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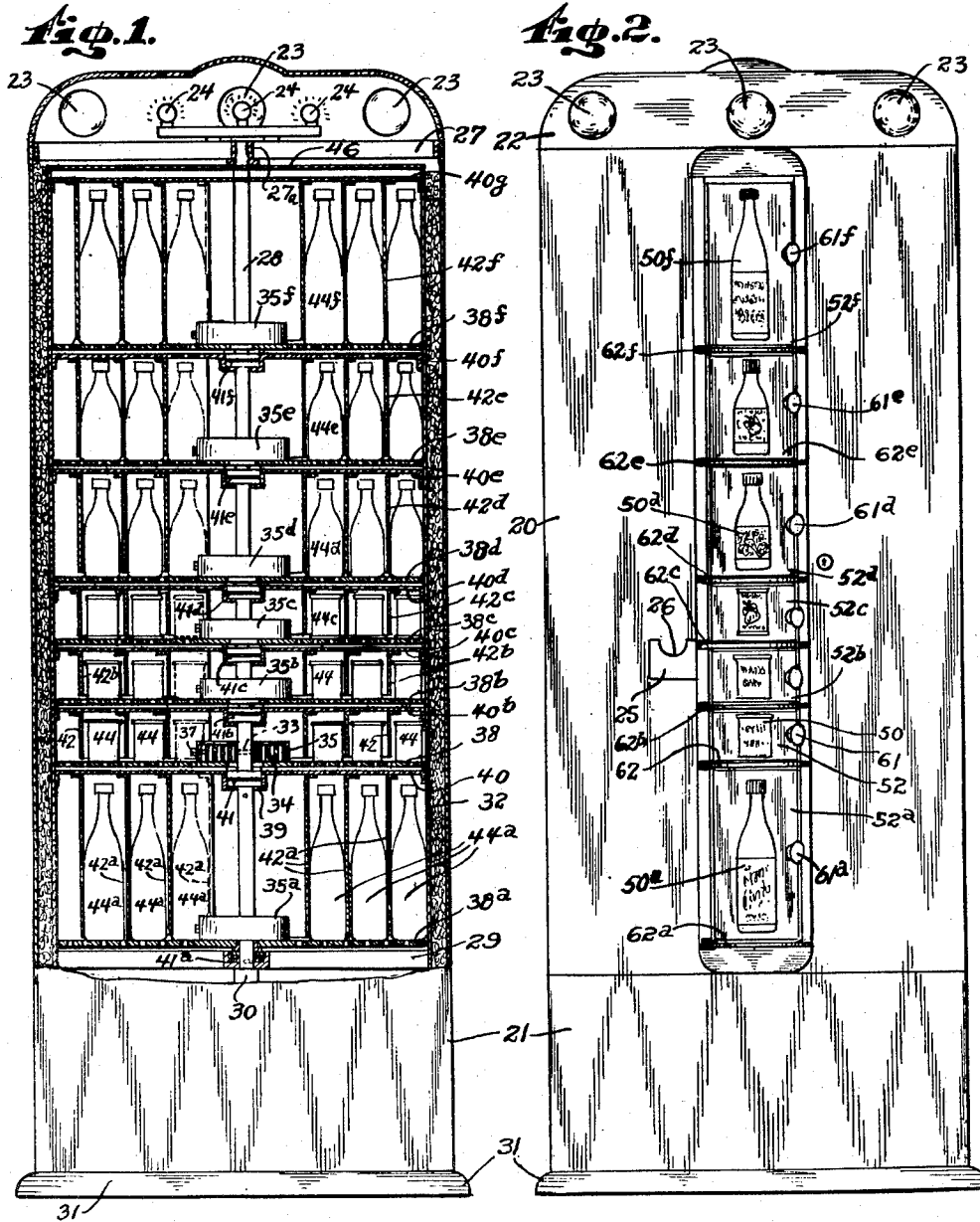
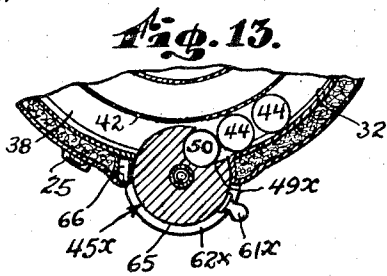
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2,423,265

