April 13, 1954 C. A. GARVER 2,675,107

COIN-OPERATED LOCK ASSEMBLY FOR TIERED BOXES

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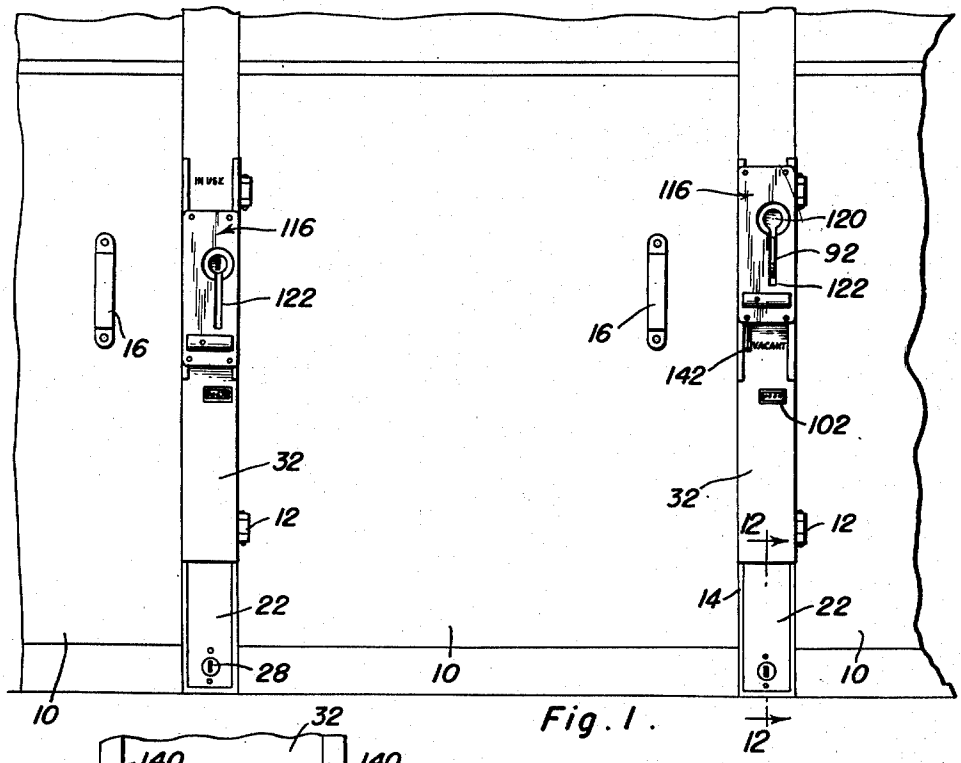


Fig. 1.

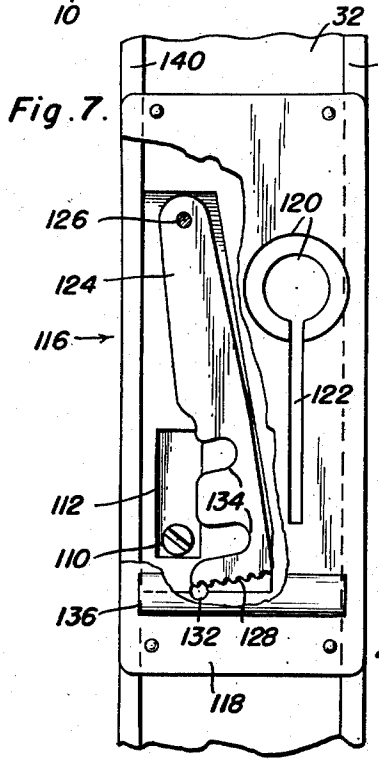


Fig. 7.

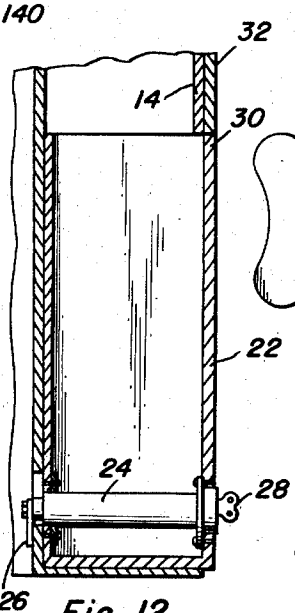


Fig. 12.

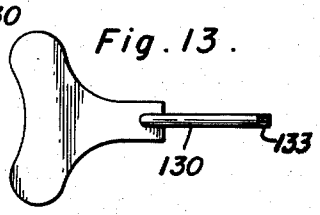


Fig. 13.

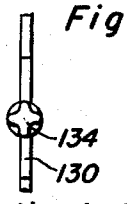


Fig. 14.

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COIN-OPERATED LOCK ASSEMBLY FOR TIERED BOXES

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Fig. 3.

