

March 27, 1951

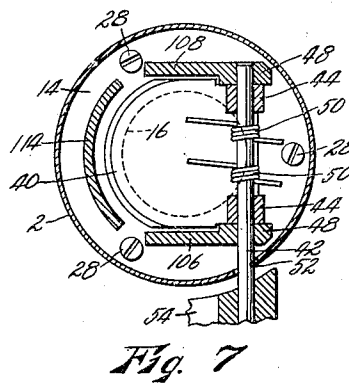
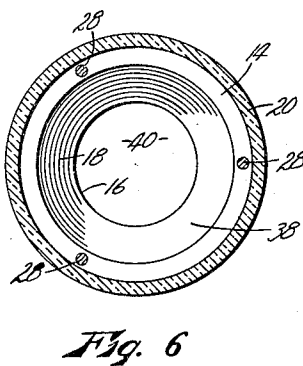
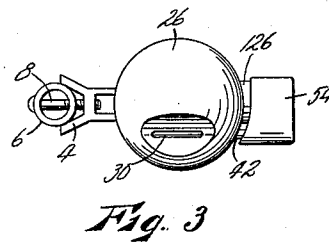
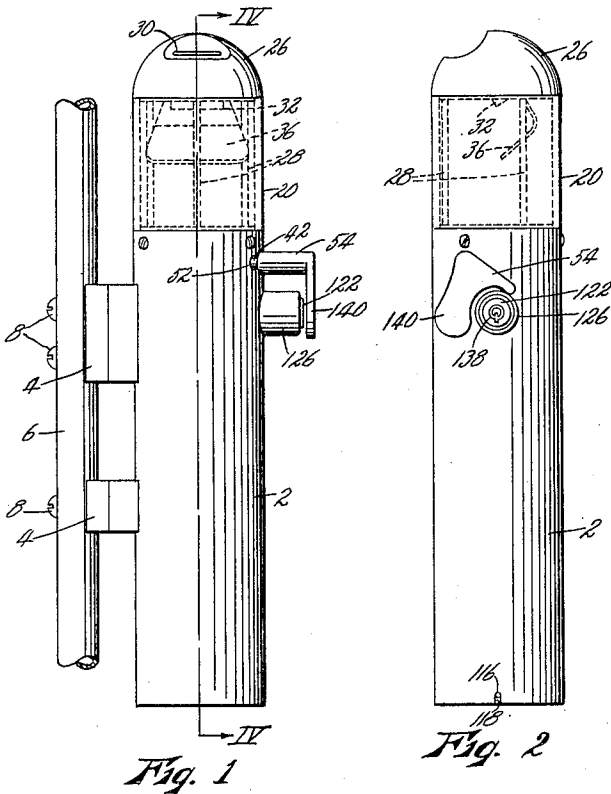
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2,546,498

