United States Patent

[11] 3,599,770

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[54] **COIN OPERATED LOCK**
4 Claims, 9 Drawing Figs.

[52] **U.S. Cl.** **194/92**
[51] **Int. Cl.** **G07f 5/00**
[50] **Field of Search** 194/17, 18, 19, 32, 40, 51, 59, 65, 67, 69, 70, 74, 78, 83, 84, 92

[56] **References Cited**

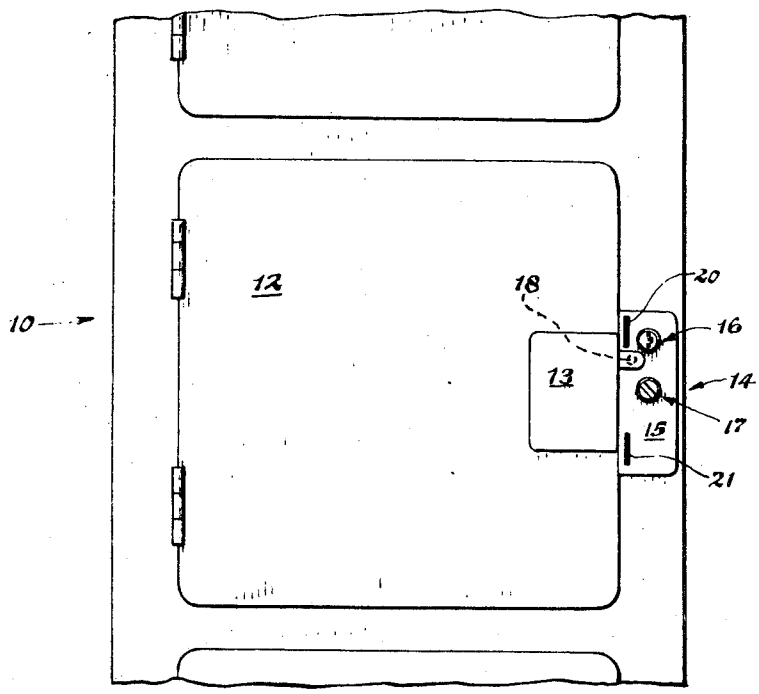
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Primary Examiner—Samuel F. Coleman
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ABSTRACT: In a coin-operated lock unit of the type including a control or custodian key controlled lock and a coin-operated patron key lock, wherein the control lock is adapted to removably secure the unit to a cabinet in position adjacent a door thereof, and the patron lock is adapted to effect locking of the cabinet door, the improvement including control means operated externally of the lock unit for selectively converting the patron lock from coin operated to free status. The control means may include as an integral part thereof means to selectively release the patron key operated lock cylinder from the lock unit to facilitate replacement thereof without the necessity of removing the lock unit from the cabinet.

A further improvement includes novel means interconnecting a lock operation counter with a coin release mechanism via the patron lock, so as to accurately record each paid actuating cycle of the patron lock.



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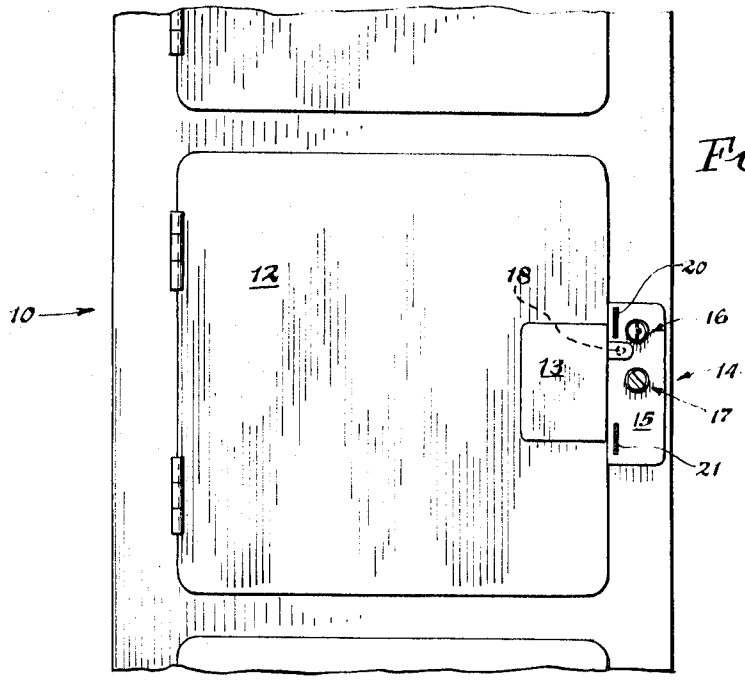


Fig. 1.

