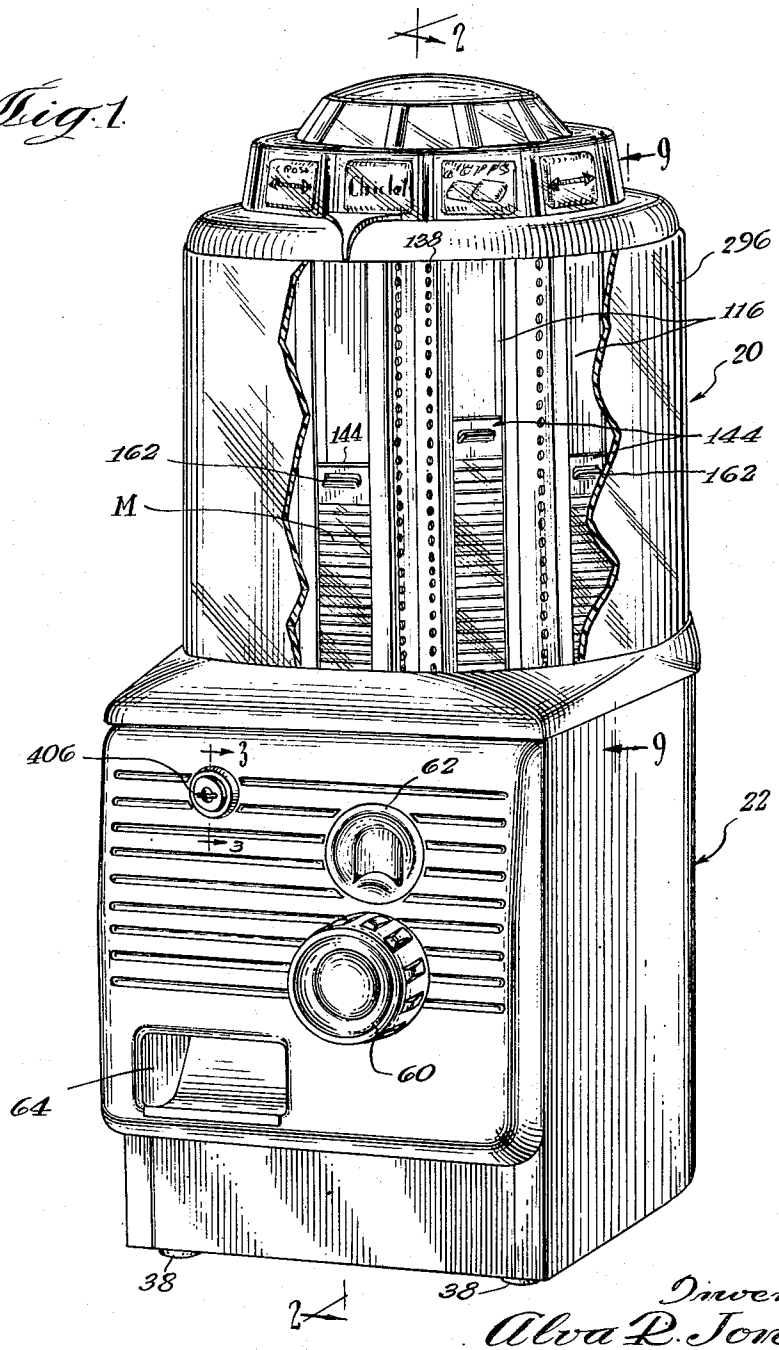
Dec. 7, 1954 A. R. JONES 2,696,324

SELECTIVE MERCHANDISE VENDING MACHINE

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Fig. 1.



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Fig. 2.

