

Dec. 30, 1952

R. SMITH ET AL

2,623,801

VENDING APPARATUS

Filed Feb. 15, 1949

5 Sheets-Sheet 1

Fig. 1.

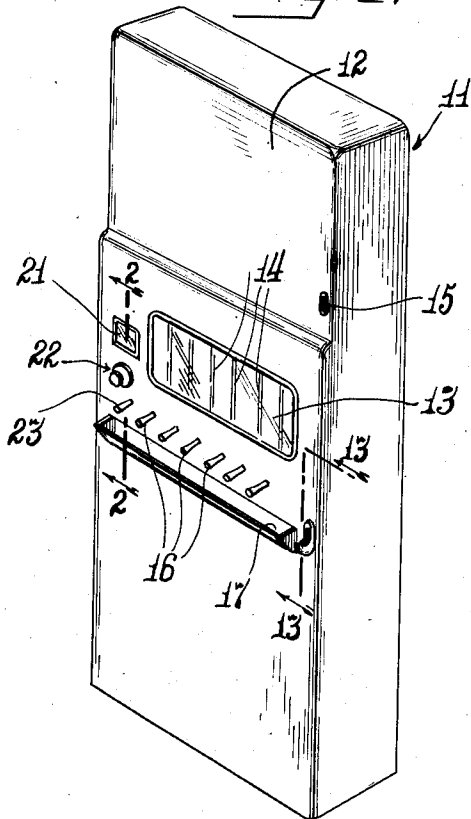


Fig. 12.

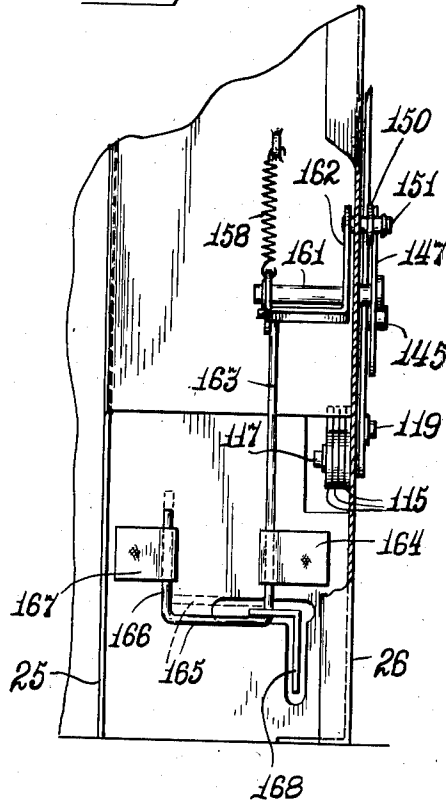


Fig. 13.

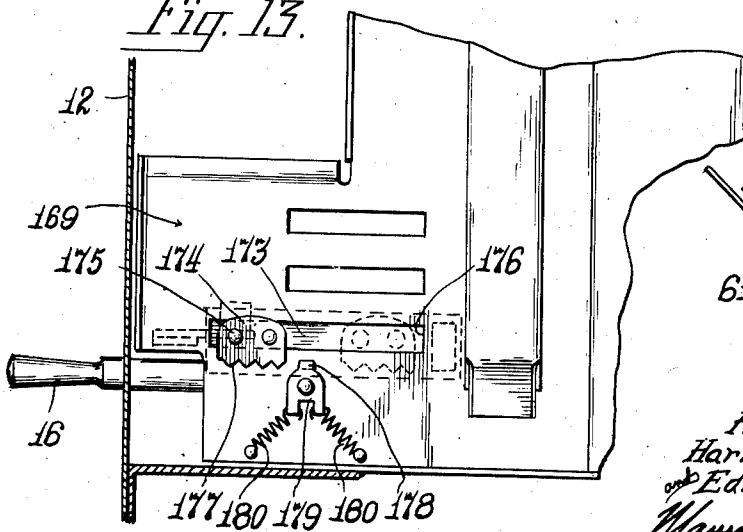
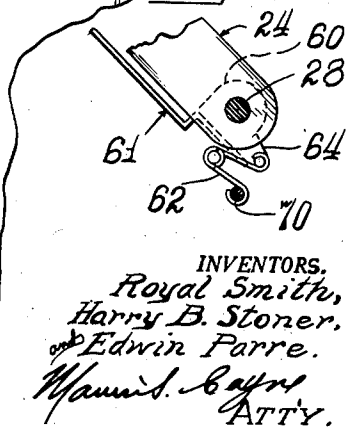


Fig. 14.



