

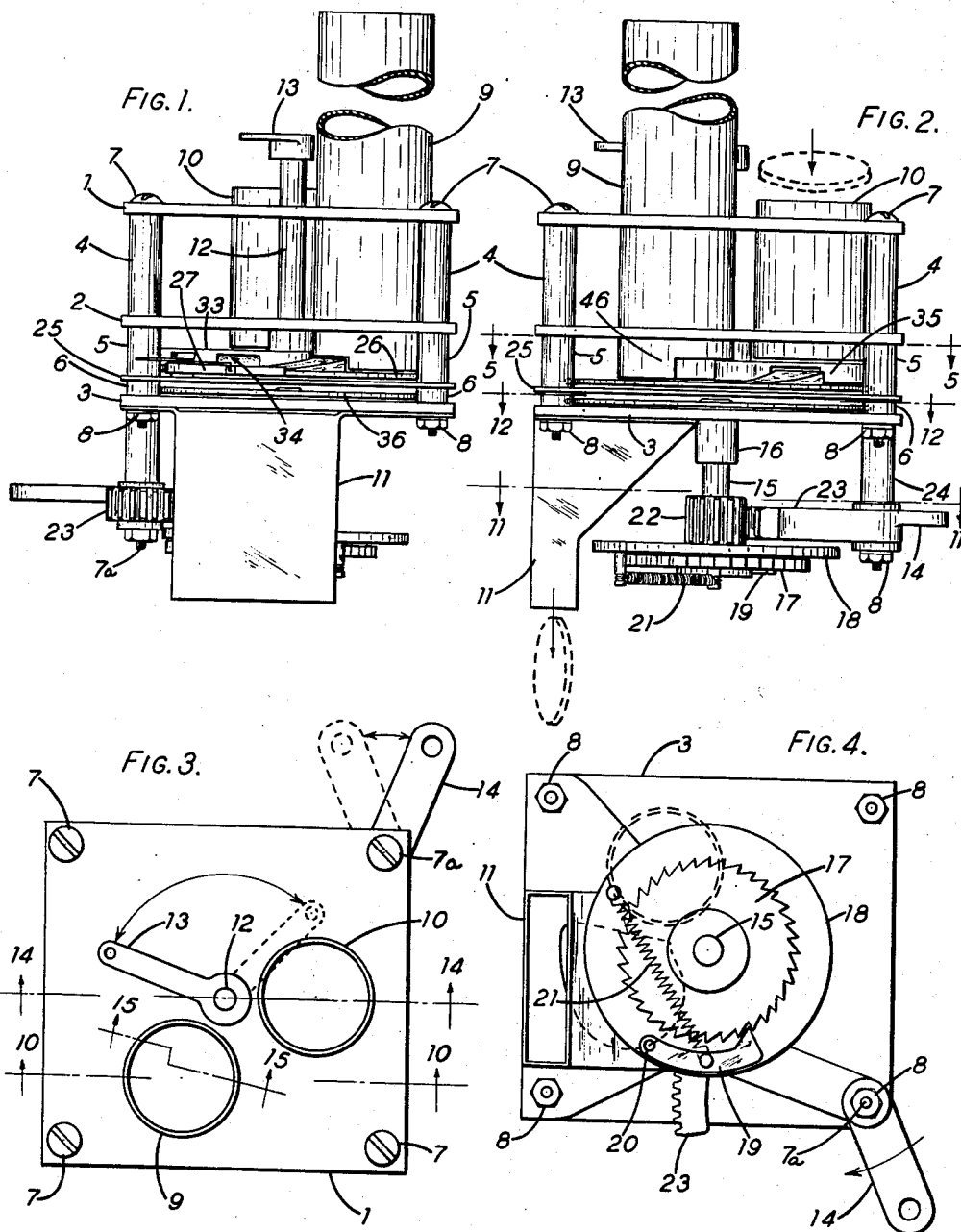
Oct. 12, 1954

R. M. FOUSHEE
COIN DISPENSER

2,691,379

Filed Feb. 10, 1950

3 Sheets-Sheet 1



INVENTOR.
ROBERT M. FOUSHEE
BY

Lloyd J. [Signature]

