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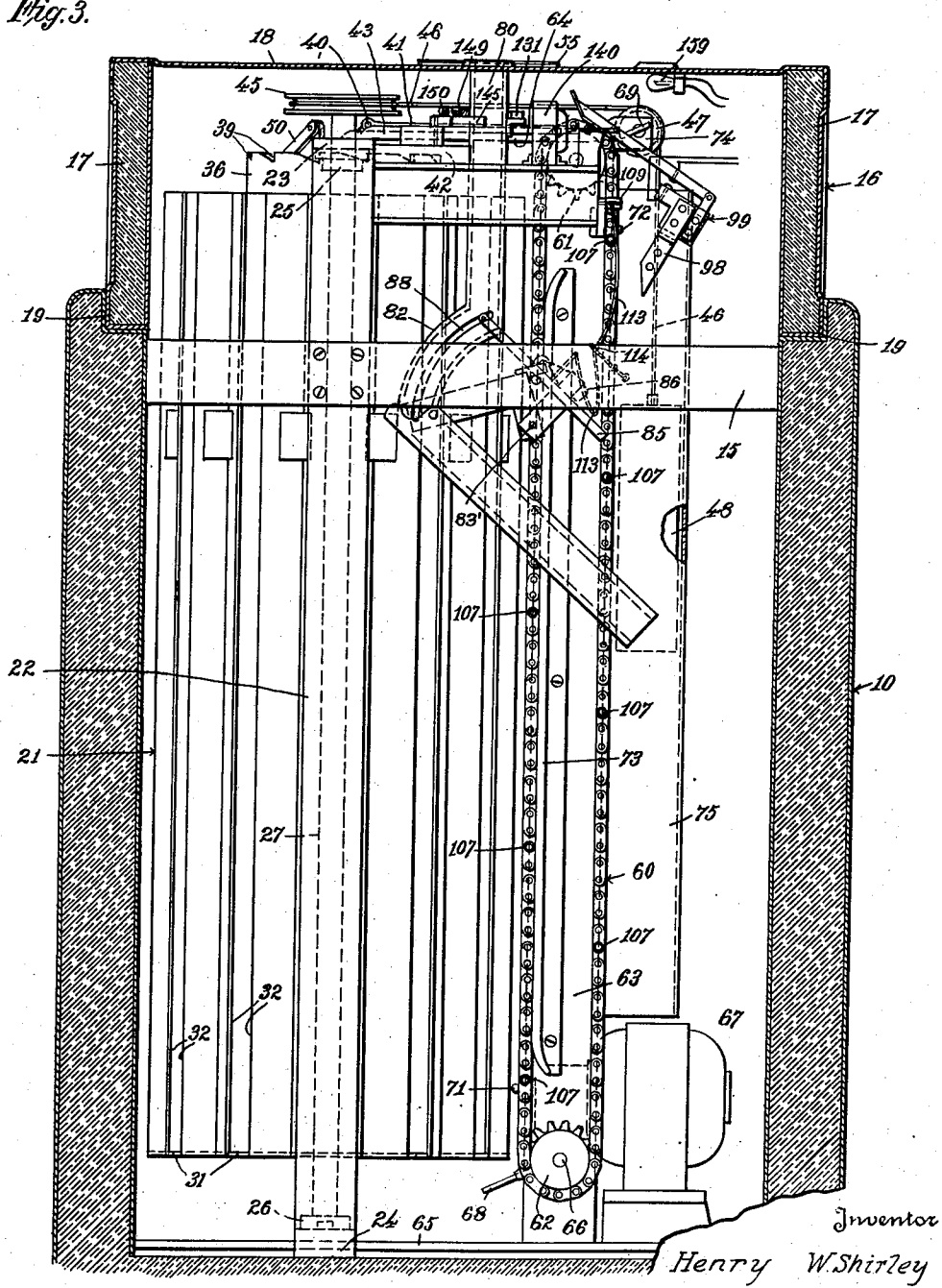
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BOTTLE VENDING MACHINE

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Fig. 3.