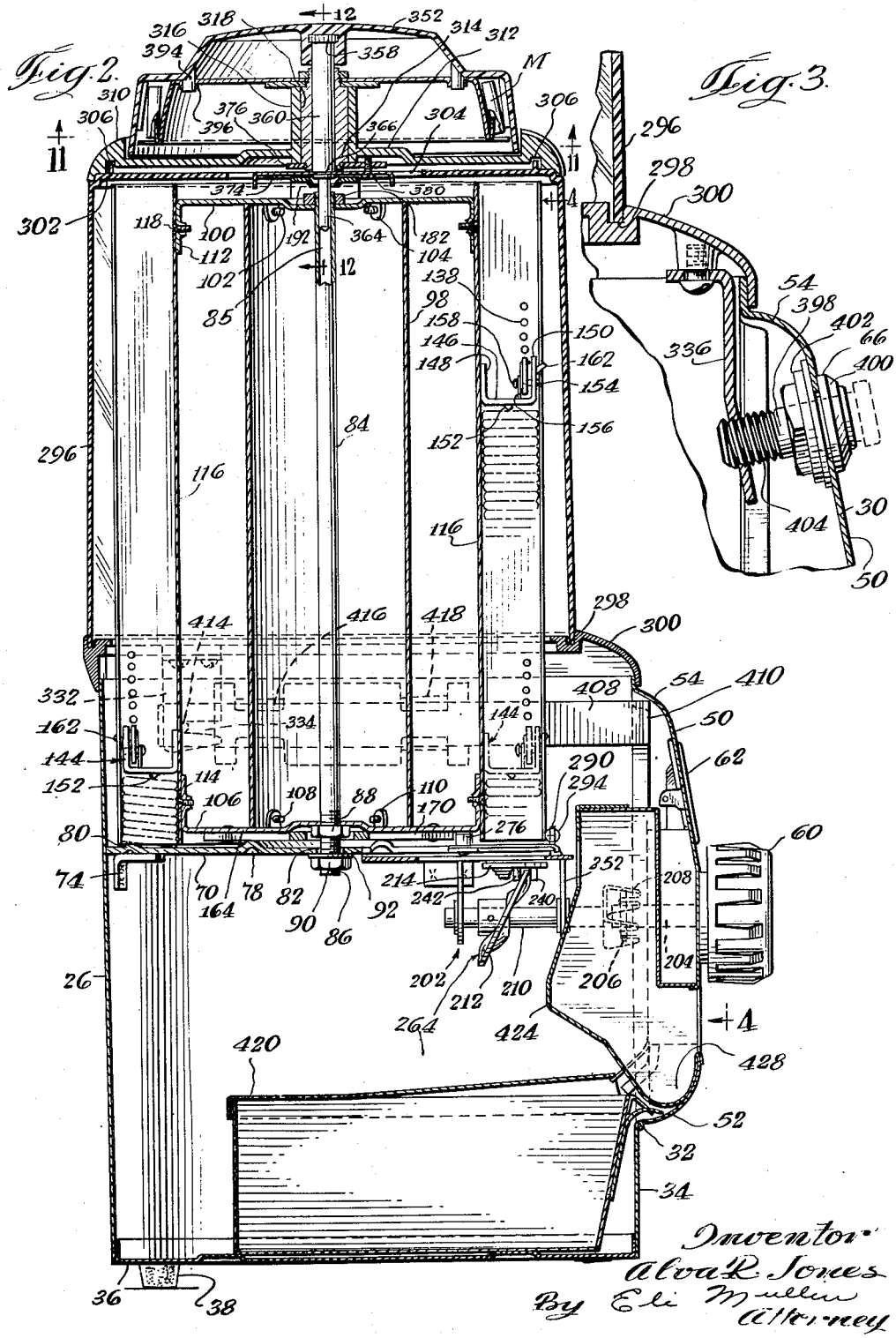


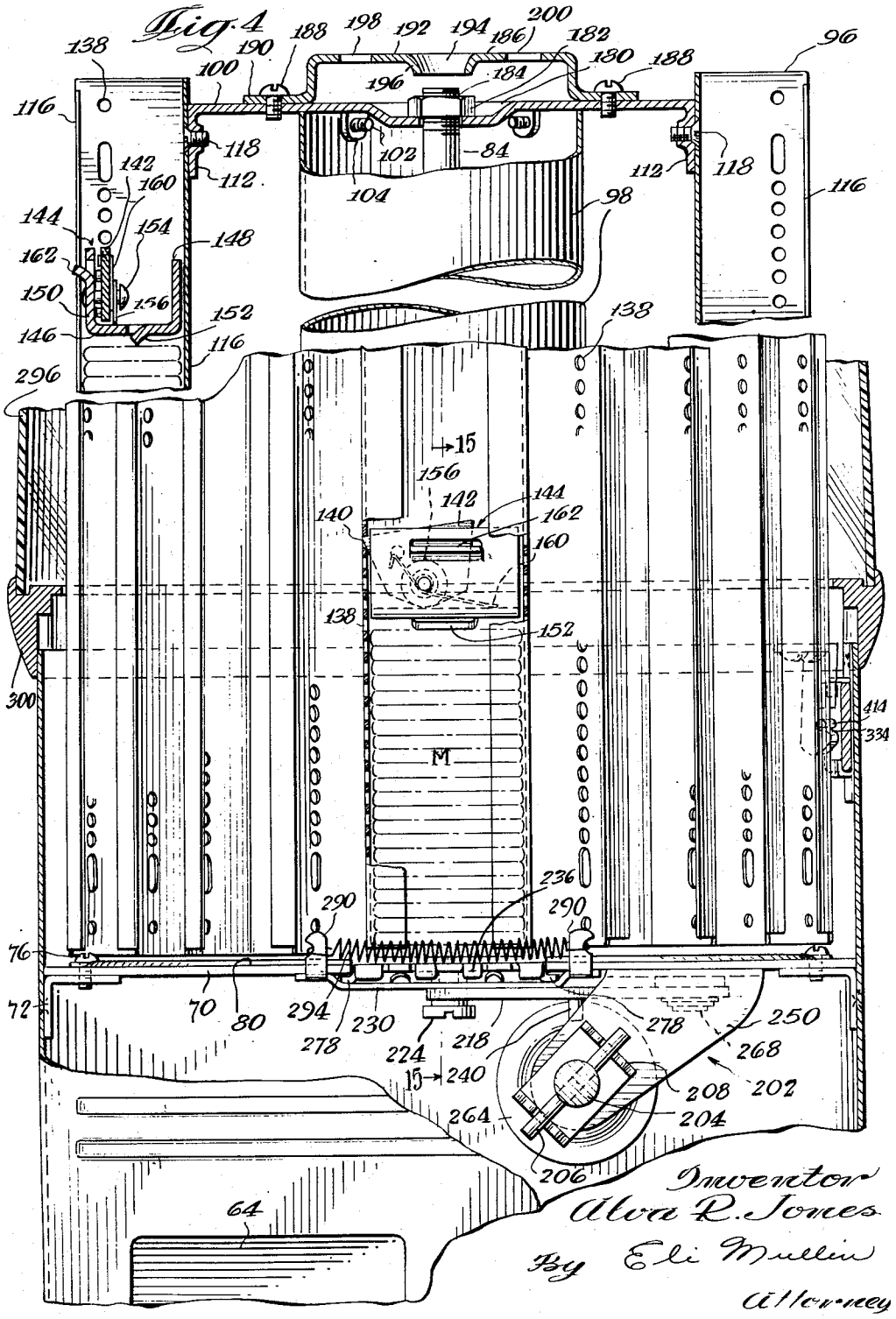
Fig. 3.

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SELECTIVE MERCHANDISE VENDING MACHINE

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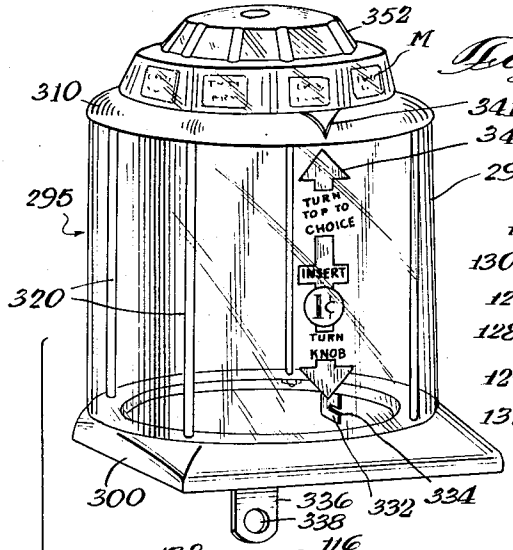


Fig. 5.

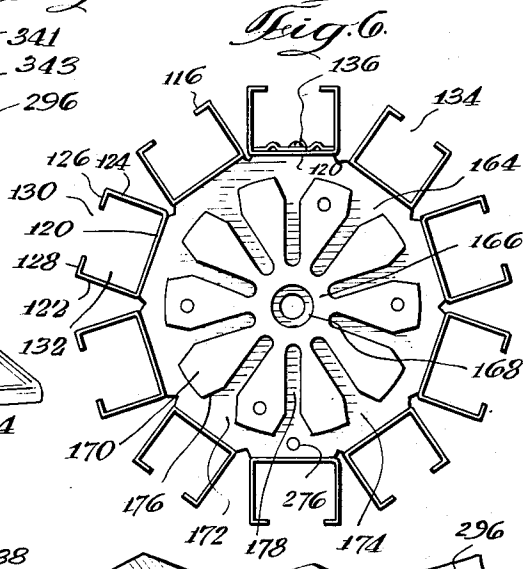
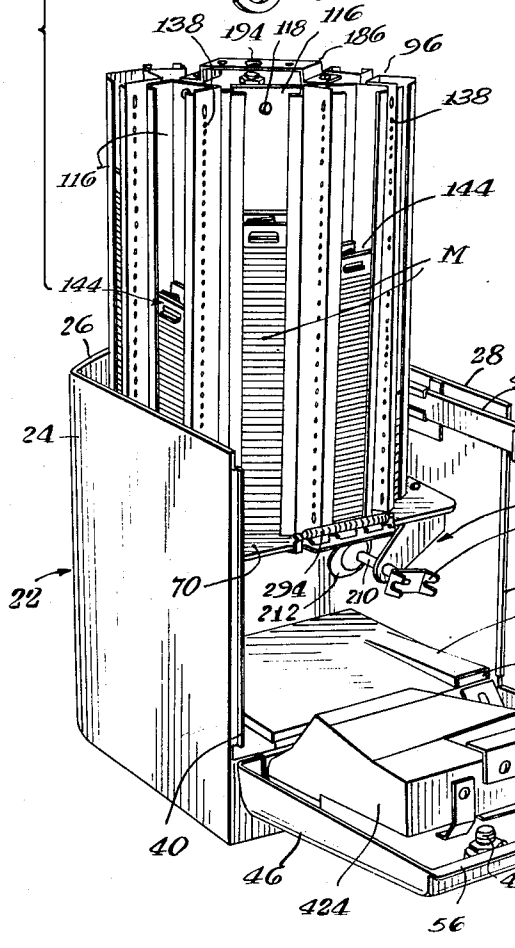


Fig. 6.



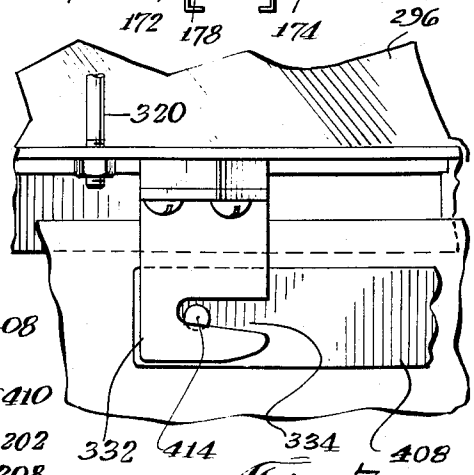


Fig. 7.

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Fig. 9.

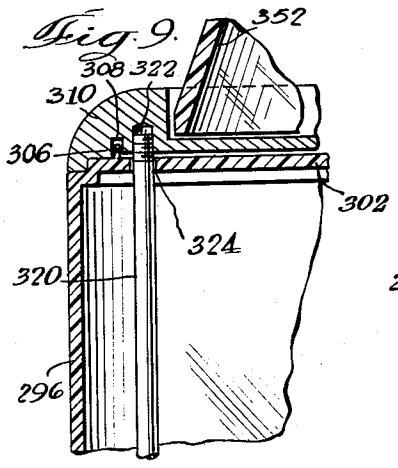
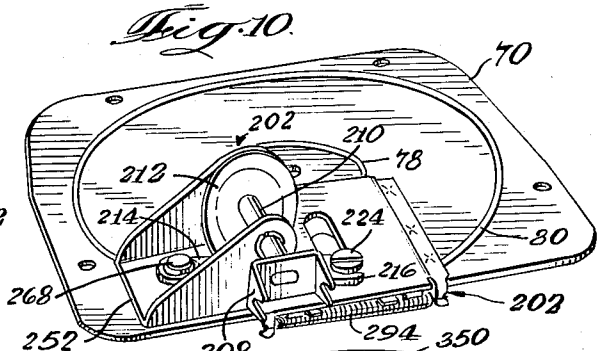
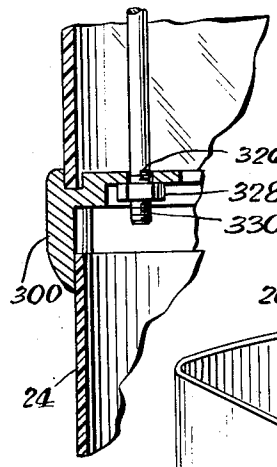


Fig. 10.





