June 9, 1953 W. W. DENNIN 2,641,347

COIN CONTROL LOCK MECHANISM

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Fig. 1.

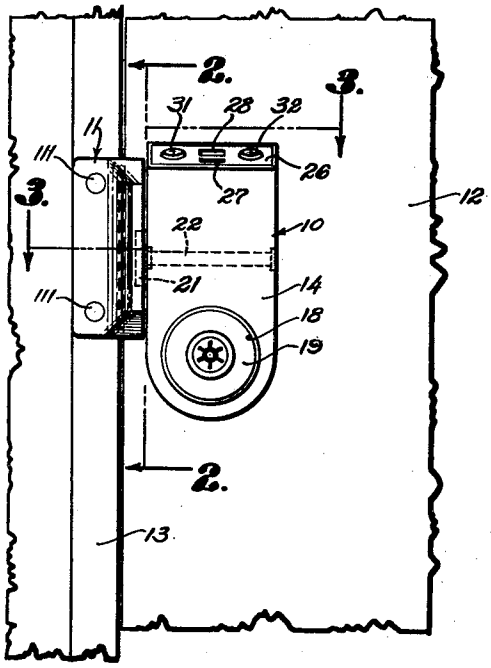
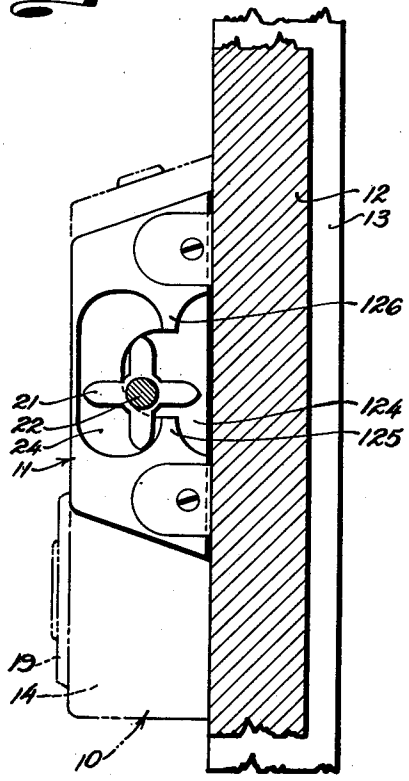


Fig. 2.



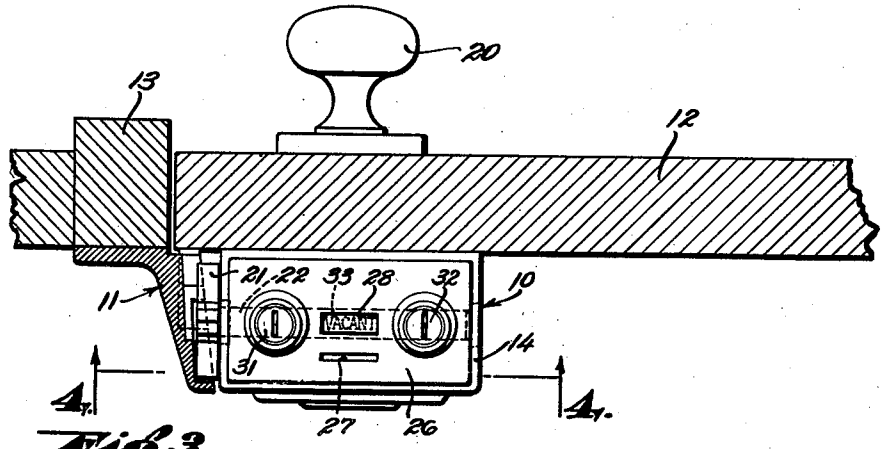


Fig. 3.

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COIN CONTROL LOCK MECHANISM

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Fig. 4.

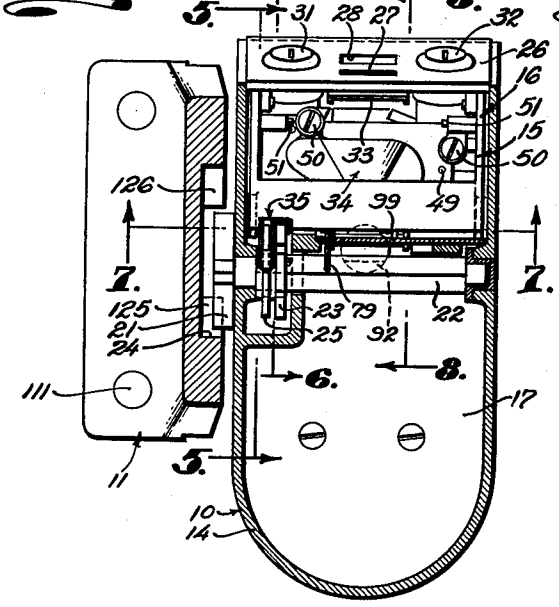
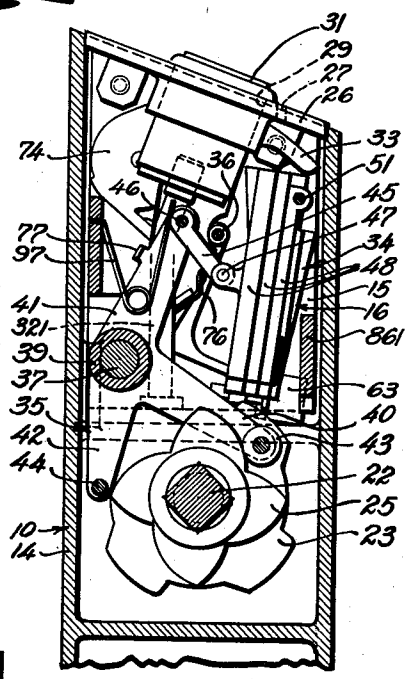


Fig. 5.



