

May 19, 1942.

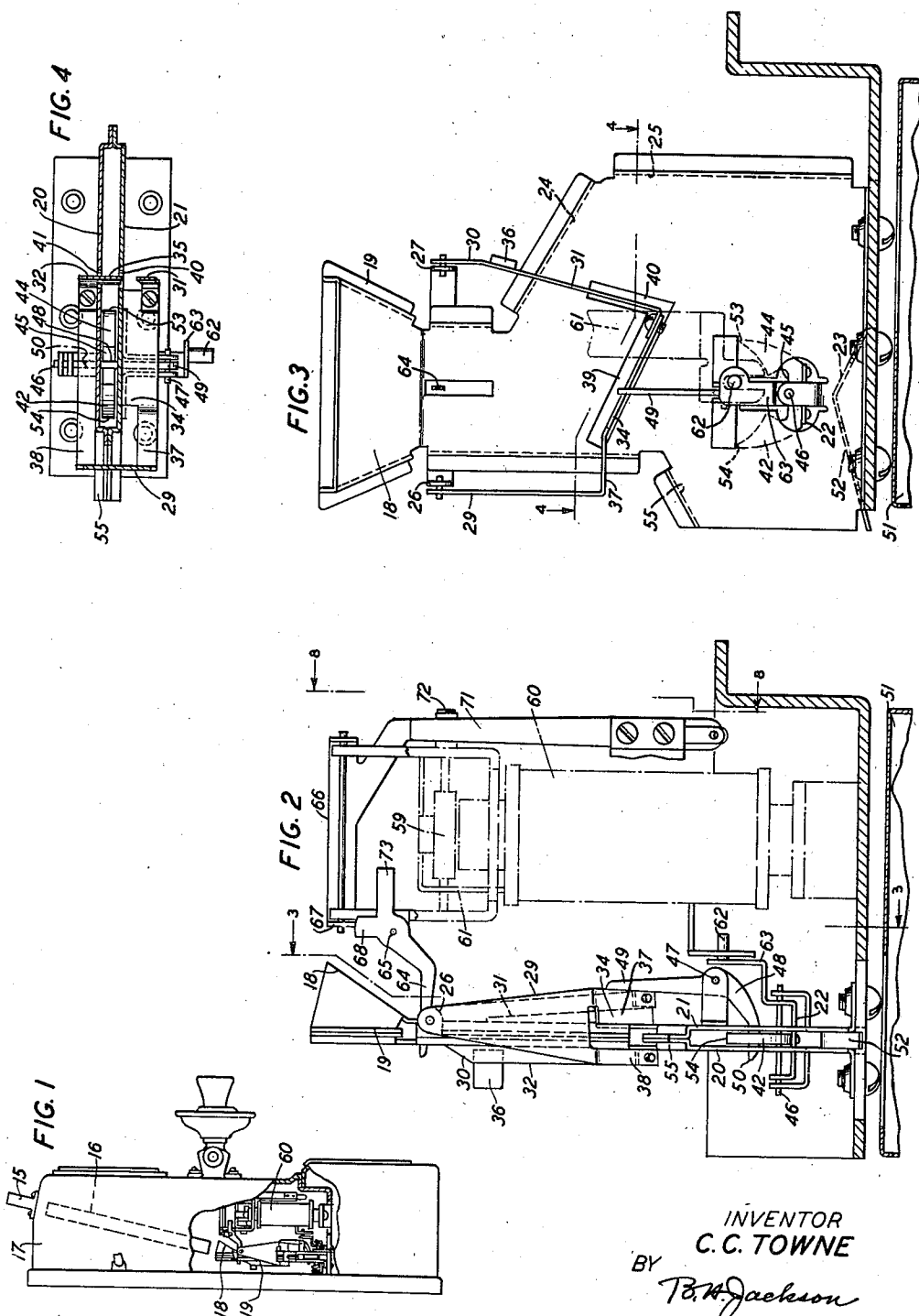
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2,283,396

