June 18, 1940. E. GOODMAN 2,204,853

COIN OR TOKEN HANDLING APPARATUS

Filed Jan. 6, 1936 2 Sheets-Sheet 1

Fig. 1

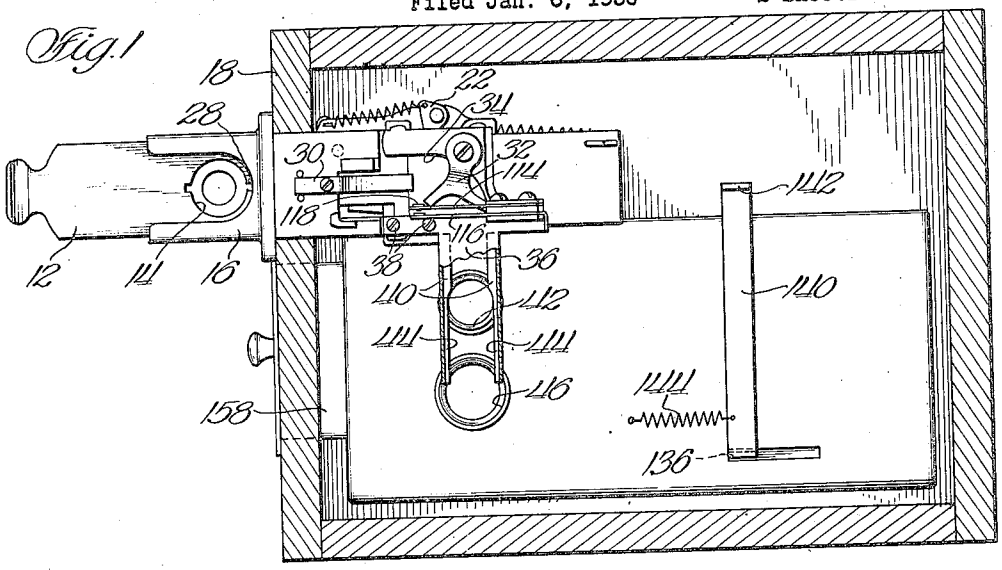


Fig. 2

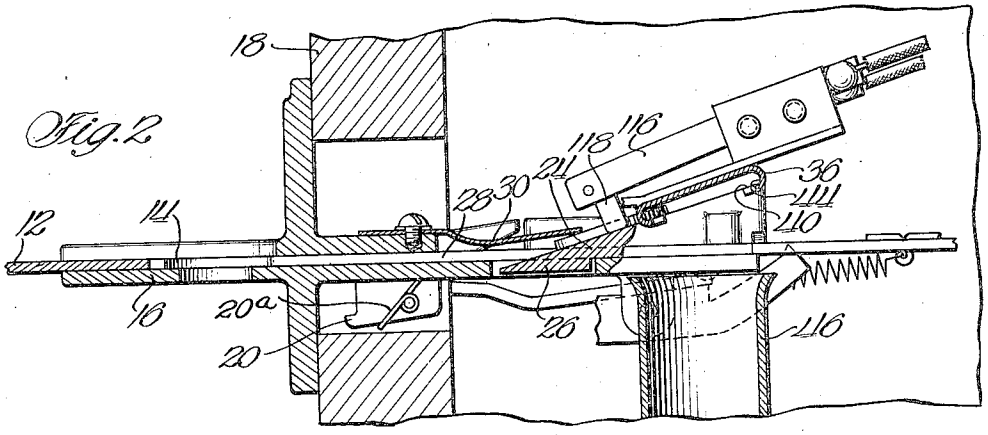


Fig. 3

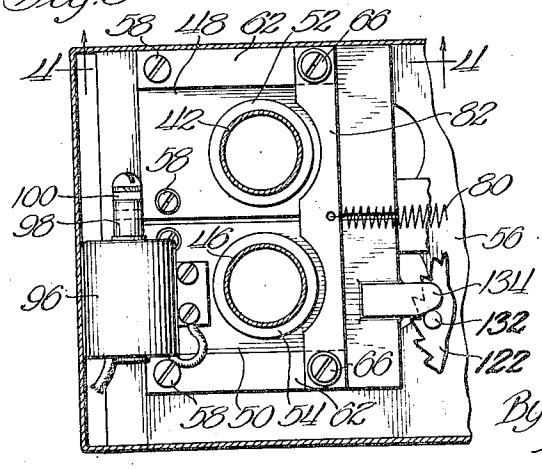
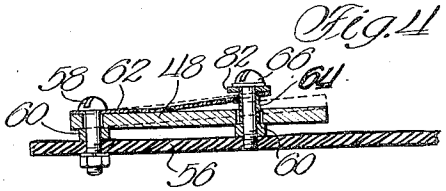


Fig. 4



Inventor:
Emil Goodman
By Williams, Bradbury,
McCaleb & Hinkle. Attys.

