Oct. 2, 1962 H. E. KRIER 3,056,530

REFRIGERATED STORAGE CHAMBER AND BEVERAGE CONTAINER LIFT

Filed July 31, 1957 8 Sheets-Sheet 1

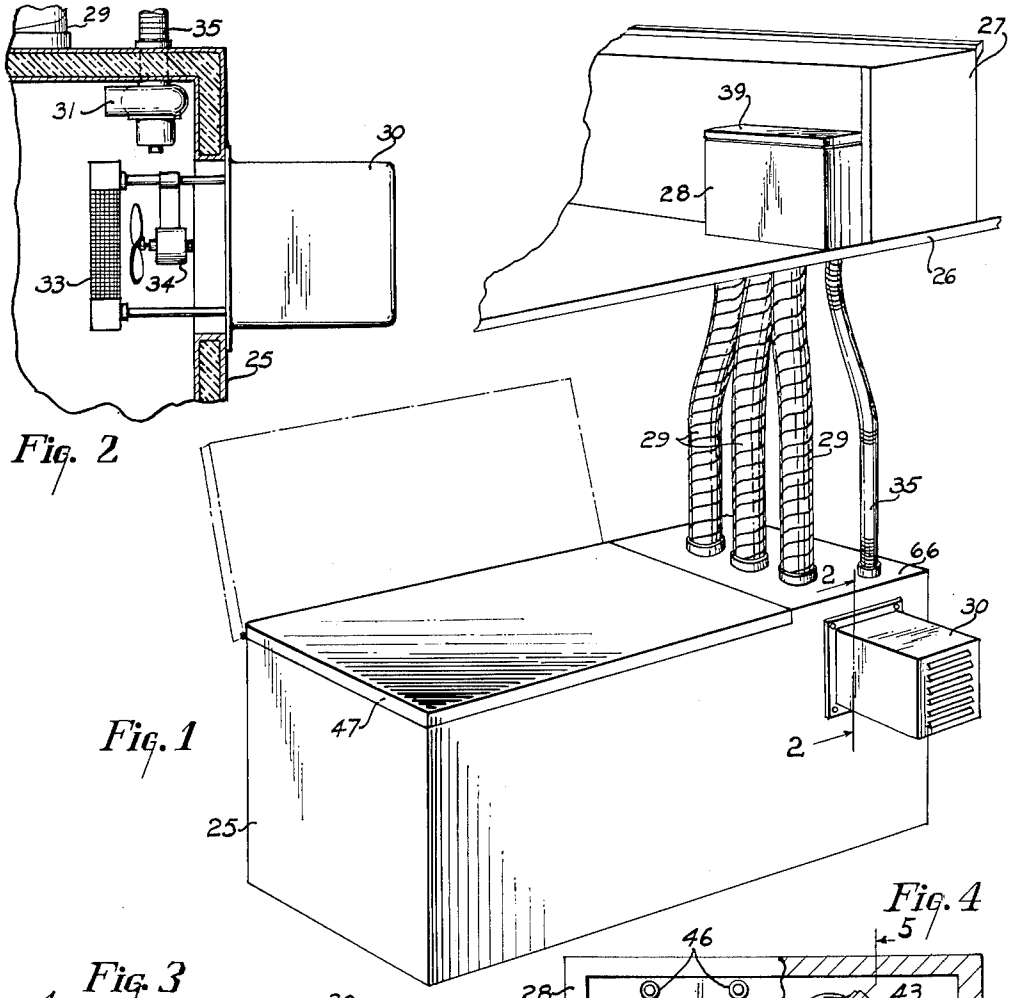


Fig. 2

Fig. 1

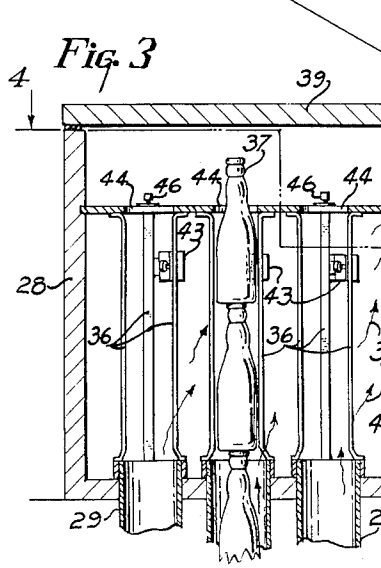


Fig. 3

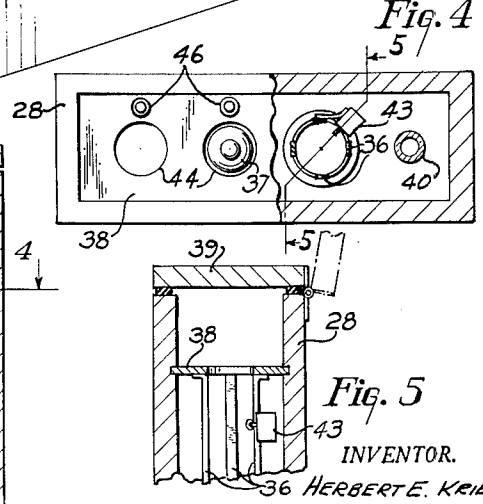


Fig. 4

Fig. 5

INVENTOR.
HERBERT E. KRIER
BY
Wheeler, Wheeler & Wheeler
ATTORNEYS

Oct. 2, 1962 H. E. KRIER 3,056,530

REFRIGERATED STORAGE CHAMBER AND BEVERAGE CONTAINER LIFT

Filed July 31, 1957 8 Sheets-Sheet 2

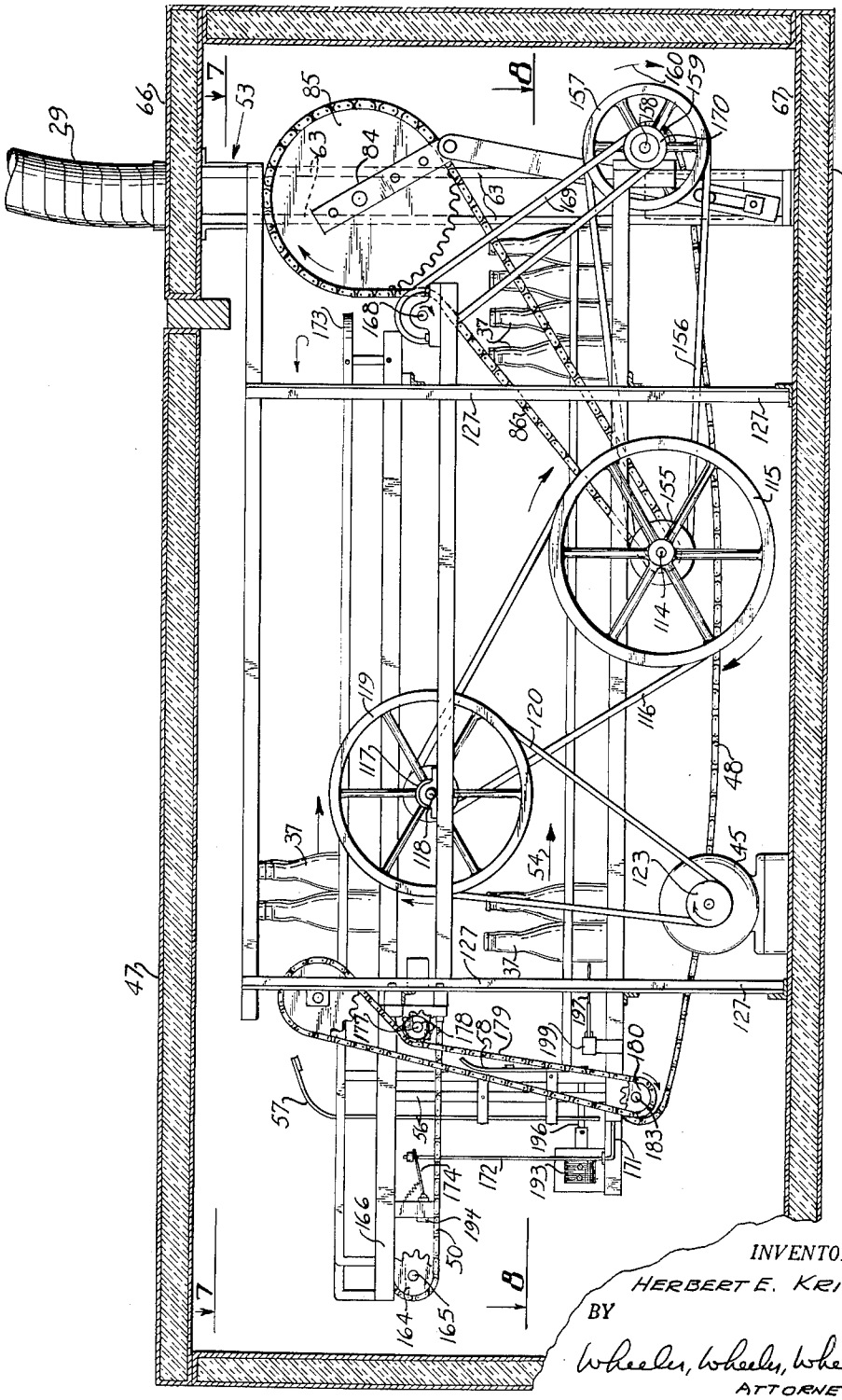


Fig. 6

INVENTOR.
HERBERT E. KRIER
BY
Wheeler, Wheeler, Wheeler
ATTORNEYS

Oct. 2, 1962 H. E. KRIER 3,056,530

REFRIGERATED STORAGE CHAMBER AND BEVERAGE CONTAINER LIFT

Filed July 31, 1957 8 Sheets-Sheet 3

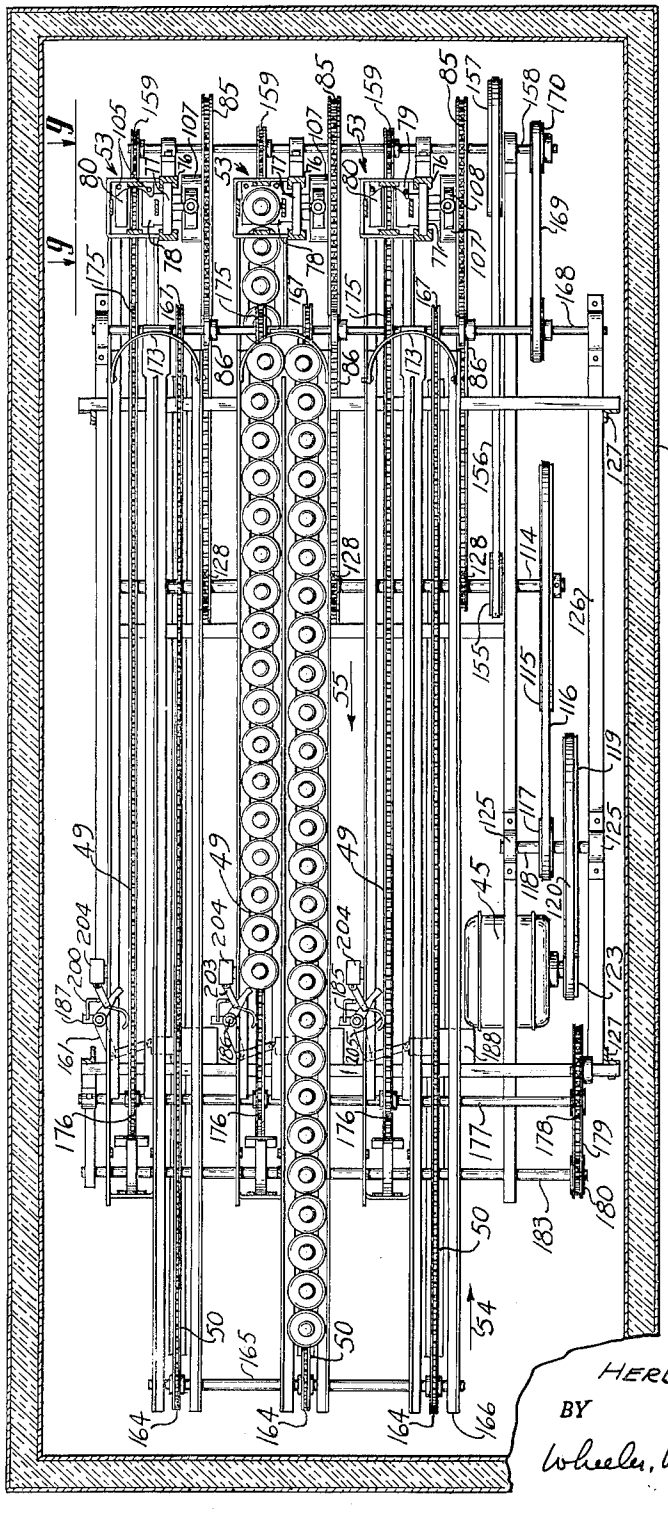


Fig. 7

INVENTOR.
HERBERT E. KRIER
BY
Wheeler, Wheeler & Wheeler
ATTORNEYS

Oct. 2, 1962 H. E. KRIER 3,056,530

REFRIGERATED STORAGE CHAMBER AND BEVERAGE CONTAINER LIFT

Filed July 31, 1957 8 Sheets-Sheet 4

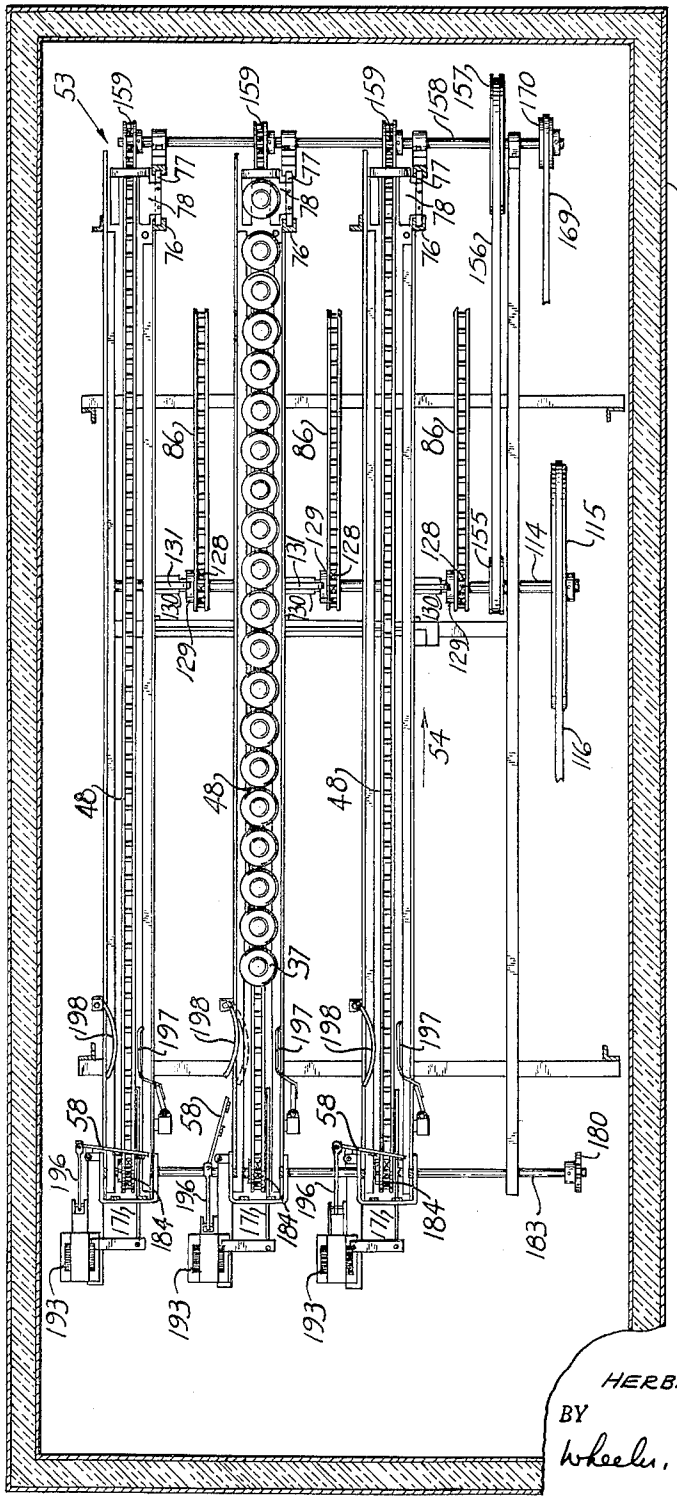


Fig. 8

INVENTOR.
HERBERT E. KRIER
BY
Wheeler, Wheeler & Wheeler
ATTORNEYS

Oct. 2, 1962 H. E. KRIER 3,056,530

REFRIGERATED STORAGE CHAMBER AND BEVERAGE CONTAINER LIFT

Filed July 31, 1957 8 Sheets-Sheet 5

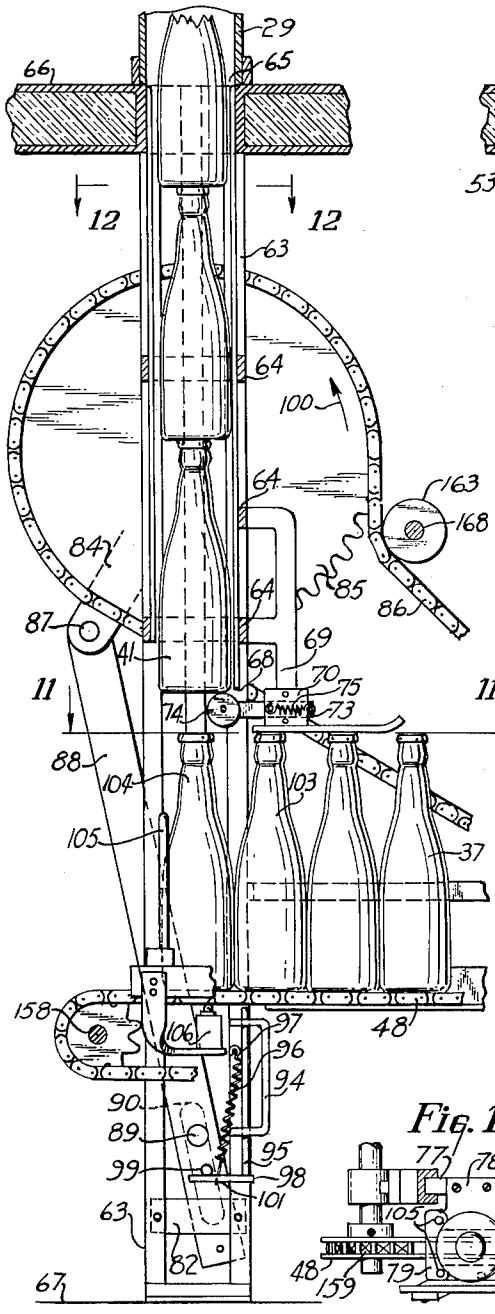


Fig. 9

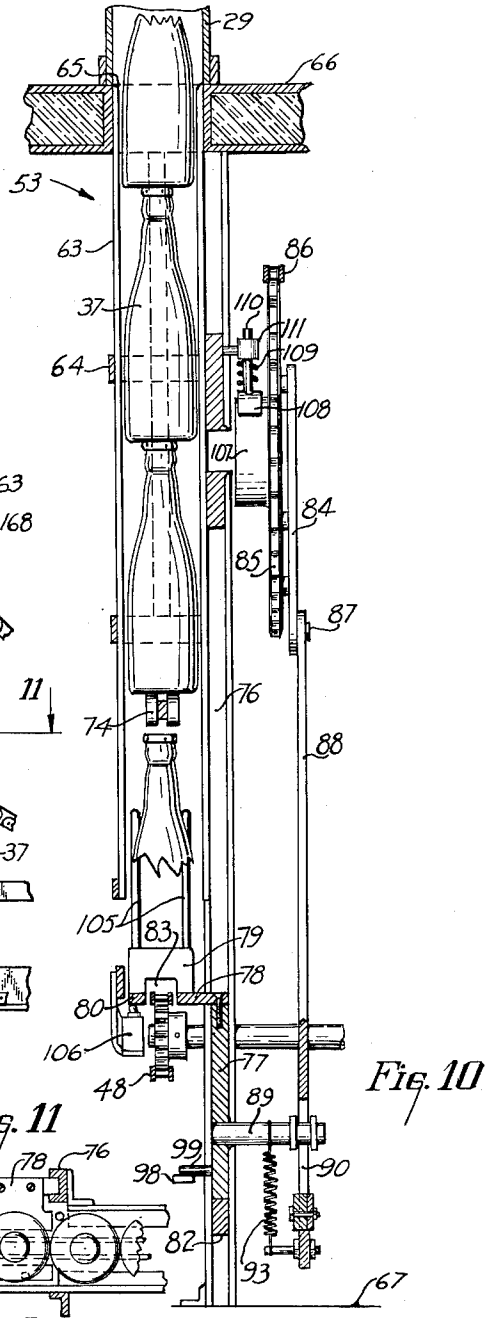


Fig. 10

Fig. 11

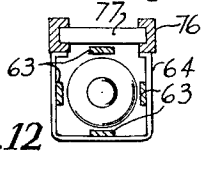


Fig. 12

INVENTOR.
HERBERT E. KRIER
BY
Wheeler, Wheeler & Wheeler
ATTORNEYS

Oct. 2, 1962 H. E. KRIER 3,056,530

REFRIGERATED STORAGE CHAMBER AND BEVERAGE CONTAINER LIFT

Filed July 31, 1957 8 Sheets-Sheet 6

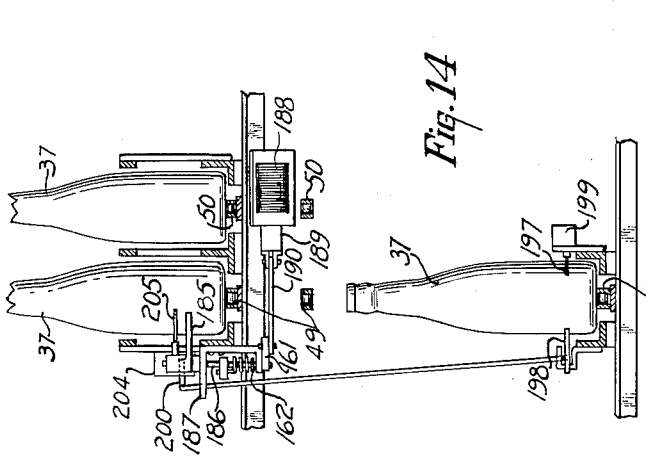


Fig. 14

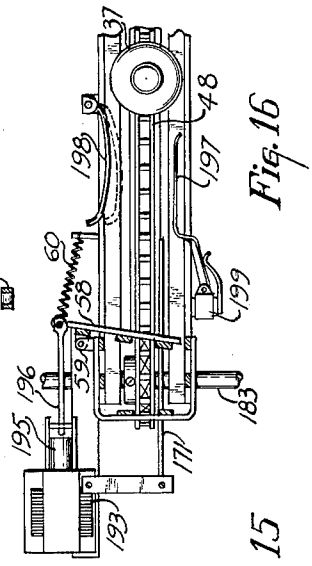


Fig. 16

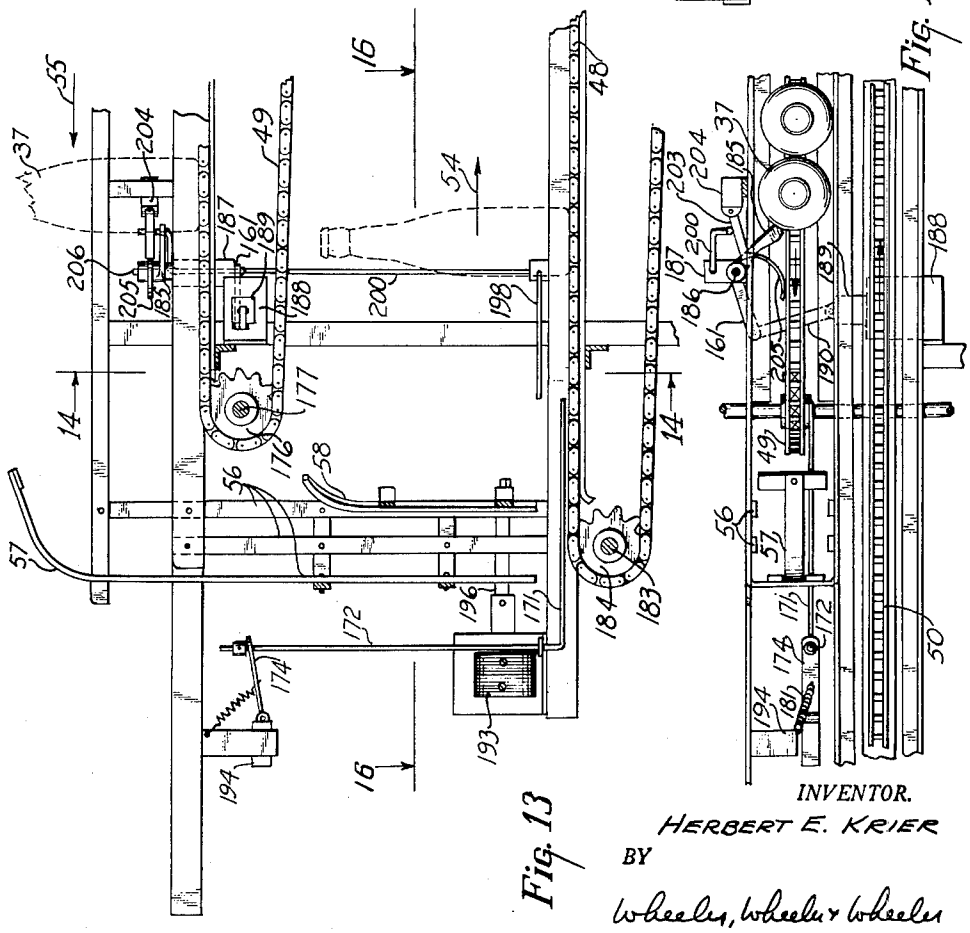


Fig. 13

Fig. 15

