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B. A. ANDREWS ET AL

2,540,856

BOTTLE VENDING MACHINE FOR COMPARTMENT CASES

Filed Feb. 2, 1948

3 Sheets-Sheet 1

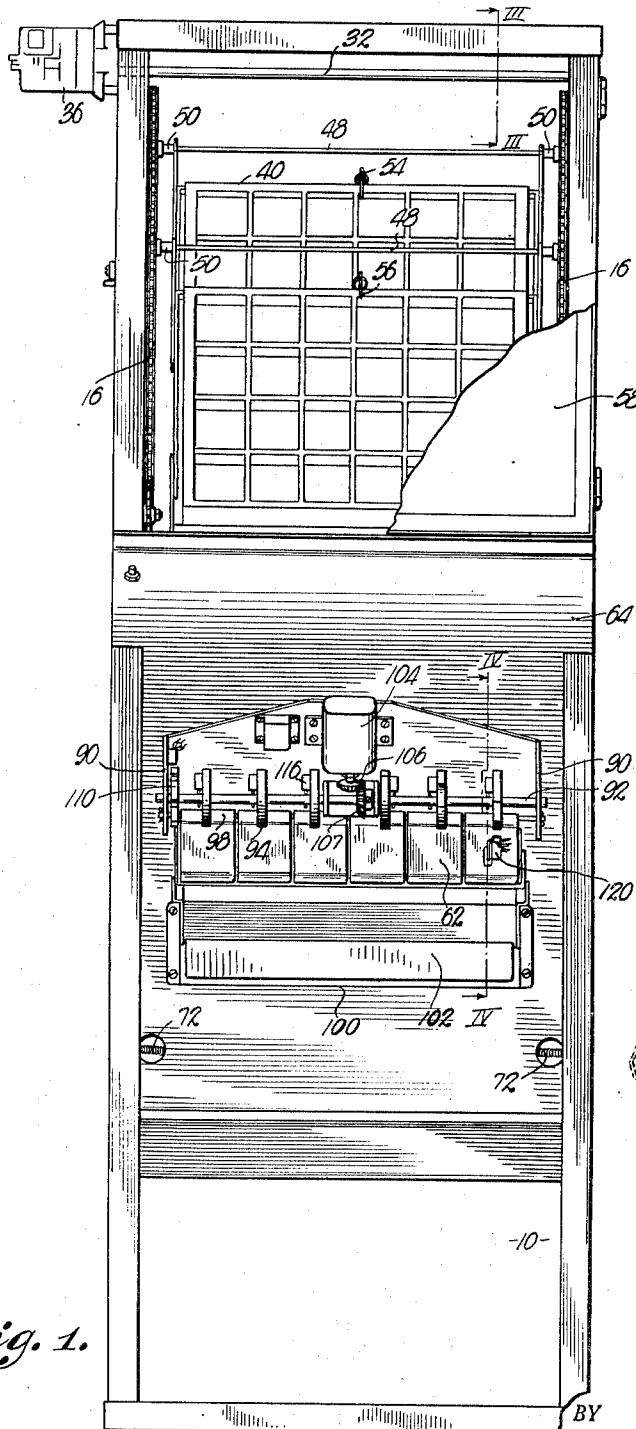


Fig. 1.

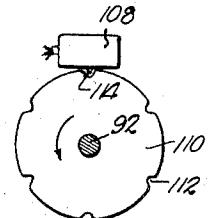


Fig. 7.

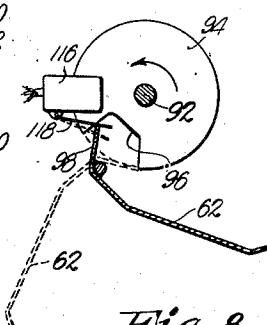


Fig. 8.