FARE BOX VAULT DOOR LOCKING MEANS

Filed Jan. 28, 1949

3 Sheets-Sheet 1



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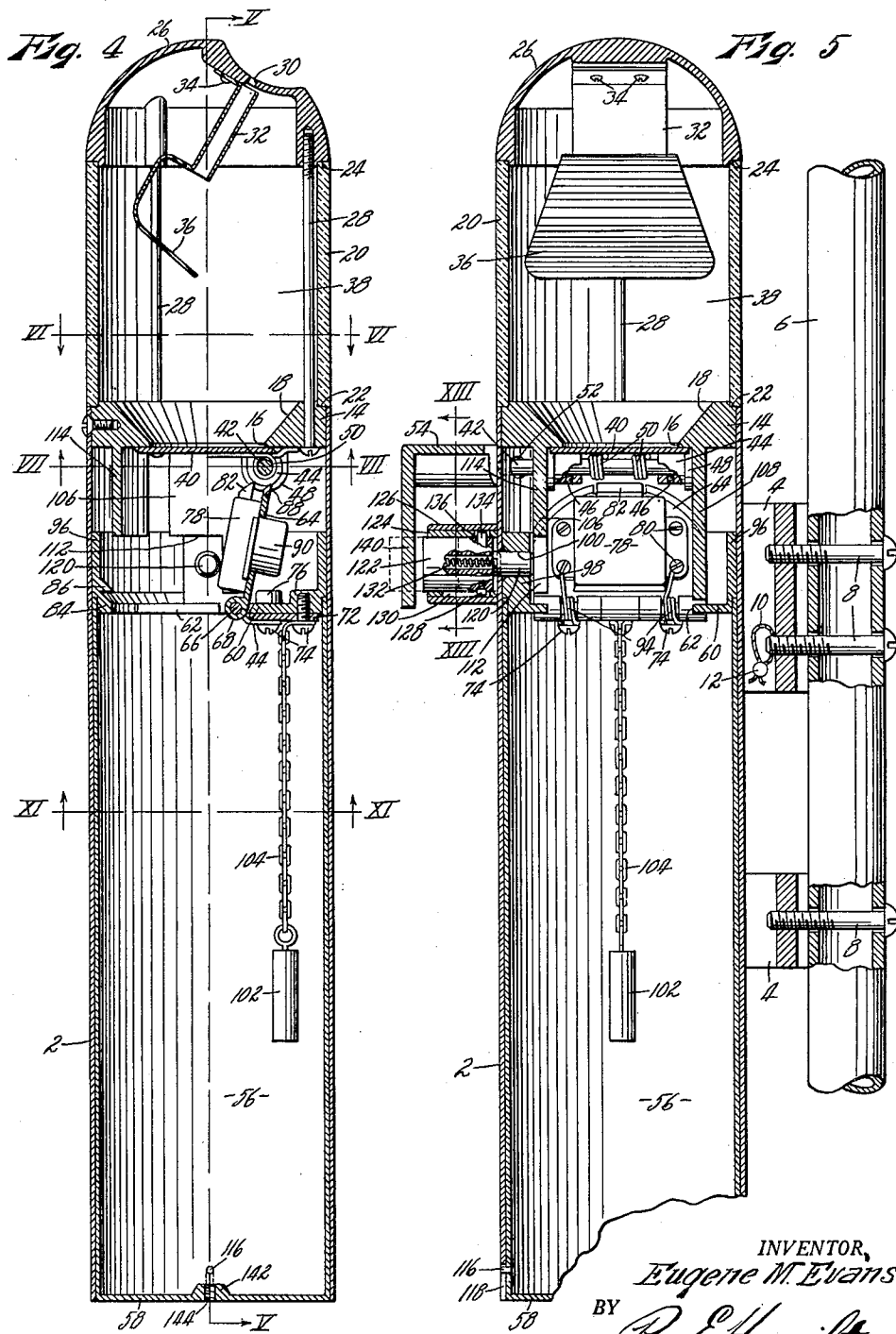
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FARE BOX VAULT DOOR LOCKING MEANS

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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