June 18, 1940. E. GOODMAN 2,204,853

COIN OR TOKEN HANDLING APPARATUS

Filed Jan. 6, 1936 2 Sheets-Sheet 2

Fig. 5

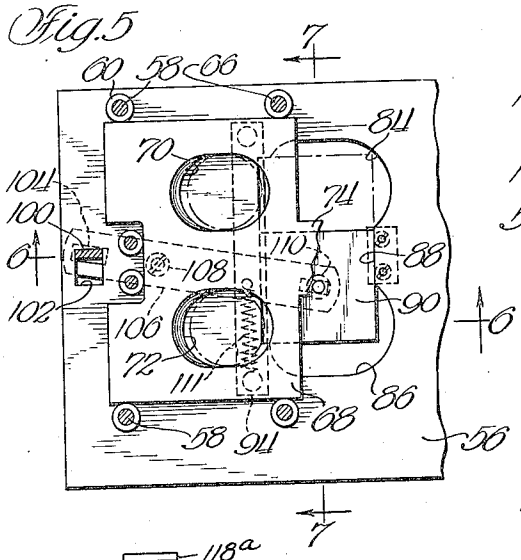


Fig. 6

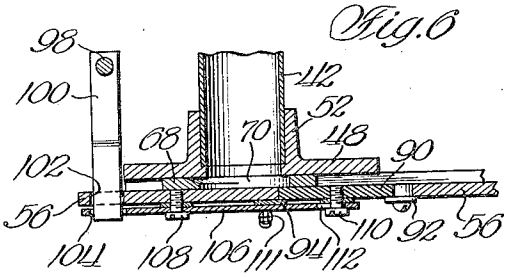


Fig. 7

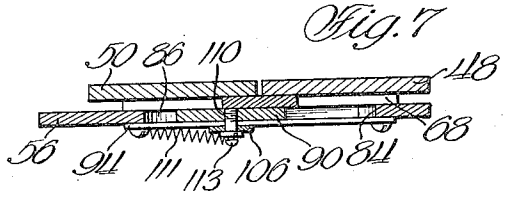
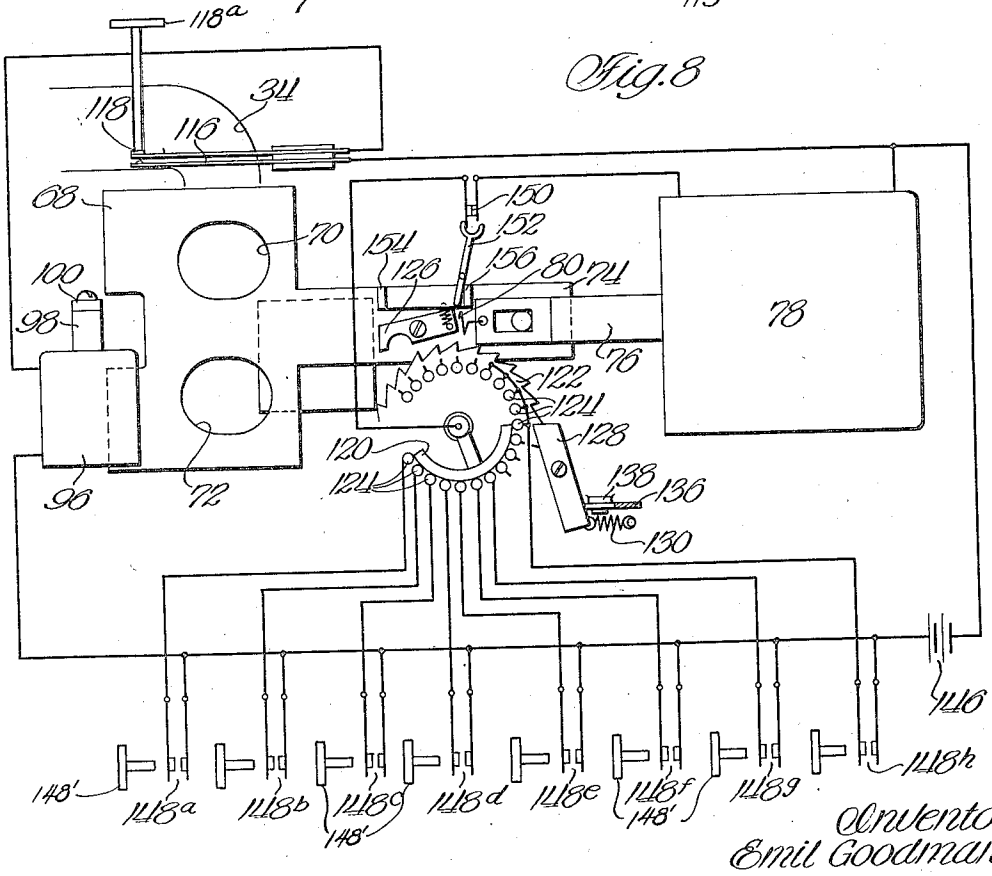


Fig. 8



Inventor:
Emil Goodman

By Williams, Bradbury, McCaleb & Hinkle.

Attys.

Patented June 18, 1940 2,204,853

UNITED STATES PATENT OFFICE

2,204,853

COIN OR TOKEN HANDLING APPARATUS

Emil Goodman, Chicago, Ill., assignor, by mesne assignments, to James E. Johnson, Chicago, Ill.

Application January 6, 1936, Serial No. 57,725

9 Claims. (Cl. 194—10)

My invention relates generally to coin or token handling apparatus, and more particularly relates to improvements upon the apparatus shown in my copending application Serial No. 48,807, filed November 7, 1935, Patent No. 2,183,611, granted December 19, 1939; and upon the apparatus shown in the application of Harry Kozel, Claude Hutchinson, and George Baca, Serial No. 30,982, filed July 12, 1935, Patent No. 2,147,954, granted February 21, 1939.

In my aforesaid application is disclosed a coin or token handling apparatus in which the size of the coin or token is utilized as a means for controlling the size of the coin or token delivered by the apparatus. In said invention are disclosed two separate coin or token delivery units, and the present invention has for its principal object the elimination of most of the parts of one of these units while retaining all of the functions thereof, thus simplifying the construction and lessening the cost of manufacture.

A more specific object of my invention is to provide an improved coin or token handling apparatus in which coins or tokens of two different sizes may be utilized, in which the coins or tokens of different sizes are stored in separate magazines, and a single coin delivery unit is selectively operable to eject coins from either of the two magazines, the selection being controlled by the size of the coin or token received by the apparatus, or by any other suitable controlling means.

A further object is to provide improved electrical circuits and electrically operated mechanism for attaining the aforesaid objects.

