

Jan. 27, 1953

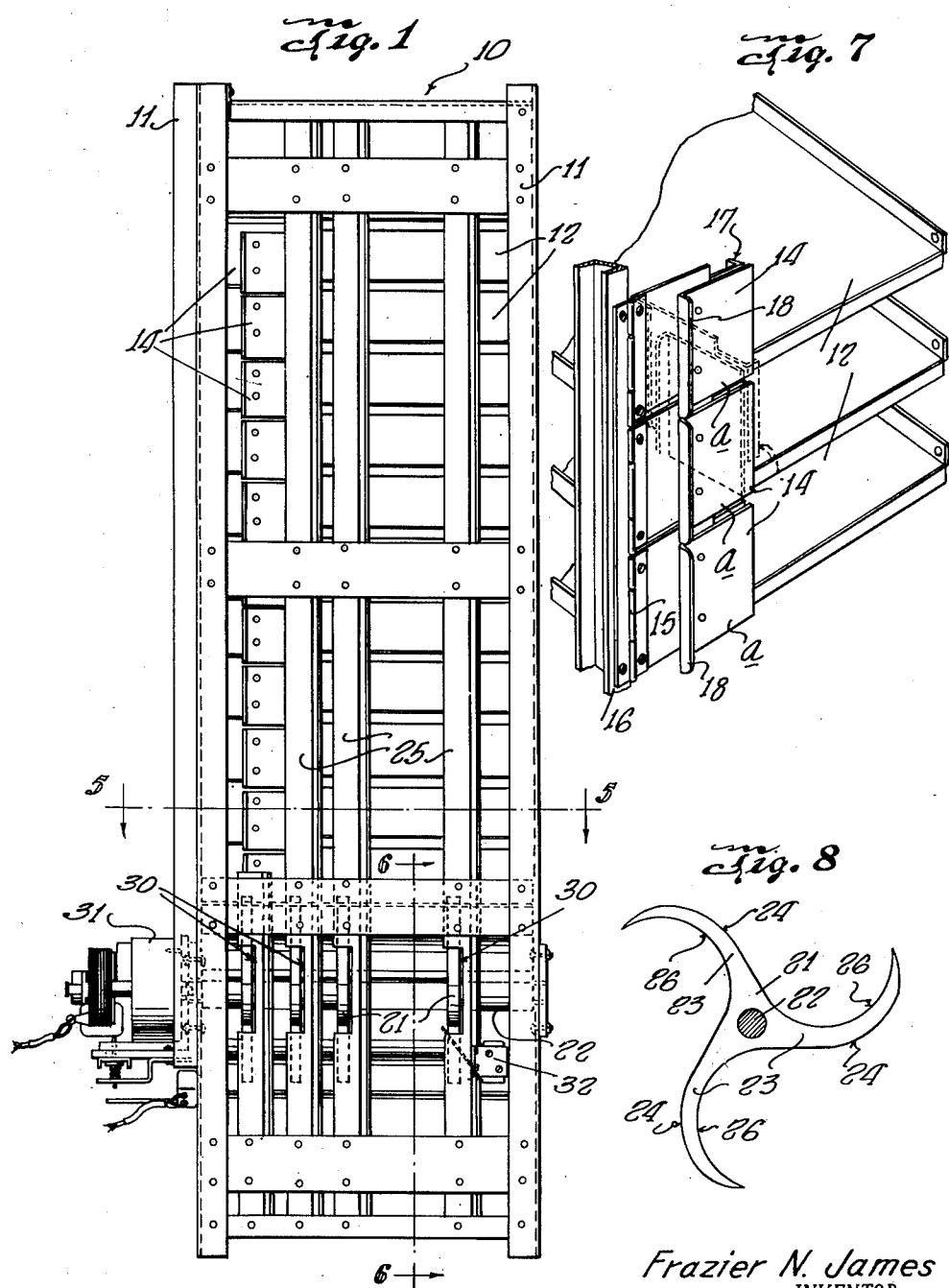
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2,626,849

