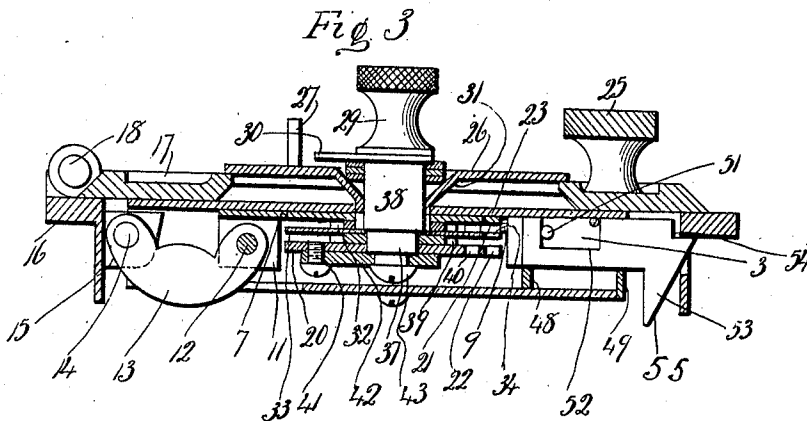
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2 SHEETS-SHEET 2.



Witnesses
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 C. L. Weed

Inventor
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 by Symon T. Carey
 Atty

UNITED STATES PATENT OFFICE.

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

PERMUTATION POST-OFFICE LOCK.

988,649.

Specification of Letters Patent.

Patented Apr. 4, 1911.

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To all whom it may concern:

Be it known that I, JAMES J. MURPHY, a citizen of the United States, residing at Terryville, in the county of Litchfield and State of Connecticut, have invented a new and useful Improvement in Permutation Post-Office Locks; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters 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 view in front elevation of a post-office lock constructed in accordance with my invention. Fig. 2 a broken view in inside elevation showing the lock on an enlarged scale, the lower portion of the door-frame being broken away, and the cap of the lock-mechanism being removed. Fig. 3 a view of the lock in horizontal section on the line *a—b* of Fig. 2. Fig. 4 a view of the lock in vertical section on the line *c—d* of Fig. 2, looking from right to left. Fig. 5 a detail view showing the train of parts by means of which the bolt is positively lifted out of the notches in the wheel-tumblers at the beginning of the opening of the door preparatory to the positive rotation of the tumblers for throwing off the combination.

My invention relates to an improvement in permutation post-office locks of the type shown and described in Patent No. 724,207 dated March 31, 1903, the object of my invention being to provide for the positive movement of the inner end of the bolt out of the alined notches of the wheel-tumblers at the very beginning of the opening of the door on which the lock is mounted and before the positive and automatic rotation of the tumblers to throw off the combination, whereby I avoid any injury to the lock which might occur from an attempt to throw off the combination before the bolt has been disengaged from the tumblers.

With these ends in view my invention consists in a post-office lock having certain details of construction and combinations of parts as will be hereinafter described and pointed out in the claims.

I may say at the outset of this description that inasmuch as my improved lock in its main features follows the lock of the patent above referred to, I will not describe

its parts with minute particularity except as relates to my present improvement.

In carrying out my invention as herein shown, the lever 2 by means of which the bolt 3 is operated, is provided with an inwardly extending arm 4 terminating in a rounded finger 5 which coacts with a cam 6 formed at the lower outer end of the box-like slide 7 upon which the racks 8 and 9 are pivoted by means of pivots 10. The said pivotal racks are formed at their inner ends with lugs 11 connected by a coupling-pin 12 also passing through the inner end of an operating-lever 13 the outer end of which is connected by a pivot 14 with a lug 15 formed upon the inner upright of the door-frame 16. By means of the train of parts just described, I provide for operating the lever 2 so as to move the bolt outward from left to right at the very beginning of the opening of the door 17 upon which the lock is mounted and which is itself hung in the frame 16 on hinges 18, the lower portion of the door being furnished in the usual manner with a glass panel 19 through which the contents of the post-office box may be inspected. I will also add that the said parts are constructed and timed so that the lever 2 is positively operated for the operation of the bolt 3 just prior to the operation of the racks 8 and 9 for turning the wheel-tumblers 20 and 21 for throwing off the combination, by which I mean the rotation of the wheel-tumblers so as to carry their respective notches 22 and 23 out of alinement so as to prevent the door 17 from being closed without throwing off the combination since if that were to occur, the post-office box might be surreptitiously opened without recourse to the combination on which it is set.

