Dec. 16, 1924. 1,519,159

W. R. NECKERMAN

COIN CONTROLLED LOCK

Filed Feb. 16, 1922 2 Sheets-Sheet 1

FIG. I.

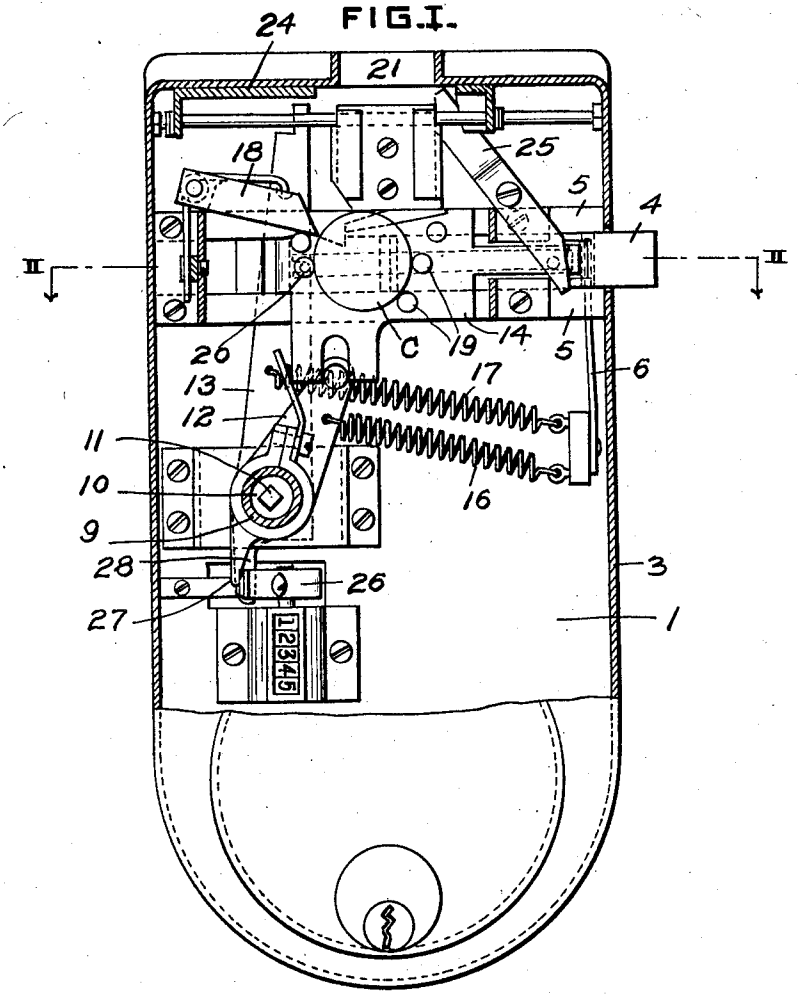
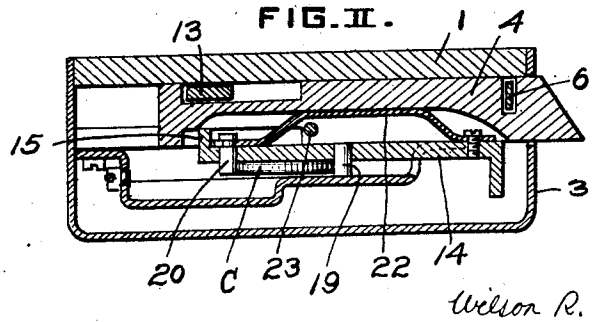


FIG. II.



INVENTOR

Wilson R. Neckerman

by Christy and Christy

his attorneys

WITNESSES

J. Hobart Bradley

Harold J. Donnason

Dec. 16, 1924. 1,519,159

W. R. NECKERMAN

COIN CONTROLLED LOCK

Filed Feb. 16, 1922 2 Sheets-Sheet 2

FIG. III.