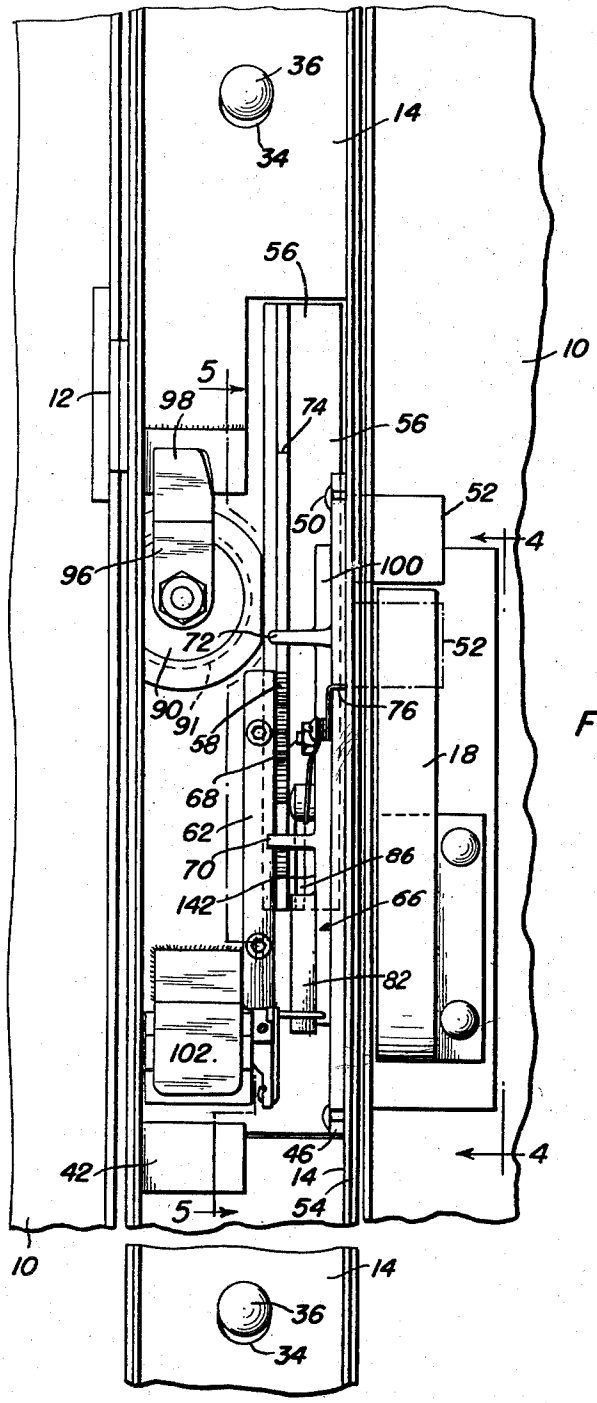


Fig. 4.

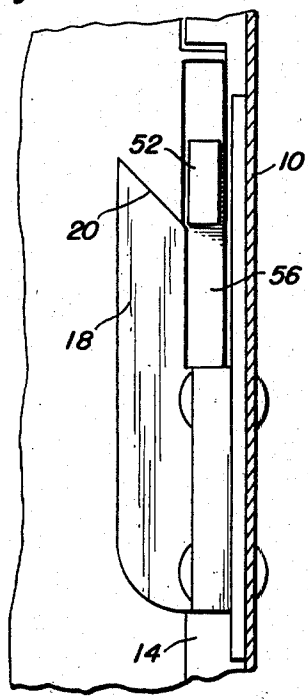
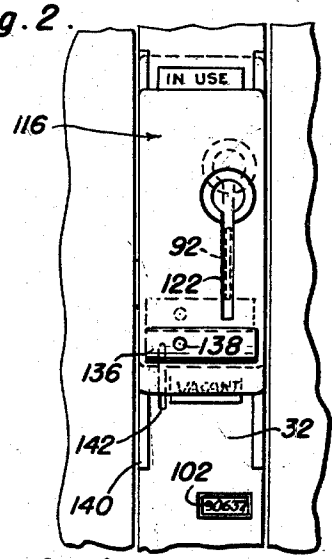


Fig. 2.



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COIN-OPERATED LOCK ASSEMBLY FOR TIERED BOXES

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Fig. 5.

