

Feb. 25, 1941.

R. M. COPE

2,233,379

BOTTLE DISPENSING MACHINE

Filed April 19, 1939

4 Sheets-Sheet 1

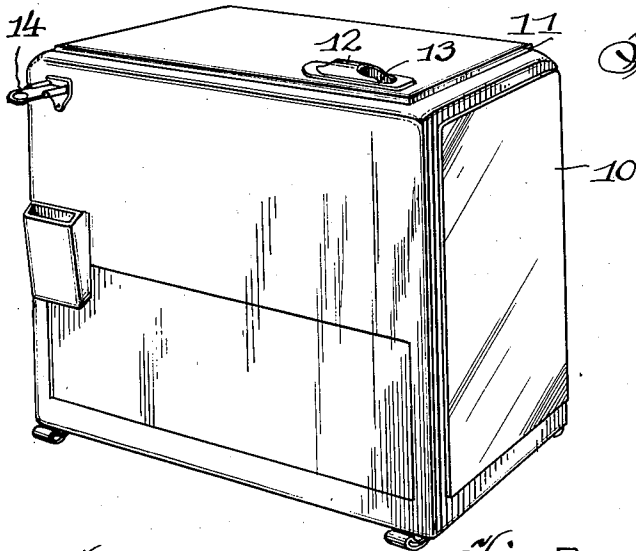


Fig. 1

Fig. 6

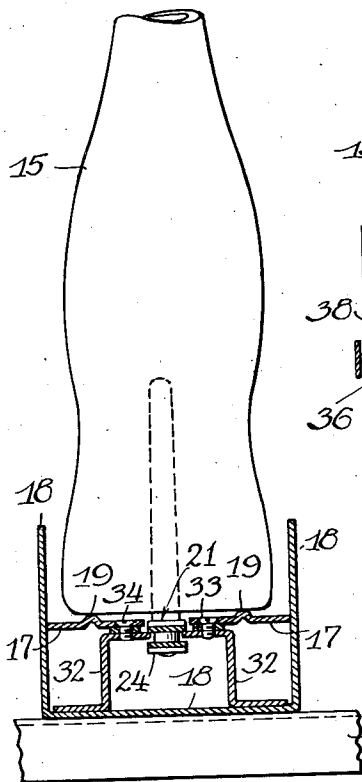


Fig. 7

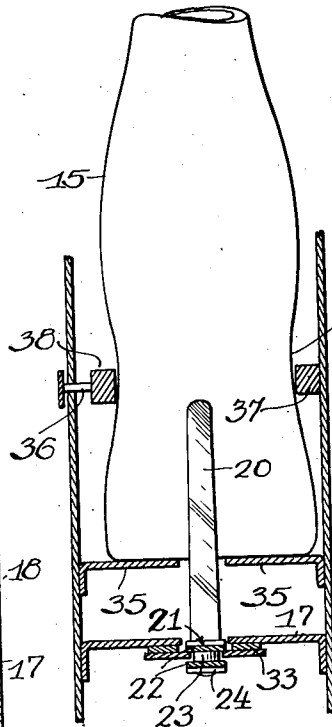
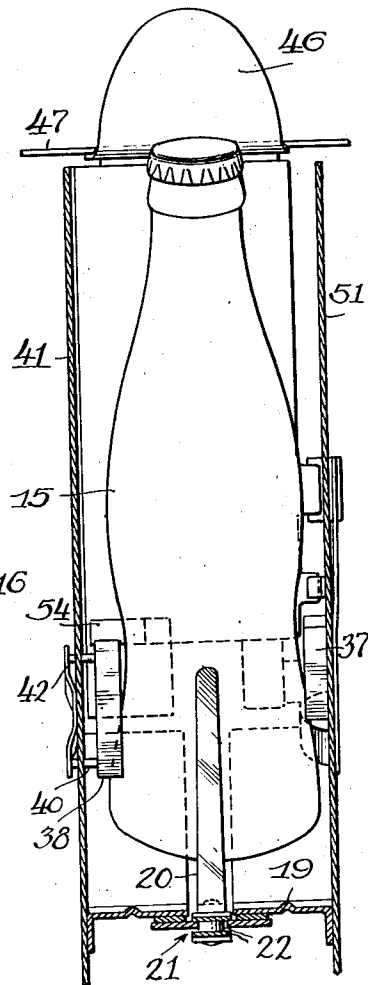