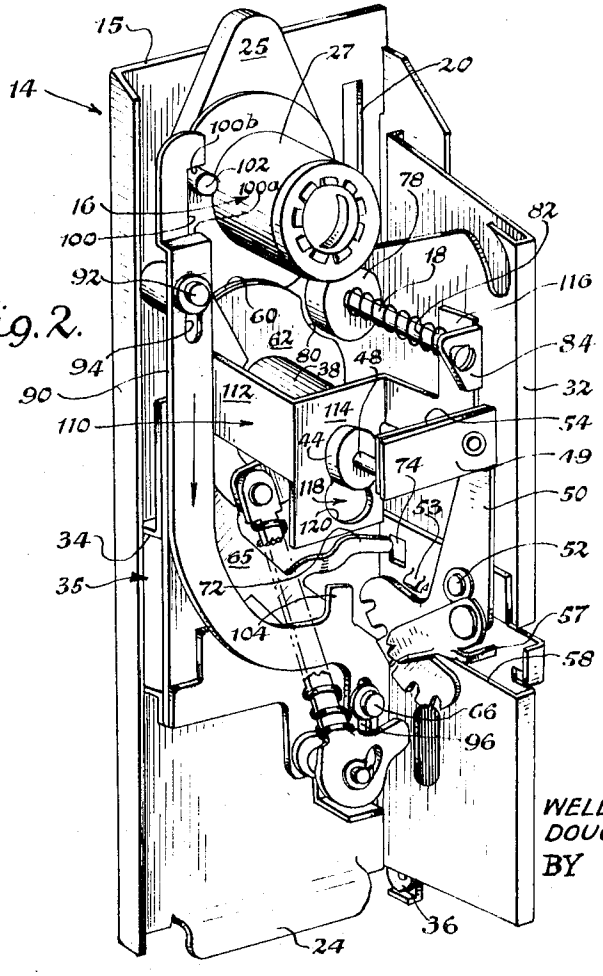


Fig. 2.

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Fig. 3.

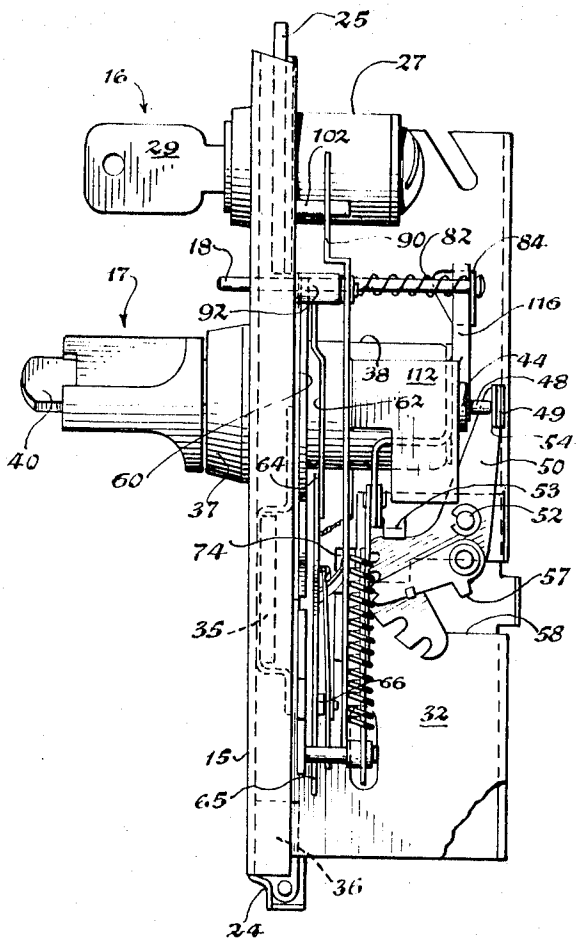
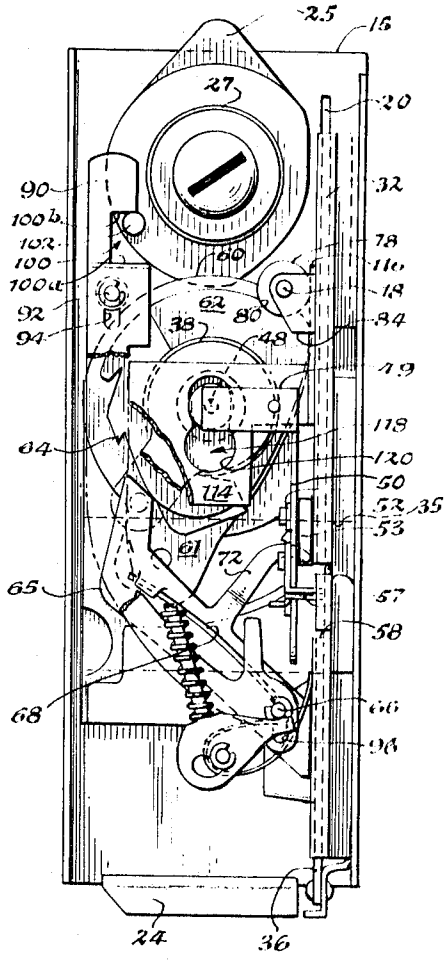


Fig. 4.