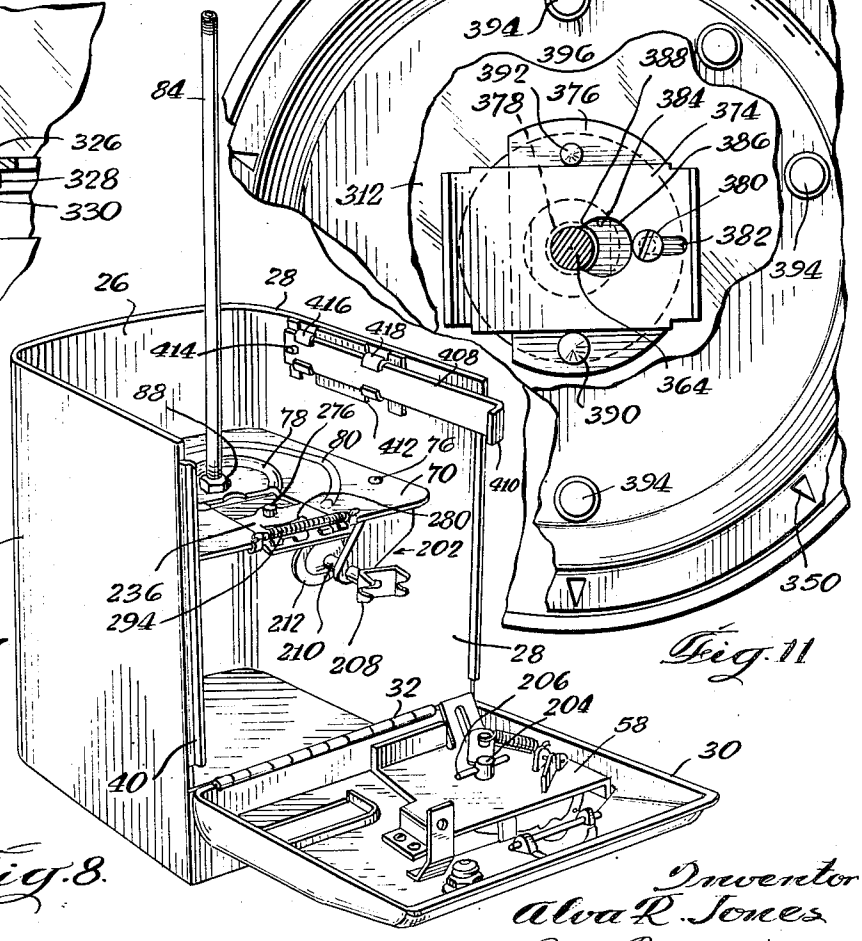


Fig. 11.

Fig. 8.

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Fig. 14

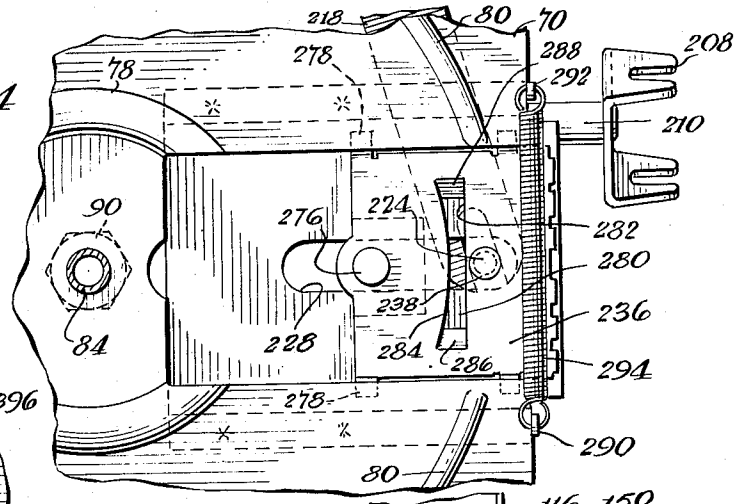
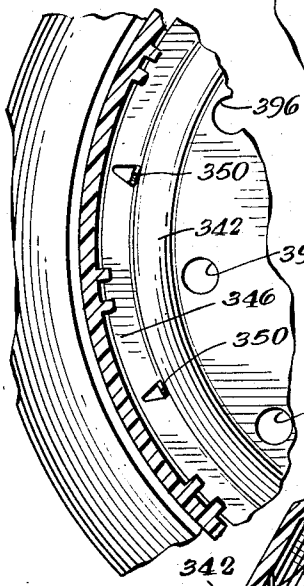


Fig. 13.



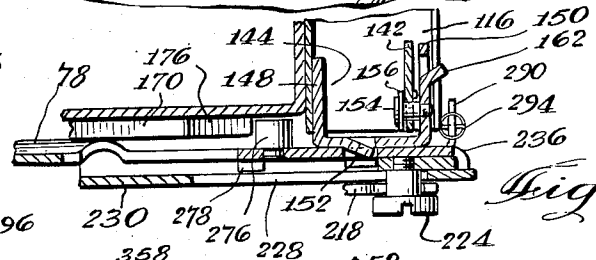
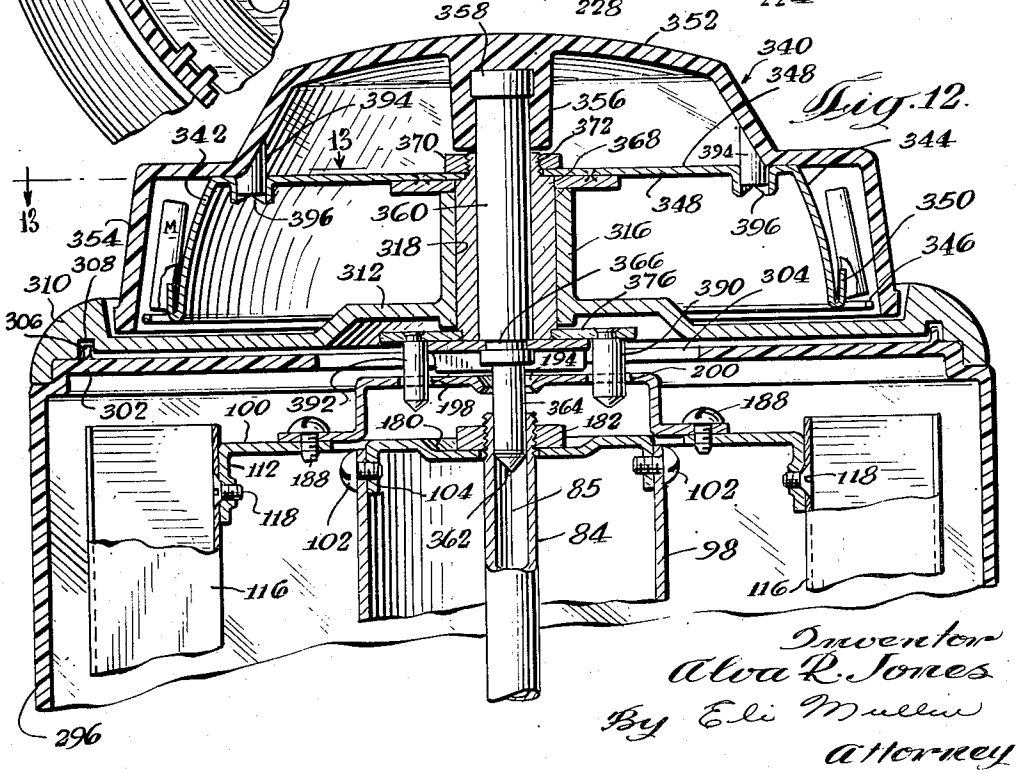


Fig. 15.

Fig. 12.



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SELECTIVE MERCHANDISE VENDING MACHINE

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Fig. 17.

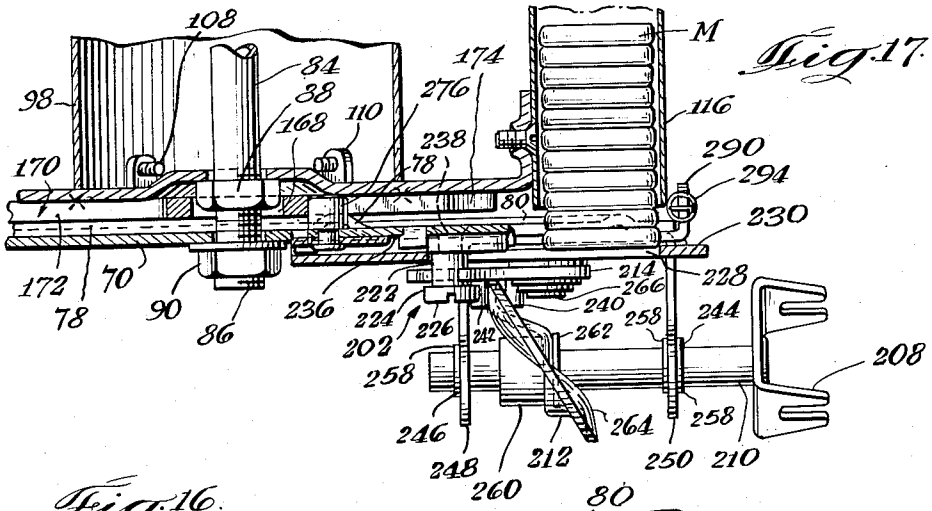


Fig. 16.