Other objects will appear from the following description, reference being had to the accompanying drawings, in which:

Fig. 1 is a horizontal sectional view of the apparatus, the operating parts of the mechanism being shown in plan view;

Fig. 2 is a fragmentary vertical sectional view taken mainly through the longitudinal center line of the coin slide;

Fig. 3 is a horizontal sectional view of the coin or token delivery mechanism;

Fig. 4 is a vertical sectional view taken on the line 4—4 of Fig. 3;

Fig. 5 is a horizontal sectional view similar to Fig. 3, taken beneath the coin magazines;

Figs. 6 and 7 are vertical sectional views taken on the lines 6—6 and 7—7 respectively of Fig. 5; and

Fig. 8 is a diagrammatic view of the coin delivery mechanism and the electrical circuits for controlling the same.

My invention may be described in general terms as comprising a coin slide which may be of any preferred construction, but which is equipped with a pair of electrical contacts which are closed whenever a coin of one size is inserted in this coin slide and remain open whenever a coin or token of a smaller size is inserted in the coin slide. If desired, these contacts may be closed by a manually operated key or any other suitable means. The coins or tokens are fed from the coin slide through a suitable guide to a pair of magazines, the first of which will receive the smaller coins and the second the larger coins or tokens.

Beneath the magazines is a coin or token ejector which is electromagnetically operated a predetermined number of times by any suitable control means to deliver coins and tokens from the magazine to a suitable chute or receptacle from which they may be manually removed. If a large coin or token is inserted in the coin slide a gate or shutter in the coin ejecting mechanism will be shifted to prevent delivery of coins or tokens from the magazine containing the smaller coins or tokens, while if a small coin or token is inserted in the coin slide the gate will remain in its normal position wherein it prevents delivery of coins from the magazine for the larger coins or tokens.

In Figs. 1 and 2 is shown a coin slide generally of conventional construction comprising the slide 12 having the usual aperture 14 to receive the coin. The coin slide 12 is mounted for longitudinal sliding movement in a guide 16 which is fastened to a suitable housing 18. The guide 16 is preferably formed with an aperture of materially less diameter than the aperture 14 in the slide 12 so as to support coins of more than one diameter within the aperture 14. A spring pressed pawl 20 operable by a spring 20a into the coin opening 14 is provided to prevent complete actuation of the slide 12 when no coin has been inserted in the aperture 14 of the coin slide, in the well known manner. The coin slide may be provided with the usual full stroke mechanism including the full stroke pawl 22 and the usual magnetic slug detector (not shown). The coins or tokens are pushed by the coin slide up an inclined guide 24 which has a tongue 26 projecting through a longitudinal slot 28 which extends forwardly (to the left, Fig. 2) to the coin receiving aperture 14. The coins are maintained against the inclined surface of the member 24 by a leaf spring 30 and by a Y-shaped flat spring 32 and are directed into contact with a

curved guide wall 34 which is provided on the member 24. Thus it will be seen that a coin, such as a nickel, having a diameter greater than the distance between the curved wall 34 and a spring leaf carrying contact 114 of the jack type switch, shown particularly in Fig. 1, will deflect this spring member 114. On the other hand the passage of a smaller coin, such as a dime, between the wall 34 and the contact carrying spring leaf can be effected without operating the switch, as the diameter of such a size coin is less than the distance between the wall 34 and contact spring 114. The contact is of a strength such that when engaged by such smaller coin it moves the coin toward the wall 34 and will not be deflected out of its normal position, shown in Fig. 1.

By means of the curved guide surface 34 the coins are guided into a channel-shaped coin or token conveyor 36 which is secured to the member 24 by screws 38. The conveyor 36 has a pair of inwardly extending flanges 40 which between them form a relatively narrow slot terminating above a coin or token magazine 42. Thus the smaller coins or tokens fed through the conveyor 36 will drop into the magazine 42 while the larger coins or tokens will be pushed along the extensions 44 of the flanges 40 and thereby conveyed to the magazine 46 for the larger coins or tokens.