VENDING MACHINE

Filed June 16, 1943

4 Sheets-Sheet 1



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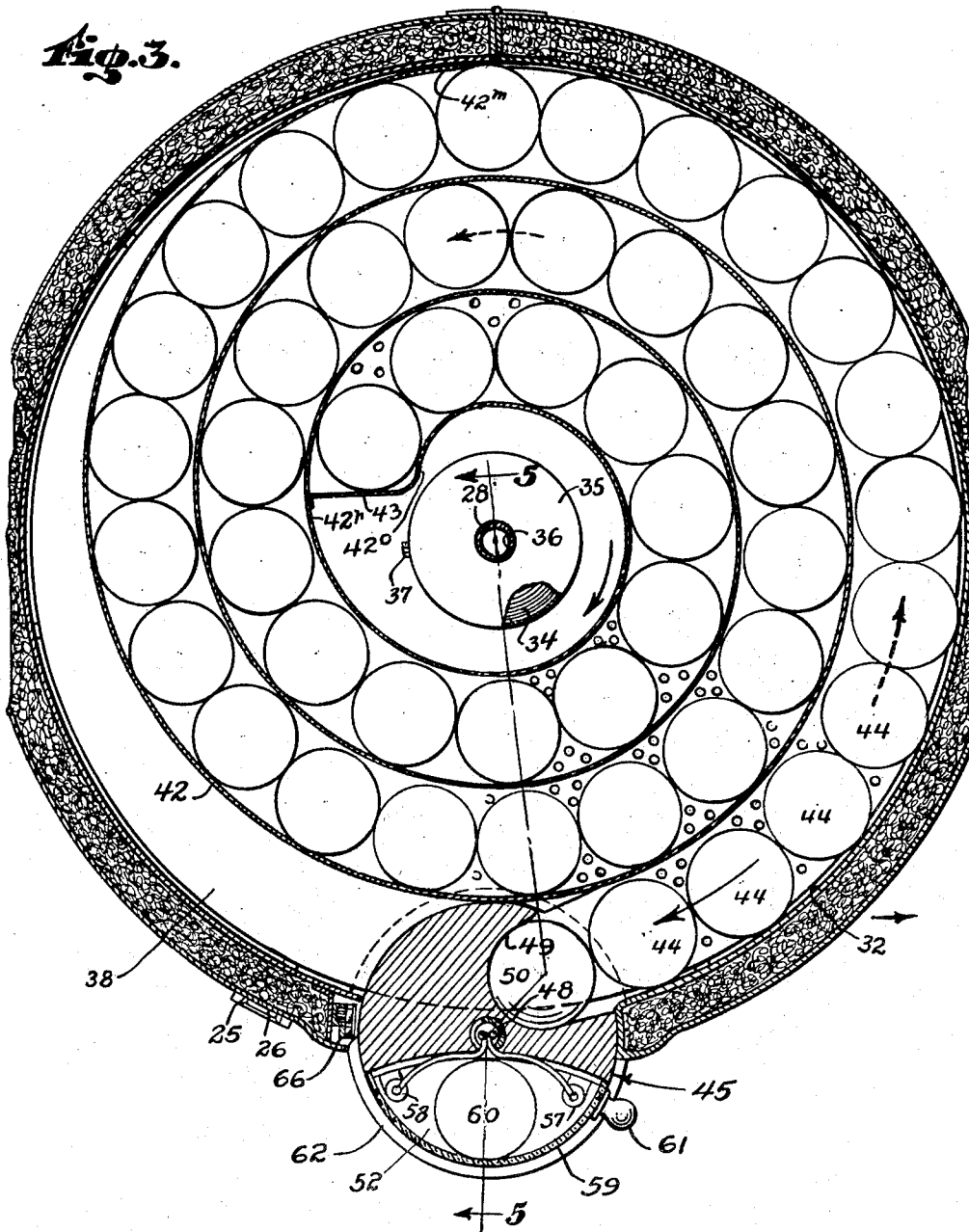
2,423,265