INVENTOR.
HERBERT E. KRIER
BY
Wheeler, Wheeler & Wheeler
ATTORNEYS

Oct. 2, 1962 H. E. KRIER 3,056,530

REFRIGERATED STORAGE CHAMBER AND BEVERAGE CONTAINER LIFT

Filed July 31, 1957 8 Sheets-Sheet 7

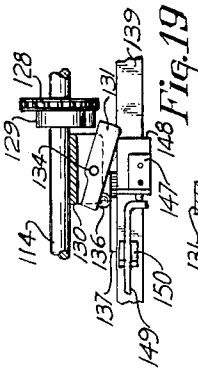


Fig. 19

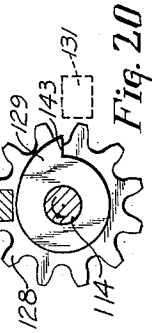


Fig. 20

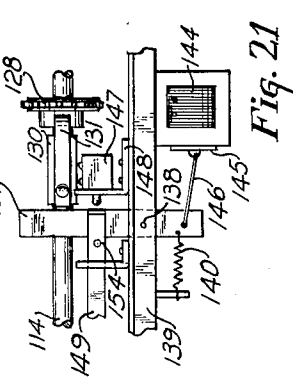


Fig. 21

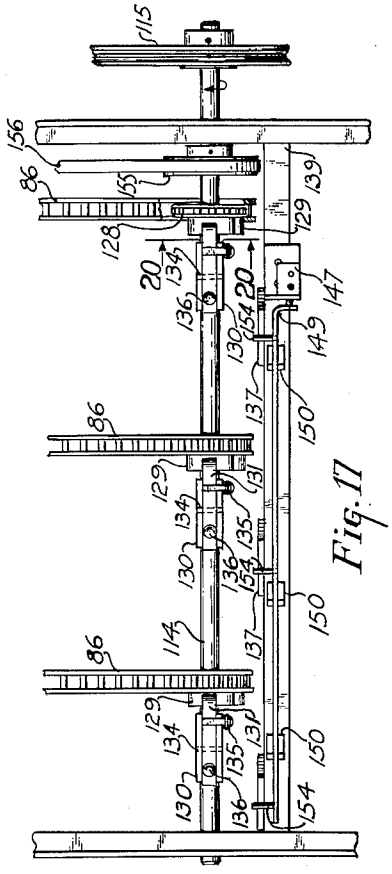


Fig. 17

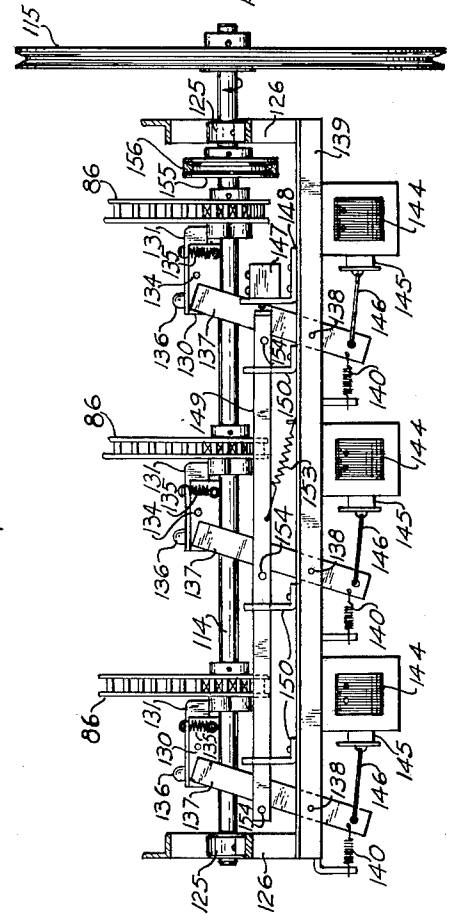


Fig. 18

INVENTOR.
HERBERT E. KRIER
BY
Wheeler, Wheeler & Wheeler
ATTORNEYS

Oct. 2, 1962 H. E. KRIER 3,056,530

REFRIGERATED STORAGE CHAMBER AND BEVERAGE CONTAINER LIFT

Filed July 31, 1957 8 Sheets-Sheet 8

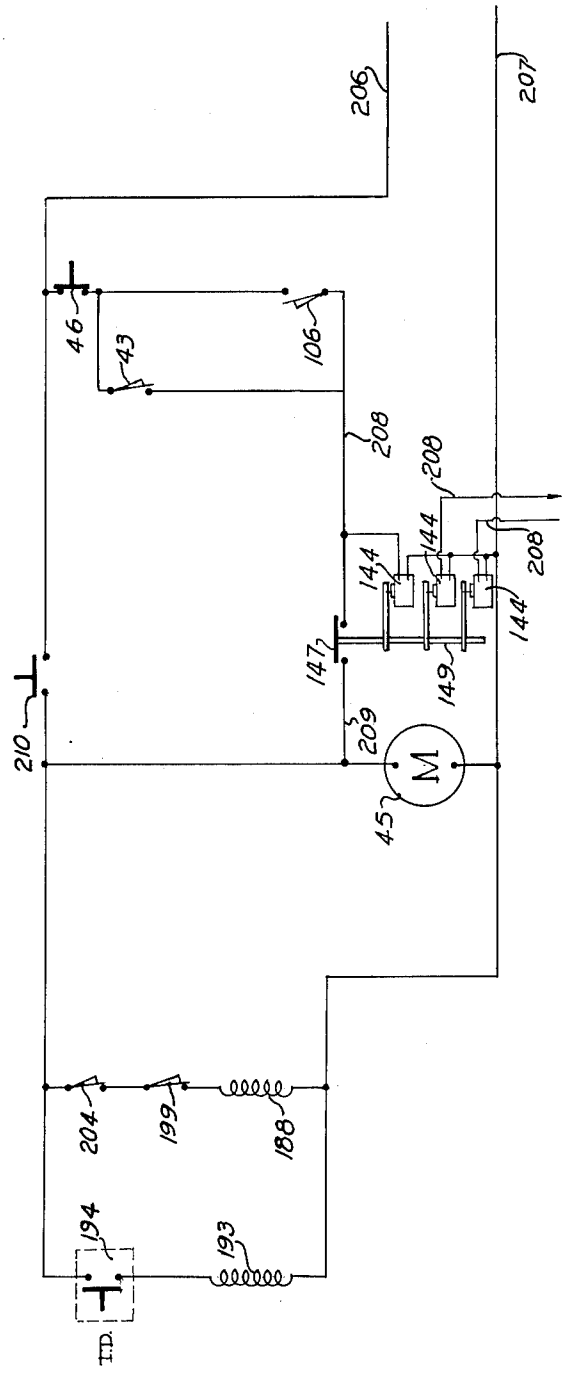


Fig. 22

INVENTOR.
HERBERT E. KRIER
BY
Wheeler, Wheeler & Wheeler
ATTORNEYS

United States Patent Office

3,056,530

Patented Oct. 2, 1962

3,056,530
REFRIGERATED STORAGE CHAMBER AND BEVERAGE CONTAINER LIFT

Herbert E. Krier, P.O. Box 185, Belgium, Wis.

Filed July 31, 1957, Ser. No. 675,393
6 Claims. (Cl. 221—22)

This invention relates to apparatus including elevator means for automatically delivering refrigerated beverage containers or the like from a storage chamber on a lower floor to a dispenser unit on an upper floor in response to demand for such containers at the dispensing unit.

The device of the present invention is intended primarily for use in taverns. The handling of bottled or canned beverages may be a serious problem in taverns because of the failure of the industry heretofore to provide automatic dispensing apparatus. Prior to the present invention, it was necessary for the tavern operator to manhandle cases of bottled or canned beverages from a place of storage in the basement or elsewhere to the point of dispensing the beverage, usually the bar.