Fig. 8



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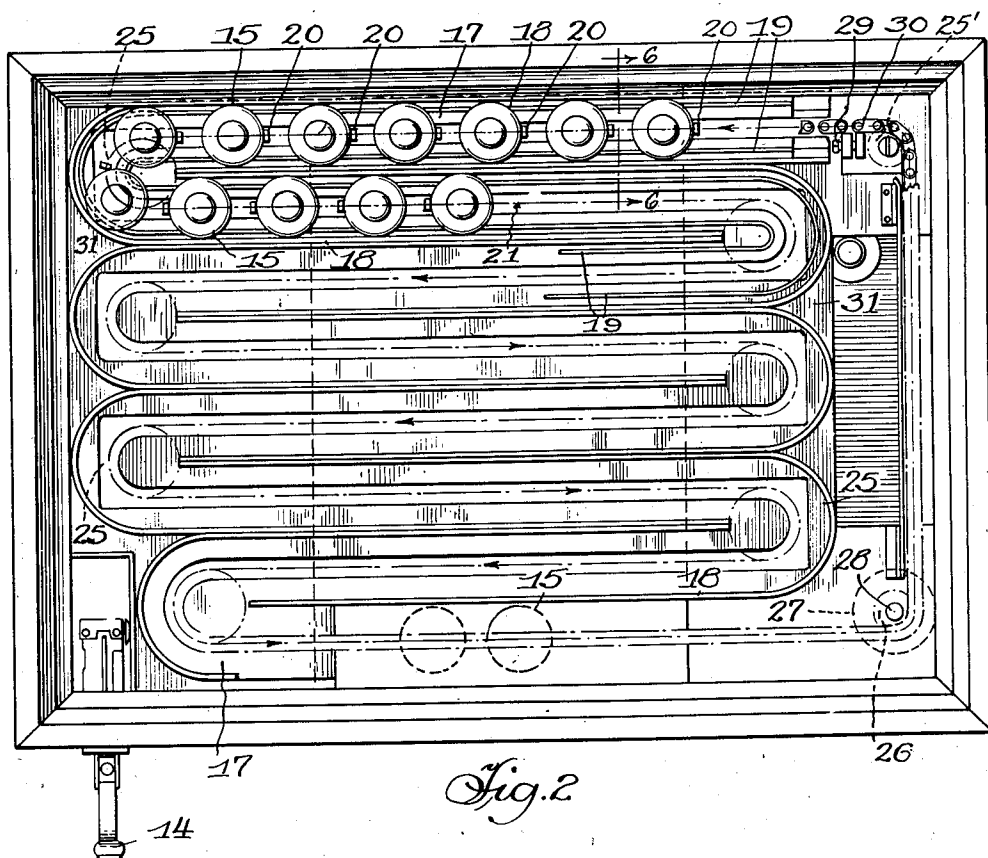
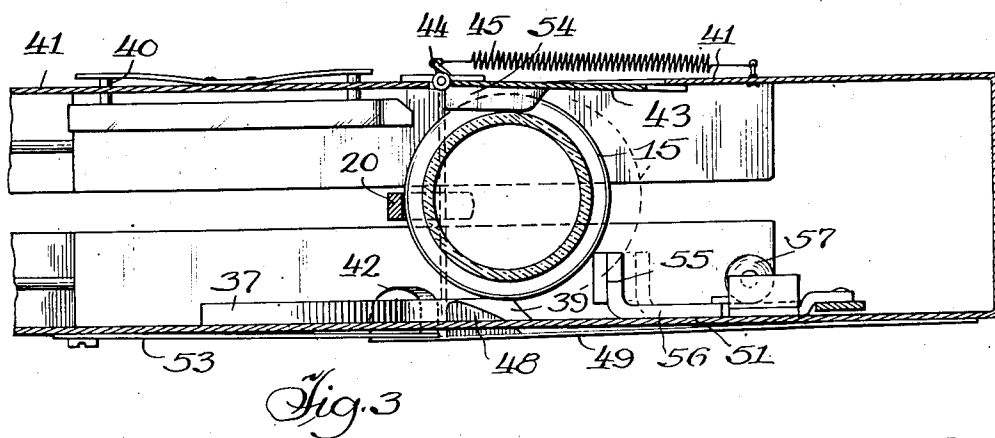
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4 Sheets-Sheet 2



