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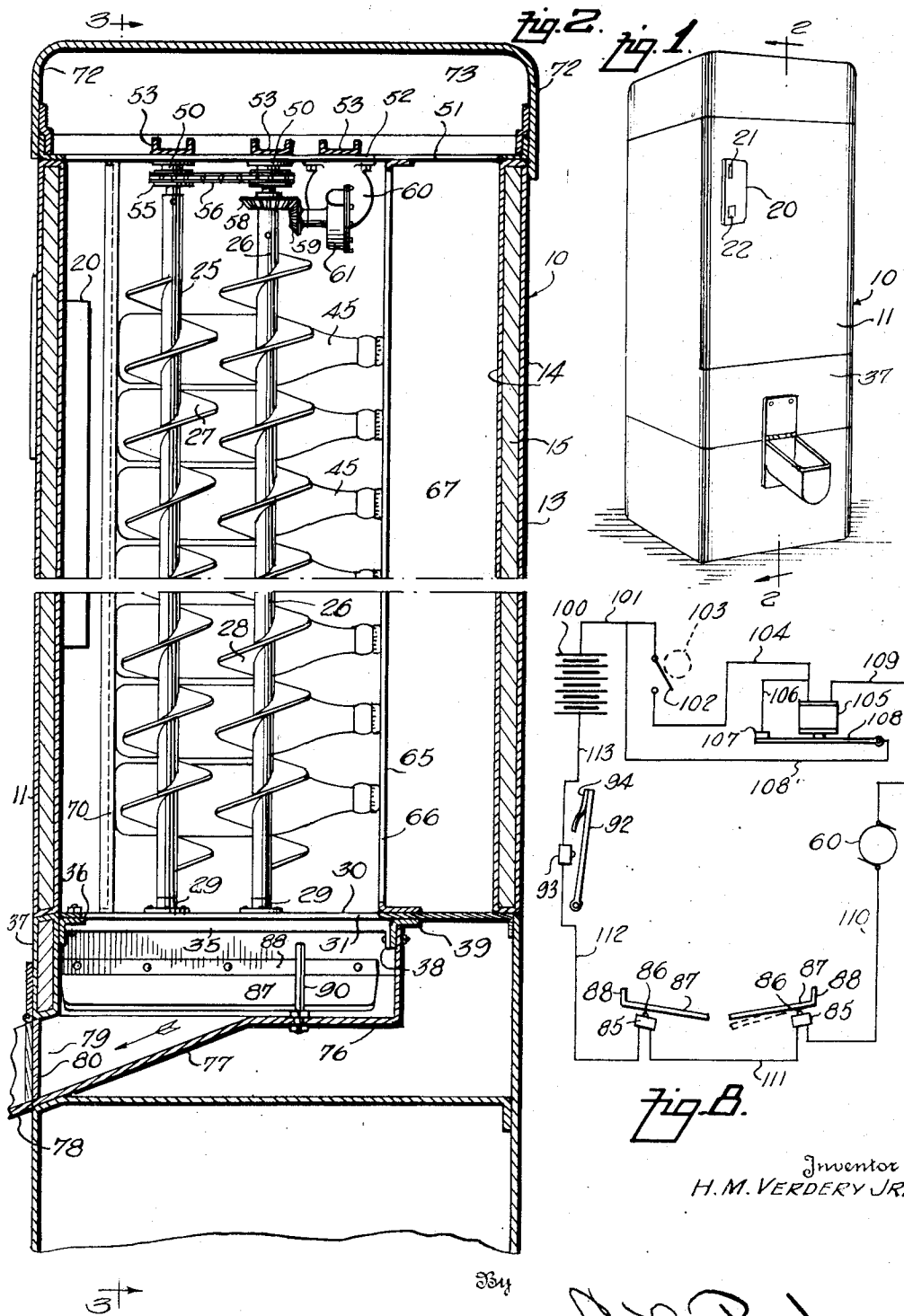
H. M. VERDERY, JR

