March 18, 1930. J. E. OLVIS 1,751,288

COIN CONTROLLED DOOR LOCK

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Fig. 2

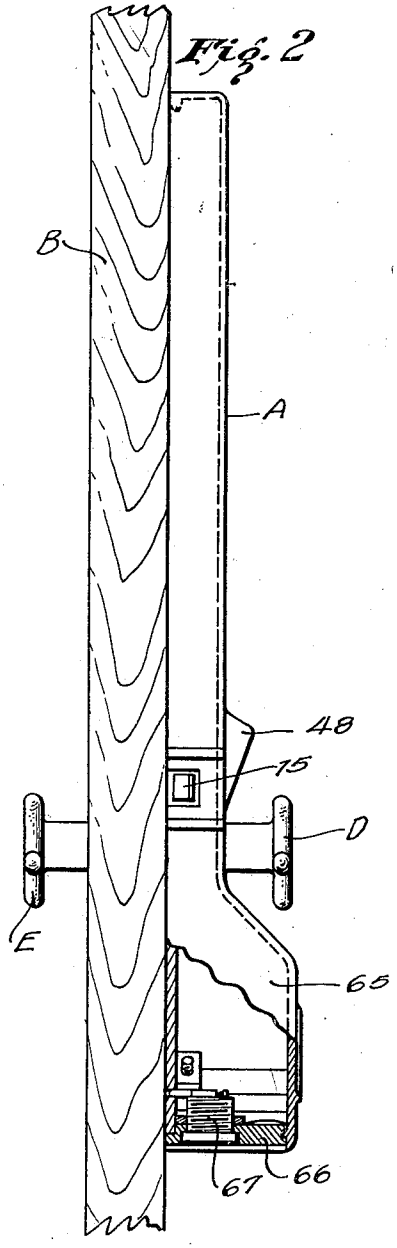
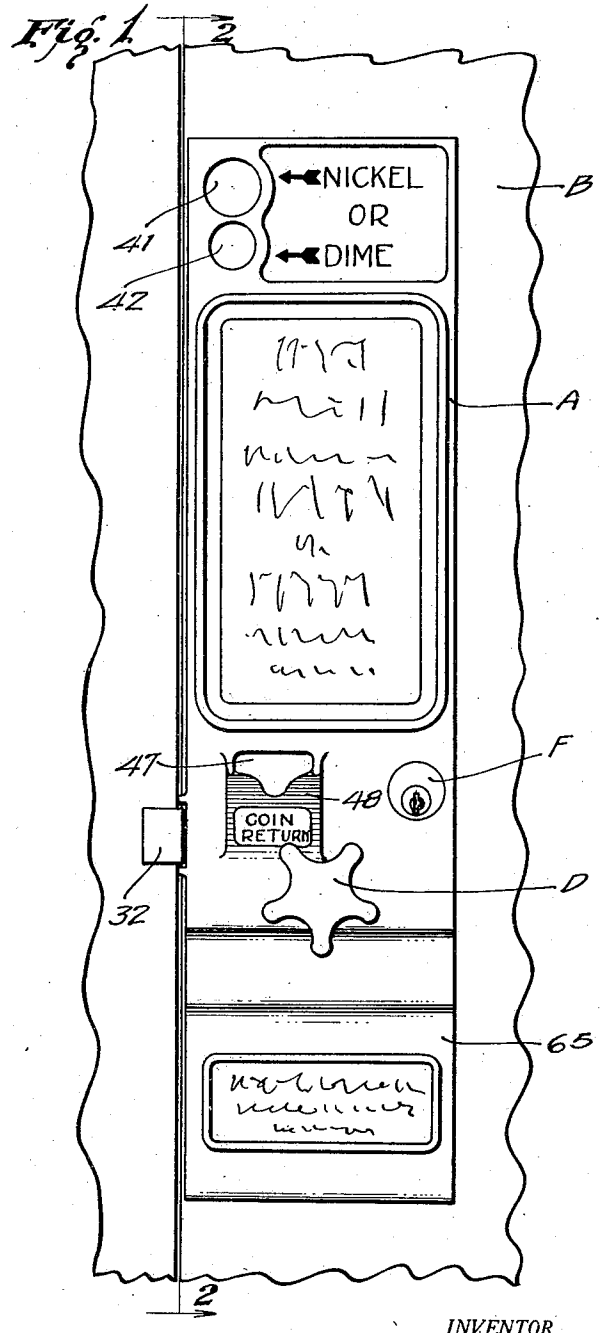



