

July 18, 1939.

R. L. PEEK, JR

2,166,639

COIN COLLECTOR APPARATUS

Filed May 14, 1938

2 Sheets-Sheet 1

FIG. 1

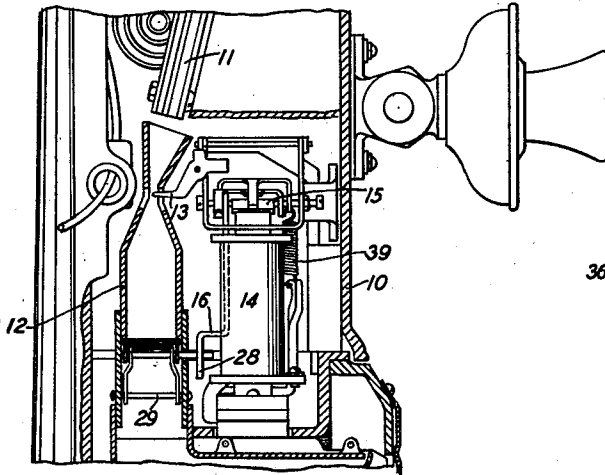


FIG. 2

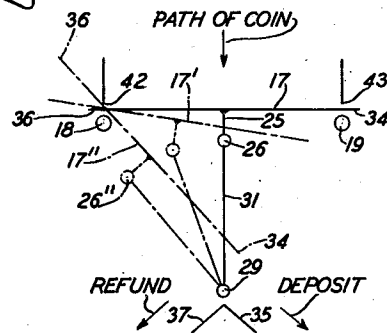


FIG. 3

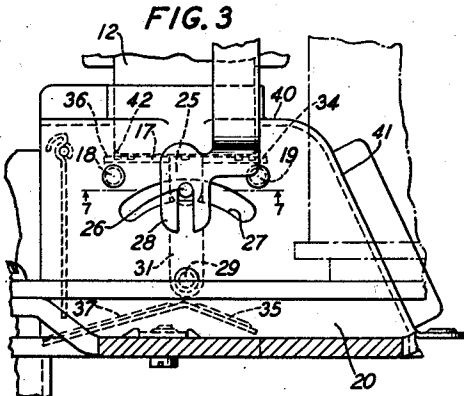


FIG. 4

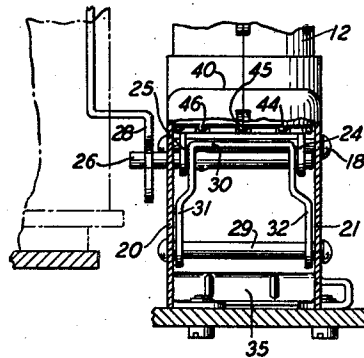


FIG. 5

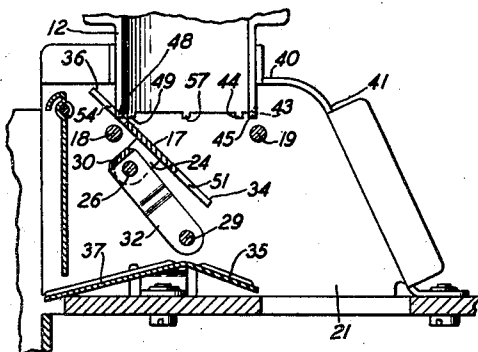
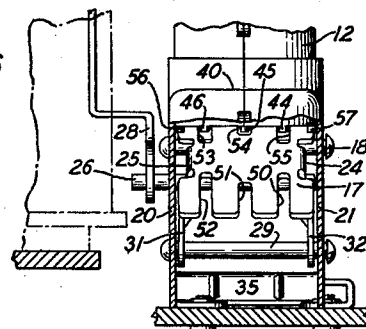


