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W. J. WEIRICH ET AL
COIN DISPENSING APPARATUS

2,532,976

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2 Sheets-Sheet 1

Fig. 2

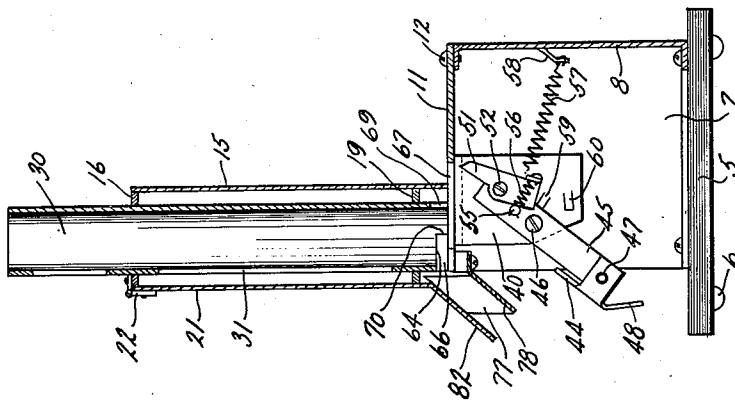
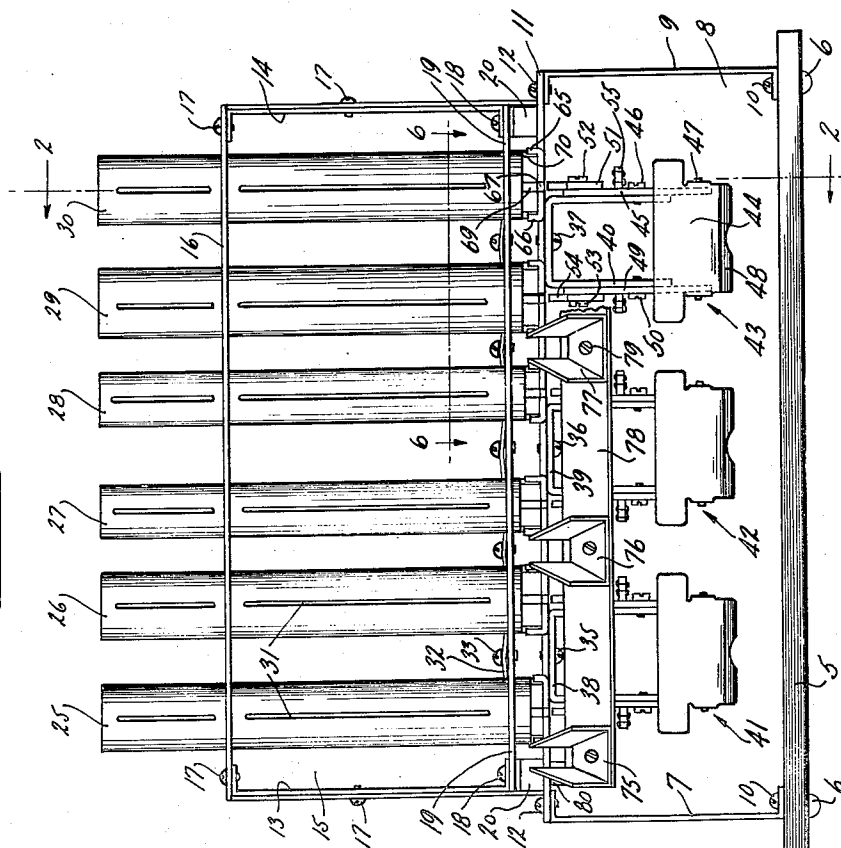