CONTROL GATE FOR BOTTLE VENDING MACHINES

Filed Jan. 26, 1950

3 Sheets-Sheet 1



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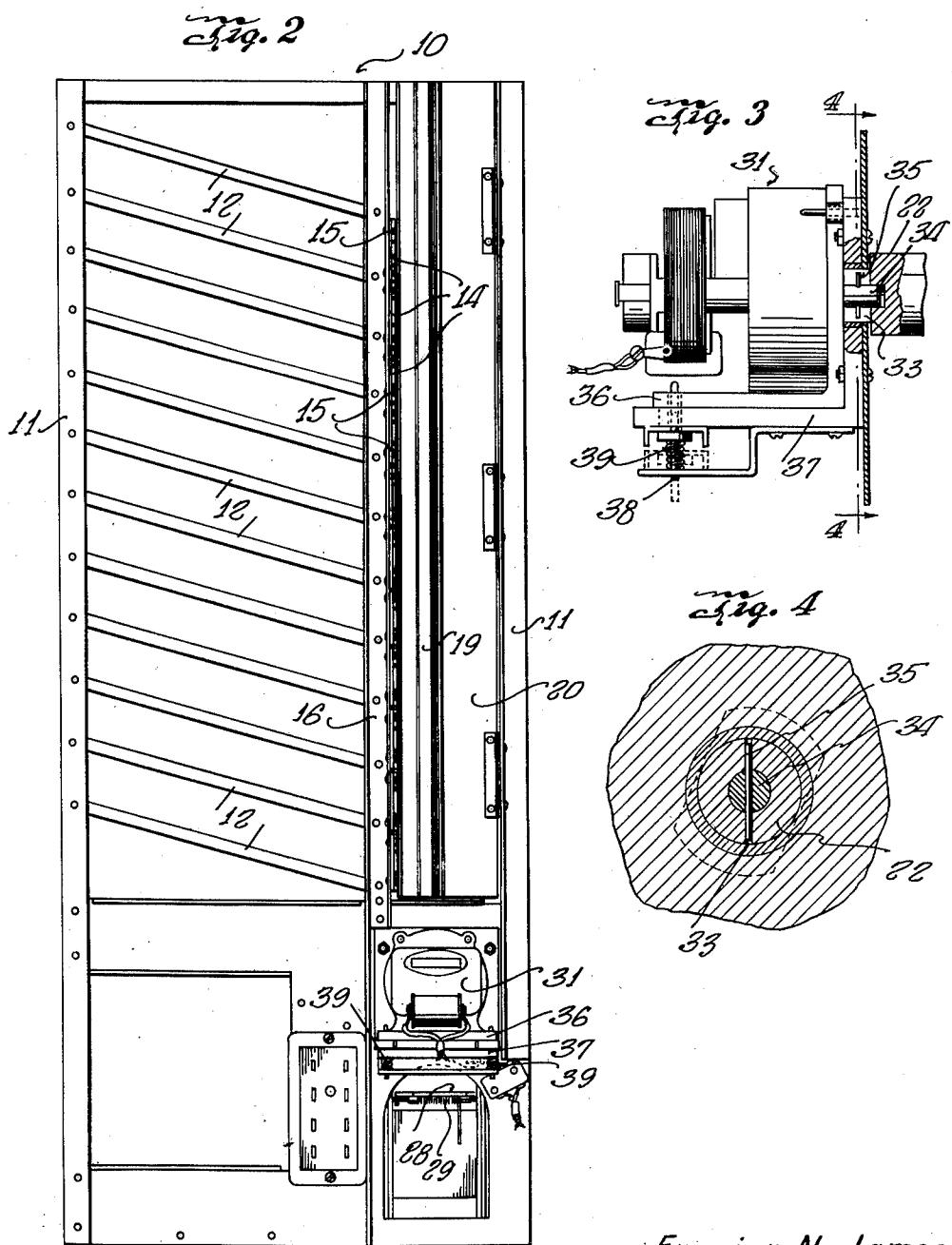
