

March 25, 1941.

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2,236,100

CONVEYER FOR VENDING MACHINES

Filed March 31, 1938

3 Sheets-Sheet 1

Fig. 1

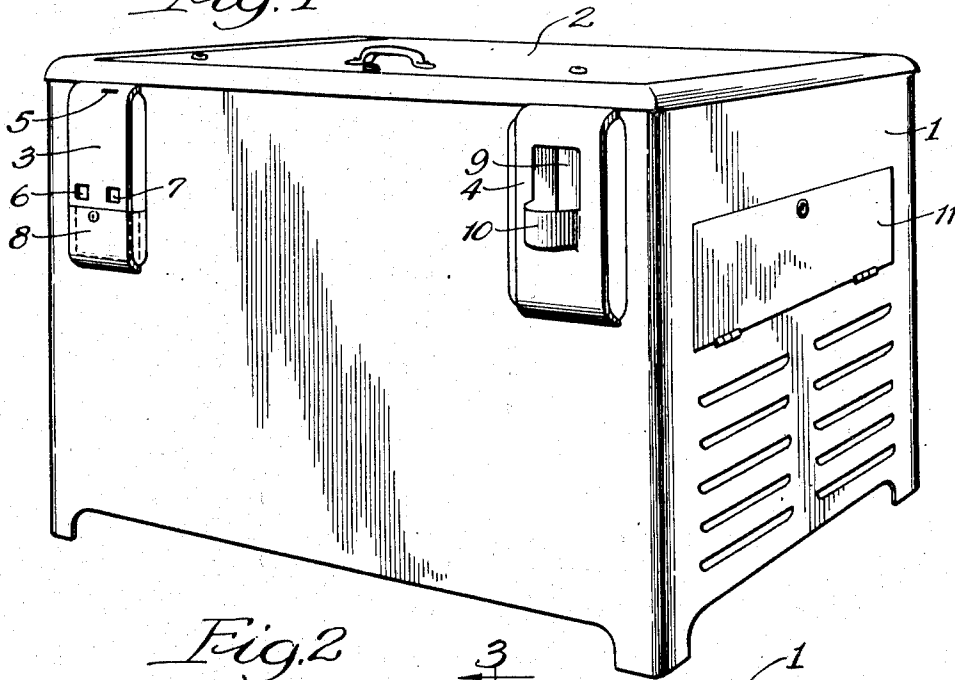
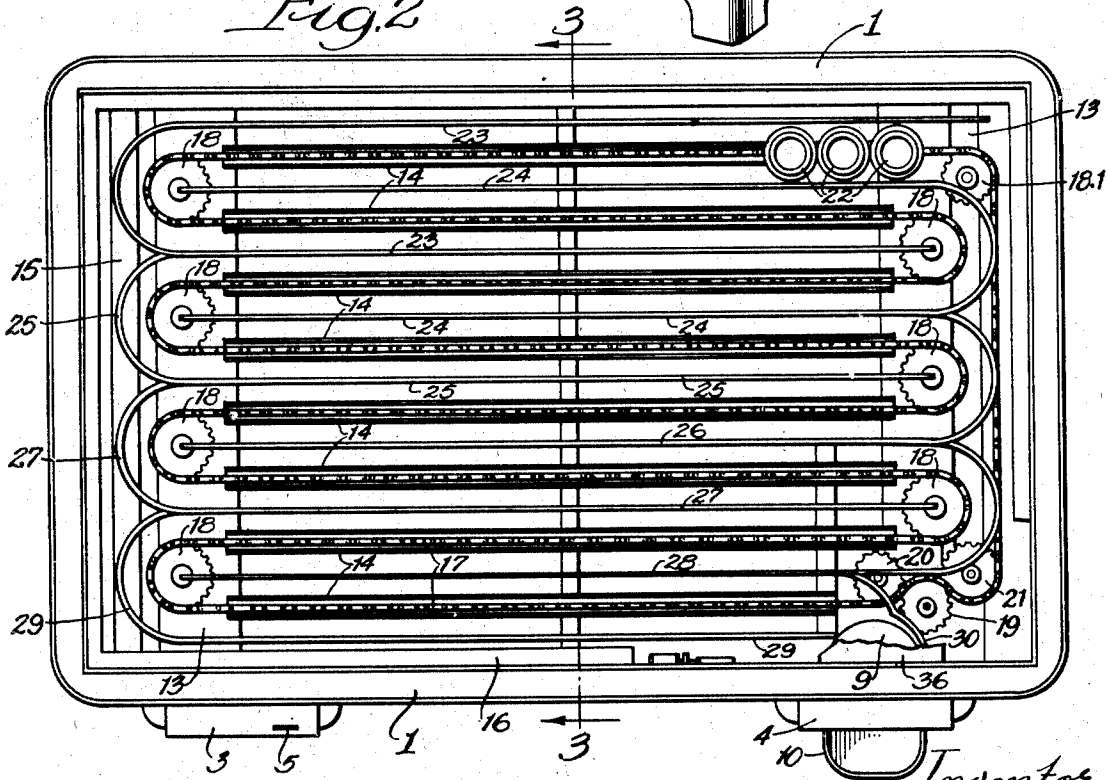