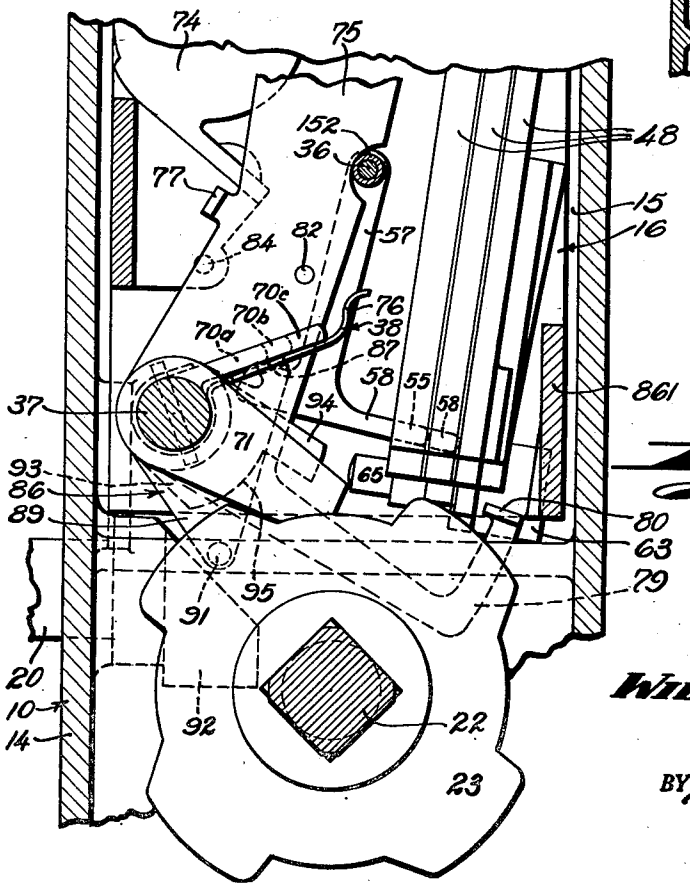


Fig. 6.

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June 9, 1953 W. W. DENNIN 2,641,347

COIN CONTROL LOCK MECHANISM

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Fig. 1.

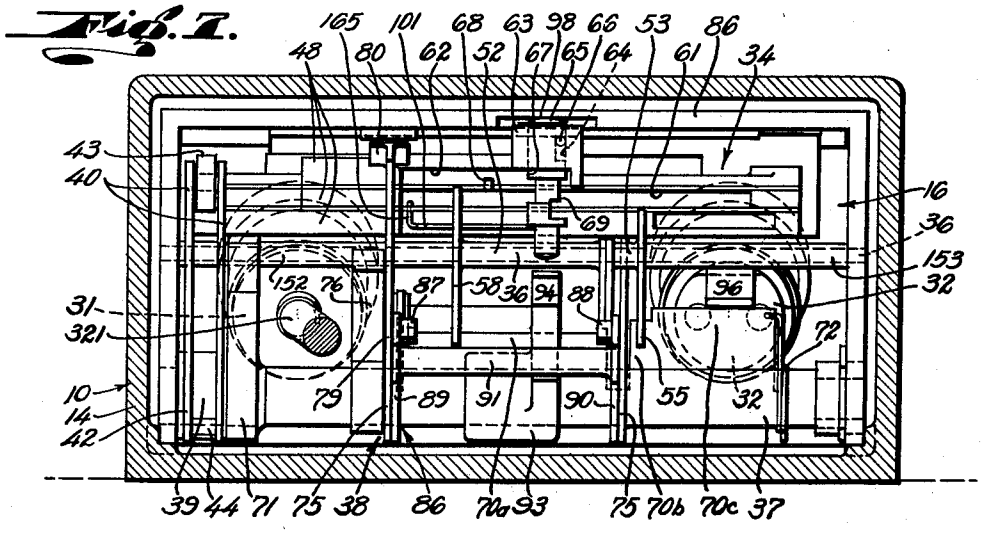


Fig. 8.

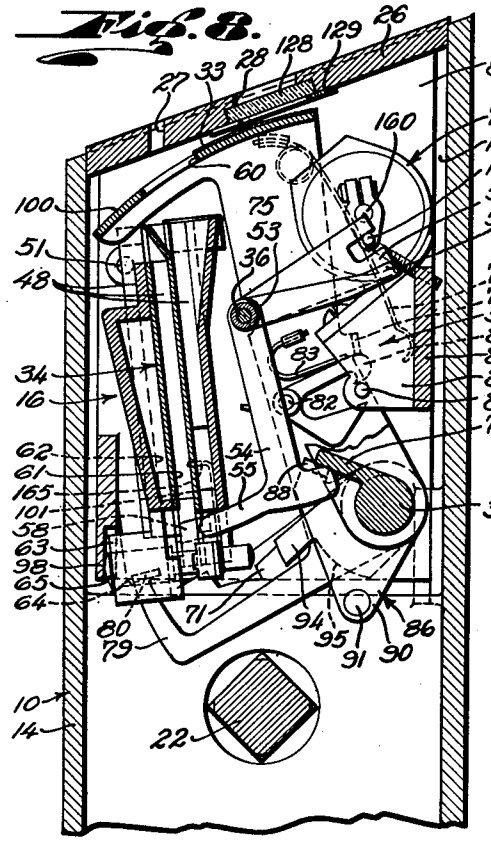
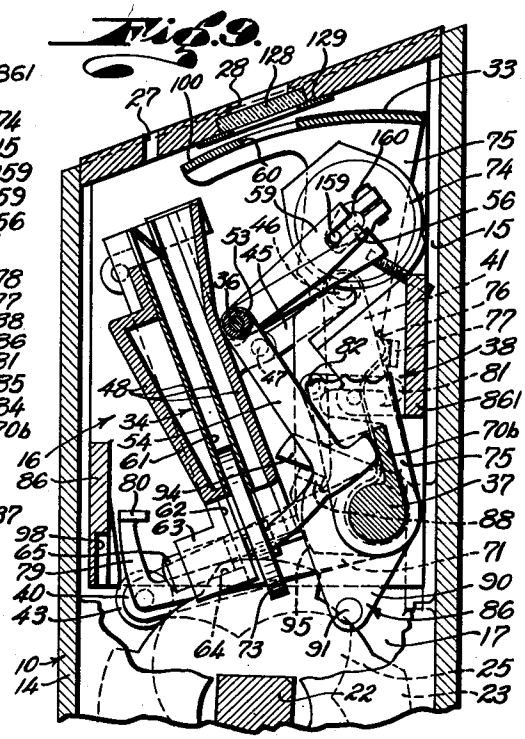


Fig. 9.