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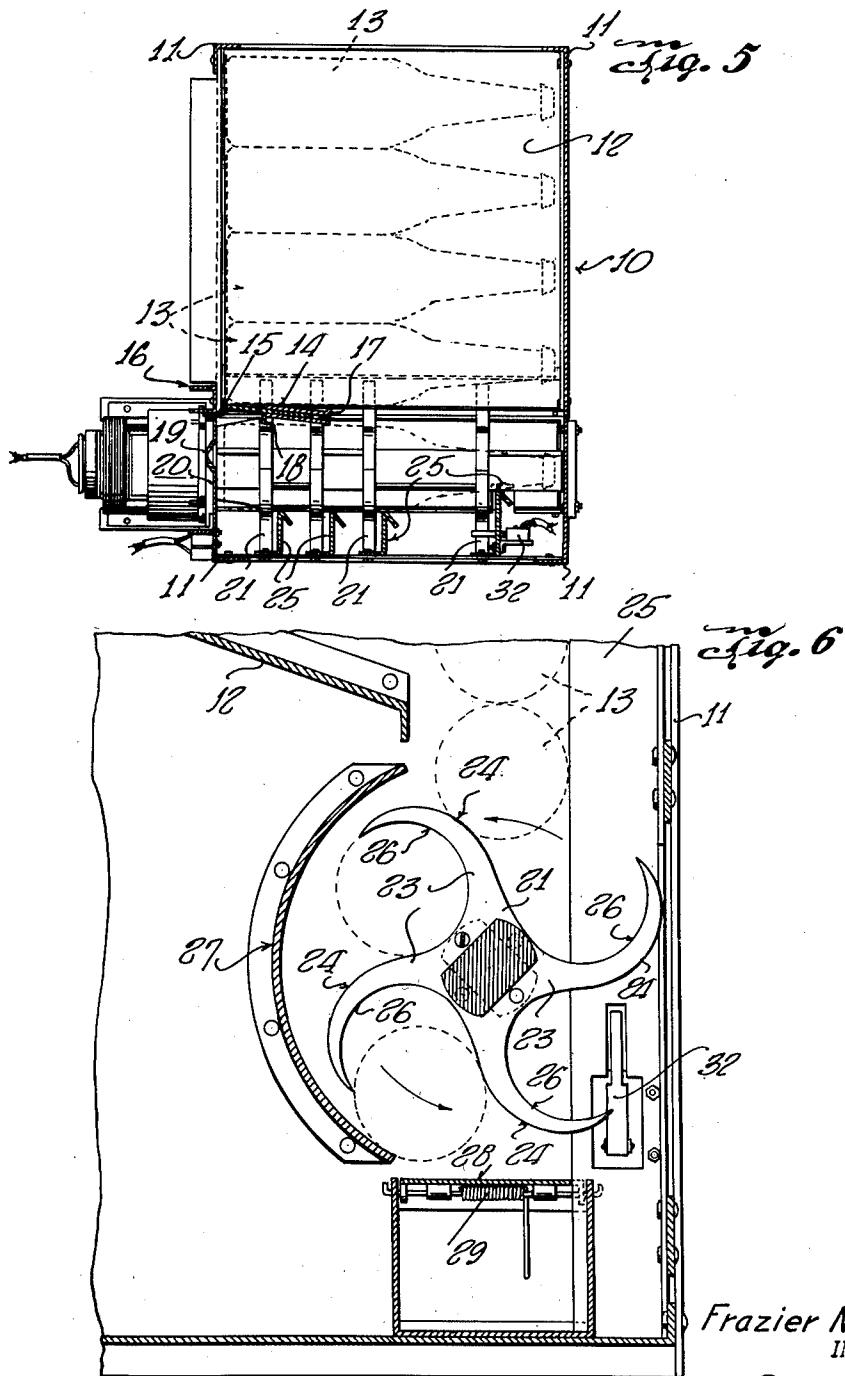
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CONTROL GATE FOR BOTTLE VENDING MACHINES

