

Oct. 14, 1941.

W. A. TRATSCH ET AL

2,258,916

VENDING MACHINE

Filed March 3, 1938

4 Sheets-Sheet 1

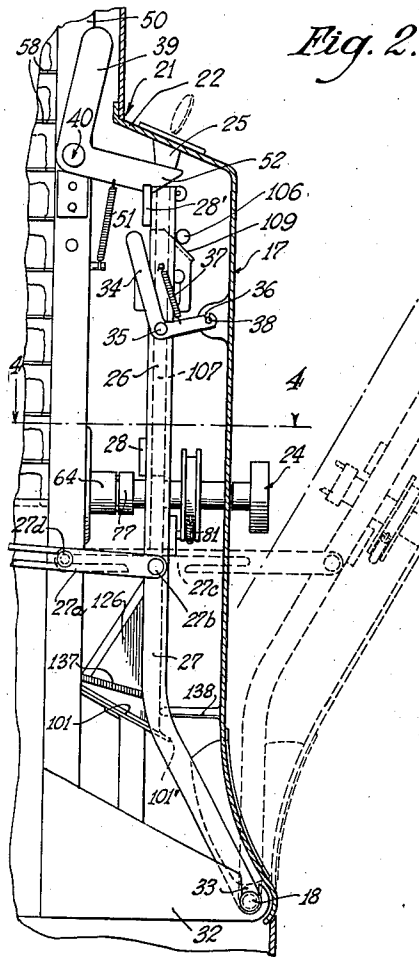


Fig. 2.

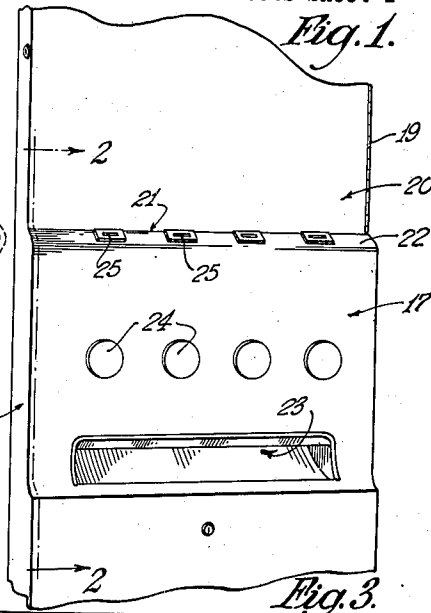


Fig. 1.

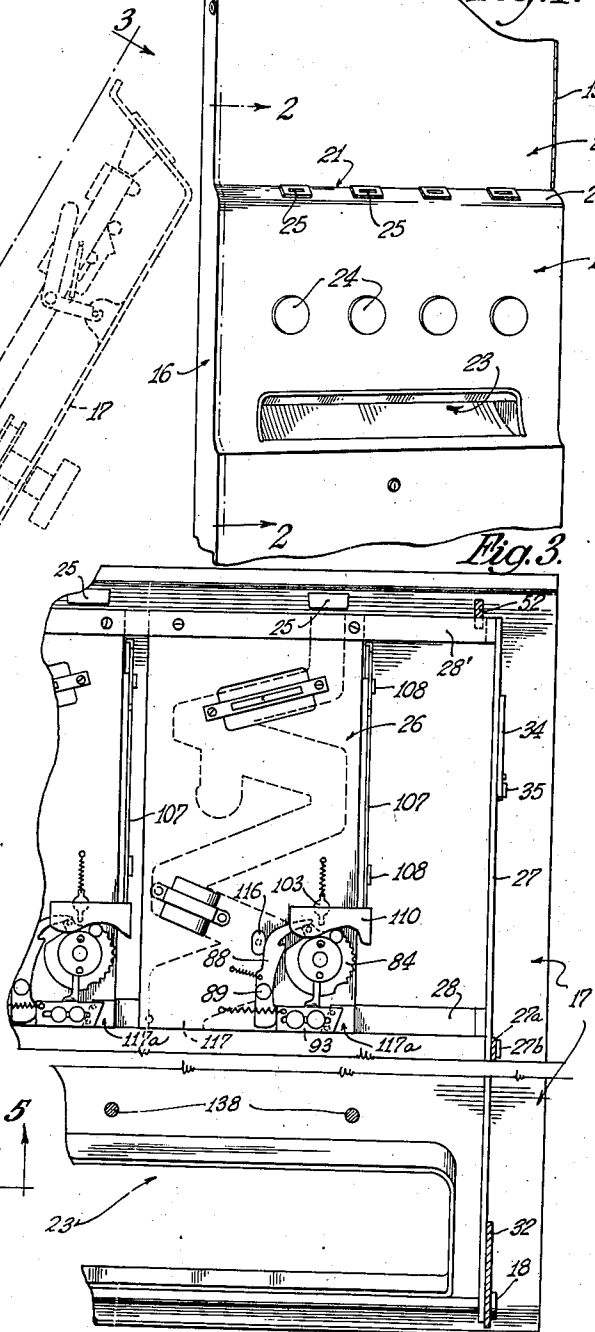


Fig. 3.

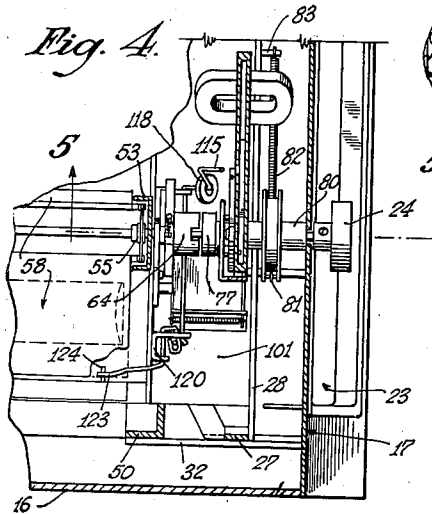


Fig. 4.

INVENTORS
Walter A. Tratsch
and William Patzer
BY Clarence E. Freedy
THEIR ATTORNEY.

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W. A. TRATSCH ET AL

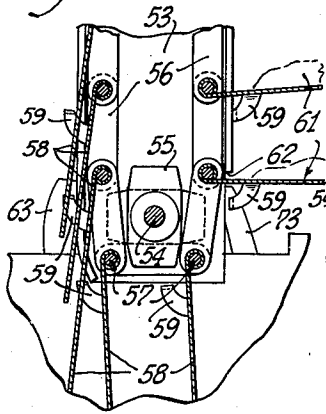
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Fig. 6A.



