Feb. 19, 1952 H. T. LARIMORE 2,586,351

BOTTLE VENDING MACHINE

Filed Oct. 12, 1948 6 Sheets-Sheet 1

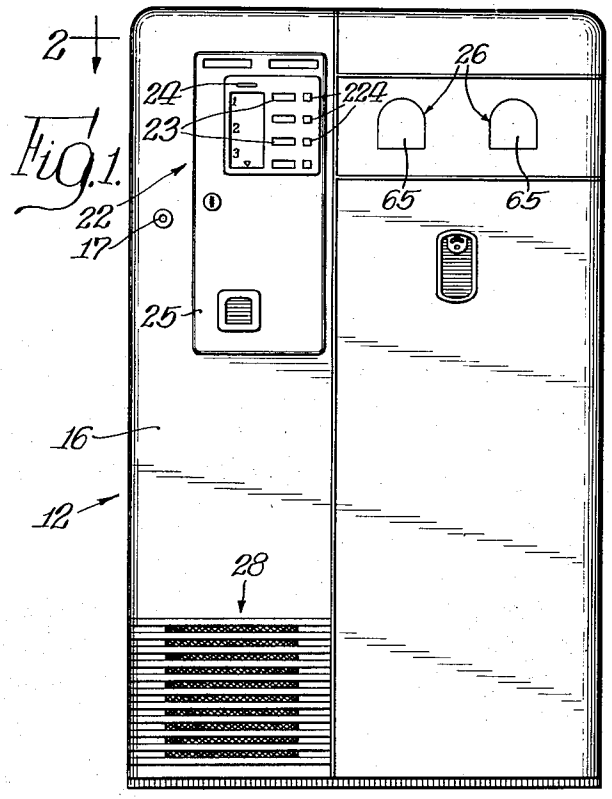


Fig. 1.

Fig. 3.

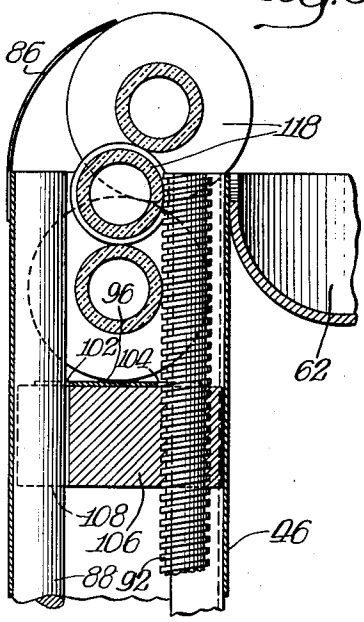
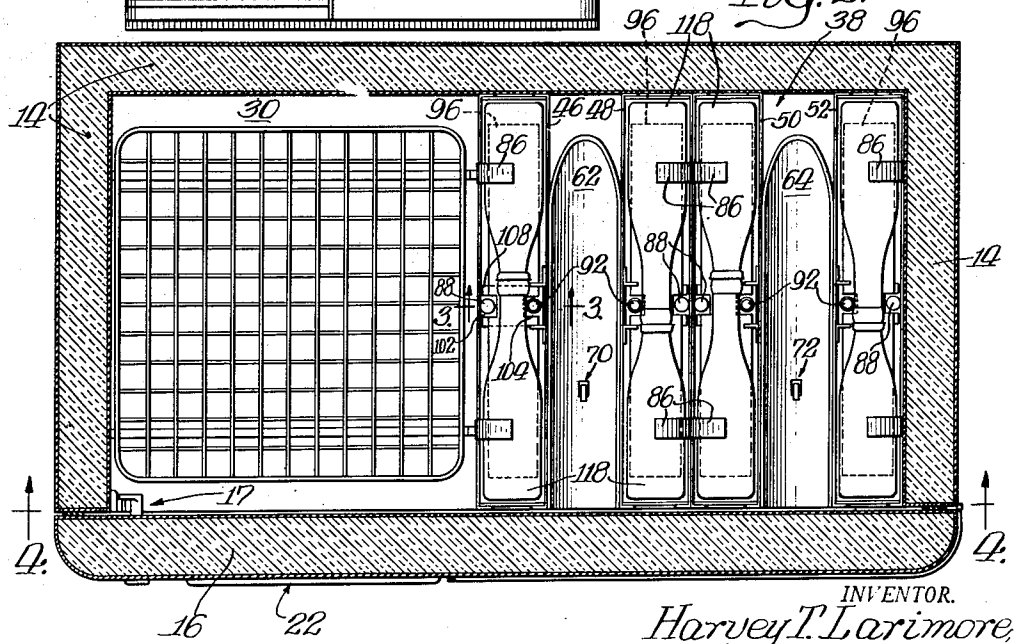


Fig. 2.