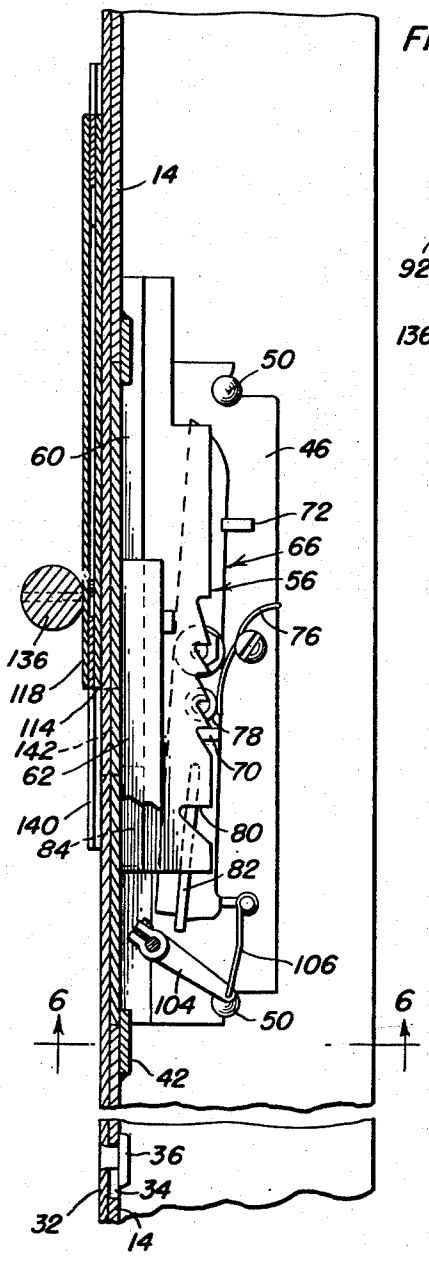


Fig. 6.

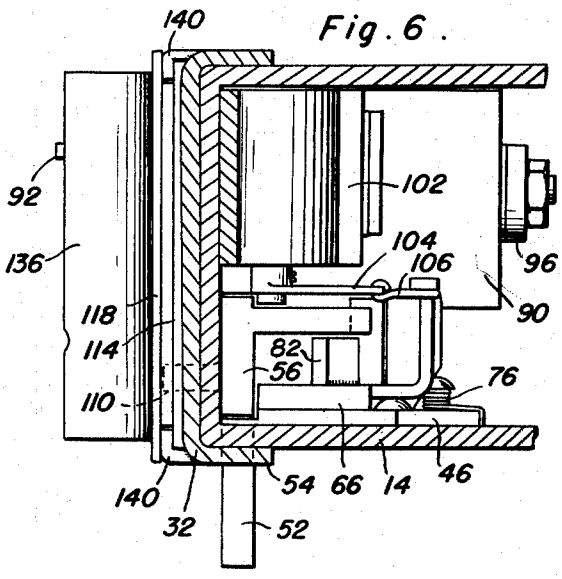
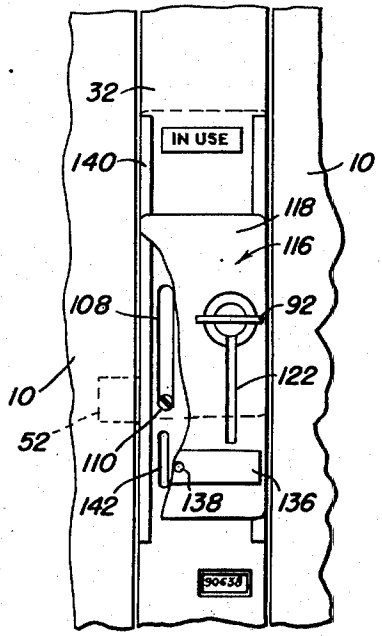


Fig. 8.



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COIN-OPERATED LOCK ASSEMBLY FOR TIERED BOXES

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Fig. 9.

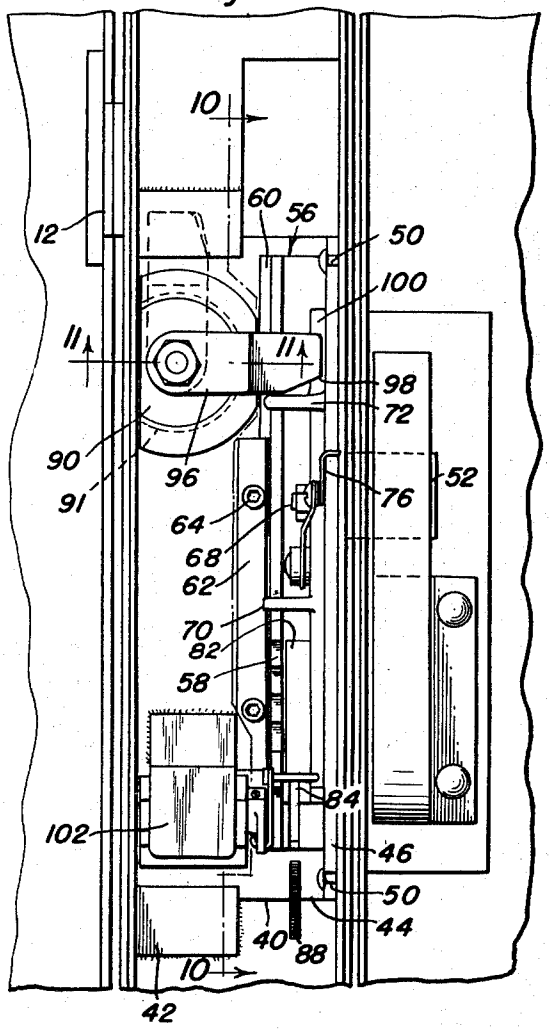


Fig. 10.