Fig. 2



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Fig. 3.

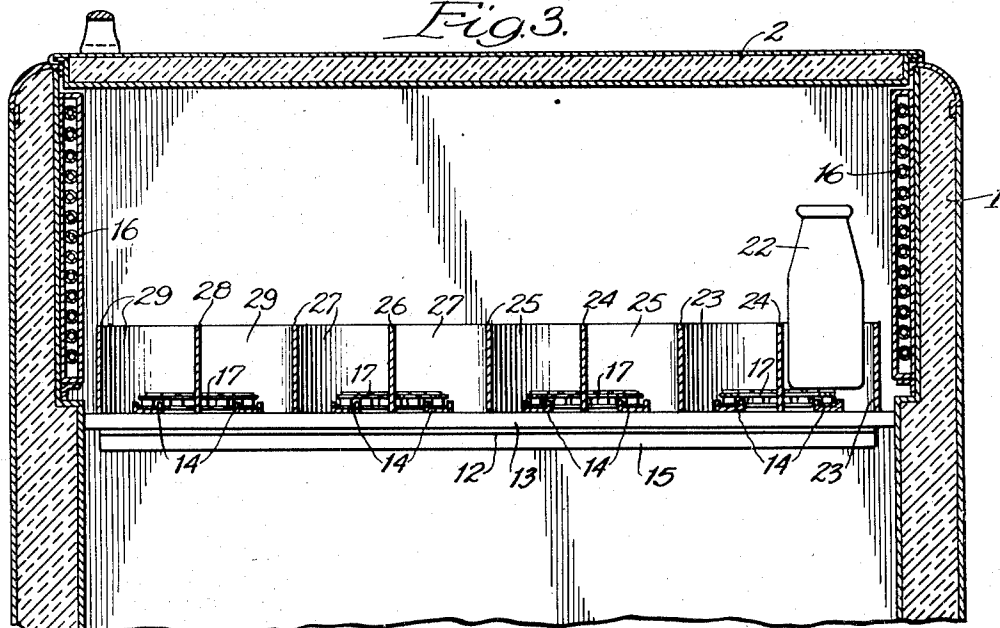
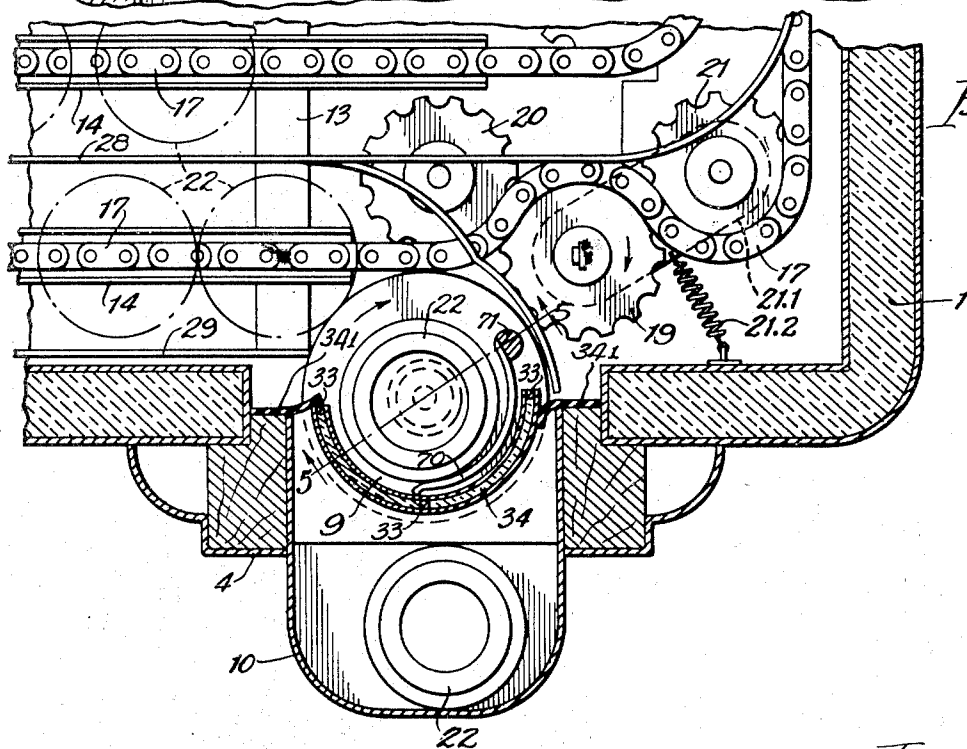