The magazines 42 and 46 may be in the form of cylindrical tubes as shown in Figs. 3 and 6, and are mounted upon base castings 48 and 50 respectively, being pressed into upwardly extending annular bosses 52 and 54 formed integrally with the magazine base castings 48 and 50 respectively.

To compensate for slight irregularities in the thickness of the coins or tokens, the magazine castings 48 and 50 are mounted for limited tilting movement. As shown in Fig. 4, the castings 48 and 50 are each secured to a base plate 56 by a pair of bolts 58, the castings 48 and 50 being separated from the base plate 56 by spacing washers 60. The holes in the magazine base castings 48 and 50, through which the bolts 58 project, are larger in diameter than the bolts to permit the slight tilting of the magazine base castings, as indicated by the dotted and full line positions in Fig. 4. A leaf spring 62 has one end held in position by one of the bolts 58 and its other end perforated to fit around a spacing sleeve 64 held in place by a guiding cap screw 66. The leaf spring 62 has a slight bend formed near its center so that the spring will be effective normally to hold the magazine base casting 48 in its lowermost position against the spacing washer 60, as indicated in full lines in Fig. 4.

The magazine base castings 48 and 50 are mounted in this manner so that if a coin or token of unusual thickness is fed through the magazine, the magazine base plate may tilt slightly to permit the coin to pass through the space between the lower surface of the magazine base casting 48 and the upper surface of the base plate 56.

Suitably mounted for reciprocation between the magazine base castings 48 and 50 and the base plate 56 is a coin ejector slide plate 68 having a coin or token receiving opening 70 normally lying in registry with the lower end of the magazine 42 and a similar but larger opening 72 which normally lies beneath the coin magazine 46. As shown diagrammatically in Fig. 8, the coin ejector slide 68 has a tongue 74 formed integrally therewith, this tongue being connected by a pin and slot connection with the plunger 76 of a solenoid 78. The solenoid plunger is normally moved to the left (Figs. 3 and 8) by a tension coil spring 80, one end of which is secured to the plunger 76 and the other end of which is anchored to a strap 82 secured to the base plate 56 by the screws 66.

The coin ejector slide 68 is movable by the solenoid 78 from the position in which it is shown in Fig. 3 with its openings 70 and 72 beneath the coin or token magazines to a position in which these openings lie above holes 84 and 86 respectively, formed in the base plate 56. The openings 84 and 86 through which the coins are removed from the magazines by the coin ejector plate 68, are connected by a slot 88 in which a shutter 90 is reciprocable. The shutter 90 rests upon a pair of guides 92 and 94 which are suitably secured at the lower surface of the base plate 56. The shutter 90 is slidable on the plates 92 and 94 from a position such, for example, as shown in full lines in Fig. 5, wherein it partially closes the coin discharge opening 86 to the position shown in dotted lines in said figure wherein it partially closes the coin discharge opening 84.

The means for shifting the shutter from one position to the other comprises a solenoid 96 having a plunger 98. A finger 100 is secured to the end of the plunger 98 and depends through a suitable slot 102 formed in the base plate 56, the finger projecting through a slot 104 formed in a lever 106 which is pivotally mounted on the lower surface of the base plate 56 by a stud 108. The end of the lever 106 opposite the slot 104 is pivotally connected to the shutter 90 by a stud 110, the latter extending freely through an elongated slot 112 formed in the lever 106. The shutter is returned to its normal position, shown in full lines in Fig. 5, by a tension spring 111 one end of which is secured to a pin 113 and the other end of which is anchored to one of the screws which holds the guide plate 94.

From this description it will be apparent that when the solenoid 96 is energized the shutter 90 will be moved from the position in which it is shown in full lines in Fig. 5 to the position in which it is shown in dotted lines in said figure, thereby, when in the dotted line position, preventing the delivery of any coin or token which may be present in the opening 70 of the coin ejector 68. Conversely, when the solenoid 96 is not energized, the shutter 90 will be in the position shown in full lines in Fig. 5 and prevents the delivery of any coin or token which may be present in the opening 72 of the coin ejector 68.