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4 Sheets-Sheet 2

**Fig. 3.**



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2,423,265

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4 Sheets-Sheet 3

*Fig. 4.*

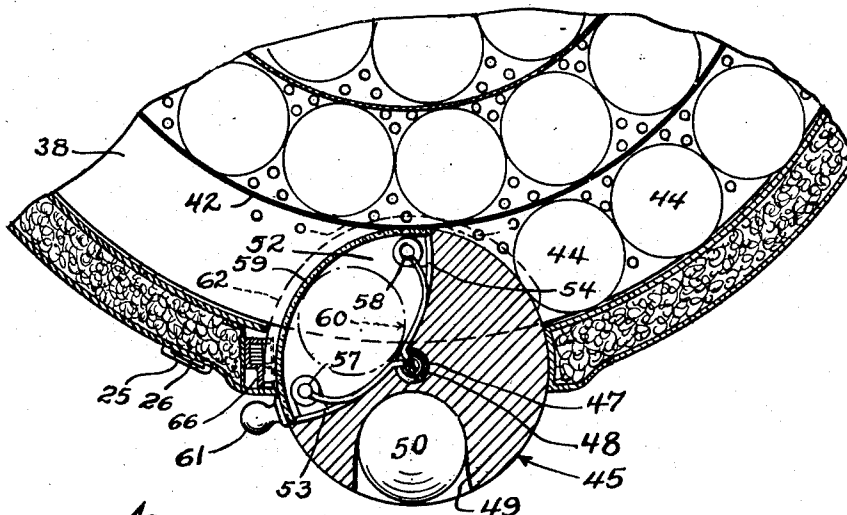
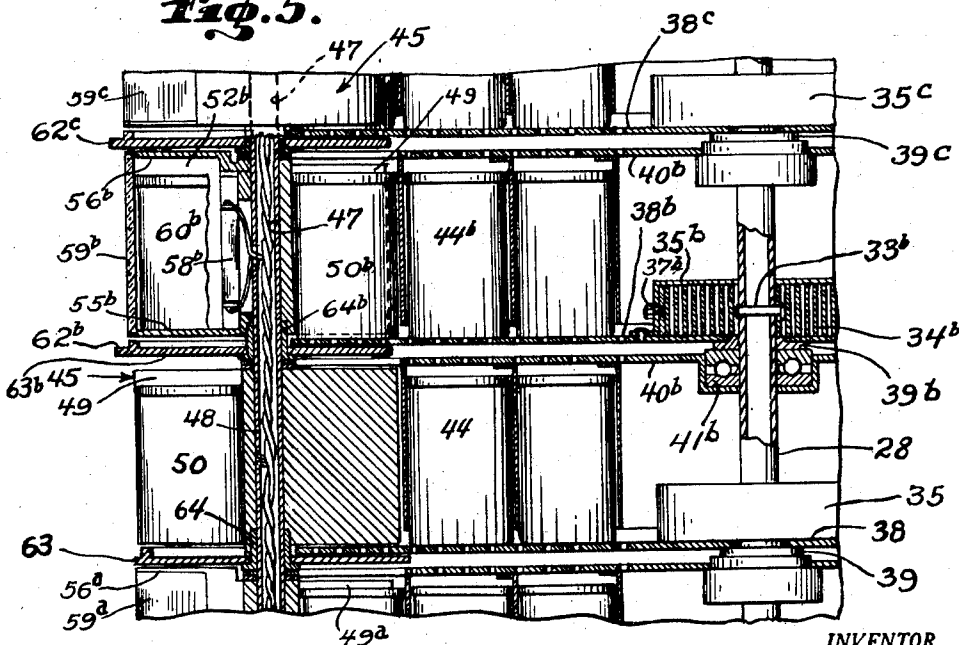