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Fig. 5.

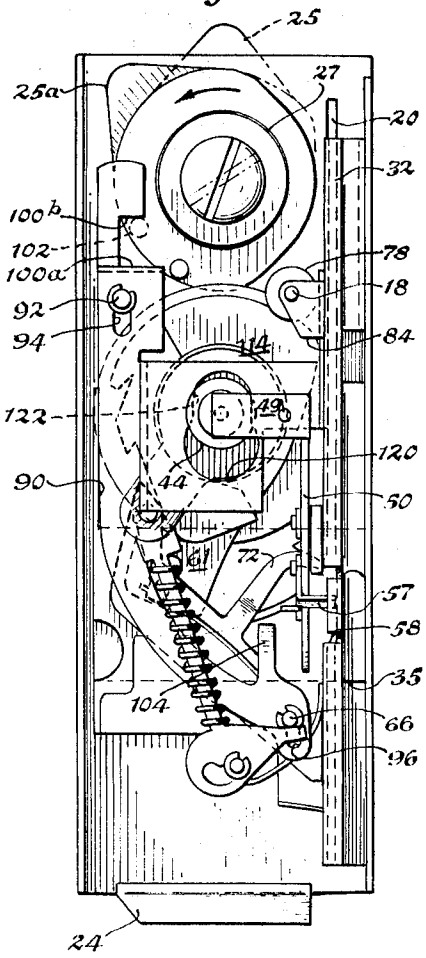


Fig. 6.

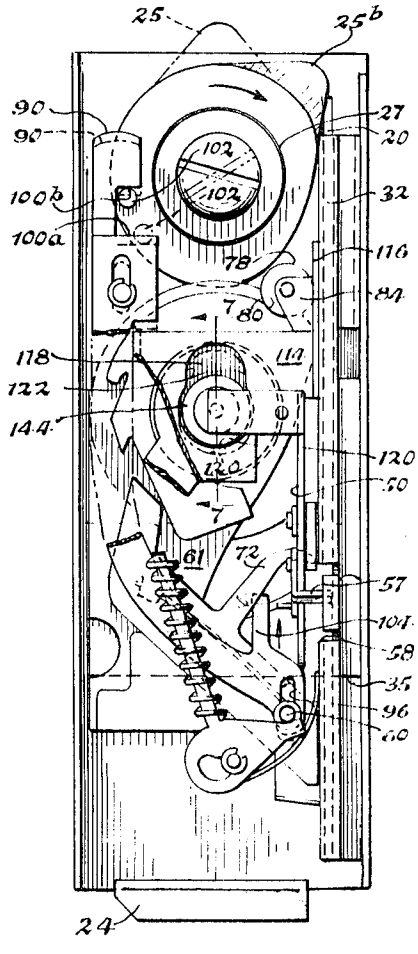
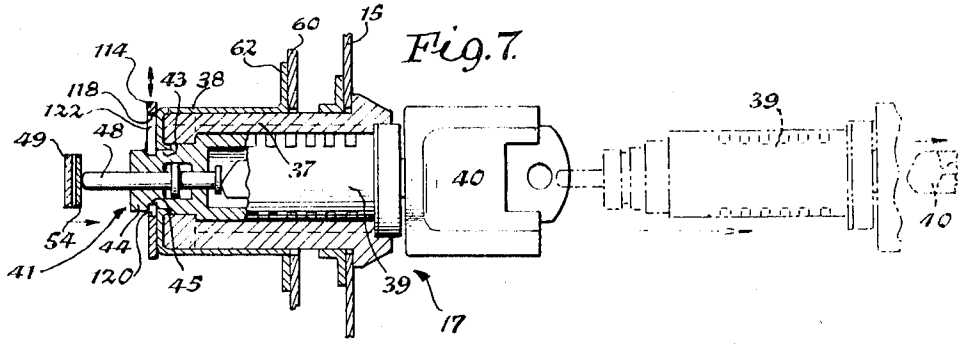


Fig. 7.



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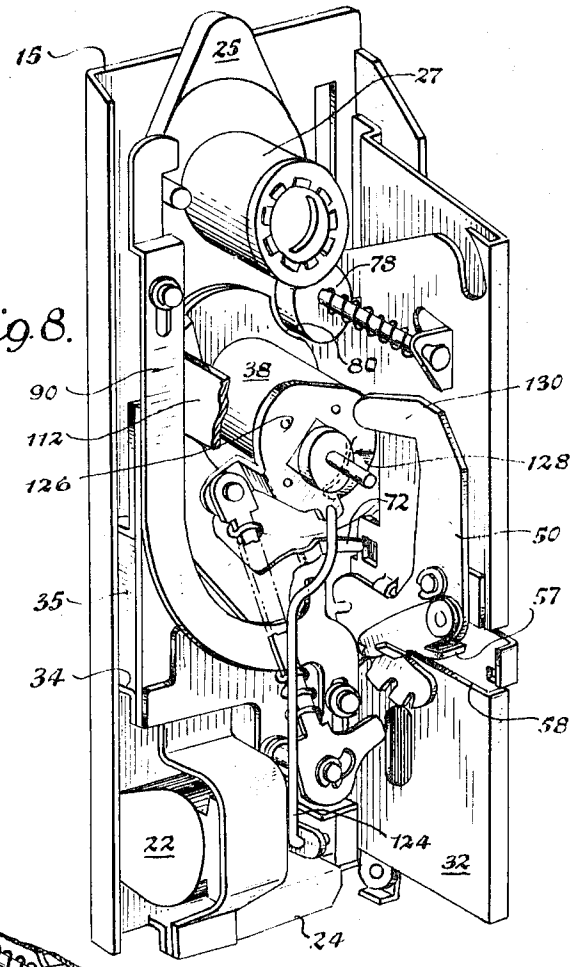