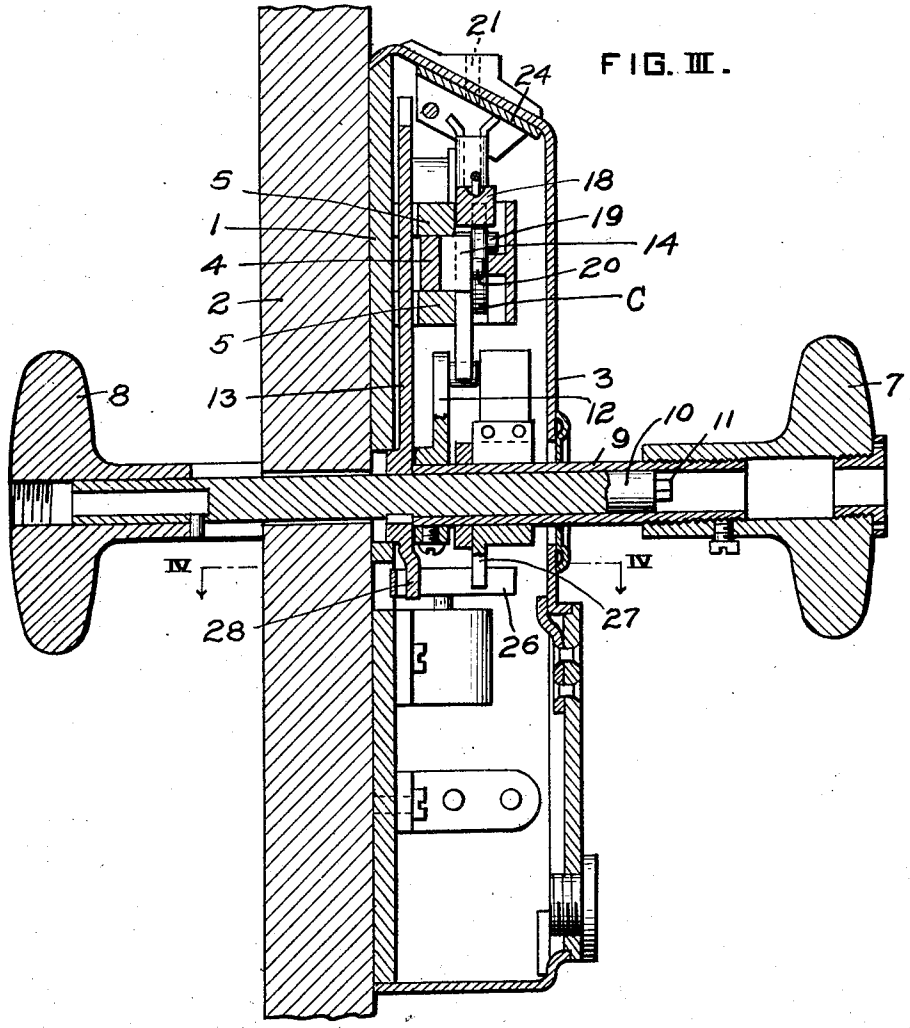
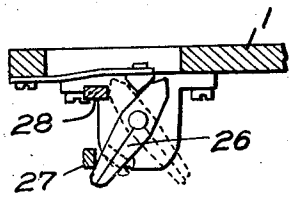


FIG. IV.



WITNESSES

J. Hobart Bradley.

Francis J. Donahoe

INVENTOR

Wilson R. Neckerman

by Christy and Christy

his attorneys

Patented Dec. 16, 1924. 1,519,159

UNITED STATES PATENT OFFICE.

WILSON R. NECKERMAN, OF PITTSBURGH, PENNSYLVANIA.

COIN-CONTROLLED LOCK.

Application filed February 16, 1922. Serial No. 536,878.

To all whom it may concern:

Be it known that I, WILSON R. NECKERMAN, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Coin-Controlled Locks, of which improvements the following is a specification.

My invention relates to coin-controlled locks, such as are now widely used on the doors of public toilet rooms; it consists in improvements upon the general structure described and claimed in the specification of Letters Patent of the United States No. 1,341,433, granted me May 25, 1920.

The invention is illustrated in the accompanying drawings. Fig. I is a view in vertical section through the casing, showing in elevation the parts contained within; Fig. II is a view in horizontal section, on the plane indicated by the line II—II, Fig. I; Fig. III is a view in vertical section through the lock, on a plane at right angles to that of Fig. I, and a plane in which the axis of the knob shafts lies. Fig. III shows the lock applied to a door. Fig. IV is a fragmentary view in section, on the plane indicated at IV—IV, Fig. III.

In the use of locks of this sort as now commonly made, if the user, having inserted his coin and turned the knob, happens to release the knob again before swinging the door, the door is locked again and his coin is lost to him. The structure of the lock of my present invention overcomes this disadvantage. In the improved lock which I am about to describe, after the coin has been introduced and so long as the door remains closed the knob may be turned and released and turned again as often as the user will, and with each turning the bolt will be slid to unlocking position and upon each release the bolt will return to locking position. It is only a shifting of the bolt independently of the outer knob (as occurs when the door is allowed to slam shut) which releases a previously introduced coin and prepares the lock for a second operation.