Fig. 1




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COIN CONTROLLED DOOR LOCK

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Fig. 4

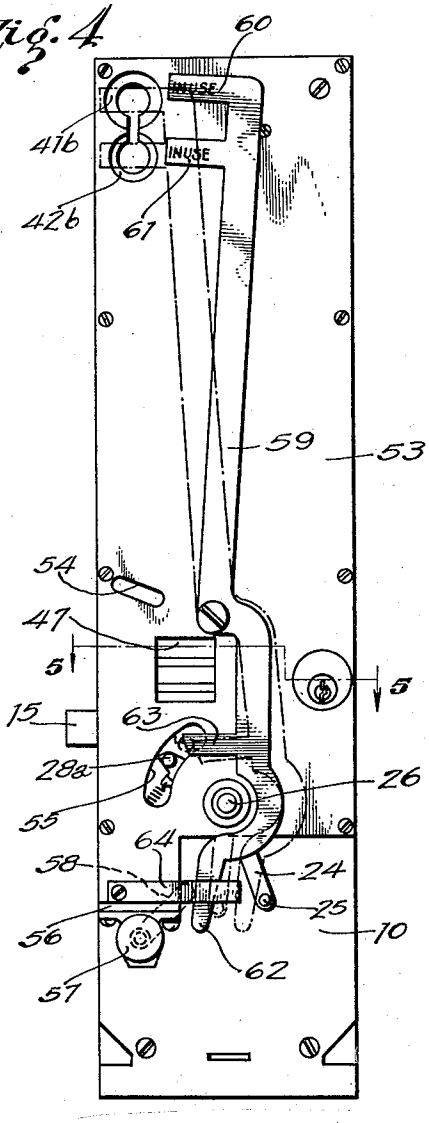



Fig. 3

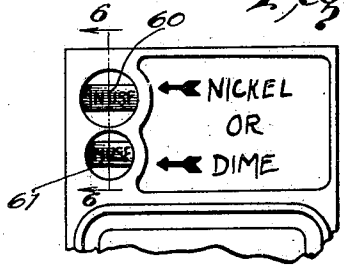



Fig. 5

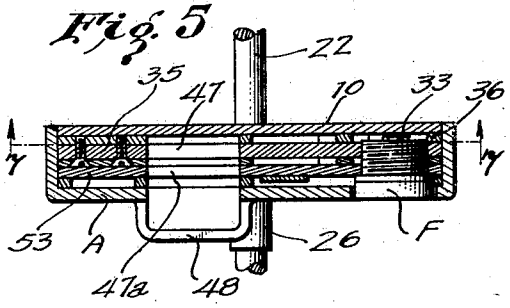
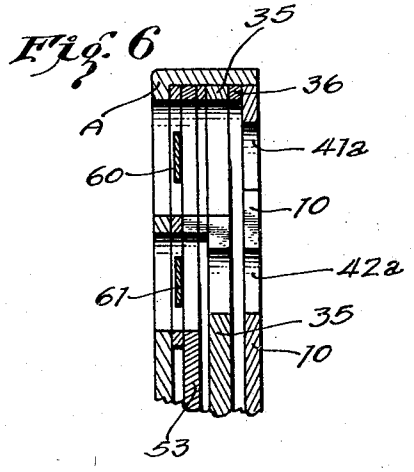



Fig. 6




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March 18, 1930. J. E. OLVIS 1,751,288