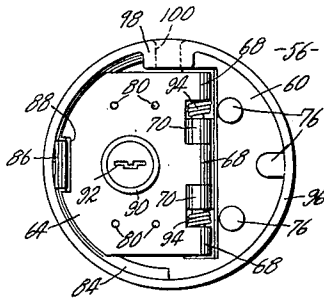


Fig. 8

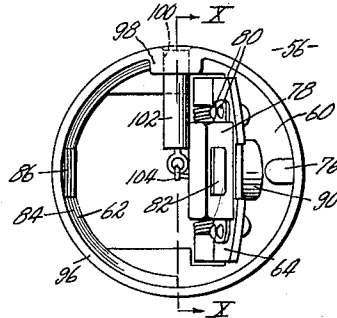


Fig. 9

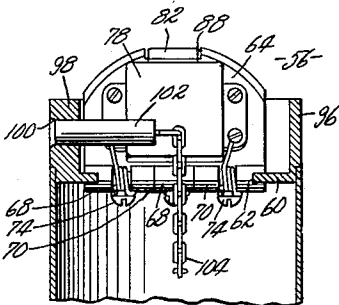


Fig. 10

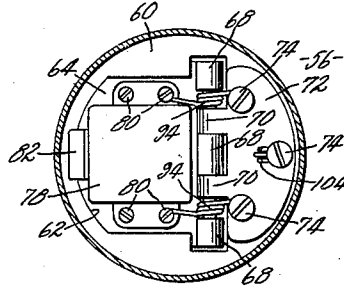


Fig. 11

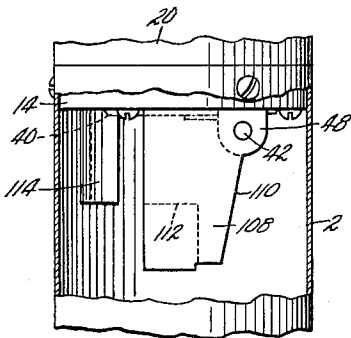


Fig. 12

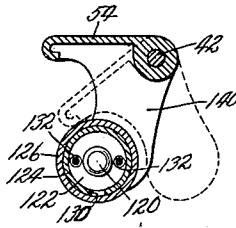


Fig. 13

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FARE BOX VAULT DOOR LOCKING MEANS

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7 Claims. (Cl. 232-15)

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This invention relates to new and useful improvements in fare boxes, and has particular reference to a fare box adapted for use on street cars, busses, and other public conveyances.

The principal object of the present invention is the provision of a fare box which is tamper and pilfer-proof in a high degree.

Another object is the provision of a fare box having a coin receiving and viewing chamber, a coin dumping means whereby coins are dropped from said coin receiving chamber to a removable vault, and means whereby said coin dumping means must be actuated before said vault may be removed.

A further object is the provision of a fare box having a housing and a removable vault carried in said housing for receiving coins, of means whereby said vault is automatically closed and locked as it is removed from said housing.

Other objects are simplicity and economy of construction, convenience and dependability of operation, and adaptability for use wherever a tamper-proof receptacle for coins or the like is desired.

With these objects in view, as well as other objects which will appear in the course of the specification, reference will be had to the drawing, wherein:

Figure 1 is a side elevation of a fare box embodying the present invention.

Fig. 2 is a front elevation of the fare box, showing the coin dumping handle in its coin dumping position.

Fig. 3 is a plan view of the fare box.

Fig. 4 is an enlarged section taken on line IV-IV of Fig. 1, with parts left in elevation.

Fig. 5 is a section taken on line V-V of Fig. 4, partially broken away and with parts left in elevation, showing the vault retaining lock in its operating position in solid lines and in its unlocked position in dotted lines.

Fig. 6 is a section taken on line VI-VI of Fig. 4.

Fig. 7 is a section taken on line VII-VII of Fig. 4.

Fig. 8 is a plan view of the vault shown removed from the barrel, with the vault door closed.

Fig. 9 is a plan view of the vault with the vault door held in the open position by the retaining pin.

Fig. 10 is a fragmentary section taken on line X-X of Fig. 9.

Fig. 11 is a section through the vault taken on line XI-XI of Fig. 4, with the vault door closed.

Fig. 12 is a fragmentary elevational view of the

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fare box, with a portion of the barrel broken away and with the vault removed.

Fig. 13 is a section taken on line XIII-XIII of Fig. 5, showing the coin dumping handle in its normal position in solid lines, and in its coin dumping position in dotted lines, with parts left in elevation.

Like reference numerals apply to similar parts throughout the several views, and the numeral 2 applies to a hollow cylindrical barrel or housing disposed vertically and serving as a support for the remainder of the parts of the fare box. A plurality of V-brackets 4 are welded or otherwise rigidly secured to the outer surface of the barrel, and are adapted to be secured to a support pipe 6 by screws 8. A sealing wire 10 may be threaded through the inner end of one or more of screws 8 as shown in Fig. 5, and its ends joined by a sealing disc 12, in order to indicate any unauthorized removal of the box from its support. Secured rigidly within barrel 2 at the upper end thereof is a ring 14 having a central coin opening 16 formed therein, said ring being bevelled adjacent said opening as at 18 to direct coins through said opening. A cylinder 20 of glass or other transparent material and having substantially the same diameter as barrel 2 is seated at its lower end in a circumferential groove 22 formed in ring 14 and at its upper end in a circumferential groove 24 formed in substantially hemispherical, hollow cap 26. A plurality of tie rods 28 pass through ring 14, through glass cylinder 20 adjacent the inner wall thereof, and are threaded into cap 26 as shown in Fig. 4 to secure said cap, glass cylinder, ring, and barrel permanently together.