*Fig. 5.*



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**Fig. 6.**

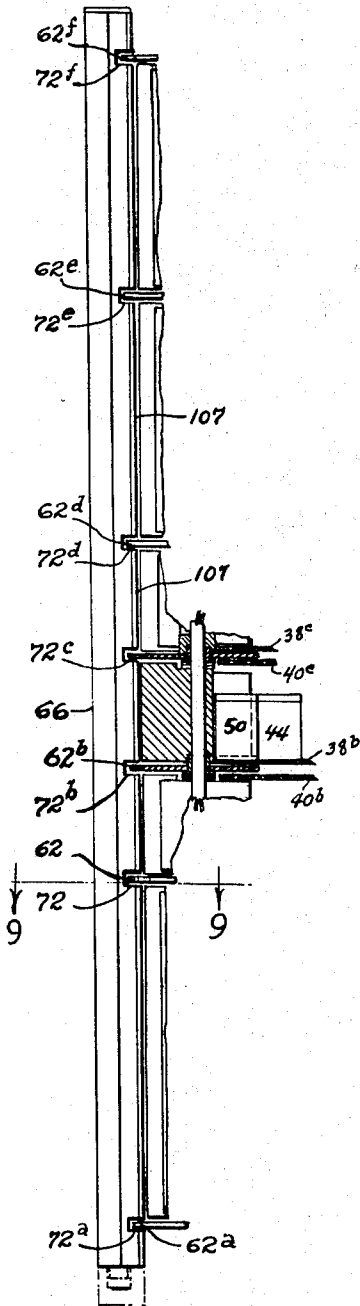


**Fig. 7.**

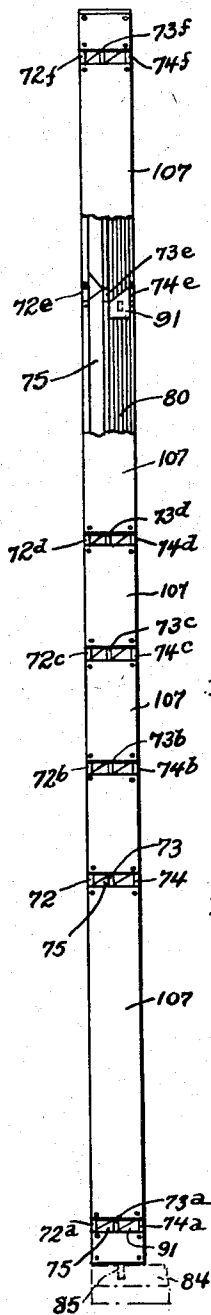


**Fig. 8.**

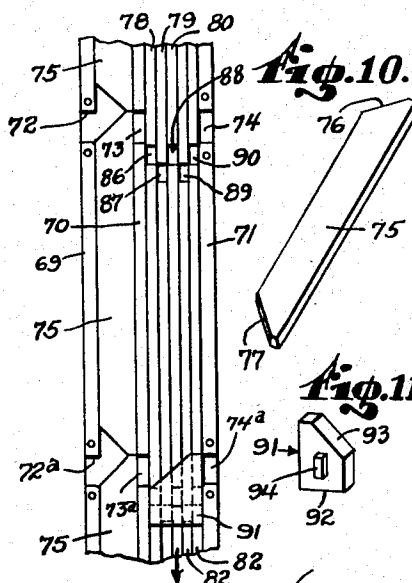


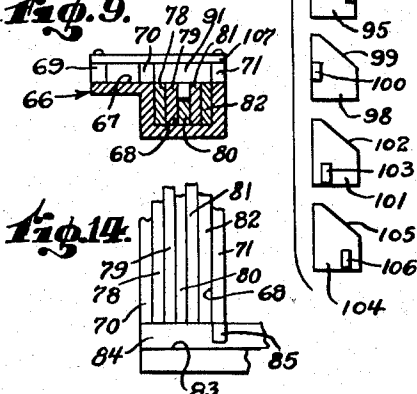
**Fig. 10.**

**Fig. 11.**

**Fig. 9.**

**Fig. 14.**

**Fig. 12.**



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## UNITED STATES PATENT OFFICE