COIN CONTROLLED DOOR LOCK

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Fig. 7

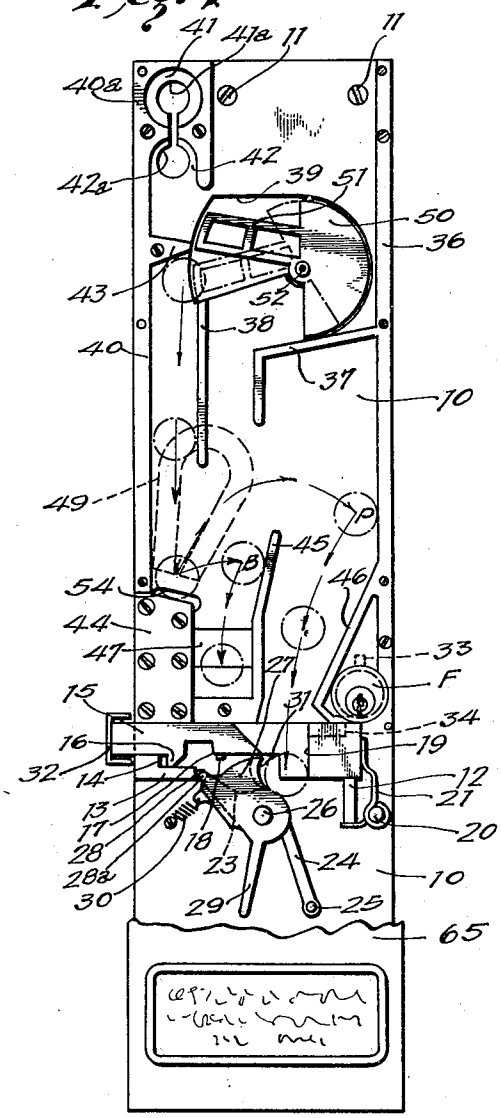



Fig. 9

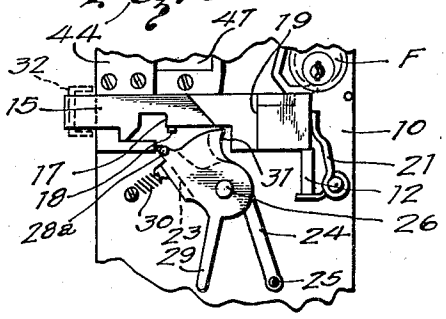
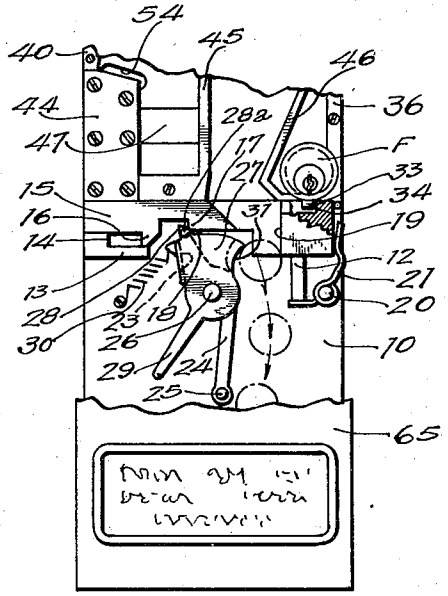



Fig. 8




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Patented Mar. 18, 1930 1,751,288

# UNITED STATES PATENT OFFICE

JAMES E. OLVIS, OF LOS ANGELES, CALIFORNIA

## COIN-CONTROLLED DOOR LOCK

Application filed January 28, 1929. Serial No. 335,500.

This invention relates to a coin controlled lock which may be employed to control a door, although it is not limited to such use. Doors of public pay toilet rooms are commonly locked by mechanism which may be operated by aid of a coin. In many semi-public toilet rooms, such as in office buildings it is desirable to have a lock operable by a key in possession of tenants and also operable upon introduction of a proper coin. The present invention relates particularly to such locks.

The objects of this invention are to provide a lock of the character described having any or all of the following features:—

Key operable mechanism associated with a coin control mechanism; a visual signal mechanism to indicate when the room is occupied associated with means to prevent introduction of a coin into the lock mechanism while the room is so occupied; means to restore automatically the signal mechanism upon the occupant opening the door; means to prevent restoration of the visual signal except by first closing the door; a counter to record only the number of times the door is operated by coins; and details of construction whereby bogus coins are rejected and whereby simplicity of construction and operation together with compactness are obtained.

These objects together with other objects and corresponding accomplishments are obtained by means of the embodiments of my invention illustrated in the accompanying drawings, in which:—

Fig. 1 is a front elevation showing a fragment of a door with my improved lock mechanism mounted upon the outside thereof; Fig. 2 is a side elevation, the indicator denoting use being retracted; Fig. 3 is a front view of a fragment of the lock mechanism with the indicator shown in position indicating use; Fig. 4 is a front view of the mechanism with the cover removed; Fig. 5 is a section as seen on the line 5—5 of Fig. 4; Fig. 6 is a section as seen on the line 6—6 of Fig. 3; Fig. 7 is a section as seen on the line 7—7 of Fig. 5; Fig. 8 is a fragmentary view similar to Fig. 7 showing the bolt and associated parts in fully retracted position; and Fig. 9 is a view similar to Fig. 8 showing the bolts fully protracted.