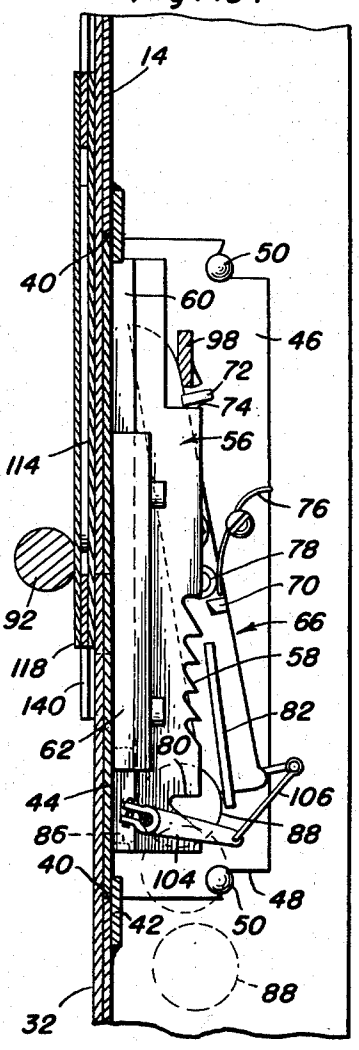
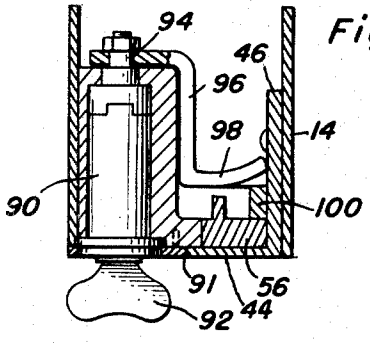


Fig. 11



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Patented Apr. 13, 1954

2,675,107

UNITED STATES PATENT OFFICE

2,675,107

COIN-OPERATED LOCK ASSEMBLY FOR TIERED BOXES

Curtis A. Garver, Lexington, Ky., assignor, by direct and mesne assignments, to Guardian Lockers Incorporated, a corporation of Delaware

Application May 12, 1948, Serial No. 26,620

8 Claims. (Cl. 194—54)

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This invention relates generally to lock mechanism, and more particularly to a coin-operated lock assembly for tiered boxes, such as those boxes provided in public buildings for the temporary storage of luggage.

In brief, this invention includes means for locking the doors of tiered boxes having a vertical door jamb at one side of a vertical row of boxes, a coin box being provided preferably at the lower end of this door jamb and securing in place a face plate which is removably mounted upon the door jamb and coin-operated door locks are incorporated partially on the said face plate and partially on the door jamb. The different elements are so arranged that removal of the coin box allows removal of the face plate, in order to give access to the portions of the lock carried on the door jamb. It will be understood that this arrangement allows for inspection by the operator of the establishment, who alone has keys allowing him to remove the coin box, while the patrons are made free to use the boxes upon the insertion of a coin in the coin-operated lock associated with each door. The above arrangement also allows provision of separately removable lock chambers and the operator of the establishment to easily remove, replace or interchange lock chambers when keys are lost or not returned to lock by patron without replacing entire locking mechanism. The details of construction in the actual locking mechanism of the door contain novel features distinct from but cooperating with the face plate and coin box construction, the novel features of the lock mechanism per se being set forth in some detail in the following specification.

A primary object of this invention is to provide a coin-operated lock assembly for doors of tiered boxes of a character which can be easily understood and operated by patrons without extensive instructions, the only instruction which is necessary being of very simple character and applicable to the face plate in such manner that the operation of the lock automatically discloses the operative condition of the box with which the lock assembly is associated.

Another object of this invention is to provide a coin-operated lock assembly for public baggage storage devices which is relatively proof against tampering or misuse.

Still another object of this invention is to provide such means for positively locking the doors of the boxes, while allowing easy opening of the locked boxes by the key whenever a proper coin has been inserted into the lock, except when

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storage is due, the lock being prevented from opening in this last instance, and it is a feature of this invention to provide simple means whereby the operator of the establishment may easily adjust the lock to the "storage due" position whenever the box has been occupied over a predetermined period without reinsertion of another coin.

Yet another object of this invention is to provide a coin-operated lock assembly which is economical to operate, and which, as mentioned in the preceding objects, prevents loss of revenue for over-time storage.

And a last object to be mentioned specifically is to provide a device of this character which is relatively inexpensive and practicable to manufacture, which is safe and trouble-free in use, and which will give generally efficient and durable service.