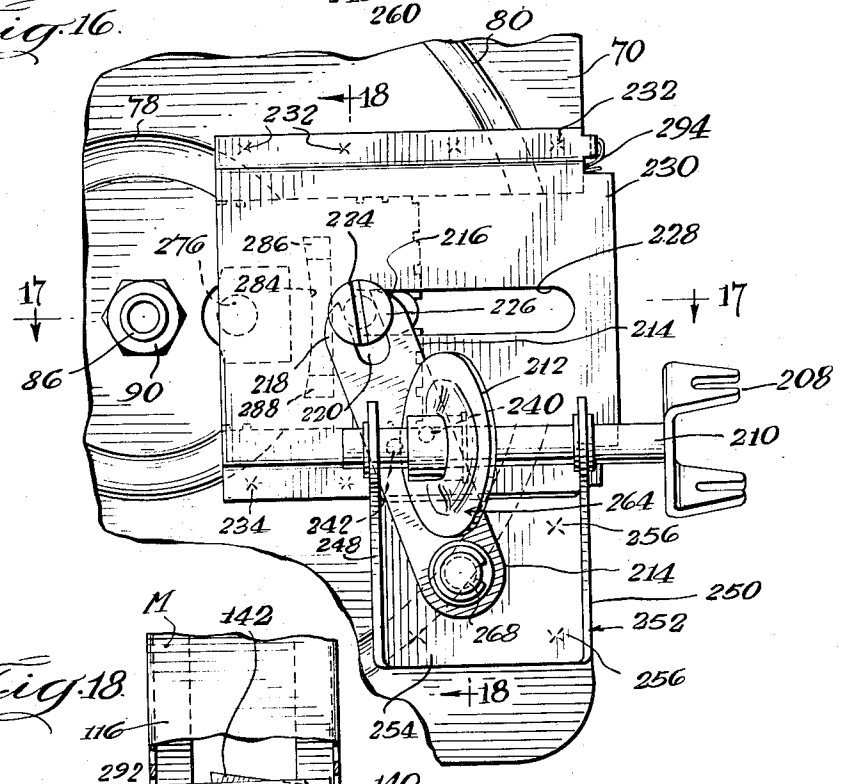
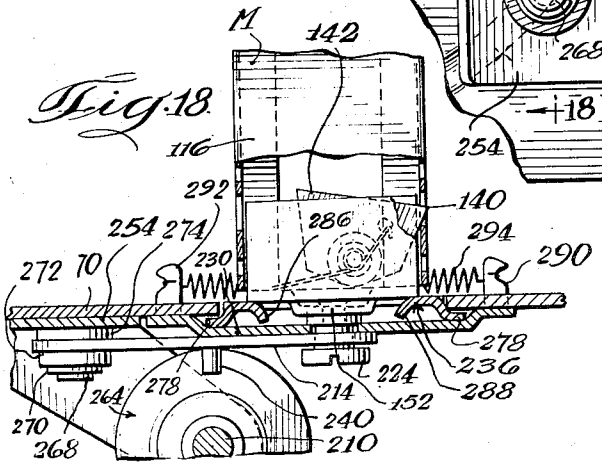


Fig. 18.



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United States Patent Office 2,696,324 Patented Dec. 7, 1954

2,696,324

SELECTIVE MERCHANDISE VENDING MACHINE

Alva R. Jones, Morris, Ill., assignor to The Northwestern Corporation, Morris, Ill.

Application August 18, 1951, Serial No. 242,480

6 Claims. (Cl. 221—20)

This invention relates to a merchandise vending machine and more particularly to that class of vending machines adapted to selectively vend successive packaged articles such as gums and confections stored and displayed in a rotatable magazine positioned within the machine housing. Specifically this invention is directed to improvements in the ejecting mechanism, the selecting mechanism, the magazine and the housing construction and assembly.

Heretofore vending machines of many types and constructions have been widely utilized for dispensing innumerable articles, including small packaged articles such as gums, candies and the like. Such vending machines have included types which permitted the selection of one of a plurality of flavors and brands of sticks of gums and candies. Such machines have likewise included types in which the merchandise has been stored in rotatable magazines having a plurality of columns for accommodating therein the various types and flavors of articles of merchandise.

However, an exhaustive examination of such machines has revealed that particularly the latter class of vending machines have not been universally adapted for a number of reasons.

Machines which succeeded in dispensing such merchandise were found to be objectionable in that they were not "fool proof." Others included mechanisms which were too complicated, expensive and impracticable. The impracticability was often directly attributable to insufficient durability for withstanding the abuse to which such machines are often subjected. So also others of these machines were impracticable for the reason that the servicing could be accomplished only after considerable mechanical dismantling of the machine, and still other machines were impracticable because of various other objectionable reasons.

It is therefore a primary object of this invention to provide a selective merchandise vending machine which will overcome all of the objections set forth hereinabove.

An important object of this invention is to afford a vending machine in which a large variety of various sizes and brands of gums and confections may be temptingly displayed in full view of the prospective purchaser.

Another object is to provide a machine having an unusually large capacity but so constructed that the over-all space occupied thereby is comparatively small.

A further object is to afford a selective vending machine provided with a number of safeguards to prevent pilfering or "milking" of the machine while at the same time safeguarding the customer by assuring the dispensing of an article of merchandise for each coin accepted by the machine. In the event that the merchandise is exhausted, the machine is designed to refuse acceptance of a coin thereby. In this connection it is only fair to point out that many safeguards to accomplish similar functions have been utilized in the past. However, in view of the novel construction of the present invention, novel safeguard devices are required. Moreover, it is believed that certain of these safeguard devices are simpler, sturdier and more effective than those heretofore utilized.

Still another object is to provide a vending machine having simple, manually operable, non-mechanical, selective means. An object relating thereto is to construct such a machine with a plural-columned magazine drum, freely rotatable to a selective ejecting position; said rotation being entirely independent of any releasing mechanism, whether or not coin-operated.

A further related object is to provide a cover for the magazine housing which may be further utilized as the actuating member for the selecting mechanism. This cover may be also constructed to afford clearly visible individual display compartments in which may be exhibited the various articles of merchandise which the machine is currently vending.

Still a further object is to afford a vending machine in which certain parts may be readily dismantled for servicing or restocking the machine. An object relating thereto is to so construct the housing and the assembly thereof that no tools, exclusive of the unlocking key, are required to accomplish the dismantling.

Yet another object is to provide a simple, effective, exceptionally durable and fool-proof ejecting mechanism for the machine. An object relating thereto is to so construct the machine that a single ejecting mechanism serves each and every magazine column dependent only upon the proper positioning of the column for service by this ejecting mechanism.

Yet a further object is to afford an ejecting mechanism which may be controlled by a coin mechanism, in such a way that upon actuation of the coin mechanism the following functions are successively performed; first the magazine is locked against further rotation during the ejecting operation; then the lowest package is moved forward until the same is dispensed through a merchandise chute, and finally the magazine cylinder is released for further selective rotation; the various mechanisms being returned to their normal positions in preparation of additional actuations. In this connection it should be noted that since the magazine columns are designed to be top-loaded, the oldest merchandise is dispensed before the newer articles are available for vending.

Another object is to provide novel means for retaining the merchandise in the magazine columns. An object relating thereto is to provide novel follow-up locking weights positioned on top of each column of merchandise and adapted to cooperate with means provided in said columns to prevent unauthorized removal of the merchandise under any conditions including actual tipping of the machine.

And still a further object is to provide additional safeguarding devices for preventing the ejector from being actuated in the event that all the merchandise in a particular selected magazine column has been exhausted. An object relating thereto is to construct the machine to provide a safeguarding device which prevents the acceptance of a coin by the coin mechanism in the event that the column selected has been exhausted of merchandise. In this connection it should be pointed out that the safeguarding device is so constructed that in such an event the selecting mechanism is not locked as is usually the case, but on the contrary permits rotation of the magazine to any of the other columns in which the merchandise may not yet have been exhausted.

And finally an important object of this invention is to provide a selective merchandise vending machine of simple, effective, sturdy, inexpensive and attractive construction.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel features of construction, arrangement and a combination of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportion, size and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

For the purpose of facilitating an understanding of my invention, I have illustrated in the accompanying drawings a preferred embodiment thereof, from an inspection of which, when considered in connection with the following description, my invention, its mode of construction, assembly and operation, and many of its advantages should be readily understood and appreciated.