Fig. 4



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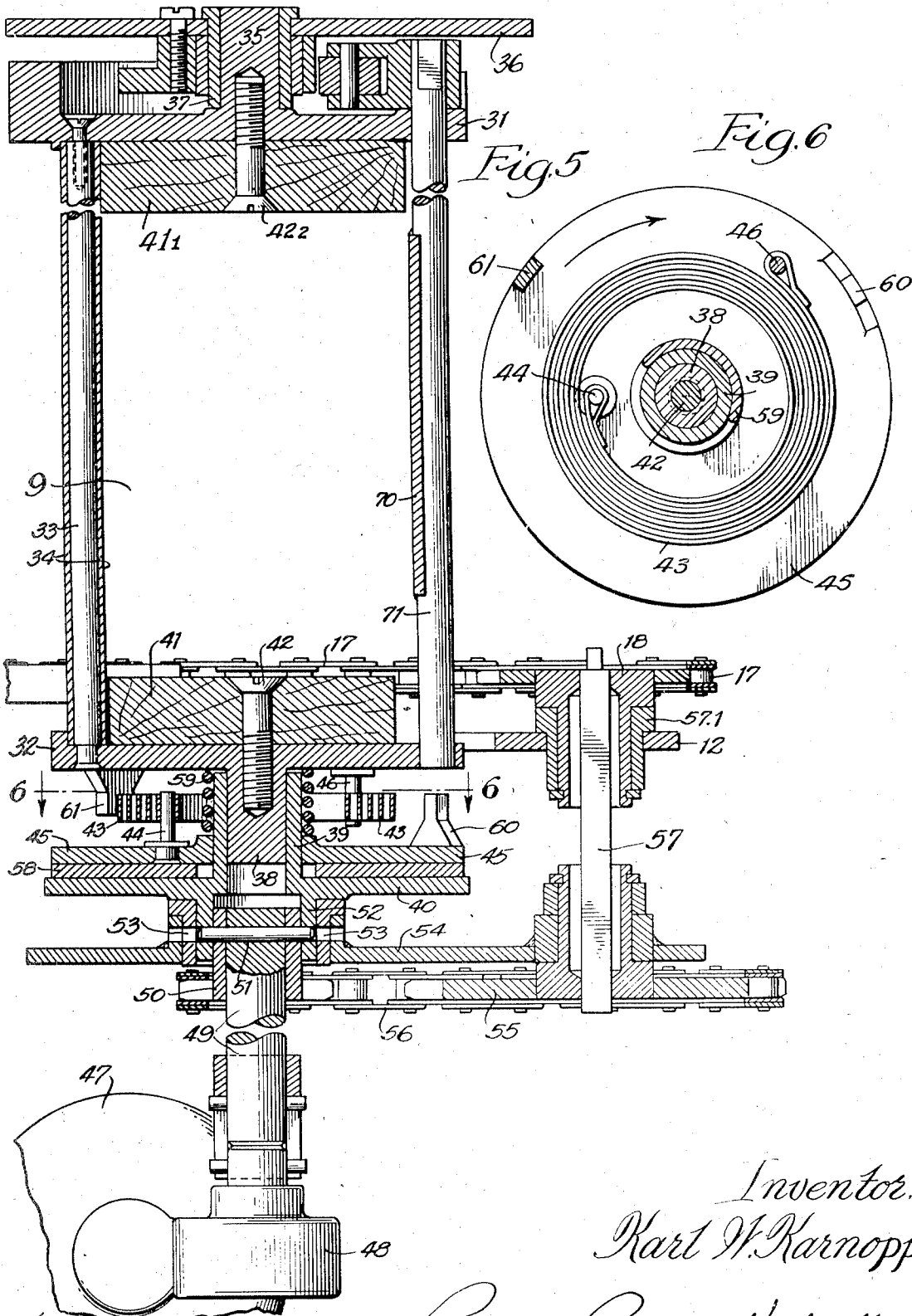
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CONVEYER FOR VENDING MACHINES