6A

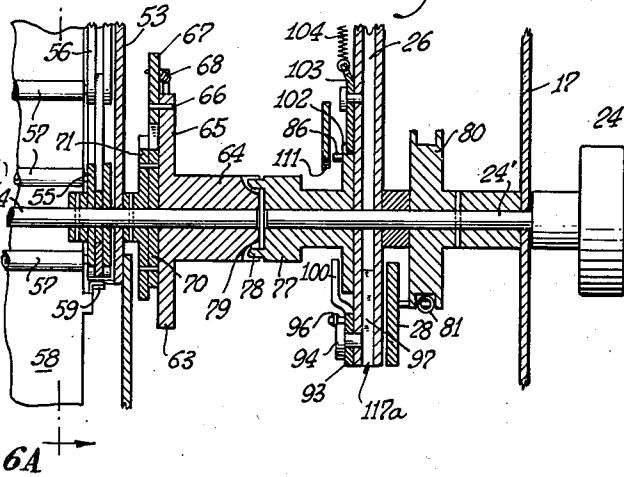
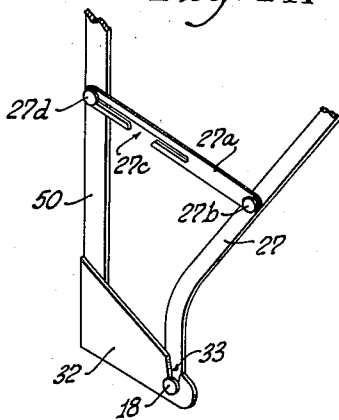


Fig. 5A.

Fig. 2A



Walter A. Tratsch
and William Patzer
INVENTORS

BY *Clarence E. Freedy*
THEIR ATTORNEY.

Oct. 14, 1941.

W. A. TRATSCH ET AL

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Fig. 6.

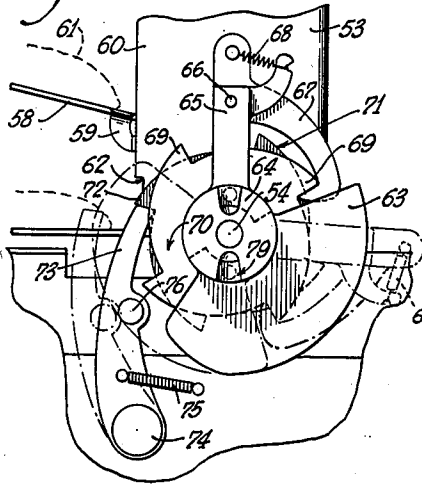


Fig. 5.

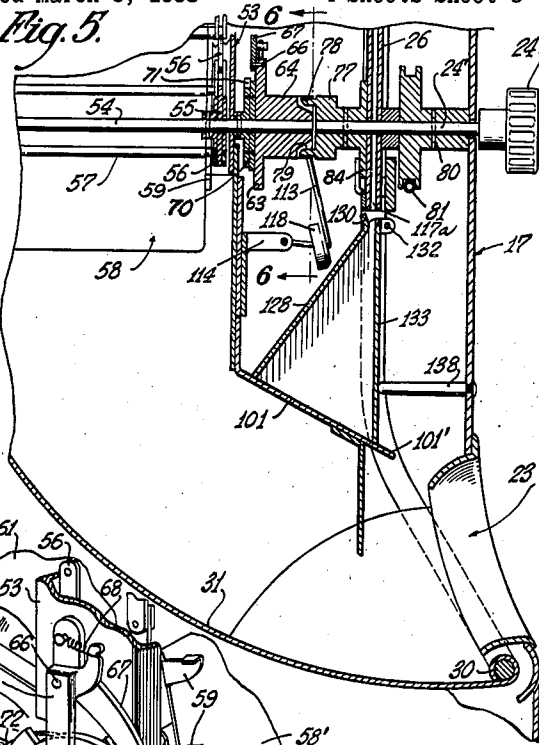


Fig. 7.

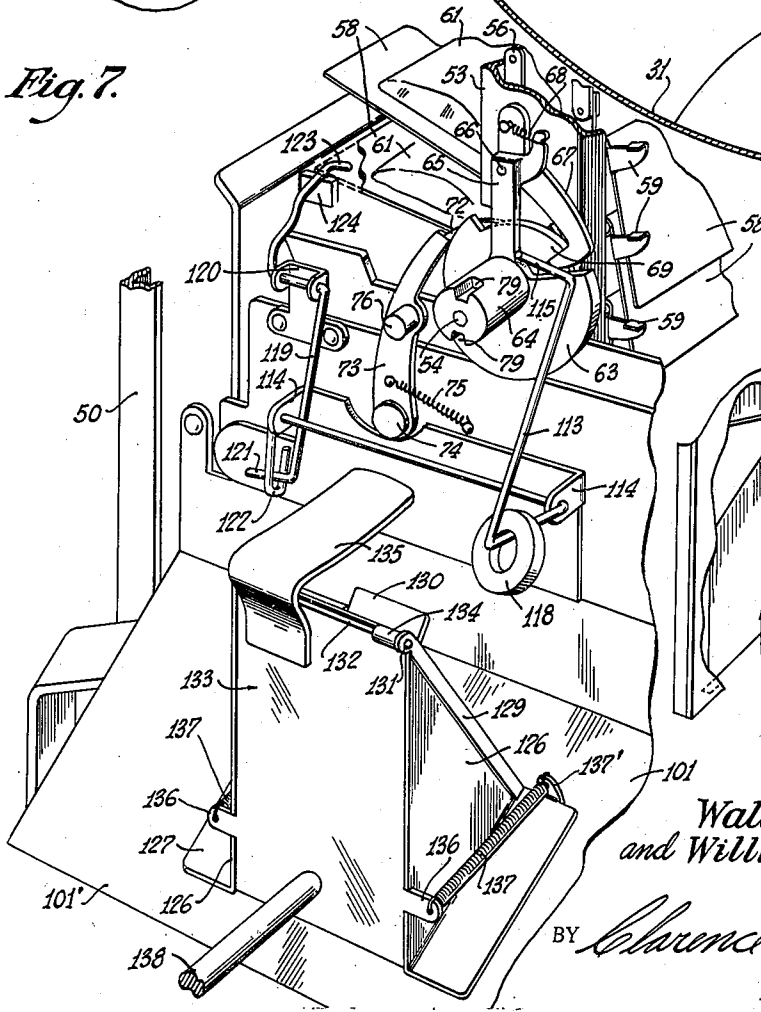
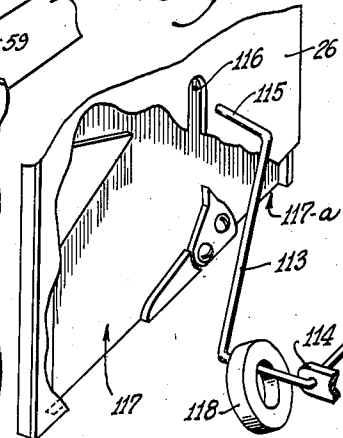


Fig. 8.