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3 Sheets-Sheet 2

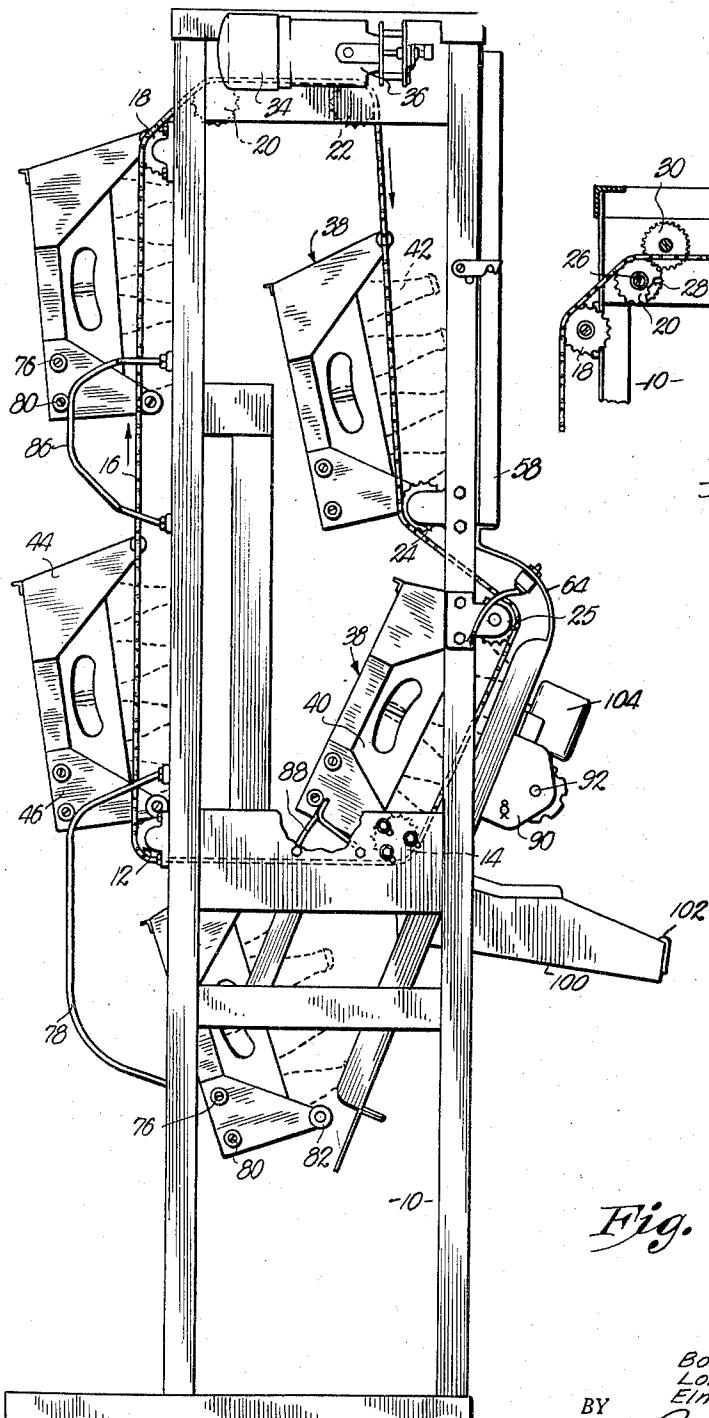


Fig. 2.

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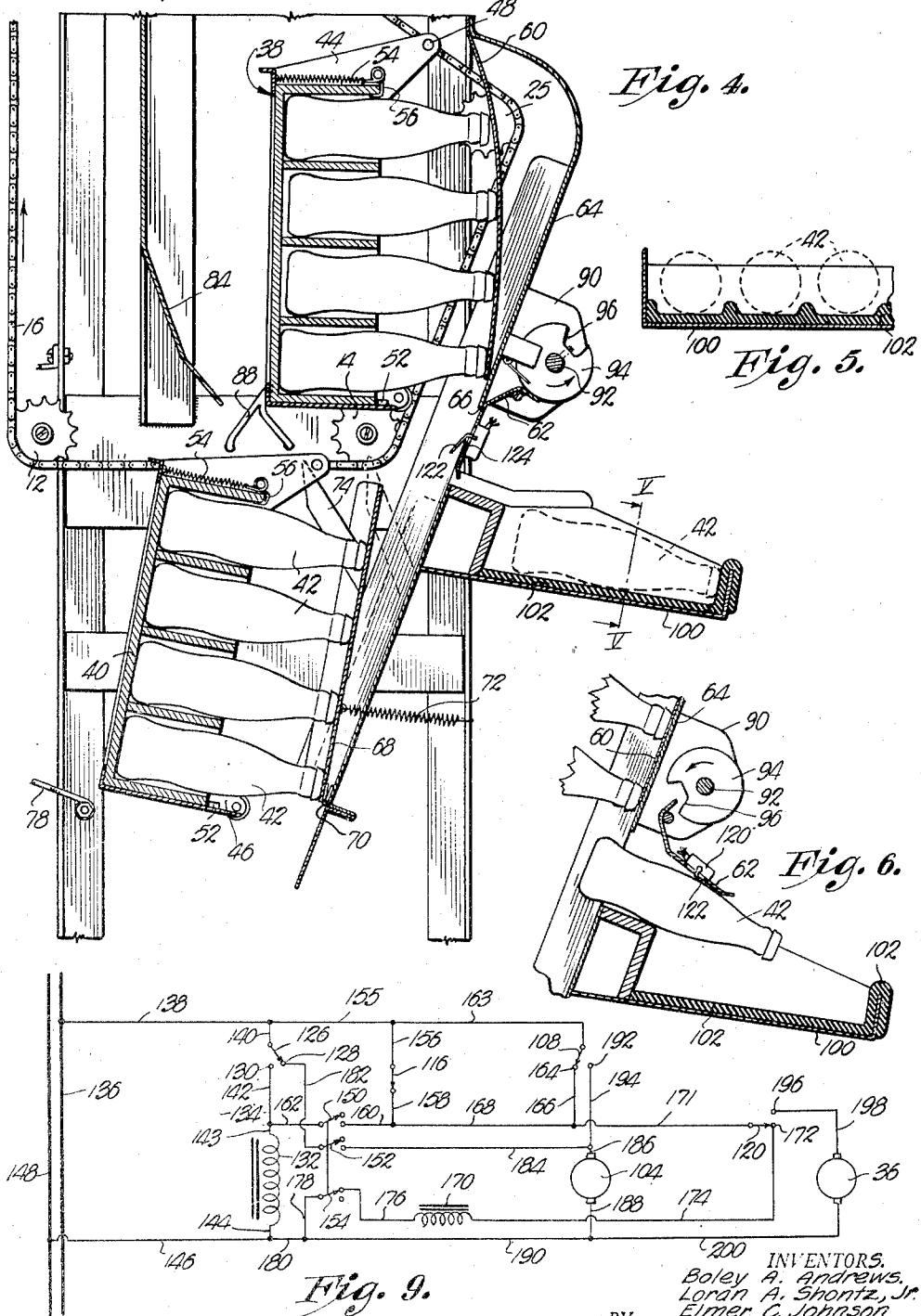
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BOTTLE VENDING MACHINE FOR COMPARTMENT CASES