The lock as shown in the drawings is contained in a casing which consists of a mounting plate 1 adapted to be attached to a door 2, and a cover 3 attached to the mounting plate.

The locking mechanism consists primarily of a locking bolt 4 adapted to slide between guides 5 to and fro between its two essential positions, sufficiently designated as locking position and unlocking position. Bolt 4 is normally held in locking position by a spring 6; its outer end is bevelled in familiar manner as appears in Fig. II. The movement of the bolt is ordinarily easy and the tension of the spring is light, these being features which conditions of service dictate.

The inner and outer knobs 7 and 8 are carried on shanks or shafts 9 and 10. These shafts are axially aligned, and conveniently the shaft 9 of the outer knob is a hollow shaft and the shaft 10 of the inner knob extending within turns freely within shaft 9. The shaft of the inner knob is accessible from the outside, that a key introduced through an opening in the outer knob and through its hollow shaft may be applied to the shaft of the inner knob to turn it. The outer end of the shaft 10 of the inner knob is formed with a seat for such a key, as indicated at 11. This feature is fully explained in my earlier patent alluded to.

The two knob shafts 9 and 10 carry integrally each a crank arm. The crank arm carried by the shaft of the outer knob is indicated at 12, that carried by the shaft of the inner knob, at 13. The latter, the crank arm extending from the shaft of the inner knob, is adapted at proper time to bear directly upon the bolt 4 and by the turning of the inner knob to shift the bolt 4 from locking to unlocking position. It will be seen in Fig II that the arm 13 extends through a recess formed in the inner vertical face of the bolt 4, and that the parts are so shaped and arranged that a movement of the arm 13 from right to left, as viewed in Fig. II, consequent on the turning of the knob shaft 10 anti-clockwise, as viewed in Fig. I, will effect the right to left shifting of locking bolt 4 against the tension of spring 6.

The crank arm 12 which extends from the shaft of the outer knob also engages bolt 4 to shift it, but the engagement is not immediate. A slide 14 overlies the outer vertical face of bolt 4, and it is this slide which crank arm 12 immediately engages, as clearly appears in Figs. I and III. The slide 14 is provided with an extension 15 which enters a recess formed in

the outer vertical face of locking bolt 4, and the parts are so shaped and arranged that shifting of slide 14 from right to left, as viewed in Fig. II, consequent on the turning of the knob shaft 9 anti-clockwise, as viewed in Fig. I, will effect unlocking movement of bolt 4 against the tension of spring 6.

Two springs 16 and 17 anchored in mounting plate 1 engage severally the two crank arms 12 and 13 and normally hold the crank arms at the limit of clockwise turning, as viewed in Fig. I, and when both arms are in this position, the bolt 4 is freely responsive to the tension of spring 6 and stands in the locking position shown in Figs. I and II.

As best seen in Fig. II, when the knobs and their connections are in the inactive positions last considered the extension 15 from slide 14 stands remote at a slight space to the right from the surface of bolt 4 upon which in operation it bears in shifting the bolt to unlocking position. As appears in Fig. I, a spring-backed detent 18 resting at its tip upon the upper surface of slide 14 stands ready by engagement with a notch formed in the slide to arrest after slight movement further right to left movement of the slide.

Slide 14 is provided on its outer vertical face with a plurality of pins 19, 20, adapted to sustain between the face of the slide and an over-extending stationary guard plate a coin of suitable size introduced through the slot 21 formed in casing 3 above. Figs. I and II show a coin C in position in slide 14. The edge of detent 18 is wider than the edge of slide 14, and is adapted to be engaged by the edge of a coin when in place as indicated at C in the drawings.

So long as no coin is introduced the effort to turn the outer knob of the lock will be resisted by engagement of detent 18 with the notch in the upper edge of slide 14 and this engagement is effective after but a slight movement of slide 14 and before bolt 4 is shifted from locking position. When a coin has been introduced and has come to the position shown in the drawings, turning of the outer knob brings the edge of the coin into engagement with edge of detent 18 and while slide 14 is moving through the interval noted above and shown in Fig. II the coin is lifting the detent from notch-engaging position. Consequently the turning of the knob and the withdrawal of the locking bolt are now unresisted. The features thus far described are found, all of them, in my earlier patent, already named.

The lock of that earlier patent is so constructed that the full right to left shift of slide 14 which unlocks the door effects automatic release of the coin, so that when once the outer knob has been turned and released it can not again be turned until another coin has been introduced,—and that, in the course of normal operation, can not be accomplished until after the inner knob has in sequence been turned. It follows that a user of a toilet equipped with that lock, if after turning he happens to let the outer knob slip before opening the door, finds that be must call an attendant with a master key to help him out of difficulty.