In the device of the present invention, however, manhandling is completely eliminated in favor of automatic delivery from a refrigerated storage cabinet in the tavern basement to a dispenser unit conveniently located beneath the bar.

In the device of the present invention the conduits between the refrigerated storage cabinet and the dispenser desirably consist of flexible tubing through which refrigerated gas is desirably blown to keep the containers cool in transit.

It is a feature of the device of the present invention that the containers are in direct series contact within the elevator conduits. Accordingly, lifting pressure exerted on the bottommost container in any conduit will be transmitted through the intervening containers to the uppermost container, thus to project such uppermost container into dispensing position. Moreover, the act of removing the topmost container from the dispenser cabinet automatically triggers electrical control mechanism which actuates the elevator for delivering another bottle to dispensing position.

In the device of the present invention, ample refrigerated container storage capacity is provided in the basement cooler. The cooler need not be filled except at relatively infrequent intervals. The containers for each delivery line are stored in the cabinet on vertically related horizontal conveyors having means for transferring bottles from one level to the other in the course of advancing the containers toward the elevator.

Elevators are provided in each delivery line to lift containers from the storage cabinet into the delivery conduits and thence to the dispenser. The elevators are provided with escapement mechanism to transfer a single container from the horizontal delivery line to the elevator in timed relation with the delivery of a container into dispensing position in the dispensing unit.