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Patented June 9, 1953

2,641,347

UNITED STATES PATENT OFFICE

2,641,347

COIN CONTROL LOCK MECHANISM

William W. Dennin, Long Beach, Calif., assignor to Denmil Supply Company, Los Angeles, Calif., a corporation of California

Application April 9, 1948, Serial No. 19,933

21 Claims. (Cl. 194—65)

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This invention relates to improved door locks of the type in which the unlocking operation is controlled by the insertion of a coin. Locks embodying the present invention are characterized by their ease of operation, mechanical simplicity, and certain novel features which render them particularly adapted for use in public rest rooms.

To unlock a conventional coin controlled door lock from the outside, it is necessary to carry out the three step process of inserting a coin, manipulating an outside operator such as a knob, and opening the door. The present invention greatly simplifies this process by providing a lock in whose operation the second of the above steps becomes unnecessary, as the result of a novel arrangement which entirely eliminates the use of an outside operator. In a lock constructed according to the present invention, the mere insertion of a proper coin serves to place the control mechanism in such a condition that the door may be easily opened without any additional operation.

In the preferred form of the invention, the initial opening movement of the door itself supplies the unlocking motion which would otherwise have to be separately applied through an outside operator. For this purpose, I prefer to employ a rotary type bolt capable of disengagement from its keeper to permit opening of the door only by rotation. When the door is locked, such rotation is limited, by suitable latching means, to an amount less than that required for disengagement of the bolt and keeper. This, of course, permits slight opening movement of the door at all times, but normally that movement has no effect on the bolt latching means. After insertion of a proper coin, the control mechanism is so conditioned that the defined slight opening movement is sufficient to release the latch which previously limited rotation of the bolt and allow escape of the bolt from its keeper. The above limited movement also serves to reject any slug or improper coin having a central opening.

Desirably, I provide an operating mechanism movable at all times in response to the permitted rotation of the bolt but normally ineffective to release the bolt latch to permit opening of the door. The design may be such that an inserted coin comes to rest at a predetermined location in which its presence causes the defined permitted movement of the operating mechanism in response to slight opening of the door, to release the bolt latch and allow the door to be completely opened.

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The present invention also includes an easily removable unitary control assembly which may be withdrawn from the lock housing for replacement by the release of a single retaining means. In the preferred form, this retaining means comprises a key controlled hold down bolt, the use of which prevents access to the mechanism without the air of a key. In addition, the lock housing may be compartmented in such a manner as to prevent removal of previously deposited coins without the opening of an additional locked vault door.

Novel key operated means are provided for permitting release of the lock without the insertion of a coin and also to allow reading of a counter which records the number of coins deposited.

The conventional door lock of this type is operable after the insertion of a single predetermined type of coin, most locks being designed to receive nickels and some to receive dimes. The present invention represents an advancement over such a device in providing a lock which may be opened after the insertion of any one of two or more types of coins.

The above and further features and objects of the present invention will be more clearly understood from the following detailed description of the preferred embodiment illustrated by the accompanying drawings, in which:

Fig. 1 is a front elevation of the lock and keeper;

Fig. 2 is an enlarged vertical section taken on line 2—2 of Fig. 1;

Fig. 3 is an enlarged section taken on line 3—3 of Fig. 1, showing the bolt assembly, door, and inside operating knob in plan elevation;

Fig. 4 is a vertical section through the bolt housing and keeper taken on line 4—4 of Fig. 3;

Fig. 5 is an enlarged fragmentary vertical section taken on line 5—5 of Fig. 4;

Fig. 6 is an enlarged fragmentary vertical section taken on line 6—6 of Fig. 4;

Fig. 7 is an enlarged horizontal section through the bolt housing taken on line 7—7 of Fig. 4;

Fig. 8 is an enlarged fragmentary vertical section taken on line 8—8 of Fig. 4, showing the mechanism in normal position; and

Fig. 9 shows the mechanism illustrated by Fig. 8 in the displaced position which occurs while the door is being opened after insertion of a coin.

Referring to Fig. 1, the invention comprises a bolt assembly, generally indicated at 10, and a keeper 11. The bolt assembly is borne by the door

12 whose operation is to be controlled, and the keeper is secured to the door frame 13 at a point opposite the bolt. The bolt assembly is contained within a housing 14, which is divided interiorly by a partition 99, see Fig. 4, into an upper chamber 15 for the reception of the coin operated control mechanism generally indicated at 16, and a lower chamber or box 17 for the reception and retention of coins. The lower chamber is accessible for removal of coins through opening 18, which is closed by key controlled door 19. The lock requires no outside operator, but employs an inner knob 20 which may be turned to unlock the bolt and permit opening of the door irrespective of the condition of the control mechanism.

Cruciform bolt 21 is carried on the keeper side of housing 14 for engagement with the recesses of the keeper and is rotatable with shaft 22 to which it is rigidly secured. Shaft 22 bears, within the housing, a ratchet wheel 23 which is normally retained against rotation by dog or latch 71 of the coin controlled mechanism 16 to also prevent rotation of the shaft and bolt 21. When the bolt is thus prevented from rotating, the interengagement of its then depending finger with lug 125 of the keeper acts as a lock to prevent opening the door. A multiple lobed cam 25 is also carried by the shaft 22 within the housing and operates the control mechanism 16, when a suitable coin has been inserted, to disengage the dog from ratchet 23 in response to slight rotation of the shaft. Such unlocking rotation occurs when pressure is exerted against the door to slightly move it in the opening direction. The claims refer to the bolt releasing action as being a result of the exertion of pressure against the bolt housing. However, this terminology is, of course, intended to also include a device in which the pressure acts against the door.

