United States Patent

[11] 3,613,855

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Jamestown, N.Y.

[54] **COIN CONTROLLED LOCK FOR TWO COINS**
11 Claims, 11 Drawing Figs.

[52] **U.S. Cl.** **194/51,** 194/DIG. 2
[51] **Int. Cl.** **G07f 17/14**
[50] **Field of Search** ..... 194/.01, 9, 17, 19, 32, 51, 59, DIG. 2

[56] **References Cited**

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ABSTRACT: A key lock operable only by two properly sized coins, such as quarters, deposited through a common slot including a switch mechanism operable to automatically direct the properly sized coins sequentially into outer and inner coin receiving positions; the presence in the inner receiving position of a properly sized coin permitting operation of the lock. Smaller sized coins deposited in any sequence relative to the two properly sized coins or excess properly sized coins are permitted to fall through the lock without influencing its operation.

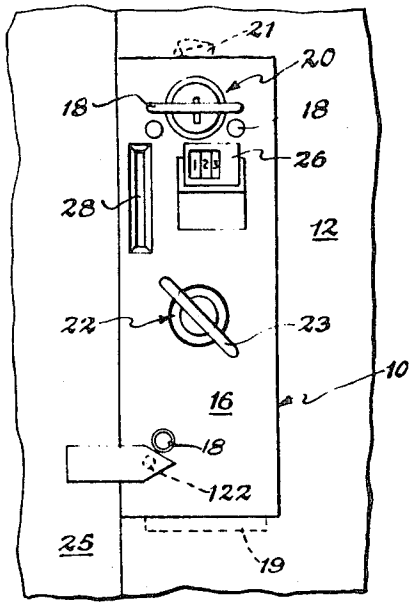


Fig. 1.

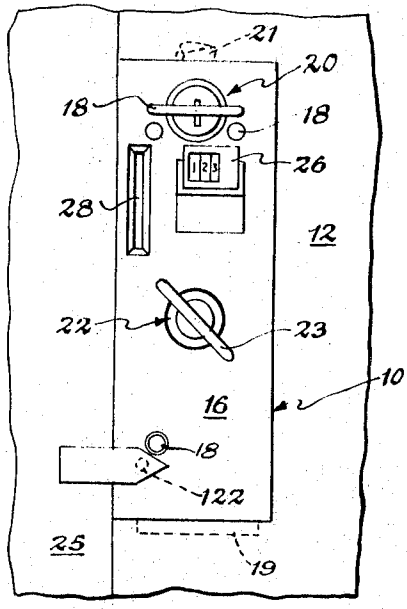


Fig. 2.

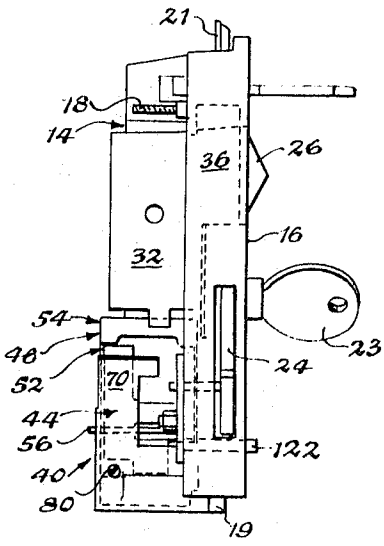


Fig. 3.

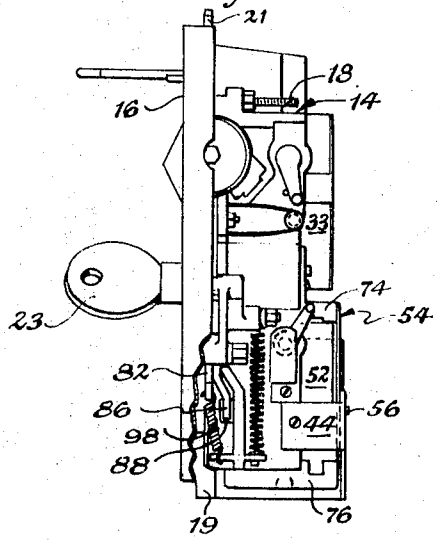
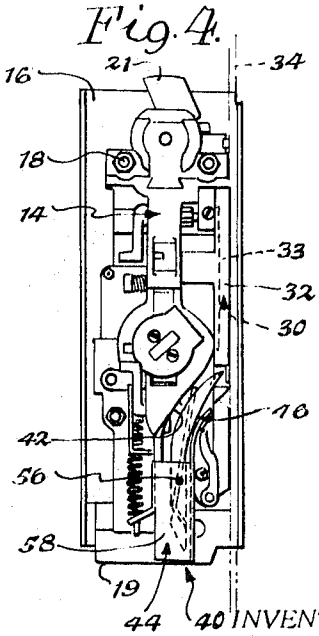


Fig. 4.