In the device of the present invention, I prefer to use a single motor for driving all the apparatus. The motor is subject to an electrical control circuit responsive to removal of a container from any delivery station for any of the delivery lines to energize the apparatus to replace the container removed therefrom.

Other features, objects and advantages of the invention will be more apparent from the following disclosure in which:

FIG. 1 is a fragmentary perspective view diagrammatically illustrating a tavern bar with the refrigerated chamber disposed at a lower level, such as a basement.

FIG. 2 is a fragmentary vertical cross section taken through the storage chamber and substantially along the line 2—2 of FIG. 1.

FIG. 3 is a vertical cross section taken through the dispensing unit.

FIG. 4 is a cross section taken along the line 4—4 of FIG. 3.

FIG. 5 is a fragmentary cross section taken along the line 5—5 of FIG. 4.

FIG. 6 is an enlarged side elevation of the apparatus within the refrigerated storage cabinet, one wall of the cabinet being omitted to expose details of the interior mechanism.

FIG. 7 is a horizontal cross section taken generally along the line 7—7 of FIG. 6.

FIG. 8 is a horizontal cross section taken through the storage cabinet substantially on the line 8—8 of FIG. 6.

FIG. 9 is a detailed view partly in elevation and partly in section showing a typical lift conveyor or elevator for one of the lines.

FIG. 10 is a side view of the apparatus shown in FIG. 9.

FIG. 11 is a cross section taken along the line 11—11 of FIG. 9.

FIG. 12 is a cross section taken along the line 12—12 of FIG. 9.