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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CONVEYER FOR VENDING MACHINES

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5 Claims. (Cl. 198—181)

This invention relates to improvements in coin controlled vending machines, and particularly to refrigerated devices for automatically dispensing bottled beverages which are preferably kept in an upright position.

The main objects of this invention are to provide a refrigerated bottled-goods vending machine wherein the bottled goods are at all times, maintained in an upright position; to provide such a device having a simplified and improved conveyer mechanism for storing, carrying and delivering the bottled goods; to provide an improved bottled goods vending machine of compact and efficient design, having an increased capacity over arrangements at present in use; to provide such a device having a horizontally disposed storing and conveyer means and wherein delivery is effected at the same level as the conveyer means; to provide a bottled goods vending machine for paper capped containers, wherein leakage of the bottled contents through the cap is obviated; to provide such a device that is proof against tampering or surreptitious manipulations; and to provide a bottled goods vending machine having numerous other novel features and advantages, as will appear from the following disclosure.

A specific embodiment of this invention is shown in the accompanying drawings, wherein:

Fig. 1 is a perspective view of the vending machine or dispenser.

Fig. 2 is a plan view of the same with the top removed.

Fig. 3 is a vertically sectioned view of the same, as taken on line 3—3 of Fig. 2.

Fig. 4 is an enlarged fragmentary sectional plan view showing details of the delivery door and drive for the conveyer, as shown in Fig. 2.

Fig. 5 is an enlarged sectional detail, in elevation, of the delivery door and its operating mechanism as taken on line 5—5 of Fig. 4, and showing the conveyer driving means.

Fig. 6 is a sectional plan view of the delivery door actuating spring, as taken on line 6—6 of Fig. 5.

In the form shown in the drawings, my improved bottled goods vending machine comprises a refrigerated cabinet 1, arranged to house refrigerating apparatus not shown, in its lower portion, and a coin controlled bottled goods storage and dispensing mechanism in its upper portion. A cover 2 is provided in the top of the cabinet 1 for access to the storage and dispensing mechanism, particularly for loading the same, and a coin receiving and control unit 3 and a deliver-

ing door unit 4 for the dispenser are mounted on the front side of the cabinet 1, as shown in Fig. 1. As shown, the coin receiving unit is provided with a coin slot 5, a coin return aperture 6, and a signal light aperture 7 which is arranged to indicate that the dispensing mechanism is empty or inoperative when that is the case. The lower portion of the coin receiving mechanism comprises the cash box thereof, and a locked cover 8 is provided for access thereto.