2,564,552

BOTTLE VENDING MECHANISM

Filed Jan. 27, 1948

4 Sheets-Sheet 1



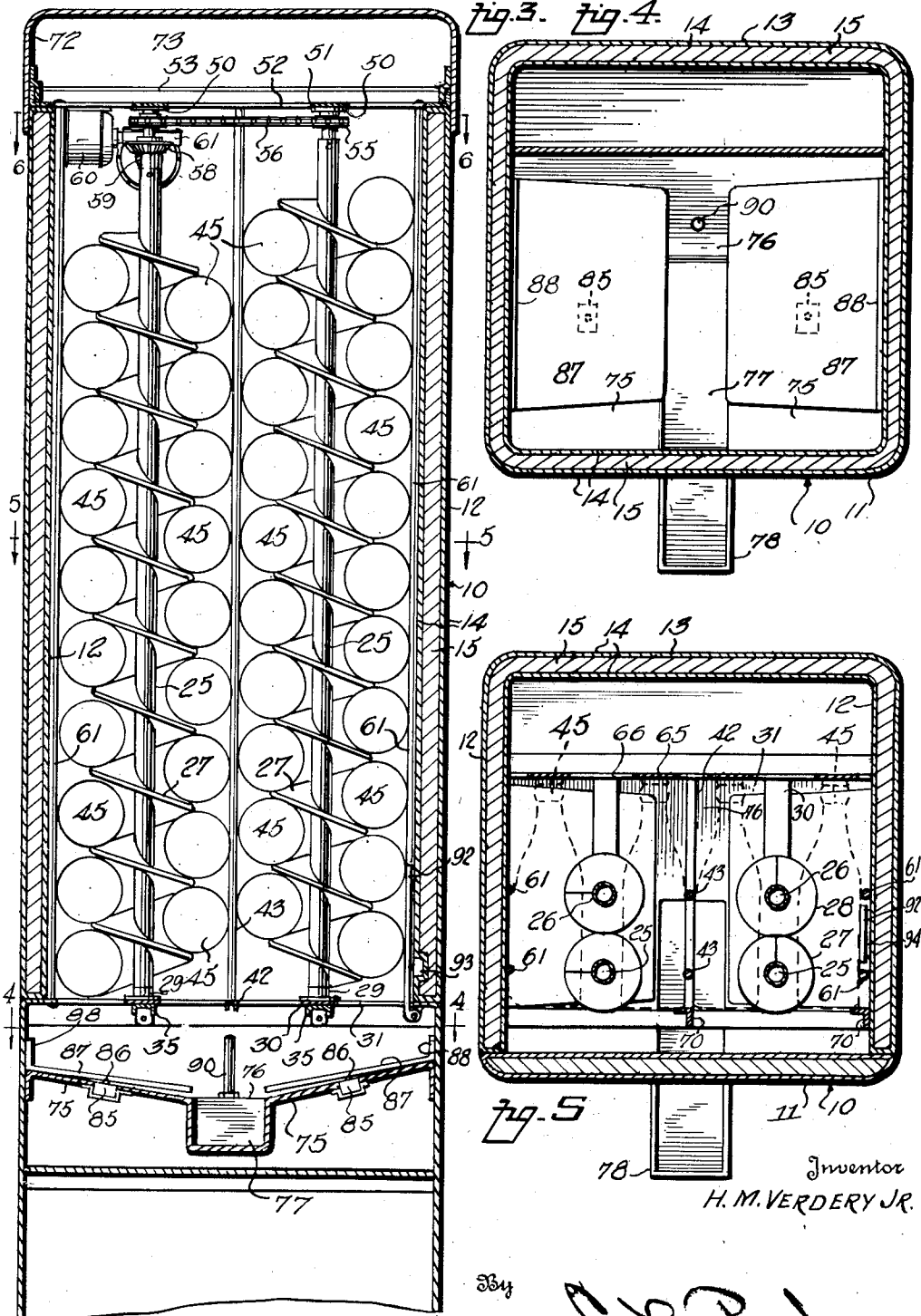
Aug. 14, 1951

H. M. VERDERY, JR
BOTTLE VENDING MECHANISM

2,564,552

Filed Jan. 27, 1948

4 Sheets-Sheet 2



C. P. Parker

Aug. 14, 1951

H. M. VERDERY, JR

2,564,552

BOTTLE VENDING MECHANISM

Filed Jan. 27, 1948

4 Sheets-Sheet 3

Fig. 6.

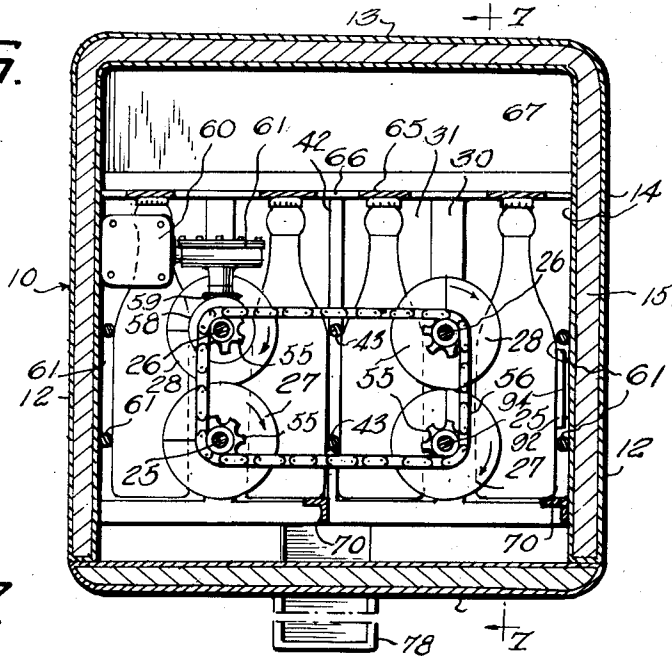
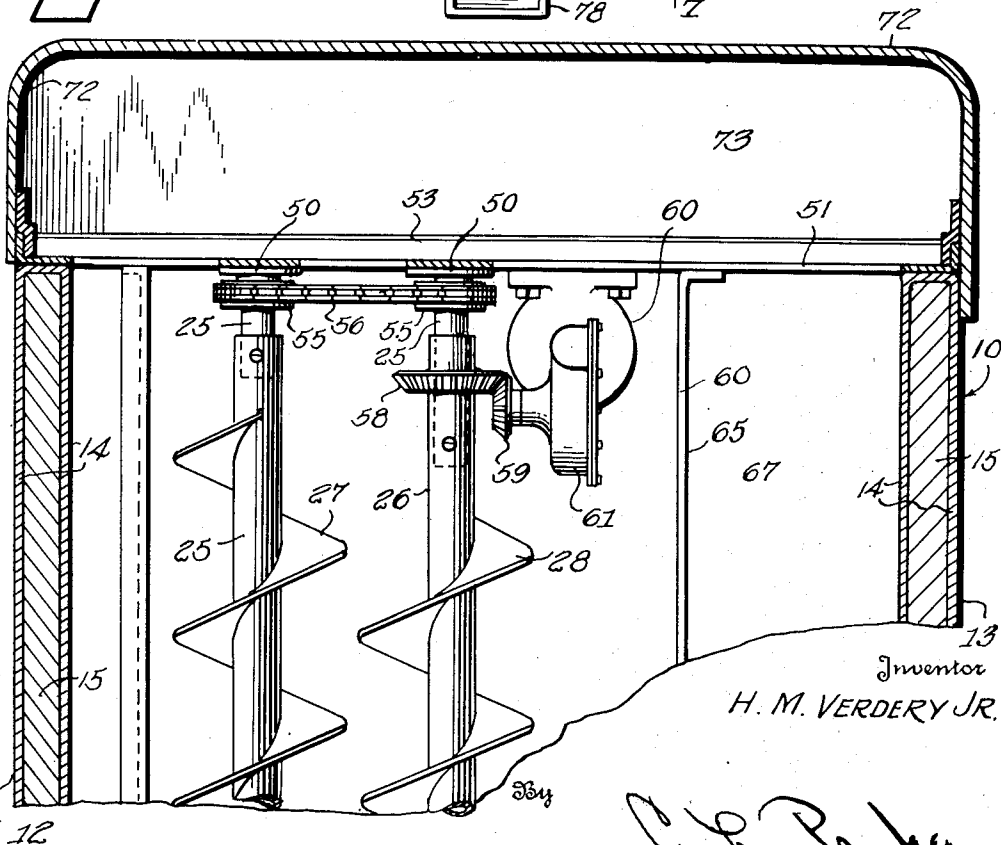