Walter A. Tratsch
and William Patzer
INVENTORS

BY *Clarence E. Freedy*
THEIR ATTORNEY.

Oct. 14, 1941.

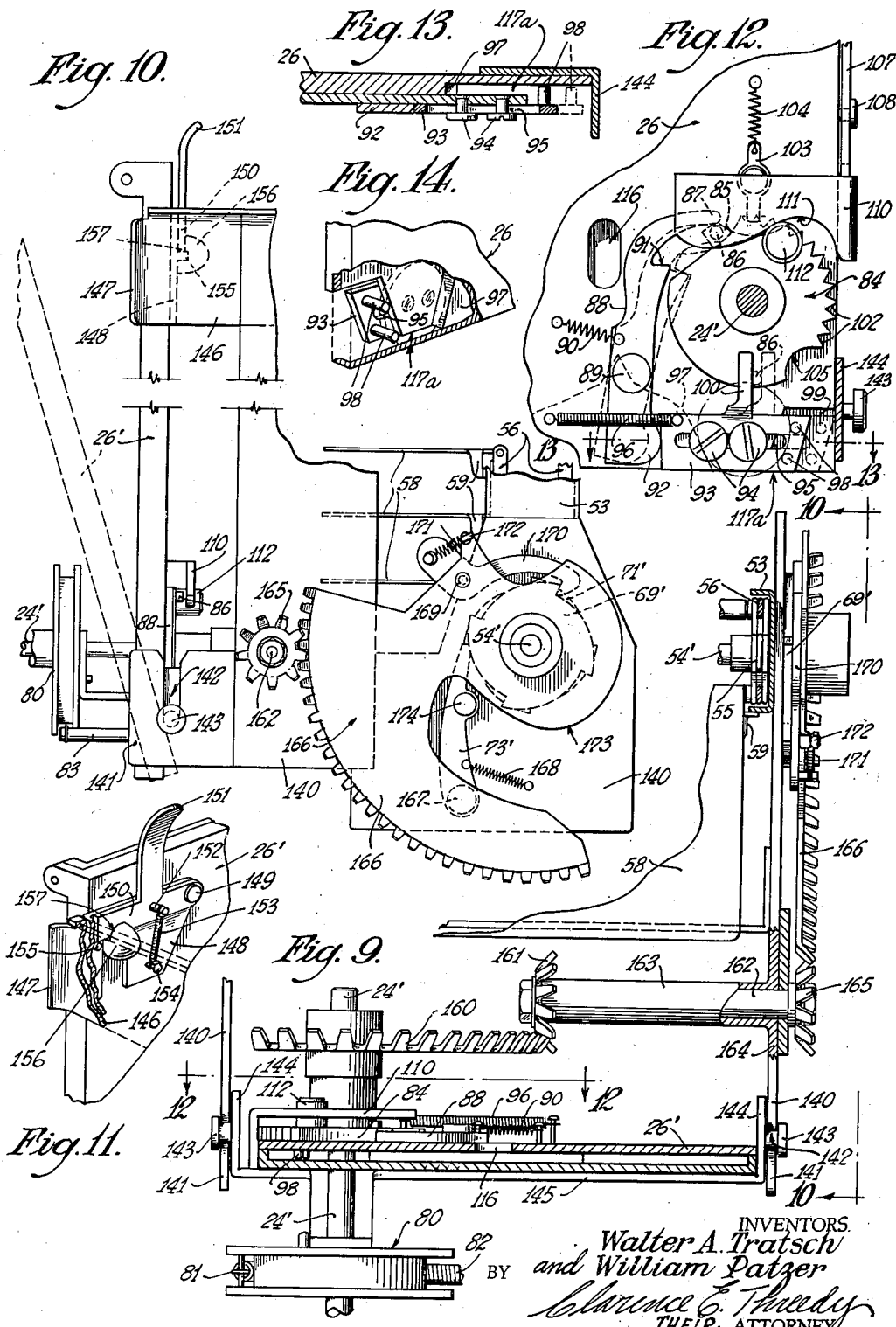
W. A. TRATSCH ET AL

2,258,916

VENDING MACHINE

Filed March 3, 1938

4 Sheets-Sheet 4



INVENTORS.
 Walter A. Tratsch
 and William Patzer
 BY *Lawrence C. Thedy*
 THEIR ATTORNEY.

UNITED STATES PATENT OFFICE

2,258,916

VENDING MACHINE

Walter A. Tratsch and William Patzer,
Chicago, Ill.

Application March 3, 1938, Serial No. 193,681

8 Claims. (Cl. 194—93)

This invention relates to dispensing apparatus, and particularly to the coin-controlled variety adapted to dispense or vend small packaged articles.

The objects of the invention relate to improvements in the cabinet structure whereby the operating and control mechanism is made more conveniently accessible, and by virtue of a certain novel construction of overlapping movable panel sections is made more secure.

The objects further relate to improvements in manually operable control means for actuating the vending or dispensing mechanism, together with novelly arranged coin control unit for the manual operating control, and arranged to be easily accessible by virtue of the aforesaid improvements in the cabinet structure and also by virtue of the mounting in which it is removably mounted in the cabinet structure.

It is a further object to provide an improved coin receiving structure arranged as a cooperative part of the improved cabinet structure to facilitate access to the coins deposited in the machine.

Another object is the provision of a novel coin-operated latching or dog means for the manual controls.

Another object is the provision of an improved form of article storing and moving means in the form of an endless conveyor, and novel driving mechanism drivingly connecting the same with the manual control.

Still another object is a coin blocking mechanism operably controlled by the article storing and conveying means for deflecting coins to return the same when the magazine or conveyor is empty.

Stated more specifically, the objects of the invention include the provision in a vending machine, of a cabinet structure having a control panel pivotable about a horizontal axis, and a magazine panel pivotable about a vertical axis into overlapping relation with the control panel when the latter is in closed position, the control panel tilting to permit access to the entire mechanism as will be hereinafter pointed out, together with a coin chute removably latched into operative position behind the tilting control panel, the coin-controlled latch dog mechanism mounted behind the control panel and automatically coupled with the control when the panel is pivoted into position, the latch mechanism being devised so that a proper coin delivered from the chute will permit effective manipulation of the control for vending purposes.

The novel article storing or magazine means is in the form of an endless belt conveyor with pivotable shelves or trays which are held in substantially horizontal position on one side of the conveyor and in collapsed condition on the opposite side thereof, the conveyor having driving connection with the coin-operated latch means and manual control such that when a tray reaches a predetermined position it automatically drops to discharge its contents.

The coin blocking mechanism is in the form of a pivoted blocking member normally held in ineffective position by a tray on which there is an article, and which is substantially in position to discharge such article when the control is actuated, the blocking member being automatically projected into the coin chute to deflect the coin toward a discharge opening if there be no article on said tray.