Fig. 1



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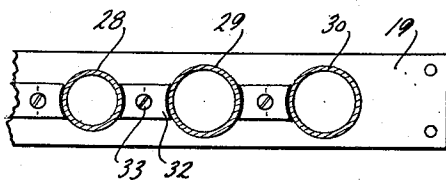
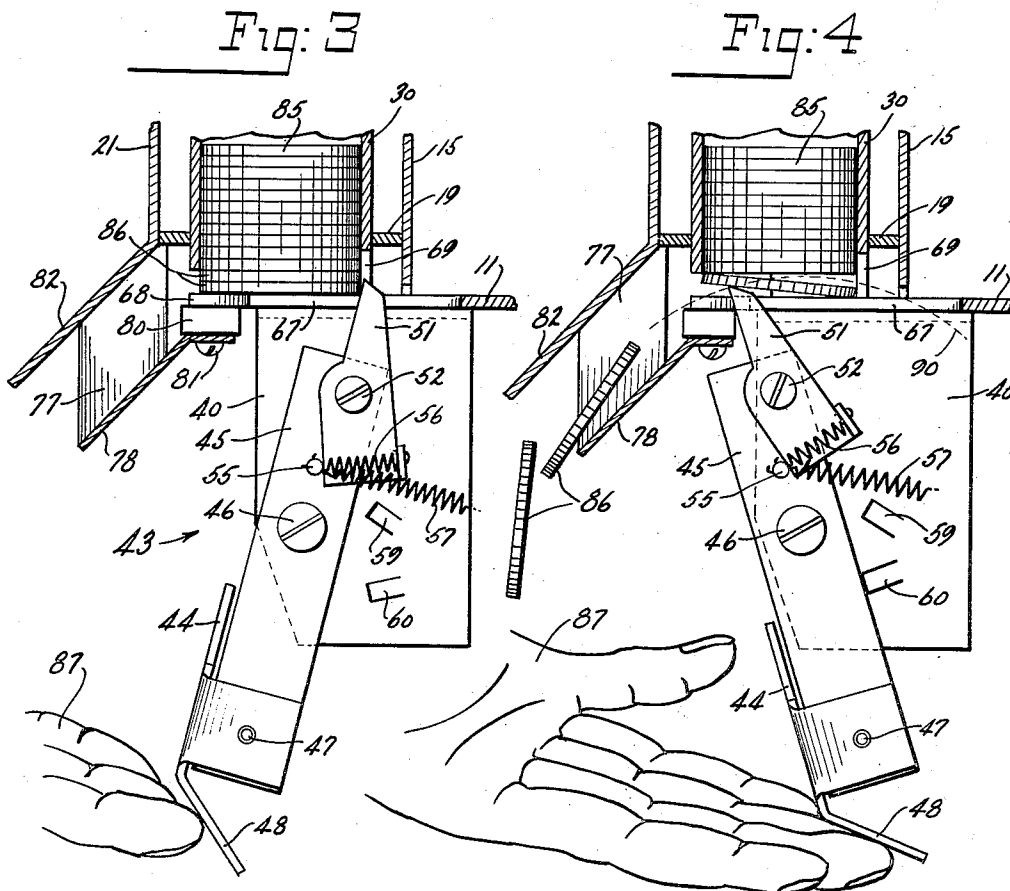


Fig: 6

Fig: 5

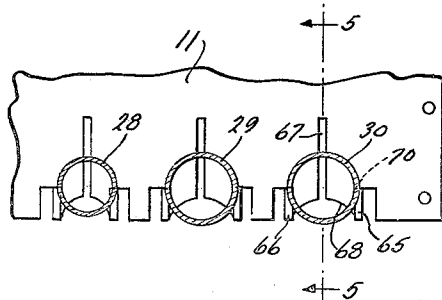
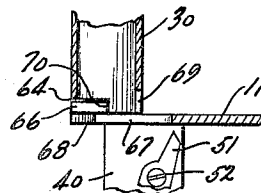


Fig: 7



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COIN DISPENSING APPARATUS

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5 Claims. (Cl. 133—4)

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The present invention relates in general to apparatus and machines for dispensing coins and the principal object is to provide a new and improved coin dispensing apparatus in which the dispensing of a plurality of coins is greatly facilitated and with a high degree of accuracy.