Fig. 7.



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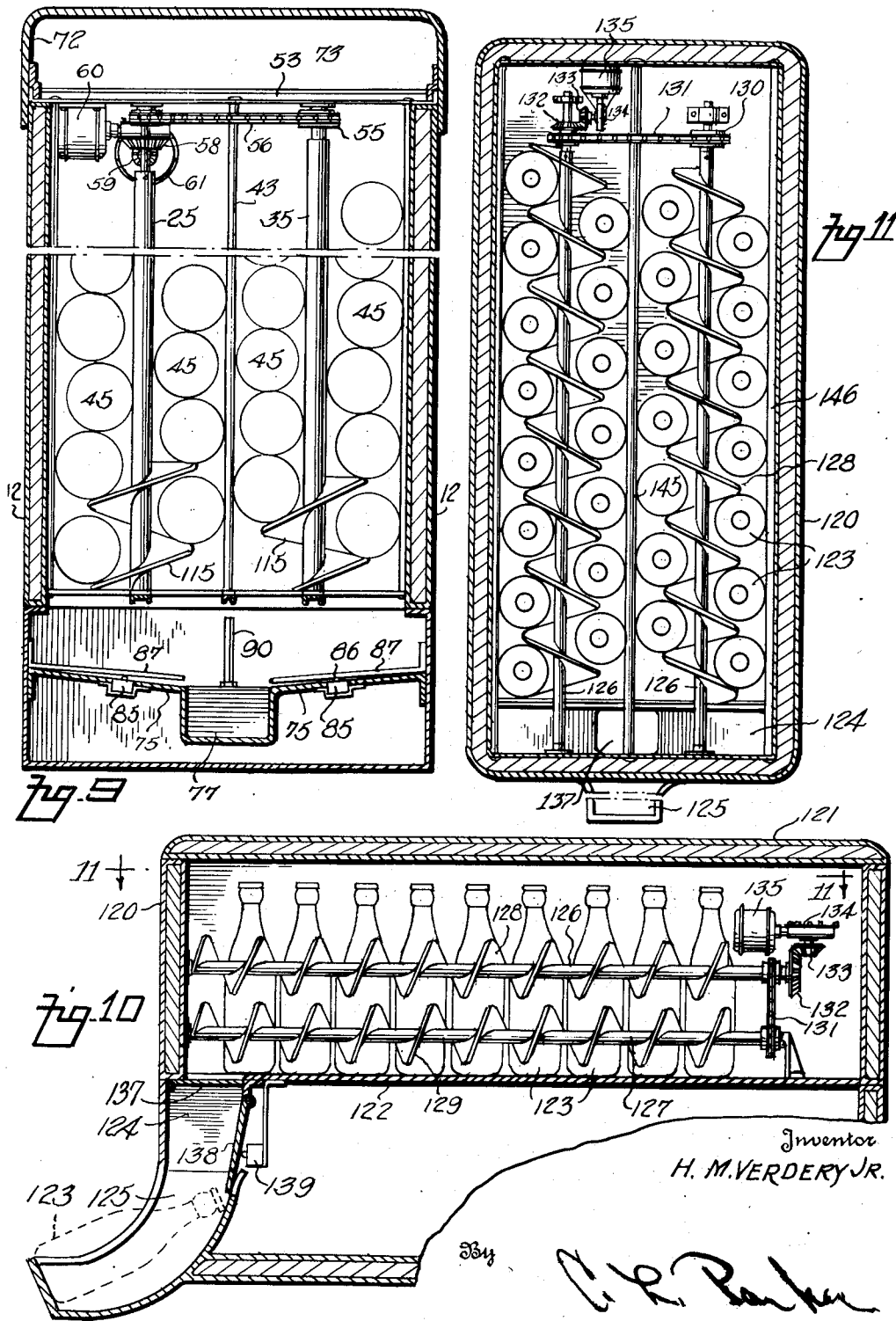
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4 Sheets-Sheet 4



UNITED STATES PATENT OFFICE

2,564,552

BOTTLE VENDING MECHANISM

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4 Claims. (Cl. 312-94)

1

This invention relates to a bottle vending mechanism, and has particular reference to an apparatus for vending chilled bottles of soft drinks and is adapted to be used in connection with a conventional coin-controlled mechanism.