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3 Sheets-Sheet 3



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2,540,856

BOTTLE VENDING MACHINE FOR
COMPARTMENT CASES

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Application February 3, 1948, Serial No. 5,884

17 Claims.

(CL. 312—88)

1 This invention relates to vending machines and more particularly to apparatus for automatically dispensing bottled goods singly to purchasers thereof, the primary object being to provide a machine for vending bottles from compartment cases therefor.

The most important object of this invention is the provision of a bottle vending machine capable of receiving a plurality of compartment cases having the bottles arranged therein in rows and dispensing such bottles singly from said compartment cases.

Another important object of this invention is the provision of a bottle vending machine for compartment cases having means for advancing the cases to successively dispose a single row of bottles in a vending position and having structure for directing the bottles to a position where the same are normally free to move from the compartment case by force of gravity.

A further object of this invention is to provide in a vending machine of the aforesaid character, means for positively holding all of the bottles in the case disposed to dump its contents by force of gravity against discharge until such bottles are themselves moved to the vending position.

A still further object of this invention is the provision of a bottle vending machine of the aforementioned character having shiftable elements operable to normally hold the bottles disposed in the vending position against movement from their case until such elements themselves are shifted from such holding position.

Another object of this invention is the provision of a bottle vending machine for compartment cases having an endless conveyor for moving the cases and bottles contained thereby toward a vending position, the cases being mounted on the conveyor for free swinging movement and said machine having means for tilting a single case as the same approaches the vending position to place the bottles of said case in a position where the same are normally free to move by force of gravity from such tilted case.

Another important object of this invention is to provide a vending machine of the type aforementioned wherein the inherent weight of the bottles themselves serve to actuate the holding element therefore when such element is released.

An additional object of this invention is to provide a vending machine operable continuously after a suitable purchasing coin has been inserted thereinto until a bottle is definitely delivered, regardless of how many missing bottles there may be in an individual case or how many of such bottles might accidentally become stuck

2 and unable to be vended when the machine is initially actuated.

A further object of this invention is to provide a vending machine as above specified having means for automatically advancing the rows of bottles in the individual cases and the cases themselves as the rows and cases respectively become depleted of bottles automatically upon discharge of the last bottle of a given row of 10 such bottles.

Other objects of this invention include the manner in which the compartment cases are individually mounted for free swinging movement on the advancing conveyor therefor; the way in 15 which the cases are guided throughout their path of travel to positively prevent displacement of the bottles from their cases whenever such cases are disposed in a dumping position; the way in which the cases themselves are mounted in the 20 swingable cradles therefor; the manner in which the individual trap door elements for releasing the bottles singly are released by a cam assembly whereby such elements operate consecutively; the manner in which the bottle itself 25 serves to assure continuous operation of the machine until a bottle is delivered; and the way in which the last bottle in a given row operates when vended to cause advancement of the cradle and case supporting conveyor.

Many and numerous additional objects will be 30 made clear during the course of the following specification, reference being had to the accompanying drawing, wherein:

Fig. 1 is a front elevational view of a bottle 35 vending machine for compartment cases made in accordance with the present invention, parts of the covering shell therefor being either entirely eliminated or broken away for clearness.

Fig. 2 is a side elevational view thereof, the 40 covering shell being entirely eliminated.

Fig. 3 is a fragmentary, detailed, cross-sectional view taken on line III—III of Fig. 1 looking in the direction of the arrows.

Fig. 4 is an enlarged fragmentary cross-sectional view taken on line IV—IV of Fig. 1 looking in the direction of the arrows.

Fig. 5 is a fragmentary cross sectional view 50 taken on line V—V of Fig. 4.

Fig. 6 is a fragmentary cross-sectional view similar to that illustrated in Fig. 4 but showing a different position of parts during the cycle of operation of the vending machine.

Fig. 7 is a side elevational view of the cam switch perse.

Fig. 8 is a view partially in section and partially

side elevational, showing a portion of the delivery switch assembly per se; and

Fig. 9 is a schematic wiring diagram showing the electrical assembly forming a part of the vending machine.

It is common knowledge particularly to those skilled in the art that heretofore bottle vending machines have been produced and designed to automatically dispense bottled goods singly upon insertion of a suitable coin or other medium. Such vending machines however, all require that the bottles be loaded into the machine singly by first removing the same from their individual carrying cases. Obviously, this inherent characteristic of conventional bottle vending machines is disadvantageous because of the additional work required on the part of the service operator.