FIG. 13 is a fragmentary detailed view showing the apparatus for transferring containers from the upper to the lower horizontal delivery conveyors.

FIG. 14 is a fragmentary cross section taken along the line 14—14 of FIG. 13.

FIG. 15 is a fragmentary plan view of the apparatus shown in FIG. 13.

FIG. 16 is a cross section taken along the line 16—16 of FIG. 13.

FIG. 17 is a fragmentary plan view of the apparatus for driving the respective chains which power the respective elevators.

FIG. 18 is an end view of the device shown in FIG. 17.

FIG. 19 is a fragmentary view of a portion only of the device shown in FIG. 17, the shaft 114 being rotated through 90°.

FIG. 20 is a cross section taken along the line 20—20 of FIG. 17.

FIG. 21 is a fragmentary view of one of the chain drives shown in FIG. 18 with the control lever 137 in a different position.

FIG. 22 is a simplified electrical circuit diagram.

As best shown in FIG. 1, a refrigerated storage cabinet 25 is desirably disposed in the basement of a tavern, or the like, which has upper floor 26 which supports a bar 27 beneath which the container dispensing unit 28 is disposed. The dispensing unit 28 is connected to the cabinet 25 through one or more container conduits 29. These are preferably fabricated of flexible metal tubing, although they may be rigid if appropriate.

There is a refrigerating unit 30 mounted on the side of the storage chamber 25. As shown in FIG. 2, it is provided with an evaporator coil 33 and with a fan 34 which circulates air cooled by the evaporator 33 throughout the cabinet 25. Beverage containers within the conduits 29 and the dispenser box 28 are kept cool by blower 31 which circulates air through the conduits 29 and through the interior of the box 28, the circuit to the blower 31 being completed through the flexible return conduit 35.