It has become the extensive practice to install vending machines for bottled soft drinks in factories, office buildings, and numerous places where substantial numbers of people gather and where no store is immediately available where such goods can be obtained. A number of forms of apparatus have been developed for this purpose and while most of them are satisfactory from the standpoint of operation, they are quite complicated and expensive to manufacture. Moreover, they involve the use of a substantial number of parts which increases the chances of mechanical difficulties, and are difficult to service when breakdowns occur.

An important object of the present invention is to provide a novel and highly simplified type of bottle vending apparatus which requires the use of a minimum number of parts several of which are duplicates of each other, thus greatly reducing the cost of manufacturing the apparatus.

A further object is to provide an apparatus of this character which makes novel use of Archimedes screw means for both supporting the bottles and feeding them to the outlet of the apparatus when such screw means are rotated.

A further object is to provide an apparatus of this character wherein the loading of the apparatus with bottles of soft drinks may be quickly and easily accomplished and wherein the last bottles placed in the apparatus are the last to be dispensed therefrom, thus allowing ample time for the cooling of the bottles.

A further object is to provide an apparatus of this character wherein a plurality of rows of bottles up to a substantial number may be simultaneously fed toward the discharge point and discharged singly upon each operation of the apparatus, and wherein a single source of power operates all of the screw means employed for feeding the bottles toward the outlet.

A further object is to provide one or more pairs of Archimedes screws, each pair of which is adapted to support and feed two rows of bottles toward the outlet, and to so time the pairs of screws relative to each other that they may be simultaneously driven upon each operation of the apparatus but will dispense only a single bottle at each operation.

A further object is to provide such an appa-

2

ratus wherein, when initiated, the operation of the screw means will continue until the next single bottle intended to be vended is discharged from the apparatus and wherein any such bottle immediately stops the operation of the entire apparatus before the screw means can dispense another bottle.

A further object is to provide such an apparatus which so takes advantage of the Archimedes screw principle that any gap or gaps in the stacks or rows of bottles will not interfere with the normal operation of the apparatus, the drive means for turning the screws continuing until a bottle is dispensed, whereupon the operation of the apparatus will be immediately arrested.

A further object is to provide an apparatus of the character referred to which lends itself particularly well to the use of vertical screws and vertical columns of horizontally arranged bottles, and to provide in conjunction therewith a plate or plates upon which each bottle drops as it is about to be discharged from the apparatus, such plate or plates serving to cushion the bottle and prevent damage thereto and to serve the additional purpose of breaking the motor-operating circuit to arrest operation of the apparatus.

Other objects and advantages of the invention will become apparent during the course of the following description.

In the drawings I have shown several embodiments of the invention. In this showing:

Figure 1 is a perspective view showing the preferred form of the apparatus,

Figure 2 is a central vertical sectional view through the apparatus taken substantially on line 2-2 of Figure 1, parts being broken away,

Figure 3 is a vertical sectional view on line 3-3 of Figure 2,

Figure 4 is a horizontal sectional view on line 4-4 of Figure 3,

Figure 5 is a horizontal sectional view on line 5-5 of Figure 3,

Figure 6 is a horizontal sectional view on line 6-6 of Figure 3,

Figure 7 is an enlarged fragmentary sectional view on line 7-7 of Figure 6,

Figure 8 is a diagrammatic view of an electrical system for the apparatus,

Figure 9 is a view similar to Figure 3 of a slightly modified form of the apparatus, portions being broken away,

Figure 10 is a vertical fragmentary sectional

view showing a further modified form of the apparatus, and

Figure 11 is a horizontal sectional view on line 11—11 of Figure 10.

Referring to Figures 1 to 7 inclusive, the numeral 10 designates a cabinet for the apparatus having a front wall 11 forming a door adapted to be opened to provide access to the interior of the apparatus. The cabinet further includes side walls 12 and a rear wall 13. The door 11 and each of the front and rear walls is preferably formed of inner and outer metal sheets 14 suitably heat insulated from each other as at 15.

Mechanism to be described is provided for dispensing one bottle at a time from the apparatus, subject to control by any desired type of coin control mechanism generally indicated by the numeral 20 and having a coin slot 21 and a coin return chute 22 operative in any manner for returning coins if the apparatus is empty. The particular coin control mechanism forms no part of the present invention and may be of any desired type.

In the form of the invention shown in Figures 1 to 7 inclusive, four stacks or vertical columns of bottles are adapted to be dispensed, but it will become apparent that the apparatus may be used for dispensing bottles from two or more of such vertical columns. The apparatus, as shown, thus comprises two dispensing units. Each such unit comprises a pair of vertical shafts 25 and 26 (Figures 2 and 5) and these shafts carry Archimedes screws 27 and 28 respectively. Each of the shafts 25 and 26 is supported by a thrust bearing 29 as shown in Figures 2 and 3. These bearings are supported on a plate 30 cut away to provide openings 31 for the downward passage of the bottles to be discharged, as will be described below.