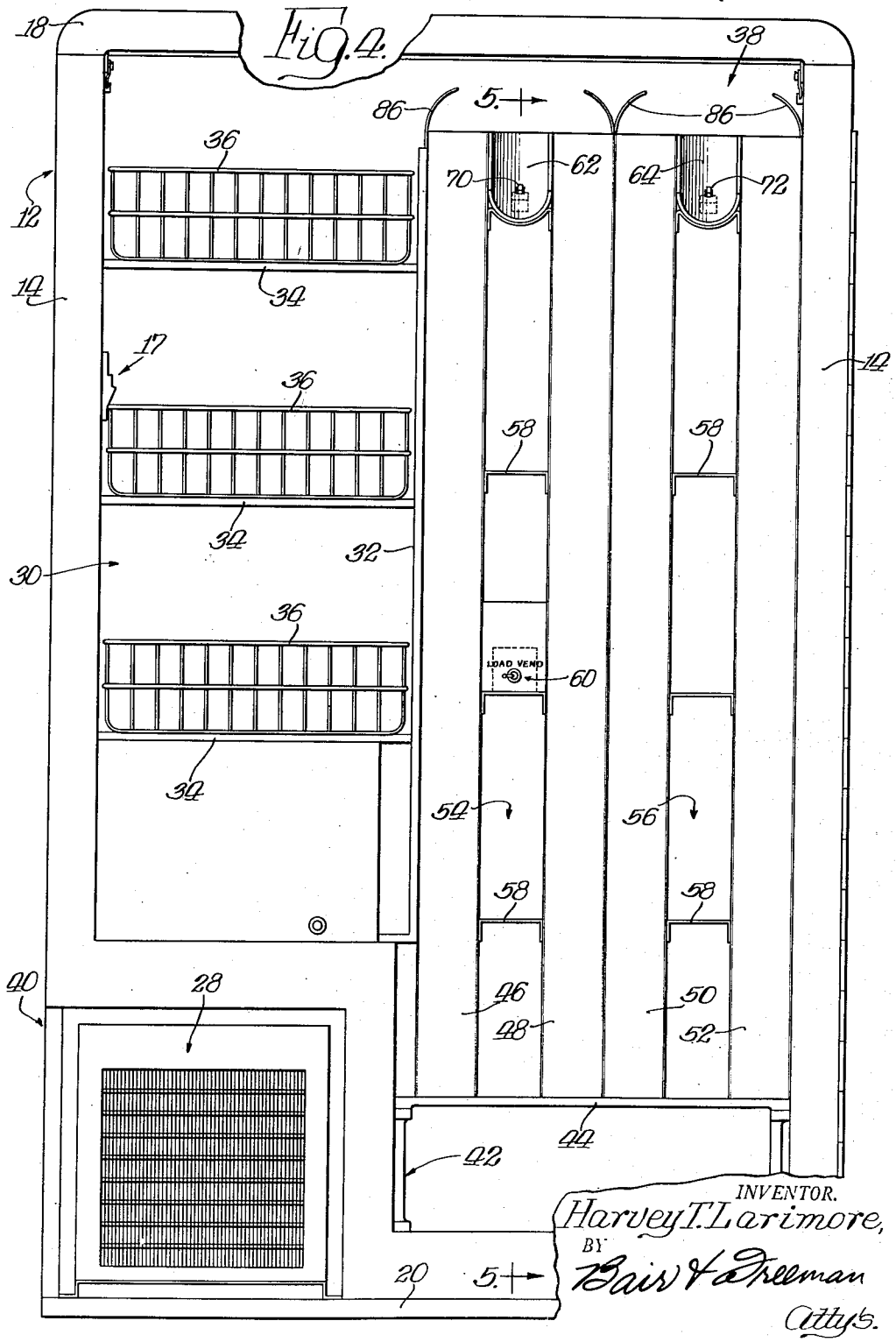
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BOTTLE VENDING MACHINE

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Fig. 4.



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BOTTLE VENDING MACHINE

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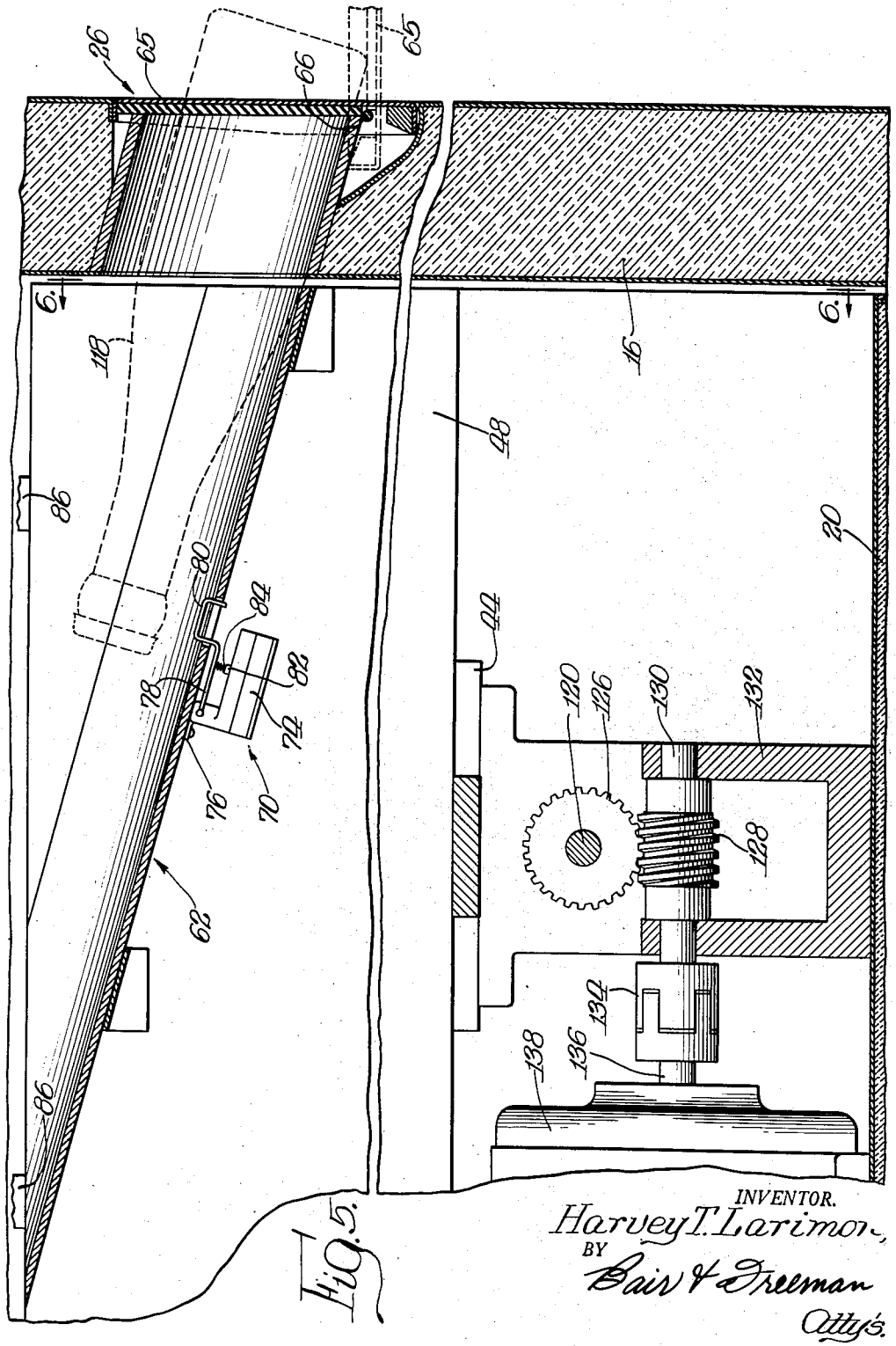


FIG. 5.