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Fig. 5.

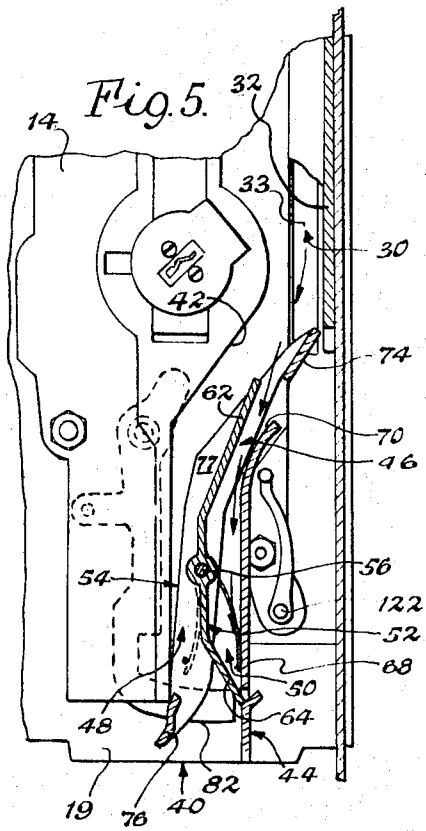


Fig. 6.

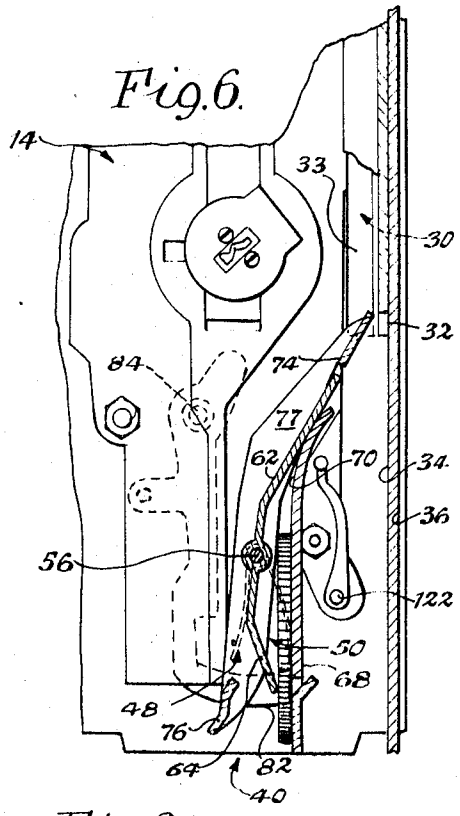


Fig. 7.