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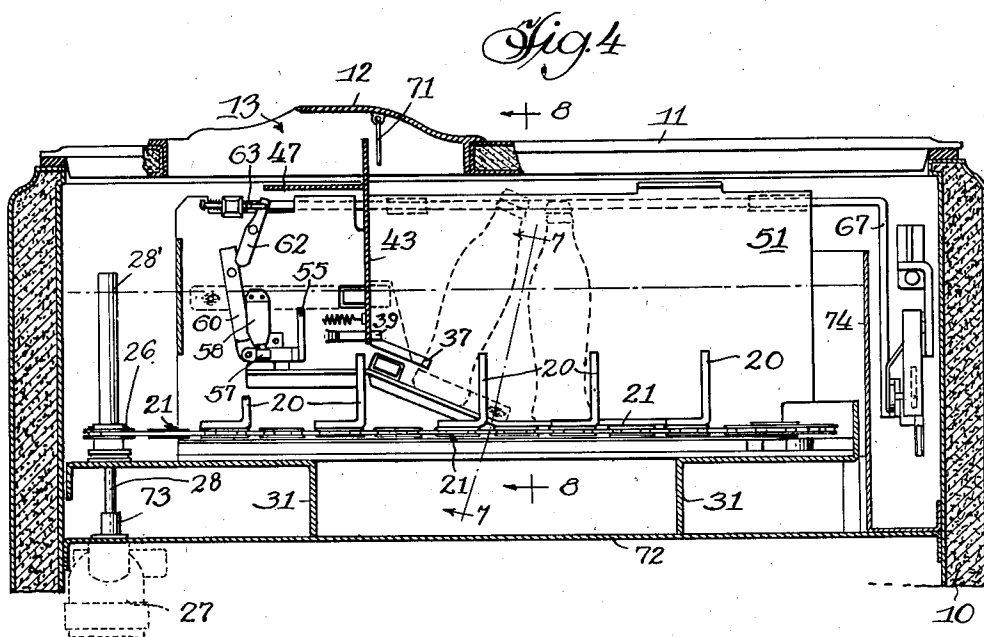
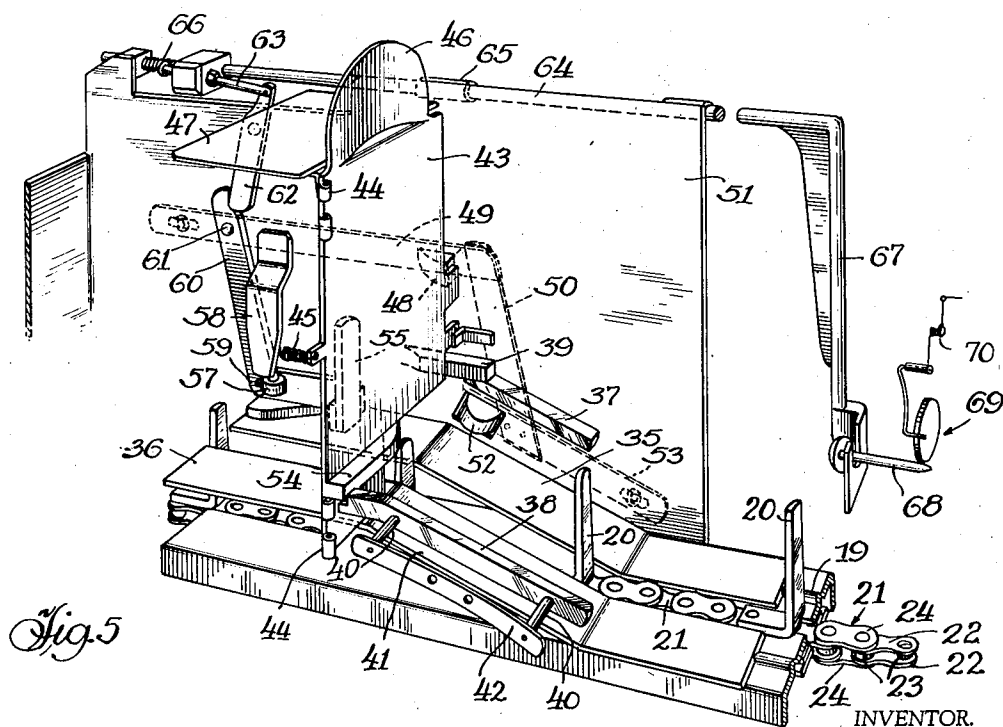
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BOTTLE DISPENSING MACHINE