TELEPHONE COIN COLLECTOR

Filed Aug. 24, 1940

3 Sheets-Sheet 1



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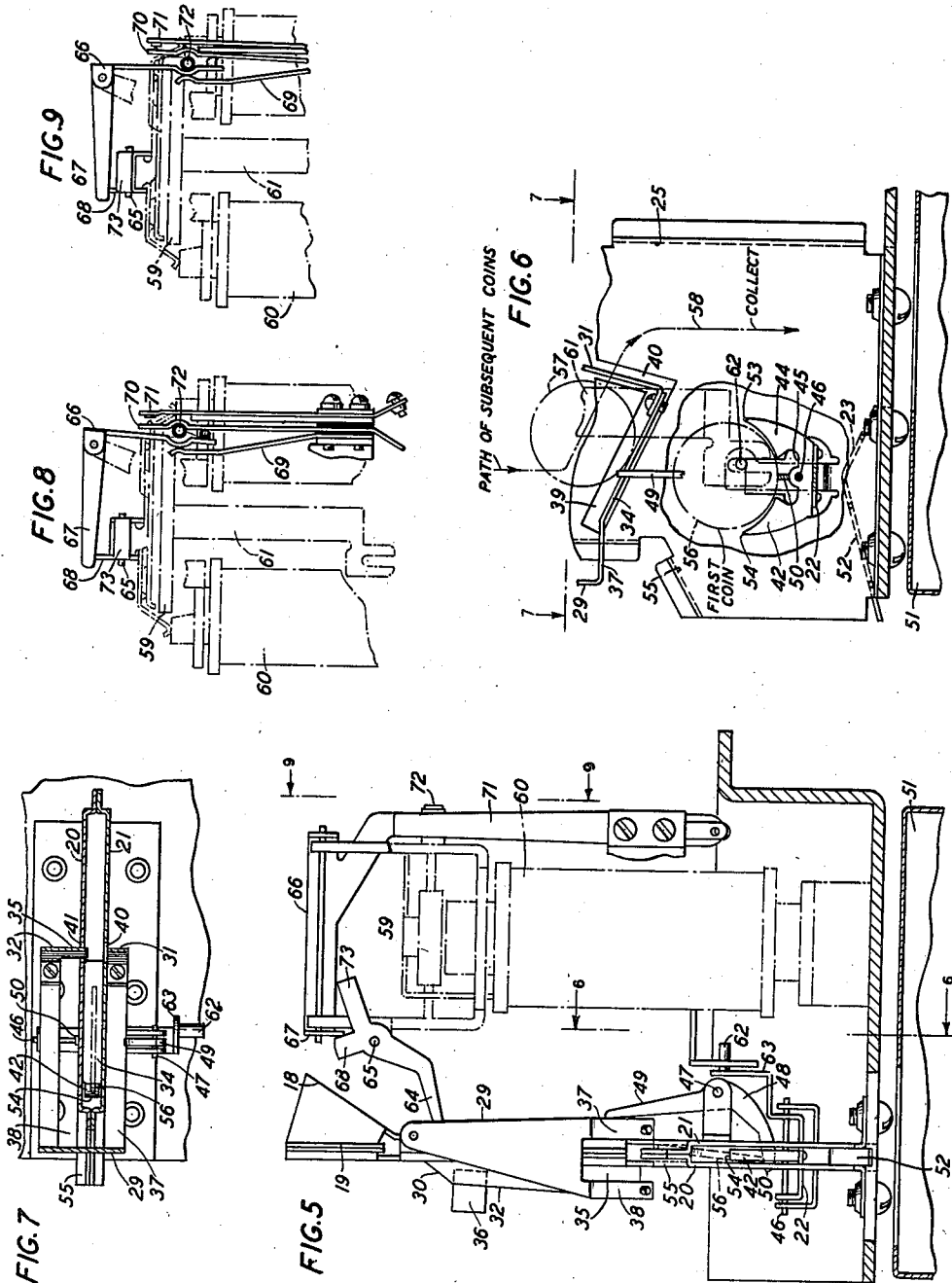
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3 Sheets-Sheet 2