The delivery door unit 4 comprises a revolving delivery door 9 which will be hereafter described, and which operates to deliver or dispense the goods handled by the device onto a walled shelf 10. One end of the cabinet 1 is also provided with a locked door 11 which leads to a storage compartment occupying a space below the dispensing mechanism that is not taken up by the refrigerating unit.

As shown in Figs. 2 and 3, the bottled goods storing, carrying and dispensing mechanism is constructed to lie entirely in a horizontal plane, and is built on a rectangular frame 12 arranged to be positioned within the upper part of the cabinet 1 in the manner of a shelf or horizontal partition. The frame 12 comprises spaced, transversely extending members 13 tied together by longitudinally extending channel members 14, which also serve as tracks or guides for the conveyer means.

As shown in Figs. 2 and 3, the endmost transversely extending members 13 of the frame 12 rest upon angle bars 15 mounted on the inside of the end walls of the cabinet 1, and refrigeration is provided by cooling coils 16 disposed on the side walls of the cabinet 1 so as to substantially surround the upper portion thereof in which the storing, conveying and dispensing mechanism is housed.

In the form shown, the conveyer comprises an endless chain 17, which is arranged to follow a reciprocating or back-and-forth path in a direction which is mainly longitudinal of the cabinet 1, the chain 17 being disposed on its side and guided longitudinally in the channel members 14 and the return bends at the ends of the cabinet being accomplished by means of idler sprockets 18, the center lines of which are midway between the channels 14. As shown, in Figs. 2 and 4, the chain 17 is driven by a sprocket 19 located near the corner of the cabinet, adjacent the delivery unit 4. But first the chain passes over an idler sprocket 20 disposed with its pitch circle tangential with the center line of the chain as it passes along the channel 14 which termi-

ates at the delivery door, and then the chain 17 passes over the drive sprocket 19 and thence around a second idler sprocket 21 which is arranged to be shiftable arcuately about the axis of the drive sprocket 19 to provide for taking up of slack in the chain 17. As shown, the sprocket 21 is carried by a swinging bracket means 21.1 and the action of the spring 21.2 thereon keeps the chain taut.

From the adjustable idler sprocket 21 the chain passes transversely of the cabinet to the side thereof opposite the side in which the delivery door is located, where it passes over a small idler sprocket 18.1 and thence along the first channel 14 to the opposite end of the cabinet 1 where the first return bend is effected by the first idler sprocket 18. The chain 17 then follows the reciprocatory or back-and-forth path between the oppositely disposed idler sprockets 18 until it reaches the drive sprocket 19, adjacent the delivery door.

As shown in Figs. 2, 3, and 4, the conveyer chain 17 is disposed entirely within a single horizontal plane and the bottles 22, which the device is intended to handle, rest directly upon the upturned side of the chain 17, the bottles being conveyed or moved along the reciprocating or back-and-forth path of the chain 17 by frictional engagement of the chain with the bottle bottoms.

In order to guide the bottles 22 and keep them centered on the conveyer chain 17 guide walls are provided to define channels along which the bottles 22 travel in following the back-and-forth course of the chain 17. As shown, the guide walls are spaced on each side of the center line of the chain so as to just clear the bottles 22 and each side wall, at one of its ends, curves around a respective return bend sprocket 18 on a circle that has its center at the axis of that sprocket.

Thus, the first side wall 23 begins adjacent the small idler 18.1 and extends along the side of the cabinet 1 to the opposite end thereof, where it passes around the first idler sprocket 18 and then travels longitudinally of the cabinet to terminate at the axis of the next idler sprocket 18 in the path of chain travel. The opposite side wall 24 of the first conveyer pass follows a similar course, but in an opposed direction beginning at the axis of the first idler sprocket 18 and passing around the next opposed idler sprocket and terminating at the axis of the third idler sprocket 18 in the course of chain travel. The remaining side walls or partitions 25 to 29, inclusive, are oppositely disposed members which merely curve around a respective idler sprocket 18 and then extend longitudinally of the cabinet to terminate at the axis of the next idler sprocket in the line of chain travel, except that the last side wall or partition 29 terminates at the delivery door.