A further object is to design a new and improved coin dispensing apparatus in which the coins are arranged in a plurality of coin tubes and a single operation of the coin ejecting means is effective to dispense a plurality of coins from each coin tube into a single discharge channel.

Another object is to provide a new and improved coin ejecting mechanism for ejecting a predetermined number of coins from a pair of coin tubes by a single operation.

A still further object of the invention is to design a new and improved coin dispensing mechanism in which the exact desired number of coins are always ejected regardless of variations in the thickness of the stacked coins.

The foregoing objects and others not specifically mentioned, including the arrangement, construction and operation of the various parts and elements, will be apparent from the following specification and appended drawings which disclose a preferred embodiment of the invention.

Referring specifically to the drawings in which like parts throughout the various figures are represented by the same reference characters:

Fig. 1 is a front elevation with certain parts cut away showing the coin dispensing apparatus;

Fig. 2 is a cross-sectional side view taken along the line 2—2 of Fig. 1;

Fig. 3 is an enlarged fragmentary view of the coin ejecting mechanism in one stage of its operation;

Fig. 4 is another fragmentary view of the coin ejecting mechanism in its final movement of ejecting coins;

Fig. 5 is a fragmentary view of a portion of the coin ejecting mechanism and coin tube taken along the line 5—5 of Fig. 7;

Fig. 6 is a top view taken along the line 6—6 of Fig. 1 showing the coin tube clamping means; while

Fig. 7 is also a top view of a portion of the mechanism showing the coin guiding means.

The coin dispensing apparatus of the present invention is applicable for use, for example, in various business enterprises where it is necessary for the proprietor or employee of the business to continually make change for the customers, not necessarily applying to the purchase

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of goods, but for the even exchange of larger coins or bills into smaller denominations. Usually this change making is an adjunct to the regular business and is a time consuming annoyance requiring the proprietor to repeatedly go to the cash register or till and pick up the wanted change, usually in several denominations, from the several compartments in the till. The present invention obviates this disadvantage by providing a mechanism whereby a single simple action by a person upon the device dispenses a plurality of the desired coins of the exact change desired, directly into the person's palm for transmittal to the customer. The present coin dispensing apparatus has many other uses such as the filling of pay envelopes, banking institutions, amusement centers, and other uses readily apparent.

In an exemplification of the present invention it is contemplated that a plurality of coin tubes be arranged in a row with the coin tubes grouped in pairs and each pair of tubes containing a stack of coins of the same denomination. One pair of tubes will contain nickels, another dimes, and a third quarters. A single coin ejecting means is provided for each pair of coin tubes and guiding means are provided for guiding the coins from each pair of coin tubes into a single discharge channel. A single operation of the coin ejector mechanism for the nickel tubes will eject three nickels from one of the pair of tubes and two nickels from the other tube of the pair, thereby making change for a quarter. The same would apply to the pair of "dime" coin tubes to make change for a half dollar. The coin ejector would, however, dispense two quarters each from the "quarter" tubes to make change for a dollar.

Former coin dispensing apparatus usually employed a single coin tube for each denomination of coins and difficulty was always experienced when a plurality of coins were discharged in securing the exact amount of coins desired. This error in the number of coins dispensed was caused primarily by the fact that the stack of coins included relatively new coins as well as old worn down coins which had been in circulation a long time. Repeated tests have shown that a stack of five brand new nickels was higher than six worn down ones. With the coin dispensing apparatus of the present invention the same denomination of coins are placed in two separate stacks or coin tubes and ejected simultaneously by the action of a single coin ejector. And since only two, or a maximum of three, coins are

ejected from each tube the chances of error, caused by various thicknesses of the coins, is entirely eliminated. Another advantage is that the coin tubes need not be as long, and a more compact and stable device is made possible.