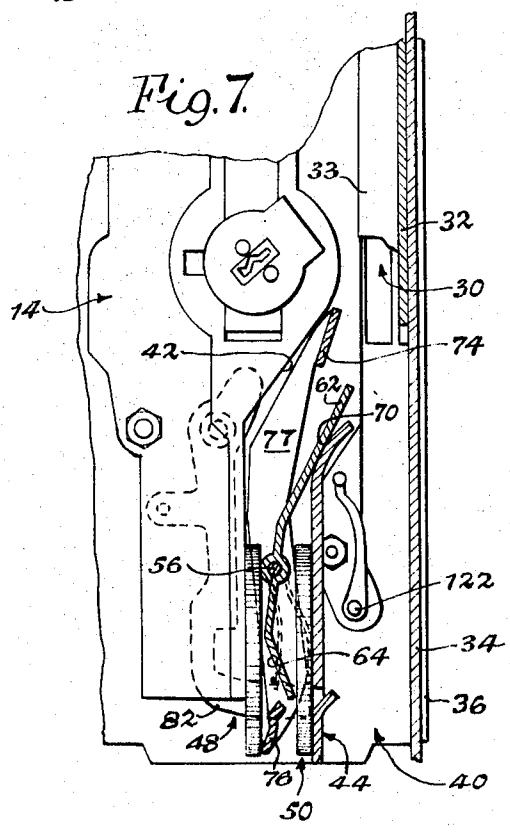
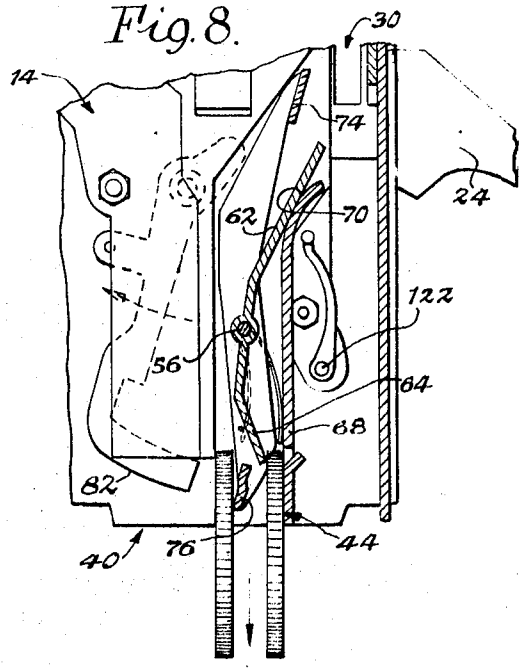


Fig. 8.



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Fig. 9.

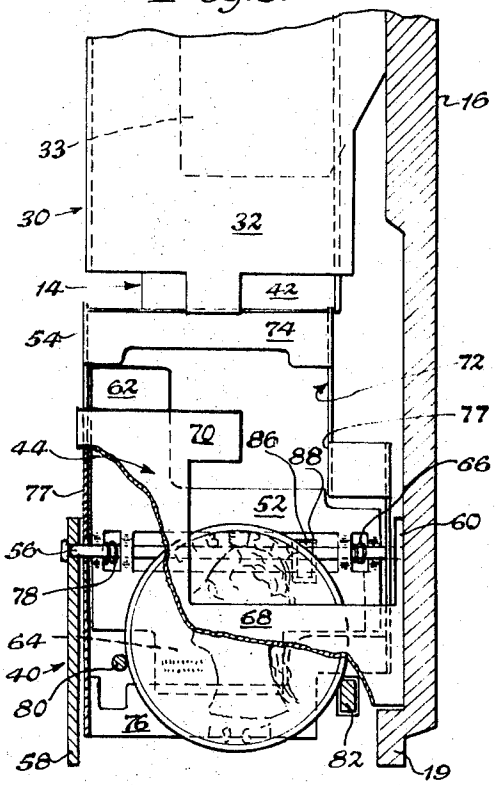
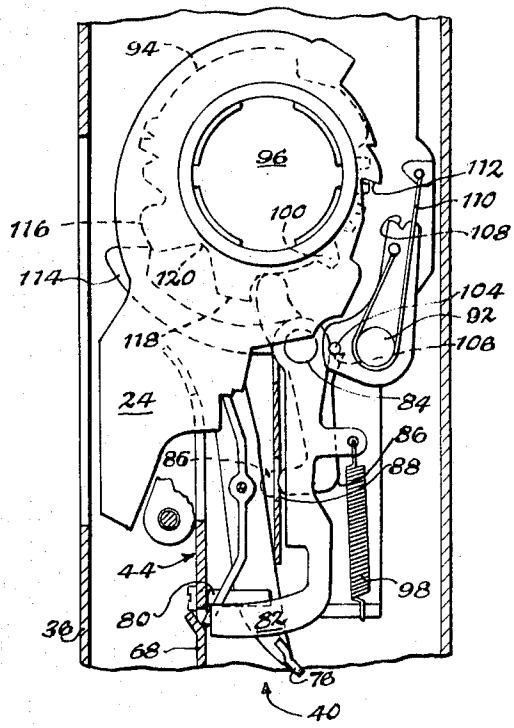


Fig. 10.