Referring to the drawings in which the same characters of reference are employed to indicate corresponding or

similar parts throughout the several figures of the drawings:

Fig. 1 is a perspective view of an assembled selective merchandise vending machine in which is incorporated the various features of my invention and in which a portion of the magazine housing has been broken away to reveal certain details of the magazine itself;

Fig. 2 is an elevational sectional view taken on the plane of line **2—2** in Fig. 1 of the drawings and viewed in the direction indicated;

Fig. 3 is an enlarged fragmentary sectional view taken on the plane of line **3—3** in Fig. 1 of the drawings and viewed in the direction indicated;

Fig. 4 is a sectional view taken on the plane of the irregular line **4—4** in Fig. 2 of the drawings and having certain portions thereof broken away to better illustrate certain details of construction and also for convenience of illustration;

Fig. 5 is an exploded perspective view of the vending machine illustrating the method of dismantling said machine;

Fig. 6 is a bottom plan view of the magazine alone, removed from the machine itself;

Fig. 7 is a fragmentary elevational view illustrating a detail of construction;

Fig. 8 is a perspective view of the case and door assembly of the machine with the door in open position so that the enclosed mechanism may be better illustrated;

Fig. 9 is a fragmentary view taken on the plane of line **9—9** in Fig. 1 of the drawings and viewed in the direction indicated;

Fig. 10 is a perspective view of the mounting plate with the ejecting mechanism affixed thereto, said mounting plate having been turned bottom-side up;

Fig. 11 is an isolated fragmentary sectional view taken on the plane of line **11—11** in Fig. 2 of the drawings and viewed in the direction indicated;

Fig. 12 is likewise a sectional view taken on the plane of line **12—12** in Fig. 2 of the drawings and having certain portions broken away for the purpose of better illustrating the constructional details;

Fig. 13 is a fragmentary sectional view taken on the plane of line **13—13** in Fig. 12 of the drawings and viewed in the direction indicated;

Fig. 14 is a fragmentary top plan view of a portion of the mounting plate and particularly of the ejector mounted thereon.

Fig. 15 is a fragmentary sectional view of the ejecting mechanism taken on the plane of line **15—15** in Fig. 4 showing the follow-up weight in locking position;

Fig. 16 is a fragmentary bottom view illustrating the ejecting mechanism and a portion of the mounting plate;

Fig. 17 is a sectional view taken on the plane of line **17—17** in Fig. 16 and viewed in the direction indicated; and

Fig. 18 is a fragmentary sectional view taken on the plane of the irregular line **18—18** in Fig. 16 of the drawing and viewed in the direction indicated.

Pedestal case and door assembly

Referring now to the several figures of the drawings, it will be noted that the machine which is generally designated in Fig. 1 of the drawings by the reference numeral **20**, comprises a number of separable housing members including a pedestal base designated generally by reference numeral **22** and comprising a three sided, closed bottom case with substantially vertical walls **24**, **26** and **28** and closed by a door assembly **30**. The door assembly **30** is pivotally connected by means of a hinge **32** which is positioned at the top of a short bottom front wall **34**. The case is completed by a bottom member **36**. Pedestal legs such as **38** may be provided at each corner for the purpose of supporting the machine on a surface. The front edges of walls **24** and **28** are integrally flanged as at **40** and **42** to cooperate with the door member **30** to effect a proper closure of the case.

The door member **30** is stamped to afford a dish-shaped depression **44** defined by sides **46** and **48**, a front wall **50**, a curved bottom portion **52** and a curved top segment **54** with an outwardly flanged portion **56**. Within this dish-shaped depresison **44**, a coin mechanism **58** of any suitable full-stroke type may be affixed by any conventional method.

To the front **50** of the door assembly **30** may be affixed an actuating knob **60**, a coin slot **62**, a coin chute delivery opening **64** and a locking mechanism **66**. The integration of the actuating knob **60** with the machine itself will be set forth in greater detail as the description proceeds.

Within the pedestal case **22** may be affixed a mounting plate **70** which is positioned in a horizontal plane and spaced below the top edges of the casing walls as illustrated in Figs. 2, 4, 5 and 8 of the drawings. The mounting plate **70** may be removably positioned within the case **22** by any conventional method. The method chosen for illustration herein comprises a plurality of L-shaped brackets such as **72** having a vertical leg affixed to the walls of the case as by welding at **74** and the plate itself connected to the horizontal leg of the brackets **72** by means of bolts **76**. The mounting plate **70** is formed with a pair of concentric annular ring-like protuberances **78** and **80**, the functions of which will be described in greater detail as the description proceeds.

The mounting plate **70** is formed with a central aperture **82** designed to accommodate therein a portion of a center rod **84** centrally bored at the top as at **85**, threaded at the bottom as at **86** and affixed to the mounting plate **70** by means of a pair of cooperating nuts **88** and **90** together with a locking washer **92**. Lock nut **90** is designed to be tightened on the screw threaded portion **86** until the mounting plate **70** is firmly griped between the lock nut and the cooperating nut **88** as illustrated in Fig. 2 of the drawing. The function and assembly of the center rod **84** will further be described in connection with the merchandise magazine, a description of which follows herewith. It should also be noted that ordinarily the center rod is assembled with the magazine.

Merchandise magazine

An important element of the vending machine is a freely rotatable merchandise magazine which may be generally designated by reference numeral **96**. This magazine may comprise a drum formed with a central cylinder **98** encompassing the center rod **84**. To the top of the cylinder **98** may be affixed a top closure member **100** which in turn may be affixed to the cylinder **98** by means of bolts such as **102** threaded thru flanges such as **104** provided by punching and bending portions of the top closure member **100**. To the bottom of the cylinder **98** may be affixed a similar bottom closure member **106** affixed to the cylinder **98** in the same manner as the top plate **100**, that is by means of bolts such as **108** and brackets **110** formed from the bottom closure member **106** in the same manner as the brackets **104** were formed from the top closure member **100**.

Both the top and bottom closure members **100** and **106** respectively are formed with a plurality of depending or upstanding flanged portions such as **112** and **114** respectively, to each of which may be attached a merchandise storage column member such as **116**. Screws or bolts such as **118** may be used as a means for affixing these columns to the flanges **112** and **114** of the closure members **100** and **106** to form the drum shaped magazine illustrated in the drawings.

These columns may be formed by bending a single strip of material in rectangular cross-sectional shape affording a back member **120**, side members **122** and **124** and short front wall segments **126** and **128**. The front wall segments are separated by a space **130** giving front access to the merchandise chamber **132** defined by the walls previously mentioned. The width of the columns **116** may be varied to accommodate varying sizes of articles. Thus for example, it will be noted that narrow columns such as **134** may be utilized in conjunction with the wider columns **116**. To vary the depth of the merchandise chamber **132** a filler plate such as **136** may be affixed to the back wall **120** of the column **116** as shown in Fig. 6 of the drawings.

The number of merchandise columns such as **116** and **134** which may be provided in a magazine is dependent upon the width of the columns themselves, the diameter of the drum, and the number of flanges such as **112** and **114** which are provided on the periphery of the top and bottom closure members **100** and **106**. As will be noted in Figs. 1, 2, 4 and 5 of the drawings, stacks of merchandise articles M may be positioned in each column such as **116** and **134** and retained therein by the walls of the column.

Vertically aligned rows of annular openings such as **138** are formed in the side walls **122** and **124**. These openings are designed to accommodate therein the angular edge **140** of a locking member **142** which in turn

is affixed to a novel self-locking follow-up weight **144**. This follow-up weight is positioned at the top of each column of merchandise M and performs a number of functions including the insurance of the dispensing of the merchandise, the prevention of the removal of articles from the merchandise columns from any position except that intended by the machine and other functions which will subsequently be revealed as the description proceeds.

The weight may be formed in a U-shape as defined by bottom portion **146** and parallelly spaced vertical walls **148** and **150**. The bottom portion **146** has a central portion **152** stamped and bent downwardly for a purpose which will later be disclosed. The locking member **142** is pivotally mounted on the inside of wall **150** by means of a rivet **154** which serves as a pivot shaft for the member **142**. A washer **156** is disposed on the pivot shaft **154** between the inner rivet head **158** and the locking member **142**. Between the washer **156** and the locking member **142**, a spring wire member **160** is coiled about the shaft **154** with one end affixed directly to the locking member **142** and the other bearing against the bottom **146** of the follow-up weight. The spring thus urges the tip **140** of the locking member **142** into engagement with each successive hole in the column of openings **138**. This in turn prevents the follow-up weight **144** from movement upwardly so that if the machine is completely tipped over the follow-up weight will prevent the merchandise from being removed from the top of the column. However, the movement downwardly is not prevented by the self-locking member **142**. On the contrary, the weight **144** rides the top of the merchandise and follows it downwardly as the articles of merchandise are dispensed from the column. An outwardly punched and stamped projection **162** may be afforded in wall **150** for the purpose of affording a grasping edge for aiding in the ready removal of the follow-up weight from the column.