Within the dispensing box 28 I provide air pervious conduit extensions comprising guide slats or straps 36 arranged in circular pattern and which ensleeve beverage containers 37 fed upwardly into the box 28 through the conduits 29. In the embodiment of the invention shown in the instant drawings, three such slat conduits and communicating flexible conduits 29 are illustrated. Accordingly, beverages of three distinct types or brands may be accommodated.

The box 28 is provided with a horizontal partition 38 to substantially close the refrigerated portion thereof

from exposure to the atmosphere when the dispensing lid 39 is opened. At one side the box 28 is provided with a stand pipe 40 which connects with the flexible return air conduit 35. The path of air flow through the conduits and box 28 is indicated by arrows 32.

Appropriate conduit slats 36 are provided for each conduit with a switch 43 in the electric circuit shown in FIG. 22. Switch 43 is normally closed but is opened under pressure of a container 37 in the dispensing position which it assumes as shown in the middle conduit in FIG. 3. When the container is removed from the dispensing box 28 through the appropriate opening 44 in the partition 38, the appropriate switch 43 will close to energize the motor 45 and start an automatic cycle of operations which will hereinafter be explained in greater detail. The partition 38 is further provided adjacent each of the dispensing openings 44 with a manual cut-off switch 46 which, as hereinafter explained, permits the operator to cut out abortive operation of any particular elevator line in the event the supply of containers therefor has become exhausted.

The refrigerated storage chamber 25 is provided with a top lid 47 through which access may be had to the interior of the chamber 25. Within the chamber, I provide apparatus for storing beverage containers 37 under refrigerated conditions and feeding such containers to the conduits 29. For each conduit 29 the apparatus within the chamber consists of an elevator 53 and sets of superimposed upper and lower horizontal conveyors 48–50. For each conduit 29 there is a single lower conveyor 48, an upper conveyor 49 directly thereover, and a second upper conveyor 50 which is at the side of upper conveyor 49. The conveyors 48–50 will ordinarily provide storage capacity for several cases of beverage containers, the first containers placed in the chamber being the first delivered to the dispenser unit 28.

By superimposing conveyors 49, 50 over lower conveyor 48, substantially the full height of the cabinet 25 can be utilized for container storage.

As best shown in FIGS. 6 and 13 conveyors 48 are powered to move in the direction of arrow 54 and conveyors 49 are powered to move in the direction of arrow 55. At the discharge end of upper conveyor 49 and the receiving end of lower conveyor 48, I provide a transfer mechanism for shifting containers 37 vertically between conveyors. As is best shown in FIG. 13, the transfer mechanism includes a vertical slat chute, one of the slats 56 being curved at 57 to guide the containers 37 thereinto. Near its bottom end, the slat chute is provided with a door 58 which is pivotally mounted at 59 and is biased by spring 60 towards constriction of the chute.

According to a cycle of operations which will be hereinafter explained, the containers 37 on horizontal upper conveyor 49 are dropped through slat chute 56 onto input end of lower horizontal conveyor 48 from whence they are conveyed horizontally to the elevators 53.

Upper conveyor 50 simply adds to the storage capacity of the device. It moves in the direction of arrow 54. Containers are delivered to conveyor 49 by the curved deflector or guide plate 173.

Details of the elevator 53 are best shown in FIGS. 9 through 12. Elevators 53 consist of upright chutes formed by slats or straps 63 cross tied together at intervals by transverse straps 64. The respective elevators 53 are aligned with openings 65 in the top portion 66 of the chamber 25 and communicate with the respective flexible conduits 29. The bottommost end portions of the slats 63 are supported directly on the floor 67 of the chamber 25 and the respective lower horizontal conveyors 48 lead into the respective elevators 53 through openings provided by terminating one of the slats 63 at 68 (FIG. 9). Cross tie members 64 adjacent end 68 of said slat 63 are provided with a bracket 69 which carries a slide block 70 in which escapement slide 73 is mounted. The escapement slide 73 carries a roller 74 and the slide and roller are biased by spring 75 to the position shown in FIG. 9 in which the roller 74 is beneath and in support relation to container 41 in the elevator chute. The roller 74 and slide 73, however, may yield on upward movement of the container 104 below container 41 in the course of elevator operation.

Alongside of each elevator 53 I provide vertical slide ways 76 within which slide blocks 77 for the respective elevator platforms 78 are vertically slidable. Each platform is made in two parts 78, 80 and is provided with a yoke 79 interconnecting the parts in bridging relation. The space 83 between platform portions 78, 80 receives the chain conveyor 48.

The platform 78 is raised and lowered under power of motor 45 by means of the crank arm 84 connected to the sprocket 85 which receives power from the drive chain 86. Crank arm 84 is pinned at 87 to the link 88 which is in turn pivotally connected at its lower end to the pin 89 which slides in an elongated slot 90 in the link 88. The pin and slot connection aforesaid provides for lost motion between the link 88 and the slide block 77, thus eliminating the need for accurate interconnection of these parts. Pin 89 is ordinarily constrained by the spring 93 to ride at the lower end of slot 90 except when slide 77 bottoms on stop abutment 82 before link 88 is vertical.

The chute for elevator 53 is provided near its lower end with a staple-shaped guide 94 having apertures through which escapement pins 95 are biased upwardly by spring 96. One end of the spring is anchored to the chute at 97 and the other end of the spring is connected at 101 to cross arm 98 which is beneath the pin 99 which laterally projects from the slide block 77. Accordingly, when the link 88 is moved upwardly by rotation of the sprocket 85 in the direction of arrow 100, downward pressure on the spring 96 is relieved and the escapement pins 95 are projected upwardly in front of container 103 on conveyor 48 to hold said container against movement into the chute.

Meanwhile, the slide block 77 carries upwardly the platform 78, 80 upon which the lowermost container 104 in the chute is disposed. The container displaces the roller 74 and slide 73 in the course of upward movement thereof and shifts the entire column of containers in the chute upwardly for a distance equal to the height of one container. As the sprocket 85 completes one revolution the slide block 77 will return to its lowermost position as shown in FIGS. 9 and 10 and when thus returned the pins 95 will be retracted to their position shown in these views whereupon conveyor 48 may advance container 103 onto the platform 78, 80. Pending retraction of the pins 95, conveyor 48 will simply slide beneath the containers resting thereon, as is conventional. The platform 78, 80 is further provided with a pair of end rods 105 against which containers seat on the platform.

A normally closed switch 106 is provided near the bottom of the elevator 53 and is held open when the platform 78, 80 is in its position shown in FIGS. 9 and 10. However, as soon as the platform moves upwardly, pressure on the switch 106 is released and it closes. When the platform returns to its FIG. 9 and 10 position, it reapplies pressure on the switch 106 to open it. The detailed functioning of the switch 106 will be explained in connection with the circuit diagram in FIG. 22.

Accordingly, for each revolution of the sprocket 85, containers are transferred in an escapement cycle from the horizontal conveyor to the vertical chute and the containers in the chute are raised a distance equal to the height of one container and the switch 106 is sequentially closed during movement of the platform from lowermost position and opened upon return of the platform to lowermost position.

I may optionally provide the sprocket 85 with a brake drum surface 107 upon which a friction brake pad 108

is biased into engagement by the compression spring **109**, the spring being coiled about the guide rod **110** mounted in a guide sleeve **111**. Accordingly, overrun of the platform is avoided by reason of the drag provided by the brake shoe **108** on the brake drum **107**.

As best shown in FIGS. 6, 17 and 18, the chains **86**, one for each of the elevator sprockets **85**, are selectively driven from shaft **114** which is provided on one end thereof with the pulley **115** about which the belt **116** is trained. Belt **116** passes over pulley **117** fixed to a jack shaft **118** having a pulley **119** connected by belt **120** to the pulley **123** on the armature shaft of motor **45**. The elements **115–123** are principally intended for speed reduction.