The means for controlling the energization of the solenoid 96 comprises a pair of contacts 114, 116, which are suitably secured to but insulated from the coin conveyor 36 (Figs. 1 and 2). The contact 114 has an ear 118 extending downwardly therefrom and lying in the path of the coins as they are pushed up the inclined coin guide 24. If the coin or token is of large size it will engage the ear 118 and close the contacts 114 and 116, whereas if the coin or token passing the ear 118 is of less than a predetermined diameter, it will pass the ear 118 without closing the contacts. The springs 30 and 32 which engage the coins as the latter are moved over the inclined surface of the member 34, prevent lateral shifting of the coins toward the contacts 114 and 116 and thereby prevent the closing of said contacts except by a coin of predetermined size. In using the apparatus as a token delivery machine in restaurants and the like, the contacts 114, 116 will be arranged to be closed by a suit-

able depressible key such as key 118a shown in Figure 8, so that the cashier may readily control the size of tokens which are to be delivered.

The number of operations of the coin ejector is controlled by a segmented contactor 120 which is rotatably mounted and has a ratchet wheel 122 secured thereto. The rotary contactor 120 is adapted to make electrical contacts with fixed contact points 124. The contactor 120 is arranged to break contact with the points 124 successively, upon each operation of the coin ejector. For this purpose the tongue 74 of the coin ejector slide carries a pawl 126, which is engageable with the ratchet wheel 122 and, upon each reciprocation of the slide, advances the contactor 120 through an angular distance corresponding to the angular spacing of the contact points 124. A second dog or pawl 128 is resiliently held against the toothed face of the ratchet wheel by a spring 130, and is adapted to hold the ratchet wheel 122 in the position to which it has been advanced by the pawl 126.

The ratchet wheel 122 is resiliently biased to rotate in a clockwise direction, such movement being limited by the engagement of a pin 132 on the ratchet wheel (Fig. 3) with a lug 134 formed on the magazine base casting 50. A release lever 136 (Figs. 1 and 8) is pivoted at 138, its lower arm being adapted to engage the pawl 128 and move the latter to disengaging position, and its upper arm having an extension 140, the extremity 142 of which lies in the path of movement of the coin slide 12 and is adapted to be engaged and moved thereby whenever the coin slide is moved to its innermost position. The lever 136, 140 is preferably biased to the position in which it is shown in Fig. 1, as by a spring 144.

Any desired one or more of the contacts 124 may be connected to one side of a source of electricity, shown as a battery 146, by means of a plurality of switches 148 individually identified by the letters *a* to *h* inclusive. These switches may be manually operated by means of suitable keys 148' as shown in the aforesaid patent of Harry Kozel et al., or may be closed by other suitable means depending upon the particular use to which the apparatus of my invention is to be adapted.

The contactor 120 is connected through a switch 150 with one end of the winding of solenoid 78, the other end of the winding being connected to the battery 146. The switch 150 is normally closed, but is adapted to be opened at each operation of the solenoid 78 by a lever 152, which is shifted by a stop 154 to open the switch 150 and by a stop 156 to close the switch. The stops 154 and 156 are secured to the tongue 74 of the slide 68.

As shown in Fig. 8, the switch contacts 114, 116 are connected in series with the winding of solenoid 96 and battery 146.

The coin or token handling apparatus of my invention operates in the following manner: The coin or token is inserted in the opening 14 of the coin slide 12 and the slide pushed inwardly to bring the coin to a position adjacent the depending ear 118 attached to the contact 114, whereupon if the coin is of greater than a predetermined diameter the switch contacts 114, 116 will be closed, thereby energizing the solenoid 96, causing the plunger to be pulled inwardly and shifting the shutter or gate 90 from the position in which it is shown in full lines in Fig. 5 to the position in which it is shown in dotted lines in said figure. The apparatus will thus be conditioned to eject coins from the magazine 46 containing the larger coins or tokens.