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Fig. 9

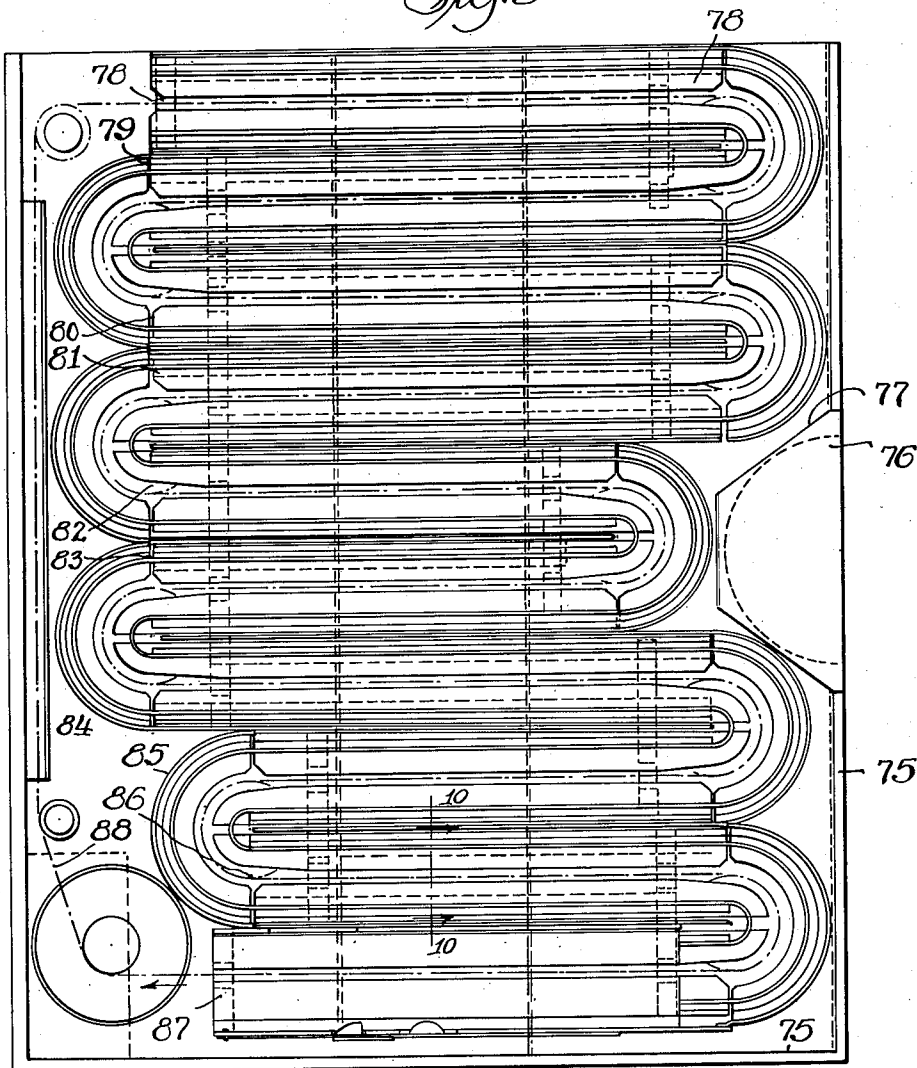
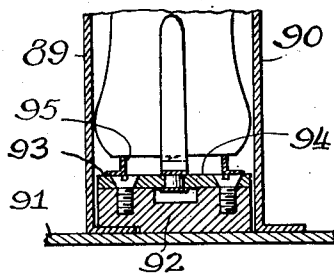


Fig. 10



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UNITED STATES PATENT OFFICE

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BOTTLE DISPENSING MACHINE

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7 Claims. (Cl. 312—36)

This invention relates to improvements in bottle dispensing machines, in which the bottles, containing beverages, are cooled in a closed receptacle or compartment and are advanced by a step by step movement by a coin controlled mechanism, to a point where they are accessible and may be removed from the compartment, by hand.

One object of the invention is to provide equipment of this character in which only a small amount of power is required to advance the bottles.

Another object is to provide ample storage space for the bottles by placing them vertically in a refrigerating compartment on a track which doubles back and forth on itself in substantially parallel spans, whereby a row of bottles of considerable length may be stored in a compartment of moderate size.

A further object is to provide a bottle dispensing machine of this type in which the bottles are delivered one at a time to a chamber where they are readily accessible for removal by hand.

Another object is to provide in such equipment a chamber having an automatically opened door provided with safety devices so that none of the bottles other than the one intended to be delivered, is accessible to the person operating the device by dropping a coin in the slot.

An additional object is to provide the track with an elevated portion leading into said chamber, whereby the bottles are raised, as they enter the chamber one at a time, so that the top of each bottle projects through an opening in the compartment, enabling it to be grasped readily and lifted from said compartment.

A further object is to provide devices to prevent the bottles from tipping over as they are riding up an inclined portion of the track to the elevated point of delivery.

Another object is to provide a dispensing machine having an endless conveyor to advance the bottles on the track with a step by step movement.

An additional object is to provide guiding means for a chain conveyor, to insure movement thereof in a horizontal plane, without sagging or without substantial tilting of the individual links.

Another object is to provide a machine in which the bottles slide in a channel, being guided at the sides and resting on rails to reduce friction, with the conveyor chain mounted below the rails and having projecting arms at intervals, one to engage each bottle and advance the same on the rails.