The novel coin storing means is in the form of a container having a spring-closed door which may be tilted open only when the control panel is tilted into open position, such action being effected to spill all of the coins from that container into the main discharge chute for the vending machine.

Other novel aspects and objects of the invention reside in certain details of construction and operation of the parts and mechanism herein-after to be described in view of the several drawings, in which:

Fig. 1 is a fragmentary front perspective of the improved cabinet;

Fig. 2 is an enlarged fragmentary vertical side section along line 2—2 of Fig. 1;

Fig. 2a is a fragmentary perspective view, to enlarged scale, of the control panel latching means;

Fig. 3 is a fragmentary rear elevation of the control panel as viewed along line 3 of Fig. 2;

Fig. 4 is a fragmentary horizontal section through the coin chute and manual control panel looking down along line 4—4 of Fig. 2;

Fig. 5 is an enlarged vertical sectional detail through the manual control means and main discharge chute, as seen from the side, or in the direction of line 5—5 of Fig. 4;

Fig. 5a is a vertical sectional detail view of the manual control seen in Fig. 5 at an enlarged scale;

Fig. 6 is an enlarged front elevational detail of the unidirectional driving ratchet mechanism, as seen along line 6—6 of Fig. 5;

Fig. 6a is a vertical sectional detail view as seen from line 6a—6a in Fig. 5a;

Fig. 7 is an enlarged front perspective detail of one of the units showing the coin box, the automatic coin blocking means, the unidirectional ratchet drive and magazine conveyor;

Fig. 8 is a fragmentary perspective detail of a coin chute illustrating the operation of the automatic coin blocking or return means;

Fig. 9 is a fragmentary horizontal section looking down on a modified form of driving mechanism;

Fig. 10 is a fragmentary side elevation of the modified driving mechanism of Fig. 9, as viewed in the direction of line 10—10 of the latter;

Fig. 11 is an enlarged fragmentary perspective of the coin chute latching means;

Fig. 12 is a fragmentary rear elevational detail of the coin-operated latch dog means employed with all forms of the device and looking in the direction of line 12—12 of Fig. 9;

Fig. 13 is an enlarged horizontal sectional detail through the coin latch slide looking down along line 13—13 of Fig. 12; while

Fig. 14 is an enlarged fragmentary front perspective of the coin latch slide.

In the embodiment of the invention shown herein in Fig. 1, for example, the improved vending machine includes a cabinet structure 16 provided with a front control panel 17 mounted for pivotal movement about a horizontal axis or pivot means 18 (Fig. 2) so as to tilt toward and away from the front of the cabinet into and out of the dotted line position shown in Fig. 2, to provide access to the mechanism.

Mounted for pivotal movement about a vertical axis or hinge means 19 above the control panel 17, is a magazine panel 20, the lower edge 21 of which overlaps or overlies a top ledge formation 22 of the control panel 17 in such manner that when the said panels are in closed position, the control panel is locked into such position by the magazine panel 20 and by other latch means hereinafter to be described.

A main discharge chute 23 is provided in the front of the control panel and through which the selected merchandise is discharged to the customer. Mounted in the control panel 17 above the discharge chute 23 are a plurality of manual operating controls 24, and corresponding to each of these controls is a coin slot 25 arranged in the ledge portion 22 for communication with the coin receiving or entrance opening of a coin testing chute 26 (Fig. 2) removably mounted behind the panel 17 below the ledge portion 22.

The coin testing chute or chutes 26 are removably mounted upon the inner side of the control panel by means of a rack including a pair of uprights 27 near opposite edges of the panel 17 (Figs. 2 and 3) to which are secured spaced cross straps 28 and 28' to which, in turn, the several coin testing chutes 26 are secured by any suitable means. At their lower ends the uprights 27 are bifurcated or slotted to seat on the headed pivot rod 18 which is embraced between its ends by a turned-over lip portion 30 of the merchandise discharge apron or chute 31 (Fig. 5), this latter chute being suitably secured at its upper end to a portion of the cabinet structure (not shown). Secured to the inner cabinet structure near opposite ends of the rod 18 are triangularly shaped pivot brackets 32 (Figs. 2 and 3) having open slots 33 into which the headed end portions of the pivot rod 18 seat between the headed end portion thereof and the bifurcated lower end portion of the uprights 27.

The control panel unit 17 is held in open posi-

tion by means of a catch rod 27a pivotally connected with one of the uprights 27 as at 27b and having an open slot 27c removably engageable with a pin 27d attached to the frame (see Fig. 2a).

Thus, it will appear that the control panel 17 may pivot about the rod 18 as illustrated in Fig. 2. Likewise, the frame structure 27—28 may also pivot on the rod 18 relative to the panel 17. However, this latter pivotal movement of the coin chute supporting frame or rack 27—28 is normally prevented by a releasable coin chute latching means in the form of a bell crank 34 pivotally mounted as at 35 on the upright 27 and having a latching slot 36 which is urged by a spring 37 into latching engagement with pin means 38 on a lug on the inner side of the panel 17. In this manner, the rack structure 27—28 is held in operative position with relation to the inner surface of the panel 17.

In turn, the panel 17 is latched into closed or operative position by means of a second latch device in the form of the bell crank latch arm 39 pivotally mounted as at 40 upon a cabinet upright 50 and urged by a spring 51 to dispose the notched end portion 52 thereof in latching engagement with the upper edge of the upper rack or crossbar 28'. Thus, the entire control panel unit will be securely and automatically latched into upright position when the panel is closed, apart from the locking effect of the overlapping lower edge portion 21 of the magazine panel 20.

The merchandise which the present machine is intended to vend is preferably in the form of small packaged items such as candy bars, cigarettes and the like, individual packages being supported on collapsible trays or drops on an endless chain, the trays being successively positioned and dropped to discharge the merchandise onto the discharge chute 31. For purposes of convenience, I have characterized this type of merchandise dispensing mechanism as a conveyor magazine, the same being broadly similar in principle to the vending mechanism shown in United States application Serial No. 168,982 in the name of Walter A. Tratsch.

In the present form of conveyor magazine, there are a pair of upright guide or channel brackets 53 (Figs. 4 to 7), between the respective tops and bottoms of which extend drive shafts 54, the lower one of which extends into a ratchet and clutch mechanism hereinafter to be described. On these drive rods 54 within the uprights or channels 53 are driving sprockets 55 over which are trained conveyor chains 56. Between corresponding link portions of the opposite chains, are extended a plurality of tray rods 57 upon which are pivotally mounted merchandise carrying trays or drops 58 (Fig. 6, particularly) and each of these drops is provided on one side thereof with a lug 59 adapted to ride along the vertical side portion 60 of one or more of the channel-shaped uprights 53 in such manner that as the trays descend on one side (left-hand, Figs. 6 and 7) of the upright 53, they will be maintained in substantially extended or horizontal position suitable for supporting articles of merchandise 61 thereon. It may be explained here that there is provided a tripping notch or cut-away portion 62 in the lower part of the channel side 60 corresponding to the discharge position, such that when the tray 58, and particularly the lug 59 thereof, reaches the notch 62, the tray or drop will collapse and the merchandise 61 thereon will gravitate onto the dis-

charge apron or chute 31 for access through the discharge opening 23.