As shown in Fig. 2, a small guide wall or partition 30 is provided at the delivery door to guide the bottles 22 from the delivery end of the conveyer into the revolving door 9, the partition or wall 30 extending in a curved direction from the partition 28 toward the door 9, and breaking adjacent the center line of the last pass of conveyer travel to curve around the door 9 so as to not interrupt its operation.

The chain 17 may be of any suitable type such as roller chain or the common block chain known as bicycle chain and the pitch of the sprocket teeth will, of course, be in accordance with the chain used. As shown, however, the teeth of the sprockets 19, 20 and 21 are cut off at their

pitch diameter and the said sprockets are positioned so that their pitch circles are substantially tangential with each other. This arrangement results in a considerable saving of space and length of chain travel without detracting from the grip obtained on the chain as it passes between the drive sprocket 19 and the adjacent idlers 20 and 21.

The revolving delivery door 9 and its operating mechanism are shown in Figs. 5 and 6.

As shown in Figs. 4 and 5, the revolving door 9 is a cylindrical device having a top plate 31 and a bottom plate 32 spaced apart by spacer rods 33 on which is mounted an insulating wall 34, which extends substantially one-half way around the circumference of the top and bottom plates 31 and 32, thus providing a cylindrical compartment in which approximately one-half the side wall is open to provide access to the inside of the compartment. As shown, the top plate 31 is provided with an upwardly projecting axial stub shaft 35, which extends upwardly through a bracket member or plate 36, which in turn is suitably fastened to the inner wall of the cabinet 1, a bushing 37 being provided on the stub shaft 35 to provide a journal in which a stub shaft 35 can rotate. The bottom plate 32 is, likewise, provided with a downwardly projecting axially disposed stub shaft 38, which is journaled in an upwardly projecting collar 39, integral on a friction clutch drive plate 40. Also, the cylindrical door 9 is provided with a wooden floor block 41 which is fixed to the bottom plate 32 by means of a screw 42, the floor block 41 being of such thickness that its upper surface will lie just below the top surface of the conveyer chain 17. An upper block 41.1 is likewise provided secured by the screw 42.2 to the upper part of the door structure.

The revolving door 9 is actuated by means of a coiled spring 43, which has its inner end fixed to a pin 44, projecting upwardly from a driven clutch plate 45, and its outer end fixed to a pin 46, projecting downwardly from the bottom plate 32 of the revolving door 9. Thus, with the revolving door 9 held against rotation, the spring 43 may be tensioned by revolving the driven clutch plate 45 in a clockwise direction when viewed from above, which tensioning of the spring 43 will cause the door 11, upon its being released, to likewise revolve in a clockwise direction when viewed from above. Flexible sealing strips 34.1 are shown at the sides of the revolving door for insulating the edges of the opening whenever the door is closed.

As shown in Fig. 5, power for driving the conveyer chain 17, as well as for tensioning the spring 43, is provided by an electric motor 47, which, operating through a reduction gear 48, drives a power shaft 49. The upper end of the power shaft 49 carries a sprocket 50 and the driving clutch plate 40, both of which are fixed to the shaft by means of a pin 51, the driving clutch plate 40 having a downwardly projecting axially disposed collar 52 into which the upper end of the power shaft 49 extends. Also the collar 52 is journaled in a bushing 53 held in a bracket member 54, which in turn, is suitably secured to the inside of the cabinet 1 in a manner not shown.

The sprocket 50 is connected to a laterally disposed sprocket 55 by means of a chain 56, and the sprocket 55 is journaled in the bracket 54. Power for driving the chain 17 is taken from the sprocket 55 by means of a shaft 57 which is suit-

ably keyed thereto, and which extends upwardly into fixed engagement with the chain drive sprocket 19, the chain drive sprocket 19 being journaled in a bushing 57.1 suitably mounted in a portion of the conveyer supporting frame 12.