With these and other objects definitely in view, this invention resides in certain novel features of construction, combination and arrangement of elements and portions as will be hereinafter described in the specification, particularly pointed out in the appended claims, and illustrated in the accompanying drawings which form a material part of this application, and in which:

Figure 1 is a front elevational view of a plurality of boxes, with a vertical door jamb and coin box structure, the figure being fragmentary in character and showing lock mechanism in "vacant" and "in use" positions;

Figure 2 is an enlarged fragmentary elevational view designed to show the positions assumed by the outside portions of the lock mechanism when in "storage due" position, the figure also indicating the positions of certain of the same elements when in unlocked position, the notice "vacant" being visible in this last-mentioned position;

Figure 3 is a rear elevational view showing the principal parts of the lock mechanism in unlocked position and also showing to advantage how the face plate is removably secured to the door jamb;

Figure 4 is a vertical sectional view, taken on the line 4—4 in Figure 3 but prior to complete movement of the latch bar to unlock position and designed to show how the opening of the door completes the raising of the latch bar;

Figure 5 is a vertical sectional view, taken on a line 5—5 of Fig. 3, but with the latch bar only being partially elevated prior to opening the locker door;

Figure 6 is a horizontal sectional view taken

on the line 6—6 in Figure 5 and looking upward in the direction of the arrows;

Figure 7 is a front elevational view with part of the slide plate broken away to illustrate the mechanism employed to fasten the lock mechanism in "storage due" position;

Figure 8 is a front elevational view designed to show the positions assumed by the elements of the lock mechanism when the door is locked and the key is free to be withdrawn, portions of the figure being broken away to facilitate the illustration;

Figure 9 is a rear elevational view, similar to Figure 3, but showing the various elements in the positions assumed when the door has been closed and locked and the key withdrawn or about to be withdrawn;

Figure 10 is a vertical transverse sectional view, taken substantially on the line 10—10 in Figure 9 and looking in the direction of the arrows;

Figure 11 is a horizontal sectional view, taken on the line 11—11 in Figure 9, and looking in the direction of the arrows and with the face plate and slide plate removed;

Figure 12 is a vertical transverse sectional view taken on the line 12—12 in Figure 1 and designed to illustrate how the coin box locks the face plate in place;

Figure 13 is a side elevational view of the key used by the operator of the establishment wherein the boxes are provided to operate the mechanism illustrated in Figure 7 when over-time storage is due; and

Figure 14 is a fragmentary and enlarged end view of the key illustrated in Figure 13.

Similar characters of reference designate similar or identical elements and portions throughout the specification and throughout the several views of the drawings.

Referring now to the drawings in detail, this invention is adapted to be incorporated with tiered boxes closed by doors 10 and hinged, as at 12, to vertical door jambs 14. The doors are illustrated as provided with handles 16 on the outside thereof, and a member 18 having an inclined face 20 at one edge and projecting from the inner face of the door, as illustrated to advantage in Figure 4. As best illustrated in Figures 1 and 12, a coin box 22 is removably inserted into the recessed lower end of the door jamb 14, the coin box having its own individual locking means, details of which are not particularly important in this application, indicated at 24 as having a latch member 26 inserted through an engageable on a rear portion of the door jamb when the key 28 is operated to lock the coin box in the position indicated in the figures. When the coin box is in this position, the upper and outer edge 30 thereof engages the lower edge of a face plate 32, holding this plate, as best illustrated in Figure 5, in its raised or lifted position on the door jamb 14, the latter being apertured as at 34 to receive headed studs 36 which hold the face plate on the door jamb when the face plate is moved into the raised position indicated in the figures. This structure is also clearly shown in Figure 3.

The actual locking mechanism for each door is in two parts, the outer portion of the lock being mounted on the face plate 32, while the inner portion of the lock is mounted on the door jamb 14. The inner portion will be first described and it will be first noted that the door jamb is recessed to receive this inner portion. The door jamb will preferably be constructed

of channel material and the front panel of this door jamb is apertured, as indicated by the short lines 40 in Figure 10 and the corresponding lines in Figure 9, abutment plate 42 being welded or otherwise secured on the rear face of this front panel at the top and bottom of the recess therein to limit the inward movement of the front plate 44 upon which several elements to be described hereinafter as constituent parts of the said inner portion of the lock are mounted. This front plate may be integral with a normally disposed flange 46 which is notched, as at 48, to engage headed fixed studs 50 on one of the side panels of the door jamb 14. The flange 46 is slotted vertically to allow the latch bar 52 to extend therethrough, and the corresponding side panel of the door jamb 14 is similarly slotted, as is also the inturned flange 54 of the face plate 32, as illustrated in Figure 6 and in Figure 3. The latch bar 52 may be integral with and extends normally from the member 58 which will be hereinafter referred to simply as the ratchet 56, this ratchet being an elongated angle bar having one part mounted to slide vertically upon the inner face of the front plate 44, while the other angular extension of the ratchet is formed with ratchet teeth 58. In the form of this invention illustrated in the drawings, the ratchet 56 is constructed with a rail 60 on one side thereof adapted to slide within a suitably shaped friction block 62 secured as indicated at 64 on the front plate 44, while the edge of the ratchet remote from the rail 60 is in sliding engagement with the flange 46. The ratchet is, therefore, free to move vertically, carrying the latch bar 52, except as limited in this movement by a pawl 66 of special design. This pawl 66 is pivoted, as at 68, on the flange 46 and is provided with a tooth 70 on an intermediate portion thereof and an offset portion 72 on an upper part of the pawl. The tooth 70 selectively engages the ratchet teeth 58 to prevent the ratchet from falling under the influence of gravity, while the offset member 72 engages a shoulder 74 on an upper portion of the ratchet 56 when the pawl 66 is in the position indicated in Figure 10 and an attempt is made to raise the ratchet 56. The pawl is biased into the position indicated in Figure 5 by the spring 76 carried on the flange 46 and having one end in engagement with a roller 78 on the pawl 66. It may be here noted that the inclined face 20 on the member 18 in Figure 4 is used to raise the latch bar 52 and the ratchet 56 into the fully elevated position of the ratchet and latch bar and when in this position, the tooth 70 engages the notch 80 in the lower end of the ratchet 56.