It will be understood that as the conveyor chain 56 trains over the sprockets (anticlockwise, Fig. 7), the dropped or collapsed trays 58 will hang in the position indicated by the tray 58' on the right-hand side of the upright 53 in Figs. 6 or 7, the trays on the left-hand side of the conveyor being loaded, of course, when the machine is set up for operation. Thus, the merchandise trays 58 each drop in succession as they descend toward the lower left-hand side of the conveyor system in register with the tripping notch 62.

Means for driving the conveyor system and successively positioning the trays at the discharge point include a coin-freed unidirectional driving ratchet and clutch means shown in detail in Figs. 6, 7 and 12. This latter mechanism includes a cam member 63 provided with a hub 64 rotatively mounted or floating on the right-hand outer end portion of the lower conveyor shaft 54 (Figs. 5 and 6). Forming part of this cam and hub structure 63, 64 is a radial arm 65 upon which is pivotally mounted as at 66 a pawl 67 normally urged by spring means 68 downwardly into engagement with ratchet teeth 69 on an intermediate ratchet member 70 which is coupled to the shaft 54 to rotate with the latter. Mounted behind the intermediate ratchet member 70 is a second or unidirectional ratchet 71, the teeth 72 of which are pitched oppositely to the teeth 69 of the intermediate ratchet so as to have stopping engagement with the end of a pawl 73 pivotally mounted as at 74 on a frame member and urged by spring means 75 into latching engagement with the second or unidirectional ratchet 71 (Figs. 6 and 7). This latter ratchet member 71, it may be observed, is also coupled to the shaft 54 for rotation therewith.

In operation, it will appear that the driving ratchet unit normally cannot be turned in an anticlockwise direction because of the latching effect of the pawl 73. However, the unit is free to turn in a clockwise direction and when the hub member 64 is so turned, the driving pawl 67 advances (clockwise, Fig. 6) into engagement with the next succeeding tooth 69 so that when and if the hub member 64 is turned back in an anticlockwise direction, the intermediate ratchet member 70 will likewise be turned and be effective to rotate the conveyor shaft 54 in this direction, provided the latching pawl 73 be released. Such release is effected by means of a release cam 63 on hub 64 and which bears against a roller stud 76 on the pawl 73 and pivots the latter against the tension of its spring 75 in an anticlockwise direction out of the path of the ratchet tooth 72 at such a time as the intermediate ratchet member 70 is drivingly engaged by its pawl 67 so that such reverse or counterclockwise movement of the driving ratchet assembly will be effective to rotate the conveyor shaft 54. As soon as the shaft 54 has thus been turned a distance equivalent to that necessary to drive the conveyor chain 56 a distance adequate to bring the next succeeding tray or drop into the releasing position, the cam 63 will ride off the roller 76 and permit the latching pawl 73 to be returned to latching position, thus preventing further anticlockwise movement of the driving ratchet assembly and stopping the latter at a particular position for reasons hereinafter to appear.

The foregoing operation of the driving ratchet assembly is accomplished through a releasable coupling with one of the manual controls 24 and with the assistance of a return spring mechanism.

Referring to Fig. 5, it will be observed that each of the manual controls 24 is fixed for rotation with a stud shaft 24' and each of these latter shafts is provided at its inner end with a coupling member in the form of a collar 77 provided with axially extending lugs 78 freely receivable in axially extending notches 79 in the hub 64 when the control panel 17 is pivoted into its upright closed operating position, as viewed in Fig. 5.

It will be observed in Fig. 5 that the stud shaft 24' extends through the coin chute unit 26, this being arranged so that the shaft will not interfere with any of the coin passages in the chute, and fixed upon the shaft at the inner surface of the panel 17 and the chute 26 is a pulley member 80, in the pulley track of which is attached as at 81 a spring 82 (see particularly Figs. 4 and 9) secured at its opposite end 83 conveniently to one of the cross rack members 28. This spring 82 serves to urge the control stud shaft 24' in an anticlockwise direction. Thus, when one of the control knobs 24 is turned in a clockwise direction (assuming a coin to have been deposited, as will be explained hereinafter), the driving ratchet assembly heretofore described in conjunction with Fig. 6, for example, will be likewise turned in a clockwise direction by virtue of the coupling with the hub member 64 so as to cause the pawl 67 to advance to the next tooth on the intermediate ratchet member 70; and when the cam 63 pivots the latch dog 73 into ineffective position, further clockwise movement of the control and assembly is stopped by the special coin control means later to be described, so that as soon as the control handle 24 is released, the spring 82, having been previously tensioned by the clockwise movement thereof, will restore the ratchet assembly to normal position in an anticlockwise direction, thus effecting a rotation of the conveyor shaft 54 through the agency of the pawl 67 and the intermediate driving ratchet until the latch dog 73 snaps into position and stops such movement.

A novel form of coin-operated latch dog mechanism is provided for the apparatus, although it may be of general application, and is illustrated especially in Fig. 12 as constituting a mechanism arranged to coact with the coupling collar means 77, in that there is mounted upon the stud shaft 24' as it emerges from the innermost side of the coin chute 26, a special cam 84 fixed for rotation therewith. This special cam 84 is provided with a radial projection or lug 85 from which extends a lateral pin 86, and this lug 85 is disposed so as to engage the end portion 87 of a pawl or dog 88 pivotally mounted as at 89 on the rear wall of the coin chute 26, there being provided a spring 90 normally urging the end portion 87 of the pawl in an anti-clockwise direction away from the cam 84 and the lug or tooth 85 thereon.

On the edge of the dog 88 between the end 87 and the pivotal mounting 89 thereof, is a latch tooth or stopping formation 91 engageable with the lug or tooth 85 on the cam when the latter is turned to the left as seen in Fig. 12, so as to prevent free movement of the latter and hence of the stud shaft 24' and its handle 24. The

lower end portion of the latch dog 88 is provided with a cam portion 92 normally engaged with the left-hand end portion of a coin-operated slide 93 slidably mounted on members or screws 94 extending through a horizontal slot 95 in the slide so that the latter may shift back and forth in a horizontal direction, there being a normal spring 96 attached to the coin slide and normally urging the latter toward the left into engagement with the cam portion 92 so as to pivot the dog 88 toward the right (Fig. 12) to project the tooth 91 into the path of the lug 85 to prevent free movement of the cam 84 and the operating control.