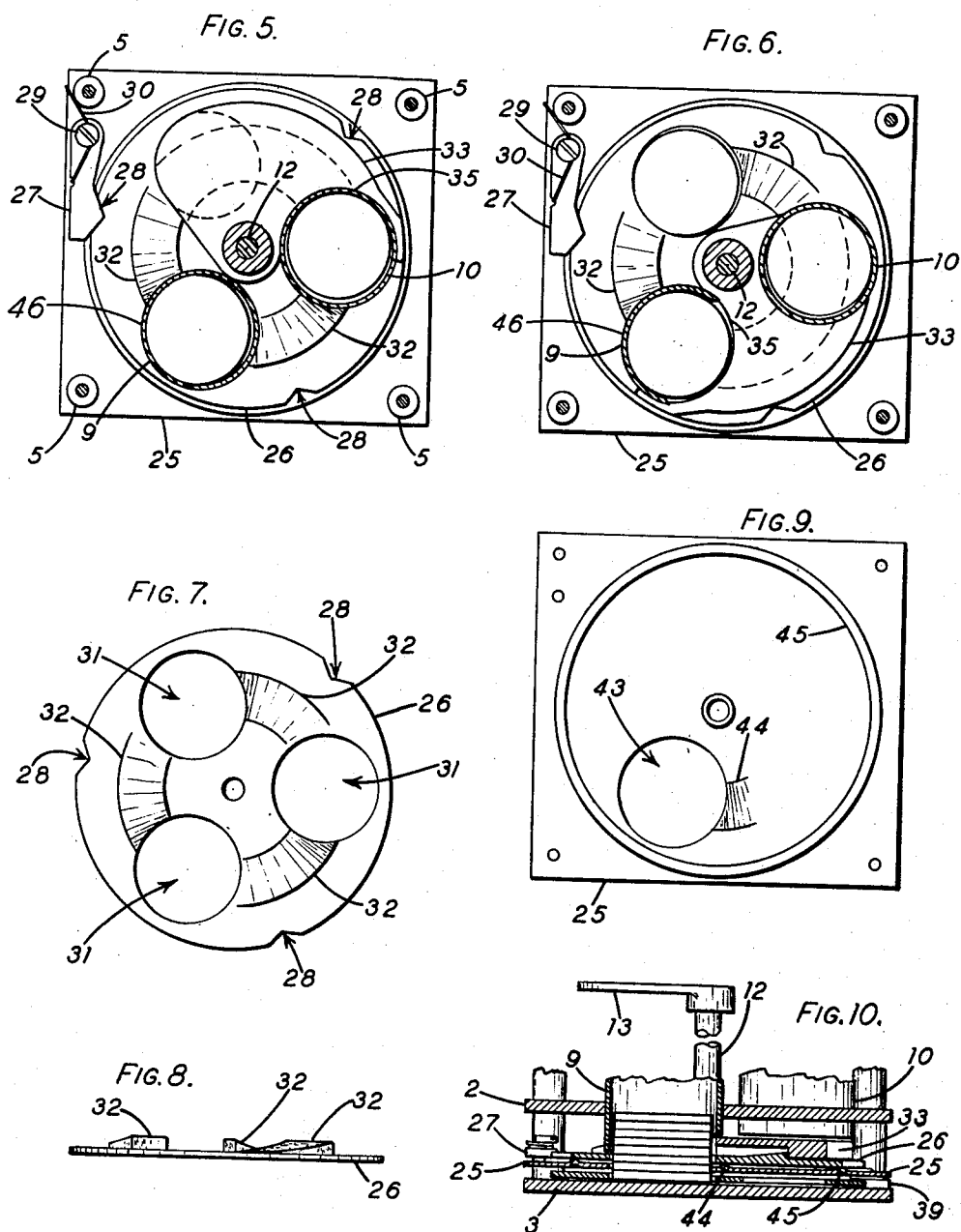
Oct. 12, 1954

R. M. FOUSHEE
COIN DISPENSER

2,691,379

Filed Feb. 10, 1950

3 Sheets-Sheet 2



INVENTOR.
ROBERT M. FOUSHEE
BY
Lloyd J. Moore

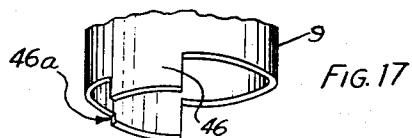