In the lock now under explanation the right to left traverse of slide 14 under the turning force from the outer knob does not automatically release the coin. To the contrary, the coin once introduced remains in place, and is normally dislodged only by a subsequent movement in the cycle of operation; so that until that next movement transpires, the outer knob may be turned and released and turned again without hindrance.

The coin is released from its position in slide 14 on the shifting of locking bolt 4 from locking to unlocking position while slide 14 stands in the inactive position shown in Figs. I and II, and it is released in no other manner. One of the coin-sustaining pins which extend from the face of slide 14, the pin designated in the drawings as 20, is retractible from its normal position, and means are provided whereby the sliding of bolt 4 to unlocking position while the slide 14 remains in its normal right-hand position, as shown in Fig. II, effects such retraction. These means are found in a strap spring 22 anchored in slide 14, and carrying at its outer end the pin 20, and in a pin 23 borne in bolt 4 and extending vertically across the recess formed in its outer vertical face. The strap spring and the pin are so shaped and arranged that so long as bolt 4 and slide 14 move in unison there is no interaction between these parts; but if, while slide 14 remains in its normal inactive position (that shown in Fig. II), bolt 4 be shifted from locking to unlocking position (from right to left, Fig. II), pin 23, bearing upon the extended and obliquely disposed length of spring 22, will deflect it and effect withdrawal of pin 20. When pin 20 is withdrawn a coin resting upon pins 19 and 20, as shown in Fig. I will be released and will fall to its ultimate receptacle in the bottom of the casing. Pin 20 will be restored to its extended and coin-sustaining position as soon as bolt 4 returns to its normal position relative to slide 14.

Operation may be traced briefly. The lock is shown in the figures in its normal position,—the position in which the user approaches it. It may be understood that the extended locking bolt 4 is then holding the door which carries it locked. The user drops the proper coin through slot 21

and it descends and takes the position indicated at C. When this has been done the user may turn the outer knob, unlocking the door, and he may then enter through the door into the toilet room or whatever place it may be, to which the door opens. If after turning the outer knob the user, not having yet opened the door, happens to release the knob from his grasp both bolt 4 and knob 7 will return to initial position, but coin C will still remain in place in slide 14, and the knob may be turned again, just as before. The user opens the door, releases his hold on knob 7, and passes through the door, closing the door or allowing the door to close behind him. Immediately he releases the knob, the parts will resume the positions shown. When thereafter the door closes the bolt 4 will by engagement of its beveled end with the plate in the door jamb slide independently of the slide 14 from extended to retracted or unlocking position, and then, as soon as the door is fully closed it will spring out again to locking position. This independent sliding of the bolt will release the coil. Thereupon the outer knob ceases to be effective to unlock the door. When the occupant of the room goes out again he turns the inner knob, unlocks the door, opens it and passes out. The door shuts again (ordinarily under spring tension) and the lock is then in its initial position again.

Accessory apparatus may be briefly indicated. A shutter 24 for slot 21 closes the slot the first time the outer knob is turned and remains closed until the inner knob is turned. Closing movement is effected from slide 14 through lever 25; opening movement by direct bearing of crank arm 13 upon the body of the slide.

Operation of the tally is effected through the swinging of a beam 26 (cf. Figs. III and IV), first in one direction, then in the other. It is swung anti-clockwise (Fig. IV), to drive the tally, by the initial turning of the outer knob, through the crank arm 27 borne integrally by shaft 9; it is swung clockwise, to restore it to initial position by the subsequent turning of the inner knob, through the crank arm 28 borne integrally by shaft 10.

I claim as my invention:

In a coin-controlled lock the combination of a bolt movable between locking and unlocking positions, a slide movable in parallelism with said bolt, interconnection between the two members whereby the bolt may be moved from locking position to unlocking position in response to movement of the slide or may be so moved while the slide remains stationary, a latch normally restraining the slide from bolt-unlocking movement, a coin-sustaining pin borne by said slide and retractible and extensible, means borne by said bolt for retracting said pin, a rotatable knob, and operative connection between knob and slide, the said parts being so coordinated that when a coin rests on said coin-sustaining pin knob turning will (through the coin) effect removal of said latch and consequent bolt shifting movement of the slide, while shifting of the bolt independently of the slide will effect retraction of said coin-sustaining pin, substantially as described.

In testimony whereof I have hereunto set my hand.

WILSON R. NECKERMAN.

Witnesses:

BAYARD H. CHRISTY.

FRANCIS J. TOMASSON.