Upon closing any one of the switches 148a to 148h, a circuit from the battery 146 through the closed switch 148 through one or more of the contact points 124, contactor 120, switch 150 and solenoid 78 back to the battery 146 will be completed. Upon energization of the solenoid 78 its plunger 76 will draw the coin ejector 68 to the right (Figs. 3, 5, 6, and 8), thereby ejecting one coin or token from the magazine 46, permitting the coin or token to drop into a suitable receptacle or tray, illustrated in Fig. 1 as a drawer 158. As the plunger 76 of the solenoid 78 reaches its innermost position the stop 154 moved thereby swings the lever 152 to open the switch 150 thereby de-energizing the solenoid 78. The solenoid plunger 76 will thereupon be pulled outwardly by the spring 80, the pawl 126 engaging the ratchet wheel 122 to advance the latter (counterclockwise, Fig. 8) an angular distance corresponding to one tooth of the ratchet wheel, in which position the latter will be held by the spring pressed pawl 128. In Fig. 8 the contactor 120 is shown in its initial position and if the switch 148a is the switch which has been operated, the contactor 120 will thus be moved from contacting engagement with the contact point 124 connected to the switch 148a.

Thus when the stop 156 operates the lever 152 to close the switch 150 upon the completion of the return stroke of the plunger 76, the solenoid 78 will not be re-energized because of the open circuit between the contactor 120 and the contact point 124 connected to the switch 148a. If, however, one of the switches 148 has been closed, the solenoid will operate the coin ejector slide a number of times determined by the contact point 124 to which the closed switch 148 is connected. Closing the switches 148a to 148g inclusive will therefore cause ejection of one to seven coins or tokens respectively, while closing switch 148h will cause the ejection of fifteen coins or tokens.

If a coin or token of small diameter is inserted in the opening of the coin slide 12 and the latter operated, the coin will not be sufficiently large to engage the depending ear 118 of the contact member 114 and the switch 114, 116 will therefore remain open. The solenoid 96 will thus not be energized and the shutter 90 will be retained in the position shown in full lines in Fig. 5 by the shutter return spring 111. Upon closure of one of the switches 148 under these conditions, the coin ejector will be operated to eject coins or tokens from the magazine 42 only, since the lowermost coin removed from the magazine 46 by the coin ejector slide will not be permitted to fall out of the opening 72 of the ejector slide, and thus will be returned to the magazine. Whenever the coin slide 12 is operated, the end thereof engages the extremity 142 of the lever 136 and causes the latter to swing the pawl 128 (Fig. 8) clockwise, thereby releasing the ratchet wheel 122 for operation by its torsion return spring to its normal position in which the stop pin 132 on the ratchet wheel engages the fixed stop 134 (Fig. 3).

As previously stated, the switch 114, 116 may be manually operated by means of a suitable key 118a (see Figure 8) instead of being operated by the coin or token. For example, the apparatus of my invention could readily be used to deliver a predetermined number of coins or tokens of two (or more) certain denominations or sizes. In this event the operator would close

the switch 114, 116 by means of such key 118a just prior to closing the desired switch 148a to 148h, and retain the switch 114, 116 closed during the coin ejecting operation. In restaurants and other places of business where the customer must exchange currency for tokens to be used in the purchase of food or other commodities, the apparatus of my invention is of particular utility since it enables the cashier very quickly and accurately to deliver the desired number of tokens of the desired denomination.

While I have shown and described but a single embodiment of my invention it will be understood by those skilled in the art that the basic principles thereof may be utilized in many variant and different forms without departing from the basic principles of my invention.

I therefore desire the claims which follow to be construed to cover all such modifications and variant constructions by which substantially the results of my invention are obtained in substantially the same way.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a coin or token handling apparatus, the combination of a plurality of coin magazines, a common coin ejector movable between a position in which it receives coins or tokens from the magazines and a position in which the coins or tokens are discharged from the ejector, and a shutter movable below said ejector to prevent coins or tokens from one magazine from being discharged from the ejector while permitting free discharge from the ejector of coins or tokens from another of the magazines.

