

Aug. 27, 1940.

H. J. SMITH
VENDING MACHINE

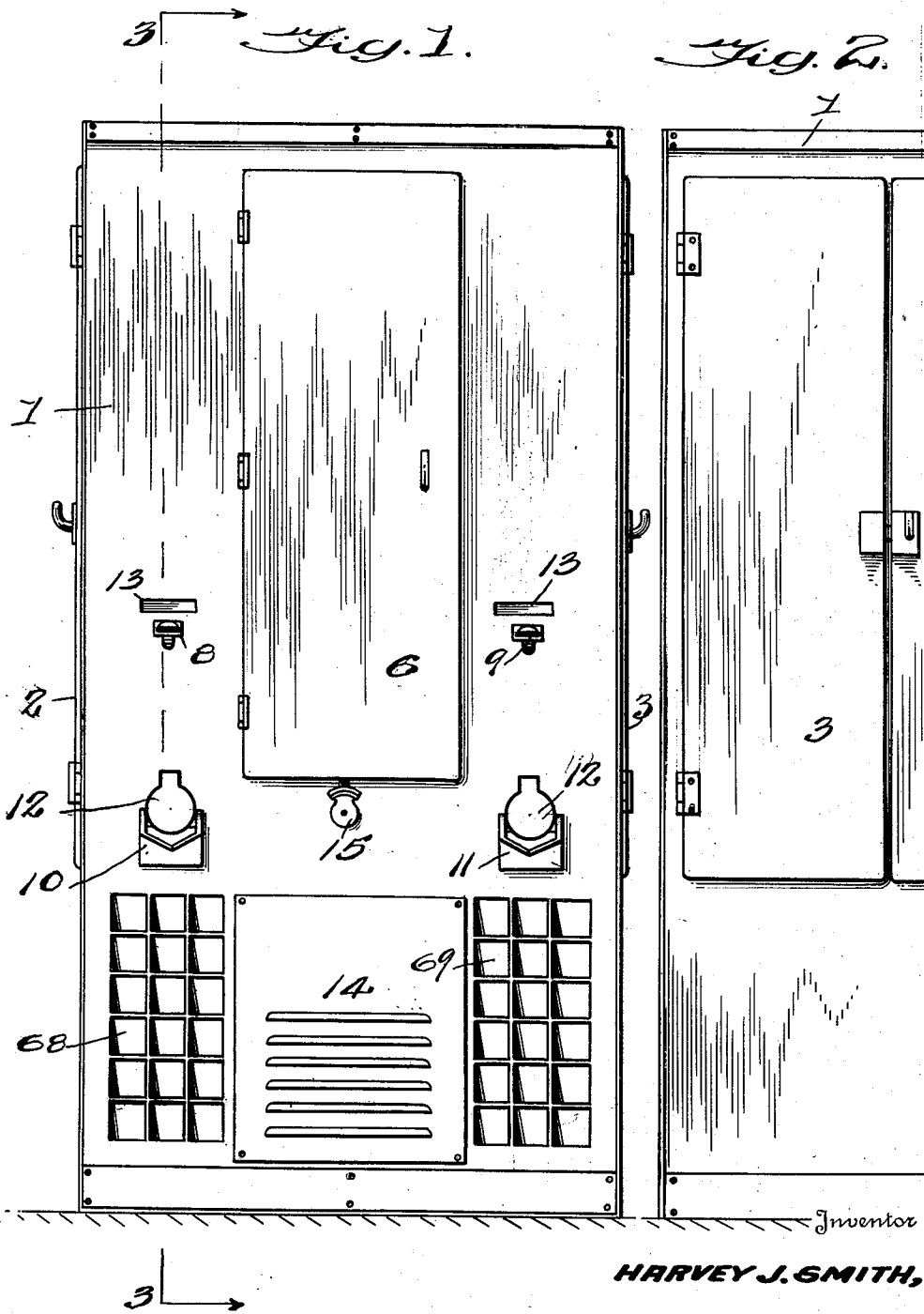
2,212,797

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5 Sheets-Sheet 1

Fig. 1.

Fig. 2.