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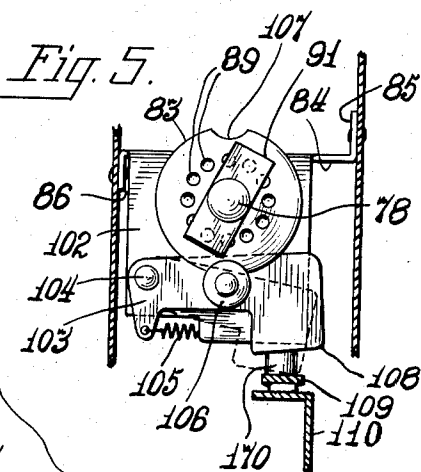
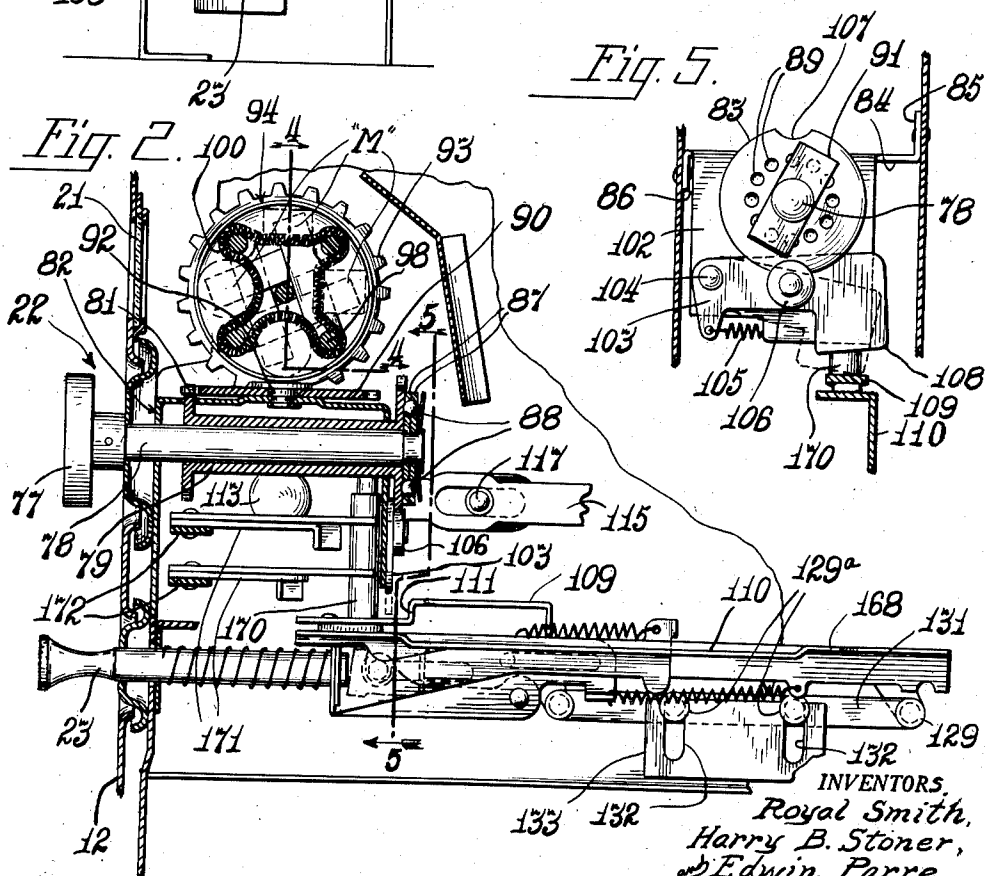
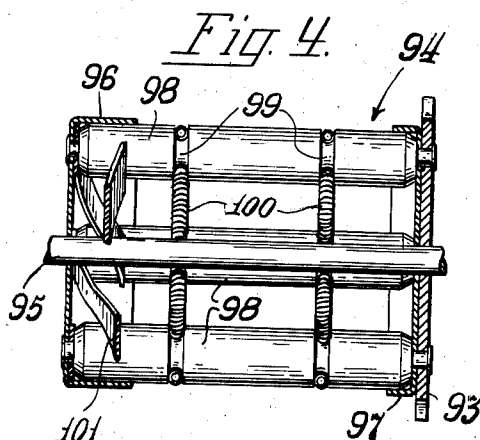
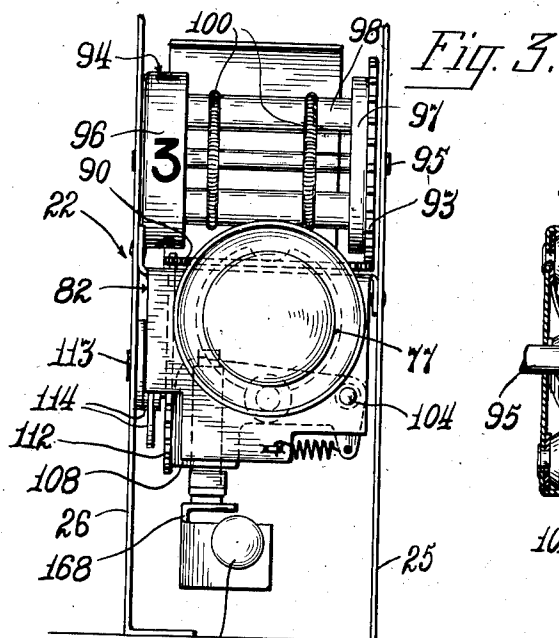
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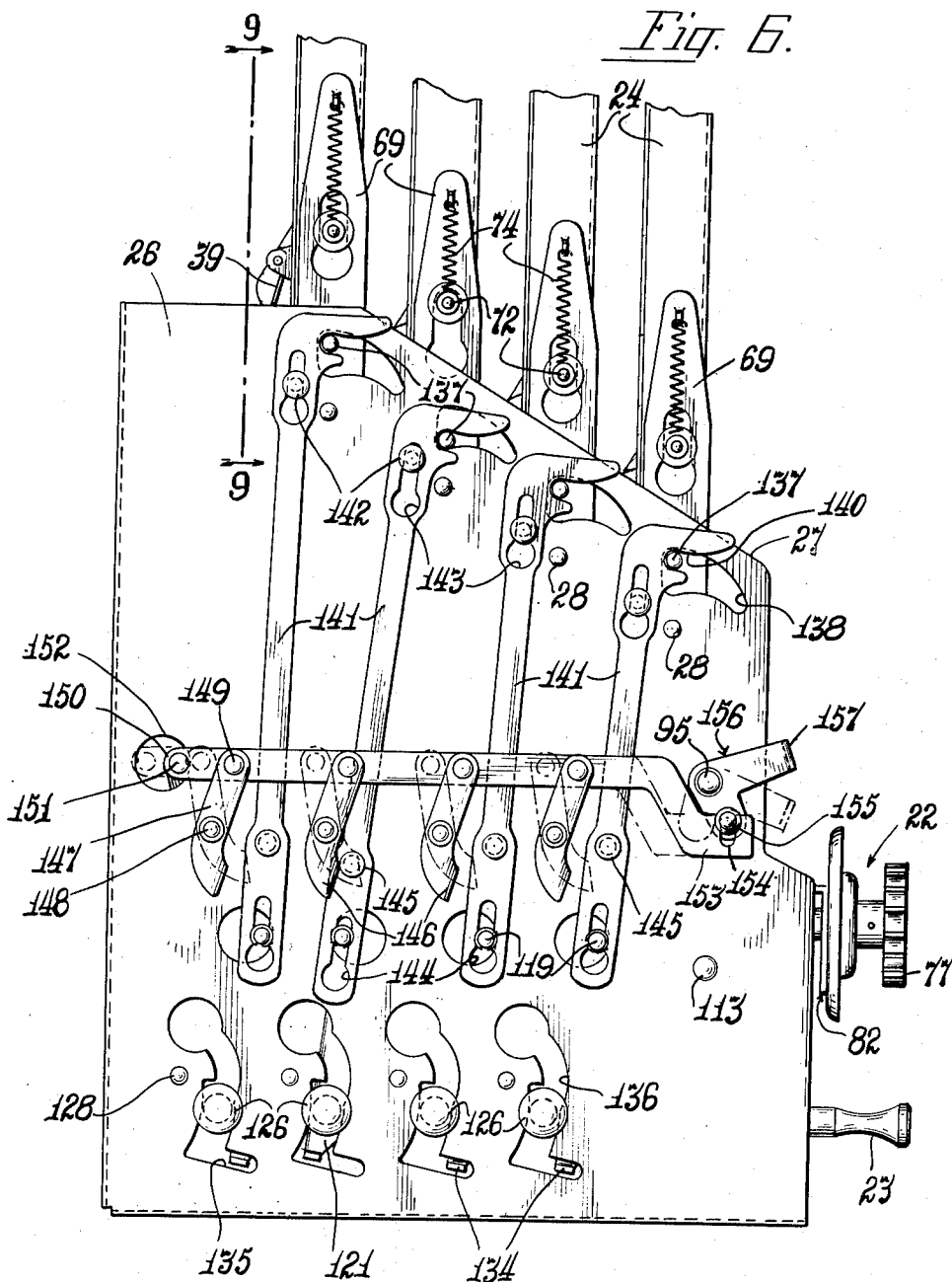
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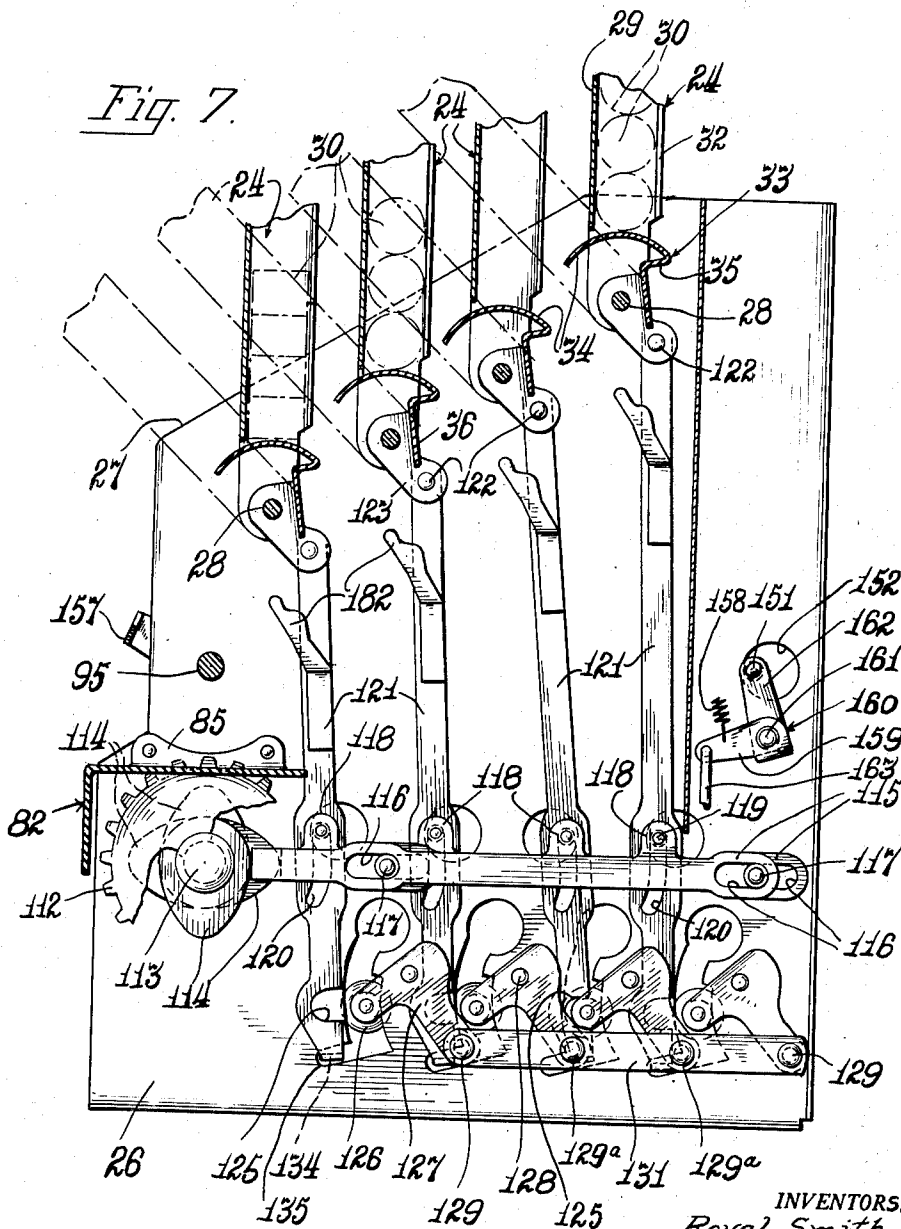
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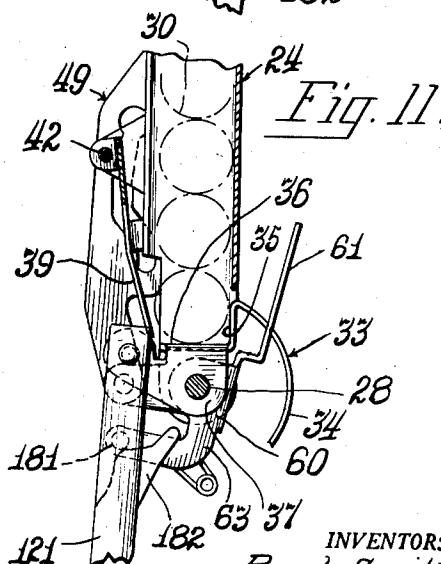
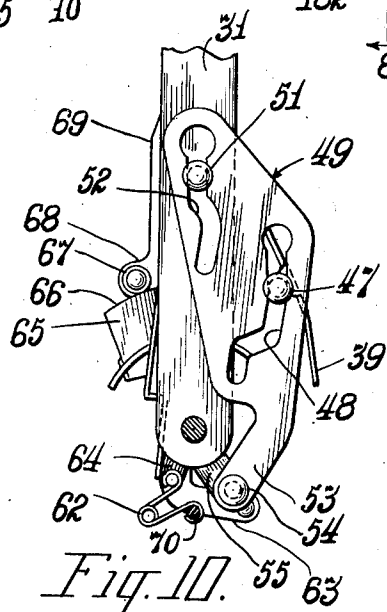
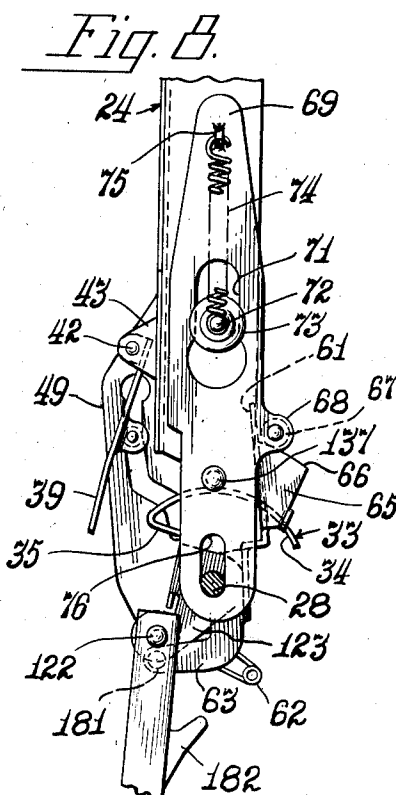
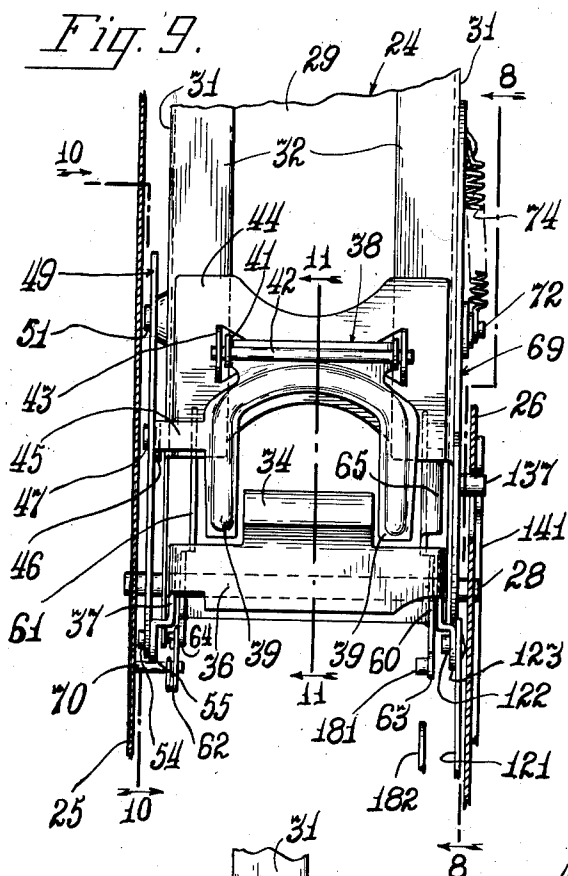
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UNITED STATES PATENT OFFICE