FIG. 6



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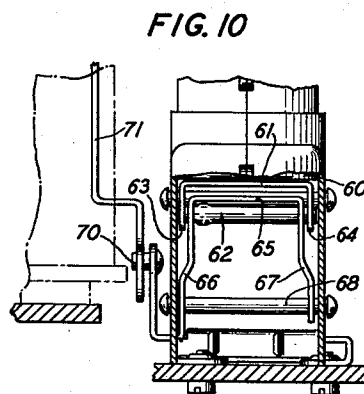
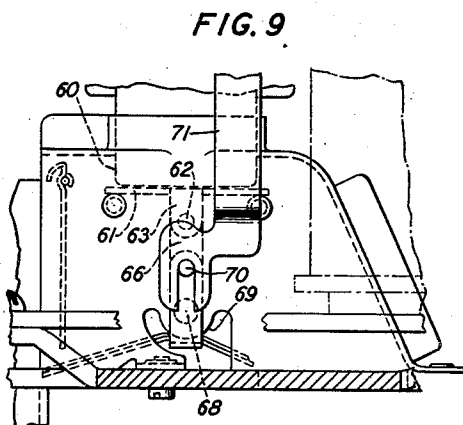
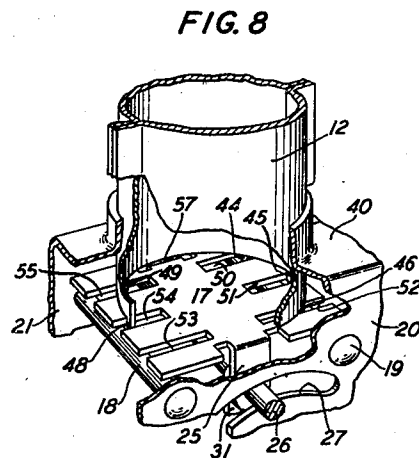
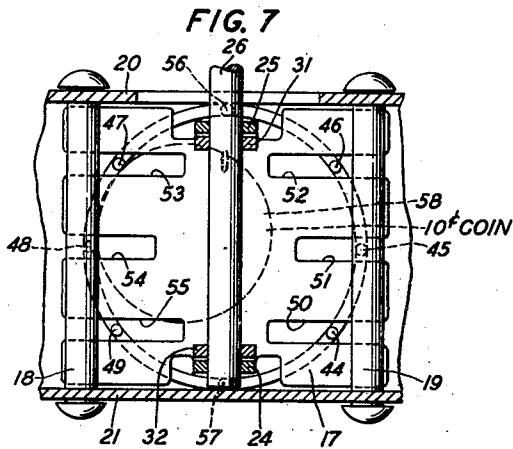
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COIN COLLECTOR APPARATUS

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2 Sheets-Sheet 2



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COIN COLLECTOR APPARATUS

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Application May 14, 1938, Serial No. 207,908

19 Claims. (Cl. 232—57.5)

This invention relates to coin collector apparatus particularly such apparatus for use at a telephone pay station.

As applied to a telephone pay station the present invention is particularly adapted for that type of coin collector wherein the calling party tentatively deposits a coin or coins and the money under the control of the central office is later collected or refunded depending upon whether or not the desired connection is obtained. In such apparatus as shown, for example, in the O. F. Forsberg Patent 1,043,219 of November 5, 1912, it heretofore has been customary to have the coins temporarily deposited upon a pivoted coin trap located in a coin hopper and normally supported by a deflector vane adapted to be actuated by a polarized electromagnet to allow the trap to drop and discharge the money either into a collect chute or refund chute depending upon the direction of movement of the supporting vane. The coin trap of the Forsberg patent is provided with a counterweight to restore the trap to normal position after the coins have been discharged.

An object of this invention is to provide improved apparatus for temporarily retaining deposited coins within a coin channel and for later disposing of the coins in a desired manner.