An additional object is to provide means for shutting off the machine by a pull-out bar connected to a standard coin chute in such manner

as to retain the coin until the bottle reaches the desired point of delivery, at which time the bottle moves said bar to drop the coin and stop the motor which actuates the conveyor.

Other objects and advantages will be apparent from the description which follows.

In the accompanying drawings I have illustrated a commercial embodiment of the invention which will serve to illustrate the novel features. Said invention may, however, be embodied in various other forms.

Fig. 1 is a perspective view of a refrigerator containing the mechanism for moving the bottles to the delivery point;

Fig. 2 is a top plan view thereof with the cover removed;

Fig. 3 is an enlarged, sectional view taken on a horizontal plane through the delivery chamber;

Fig. 4 is a sectional elevation through said chamber and the adjacent part of the cabinet;

Fig. 5 is a perspective view of the parts shown in Fig. 4;

Fig. 6 is an incomplete section on the line 6, 6 of Fig. 2;

Fig. 7 is an incomplete section in the inclined plane shown by the line 7, 7 of Fig. 4;

Fig. 8 is a vertical section on the line 8, 8 of Fig. 4, showing the same bottle in inclined position;

Fig. 9 shows a modified form of conveyor; and Fig. 10 is a section on the line 10, 10, of Fig. 9.

The device as a whole is shown in perspective in Fig. 1 and comprises a cabinet 10 having a removable or hinged top 11 with an elevated hood 12 and an opening 13 through which one bottle at a time may be lifted after placing a coin on the slide and pushing in the handle 14. Every time that the coin controlled device is actuated, a motor operates to advance the bottles with a step by step motion, causing the top of one of them to appear at the opening 13, whereby it may be lifted out by hand.

In the drawings the bottles are indicated by 15. Bottles as used in a dispensing machine of this character usually contain beverages and may be of any suitable shape. Certain parts of the mechanism are adapted for dispensing containers of other kinds and shapes, other than bottles, as for example tin cans or other containers of cylindrical or special shape. The present mechanism, however, is designed particularly to dispense Coca Cola bottles, i. e. bottles shaped as shown in Figs. 6, 7 and 8, in which the bottles are of reduced diameter at the zone 16 so that

the bottle flares outwardly both above and below this intermediate zone.

In filling the container with the bottles to be cooled, said bot'tles are placed vertically on a track or runway 17 comprising part of a channel 18 having side flanges. The false bottom or partition 17 of the channel, as shown in Fig. 6, is not uninterrupted but has a slot in it. In other words, it is formed of the two horizontal shelves or ledges which comprise the false bottom 17, made preferably of metal and spaced apart to provide the slot. These ledges each have a ridge or track 19 thereon which may be struck up from the metal or may comprise a separate strip of metal. The bottles rest on these elevated ridges and thus may be slid along the horizontal track very readily, with little friction. Each bottle is adapted to be engaged by a vertical arm or pusher 20 which is mounted on the conveyor chain indicated as a whole by 21. Said chain comprises alternate pairs of spaced links 22 held together by the usual rivets each surrounded by a roller 23. The remaining alternate links comprise the usual pairs of metal strips 24 but spaced farther apart than the links 22. This chain is shown in perspective in Fig. 5 and in section in Figs. 6, 7 and 8 and is of standard construction. The diameter of the rollers 23, it will be noted, is less than the width of the links 22 and 24. Said chain, which is an endless chain, is supported on a series of idler sprocket wheels 25, including an adjustable sprocket 25' and a driving sprocket wheel 26, all shown in Fig. 2, the sprocket wheels being mounted to rotate in a horizontal plane and so positioned that the chain travels horizontally back and forth in spans which are substantially parallel to each other and which underlie the slot in the track or false bottom of the channel 18, which channel also doubles back and forth on itself to parallel the chain, as shown in Fig. 2. Said chain is driven by a suitable motor 27 of conventional design, (Fig. 4) having a switch for starting and stopping the same, which is actuated by any suitable coin controlled mechanism. The motor rotates the vertical shaft 28, the upper part of which is surrounded by a tube 28' which turns with it and on which the sprocket wheel 26 is mounted. The tension of the chain may be adjusted by adjusting the position of the sprocket 25', by means of a suitable adjusting screw 29 which moves the support 30 in which said sprocket is mounted, in a direction to lengthen or shorten the first of the horizontal spans, without disturbing its alignment or registration with the track above it. The channel 18 and the sprockets 25, 26, are mounted on a base 31, having the form of an inverted channel.