Referring now specifically to Figs. 1 and 2, the coin dispensing device is supported upon a suitable supporting base 5 having rubber feet 6 on the bottom to prevent sliding of the device when placed upon smooth surfaces. The lower base portion of the mechanism is enclosed by a housing on three sides and is open at the front, the sides and rear preferably including thin metal plates 7, 8 and 9 supported by screws 10 suitably threaded into the base 5, as shown. A main supporting plate 11 is attached, as by a number of screws 12, to the top edges of the enclosing plates 7, 8 and 9. Directly on top of the main mounting plate 11 thin metal side enclosures 13 and 14 and a rear enclosure 15 are provided, serving as a coin tube enclosure. The upper edges of the enclosure plates 13, 14 and 15 serve to support an upper coin tube yoke plate 16 secured at the ends to the enclosure by the screws 17.

At the bottom end the enclosing plates 13 and 14 are fastened by screws 18 to a bottom coin tube yoke plate 19. Spacers 20 on each end of the plate 19 into which screws 18 thread support the yoke plate 19 in spaced relationship to the main plate 11. The front side of the coin mechanism is enclosed by a cover plate 21 suitably hinged at the top edge by hinge 22 attached to the upper yoke plate 16, as shown in Fig. 2. This front plate 21 may be rotated from the bottom about the hinge 22 to expose the coin tubes. The foregoing elements constitute the principal enclosure members for the coin mechanism as well as the supporting members therefor.

The coin mechanism preferably includes a plurality of vertically disposed coin tubes 25 to 30 inclusive, arranged in pairs and spaced apart, as shown, the coin tubes 25 and 26 constituting a pair of coin tubes containing the same denomination of coins, for example, nickels; coin tubes 27 and 28 containing dimes; while the pair of coin tubes 29 and 30 contain quarters. Any other denomination or size of coins may be accommodated by the device by merely providing the correct size or diameter of tubes to hold the same. Each of the coin tubes is preferably provided, on the front side where it can be readily observed by lifting the front plate 21, with a series of slotted openings 31. The purpose of this slot 31 is to readily observe when any coins are not stacked properly in the coin tubes as this would cause jamming of the device. Insertion of a wire or pointed instrument in the slot 31 will readily disengage or dislodge the jammed coins and permit them to stack properly.

The coin tubes 25 to 30 inclusive are properly spaced apart and held in alignment by the upper yoke plate 16 and the lower yoke plate 19 through which they pass. In order to prevent displacement of the coin tubes vertically and to hold them firmly in position a novel clamping plate is provided. This includes a clamp plate 32, more clearly seen in Fig. 6, which is bent slightly upward at its mid point and placed with its edges in engagement with the sides of a pair of tubes between which it is arranged. Screws 33 threaded into lower yoke plate 19 are then turned inward and pressure is thereby applied to the top of the clamp plate 32 which forces its edges firmly with a biting action into the sides of the tubes thereby rigidly holding them in position.

It will be understood that the coins are fed into the coin tubes 25 to 30 inclusive, at the top end thereof in the usual manner. However, for the sake of clearness no coins have been shown stacked in the coin tubes of Figs. 1 and 2.

The coin ejecting means comprises mechanism whereby the coins from each pair of tubes containing coins of the same denomination are dispensed simultaneously by a single action of the coin ejecting mechanism. The three sets of coin ejecting mechanisms shown are arranged and constructed similarly for each pair of tubes.

Each coin ejecting mechanism is supported by pairs of screws 35, 36 and 37, which fasten U-shaped brackets 38, 39 and 40 directly on the lower side of the main mounting plate 11. The U-shaped brackets 38, 39 and 40 are arranged between each associated pair of coin tubes, the one coin ejecting mechanism indicated generally by the reference character 41 being associated with the nickel coin tubes 25 and 26, the ejecting mechanism 42 with the dime coin tubes 27 and 28, and the ejecting mechanism 43 with the pair of quarter coin tubes 29 and 30. The details of the coin ejecting mechanism 43 will be described in detail, it being understood that the mechanism of coin ejectors 41 and 42 are exactly the same.