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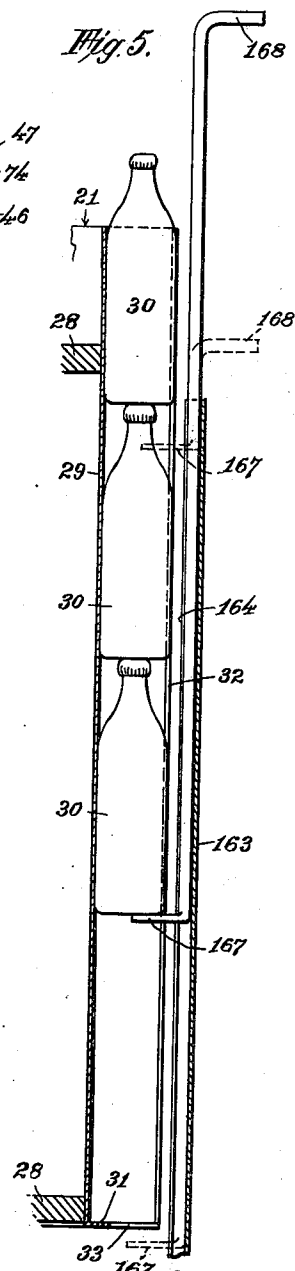
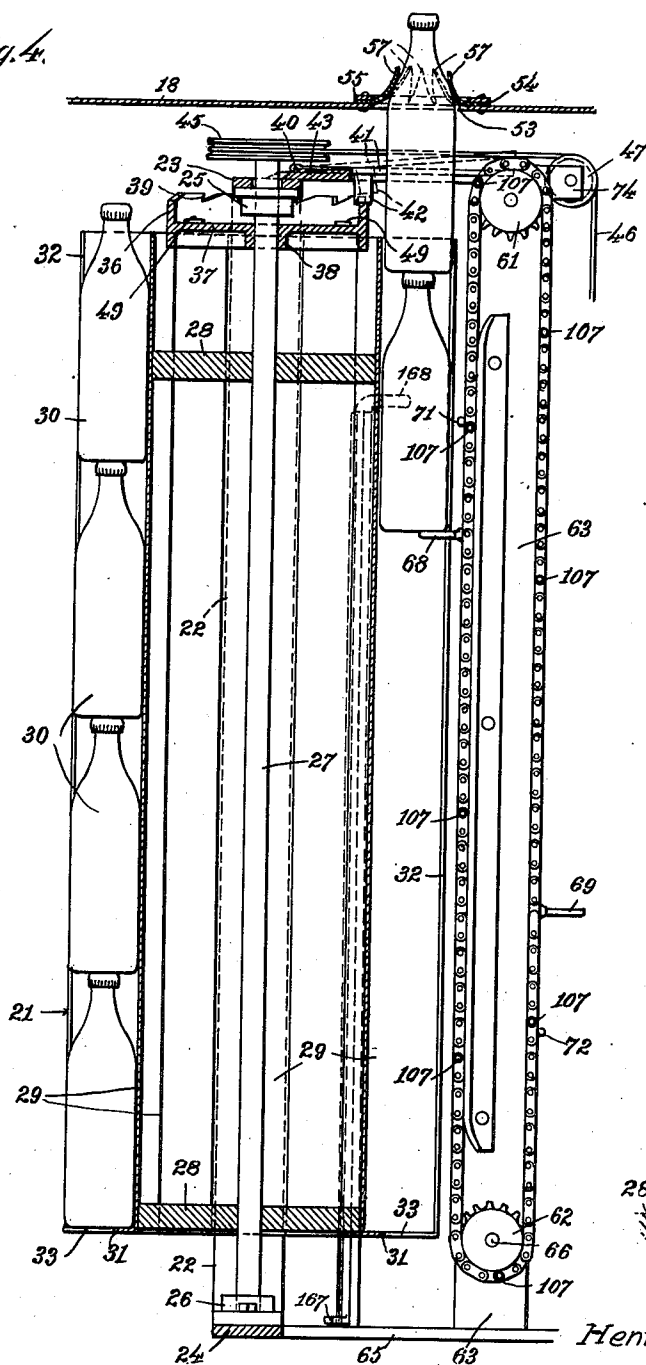
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Fig. 4.



