Nov. 2, 1937. I. H. WILSEY 2,097,610

COIN OR TOKEN DISPENSER

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Fig. 1.

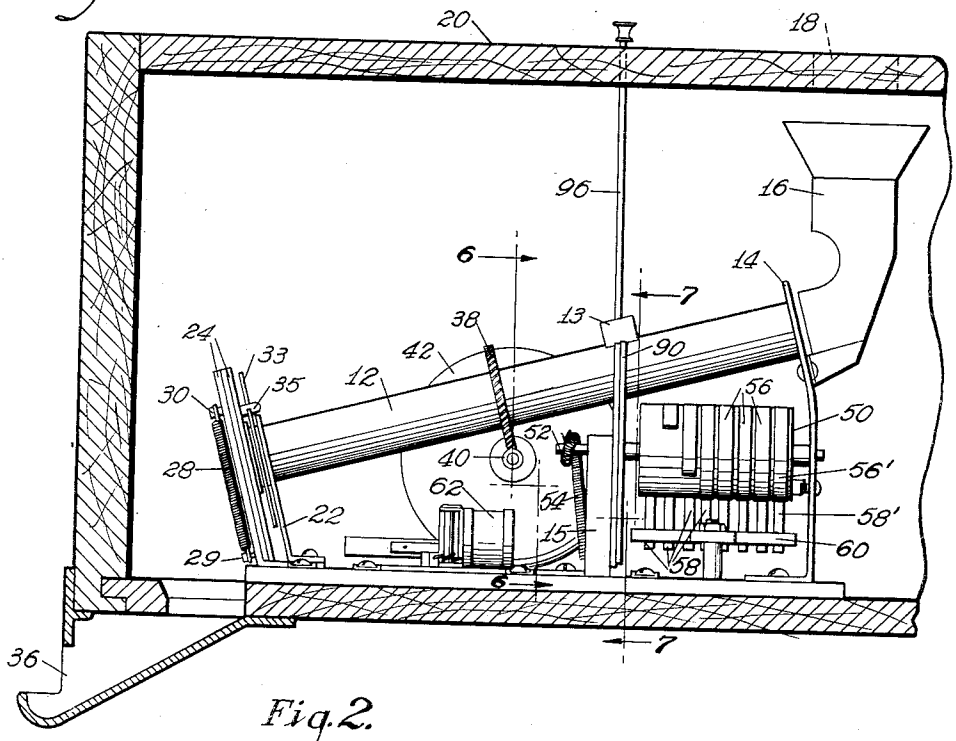
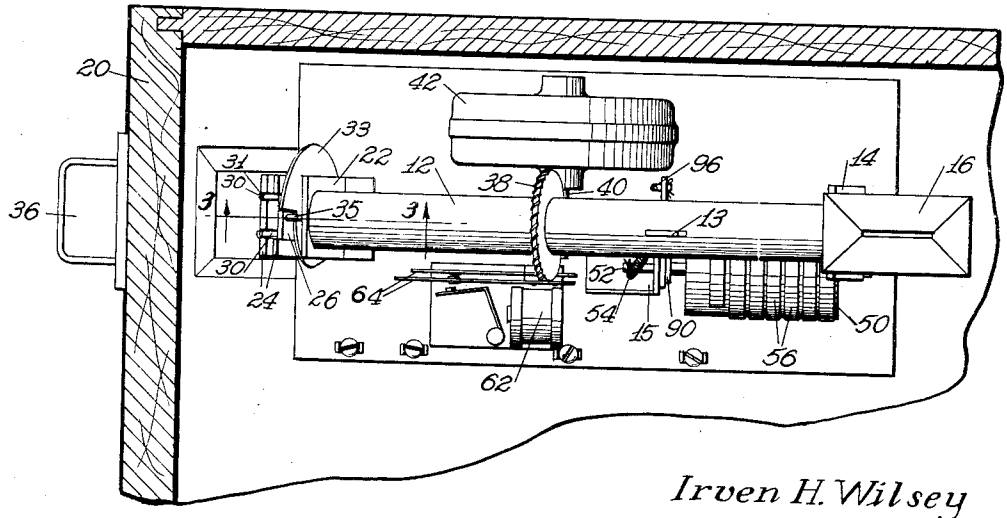


Fig. 2.



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Fig. 4.

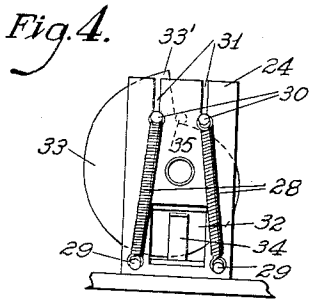


Fig. 3.