This coin slide 93 is mounted near the lower edge portion of the coin chute 26, as seen in Figs. 13 and 14, at a point corresponding to the accepted coin discharge opening 117a thereof, there being a small angularly edged anvil or block 97 arranged within the chute adjacent the discharge opening thereof and spaced opposite from a pair of lateral pins 98 projecting from the coin slide 93 into a notch 99 in the chute at a distance sufficient to accommodate a coin between the pins 98 and the block 97, as indicated in dotted lines in both Figs. 12 and 14.

It will thus appear that a coin which has been tested and accepted by the chute 26 will be delivered into the dotted line position in Fig. 12, so that movement of the slide 93 toward the left will be prevented, the slide being normally moved a slight distance to the right (Fig. 12) due to the tension of the spring 90 on the dog 88 and tending to turn the latter in an anti-clockwise direction against the tension of the slide spring 96.

With a proper coin positioned as aforesaid, a clockwise movement of the manual control 24 will effect, as seen in Fig. 12, a similar movement of the special cam member 84 which will be seen as an anticlockwise movement in Fig. 12, and this will cause the tooth or lug 85 to approach the latching ledge or tooth 91 on the dog 88. However, the latter dog is held in a position such that the lug 85 will pass the tooth 91 because the coin prevents movement of the slide 93 by its spring 96 to urge the dog 88 in a clockwise direction so as to project the tooth 91 in the path of this lug 85. Therefore, the special cam member 84 may continue its movement in an anticlockwise direction (Fig. 12) until the lateral pin 86 on lug 85 engages an offset lug or arm 100 on the coin slide 93 and shifts the latter against the tension of its spring 96 toward the right (Fig. 12), thus permitting the coin to drop from between the block 97 and the pins 98 onto an apron 101 constituting the bottom of a special coin receiver hereinafter to be described. At this juncture, the movement of the entire control mechanism, including the special cam member 84, is stopped by virtue of the fact that the coin slide 93 is shifted to the right to the limit of its movement, and this constitutes an operative movement of the several parts adequate to turn the driving clutch assembly and the conveyor shaft 54 through the coupling collar 77 and means 77-78-79. This actuation will effect the dropping of the next successive conveyor shelf or tray 58 dispensing an article of merchandise.

It may be observed that there are a plurality of latch teeth 102 on the periphery of the cam member 84 and these teeth are cooperable with a small full-stroke dog 103 normally positioned by a spring 104, as seen in Fig. 12, to ride into the teeth and prevent retrograde movement of the cam member until the large releasing tooth 105

is reached so as to permit the dog 103 to pivot in the opposite direction.

The coin chute 26 is preferably of the type shown in our U. S. Patent 2,158,919 granted May 16, 1939, which includes a form of scavenging mechanism adapted to open up the chute or otherwise dislodge defective coin elements and the like which may have become lodged therein. To this end, the coin chute illustrated herein is provided with a movable scavenging element including an actuating stud 106 (Fig. 2) near the upper part of the chute and which is movable to effect operation of the scavenging means (in a manner similar to the operation of the pin 33 in Fig. 2 of the aforesaid patent).

In order to effect movement of the scavenging member 106, there is provided a shift rod 107 (Figs. 3 and 12, particularly) slidably mounted for vertical movement on pin means 108 along the side of the chute 26. This shift rod 107 has an enlarged end portion provided with a cam edge 109 underlying the scavenger actuating pin or lug 106 in such manner that when the rod 107 is shifted vertically the pin member 106 will be cammed outwardly to open the scavenging gate or other clearing means.

Vertical reciprocation of the scavenger operating rod 107 is effected twice for each dispensing operation of the control 24 by means of an offset cam bracket 110 secured by any suitable means to the lower end of the shift rod 107 and extending around to the rear side of the coin chute 25 above the special latching cam 84. The lower edge of the bracket 110 is provided with an S-shaped cam track 111 which is engaged by a cam roller 112 on the special cam member 84 so as to raise and lower the member 110 twice for each operative oscillation of the special cam member 84, thus assuring that the coin chute will be frequently cleared.

An automatic blocking or coin return mechanism is provided in the form of a blocking arm 113 (Figs. 7 and 8) pivotally mounted in lugs 114 constituting part of the frame structure and having an offset finger or end portion 115 positioned before an opening 116 into the coin passage on the rear side of the chute 26 at a point at which a coin otherwise moving toward the acceptance exit opening so that it would be positioned to release the latch dog mechanism 88, etc., will be deflected toward a reject opening 117 positioned above the merchandise discharge apron 31.

A small weighting washer 118 on one of the arms of the member 113 normally urges the latter so as to project the blocking finger 115 thereof into blocking position. However, the blocking member 113 is normally urged into ineffective position by means of a lever arm 119 pivotally mounted between its ends in a bracket 120 on the frame structure and having an offset lower end portion 121 projecting into a loop 122 formed on the other end of the blocking arm 113. The upper end 123 of the lever 119 is bent over a lug 124 on the frame structure so as to underlie the descending conveyor trays 58. The weight 118 is effective to pivot the blocking member 113 into effective position only when the end portion 123 of the lever 119 is free to move upwardly away from the lug 124, but this latter movement is normally prevented by the weight of the lowermost tray 58, provided there is an article of merchandise 61 thereon; if there be no such article, then this upper end portion 123 of the lever 119 may move up-

wardly under the urgency of the weight 118 sufficient to permit the movement of the blocking member 115 into position. Thus, if there is no merchandise on the lowermost shelf as it approaches discharging position, the coin passage will be blocked by the member 115 and the coin deflected and returned to the customer via the discharge opening 117 (Fig. 8).

In Fig. 7 there is illustrated a novel form of coin receptacle or receiver including the coin apron 101 upon which are mounted spaced uprights 126 of substantially triangular shape and having an offset flange 127 along their base portions and secured to the apron 101 by welding or other suitable means.

Thus, the apron 101 constitutes the bottom of the receptacle, and the back portion is provided in the form of a plate 128 (Fig. 5) having side portions 129 bent over and secured as by welding to the underlying side portions of the uprights 126, there being also an offset lip 130 along the top edge of this back plate and which is positioned beneath the accepted coin discharge opening 117a along the bottom edge of the coin chute 26 so that accepted coins will be guided thereby in their gravitating movement into the receiver.

The side flanges 129 on the back plate are extended at their upper ends to provide ears 131 between which extends a pintle 132 on which is pivotally suspended a door 133 provided at its upper end with turned-over sleeve portions 134 embracing the pintle. An offset strap 135 is secured to the door to provide a handle. Along its lower longitudinal edge portions the coin receiver door is provided with opposite laterally extending ears 136 which fit into slots in the upright side plates 126, so as to limit the movement of the door into closed position, and flush with the side plates so as to avoid openings into which defrauding instruments might be inserted. To each of the ears 136 there is secured one end of a closing spring 137, each of which is anchored at its opposite end to a lug 137' struck up on the flange portion 127 of the side uprights.