Referring more particularly to Figs. 1 and 2, A indicates a case housing the lock mechanism, B a door and C the door jamb. An outside knob D is provided for opening the door from the outer side and an inside knob E for opening the door from the inner side. F marks a key operated cylinder lock for independently actuating the lock mechanism. The lock mechanism may be actuated by a large or a small coin such as a nickel or a dime. Separate mechanism is provided for reception and delivery of nickels and dimes, but as the structure for each is similar, it will only be necessary to describe one.

A back plate 10 is provided and arranged to be secured to the door by suitable screws 11. Projecting forwardly from the back plate is a guide lug 12 for the bolt. A guide lug 13 is also provided for the bolt and has an abutment stop 14 formed thereon. Slidably mounted upon the lugs is a bolt 15 having a stop lug 16 for cooperation with the abutment stop 14. A talon 17 hereafter designated as the primary talon is formed on the lower side of the bolt for engagement by the tip of a wing operated from the outer knob. A secondary talon 18 is provided for a secondary wing operated from the inner knob. The bolt has a laterally extending shoulder 19 providing a coin seat. Extending from the back plate 10 is a post 20 for supporting a coil spring 21, one end of the spring engaging the bottom of lug 12 and the other engaging the tail side of the bolt and tending to project the latter. Rotatably mounted in the back plate is an inner knob spindle 22 having formed thereon a secondary wing 23 and a tail 24. Tail 24 has a post 25 extending laterally therefrom for retracting the indicator later described. The tip of the wing 23 is arranged to engage the talon 18. Spindle 22 is hollow and rotatably mounted therein is an outer knob spindle 26 for attachment thereto of the outer knob. A wing 27 is formed on the spindle 26 and has a tip 28 for engagement with the primary talon 17. Extending laterally from the tip is a post 28[a] arranged so as to operate the indicator and move it into use position.

A tail 29 is provided as an extension of wing 27 and is for the purpose of operating a counter. Wing 27 has a lug to which a tension spring 30 is secured, the other end of the spring being secured to a post upon the back plate. A concave coin seat is formed on wing 27 for coaction with coin seat 19 upon the bolt.

The arrangement of parts is such that when a coin is disposed between the seats as shown in Fig. 7 it acts as a coupling so that upon turning the outer knob, retraction movement of the bolt 15 is initiated. However, the wing will reach a position such as shown in Fig. 8 and the coin will be released. In this position, the wing tip 28 will have engaged the primary talon 17 and full retraction of the bolt may be effected by further turning of the outer knob. Wing 27 may have a limited turning movement when the bolt is protracted or in the position shown in Fig. 7, no coin being between the seats. However, the talon 17 will be forward of the point of contact for tip 28 and talon 17, the tip engaging the under side of the bolt and being stopped from further movement. Thus, it is necessary to have a coin between the coin seats in order to enable retraction of the bolt 15 by means of the outer knob. The tip on the secondary wing 23 may be moved to engage talon 18 and retract the bolt. The swinging of wing 23 is effected from the inner knob. However, if the bolt 15 is in full protracted position as shown in Fig. 9, the tip of wing 23 upon being swung will not engage talon 18, but the latter will be forward so that it will engage the underside and cannot be operated to retract the bolt. The keeper 32 prevents full protraction of the bolt so that when the door is closed, the bolt is in the position shown in Fig. 7 and the inner knob may be operated to retract the bolt. When the bolt is in fully protracted position, such as it will be when the door is open, the inner knob cannot be operated to retract the bolt. This construction is designed to prevent the use signal from being thrown into non-use position by operation of the inner knob before closure of the door.

The cylinder lock F may be of any well known type having a rotatable plug with an extension 33. This extension is arranged to be engaged with the shoulder 34 of a recess as shown in Fig. 8. In Fig. 7 the lock is shown in non-operating position. Upon turning the plug, the wing extension is moved into engagement with the shoulder 34, and the bolt may be withdrawn from the keeper, the wings being clear of the bolt to permit independent retractive movement of the bolt.