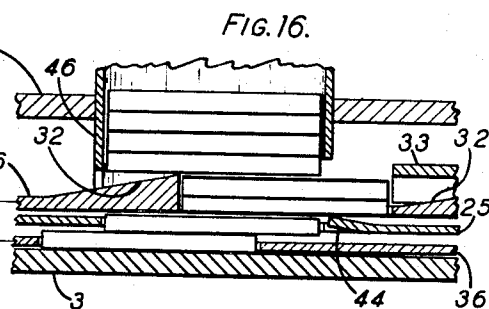
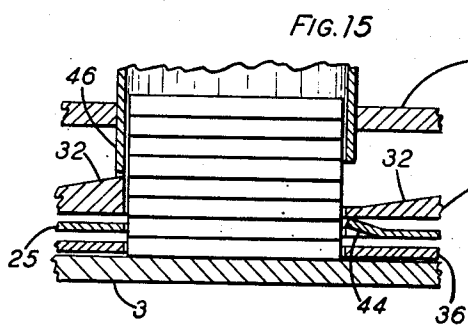
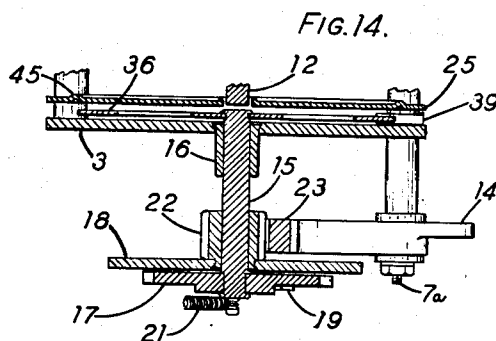
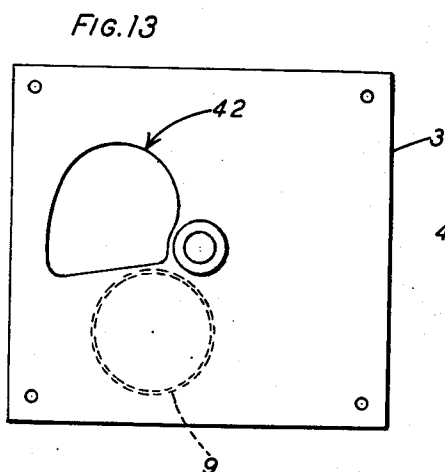
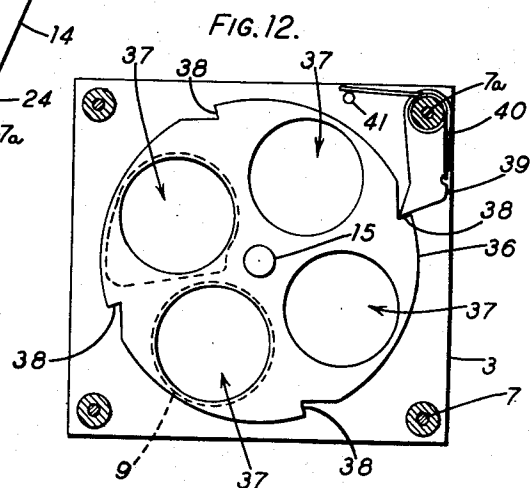
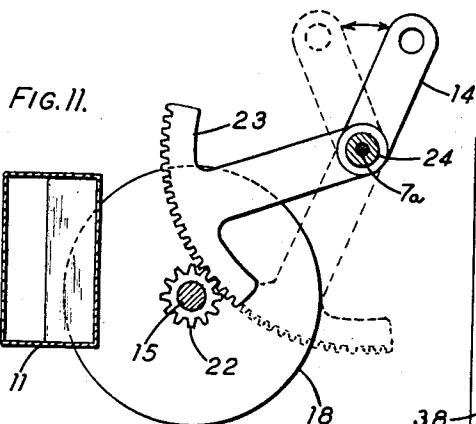
Oct. 12, 1954