On the inner side of the control panel 17 opposite the coin receptacle door 133, there is provided an inwardly extending projection or stud 138 adapted to bear against the door 133 when the control panel is in closed position so as to prevent any possibility of opening the coin receptacle door 133, it being observed that the lower edge portion 101' of the apron 101 terminates in space above the discharge opening 23, so that such precautions are necessary to prevent fraudulent access to the coin box.

The foregoing novel coin receptacle structure cannot be opened until the control panel 17 is tilted into the open position of Fig. 2 to withdraw the stud 138 from blocking position in front of the door 133. When, however, such withdrawal is effected, the operator may grasp the handle 135 and tilt the door 133 against the tension of its springs 137 to release coins for movement down the apron 101 to spill onto the merchandise discharge apron 31 where they will be accessible through the discharge opening 23. In this manner, the coins are discharged quickly into a position where they can be conveniently reached by the collector, the pitch of the apron 101 being adequate to assure that no coin will remain thereon, so that it is unnecessary to inspect the receptacle for left-over coins.

A modified form of actuating mechanism for

automatic coupling with the control member on the novel control panel arrangement, is shown in the arrangement of Figs. 10 and 11 wherein the several coin chutes and corresponding operating mechanism are mounted as individual units, each tiltable independently of the others into accessible position, as will be described.

Referring to Fig. 10, the individual control units include spaced side supports 140 provided at their lower ends with extensions 141 having vertically opening slots 142 in which are pivotally seated headed studs 143 at the bottom portions of upturned flanges 144 on a mounting strap 145 extending laterally across the bottom region of a coin chute 26' and secured to the latter by any suitable means, so that the chute may be tilted into and out of vertical position on the studs 143 (Fig. 9).

The supporting structure 140 has a pair of opposite extensions 146 in its upper region, each of these having a forward vertical edge portion 147 turned back to provide curved lip portions between which the coin chute may be readily moved into vertical position. An automatic latch structure for locking the chute in upright operative position on its mounting, includes Fig. 11) an angle bracket 148 secured to the bracket portion 146 so as to lie behind the chute 26' and provide a stop for the latter. Pivotaly mounted on the bracket 148 as at 149 is a latch arm 150 having an upwardly extending handle portion 151 and provided with a pin 152 to which is secured one end of a normal spring 153, the other end of this spring being secured to a pin 154 on the bracket 148 to urge the latch arm downwardly in normal latching position, there being a stop pin 155 below the latch arm. On the rear of the coin chute 26' is a boss or stud 156 having a rounded head portion providing a cam surface and having a horizontal slot 157 providing a latch seat into which the arm 150 is urged by its spring.

The latch arm 150 is normally in latching position, as seen in Fig. 11, so that when the coin chute 26' is tilted into upright position on its studs 143, the cam surface of the boss 156 on the upper rear face of the chute will bear against the lower edge portion of the latch arm 150 and pivot the latter into open position so that the arm may seat in the latching slot 157 automatically. Thus, the chute or chutes are removably mounted for pivotal movement into and out of upright operative position and are provided with means for automatically latching the same in said position.

The modified driving mechanism and automatic coupling means therefor, as shown in Fig. 9, includes the shaft 24' extending through the pulley 80 and the mounting strap 145, through the chute 26' and a coin-operated latch dog mechanism 84-88, such as described in conjunction with Fig. 12. On its rearward portion, the shaft 24' has mounted a stamped gear 160 with its teeth offset in the manner of a bevel or crown gear, which meshes with a smaller and similarly constructed gear 161 mounted on the end of a stud shaft 162 extending through a sleeve 163 secured at one end to the bracket member 140 as at 164. The opposite end of the shaft 162 is provided with a small crown gear 165 (Fig. 10) meshing with the opposite teeth on an arcuate gear arm 166 floating on a drive shaft 54' having driving connection with a sprocket chain system 55-56, similarly to that described in conjunction with Figs. 2 and 5, with the ex-

ception that the conveyor sprocket drive, and hence the tier of drops or shelves, have been turned 90 degrees from the position seen in Fig. 7, so as to dispose the driving shaft 54' on the side of the bracket 140 instead of on the front, as seen in Fig. 7.

A unidirectional clutch or ratchet mechanism is arranged for cooperation with the arcuate driving gear 166 and includes a construction similar to that described in conjunction with Fig. 6 in that there is an intermediate ratchet wheel 69' coupled to the drive shaft 54' behind the hub portion of the arcuate gear, there being mounted behind the intermediate ratchet 69' a second or stopping ratchet 71' cooperable with a pawl 73' pivotally mounted on the bracket or frame member 140 as at 167 and urged by a spring 168 into position for stopping engagement of the ratchet 71'.

Pivotally mounted as at 169 on the arcuate gear 166 is a driving pawl 170 engageable with the teeth of the intermediate or driving ratchet 69' by the urgency of a spring 171 anchored to a lug 172 on the arcuate gear.

The operation of the control knob to effect the oscillation of the driving gear 160 when the coin-operated dog means 84-88 is actuated, is substantially the same as that described for the mechanism of Figs. 6 and 12, there being an initial clockwise movement of the control from its normal position (into which it is moved by the spring 82), which effects, through the gears 161-165, a clockwise movement of the arcuate gear 166, so that the pawl 170 advances to engage the next tooth on the intermediate ratchet 69'. During this latter movement, the cam edge portion 173 formed in the region of the hub portion of the gear arc 166, moves into engagement with an offset roller 174 on the dog 73' and pivots the latter into ineffective position. When the control knob and shaft 24' are restored, in an anticlockwise direction by the spring 82, to normal position, the gear arc 166 likewise moves in the same manner back to its normal position, the pawl 170 thereof carrying with it the intermediate ratchet wheel 69' and rotating the drive shaft 54' a distance necessary to move the conveyor chain 56 to position the next article tray or drop in discharging position, the cam portion 173 meanwhile permitting the return movement of the dog 73' into stopping position to assure the proper registration of the tray or drop.

The preferred embodiment of the invention set forth herein has been described in detail for purposes of illustration, it being understood that the objects of the invention may be accomplished by other forms and modifications of the specific embodiment set forth, so that the invention is not to be limited to any precise details of form, location or function except as may be provided hereinafter in the appended claims.