Disposed in front of back plate 10 is an intermediate plate 35 spaced thereon by ribs so arranged as to form passageways and chambers for coin selector mechanism. A rib 36 extends longitudinally with respect to the back plate and has a deflecting rib 37 extending inwardly therefrom and provided with depending portion. Parallel to the depending portion is a rib 38. A chamber is formed between the back plate and intermediate plate by recessing the latter as indicated by 39 so as to form a chamber for a tiltable classifier. A marginal rib 40 is provided on the side opposite to rib 36. This rib has an enlargement at the upper end indicated by $40^a$ provided with a coin opening 41 communicating with the space between the intermediate plate and the back plate but preventing the coin introduced therein from passing downward between the intermediate plate and the front plate. A concave recess is formed below opening 41 so that a coin introduced therein through a coin intake 42 in the front plate may drop downwardly. However, there is a deflection rib 43 which directs the descending coin into the chamber 39. At the lower end of rib 40 is an anvil 44 to receive coins which are dropped from the classifier, this anvil being such that the descending coin will bounce, and, if a proper coin, will hurdle a barrier rib 45 into the passage formed between the barrier rib and a rib 46, the ribs 45 and 46 converging and forming a passageway with its delivery end above the coin seats 19 and 31, the coin being caught as shown in Fig. 7. In Fig. 7 the dash lines with arrows indicate the path of a coin delivered to the passageway between ribs 38 and 40. A proper coin marked P will hurdle the barrier 45, while a bogus coin marked B will not hurdle the barrier and will drop into the space formed between the anvil 44 and rib 45. It is deflected laterally through an opening 47 into a coin return pocket 48. In the back plate a small opening $41^a$ registers with opening 41 and an opening $42^a$ smaller than recess 42 is also provided. These openings serve for dislodgment of coins which may become stuck, without requiring disassembly of the apparatus. Embedded in the intermediate plate is a horse shoe magnet, which is covered by a plate of non-magnetic material, its position being indicated by 49. The magnet is in the path of a coin descending through the passage formed between ribs 38 and 40. The magnetic field acts to retard the travel of bogus coins of magnetic material so that their momentum when striking the anvil is less than that of a proper coin, also retarding the bounce. Thus, in case of a bogus coin having proper resiliency but formed of magnetic material such as iron, such a bogus coin will not hurdle the barrier. In order to reject coins which are non-magnetic and of proper resiliency, but not of proper weight a tiltable classifier is provided consisting of a cage having a counterweight portion 50 comprising spaced side walls and a delivery chute arm 51 open at the outer end and communicating at the inner end with the space between walls 50. Trunnions 52 are mounted in bearings in the

front and intermediate plates so as to pivotally support the classifier. A coin of sufficient weight introduced into opening 42 will drop and be delivered to the outer end of chute 51. If the coin is of sufficient weight, it causes the classifier arm to swing downwardly until it abuts the top of rib 38, thence discharging the coin into the top of the passageway formed between ribs 38 and 40. This insures that the coin will always be delivered at the same point and will drop with an initial zero speed so that there is uniformity in the speed of a proper coin when it strikes the anvil 44. If the coin is of insufficient weight, it will roll along the chute 51 to the space between the walls 50 of the counterweight and be delivered into the chute formed between ribs 37 and 38 and thence will pass directly inwardly to the rejection opening 47.

