Oct. 20, 1942. C. C. TOWNE 2,299,664

TELEPHONE COIN COLLECTOR

Filed Aug. 24, 1940 3 Sheets-Sheet 1

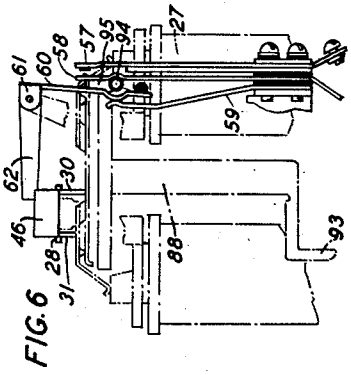

FIG. 6

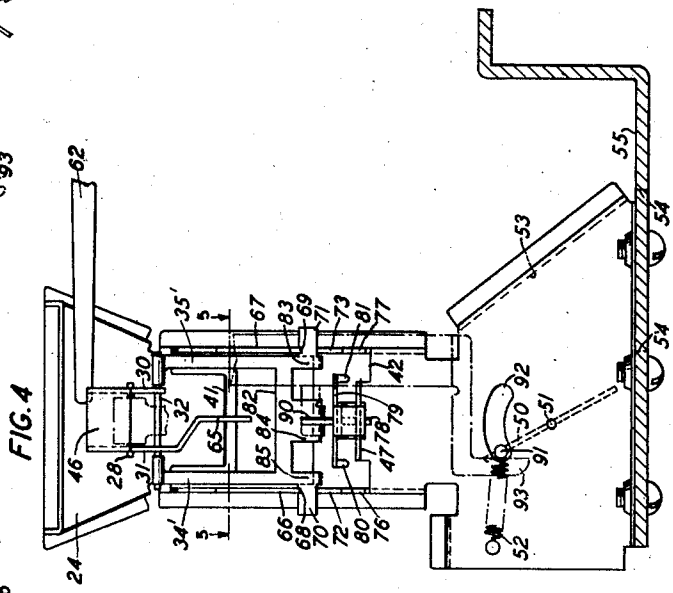

FIG. 4

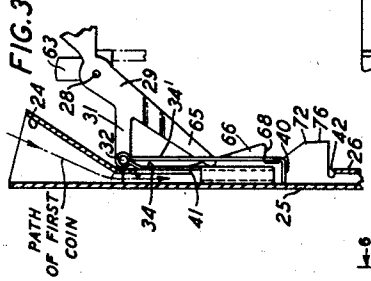

FIG. 3

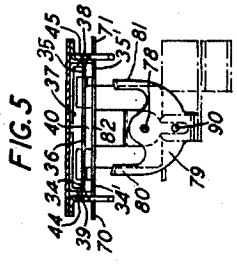

FIG. 5

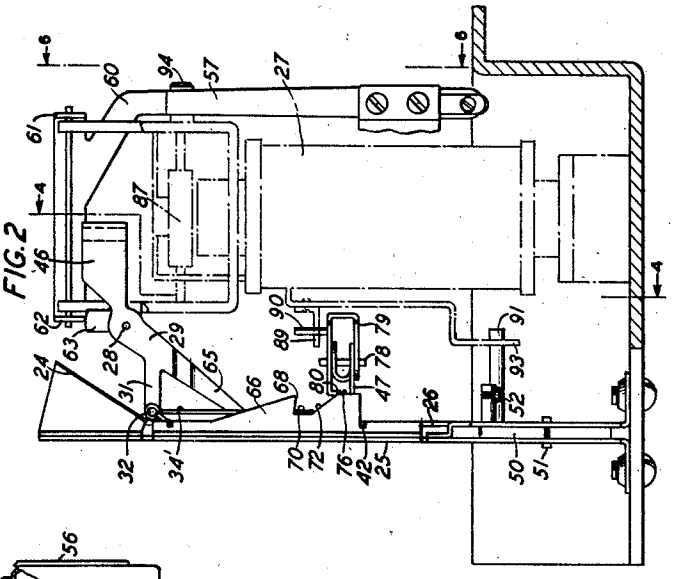

FIG. 2