To the bottom of the bottom closure member **106** may be affixed as by riveting or welding, a spider structure **164**. This structure comprises a hub **166** formed with a central annular opening **168** and having a plurality of shaped arms or ribs **170** extending radially from the hub **166**. Each of these arms **170** are separated from each other by means of slots **172**. The slots **172** are flared outwardly as at **174**. This flaring is defined by the sides **176** of the ribs **170** converging to terminate in a straight sided slot portion **178**. The functions of this spider member **164** in the selection of the merchandise column will be set forth in greater detail as the description proceeds.

The top closure member may be formed with a central off-set portion **180** affording a depression in which may be positioned a nut **182** threaded on the top end **184** of the center rod **84**. By this means the center rod is assembled as an integral member of the magazine **96**.

To complete the magazine, an inverted U-shaped strip **186** is positioned over the top end of the center rod **84**, with the nut **182** threaded thereon, and fastened to the top closure member **100** by means of screws such as **188** threaded through outwardly flanged end portions **190** of the strip **186**. The central portion **192** of the strip **186** is off-set and thereby spaced from the top closure member **100** as shown in Figs. 4 and 12 of the drawings. This off-set portion **192** has a central opening **194** formed therein defined by a depending short wall **196** formed integrally from the strip **186** as by stamping or drawing. Also formed in the off-set strip portion **192** are a pair of openings **198** and **200** respectively. It will be noted that these are spaced equidistant from the central opening **194** and that opening **198** is smaller in diameter than opening **200**. The function of this strip and the openings therein will likewise be described as the description proceeds.

Ejector mechanism assembly

A most important feature of this dispensing machine is the simple, sturdy but positively effective merchandise ejecting mechanism which will now be described in detail. Attention is therefore directed to those figures of the drawings which best illustrate this mechanism such as Figs. 2, 8, 10, 14 and 16–18 inclusive.

In these figures the entire ejector assembly is designated generally by the reference numeral **202**. This mechanism is positioned on a central front portion of the mounting plate **70** and is adapted to be controlled by the coin mechanism **58** as actuated by the knob **60**. For this purpose attention is invited first to the transmission mechanism which comprises the coin wheel shaft **204** journaled through the front of the door **30** and upon the outer end of which is mounted the actuating knob **60**. The inner end of the shaft **204** protrudes through the coin mechanism **58** and has a cross-pin **206** affixed transversely therethrough.

This pin **206** is adapted to be engaged by a bifurcated yoke **208** rigidly mounted on the outer end of a cam shaft **210** so that the two shafts may be readily operationally joined together by merely closing the door so that the bayonet points of the pin **206** are seated in the bifurcations of the yoke **208**.

Rigidly mounted on the cam shaft **210** may be a uniquely designed wobble-plate cam **212** which in turn is positioned beneath an operating lever **214**. The lever **214** is pivotally mounted at one end below the mounting plate **70**. The other end is free but bifurcated to afford two arms **216** and **218** spaced apart by an open slot **220**. Within the slot **220** may be slidingly positioned the shaft **222** of a bolt or rivet **224** having an enlarged head **226** at the lower end. The shaft **222** extends through a longitudinal slot **228** formed in an offset plate **230** affixed to the bottom of the mounting plate **70** as by welding along both sides as at **232** and **234**. The upper end of the bolt **224** is rigidly joined to an ejector slide plate **236** by means of a rivet **238**.

Positioned intermediate of the length of the lever **214** are a pair of depending pins **240** and **242** spaced apart a distance sufficient to accommodate therebetween a marginal portion of the wobble plate cam **212**. In Fig. 17 of the drawings it will be noted that the cam **212** is disposed in a plane inclined to a vertical axis. Thus when the cam is rotated the rotative motion is translated by means of the pins **240** and **242**, the lever **214** and the bolt **224** to impart a reciprocating motion to the ejector slide **236**. As the ejector slide moves backwards towards the center of the mounting plate **70**, the merchandise which is positioned directly above within the column **116**, drops down into the space vacated by the ejector slide. As the rotary motion of the cam shaft is continued the ejector slide is caused to move forward again pushing ahead of it the bottom piece of merchandise forward for delivery into a chute which will be subsequently described.

Turning now to a more detailed description of the mechanism described hereinabove in general terms. It will be noted from an examination of Figs. 16 and 17 that the cam shaft **210** is journaled through a pair of aligned openings **244** and **246** formed in the depending spaced-apart arms **248** and **250** of a bracket **252**. The depending arms **248** and **250** of the bracket **252** are integrally connected by means of a top portion **254** which is affixed to the bottom of the mounting plate **70** as by spot welding **256**. Retaining washers such as **258** may be mounted on the shaft **210** and positioned adjacent the arms **248** and **250** respectively to retain the shaft in operational position within the bracket arms **248** and **250**.

The wobble plate cam **212** may be assembled on the shaft **210** between the arms **248** and **250** by means of a centrally bored hub **260**, having a flange **262** formed at one end and against which the eccentric wobble plate **264** abuts. The two pieces may then be assembled as by welding. It will further be noted that the eccentric wobble plate **264** is elliptically shaped rather than perfectly round. This shape is found to be necessary to maintain the marginal edge thereof in contact with the lever **214** and between the pins **240** and **242** since the distance between the lever **214** and the shaft **210** at the point that the hub **260** is rigidly mounted thereon varies as the lever **214** is reciprocated back and forth.

As was stated above, the lever arm **214** is pivotally connected to the mounting plate. This may be accomplished by means of a pivot **266** riveted at the upper end to the plate **70**. The lower end of the pivot is formed with a head **268** on top of which is positioned a split retaining washer **270** and a bearing washer **272**. The lever arm **214** is spaced from the top portion **254** of the bracket **252** by means of a boss **274**.

The ejector slide plate **236** is formed with an upstanding pin **276** formed near the inner edge of the plate. The function of this pin **276** will become apparent when

the operation of the machine is described in full. The side edges of the ejector plate **236** are formed with a plurality of tongues such as **278** which are adapted to be slidingly retained between the bottom of the mounting plate **70** and the top of the offset portion of the plate **230**; the offsetting providing a space to accommodate said tongues **278** therein. Also formed transversely in the ejector plate **236** is a slot **280** positioned intermediate the depth of the plate **236** and formed with its leading edge **282** in a straight plane and with its trailing edge **284** curved as shown in Fig. 14 of the drawings. The ends of the slot **286** and **288** are beveled or inclined for a purpose which will become apparent as the description proceeds.

The front corners of the offset plate **230** are stamped and bent upwardly to afford notched standards **290** and **292**. Stretched between these standards **290** and **292** is a coil spring **294**. The function of this coil spring will likewise be revealed when the operation of the machine is subsequently described in detail.

Magazine housing

In the objects of the application set forth hereinabove, it was stated that it was highly desirable to display the merchandise in tempting full view of the prospective purchaser. This is accomplished by means of a novel housing designated generally by reference numeral **295** which will now be described in further detail. Attention is accordingly invited to Figs. 1, 2 and 5 of the drawings. Examination of these figures will reveal a housing comprising a transparent, substantially cylindrical casing **296** the bottom marginal edges **298** of which are fitted into an adaptor ring **300** which in turn is designed to join the magazine housing **295** to the pedestal case **22**. The vertical walls of the casing **296** are closed by an integrally formed top **302**. This top **302** is formed with a central aperture **304** and an upstanding annular marginal ridge **306**. This marginal ridge **306** is adapted to fit into an undercut annular groove **308** formed in a top ring member **310**. This top member **310** is formed with a central, raised portion **312** which terminates in a central opening **314** defined by an annular upstanding boss **316** which in turn provides a central passageway **318**. The transparent casing **296** may be made of glass but I prefer a clear transparent plastic.

In assembling the housing **295** a plurality of tie rods such as **320** are provided for joining together the various parts of the case. The tie rod **320** may be threaded into the metal top member **310** as at **322**. It may then be passed through an opening such as **324** provided in the transparent top member **302**. The bottom end is likewise passed through an opening **326** formed in the bottom of the inner flange of the adaptor ring **300** and the entire assembly retained in place by means of a nut **328** threaded on the bottom portion of the tie rod **320** as at **330**.

The adaptor ring **300** is also provided with means for joining the magazine housing **295** to the pedestal case **22** and for locking the entire assembly together. These assembling and locking means comprise respectively a transversely notched depending hook **332** with said hook having a notch **334** formed therein. The function of this hook member **332** will be described in greater detail in connection with the cooperating mechanism.

The locking means comprises a depending metallic strip **336** apertured as at **338**. The function of this locking strip will likewise be subsequently described in connection with the mechanism for locking the entire machine.

Selecting mechanism assembly

The selecting mechanism which may be generally referred to by reference numeral **340** is a mechanism which may be actuated to revolve the magazine **96** in either direction until the selected column of merchandise is positioned in alignment with the ejector assembly **202** as indicated by the pointer **341** and the indicia **343** shown in Fig. 5 of the drawings. This selecting mechanism may be assembled from several parts including an inverted cup-shaped display tray **342** comprising a sloped annular wall **344** terminating at the bottom in an outwardly flanged portion **346** and with an integrally formed top **348**. Portions of this flange **346** are stamped and bent upwardly to afford sheared spikes such as **350**, upon which may be impaled the various articles of merchandise M which are to be dispensed by the vending machine. The spikes **350** are positioned in alignment, one with each column in the magazine. Hence the article of merchandise contained in each respective column may be displayed directly thereabove on the display tray.