Fig. 8.

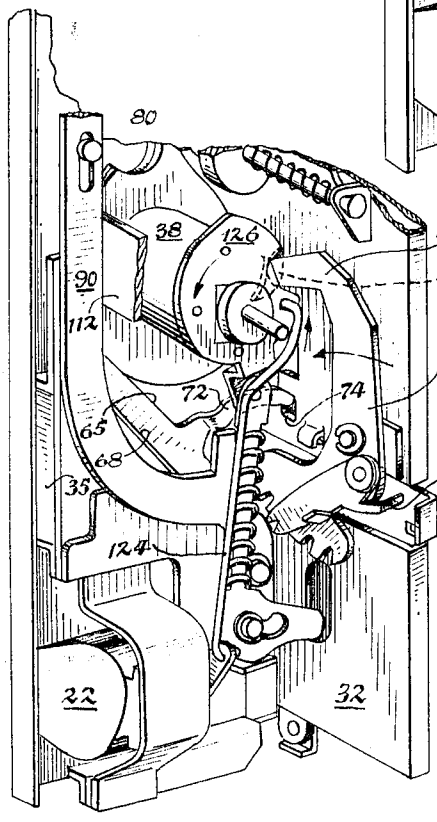


Fig. 9.

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COIN OPERATED LOCK

BACKGROUND OF THE INVENTION

The present invention relates to coin controlled locks. More particularly, it relates to improvements in coin controlled locks of the type disclosed in U.S. Pat. No. 3,228,506, wherein a lock unit including a control or custodian operated lock and a coin-operated patron lock, is removably secured to a cabinet by operation of the custodian lock and the cabinet door locked in closed position by operation of the patron lock.

In locks of the type disclosed in above-mentioned U.S. Pat. No. 3,228,506, provision is made to selectively permit free operation of the patron lock and allow for replacement of the patron key operated lock cylinder should it become defective or the patron key become lost or damaged.

A decided drawback of such prior lock units is that it is necessary to remove the lock unit from the cabinet in order to afford a custodian access to the interior of the unit to permit changeover between coin operated and free status, and/or replacement of the patron lock key cylinder. Also, even when in free status, such units require that a patron insert a properly sized coin into the lock in order to permit its operation; the coin being thereafter returned to the patron.

Further, in lock units of the type under consideration it is common to employ a counter with a view to maintaining an accurate record of the number of occasions on which the cabinet was in use and thus the amount of money collected. The counter is conventionally connected to a patron key operated barrel, such that each time the barrel is rotated into cabinet door locking position the counter is stepped. However, since the mechanism which releases the deposited coin to the coin collection box is not permitted to operate until the patron key is removed from the key cylinder, it was possible for a patron before withdrawing his key from its cylinder to rotate the barrel more than the one required time and thus produce an inaccurate tally of the total number of times the cabinet was in paid use.

SUMMARY

The present invention is directed towards an improvement in locks of the type disclosed in U.S. Pat. No. 3,228,506, wherein a control bar supported within the lock unit is positionally adjusted by the control or patron lock, so as to selectively convert the patron lock from coin-operated to free status without the necessity of removing the lock unit from a cabinet.

Preferably, there is formed as an integral part of the control bar a securing device, which permits the patron key operated lock cylinder to be replaced without the necessity of removing the lock unit from the cabinet.

The novel lock construction of the present invention also includes the provision of a cam element on the patron key barrel in combination with a cam follower associated with the coin release mechanism, whereby permitting a coin to be released to a coin collection box each time the patron key barrel is rotated into full locking position. This arrangement permits a counter, which is operably connected to the patron key barrel to be operated only when a coin is released to the collection box and thus to produce an accurate tally of the total number of times a cabinet has been in paid use.