R. M. FOUSHEE
COIN DISPENSER

2,691,379

Filed Feb. 10, 1950

3 Sheets-Sheet 3



INVENTOR.
ROBERT M. FOUSHEE

BY

Lloyd G. Anderson

UNITED STATES PATENT OFFICE

2,691,379

COIN DISPENSER

Robert M. Foushee, St. Louis, Mo., assignor to
National Rejectors, Inc., St. Louis, Mo., a cor-
poration of Missouri

Application February 10, 1950, Serial No. 143,581

3 Claims. (Cl. 133-5)

1

This invention relates in general to coin handling apparatus and more particularly to a change making mechanism for receiving, storing and dispensing coins.

Coin operated machines utilizing change making devices previous to this invention commonly used a vertically positioned cylindrical tube for storing coins in stacked relation. The tubes were ordinarily filled by directing coins of proper denomination into the upper open end thereof. This general arrangement has proved to be troublesome from a service standpoint and requires an excessive amount of space in a coin operated machine. One of the difficulties of the top filling tube resides in the fact that when coins are directed therein by a coin testing or actuating device they must fall by gravity in the tube different distances, depending upon the number of coins therein, thus one or more descending coins often come to rest in vertical position in the tube, thereby disabling the device. Also, this type of storage and dispensing device must be positioned under a coin testing or actuating device and when the tube is made high enough to retain a reasonable number of change coins an excessively large vertical space is required. Furthermore, the conventional method of dispensing coins from the bottom of a tube requires either a reciprocating means for dispensing each coin or means for laterally dispensing a variable plurality of coins at one time. The former method is fraught with shock and rebound problems and the latter is unsatisfactory because of the large variation in the thickness of coins in circulation, which results in the probability of dispensing an improper number of coins or the jamming of coins in an ejection aperture having fixed dimensions.

The present invention overcomes all the above objections, first by providing a separate coin receiving receptacle of given dimensions resulting in the positive horizontal positioning of coins deposited therein; second, coins are loaded into the storage tube from the bottom, thus permitting a great saving in vertical space and the resultant possibility of storing a larger number of change coins in a vertical stack, and third, the dispensing of one or a predetermined plurality of coins is made by a continuous movement free from rebound and entirely independent of the normal variation in the thickness of individual coins.

A principal object of the invention is the provision of a coin dispensing mechanism having a separate loading receptacle and means for loading a storage tube from the bottom thereof and provision for dispensing one or more of a predeter-

2

mined number of coins from the bottom of the tube by unidirectional movement of a dispensing means by an actuator.

Another object of the invention is the provision of a rotary coin transfer means for simultaneously transferring and elevating coins from an entry receptacle into the bottom of a coin storage tube and independently dispensing a predetermined number of coins from the bottom of said tube corresponding to different predetermined movements of an actuator.

These and other objects in one embodiment of the invention are described and shown in the appended specification and drawings in which:

Fig. 1 is a front elevation of the device.

Fig. 2 is a side elevation of the device shown Fig. 1.

Fig. 3 is a top view of the device shown Fig. 2.

Fig. 4 is a bottom view of the device as shown Fig. 2.

Fig. 5 is a cross-sectional plan view taken through section line 5-5 Fig. 2.

Fig. 6 is the same as Fig. 5 with elements in changed position.

Fig. 7 is a plan view of an element shown Fig. 5.

Fig. 8 is a side elevation of the element shown Fig. 7.