A coin receiving slot 30 is formed through cap 26, and a tubular sheet metal chute 32 is fixed to the inner surface of cap 26 by any suitable means such as screws 34 and adapted to receive coins as they are passed through slot 30 and to discharge them at its lower end. At its lower end chute 32 is provided with an angled extension which forms a deflector plate 36 spaced apart from the end of the chute. Chute 32 and deflector plate 36 prevent the removal of coins through slot 30, as for example by inverting the box or by inserting an adhesive-tipped rod through said slot.

Glass cylinder 20 forms a viewing chamber 38 through which the operator, as for example a street car conductor, may inspect the coins inserted to determine if the proper fare has been paid. The coins are normally retained in said viewing chamber by a dump door 40 disposed

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against the lower surface of ring 14 and covering opening 16 therein, as best shown in Figs. 4 to 7. Said door is pivotally supported adjacent one edge of opening 16 by a shaft 42, said shaft passing through lugs 44 formed integrally with door 40 and being rigidly fixed therein by set screws 46, as shown in Fig. 5. Said shaft is carried rotatably in bearing lugs 48 formed integrally with and extending downwardly from ring 14. A pair of coil springs 50 are carried on shaft 42, and each of said springs has oppositely extending end portions bearing respectively against the lower surface of ring 14 and the lower surface of door 40, whereby said door is urged upwardly to its closed position. As best shown in Fig. 7, one end of shaft 42 is extended outwardly through a hole 52 provided therefor in barrel 2, and is rigidly connected at its outer end to a manually operable handle 54, by means of which door 40 may be opened to dump coins from viewing chamber 38 into barrel 2.

A cylindrical vault 58 is adapted to be carried within barrel 2, being slidably inserted into said barrel from the lower end thereof. Said vault is provided at its lower end with a closure wall 58, and its upper end with a rigidly attached closure plate 60. Said closure plate is provided with an opening 62 adapted to be closed by a vault door 64. Said vault door is pivotally mounted along one edge by means of a pivot pin 66 which passes through bearing lugs 68 formed integrally with door 64 and through bearing lugs 70 formed integrally with a plate 72 rigidly secured to the lower surface of closure plate 60 by screws 74, said closure plate being provided with tapped bosses 76 for receiving said screws. Door 64 opens upwardly.

A snap lock 78 is rigidly attached to the lower surface of door 64 by screws 80. Said lock is of a common type, being provided with an outwardly projecting spring loaded latch bolt 82 parallel to the plane of door 64. Closure plate 60 is formed to present a bevelled lip 84 adjacent the edge of opening 62 in order that latch bolt 82 will be deflected inwardly as door 64 moves to its closed position. When the door is completely closed latch bolt 82 will be moved outwardly by spring pressure to engage the lower surface of lip 84 to lock the door closed. A second latch lug 86 having a bevelled upper surface is provided immediately above the bevelled lip 84 of closure plate 60. Latch bolt 82 must pass over this lug also, thus providing a double latch, the purpose of which will be described hereinafter. The outer edge of door 64 is notched as at 88 to pass over lug 86. The key cylinder 90 of lock 78 extends upwardly through door 64 and is provided at its upper end with the usual keyhole 92, as shown in Fig. 8. Door 64 is urged toward its closed position by two coil springs 94 carried on pivot pin 66, each of said springs having oppositely extending end portions attached respectively to closure plate 60 by one of screws 74, and to door 64 by means of one of screws 80, as best shown in Fig. 11.