It has long been known that a bottle vending machine capable of receiving the conventional cases and the bottles therein without the necessity of first removing such bottles, would be advantageous in the field but many difficulties have presented themselves particularly in the manner in which such bottles could be removed from their cases and discharged to the purchasing public.

These problems and many others have all been met by the machine about to be described and in the drawings the numeral 10 designates broadly a suitable frame-work for operably supporting all of the mechanism about to be described. This frame-work 10 carries intermediate the ends thereof a pair of spaced apart sprockets 12 and 14 disposed on a substantially horizontal line. There are two sprocket wheels 12 and two sprocket wheels 14 disposed oppositely and each receives an endless chain 16. Each of these chains 16 extend upwardly from the sprocket wheel 12 to an idler sprocket 18, a drive sprocket 20, a second idler sprocket 22 and thence chain 16 passes downwardly and under a sprocket 24 mounted upon the frame-work 10. After passing below the respective sprocket 24, the chains 16 each extend outwardly beyond the frame 10 and over an idler sprocket 25 before passing downwardly at an angle toward and under the sprocket 14.

The two drive sprockets 20 for each of the chains 16 respectively, are mounted on stub shafts 26 and one of these stub shafts 26 has a gear 28 secured thereto as clearly illustrated in Fig. 3 of the drawings. In other words, the gear 28 and the sprocket 20 next adjacent thereto, rotate together when driven by a gear 30 mounted upon a shaft 32 extending across the frame 10 and suitably journaled thereon. This drive shaft 32 extends directly from suitable gear reduction means 34 operated by an electric motor or the like 36.

It is clear from the foregoing that as the motor 36 is energized, the chains 16 serving as a conveyor, as hereinafter more fully described, will travel in the direction indicated by the arrows in Figs. 2 and 4 of the drawings.

A plurality of cradles broadly designated by the numeral 38 are swingably supported by the chains 16. These cradles 38 are formed to receive a conventional compartment case 40 for bottles 42 to be vended, said cases 40 receiving bottles 42 in a plurality of side-by-side rows. Each end of the cradles 38 is provided with a pair of spaced apart substantially triangular extensions 44 and 46 terminating above the top of the case 40 and below the uppermost ends of the bottles 42 within cases 40. Each of the cradles 38 has a shaft 48 interconnecting the two end-

less chains 16 and journaled for free rotative movement in bearings 50 affixed to one of the links of the two chains 16.

Each of the extensions 44 of the cradles 38 is affixed to the shaft 48 and cradles 38 thereby rendered freely swingable upon the spaced apart chains 16 by virtue of rotation of shaft 48 within the two bearings 50.

It is clear from the foregoing that the cradles 38 mounted as above described upon the chains 16, will hold the cases 40 in a position where all of the bottles 42 therein are substantially horizontal. The cases 40 are held against displacement from the cradles 38 by virtue of a stop 52 on the innermost face of one side of cradle 38 and by a spring member 54 in opposed relationship to the stop 52.

This spring 54 has a hook 56 at one end thereof that is looped about the adjacent edge of one side of case 40. Cases 40 may thereby be placed in the cradles 38 and removed therefrom by simply grasping the spring 54.

Access to the interior of the machine to replenish cases 40 having bottles 42 therein is through a hingedly mounted door 58 disposed at the front of the cabinet defined by frame-work 10 and the shell (not shown) mounted upon frame-work 10. As the cradles 38, cases 40 contained thereby and the bottles 42, travel downwardly between sprockets 22 and 24, the cradles 38 are hanging freely and the bottles 42 disposed angularly and upwardly, as clearly illustrated in Fig. 2 of the drawings. As the lowermost row of the bottles 42 approaches the sprocket 24, they come into contact with a plurality of elongated resilient members 60 suitably supported at their uppermost ends to the frame-work 10. These members 60 are all longer than the distance across the rows of bottles, there being four rows in the type of case 40 chosen for illustration. Thus as the cradle 38 progresses downwardly, the four bottles in the vertical row all have their uppermost ends in engagement with the resilient strips 60. It is to be noted that there are six of these strips 60, one for each of the six vertical rows of bottles 42. As the shaft 48 and bearings 50 approach and pass over the sprocket wheel 25, the extensions 44 will move outwardly from the frame-work 10 while the lowermost horizontal row of bottles 42 move into engagement with a plurality of gates 62.

A portion of the coverage shell for the machine is illustrated in the drawings and constitutes a panel 64 mounted upon frame 10 at the front of the machine and immediately below door 58. This panel 64 is disposed at an angle to the vertical, the uppermost end thereof projecting outwardly beyond frame-work 10 and the lowermost end extending inwardly into the interior of the machine within the confines of frame-work 10. It is upon this inclined panel 64 that the plurality of trap doors 62 and associated mechanism are mounted. These trap doors 62 are all held in a closed position covering an elongated outlet opening 66 formed in the panel 64 by structure hereinafter more fully described.