Fig. 9 is a plan view of an element shown Fig. 6.

Fig. 10 is a fragmentary cross-sectional elevation taken through section line 10-10 Fig. 3.

Fig. 11 is a cross-sectional plan view taken through section line 11-11 Fig. 2.

Fig. 12 is a cross-sectional plan view taken through section line 12-12 Fig. 2.

Fig. 13 is a plan view of an element shown Fig. 12.

Fig. 14 is a fragmentary cross-sectional elevation taken through section line 14-14 Fig. 3.

Fig. 15 is an enlarged fragmentary cross-sectional view of elements shown Fig. 10.

Fig. 16 is the same as Fig. 15 with elements in changed position.

Fig. 17 is a fragmentary perspective view of the lower end of the coin receptacle shown Fig. 15.

Referring to Figs. 1 and 2, the frame of the device consists of three main support members or plates 1, 2 and 3, fixed in horizontal spaced relation by four spacers 4, four spacers 5, and four spacers 6; three screws 7, one screw 7-a and retained by four nuts 8. A coin storage receptacle or tube 9 is secured in and supported by plates 1 and 2. A coin entry receptacle or tube 10 is also secured in and supported by plates 1 and 2. A coin discharge chute 11 is positioned under plate 3 and is retained by ears integral there-

3

with by two of the screws 7 and nuts 8. A coin loading drive shaft 12 is journaled for rotation about a vertical axis in plates 1 and 2 and terminates at its upper end in a loading lever 13 normally responsive to the operation of a coin actuator not shown.

The top view Fig. 3 shows the placement of the coin storage and coin entry tubes in plate 1 with respect to shaft 12 and also shows the range of movement of the lever 13 and shaft 12. A coin dispensing lever 14 is journaled for oscillating movement above screw 7-a as shown in full and dotted lines.

Referring to the lower portion of Fig. 2 and the bottom view Fig. 4, the coin dispensing drive mechanism comprises a drive shaft 15 journaled for coaxial rotation with drive shaft 12 in bushing 16 integral with plate 3. A ratchet wheel 17 having a plurality of equi-spaced teeth about its periphery is concentrically secured with the lower end of shaft 15. A pawl wheel 18 is freely journaled on shaft 15 and provided with a pawl 19 pivotally secured by pin 20 to the lower face of the wheel 18. A ratchet spring 21 secured at one end to wheel 18 and at its opposite end to pawl 19 normally urges the pawl into engagement with the teeth of the ratchet wheel. A pinion 22 concentric and integral with pawl wheel 18 is meshed with a quadrant gear 23, which quadrant is integral with lever 14 and journaled about screw 7-a and positioned by bushing 24 retained by nut 8.

When lever 14, shown in Fig. 4, is moved in a direction shown by arrow the pinion 22 will be rotated by quadrant gear 23 and by virtue of the pawl 19 in engagement with ratchet wheel 17 shaft 15 will be rotated in a counterclockwise direction and when lever 14 is moved in the opposite direction the shaft 15 and the ratchet wheel 17 will remain stationary and the pawl wheel 18 will move clockwise by virtue of the escapement action of the pawl 19. The discharge of change coins from tube 9 and the loading of like coins from the entrance tube 10 into the change tube are two separate and distinct functions initiated at predetermined time intervals.

Referring to Fig. 3, the loading of each coin deposited in tube 10 into the bottom of tube 9 is accomplished by the movement of lever 13 and shaft 12 from the position shown in full lines to the position shown in dotted lines by virtue of the construction and arrangement of elements shown in detail, Figs. 5 to 9 inclusive. An intermediate support member or plate 25 secured by spacers 5 below and in spaced relation with plate 2 separates the coin loading mechanism from the coin discharging mechanism and referring to Fig. 5 a coin transfer member or disc 26, better shown Figs. 7 and 8, is freely journaled about shaft 12 and adapted to be normally retained in each of three equi-angular positions by the successive engagement of detent lever 27 with each of three notches 248 equi-spaced about the periphery of the disc. A detent lever 27 is journaled about a fixed stud 29 in plate 25. A spring 30 articulated with lever 27 stud 29 and spacer 5 normally urges the lever into contact with the periphery of disc 26.