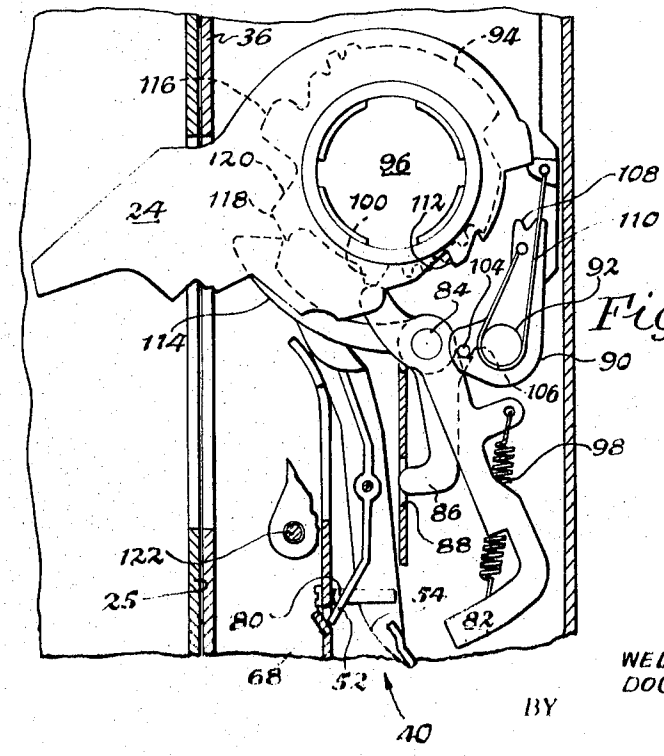


Fig. 11.

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COIN CONTROLLED LOCK FOR TWO COINS

SUMMARY OF THE INVENTION

The present invention generally relates to coin controlled, key operated locks of the type employed in parcel checking cabinets, wherein a lock is provided one in association with each cabinet for the purpose of locking the door thereof in closed position. More particularly, the present invention is directed to an improvement in a coin gauging station for use in two coin controlled locks of the type disclosed in U.S. Pat. No. 3,229,797.

In accordance with the present invention a coin gauging station is offset from the vertical path of travel of coins deposited in the lock through a common slot and includes inner and outer movably mounted dividers cooperating to sequentially position two properly sized coins, such as quarters, in relatively outer and inner coin receiving positions within the gauging station; the lock being operative only when a second properly sized coin is deposited in the inner receiving position. Also, this arrangement permits smaller sized coins, such as pennies, nickels or dimes which are deposited in any sequence relative to the two properly sized coins, such as quarters, or excess properly sized coins to fall through the lock without influencing its operation. This arrangement represents a substantial improvement over prior two-coin lock constructions employing a gauging station, wherein coins were associated in a face-to-face abutting relationship and the composite thickness of the coins sensed or gauged. In such prior constructions faulty coin gauging or jamming of the lock would ofttimes result due to misorientation of the first deposited properly sized coin within the gauging station.

These and other features of the invention will become more fully apparent from the following detailed description of a preferred embodiment of the invention, with reference being made to the accompanying drawings, in which:

FIG. 1 is a view in front elevation of a coin-controlled lock made according to the invention, and showing portions of a checking locker;

FIG. 2 is a side elevational view of the lock;

FIG. 3 is a side elevational view showing the opposite side of the lock;

FIG. 4 is a view in rear elevation;

FIGS. 5, 6, 7 and 8 are fragmentary detail views in rear elevation showing the operation of the inner and outer coin dividers;

FIG. 9 is a fragmentary view similar to FIG. 2, but having parts broken away to show a coin retained within the outer coin receiving position of the gauging station; and

FIGS. 10 and 11 are detail views in front elevation illustrating the operation of the coin-release mechanism.

BACKGROUND OF THE INVENTION

Referring now to the drawings, reference character 10 generally indicates a coin-controlled and key-operated locking unit mounted in a parcel checking cabinet 12. The locking unit is of the general type shown in U.S. Pat. Nos. 2,437,742 and 3,229,797. Typically, with this type of lock and locker arrangement, when the checking cabinet is not in use, the lock is in an unlocked position and the cabinet door can be opened for depositing parcels, luggage and the like in the cabinet. The depositing of two properly sized coins, such as quarters, in the lock functions to permit the key to be rotated to its door locking position and thereafter to be removed and taken by the patron as his check.