DRAWINGS

The present invention will now be described in detail in the following description taken with the accompanying drawings, wherein:

FIG. **1** is a fragmentary front elevational view of a bank of checking lockers embodying the invention;

FIG. **2** is a perspective view of a lock embodying the present invention;

FIG. **3** is a side elevational view of the lock shown in FIG. **2**, partly broken away and showing the lock in unlocked position;

FIG. **4** is a rear elevational view of the lock shown in FIG. **3**;

FIG. **5** is a view similar to FIG. **4** but showing the control or custodian lock rotated to set the lock for paid use status;

FIG. **6** is a view similar to FIG. **4** but showing the control or custodian lock rotated to set the lock for a free use status;

FIG. **7** is a sectional view taken generally along the line **7–7** in FIG. **6**;

FIG. **8** is a perspective view similar to FIG. **2**, but showing a further embodiment of the invention; and

FIG. **9** is a fragmentary perspective view of the embodiment shown in FIG. **8**, showing the relationship of parts when the patron key barrel has been rotated in locking condition.

DETAILED DESCRIPTION

Now referring particularly to FIG. **1**, **10** indicates a bank of coin-controlled checking cabinets and **12** indicates a door closure of one of the cabinets on which is fixed a handgripping block or flange **13** adapted to facilitate opening and closing of the door.

A locking unit **14**, which is employed to lock door **12** in closed position, includes a face or front plate **15** through which extends a control or custodian lock **16**, a patron lock **17**, and a patron lock release rod **18**. Faceplate **15** is also apertured to define a coin insertion slot **20** and a coin return slot **21**. Faceplate **15** may also be provided with an opening, not shown, through which may be viewed the numeral wheels of a counter **22**, shown only in FIGS. **8** and **9**.

The various elements forming lock unit **14** may be mounted on faceplate **15**, so as to permit the lock unit to be removably secured within an opening, not shown, provided in a marginal portion of the cabinet adjacent door **12**. Lock unit **14** is secured by cooperation of faceplate bottom lip **24** and lip **25**, which is carried by barrel **27** of control lock **17**. Barrel **27** may be rotated by means of a removable custodian controlled key **29**, so as to move lip **25** between the full line positions, designated as **25***a* and **25***b* in FIGS. **5** and **6**, respectively. When key **29** is removed, lip **25** is disposed in its securing position, shown in full line in FIGS. **2**, **3**, **4** and **8**. The lock unit may be removed from the cabinet when the lip is in position **25***a*.

By referring to FIG. **2**, it will be understood that a vertically extending coin guide **32** of generally U-shaped section is suitably affixed to the rear surface of face plate **15**, such as to be disposed in communication with slots **20**, **21** adjacent the upper and lower ends thereof, respectively. The lower end of coin guide **32** is open and normally disposed in communication with a coin collection box, not shown. Also carried on the rear face of front plate **15** is a bracket **34**, which serves to slidably support a locking bolt **35** for reciprocation between an unlocked position, shown in FIG. **2**, and an extended position, not shown, in which it is disposed in association with door **12**.

In prior art lock constructions of the type disclosed in above mentioned U.S. Pat. No. 3,228,506, locks were made convertible between coin operated or pay and free status by means of a bar **36**, which was pivotally mounted adjacent the lower end of coin guide **32**. When bar **36** was pivoted into an upstanding position, return slot **21** was closed and the bottom of guide **32** disposed in open communication with the coin collection box, whereas when bar **36** was pivoted into a lowered position, it served to divert a coin passing downwardly through the coin guide through slot **21** in order to return same to a patron. Since custodian control of the positioning of bar **36** was necessary in order to prevent fraudulent use of the checking cabinets, a suitable mechanism, not shown, for releasing bar **36** was positioned within the body of lock unit **14**, thereby requiring the entire lock unit to be removed from the cabinet by the use of the custodian's key before the unit could be changed to a free status.

In FIG. **7**, patron lock **17**, is shown as including a cylindrical housing **37**, which is nonmovably carried by face plate **15**; a barrel **38**, which is rotatably supported by housing **37**; and a lock cylinder **39**, which is rotatably supported by housing **37**; so as to permit rotation thereof only under the control of

patron's key **40**. The inwardly extending end portion **41** of lock cylinder **39**, which is adapted to project rearwardly through housing **37**, is provided with a nonround, as for instance square sectioned, portion **43** which is removably received within a like configured aperture in barrel **38** in order to permit the cylinder and barrel to be drivingly interconnected. End portion **41** also includes a cylindrical end portion **44**, which cooperates with portion **43** to define an annularly extending slot recess **45**. It will be understood that prior lock arrangements conventionally employed a split-ring-type fastener, not shown, which was removably seated within slot recess **45** for the purpose of retaining lock cylinder **38** within housing **37**. Thus, heretofore it was necessary for a custodian to gain access to the rear of the lock unit in order to permit removal of such cylinder, as indicated in phantom line in FIG. **7**, in cases where the patron's key was lost or damaged.