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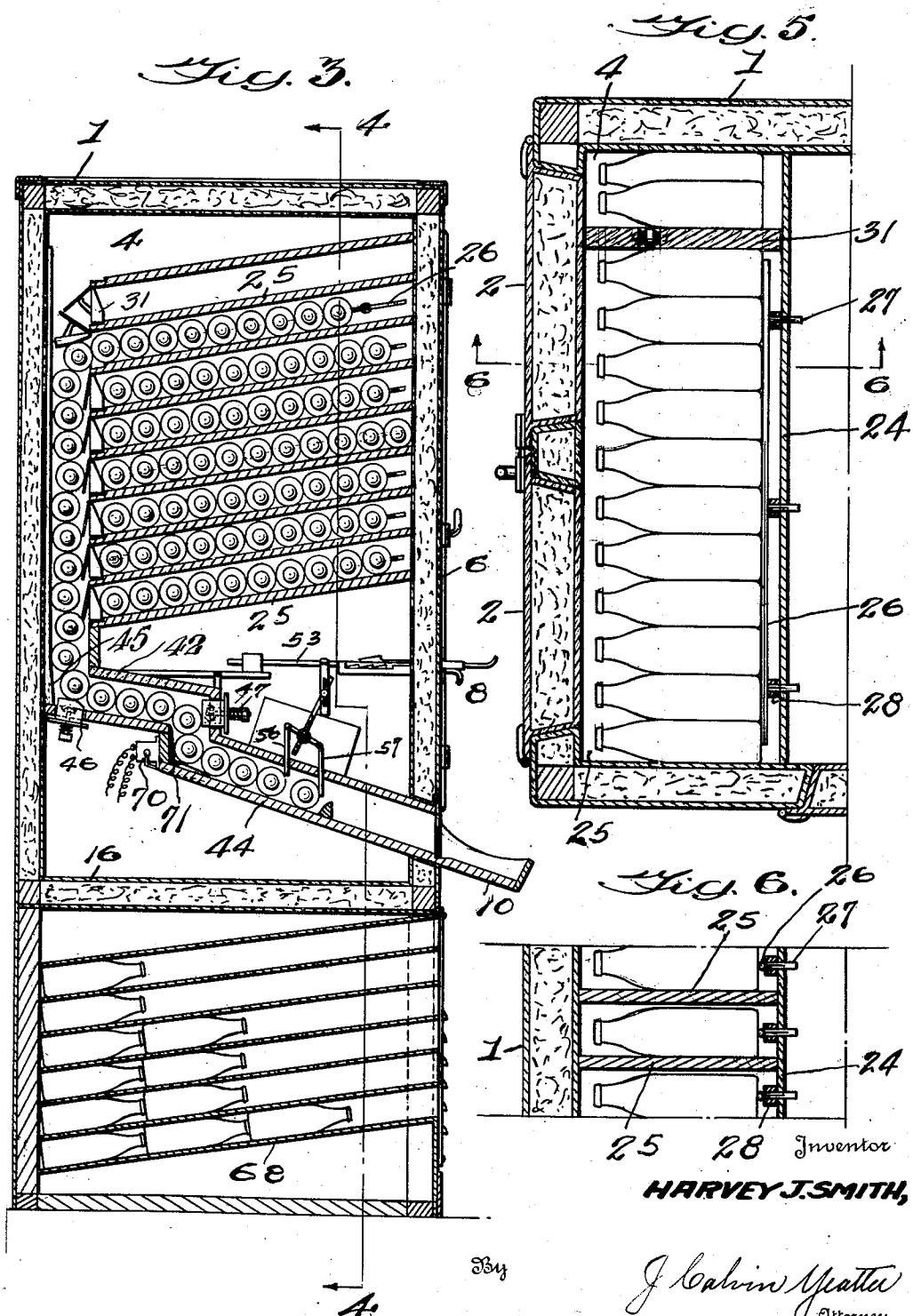
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VENDING MACHINE