Beneath the plate 30, to support the loads on the shafts and spirals and the load on the bottles carried thereby in a manner to be described, are a pair of channels or similar structural members 35 and accordingly one of the channels 35 will be arranged beneath each pair of the shafts 25 and 26. The forward end of each channel 35 (see Figure 1) is secured to an angle or other structural member 36 carried by the front wall 37 of the cabinet beneath the door 11. The rear end of each channel 35 has its base turned downwardly as at 38 and secured to a channel 39 or similar structural member extending between the side walls 12.

The portion of the plate 30 forming the two inner openings 31 is turned downwardly adjacent each such opening into substantially channel shape as at 42 (Figure 3) to provide sufficient additional structural strength at such portion of the plate 30 to support a pair of vertical guide rods 43 to be referred to later.

Each side of the screws 27 and 28 of each pair is adapted to support a column of bottles each indicated by the numeral 45. The bottles are arranged between respective convolutions of the screws as shown in Figure 3, and the convolutions of each screw 27 are arranged to correspond in position to the convolutions of the associated screw 28 whereby each bottle will be horizontally arranged. However, the convolutions of the screws of the two units are arranged 90 degrees apart where two units are employed, and with this arrangement, the bottles will be discharged singly from the apparatus as further referred to below.

The upper ends of the shafts 25 and 26 are journaled in bearings 50 carried by a relatively

heavy plate 51 apertured as at 52 for a purpose to be described. The plate 51 may be stiffened to render it more rigid by suitable channel irons 53 (Figure 3). Each of the shafts 25 and 26 carries a sprocket 55 around which passes a chain 56, as clearly shown in Figure 6. One of the shafts, for example, the rear shaft 26 in Figure 7, is provided with a bevel gear 58 meshing with a bevel pinion 59 driven by a motor 60 through a conventional reduction gearing 61. The motor 60 is connected to the plate 51. All of the shafts having their sprockets 55 connected by the chain 56, it will be apparent that the driving of one of the shafts by the motor as shown will effect simultaneous rotation of all of the shafts in the same direction.

The successive convolutions at both sides of the screws of each pair 27 and 28 receive bottles 45 therebetween, as clearly shown in Figure 3. In order that the bottles will be fed downwardly, the screws turn in a clockwise direction as viewed from the top, and as indicated by the arrows in Figure 6. The downward sloping of the convolutions of the screws on which the bottles rest tends to feed the bottles radially outwardly relative to the screws, as will be apparent. The bottles of the inner two columns of bottles are adapted to contact with and slide along the single pair of vertical guide bars 43. The bottles adjacent each side of the apparatus are held in position relative to the screws by side guide bars 61 lying adjacent the side walls of the casing 10.

The columns of bottles to the left of the associated screws, as viewed in Figures 3 and 6, contact with portions of the screws which move rearwardly in their turning movement and thus will have their cap ends held in engagement with a rear wall 65 apertured as at 66. The wall 65 is spaced from the rear wall 13 of the cabinet to form a chamber 67 in which suitable refrigerating coils (not shown) may be conveniently arranged and the air chilled by such coils may circulate through the openings 66. These openings will lie between the adjacent stacks or columns of bottles and outwardly of the remote columns of bottles, the solid portions of the plate 65 extending vertically of the planes of the columns of bottles so that the caps of the bottles may slide therealong and be prevented from moving rearwardly into the compartment 67.

The bottles of the right hand column of each pair will contact portions of the associated screws which are moving forwardly in their turning movement. There may be some tendency for such bottles to be urged forwardly because of the turning movement of the screws, and to prevent any such forward movement, vertical stop bars 70 are provided, and the arrangement of these stop bars relative to the associated columns of bottles is most clearly shown in Figure 6. The stop bars 70 may be of angle section, as shown, and they may be fixed at their ends to the plates 30 and 51. The space between each bar 70 and the associated shaft 25 is sufficiently wide for the insertion of the columns of bottles referred to from the front of the apparatus when the door 11 is open.

The cabinet is provided with a top 72 forming therewithin a chamber 73 in which any suitable refrigerating mechanism (not shown) may be arranged and such mechanism will be connected to the cooling coils on the chamber 67.

Beneath each pair of screws and the associated columns of bottles is arranged a downwardly and

5

inwardly inclined plate or shelf 75 leading to a central discharge shelf 76, the forward portion 77 (Figure 2) of which forms a trough sloping downwardly toward the front of the apparatus and communicating with a receiving trough 78 projecting forwardly of the cabinet. The troughs 77 and 78 communicate through an opening 79 in the front wall 37 (Figure 1) and this opening is normally closed by a door 80 to prevent transfer of heat from the interior of the apparatus and the outside air. The door 80 may be biased to closed position solely by gravity.

Each shelf 75 supports a micro-switch 85 having the usual conventional button 86 projecting upwardly therefrom. As is characteristic of switches of this character, very slight movement of each button 86 is necessary to operate the associated switch 85. As will become apparent, these switches are in series and are normally closed. An operating plate 87 is arranged above each switch 85. Each plate 87 is flanged as at 88 to be welded or riveted to the casing. Each of the plates 87 is resilient and normally occupies the position shown in Figure 3 diverging inwardly slightly from the associated shelf 75. While the operating plates 87 are preferably resilient for a purpose to be described, they may be arranged in any manner to be moved downwardly slightly by a discharging bottle to open one of the switches 85.