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BOTTLE VENDING MACHINE

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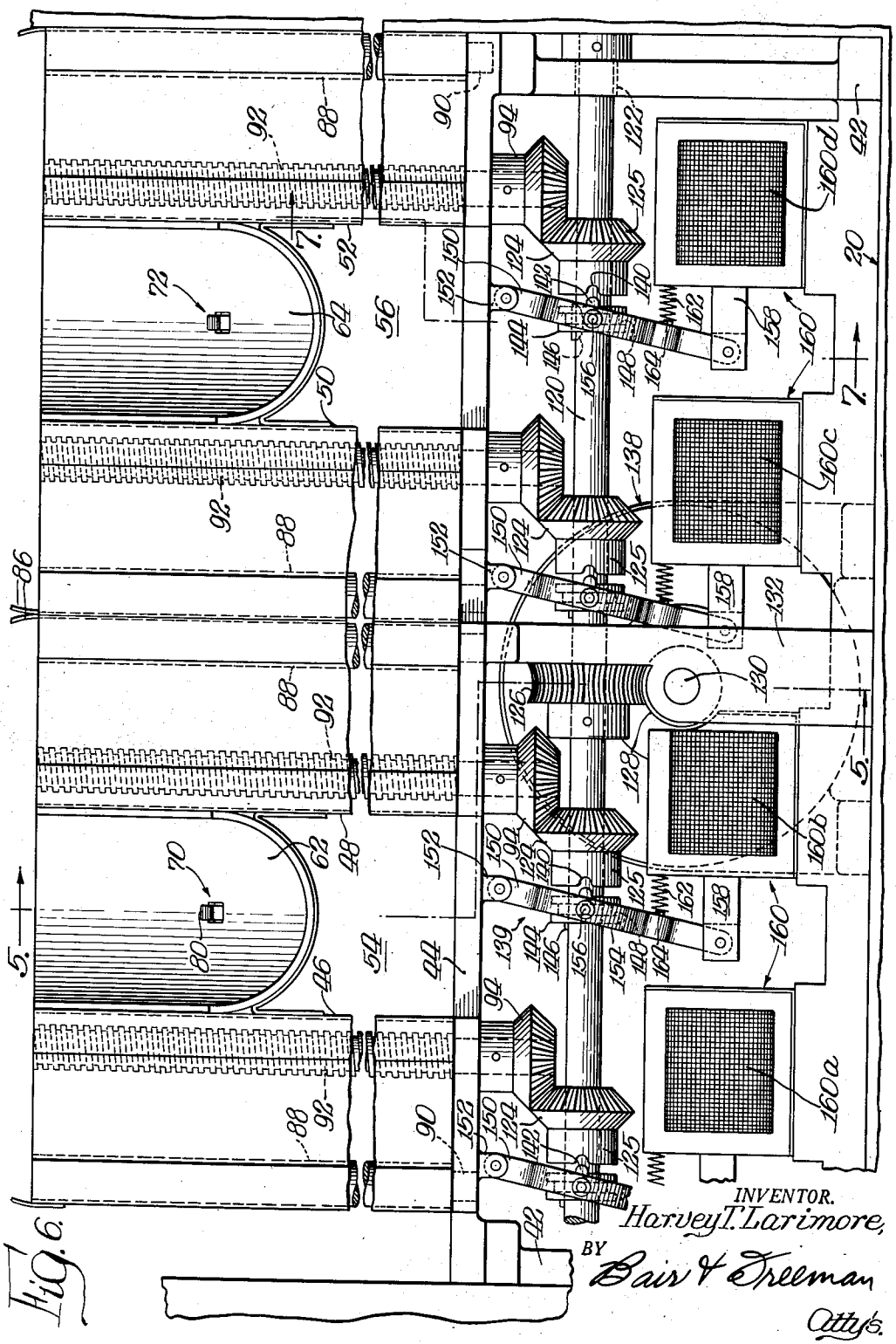


Fig. 6.

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BOTTLE VENDING MACHINE

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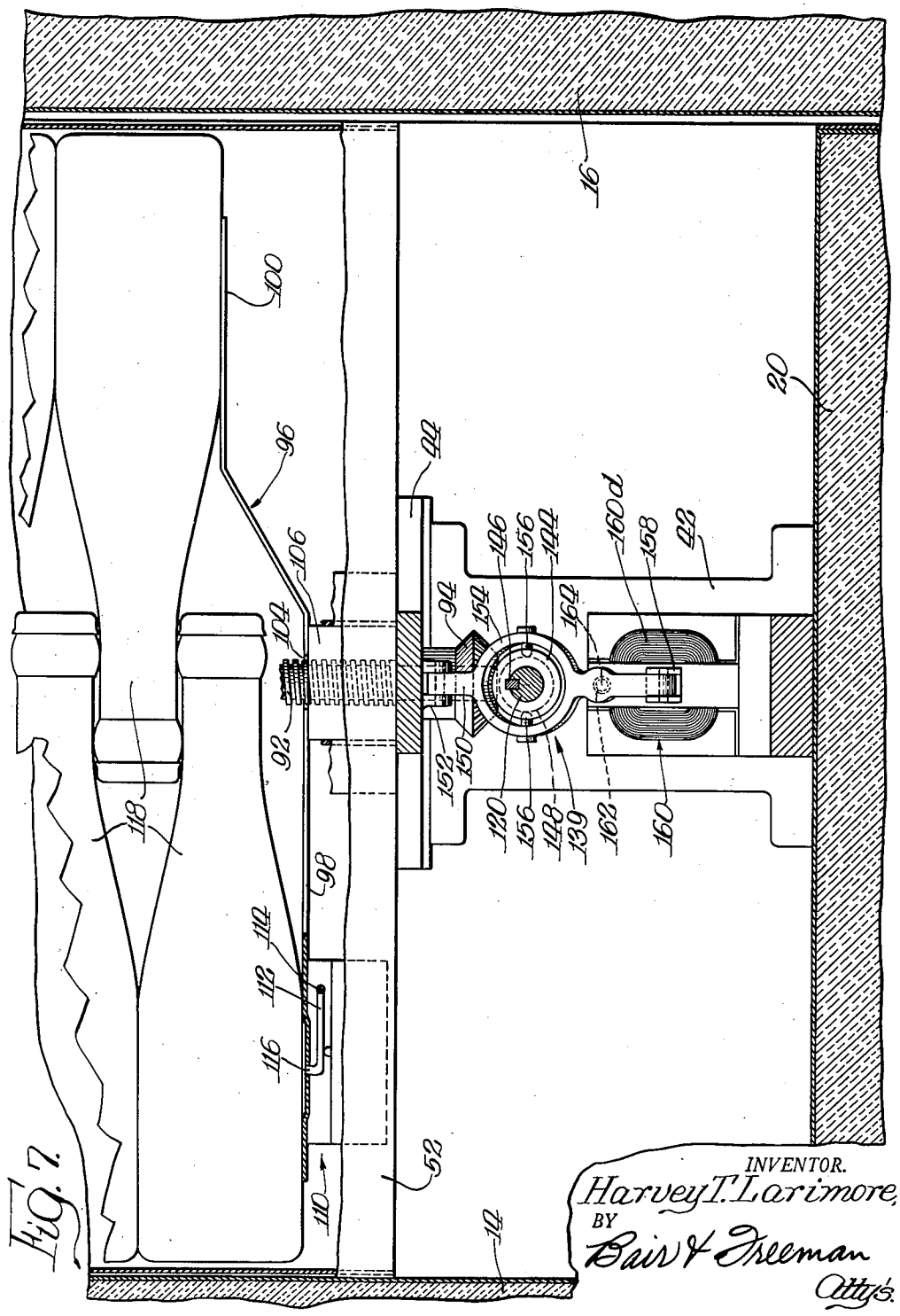