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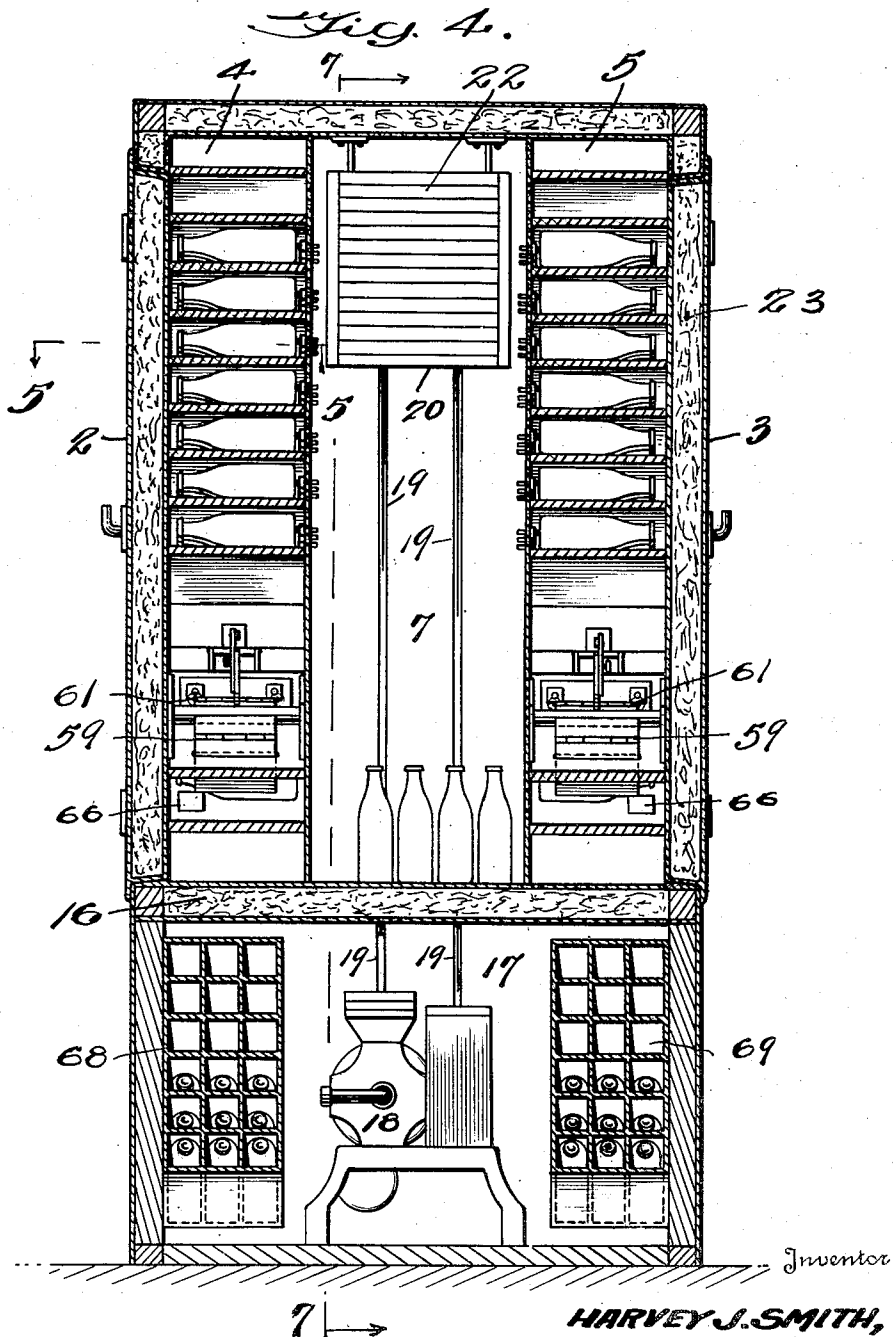
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5 Sheets-Sheet 3



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Filed April 3, 1939

5 Sheets-Sheet 4

Fig. 7.

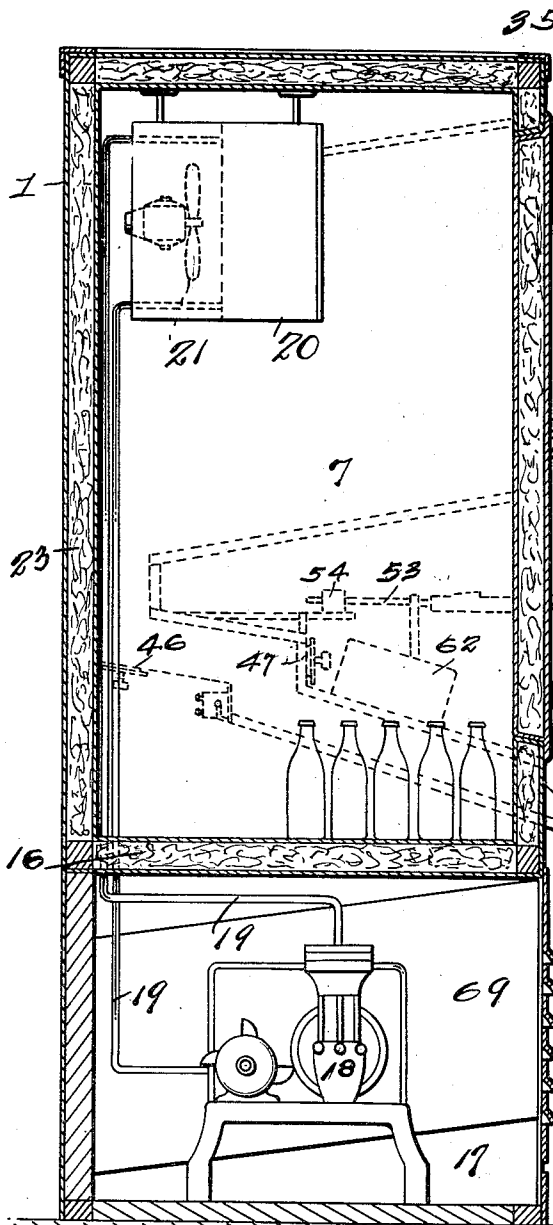


Fig. 8.