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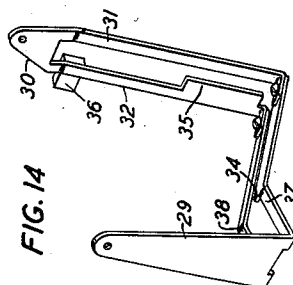
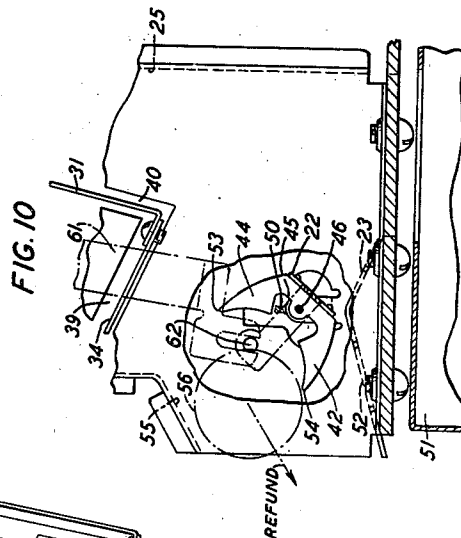
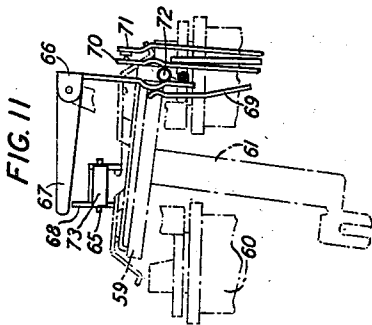
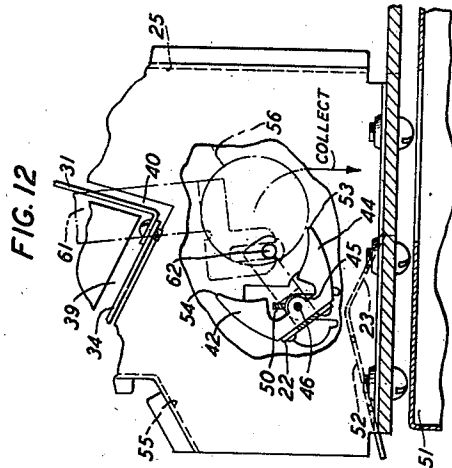
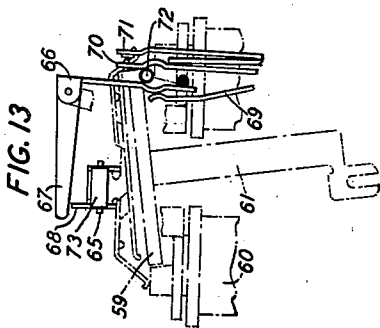
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,283,396

TELEPHONE COIN COLLECTOR

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Application August 24, 1940, Serial No. 354,092

1 Claim. (Cl. 194—1)

This invention relates to telephone coin collectors and has for an object the provision of a collector in which certain deposited coins will be held in suspense for subsequent collection or refund while other coins will be collected immediately upon deposit.

Telephone coin collectors as now used commercially are, in general, of two main types. In the prepay type the deposit of a coin is required before the operator can be signaled or before the number can be dialed, and in this case the deposited money is collected or refunded depending upon whether or not the desired connection is established. In the postpay type no money deposit is required until the desired connection is available or is established whereupon the deposit of a coin is required, which coin is immediately collected without any provision for coin refund.

The collector of this invention is adapted to be used as a collector of a prepay type for local calls and as a collector of the postpay type for toll or long distance calls. For this purpose the coin hopper for receiving deposited coins is provided with two channels, one a by-pass channel leading to the cash box and the other leading to a coin trap where the coin may be temporarily held in suspension for subsequent collection or refund, depending upon conditions occurring after coin deposit.

Mounted on the coin hopper is a pivoted cradle carrying two vanes, one adapted to close the entrance to the by-pass channel and to direct a deposited coin on to the coin trap, and the other adapted to close the entrance to the coin trap channel and to direct a deposited coin into the by-pass channel. The two vanes are preferably so related that with the cradle in its normal position the entrance to the by-pass channel is closed and the entrance to the coin trap channel is open so that the initial coin is positively directed on to the coin trap. Prior to reaching the coin trap the initial coin strikes a pivoted lever which in its actuation serves to move the cradle to an advanced position where the two vanes occupy such positions that the entrance to the coin trap channel is closed and the entrance to the by-pass channel is open. The cradle preferably remains in the advanced position just described as long as the initial coin remains on the coin trap. Whenever the coin trap is operated to discharge the initial coin thereon into the collect or refund chute, this cradle is released to permit the cradle to be restored to its normal position.