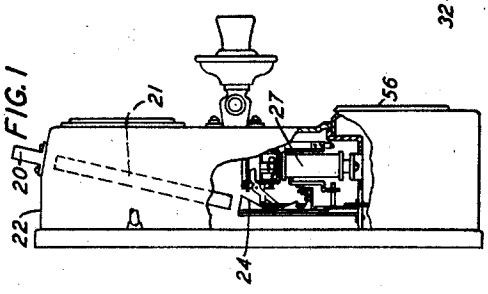

FIG. 1

INVENTOR
C. C. TOWNE
BY
P. W. Jackson
ATTORNEY

Oct. 20, 1942. C. C. TOWNE 2,299,664

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FIG. 10

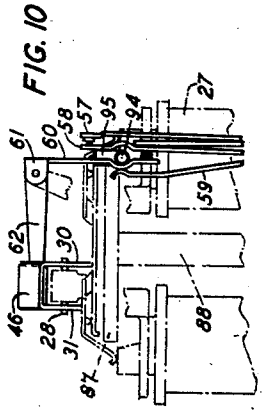


FIG. 8

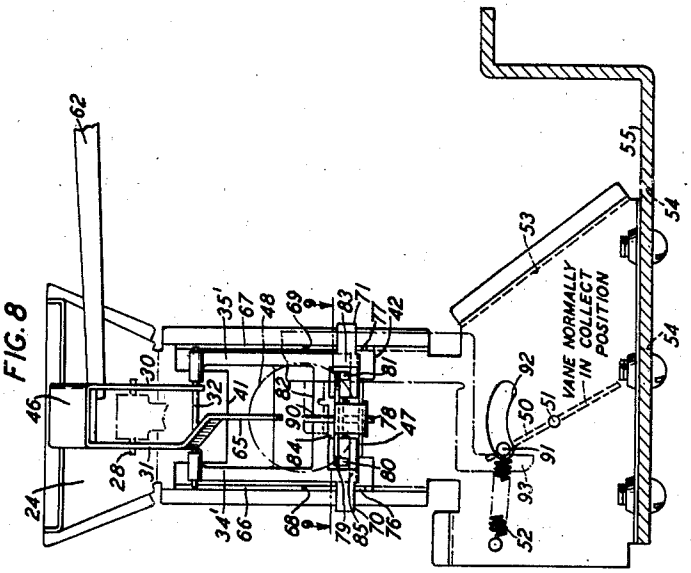


FIG. 9

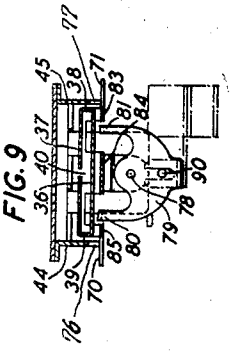
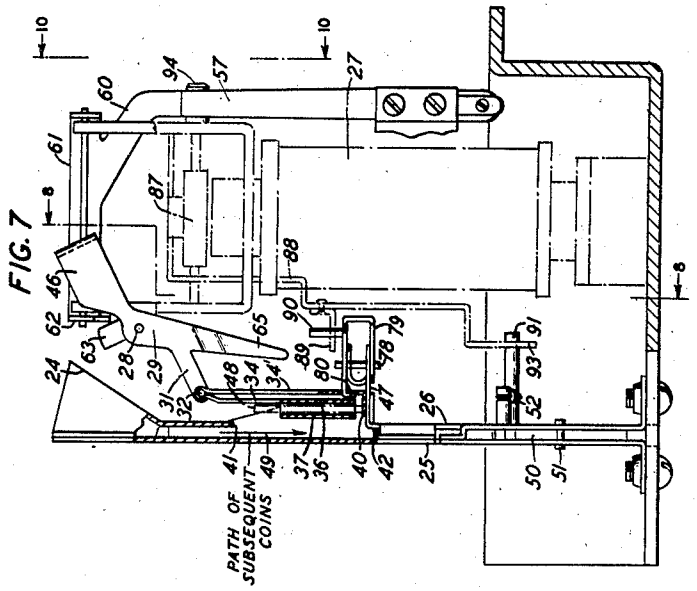