Each coin ejector is provided with a push plate or pad 44, which is attached to the lower end of a lever arm 45 of the coin ejector, associated with the coin tube 30. This lever arm 45 is hinged by a shoulder screw 46 threaded into one leg of the U-shaped bracket 40. The push plate 44 may be loosely hinged for limited rotary movement to the bottom end of the lever arm 45, as by a pin 47. The lower edge portion of the push plate 44 is provided with a depending turned under portion 48 to facilitate the movement of the push plate 44 when contacted by a person's fingers. The opposite end of the U-shaped bracket 40 also serves as a support for a second lever arm 49, which is pivoted to the bracket 40 by the shoulder screw 50. The lower end of this lever arm 49 is fastened by the pin 47 to the other side of the push plate 44.

With this construction it is seen that a single inward actuation of push plate 44 will pivot both of the coin lever arms 45 and 49 simultaneously. At the upper end lever arm 45 carries a coin ejecting pawl 51, which is pivoted with a shoulder screw 52 threaded into the lever 45. The other and opposite lever arm 49 is similarly provided with a coin ejecting pawl 54 pivoted by shoulder screw 53 into the lever arm 49. The pawl 51 is arranged to eject coins only from the coin tube 30, while the pawl 54 ejects the coins from coin tube 29, both tubes containing coins (quarters) of the same denomination. The lower end of pawl 51 is normally urged into engagement with a pin 55 carried on the lever arm 45 by a spring 56 which is connected at one end to the pin 55 and at the other end with the lower end of the pawl 51. A second and longer spring 57 is connected at one end to the pin 55 and has its other end connected to a punched-out hook 58 formed in the rear enclosing plate 8, as seen in Fig. 2. The purpose of the spring 57 is to provide tension on the upper end of coin lever arm 45 to normally urge it into its retracted position, so that the coin ejecting mechanism is restored each time after the removal of applied pressure on the push plate 44. In order to limit the restoring or backward movement of the lever arm 45 a stop 59 is provided, which may be a punched-out section of the U-shaped bracket 40, as more clearly

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seen in Fig. 3. To limit the forward movement of the lever arm 45 by manual actuation a similar stop 60 is provided in the bracket 40.

Referring now more particularly to Figs. 5 and 7 as well as Fig. 1, the main mounting plate 11 is provided with punched-up projections or coin guides 65 and 66 arranged on each side of each coin tube which serve to correctly guide the coins in their ejecting movements. The plate 11 is also arranged with a slot 67 directly below each coin tube and the forward end of this slot 67 terminates in a curved section indicated at 68 from which the ejected coins drop off. The slot 67 provides a pathway for the associated coin pawl 51 to project and pass through. For a similar purpose the lower rear edge of each coin tube is slotted as indicated at 69. The lower front portion of each coin tube is cut out at 64, as seen more clearly in Figs. 2 and 5, and the rear edge 70 butts up against the rear side of each guiding projection 66. The guiding projections 65 and 66, as shown in Fig. 1, are spaced apart slightly further than the internal diameter of the tubes 30 so that the coins can be freely ejected.

In order to direct or guide the dispensed coins from each pair of coin tubes into a single discharge channel, a series of angular U-shaped coin guides, 75, 76 and 77 are provided which are attached as by screws 79 to a horizontal guide plate 78. The coin guides 75 and 76 are arranged on each side of the pair of coin tubes 25 and 26 and guide the coins over the guide plate 78 to a position directly above the push plate 41. The guide plate 78 is supported as by spacing blocks 80 and screws 81 at each end to the bottom of the main mounting plate 11, as is more clearly seen in Fig. 3. Directly above the coin guide plate 78 there is disposed a parallel guide portion 82 formed on the lower end of the hinged tube cover plate 21. The coins are ejected from a position between the two plates 78 and 82 which together with the U-shaped guide members 75 and 76 serve to guide them and prevent scattering.