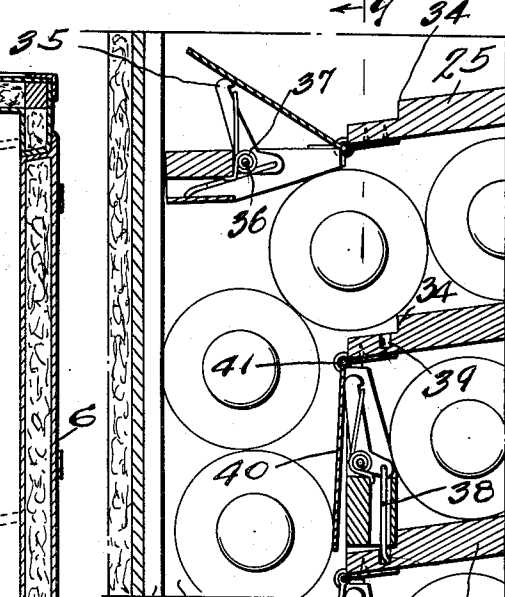
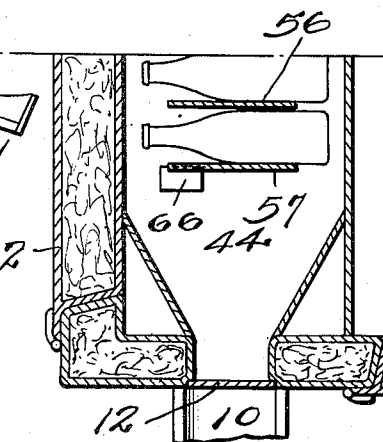


Fig. 11.



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Fig. 9.

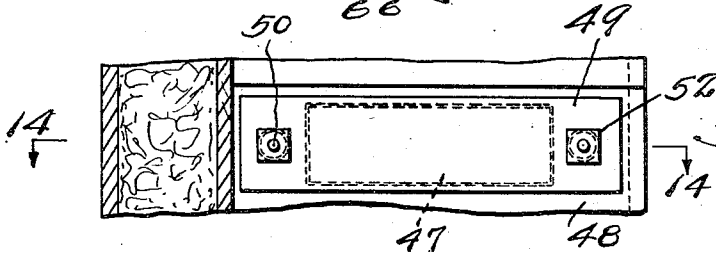
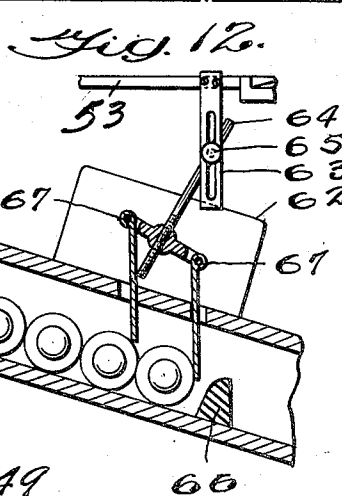
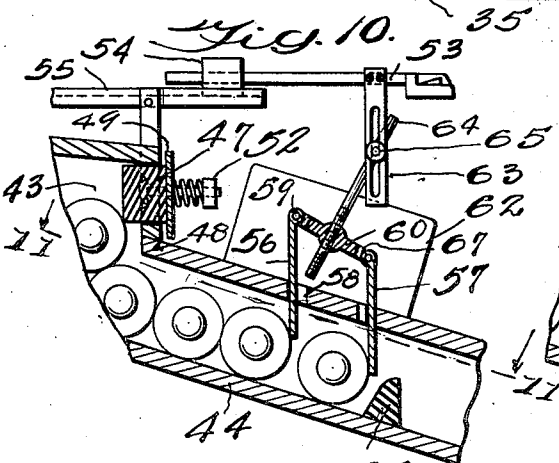
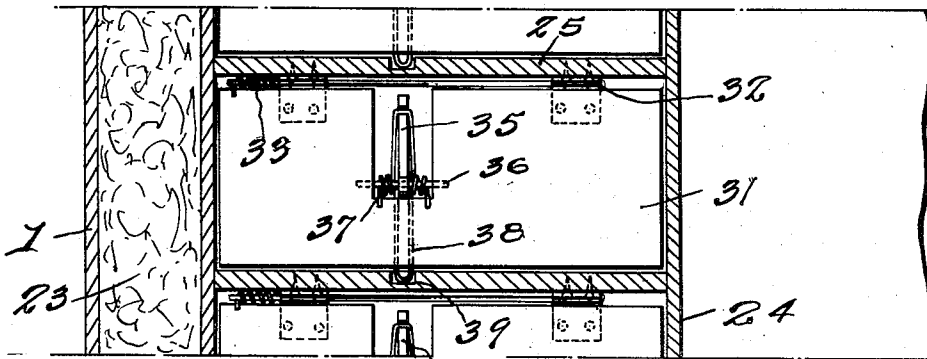


Fig. 13.