Referring to Fig. 7, the disc 26 contains three equi-spaced circular holes or pockets 31 equidistant from the axis of the disc and each pocket having a diameter slightly larger than the diameter of the predetermined change coin. Three inclined face cams 32 integral with disc 26 are arranged concentric and between pockets 31, as

4

shown Figs. 7 and 8. Each cam provides an incline from the upper face of the disc 26 between adjacent pockets 31, thus forming an inner vertical wall in one portion of each pocket slightly less than in height than the thickness of two change coins and an abutment above the upper surface of the disc slightly greater than the thickness of a single change coin.

A coin loading member 33 is secured to the lower end of shaft 12 and adapted for rotation thereby directly above cam disc 26 and is shown in normal position, Figs. 1 and 5. The member 33 contains a concentric channel 34 (shown Fig. 1) in its lower face to permit the free relative movement of the cams 32. The leading edge 35 of the member 33 has a circular contour adapted to engage the edge of a said change coin as shown Figs. 2 and 5. The range of movement required for the transfer of a coin from the coin entry tube 10 to the coin storage tube 9 is shown Fig. 6, the operation of which will be hereinafter described.

The plate 25, shown Fig. 9, contains a circular discharge aperture 43 slightly larger than the diameter of said change coin and is positioned coaxially with the axis of tube 9. A coin guide lip 44 projects upwardly a predetermined distance from the inner periphery of the aperture 43 as shown in Figs. 9 and 10. A circular rib 45 is formed in plate 25 concentric with shaft 12 and serves as a bearing for disc 26.

The coin dispensing elements are shown in detail in Figs. 10 to 14 inclusive and referring to Figs. 12 and 14, a dispensing member or disc 36 is secured concentric to the upper end of shaft 15 and positioned for rotation directly above and parallel with plate 3 and is provided with four circular pockets 37 equal in diameter to pockets 31 in disc 26.

Four equi-spaced notches 28 provide ratchet abutments 38 about the periphery of the disc 36. A pawl 39 pivoted about screw 7-a is normally urged into contact with the periphery of the disc 36 by a spring 40 coacting with the pawl and a fixed pin 41 in plate 3. It is now apparent that the disc shown Fig. 12 may be rotated in a clockwise direction to successively register each pocket 37 coaxially with the tube 9 and the aperture 43 and maintain this successive register by virtue of the simultaneous registration of the pawl with successive abutments 38, thus preventing reverse movement of disc 36. The position of the fixed coin storage tube 9 with respect to the pockets 37 in the disc 36 is indicated in dotted lines.

The plate 3, Fig. 13, contains a discharge aperture 42 positioned to one side of the coin tube 9 as shown in dotted lines. The aperture is positioned directly above the enlarged upper opening of the coin chute 11, shown Figs. 1 and 2. The lower end of the tube 9 has a semi-circular stop extension 46, shown Figs. 15 and 17, which extension includes a clearance pathway 46a for the free passage of the cams 32, and to provide lateral stops for the fourth and fifth lowermost coins retained in the tube.

Referring to Fig. 11, the full line position of lever 14 and quadrant 23 with respect to the pinion 22 corresponds with the normal rest position of the dispensing disc 36, shown Fig. 12. The dotted line position of lever 14 and quadrant 23 corresponds with one complete 360 degree rotation of dispensing disc 36, which movement is required for the dispensing of four said change coins. It is apparent that one quarter movement

5

of lever 14 will rotate the dispensing disc 90 degrees for the discharge of a single change coin.