As the screws 27 and 28 rotate, successive bottles will be dropped as further described below, and each such bottle strikes one of the plates 87. Each bottle thus dropped, is cushioned by the resiliency of one of the plates 87 and the latter will be flexed to operate one of the switches 85. The bottle thus striking one of the plates 87, will move by gravity toward the center of the apparatus and to prevent the lighter capped end of a bottle from swinging too far across the shelf 76, a rigid upstanding pin 90 is arranged centrally of the shelf 76. This pin positively insures the dropping of the heavy end of the bottle in the trough 77, whereupon the bottle slides downwardly in such trough and almost immediately frees itself from engagement with the pin 90.

Assuming that the driving of the shafts 25 and 26 is accomplished through the bevel gear 58 associated with one of the shafts at the left side of the apparatus looking from the front, as shown in the drawings, the associated screws will be shorter than the screws at the opposite side of the apparatus, as shown in Figure 3. If the apparatus is fully loaded with bottles, therefore, the right hand screws 27 and 28 will finish dispensing their bottles last. Such side of the apparatus is provided with a switch operating plate 92 arranged adjacent one side wall 12 and engaged by the two lowermost adjacent bottles 45 when the latter occupy the positions shown in Figure 3. This operating member 92 controls a micro-switch 93 which is biased to open position for a purpose to be described. A leaf spring 94 urges the plate 92 away from the adjacent wall 12 to release the switch 93 to be automatically opened when the last bottle in the apparatus is dispensed.

A suitable control circuit for the apparatus is shown in Figure 8. A source of current 100 has one terminal connected by a wire 101 to a coin controlled switch 102 of any conventional type and adapted to be operated upon the insertion of the proper coin 103. From this switch a wire 104 leads to one terminal of an electro-magnet 105. A wire 106 is connected between

6

the wire 104 and a stationary contact 107 engageable by the armature 108 of the electro-magnet 105. The armature 108 is connected to the wire 101 by a wire 108'. The other terminal of the magnet 105 is connected by a wire 109 to one terminal of the motor 60. The other terminal of the motor 60 is connected in series with the switches 85 and 93 through wires 110, 111, 112 and 113, the latter wire leading back to the source 100.

Except as particularly referred to below, the form of the invention shown in Figure 9 is substantially identical with the form previously described and the same reference numerals have been employed to designate identical parts. In the form of the invention shown in Figure 9, the same shafts are employed for supporting the screws, but instead of employing relatively long screws, the screws are substantially shortened. These screws are indicated in Figure 9 by the numeral 115, and each may be less than two convolutions in length. Under such circumstances, the screws will control the discharging of the bottles in the same manner as for the previously described apparatus. However, above the upper limits of the screws, the bottles will be supported on each other instead of by convolutions of the screws, as in the apparatus described above. This is advantageous solely in providing a slightly cheaper screw structure to manufacture and in slightly increasing the capacity of the apparatus, but disadvantageous in that it does not slightly space all of the bottles for the circulation of chilled air.

The form of the invention shown in Figures 10 and 11 employs horizontal screws for moving vertically arranged bottles toward a discharge spout. The apparatus in Figures 10 and 11 comprises an insulated cabinet 120 having a removable top 121 through which the apparatus may be filled with bottles. The apparatus may be refrigerated in any suitable manner (not shown). The cabinet comprises a bottom plate 122 for supporting in vertical position a plurality of bottles 123 adapted to be moved toward a transverse discharge trough 124 for discharge through a spout 125.

In the embodiment illustrated, two sets of screw conveying means are employed, each set comprising upper and lower shafts 126 and 127 respectively. The upper shaft 126 carries a spiral 128 and the lower shaft carries a spiral 129, and the spirals of each set are correspondingly arranged as is true of the spirals of each set or unit described above. However, the spirals of the two sets are set 90 degrees apart to dispense one bottle at a time, as further described below.

Each of the four shafts 126 and 127 is provided with a sprocket 130, and a chain 131 extends around all four sprockets whereby the driving of any one shaft 126 or 127 will simultaneously rotate all of the shafts in the manner described in connection with the preferred embodiment of the invention. One of the shafts carries a bevel gear 132 driven by a bevel pinion 133 associated with a speed reduction gearing 134 driven by a motor 135, similar to the motor 60.

Each bottle discharged into the trough 124 will open and pass a normally closed door 137. The bottle will then move into the discharge spout 25 and will actuate a pivoted plate 138 associated with a micro-switch 139. This micro-switch corresponds to the micro-switches 85, and

where such switch is placed in a common outlet, only one need be employed instead of the two switches 8 5as in the form of the invention shown in Figures 1 to 8 inclusive.

One or more rods 145 extend lengthwise through the apparatus centrally thereof. This rod or rods will contact the adjacent rows of bottles to prevent them from moving away from their associated shafts out of engagement with the screws. It will be apparent that the turning of the screws exerts a horizontal force at a slight angle to the length of the apparatus as viewed in Figure 11 and the rod or rods 145 will act as guide means. One of these rods is sufficient but it is preferred that two be employed in the same vertical plane and these rods will correspond to the rods 43 (Figures 3 and 5) of the preferred form of the apparatus. Guide rods similar to the previously described guide rods 61 will be employed for similarly guiding the remote rows of bottles, and such guides have been indicated by the numeral 146 in Figure 11. These rods will extend along the sides of the cabinet and all of the rods 145 and 146 may be conveniently secured at their ends to the end walls of the cabinet.