A flange 82 is provided on the lower portion of the pawl 66 and a slot 84 is provided in the adjacent portion of the ratchet 56, the slot being closed by an end wall 86. A coin 88 is held in this slot by the flange 82 when the coin is in an intermediate position, as will be better understood when the remaining structure has been described. A removable lock chamber 90 of conventional design is secured on the inner face of the plate 44 near the top end thereof by means of a lock ring 91 and this lock is operated by the patron's key 92 to turn a shaft in the lock having a squared portion 94 extending from the inner end of the lock and carrying a keeper 96. This keeper 96 is provided with an offset beveled portion 98 to be moved by the key 92 into a position indicated in Figures 9 and 10, that is, as having forced the beveled end 100 of the pawl toward the plate 44 so as to allow the flange 82 to re-

lease the coin 88 from the slot 84. However after a coin is inserted and the ratchet 56 moves downwardly, when the key 92 is used to turn the keeper 96 so that the offset portion 98 is in the transversely disposed position indicated in these same figures and when, prior to such operation of the keeper, the pawl 66 is substantially in the position indicated in Figure 5 but having been pushed slightly inwardly at its lower end to disengage tooth 70 from notch 80 by insertion of a coin to permit downward movement of the ratchet 56, then the keeper will pivot the pawl further to the position shown in Fig. 10 and lock the pawl 66 against movement from this position, thereby retaining the ratchet 56 in its lowered position shown in Figure 9. Finally, the keeper may be turned by the key 92 into the inoperative position indicated in dash lines in Figure 9. A counter of conventional design is indicated at 102 and the operating arm 104 of this counter is operatively connected to the lower end of the pawl 66 by means of a link 106, so that the full tilting of the pawl will cause the counter to be operated.

The outer portion of the lock mechanism incorporated with the face plate 32 will now be described. It should first be noted that the face plate is preferably of channel form as illustrated to advantage in Figure 6, the slot mentioned above to accommodate the latch bar 52 being formed in one of the flanges 54 of the face plate, and if reference be now had to Figure 8, it will be observed that the face plate has another elongated aperture 108, this aperture registering with a similarly dimensioned elongated aperture in the plate 44, so that a pin 110, illustrated to advantage in dash lines in Figure 6 and illustrated in end elevation in Figure 8, may extend forwardly through these apertures, this pin 110 being carried by the ratchet 56 and being adapted to be engaged in a slot 112 in the rear panel 114 of what is generally referred to as the slide plate 116. In other words, the term "slide plate" will be used to denote that member, shown to advantage in Figure 7, which is comprised of a rear panel 114, a front panel 118 riveted together with suitable spacers at the top and bottom, both plates being provided with a key-hole 120 with a depending slot extension 122 and the lock lever 124. This lock lever is pivoted, as at 126, to the slide plate 116 and is provided with a rack 128 on the lower end thereof, so that a key 130 may be inserted in a key-hole 132 and turned so that longitudinally disposed teeth 133 on the inner end of the key will operatively engage the rack 128, thus shifting the slide plate lock lever 124 between the front and rear panels 114 and 118 so that the pin 110 is received in one of the lateral slots 134 and relative movement between the latch bar 52 and the slide plate 116 thereby prevented. This locking of the slide plate 116 is, as mentioned in an early portion of this specification, used by the operator of the establishment wherein the device is installed to lock the mechanism in "storage due" position. The lower lateral notch 134 represented in Figure 7 is engaged with pin 110 when the slide plate is in normal operating position and the upper lateral notch 134 is engaged with pin 110 when the slide plate is placed in "storage due" position. The operator changes the position of the slide plate 116 when storage is due by inserting the key 130 in key-hole 132 and turning the key to release the lock lever 124. Next the slide plate 116 is moved down to the position shown in Fig. 2 and

the key 130 is turned back to engage the pin 110 in the upper of the slots 134. A simple bar handle 136 is riveted or otherwise secured to the outer panel 118, and this handle is preferably mounted over the key-hole 132 and has a bore 138 registering with the key-hole 132, whereby the shank portion of the key 130 is guided into proper operative relationship with the rack 128. It will be noted that the face plate 32 has laterally disposed inturned rails 140 engaged between the marginal portions of the front and rear panels 114 and 118 to guide the slide plate 116 during the operation of the device.