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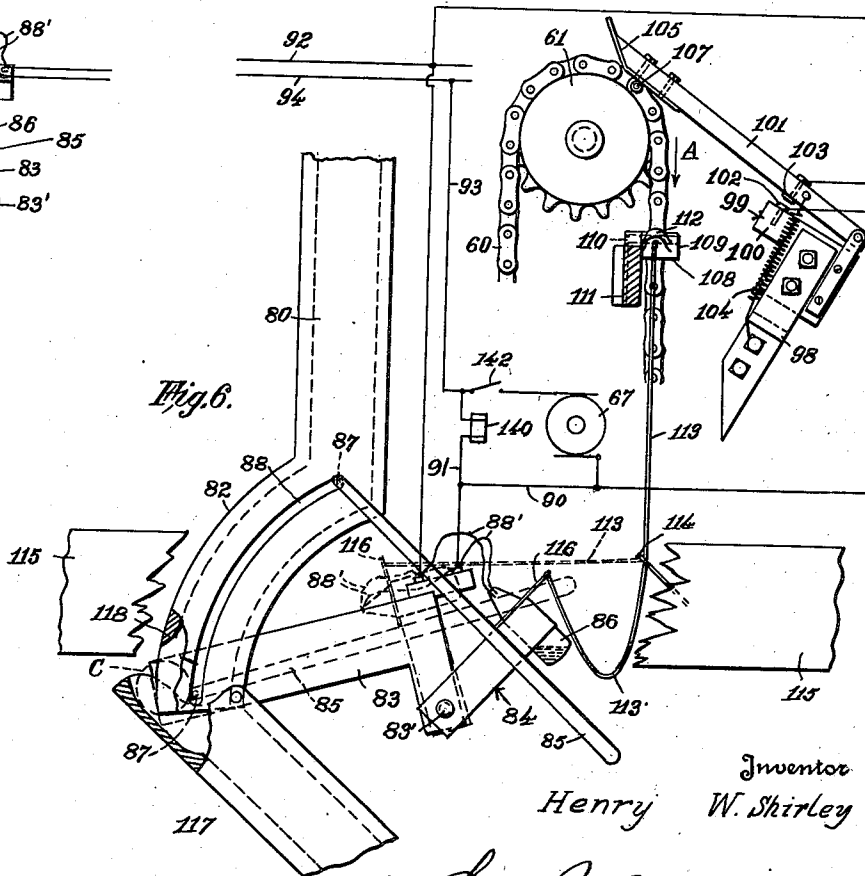
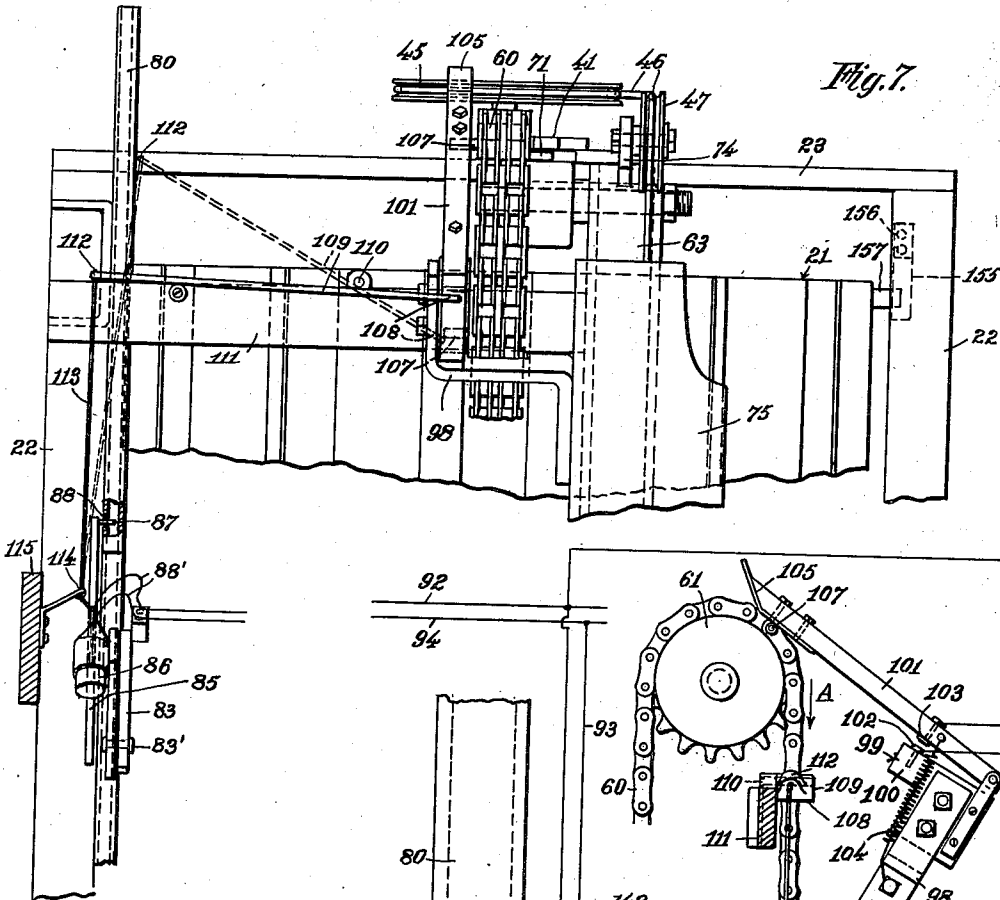
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BOTTLE VENDING MACHINE

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9 Claims. (Cl. 194—10)

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This invention relates to bottle vending machines, that is to coin controlled machines for dispensing bottled beverages.