FIG. 7



INVENTOR
C. C. TOWNE
BY
B. H. Jackson
ATTORNEY

Oct. 20, 1942. C. C. TOWNE 2,299,664

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FIG. 14

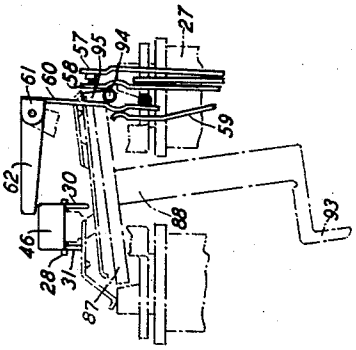


FIG. 12

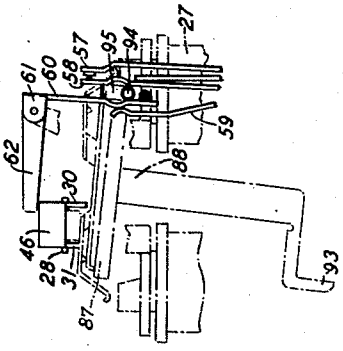


FIG. 15

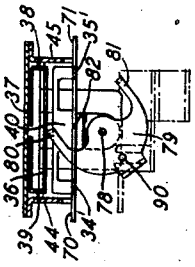


FIG. 16

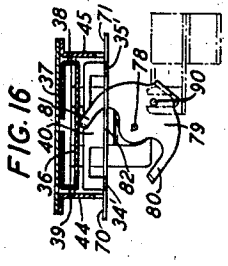


FIG. 13

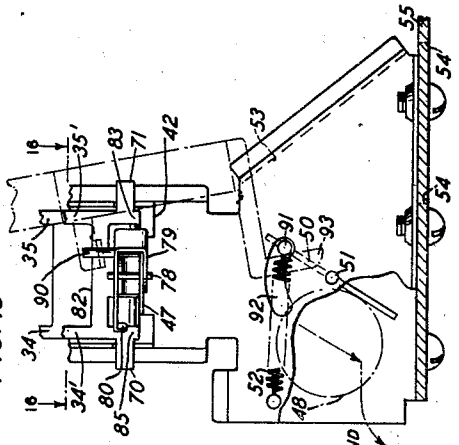
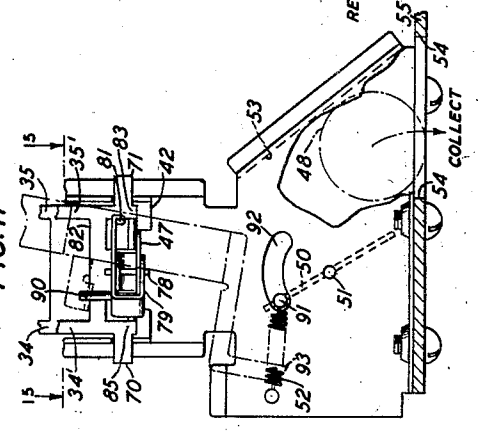


FIG. 11



INVENTOR
C. C. TOWNE
BY
T. H. Jackson
ATTORNEY

Patented Oct. 20, 1942

2,299,664

UNITED STATES PATENT OFFICE

2,299,664

TELEPHONE COIN COLLECTOR

Charles C. Towne, Summit, N. J., assignor to Bell Telephone Laboratories, Incorporated, New York, N. Y., a corporation of New York

Application August 24, 1940, Serial No. 354,093

4 Claims. (Cl. 194—1)

This invention relates to telephone coin collectors and in particular relates to the type of collector in which certain coins after deposit may be held in suspense for subsequent collection or refund while other deposited coins may be collected immediately.

In the usual telephone coin collector of the prepay type it is customary to direct coins deposited for a given call into a coin hopper where they are held in suspense on a coin trap for subsequent collection or refund by the actuation of a relay which releases the trap to direct the coins into the proper channel. It is obvious that in the operation of such a collector the coin load on the coin trap varies widely from a single coin for a local call to a large number of coins for a long distance call. This imposes rather severe restrictions on the design of the coin trap and relay mechanism since the relay armature must be capable of releasing the coin trap with the maximum coin load encountered in service.