Registering apertures are provided in the plate 44 and the face plate 32 in order to make the counter 102 visible from the front, and registering coin slots are provided in the face plate 32 and the plate 44 but not in the slide plate 116. The coin slot in the face plate 32 is indicated at 142, Figure 8, and the coin slots are aligned with the central portion of the flange 82.

The operation of this invention will be clearly understood from the foregoing description of the mechanical details thereof, taken in connection with the drawings and with the recitation of objects sought to be achieved by this invention. In recapitulation, when the door is unlocked, the insertion of a coin 88 into the coin slot 142 will allow the inner edge of the coin to engage the tooth 70 and forcing the coin inwardly will rock the pawl 66 so as to disengage the tooth 70 from the ratchet 56. The ratchet 56 falls under the force of gravity and the coin 88 is in the slot 84, being held against further downward movement by edge engagement with the end wall 86 and flange 82 of pawl 66. The ratchet 56 has meanwhile carried the pin 110 downwardly and this pin has traveled the length of the slot 108 in the face plate and has carried the slide plate 116 with it by the pin 110 and lock lever 124 engaged therewith to move the slide plate into its downward position, as indicated in Figure 8. The key-holes 120 in the slide plate 116 now register with a key-hole in the face plate and the patron's key 92 can now be turned in the lock 90 since the flat shank portion of the key has been released from the key-hole extension slot 122. Since the key 92 is the patron's receipt and is numbered so as to facilitate identification of his box, he is desirous of removing the key and taking it with him. In order to remove the key, it must be turned through ninety degrees, this requirement being conventional in locks of the type which will be used in this invention. When the key is so turned, the keeper 96 is moved so as to shift the pawl into the position indicated in Figures 9 and 10 and the end of the keeper 98 engages the upper end of the pawl indicated at 100, rocking the pawl into the position shown in these same figures and releasing the coin 88 to fall into the coin box 22, that is, the flange 82 is moved outwardly sufficiently to allow the coin to escape from the slot 84 and to fall through the channeled door jamb 14 into the coin box. The patron has ostensibly stored baggage or the like in the box 10 before locking the door as described immediately above. Upon his return, the key can be inserted and turned so that the flat shank portion of the key once more is aligned with the key-hole slot extension 122, allowing the slide plate 116 to be raised and the pin 110 carries the ratchet 56 upwardly until the tooth 70 engages the lowermost of the teeth 58 on the ratchet. Upward movement of the slide plate 116 is limited by the keys engagement with the

slot 122. Upon opening the door, the inclined face 20 of the member 18 carried by the door raises the latch bar 52 the remaining portion of the full upward travel thereof and the tooth 70 engages the notch 80 in the lower end of the ratchet 56 to hold the slide plate 116 and parts carried thereby in the upwardly shifted position indicated in the right-hand side of Figure 1. The door is unlatched and the mechanism is now in position to allow reinsertion of a coin by the next patron.

Obviously, many minor variations may be made in the exact structural details and the proportionment of the various elements in this illustrated and described embodiment of the instant invention, all without departure from the spirit and scope thereof. Accordingly, limitation of this invention should be only as determined by a proper interpretation of the terminology used in the subjoined claims.

Having described the invention, what is claimed as new is:

1. A door assembly for tiered boxes or the like including a box, a door jamb at one side of the box, a face plate secured to the door jamb, a door lock means having an outer portion operatively mounted on said face plate and an inner portion operatively mounted on said door jamb, said outer portion including a slide plate slidably mounted on said face plate on an outer portion thereof, said face plate having an elongated aperture therein, said inner portion of said lock means including a latch bar, and pin means on said latch bar extending through said aperture for operatively connecting said latch bar with said slide plate said slide plate also having an elongate aperture therein, said slide plate and said face plate having enlarged annular openings therein with the annular opening in said slide plate being at the top of the said elongate aperture therein, said slide plate being movable to bring said annular apertures into registery by movement of said slide plate, and key means extending through said enlarged annular apertures for engaging rotatably positioned lock means in the door jamb and being rotatable only when the annular openings are brought into registery by movement of said slide plate.

2. In a storage locker, a box having a vertical door jamb at one side thereof, a face plate having an aperture therein secured to said door jamb, a door lock positioned within said door jamb behind the aperture in said face plate but accessible for operation from the outer surface of said face plate, a slide plate slidably mounted on the outer face of said face plate over said door lock, latch means slidably and operatively carried by said door jamb, said slide plate having an access aperture therein for alignment with said door lock and the aperture in said face plate, and means connecting said slide plate to said latch means and including a pin extending from said latch means through slots in said door jamb and face plate, and a lock lever having a plurality of spaced slots therein for receiving said pin to make said slide plate a unit with said latch means for movement therewith, said slide plate covering said aperture in said face plate in one position of engagement of said lock lever and pin.