The keeper 11 comprises an angular member attachable to the door frame, as by bolts 111, and having two communicating recesses 24 and 124. These recesses are partially separated by lugs 125 and 126. As a depending finger of bolt 21 is moved against lug 125, the latter causes the bolt to rotate out of latched engagement with the keeper. The lug 126 fulfills no function in the installation illustrated, but is provided in order that the same keeper may be employed in vertically reversed position for use with a door hinged in the opposite manner, in which case the lug 126 is used and lug 125 performs no function. Similarly, bolt 21 may be borne on the opposite side of housing 14 to permit use of an otherwise identical bolt assembly on an oppositely hinged door.

Though the bolt normally will only operate through approximately a 90 degree angle, it is capable of effective operation regardless of angular position, and consequently cannot by tampering, be preset to any inoperative position. This result is achieved by the provision of a bolt presenting a plurality of uniformly spaced projections.

The control mechanism is rigidly secured to an upper plate 26, which serves as the top of housing 14 when installed and contains a coin slot 27, a sign viewing window 28; and two circular openings 29 and 30. Window 28 is closed by a transparent pane 128, which is retained in position by holder 129. A key operated hold-down nut 31 is receivable within opening 29 and screws onto stud 321, projecting upwardly within the housing, to rigidly secure the control mechanism in the operative position and prevent its unauthorized removal. Key operated control 32, within opening 30, is rotatable to operate the lock without a coin and to displace sign 33 from beneath window 28 for purposes which will appear later.

Essentially, the control mechanism comprises a coin selector generally indicated at 34, a cam operated bell crank 35 which causes pivotal movement of the coin selector in response to rotation of cam 25, a pair of fingers 55 and 58 borne by shaft 36 and movable with coin selector 34 after insertion of a suitable coin, a shaft 37 rotatable by such finger movement to unlock ratchet wheel 23, and a sign controlling mechanism generally indicated at 38, rotatable on shaft 37 to control the positioning of sign 33 beneath window 28.

Bell crank 35 has a sleeve-like bearing portion 39 surrounding one end of the shaft 37 about which the crank is freely pivoted. Three pairs of spaced arms 40, 41 and 42 project from sleeve 39. A roller 43 is carried between arms 40 at their extremity and serves as a low friction follower for contacting the cam 25. A pin 44 extends between the extremity of arms 42 to follow the opposite side of the lobe of cam 25 adjacent to the lobe contacted by roller 43 and thus cause the cam to be followed exactly. The arms 41 are pivotally connected at 46 to link 45, whose other end is connected to coin selector 34 by pin 47.

The coin selector may be of any conventional design suitable for the purpose and is typically shown as being composed of several sections 48, doweled by pins 49, and retained together as by screws 50. The coin selector is pivotable about pins 51. It can readily be seen that rotation of cam 25 from the locked position of Fig. 5 causes upward movement of arms 40 and consequent pivoting of the bell crank about shaft 37 to move arms 41, and link 45 to the left and thus cause pivotal movement of the coin selector about pins 51.

Shaft 36 carries two operating sleeves 52 and 53, and two spacer sleeves 152 and 153. At one end, sleeve 53 carries a depending arm 54 which bears, at its lower extremity, a finger 55. A counter controlling arm 56 is secured to the opposite end of sleeve 53. Sleeve 52 bears a similar depending arm 57 having a finger 58 at its lower extremity, and also bears a counter controlling arm 59. Thus, each of these finger elements comprises essentially a bell crank pivotable about the shaft 36. The counter controlling arms act against a pin 159 carried eccentrically by shaft 160 of counter 74. Movement of recessed arm 59 from the position of Fig. 8 to that of Fig. 9 registers two units on the counter. Movement of arm 56 through the same arc changes the counter reading only one unit because of its initial distant position from pin 159. As will be seen later, arm 59 thus advances the counter two numbers when a dime is used to open the door, and arm 56 operates the counter when a nickel is used. Therefore, the counter indicates, at all times, the number of five cent coin units which have entered the lock.

Normally, pivotal movement of the coin selector 34 has no effect upon either finger 55 or finger 58 for the portion of the coin selector opposite these fingers is cut away. The coin selector is, however, designed in such a manner that a proper coin follows its passageways to a point in the lower portion of the coin selector where the coin closes the cutaway portion of the selector and causes any subsequent movement of

the coin selector to be transmitted to the finger through the coin itself. For instance, a nickel, when inserted through slot 27, passes through opening 60 in the sign, falls into the coin selector and comes to rest in the lower portion of slot 61 opposite finger 55. Similarly, a dime falls to a position in the lower portion of slot 62 opposite finger 58.

The lower portion of the coin selector is provided with a projection 63 having an opening 64 for the reception of coin retaining pin 65. Rotation of this pin is prevented and its longitudinal movement within the opening is limited by stop 66. Fig. 7 illustrates the normal position of pin 65 within opening 64. In that position, shoulder 67 projects into opening 62 to retain any subsequently inserted dime in a position opposite finger 58. A short guide 68 directs the coin to the forward part of slot 62 in order to assure its engagement with shoulder 67. Pin 65 bears an additional shoulder 69, which serves to retain an inserted nickel in a position opposite finger 55. It will thus be readily understood that, when the mechanism is in its normal position, a proper coin inserted through slot 27 will fall to a position at the bottom of the coin selector where it will be retained opposite either finger 55 or 58 by one of the shoulders on pin 65. The coin itself will then transmit any pivotal movement of coin selector 34 to the adjacent finger. L-shaped wire 101 extends transversely from pin 65 terminating in the end 165 which passes through a hole in the coin selector into the passageway through which nickels pass downwardly within the selector. Shifting of the pin within opening 64 also shifts wire 101. When the pin is in a position to allow coins to fall from the selector, the wire stops any newly inserted coin and thus prevents its passage completely through the coin selector.