2. In a coin or token handling apparatus, the combination of a plurality of coin magazines, a coin ejector operable to receive coins or tokens from both of said magazines, a receptacle for receiving coins or tokens removed from said magazines by said ejector, a shutter operable to prevent the delivery from the ejector of coins of one of said magazines to said receptacle while permitting free discharge from the ejector of coins from another of said magazines, a coin slide mechanism, and means controlled by a coin of a predetermined size inserted in said mechanism to govern the operation of said shutter.

3. In a coin or token handling apparatus, a plurality of vertical magazines for coins or tokens, a movable plate having openings adapted to register with said magazines, means below the movable plate for preventing the coins from falling therefrom except at a discharge position of the plate, and a movable member at said discharge position adapted to retain coins in certain of the openings in the first said movable plate while permitting coins to fall freely from at least one other opening of the movable plate.

4. In a coin or token handling apparatus, a plurality of vertical magazines for coins or tokens, a movable plate having openings adapted to register with said magazines, means below the movable plate for preventing the coins from falling therefrom except at a discharge position of the plate, a movable member at said discharge position adapted to retain coins in certain of the openings in the first said movable plate while permitting coins to fall freely from at least one other opening of the movable plate, and means causing a predetermined number of movements of the movable plate whereby a corresponding number of coins are discharged from at least one of the magazines.

5. In a coin or token handling apparatus, a plurality of vertical magazines for coins or tokens, a movable plate having openings adapted to register with said magazines, means below the movable plate for preventing the coins from falling therefrom except at a discharge position of the plate, a movable member at said discharge position adapted to retain coins in certain of the openings in the first said movable plate while permitting coins to fall freely from at least one other opening of the movable plate, and coin controlled means for positioning said movable member.

6. In a coin or token handling apparatus, a plurality of vertical magazines for coins or tokens, a movable plate having openings adapted to register with said magazines, means below the movable plate for preventing the coins from falling therefrom except at a discharge position of the plate, a movable member at said discharge position adapted to retain coins in certain of the openings in the first said movable plate while permitting coins to fall freely from at least one other opening of the movable plate, means causing a predetermined number of movements of the movable plate whereby a corresponding number of coins are discharged from at least one of the magazines, and independent coin controlled means for positioning said movable member.

7. In a coin handling apparatus, the combination of a pair of selectable coin magazines, a coin ejector common to both said magazines for removing coins therefrom, a shutter cooperable with said ejector, and selectively operable means for shifting said shutter in directions to prevent discharge from said ejector of coins received from the non-selected magazine while permitting discharge from the ejector of coins received from the selected magazine.

8. In a coin handling apparatus, a pair of coin magazines, a coin receptacle, a coin ejector slidable beneath said magazines for removing coins from one or the other of the magazines and delivering the same to said receptacle, electrically controlled means for effecting the selective operation of said ejector once or a plurality of times for removing a corresponding number of coins from one of said magazines, a member associated with said ejector and laterally shiftable with respect thereto to a position for preventing the discharge of coins by the ejector from said last mentioned magazine for permitting discharge of coins by the ejector from said other magazine, and electrically controlled means for moving said shiftable member to said position.

9. In a coin handling device, a pair of coin magazines, an ejector common to said magazines for receiving coins from both magazines and provided with a shiftable shutter normally in a position for preventing discharge from the ejector of coins received from one of said magazines while permitting discharge of coins from the ejector of coins received from the other magazine, operating means for shifting said shutter to a position for permitting discharge of coins from said first mentioned magazines while preventing discharge of coins from said second magazine, operating means for said ejector and electrically actuated control means for effecting the actuation of said ejector operating means once or a plurality of times for effecting the discharge of a corresponding number of coins from one or the other of said magazines as predetermined by the position of said shutter.

EMIL GOODMAN.