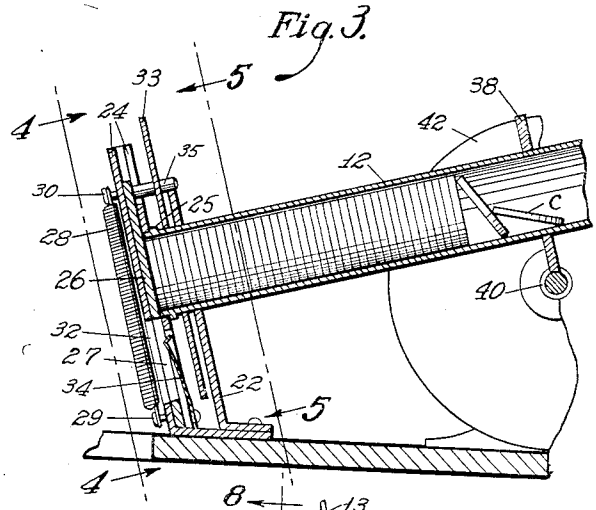


Fig. 5.

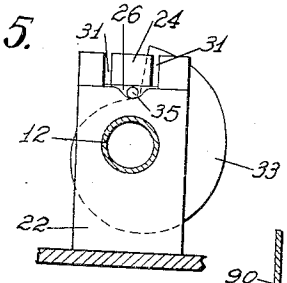


Fig. 8.

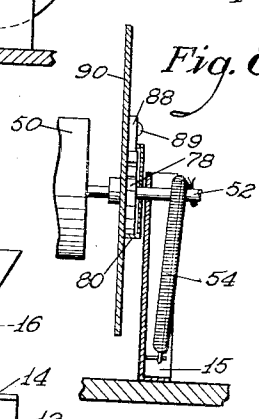


Fig. 7.

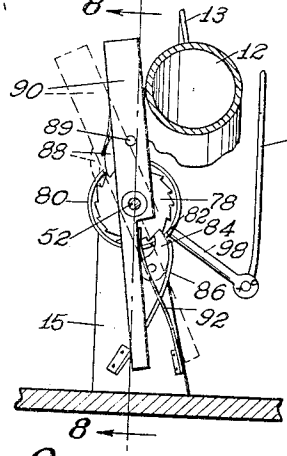


Fig. 6.

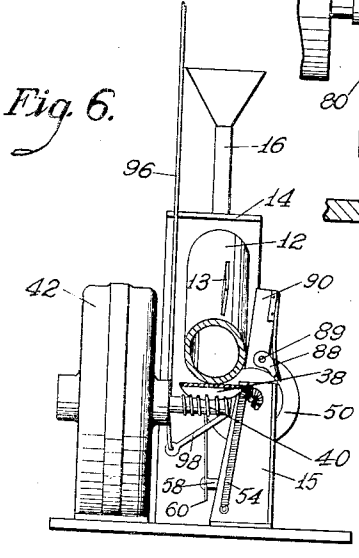
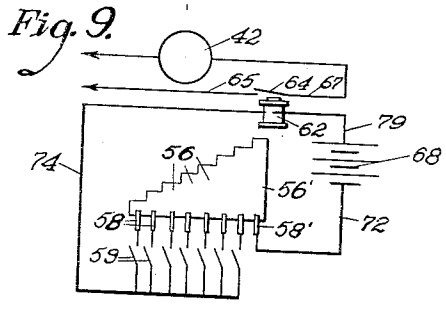


Fig. 9.



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Patented Nov. 2, 1937

2,097,610

UNITED STATES PATENT OFFICE

2,097,610

COIN OR TOKEN DISPENSER

Irven H. Wilsey, Chicago, Ill.

Application October 21, 1936, Serial No. 106,719

7 Claims. (Cl. 312—67)

This invention relates to coin dispensers, and has for one of its important objects the provision of a novel coin or token storage device, means for automatically stacking coins in the coin storage tube, and means for automatically ejecting coins from the tube.

A more specific object is the provision of an inclined coin storage tube adapted to receive coins at one extremity thereof, and provided with an ejecting member at the other extremity thereof for releasing or discharging coins, together with power driven means for rotating the tube so as to stack coins deposited therein in an orderly manner to facilitate ejection and economize storage space.