A similar system of passages together with a classifier is interposed between the intermediate plate 35 and a second intermediate plate 53 for reception of larger coins such as nickels, the rejection passage communicating with opening 47 to return the coin, and the delivery passage for proper coins being disposed along side of the delivery passage for smaller coins, thus on the opposite side of the bolt which is provided with a coin seat corresponding to seat 19 and cooperating with the coin seat 31 on wing 27. The coin selector mechanisms are in substance duplicates of one another. It will be noted that both the intermediate plates 35 and 53 end short of the bottom of the back plate and that their lower edges serve as an upper guide for the bolt 15. The plate 53 is mounted over the intermediate plate 35 and has coin intake openings $41^b$ and $42^b$ registering with the corresponding coin openings in the other plate. It is provided with a coin return opening $47^a$ to communicate with the coin pocket 48. A clean out opening 54 to register with the anvil surface is provided so that any dirt which accumulates on the anvil surface may be removed. An arcuate slot 55 in plate 53 accommodates post $28^a$ which projects through the opening. A shelf 56 projects forwardly and mounted thereon is a counter 57. This counter may be of any well known type and is operated by oscillation of an arm 58 engaged by tail 29 operated from the outer knob. Thus, upon each oscillation of tail 29, as would be occasioned by complete turning of outer knob D, the counter is operated. The counter records the number of times that the lock is actuated by means of coins. Pivotally mounted upon the front plate 53 is an indicator lever 59 having at the upper end fingers 60 and 61 adapted to act as gates and be projected across the coin openings so as to prevent the insertion of coins. These fingers are also marked with the legend "In use". The lower arm of the indicator lever has a curved portion to clear the knob spindle 26. The lower tip end marked 62 is disposed to be engaged by the post 25 on the secondary tail 24 which is oscillated from the inner knob. A finger 63 on lever 59 is disposed to be engaged by the post $28^a$ upon the tip of the primary wing which is operated by the outer knob.

Assuming that the door is closed and the room unoccupied, it may be opened by introducing a key into the lock F and retracting the bolt. If the parts are in the position shown in Figs. 4 and 7 and a proper coin is introduced into the corresponding coin opening, it will lodge between the corresponding coin seats and couple the primary wing to the bolt. The outer knob is then turned, the bolt being initially retracted until the tip 28 of the primary wing engages the primary talon 17, and thereupon the coin is released and completion of the retraction of the bolt is effected by the wing. Turning of the knob and wing causes the tail 29 to act upon the counter actuating arm 58 and record an admission. The post $28^a$ will have engaged finger 63 and swung the indicator lever into the position shown in dot and dash lines in Fig. 4 and in full lines in Fig. 3. Thus, occupancy of the room is visually indicated and admission of coins is prevented. While the door is open and the bolt is in projected position as will be occasioned by the spring 21, the parts are in the position shown in Fig. 9 and the inner knob cannot be operated to retract the bolt as the tip of secondary wing 23 operated from the inner knob will not engage the talon 18. However, upon the door being closed, the keeper will cause the bolt 15 to be retracted a limited distance. This distance is sufficient for the tip of secondary wing 23 to engage talon 18 whereby the bolt may be retracted from the inner knob. Upon the occupant of the room leaving, the inner knob is grasped and turned to cause retraction of the bolt. At the same time post 25 engages the lower end 62 of the indicator lever and swings the latter so that the gates 60 and 61 are withdrawn, and the mechanism is in position for another operation. A guide 64 tends to hold the lower end of the indicator lever in proper position. The case A is provided with coin intake openings registering with openings 41 and 42 and a coin receptacle 65 at the bottom. A removable bottom plate 66 is provided which may be locked by any suitable lock such as 67. This particular structure forms no part of my invention and merely serves as a coin receptacle.

What I claim is:—

1. A door lock mechanism comprising the combination of a slidable bolt having a talon, means tending to project said bolt into locking position, a knob spindle, a coin wing connected to said spindle and having a projection for engaging said talon and retracting said bolt, said talon being disposed to be out of

operative engagement by said projection when said bolt is in projected locking position, a coin seat on said coin wing, a coacting coin seat on said bolt whereby a coin may be interposed between said seats to form a coupling between said coin wing and bolt to provide for initiating retractive movement of said talon to position latter for engagement by said projection whereby completion of the retractive movement may be effected by said projection.

2. A door lock mechanism comprising the combination of a slidable bolt having a talon, means tending to project said bolt into locking position, a knob spindle, a coin wing connected to said spindle and having a projection for engaging said talon and retracting said bolt, said talon being disposed to be out of operative engagement by said projection when said bolt is in projected locking position, a coin seat on said wing, a coacting coin seat on said bolt whereby a coin may be interposed between said seats to form a coupling between said wing and bolt to provide for initiating retractive movement of said talon to position the latter for engagement by said projection whereby completion of the retractive movement may be effected by said projection, the seat on said wing being curved to release the coin after initial retractive movement of said bolt has been effected.