Referring to the drawings:

Fig. 1 is a side view of a telephone coin collec-

tor employing the coin hopper of this invention;

Fig. 2 is a side view of the coin hopper and associated coin relay in their normal positions in the absence of a deposited coin;

Fig. 3 is a front view of the coin hopper taken in the direction indicated by the arrows 3—3 in Fig. 2;

Fig. 4 is a sectional view of the coin hopper taken along the line 4—4 of Fig. 3;

Fig. 5 is a side view of the hopper similar to that of Fig. 2 except that certain movable parts are shown in their actuated positions due to the presence in the hopper of the initially deposited coin;

Fig. 6 is a front view of the hopper of Fig. 5 taken in the direction indicated by the arrows 6—6 of Fig. 5;

Fig. 7 is a sectional view taken along the line 7—7 of Fig. 6;

Figs. 8 and 9 are detail views of the electrical spring contacts associated with the coin relay showing the position of these contacts before and after coin deposit;

Fig. 10 discloses the manner in which the initial coin is refunded;

Fig. 11 illustrates the coin relay armature and other movable parts after movement to coin refunding position;

Fig. 12 discloses the manner in which the initial coin is collected;

Fig. 13 illustrates the relay armature and other movable parts after movement to coin collect position; and

Fig. 14 is a view in perspective of the vane carrying member of Fig. 2 shown detached from the coin hopper.

Fig. 1 is a side view of a telephone coin collector of the general type disclosed in the O. F. Forsberg U. S. Patent 1,043,219 issued November 5, 1912, to which reference may be had for a detailed description of the manner of operation of such a collector. The collector of the present invention may be assumed to be the same as that disclosed in the Forsberg patent except for the substitution of a new type of coin hopper for that disclosed by Forsberg.

A nickel, dime or quarter deposited in the coin gauge 15 enters the proper channel of the multi-coin chute 16 located in the upper housing 17 which chute guides the deposited coin along a path to cause the coin to strike a signaling element, such as a gong or bell, after which the deposited coin drops into the mouth 18 of a coin hopper 19 of a construction shown in detail in Figs. 2, 3, 4 and 14.

The coin hopper of Fig. 2 and the subsequent figures has a main coin channel defined by the substantially vertically arranged and opposed side walls 20, 21 which channel terminates in a U-shaped coin trap 22. As shown particularly in Fig. 3, the side walls 20, 21 are extended laterally to provide a by-pass channel around the coin trap, the outer edge of the by-pass channel being defined by end walls 24, 25 while the opposite edge of the by-pass channel is defined by coin trap 22 and the downwardly sloping ledge 23 which forms a part of the bottom wall of the hopper.

Extending from the upper part of the coin hopper are two tabs 26, 27 to which is pivoted a cradle comprising a depending arm 29 supported by tab 26 and a forked arm 30 supported by tab 27, the two branches 31, 32 of arm 30 being located on opposite sides of the hopper. The lower ends of arm 29 and branch 31 of arm 30 are joined by a cross-arm 37 from which projects a downwardly inclined coin deflecting vane 34 which is adapted to be moved across the coin channel between the walls 20 and 21.

The lower end of arm 29 is also joined to the lower end of branch 32 of arm 30 by a cross-piece 38 with the adjacent parallel edges of cross-piece 38 and vane 34 spaced from each other a distance substantially equal to the distance between the inner faces of channel side walls 20 and 21. Branch arm 32 carries a vertically arranged coin deflecting vane 35 which is adapted to be projected into the coin passage to normally prevent a coin from by-passing the coin trap. Channel side wall 21 has an L-shaped slot comprising a downwardly inclined portion 39 and a substantially vertical portion 40 and it is to be assumed that the opposite wall 20 has a juxtaposed L-shaped slot of similar type, the vertical portion 41 of which is shown in section in Fig. 4. Slot 39 in wall 21 and the corresponding slot in wall 20 are located so as to permit vane 34 to project completely across the coin channel to occupy a coin obstructing position. Similarly, vertical slot 40 in wall 21 and the corresponding vertical slot 41 in wall 20 are located so as to permit vane 35 to be projected completely across the coin channel between walls 20 and 21.