As shown more clearly in Figs. 3 and 4 a stack of coins represented by the reference character 85 is placed in the quarter coin tube 30, the bottom two of the coins being indicated at 86 in a position to be ejected from the coin tube. For the purposes of illustration a person's hand has been indicated at 87 in its various positions assumed when a coin is being ejected.

The purpose and operation of the coin mechanism is as follows: Assume that a person wishes to exchange a dollar bill for example, for four quarters, and the machine being properly located in back of the counter where the proprietor only has access to the same, he will immediately reach back and with his finger tips press forwardly against the push plate 44 and against the tension exerted by the restoring spring 57. This spring 57 may be relatively light so as not to require too great an effort on the part of the person operating the coin mechanism, but still be sufficiently strong so as to restore the lever arms again to normal position. The first movement of the push plate 44 rotates the lower ends of the coin lever arms 45 and 49 together about their pivots 46 and 50 and so that the upper end of lever arm 45 moves away from the stop 59. The upper end of pawl 51 on lever arm 45 is moved from the normal position shown in Fig. 2 to the position shown in Fig. 3 through an arc as shown by the dotted lines 90 in Fig. 4. The forward edge of the pawl 51 passes upwardly through slot

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67 in main mounting plate 11 and also the slot 69 on the bottom rear edge of coin tube 30. As shown in Fig. 3 the height of the pointed end of pawl 51 is just sufficient to engage approximately half the thickness of the second coin 86 from the bottom, thereby insuring that it will positively engage either two thick coins or two thin coins without engaging a third thin coin. Accordingly there will always be two coins ejected regardless of their thicknesses thereby greatly reducing the error of ejecting too many coins and providing the wrong change.

Further forward motion of the lever arm 45 about its pivot 46 causes the upper end of pawl 51 to push the bottom two coins 86 forwardly with a sliding movement off of the main mounting plate 11. During this movement it will be noted the pin 55 on lever arm 45 acts as a stop to hold the pawl rigid. The last step in the complete coin ejecting movement is shown in Fig. 4 when the lower end of the lever arm 45 engages stop 60. At this point the coins 86 have been pushed by the pawl 51 slightly beyond the point where they leave the curved forward portion 68 of mounting plate 11. The two coins drop by gravity between guiding plates 78 and 82 directly into the palm 87 of the person performing the action. It will, of course, be understood that the pawl 54 on lever arm 49 is simultaneously performing a similar coin ejecting action on the lower two coins in the quarter coin tube 29. The coins are also guided into the person's palm 87 by the single discharge channel formed between the coin guides such as 75 and 76.

It will be observed that the push plate 44 in its normal position as viewed in Fig. 2 is located where it can be readily contacted by the person collecting the dispensed coins. As the hand is pushed further inward to rotate the coin lever arms the finger tips perform a rolling action around the angular portion 43 and over the front portion 44, so that as the fingers are pushed further and further under the coin mechanism, the palm portion 87 will be positioned directly under the discharged coins where they can be readily cradled in the hand and grasped for removal. This is a time saving feature and obviates the necessity of picking up the coins from a trough or pan after they have been ejected. Only a single movement by the person collecting the coins is required, thereby facilitating the making of change.

Another important feature of the present invention is the fact that great accuracy and speedy ejection in the dispensing of coins is provided by arranging the coin tubes in pairs and dispensing only a few coins from each tube, the total of the two coin tubes being four or five coins only. Referring to the coin tubes 25 and 26 which together dispense nickels, the tube 25 is arranged for ejecting only two nickels while the tube 26 simultaneously is arranged to eject three nickels, the five nickels constituting change for a twenty-five cent piece. Similarly the dime tube 27 is arranged to eject three dimes while the tube 28 simultaneously ejects two dimes, the combined number of dimes constituting change for a fifty-cent piece, or two quarters.