The shaft **114** is mounted in end bearings **125** supported on the frame elements **126** which are in turn supported on the upright posts **127** which rest on the floor **67** of the cabinet **25**. Upon the shaft **114** sprockets **128** for the respective chains **86** are loosely mounted. The sprockets are connected, however, to one revolution clutches which may selectively engage the respective sprockets **128** to the shaft **114** to transmit power selectively to one or more of the chains **86**. The one revolution clutch illustrated in the drawings has been found to be satisfactory but any conventional clutch of this type can be used in the device of the present invention.

The clutch consists of a cam **129** which is fixed to one side face of sprocket **128** and is thus anchored to rotate with sprocket **128** but is free of positive connection to the shaft **114**. Fixed to rotate with shaft, and adjacent cam **129**, is a carrier **130** for dog **131**. The dog **131** is mounted on a pintle **134** and is biased by spring **135** toward engagement with the cam **129**. At the side of spring **135** opposite pintle **134** the dog has a striker button **136** which, in the normal path of rotation thereof, will be cammed against disengagement of lever **137** when the lever is in its normal position shown in FIGS. 17, 18 and 19.

There is a lever **137** for each clutch and the respective levers **137** are pivotally mounted on pins **138** on the fixed frame member **139** and are biased by springs **140** to their position shown in FIGS. 17 through 19 in which the ends of the levers **137** opposite pins **138** from springs **140** project into the path of the striker button **136** on the dog **131**.

When the shaft **114** rotates counterclockwise as shown in FIG. 20, it will carry with it the dog **131**. However, just before dog **131** engages the shoulder **143** of cam **129**, striker button **136** of the dog **131** will engage lever **137** to lift the dog **131** against the bias of its spring **135** over the shoulder **143** to its dotted line position as shown in FIG. 20. Accordingly, the sprocket fails to become engaged with the shaft **114**.

However, if the lever **137** has been shifted to its position shown in FIG. 21 pursuant to action of the solenoid **144** which has an armature **145** connected to the lever **137** by link **146**, the lever **137** will be swung out of the path of rotation of the striker button **136** of the dog **131** and dog **131** will engage the shoulder **143** of cam **129** to lock the sprocket to the shaft for actuation of the appropriate chain **86**. Said chain **86** will be driven until the solenoid **144** is deenergized to permit spring **140** to restore the lever **137** to its position shown in FIG. 18. Thereafter continual rotation of shaft **114** will simply lift the dog **131** over the shoulder **143** of the cam **129** until the lever **137** is returned by solenoid **144** to its FIG. 21 position, pursuant to actuation of switch **43** as hereinafter described.

Actuation of any one of the three solenoids **144** will also close normally open switch **147** which is mounted on a bracket **148** upon frame member **139**. Switch **147** is normally held open by the pressure of bar **149** which is slidably mounted in the brackets **150** also mounted on frame member **139**. Spring **153** biases the bar **149** toward the right in FIG. 18 to hold the switch **147** open.

However, the bar **149** is provided with projecting pins **154** which are in the paths of oscillation of the respective levers **137**. Accordingly, when any one or more of such levers **137** is swung to its FIG. 21 position, bar **149** will be moved against the bias of its spring **153** to release pressure on switch **147** and permit it to assume its normally closed position. This completes the motor circuit in the electrical circuit diagram shown in FIG. 22.

The respective upper and lower conveyors **48**, **49**, **50** are also powered from motor **45** through shaft **114**. The shaft **114** has pulley **155** fixedly mounted thereto and about which is trained a belt **156** which is trained over the pulley **157** on shaft **158**. Shaft **158** has sprockets **159** about which the respective lower conveyor chains **48** are engaged as shown in FIGS. 7 and 8. Accordingly, as shaft **158** is driven in the direction of arrow **160** in FIG. 6 the lower conveyor chains **48** are driven toward the right or in the direction of arrow **54** in FIGS. 7 and 8.

Upper conveyor chains **50** are also driven in the direction of arrow **54**. Conveyor chains **50** pass around idler sprockets **164** supported at the left of the drawings on idler shaft **165** in turn supported on frame elements **166**. At their other ends the chains **50** pass about sprockets **167** which are fixed to shaft **168** which is driven clockwise as shown in FIG. 6 by belt **169** which passes over the pulley **170** on shaft **158**.

Containers proceeding on conveyor chains **50** in the direction of arrow **54** are turned by the curved guide rails **173** and are thereby transferred onto conveyor chains **49** which travel in the direction of arrow **55** in FIG. 7. Chains **49** are supported at the right of the drawings on sprockets **175** which idle on shaft **168**. At their opposite ends the chains **49** engage drive sprockets **176** and are driven from shaft **177** in the direction of arrow **55**. Shaft **177** has a drive sprocket **178** engaged with drive chain **179** which receives its power from sprocket **180** on the shaft **183**. This shaft also carries sprockets **184** about which the lower conveyor chains **48** are trained at their extreme left ends as shown in FIG. 8. In this manner, chains **48** drive shaft **183** and shaft **177**. Accordingly, the respective upper and lower conveyor chains **48**, **49**, **50** are all driven from the motor **45** by the mechanism just described.

As is conventional in the art, the respective conveyor chains are in impositive friction driving connection with the bottoms of containers **37** and are free to slip beneath the containers when the path of container movement is obstructed. The lift platforms of the elevators **53**, however, are in positive driving engagement with the containers therein.

The apparatus for transferring containers from the upper horizontal conveyor chain **49** to the lower horizontal conveyor chain **48** is best shown in FIGS. 13 through 16. With the apparatus at rest, a stop dog **185** which is pivotally mounted on pin **186** of bracket **187** extends into the path of the containers **37** on conveyor **49**. The dog **185** has a bell crank arm **161** provided with a spring **162** which biases the dog **185** into the path of the containers, as shown in FIG. 15. Dog **185** can be removed from the path of the containers **37** by actuation of the solenoid **188** which has an armature **189** connected to the bell crank arm **161** by the link **190**. Pursuant to energizing the solenoid **188** and removal of the stop **185** from the path of the containers **37**, conveyor **49** will advance end container **37** toward the transfer chute **56**, **57**. En route to the chute, container **37** will actuate switch **204** by camming aside its actuator arm **205**. Thereafter the container will drop bottom first through the chute and onto the input end of chain conveyor **48**. The gate **58** which constricts the bottom of the chute under bias of its spring **60** will cushion the fall of the container.

The container lands on the finger **171** of an arm **172** which is connected to the actuating arm **174** of time delay

switch 194 in the circuit which energizes solenoid 193. As shown in FIG. 22, solenoid 193 is actuated, after an appropriate time delay, to permit the container to steady, to open the gate 58 by pivoting it about its pintle 59 and against the bias of spring 60. The armature 195 of the solenoid 193 is connected by means of link 196 to a movement arm for the gate 58, as shown in FIG. 16. The container 37 then proceeds on conveyor 48 and through a throat provided by the spring arms 197, 198. Pressure of the container 37 on finger 197 opens normally closed switch 199 and pressure on the finger 198 is transmitted through the link 200 to restore the actuator 203 for switch 204 into the path of containers on conveyor 49. The switch 204 is of a conventional type which snaps into both open and closed position. Both switches 204 and 199 are closed at the beginning of the transfer cycle. From FIG. 22, it is clear that whenever the motor 45 is energized a circuit is completed through closed switch 199, 204 to solenoid to remove dog 185 from the path of container 137. As soon as one container passes the dog 185 and cams aside the switch actuator 205, the switch 204 is opened to break the circuit to the solenoid 188 and thus restore the dog 185 under bias of its spring 162 into the path of any succeeding container. Accordingly, another container cannot advance toward the transfer chute 57, 56 until switch 204 is reclosed pursuant to pressure of transferred container 37 on spring finger 198. Switch 199 is concurrently opened, however, to prevent actuation of the solenoid 188 until the transferred container 37 has passed completely through the throat and fingers 197, 198 are restored to their FIG. 16 position. Thereupon, if the motor 45 is still energized in response to demand for containers, the solenoid will again operate to transfer another container from conveyor 49 onto conveyor 48.