2,623,801

VENDING APPARATUS

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Application February 15, 1949, Serial No. 76,506

14 Claims. (Cl. 312—63)

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The invention relates to improvements in vending machines and more particularly to a machine of the kind adapted to vend a selected piece of merchandise upon the insertion into said machine of a coin of predetermined denomination.

Merchandise vending machines of the kind with which the present invention is concerned frequently have a plurality of movable racks, each containing a different kind of merchandise, which are selectively placed in position to permit discharge of merchandise contained therein selectively. Such machines, however, locate the actual merchandise to be vended in a position to be viewed through a window. This necessarily involves a structure that is costly to manufacture and service. It is therefore an object of the present invention to provide a vending machine with a plurality of stationary merchandise racks and with novel means to effect selection of merchandise in any one of the racks for vending.

Another object of the present invention is to provide a vending machine of the character referred to with novel viewing means operable, during the selection of the merchandise, to display a non-vendable sample or specimen of the merchandise contained in each rack.

Another object is to provide means whereby the mechanism effective to vend a piece of merchandise is operative to prevent vending of more than one piece of merchandise during each cycle of operation.

Another object of the invention is to provide means common to all of the merchandise racks effective upon operation of the selector mechanism to indicate when a rack is empty of merchandise and to prevent operation of the machine insofar as that rack is concerned.