Shaft 37 bears a three section operating plate 70*a*, 70*b*, and 70*c* extending tangentially from its surface. One end of the finger 58 operates against the central portion 70*a* of this plate to transmit the finger movement to the plate and thereby to the shaft 37. Similarly, finger 55 operates against end portion 70*b*. Locking dog 71 is rigidly attached to shaft 37. Spring 72 operates against plate portion 70*c* to normally retain the shaft 37 in a position causing engagement of dog 71 with ratchet wheel 23. It is this engagement which prevents the door opening rotation of the shaft 22 and thus causes the door to be normally locked. However, when shaft 37 is rotated from the position of Fig. 8 to that of Fig. 9, dog 71 is disengaged from the ratchet wheel and the door may then be opened. Such rotation may result from pivotal movement of coin selector 34 when a coin 73 is in position, say opposite finger 55 to transmit that pivotal movement through the finger to plate 70*b*, and similarly where a different coin is positioned opposite finger 58 to transmit the movement therethrough to plate 70*a*.

The sign mechanism 38 controls sign 33 which has three positions indicating to the operator the internal condition of the lock. In the normal position of Fig. 8, the word "Vacant" is readable through window 28. In the displaced position of Fig. 9, opening 60 is opposite the window to allow reading of counter 74. An intermediate position causes the sign "In Use" to be visible. Sign 33 is borne by a pair of spaced arms 75 which are pivotable about shaft 37 to permit the three previously mentioned positions of the sign. A spring 76 acts as an extension of portion 70*a* of the operating plate to bear against projection 77 on one of the arms 75 and cause movement of the sign in response to rotation of shaft 37. Spring 76 is normally spaced from projection 77, as can be seen in Fig. 6, so that rotation of the shaft will move the sign only when that rotation is of a predetermined magnitude. If the sign is prevented from moving for any reason, spring 76 yields to allow unlocking rotation of shaft 37 while the sign remains stationary. The sign is normally urged to the Fig. 8 position by spring 78. One of the arms 75 bears an L-shaped extension 79, having a spacer 80 at its extremity for preventing complete return of the coin selecting mechanism to its normal position when the sign is in other than the "Vacant" position. When the sign is thus displaced, the spacer 80 is positioned in the path of the coin selector to retain it in a position slightly removed from the normal position.

A hook 81 is pivoted at 82 to one of the arms 75 and is yieldingly urged downwardly by spring 83 also borne by that arm. In the normal position, see Fig. 8, this hook rests above pin 84 projecting from the counter supporting member 85, which is rigidly attached to the frame 861 of the operating mechanism. When, however, the sign is moved to the position of Fig. 9, the hook end engages pin 84 to prevent movement of the sign back to normal position even after the pressure of spring 76 against projection 77 is released. The sign can then return only to the intermediate "In Use" position where it is retained until release of the hook.

In addition to the above described coin operated mechanism for unlocking the door, a knob operated means is provided. This means includes a double armed bell crank 86, which is pivoted about shaft 37 and whose arms bear projections 87 and 88 for engaging plate portion 70*a* to cause unlocking rotation of shaft 37. Projection 87 also engages the lower arm of hook 81 to release the sign from its "In Use" position if the hook has previously been engaged with pin 84. The arms 89 and 90 of the bell crank 86 are connected by an operating rod 91. Knob 20 bears a cam 92 which operates against rod 91, when the knob is turned, to cause pivoting of the bell crank and through it rotation of shaft 37 to disengage dog 71 from the ratchet wheel 23.

A shifting stop 93 is rigidly carried by shaft 37 and operates to shift the position of pin 65 within opening 64 when the coin selector is pivoted to cause contact of that pin with the stop. In the normal position of Fig. 8, lug 94 on stop 93 engages and shifts pin 65 after only slight movement of the coin selector. When, however, stop 93 has been rotated with shaft 37 in the unlocking direction, lug 94 is moved out of the path of pin 65, which may then move to a point of contact with the face 95 of stop 93 before shifting occurs.

To permit opening of the door by an attendant without the insertion of a coin, key operated control mechanism 32 is provided. By use of the proper key, the attendant may rotate this control mechanism to move operator 96 against plate 70*c* and, through it, cause unlocking rotation of shaft 37. This also enables him to move the sign 33 to a position in which the counter reading is visible through window 28.

The mechanism is normally in the locked position of Fig. 8 in which the word "Vacant" is readable on sign 33 through window 28 and dog

71 is engaged with ratchet wheel 23 to prevent rotation of shaft 22 and thus prevent rotational disengagement of cruciform bolt 21 from recess 24 of the keeper. However, the dog and ratchet do not hold the door absolutely motionless, but rather permit a slight movement of the door and rotation of shaft 22 from the extreme closed position before the dog and ratchet engage. When a coin has been inserted into the mechanism, that small amount of rotation is sufficient to cause the unlocking of the door. The coin is inserted through slot 27 into the coin selecting mechanism, through which it falls into its operative position at the bottom of the selector, in which it is retained by one of the shoulders of pin 65. If the door is then pushed, engagement of bolt 21 with keeper 11 causes rotation of shaft 22 and cam 25. Such rotation of cam 25 pivots bell crank 35 about shaft 37 to cause pivotal movement of coin selector 34 through link 45. During this movement, coin 73 carried by the coin selector, operates against finger 55 or 58, as the case may be, to pivot it about shaft 36. This finger movement operates plate 70a or 70b to rotate shaft 37 and move dog 71 to the unlocked position. Simultaneously, stop 93 is rotated sufficiently that, upon further movement of the coin selector, pin 65 will not engage lug 94. Since dog 71 no longer limits rotation of shaft 22, the door is free to be opened.