The locking unit comprises a frame casting 14 to the front face of which is secured a front plate 16 by bolts 18. The front plate is disposed over and fills an opening through the cabinet wall; the lower end of the plate being provided with a lip 19 engaging behind the cabinet wall and the upper end being equipped with a custodian controlled lock 20 having a locking bolt 21 for engaging behind the cabinet wall thereby securing the unit in place in the cabinet.

The unit also carries a lock 22 having a patron check key 23 and a pivotally mounted bolt 24 for engaging and locking the cabinet door 25 in closed position. A counter 26 is operated by the lock 22 and is adapted to record each actuating cycle of the lock. The key receiving lock cylinders of locks 20 and 22 are made readily removable, so as to permit replacement thereof from time to time as is necessary in the normal course of servicing the locks.

A slit opening 28 is formed in the front face of the plate 16 near the upper left-hand side thereof, as viewed in FIG. 1. This opening, whose size serves to control the maximum size or denomination of coins which may be deposited in the lock, is disposed in open communication with a vertically extending, rectangular cross-sectioned coin chute 30, which is formed by cooperating L-shaped partitions 32, 33, mounted on the frame 14. When the lock unit is mounted to the cabinet, cabinet wall 34 is disposed intermediate partition 32 and a panel 36, which extends rearwardly from plate 16, as best shown in FIGS. 4–8.

Disposed in an offset relationship vertically below chute 30 is a coin gauging station 40, which is bounded by contoured sidewall surface 42 of frame casting 14 and a frame casting mounted bracket 44.

By referring particularly to FIGS. 5–9, it will be understood that in accordance with the present invention a switching mechanism, generally designated as 46, is disposed within gauging station 40 and cooperates with frame casing 14 and bracket 44 to define inner and outer coin receiving positions 48, 50, respectively. Switching mechanism 46 includes inner and outer dividers 52, 54, which are mounted for relative pivotal movement on a common bearing shaft 56, which is in turn end supported by spaced flanges 58, 60 of bracket 44.

In FIGS. 5–9 inner divider 52 is shown as having FIGS. inclined upper guide and lower stop portions 62 and 64, respectively. Suitable means, such as bearing shaft mounted coil spring 66 is provided to normally bias inner divider 52 in a counterclockwise direction into its rest position, as viewed in FIG. 5. In this position, lower stop portion 64 is disposed in abutting engagement with intermediate flange 68 of bracket 44 and upper guide portion 62 is disposed in a spaced relationship to the curved upper guide tab 70 of flange 68.

Again viewing FIGS. 5–9, it will be seen that outer divider 54 is provided with opening 72, which is adapted to freely receive inner divider 52. Opening 72 is bounded by horizontally disposed upper guide and lower stop web portions 74, 76, respectively, and vertically disposed bearing webs 77. The spacing between bearing webs 77 is sufficient to permit passage therebetween of coins having diameters at least as large as the coin, such as a quarter, to be employed to operate the lock. Suitable means, such as bearing shaft mounted coil spring 78 is employed to normally bias outer divider 54 in a clockwise direction into its rest position, as viewed in FIG. 5. In this position, outer divider 54 is disposed in abutting engagement with bracket flange guide tab 70, as as to position upper guide web 74 in vertical alignment with the lower end of coin guide chute 30.

The size or diameter of the coins required to control operation of the lock is determined by the spacing between stationary abutment screw or pin 80, which is carried by bracket flange 68, and gauge pawl 82. Pawl 82 is pivotally supported by casing frame mounted pivot pin 84 for movement transversely of coin receiving positions 48, 50 between its normal coin arresting position shown in FIGS. 5, 6, 7 and 10 and its coin release position, shown in FIGS. 8 and 11. Preferably, the spacing between screw 80 and pawl 82 is sufficient to arrest movement of quarters, while permitting free fall of smaller sized coins, such as pennies, nickels or dimes, downwardly through coin receiving positions 48, 50.

For the purpose of gauging or sensing the presence of a quarter, positioned in inner coin receiving position 48 in the manner to be described, there is provided a feeler pawl 86, which is pivotally supported on frame mounted pivot pin 84 and insertable into coin receiving position 48 through frame casing opening 88.

Pawls 82 and 86 are best shown in FIGS. 10 and 11 as being associated with latch pawl 90, which is pivotally supported on frame casing mounted pivot pin 92, and cam plate 94 and locking bolt 24, which are mounted for rotation with barrel 96 of patron lock 22. Rotation of barrel 96 and thus locking bolt 24 with respect to frame casting 14 between cabinet door unlocked and locked positions, shown in FIGS. 10 and 11, respectively, is controlled by patron key 23.