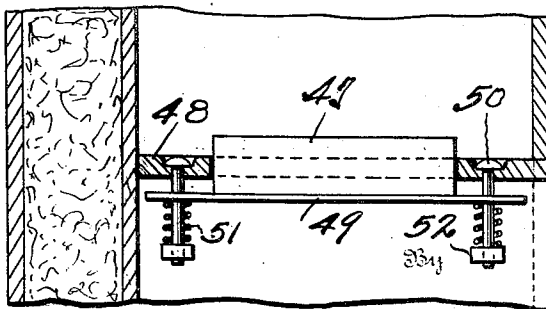


Fig. 14.

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UNITED STATES PATENT OFFICE

2,212,797

VENDING MACHINE

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4 Claims. (Cl. 312-48)

My present invention relates to an improved vending machine of the coin controlled type in which is also incorporated a refrigerating or cooling system for the bottled beverages stored in the machine. I preferably utilize a dual or two-section machine for vending or dispensing, singly, the bottled goods from the separated sections or dual machines, and a single intermediate cooling chamber is employed to provide a compactly arranged, and self contained vending machine.

By the use of two separate, or dual dispensing mechanisms ample storage is provided for a large quantity of bottles, which bottles may be of two different sizes, or the two sets of bottles may contain different beverages, thus facilitating the sale of the bottled goods, and at the same time reducing the frequency with which the usual vending machines must be refilled.

Means are provided for controlling the movements of the bottles from successive interior storage chutes to a gravity feed chute, thence to an arrester chute, and finally to the discharge chute and its trough, in order to prevent jamming of the bottles; to provide for a free flow of the bottles under control means; and for finally discharging a single bottle from the dispensing machine after the proper coin has been deposited in the coin chute.

The invention consists in certain novel combinations and arrangements of parts as will hereinafter be fully set forth and claimed. In the accompanying drawings I have illustrated one example of the physical embodiment of my invention wherein the parts are combined and arranged in a dual vending machine, but it will be understood that changes and alterations may be made in these exemplifying structures, within the scope of my claims without departing from the principles of my invention.

Figure 1 is a view in front elevation of the duplex, coin controlled vending or bottle dispensing machine embodying my invention.

Figure 2 is a side elevation of the machine of Figure 1 showing one of the two side doors giving access at each side of the cabinet to the interior bottle storing compartments, and other parts of the machine.

Figure 3 is a transverse vertical sectional view at line 3-3 of Figure 1 showing the interior arrangement of parts in one of the dual sections of the machine.

Figure 4 is a sectional view of one side of the machine as at line 4-4 of Figure 3, showing the cooling chamber between the duplex vending devices, the refrigerating apparatus in the lower

compartment between the empty-bottle containers, the heat exchange unit and the tiers of bottled beverages in the two storage compartments.

Figure 5 is a horizontal view, enlarged, at line 5-5 of Figure 4 showing a row of bottles in an inclined storage chute, and the double side doors.

Figure 6 is a fragmentary vertical sectional view at line 6-6 of Figure 5 showing bottles in the several storage chutes, and guides therefor.

Figure 7 is a vertical transverse sectional view at line 7-7 of Figure 4 showing by dotted lines one of the coin controlling mechanisms for a double-acting single discharge gate, the refrigerating apparatus in the lower chamber and the air cooling and distributing unit in the upper end of the central cooling chamber for both sections of the machine.

Figure 8 is an enlarged detail vertical sectional view showing parts of two of the storage chutes, with one exit gate opened and the gate to the other chute closed, with the bottles in the upper chute passing into the vertical feed chute.

Figure 9 is a sectional view at line 9-9 of Figure 8 showing the inner side of an automatically opening exit gate, and the spring device for opening the gate at the proper time.

Figure 10 is an enlarged detail sectional view showing the duplex discharge gate (closed) and the operating mechanism therefor together with a cushioned abutment or stop at one end of the arrester-chute.

Figure 11 is a horizontal sectional view at line 11-11 of Figure 10 showing a bottle between the duplex or double acting discharge gates together with an abutment in the path of the neck of the discharging bottle which causes the bottle to turn through an arc of 90 degrees and therefore slide out of the discharge chute in a longitudinal position with relation to the discharge chute.