During the opening process, shaft 22 and cam 25 are further rotated to cause the coin selector, finger, shaft 37 and associated mechanism to be further displaced to the positions of Fig. 9. This displacement operates counter 74 through arm 56 or 59 and causes spring 76 to engage projection 77 and move sign 33 to the position of Fig. 9. Also, as these movements are completed, pin 65 engages face 95 of stop 93 and is shifted to its coin releasing position. The rotation of cam 25 then continues past the extremity of one lobe and into the adjacent depression to permit return of the mechanism toward normal position under the influence of springs 72, 78 and 97. Hook 81, carried by the sign mechanism, engages pin 84 to limit return of the sign and retain it in the "In Use" position. As spacer 80 is carried by the sign mechanism, it too is not returned to the original position but remains in such a position as to prevent complete return of coin selector 34. This spacer serves only to prevent contact of pin 65 with the frame 86 at 98. Pin 65, having been shifted by contact with stop 93, no longer retains the coin in the operative position. Therefore, as soon as the coin selector has returned to the defined position of only slight displacement from normal, in which position the force exerted by finger 55 due to the tension of spring 72 becomes insufficient to hold the coin, the coin drops through a suitable opening in the partition 99 into the vault 17.

The sign now reads "In Use," and portion 100 of the sign blocks coin slot 27 to prevent the insertion of another coin. The lock is then operable only by the inside knob 20. Turning of this knob pivots bell crank 86 to rotate shaft 37 by engagement of projections 87 and 88 with plate 70a. This disengages dog 71 from the ratchet wheel to unlock the door. Such movement of the bell crank simultaneously engages the lower arm of hook 81 to release it from pin 84. After release of the knob by the operator, as shaft 37 returns to normal position under the influence of spring 72, spring 78 causes the sign mechanism to return also to normal position. To assure that the sign will return as desired without reengagement of the hook and pin, spring 83 is weak in comparison with spring 78. This permits spring 78 to return the sign to normal position before spring 83 will operate to downwardly pivot hook 81. Thus, opening by the knob returns the mechanism completely to normal position and the sign "Vacant" is again readable through the window.

Wire 101 prevents a coin from falling into operative position as long as pin 65 is in its displaced coin releasing position. Thus, a coin can not pass completely through the coin selector merely because pin 65 may be shifted. Also, if the operator is leaning against the door when he deposits the coin, lug 94 shifts the pin and wire 101 to prevent dropping of the coin into operative position until pressure against the door is released. This is intended to prevent any accidents which might otherwise occur should the door open while a person is leaning against it.

Because of the unique design of the control mechanism, the lock is not operable by the use of a washer type slug having a central hole opposite the finger. Such a slug can not affect the latching mechanism, for its movement is not transferred to the finger. In addition, movement of the door through the slight range permitted at all times serves to reject the slug from the coin selector and ready the apparatus for reception of a proper coin. That is, engagement of pin 65 with lug 94 upon slight movement of the coin selector in a bolt releasing direction shifts the pin to a condition permitting the slug to fall downwardly as far as permitted by fingers 55 and 58. Return movement of the selector then moves the slug away from finger 55 or 58 to permit it to fall into the coin box.

I claim:

1. A coin controlled door lock comprising a housing and a keeper to be mounted separately one to a door and the other to an adjacent support, a rotary bolt carried by the housing for 360 degree rotation and adapted to engage the keeper and rotate in a first latching direction upon closing of the door, said bolt being rotatable by said keeper in a reverse antilatching direction upon opening of the door, holding means movable between an active position in which it holds the bolt to a limited antilatching rotation insufficient to disengage the bolt and keeper and a released position permitting said disengagement, and means conditioned by reception of a coin and operable to release said holding means in response to said limited antilatching rotation of the bolt.

2. A coin controlled door lock comprising a housing and a keeper to be mounted separately one to a door and the other to an adjacent support, a rotary bolt carried by the housing and adapted to engage the keeper and rotate in a first latching direction upon closing of the door, said bolt being rotatable by said keeper in a reverse antilatching direction upon opening of the door, a holding part movable between an active position in which it holds the bolt to a limited antilatching rotation insufficient to disengage the bolt and keeper and a released position permitting said disengagement, a member in the housing movable by the bolt upon said limited antilatching rotation thereof and adapted to engage and displace a coin inserted into the housing, and mechanism engageable and operable by the coin upon displacement by said member to release said holding part in response to said antilatching rotation of the bolt.

3. A coin controlled door lock comprising a

housing and a keeper to be mounted separately one to a door and the other to an adjacent support, a rotary bolt carried by the housing and adapted to engage the keeper and rotate in a first latching direction upon closing of the door, said bolt being rotatable by said keeper in a reverse antilatching direction upon opening of the door, a holding part movable between an active position in which it holds the bolt to a limited antilatching rotation insufficient to disengage the bolt and keeper and a released position permitting said disengagement, a member mounted for swinging movement in the housing and adapted to receive and hold a coin, means for swinging said member in response to antilatching rotation of the bolt, an element in the housing engageable and displaceable by a coin held by said member upon said swinging movement thereof, and mechanism operable by said element to release said holding part in response to said limited antilatching rotation of the bolt.

4. A coin controlled door lock comprising a housing and a keeper to be mounted separately one to a door and the other to an adjacent support, a rotary bolt carried by the housing and adapted to engage the keeper and rotate in a first latching direction upon closing of the door, said bolt being rotatable by said keeper in a reverse antilatching direction upon opening of the door, a holding part movable between an active position in which it holds the bolt to a limited antilatching rotation insufficient to disengage the bolt and keeper and a released position permitting said disengagement, a member mounted for movement in the housing and adapted to receive and hold at two different locations coins of two different sizes, means for moving said member in response to said limited antilatching rotation of the bolt, and mechanism in the housing engageable and operable by a coin of either size held by the member to release the holding part upon said bolt induced movement of the member.