FIG. 7.

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BOTTLE VENDING MACHINE

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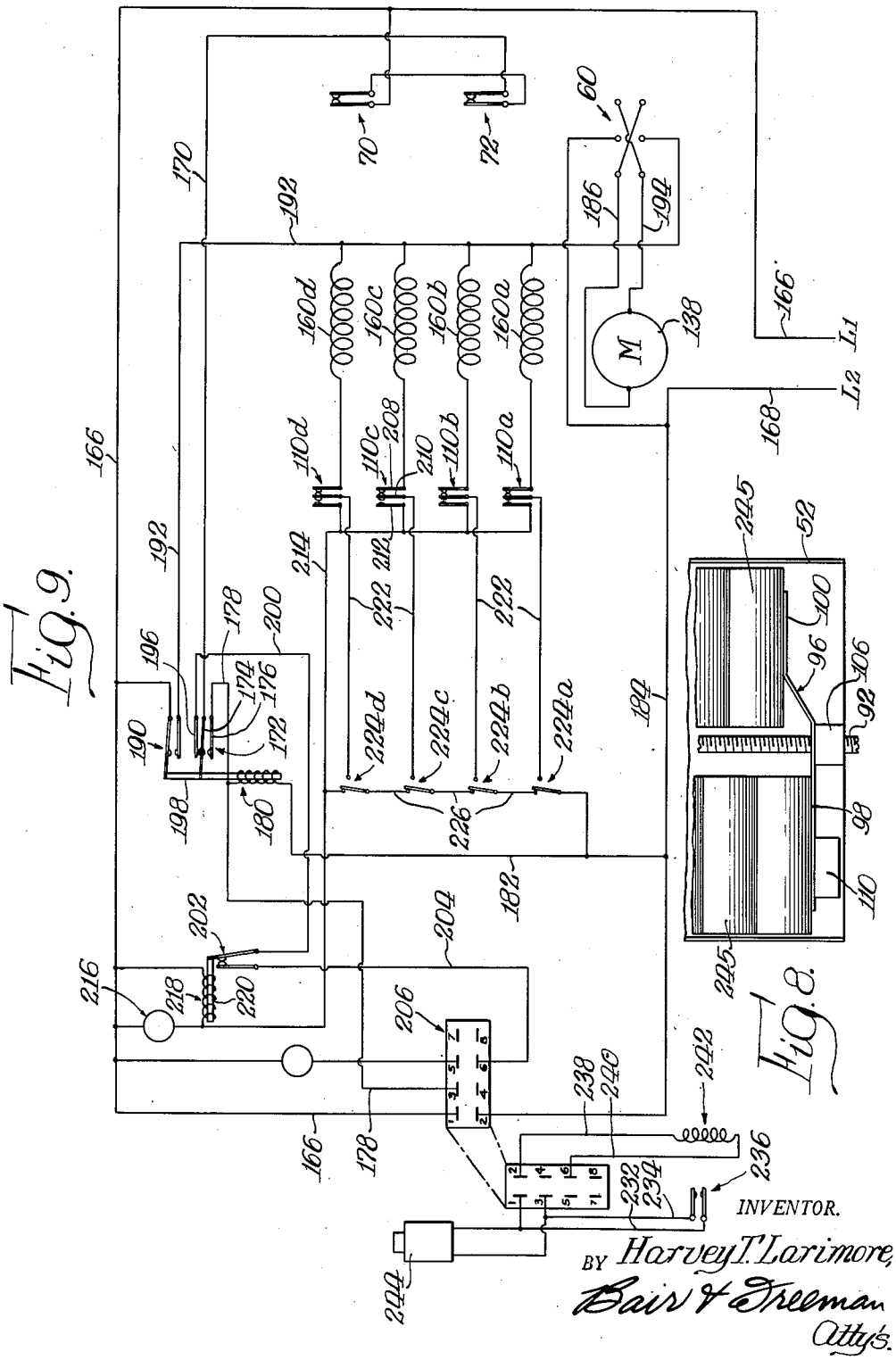


Fig. 9.

Fig. 8.

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Patented Feb. 19, 1952

2,586,351

UNITED STATES PATENT OFFICE

2,586,351

BOTTLE VENDING MACHINE

Harvey T. Larimore, Chicago, Ill.

Application October 12, 1948, Serial No. 54,043

5 Claims. (Cl. 312—45)

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This invention relates to vending machines, adapted to vending bottled goods, canned goods, or goods in cartons, or other containers.

An object of the present invention is the provision of a vending machine in which the articles to be vended are stacked in a novel staggered arrangement whereby a single impelling means controls the delivery of twice as many articles as was the case with former vending machines.

Another object of the invention is the provision of a vending machine adapted to articles or containers or different sizes.

Another object is the provision of a vending machine having great capacity for articles to be vended.

Still another object is the provision of such a vending machine having a great capacity for articles not only in position for immediate vending, but in addition thereto, a reserve capacity for placing articles for storing and cooling purposes to be later placed in position for vending.

A further object of the invention is the provision of a vending machine having vertically arranged columns or cells in which the articles to be vended are placed, and from which the articles are expelled from the top in response to upward movement of platforms actuated by a motor.

A still further object is the provision of a vending machine as just referred to, in which the platforms can be reversed in movement, or lowered, by means of which feature the cells can be filled with articles.