Figure 12 is a view similar to Figure 10 but with the duplex discharge gates adapted to pass a single bottle of less diameter than the gates of Figure 10.

Figure 13 is an enlarged front elevation of the cushioned stop at one end of the arrester chute, and Figure 14 is a sectional view at line 14-14 of Figure 13.

As before stated I preferably carry out my invention in the form of a dual or duplex vending machine, from which two sizes of bottles may be dispensed, singly, or the dual machine may be equipped to dispense two sets of bottles singly, of the same size and containing two different liquid beverages.

As shown in Figures 1 and 2 the cabinet 1 is provided with two double side doors 2, 2 and 3, 3 that give access to the two interior storage compartments 4 and 5 respectively, and the front central door 6 gives access to the central cooling chamber 7 located intermediate these storage chambers. In Figure 1 the coin slots are indicated at 8 and 9 and the bottle-discharging troughs are indicated at 10 and 11, each having a hinged closure or flap 12 to prevent uncontrolled discharge of a bottle from the interior of the cabinet. At 13, 13 two "empty" indicators are provided adjacent the coin slots to announce the exhaustion, or near exhaustion, of the supply of bottled beverages in the two sections of the vending machine.

A removable panel 14 is located centrally of the cabinet near the bottom thereof, and at 15 in Figure 1 a device is attached to the front of the cabinet for use in removing a bottle cap.

As shown in Figure 4 a horizontal partition 16 separates the upper storage chambers and the intermediate cooling chamber from a bottom compartment 17, in which a refrigerant compressor 18 of suitable type is located, and the two pipes 19, 19 passing upwardly through the cooling chamber communicate with the heat exchange unit 20 supported at the top of the cooling chamber. This unit includes an electric fan 21 operated from a suitable source of electric supply, and the usual louvers 22. From this unit the cooled air is distributed throughout the cooling chambers and storage chambers, and as indicated the walls and doors forming the storage compartments and cooling chamber are insulated as at 23 to insulate the interior of the machine.

Inasmuch as the dual dispensing mechanisms are substantially similar in construction and operation a description of one dispensing mechanism will suffice for both of them.

As indicated in Figures 4, 5, and 6 two upright, open partitions 24, 24 are spaced apart in the interior of the cabinet to form the two bottle storage compartments 4 and 5 and the central cooling chamber 7, and the bottles are deposited in their respective storage chutes and the upper part of the compartments through the open double doors 2, 2 and 3, 3, the bottles being inserted butt end first. As seen best in Figure 3 a vertical series of spaced inclined shelves 25 is arranged in a storage compartment to form storage chutes declining toward the rear of the cabinet, and the bottles stored in these chutes, as well as in the top of the compartment above the chutes, are held against accidental rolling movement by exit gates that are manually closed. These gates are held in closed position by bottles in a vertical feed column and successive exit gates beginning with the top gate are automatically opened as the height of the feed column diminishes.

In their gravity-rolling movement down the inclined chutes the bottles are guided and held in proper alinement by means of guide rails 26 that extend longitudinally of each storage chute for contact with the butt-ends of the bottles and the rails are secured to an inner partition 24 of the cabinet. These rails are adjustable toward and away from the row of bottles, and they are secured to the partition as by pins or bolts 27. As seen in Figure 5 removable filler blocks 28 may be mounted on the pins between the guide rails and the partition so that the rails will guide bottles of one size, and these filler blocks may be removed to permit the guide rails to be moved

to position against the partition to accommodate bottles of greater length.

At the rear of the interior of the storage compartment a vertical feed chute 29 is provided, having a guide strip 30 fixed to the inner face of the back wall of the cabinet, and as seen in Figure 8 this feed chute 29 is slightly wider than the diameter of the bottles forming the feed column therein, but not of sufficient width to permit jamming of the bottles in the feed column.

An automatically opened exit gate is provided at the rear end of each storage chute, and as the height of the feed column decreases, the exit gates of the storage chutes are successively opened to the feed chute 29 to permit the bottles in successive chutes to roll into the upright feed chute 29, thus forming the upright feed column of bottles as best seen in Fig. 3.

In the enlarged detail view in Figure 8, it is assumed that the bottles in the top of the storage compartment above the chutes have passed down into the feed chute 29, and the top, automatically opened exit gate, which had been held in closed position by the bottles in the upper end of the feed column, has been swung open, while the exit gate of the storage chute second from the top of the series of chutes is held closed by the bottles rolling out of the top storage chute, into the feed column.