Again referring to FIGS. 10 and 11, it will be understood that gauge pawl 82 is normally biased in a clockwise direction into its normal coin arresting position by operation of coil spring 98, but is adapted to be forced from its coin arresting position, when lock bolt 24 is moved to its locking position, upon engagement thereof by radially extending projection 100 of cam plate 94.

Latch pawl 90 is provided adjacent opposite ends thereof with abutment pin 104, which is normally disposed in engagement with feeler pawl stop 106, and lock barrel rotation limiting stop 108, which is normally biased by wire spring 110 in a counterclockwise direction, as viewed in FIGS. 10 and 11 towards the peripheral surface of locking bolt 24, which defines a lock notch 112. Due to engagement of pin 104 with feeler pawl stop 106, spring 110 additionally tends to bias feeler pawl 86 in a clockwise direction so as to project same into coin receiving position 48. Due, however, to engagement of feeler pawl extension 114 with cam plate projections 116 and 118, feeler pawl 86 is maintained in its contracted or rest position when lock bolt 24 is in its unlocked and locked positions, shown in FIGS. 10 and 11, respectively. When feeler pawl 86 is so positioned, feeler pawl stop 106 and pin 104 cooperate to maintain latch pawl 90 in its rest position, wherein stop 108 is disposed out of locking engagement with locking bolt 24. Intermediate the unlocked and locked positions of locking bolt 24, feeler pawl extension 114 is receivable within cam plate notch 120, which is disposed intermediate cam plate projections 116, 118, thereby permitting wire spring 110 to project feeler pawl 86 into coin receiving position 48. If a coin is present, movement of feeler pawl 86 into cam plate notch 120 is sufficiently limited so as to prevent disengagement of feeler pawl stop 106 from abutment pin 104 with the result that latch pawl 90 is maintained out of engagement with locking bolt 24, so as to permit the latter to proceed into its locked position. If, however, a coin is not positioned within coin receiving position 48, feeler pawl 86 is permitted to project inwardly thereof to an extent determined by the movement with feeler pawl extension 114 inwardly of recess 120. This movement removes feeler pawl stop 106 from engagement with abutment pin 104, so as to permit wire spring 110 to move latch pawl stop 108 into engagement within locking bolt notch 112 and thereby arrest rotation of locking bolt 24 towards its locked position Return rotation of locking bolt 24 to its fully unlocked position causes latch pawl stop 108 to ride out of notch 112 and feeler pawl extension 114 to ride out of notch 120 onto projection 116 so as to return the parts to their original unlocked position.

It will be noted that when locking bolt 24 is in its locked position, gauge pawl 82 is fully retracted from its coin arresting position, so as to permit quarters previously presented to gauging station 40 to pass downwardly to a suitable coin receiver, not shown. In order to prevent loss of a patron's coins, should he inadvertently operate the lock when the cabinet door is in open position, there is provided a plunger 122, which must be fully depressed by the closing of the cabinet door before rotation of lock bolt 24 is permitted. A suitable arrangement for interconnecting plunger 122 with lock bolt 24 is shown and described in U.S. Pat. No. 3,229,797 and accordingly forms no part of the present invention.

Operation of switching mechanism 46 will be apparent from viewing FIGS. 5–8. In FIG. 5, dividers 52 and 54 are shown as being in their initial or rest positions. When so positioned, outer divider guide web portion 74 is disposed in vertical alignment with coin guide chute 30 and is operable to divert a deposited coin through outer divider opening 72 into outer coin receiving position 50 intermediate flange 68 and inner divider 52. Engagement of the thus diverted coin with inner divider stop portion 64 serves to force inner divider guide portion 62 into engagement with bracket flange guide tab 70, so as to close the entrance to outer coin receiving position 50. If a quarter has been deposited, movement thereof downwardly through coin receiving position 50 will be arrested by abutment pin 80 and gauge pawl 82, so as to maintain the outer coin receiving position closed at its top in the manner described above and shown in FIGS. 6, 7 and 8. On the other hand, if a coin of smaller denomination or diameter, such as a penny, nickel or dime had been deposited, it would be permitted to freely fall downwardly between abutment pin 80 and gauge pawl 82, thereby disengaging inner pawl stop portion 64 and permitting coil spring 66 to return the inner divider to its original or rest position, as shown in FIG. 5. Thus, the outer coin receiving position may be maintained in an open condition until a quarter has been positioned therein and thereafter maintained in a closed condition until operation of the lock withdraws gauge pawl 82 from its arresting position.