3. In a coin controlled door lock mechanism the combination specified in claim 1 including an indicator operating post on the coin wing, a coin intake opening, a passage from said coin intake opening to direct coins to the coin seats, an indicator lever having a gate for projection across said opening to bar admission of coins, said indicator lever having an arm disposed back of said post so that on swinging said coin wing said indicator lever will be swung to project said gate across said opening, an inside knob spindle, a knob wing secured to said inside spindle, an opening projection on said knob wing, a second talon on said bolt for said opening projection, said second talon being disposed so that it may be operatively engaged by said opening projection, a post on said knob wing engageable with said indicator lever to retract the same upon opening movement of said inside knob.

4. In a coin controlled door lock device the combination specified in claim 1 including a keeper for said bolt, an indicator operating post on the coin wing, a coin intake opening, a passage from said coin intake opening to direct coins to the coin seats, an indicator lever having a gate for projection across said opening to bar admission of coins, said indicator lever having an arm disposed back of said post so that on swinging said coin wing said indicator lever will be swung to project said gate across said opening, an inside knob spindle, a knob wing secured to said inside spindle, an opening projection on said knob wing, a second talon on said bolt for said opening projection, said second talon being disposed so that it may be operatively engaged by said opening projection when said bolt abuts said keeper in protracted position and will be disposed out of operative engagement position when fully protracted, a post on said knob wing engageable with said indicator lever to retract the same upon opening movement of said inside knob.

5. A door lock mechanism comprising a slidable bolt, an outside knob, coin controlled means to couple said bolt to said lock whereby it may be operated by the latter, a primary wing operatively connected to said knob to be swung therewith, an indicator operating post on said primary wing, a coin intake opening, an indicator lever having a gate for projection across said opening to bar admission for coins, said indicator lever having an arm disposed back of said post so that on swinging said primary wing said indicator lever will be swung to project said gate across said opening, an inside knob spindle, a secondary wing secured to said spindle, an opening projection on said secondary wing, a talon on said bolt for said projection, said projection being disposed so that it may be operatively engaged by said projection, a post on said secondary wing engageable with said indicator lever to retract the same upon opening movement of said inside knob.

6. A door lock mechanism comprising a slidable bolt, a keeper for said bolt, an outside knob, coin controlled means to couple said bolt to said lock whereby it may be operated by the latter, a primary wing operatively connected to said knob to be swung therewith, an indicator operating post on said primary wing, a coin intake opening, an indicator lever having a gate for projection across said opening to bar admission of coins, said indicator lever having an arm disposed back of said post so that on swinging said primary wing said indicator lever will be swung to project said gate across said opening, an inside knob spindle, a secondary wing secured to said spindle, an opening projection on said secondary wing, a talon on said bolt for said projection, said talon being disposed so that it may be operatively engaged by said projection when said bolt abuts said keeper in protracted position and will be disposed out of operative engagement position when fully protracted, a post on said secondary wing engageable with said indicator lever to retract the same upon opening movement of said inside knob.

7. A door lock mechanism comprising the combination of a slidable bolt having a talon, means tending to project said bolt into locking position, a knob spindle, a coin wing connected to said spindle and having a projection for engaging said talon and retracting

said bolt, said talon being disposed to be out of operative engagement by said projection when said bolt is in projected locking position, a coin seat on said coin wing, a coacting coin seat on said bolt whereby a coin may be interposed between said seats to form a coupling between said coin wing and bolt to provide for initiating retractive movement of said talon to position the latter engagement by said projection whereby completion of the retractive movement may be effected by said projection, a tail on said wing, a counter having an operating arm disposed to be engaged by said tail so as to operate said counter.

8. A door lock mechanism comprising the combination of a slidable bolt having a talon, means tending to project said bolt into locking position, a knob spindle, a coin wing connected to said spindle and having a projection for engaging said talon and retracting said bolt, said talon being disposed to be out of operative engagement by said projection when said bolt is in projected locking position, a coin seat on said coin wing, a coacting coin seat on said bolt whereby a coin may be interposed between said seats to form a coupling between said coin wing and bolt to provide for initiating retractive movement of said talon to position the latter for engagement by said projection whereby completion of the retractive movement may be effected by said projection, means independent of said coin wing to retract said bolt, a tail on said coin wing, a counter having an operating arm disposed to be engaged by said tail at the end of operating swinging movement of said coin wing so as to operate said counter.

In witness that I claim the foregoing I have hereunto subscribed my name this 9th day of January, 1929.

JAMES E. OLVIS.