As applied to the type of coin collector shown in the Forsberg patent the coin trap of this invention comprises a plate adapted to be moved about one bearing for coin collection and adapted to be moved about a second bearing for coin refunding, the trap actuating mechanism comprising means for subjecting the plate to a lateral movement followed by a rotative movement about either of said bearings. Thus the coin trap preferably comprises a plate normally lying above two supporting pins spaced apart a distance slightly less than the length of the plate. The tilting of the plate may be controlled by a toggle joint comprising a short arm fastened to the lower side of the plate and a long arm rotatable about a fixed pivot, the two arms being hinged together with the hinge having an extension adapted to be actuated by the coin relay. In the normal coin supporting position of the trap the two specified arms are in alignment but when the relay is energized the resulting arcuate movement of the hinge causes the plate to first move laterally to clear one of its supports and then tilt downwardly to discharge the coins from the plate into a collect chute or refund chute depending upon the direction the relay armature is actuated.

Referring to the drawings:

Fig. 1 is a view partly in section of the central portion of a telephone coin collector;

Fig. 2 illustrates schematically the manner of operation of the coin trap of this invention;

Fig. 3 is a rear view and Fig. 4 a side view of a coin hopper embodying this invention, with the coin trap in coin supporting position;

Fig. 5 is a rear view and Fig. 6 a side view of the coin hopper, with the coin trap in coin discharging position;

Fig. 7 is a sectional view of the coin hopper taken along the plane 7—7 of Fig. 3;

Fig. 8 is a perspective view partly in section of the hopper of this invention; and

Figs. 9 and 10 are rear and side views respectively of an alternative form of the invention.

In general, the portion of a telephone coin collector shown in Fig. 1 is similar to that of the Forsberg patent in that the upper housing 10 encloses a multiple coin chute 11 for receiving deposited coins and the coins discharged from chute 11 drop into the upper portion 12 of a coin hopper and actuate a pivoted coin trigger 13 to close electrical contacts (not shown) whereby the polarized electromagnet 14 is placed under the control of the central office to enable the electromagnet to be energized later to cause its armature 15 due to armature extension 16 to discharge the deposited coins either in a collect chute or refund chute, depending upon the polarity of the applied current.

After actuating coin trigger 13 a deposited coin drops upon a flat plate 17 normally supported within the hopper above two parallel stationary pins or rollers 18 and 19 spaced apart a distance slightly less than the length of plate 17. Each of the pins 18 and 19 passes through apertures in the front wall 20 and rear wall 21 of the hopper and may, if desired, be rotatably supported thereby.

Midway its length plate 17 has two downwardly projecting arms 24, 25 adjacent the front and rear walls of the hopper, these two arms projecting in a direction perpendicular to plate 17 and being apertured at their lower ends to receive a pin 26. Pin 26 projects through an arcuate slot 27 in front wall 20 to be embraced by the forked end 28 of armature extension 16. Located below pin 26 and just above the convergence of the bottom walls of collect chute 35 and refund chute 37 is a stationary pin 29 suitably supported between the front and rear walls of the coin hopper. This pin 29 acts as the pivoting axis for an inverted U-shaped member 30

whose arms 31 and 32 at their lower ends are apertured to receive pin 29 and whose arms at their upper ends are apertured to receive pin 26. Pins 26 and 29 are parallel to each other and when the plate 17 is in its normal coin supporting position the two pins 26 and 29 lie in a common vertical plane bisecting plate 17; that is, arms 25 and 31 are in alignment with each other and arms 24 and 32 are in alignment with each other when plate 17 is in its normal coin supporting position.

As shown particularly in Figs. 5 and 8 the coin hopper is of special construction in that the upper tubular portion 12 extends downwardly a short distance below the top wall 40 of the enlarged lower portion 41 of the hopper, and the diametrically opposite edges 42 and 43 of the tubular portion immediately above the ends 34 and 36 of plate 17 are preferably beveled for a purpose to be described later. The distance between rod 18 and edge 42 and the distance between rod 19 and edge 43 are preferably just sufficient to allow freedom of movement of plate 17 from its normal position to either of its coin discharging positions. Rod 18 and beveled edge 42 by restricting the movement of plate 17 in a vertical plane jointly define an axis or bearing about which the plate pivots for coin collection. Similarly, rod 19 and beveled edge 43 by restricting the movement of plate 17 in a vertical plane jointly define an axis or bearing about which the plate pivots for coin refunding. It will be obvious that beveled edges 42 and 43 may, if desired, be replaced by rollers similar to rollers 18 and 19.