Operation

In the form of the invention shown in Figures 1 to 8 inclusive, a prospective purchaser will drop the proper coin in the slot 21 to initiate the operation of the apparatus. The coin control mechanism may be of any conventional type and will include the usual coin operated switch 102 (Figure 8). When the coin 103 closes the switch 102, a circuit will be completed through wire 101, switch 102, wire 104, magnet 105, wire 109, motor 60, wire 110 and thence through the switches 85 and 93 and back to the source. It will be understood that the switches 85 are biased to closed position and are normally closed, while the switch 93 is biased to open position and is held closed by the operating plate 92 so long as at least one bottle contacts this plate to hold it in the position shown in Figure 3.

Thus the motor 60 will be energized to drive the shafts 25 and 26, these shafts being simultaneously driven in the same direction by the chain 56. As soon as the circuit referred to is closed, the magnet 105 will attract its armature 108 to complete a holding circuit through wire 108', armature 108, contact 107, wire 106 and thence through the magnet 105 and the remainder of the circuit described. Accordingly the coin 103 need only momentarily close the switch 102. The screws 27 and 28 will rotate in a clockwise direction as viewed in Figure 6 and all of the bottles supported by all of the screws will thus move downwardly. In Figure 3 the lowermost bottle at the left side of the apparatus will be the first bottle discharged when it passes from the end of the associated screw, and immediately upon being released from engagement with such screw, this bottle will drop upon the associated plate 87. The resiliency of this plate cushions the fall of the bottle and the plate flexes downwardly to operate the associated switch button 86 to open the corresponding switch 85, and thus break the circuit through the motor 60. The breaking of this circuit is only momentary since the bottle does not remain on the plate 87 referred to. However, the momentary breaking of the motor circuit deenergizes the magnet 105 to drop the armature 108 and thus break the holding circuit. No further motor operation will

occur thereafter until another coin is inserted in the machine. The motor operation will be arrested before its momentum can turn the screws sufficiently to discharge the next bottle.

The bottle thus dropped on the left hand plate 87 as viewed in Figure 3, will roll downwardly toward the center of the apparatus. There is some tendency for the lighter or capped end of the bottle to swing toward the center of the apparatus ahead of the heavier part of the bottle, and for this reason the post 90 is provided. This post will contact the head end of the body and prevent the bottle from swinging across the troughs 76 and 77. The heavier end of the bottle will then fall into the slot 77 and will slide there-through to be discharged. The bottle will open the door 80 and come to rest in the receiver 78.

It will be obvious that the bottles associated with the two sides of each set of screws will be arranged 180° apart in terms of the rotation of such screws. The two sets of screws will be arranged 90° apart, and accordingly a bottle will be discharged upon each 90° turning movement of the screws. Referring to Figure 3, therefore, it will be noted that after the discharge of the bottle previously described, the lowermost bottle at the right side of the apparatus will be the next bottle discharged, followed by the right hand bottle of the left hand dispensing unit in Figure 3. The next bottle thereafter will be the next lowermost bottle of the left hand column of the right hand dispensing unit, followed by the lowermost bottle in the left hand column of the left hand unit. This sequence of discharging the bottles continues throughout the operation of the apparatus.

The switch operating plate 92 is arranged as shown in Figure 3 in the embodiment of the invention illustrated therein for the reason that the right hand dispensing unit will be higher than the left hand dispensing unit, which is shortened at its upper end to a slight extent to provide space for the driving mechanism. Ordinarily, therefore, the column of bottles adjacent the switch plate 92 will be the last column to be completely discharged. Assuming that the machine has been emptied to the point where there are only two bottles left in the column controlling the switch plate 92, such switch plate will be held in operative position by the upper of such two bottles when the lower bottle is discharged. Upon the discharging of the last bottle in such column, the leaf spring 94 will swing the plate 92 inwardly to release the switch 93 to be opened and thus prevent the energizing of the motor circuit. Thus the apparatus cannot be operated when empty, and the wiring circuit shown in Figure 8 will be utilized in conjunction with the conventional coin-control mechanism to return the purchaser's coin through the return slot 22 if the machine is empty. The coin control and return mechanism forms no part of the present invention.

It will be apparent that the arresting of the operation of the motor 60 depends upon the operation of one of the switches 85 by a bottle being discharged. If there is a gap in any column of the apparatus due to carelessness in loading the machine, the operation of the apparatus will not be affected. When such gap in a column reaches the point where the bottle therein normally would be the next one discharged, the apparatus merely will continue to operate upon the insertion of the proper coin until a bottle from some other column is discharged.

One of the advantages of the present apparatus lies in the fact that as additional bottles are placed in the machine, the spaces for such bottles are automatically provided remote from the discharge point. In other words, as the bottles are discharged all of the columns gradually move simultaneously downwardly, thus providing spaces at the top of the apparatus to be refilled with bottles. These empty spaces occurring at points remote from the discharge point, the newly inserted bottles will have the longest possible time to become chilled.