Another object is to provide novel coin-controlled means to lock and unlock the mechanism operable to vend merchandise.

Another object of the invention is to provide novel means for holding samples of merchandise for selective display.

Another object of the invention is to provide novel mechanism to prevent selector manipulation during operation of the vending mechanism, and vice versa.

Another object is to provide means to prevent repeated operation of the vending mechanism actuating means when but a single coin has been deposited.

Another object of the invention is to provide a vending machine embodying all of the features outlined hereinabove and which is not expensive to manufacture but is positive and fool-proof in

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its operation and easy to manipulate and service.

Other and further objects of the present invention will be apparent from the following description and claims and are illustrated in the accompanying drawings, which by way of illustration show a preferred embodiment and the principle thereof and which is considered to be the best mode contemplated for applying that principle. Other embodiments of the invention embodying the same principle may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

In the drawing:

Fig. 1 is a perspective view of a vending machine embodying the present invention.

Fig. 2 is a vertical sectional view through a portion of the vending machine, taken substantially on line 2—2 of Fig. 1 to illustrate the selector mechanism.

Fig. 3 is a front elevational view of the selector mechanism shown in Fig. 2, the front wall of the machine housing being omitted.

Fig. 4 is a longitudinal sectional view of the selector indicating drum, taken substantially on line 4—4 of Fig. 2.

Fig. 5 is a rear end elevational view of the selector mechanism, showing the vending plunger in section, taken substantially on line 5—5 of Fig. 2.

Fig. 6 is an end elevational view of the vending mechanism, showing the machine housing removed.

Fig. 7 is a vertical transverse sectional view, similar to Fig. 2, but illustrating the mechanism mounted on the inside face of the vending machine end wall shown in Fig. 6.

Fig. 8 is a side elevational view of one of the merchandise racks as viewed substantially along line 8—8 of Fig. 9.

Fig. 9 is an elevational view of the rear side of the rack shown in Fig. 8, taken substantially along line 9—9 of Fig. 6.

Fig. 10 is a side elevational view of the opposite side of the merchandise rack, taken substantially on line 10—10 of Fig. 9.

Fig. 11 is a sectional view of a merchandise rack taken substantially along line 11—11 of Fig. 9, showing the gate and connecting link in elevation.

Fig. 12 is a fragmentary rear elevational view of the vending machine, showing the plunger locking mechanism.

Fig. 13 is an end elevational view of the vend-

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ing machine showing the housing broken away and taken substantially along line 13—13 of Fig. 1.

Fig. 14 is a fragmentary detail view of the rack and merchandise contact fingers in the position assumed when the rack is tilted forward for filling.

Referring to the drawings and more particularly to Fig. 1, the vending machine, designated generally at 11, includes a housing 12 having a window opening 13 in its front wall. A plurality of stacks, indicated at 14, is arranged within the housing 12. These stacks may be arranged side by side and each is adapted to contain merchandise to be vended. Vending of merchandise from the stacks 14 is accomplished by inserting a coin of the correct denomination in a coin slot 15 and then pulling a selected one of a plurality of plungers 16 projecting from the front of the machine outwardly. The piece of merchandise vended is deposited in a trough 17 where it may be removed by the purchaser. The specific construction and mode of operation of the vending machine insofar as it has been described hereinabove are of a kind particularly shown, described and claimed in Stoner Patent No. 2,324,040, granted July 13, 1943, or in the pending Stoner et al. application Ser. No. 66,224, filed December 20, 1948, and, inasmuch as it constitutes no part of the present invention, further detailed description of that structure is not deemed to be necessary.

The vending mechanism embodying the features of the present invention preferably is located along one side of the vending machine mechanism referred to hereinabove. As viewed in Fig. 1, the novel vending machine mechanism is located at the left hand side of the housing 12. This mechanism is particularly adapted to permit manual selection and vending of any one of a plurality of different kinds of merchandise upon the deposit of a coin of a predetermined value in the coin slot 15 and manipulation of a single operating plunger. It includes a window opening 21 provided in the front wall of the housing 12 and a selector 22, located below said window and projecting from the front side of the housing. A manually actuatable plunger 23, which is like plunger 16, also is associated with said vending mechanism and is operable when the coin-controlled mechanism of the vending machine is unlocked so as to vend the piece of merchandise selected by the setting of the selector 22. The piece of merchandise vended, like the pieces of merchandise vended by the other vending mechanism embodied in the machine, is deposited in the trough 17 so as to be readily removed by the purchaser.

The novel vending mechanism embodying the features of the present invention includes a plurality of racks 24 (Fig. 6) each of which is substantially rectangular in section and extends upwardly from a chassis including spaced apart walls 25 and 26. The walls 25 and 26 are substantially rectangular in shape and preferably have their foremost upper corners cut away to provide inclined top edges 27. The lower end of each of the racks 24 is pivotally secured, as by a hinge pin 28, to and between the walls 25 and 26 at uniform distances below the inclined edges 27. The pivotal mounting of the racks 24 affords means whereby said racks may be moved from the substantially vertical position illustrated, in full line, in Fig. 7 into forwardly inclined positions (broken lines) for convenience when re-

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plenishing the merchandise to be contained therein.

Upon referring specifically to the disclosure of one of the racks in Figs. 8 through 11 inclusive, it will be observed that each rack includes a front wall 29, side walls 31 and inwardly turned flanges 32 which constitute the open back wall of the rack. Merchandise to be dispensed is contained within the rack between the confines of the front wall 29 and inwardly turned flanges 32 in the manner illustrated at 30 in Fig. 7. This merchandise is adapted to be dispensed piece by piece each time the plunger 23 is operated. The particular rack from which merchandise is to be dispensed is selectively determined by the operator upon manipulation and setting of the selector 22.

The manner of selecting the rack from which merchandise is to be dispensed will be described in detail presently. It is sufficient to note at this time, however, that the merchandise is retained in the rack by means of a gate 33, the latter normally being positioned as illustrated in Figs. 7 and 8. As there shown, each gate comprises an arcuate portion 34 normally underlying and supporting the lowermost piece of merchandise in the rack. The arcuate portion 34 is of a length considerably greater than the width of the rack 24 and it terminates along its rearmost edge in an abrupt shoulder 35 which merges with a shelf-like portion 36. The ends of the shelf-like portion 36 are provided with downturned flanges 37 suitably apertured to receive there-through the hinge pin 28. It should be evident that the gate 33 is free to rock about the hinge pin 28. Novel means is provided to effect such movement whereby when the gate 33 is rocked in a clockwise direction, from the position illustrated in Fig. 8 into the position illustrated in Fig. 11, the lowermost piece of merchandise in the rack drops onto the shelf 36. Return movement of the gate toward its initial position causes the piece of merchandise resting upon the shelf 36 to be discharged therefrom into a suitable guideway or other means, not illustrated, for conveying said merchandise into the trough 17.

Each rack 24 is also provided with means to prevent more than one piece of merchandise to be dispensed each time its gate 33 is operated. To this end, a substantially U-shaped bracket 38 (Fig. 9) is pivotally mounted on the lower end of each rack 24. The bracket 38 includes a pair of downwardly extending fingers 39 and is suitably formed on its upper end with ears 41 apertured to receive therethrough a hinge pin 42 having its ends journaled in lugs 43 preferably struck outwardly from a bridge plate 44 firmly secured, as by welding, to the rack flanges 32.