The bolt-operating lever 2 is mounted upon the inner end of the stem 24 of a bolt-knob 25 mounted in the door 17 and projecting from the front thereof, being located close to the rotatable dial 26 which is furnished with an operating-pin 27 by means of which it is turned to the right or left as may be required to bring the letters arranged in circular series upon it into registration with an index mark 28 in the center of the top of the door. In the center of the dial 26 I mount a knob 29 which, although it is rotatable independently of the dial, I shall call the dial-knob for conven-

ience in distinguishing it from the bolt-knob 25. The said dial-knob 29 is provided with an index-finger 30 which, as the knob is rotated, is swept over the letters on the dial 26. The said dial 26 is formed with an inwardly extending hub 31 upon which the wheel-tumbler 21 is mounted in the usual manner. The said wheel-tumbler 21 is provided upon its inner face with a ratchet-wheel 32 which coacts with the teeth of the longitudinally movable rack 9, before mentioned, for the automatic rotation of the wheel-tumbler 21 in throwing the combination off. Against the ratchet-wheel 32 I place a thin spacing-washer 33 having a clearance-notch 34 corresponding to the notches 22 and 23 in the wheel-tumblers 20 and 21, and receiving the inner end of the said bolt 3 when the same enters the said notches 22 and 23. The said washer is itself held against rotation by being provided with an offset having a notch 35 which receives a stop-pin 36. The other wheel-tumbler 20 is mounted to turn loosely upon a shoulder 37 at the inner end of the stem 38 of the dial-knob 29, the said wheel-tumbler 20 carrying a ratchet-wheel 39 corresponding to the ratchet-wheel 32 before mentioned, and being engaged with and operated by the upper longitudinally movable rack 8, whereby as the rack is moved longitudinally, the tumbler 20 is automatically rotated in throwing the combination off. These racks 8 and 9, also have radial movement toward and away from the ratchet-wheels 32 and 39 as will be described later on. The wheel-tumbler 20 is formed with a circular series of permutation holes 40 receiving a pin 41 mounted in the end of a permutation-lever 42 non-rotatably mounted upon the extreme inner end of the stem 38 of the dial-knob 29, the lever 42 being secured to the squared end of the stem 38 by means of a short screw 43. It will be understood from the foregoing that the wheel-tumbler 21 is set by the rotation of the dial 26, and that the wheel-tumbler 20 is set by the manual rotation of the dial-knob 29.

On account of the character of the connection of the pivotal racks 8 and 9 with the door-frame 16, the toothed ends of the racks are swung inwardly toward the ratchet-wheels 32 and 39 when the door 16 is opened so as to effect the engagement of the racks at the proper time with the said ratchet-wheels. On the other hand, when, to close it, the door 17 is swung toward the frame 16, the racks will be thrown outward away from the ratchet-wheels 32 and 39 so as to leave them, and hence the wheel-tumblers 20 and 21 free to be rotated by the dial 26 and the dial-knob 29. The racks 8 and 9 are provided, as shown, with stop-lugs 44 for limiting the outward movement of the racks by engaging with the inner faces of

the upper and lower flanges of the box-like slide 7 which is mounted for longitudinal movement in a lock-frame or case 45 which is fixed to the back of the door 17 of the lock. A cap 46 secured to the frame or case 45 by screws 47, incloses the operative parts of the lock-mechanism.

The bolt 3 aforesaid passes at its ends through parallel plates 48 and 49 arranged at a right angle to it, and mounted in the frame 45, the bolt having a notch 50 for the reception of the upper end of the bolt-operating lever 2. A projection 51 upon the upper face of the bolt 3 enters a notch 52 formed in the latch-bolt 53 the outer end of which is formed with a notch 54 for its engagement with the outer upright of the door-frame 16 and which is also formed with a beveled wing 55 whereby the latch-bolt 3 is retired against the tension of its spring 56 for the snapping of the latch-bolt into engagement with the door-frame as the door is closed. Under this construction the latch-bolt 3 is always retracted with the bolt proper 2 but has movement independent thereof, as described, for the discharge of its latching function.