A plastic display cover **352** is provided for completing the assembly and covering the merchandise contained in the merchandise display tray. So that the merchandise may be displayed in full view it is important that at least that portion of the cover wall **354** which is positioned in front of the merchandise M should be transparent.

The display cover **352** is formed with a central depending boss **356** in which may be permanently affixed the top end **358** of a display cover shaft **360**. The lower end of this shaft **360** is pointed as at **362** and is formed with a reduced portion **364**. An annular groove **366** is undercut near the bottom of the portion of the shaft which is larger in diameter than the reduced section **364**. This shaft is adapted to be journaled through a short hollow bushing **368** the top portion of which is threaded through a central opening formed in the top of the display tray **342** and retained therein by a lock nut **370** threaded on a reduced upper portion **372** of the bushing **368**. Thus the top **348** of the display tray **342** is retained between the nut **370** and the shoulder of the bushing **368** provided by the reduced portion **372**. In operational position the bottom reduced portion **364** of the shaft **360** is positioned in the central bore **85** of the center rod **84**.

The display cover **352** is retained by means of a sliding lever plate **374** positioned below the top ring member **310** and the display tray **342**. The bottom end of the bushing **368** may be forced into, and rigidly affixed within, a central opening **378** provided in a plate **376**. The lever plate **374** may be slidingly affixed to the plate **376** by means of a headed bolt **380**, the shaft of which is positioned within a slot **382** formed in the plate **374**. A keyhole shaped slot **384** is also formed in the plate **374** with an enlarged portion **386** and a reduced portion **388** This keyhole slot is so positioned that either the reduced portion or the enlarged portion as desired may be moved into alignment with the central opening **378**. The reduced portion of the keyhole slot **384** is adapted to be engaged within the groove **366** of the shaft **360** to lock the cover in position.

A pair of depending pointed pins **390** and **392** are provided on the plate **376** for the purpose of engaging in the openings **198** and **200** formed in the strip **186** of the magazine **96**. This forms an operational connection permitting rotation of the magazine when the top cover is revolved. To insure proper alignment it should be noted that the diameter of pin **390** is somewhat larger than pin **392** and hence can be accommodated only when aligned with the proper opening, in the magazine.

To operationally connect the display cover to the display tray a plurality of depending projections such as **394** are provided in the bottom of the top of the display cover as shown in Figs. 11 and 12 of the drawings. These projections are adapted to be engaged in openings such as **396** formed in the top **348** of the display tray **342**.

Locking mechanism

An extremely simple locking mechanism **66** is provided for locking the assembled housing members and thereby the machine itself. This comprises a locking tumbler **398** journaled through a bushing **400** afforded in the door **30** and retained therein by means of the nut and washer assembly **402**. The inner end of this tumbler is threaded as at **404** and positioned to be threaded through the opening **338** provided in the strip **336** which in turn is affixed to the adapter ring **300** of the globe casing **295**. The outer end of the tumbler is formed with a keyhole **406**. Thus to open the machine all that need be done is to insert the key into the keyhole **406**. This releases the tumbler **398** and permits it to be rotated until the tumbler is unscrewed free of the opening **338** in the strip **336**. The door may then be opened giving free access to the interior of the pedestal casing **22**.

Assembling mechanism

For the purpose of assembling the magazine housing **295**, with the pedestal casing **22** an extremely simple but effective mechanism is provided. The mechanism comprises a locking lever **408** formed with the outer end bent

as at 410 and designed to be slidingly retained by means of a clamping structure 412 adjacent the inner side of the pedestal casing wall 28 and near the top thereof. The inner end of the lever 408 has formed near the end a protruding pin 414. This pin is designed to be engaged in the notch 334 of the depending hook 332 which in turn is affixed to the globe housing 295.

The clamping device 412 comprises a strip of metal having portions thereof stamped and bent to provide lever guides such as 416 and 418. When it is desired to assemble the machine, the globe housing 295 is positioned over the magazine 96 so that the depending hook 332 is aligned with the pin 414. The lever 408 is then shoved inwardly until the pin is engaged within the notch 334, thereby assembling the two housings in operative position.

Coin box and merchandise chute

The machine is completed by the provision of a coin box 420 adapted to receive coins from the coin mechanism 58 through a front opening 422, and a merchandise chute 424 having a merchandise-receiving opening 426 and a delivery chute 428 aligned with the delivery opening 64 formed in the door 30. The chute may be directly mounted on the door 30 and positioned with the receiving opening 426 aligned with the front of the ejector slide 236.

Loading and assembly

To load and assemble the vending machine, assuming that the machine has been dismantled in the usual manner prior to loading, the magazine 96 is first positioned on the mounting plate 70 with the lower end of the center rod 84 positioned within the opening 82. The lock washer and nut 92 and 90 respectively are then threaded on the lower threaded end 86 of the rod 84 and tightened until they abut the mounting plate 70. The stacks of merchandise M are then inserted from the top and front of the columns 116 and 134 until the said columns are filled to capacity or as desired. The follow-up weights 144 are then positioned within the columns on the top of each stack of merchandise M with the angular tip 140 of the locking member 142 positioned so that it may enter one of the openings 138 in the side wall of the column.

A sample of each article of merchandise which has been inserted in the magazine is then impaled on each of the sheared spikes 350 in the display tray 342. Care should be taken that the sequence of merchandise articles displayed in the display tray should correspond with the sequence of merchandise loaded in the columns and that the proper sample is aligned with its respective column. The display cover 352 may then be inserted over the display tray, with the shaft 360 inserted through the bushing 368 until the same protrudes below the bottom of the magazine housing top 302. Care should be taken that the display cover projections 394 are aligned with the display tray openings 396. This is necessary to insure proper assembly of the display cover and display tray. As a matter of fact unless the projections 394 are properly seated in the openings 396, the two members cannot be locked together.

In assembling the two members it will be necessary to position the enlarged portion 386 of the keyhole opening 384 of the sliding lever plate 374 in alignment with the shaft 360. The sliding lever 374 is then moved until the reduced opening 388 engages the groove 366. As soon as this is accomplished, it will be found that the display cover 352 is securely locked over the display tray and on the top of the magazine housing 295.

The assembled magazine housing may then be positioned over the magazine 96 and lowered until the hook notch 334 is aligned with the pin 414 of the lever 408. The end 410 of the lever 408 may then be grasped by the operator and pushed back until the pin 414 is engaged within the notch 334.

This completes the assembly of the machine, with the exception of the closing of the pedestal door 30 for the purpose of operationally connecting the coin mechanism with the ejecting mechanism assembly and also locking the machine. This is accomplished by positioning the yoke 208 with the bifurcations disposed in a horizontal plane so that when the door is closed they will engage the coin shaft pin 206. In closing the door, it is important that the top flange 56 be engaged below the front edge of the adapter ring 300. This is accomplished by lifting up on the front of the adapter ring 300 sufficiently to permit clearance of the top of the flange 56 therebelow. The locking of the entire machine may then be accomplished by inserting a key in the keyhole 406 and rotating the locking tumbler 398 until the same is threaded through the opening 338 in the locking strip 336.

To dismantle the machine the operations hereinabove described may be performed in reverse sequence. Because of the novel design and assembly, the dismantling, loading and assembly may be performed in a surprisingly short period of time, with a minimum of effort and without the use of tools.

Operation

In describing the operation of the machine various conditions will be assumed so that the many features and full performance of the machine may be appreciated.

To begin let us assume that a prospective customer approaches the machine and proceeds to manipulate the device under the usual and normal circumstances. As he approaches he sees displayed in full view behind the clear glass or plastic walls 296 of the magazine housing 295 the many merchandise-filled columns of the magazine 295. He also immediately recognizes that a sample M of the merchandise contained in each column is displayed above each respective column impaled on the sheared spikes 350 of the tray 342 so that the front of the package or label is clearly visible. Each such sample is positioned within its respective compartment and behind the transparent walls 354 of the display cover 352. Hence each such sample readily identifies and indicates the location of the merchandise contained in the machine without necessitating additional indicia.

The customer determines the brand or flavor of gum or other merchandise he desires and selects the same by grasping the display cover, rotating it in either direction until the sample M is aligned with the pointer 341 formed on the top member 310 of the housing 295. When properly aligned it will be noted that the indicia 343 is likewise aligned with the selected column directly behind it. At this point the customer may still change his selection in the event he has changed his mind. As a matter of fact the selection may be changed at any time up to the actual actuation of the ejecting mechanism.