In accordance with this invention a coin hopper is provided in which for a given telephone call only a limited number of the initially deposited coins is held in suspense while any subsequently deposited coins are diverted around the coin trap directly into the collection receptacle. In the preferred form of the invention the first coin entering the coin hopper drops into a bucket hanging in the hopper and so pivoted to a weighted lever arm that the weight of the coin is sufficient to move the bucket out of the path of subsequently deposited coins whereby all other deposited coins pass directly into the collection receptacle. The initially deposited coin held in the bucket may be collected or refunded by energizing a relay to restore the bucket into the hopper channel where the coin is discharged in a suitable manner as by removing the bottom of the bucket.

Referring to the drawings:

Fig. 1 is a side view of a telephone coin collector employing the coin hopper of this invention;

Fig. 2 is an enlarged side view of the coin hopper and associated coin relay with their movable parts in normal position;

Fig. 3 is a sectional view of the upper part of the coin hopper of Fig. 2;

Fig. 4 is a front view of the hopper partly in section taken along the line **4—4** of Fig. 2;

Fig. 5 is a horizontal section of the hopper taken along the line **5—5** of Fig. 4;

Fig. 6 illustrates the electrical spring contacts controlled by coin deposit and the coin relay;

Figs. 7, 8, 9 and 10 correspond to Figs. 2, 4, 5 and 6, respectively, except that certain parts are in their actuated positions caused by initial coin deposit;

Figs. 11 and 12 represent certain parts of the coin relay and coin hopper advanced to positions for securing the collection of the initial coin;

Figs. 13 and 14 represent certain parts of the coin relay and coin hopper advanced to positions for securing the refund of the initial coin; and

Figs. 15 and 16 are sectional views taken along the lines **15—15** and **16—16**, respectively, of Figs. 11 and 13, respectively.

A general view of a complete telephone coin collector is shown in Fig. 1 which for the purpose of this specification may be assumed to be of the type disclosed in the O. F. Forsberg U. S. Patent 1,043,219, issued November 5, 1912, except for the substitution of the coin hopper arrangement of the present invention. A nickel, dime or quarter deposited in the coin gauge **20** enters a multiple coin chute **21** within the upper housing **22** by means of which the coins are caused to selectively strike suitable signaling devices such as a gong or a bell before being dropped into the coin hopper **24**. The path taken by a coin through hopper **24** depends upon whether or not it is the initial coin or a subsequent coin deposited in payment for a given call and hence the structure of the hopper and related parts will first be described before tracing the coin path.

The coin hopper **24** has a rather wide coin receiving mouth which tapers down to a narrow coin channel defined generally by the opposed side walls **25, 26**. The adjacent coin relay **27** supports a pin **28** about which is pivoted an angular lever or bracket **29** having two laterally spaced arms **30, 31** (Fig. 8) joined by a pin **32** at a point remote from the lever pivoting axis **28**. The outer ends of pin **32** serve as a hinge on which are hung two inverted U-shaped arms **34, 34'** and **35, 35'**. The inner branches **34** and **35** of these arms supoprt a coin channel section in the form of a bucket-shaped temporary coin receptacle comprising side walls **36, 37** and end walls **38, 39** as shown in Figs. 7, 8 and 9. Between the lower ends of the outer branches **34', 35'** is formed a horizontal shelf **40** which normally serves as the bottom of the bucket **36, 37**. The outer depending arms **34', 35'** are joined by a cross arm **82**. The two U-shaped arms **34, 34'** and **35, 35'** are preferably made of resilient metal strips whereby under a small pressure the outer branches **34', 35'** may be spread away from the

inner branches 34, 35 far enough from their normal biased position of Fig. 3 to one in which shelf 40 no longer serves as a bottom for bucket 36, 37.