Another of the important features of the apparatus lies in the fact that it involves a minimum number of operating parts most of which are conventional. For example, a single drive chain 56 is used and passes around four sprockets which are duplicates of each other, and the bevel gears 58 and 59 are wholly conventional. Inasmuch as the weights of the bottles on the screws tend to turn them in a discharging direction, a very low powered motor 60 may be employed. The reduction gearing 61 is conventional and preferably of the worm drive type so as to be irreversible. Therefore, while the weights of the bottles greatly reduce the work which must be performed by the motor, the bottles then cannot effect turning movement of the screws. The motor 60 is preferably of the conventional automatic solenoid brake type, which is in common use, and this type is preferred so as to arrest operation of the motor instantly upon the breaking of the motor circuit. However, it has been found that while bottles are discharged at 90° intervals in the turning movement of the screws, a conventional motor 60 for the solenoid brake means is fully operative and satisfactory in use.

The apparatus, of course, is filled by opening the door 11 which is provided with a suitable lock (not shown). With the door opened, the operator can easily grasp two bottles in each hand and insert the bottles in position between the convolutions of the screws. It requires very little time to load the apparatus, as will be apparent. The extension of the screws substantially throughout the height of the apparatus is preferred since the bottles will be retained slightly spaced as shown in Figure 3 for the free circulation of the chilled air from the refrigerating chamber 67.

The operation of the form of the invention shown in Figure 9 is identical with that described and need not be referred to in detail. There are two advantages to the modified form referred to. In the first place, it is slightly more economical to manufacture because of the use of shorter screws 115. In the second place, the capacity of the apparatus for a given size cabinet is slightly increased since the only bottles vertically spaced from each other will be those engaged by the screws. The remaining bottles will rest directly one upon the other, and in the average size apparatus this will increase the capacity by four bottles, one in each column. It has been found, however, that much better circulation of the chilled air is provided with the form of the invention shown in Figures 1 to 7 inclusive.

In the form of the invention shown in Figure 10, the bottles remain in vertical position and are moved toward the discharge point while in such position. There is no advantage in the apparatus shown in Figure 10 over those previously described except that it is capable of being installed in stores or similar places at points where the previously described form of the invention

cannot be used because of their heights. For example, it has been found that there are some places where the desired points of installation will be beneath shelving or at the end of or adjacent one side of a counter, where it is undesirable to have the casing project upwardly a substantial distance. The form of the invention shown in Figure 10 can be made very readily of the conventional height of a store counter and may form a continuation thereof. The operating circuits for all of the three forms of apparatus obviously may be identical except that where a single discharge spout is used as in Figure 10, with the switch 139 arranged in such spout, only one such switch need be employed instead of the two switches 85 in Figure 8.

As previously stated, the form of the invention shown in Figures 1 to 7 is preferred. However, all forms of the invention are highly advantageous in use because of their simplicity and economy in manufacture, because of the ready accessibility of all of the few working parts, and because the design in each case is such that there is little or nothing to get out of order or be subject to breakage. Additionally, all of the apparatus may be supported solely at the tops and bottoms of the working parts, and this is particularly true in the first two forms of the invention, and thus manufacture and installation is highly simplified.

I claim:

1. A bottle vending machine comprising a pair of bottle vending units each comprising a pair of vertical parallel screws having their axes arranged in a common plane, the planes of the two units being parallel to each other, inner guide means between said units parallel to said planes, outer guide means arranged outwardly of the two units parallel to said planes, both screws of each unit being correspondingly pitched and arranged and having the spaces between the convolutions thereof at each side of the associated plane forming pockets to receive horizontally arranged bottles engageable with said guide means, common means, including an electric motor, for driving the screws of both units simultaneously in the same direction and at the same speed to move the bottles downwardly, the screws of the two units being identically pitched but differently arranged whereby single bottles will be released from the lower ends of said screws upon rotation thereof, a single discharge chute beneath said units, and a single resiliently supported plate beneath each unit and onto which the bottles of the associated units fall, said plates being sloped downwardly toward said chute.

2. Apparatus constructed in accordance with claim 1 provided with a vertical stop member adjacent the upper end of said chute to engage a bottle moving to said chute from either of said plates to prevent the associated end of said bottle from moving beyond said chute.

3. A bottle vending machine comprising means for supporting a plurality of horizontally arranged bottles, means for discharging said bottles from said supporting means singly at a plurality of laterally spaced points, downwardly and inwardly inclined plates beneath said supporting means and on one of which any bottle discharged from said supporting means will fall to move thereover toward the lower edge thereof, said plates having their lower edges parallel and spaced from each other, a discharge trough arranged beneath the lower edges of said plates and having a bottom a portion of which slopes from

11

the horizontal, and a vertically arranged pin in said trough adjacent the end remote from the lower end of the sloping portion thereof to engage bottles moving into said trough from either of said plates whereby the portion of each such bottle remote from such pin will swing into said trough ahead of the portion of the bottle engaged by said pin.

4. A bottle vending machine comprising means for supporting a plurality of horizontally arranged bottles, means for discharging said bottles from said supporting means singly at a plurality of laterally spaced points, downwardly and inwardly inclined plates beneath said supporting means and on one of which any bottle discharged from said supporting means will fall to move thereover toward the lower edge thereof, said plates having their lower edges parallel and spaced from each other, a discharge trough arranged beneath the lower edges of said plates, said trough having a bottom one end of which is horizontal and the other end of which slopes downwardly away therefrom, and a pin extending

12

vertically upwardly from the horizontal bottom end of said trough to engage one end of a bottle moving into said trough from either of said plates whereby the other end of each such bottle will swing into said trough over the sloping bottom end thereof ahead of the end of the bottle engaging said pin.

HOLCOMBE M. VERDERY, JR.

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