Mounted to slide axially within and projecting rearwardly of locking cylinder end portion **41** is a rod **48** having an enlarged middle portion for limiting such movement. The inner end of rod **48** is engageable with the forward end of patron key **40**, whereas the outer end of rod **48** is engageable with the offset top end **49** of a lever **50**, which is pivotally supported on coin guide **32**, as at **52**. When patron's key **40** is fully inserted to the position indicated in FIGS. **3** and **7**, it forces rod **48** to its fully extended position, which in turn serves to pivot lever **50** into contact with a fixed stop **53**. Preferably, a leaf spring **54** is secured to top end **49**, so as to insure that lever **40** is maintained in contact with stop **53**. When lever **50** is disposed in the above described condition, a coin intercepting finger **57**, which is adjustably carried thereon and extends through an aperture **58** provided in coin guide **32**, is positioned so as to releasably retain a deposited coin, not shown, in a predetermined position within coin guide **32**. When patron's key **40** is removed from cylinder **39**, rod **48** is freed for movement and lever **50** thereby permitted to swing in a counterclockwise direction, as viewed in FIG. **3**, in order to release the previously positioned coin and permit same to pass either downwardly towards the coin collection box or outwardly through return slot **21**. By adjusting the position of finger **57** on lever **50**, the size of coin which the finger will retain and thus the size of coin adapted to permit operation of the lock unit may be selectively controlled.

Again referring to FIGS. **3** and **4**, it will be understood that a disc **60** is fixed to the forward end of barrel **38** and provided with an arm **61** suitably connected to lock bolt **35**, such that upon rotation of barrel **38** in a counterclockwise direction, as viewed in FIG. **4**, bolt **35** is moved to an extended door-locking position, not shown. A disc **62**, which is also carried on the forward end of barrel **38**, is notched to provide a shoulder **64** adapted to cooperate with a pawl **65**, which is in turn pivotally supported by pin shaft **66**. A spring **68** serves to normally bias pivot pawl **65** into contact with disc **62** for engagement with shoulder **64**.

In FIG. **4**, barrel **38** is illustrated as being in its normal unlocked position, wherein a high-peripheral portion of disc **62** engages with pawl **65**, so as to position the latter radially outwardly of shoulder **64**. When barrel **38** is rotated in a counterclockwise direction, as viewed in FIG. **4**, spring **68** pivots pawl **65** inwardly, whereupon the shoulder engages the pawl and limits further rotation of barrel **38**, in the absence of a coin being positioned within coin guide **32** by intercepting finger **57** in the manner described above. When a coin is properly positioned by intercepting finger **57**, a coin feeling finger **72**, formed integrally with pawl **65**, is engageable with such coin through coin guide opening **74**. When coin feeling finger **72** contacts a coin, it serves to hold pawl **65** in a position radially outwardly of shoulder **64**, so as to permit shoulder **64** to move past the pawl as barrel **38** is rotated into its locking position, shown only in FIG. **9**.

It will be apparent that, due to the above described operation of pawl **65** in the lock constructions of the type disclosed by U.S. Pat. No. 3,228,506, it was necessary for a patron to employ a properly sized coin to permit his use of a cabinet locker even though the lock unit had been changed to free status.

In that it is desirable that operation of lock unit **14** shall be prevented until door **12** is in closed position, patron lock release rod **18** is provided with a cylindrical stop **78**, which is receivable within notch **80** provided in discs **60** and **62**. A compression spring **82**, which is supported by rod **18** intermediate stop **78** and rod supporting bracket **84**, is employed to bias rod **18** forwardly, so as to position stop **78** within notch **80** in order to prevent rotation of barrel **38**, and to position the forwardly projecting end of rod forwardly beyond face plate **15**. Inward pressure on the outwardly projecting forward end of rod **18**, as by engagement thereof by gripping block **13** when the door **12** is moved into its closed position, serves to move the rod inwardly against the bias of spring **82** and carry stop **78** out of notch **80** in order to permit barrel **38** to be rotated upon insertion of the patron's key. A further detailed description of the lock mechanism thus far described may be had by referring to the above-mentioned U.S. Pat. No. 3,228,506.

Lock unit **14** is improved in accordance with the present invention by providing a control bar **90**, whose position is adapted to control setting of the lock unit in either a coin operated or free status, the latter not requiring the temporary depositing of a coin for purposes of operation. More specifically, control bar **90** is supported for vertically reciprocating movement rearwardly of faceplate **15** by pin shafts **92** and **66**, which are received within vertically extending slot openings **94** and **96** provided adjacent the upper and lower ends of the control bar, respectively. Suitable means, such as a spring washer, not shown, carried on pin shaft **92** is provided to frictionally prevent free sliding movement of the pin shafts within the control bar slot openings in order to retain the control bar in any desired preset position against the force of gravity.

Control bar **90** is formed with a side opening recess **100**, which is disposed immediately above upper slot opening **94** and provided with lower and upper operating edge portions **100*a***, **100*b***, respectively. An operating pin **102**, carried by control lock barrel lip **25**, is adapted to alternatively cooperate with edge portions **100*a***, **100*b*** to effect vertical reciprocation of control bar **90**. Immediately above lower control rod slot opening **96**, there is provided an arresting finger **104**, which is adapted to selectively cooperate with coin-feeling finger **72** of pawl **65**.