Closure plate 60 is provided with an upwardly extending flange 96 having a diameter substantially equal to that of vault 58. Said flange has a thickened portion 98 adjacent one side of vault door 64, and a hole 100 is formed horizontally therethrough, and radially relative to the vault. Vault door 64 may be retained in the open position when the vault is removed from the barrel by means of a retaining pin 102 which normally hangs downwardly within vault 58 on a chain

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104 having its opposite end attached to one of screws 74. As best shown in Figs. 9 and 10, when the vault door has been opened, pin 102 may be inserted outwardly into hole 100. The inner end portion of said pin then lies in the path of door 64, abutting against lock 78, and holds the door in the open position.

Vault door 64 is held open when the vault is positioned within barrel 2 by means of a pair of depending parallel walls 106 and 108 formed integrally with ring 14 and disposed respectively along opposite sides of door 40, as best shown in Figs. 5 and 7. Shaft 42 carrying door 40 and pivot pin 66 carrying vault door 64 are parallel. Door 40 operates between walls 106 and 108, but vault door 64 is sufficiently wider than dump door 40 that it strikes the inclined edges 110 of walls 106 and 108, and is thus prevented from closing. It will be noted that wall 106 is notched at its lower end at 112 in order that the vault may be inserted into the barrel while door 64 thereof is held open by retaining pin 102. Walls 106 and 108 extend downwardly to a point just above vault closure plate 60. An arcuate wall 114 is formed integrally with ring 14 and depends vertically therefrom adjacent the free edge of door 40. Walls 106, 108 and 114 serve to deflect coins falling from viewing chamber 38 when door 40 is opened into vault opening 62. Adjacent its lower end, vault 58 is provided with an outwardly projecting positioning pin 116 adapted to be engaged in a notch 118 formed in the lower edge of barrel 2, thus insuring that the vault is turned so that door 64 thereof engages walls 106 and 108 properly.

Vault 58 is retained in the barrel by means of a lock bolt 120 which extends transversely through the wall of barrel 2 and is adapted to project through hole 122 of vault flange 58, as best shown in Fig. 5. Said bolt is rigidly attached to and extends axially from a lock cylinder 122 which is carried for sliding movement in a sleeve 124 welded or otherwise rigidly attached to the outer surface of barrel 2. A housing cylinder 126 is disposed about sleeve 124 and is also rigidly fixed to barrel 2. The sliding movement of lock cylinder 122 in sleeve 124 is limited by a screw 128 fixed in said cylinder and slidable in a slot 130 formed longitudinally in said sleeve. Said lock cylinder is urged outwardly toward its unlocked position by a pair of helical springs 132 each bearing at one end in a socket provided in cylinder 122 and at its opposite end against the outer surface of barrel 2. Lock cylinder 122 is normally retained in its inward or locking position by a detent 134 carried in said cylinder and extending radially outwardly to engage a socket 136 formed in sleeve 124. Said detent may be retracted by a suitable mechanism, not shown, carried in lock cylinder 122 and operable by a key which may be inserted in a keyhole 138 in the outer end of said cylinder. Handle 54, which operates coin dumping door 40, is provided with a depending flange 140 which overlaps lock cylinder 122 and keyhole 138 as long as door 40 is closed, but which uncovers said keyhole when handle 54 is operated to open door 40.

The operation of the fare box is substantially as follows: With the vault removed from the barrel, door 64 of the vault is opened and retained open by inserting retaining pin 102 in hole 100 as shown in Figs. 9 and 10. Lock bolt 120 is moved to its outer position as shown in dotted lines, in Fig. 5. The vault is then inserted in the barrel from the lower end thereof as previously

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described, engaging pin 116 in notch 118. Vault door 64 is then in engagement with inclined edges 110 of walls 106 and 108, and is held open thereby. Lock cylinder 122 is then pushed inwardly against springs 132 until detent 134 engages socket 136. Lock bolt 120 is thus projected inwardly into hole 100 of flange 96, and pushes retaining pin 102 out of said hole. Said retaining pin then falls into the vault and hangs at the end of chain 104. The parts then have the positions shown in solid lines in Fig. 5, the vault being locked in the barrel by bolt 120 and the vault door being held open only by its engagement with walls 106 and 108. Coins or fare tokens may then be received in the usual manner. As they are dropped through slot 30, they pass through chute 32, strike deflector plate 36, and come to rest on door 40, where they may be viewed by the operator. By manually depressing handle 54, the operator may open door 40 to permit the coins to fall into vault 56. The movement of handle 54 is arrested when it strikes lock housing 126, as shown in dotted lines in Fig. 13.