5. A coin controlled door lock comprising a housing to be carried by a door, a keeper to be supported independently of the door, a multiheaded rotary bolt mounted by the housing for 360° rotation and adapted to engage the keeper and rotate in a first latching direction upon closing of the door, said bolt being rotatable by said keeper in a reverse antilatching direction upon opening of the door, a shaft carrying said bolt and projecting into the housing, a headed rotor carried by the shaft at the inside of the housing, a releasable holding part acting against said headed rotor and movable between an active position in which it holds the bolt to a limited antilatching rotation insufficient to disengage the bolt and keeper and a released position permitting said disengagement, a cam carried by said shaft, a member mounted for swinging movement in the housing and adapted to receive and hold a coin, a lever for swinging said member in response to rotation of said cam, an element in the housing engageable and displaceable by a coin held by said member upon said swinging movement thereof, and mechanism operable by said element to release said holding part in response to said limited antilatching rotation of the bolt.

6. A coin controlled door lock comprising a housing and a keeper to be mounted separately one to a door and the other to an adjacent support, a rotary bolt carried by the housing and adapted to engage the keeper and rotate in a first latching direction upon closing of the door, said bolt being rotatable by said keeper in a reverse antilatching direction upon opening of the door, a holding part movable between an active position in which it holds the bolt to a limited antilatching rotation insufficient to disengage the bolt and keeper and a released position permitting said disengagement, a movable member in the housing adapted to receive and hold a coin, means for moving said member in response to said limited antilatching rotation of the bolt, mechanism in the housing engageable and operable by a coin held by said member to release said holding part upon said bolt induced movement of the member, a coin retaining element carried by said member and shiftable relative thereto between a first coin retaining position and a second position for permitting the coin to drop from the member, and means engageable by said element upon movement of said member in the housing to shift the element relative to said member.

7. A coin controlled door lock comprising a housing and a keeper to be mounted separately one to a door and the other to an adjacent support, a rotary bolt carried by the housing and adapted to engage the keeper and rotate in a first latching direction upon closing of the door, said bolt being rotatable by said keeper in a reverse antilatching direction upon opening of the door, means for releasably holding the bolt against said antilatching rotation, coin responsive mechanism for controlling the release of said holding means, a member mounted in the housing for movement between a pair of positions, means for actuating said member from a first one of said positions to the second in response to antilatching rotation of the bolt, a manual operator for releasing said holding means, and means for moving said member from said second position back to the first in response to actuation of said manual operator.

8. A coin controlled door lock comprising a housing and a keeper to be mounted separately one to a door and the other to an adjacent support, a rotary bolt carried by the housing and adapted to engage the keeper and rotate in a first latching direction upon closing of the door, said bolt being rotatable by said keeper in a reverse antilatching direction upon opening of the door, a holding part movable between an active position in which it holds the bolt to a limited antilatching rotation insufficient to disengage the bolt and keeper and a released position permitting said disengagement, a member in the housing adapted to receive and hold a coin and movable between first and second positions in response to antilatching rotation of the bolt, mechanism engageable and operable by a coin carried by said member to release said holding part in response to movement of the member resulting from said limited antilatching rotation of the bolt, said member being returnable from said second position to a third and intermediate position in which the coin is releasable from the member, an element movable in response to said antilatching rotation of the bolt to a position for limiting the return movement of said member at said third position, a manual operator for releasing said holding part, and means responsive to actuation of said manual operator to move said element to a position permitting complete return of said member to said first position.

9. A coin controlled door lock comprising a housing and a keeper to be mounted separately

one to a door and the other to an adjacent support, a rotary bolt carried by the housing and adapted to engage the keeper and rotate in a first latching direction upon closing of the door, said bolt being rotatable by said keeper in a reverse antilatching direction upon opening of the door, holding means movable between an active position in which it holds the bolt to a limited antilatching rotation insufficient to disengage the bolt and keeper and a released position permitting said disengagement, means conditioned by reception of a coin and operable to release said holding means in response to said limited antilatching rotation of the bolt, said last mentioned means including a coin receiving and holding member in the housing movable between first and second positions in response to antilatching rotation of the bolt, a second member mounted in the housing for movement between a pair of positions, means for actuating said second member from a first one of its positions to the second in response to antilatching rotation of the bolt, a manual operator for releasing said holding means, means for moving said second member from its second position to its first position in response to actuation of said manual operator, a sign carried by said second member for indicating the internal condition of the lock, a barrier carried by said second member for preventing the insertion of a coin into the coin responsive mechanism when the second member is in its said second position, and a member carried by said second member for limiting the return movement of said first member toward its first position when the second member is in its second position.

10. A coin controlled door lock comprising a housing and a keeper to be mounted separately one to a door and the other to an adjacent support, a bolt pivotally mounted to the housing and adapted to engage the keeper and pivot in a first latching direction upon closing of the door, said bolt being pivotable by said keeper in a reverse antilatching direction upon opening of the door, holding means movable between an active position in which it holds the bolt to a limited antilatching pivotal movement insufficient to disengage the bolt and keeper and a released position permitting said disengagement, and means conditioned by reception of a coin and operable to release said holding means in response to said limited antilatching rotation of the bolt.

11. A coin controlled door lock comprising a housing and a keeper to be mounted separately one to a door and the other to an adjacent support, a bolt pivotally mounted to the housing and adapted to engage the keeper and pivot in a first latching direction upon closing of the door, said bolt being pivotable by said keeper in a reverse antilatching direction upon opening of the door, a holding part movable between an active position in which it holds the bolt to a limited antilatching pivotal movement insufficient to disengage the bolt and keeper and a released position permitting said disengagement, and coin responsive mechanism forming an energy transmitting connection between said bolt and said holding part acting to release said holding part in response to said limited antilatching rotation of the bolt.

12. A lock as recited in claim 11, in which said bolt is rotatable through 360 degrees, and including means mounting said bolt for said 360 degree rotation.

13. A lock as recited in claim 11, in which said last mentioned mechanism includes a member in the housing movable by the bolt upon said limited antilatching pivotal movement thereof and adapted upon said bolt induced movement to engage and displace a coin inserted into the housing, and mechanism engageable and operable by the coin upon displacement of said member and acting to release said holding part in response to said antilatching rotation of the bolt.