One of the features of the invention is the provision of means for supporting the chain between the sprocket wheels to prevent any sagging or lateral movement thereof and to make feasible the use of the pusher arms 20. This construction permits the bottles to be lowered from above onto the track instead of hanging the same from a chain above said bottles, which latter arrangement interferes with or renders less simple the filling of the refrigerating chamber with the bottles. The means for supporting and guiding the chain to provide an easy moving but substantially rigid conveying unit, will now be described.

The track or channel member is, in effect, a double bottom channel having a horizontal base 18 as shown in Fig. 6 with the ledges 17 spaced above it. A second pair of longitudinal flanges 75 is provided beneath the flanges 17, which flanges

may be conveniently provided by means of 2 bars 32 secured to the base, and having their upper ends spaced apart to form a slot of less width than the slot between the ledges 17. These horizontal upper flanges are spaced from the ledges 17 by means of metal spacers 33 secured thereto and to the ledges 17 in any suitable manner, as for example by small screws 34 or by welding. The endless chain rides in the narrower of the two slots, being supported on the upper flanges 10 of the Z bars, the width of the links 22 being greater than the width of the lower of the two slots. The rollers 23 minimize friction with the side walls of said slot.

The pusher arms 20, as shown in Figs. 5 and 6, 15 are secured to certain of the links of said chain but when said arms bear against the bottles to advance then along the track, the tendency is to rock the links about a horizontal axis thus tending to cramp the chain, except as it is constrained to follow the predetermined path defined by the guide bars formed by the upper flanges of said Z bars. Thus the links of the chain are maintained in definite horizontal alignment, forming in effect a rigid member. Said 25 guide bars also prevent the span of the chain between two sprocket wheels from sagging and hence from approaching the sprocket wheels on an upward incline which might cause them to climb the sprocket teeth and jam.

With the arrangement described, the weight of the bottles is not carried by the chain but is carried independently by the small rails 19, leaving the chain to run freely and act through its vertical arms as a pusher only.

As shown in Fig. 2 the bottles travel back and forth along the channel member as a guide, for a substantial distance, as compared with the area of the chamber, thus allowing ample time for cooling purposes. Toward the end of the runway and approaching the delivery station, there is provided an upwardly inclined track 35, as shown in Figs. 4 and 5, composed of spaced strips of metal, which, in effect, are continuations of the metal ledges 17 and which inclined strips terminate in horizontal extensions 36. On opposite sides of the inclined runway are guide bars 37 and 38, the former having a horizontal extension 39 and the latter being yieldingly mounted on pins 40 which pass through openings in the adjacent wall 41 defining the exit chamber. Said pins are normally pressed inwardly by a spring 42 secured to said wall. As shown in Figs. 7 and 8, the guide bars 37 and 38 yieldingly engage the bottle at the point of least diameter and thus prevent it from tipping over backwards as it rides up the incline, as shown for example in dotted lines in Fig. 4. The pusher arm 20, immediately behind each bottle, also aids in preventing backward tipping of the bottle. Said arms are long enough to engage the bottles at a point at least as high as the zone of reduced diameter 16, as shown in Fig. 4. They are also long enough to continue to advance the bottle after it reaches the highest point on the incline and in fact said bottles are advanced into said chamber along the horizontal portions 36 of the track.

The delivery chamber normally is empty and has a metal door 43 provided with vertical hinges 44 whereby it may be pushed open by one of the bottles riding up the incline, said door having a suitable spring 45 which normally maintains it in closed position. Said door has preferably an upward extension or baffle 46 and 75

a horizontal baffle wall 47 as shown in Fig. 5, the latter serving to render the compartment inaccessible through the opening above it, except when the door swings open to the position shown in Fig. 3. Said door is normally held in closed position by a bevelled latch 48 mounted on a flat spring 49 which engages a downward extension 50 at one end and is adjustably secured at the other end to the outer wall 51 of the compartment. To permit the bottles to automatically unlatch the door, a rounded protuberance 52 is mounted on one end of a flat spring 53, the other end of which is also adjustably mounted on said wall 51 by means of a screw passing through a slot in the other end of said spring, as shown in Figs. 3 and 5. As one of the bottles near the top of the incline, as shown in dotted lines in Fig. 4, it presses aside the protuberance 52, causing the flat spring 53 to press outwardly on the upward extension 50 of the other flat spring 49, and thus withdraw the latch 48 so that the bottle, as it continues its upward travel, may push open the door 43.