In normal operation and assuming that the coin storage tube 9 is partially filled with change coins, the lowermost coin in the stack will rest upon the upper surface of plate 3 and in pocket 37 of disc 36 in coaxial position with respect to storage tube 9, as shown Figs. 12 and 15. The second lowermost coin rests upon the upper face of the first coin and is retained in aperture 43 of plate 25 coaxial with storage tube 9, shown Figs. 9, 10 and 15. The third lowermost coin rests upon the upper face of the second coin and is positioned in a pocket 31 of the disc 26 also coaxial with storage tube 9. The fourth lowermost coin is coaxially positioned on the upper face of the third coin with its edge adjacent to the abutment formed by the upper edge of cam 32 and in close proximity to the stop extension 46. The fifth lowermost coin rests upon the upper face of the fourth coin and is also retained coaxially within the coin tube by the extension 46 of the tube; the remaining stack of change coins rests upon the upper surface of the fifth coin and is retained within the wall of the coin tube.

It is to be noted that a change coin is normally retained in each of the remaining two pockets 31 in the disc 26, shown Fig. 7. Thus a change coin under the influence of gravity deposited in the acceptance tube 10, as indicated by dotted lines in Fig. 2, will descend and come to rest in parallel stacked relation upon the face of a previously deposited coin held in a pocket 31 in the disc 26 with its edge positioned adjacent to the leading edge 35 of the member 33, shown Fig. 5. The first increment of motion of the loading lever 13 will begin the rotation of the coin loading member 33, shown Fig. 5, and move its leading edge 35 into contact with the coin. Continued movement of member 33 will move the coin's opposite edge into engagement with the abutting surface of a cam 32 and thus impart clockwise motion to the disc 26, shown Figs. 5 and 6. This movement will cause cam 32 to engage the lower face of the fourth lowermost coin and raise it and all coins stacked thereabove in the tube sufficiently far to permit the transferred coin to be moved into coaxial stacked alignment with the coins in the tube with its leading edge against the stop extension 46. At this point of movement the detent lever 27 will engage one of the notches 28 in the disc 26 and the transfer and loading cycle of a single coin is completed. The lever 13 and the member 33 are then returned to their normal position, shown Fig. 5, by the actuator means, not shown, and are in position for the transfer and loading of a subsequently deposited coin.

Referring to Fig. 6, it is to be noted that the semi-circular opening in the receptacle 9 is slightly smaller than the diameter of the coin to provide a detent action when a coin is inserted thus preventing coin displacement from the lower end of the tube when the device is subjected to shock.

This cycle of movement is indicated by the upper arrow in Fig. 16, which illustrates the relative position of the coins immediately following the raising of the stack and the partial insertion of the coin being transferred by member 33. During the previously described transfer cycle the third uppermost coin retained in a pocket 31 will engage lip 44 and slightly rise in its pocket 31 to prevent the possibility of engagement and jamming with the edge of the second lowermost coin. This expedient is provided to compensate for the difference in thickness of like coins in circulation.

6

Referring to Fig. 11, the discharge of a single coin from the device requires the transmission of movement to lever 14 by actuator means, not shown, of sufficient range to rotate disc 36, shown Fig. 12 ninety degrees in order to displace the lowermost coin in the stack, shown Fig. 15, to a position where it will fall by gravity from aperture 42 in plate 3 and thence through the chute 14, as indicated in Fig. 2.

Fig. 16 indicates by lower arrow a partial movement applied to disc 36 in transferring the lowermost coin toward the discharge aperture 42. Upon the completion of a ninety degree movement of disc 36 pawl 39 will have registered with one of the corresponding ratchet abutments 38, thus permitting the lever 14 to be returned to its normal position, shown full lines Fig. 11, by virtue of the ratchet means previously described and shown Fig. 4.

It is now apparent that the action of gravity upon the stack of coins will move the next lowermost coin downward from its previous position in aperture 43 in plate 25 and in position on the upper surface of plate 3 for subsequent discharge and it is also apparent that the entire stack will move downward a distance equal to the thickness of one coin through the registered pocket 31 in disc 26, thus conditioning the mechanism for either the transfer and loading of a subsequent coin or the discharge of one or more coins from the bottom of the stack.