As best seen in Figure 9 the gate 31 is of rectangular shape, and hinged at 32 to the shelf 25 above; at least one of the hinges having a spring 33 which swings the gate outwardly and upwardly from the chute as in Figure 8, when the gate is free to swing. Beginning with the bottom storage chute, the gates are manually closed, and as the storage chutes and feed chute are filled with bottles, from the bottom up, each succeeding gate is manually closed against the tension of spring 33 and against a stop 34 of its chute. A latch device is provided for each gate comprising an angular trip lever 35 pivoted at 36 in a slot of the gate, and a coiled spring 37 tends to swing the trip lever toward the feed chute.

After the gate is closed against its stop 34 this angular trip lever is manually pushed from its upper unlatched position of Figure 8 to the lower latched position in the same figure. As the lever is pushed inwardly toward the chute a latching 50 detent or latch 38 suspended from the short inner arm of the lever slips into a socket 39 of the bottom of the chute and locks the gate against opening by pressure imposed on the gate from the row of bottles in the chute. To confine the latch and the gate in closed position I utilize a presser plate 40 hinged at 41 at the outside of the gate. Thus, after the latch for the gate has been set, this presser plate is manually turned down over the slot in the gate and against the free end of the angular lever, and the bottles in the feed column pressing against this plate as well as the door, hold the door closed.

As soon as the top of the feed column of bottles passes below a gate the presser plate and gate are freed from the laterally disposed weight of the bottle, the spring latch lever is swung outwardly to swing the presser plate on its hinge, and the latch 38 is lifted from its socket 39, thereby permitting the spring 33 to swing the gate, latch and plate outwardly and upwardly, thus opening a chute so that the contained bottles may roll down into the feed chute and form a part of the feed column of bottles.

As indicated in Figure 3, for the purpose of 75

decreasing the load of the feed column and thereby preventing an excessive load on the control and discharge means for the single bottles I provide an inclined arresting chute 42 at the bottom of the feed chute, and this arresting chute has an end vertical port 43 which opens downwardly into a discharge chute 44, and the two discharge chutes of the dual machine terminate in the troughs 10 and 11 indicated at the front of the cabinet in Figure 1.

At the bottom of the feed the guide strip 30 for the feed column of bottles, is thickened as at 45 in order to guide the bottles in the column into an off-center position with relation to the feed chute, thus preventing the column of bottles from assuming a straight line column.

The guide strip 30, and its thickened lower end 45 are preferably of resilient material to prevent rattling of the bottles in the feed chute, and at the bottom of the feed chute a resilient buffer 46 protrudes into the chute to receive the impact from descending bottles as they successively reach the bottom of the feed column. A similar device, as bumper 47 is located in the end of the arresting chute, and as this buffer and bumper are of similar construction and operation, a description of one will suffice for both as disclosed in detail in Figures 13 and 14.

The bumper 47, of rubber or resilient material is mounted in a slot in a wall 48 of the chute, and the bumper is provided with a back plate 49 outside the chute, while the front face of the bumper projects into the chute to receive the impact of bottles moving through the chutes. The back plate 49 is mounted by two bolts 50 in the wall of the chute, and springs 51 are interposed between nuts 52 on the threaded ends of the bolts, as best seen in Figure 14. The nuts 52 may be turned to increase or decrease the tension of the springs and thus vary the resistance of the bumper offered to the row of bottles in the arresting chute. Thus the buffer 46 receives and softens the impact of the lowest bottle in the feed column, reduces noises of the falling bottles, and serves to hold the column against jamming. The bumper 47 together with the arresting chute, relieves the bottles in the discharge chute 44 from the weight of the feed column of bottles, and the successive discharge of single bottles from the chute 44 is more readily controlled.

The discharge or dispensing of bottles, one at a time, from the discharge chute to the receiving trough 10, as in Figure 3 is initiated by manipulating the coin controlled appliance at 8, and this appliance includes a slide rod 53 supported in slide block 54, which slides in a track 55 forming part of a frame fixed to a suitable support in the interior of the cabinet. The sliding movement of the rod and block inwardly controls the movement and position of a double discharge gate comprising panels or plates 56 and 57 that move in slots 58. These panels or double acting discharge gates are each pivoted at 59 to the opposite ends of a cross-head 60, and the cross-head is centrally pivoted at 61 on suitable supports as 62 so that as the cross head is rocked the two gates 56 and 57 are moved up and down to discharge one bottle and retain the next one. The rocking of the cross head 60 is accomplished from the slide 53 of the coin controlled apparatus, which slide has a slotted depending arm 63 which moves with the slide, and a screw bar 64 which is threaded in the cross head for adjustment is connected with the slide arm 63 by a pin 65. It will be understood that the dual gates 56 and 57 are spaced apart a

distance slightly more than the diameter of a bottle, but the widths of the two guide slots 58, 58 for the gates permit them to spread slightly so that they will adjust themselves to the discharging bottle.