The object of the present invention is to provide an improved device of the class mentioned from which a beverage containing bottle will be dispensed automatically upon the insertion of a suitable coin or token.

A further object of the invention is to provide a machine of the class mentioned in which the bottles to be vended are arranged and maintained in vertical or upright position therein, and dispensed therefrom in said vertical position and in such manner as to minimize the loss of refrigerating air.

A further object of the invention is to provide in a device as mentioned, a refrigerating cabinet having a storage chamber and a dispensing chamber, dispensing means arranged in said dispensing chamber, and reloading means for the dispensing means arranged in operative relation thereto and in convenient relation to the storage chamber whereby the bottles may be readily removed from the storage chamber and quickly loaded into the dispensing means.

A further object of the invention is to provide an automatic safety device to prevent the insertion of a coin while the mechanism is set to deliver a bottle, and to prevent the delivery of a bottle while the coin chute is open for the reception of a coin.

A further object of the invention is to provide an automatic signal for indicating when the dispensing mechanism is empty of bottles.

Other objects will appear hereinafter.

The invention will be more readily understood by reference to the accompanying drawings forming a part of this specification and in which:

Fig. 1 is a top plan view of a mechanism embodying the invention, the top closures being removed,

Fig. 2 is a plan view with the closures in place,

Fig. 3 is a vertical section through the housing on the line 3—3 with the dispensing mechanism illustrated in elevation,

Fig. 4 is a vertical sectional view of the dispensing mechanism illustrating the same in the process of delivering a bottle through the discharge opening,

Fig. 5 is a detail vertical section of the reloading device, on the line 5—5 of Fig. 1,

Fig. 6 is a diagrammatic elevation illustrating the starting switch and the power or running switch,

Fig. 7 is an elevation of the same taken at right angles to that illustrated in Fig. 6,

Fig. 8 is a plan view of the safety mechanism upon an enlarged scale,

Fig. 9 is a section on the line 9—9 of Fig. 8,

Fig. 10 is a detail of the signal switch, and

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Fig. 11 is a diagram of the electric circuit of the machine.

Referring to the drawings, 10 indicates the cabinet or housing for the device which may be divided by a partition 11 into a dispensing chamber 12 and a storage chamber 13. A refrigerating element, designated by the numeral 14, is preferably provided, and arranged at any convenient location in the storage chamber 13; and said partition 11 is preferably reticulate in order that both chambers 12, and 13 will be uniformly chilled.

The storage chamber 13 is provided with a closure 15 giving ready access thereto for a purpose hereinafter described. A closure 16 for the dispensing chamber 12 extends upwardly from the cabinet 10 to encase the upper end of the dispensing mechanism hereinafter described; and said closure comprises a rectangular member 20 having vertical walls 17 and a horizontal top wall 18. The lower edges of the walls 17 rest in rabbets 19 formed in the upper edges of the housing 10.

The dispensing mechanism comprises generally a magazine rotatably mounted on a vertical axis and having a plurality of vertical cylindrical receptacles, each adapted to hold a plurality of bottles arranged one upon the other in upright position, discharge mechanism arranged closely adjacent said magazine, means for intermittently actuating said discharge mechanism to raise the bottles in the adjacent cylindrical receptacle and deliver the same one at a time through a delivery aperture in the top of the closure, and means controlled by the discharge of the last bottle from each cylindrical receptacle for moving the magazine to bring the next receptacle into operative relation with the discharge mechanism.

The rotary magazine 21 is mounted in a rectangular supporting frame comprising a pair of vertically disposed channel members 22—22, connected at their ends by upper and lower horizontal transverse members 23 and 24 respectively. Mounted in bearings 25 and 26 in the respective transverse frame members 23 and 24 is a vertical shaft 27 to which are fixed a pair of discs 28; and fixed to the peripheries of said discs are a plurality of vertical cylinders 29 each of which constitutes a receptacle for a plurality of bottles 30 stacked end on end. The cylindrical receptacles 29 are slightly larger in internal diameter than the diameter of the bottles to be dispensed, and are of sufficient height to accommodate the desired number of bottles. As illustrated in the drawings there are preferably twelve receptacles each adapted to hold four bottles, which gives the magazine 21 a capacity of four dozen bottles.

Each cylindrical receptacle 29 is provided with a bottom 31 upon which the stack of bottles normally rests. Each receptacle 29 is formed with

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a longitudinal slot 32 in the radially outward portion of its wall, said slot extending the entire length of the receptacle. The bottom 31 is provided with a radial slot 33 forming a continuation of the slot 32 for a purpose hereinafter described.