Now referring specifically to FIG. 6, it will be understood that after a quarter has been positioned in outer receiving position 50, inner divider guide portion 62 serves to divert subsequently deposited coins, which have been diverted from chute 30 by outer divider guide web portion 74, into inner coin receiving position 48. As in the case of coins diverted to the outer coin receiving position, coins of smaller denominations than a quarter will fall freely downwardly through coin receiving position 48 between abutment pin 80 and pawl gauge 82. During such passage, smaller denomination coins will momentarily engage outer divider stop web portion 76, so as to pivot the outer divider against the bias of coil spring 78 into the position shown in FIG. 7; guide web portion 74 being thereafter returned to its original or coin diverting position shown in FIGS. 5 and 6 by operation of coil spring 78. When, however, a quarter is diverted into inner coin receiving position 48, it is retained therein by abutment pin 80 and gauge pawl 82, so as to positively retain guide web portion 74 in its inoperative position, shown in FIG. 7, wherein it is removed from operable association with guide chute 30. When outer divider 54 is disposed in its inoperative position, all subsequently deposited coins regardless of denomination, are permitted to fall downwardly through an extension of the guide chute defined by bracket intermediate flange 68 and cabinet wall 34.

Preferably, all coins passing through both gauging station 40 and the guide chute extension are passed to a common receiver from which no inadvertently or fraudulently deposited coins are returned to the patron. By omitting the coin return conventionally provided in cabinet locks, the present lock structure is both greatly simplified and the possibility of fraudulently jamming the lock by plugging the coin return opening is prevented.

From the foregoing, it will be apparent that the present invention provides a two quarter lock whose operation is prevented until a second of two required quarters has been deposited; jamming of the lock due to the depositing of coins of smaller denominations or quarters in excess of two being positively prevented.

While the invention has been described with particular reference to the preferred embodiment wherein two quarters are employed to control operation, it will be understood that numerous modifications will be apparent to those skilled in the art. Exemplary thereof would be to vary the dimensions of the lock unit to accommodate coins of various denominations or modify the switching mechanism to provide a three quarter operated lock.

What is claimed is:

1. In a coin controlled mechanism adapted to be operated by two coins of a proper size or denomination, the combination comprising:

a lock having a bolt for locking a door in a closed position;

means mounting said bolt for movement between door unlocking and locking positions;

means providing a slot for depositing coins and a coin passage in communication with said slot;

a coin gauging station offset from and normally communicating with said coin passage, said station including separate first and second coin receiving positions;

switching means movably mounted on said lock and normally extending across said coin passage for diverting deposited first and second properly sized coins passing along said passage successively into said first and second receiving positions, said switching means being movable from across said coin passage automatically upon receipt of said second coin in said second receiving position thereby to permit additionally deposited coins passing along said coin passage to bypass said gauging station; and

coin detecting means operatively connected to said lock and responsive only to the presence of said second coin in said second receiving position, said coin detecting means preventing operation of said lock to lock said door in closed position until said second coin is detected as aforesaid.

2. A coin controlled mechanism according to claim 1, wherein said switching means is disposed intermediate said receiving positions and forms a common boundary thereof, whereby said first and second coins are arranged in engagement with and on opposite sides of said switching means when received within said receiving positions.

3. A coin controlled mechanism according to claim 1, wherein said switching means includes a pair of dividers, a first of said dividers normally extending across said coin passage so as to divert said first and second coins to said gauging station, a second of said dividers being operable to direct said first coin when diverted to said first receiving position and to thereafter close said first receiving position such that said second coin is diverted from said first receiving position to said second receiving position and said first divider being movable from across said coin passage when said second coin is presented to said second receiving position, thereby to permit additionally deposited coins to bypass said gauging station.