A further important result of the novel construction outlined above is the lessening of the load on the ejecting slide where a large number of coins are stored due to the angular disposition of the coins, the motor or driving means necessary for the operation of such slide therefore requiring appreciably less power.

The invention also provides novel ejecting control means and other important structural and functional objects which will appear as the following detailed description proceeds in view of the annexed drawings, in which:

Fig. 1 is a side elevation;

Fig. 2 is a top plan view;

Fig. 3 is a fragmentary side view in section taken along the lines 3—3 of Fig. 2;

Fig. 4 is a lower end view of the ejecting slide taken in the direction of lines 4—4 of Fig. 3;

Fig. 5 is an interior end view of the mechanism of Fig. 4 taken in the direction of lines 5—5 of Fig. 3;

Fig. 6 is a vertical sectional detail taken along the lines 6—6 of Fig. 1;

Fig. 7 is an operating detail of the ratchet mechanism for the commutator and taken along the lines 7—7 of Fig. 1;

Fig. 8 is a vertical sectional detail along the lines 8—8 of Fig. 7; and

Fig. 9 is a circuit diagram.

Heretofore it has been a common practice to support coin storage tubes in substantially vertical position with the coin receiving opening at the upper extremity of the tube so that the entire weight of the coins rested upon the closure, commonly a coin slide or ejector, at the bottom of the tube, thus effecting a gravity feed for the ejecting mechanism, but also in the case of larger installations applying a very considerable load directly upon the coin slide mechanism due to the aggregate weight of the coins so that the driving mechanism for the ejecting slide of necessity was a relatively powerful device to insure positive ejecting action. In addition in these former types of coin chute the likelihood of improper stacking was an element of importance and the vertical positioning of the storage tube took up an unnecessary amount of space.

The present invention obviates the foregoing difficulties by the provision, as shown in Fig. 1, of an inclined coin storage tube 12 rotatably supported at its upper extremity in a bracket 14, this extremity having communication with the lower end of a coin chute or funnel 16 adapted to receive coins through any form of depositing opening or mechanism, generally indicated at 18, in the upper wall of a housing or cabinet 20.

The lower end of the coin tube 12 is rotatably seated in a lower bracket 22 which also serves as a partial support for an ejecting mechanism (see Fig. 3) which comprises a pair of spaced plates 24 having an ejecting slide 26 slidably positioned therebetween for movement in an upward direction against the tension of a pair of springs 28 (Fig. 4) having their respective upper extremities attached by means of pins 30 extended from the ejecting plate 26 through a pair of slots 31 and having their lowermost extremities anchored to the outermost plate 24 by means of pins 29, such that a coin opening 27 in the lower part of the plate 26 may be registered with the lower open extremity of the tube 12 to receive a coin therefrom by urging the gate or ejector slide 26 upwardly against the tension of the springs 28.

It will be observed that the extreme lower end of the tube 12 is seated in an opening in the innermost of the parallel plates 24 so as to bring the lower mouth of the tube 12 as close as possible to the slide 26, the tube 12 being provided with a collar portion 25 adapted to bear against the innermost surface of the inner plate 24 to keep the tube in position during its rotation.

The outermost of the plates 24 is provided in its lower region with a square opening 32 (Figs. 3 and 4) behind which is a spring member 34 supported on the innermost plate 24 so as to urge a coin positioned behind the opening 32 by the downward movement of the slide 26 outwardly through the opening in a desired receptacle such as the chute 36 shown in Fig. 1.

The rotation of the storage tube 12 is effected by means of a ring gear 38 (Figs. 1 and 2) embracing the tube at a desired point intermediate its extremities and engageable with a worm gear 40 on the shaft of a driving motor 42, the ratio

of the gearing and the rate of speed of the motor being suited to the speed of operation required of the ejecting mechanism, and in general the power rating of the motor being relatively low since the load placed upon it both by the ejecting mechanism and the loaded coin tube is comparatively slight as a result of the angular disposition of the tube.

To control the ejecting operation of the slide mechanism, I have provided a selector mechanism which includes a commutator drum 50 rotatably supported at one axial extremity on the bracket 14 and at its other extremity on a suitable bracket 15, the inner or left-hand portion of its shaft 52 being extended beyond the bracket 15 and having anchored thereto one extremity of a return spring 54, the other extremity of which may be anchored to the said bracket.

The drum 50 is provided with a plurality of adjacent contact paths 56 of sequentially varying length, each such path having a stationary contact finger 58 supported upon a suitable insulating arm 60.