When the gate 33 is in merchandise-supporting position, as illustrated in Figs. 8 and 9, the bracket 38 is positioned substantially as shown with its fingers 39 inclined outwardly away from the rack. When the gate 33 is moved into merchandise-dispensing position, the bracket 38 is rocked about its hinge pin 42 to carry the fingers 39 inwardly substantially into the position shown in Fig. 11. In this position the fingers 39 lie closely adjacent to the piece of merchandise resting upon the shelf 36 and prevent said piece of merchandise, as well as the next succeeding piece or pieces, from being vended. As the gate 33 returns to its initial merchandise-supporting position, the fingers 39 move outwardly substantially at the same rate as movement of the gate so

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as to afford an opening between the gate and said fingers to permit the selected piece of merchandise to drop off of the shelf 36. Any tendency of the next succeeding piece of merchandise to follow the path of the dispensed piece of merchandise is prevented by the re-entrance of the arcuate gate portion 34.

The mechanism provided to afford this manner of cooperation between the fingers 39 and gate 33 is best illustrated in Figs. 9 and 10. As shown, the bracket 38 has an arm 45 extending laterally on one side thereof provided with a lip 46 bent at right angles thereto. The lip 46 carries a cam pin 47 which travels in a cam slot 48 formed in a cam plate 49 carried on the side wall 31 of the rack 24. Mounting of the cam plate 49 on the rack 24 is best accomplished by means of a pin 51, firmly secured to the rack side wall 31, which is engaged at all times in a cam slot 52 in said cam plate. The cam plate 49 has a downwardly extending arm 53 pivotally secured at 54 to an ear 55 formed integral with one end flange 37 of the gate 33.

The cam plate construction described hereinabove is such that when the gate 33 is rocked through one cycle of operation, the cam plate 49 likewise is reciprocated through an operating cycle to cause the cam slot 48, acting through the pin 47, to rock the bracket 38.

Means is provided in each rack 24 to prevent operation of the vending mechanism when the rack is empty. To this end, a bracket, including a pair of rigidly joined fingers 61, having apertured end walls 60, is pivotally mounted on the pivot pin 28. These fingers normally are adapted to rest against the lowermost pieces of merchandise in the rack. A toggle spring 62, having one end connected to a projecting ear 64 depending from one of the end walls 60 and its other end secured to a pin 70 projecting inwardly from the wall 25, tends to urge the fingers 61 into the position referred to. An arm 63 depends from the other end wall 60 for a purpose to be described hereinafter. One of the fingers 61 is provided with an outwardly extending flange 65 having its top edge 66 cut on an arc having the pin 28 as its center. The arcuate edge 66 normally underlies a roller 67 carried on a lug 68 projecting laterally from one edge of a reciprocal plate 69 mounted for vertical sliding movement on one side wall 31 of the rack 24.

As best illustrated in Figs. 8 and 9, the plate 69 has a slot 71 through which a fixed guide pin 72 projects. A washer 73, firmly secured on said guide pin 72, holds the plate 69 firmly against the outside face of the side wall 31. A spring 74, connected at one end to the pin 72 and at its other end to an eyelet 75 struck out of the plate 69 adjacent its upper end, normally tends to urge the plate 69 in a downwardly direction. Downward movement of the plate 69 in response to the urging of the spring 72 is, however, prevented by the coaction of the roller 67 and arcuate edge 66 previously referred to.

When the rack 24 is empty of merchandise, the fingers 61 rock inwardly into the rack under tension of spring 62. When this occurs, the arcuate edge 66 is carried inwardly out from beneath the roller 67, thereby allowing the plate 69 to move downwardly under the tension of its spring 74. The distance the plate 69 is permitted to move in a downwardly direction is determined by the length of a vertical guide slot 76 adjacent the lower end thereof through which the pivot pin 28 extends. Such repositioning of the plate

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69, when the rack is empty, operates to adjust mechanism, to be described presently, which is effective to prevent actuation of the operating plunger 23 through the cycle of operation necessary to accept a coin and vend merchandise.

As noted hereinabove, the vending machine illustrated is provided with means to enable the customer to select any one of four different kinds of merchandise contained in the racks 24. Accordingly, the selector 22, projecting on the front face of the housing 12, is adapted to be manipulated to actuate means for positioning a specimen of the merchandise contained in either one of said racks within the view of the operator and to condition the machine to vend merchandise of the kind selected. As best shown in Figs. 2, 3, 4 and 5, the selector 22 includes a knob 77 firmly mounted upon a shaft 78 which extends through the front wall of the vending machine housing and has a sleeve 79 rotatably mounted thereon. The sleeve 79 is substantially co-extensive with the shaft 78 and is provided on its end disposed toward the housing front wall with a pinion 81. Its other end is journaled for free rotation in a bracket 82 and has a disk 83 secured firmly to its projecting end. Upon referring to Fig. 5, it will be observed that the bracket 82 includes a substantially horizontally disposed wall portion 84 suitably flanged on its side edges, as at 85 and 86, to provide means for securing said bracket firmly between the spaced apart walls 25 and 26.

A slip connection is provided between the shaft 78 and sleeve 79. As shown, this connection preferably includes the disk 83 and a pair of strap members 87, both of which are firmly secured to the end of the shaft 78. The strap members 87 are apertured adjacent their ends to receive balls 88 which are adapted to selectively cooperate diametrically opposed pairs of shallow recesses 89 provided in the underlying face of the disk 83. The balls are resiliently held in engagement with the recesses by means of a leaf spring 91 which overlies the plates 87. Under normal conditions of operation, the sleeve 79 rotates in unison with shaft 78. However, under certain conditions of misuse, efforts may be made to rotate the sleeve 79 and its disk 83 while related mechanisms are jammed or otherwise held against manipulation. Under such conditions of misuse any abortive attempt to rotate the sleeve 79 by rotation of the selector knob 77 will cause the balls 88 to disengage from the engaged recesses 89 and successively pass over any recesses subsequently encountered.

The pinion 81 on the forward end of the sleeve 79 is in constant mesh with a horizontal sprocket 90 journaled, at 92, on the top face of the bracket wall 84. This sprocket is constantly meshed with a sprocket wheel 93 mounted on one end of a selection indicating drum, generally indicated at 94.

The drum 94 is mounted for free rotation upon a horizontal shaft 95 which is journaled, at its ends, in the walls 25 and 26 above the bracket 82. It preferably consists of a pair of substantially cup-shaped end members 96 and 97 held in spaced apart relationship by circumferentially spaced rods 98. In the present disclosure there are four such rods and each is anchored at its ends by being riveted to the end walls of the cup-like end members 96 and 97 respectively. The sprocket wheel 93 may be secured firmly to the selector drum by being riveted thereto in the manner illustrated.

Each rod 98 is provided with a pair of longitudinally spaced circumferential channels 99, and endless springs 100 are laid in said channels to provide a pair of continuous resilient bands circumscribing the selector drum. These resilient bands afford the means whereby specimens of the merchandise contained in the racks 24 may be mounted for display. As shown in Fig. 2 several such pieces of merchandise, generally indicated by the letter "M," are illustrated. Such pieces of merchandise may be mounted readily by simply inserting one end thereof beneath the circumferential flange on the cup-like end member 96 and pressing the same inwardly radially between adjacent rods 98 to locate its opposite end in position to engage beneath the circumferential flange on the other cup-shaped end member 97. Leaf springs 101 firmly secured on the inside face of the cup-like end member 96 co-act with the related ends of the pieces of merchandise to urge them against the inside face of the end member 97 and thereby prevent longitudinal displacement thereof.

The mechanism described hereinabove is such that upon rotation of the knob 77, the sprocket 99 is rotated to impart rotation through the sprocket wheel 93 to the selector drum 94. The ratio between the pinion 81 and the sprockets 93 and 93 is such that a one-half revolution of the knob 77 will rotate the drum 94 one-fourth of a revolution. In this manner the various pieces of merchandise carried by the drum 94 may be successively positioned so as to be viewed through the viewing window 21 in the vending machine housing 12.