Still another object is the provision of such a vending machine in which several platforms, individual to the respective cells, are selectively actuated by a single motor.

Another object is the provision of a vending machine, as described above, in which the mechanism for expelling articles ceases operation in response to each individual article being expelled and falling into a chute and actuating a switch means.

A further object is the provision of a vending machine, in which the articles to be vended therefrom are so arranged and stacked as to permit the greatest number of articles to be accommodated in a given space. For example, a particular instance of the novel stacking arrangement is the stacking of bottles—the bottles are stacked in tiers in such a manner that the necks or small parts of the bottles in adjacent tiers interlock, and the body or large parts of the bottles rest upon one another with the greatest number of bottles being accommodated in a given space.

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With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my device whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawings, wherein:

Figure 1 is a front elevational view of the vending machine of the present invention;

Figure 2 is a horizontal view taken on line 2—2 of Figure 1 showing the interior of the machine;

Figure 3 is an enlarged sectional view taken on line 3—3 of Figure 2;

Figure 4 is a view taken on line 4—4 of Figure 2, showing the machine with the door removed;

Figure 5 is an enlarged view taken on line 5—5 of Figure 4, with an intermediate portion removed; this view is also taken on staggered line 5—5 of Figure 6;

Figure 6 is a view taken on line 6—6 of Figure 5;

Figure 7 is a view taken on staggered line 7—7 of Figure 6;

Figure 8 is a diagrammatic view of a portion of a cell, oriented as Figure 7, showing the staggered stacking arrangement of articles other than bottles; and

Figure 9 illustrates the diagram of the electric circuit employed in the vending machine.

The vending machine, as illustrated particularly in Figures 1, 2 and 4 includes a cabinet indicated generally at 12 having side and rear walls 14 and a door 16 having a lock 17. The cabinet is, of course, provided with a top 18, and a base indicated generally at 20.

The enclosing walls of the cabinet, as illustrated, are formed of insulating material so that the machine may be refrigerated, although it will be understood that the vending machine may be used for articles which are not intended to be refrigerated, and in the latter case the walls need not be of insulating material.

The front door of the machine is provided with a panel 22 for inclusion therein of various switch buttons, and label windows 23 employed in the operation of the machine. A coin slot 24, and a coin return chute 25 is also provided in the door as well as delivery chute outlets 26. At the lower portion of the door is a grill 28 for dissipation of heat from the refrigerating apparatus.

Referring particularly to Figures 2 and 4, the interior of the cabinet is divided into two vertical spaces, one of which is indicated at 30 and comprises a supply, or storing area. The space 30

is bounded on one side by a side wall of the cabinet and a vertical support 32 between which are mounted a plurality of shelves 34. Containers, or baskets, 36 are supported by the shelves 34.

The other portion of the interior of the cabinet is indicated generally at 38 and includes the operating mechanism space of the cabinet. Below the space 30 is another area, or space, 40 for containing the refrigerating mechanism. The cooling unit of the refrigerating apparatus may be placed conveniently in the cabinet, and the heat dissipation unit has communication with the grill 28.

A convenient supporting stand 42, having a horizontal supporting base 44, is mounted in the lower portion of the operating space 38. The base 44 is spaced from the base 20 of the cabinet. Mounted on the upper surface of the supporting base 44 are a plurality of cells 46, 48, 50 and 52 which extend vertically upward therefrom and terminate near the upper end of the space 38. The two cells 46 and 48 form one pair, being spaced apart to form a space 54. Similarly, the two cells 50 and 52 form a pair and are spaced apart to form a space 56. The innermost cells 48 and 50 are juxtaposed and the outermost cells 46 and 52 are disposed adjacent the lateral sides of the space 38.

The cells 46 to 52, in horizontal cross section, are of elongated rectangular formation, as illustrated in Figure 2, each having a long transverse dimension extending from front to rear of the cabinet, and a short transverse dimension extending transversely across the cabinet. The cells 46 to 52 may be formed of any convenient material, such as sheet metal fabricated in the usual manner. The cells are open at the top.

A plurality of vertically spaced shelves 58 are mounted in the spaces 54 and 56, being supported by the side surfaces of the adjacent cells.

Mounted in the space 54 is a switch 60 on one of the shelves therein and is provided with legends "Load" and "Vend." The purpose and operation of this switch will be referred to in detail later.

Mounted in the space 54 is a switch 60 on one top thereof are chutes 62 and 64, respectively, which may be formed of sheet metal and are mounted on the side walls of the adjacent cells. The chutes 62 and 64 slope downwardly from rear to front, as indicated in Figure 5, and extend from the front to a position adjacent the rear, as indicated in Figure 2. The lower ends of the chutes 62 and 64 communicate with the chute outlets 26 which extend through the door 16 of the cabinet. The outlets 26 may be provided with doors 65, pivoted at 66. The doors are adapted to swing outwardly and downwardly to the dotted line position shown in Figure 5 and may be urged to closed position by means of springs, or other convenient means.

The chutes 62 and 64 may be of the open-top gutter type chutes. Mounted in the floor of the chutes 62 and 64 are switches 70 and 72, respectively. Each switch includes a body portion 74 mounted on the underside of the floor of the respective chute, as indicated at 76 and a lever arm 78 pivoted in the mounting 76, the lever arm having a portion 80 extending upwardly through an opening of the floor of the chute. A switch contact element 82 extends up out of the body portion 74 and a spring 84 is biased between the contact element 82 and the lever arm 78. The switches 70 and 72 are normally closed and are opened when the lever arms 78 are depressed.

The purpose of these switches will be referred to in detail later in the description of the circuit employed in the machine, and the operation of the machine.

Mounted on the upper end of each of the cells 46 to 52 are deflector strips 86. These deflector strips are preferably spaced along the long transverse dimension of each cell, and are secured to the outermost walls of the cells of the respective pairs, curving upwardly and inwardly and are directed toward the respective chutes 62 and 64.

I have found that several kinds of means may be employed for impelling the articles to be vended and delivering them to the dispensing chutes. One such means includes a screw thread drive. Mounted in each cell 46 to 52 is a guide rod 88, supported as indicated at 90 in the supporting base 44, and extending to the top of the cell. The guide rods 88 are disposed substantially midway of the long transverse dimension of the cells and at the sides of the cells remote from the respective chutes 62 and 64. Also, mounted in each of the cells 46 to 52 is a screw threaded shaft 92, journaled in the supporting base 44 and having a portion extending therebelow. Each shaft 92 is disposed on the side of its cell substantially opposite the guide rod 88 and extends to the top of the respective cell. The lower projecting end of the shaft 92 extending below the supporting base 44 is provided with a bevel gear 94 secured to the shaft for rotation therewith. All of the shafts 92 and the gears 94 thereon are in alignment with each other.