Hopper side wall 26 contains an aperture defined by an upper edge 41 and a lower edge 42 and extending laterally substantially the full distance between hopper end walls 44, 45. Lever 29 has a counterweight 46 of sufficient size to normally hold bucket 36, 37 within the coin hopper (Fig. 3) in a position to receive the first coin dropped into the mouth of the coin hopper. Since the bottom of bucket 36, 37 is normally closed by shelf 40 it follows that the initial coin is retained within the bucket while the weight of the initial coin is sufficient to overbalance the counterweight 46 to cause lever 29 to rotate counterclockwise from its position of Fig. 2 to its position of Fig. 7 and this rotation is sufficient to move bucket 36, 37 outwardly and downwardly until shelf 40 comes to rest on a stationary horizontal bracket 47. The initially deposited coin 48 is shown held in the bucket in Figs. 7 and 8 with the bottom edge of the coin resting on shelf 40. It will be obvious from Fig. 7 that bucket 36, 37 has in the above manner been advanced to a position external to the coin hopper. It will be noted from Fig. 7 that the bucket side wall 37 lies in a vertical plane a small distance to the right of the vertical plane defined by the apertured hopper side wall 26. It, therefore, should be apparent that the initially deposited coin 48 will be retained in bucket 36, 37 with the weight of the initial coin sufficient to carry the bucket out of the hopper so that any subsequently deposited coins in falling through the hopper will by-pass the bucket and will immediately enter the lower portion of the hopper below the bucket as indicated by the full line arrow 49 of Fig. 7.

The enlarged bottom portion of the coin hopper has between side walls 25, 26 a coin deflecting vane 50 pivoted about an axis 51 intermediate its ends. Vane 50 is biased by a spring 52 to the position shown in Figs. 4 and 8 whereby any coin deposited after the initial coin will be guided into a coin passage between vane 50 and hopper wall 53 to pass through an aperture 54 in the relay tray 55 and drop into a suitable collection box not shown but usually contained in the lower housing 56 of the collector. The above description has, therefore, shown how the initially deposited coin is temporarily held in bucket 36, 37 while subsequently deposited coins pass through the hopper directly to the collection box.

It is usual in collectors of the type disclosed in the Forsberg patent to have the initially deposited coin close a pair of electrical spring contacts in circuit with the coin relay windings to signal the operator and to place the coin relay under the control of the ceneral office. Referring to Fig. 6 a pair of normally open spring contacts 57, 58 is disclosed and the associated spring member 59 is biased to close these contacts but is normally restrained from so doing by the interposed arm 60 of an angular lever 61 whose laterally extending arm 62 normally rests on shoulder 63 of the bucket supporting lever 29. However, the deposit of the initial coin 48, in causing the counter-clockwise rotation of lever 29 to its advanced position of Fig. 7, removes shoulder 63 from beneath lever arm 62 and thereby permits spring 59 to move lever arm 60 to the right and cause the closure of the contacts as shown in Fig. 10. The closure of these contacts 57, 58 performs the usual function of providing a circuit through the windings of the polarized relay 27 whereby at the central office positive or negative battery may be applied to the coin relay to cause the relay armature 87 to move either to coin refunding or coin collecting position.

Before describing the manner in which the initial coin in bucket 36, 37 is collected or refunded, certain other details of the bucket arrangement should be noted. The lever arm 29 has an extension 65 which, in the normal position of the bucket, engages bucket wall 36 to positively hold the bucket within the hopper in coin receiving position as shown in Fig. 3. The end walls 44, 45 of the coin hopper have lateral extensions 66, 67 containing shoulders 68, 69 which are normally engaged by projections 70, 71 formed on the lower ends of the shelf supporting arms 34', 35' so that shoulders 68, 69 act as stops against further upward movement of the bucket due to the lever counterweight 46. When the initial coin 48 has been received in the bucket the outward movement of the bucket is insured by having projections 70, 71 slide down the sloping surfaces 72, 73 of hopper extensions 66, 67 until, when the downward movement of the bucket is stopped by shelf 40 resting on bracket 47, the two projections 70, 71 are in engagement with the vertical faces of shoulders 76, 77 as shown in Fig. 9.