It is apparent that for each ninety degree rotation of disc 36 by lever 14 a single change coin will be discharged and it is also apparent that a full three hundred and sixty degree rotation of the disc 36 will consecutively discharge four change coins.

It is to be understood that Fig. 16 is used to illustrate both the loading and discharge cycles, which cycles must occur at different intervals as previously pointed out.

It will be apparent to those skilled in this art that many modifications of the device are possible, including the use of different numbers of pockets in the transfer members and different arrangement and means employed for independently driving the loading and discharge members without departing from the intent and scope of the appended claims.

Having described my invention I claim:

1. In a coin storage and transport device means forming a frame said frame including a horizontal support member, a vertical coin storage receptacle secured in said frame having its lower open end spaced from said support member, said storage receptacle adapted to retain a vertical column of like coins resting on said support member, a coin retainer in said frame for temporarily holding a coin in said column in horizontal position between said supporting member and the end of said storage receptacle, a coin transport means journaled for rotation about a fixed vertical axis in said frame, said transport means having a plurality of equispaced holes for independently receiving a horizontally positioned said coin, said holes positioned equidistant from said axis and adapted to successively register with the open end of said storage receptacle when said transport means is successively rotated, a like plurality of cam means on said transport means positioned between said holes, each of said cam means adapted to successively move in a path under the open end of said storage receptacle to raise the portion of said column positioned above said transport means when said transport means

is rotated, a coin loading means in said frame journaled for rotation about a vertical axis, said loading means adapted to successively oscillate over the upper surface of said transport means through a predetermined path to engage and drive a deposited coin in each of said holes and move said coin from a position adjacent said storage receptacle to a position in said column when oscillated.

2. In a coin storage and transport device means forming a frame and a horizontal support including a vertical coin storage receptacle having its lower open end spaced from said support, said lower end shaped to provide a concentric coin stop on one side thereof and a pathway therebetween, said receptacle adapted to retain a vertical column of like coins resting on said support, a coin transport means journaled for rotation about a fixed vertical axis in said frame and adapted for movement through said column, said transport means having a plurality of holes therein for independently receiving coins in horizontal position including a like plurality of upward projecting cams positioned between said holes, said transport means adapted to move in a unidirectional path under the open lower end of said receptacle and said cams adapted to move through said pathway, a coin loading member journaled in said frame for oscillation about a vertical axis and adapted to move over a predetermined portion of said transport means for simultaneously driving each said coin and said transport means whereby each of said cams on said transport means will successively move through said column of coins and raise said column and successively insert coaxially therein against said stop a like coin carried in each of said holes when said coin loading member is oscillated.

3. In a coin storage and transport device means forming a frame and a horizontal support including a vertical coin storage receptacle having

its lower open end spaced from said support, said lower end shaped to provide a concentric coin stop projection on one side thereof and a pathway through said projection, said receptacle adapted to retain a vertical column of like coins resting on said support, a coin transport means journaled for rotation about a fixed vertical axis in said frame and adapted for movement through said column a predetermined distance above the lowermost coin in said column, said transport means having a plurality of holes therein for independently receiving coins in horizontal position and including a like plurality of upward projecting inclined cams positioned between said holes, said transport means adapted to move in a uni-directional path under the open lower end of said receptacle with each of said cams positioned to move through said column of coins and said pathway to raise a predetermined portion of said column when operated, a coin loading means having a leading edge positioned for movement in said frame, said leading edge adapted to oscillate over the upper surface of said transport means whereby each coin carried in each of said holes in said transport means will be engaged by the said leading edge of said loading means and moved in coaxial relation with said column against said projection by said transport means when said loading means is oscillated.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
757,362	Sumner	Apr. 12, 1904
1,260,382	Hosking	Mar. 26, 1918
1,278,349	Hosking	Sept. 10, 1918
1,801,800	Chalmers	Apr. 21, 1931
1,868,272	Brandt	July 19, 1932
2,208,515	Mills	July 16, 1940
2,239,435	Wahl	Apr. 22, 1941