When it is desired to remove the vault, it is apparent that handle 54 must be depressed to dump coins from door 40 into the vault, since no key can be inserted into keyhole 138, and lock cylinder 122 can not move outwardly, as long as flange 140 of said handle overlaps the outer end of said lock cylinder. Thus the operator is prevented from retaining a quantity of coins over door 40 while the vault is being removed, whereupon he could appropriate the coins simply by dropping them through the empty barrel. When handle 54 has been depressed, as shown in Fig. 2 and in dotted lines in Fig. 13, and lock cylinder 122 moved outwardly by springs 32 as shown in dotted lines in Fig. 5, lock bolt 120 is withdrawn from hole 100 in vault flange 96 and the vault is free to be lowered out of the barrel. As soon as the vault has been lowered sufficiently to move door 64 thereof out of engagement with edges 110 of walls 106 and 108, vault door 64 will be snapped shut by springs 94, and latch bolt 32 will pass over latch lugs 86 and 84 to lock the vault door closed. The vault door of course closes while the upper portion of the vault is still contained well within barrel 2, and before any coins could be removed therefrom. Lock 122 and lock 76 of course require separate keys, neither of which is ordinarily in the possession of the operator. Another employee, possessing only the key to lock 122, removes vault 56 from the barrel and takes it to a central location where still other employees open it and remove the money therefrom. The bottom closure wall 58 of the vault is formed to present a central boss 142 having a tapped hole 144 therein as shown in Fig. 4. Any suitable threaded tool, not shown, may be screwed into said hole for exerting a downward force on the vault in the event it should become jammed in the barrel.

The double latch effect of vault door 64 provided by vertically spaced latch lugs 84 and 86 serves to prevent the removal of the vault with its door unlocked. It has been determined experimentally that a small, flexible chain may be inserted through coin slot 30 and allowed to hang downwardly through viewing chamber 38, past door 40 and into vault 56 through opening 62. Said chain will prevent the vault door from closing completely. However, in the present invention, latch bolt 32 may engage the upper latch lug 86, thus being securely locked against opening, and still be open sufficiently to permit the

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largest chain which could be passed through slot 30 to pass between lip 84 and the edge of vault door 64.

What I claim is:

1. A fare box comprising a housing having a coin receiving and viewing chamber in the upper portion thereof, a door carried by said housing and adapted to close the lower end of said viewing chamber, a vault carried removably in said housing beneath said door, a handle disposed outside of said housing and manually operable to open said door to drop coins into said vault, a locking member carried slidably by said housing and including a bolt adapted to project inwardly to engage said vault to retain it in said housing, and a member carried rigidly by said handle and overlapping the outer end of said locking member whenever said door is closed, whereby said bolt can not be moved outwardly and said vault can not be removed except when said door is open.

2. A fare box comprising a housing having a coin receiving and viewing chamber in the upper portion thereof, a door carried by said housing and adapted to close the lower end of said viewing chamber, resilient means urging said door to its closed position, a vault carried removably in said housing beneath said door, a handle disposed outside of said housing and manually operable to open said door to drop coins into said vault, a lock housing rigidly fixed to the outer surface of said housing, a lock cylinder carried in said housing for sliding movement transverse to the direction of movement of said vault as it is inserted into said housing, a lock bolt fixed to said cylinder and adapted to project through said housing to engage and secure said vault within said housing, key actuated means in said lock cylinder for normally securing said bolt in its inward or locking position, said handle being adapted to overlap the outer end of said lock cylinder when said door is closed, thereby preventing the outward movement of said bolt except when said door is open.