The manner in which the cradles 38 approach the vending position adjacent trap doors 62 is illustrated in Fig. 4 of the drawings, whereas Fig. 2 shows one of such cradles 38 disposed in a position for vending the lowermost row of bottles 42. In this vending position of cradles 38, as shown in Fig. 2, the shaft 48 and the bearings 50 therefore, are disposed adjacent the two spaced apart sprocket wheels 25 whereas the lowermost

row of bottles 42 is bearing directly against the trap door 62. This position of the cradle 38 disposed as shown in Fig. 2, is at an angle and all of the bottles within the case 40 are tipped where the same would normally fall from their case 40 by action of gravity. The trap doors 62 all being normally closed and held closed, serve to prevent such movement of the bottles 42 from their case 40 and the strips 60 of flexible material, hold the remaining bottles above the lowermost row against free movement by gravity from the case 40 disposed in the vending position.

When all of the bottles 42 of the lowermost row thereof are dispensed, the conveyor, including chains 16, is actuated to move the row of bottles 42 next above to a position where the same bear against the trap doors 62. This operation continues until all of the bottles of a given case 40 are dispensed, whereupon the next cradle 38 is moved into vending position in the same manner. When the machine is being loaded with all of the cradles 38 containing cases 40 of bottles 42, there will be full cases of bottles travelling downwardly from the door 58, past the gates 62 in the manner illustrated in Figs. 2 and 4 of the drawings. Similarly, if any bottles 42 become lodged or stuck in the case 40 and are not dispensed, such bottles will also travel downwardly from the doors 62 beneath the sprockets 14. Thus, means must be provided to prevent automatic movement of the bottles 42 from case 40 by action of gravity and such means constitutes a swingable member 68 hingedly mounted at the lowermost end thereof to the panel 64 as at 70. This member 68 constitutes merely a flat panel yieldably held against the innermost face of the panel 64 by means of a pair of springs 72 each having one end thereof connected to the member 68 and their opposite ends joined to a portion of the frame 10.

This member 68 has a pair of arms 74 extending laterally and upwardly therefrom and inwardly with respect to the interior of the machine, said arms being spaced apart a distance equal to the spacing between bearings 50. It is noted that the bearings 50 are disposed between the adjacent chains 16 and the cradles 38 and as these bearings 50 move downwardly to a position next adjacent the sprockets 14, they will come into contact with the arms 74 in overlying relationship therewith. The normal retrieved position of the member 68 and its arms 74 is illustrated by dotted lines in Fig. 4 of the drawings. As the bearings 50 move downwardly around the sprockets 14, they will move the arms 74 and member 68 toward the interior of the machine as such bearings 50 travel in a substantially horizontal path between sprockets 14 and 12. Such movement of arms 74 by bearings 50 pulls the member 68 tightly against the uppermost ends of the bottles 42 and such member 68 thereby holds bottles 42 in their case 40 until such time as the cradle 38 swings to a position where the bottles 42 are no longer tipped in the dumping position. As the bearings 50 move away from the sprockets 14, they will slip from the uppermost ends of the arms 74 and springs 72 will serve to automatically move member 68 to the normal inoperative position. As the cradle 38 continues to move toward the sprocket 14, it will right itself by virtue of its free swinging movement on chains 16 to the position illustrated in Fig. 2 of the drawings and as the bearings 50 approach sprocket 12, a roller 76 on the extension 46 of cradle 38 will engage a substantially U-shaped rod 78 in underlying relationship thereto.

This rod 78 serves as a guide and extends rearwardly from the frame 10. There are two of these rods 78 and consequently two rollers 76, one on each of the extensions 46 of cradle 38. As the cradles progress upwardly between the sprockets 12 and 14, a second set of rollers 80 also on the extensions 46 of cradles 38, come into contact with the guide rod 78 until the cradle passes beyond the uppermost end of rod 78.

Rollers 82 on each of the extensions 46 then guide themselves along tracks 84 mounted on frame 10 until rollers 76 and 80 come into contact with a second pair of guide rods 86 directly above the rods 78.

It is clear from the foregoing that rods 78 and 80 and tracks 84 cooperating with the rollers 76, 80 and 82, all serve to maintain the cradles 38, cases 40 and bottles 42 in a path of travel where no interference will be occasioned with the cradles 38 passing downwardly between sprockets 22 and 14.

It is to be noted in Figs. 2 and 4 that the rollers 80 serve to guide the cradle 38 when the same approaches the vending position by over-riding a pair of brackets 88 mounted on frame 10 between the sprockets 12 and 14. It is to be understood that in lieu of the plurality of guiding means 86, 78, 84 and 88 suitable tracks may be used to continuously guide the cradles 38 throughout substantially their entire path of travel if desired.

A pair of spaced apart bearings 90 mounted directly upon the inclined panel 64 rotatably support an elongated shaft 92. This shaft 92 is disposed directly above the gates 62 and outlet openings 66 formed in the panel 64 and carries a plurality of cams 94. It is to be noted that there is a gate for each of the bottles 42 of the horizontal row thereof and there is a cam 94 for each of the gates 62 as clearly indicated in Fig. 1 of the drawings. Each of these cams 94 is provided with a notch 96 and the cams 94 are disposed and secured to the shaft 92 to displace the notches 96, 60° apart.

The cross sectional contour of gates 62 (swingably mounted on a rod 98 supported by bearings 90 in substantial parallelism to shaft 92) is shown in Fig. 8. A flap 98 integral with the main body of gates 62 extends laterally to one side of rod 92 and substantially perpendicular to panel 64 when gates 62 are closed. (See Fig. 4.)