In order to prevent the possibility of a thin coin becoming wedged between the lower edge of the tubular portion of hopper 12 and the upper surface of plate 17, the hopper tubular portion may be provided with a plurality of spaced downwardly projecting pins or extensions 44 to 49 which project centrally into slots 50 to 55, respectively, of plate 17, pins 44 to 49 preferably being of such length that they do not project below the lower surface of plate 17 in its normal position. The tubular hopper portion also has a downwardly projecting pin 56 lying outside the path of plate arm 25 and another downwardly projecting pin 57 lying outside the path of plate arm 24. These pins 44 to 49 and 56, 57 serve to prevent any coin from being wedged between plate 17 and the bottom edge of the hopper while freely permitting the coin discharging movement of plate 17 and the subsequent movement to normal. In order to show the preferred ratio between the diameter of hopper 12 and the diameter of a dime, a dime 58 is shown lying on plate 17 in Fig. 7.

The manner in which the coin trap 17 is operated by the electromagnet 14 is best described in connection with the schematic showing of Fig. 2 where the full line 17 represents the plate in normal coin supporting position supported above spaced rollers 18 and 19 with the adjacent ends of arms 25, 31 pivoted about movable pin 26 and with the other end of arm 31 pivoted about the stationary pin 29. If we assume that pin 26 in Fig. 2 is moved counter-clockwise along an arcuate path with pin 29 as an axis, plate 17 will first be subjected to a substantially lateral movement until its edge 34 is free of roller 19 whereupon with further counter-clockwise movement of pin 26 the plate will begin to rotate clockwise about an axis lying between rod 18 and hopper edge 42 as shown in intermediate posi-

tion 17' until with pin 26 in its fully operated position the plate assumes position 17'' where it is tilted downwardly an extent sufficient to ensure that all coins on plate 17 will be discharged into collect chute 35 leading to the cash compartment of the collector. When pin 26 is moved from its fully operated position 26'' to its normal position the plate 17 will be rotated counter-clockwise about an axis lying between rod 18 and hopper edge 42 and as the result of which the right edge 34 of the plate will be lifted upwardly until it lies above roller 19 so that for the last portion of the restoring movement of pin 26 plate 17 will be moved substantially laterally to the right to enable the right edge 34 to again be supported above roller 19. It will be obvious that for a movement of pin 26 from its normal position to its fully operated position in a clockwise direction the left edge 36 of plate 17 will first be freed of roller 18, and the plate 17 then rotated counter-clockwise about an axis lying between rod 19 and hopper edge 43 to enable any coins on plate 17 to be discharged into a refund chute 37 leading to a coin pocket accessible to the user of the instrument.

In actual operation under coin load, plate 17 may contact with rod 18 for its initial rotative movement for coin collection and then contact with edge 42 for the remainder of its coin discharging movement. In being restored from its coin collect position to normal, plate 17 will generally remain in contact with edge 42 until the plate has substantially reached its horizontal position. Similarly, for coin refunding, plate 17 in its initial rotative movement may contact with rod 19 and then contact with edge 43 for the remainder of its coin refunding movement while in its return to normal it will generally remain in contact with edge 43.

It will, of course, be understood that the above-described operation of the coin trap is secured by the energization of polarized electromagnet 14 which for one polarity of applied current will cause its armature extension 15 to move pin 26 counterclockwise to tilt plate 17 and discharge coins into the collect chute 35 and which for applied current of the opposite polarity will cause its armature extension 16 to move pin 26 clockwise to tilt plate 17 in the opposite direction and discharge coins into refund chute 37.