Having thus described our invention, what we claim as new and desire to protect by Letters Patent is:

1. In combination, a coin testing device including a chute body having a coin discharge opening and reciprocally operable scavenging mechanism, and control mechanism comprising a driving shaft having support on said chute body, an oscillable cam member on said shaft and provided with a cam nose, a latch dog pivotally mounted on said chute body adjacent said cam member and provided with a stopping formation engageable with said cam nose to prevent effective movement of the cam member, yieldable

means normally urging said latch dog out of position for locking engagement with said cam nose, means including a reciprocable coin-engaging slide and a coin stop cooperable therewith and mounted to receive coins therebetween from said discharge opening, said slide being normally urged by spring means in a direction to engage and pivot said latch dog into position for locking engagement with said cam nose, means on said coin slide engageable with a coin positioned before said stop to prevent movement of the slide for the purpose of pivoting the dog as aforesaid, said dog having a cam portion engaged by said cam nose on the oscillable cam member whereby said dog will be pivoted to move said slide for operative engagement with a coin received from said discharge opening as aforesaid, whereby said first-mentioned spring means may urge said dog into ineffective position, together with means on said cam member for shifting said slide to disengage a coin received as aforesaid, when the cam member is moved a predetermined distance, and means for actuating said scavenging means including a reciprocable drive member having cam means engaged by means on said cam member for effecting reciprocation of the drive member when the cam member is oscillated.

2. In a vending machine of the type having a unidirectional conveyor dispensing mechanism, control means including a unidirectional ratchet mechanism drivingly connected with said conveyor mechanism and provided with driving pawl means oscillable to effect unidirectional driving movement of said conveyor mechanism, a latch dog normally locking said ratchet mechanism against movement in a particular direction, said driving pawl means including an arcuate gear member with a cam formation engageable with said latch dog to pivot the latter into ineffective position when said gear is moved a predetermined distance opposite to said particular direction, and operating means drivingly connected with said arcuate gear for oscillating the same.

3. In combination, a driven member, relatively movable and stationary coin gripping members, and spring means urging the movable member toward the stationary member to grip a coin therebetween and urge the movable member a predetermined amount nearer the stationary member when there is no coin between said members, a locking pawl normally moved by said movable coin gripping member into position to lock said driven member against effective movement from an initial position but permitting idle movement in said initial position, means on said driven member engaging said pawl to move the latter and effect movement of the movable coin gripping member an amount away from the stationary member sufficient to permit a coin to be disposed for support between said members when the driven member is displaced in idle movement as aforesaid, and spring means arranged to move the locking pawl out of locking position when a coin is gripped between the gripping members as aforesaid so as to prevent movement of the movable gripping member the aforesaid predetermined amount nearer the stationary member, and means moved by the driven member into engagement with the movable coin gripping member to shift the latter away from said stationary member and effect release of a coin from support between said members when the driven member is effectively moved a certain

distance away from said initial position free of the locking effect of said pawl.

4. Coin operated mechanism comprising an oscillable control and spring means normally urging the same into initial position, means oscillable by said control, a pivoted detent adapted to latchingly engage said oscillable means to prevent effective movement of the control but permitting idle movement of the same, a coin stop, a reciprocable element including coin engaging means disposed in spaced relation with said stop, means for directing a coin into position between said stop and coin engaging means, spring means normally urging said detent into operative engagement with said reciprocable element and out of latching engagement with said oscillable means, spring means normally urging said reciprocable element toward said coin stop and said pivoted detent to urge the latter into latching engagement with said oscillable means upon movement of the latter when there is no coin between the stop and the coin engaging means, said coin engaging means being adapted to engage a coin thereby blocking movement of the reciprocable member to pivot the detent into latching position such that said oscillable means can be moved effectively, said oscillable means being operatively engageable with said reciprocable element when the oscillable means is moved a predetermined distance in effective operation for moving the reciprocable element away from said coin stop whereby said coin will be released from the blocking position aforesaid.

5. In a coin control mechanism, control means comprising a manually oscillable member and a cam member oscillated therewith, a latch dog engageable with said oscillable member to latch the same against effective movement, spring means normally urging said latch dog out of effective engagement with said oscillable member, a reciprocable coin slide, means yieldably urging said coin slide into engagement with said latch dog to move the latter into position for effecting locking engagement with said oscillable member, spring means normally urging said latch dog into operative engagement with said coin slide, relatively stationary means for receiving and holding a coin cooperatively with said slide in a position to blockingly limit movement of said coin slide by said yieldable means for the purpose aforesaid, and means on said slide engaged by said cam member, when the latter is moved effectively into a certain position, to move said slide relative to said stationary means to render the latter and said coin slide ineffective to hold a coin in the blocking position aforesaid.

6. A coin control including a driven member, a locking pawl arranged for movement into a position for locking engagement with said driven member when the latter is moved from an initial position, means providing a coin seat including a coin slide and means yieldably urging the slide in a direction to engage and support a coin in said seat, means yieldingly urging said pawl out of said locking position and into operative engagement with said coin slide, said slide being moved a predetermined amount past coin engaging position upon movement of said driven

member when there is no coin in said seat to move said pawl into locking position, said slide being prevented from moving said predetermined amount and being thus rendered ineffective to move the pawl into locking position when the coin is disposed in said seat, and means actuated by the driven member to move the coin slide out of coin supporting position and free a coin from said seat when the driven member has been moved a certain amount from said initial position.

7. A coin control including an oscillable member, and a locking member arranged for movement in a direction toward and away from said oscillable member into and out of position for locking engagement therewith, a coin receptacle including a stationary coin engaging member and a moveable coin engaging member, spring means normally urging said locking member in a direction away from the oscillable member and into operative engagement with said movable coin engaging member, spring means normally urging said moveable coin engaging member in a direction toward said stationary coin engaging member to bear against said locking member so as to move the latter into locking position upon movement of said oscillable member when there is no coin in the receptacle, said coin engaging member being prevented from moving the locking member into locking position as aforesaid by engagement with a coin in the receptacle.

8. In a coin control, a coin receiver including a stationary coin engaging member, and a movable coin engaging member arranged for movement toward and away from the stationary member to supportably engage a coin disposed in said receiver, means yieldingly urging the movable member into coin supporting position toward the stationary member, a driven cam and a moveable locking member therefor and means normally urging said locking member into operative engagement with said moveable coin engaging member and out of locking relationship relative to the cam, said locking member and moveable coin engaging member being arranged for cooperation such that the locking member is normally positioned by the coin engaging member when the latter is urged, as aforesaid, a certain distance toward said stationary member, to dispose the locking member in a locking condition upon movement of the latter when there is no coin disposed between said engaging members, said moveable coin engaging member being prevented from moving the locking member into locking position as aforesaid by engagement with a coin between said engaging members, and means actuated by said cam when the latter is moved a certain distance from an initial position free of said locking member to shift the moveable coin engaging member away from and out of coin engaging relationship with said stationary coin engaging member, said cam being arranged when in said initial position to move the moveable coin engaging member through the agency of said locking member away from the stationary member to permit disposition and support of a coin between said engaging members.

WALTER A. TRATSCH.
WILLIAM PATZER.