The gates 62 are held in the closed position by their respective cams 94 when such cams 94 bear against flaps 98 in the manner shown in Fig. 4. As the cams 94 rotate in the direction indicated by arrows in Figs. 4, 6 and 8, their notches 96 move to a position to receive the adjacent flap 98 of gate 62. Gates 62 are then free to swing open as determined by the weight of a bottle 42 thereagainst.

These bottles 42 then fall by gravity from case 40, through outlet opening 66 into a tray 100. This tray 100 is cup-shaped and disposed below opening 66 and is substantially coextensive in length with opening 66. A bumper 102 of resilient material such as rubber, lines the tray 100 to cushion bottles 42 as they discharge from case 40.

After a given bottle 42 is vended, continued rotation of shaft 92 will move notch 96 of cam 94 to a position where its trailing edge contacts flap 98, forcing door 62 closed. The edge of cam 94 will then hold door 62 closed in the manner shown in Fig. 4.

Actuation of shaft 92 is accomplished through a motor 104 mounted on panel 64, having a gear

106 secured to its drive shaft in mesh with a gear 107 on shaft 92.

Fig. 7 of the drawings illustrates a cam switch 108 controlled by a disc-like cam 110 mounted on shaft 92 for rotation therewith. Cam 110 is provided with a plurality of notches 112 for receiving button 114 of switch 108, there being six notches 112 to conform to the six gates 62. This switch 108 is normally closed by virtue of its button 114 resting in a notch 112 when the machine is in the standby condition.

Each of the doors 62 is provided with a delivery switch 116, there being only one shown in Fig. 9 for convenience of illustration. These switches 116 are all normally closed when the doors 62 are closed, but have their actuating arms 118 disposed in the path of travel of flaps 98 that serve to open switch 116 when the door 62 opens.

The cams 94 have their notches 96 arranged relative to each other to render the door 62 next adjacent cam 110 the first to open when the machine is placed in operation. The door 62 at the opposite end of the series thereof is therefore, rendered operative to advance the conveyor including endless chains 16 by controlling drive motor 36 to dispose the next row of bottles 42 in the vending position. This end door 62 has a switch 120 mounted thereon and is provided with an actuating arm 122 that projects through an opening 124 in such end door 62 to be normally actuated by a bottle 42 resting thereagainst. This arm 122 remains actuated to hold switch 120 normally open until bottle 42 is within tray 100 and clear thereof as shown in Fig. 6.

All of the electrical circuits are in the condition shown in Fig. 9 when the machine is in the normal standby position. A switch 126 (shown only in Fig. 9) is actuated by any of the well known types of coin controlled assemblies, not illustrated. When this coin switch 126 is moved from the normal position shown in Fig. 9 in connection with a contact point 128, it joins with a contact point 130 to close the following circuit through the coil 132 of a holding relay 134:

From lead line 136, through wires 138 and 140, switch 126, contact point 130, wires 142 and 143, coil 132 of relay 134 and wires 144 and 146 to lead line 148.

Energization of relay 134 as above described closes its switches 150 and 152 and opens its switch 154. The relay 134 remains energized after switch 126 returns to the normal position shown in Fig. 9 through the following circuit:

From lead line 136 through wires 138, 155 and 163, normally closed switch 116, wires 158 and 160, closed switch 150, wires 162 and 143, coil 132 of relay 134 and wires 144 and 146 to lead line 148.

This relay 134 is also held energized momentarily through cam switch 108 normally engaged with a contact 164. This circuit is traced as follows:

From lead line 136 through wires 138, 155 and 163, switch 108, contact 164, wires 166, 168 and 160, closed switch 150, wires 162 and 143, coil 132 of relay 134 and wires 144 and 146 to lead line 148.

Energization of relay 134 also causes deenergization of a coin reject relay 170 (shown only in Fig. 9) by opening of switch 154. This cir-

cuit when the machine is at standby is traced as follows:

From lead line 136, through wires 138, 155 and 156, closed switch 116, wires 158, 168 and 171, switch 120, contact point 172 (with which switch 120 is normally engaged) wire 174, relay 170, wire 176, switch 154 and wires 178, 180 and 146 to line 148.

A second circuit for relay 170 though switch 116 may be open, is traceable as follows.

From lead line 136 through wires 138, 155 and 163, switch 108, wires 166 and 171, switch 120, contact 172, wire 174, relay 170, wire 176, switch 154 and wires 178, 180 and 146 to line 148.

As soon as switch 126 returns to the normal position in connection with contact 128, motor 104 is energized to rotate shaft 92, cams 94 and cam 110 through the following circuit:

From lead line 136 through wires 138 and 140, switch 126, contact 128, wire 182, closed switch 152 of relay 134, wires 184 and 186, motor 104 and wires 188, 190, 180 and 146 to line 148.

As soon as cam 110 starts to rotate, switch 108 is moved from contact 164 to a contact 192, de-energizing relay 134 and energizing the following circuit to cause motor 104 to continue operating:

From lead line 136 through wires 138, 155 and 163, switch 108, contact 192, wires 194 and 186, motor 104, wires 188, 190, 180 and 146 to lead line 148.