Mounted in each of the cells 46 to 52 is a load supporting platform 96. The platform 96 may be made of any convenient material, such as rigid and strong sheet metal. The platform 96 is of a shape as viewed from the top, substantially co-extensive the cross sectional dimensions of the cells. The platform includes (Figure 7) a horizontal portion 98 extending from adjacent one end of the cell past the central point, or the threaded shaft 92, and a horizontal portion 100 offset vertically with respect to the portion 98. Each platform 96 is provided with holes, or cut-out portions 102 and 104 (Figure 2), for the reception of the guide rod 88 and the threaded shaft 92.

A block 106, of considerable vertical depth, is secured to the under surface of the horizontal portion 98 in registration with the guide rod 88 and shaft 92. One end of the block 106 is of U-shape, having legs 108 (Figure 3) disposed on opposite sides of the guide rod 88. The other end of the block 106 is provided with an interiorly threaded hole through which the shaft 92 is threaded. Upon rotation of the threaded shaft 92, the block 106 and the platform 96 are raised or lowered, and the platform is guided by the shaft 92 and by the guide rod 88. Mounted on the under surface of the horizontal portion 98 of each platform 96 is a two-way switch 110, which is included in the circuit for operation of the vending machine. The switch 110 is provided with a lever 112, pivoted at 114. The lever 112 has an upstanding portion 116 adapted to project through an opening in the platform 96. The switches 110 are designated with postscripts *a*, *b*, *c* and *d*, in the circuit diagram to be described later, to correspond with the respective cells.

As mentioned above, the vending machine is adapted to various kinds of articles. One type of articles is bottles, to which reference is now

made. A plurality of bottles 118 are stacked in each of the cells 46 to 52. As viewed particularly in Figures 2 and 7, the bottles are stacked in two tiers, arranged with their large ends toward the ends of the long dimension of the cell and their necks disposed toward each other and overlapping at the center of the cell. The horizontal portion 100 of the platform 96 is disposed above the horizontal portion 98 approximately one-half of the diameter of a bottle so that when the bottles are stacked, as represented in Figure 7, the large portions of the bottles in each tier are enabled to rest directly on one another and the necks of the bottles project in between adjacent necks of the bottles in the other tier. The offset portions 98 and 100 of the platform 96 are so related for the particular size bottle employed; the offset spacing may be varied for bottles of other sizes.

The mechanism for operating the screw threaded shafts 92 is disposed below the supporting base 44 in the lowermost portion of the cabinet. This mechanism is best illustrated in Figures 5, 6, and 7, and has been eliminated from Figure 4 for the sake of clarity. A drive shaft 120 is journaled at its ends in the upright portions of the supporting structure 42, as indicated at 122. The drive shaft 120 is disposed directly under the aligned bevel gears 94 on the lower ends of the threaded shafts 92. A plurality of bevel gears 124, having hubs 125, are mounted on the drive shaft 120, being fixed thereon against axial displacement and are in mesh with the respective bevel gears 94. The gears 124 are free for rotation with respect to the shaft 120, or conversely, the shaft 120 is enabled to rotate with respect to the gears 124. A worm gear 126 is fixedly mounted on the shaft 120 and meshes with a worm 128 on a shaft 130 which is mounted in a vertical portion 132 of the supporting means 42. The shaft 130 is coupled by means of a connector 134 to the shaft 136 of a reversible electric motor 138.

Associated with each of the gears 124 is a clutch means indicated in its entirety by the numeral 139. The hub 125 of each gear 124 is provided with a notch 140, adapted to receive a projection, or lug, 142 extending axially from a collar 144 on the shaft 120 and associated with the respective gear. The collar 144 is keyed to the shaft 120 by means of a conventional key 146 for rotation with the shaft, but the collar has axial sliding movement with respect to the shaft.

An arm 150 is pivoted in a bracket 152 on the under surface of the supporting base 44 adjacent each of the collars 144, and is adapted to swing on an axis transverse to the shaft 120. The arm 150 has a central loop portion 154 surrounding the collar 144. Pins 156 extend inwardly from opposite sides of the loop 154 and into the groove 148 in the collar. The lower end of the arm 150 is pivoted in the outer end of an armature 158 of a solenoid 160. A compression spring 162 is biased between the solenoid 160 and a pin 164 on the arm 150. The spring 162 biases the arm 150 to the left (Figure 6) and swings the collar 144 out of engagement with the gear 124.

From Figure 6, it will be noted that there is one solenoid 160 for each of the cells 46 to 52 and for further detailed description of the operation of the device in connection with the circuit diagrams, the individual solenoids 160 are given postscript references *a*, *b*, *c* and *d*, for association with the cells 46, 48, 50 and 52, respectively.

Figure 8 illustrates the adaptation of the machine to articles other than bottles. A plurality of containers 145, such as cans or round cartons, are shown in the cell 52. In this instance also, the containers 145 are arranged in two tiers, and those in one tier are staggered or offset vertically with respect to those in the other tier. There is, of course, no overlapping or intermeshing between the containers of the two tiers, but the staggered relationship produces an advantage which will be referred to later.

Use and operation of the mechanical dispensing mechanism

Containers or bottles of various flavors are placed in the different cells 46 to 52, to be dispensed according to the purchaser's selection as will be explained later.

When the motor 138 is operating, the shaft 120 rotates continuously during the operation of the motor. When all of the solenoids 160 are de-energized, the clutch means 139 are in declutched position, but when any one of the solenoids 160 is energized, the respective clutch means is moved into clutching position, which connects the respective gear 124 with the shaft 120 and the gear 124, therefore, rotates therewith. This, in turn, rotates the respective screw threaded shaft 92. Upon rotation of the shaft 92 in one direction, the block 106 is moved upwardly, which carries the associated platform 96 upwardly. The bottles of goods in the particular cell are thereby lifted and the top bottle is forced out of the top of the cell. When this occurs, the deflector means 86 force the bottle toward the adjacent chute 62 or 64. The bottle then slides down the chute and out through the delivery opening 26, where it can be picked up by the purchaser.