Frictional drive between the driving clutch plate 40 and the driven clutch plate 45 is provided by a clutch disc 58, made of cork or any other suitable clutching material, and driving friction between the clutch plates 40 and 45 and the disc 58 is provided by a helical compression spring 59 which surrounds the collar 39 of the driving clutch plate 40, and bears between the driven clutch plate 45 and the bottom plate 32 of the revolving door 9. Thus, as power is supplied by the motor 47 to turn the power shaft 49 in a clockwise direction, when viewed from the top, the clutch plates 40 and 45 will be caused to revolve likewise in a clockwise direction to tension the spring 45, the revolving door 9 to which one end of the spring 43 is attached being held in a fixed position by a suitable latch mechanism.

In order to prevent the spring 43 being wound more than one revolution, a stop 60, integral with and projecting upwardly from the driven clutch plate 45 is provided, the stop 60 being arranged to come into engagement with a downwardly projecting stop 61 integral on the bottom plate 32 of the revolving door. Thus, when the driven clutch plate 45 is rotated to a point where the spring 43 is wound, the stop 60 will engage the stop 61 to prevent further rotation of the driven clutch plate 45 and from that point on the driving clutch plate 40 will slip on the clutch disc 58, so that the power shaft 49 may continue to rotate to drive the conveyer as will be further described.

The normal position of the revolving door 9 is such that its open side will face inwardly of the cabinet 1 toward the delivery end of the conveyer mechanism, so that the bottles 22 carried by the conveyer chain 17 may be loaded singly into the revolving door.

Latch mechanism is provided to hold the door in its normal position until dispensing of the bottle loaded into the door is desired. Also mechanism including the arcuate arm 70 mounted on the vertical shaft 71 is provided to eject the bottle from the revolving door as it turns one-half of a revolution upon being released by the latching mechanism. The latching mechanism is also arranged to control the entire operation of the dispensing device after the initial actuation has occurred through the coin receiving mechanism, and the ejecting means incorporated in the revolving door 9 is arranged to so coact with the latching mechanism as to cause the latter to assume a neutral position, wherein operation of the conveyer mechanism is stopped, upon the completion of the loading of a fresh bottle 22 into the revolving door 9 against the arm 70 by the conveyer 17.

In the operation of the herein described dispensing mechanism, the conveyer compartment is first fully loaded with merchandise through the upper lid 2 of the cabinet, the merchandise packages, if bottled goods, being set in an upright position with their bottoms resting directly upon the conveyer chain 17.

The delivery mechanism is actuated by inserting a coin in the coin slot 5, which passes through a receiving and selecting mechanism, which is not shown, in order to close a suitable electric circuit. Thereafter the conveyer moves until the

package or bottle is deflected by the partition 30 to the delivery platform. At this point the conveyer is stopped, the platform is rotated and the package deposited upon the balcony 10. The platform then returns to its initial position and the machine is ready for its next delivery operation.

The main advantages of this invention lie in the construction and arrangement wherein bottled goods may be stored, carried and delivered in a vertical position, thus obviating any danger of leakage through the bottle caps, particularly when such caps are of paper as is usually the case with bottled dairy products. Other advantages reside in the horizontal conveyer arrangement, and particularly in the simplified construction thereof, wherein a maximum of storage space is provided, and wherein a single chain friction conveying means is used. Other advantages reside in the arrangement wherein the conveyer and storage mechanism is disposed entirely on one level in the manner of a shelf or partition, thus permitting the construction of the conveyer mechanism as a single unit, which may be readily replaced and which may be incorporated into vending apparatus in a series of layers or tiers, one above the other, thus making possible a simple, compact dispenser arranged to handle several kinds of merchandise.

Although but one specific embodiment of this invention is herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims:

1. An endless conveyer for supporting a quantity of articles throughout its length and for carrying said articles to an unloading mechanism comprising an endless carrier forming a tortuous path including straight sections and curved sections joining said straight sections, retainers for the carrier at the straight sections comprising channel members having a web for supporting the carrier and legs extending to a level below the upper surface of said carrier spaced apart a distance greater than the width of the carrier and idler wheels in the same horizontal plane as said carrier for conducting the carrier around the curved sections, and guides for the articles comprising partitions between adjacent sections of the carrier spaced apart a distance slightly in excess of the width of an article, said guides being positioned parallel to the channels at the straight sections and being curved at one end of each for guiding articles at either side, one of said guides at the unloading end of the carrier having an opening in the outside straight section thereof to permit removal of said articles from the carrier, and a deflecting vane extending obliquely across a straight section of the carrier from one side of said opening for directing articles from the conveyer outward through the opening.