In the event a bottle 42 is not delivered for some reason, movement of switch 108 from contact 164 to contact 192 by action of cam 110, will fail to deenergize relay 134 because the switch 116 which would normally be opened, would remain closed. Motor 104 continues to operate even after switch 108 returns to the contact 164 until movement of a bottle 42 operates to open a switch 116.

When the last bottle 42 in a given row thereof falls into the tray 100, switch 120 immediately moves from contact 172 to a contact 196. As soon as door 62 having switch 120 thereon returns to a position closing switch 116 or cam 110 moves to close switch 108 with contact 164, motor 36 is energized to advance cradles 38 through the following circuits:

From lead line 136 through wires 138, 155 and 163, switch 108, contact 164, wires 166 and 171, switch 129, contact 196, wire 198, motor 36 and wires 200, 190, 180 and 146 to line 148; or

From lead line 136 through wires 138, 155 and 156, switch 116, wires 158, 168 and 171, switch 120, contact 196, wire 198, motor 36, and wires 200, 190, 180 and 146 to line 148.

It is seen that when bottle 42 is in the position shown in Fig. 6, switch 120 is still closed, but that, as soon as bottle 42 is deposited in tray 100, as shown in Fig. 4, actuating arm 122 will be clear and the switch 120 will immediately close with contact 196. Motor 36 will be energized, moving the next cradle 38 downwardly until the lowermost row of bottles 42 are in alignment with gates 62. At this point in the cycle, the bottle 42 adjacent switch 120 will contact arm 122 and open switch 120 to de-energize motor 36. When the last bottle 42 of the lowermost row thereof moves to tray 100, switch arm 122 will again be clear, motor 36 will be energized, and the cradle 38 will move downwardly until switch 120 is again opened with respect to contact 196. Switch 120 remains closed with respect to contact 172 and open with respect to contact 196 until all six bottles 42 of a given row thereof have been vend- ed into tray 100.

It is to be noted that coin reject relay 170 is connected through switches 116, 108 and 120. Thus while the machine is operating, either to deliver a bottle 24 or advance the cradles 38, subsequently inserted coins will be rejected through holding relay 134 is deenergized and switch 154 thereby closed.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent is:

1. A machine for vending bottles from cases having bottle receiving compartments arranged in side-by-side rows, said machine comprising a cabinet having an outlet opening formed therein; means for advancing said cases and the bottles therein to successively bring rows of bottles to rest with each bottle of the row thereof in a vending position in alignment with said outlet opening; and releasable means for rendering the bottles normally inaccessible through said outlet opening.

2. A machine for vending bottles from cases having bottle receiving compartments arranged in side-by-side rows, said machine comprising a cabinet having an outlet opening formed therein; means for advancing a plurality of cases and the bottles therein past said outlet opening to successively bring rows of bottles to rest in alignment with said outlet opening; releasable means for rendering the bottles normally inaccessible through said outlet opening; and mechanism for shifting the case disposed adjacent said outlet opening to a position for discharging its bottles by gravity.

3. A machine for vending bottles from cases having bottle receiving compartments arranged in side-by-side rows, said machine comprising a cabinet having an outlet opening formed therein; means for advancing said cases and the bottles therein to successively bring rows of bottles to rest in alignment with said outlet; and releasable means for each bottle respectively of the aligned row rendering the bottles normally inaccessible through said outlet opening, said means being disposed to normally hold proximal bottles against discharge from their case.

4. A machine for vending bottles from cases having bottle receiving compartments arranged in side-by-side rows, said machine comprising a cabinet having an outlet opening formed therein; means for advancing said cases and the bottles therein to successively bring rows of bottles to rest in alignment with said outlet; releasable means for rendering the bottles normally inaccessible through said outlet opening, said means being disposed to normally hold proximal bottles against discharge from their case; and structure for holding bottles of the case disposed on either of the two opposed sides of the outlet opening not in alignment with said outlet opening against discharge from their case.

5. A machine for vending bottles from cases having bottle receiving compartments arranged in side-by-side rows, said machine comprising a cabinet having an outlet opening formed therein; a plurality of closures for said outlet opening, each shiftable to and from a closed position; releasable means for holding said closures normally closed; structure for advancing said cases and the bottles therein to successively bring rows of bottles to rest in alignment with said outlet opening; mechanism for shifting the case adjacent said outlet opening to a position for directing the aligned row of bottles against the closures by gravity, there being a closure for each bottle

in said aligned row of bottles respectively; and means for releasing said closure holding means to consecutively open the closures and discharge the bottles held thereby.

6. A machine for vending bottles from cases having bottle receiving compartments arranged in side-by-side rows, said machine comprising a cabinet having an outlet opening formed therein; a plurality of closures for said outlet opening, each shiftable to and from a closed position; releasable means for holding said closures normally closed; structure for advancing said cases and the bottles therein to successively bring rows of bottles to rest in alignment with said outlet opening; mechanism for shifting the case adjacent said outlet opening to a position for directing the aligned row of bottles against the closures by gravity, there being a closure for each bottle in said aligned row of bottles respectively; means for releasing said closure holding means to consecutively open the closures and discharge the bottles held thereby; and means operable upon release of one of said closures to control said case advancing structure.