Upon rotation of the motor 138 in the opposite direction, the screw threaded shafts 92 are rotated in the opposite direction and the platforms 96 are therefore lowered in the cell. The service man utilizes the lowering operation for reloading the cells by feeding bottles into the cells until the platform is in its lowermost position.

From the above description of the cabinet and the operating mechanism, it will be noted that a great capacity of goods to be vended is possessed by the vending machine. A large number of bottles can be accommodated in the cells 46 to 52 by reason of the stacking arrangements in tiers. Bottles may be contained in the basket 36 and on the shelves 58 in the spaces 54 and 56 for storing purposes. The bottles while being stored are also cooled and when the cells are to be replenished, the bottles may be taken from the storage space and put in the cells and the machine is immediately ready for vending.

Circuit diagram of Figure 9

The circuit includes leads 166 and 168 for connection with the usual line. The lead 166 is connected with the two switches 70 and 72, which are disposed in the chutes 62 and 64 and are connected in series; a lead 170 leads from the switches 70 and 72 to a two-way switch 172, being connected with the element 174 therein; another switch element 176 of the switch 172 is connected to a lead 178 and a relay 180 and continues through lead 182 to the lead 184. The lead 184 is connected to one side of the reversing switch 60 (referred to above) and to the lead 168. Another lead 186 leads from one post of the

switch 60 to one side of the reversible motor 138.

The lead 166 is also connected to one switch element of a switch 190. The other side of the switch 190 is connected to a lead 192 which is connected with the reversing switch 60 on the side thereof opposite the lead 184. Another lead 194 leads from another post of the switch 60 to the motor 138.

The switch 174 includes a third switch element 196. The armature 198 of the relay 180 is connected with the switches 172 and 190. When the relay 180 is de-energized, the armature 198 thereof is disposed upwardly and switch 190 is open; in this same position, contact is made between switch elements 174 and 196 in the switch 172. When the relay 180 is energized, the switch 190 is closed and in the switch 172, there is contact between the switch elements 174 and 176.

The switch element 196 of the switch 172 is connected to a lead 200, which, in turn, is connected to one side of a switch 202; the other side of the switch 202 is connected to a lead 204, which, in turn, is connected to one terminal of a plug 206. The plug 206 has terminals numbered 1 to 8, inclusive.

The solenoids 160, referred to in connection with the operation of the mechanical dispensing apparatus, are connected in parallel with the lead 192. The opposite ends of the solenoids 160 are connected to the two-way switches 110, which are mounted in the load lifting platforms 96 in the cells. The switches 110 are provided with the postscripts *a*, *b*, *c* and *d* to correspond with the respective solenoids 160 and with the respective cells 46 to 52. Each of the switches 110 includes three contact elements 208, 210 and 212, the element 208 being connected directly with the respective solenoid 160. The switches 110 are all arranged so that when there are bottles in the cells, the bottles depress the lever arms 112 and there is contact between the elements 208 and 210. When the cells are empty, the lever arms 112 are biased upwardly, and the contact is broken between the elements 208 and 210 and contact is made between elements 210 and 212. The elements 212 are connected in parallel with a lead 214, which leads to a test lamp 216 and to a relay 218 and the lead 166. The relay 218 is provided with an armature 220, connected to one side of the switch 202. When the relay 218 is energized, the switch 202 is open. The relay 218 is normally de-energized and the switch 202 normally closed.

The elements 210 in the switches 110 are connected respectively to leads 222, having contacts adapted to be contacted by respective switches 224. The switches 224 are also provided with the postscripts *a*, *b*, *c*, and *d* to correspond with the respective switches 110 and solenoids 160. The switches 224 are of the conventional push button type, in which, when one is actuated all others are released. The buttons are indicated at 224 (Figure 1) in the panel 22 on the door of the machine. The switches 224 have constant contact with one end of adjacent leads 226, and when they are depressed they contact the respective lead 222; when the switches are released, they continue the circuit through leads 226 which are arranged in series and connected between leads 182 and 214.

The lead 184 is connected to one of the terminals of the plug 206.

The reference numeral 228 designates generally a coin control and selector mechanism, which may be of conventional construction. The mechanism 228 includes a connector plug 230, having terminals numbered 1 to 8 inclusive, corresponding to the terminals in the plug 206 and between which appropriate connection is made. Leads 232 and 234 are connected to the terminals 1 and 3 of the plug 230 and terminate in a switch 236. The switch 236 is adapted to be closed by a coin inserted for operating the machine.

Leads 238 and 240 are connected with terminals Nos. 2 and 6 in the plug 230 and are connected to a lock-out relay, 242.

A manually operated switch 244 is inter-connected between the leads 232 and 234 to shunt the switch 236.

The lock-out relay 242 is included in the coin mechanism 228 and is for the purpose of preventing the coin mechanism from accepting a coin and the coin will then be returned to the purchaser.

Operation of the circuit

Assume the purchaser desires a particular flavor of bottled beverage, as indicated by one of the labels 23 and pushes the button of switch 224*a*. The switch then makes contact with the respective lead 222. If the particular cell, which in the given case is cell 46, for the flavor desired is empty, then the contact element 210 in the switch 110*a* is in contact with the element 212. This closes the circuit to the lead 214. The circuit then is: lead 168, 184, 182, switch 224*a*, lead 222, switch 110*a*, lead 214, test lamp 216 and lead 166. The circuit is also closed through the relay 218 and lead 166. When this condition occurs, the relay 218 is energized and the switch 202 is opened, bringing into action the lock-out relay 242. The latter is then effective for preventing the mechanism from accepting a coin. The test lamp 216 indicates to the purchaser that the particular flavor is depleted and, of course, that the cell is empty. The lock-out relay 242 is a conventional arrangement incorporated in the coin control mechanism 228, and so arranged that when the circuit is broken through switch 202 (and lead 204, plug 206 and lead 240) it actuates a device for preventing the coin mechanism from accepting a coin.

The same conditions prevail when none of the switches 224 are actuated by the purchaser. When none of the switches 224 are actuated, the circuit is closed continuously through the leads 226 and switches 224 to lead 214, bypassing the switches 110 and has the same effect in lighting the test lamp 216 and energizing the relay 218.