The bottle does not engage the door directly but engages a horizontal rail 54 near the bottom thereof and pushes the door open to the approximate position shown in Fig. 3. Said rail serves to keep the bottle against or near the horizontal rail 39 on the opposite side and thus compels it to advance in a straight line. This insures that said bottle will engage the yielding stop 55 which is mounted on an arm 56, sliding under the roller 57 mounted on the bracket 58. Said arm 56 is pivoted at 59 to a depending link 60, pivoted at 61 and arranged so that its upper end, when it moves in a direction opposite to the advance of the bottles, will push rearwardly the lower end of the pivoted link 62 and cause the upper end to push forwardly on the rod 63 and thus move forwardly a coin controlling rod 64 which is mounted in a sleeve 65, all as shown in Fig. 5.

The forward movement of said rod 64 is opposed by the spring 66 but the rear end 67 of said rod which extends downwardly, withdraws the pin 68 from the coin 69 which has previously been deposited in the machine, permitting the latter to drop. Thus the starting switch 70, shown diagrammatically in this figure is opened to stop the motor and to stop the movement of the conveyer.

When the door is open, the horizontal baffle 47 is swung to one side and as the bottle has been elevated a predetermined amount in reaching the delivery station, its top may be caused to appear through the opening in the cover, where it may readily be grasped and lifted from the compartment. The door 43 thereupon swings shut immediately, latches automatically and the stop member 55 is returned to the normal position in which it is shown in Fig. 3 and the pin 68 is projected sufficiently to arrest the next coin dropped into the machine so that said coin will effect the closing of the switch and start the motor. In the meantime, it is impossible to insert the hand in the delivery compartment and take out another bottle because of the obstruction provided by the closed door. Furthermore, the inclined guides 37 and 38, which fit the narrow part of the bottle, would prevent lifting the bottle upwardly from the inclined runway even if the bottles on said runway were accessible from above. The further function of said hinged door is to prevent a free circulation of air into the cooling chamber with the resulting loss of refrigeration. A depending baffle 71 or baf-

fies may also be mounted adjacent the hinged door as a further obstruction to the free exit of cold air, as well as serving to limit the size of the opening to prevent unauthorized meddling with the apparatus.

The reciprocable bar 64 is related to the coin chute in such a way that a standard coin chute may be used. This device, in conjunction with the hinged door 43, is very simple and avoids the necessity of any complicated timing device and also insures dependable operation of the machine.

The refrigerant may, of course, be of any desired type. It may circulate in closed coils installed in the cabinet or it may be used to cool water in which the bottles are nearly immersed as they rest on the runway. The refrigerating compartment has a bottle partition 72, providing a storage space in the lower part of the box in which the motor is housed. Fig. 4 shows the inverted channel members 31 on opposite sides of the refrigerating compartment, which members serve as the base on which the entire mechanism, including the sprockets, is mounted. The driving shaft 28 passes through the wall of the channel 31, shown at the left hand side of said figure, being protected against leakage of the refrigerant by a suitable packing device 73. The coin mechanism is shut off from the refrigerating compartment by an additional wall 74, also shown in Fig. 4.

In the form of apparatus thus far described, water is used in the refrigerating compartment, of a depth equal to about two-thirds of the height of the bottles. Said water may be cooled by any suitable means.

In order to adapt the conveying mechanism to a refrigerating container for Coca Cola bottles of a well known type now on the market, I have provided a slightly modified arrangement of the conveyer lengths, as shown in Fig. 9. The box or container is indicated by 75 and has a standard, vertical water cooling coil 76 built into the same and enclosed in part by a casing 77 through which the water to be cooled may circulate to contact with the cooling coil. The individual back and forth spans of the conveyer 78-87 inclusive, are so arranged as to be fitted into the outer casing and provide sufficient clearance to avoid the coils in the housing 77. For this purpose the spans 82 and 83 are a little shorter than some of the other spans, as will be noted. The conveyer chain 88 is shown also in this figure.

The runway or track shown in Fig. 10 is also a modification of the track shown in the form of invention first described. The channel member comprises a pair of angle irons 89, 90, mounted on a base 91. A filler member 92 is positioned between the vertical walls 89, 90, and has the narrow plates 93, 94 secured thereto, as for example by means of screws, said plates being spaced so as to provide a slot as before. The filler member has a slot in its upper face, as shown, and the conveyer chain operates in the slot between said plates 93, 94, as will be understood. Small angle irons 95 provide the rails on which the bottles slide. The bottles are advanced with a step by step movement as in the case of the mechanism first described. The conveyer and track construction just described is somewhat simpler and certain parts are more readily accessible for installation and removal than in the channel with the false bottom, as previously described.

This modified form of conveyer has the ad-

vantage, previously mentioned, that it can be mounted in the standard Coca Cola box without any change in the latter, other than to provide a special top with an opening therein such as shown in Fig. 1.