Cradle 29, 30 is biased by a weight 36 to a normal position in which a portion of the cross-arm 38 engages channel side wall 20 in which position vane 35 extends through slots 40, 41 to occupy a coin obstructing position within the coin channel while vane 34 is external to the coin channel as shown in Fig. 4. The normal position of the cradle 29, 30 (Figs. 2, 3 and 4) is therefore such that a deposited coin entering the coin hopper mouth 18 will drop vertically between the walls 20 and 21 until the coin comes to rest on the coin trap 22. If vane 35 were not in the coin channel there would be a possibility that the coin might be deflected to the right of trap 22, as seen in Fig. 3, to pass out of the coin hopper without coming to rest on the coin trap, but vane 35 is so positioned that any coin tending to pass to the right of the coin trap strikes vane 35 and is directed on to the coin trap.

The coin trap 22 has two arms 42, 44 presenting a U-shaped coin receiving surface. These arms are of sufficient thickness to extend substantially across the coin passage between walls 20 and 21 and between the arms is a hollowed-out portion or cavity 45 centrally located above the coin trap pivoting axis 46. Above the coin trap and pivoted externally of the hopper on pin

47 is a coin-operated lever 48 whose upwardly directed arm 49 engages the cradle cross-arm 37 and whose laterally extending arm 50 normally projects across the coin channel at a point a short distance above the lowermost part of the coin supporting surfaces of arms 42, 44 whereby arm 50 is adapted to be struck downwardly by the initially deposited coin before the coin comes to rest on the coin trap. This coin trap 22 by means to be described later, may be rocked either clockwise or counter-clockwise from its normal position of Fig. 3. If rotated clockwise the coin held thereon will be discharged to the right of the trap as seen in Fig. 3 to direct the coin into a collect chute 23 leading to a coin receptacle shown diagrammatically at the point 51. If rotated counter-clockwise the coin will be discharged to the left of the coin trap into a refund chute 52 whereby the coin will be returned to the depositor. With the trap 22 in its normal position of Fig. 3, the distance between the tip 53 of arm 44 and the lower edge of vane 35 is substantially less than the diameter of the smallest standard coin to be received by the hopper; and, similarly, the distance between the tip 54 of arm 42 and the end of wall 55 of the coin hopper is substantially less than the diameter of the smallest standard coin. This relationship insures that when cradle 29, 30 is in its normal position the first deposited coin will not only be positively directed on to the coin trap 22 but will be prevented from leaving the coin trap until the coin trap has been positively rotated in a clockwise or counter-clockwise direction from its normal position.

It will therefore be apparent that with cradle 29, 30 in its normal position the initially deposited coin will drop downwardly through the coin hopper until it strikes the coin trap 22 where it will be temporarily held. Just prior to reaching the coin trap the initial coin will strike arm 50 of lever 48 to drive arm 50 downwardly within cavity 45.

The final positions of the initial coin 56 and arm 50 are shown in Figs. 5 and 6 with the initial coin resting on trap arms 42, 44 and with lever 50 held down by the weight of the deposited coin. This downward movement of lever arm 50 causes the vertical lever arm 49 to swing towards the coin hopper from its position of Fig. 2 to its position of Fig. 5 thereby causing a clockwise movement of cradle 29, 30 from its normal position of Fig. 2 to its advanced position of Fig. 5 which movement ceases when cradle cross-arm 37 engages the hopper side wall 21. In this advanced position of the cradle, particularly as shown in Fig. 7, the downwardly inclined vane 34 extends through slots 39 fully across the coin channel while vertical vane 35 is external to the coin hopper in a coin non-obstructing position. It follows, therefore, that a second deposited coin in falling down the hopper will be prevented from reaching the coin trap because of the intervening vane 34 whereby the second coin 57 will strike vane 34 and will roll downwardly over the lower end of vane 34 to fall directly into the collect chute 23 leading to the coin receptacle 51 as shown by dotted arrow 58 of Fig. 6. It also follows that all coins deposited subsequently to the initial coin 56 will take the same path as just described for coin 57 so that in the coin hopper of the present invention the maximum load on the coin trap is a single coin. As a result of this small load on the coin trap there is no possibility that for a toll call the coin load on the coin trap

will be sufficient to endanger the operation of the trap in disposing of its coin load.