3. A door assembly for tiered boxes or the like including a box, a door jamb at one side of the box, a face plate secured to the door jamb, a door lock means having an outer portion operatively mounted on said face plate and an inner portion operatively mounted on said door jamb, said outer portion including a slide plate slidably mounted on said face plate on an outer portion thereof, said face plate having an elongated aperture therein, said inner portion of said lock means including a latch bar, and pin means on said latch bar extending through said aperture for operatively connecting said latch bar with said slide plate, said slide plate and said face plate having registerable key slots, said door lock having a removable key, and means for temporarily securing said slide in a position with said slots out of registry so that said key cannot be inserted in the door lock.

4. A door assembly for tiered boxes or the like including a box, a door jamb at one side of the box, a face plate secured to the door jamb, a door lock means having an outer portion operatively mounted on said face plate and an inner portion operatively mounted on said door jamb, said outer portion including a slide plate slidably mounted on said face plate on an outer portion thereof, said face plate having an elongated aperture therein, said inner portion of said lock means including a latch bar, pin means on said latch bar extending through said aperture for operatively connecting said latch bar with said slide plate, said face plate having a key slot covered by said slide plate when the slide plate is in one position, and means for temporarily securing the slide plate in said one position, said last-named means including a lock lever pivotally carried by said slide plate and having a plurality of vertically spaced slots therein for receiving the said means extending through said aperture in said face plate, and means for controlling the pivotal position of said lock lever.

5. A door assembly for tiered boxes or the like including a box, a door jamb at one side of the box, a face plate secured to the door jamb, a door lock means having an outer portion operatively mounted on said face plate and an inner portion operatively mounted on said door jamb, said outer portion including a slide plate slidably mounted on said face plate on an outer portion thereof, said face plate having an elongated aperture therein, said inner portion of said lock means including a latch bar, pin means on said latch bar extending through said aperture for operatively connecting said latch bar with said slide plate, said latch bar having a ratchet carried thereby, said face plate having a coin slot therein and being adapted to be vertically positioned, and a pawl for said ratchet operatively mounted for actuation by a coin inserted through said coin slot in said face plate.

6. A door assembly for tiered boxes or the like including a box, a door jamb at one side of the box, a face plate secured to the door jamb, a door lock means having an outer portion operatively mounted on said face plate and an inner portion operatively mounted on said door jamb, said outer portion including a slide plate slidably mounted on said face plate on an outer portion thereof, said face plate having an elongated aperture therein, said inner portion of said lock means including a latch bar, pin means on said latch bar extending through said aperture for operatively connecting said latch bar with said slide plate, said latch bar having a ratchet carried thereby, said face plate having a coin slot therein and being adapted to be vertically positioned, and a pawl for said ratchet operatively mounted for actuation by a coin inserted through said coin slot in said face plate, said pawl and ratchet being adapted for preventing

movement of said ratchet downwardly under the force of gravity and upwardly from positions in which said latch bar is in latched and unlatched positions, respectively.

7. A door assembly for tiered boxes or the like including a box, a door jamb at one side of the box, a face plate secured to the door jamb, a door lock means having an outer portion operatively mounted on said face plate and an inner portion operatively mounted on said door jamb, said outer portion including a slide plate slidably mounted on said face plate on an outer portion thereof, said face plate having an elongated aperture therein, said inner portion of said lock means including a latch bar, pin means on said latch bar extending through said aperture for operatively connecting said latch bar with said slide plate, said latch bar having a ratchet carried thereby, said face plate having a coin slot therein and being adapted to be vertically positioned, a pawl for said ratchet operatively mounted for actuation by a coin inserted through said coin slot in said face plate, said pawl and ratchet being adapted for preventing movement of said ratchet downwardly under the force of gravity and upwardly from positions in which said latch bar is in latched and unlatched positions, respectively, said face plate having a key slot therein, a key engaged with said key slot and a keeper operable by said key and adapted when in one position to secure said pawl in a position to prevent upward movement of said ratchet and latch bar, the key being removable from said key slot in the face plate when said keeper is in said last-mentioned one position.

8. A door assembly for tiered boxes or the like including a box, a door jamb at one side of the box, a face plate secured to the door jamb, a door lock means having an outer portion operatively mounted on said face plate and an inner portion operatively mounted on said door jamb, said outer portion including a slide plate slidably mounted on said face plate on an outer portion thereof, said face plate having an elongated aperture therein, said inner portion of said lock means including a latch bar, pin means on said latch bar extending through said aperture for operatively connecting said latch bar with said slide plate, said slide plate comprising front and rear panels positioned in spaced relation, and movable lock means positioned intermediate said panels for engaging said pin means to position said slide plate and latch bar in different relationship to each other.

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