On bracket 47 is a vertically mounted pin 78 about which is pivoted a rotatable member 79 having two horizontally spaced arms 80, 81 of equal length projecting towards the coin bucket. Below the cross-arm 82 which joins the outer depending arms 34', 35' are three spaced projections 83, 84, 85 the lower ends of which are turned inwardly to constitute the horizontal coin supporting shelf 40 previously described. When the bucket is dropped downwardly by the coin deposited therein, arm 80 lies in the space between projections 85 and 84, and arm 81 lies in the space between projections 84 and 83 as shown in Fig. 9, with the ends of arms 80, 81 adjacent but not contacting with side wall 36 of the coin bucket. By comparing Figs. 9 and 15 it will be apparent that when member 79 is rotated clockwise the end of arm 80 engages side wall 36 of the coin bucket to force the bucket back into the coin hopper as shown in Fig. 15, but the coin supporting shelf 40 is not moved into the coin channel with the bucket because projections 70, 71 are held against such movement by shoulder 76, 77. The two U-shaped arms 34, 34' and 35, 35' have sufficiently flexibility upon the application of a small force to permit the spreading of the two branches of each arm caused by this relative movement between bucket 36, 37 and its shelf 40; and when the spreading force is released these two double arms have sufficient resilience or bias to restore their branches 34, 34' and 35, 35' to the original relative positions of Fig. 7. It follows, therefore, that the clockwise rotation of member 79 moves the initial deposited coin 48 off the shelf 40 and allows it to drop into the lower part of the hopper. Alternatively, if member 79 is rotated counter-clockwise from its position of Fig. 9 to its position of Fig. 16 arm 81 will function in the same manner as arm 80 to force the bucket without its bottom into the coin hopper to release the initially deposited coin 48.

This clockwise or counter-clockwise rotation of member 79 is produced by the energization of coin relay 27. The relay armature 87 has an extension 88 which carries a fork 89 embracing a stationary vertical pin 90 carried by member 79

at a point remote from the pivoting axis of member 79. It follows, therefore, that when armature 87 is moved from its normal position to its collect position of Fig. 12 or its coin refunding position of Fig. 14 member 79 will be rotated in one direction or the other to discharge the initially deposited coin into the lower portion of the hopper as previously described.

It will be noted that the coin deflecting vane 50 by means of spring 52 is biased to a coin collecting position as shown in Figs. 4 and 8 so that for the coin collect operation of armature 87 vane 50 should not be actuated but should remain in its normal position. Vane 50 carries a pin 91 which projects through an arcuate slot 92 in the hopper side wall, to which pin spring 52 is attached to bias vane 50 to a coin collecting position adjacent the left end of slot 92 with a single prong 93 on the lower end of armature extension 88 acting as a stop for pin 91 in the normal coin collecting position of vane 50 as shown in Figs. 4 and 8. Therefore, when relay 27 is energized to collect the initially deposited coin to cause armature 87 to move to its actuated position of Fig. 12 it follows as shown in Fig. 11 that prong 93 merely moves to the left without disturbing the normal coin collecting position of vane 50. However, when armature 87 is moved to the coin refunding position of Fig. 14 the armature extension prong 93 in moving to the right carries pin 91 with it to rotate vane 50 to an advanced position where the initially deposited coin is directed into a refund channel as shown in Fig. 13.

Whenever the relay 27 is energized either to collect or refund the initially deposited coin a roller 94 carried by armature extension 95 is moved upwardly or downwardly from its normal position of Fig. 10 to its actuated position of Fig. 12 or 14, thereby forcing lever arm 60 to the left and raising lever arm 62 from its position of Fig. 7 to its position of Fig. 12 or 14; and in its new position lever arm 62 is out of the path of lever shoulder 63 so that as soon as the initially deposited coin has been discharged from bucket 36, 37 the counterweight 46 is free to move the bucket upwardly to its normal position of Fig. 2 ready to receive the next initially deposited coin. In this upward movement of the bucket, projections 70, 71 on arms 34', 35' ride up the sloping surfaces 72, 73 until they again engage the lower edges of shoulders 68, 69 whereby shelf 40 is again in position to retain the next initially deposited coin within the bucket.

When relay 27 is deenergized from its collect position of Fig. 12 or its refund position of Fig. 14 to permit the usual restoring springs to restore armature 87 to its normal position of Fig. 6 it follows that lever arm 62 will again rest on shoulder 63 to permit contacts 57, 58 to reopen; armature extension fork 89 will restore member 79 to its normal position of Fig. 5; armature extension prong 93, of course, is restored from its position of Fig. 11 or Fig. 13 to its normal position of Fig. 8; and in the case of coin refunding the restoration of prong 93 enables spring 52 to move vane 50 from its coin refunding position of Fig. 13 to its normal position of Fig. 8.

It is to be understood that the coin collection apparatus described above may be modified in various particulars without departing in any wise from the spirit of this invention as defined by the appended claims.