When, in accordance with the present invention, it is desired to have lock unit **14** function on a coin-operated status, it is merely necessary for a custodian to employ custodian key **29** to rotate control lock barrel lip **25** into the position indicated at **25*a*** in FIG. **5**, whereafter, the control lock barrel lip may be immediately returned to its phantom line, lock unit securing position, indicated at **25**. It will be understood that during rotation of the control lock barrel lip into its full line position, operating pin **102** cooperates with edge portion **100*a*** for the purpose of reciprocating control bar **90** into its lowermost position, shown in full line in FIG. **5**. In this position, arresting finger **104** is spaced from coin feeling finger **72**, and the lock unit permitted to function on a pay status in exactly the same manner disclosed in U.S. Pat. No. 3,228,506.

Referring to FIG. **6**, it will be understood that when it is desired to change lock unit **14** to free status, it is merely necessary for a custodian to operate control key **29** so as to rotate the control lock barrel lip into its full line position indicated at **25*b***, and immediately thereafter return same to its lock unit securing position, indicated in phantom line at **25**. During the thus described movement of the control lock barrel lip, operating pin **102** is first brought into engagement with operating edge portion **100*b*** for the purpose of raising control bar **90** into its full line position, shown in FIG. **6**, and thereafter cooperates with lower operating edge portion **100*a*** to return the control bar to an intermediate upper position, shown in phantom line. When control bar **90** is disposed in either of its full or phantom line positions, indicated in FIG. **6**, arresting finger **104** is disposed in engagement with coin-feel-

ing finger 72. When finger 72 is so engaged, pawl 65 is forced to assume substantially the same position radially outwardly of shoulder 64 as would be the case if finger 72 were disposed in contact with a coin retained within coin guide 32 by coin-intercepting finger 57. Thus, when lock unit 14 is in a free status operating condition, pawl 65 is rendered inoperative, so as to negate the the need for the patron depositing a properly sized coin. Further, since the patron no longer has to employ a coin in order to effect operation of the lock when in free status, there is no need for providing a coin return arrangement including coin return slot 21 and bar 36.

Preferably, control bar 90 is further provided with an integrally formed flange projection 100, which is adapted to releasably secure lock cylinder 39 within housing 37. Flange projection 100 is defined by a connecting spacer portion 112, a securing portion 114 and a guide and positioning tab portion 116. Securing portion 114 is provided with a vertically extending slot opening 118, which is enlarged adjacent its lower end, as at 120. Slot enlargement 120 is sized to permit passage of lock cylinder cylindrical end portion 44 therethrough in order to removably position securing portion 114 in alignment with annular slot recess 45. It will be understood that slot enlargement 120 is positioned in alignment with cylindrical end portion 44 only when control bar 90 is in its uppermost or full line position shown in FIG. 6. In all other positions of control bar 90, slot enlargement 120 is moved out of alignment with end portion 44, so as to permit edge portions 122, which bound the upper extent of slot opening 118, to be received within annular slot recess 45. Thus, when it is desired to remove lock cylinder 39 from housing 37, a custodian, by use of control key 29, may rotate the control lock barrel lip into its full line position, indicated at 25*b*, for that period of time necessary and to remove one lock cylinder and insert a replacement. Thereafter, upon returning the control lock barrel lip to its lock unit securing position, operating pin 102 will serve to move control bar 90 and thus securing portion 114 downwardly for the purpose of retaining the lock cylinder in position. Referring particularly to FIG. 3, it will be understood that tab portion 116 cooperates with release rod supporting bracket 84 to guide securing portion 114 during vertically reciprocating movement thereof, so as to insure that it will be properly aligned with annular slot recess 45 when a replacement lock cylinder is positioned within housing 37.

Also, in accordance with the present invention, there is provided an improved lock unit arrangement, which permits a counter 22, which is drivingly connected by rod 124 to patron lock barrel 38, to accurately record each paid locking operational cycle of patron lock 16. Counter 22, which forms no part of the present invention, is preferably of a type adapted to be stepped once during each operational cycle of patron lock barrel 38 between its normal unlocked position, shown in FIG. 8 and its locked position, shown in FIG. 9.

In accordance with the arrangement illustrated in FIGS. 8 and 9, the rearwardly facing, radially disposed surface 126 of patron lock barrel 38 is provided with a forwardly sloping or inclined arcuate cam surface 128, and lever 50 is modified so as to provide an integrally formed forwardly projecting finger or cam follower 130. Lever 50 and its associated parts are formed, such that the lever tends to pivot in a counterclockwise direction, as viewed in FIG. 8, under the force of gravity so as to position finger 130 in operative sliding engagement with barrel surface 126. Thus, when patron lock barrel 38 is rotated into its locking position, shown in FIG. 9, finger 130 is forced by gravity to follow arcuate cam surface 128, thereby permitting coin intercepter finger 57 to be removed from engagement with the coin previously positioned thereby within coin guide 32 and permit such coin to pass downwardly towards a coin collection box. Upon the release of such coin, it is impossible to again rotate barrel 38, until pawl 65 is released by the act of depositing another coin. Thus, the arrangement permits barrel 38 and, thus, counter 38 to be operated only once for each paid operation of lock unit 14.