Fixed to the upper portion of the shaft 27 below the transverse frame member 23 is a crown ratchet 36 having a web 37 and a hub 38 by means of which it is fixed to the shaft 27. The ratchet 36 extends above the upper end of the rotary magazine 21 and is provided with a number of teeth 39 corresponding in number to the number of cylinders 29, in the present case twelve. Pivotaly mounted at 40 on the cross frame member 23 is a release lever 41 having a depending detent 42 which rides on the upper edge of the crown ratchet 36 and engages the teeth 39. The operation of the release lever will be fully described hereinafter.

Fixed to the upper end of the shaft 27 is a grooved pulley 45. Secured to, and wound about said pulley is a flexible cable 46 which passes over an idle pulley 47 and fixed to a weight 48 suspended thereby. It is obvious that by raising the detent 42 to release the ratchet 36, the magazine will be turned by means of the weight 48 the distance between the centers of adjacent cylinders 29, such action taking place when the last bottle is delivered from the respective cylinders, as will hereinafter more fully appear.

After the detent is raised to release the ratchet, it rides on the upper edge of the ratchet until it is engaged by the next ratchet tooth 39. To prevent rebound when the tooth 39 is thus engaged, the web 37 of the ratchet is provided with stops 49 which are engaged by a pawl 50 pivotaly mounted on the frame member 23. In order to prevent lateral displacement of the release lever 41 and detent 42, a guide arm 43 is extended from the frame member 23 and bears against the lateral edge of said lever.

As hereinbefore stated the bottles are delivered upwardly one at a time through the top wall 18 of the dispensing chamber closure 16. To this end the wall 18 is provided with a discharge opening 53 which is normally closed by a disc 54 held in place by an annular member 55 riveted or otherwise secured to the said wall. The disc, within the member 55 is provided with radial slits 56 forming a plurality of flexible tongues 57 which are forced outwardly by the bottle as it emerges from the cabinet. When the bottle is removed by the purchaser the tongues return to normal position, closing the opening and preventing loss of the refrigerated air. It should also be noted that the dispensing of the bottles through the top of the device further conserves the chilled air as the same is heavier than the normal atmosphere.

The dispensing mechanism consists generally in an endless chain 60 arranged in close proximity to the magazine 21 and passing around upper and lower sprockets 61 and 62 respectively, bottle engaging means on said chain adapted to engage the bottles through the slots 32, and means for intermittently driving said chain.

To support said chain and sprockets a vertical frame member 63 is provided, which is connected at its upper end to the frame member 23 by a horizontal member 64, and at its lower end to the member 24 by a bar 65. The shaft 66 of the lower sprocket 62 is connected to a motor 67 through reducing gearing, not shown.

The chain 60 extends from slightly below the

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bottom of the magazine to above the upper end thereof and is provided with two feet 68 and 69 which are spaced apart half the length of the chain, and project outwardly from the face thereof. The feet 68-69 are adapted to extend through the slot 32 of the adjacent cylinder 29 and engage under the lowermost bottle therein. The motor is actuated upon the insertion of a coin in the machine, as will hereinafter appear, to raise one of the feet within the slot a distance equal to the height of a bottle, and thereby project the upper portion of the uppermost bottle in the cylinder through the discharge opening 53. This is repeated upon the insertion of a coin until the cylinder is emptied. One foot will empty one cylinder, and as this is being done the other foot travels downwardly with the outer lap of the chain in order to be in position to engage the bottles in the next succeeding cylinder when the same is brought into dispensing position.

Extending laterally from the side of the chain 60 adjacent the supporting frame member 63 are trip pins 71 and 72; these are arranged on the chain a short distance in advance of the feet 68 and 69 respectively. The release lever 41 extends into the path of the pins 71 and 72 and as soon as the respective foot has discharged the last bottle from the cylinder, and has cleared the upper end of the magazine, the corresponding pin 71 or 72 will raise the lever 41, disengaging the detent from the crown ratchet, and permitting the weight 48 to shift the next cylinder into discharging position. A guide strip 73 forms a backing for the working lap of the chain and maintains the foot within the cylinder from which the bottles are being dispensed.

A bracket 74 fixed to the upper end of the frame member 63 supports the idle pulley 47, and a tubular housing guide 75, also secured to the member 63, is provided for the weight 48.

To set the device into operation a coin-actuated starter switch is provided which initially closes the circuit to the motor 67 and thereby starts the chain 60. After the chain moves approximately a half inch a main running switch which is in parallel with the starting switch is closed and the starting switch opened. This portion of the device is illustrated diagrammatically in Figs. 6 and 7 of the drawings.