After the cessation of the energizing current for electromagnet 14, armature extension 16 is restored to its normal position by means of one of the restoring springs 39 in the same manner as in the Forsberg patent. The restoration of armature extension 16 to normal ensures that coin trap 17 is positively restored to its normal coin supporting position. It is also to be assumed that when electromagnet 14 is deenergized the previously mentioned electrical contacts will be reopened and coin trigger 13 restored to normal in the manner described in the Forsberg patent.

In Figs. 3 and 4 of the drawings, the coin trap 17 and associated parts are in their normal positions with plate 17 supported above rollers 18 and 19 and with arms 25, 31 and arms 24, 32 vertically aligned with pin 26 lying at the midpoint of slot 27.

In Figs. 5 and 6 the plate 17 and associated parts are shown in their coin discharging position for coin collection with the upper end of plate 17 against hopper edge 42. The position of these parts for coin refunding position would be the reverse of that shown in Fig. 5 with pin 26 in its maximum clockwise position and with plate 17

tilted downwardly from hopper edge 43 to direct the coins towards refund chute 37. It will be noted particularly from Fig. 5 that when plate 17 has been tilted to direct the coins into one of the branch chutes 35, 37, the plate is in a position to block the entrance to the other branch chute.

In a preferred form of the invention with pin 26 in its normal position and arms 25, 31 in alignment, there is a small amount of play allowed plate 17 between the bottom edge of the hopper and the rods 18 and 19. For example, plate 17 may have a thickness of $\frac{3}{4}$ of an inch and the distance between the upper side of rod 18 or 19 and the adjacent bottom hopper edge 42 or 43 may be $\frac{3}{4}$ of an inch. The combined length of arms 25, 31 or arms 24, 32 is preferably such that in normal position the under surface of plate 17 need not be in contact with either rod 18 or 19. As to the length of plate 17 compared to the distance between rods 18 and 19 it was found satisfactory in one embodiment of the invention to have plate 17 in its normal position extend about $\frac{3}{4}$ of an inch beyond the center of each pin 18 or 19 where each pin had a diameter of $\frac{1}{8}$ of an inch.

Figs. 9 and 10 show a modified form of the invention where the lower tubular portion 60 of the coin hopper has no projections corresponding to pins 44-49 of Fig. 7 and the coin supporting plate 61 has no slots corresponding to the slots shown in plate 17, particularly in Figs. 7 and 8. Movable pin 62 corresponds to pin 26 of the earlier figures except that pin 62 does not project outside the coin hopper. The lower ends of the plate tabs 63 and 64 are apertured to receive pin 62 and the inverted U-shaped member 65 has the upper ends of its arms 66, 67 apertured to receive pin 62 while the lower ends of arms 66, 67 are pivoted about the stationary pin 62. Member 65 differs from member 30 of the earlier figures in that its arm 66 extends below pin 62, then outwardly through an arcuate slot 69 in a side wall of the hopper, and then upwardly to a point above pin 62 where its end carries a pin 70 engaging the fork extension 71 of the coin relay armature. It will be apparent that the energization of the coin relay to move extension 71 will serve to tilt plate 61 for coin collection or coin refunding in substantially the same manner as described for the earlier figures.

The form of the invention shown in Figs. 9 and 10 has certain advantages over the form of Figs. 1 to 8. A deposited coin is less likely to become wedged in slot 69 of Fig. 9 than in slot 27 of Fig. 3; and the total amount of travel required for armature extension 71 is less than the amount of travel required for armature extension 16 since pin 70 described an arc on a shorter radius than the arc described by pin 26.

It will be apparent that if desired the non-slotted plate 61 may be actuated by the linkage of Figs. 3 to 5 and that the slotted plate 17 of Figs. 3 to 5 may be actuated by the linkage of Figs. 9 and 10.

It is to be understood that the invention may possess still other embodiments commensurate with the scope of the appended claims.