Having now described in a detailed way the parts of my improved lock, I will briefly set forth its operation.

Supposing the dial 26 and dial-knob 29 to have been operated as required to bring the notches 22 and 23 in the wheel-tumblers 20 and 21 into alinement with the inner end of the bolt 3, the said bolt may be shot inward for the retraction of the latch-bolt 53 by turning the bolt-knob 25, whereby the door is unlocked. Now as the door is opened, the bolt-operating lever 2 will be positively swung from right to left so as to positively retract the inner end of the bolt 3 from the notches 22 and 23 in the wheel-tumblers 20 and 21, by the cam 6 of the box-like slide 7 which will begin to move longitudinally at the very beginning of the opening of the door owing to the connection of the slide with the racks 8 and 9 which in turn are connected with the door by means of the lever 13. Therefore even if the user of the lock should fail to release his grip upon the knob 25 at the time he begins to open the door, despite his grip the knob will be turned in his fingers so as to permit the bolt 3 to be shot out of the notches in the wheel-tumblers, positively by the very act of opening the door itself. After this function of unlocking the wheel-tumblers has taken place, the racks 8 and 9 being properly timed, will swing inward for engagement with the ratchet-wheels 32 and 39 for positively rotating the wheel-tumblers so as to throw the combination off, this being done in the lock at present under description during the opening of the door rather than during the closing of the door as in the lock of

Patent No. 724,207 before referred to. By thus providing at the very beginning of the opening of the door of the lock, for unlocking the wheel-tumblers from the bolt prior to rotating them for throwing the combination off, I prevent the breakage or derangement of the parts of the lock which might otherwise happen owing to an effort to turn the wheel-tumblers to throw the combination off before their disengagement from the bolt. Just as soon, of course, as the wheels have been turned and the combination has been thrown off, all danger of the reëtrance of the bolt 3 into the locking-notches 22 and 23 has passed.

I claim:—

1. In a permutation lock, the combination with the bolt thereof, of a bolt-knob, wheel-tumblers notched for the reception of the bolt, means for positively retracting the bolt from the notches of the tumblers at the beginning of the opening of the door to which the lock is applied, the knob being also positively turned at the same time by the said retracting means, and means for turning the said tumblers to throw their notches out of alinement after the positive retraction of the bolt therefrom.

2. In a permutation lock, the combination with the bolt thereof, of a bolt-knob, wheel-tumblers notched for the reception of the bolt, means for positively retracting the bolt from the notches of the tumblers, the knob being positively turned by the said means concurrently with the retraction of the bolt from the said notches, and racks for turning the tumblers to throw their notches out of alinement as soon as the bolt has been retracted from the said notches.

3. In a permutation post-office lock, the

combination with the door and door-frame thereof, of a bolt, a bolt-knob, wheel-tumblers notched for the reception of the said bolt, an operating-lever connected at one end with the door-frame, a connection between the other end of the said lever and the bolt, whereby at the beginning of the opening of the door the bolt is positively retracted from the said notches in the wheel-tumblers, and means for turning the tumblers to throw their notches out of alinement as soon as the bolt has been retracted from the said notches.

4. In a permutation post-office lock, the combination with the door and door frame thereof, of a bolt, a bolt-knob, wheel-tumblers notched for the reception of the said bolt, a lever for operating the bolt, a box-like slide coacting with the said lever for operating the same in positively retracting the bolt from the notches in the wheel-tumblers and at the same time positively turning the bolt-knob, racks pivotally connected with the said slide and turning the said wheel-tumblers for throwing their notches out of alinement, and a connection between the said racks and the said door-frame, whereby, as the door is opened, the said lever is operated for positively retracting the bolt from the notches in the wheel-tumblers after which the racks are operated for turning the tumblers to throw their notches out of alinement. In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

JAMES J. MURPHY.

Witnesses:

OTIS B. HOUGH,
C. W. PLUMB.