14. A coin controlled door lock comprising a housing and a keeper to be mounted separately one to a door and the other to an adjacent support, a rotary bolt carried by the housing for 360 degree rotation and adapted to engage the keeper and rotate in a first latching direction upon closing of the door, said bolt being rotatable by said keeper in a reverse antilatching direction upon opening of the door, a rotor in the housing operatively connected to and rotating in accordance with said bolt, a holding part acting against said rotor and movable between an active position in which it holds the bolt to a limited antilatching rotation insufficient to disengage the bolt and keeper and a released position permitting said disengagement, and coin responsive mechanism forming an energy transmitting connection between said bolt and said holding part acting to release said holding part in response to said limited antilatching rotation of the bolt.

15. A coin controlled door lock comprising a housing and a keeper to be mounted separately one to a door and the other to an adjacent support, a rotary bolt carried by the housing and adapted to engage the keeper and rotate in a first latching direction upon closing of the door, said bolt being rotatable by said keeper in a reverse antilatching direction upon opening of the door, a holding part movable between an active position in which it holds the bolt to a limited antilatching rotation insufficient to disengage the bolt and keeper and a released position permitting said disengagement, a movable member in the housing adapted to receive and hold a coin, means for moving said member between a normal position and an actuated position in response to antilatching rotation of the bolt, mechanism in the housing engageable and operable by a coin held by said member to release said holding part upon said bolt induced movement of the member, a coin retaining element carried by said member and shiftable relative thereto between a first coin retaining position and a second position for permitting the coin to drop from the member, and means engageable by said element upon movement of said member to said normal and actuated positions respectively to shift said element to said first and second positions respectively.

16. A coin controlled door lock comprising a housing and a keeper to be mounted separately one to a door and the other to an adjacent support, a rotary bolt carried by the housing and adapted to engage the keeper and rotate in a first latching direction upon closing of the door, said bolt being rotatable by said keeper in a reverse antilatching direction upon opening of the door, a holding part movable between an active position in which it holds the bolt to a limited antilatching rotation insufficient to disengage the bolt and keeper and a released position permitting greater antilatching rotation effecting said disengagement, a member in the housing adapted to receive and hold a coin and movable between a normal position and an actuated position through an intermediate position, means for mov-

ing said member from said normal position to said intermediate and actuated positions respectively upon said limited and greater antilatching rotation of the bolt respectively, mechanism in the housing engageable by a coin held by said member and operable by said coin to release said holding part upon said bolt induced movement of the member to said intermediate position, a coin retaining element carried by said member and shiftable relative thereto between a first coin retaining position and a second position for permitting the coin to drop from the member, a movable shifting element having a portion positioned in the path of said coin retaining element at a location to be engaged thereby and shift it to said second position upon said limited antilatching movement of said member, means actuating said portion of the shifting element out of said path of the coin retaining element upon release of said holding part, and means engageable by said element upon movement of said member to said normal and actuated positions respectively to shift said element to said first and second positions respectively.

17. A coin controlled lock as recited in claim 16 in which said last mentioned means includes a second portion of said shifting element movable into said path of the coin retaining element upon release of said holding part.

18. A coin controlled lock as recited in claim 15, including an additional element movable in response to said antilatching rotation of the bolt to a position for preventing complete return of said member to said normal position to thus prevent shifting of said coin retaining element to said first position thereof, a manual operator for releasing said holding part, and means responsive to actuation of said manual operator to retract said additional element to a position permitting complete return of said member to said normal position.

19. A coin controlled door lock comprising a housing and a keeper to be mounted separately one to a door and the other to an adjacent support, a multi-headed rotary bolt mounted by the housing for 360° rotation and adapted to engage the keeper and rotate in a first latching direction upon closing of the door, said bolt being rotatable by said keeper in a reverse antilatching direction upon opening of the door, a shaft carrying said bolt and projecting into the housing, a headed rotor carried by the shaft at the inside of the housing and rotating with said bolt, a second rotatable shaft in the housing extending parallel to said first shaft, a swinging holding part carried by and movable with said second shaft and acting against said headed rotor, said holding part being movable between an active position in which it holds the rotor and bolt to a limited antilatching rotation insufficient to disengage the bolt and keeper and a released position permitting said disengagement, a cam carried by said first shaft, a coin receiving member mounted in the housing for swinging movement about an axis parallel to said shafts and adapted to receive and hold a coin, a lever for swinging said member in response to rotation of said cam, a third shaft in the housing parallel to said first two shafts, an element mounted on said third shaft for swinging movement and positioned to be engaged and swung about said third shaft by a central portion of a coin held by said coin receiving member upon said swinging movement thereof, a lug projecting from and rotatable with said second shaft and engageable by said last mentioned element upon said swinging movement thereof to rotate said second shaft and thereby move said holding part to said released position in response to said limtied antilatching rotation of the bolt.

20. A coin controlled lock as recited in claim 19 including a coin retaining element carried by said coin receiving member and shiftable relative thereto between a first coin retaining position and a second position for permitting the coin to drop from the member, a shifting element mounted to and rotatable with said second shaft and having a portion positioned in the path of said coin retaining element when said holding part is in active position and acting to engage said retaining element and shift it to said second position upon said limited antilatching rotation of said member, said portion of the shifting element being movable out of said path of the coin retaining element upon rotation of said second shaft to an extent releasing said holding part, said shifting element having a second portion movable into the path of said coin retaining element upon release of the holding part and acting to engage and shift said retaining element upon the swinging movement of said coin receiving member responsive to disengagement of the bolt and keeper, and means stationarily carried by said housing and positioned to engage the coin retaining element and shift it to said first position upon movement of said coin receiving member to said normal position.

21. A coin controlled lock as recited in claim 20, including an additional element mounted for swinging movement about said second shaft and movable in response to said antilatching rotation of the bolt to a position preventing complete return of said member to said normal position, a latch element releasably retaining said additional element in said position preventing return of said member, a manual operator for releasing said holding part, means acting to release said latch element upon actuation of said manual operator, and a spring yieldingly urging said additional element to a retracted position permitting complete return of said member to said normal position.

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