We claim:

1. An improvement in a coin-operated lock unit for use with a checking cabinet having a door for closing said cabinet, wherein said lock unit includes a face plate, means for securing said faceplate to said checking cabinet, said faceplate when secured concealing rearwardly thereof hereinafter recited elements of said lock unit, a coin guide, a patron lock, a patron lock operated rotary barrel having a locking bolt connected thereto and movable therewith between cabinet door unlocked and locked position, means normally operable for retaining said barrel and bolt in one of said positions, a coin feeler operable by a coin positioned within said coin guide to render said retaining means inoperative, a counter, means operably connecting said counter to said barrel such that said counter is actuated by each rotational movement of said barrel serving to move said bolt between said positions, and means operable for releasably retaining said coin positioned within said coin guide as aforesaid, said improvement comprising in combination:

control means mounted rearwardly of said face plate, said control means being operably connected to means under the control of a custodian for movement between at least first and second positions, said means under the control of a custodian being accessible forwardly of said face plate, said control means when moved into said first position rendering said coin feeler inoperative, whereby said lock unit may function in a free status, and said control means when removed into said second position rendering said coin feeler operative, whereby said lock unit may function in a coin operative status; and

cam means mounted for rotational movement with said barrel and cam follower means associated with said coin retaining means, said cam means cooperating with said cam follower means for releasing said coin from said position when said barrel is rotated to move said bolt from one position to the other.

2. An improvement in a coin operated lock unit for use with a checking cabinet having a door for closing said cabinet, wherein said lock unit includes a faceplate, means for securing said faceplate to said checking cabinet, said faceplate when secured concealing rearwardly thereof hereinafter recited elements of said lock unit, a coin guide, a patron lock, a patron lock operated rotary barrel having a locking bolt connected thereto and movable therewith between cabinet door unlocked and locked positions, means normally operable for retaining said barrel and bolt in one of said positions, a coin feeler operable by a coin positioned within said coin guide to render said retaining means inoperative the improvement comprising:

a custodian controlled lock accessible forwardly of said faceplate, said custodian lock including a rotary barrel having a lip carried for movement therewith, said lip when in a first position thereof securing said faceplate to said checking cabinet, said lip carrying an operating pin for movement therewith; and

a control bar mounted for vertically reciprocating movement between at least first and second positions, said bar mounting coin feeler engaging means for movement therewith, said engaging means being disposed in engagement with said coin feeler when said bar is moved into said first position thereof whereby rendering said coin feeler inoperative to permit said lock unit to function in a free status, said engaging means being disposed out of engagement with said coin feeler when said bar is moved into said second position thereof whereby to permit said lock unit to function in a coin operative status, said bar defining spaced operating edges, said custodian lock barrel when rotated being adapted to move said lip in opposite directions from said first position thereof into second and third positions thereof, at least one of said second and third positions of said lip being a faceplate releasing position, said pin being alternately engageable with said edges when said lip is moved in said opposite direction so as to move said bar into said first and second positions thereof.

3. An improvement in a coin-operated lock unit according to claim 2, wherein said patron lock includes a patron key operated lock cylinder having ends thereof extending inwardly and outwardly of said unit through said faceplate, said lock cylinder being removably interconnected to said patron lock barrel, and said bar includes an integrally formed flange retaining means adapted to releasably engage said inwardly extending end of said lock cylinder, said flange retaining means being disengaged from said inwardly extending end of said lock cylinder to permit removal thereof outwardly of said unit when said lip is in the other of said second or third positions thereof, and said flange retaining means being engaged with said inwardly extending end of said lock cylinder so as to prevent removal thereof as aforesaid when said lip is in all other positions thereof.

4. An improvement in a coin-controlled lock unit for use with a checking cabinet having a door for closing said cabinet, wherein said lock unit includes a coin guide, a counter unit, a patron lock operated rotary barrel having a locking bolt connected thereto and movable therewith between cabinet door locking and unlocking positions, means normally retaining said barrel and bolt in one of said positions, means operably connecting said counter to said barrel such that said counter is actuated by each rotational movement of said barrel serving to move said bolt between said positions, means for retaining in a predetermined position within said coin guide a coin deposited thereinto, coin feeler means operable by a coin retained in said predetermined position to render said first said retaining means inoperative, the improvement comprising:

cam means mounted for rotational movement with said barrel and cam follower means associated with said coin-retaining means, said follower means cooperating with said cam means for releasing said coin from said predetermined position when said barrel is rotated to remove said bolt from one position to the other.