What is claimed is:

1. In a coin collector, a coin trap comprising a plate, supports for said plate spaced apart a distance slightly less than the length of said plate, a toggle joint having one arm fastened to said plate and having a second arm rotatable about a fixed pivot, and means for actuating the hinge of said toggle joint.

2. In a coin hopper, a coin trap for temporarily arresting coins deposited in said hopper, two spaced bearings about either of which said trap may be moved, an arm fastened to said trap and projecting downwardly from the lower surface thereof, and means hinged to said arm for controlling the movement of said trap about either bearing.

3. In a coin hopper of the coin collector type provided with a refund chute and a collect chute, 10 a coin trap for temporarily arresting coins deposited in said hopper, a bearing about which said trap may be moved to discharge coins into said collect chute, a second bearing about which said trap may be moved to discharge coins into said refund chute, and means for subjecting said trap to a lateral movement followed by a rotative movement about either of said bearings.

4. In a coin hopper of the coin collector type provided with a refund chute and a collect chute, 20 a coin trap for temporarily arresting coins deposited in said hopper, a bearing about which said trap may be moved to discharge coins into said collect chute, a second bearing about which said trap may be moved to discharge coins into said refund chute, and means for subjecting said trap first to a lateral movement sufficient to free said trap from one of said bearings and then to a rotative movement about the other of said bearings.

5. In a coin hopper, a plate for temporarily arresting coins deposited in said hopper, two parallel rods for normally supporting said plate, said rods being spaced apart a distance slightly less than the length of said plate, an arm rigidly fastened to said plate and projecting downwardly from said plate towards the bottom of said hopper, a stationary pin centrally located below said plate, an arm pivoted about said pin and a hinged connection between said first arm and said second arm.

6. In a coin hopper, a plate for temporarily supporting coins deposited in said hopper, two spaced parallel rods supporting said plate with said plate lying above said rods in its normal position, and means at times for rotating said plate about a bearing defined by one of said rods and at other times for rotating said plate about a bearing defined by the other of said rods.

7. In a coin channel having a main coin chute leading to branched chutes, a movable plate acting as a closure for said main chute and adapted to support coins deposited in said main chute, two spaced parallel pins for supporting said plate, said plate lying above said pins in its normal position, and means at times for tilting said plate about a bearing defined by one of said pins to discharge a deposited coin into one of said branch chutes and at other times for tilting said plate about a bearing defined by the other of said pins to discharge a deposited coin into the other branch chute.

8. In a coin chute, a coin trap for temporarily supporting coins received in said chute, and actuating means for said trap, said means comprising an arm rigidly fastened to said trap, a second arm rotatable about a fixed pivot and a hinged connection between said arms.

9. In a coin chute, a coin trap for temporarily supporting on its upper surface coins received in said chute, an arm rigidly fastened to said trap and projecting downwardly from said trap, a second arm rotatable about a fixed pivot below said trap and a hinged connection between said arms.

10. In a coin channel having a main coin chute,

leading to branched chutes, a trap door in said main chute adapted to support a deposited coin, an upwardly extending arm pivoted at its lower end on an axis adjacent the convergence of said branch chutes, a second arm rigidly fastened to said trap and projecting downwardly towards said branch chutes, and a hinged connection between said arms.

11. In a coin channel having a main chute leading to branched chutes, a trap door in said main chute adapted to support a deposited coin, an upwardly extending arm pivoted at its lower end on an axis adjacent the convergence of said branch chutes, a second arm rigidly fastened to said trap and projecting downwardly towards said branch chutes, a hinged connection between said arms, and means for actuating said hinge to cause said trap to block the entrance to one of said branch chutes and to discharge the deposited coin into the other branch chute.