The customer next inserts the proper coin in the slot 62 and then grasps the actuating knob 60 and begins the rotation thereof. As the rotation begins the coin drops into the coin wheel (not shown) which in turn is moved by the coin wheel shaft 204 to release the shaft so that it may rotate completely through its predetermined orbit. As the shaft rotates the pin 206 bears against the sides of the bifurcations in the yoke 208 thereby rotating the cam shaft 210 with the wobble-plate cam 212 mounted thereon.

As the eccentric cam 212 rotates a horizontal path is described on the plate 230 as the cam moves from the initial position illustrated in Fig. 2 to the position shown in Fig. 17. During this phase of the operation the rear side of the marginal edge of the cam bears against the ejector slide-plate pin 242, thereby moving the ejector plate 236 back to the position shown in Fig. 17.

As the ejector plate is moved back, the upstanding pin 276 is likewise carried rearwardly therewith. If the magazine is properly positioned the pin will slide into one of the slots 172 of the spider 164 proceeding back until the full stroke of the ejector plate has been completed. In the event the magazine is not properly aligned the pin will strike against the straight front of the rib 170 thereby preventing further rearward movement of the ejector plate 236 until the magazine is rotated further by the operator to the proper position, viz. to a position where a slot 172 is aligned with the pin 276. In the event the slot 172 is not exactly in line with the pin but only slightly off-alignment, then the pin will strike the cambered side 176 of the rib 170. Continued actuation and hence exertion of force by the pin on the camber will cause the magazine to rotate sufficiently until the straight-sided slot portion 178 is aligned with the pin. The pin may then complete its predetermined path.

As the ejector plate moves rearwardly it slides back from underneath the merchandise in the column so that the bottom article M drops down into the space thereby vacated. The article then rests on the top of the plate 230 and in front of the leading edge of the ejector 236.

Continued rotation of the knob 60 (assuming that the coin mechanism is a "full-stroke" type) rotates the

wobble-plate cam back through the same path. The front face of the marginal edge of the wobble-plate is then brought to bear against the front pin **240**, thereby reciprocating the ejector slide forward. As the slide moves forward it pushes the article M in front of it until it enters the merchandise chute opening **426**. The article drops down through the delivery chute **423** to be dispensed through the delivery opening **64** in the front of the door **30**.

Attention is again momentarily directed to the upstanding pin **276** and spider structure **164**. It should be noted that immediately upon the entrance of the pin **276** within the slot **172**, rotation of the magazine **96** is limited thereby. The magazine is locked against rotation during the time the pin remains in the slot and can only be unlocked by reciprocating the pin out of the slot. Hence, it is obvious that the only time that the selecting mechanism is made inoperative is during the actual ejecting operation.

For the purpose of minimizing friction during the selecting operation a very simple construction has been provided. Attention is accordingly invited to the concentric annular protuberances **78** and **80** formed in the mounting plate **70**. These protuberances are provided for the purpose of affording one-point support of the magazine drum **96** and stacks of merchandise M. The inner protuberance **78** is of slightly higher elevation than the protuberance **80**. Upon this protuberance rests the bottom of the spider structure **164**. Since contact is limited to only the top of the protuberance, the friction therebetween is minimized to the point that rotation of the magazine may be accomplished with very little effort.

The outer annular protrusion **80** it will be noted in Fig. 2 of the drawings is positioned directly under the front portion of the merchandise M in the columns. Again friction therebetween is limited to but a single point but additionally it will be noted that the merchandise is inclined downwardly and rearwardly. This canting of the merchandise insures better engagement by the leading edge of the ejector plate and hence, tends to make the ejecting operation more positive.

The next condition to be considered in the operation of the machine will be that existing when a column of the magazine is selected in which the merchandise has been exhausted. In such a case the operator after inserting his coin will find that the actuating knob **60** cannot be rotated beyond the point of ordinary "play" provided in the machine. To comprehend the reason for this, attention is now invited to Fig. 15 of the drawings. In this figure it will be noted that the column **116** has been exhausted of merchandise so that the follow-up weight **144** rests at the bottom of the column and on the ejector slide **236**. In this position the downwardly bent finger **152** rests within the slot **280** provided in the ejector slide. Hence when the knob is actuated the rearward movement of the ejector slide **236** is prevented by the abutment of the front of the finger **152** against the leading edge **282** of the slot.

When the customer realizes that this condition exists, he may then once again grasp the display cover **352** and rotate the magazine to align another column for dispensing. To enable this additional selecting operation it will be noted that the ends **286** and **288** of the slot **280** have been formed with inclined portions which permit the finger **152** to ride up the incline and out of the slot. It should further be noted that the locking of the ejector slide against backward movement in turn prevents the coin wheel from turning. Thus no coins can be accepted by the coin mechanism under such conditions. This of course is a safeguard for the benefit of the customer.

Completing the description of the operation of the mechanism, the safeguard afforded by the coil spring **294** stretched in front of the magazine column bottom opening will now be described. Primarily the spring is intended to prevent the unlawful dispensing of merchandise as by shaking or tipping the machine. Thus the spring is designed of sufficient strength to hold back the merchandise articles but has sufficient resilience to permit the passage of the columns of the magazine as the same is rotated past the spring during the selecting operation.

It is believed that my invention, its mode of construction and assembly, and many of its advantages should be readily understood from the foregoing without further description, and it should also be manifest that while a preferred embodiment of the invention has been shown and described for illustrative purposes, the structural details are nevertheless capable of wide variation within the purview of my invention as defined in the appended claims.

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

1. In a selective merchandise vending machine having a plurality of article receiving compartments; an ejecting mechanism, a follow-up weight member positioned in each of said article receiving compartments and a rigid element with inclined ends depending from said weight member, said ejecting mechanism including a movable ejector plate, said element and said ejector plate adapted to cooperate to prevent the actuation of said ejecting mechanism in the absence of at least one article in said compartment while simultaneously permitting selection of others of said article receiving compartments, said rigid element comprising a depending protuberance formed in the bottom of said weight member and said ejecting mechanism including an ejector plate movable beneath said compartment to eject the bottommost article from said compartment, said ejector plate formed with a slot therein, said slot adapted to accommodate therein said rigid element, said slot further formed with inclined end walls permitting substantially lateral movement of the ejector plate and follow-up weight with respect to each other.

2. In a selective merchandise vending machine having a plurality of rotatable article receiving compartments; an ejecting mechanism, a follow-up weight member positioned in each of said article receiving compartments and stop means carried by the follow-up weight member and preventing operation of the ejecting mechanism, operation of said stop means being rendered ineffective by any article positioned therebelow in said compartment, said follow-up weight member having a depending finger, said ejecting mechanism including a plate having a lateral slot adapted to accommodate therein said depending finger, said slot formed with inclined end walls up which said depending finger may ride when said article receiving compartment is rotated.

3. In a selective merchandise vending machine adapted to dispense packaged articles and having a plurality of rotatable article-storage columns with a follow-up weight positioned in each column; ejector actuating means, an ejector plate movable to permit the dispensing of at least one article of merchandise from a preselected one of said columns, said ejector plate formed with a transverse slot therein, said slot adapted to receive a depending element of said follow-up weight to lock the ejector plate against dispensing movement in the event said column is empty of packaged articles, said slot further formed with upwardly and outwardly inclined end surfaces up which said depending element may ride-up out of said slot thereby permitting continued rotation of said article-storage columns until an article-containing column is operationally associated with said ejector plate.

4. In a selective merchandise vending machine adapted to dispense packaged articles and having a plurality of rotatable article-storage columns with a follow-up weight positioned in each column; ejector actuating means, an ejector plate movable to permit the dispensing of at least one article of merchandise from a preselected one of said columns, said ejector plate and said follow-up weight each having means adapted to cooperate to lock the ejector plate against dispensing movement in the event said column is empty of packaged articles, said latter-mentioned means capable of further cooperating to permit continued rotation of said article-storage columns until an article-containing column is operationally associated with said ejector plate.

5. In a selective merchandise vending machine having a plurality of rotatable article-storage columns; a follow-up weight positioned in each column; ejector actuating means, an ejector plate adapted to dispense at least one article of merchandise from a preselected one of said columns, said ejector plate formed with a slot therein, said slot adapted to receive a depending element of said follow-up weight to lock the ejector plate against dispensing actuation in the event said column is empty of packaged articles, said slot further formed with up-

wardly and outwardly inclined end surfaces up which said depending element may ride-up out of said slot thereby permitting continued rotation of said article-storage columns until an article-containing column is operationally associated with said ejector plate.

6. In a selective merchandise vending machine having a plurality of article-storage columns; the combination of a follow-up weight positioned in each column, an ejector plate, and ejector actuating means, said ejector plate formed with a slot therein, said follow-up weight having an element adapted to being positioned in said slot to prevent the actuation of said ejector plate in the event said column is empty of articles, said slot further formed with end portions for disengaging said element from said slot thereby permitting continued rotation of said article-storage columns.

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