4. A coin controlled mechanism according to claim 3, wherein said dividers are mounted on a common shaft for pivotal movement relative to said lock, and resilient means are provided to resiliently bias said dividers in opposite directions, said second divider being movable in a direction against said resilient bias to close said first receiving position upon engagement thereof with said first coin when the latter is presented to said first receiving position said first divider being movable in a direction against said resilient bias from across said coin passage upon engagement thereof with said second coin when the latter is presented to said second receiving position.

5. A coin controlled mechanism according to claim 4, wherein said first divider is provided with an opening adapted to freely receive said second divider and coins of a diameter at least as great as said first and second coins, said first divider having upper and lower web portions bounding said opening, said upper web portion normally extending across said coin passageway, and said lower web portion being arranged for engagement by said second coin to remove said upper web portion from across said coin passage.

6. A coin controlled mechanism according to claim 1, wherein coin arresting means are provided in association with said receiving positions, said arresting means being adapted to arrest movement of said first and second coins through said receiving positions while freely permitting passage therethrough of coins having a diameter less than the diameter of said first and second coins, said coin arresting means being movable to release said first and second coins from said first and second receiving positions after operation of said lock is permitted by said detecting means.

7. A coin controlled mechanism according to claim 1, wherein said gauging station is bounded by spaced surfaces and said switching means is disposed intermediate said spaced surfaces and cooperates with said spaced surfaces to define said coin receiving positions, and coin arresting means extends transversely of said coin receiving positions, said arresting means being adapted to arrest movement of said first and second coins through said receiving positions while freely permitting passage therethrough of coins having a diameter less than the diameter of said first and second coins and being movable to release said first and second coins from said first and second receiving positions after operation of said lock is permitted by said detecting means.

8. A coin controlled mechanism according to claim 7, wherein said switching means includes first and second dividers mounted on a common pivot shaft disposed intermediate and generally parallel to said spaced surfaces and spring means for resiliently biasing said dividers in opposite directions, said first divider having an opening therethrough adapted to freely receive said second divider and coins of a diameter at least as great as said first and second coins, said first divider opening being bounded in part by an upper guide web portion normally extending across said passage so as to divert coins to said gauging station and a lower stop web portion, said second divider having angularly inclined upper guide and lower stop portions, said second divider upper guide portion normally directing diverted coins to said first receiving position and being movable against said resilient bias to close said first receiving position and thereafter direct diverted coins to said second receiving position when said first coin is presented to said first receiving position in engagement with said second divider stop portion, and said first divider guide web portion being movable against said resilient bias from across said coin passage when said second coin is presented to said receiving position in engagement with said first divider lower stop web portion.

9. In a coin controlled mechanism adapted to be operated by two coins of a proper size or denomination, the combination comprising:

a lock having a bolt for locking a door in a closed position;

means mounting said bolt for movement between door unlocking and locking positions;

means providing a slot for depositing coins and a coin passage in communication with said slot;

a coin gauging station offset from and normally communicating with said coin passage, said station including separate first and second coin receiving positions;

switching means movably mounted on said lock for diverting deposited first and second properly sized coins passing along said passage to said gauging station and for thereafter permitting additionally deposited coins to bypass said gauging station, said switching means having a normal position across said passage for diverting said first coin from said passage and for directing same into said first receiving position, said switching means in succession being movable by engagement with said first coin when received in said first receiving position for closing said first receiving position and for diverting said second coin from said passage past said first receiving position into said second receiving position and being movable from across said passage by engagement with said second coin when received in said second receiving position for permitting additionally deposited coins passing along said passage to bypass said gauging station; and

coin detecting means operably connected to said lock and responsive only to the presence of said second coin in said second receiving position, and said coin detecting means preventing operation of said lock to lock said door in closed position until said second coin is detected as aforesaid.

10. A mechanism according to claim 9, wherein said switching means includes return means tending to return said switching means to said normal position; and

coin arresting means are provided in association with said receiving positions, said arresting means being adapted to arrest movement of first and second coins through said receiving positions while freely permitting passage therethrough of coins having a diameter less than the

diameter of said first and second coins, said coin arresting means being movable to release said first and second coins from said first and second receiving positions after operation of said lock is permitted by said coin detecting means, thereby to permit said return means to return said switching means to said normal position.

11. A coin controlled mechanism according to claim 10, wherein said return means includes spring means deformable upon movement of said switching means induced by engagement thereof with said first and second coins when received in said receiving positions.