A coin chute 80, having an opening slot 81 in the top wall 18, extends substantially vertically downwardly to an arcuate portion 82. Pivotaly mounted, as at 83' on a bracket 83 is a mercury type starting switch 84 comprising a lever 85, and the mercury capsule 86 fixed thereto. The pivot 83' is at the center of curvature of the arcuate portion 82, and the end of the lever 85 is provided with a laterally extending pin 87 which extends through an arcuate slot 88 in the chute portion 82 and in the path of a coin passing through the chute. A coin engaging the pin 87 will move the lever 85 into the position illustrated in dotted lines in Fig. 6, and thereby tilt the capsule 86 sufficiently to cause the mercury therein to engage the termini of the flexible conductor wires 88 and close the circuit to the motor 67. The outer ends of the flexible wires 88 are secured to an insulating block 89 where they are connected respectively to a conductor 90 leading to the motor, and a conductor 91 connected to line wire 92. A conductor 93 from line wire 94 completes the circuit to the motor.

Supported in any suitable manner on a stationary portion of the machine, such as the weight guide 75, is a bracket 98 upon which is mounted

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the main running switch 99. This switch 99 comprises an insulating block 100, a switch arm 101 pivotally mounted above the same, and contacts 102—103 mounted on said block 100 and arm 101 respectively, and connected in parallel with the starting switch 84 to the motor 67. A spring 104 tends to keep the switch 99 closed. The arm 101 is arranged upon the opposite side of the chain 60 from the release lever 41, and lies parallel to and adjacent the chain 60 as shown in Fig. 7.

Fixed to the chain 60 and extending laterally therefrom on the side adjacent the switch arm 101 are a plurality of trip pins 107. The pins 107 are arranged on the chain in two groups, each group corresponding in number to the number of bottles contained in each of the cylindrical receptacles 29, in the present instance four; and the pins in each group are spaced apart a distance equal to the height of individual bottles to be dispensed.

The switch arm 101 lies in the path of the pins 107, and the forward end of the arm 101 is provided with an angular shoe 105 against which the pins ride and lift the arm to break the circuit to the motor. When the machine is at rest one of the pins 107 lies in the position shown in Fig. 6, thereby maintaining the contacts 102—103, separated.

When a coin is inserted in the chute, and the starting switch 84 has been actuated thereby to close the circuit to the motor, the chain 60 is moved in the direction of the arrow A in Fig. 6. As soon as the chain moves a short distance, approximately one half inch, the pin 107 moves out of contact with the arm 101 permitting engagement of the contacts 102—103 and closing the circuit through the running switch 99 to the motor 67.

Further downward movement of the pin 107 causes the same to engage and depress the end 108 of a lever 109, which is pivoted at 110 to a cross member 111 of the frame. To the opposite end, 112 of the lever 109 is attached a flexible cord 113 which passes through an eye 114 fixed to a frame member 115, and is secured to an arm 116 on the mercury switch 84. When the pin 107 actuates the lever 109 as described, the mercury or starting switch is returned to normal position, breaking the circuit therethrough and setting the same for next operation.

When the coin C has tilted the starting switch into the position illustrated in dotted lines in Fig. 6 it rolls off of the pin 87 into the upper end of extension chute 117 which leads to a coin receptacle, as shown. The lower portion of the outer wall of the chute is cut away as indicated at 118 to permit the pin 87 to pass the coin.

Means are provided to obstruct the open end of the magazine cylinder 29 which is located at the discharge station, when the device is not in operation; and to close the coin chute when the mechanism is in operation. Preferably these are so constructed and operated that as one is opened the other is closed, and vice versa. Referring to Figs. 8 and 9, 120 indicates an elongated sliding plate mounted in a plane above the upper end of the magazine. An upwardly extending slotted flange 121 on a horizontal frame member 122 serves as a bearing for the end adjacent the cylinder 29 and a rectangular sleeve 123 extending inwardly from the coin chute 80 provides a bearing for the adjacent end 124. A lever 125, pivoted intermediate its ends at 126, is provided with a slot 127 for a pin 128 on the sliding member 120. A spring 129 connected to the opposite end of

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the lever 125 and attached to a stationary portion of the frame, tends to move the member 120 in position to obstruct delivery of a bottle from the cylinder 29, as illustrated in full lines in Fig. 8.

A latch arm 131, pivoted at 132 is provided with a detent 133 which engages behind a shoulder 134 on the sliding member 120, and holds it in delivery obstructing position. A spring 135 yieldingly holds the latch in position.