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2,626,849

CONTROL GATE FOR BOTTLE VENDING MACHINES

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Application January 26, 1950, Serial No. 140,649

4 Claims. (Cl. 312—48)

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This invention relates to merchandise vending machines and more particularly to machines for vending bottled beverage.

The principal object of the invention is to provide a machine for vending bottles or similar articles in which there is actually but one driven element, the same consisting of a shaft carrying one or more article supporting and releasing members occupying the bottom outlet opening of a vertical delivery magazine, which latter is replenished by a single or two opposed banks of inclined storage or feeder magazines, from which articles are transferred to the delivery magazine singly by gravity and progressively from the uppermost to the lowermost feeder magazine.

Another object of the invention resides in the novel construction and function of the article supporting and releasing mechanism, specifically the article engaging members, the latter each consisting of a hub having thereon two or more curved arms, the compound curve of each pair of arms being calculated to provide a continuous support for the column of bottles in the vertical delivery magazine in any position of the engaging member, thus to effect detachment and release of the lowest bottle of the column with the least possible agitation.

Still another object of the invention is to provide means at the discharge end of each inclined feeder magazine to prohibit release of bottles therefrom prematurely. This control means consists of a group of vertically aligned plates, each being hinged at its outer edge to a rail parallel with one corner of the vertical delivery magazine. Each plate has a portion overlapping the next adjacent plate and while the plates are individually displaceable in an outwardly direction by the weight of a bottle seeking entrance to the delivery magazine, the overlapping portion of the plates effects interlocked relationship thereof from the top to the bottom of the assembly, requiring that they be restored to their operative positions collectively or from the lowermost plate upwardly. This arrangement prevents improper loading of the machine.

Other objects will appear as the description proceeds taken in connection with the accompanying drawings, wherein:

Figure 1 is a front elevational view of the vending unit of a bottle bending machine embodying the invention.

Figure 2 is a side elevational view thereof.

Figure 3 is a detail view of the motor for operating the bottle release mechanism, showing in section the means for detachably connecting the motor to the release mechanism.

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Figure 4 is a fragmentary sectional view taken on line 4—4 of Figure 3.

Figure 5 is a transverse sectional view taken on line 5—5 of Figure 1.

Figure 6 is an enlarged sectional view, taken on line 6—6 of Figure 1.

Figure 7 is a fragmentary perspective view showing a group of shelves defining the inclined feeder magazines and the control gates therefor, and

Figure 8 is a detail view of a modified form of article release member.

Continuing with a more detailed description of the drawing, reference numeral 10 denotes generally the frame of the vending unit which may be installed singly or in pairs in an insulated and refrigerated cabinet of any desired external design. The frame consists of the vertical rails 11 forming the corner members of the frame and to the rear pair of rails 11 is affixed the rear end of each of a plurality of inclined and vertically spaced shelves or trays 12 which define the feeder or storage magazines. The forward ends of these shelves are secured to opposing sides of the frame short of the front of the latter to define a vertical space referred to herein as the vertical delivery magazine.

In loading the machine with bottles 13, the vertical delivery magazine is first filled from bottom to top, after which each of the inclined feeder magazines is filled. As the top of the column of bottles in the delivery magazine recedes, the feeder magazines are opened progressively from top to bottom and as this occurs bottles move singly from the active feeder magazine by gravity, taking their place on top of the column.

In order to prevent interference between the bottles in the vertical delivery magazine with those seeking exit from the feeder magazines, and further, to insure orderly transfer of the bottles from the feeders to the delivery magazine, an assembly of control gates is provided, each individual gate 14 being hinged at 15 to a vertical rail 16 on one side of the frame 10 adjacent the discharge ends of the feeder magazines (Figs. 2 and 7). An examination of Figure 7 will reveal that each gate is made up of laminations of three plates, the intermediate plate having its outer edge hinged at 15 to the rail 16. The outer plate is of the same length as the inner plate but is downwardly offset at a to overlap the upper edge of the intermediate plate of the gate immediately below, so that the gates may be opened individually by pressure of bottles in the respective feeder magazines, while closing of the gates may be accomplished collectively by moving the highest

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plate to closed position, due to the interlocked relationship afforded by the offset α of the plate of each gate. This arrangement makes it impossible for an inexperienced person to improperly load the machine which would likely result in fouling of the bottles.

It is obvious that the gates 14 may be formed in a single piece while three parts are shown riveted together. In any case however, there is provided an inner and an outer vertical flange 17 and 18 respectively, on each gate 14, which have the effect to maintain relative parallelism of the bottles in the delivery and feeder magazines, as borne out in Figure 5 in dotted lines.

It is apparent from the foregoing that with the delivery magazine filled with bottles, the latter will bear against the gates 14 of all but the feeder magazine next above the top of the column of bottles in the delivery magazine and will thus restrain the bottles in these feeder magazines. However, the weight of the bottles in the feeder magazine next above the column in the delivery magazine will cause the gate of the feeder magazine to swing to one side of the delivery magazine to enable transfer of bottles from the feeder to the delivery magazine quietly and without jolting or jarring the bottles. As the gate swings to the open position, as shown in dotted lines (Fig. 7) the outer flange 18 of the gate will be received in the longitudinal V-shaped groove 19 in a vertical plate 20, disposed on one side of the delivery magazine (Figs. 2 and 5).