Thus, after a coin has been deposited in the coin slot 9 as in Figure 7, the dotted slide devices carry with them the slide rod 53, and in Figure 10 it will be seen that this slide movement swings the screw bar 64 over to the left and the cross bar also swings to lower the gate 56 and raise gate 57. The gate 57 thus frees a bottle to roll down the discharge chute, and upon automatic return (as by a spring) of the slide rod to the right, the gates assume the position of Figure 10, thus discharging one bottle and then retaining the next one in the place of the first or discharged bottle.

The bottles are thus successively discharged, one at a time, the storage chutes are successively emptied into the feed chute, the feed column of bottles gradually decreases in height, and the arresting chute and discharge chute are finally emptied.

The bottles are arranged transversely of the chutes so that they may readily roll to the discharging chute, but after the discharged bottle passes the gate 57, the head portion or neck encounters a block 66, preferably of rubber that is fixed to the bottom of the discharge chute in the path of the neck portion of the bottle. Thus as seen in Figure 11 the neck portion of the lower bottle, when it is discharged, will encounter the block 66 and hold the neck portion while the heavier body portion of the bottle will swing around through an angle of 90 degrees into a longitudinal position aligned with the discharge trough, and then the discharged bottle slides butt first into the receiving trough 10 or 11 as the case may be.

In Figure 12 the dual gates are arranged closer together than in Figure 10 to accommodate bottles of small diameter.

In Figure 10 the gates are in position with their hinge ears 67 at the inner sides of the gates thus outwardly spacing the gates, while in Figure 12 the dual gates are reversed with their hinge ears at the outer sides of the gates, so that the gates are inwardly spaced.

After the contents of a dispensed bottle have been consumed, the empty bottle is slipped into a pigeon hole or pocket forming part of two series of receptacles 68 and 69 located at opposite sides of the bottom chamber 17 with their mouths open at the front of the cabinet. The pockets decline to the rear and they are of such a cross area as to neatly accommodate the bottles, end to end so that the bottles in the several rows may not without difficulty be withdrawn.

At 70 in Figure 3 an electric switch is indicated, which is held open by a bottle, as the last bottle in the discharge chute, and when this bottle rolls off an angular, rigid pad 71 located in a corner at the rear end of the discharge chute the switch is automatically closed, and the "empty" sign is displayed at 13 shown at the front of the cabinet in Figure 1.

As indicated in Figures 4 and 5 cooling chamber 7 may be employed for refrigerating purposes, and bottled goods may be stored therein as illustrated.

From the above description taken with the drawings it will be apparent that I have provided a vending machine of large capacity that is at the same time compactly arranged to occupy a minimum of space, and which is self contained,

requiring only the usual electrical cord connection to an outlet box or source of electrical supply for the compressor and the "empty" signals.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a vending machine, the combination with a storage chute for bottles and an upright feed chute for a column of bottles, of an exit gate having an upper hinge on the storage chute, a lower abutment for the closed gate, a spring latch for retaining the gate from opening, and a presser plate hinged at the exterior of the gate for engagement with each latch, whereby the gate and latch are held closed by lateral pressure from the column of bottles, and the gate is automatically opened when the lateral pressure ceases.

2. In a bottle vending machine, the combination with a vertical series of parallel and declining storage chutes, and a vertical chute at, and common to, the lower ends of the storage chutes and adapted to contain a column of bottles, of a hinged gate located between each storage chute and the vertical chute, a spring latch for the gate and a presser plate engaging the latch, said presser plate and latch being adapted to be held closed by lateral pressure from the column of bottles, said gates being successively released as the height of the column decreases and the lateral pressure from the column

of bottles is removed, and means for dispensing the lowest bottle from said column.

3. In a vending machine, the combination with a vertical series of parallel and declining storage chutes, and a vertical chute at, and common to, the lower ends of the storage chutes and adapted to contain a column of bottles, of a hinged gate located between each storage chute and the vertical chute, means under lateral pressure from a column of bottles for retaining the gate in closed position whereby the gate is released when the lateral pressure ceases, automatic means for swinging each gate to, and retaining it in, open position when the gate is released, and means for dispensing the lowest bottle from said column.

4. In a vending machine, the combination with a declining storage chute, a vertical chute at the lower end of the storage chute adapted to contain a column of bottles, and means for dispensing the lowest bottles from said column, of a gate having a hinge at the lower end of the storage chute, a spring-latch mounted on the gate for engagement with a portion of the storage chute, a pressure-plate co-axially hinged with the gate and adapted to hold the latch and gate in closed position by lateral pressure from the column of bottles, and a spring-device for swinging said gate and presser-plate to open position when the lateral pressure ceases.

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