The selector mechanism is provided with means to assist the operator in determining when the selector knob 77 has been rotated a distance sufficient to properly position a piece of merchandise for viewing and to prevent inadvertent operation of the machine in the absence of proper selection. As best illustrated in Fig. 5, the top wall 84 of the bracket 32 has a downwardly extending rear flange 102 through which the sleeve 79 extends. The portion of the flange 102 extending below the journal for the sleeve 79 has a pawl 103 pivotally mounted thereon, as at 104. A spring 105 urges the pawl 103 in a counter-clockwise direction as viewed in Fig. 5. A roller 106 carried by said pawl, is disposed in vertical alignment with the sleeve disk 93 so as to ride upon the circumferential edge of said disk during operation of the selector mechanism. The disk 93 has a pair of diametrically opposed notches 107, each of which is of a size sufficient to enable the roller 106 to enter therein when either one of said notches is in alignment therewith. As a result of this co-action between the roller 106 and notches 107, rotation of the knob 77 is momentarily interrupted each time the roller enters one of the notches. When such engagement occurs the selector drum 94 is in one of its four positions of adjustment.

After the operator has selected the merchandise to be purchased and has deposited a coin of the correct denomination in the coin slot 45, the plunger 23 is grasped and pulled outwardly. Movement of this plunger outwardly is effective to actuate the means for releasing a piece of merchandise corresponding to the kind selected, from one of the racks 24 containing the same. Outward movement of the plunger 23 will be prevented in the event the operator has failed to properly position the selector. Locking of the plunger 23 against outward movement is accomplished by means of the pawl 103 which, as best

shown in Fig. 5, has a downward extending free end portion, as at 108, which terminates normally above the top plane of an upwardly offset strap 109 constituting a part of the plunger assembly. Inasmuch as the plunger assembly is for the most part fully disclosed in prior art, no specific recitation of its detailed construction is thought to be necessary.

It might be observed, however, that the plunger assembly, including the plunger 23, has a rearwardly extending angle bar 110 carrying the strap 109. When the depending end 108 of the pawl 103 is in its lowermost position, as illustrated in dotted lines in Fig. 5, the shoulder 111 of the offset strap 109 abuts said pawl end and prevents withdrawal of the plunger 23. However, when the selector mechanism is properly positioned, the depending lever end 108 is located above said shoulder and affords no interference of any kind to withdrawal of the plunger 23. The pawl 103 also prevents manipulation of the selector mechanism while the plunger is being moved outwardly. This results from the advance of the elevated portion of the strap 109 beneath the depending lever portion 108. Such association of the parts prevents the necessary downward movement of the pawl to permit disengagement of the roller 106 thereon from the engaged notch 107.

The selection, for vending, of merchandise contained in any one of the racks 24, upon manipulation of the selector 22, is accomplished during manipulation of said selector. As a result of this coordination between the selector and the vending mechanism, to be described presently, a selected one of the racks 24 is conditioned to vend a piece of merchandise corresponding to the specimen of the merchandise viewed through the viewing window 21. Upon referring to Figs. 3 and 7 it will be observed that the horizontal sprocket 93 also meshes with a sprocket 112 suitably journaled for rotation on a horizontal stud 113. The stud 113 is firmly secured to the wall 26 and it has, mounted for free rotation thereon, a plurality of cam elements 114. In the present machine four merchandise racks are provided. Consequently, there are four cam elements 114 each of which is disposed ninety degrees from the adjacent cam element. These cam elements are firmly secured to and are rotatable in unison with the sprocket 112. As a result, manipulation of the selector knob 77 to rotate the selector drum 94 likewise rotates the cam elements 114 in unison to dispose one or the other of said cam elements in such position as to shift a related one of a plurality of horizontally slidable selector bars 115.

Each of the bars 115 is provided, adjacent opposed ends thereof, with horizontal slots 116 to receive therethrough guide pins 117 firmly anchored upon and projecting inwardly from the side wall 26. Each selector bar 115 also is provided on its upper edge with one ear 118. Upon referring to Fig. 7 it will be observed that the ears 118 on the set of bars 115 are offset longitudinally relative to each other. In the present disclosure, the ear 118 on the bar 115 closest to the side wall 26 is located adjacent the forward end thereof. The ears on the remaining three selector bars 115 are selectively spaced rearwardly from the aforementioned ear and from each other and in conformity with the order of assembly. Thus, the ear 118 on the bar 115 shown in the foreground of the illustration in Fig. 7 is located adjacent to the rear end of said bar.

The mechanism to be described hereinafter is duplicated in connection with each of the racks 24. Consequently, the description, insofar as it relates to such mechanism, will be concerned with the structural relationship and function of but one of said mechanisms, it being understood that such description will apply equally to all of said mechanisms and that like numerals will identify corresponding parts.

The ear 118 on the selector bar 115 carries a horizontally disposed pin 119 which extends freely through a vertical slot 120 in a substantially vertically disposed connecting link 121. The link 121 is located on the inside face of the wall 26 and its upper end is pivotally secured as by means of a rivet 122 to an ear 123 provided on and depending from one end flange 37 of the gate 33. Any reciprocal movement of the link 121 vertically will impart rocking motion to the gate 33. This link therefore constitutes the sole means for rocking said gate from merchandise-supporting position into merchandising-vending position and for returning said gate to its initial position after vending has been effected.

Vertical reciprocation of the link 121 is obtained upon operation of the plunger 23. When the merchandise in a particular rack is not selected to be vended the lowermost end of its link, which depends below the selector bar 115, is free of any connection with any mechanism associated with the plunger 23. However, when the merchandise in a particular rack is selected to be vended, said lower end of the related link 121 is shifted horizontally into position to be operatively engaged by means to be described presently and which is actuated by the plunger 23. Such selective positioning of the link 121 for in-operation or operation is attained through horizontal shifting of the selector bars 115 during adjustment of the selector 22. In Fig. 7, the third link 121, counting from the left-hand side of the disclosure, is shifted into position for vertical reciprocation upon plunger operation. The remaining links are in non-engaging or neutral positions. This means that the merchandise contained in the third rack has been selected for purchase by the operator.

Horizontal shifting rearwardly of the lower end of the link 121 carries a notch 125 into embracing engagement with a roller 126 carried on one arm of an L-shaped bell-crank lever 127. The lever 127 is pivotally secured at 128 to the wall 26 and its other arm is pivotally connected at 129 to a horizontal link 131 common to all of said bell-crank levers. The link 131 is provided with a pair of inwardly extending studs 129a which are engaged in vertical slots 132 (Fig. 2) provided in a plate 133 depending from the angle bar 110 of the plunger assembly. It should be evident at this time that when the plunger 23 is pulled outwardly, the link 131 is shifted horizontally to thereby rock the bell-crank levers 127 in a clockwise direction. Such movement of the bell-crank levers carries the rollers 126 on their free ends upwardly so as to move the link 121 connected with one of said rollers upwardly to actuate the vending gate 33. Inadvertent shifting of the remaining links upwardly is prevented by reason of an outwardly turned lip 134 on their lower ends which project through horizontal slots 135 in the wall 26. The slots 135 terminate at one end in arcuate slots 136 which permit shifting of the links upwardly when the lips 134 are in register therewith.