In Figure 6 is shown an enlarged view of a bottle supporting and releasing means which is situated at the lower end of the vertical delivery magazine. This releasing means consists of a group of rotary members 21, mounted rigidly on a shaft 22 extending across the lower end of the delivery magazine. Three of these members according to Figure 5, are disposed to engage the body of a bottle 13 while a fourth engages the neck thereof to insure parallelism of the bottle being released, with its companions in the column. Each member 21 has a plurality of curved arms 23 (Fig. 6), the convex curves 24 of the arms defining, with a group of vertical and horizontally spaced guide rails 25, a support for the column of bottles in the delivery magazine. The convex curves 24, combined with the concave curves 26 of each blade 23 form compound curves which respectively support the column of bottles and cause separation of the lowest bottle from the column with minimum drop or uplift of the latter. As the bottles are successively displaced by the feathered ends of the blades 23, they are sustained by a curved guide plate 27 (Fig. 6) as they are carried by the members 21 to and deposited upon a hinged plate 28 which latter serves the dual purpose of a slide down which the bottles emerge from the machine and as a closure to prohibit escape of chilled air from the refrigerated confines of the cabinet. A torsion spring 29 returns the plate 28 to closed position when displaced by a bottle.

It will be observed in Figure 1 that each of the vertical guide rails 25 has cut-away portions 30 in which the curved arms 23 of the members 21 operate. This enables the hubs of the members 21 to be moved into closer adjacency to the leading edges of the vertical rails 25, thus to reduce the width of the throat formed by the arms 23 each time the rotary members 21 are actuated, and prevent the bottles from descending below the plane of the axis of the shaft 22 on which the members 21 are mounted. This makes for

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smoother performance, free from agitation referred to.

The form of release mechanism shown in Figure 1 to Figure 7 includes the rotary members 21 having four arms. In this form, the members make one quarter revolution to release a bottle and are driven by a motor 31 whose circuit is opened and closed by a switch 32 (Figs. 1 and 6), actuated by successive arms 23 of one of the members 21.

In Figures 3 and 4 is shown the manner in which the motor 31 is attached to the shaft 22 of the release mechanism to enable motors to be readily and quickly exchanged for repairs and the like. The shaft 22 is bored and slotted at 33 to receive the end of the motor armature shaft 34, which latter carries a pin 35 adapted to enter the slot 33. The motor is mounted on a support 36 which in turn, rests on a like support 37 bolted to one side of the frame 10. To hold the motor support in position, a pair of pins 38, movable in aligned openings in both supports 36 and 37 are held by coil springs 39 in a position to lock the motor support in a position to align its shaft with that of the release mechanism. By depressing the pins 38 against the resistance of springs 39, the motor support and motor may be quickly detached from the machine.

In Figure 8 is shown a slight modification of the members making up the bottle release mechanism which differs from that just described only in the number of arms. For this reason, the same reference numerals are employed to denote like parts. It is pointed out however, that instead of making one-quarter revolution for each bottle delivered, the modified member makes but one-third revolution.

Manifestly, the construction as shown and described is capable of some modification and such modification as may be construed to fall within the scope and meaning of the appended claims is also considered to be within the spirit and intent of the invention.

What is claimed is:

1. In a bottle vending machine having a vertical bottle delivery magazine and a vertically spaced series of inclined feeder magazines communicating therewith, a control gate at the discharge end of each of said feeder magazines for preventing premature release of bottles therefrom, said gate comprising a plate hinged along a vertical edge to a side of said vertical magazine and adapted to be held in closed position by pressure of bottles in said vertical magazine, said gates having a lower extension overlapping the next lowest gate to interlock said gates from the lowest to the highest gate of the assembly and means protruding from the surfaces of each of said gates for maintaining parallelism of bottles in said delivery and feeder magazines.

2. In a vending machine having a vertical bottle delivery magazine and a series of vertically spaced, inclined feeder magazines communicating therewith, a control gate for each feeder magazine hinged along one vertical edge and adapted operatively to close the discharge end of the feeder magazine under pressure of bottles in said delivery magazine but displaceable under pressure of bottles in the feeder magazine when the top of the column of bottles in the delivery magazine recedes to a point below the discharge end of the feeder magazine and means carried by each of said control gates for maintaining parallelism of bottles in said feeder and delivery magazines.

3. The structure of claim 2 in which each control gate has an extension at its bottom to overlap the upper edge of the next lowest gate.

4. The structure of claim 2 in which the means for maintaining parallelism of bottles in the feeder and delivery magazines consist of spaced apart vertical flanges on and at right angles to the opposite sides of each gate and engageable by bottles in the feeder and delivery magazines.

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