Formed on the latch arm is a cam face 136 which is engaged by a pin 137 carried by an arm 138 fixed to the core 139 of a solenoid 140. The solenoid 140 is connected in series with the starting switch 84 so that when said switch is closed then upon the insertion of a coin, the solenoid is energized causing the pin 137 to ride on the cam face 136, retracting the detent 133 and releasing the slide 120. The core 139 of the solenoid is also connected to the lever 125 by a link 141, so that the lever is actuated to move the slide 120 to open the discharge end of the cylinder, and to close the coin chute 80.

A normally open safety switch 142 is arranged in the conductor 93 of the motor circuit so that the mechanism cannot operate to dispense the bottles until the slide 120 is fully retracted. This switch comprises an arm 143, pivoted at 144 and extending into the path of the slide 120 when it extends a short distance beyond the coin chute 80, and a second arm 145 pivoted at 146; said arms provided respectively with contacts 147 and 148 connected in the conductor 93. Springs 149 and 150 connected to the respective arms 143 and 145 hold the switch in open position; the coin chute forming a stop for the arm 143 and a pin 149 forming a stop for the arm 145.

The release lever 41 is cut back as at 153 to give clearance for the bottles as they are discharged from the magazine; and to insure that the bottles will not engage under said lever and release the magazine, a guide 154 is provided which spans the lever 41 and projects beyond the same as shown in Figs. 1 and 9.

As hereinbefore stated, after the last bottle has been delivered from each cylinder 29 a pin 71 or 72 raises the lever 41 and permits the magazine to rotate and bring the next cylinder into discharging relation with the chain. It is desirable that a signal be given after the last bottle has been delivered from the magazine to indicate that the machine is empty. To this end, a pair of spaced contacts 155 are mounted in an insulating block 156 fixed to the frame of the machine, and the magazine 21 is provided with an arm or lug 157. As soon as the last bottle has been delivered, a pin 72 raises the lever 41 and permits the magazine to rotate until the lug 157 presses the contacts 155 into engagement and closes a circuit 158 across the lines 92—94. A signal light 159 is interposed in the circuit 158 and arranged under a translucent sight 160 in the top 18 of the device adjacent the coin slot 81.

Reloading of the magazine may be readily and speedily done by means of a novel loading device located adjacent the magazine and close to the storage space. This device is illustrated in Figs. 1 and 5. Mounted in close proximity to the periphery of the magazine is a tube 163, the side thereof next to the magazine being provided with a longitudinal slot 164. This tube may be attached to a frame member 22 as by a bracket or brackets 165. Slidably mounted in said tube is a rod 166 having a foot 167 projecting through said slot 164 and having its upper end bent out-

wardly forming a handle 168. In using the re-loader it is grasped by the handle 168 and raised until the foot 167 is near the top of the adjacent cylinder 29, said foot passing through the slot 32 in the cylinder. A bottle is taken from the storage space and rested on the foot, and as the rod is lowered other bottles are placed one above the other until the cylinder is filled. The magazine is then turned anti-clockwise to bring the next cylinder into position, and the operation repeated until all the cylinders are filled. As the magazine is turned during the reloading, the cable 46 will be rewound on the pulley 45, as is obvious.

It is believed that the operation of the device will be clear from the foregoing description.

I claim:

1. In a bottle vending machine, a chamber having a top wall provided with a discharge opening therein, a rotary magazine in said chamber having a plurality of vertical compartments each adapted to contain a single stack of bottles arranged in upright position one upon the other, each of said compartments having a vertical passageway in its outer face and extending the entire length thereof, a vertically disposed endless belt arranged in juxtaposition to the compartment in register with said discharge opening, a motor for driving said endless belt, a foot on said belt adapted to extend through said passageway to engage under the lowermost bottle of the stack; means for closing the circuit to said motor, and means on said belt for breaking the circuit to said motor after said foot has been raised the height of a bottle to be delivered.

2. In a bottle vending machine, a chamber having a top wall provided with a discharge opening therein, a rotary magazine in said chamber having a plurality of vertical compartments each adapted to contain a single stack of bottles arranged in upright position one upon the other, each of said compartments having a vertical passageway in its outer face and extending the entire length thereof, means for rotating said magazine to bring said compartments successively beneath said discharge opening, means for checking the rotation of said magazine when each successive compartment comes into alignment with said discharge opening, a vertically disposed endless belt arranged in juxtaposition to the compartment in register with said opening, a motor for driving said belt, a pair of feet on said belt arranged half the belt length apart whereby one of said feet moves upwardly through the passageway in the compartment which is in discharge position while the other foot is moving downwardly to a position to engage under the bottles of the next compartment, means for optionally closing the circuit to said motor, means on said belt for automatically breaking the circuit to said motor when the bottle engaging foot has raised substantially the height of one bottle, and means on said belt for freeing said checking means when the last bottle has been delivered from the compartment to permit the magazine to rotate and bring the next compartment into register with the discharge opening.