Further controlling the operation of the mechanism is a relay 62 having a pair of contact springs 64 in circuit with the motor 42 and a source of power to the line through conductors 65 and 67 (Fig. 9), while the relay winding 62 is connected to a battery 68 through conductor 79 and to the common contact surfaces 56 on the drum 50 by conductor 72 and any suitable wiping contact such, for example, as the contact finger 58' and the contact path 56' shown in Figs. 1 and 9, the return connection through the relay winding 62 being effected through any one of the several contact paths 56 on the drum 50 and a corresponding contact finger 58 by a conductor 74, through the relay winding, and back to battery, thus energizing the relay and closing its switch 64 to start the motor 42.

To time the operation of motor 42, I have provided a pawl and ratchet stepping mechanism, particularly shown in Figs. 7 and 8, and including a ratchet 78 on the shaft 52 for rotation therewith, the ratchet being seated in an open cup 80 having an opening 82 in its side wall through which extends a pawl 84 urged by means of a spring 86 into engagement with the teeth of the ratchet 78, the pawl 84 and spring 86 being adapted to prevent retrograde movement of the ratchet and being supported on a bracket 15, and a driving pawl 88 being pivotally mounted, as at 89, on a driving arm 90 which rides on the shaft 52 with the pawl 88 extended through an opening in the side wall of the cup 80 for engagement with the teeth of the ratchet.

A spring 92 attached at one extremity to the bracket 15 bears at its other extremity against the lower extension of the driving arm 90 to urge the latter in a counter-clockwise direction.

The uppermost extremity of the driving arm 90 is positioned opposite the rotatable coin tube 12, and the latter is provided with a radially extensive fin 13 which is engageable with the arm 90 once per revolution to step the ratchet 78 a distance of one tooth, and thus successively move the several contact paths 56 of the drum relative to the stationary contacts 58 until the particular path or contact ring 56 for which a circuit has been set up is moved out of contacting engagement with its respective contact finger to de-energize the relay 62 and open the circuit for motor 42.

The selective mechanism for determining the number of ejecting operations of the ejecting mechanism includes a plurality of switches 59 having common connection with the conductor 74 and each connectible with one of the fingers 58 so as to connect one of the latter with a contact ring or path of a particular length, such length determining the duration of time when the motor 42 is in operation and determining the number of operations of the ejector slide as follows:

The lowermost extremity of the tube 12 is provided with a cam plate 33 rotatable with the tube 12 and engageable with a pin 35 extended inwardly from the ejector slide 26, the pin resting on the cam face of the cam and being effective as the cam is rotated to raise the ejector slide 26 against the tension of the springs 28 until the pin reaches the point 33' of the cam plate and snaps into the lower cam face under urgence of the springs 28.

In order to reset the commutator drum, I have provided a manually operable lever 96 (see Figs. 1, 6 and 7) having one extremity extended exteriorly of the cabinet 20 and having its lowermost extremity connected with an arm 98, which in turn is extended from the cup 80. An upward movement of the lever 96 will cause the cup 80 to be rotated about the shaft 52 in a counter-clockwise direction and cause the dog 84 to be lifted so as to permit the shaft 52 under the urgence of the coiled return spring 54 to rotate back to its normal position.

The operation of the device is such that coins may be deposited through the aperture 18 into the funnel chute 16 to descend into the coin chute 12, the coins lying therein in any haphazard position shown by the uppermost coins C in Fig. 3. The operator may thereafter select one of the switches 59 and close the same to establish a circuit from battery 68 by conductor 70, solenoid winding 62 and conductor 74, through one of the contact paths 56 on drum 50. Relay 62 will thus be energized and closed, the switch 64 establishing through conductors 65 and 67 a circuit for the motor 42 to the line, whereupon the coin chute 12 will be rotated through the worm and ring gears 38 and 40, such rotation being effective to align and properly stack the coins C in the tube.

With each revolution of the tube 12, the fin 13 thereon will transiently engage the upper part of the arm 90 and step the ratchet 78 by means of pawl 88 a distance of one tooth. Likewise the cam plate 33 at the end of the tube 12 being rotatable with the latter causes the pin 35 to ride about its periphery until it reaches the radial point 33' which corresponds to a raised position of the ejector slide 26, the pin 35 thereafter snapping off the upper edge 33' of the cam and releasing the slide into the coin aperture 27 of which one of the coins C has been urged under force of gravity when the gate or slide was in raised position, such coin being urged out of the lower opening 34 in the front plate 24 by means of the presser spring 34. This latter operation will be repeated until the particular contact path 56 corresponding to the contact finger 58, which is in circuit with the particular selectively operable switch 59 actuated by the operator of the machine, passes out of engagement with its contact finger to release the relay 62 and stop the motor 42.