The design and construction of the track and of the conveyor chain, in either form of the invention, makes it possible to operate the device with a fractional horse power motor, whereby the operation is very efficient. Also, the compartment is readily filled with bottles after removing the top, as said bottles are simply lowered into the compartment so as to rest in the channel and fill the same more or less completely from one end to the other. If the runway is not entirely filled with bottles, i. e. if there are not as many bottles as there are upright pusher arms projecting up through the slot, and a coin is dropped by the slide 14, the machine will operate until a bottle is delivered at the exit point, after which the insertion of another coin will cause the delivery of another bottle to the exit point regardless of whether the two bottles were initially traveling one immediately behind the other or whether there was a gap or several unfilled spaces between said bottles.

While I have shown and described certain embodiments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims.

I claim:

1. In a bottle dispensing machine, a substantially horizontal runway on which the bottles may slide in an upright position, said runway comprising rails spaced apart less than the width of a bottle, a support for a chain between said rails consisting of horizontal flanges mounted to provide a slot, said runway curving back and forth in an elongated path to provide a large storage capacity in a relatively small area, a conveyor chain, horizontal sprockets on which said chain is mounted to move in a path adjacent said elongated runway path, said chain having horizontal upper and lower links connected by vertical pins, said upper links sliding along said horizontal flanges to prevent sagging of said chain and said vertical pins being confined in said slot against lateral movement, and pusher arms secured to said chain at intervals and extending into said runway path, whereby each bottle may be engaged by one of said arms and advanced on said runway.

2. In a bottle dispensing machine, a substantially horizontal runway on which the bottles rest and may slide, a conveyor chain, means confining the movement of said chain to a path substantially parallel to said runway, pusher arms secured to said chain in spaced relation and arranged to engage said bottles, to advance them on said runway, a yielding stop positioned to be engaged by said bottles, one at a time, a motor for operating said conveyor, a coin controlled switch for starting and stopping said motor, to move all of said bottles with a step by step movement, and means actuated by said stop and cooperating with said switch to determine the period of operation thereof.

3. In a device of the class described, a runway having a longitudinal slot therein, a conveyor chain having links and connecting pins, a roller on each pin, certain of said links being wider than said slot, overlying the same, and supported

by the spaced walls forming said slot, the rollers on said pins being of less diameter than the width of said slot and traveling therein to define the path of movement of said chain, and projections on said chain to engage and move articles along said runway.

4. A bottle dispensing machine, comprising a cabinet having a delivery opening in the top, a substantially horizontal runway on which the bottles may slide, a conveyor chain, means for supporting said chain and confining the movement of said chain to a path substantially parallel to said runway, pusher arms secured to said chain in spaced relation and arranged to engage said bottles individually, to advance them on said runway, and an upwardly extending delivery section in said horizontal runway terminating beneath said opening and up which said bottles are pushed by said arms, to render them accessible.

5. In a bottle cooling and dispensing machine, a refrigerating cabinet with an apertured top and having a horizontal runway therein on which the bottles may slide in an upright position, said runway curving back and forth to provide an elongated path of travel and a large storage capacity, in a relatively small area, a conveyor chain supported by part of said runway, horizontal sprockets on which said chain is mounted to move in a horizontal path adjacent said closed runway path, pusher arms secured to said chain at intervals and extending into said runway path substantially above the same whereby each bottle may be engaged by one of said arms and advanced on said runway, and an upwardly extending, inclined delivery section in said runway up which said bottles are pushed by said arms one at a time, said delivery section being located beneath the aperture in said top whereby each of said bottles is rendered accessible in turn and may be lifted from said cabinet.

6. In a machine for dispensing beverages in bottles which have an intermediate zone of reduced diameter, an inclined track, a conveyor having upwardly extending arms to engage said bottles at said intermediate zone and move them up said inclined track to a delivery station, and a pair of parallel guide members on opposite sides of said inclined track and substantially parallel thereto, one of said guide members being yieldingly mounted and spaced from the other member a distance sufficient to cause said members to frictionally engage said reduced diameter zone of said bottles and prevent them from tipping over backward, as they ascend said inclined track.

7. In a device of the class described, a conveyor for bottles comprising a supporting base, a pair of upwardly extending guides thereon spaced apart slightly in excess of the width of a bottle to guide the same, a pair of rails between said guides to support said bottles whereby they may be moved with little friction, a pair of spaced apart flanges below the level of said rails, and a conveyor chain having upper and lower link members, vertical pins between the same and rollers on said pins, said upper link members being slidable along said flanges with said rollers between the same to reduce friction, and upwardly extending arms secured to said chain at spaced intervals to engage the bottles, whereby the links of said chain are prevented from tilting about a horizontal axis when the upper parts thereof engage said bottles.