3. In a bottle vending machine a compartment adapted to contain a stack of bottles arranged in upright position and end on end, an endless belt having a foot to engage under the lowermost bottle of the stack, a motor for driving said belt, a main switch for said motor, a series of pins on said belt equal in number to the maximum number of bottles accommodated in said compart-

ment, said pins adapted to successively engage said main switch and hold the same in open position when the machine is at rest, a coin controlled starting switch in parallel with said main switch to initially start said motor and move the pin out of engagement with the main switch permitting the same to close, and means actuated by said pin for opening the starting switch after the main switch is closed.

4. In a bottle vending machine a rotary magazine comprising a plurality of vertical compartments each adapted to hold a stack of bottles arranged in upright position and resting end on end, delivery mechanism adapted to raise a stack of bottles in one compartment at a time and deliver them upwardly one at a time, means constantly tending to rotate said magazine, stop means for holding one compartment at a time in operative relation to said delivery mechanism until all the bottles are dispensed therefrom, a motor for driving said delivery mechanism, coin controlled mechanism including a coin chute, for closing the circuit to said motor, a sliding member adapted when in normal position to obstruct the passage of the bottles from the compartment in operative relation to said delivery mechanism, and in retracted position to close said coin chute, and means responsive to the closing of the circuit to the motor for retracting said sliding member.

5. In a bottle dispensing machine, a magazine rotatable on a vertical axis and comprising a plurality of vertical compartments each adapted to hold a stack of bottles arranged in upright position and resting end on end, a delivery mechanism adapted to raise the stack of bottles in one compartment at a time and deliver the bottles in successive steps, and means for rotating said magazine to present the compartments successively to said delivery mechanism when the preceding compartment is emptied, the last said means comprising a crown ratchet and a pulley fixed to the upper end of said magazine, a cable fixed to and wound about said pulley, tensioning means for said cable, a lever having a detent riding on said crown ratchet, and means on said delivery mechanism for momentarily disengaging said detent from said ratchet when the last bottle in the adjacent compartment has been dispensed.

6. In a bottle vending machine, a compartment adapted to hold a stack of bottles arranged end to end, dispensing means for moving said stack upwardly by successive steps to deliver the bottles one at a time from said compartment, a motor for actuating said dispensing means, coil controlled means including a coin chute and a coin controlled switch for closing the circuit to said motor, a sliding member having one end normally obstructing the passage of bottles from said compartment, and the other end thereof, when retracted, closing said coin chute, a solenoid in parallel relation with said motor and in series with said coin controlled switch, and said solenoid having a core operatively connected with said slide, whereby a coin deposited in said slot will close the circuit to the motor circuit and to said solenoid, and cause the latter to shift said sliding member to release a bottle and close said coin chute.

7. A device as set forth in claim 6 further characterized by a latch for holding said sliding member in normal position, a cam on said latch, and means carried by the core of said solenoid and engaging said cam to release said latch.

8. In a bottle vending machine, a compartment adapted to hold a stack of bottles arranged ver-

tionally end on end, dispensing means for moving said stack of bottles upwardly by successive steps to deliver the bottles one at a time from said compartment, a motor for driving said dispensing means, a starting switch and a running switch in parallel with each other and in series with said motor, coin controlled means including a coin slot and means associated therewith for closing the starting switch, means on said dispensing mechanism for closing the running switch and opening said starting switch, a sliding member having one end normally obstructing the passage of the bottles from said compartment and the other end of said sliding member closing said coin chute when retracted, a solenoid in parallel relation with said motor and in series with said coin controlled switch, a core for said solenoid operatively connected with said slide, and a safety switch in the motor circuit and arranged to be closed by the end of said sliding member when the latter is shifted by said solenoid to free the bottles and close the coin chute.

9. In a bottle vending machine, a housing comprising a dispensing chamber having a discharge opening in the top thereof, a rotary magazine in said dispensing chamber and having a plurality of vertical compartments each adapted to contain a stack of bottles arranged in upright posi-

tion one upon the other, each of said compartments having a vertical longitudinal slot in the radially outward portion of its wall, dispensing means adapted to operate through said slots to discharge the bottles through said discharge opening; and reloading means comprising a vertical guide fixed adjacent the periphery of said magazine, a rod slidably mounted on said guide and having a foot at the lower end adapted to extend through the slots of said compartments when brought into proximity thereto and upon which to rest the bottles while reloading the magazine, and an operating handle on said rod.

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