What is claimed is:

1. In a telephone coin collector having a collect chute and a refund chute and adapted to temporarily withhold from said collect chute for possible refund a first deposited coin while permitting subsequently deposited coins to pass directly into said collect chute, the combination of a coin hopper comprising an upper coin passage for receiving deposited coins, a lower coin passage spaced a substantial distance below said upper passage but adapted to receive a coin falling out of said upper passage, a basket normally adapted to receive a coin from said upper passage for ultimate disposal into said lower passage, a depending member comprising a shelf normally closing the bottom of said basket, a bracket pivoted about a substantially horizontal axis, said basket and said member being pivotally carried by an arm of said bracket at a point remote from the pivoting axis of said bracket, said basket being biased against said member whereby said basket tends to follow any lateral movement of said member, said bracket on the opposite side of its pivot comprising a counterweight of a mass sufficient in the absence of a coin on said shelf to bias said basket to an upper position beneath said upper coin passage whereby a first deposited coin is directed into said basket and is temporarily held in said basket on said shelf, the additional weight of a coin on said shelf being sufficient to move said basket and member downwardly about the axis of said bracket, cam means effective with said downward movement for engaging said member to guide said basket laterally away from the exit portion of said upper passage and the entrance portion of said lower passage to permit a subsequently deposited coin to pass directly from said upper passage to said lower passage without entering said basket, and means for moving said basket laterally relative to said member a distance sufficient to direct said first deposited coin into said lower passage.

2. In a telephone coin collector having a collect chute and a refund chute and adapted to temporarily withhold from said collect chute for possible refund a first deposited coin while permitting subsequently deposited coins to pass directly into said collect chute, the combination of a coin hopper comprising an upper coin passage for receiving deposited coins, a lower coin passage spaced below said upper passage and adapted to receive coins from said upper passage, a pivoted lever having a first arm extending from its pivot towards said hopper and a second arm extending from its pivot away from said hopper, a coin bucket hinged on said first arm, said second arm having sufficient weight to bias said bucket to a normal position in which said bucket lies between said passages for receiving and holding a coin discharged from said upper passage, the weight of a single coin in said bucket being sufficient to overcome the biasing action of said second lever arm and cause the downward movement of said bucket, means for guiding said bucket out of the path between said passages to a position in which coins discharged from said upper passage directly enter said lower passage, and means for discharging said single coin from said bucket.

3. In a telephone coin collector having a collect chute and a refund chute and adapted to temporarily withhold from said collect chute for possible refund a first deposited coin while permitting subsequently deposited coins to pass directly into said collect chute, the combination of a coin hopper comprising an upper coin passage for receiving deposited coins, a lower coin passage spaced below said upper passage and adapted to

receive coins from said upper passage, a coin bucket, pivoted supporting means for said bucket biased to hold said bucket in a coin receiving position below said upper passage but guiding said bucket when weighted by an initially deposited coin to an advanced position external to said hopper to permit subsequently deposited coins to enter said lower passage, said bucket having a bottom movable independently of the side walls of said bucket, means in said advanced position for holding said bottom against lateral movement towards said hopper while permitting lateral movement of the side walls of said bucket, and means for moving the side walls of said bucket into a coin discharging position above said lower passage.

4. In a telephone coin collector having a collect chute and a refund chute and adapted to temporarily withhold from said collect chute for possible refund a first deposited coin while permitting subsequently deposited coins to pass directly into said collect chute, the combination of a coin hopper comprising an upper coin passage for receiving deposited coins, a lower coin passage spaced below said upper passage and adapted to receive coins from said upper passage, a coin channel, pivoted means for supporting said channel biased to hold said channel in a coin receiving position below said upper passage, a closure member for the bottom of said channel supported by said means and adapted to hold an initially deposited coin in said channel, said channel with a coin therein being of sufficient weight to overcome the biasing action of said pivoted means to move said channel and said member to an advanced position away from coin receiving position under said upper passage, said collect chute and said refund chute being adapted to receive coins from said lower passage, movable means normally biased to a position guiding coins from said lower passage into said collect chute and common means for discharging said initially deposited coin into said lower passage and for moving said movable means to a position guiding the discharged initially deposited coin into said refund chute.

CHARLES C. TOWNE.