In the event the rack selected for the vending

of merchandise is empty, means previously referred to is actuated to prevent operation of the vending mechanism in the manner described hereinabove and to afford visual means for informing the prospective purchaser that said rack is empty. This automatic locking and warning mechanism is embodied in the plunger actuated assembly and its specific elements are for the most part mounted on the outside of the end plate 26. Upon referring to Fig. 6, which best illustrates such control mechanism, it will be observed that each of the reciprocal plates 69 on the racks 24 is provided with a laterally extending pin 137 which projects through a substantially triangular-shaped curved slot 138 in the end plate 26. The projecting end of each pin 137 is engaged at all times in a notch 140 provided in the upper end of one of a set of draw bars 141. The draw bars 141 are mounted in a substantially vertical position upon the outside face of the plate 26 and each is secured thereto as by means of a rivet 142 which extends through a slot 143 therein. The lower end of each draw bar likewise is provided with a slot 144 through which one of the pins 119 on the ears 118 (Fig. 7) extends.

As described hereinabove, when a rack 24 contains merchandise the reciprocal plate 69 thereon is held in an elevated position by means of the arcuate edge 66 associated therewith. When held in this position the associated draw bar 141 is held elevated, as shown on the first, second, and fourth racks as viewed in Fig. 6, for a purpose to be described presently. However, when a rack 24 is empty of merchandise and the reciprocal plate 69 is dropped into its lowermost position (third rack from right in Fig. 6) the draw bar 141 associated therewith is likewise shifted into a lowered position.

When a draw bar 141 is in its lowered position, a stop pin 145 projecting outwardly therefrom above its lower end will encounter the lower curved free end 146 of a trigger 147 when said bar is shifted to the left (Fig. 6) during manipulation of the selector. There are four such triggers 147 and each is pivotally secured to the wall 26 as by a stud 148 located midway between its ends. The upper end of each trigger is pivotally secured as at 149 to a horizontally disposed strap 150. The strap 150 is supported by the triggers 147 and its rearmost or left hand end (Fig. 6) carries a pin 151 which extends through an enlarged opening 152 in the wall 26 for a purpose to be described presently. The forward end of the strap 150 is offset downwardly, as at 153, and said end is provided with a notch 154 to freely receive a pin 155 carried on one arm of a bell-crank lever 156. The lever 156 is firmly secured for free rotation on the projecting end of the selector drum shaft 95 and its other arm has its end portion 157 bent substantially at right angles thereto to extend across the face of the selector drum. This overlying end portion 157 of the bell-crank lever 156 is provided with the designation "Out" and it is adapted, during operation of the selector, to be moved in front of the specimen of merchandise selected and carried in the selector drum when the selected rack is empty of such merchandise.

The strap 150 is held normally in the dotted line position illustrated in Fig. 6. Such position of the strap 150 is effected by a spring 158 (Figs. 7 and 12) connected at one end to the back partition wall and at its other end to an arm 159 of a bell-crank 160 pivotally mounted at 161 on the

inside face of said plate 26. The other arm 162 of said bell-crank is pivotally connected at its end to the pin 154 on said strap 150. The purpose and function of the bell-crank 160 will be explained in detail presently. It is sufficient to note that when the strap 150 is in the full line position illustrated, the "Out" signal 157 is in an elevated position and the triggers 147 are inclined forwardly by reason of movement of pin 145 (third from right in Fig. 6) thereagainst.

The location of the triggers 147 is such that their free curved ends 146 lie below the path of the pins 145 when the latter are in an elevated or "rack full" position. As a consequence, movement of an elevated draw bar 141 to the left, as viewed in Fig. 6, upon selective engagement of the notch 125 of a link 121 (Fig. 7) with its related roller 126, is ineffective to rock the trigger 147. As a result the strap 150 is not shifted out of its dotted line position and the "Out" signal remains in its lowered or non-visible position.

Shifting of the strap 150 from the dotted line position illustrated into the full line or "Out" signalling position is effective to lock the plunger mechanism against operation. Such locking of the mechanism is attained through rocking of the bell-crank 160 hereinabove referred to. Upon referring to Figs 7 and 12, it will be observed that the bell-crank 160 has a rod 163 depending from the free end of its arm 159. This rod extends through a guide bracket 164 secured to the back wall of the vending apparatus and its lower end is formed substantially U-shaped to provide a horizontal portion 165 and an upwardly extending substantially vertical portion 166. It is preferred that the vertical portion 166 also extend through a guide 167 to secure the element against displacement. The horizontal rod portion 165 normally is held in the elevated dotted-line position illustrated in Fig. 12. However, when the strap 150 is shifted forwardly to actuate the "Out" signal, said rod is moved downwardly to locate said horizontal portion 165 in the full line position shown. As a consequence, the lower extremity of the rod 163 is carried into and through a notch or recess 163 (Fig. 2) provided on the edge of the horizontal flange of the angle bar 110 forming a part of the plunger assembly. The plunger 23 is thereby held against withdrawal.

As noted hereinabove, operation of the vending machine is controlled by a coin-controlled mechanism generally illustrated in part at 169 in Fig. 13. This mechanism is fully disclosed in the aforesaid Stoner United States Patent No. 2,324,040. It is sufficient for the purposes of the present disclosure to note that the plunger mechanism carries an upstanding pin 170 (Fig. 2) which is effective, when the plunger is pulled outwardly, to actuate means including levers 171 and links 172 for shifting one or more slide elements in the coin-controlled mechanism 169. Shifting of said slide element is permitted only when a coin of the proper denomination has been deposited in the coin-controlled mechanism. Said mechanism includes means to prevent repeated operation of the plunger 23 upon the insertion of but a single coin.

As shown in Fig. 13, one of the slide elements, generally indicated at 173 of the coin-controlled mechanism carries a block 174 which is firmly secured thereto as by rivets 175 extending through a slot 176 in one wall of the coin-controlled mechanism. The lower edge of the block 174 is

serrated to provide teeth 177 adapted to cooperate with an engaging portion 178 of a pawl 179 when the slide element 173 is moved during machine operation. Tension springs 180 normally hold the pawl 179 with its engaged portion 178 disposed substantially upright. During machine operation, as the slide element 173 is moved inwardly (to the right, as viewed in Fig. 13), the serrated edge 177 will engage the engaging portion 178 and rock the pawl in a clockwise direction in which position the slide element 173 can continue moving to the right. If this movement is interrupted while the engaging portion 178 is still in engagement with the serrated edge 177, the motion cannot be reversed to the left. However, when the stroke of the slide element 173 has been completed, which corresponds to completion of the outward movement of the plunger 23, the block 175 has been carried beyond the pawl 179 and said pawl will again assume its substantially normal vertical position. When the stroke is then reversed the pawl 179 will again be effective to prevent anything but a completed return stroke for the slide element 173 and the plunger 23.

To facilitate the filling of the racks 24, said racks are swingable into a forwardly inclined position about their pivots 28. When in such position their open upper ends are readily accessible for the insertion of merchandise. In order to insure against error in placing a certain kind of merchandise in a rack and a specimen of a different kind of merchandise in the corresponding position on the selector drum 94, each rack will bear a number (not shown) corresponding to a number associated with a space in the selector drum. For example, see the index numeral "3" in Fig. 3.

Obviously, merchandise fed into an empty rack would fail to properly seat itself upon the gate 33 unless the fingers 61 are carried out of the "Out" position. Such withdrawal of the fingers 61 is accomplished automatically when the rack is tilted forward into filling position. Upon reference to Fig. 14 it will be observed that tilting of the rack has carried the spring connection on ear 64 past a line between the rack pivot 28 and the anchor pin 70. As a result, the toggle spring 62 has acted to rock the fingers outwardly. When the rack is returned to its vertical position, the fingers are returned to the merchandise engaging position shown in Fig. 10.

The fingers 61 are also moved out of contact with the merchandise when the vending mechanism is actuated. This is accomplished by co-engagement between a pin 181 carried on the free end of the arm 63 and a finger 182 (Fig. 11) firmly mounted on and projecting upwardly and laterally from the related link 121. Such co-engagement is momentary but is sufficient to rock the fingers 61 into the outwardly inclined position illustrated in Fig. 11. As soon as the link 121 is returned to its normal lowered position the fingers 61 are returned, by action of said spring 62, into merchandise-engaging position.