2. An endless conveyer for supporting a quantity of articles throughout its length and for carrying said articles one by one to an unloading mechanism comprising an endless carrier forming a tortuous path including straight sections and curved sections joining said straight sections, retainers for the carrier at the straight sections comprising channel members having a web for supporting the carrier and legs extending to a level below the upper surface of said carrier spaced apart a distance slightly greater than the width of the carrier and idler wheels

in the same horizontal plane as said carrier meshing with the carrier for conducting said carrier around the curved sections, guides for the articles comprising partitions between adjacent sections of the carrier spaced apart a distance slightly in excess of the width of an article, said guides being positioned parallel to the channels at the straight stretches and being curved at one end of each for guiding articles around the curves, a sealed container completely housing said conveyer, one of said guides adjacent the unloading end having an opening to permit removal of said articles from the carrier, a deflector extending across the carrier adjacent the opening for deflecting articles from said carrier, and means comprising a sealed removable door in the housing adjacent the opening normally closing said opening.

3. An endless conveyer for supporting a quantity of articles throughout its length and for carrying said articles to an unloading mechanism comprising a frame, an endless belt member formed in a tortuous path having parallel loops lying horizontally, idler wheels at alternate ends of adjacent loops for positioning and guiding said belt member, guides at the sides of said member for guiding said articles throughout the path to the unloading mechanism, a drive wheel stationarily journaled in the frame engaging the belt member adjacent the unloading mechanism, a floating idler wheel engaging the inside surface of the belt member at one corner, a pivoted bracket for supporting the floating idler wheel in tangential relation with the drive wheel with the pivot point substantially in line with or outside of the loop of the belt member, and resilient means for urging the bracket and the floating wheel in a direction obliquely outward from the corner to impress said belt member into contact with the drive wheel and to maintain a tension on said member without substantially changing the alignment of said belt member.

4. An endless chain conveyer for a quantity of articles positioned in alignment throughout its length, said conveyer comprising an endless carrier forming a tortuous path including straight sections and curved sections joining said straight sections and including engaging means in contact with the articles for impelling said articles toward an unloading end, retainers for the carrier at the straight sections comprising channel members having a web supporting

the carrier and legs extending upwardly along the edges of the carrier, spaced apart a distance greater than the width of the carrier and idler wheels in the same horizontal plane as said carrier for conducting the carrier around the curved sections, and guides for the articles comprising partitions between adjacent sections of the carrier spaced apart a distance slightly in excess of the width of an article, said guides being positioned parallel to the channels at the straight sections and being curved at one end of each for guiding the articles at either side, a sealed container completely housing said conveyer, one of said guides at the unloading end of the carrier having an opening in the outside section thereof to permit removal of said articles from the carrier, a deflector extending across the carrier, and means comprising a movable sealed door in the housing adjacent the opening normally closing said opening.

5. An endless conveyer for supporting a quantity of articles throughout its length and for carrying said articles one by one to an unloading mechanism comprising an endless carrier forming a tortuous path including straight sections and curved sections joining said straight sections, retainers for the carrier at the straight sections comprising channel members having a web for supporting the carrier and legs extending to a level below the upper surface of said carrier spaced apart a distance slightly greater than the width of the carrier and idler wheels in the same horizontal plane as said carrier meshing with the carrier for conducting said carrier around the curved sections, a guideway for the articles comprising partitions between adjacent sections of the carrier spaced apart a distance slightly in excess of the width of an article, said guideway having the partitions thereof positioned parallel to the channels at the straight stretches and being curved at one end of each for guiding articles around the curves, said guideway having adjacent the unloading end an opening to permit removal of said articles from the conveyer, a portion of one of said partitions being extended over and across the carrier to a point adjacent one side of said opening providing a deflector for articles from the conveyer to the opening, and means comprising a movable sealed door in the housing in alignment with the opening normally closing said opening.

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