It will be apparent to those skilled in the art that the mechanism herein described for purposes of illustration is susceptible of modification; for example, the ejector slide may be arranged to

operate any desired number of times per revolution of the tube by properly reforming the cam 33 and providing a corresponding number of commutator operating studs or fins 13 on the tube. The coin tube may be also arranged for multiple operation so as to handle coins of different denomination. It will also be apparent that the angle at which the coin tube may be inclined is variable between the vertical and the horizontal, but I have found that by inclining the tube at an angle of approximately 15° to the horizontal, very satisfactory results are obtained.

The particular details of construction and operation set forth for purposes of explanation and illustration are not intended as limitations, but are to be liberally interpreted in the light of the annexed claims.

I claim:

1. A coin stacking device comprising an inclined storage tube supported for rotation about its longitudinal axis, means for rotating said tube, means for directing coins into the upper extremity thereof, and ejecting means closing the lower end of said tube and having an ejecting member operable by means rotatable with said tube.

2. A coin stacking device comprising an inclined storage tube supported for rotation about its longitudinal axis and adapted to receive coins into its uppermost extremity, means for rotating said tube whereby the said coins will be stacked in alignment therein, together with means positioned at the lower extremity of the tube for releasably retaining coins therein.

3. A coin dispensing device comprising an elongated tube, means supporting said tube for rotation about its longitudinal axis and at an angle inclined away from the vertical, driven means for rotating said tube, means co-operable with said supporting means at the lower extremity of said tube and including a reciprocable member for releasably retaining coins in the tube, a driving member rotatable by said tube and having operative engagement with said reciprocable member to operate the latter a determined number of times during one revolution of said tube.

4. A coin dispensing device including an inclined coin storage tube supported for rotation about its longitudinal axis, electrical means for rotating said tube, means including a reciprocable ejecting slide positioned at the lower extremity of the tube for ejecting coins from the latter, together with means including a switching device operable by a member on said tube to energize said electrical driving means during a predetermined number of revolutions of said tube.

5. A coin dispensing device comprising an elongated coin storage tube supported at its longitudinal extremities for rotation about its long axis, means including a driven gear embracing said tube and a driving gear engageable therewith for rotating the tube, means for selectively ejecting coins from the tube including an apertured gate member supported at the lower end of the tube for reciprocable movement transversely of the tube to bring the apertured part thereof in registration with the open end of the tube, yieldable means urging said gate member with the apertured part thereof out of registration with the tube, means including a cam plate rotatably carried on the lower end of the tube for operative engagement with said gate member to raise the latter against said yieldable means a determined number of times for each revolution of the tube, together with selector means for determining the number of revolutions of said tube and including a rotatable commutator member having a plurality of contact paths of varying length, a plurality of contact fingers respectively engageable with one of each of said contact paths, each of the said fingers being selectively connectible in circuit with a source of power through a said contact path with motor means driving said driving gear, and means for rotating said commutator member including a pawl and ratchet mechanism operatively associated therewith and drivingly engageable with a member on said tube once per revolution of the latter whereby the said motor means may be driven to rotate said tube a number of times corresponding to the number of operations of said pawl and ratchet means necessary to rotate the said commutator member and the particular contact path thereon placed in circuit with the particular contact finger selected until said contact path is rotated out of contacting engagement with its said finger to deenergize said motor means.

6. A coin dispensing device including an elongated storage member supported in inclined position for rotation about its long axis, driving means for rotating said storage member, means for selectively ejecting coins from said member including a movable ejector member supported at the lower end thereof and having a part transiently engageable by means on and movable with said storage member to effect the release of a coin from the latter a predetermined number of times per revolution.

7. A coin dispensing device including an elongated storage member supported in inclined position for rotation about its long axis, electrical driving means for rotating said storage member, means for selectively ejecting coins from said member including a movable ejector member supported at the lower end thereof and having a part transiently engageable by means on and movable with said storage member to effect the release of a coin from the latter a determined number of times per revolution, and selector means for determining the number of revolutions of said tube and including a movable switch member having a plurality of contact parts of different length, selectively operable contact means for connecting one of said parts in circuit with said driving means to start the latter, and automatic means including mechanism driven by said rotating storage member to move said switch member so as to move a said contact part out of contact with a said selectively operable contact means, the number of revolutions made by the storage member corresponding to the length of the contact part selected.

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