The operation of the device in terms of the simplified electric circuit shown in FIG. 22 will now be described. The circuit is diagrammatic only and, except for solenoids 144, shows only those components provided for control of a single delivery line. The components shown in FIG. 22 are repeated for each of the delivery lines and elevators.

Control circuit voltage is provided by power lines 206, 207. Line 207 is connected directly to one side of the motor 45 and to one side of the respective solenoids 144, 188 and 193. The other side of the motor 45 and solenoids 144, 188, 193 are supplied from line 206 through the appropriate manual cut-off switch 46 in the dispensing box and the container operated switch 43 and elevator operated switch 106 which are in parallel. Beyond parallel switches 43, 106, the circuit leads directly through line 208 to the other side of appropriate solenoid 144 and through switch 147 and line 209 to the other side of the motor and solenoids 188, 193.

The various switches 46, 43, 106, 147 may be bypassed completely by a manually operated switch 210 which may be disposed in the cabinet to permit the operator to operate the respective conveyors 48, 49, 50 without operating the elevators. This procedure is useful in loading the cabinet with beverage containers.

Assuming switch 210 to be open, all switches 46 to be closed, and all normally closed switches 43 to be open under pressure of containers in dispensing position, the operation is as follows:

When a container is removed from any dispensing position, pressure on appropriate switch 43 is relieved and permits it to close, thus completing a circuit to the appropriate solenoid 144. As hereinbefore described, actuation of the solenoid 144 will cause the appropriate lever 137 to close switch 147 to complete a circuit to the motor 145 to drive all conveyors 48, 49, 50 and also conditions appropriate clutch 129, 131 to drive the appropriate elevator sprocket 85. A circuit is also completed through normally closed switches 199, 204 to appropriate solenoid 188 which withdraws the dog 185 from the path of containers on the appropriate conveyor 49 as shown in FIG. 15. The appropriate elevator will lift the line of containers in the appropriate conduit 29 to replace the dispensed container. Pressure of the new container arriving at dispensing position will open switch 43. However, parallel switch 106 is closed on elevation of the lift platform 78, thereby holding the circuit for one complete cycle of elevator operation. The containers are transferred from upper to lower conveyors in FIGS. 13 through 16 as hereinbefore described. When the platform of the elevator drops to bottommost position, it will accept a new bottle and at the same time will open switch 106, thus to break the circuit to solenoid 144 and also break the circuit to the motor 45. This completes the cycle and the apparatus will stop operating until another container from the same or different dispensing position in box 28 is removed. If the supply of containers in cabinet 25 for any dispensing position is exhausted, abortive cycling of the apparatus can be circumvented by opening appropriate switch 46. This does not interfere with normal cycling of the apparatus feeding other dispensing positions.

I claim:

1. The combination in a building having vertically spaced floors, the space between said floors being unrefrigerated, of a refrigerated container storage cabinet on one of said floors, a refrigerated container dispensing unit on another of said floors, a refrigerated container conduit extending through the unrefrigerated space between said floors and connecting said cabinet and dispensing unit and means automatically responsive to dispensing a container from said unit for advancing containers through said conduit to replace the dispensed container with a fresh container, said means comprising vertically spaced upper and lower horizontal storage conveyors, transfer means between the lowermost conveyor and said conduit and means for transferring containers vertically from the upper to the lower horizontal conveyor.

2. A device of the character described having multiple container conveyor lines and including a refrigerated storage cabinet having a plurality of storage container conveyors in impositive driving engagement with said containers in each line, a plurality of transfer conduits, elevators in positive driving engagement with said containers interconnecting said conveyors and conduits, and a dispenser unit to which said elevators feed containers through said conduits, of control means for automatically supplying containers to said dispenser unit in response to demand for containers in one or another of said lines and comprising apparatus for actuating all of said storage conveyors concurrently regardless of the line to which the demand relates and for actuating only the elevator in the line to which the demand relates, said apparatus including an electric circuit, a motor in said circuit, container actuated switches in said dispensing unit adjacent the respective lines whereby removal of one of said containers in one of said lines will actuate the appropriate switch to close a circuit to the motor to concurrently actuate all storage conveyors and to selectively actuate only the elevator in said line.

3. The device of claim 2 in further combination with another switch parallel with the container actuated switch, said second switch being actuated by said elevator to close said switch prior to the opening of the first switch by replacement of the dispensed container and to maintain said other switch closed until said elevator completes its cycle whereby to accept another container and condition the apparatus for a renewed cycle of operation.

4. A device for automatically supplying from a refrigerated storage cabinet to a dispensing unit dissimilar containers arranged in separate supply lines, each such line comprising a storage conveyor in the cabinet in impositive drive connection with said containers, an elevator in positive drive connection with said containers and a conduit between said elevator and said dispensing unit, said unit having a plurality of dispensing stations corre-

sponding to the respective delivery lines, a motor, a control circuit including means for concurrently actuating all of said storage conveyors when said motor is actuated and means for selectively actuating said elevators and comprising a plurality of switches each disposed adjacent a dispensing station in the dispensing unit and actuated by dispensing a container from said station, a solenoid in series with each of said switches and respectively actuated thereby and solenoid actuated drive means for each elevator.

5. The device of claim 4 in further combination with an additional storage conveyor for each storage conveyor in said cabinet and means for transferring containers from said additional conveyors to the storage conveyors first mentioned, said means including solenoid actuating escapement mechanism in circuit with said switch.

6. The combination in a building having vertically spaced floors, of a refrigerated container storage cabinet on the lower of said floors, a container dispensing unit on the upper of said floors, a container conduit connecting said cabinet and dispensing unit and means automatically responsive to dispensing a container from said unit for advancing containers through said conduit to replace the dispensed container with a fresh container, said means comprising a horizontal storage conveyor and a vertical elevator in said cabinet, said elevator being aligned with said conduit and having means for accepting containers from the storage conveyor and lifting them into the conduit, said elevator comprising a chute, escapement means for concurrently admitting a container from said storage conveyor into said chute and lifting a previously admitted container into said conduit, said means including a lift platform onto which said containers are admitted, means for lifting said platform, means for blocking containers on said conveyor while the platform is lifted and means to retain lifted containers against lowering with said platform, in further combination with a second horizontal container storage conveyor spaced vertically from the horizontal container storage conveyor first mentioned, said conveyors having respective discharge and input ends vertically spaced, transfer means located adjacent said ends, escapement means for releasing a container from the discharge end of the upper conveyor and transferring said container by gravity to the input end of the lowermost conveyor, means for locking said escapement means against reactuation until said container has cleared the input end of the lowermost conveyor and means for unlocking said escapement means when said container has cleared the input end of said lowermost conveyor.

References Cited in the file of this patent

UNITED STATES PATENTS

746,248	Baggaley	Dec. 8, 1903
1,388,668	Schumacher	Aug. 23, 1921
1,403,599	Goudeau	Jan. 17, 1922
1,609,802	Ekstrom et al.	Dec. 7, 1926
1,718,102	Bauer	June 18, 1929
2,250,086	Voigtritter	July 22, 1941
2,253,447	Stanford	Aug. 19, 1941
2,560,255	Shirley	July 10, 1951
2,645,092	Ridnour	July 14, 1953
2,674,100	Stonestreet	Apr. 6, 1954
2,799,384	Rutherford	July 16, 1957

FOREIGN PATENTS

131,728	Sweden	May 15, 1951
355,365	France	Aug. 26, 1905
659,226	Great Britain	Oct. 17, 1951