The single coin 56 held on the coin trap may be collected or refunded in any convenient manner, for example in the manner disclosed in the above-mentioned Forsberg patent. The collecting and refunding apparatus shown in the attached drawings is essentially the same as that disclosed in the Forsberg patent and hence only a brief description of this operation will be made in the present specification. The armature 59 of a polarized coin relay 60 has a depending arm 61 embracing a pin 62 mounted on an upwardly extending arm 63 of the coin trap 22 whereby the clockwise or counter-clockwise rotation of armature 59 when the relay is energized will cause a similar clockwise or counter-clockwise rotation of the coin trap. In Fig. 10 it has been assumed that the energizing current for the relay is applied in such a direction that trap 22 is rotated counter-clockwise an amount sufficient to discharge its coin 56 into the refund chute. Similarly in Fig. 12 it has been assumed that the applied energizing current is in the opposite direction causing a clockwise rotation of the coin trap to the position shown in Fig. 12 where the initial coin 56 is being discharged into the collect chute. The polarized coin relay 60 is placed under the control of the central office in the same manner as in the Forsberg patent. Projecting into the upper part of the coin hopper is a coin trigger 64 pivoted about an axis 65. In the normal position of the coin trigger as in Fig. 2, a spring pressed lever 66 has an arm 67 resting on the trigger shoulder 68. The deposit of the initial coin in striking the coin trigger 64 knocks the trigger downwardly out of the path of coin travel and, as shown in Fig. 5, this trigger movement released lever arm 67 from trigger shoulder 68 so that spring member 69 may move to the right from its position of Fig. 8 to its position of Fig. 9 to close the electrical spring contacts 70, 71. The closure of these contacts, as shown in the Forsberg patent, establishes a circuit to ground through the windings of coin relay 60 whereby positive or negative battery at the central office may at the proper time be applied to the relay to collect or refund the initially deposited coin in the manner previously described. An extension of armature 59 carries a roller 72 which, when the armature is actuated, moves upwardly or downwardly from its normal position of Figs. 8 or 9 to its actuated position of Figs. 11 or 13;

and the movement of roller 72 in either direction serves in an obvious manner to lift lever arm 67 upwardly out of the path of trigger shoulder 68 so that the coin trigger is free to return to its normal position due to its counterweight 73.

As soon as the initial coin 56 has been discharged from coin trap 22 and the coin relay has been deenergized to restore the coin trap to its normal position, it follows that the cradle 29, 30 due to its biasing weight 36 will be moved back to its normal position and in such movement the pivoted lever 48 will also be moved back to normal position since lever arm 49 at all times is in engagement with the cradle cross-arm 37.

What is claimed is:

A coin hopper comprising a main coin channel for receiving deposited coins, a first branch channel and a second branch channel leading from said main channel, the said channels having opposed side walls, a cradle pivoted externally of said hopper and having a first laterally directed vane and a second laterally directed vane, said side walls adjacent the entrances to said branch channels being slotted to receive said vanes, said vanes being arranged on said cradle so that for a first position of said cradle said second vane blocks the coin entrance to said second channel and said first vane permits coin entrance to said first channel, while in a second position said first vane blocks the coin entrance to said first channel and permits coin entrance to said second channel, said cradle being biased to said first position whereby a first deposited coin is directed into said first channel, a pivoted coin trap in said first branch channel having laterally spaced projections for temporarily supporting said first deposited coin, a pivoted finger projecting into said first branch channel and biased to a normal position above said trap but adapted upon being struck by a deposited coin to be lowered to a position between said projections and held therebetween as long as said first deposited coin is supported by said trap, means actuated by the coin movement of said finger for moving said cradle to said second position whereby a second deposited coin is directed into said second channel, a collect chute communicating with said second channel for receiving said second deposited coin, and means for moving said trap to discharge said first deposited coin from said trap whereby said finger is restored to its normal position.

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