When pressure on the push plate 44 is released by the hand 87 of the person operating the same, the tension stored in spring 57 is sufficient to rotate the lever arm 45 back to its normal position, as shown in Fig. 2. In this retroactive movement the pawl 51 pivots about shoulder screw 52 underneath the last coin of the stack

85, as shown in Fig. 4, without raising the same, the spring 56 being expanded during this movement. As soon as the edge of pawl 51 slips behind the right hand edge of the last coin 85 the spring 56 snaps the lower end of pawl 51 against the stop 55 again. In this manner the pawl will again be rigid to eject another number of coins on the next operation of the push plate 44. The weight of the stack of coins 85 always pushes down the coins after each operation and they are normally retained in the coin tubes due to their weight so will not accidentally slide forward from the bottom end of the coin tube and be dispensed unless ejected by the coin ejecting mechanism itself.

What is claimed is:

1. In a coin dispensing apparatus, a pair of spaced apart coin tubes containing coins of the same denomination, a mounting plate upon which said coin tubes are vertically supported, a U-shaped bracket depending from said mounting plate and supported thereon, a separate coin ejector pivotally supported on each leg of the U-shaped bracket in a position below each coin tube, and a manually engageable push plate bridging said pair of coin ejectors across the U-shaped bracket for simultaneously actuating said coin ejectors to dispense a plurality of coins from said coin tubes.

2. In a coin dispensing apparatus, a pair of spaced apart coin tubes containing coins of the same denomination, a mounting plate upon which said coin tubes are vertically supported, a U-shaped bracket depending from and supported on said mounting plate, a pair of coin ejector members pivotally supported on each leg of said U-shaped bracket in a position below each coin tube, a manually operative push plate bridging the lower ends of said coin ejector member across the U-shaped bracket, the upper ends of said coin ejector members adapted to engage and eject a plurality of coins from the associated coin tube upon actuation of said push plate, and means for restoring said coin ejector members after each operation by said push plate.

3. In a coin dispensing apparatus, a pair of spaced apart coin tubes containing coins of the same denomination, a mounting plate upon which said coin tubes are vertically supported, a U-shaped bracket depending from and supported on said mounting plate, a pair of coin ejector members pivotally supported upon each leg of said U-shaped bracket in a position below each coin tube, a manually operative push plate arranged across the lower ends of both of said coin ejector members, the upper ends of each of said coin ejector members adapted to engage and eject a plurality of coins from the associated coin tube upon a single actuation of said push plate, means on said U-shaped bracket for limiting the movements of said coin ejector

members in both forward and reverse directions, and means for restoring said coin ejector members after each operation to a position to again eject coins.

4. In a coin dispensing apparatus, a pair of coin tubes spaced apart and containing coins of the same denomination, a mounting plate upon which said coin tubes are vertically supported, a U-shaped bracket depending from said mounting plate, a separate coin ejector member for each coin tube pivotally supported on said U-shaped bracket below said coin tubes, a manual operative push plate arranged across the lower ends of said coin ejector members, a coin engaging pawl on the upper ends of each of said coin ejector members adapted to engage and eject a plurality of coins from each coin tube upon a single actuation of said push plate, means for restoring said coin ejector member after each operation thereof, and means for supporting said coin engaging pawls on said coin ejector members in a manner so that during a coin ejecting operation the pawls are maintained rigid with the coin ejector member and upon the restoration of the coin ejector member the pawl is pivoted to ride backward along the bottom of the last coin in said coin tube without ejecting the same.

5. In a coin dispensing apparatus, a coin tube containing a plurality of stacked coins, a mounting plate upon which said coin tube is vertically supported and said coin stack rests, the lower end of said coin tube being provided with a re-entrant notch to expose a predetermined number of coins for ejection, turned up projections formed on said mounting plate engaging the notch on each side of said coin tube to serve as a guide on each side of the tube for the ejected coins, said mounting plate having a slot cut therein directly below the stacked coins in the coin tube, and coin ejecting means adapted to pass through the mounting plate slot to eject the number of coins determined by the coin tube notch.

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