7. In a bottle vending machine of the character described, structure for supporting a plurality of bottles to be vended in a position where said bottles are normally free to move by gravity from said structure; means for holding said bottles against said gravity movement, said means including a releasable element for each of certain of said bottles respectively; and means for simultaneously advancing all of said bottles to successively bring the same to rest against a respective element.

8. In a bottle vending machine of the character described, structure for supporting a plurality of bottles to be vended in a position where said bottles are normally free to move by gravity from said structure; means for holding said bottles against said gravity movement, said means including a releasable element for each of certain of said bottles respectively, said bottles being arranged in rows in said structure, there being an element for each bottle respectively of the row next adjacent the elements; and means for simultaneously advancing all of said bottles to successively bring said rows of bottles into a position with the bottles thereof each resting against a respective element.

9. In a bottle vending machine of the character described, means for supporting a plurality of bottles to be vended in side-by-side rows; structure for advancing said bottle supporting means to successively bring said rows of bottles to rest in a predetermined vending position; means for shifting at least the row of bottles in said vending position to a place where the same are normally free to move from said supporting means by force of gravity; and releasable elements for holding the bottles in said vending position against movement from the supporting means.

10. In a bottle vending machine of the character described, means for supporting a plurality of bottles to be vended in side-by-side rows; structure for advancing said bottle supporting means to successively bring said rows of bottles to rest in a predetermined vending position; means for shifting at least the row of bottles in said vending position to a place where the same are normally free to move from said supporting means by force of gravity; and releasable elements for holding the bottles in said vending position against movement from the supporting means,

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there being a releasable element for each bottle respectively in the row of bottles disposed in said vending position.

11. In a bottle vending machine of the character described, means for supporting a plurality of bottles to be vended in side-by-side rows; structure for advancing said bottle supporting means to successively bring said rows of bottles to rest in a predetermined vending position; means for shifting at least the row of bottles in said vending position to a place where the same are normally free to move from said supporting means by force of gravity; releasable elements for holding the bottles in said vending position against movement from the supporting means, there being a releasable element for each bottle respectively in the row of bottles disposed in said vending position; and automatic mechanism for consecutively actuating said elements.

12. In a bottle vending machine of the character described, means for supporting a plurality of bottles to be vended in side-by-side rows; structure for advancing said bottle supporting means to successively bring said rows of bottles to rest in a predetermined vending position; means for shifting at least the row of bottles in said vending position to a place where the same are normally free to move from said supporting means by force of gravity; releasable elements for holding the bottles in said vending position against movement from the supporting means, there being a releasable element for each bottle respectively in the row of bottles disposed in said vending position; automatic mechanism for consecutively actuating said elements; and means operable upon movement of bottles from said supporting means through release of the respective element therefor for controlling said mechanism.

13. In a bottle vending machine of the character described, means for supporting a plurality of bottles to be vended in side-by-side rows; structure for advancing said bottle supporting means to successively bring said rows of bottles to rest in a predetermined vending position; means for shifting at least the row of bottles in said vending position to a place where the same are normally free to move from said supporting means by force of gravity; releasable elements for holding the bottles in said vending position against movement from the supporting means, there being a releasable element for each bottle respectively in the row of bottles disposed in said vending position; automatic mechanism for consecutively actuating said elements; and means operable upon actuation of one of said elements for controlling said structure.

14. In a bottle vending machine of the character described, means for receiving a plurality of bottles to be vended, said bottles being arranged in side-by-side rows; movable structure for supporting said bottle receiving means with the bottles therein disposed substantially horizontally; means for advancing said structure and the bottle receiving means supported thereby to

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successively bring said rows of bottles to rest in a predetermined position; means for shifting at least the row of bottles disposed in said horizontal position to a condition where the same are normally free to move from the receiving means by force of gravity; and releasable elements for holding said row of bottles against movement by force of gravity.

15. In a vending machine of the character described, 10 a cabinet having an outlet opening formed therein; means for supporting a plurality of bottles in side-by-side rows; mechanism for successively moving said rows of bottles to a position in alignment with said outlet opening; means

15 for shifting said bottles to a position where the same are normally free to fall by gravity from said supporting means; and structure for holding said bottles against falling after the same have been shifted to said position, said structure having releasable elements for discharging bottles in alignment with said outlet opening.

16. In a bottle vending machine of the character described, structure for supporting a plurality of bottles arranged in side-by-side rows; 20 mechanism for moving said structure to successively place said rows of bottles in a vending position; means operable upon movement of said structure toward said vending position for tilting said bottles to a position where the same are normally free to fall from the structure by force of gravity; and releasable elements for holding said bottles in said structure.

17. In a machine for vending bottles from cases having bottle receiving compartments arranged in side-by-side rows; a conveyor; a supporting cradle for each of said cases respectively, said cases being swingably secured to said conveyor; control means for said conveyor operable to advance the conveyor to successively bring rows of

25 bottles to rest in a predetermined vending position; means for tilting said cases as the same approach the vending position to place the bottles therein in a condition where the same are normally free to fall from the case by force of gravity; and means for holding bottles in the tilted case against movement therefrom by force of gravity, said means including parts operable to release bottles in the row thereof disposed in the vending position in consecutive order.

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