If the particular flavor is not depleted, but there are bottles in the cell (e. g., cell 46) when the purchaser actuates the switch 224*a*, the element 210, in the switch 110*a*, is in contact with the element 208; the circuit is then completed through the solenoid 160*a*. When this occurs, the circuit is broken to the test lamp 216, and to the relay 218. The relay 218 is de-energized and the switch 202 is closed; the test lamp 216 is not lighted and the purchaser inserts a coin in the slot. When the coin is inserted, it closes the contacts in the switch 236. The circuit is then closed as follows: lead 166, lead 232, switch 236, lead 234, lead 178, relay 180 and return leads 182, 184 and 168. The relay 180 is thus energized and the element 174 in the switch 172 is in contact with the element 176. The closed circuit continues from lead 178 through switch 172, and lead 170 through the switches 70 and 72 and then to the lead 166. At this point a holding circuit is established;

the coin makes only a momentary contact in the switch 236 and the holding circuit retains the relay 180 energized until broken, as described later. The holding circuit is: leads 168, 184, 182, relay 180, lead 178, switch 172, lead 170, switches 17 and 72, and lead 166.

At the same time, the circuit is closed through the motor 138 as follows: lead 166, switch 190 which is closed by the relay 180, lead 192 through the reversing switch 60 and then through the motor and lead 168.

When the coin is thus inserted in the coin selector mechanism, the motor 138 begins to operate, the switch 60 having been thrown to the desired position for the intended direction of rotation of the motor. During rotation of the motor, the drive shaft 120 operates also.

The circuit through the solenoid 160a having been completed, as explained above, the respective clutch means 139 is actuated, as described in connection with Figure 6, bringing into clutched relation the gear 124 and gear 94. The screw threaded shaft 92 is thereby rotated, lifting the platform 96 and forcing the uppermost bottle out of the cell 46. The bottle then is deflected by the deflector means 86 into the adjacent chute 62. The bottle on falling into the chute rides across the switch 70 and thereby breaks the circuit through this switch and between the leads 166 and 170, and thereby breaks the holding circuit. The relay 180 is thereby de-energized, opening the switch 190, and the circuits through the solenoids 160 and motor 138 are broken. The cycle is thus completed and the mechanism is at rest.

When the relay 180 is de-energized, the circuit is completed through lead 166, switches 70 and 72, lead 170, switch 172, lead 200, switch 202 (which is normally closed), lead 204, lead 240, lock-out relay 242, lead 238, and leads 184 and 168. Thus, the lock-out relay 242 is activated to prevent the coin mechanism from accepting a coin, and if a coin is inserted, it will be directed into the coin return chute.

It will be noted that the switches 224 are arranged in series with respect to each other so that if one of the switches is actuated for a selection for one flavor, none of the succeeding switches will be affected and, therefore, only one flavor can be dispensed at one time.

The operation is not regulated in predetermined timed cycles, but is controlled by the actual delivery of articles vended, i. e., by the articles opening the switches 70 and 72. Thus articles of different sizes can be accommodated, the platforms 96 being elevated in each vending cycle an amount determined by the size of the articles.

Because of the staggered arrangement of the bottles, and the intermeshing of the necks of the bottles in the two tiers, a great increase in capacity is accomplished. The spaces between adjacent necks of bottles in a single tier which were formerly not utilized in other vending machines, are now employed for increased capacity.

In the case of either bottles, or containers which do not intermesh (Figure 8), the staggered arrangement results in an advantage which I consider entirely novel: each impelling means for delivering the articles out of the cells into the chutes controls twice as many articles as would be the case if it were not for the staggered relationship.

In order to load the device, the service man throws the switch 60 to the "Load" position, as

indicated in Figure 4, and the drive motor 138 is reversed from the direction of the vending operation. He then actuates the switch 244, which closes the circuit as if a coin were inserted and presses one of the switch buttons 224. The load supporting platform 96, in the respective cell, is then lowered and the service man fills the cell with bottles and when the load supporting platform is completely lowered and the cell is filled, he releases and opens the switch 244, which opens the circuit and the motor 138 stops.

While I have herein shown and described a preferred embodiment of my invention, manifestly it is capable of modification and rearrangement of parts without departing from the spirit and scope thereof. I do not, therefore, wish to be understood as limiting this invention to the precise form herein disclosed, except as I may be so limited by the appended claims.

I claim as my invention:

1. In a vending machine, the combination comprising a cabinet, a pair of vertically disposed, laterally spaced cells in the cabinet, said cells having open upper ends and being adapted to receive and contain articles to be vended, means for raising the articles in said cells and expelling them therefrom, a chute positioned between and adjacent the top of said cells, and deflector means secured to the upper end of each of said cells, said deflector means being operable to guide articles expelled from the respective cells into said chute, said chute communicating with the exterior of the cabinet.

2. In a vending machine, the combination comprising a cabinet, a pair of vertically disposed, laterally spaced cells in the cabinet, said cells having open upper ends and being adapted to receive and contain articles to be vended, means for raising the articles in said cells and expelling them therefrom, a chute positioned between and adjacent the top of said cells, and curved deflector means secured to the top of each cell on the side thereof remote from said chute, each deflector means extending upward and over the top of the respective cell and being operable to guide articles expelled from the respective cell into said chute, said chute communicating with the exterior of the cabinet.

3. In a vending machine, the combination comprising a cabinet, a pair of vertically disposed cells in the cabinet, said cells having open upper ends and being adapted to receive and contain articles to be vended, each cell having a relative long and short transverse dimension, said cells being spaced apart with their long transverse dimensions substantially parallel, means for expelling articles from said cells, and a chute positioned between said cells adjacent the top thereof, said chute having an open top and extending transversely across the space between said cells and extending substantially the extent of the long dimension of said cells, said chute communicating with the exterior of the cabinet.

4. A vending machine for vending bottles, each bottle having a large body portion and a reduced neck portion, comprising in combination, a cabinet, a vertically disposed cell in the cabinet, said cell having a long transverse dimension, a vertically movable platform in said cell, said platform having vertically offset portions spaced along said long dimension, said portions being offset substantially half the dimension of the large body portion of each of said articles, said bottles adapted to be stacked in said cell in tiers with one tier supported on each portion of said platform,

said bottles being arranged with the reduced neck portions in respective tiers intermeshing, the long transverse dimension of said cell being substantially the length of said tiers so stacked, and means for moving said platform.

5. In a vending machine, the combination comprising a cabinet, a pair of vertically disposed, laterally spaced cells in the cabinet, said cells having open upper ends, said cells being adapted to contain articles to be vended, shelves secured to said cells in the space therebetween, means for expelling articles from said cells, a chute secured between said cells in the space therebetween adjacent the top thereof, and means for deflecting articles expelled from said cells into said chute, said chute communicating with the exterior of the cabinet.

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