The construction and mode of operation described hereinabove and specifically applied to such mechanism as is related to but a single merchandise rack 24 obviously is repeated in the instance of each rack 24, and such mechanism is of course operatively associated with the various control devices so as to actuate such control devices irrespective of which of said racks is selected for the vending of merchandise. Should any one of more of the racks 24 be empty the

vending of merchandise from the remaining racks is not interfered with.

Although an exemplary embodiment of the present invention has been disclosed in detail in the accompanying drawing and specifically described hereinabove, it should be understood that the mechanism is capable of embodying a wide variety of modifications in detail, structure and function without departing from the spirit of the invention or the scope of the appended claims.

We claim:

1. In a vending machine adapted to vend merchandise from a selected one of a plurality of racks of merchandise upon manipulation of selection means and actuation of an operating element common to all of said racks, normally closed merchandise discharge means associated with each rack, said selection means including a slidable member, a plurality of bell-crank levers, and separate links one associated with each discharge means and with each bell-crank lever, said links being movable selectively into and out of engagement with the bell-crank levers upon sliding of said sliding member, and means to rock the bell-crank levers to actuate the related discharge means.

2. In a vending machine adapted to vend merchandise from a selected one of a plurality of racks of merchandise, normally closed discharge means associated with each rack, links one connected at one end to each discharge means, a plurality of bell-cranks one located in the region of the other end of each link, common operating means for said bell-cranks, and manually actuatable selector means operable to move any one of said links into operating engagement with a related bell-crank whereby the selected discharge means is opened to discharge merchandise when the operating means is actuated.

3. In a vending machine adapted to vend merchandise from a selected one of a plurality of racks of merchandise, normally closed discharge means associated with each rack, links one connected at one end to each discharge means, a plurality of bell-cranks one located in the region of the other end of each link, common operating means for said bell-cranks, manually actuatable selector means operable to move any one of said links into operating engagement with a related bell-crank whereby the selected discharge means is opened to discharge merchandise when the operating means is actuated, and means responsive to the absence of merchandise in the rack selected effective to prevent actuation of the operating means.

4. In a vending machine adapted to vend merchandise from a selected one of a plurality of racks of merchandise, normally closed discharge means associated with each rack, links one connected at one end to each discharge means, a plurality of bell-cranks one located in the region of the other end of each link, common operating means for said bell-cranks, manually actuatable selector means operable to move any one of said links into operating engagement with a related bell-crank whereby the selected discharge means is opened to discharge merchandise when the operating means is actuated, and means responsive to manipulation of the selector means to visually indicate when a selected rack is empty of merchandise.

5. In a vending machine adapted to vend merchandise from a selected one of a plurality of racks of merchandise, normally closed discharge means associated with each rack, links

one connected at one end to each discharge means, a plurality of bell-cranks one located in the region of the other end of each link, common operating means for said bell-cranks, manually actuatable selector means operable to move any one of said links into operating engagement with a related bell-crank whereby the selected discharge means is opened to discharge merchandise when the operating means is actuated, and means responsive to manipulation of the selector means to visually indicate when a selected rack is empty of merchandise and to prevent actuation of the operating means.

6. In a vending machine adapted to vend selectively different kinds of merchandise upon actuation of coin-controlled mechanism, a plurality of merchandise racks, gates one normally closing the bottom of each rack, means to select the merchandise to be vended, means effective upon manual operation of the coin-controlled mechanism to move the gate of the rack containing the selected merchandise into vending position, a cam plate connected to the gate and movable means operable by the cam plate to prevent vending of more than one piece of merchandise while the gate is in a position for vending.

7. In a vending machine adapted to vend merchandise from a rack upon manipulation of a normally disconnected operating element, normally closed merchandise discharge means on said rack, a bell-crank lever, a link mechanically connected at one end to the discharge means and having its other end located in the region of the bell-crank lever, said link being movable into and out of engagement with the bell-crank lever, and means to rock the bell-crank lever to actuate the discharge means when the link is in engagement with the bell-crank lever.

8. In a vending machine adapted to vend merchandise from a rack upon manipulation of a normally disconnected operating element, normally closed merchandise discharge means on said rack, a bell-crank lever, a link mechanically connected at one end to the discharge means and having its other end located in the region of the bell-crank lever, said link being movable into and out of engagement with the bell-crank lever, means to rock the bell-crank lever to actuate the discharge means when the link is in engagement with the bell-crank lever, and means responsive to the absence of merchandise in the rack to prevent actuation of the bell-crank lever actuating means.

9. In a vending machine adapted to vend merchandise from a rack upon manipulation of a normally disconnected operating element, normally closed merchandise discharge means on said rack, a bell-crank lever, a link mechanically connected at one end to the discharge means and having its other end located in the region of the bell-crank lever, said link being movable into and out of engagement with the bell-crank lever, means to rock the bell-crank lever to actuate the discharge means when the link is in engagement with the bell-crank lever, and means responsive to movement of the link into engagement with the bell-crank lever to visually indicate when the rack is empty of merchandise.

10. In a vending machine adapted to vend merchandise from a selected one of a plurality of racks of merchandise, means individual to each rack operable to vend merchandise therefrom, common actuating means for all of said vending means, links one connected to each vending means, a selector effective to move and opera-

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tively connect a selected link with the actuating means, a display element operatively associated with the selector, said element carrying non-vendable display specimens of the merchandise to be vended, slidable means on each rack held in one position while the rack contains merchandise and in another position when the rack is empty, links one connected at one end to each slidable means and having their other ends connected one to each of said first named links, and a signal movable when a first named link associated with an empty rack is moved by said selector to prevent observation of a selected non-vendable specimen of merchandise.

11. In a vending machine adapted to vend merchandise from a selected one of a plurality of racks of merchandise, means individual to each rack operable to vend merchandise therefrom, common actuating means for all of said vending means, links one connected to each vending means, a selector effective to move and operatively connect a selected link with the actuating means, slidable means on each rack held in one position while the rack contains merchandise and in another position when the rack is empty, links one connected at one end to each slidable means and movable therewith, said links having their other ends connected one to each of said first named links, and latch means operable to lock the actuating means against operation when one of the first named links associated with an empty rack is moved by the selector.

12. In a selector mechanism for a vending machine, a rotatable shaft, a drum mounted on said shaft, said drum consisting of spaced apart end walls and circumferentially spaced bars extending between said end walls, and means on the end walls and means on the bars adapted to cooperate to retain a specimen of merchandise in the space between adjacent bars.

13. In a vending machine adapted to vend merchandise from a rack upon manipulation of a normally disconnected operating element, a rack, normally closed merchandise discharge means on said rack, a movable member, a link mechanically connected at one end to the discharge means and having its other end positioned for engagement with the movable member, said link being movable into and out of en-

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gagement with the movable member, means to move the movable member to actuate the discharge means when the link is in engagement with the movable member, and means responsive to movement of the link into engagement with the movable member to visually indicate when the rack is empty of merchandise.

14. A merchandise rack for a vending machine, a gate normally closing the bottom of said rack to prevent dispensing of said merchandise, means to rock said gate in one direction about a horizontal axis to carry a merchandise supporting portion of the gate out from beneath the merchandise, a shelf on said gate onto which the lowermost piece of merchandise drops, said gate rocking means being effective to then return the gate to its initial position to vend the merchandise on said shelf, and separate oscillatably rotatable means actuable when the gate is moved in said one direction to prevent premature vending of the piece of merchandise on said shelf.

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