12. In a coin hopper provided with a main chute, and chutes branching therefrom with an arcuate slot in a side wall of the hopper, a trap door for said main chute adapted to support a deposited coin, a pin supported by said hopper and lying adjacent the convergence of the bottom walls of said branch chutes, an arm pivoted on said pin, a second arm rigidly fastened to said trap and projecting downwardly towards said branch chutes, a second pin about which both of said arms are pivoted, said second pin having an extension projecting through said slot, and means for actuating said second pin.

13. In a coin hopper having a main chute and chutes branching therefrom, a trap door adapted to support a coin deposited in said main chute, spaced parallel pins in said hopper for supporting said door at points adjacent opposite ends of said door with said door lying in a plane above said pins in its normal coin supporting position, an upwardly extending arm pivoted at its lower end on an axis adjacent the convergence of the bottom walls of said branch chutes, a second arm rigidly fastened to a central portion of said door and projecting downwardly towards the convergence of said branch chutes, a hinged connection between said arms, and means for actuating said hinged connection to move said door laterally to free said door of one of said pins and thereafter tilt said door downwardly to discharge the deposited coin into one of said branch chutes.

14. A coin collector comprising a substantially vertical coin channel having a coin entrance opening, and a coin exit opening, a movable plate for normally closing said exit opening, a pair of spaced parallel pins for supporting said plate in coin supporting position, said plate normally lying between said pins and the bottom edge of said exit opening, the length of said plate being substantially greater than the distance between said pins, one of said pins and the adjacent edge portion of said exit opening defining a bearing about which said plate may be tilted to discharge coins from said plate, the second pin and the edge portion of said exit opening adjacent the second pin defining a second bearing about which said plate may be tilted to discharge coins from said plate, and means for freeing said plate of one of said pins and for tilting said plate about the bearing defined by the other of said pins.

15. A coin collector comprising a substantially vertical coin channel, a coin trap in said channel for temporarily supporting on its upper surface coins received in said channel, an arm rigidly fastened to said trap and projecting downwardly from said trap, a second arm rotatable about a fixed pivot below said trap, a hinged connection between said arms, one wall of said channel having a slot below said pivot, means coupled to said second arm and having an extension projecting through said slot, and means for actuating said extension.

16. In a coin hopper having a substantially vertical coin channel and chutes branching therefrom, a coin trap in said channel, branch chutes below said trap, an arm rigidly fastened to said trap and projecting downwardly from said trap, a second arm pivoted on an axis adjacent the convergence of the bottom walls of said branch chutes, a hinged connection between said arms, a wall of said channel having a slot located below said axis, means joined to said second arm and having an extension projecting through said slot, and means for actuating said extension.

17. A coin collector comprising a substantially vertical coin channel having a coin entrance opening, and a coin exit opening, a movable plate normally closing said exit opening, said plate having end portions normally extending beyond the edges of said exit opening, said plate containing a plurality of parallel slots, the bottom edge of said exit opening having spaced around the periphery of said exit opening a plurality of downwardly extending projections normally extending into said slots to prevent a deposited coin from becoming wedged between said plate and said exit opening, supporting means for said plate, and means for moving said plate to coin discharging position.

18. A coin collector comprising a substantially vertical coin channel having an exit opening, a movable plate for normally closing said opening, supporting means for said plate comprising a pair of spaced parallel pins supported by the walls of said channel, said plate normally lying between said opening and said pins, said plate having a length substantially greater than the distance between said pins, means for preventing a coin on said plate from becoming wedged between the upper surface of said plate and the bottom edge of said opening, and means for moving said plate to coin discharging position.

19. A coin collector comprising a substantially vertical coin channel having a coin exit opening, a movable plate normally closing said opening, supporting means for said plate comprising a pair of spaced parallel pins supported by the walls of said channel, said plate normally lying between said opening and said pins, said plate having a length substantially greater than the distance between said pins, said plate containing a plurality of substantially parallel slots, a plurality of projections spaced around the periphery of said opening and normally extending downwardly into said slots, and means for subjecting said plate first to a lateral movement sufficient to free said plate from one of said pins and then to a tilting movement to discharge any coin on said plate.

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