3. A fare box comprising a housing having a coin receiving chamber, a vault carried removably in said housing beneath said coin receiving chamber, said vault having a top opening for receiving coins as they pass from said coin receiving chamber, a door carried by said vault and adapted to close said opening, resilient means urging said vault door to its closed position, a spring lock carried by said vault door, a first latch lug carried by said vault and adapted to be engaged by said spring lock to lock said vault door whenever said door is closed, a second latch lug carried by said vault and adapted to be engaged by said spring lock with said vault door slightly open, and fixed stops carried by said housing and adapted to engage and retain said vault door open as long as said vault is positioned in said housing.

4. A fare box comprising a housing having a coin receiving chamber, a vault carried removably in said housing beneath said coin receiving chamber, said vault having a top opening for receiving coins as they pass from said coin receiving chamber, a door carried by said vault and adapted to close said opening, resilient means urging said vault door towards its closed position, fixed stops carried by said housing for retaining said vault door open so long as said vault is positioned in said housing, whereby when said vault is removed said door will close, and a spring lock carried by said door and adapted

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to secure said door either completely closed or in a slightly open position.

5. A fare box comprising a housing having a coin receiving and viewing chamber in the upper portion thereof, a dump door carried by said housing and normally closing the lower end of said viewing chamber, manual means for opening said door, a vault carried removably in said housing beneath said dump door and having a top opening adapted to received coins when said dump door is opened, locking means normally retaining said vault in said housing, said manual dump door operating means being so positioned relative to said vault retaining lock that the latter can not be released except when said dump door is open, a vault door carried by said vault and adapted to close the top opening thereof, resilient means urging said vault door closed, means for automatically locking said vault door whenever it is closed, and fixed stops carried by said housing and adapted to engage and retain said vault door open so long as said vault is positioned in said housing.

6. In a fare box of the class described having a tubular housing and a vault removably carried in said housing, said housing having a top coin receiving opening, a door carried by said vault and adapted to close said opening, resilient means urging said vault door closed, a snap lock for automatically locking said door whenever it is closed, a retaining member carried by said vault and adapted to be positioned to retain said vault door open when said vault is separated from said housing, fixed stops carried by said housing and adapted to engage and retain said vault door open when said vault is positioned in said housing, and a movable lock member carried by said housing and adapted to engage and secure said vault in said housing, said lock member being adapted by its locking movement to displace said vault door retaining member.

7. A fare box comprising a tubular housing having a coin receiving and viewing chamber in the upper portion thereof, a dump door carried by said housing and adapted to close the lower end of said viewing chamber, springs urging said door closed, a handle disposed outside of said

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housing and manually operable to open said door, a vault adapted to be slidably inserted in the lower end of said housing and having a top opening for receiving coins when said dump door is opened, a door carried by said vault and adapted to close the top opening thereof, said vault having a flange extending upwardly above said vault door, said flange having a hole formed transversely therethrough, a lock housing fixed to the outer surface thereof, a lock cylinder carried in said lock housing for sliding movement transverse to said vault, a lock bolt fixed to said lock cylinder, and adapted to project into said housing and into the flange hole of said vault to secure said vault in said housing, key actuated mechanism in said lock cylinder for securing said lock cylinder and bolt in its inward or locking position, said dump door handle being adapted to overlap the outer end of said lock cylinder when said dump door is closed, whereby said vault may be removed only when said dump door is open, springs urging said vault door closed, a retaining pin carried by said vault and adapted to be inserted outwardly into said flange hole to secure said vault door open when said vault is separated from said housing, fixed stops carried by said housing and adapted to engage and retain said vault door open when said vault is positioned in said housing, said lock bolt being adapted to displace said retaining pin from said flange hole when said bolt is moved inwardly into said hole, and a snap lock carried by said vault door and adapted automatically to lock said door either in a completed closed or slightly open position.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,072,891	Whitaker	Sept. 9, 1913
1,182,409	Ohmer	May 9, 1916
1,194,950	Burrows	Aug. 15, 1916
1,280,351	Woods	Oct. 1, 1918