2,423,265

## VENDING MACHINE

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Application June 16, 1943, Serial No. 490,995

12 Claims. (Cl. 312—97.1)

1

This invention relates to improvements in vending machines and has for an object the provision of a vending machine having a refrigerator cabinet and a plurality of rotary shelves therein, means associated with each shelf for urging it in a predetermined direction, stationary means associated with each shelf for guiding the bottles or wares thereon toward a delivery point, and coin-controlled means for each shelf for effecting the delivery one at a time therefrom.

Another object of the invention is the provision of individual delivery means for each shelf, coin mechanism adapted to render some of said delivery means operable when it receives coins of one value, and adapted to render others of said delivery means operable when it receives coins of a different value, and means common to all said delivery means and actuated by an operating delivery means for locking all the others against movement.

A further object of the invention is the provision, in a refrigerating machine for drinks, of delivery means for effecting the delivery of drinks therefrom with a minimum loss of refrigeration.

Yet another object of the invention is the provision, in a vending machine for drinks, of delivery mechanism for delivering drinks therefrom, said mechanism being adapted to illuminatedly display the kind of drink delivered thereby.

Other objects and advantages of the invention will be apparent to those skilled in the art upon a study of the following specification and the accompanying drawings.

In the drawings:

Figure 1 is an elevation, partly in section, of one embodiment of my new and improved drink vending machine for several drinks at different prices;

Figure 2 is an elevation of the machine shown in Figure 1;

Figure 3 is a transverse cross-sectional view of the machine showing the arrangement of the bottles or containers on a shelf and the means for urging said containers towards the delivery mechanism, one container having been engaged by the delivery mechanism and ready to be delivered;

Figure 4 is a fragmentary view similar to Figure 3 in which the delivery mechanism has been operated and the delivered container may be picked up by the customer;

Figure 5 is a sectional elevation of the delivery mechanism receiving the end container and showing the next succeeding container standing by;

2

Figure 6 is a side elevation of price bar mechanism for controlling the operability of the several delivery mechanisms;

Figure 7 is a face view of the machine shown in Figure 6;

Figure 8 is an enlarged view of the mechanism shown in Figures 6 and 7;

Figure 9 is a cross sectional view of the mechanism of Figures 6, 7, and 8, as seen along the line 9—9 of Figure 6;

Figure 10 is a perspective view of one of my lockout bars;

Figure 11 is a perspective view of one of my price bar cams;

Figure 12 is a group of price bar cams showing engaging lugs in different positions on each cam;

Figure 13 is a fragmentary view of a modified form of delivery door; and

Figure 14 is a fragmentary view of the lower end of the price bar mechanism with the cover removed, and showing a positionable member moved by a coin mechanism in accordance with the value of money received by the coin mechanism.

Referring first to Figures 1 and 2, the mechanism is enclosed in a tubular casing 20, the lower portion 21 of which may be used for storage, and which may also contain the coin box (not shown) for accepted coins after they leave the coin mechanism. The upper portion 22 of the casing may be domed and may be provided with bull's-eyes 23, behind which lamps 24 may be positioned for decorative effects.

A plate 25 on the wall of the cabinet has a slot 26 therein for receiving coins, and this slot communicates, through suitable conduits, with coin mechanism (not shown) adapted to receive single or plural coins and control a positionable member in accordance with the value of the coin or coins deposited, as will hereinafter be described.

Within the cabinet 20, near the upper end thereof is secured a spider ring 27, the hub 27<sup>a</sup> of which forms a rigid support for the upper end of a shaft 28. A second spider ring 29 secured within the lower portion of the inner cabinet wall 32 has a hub which engages and steadies the lower portion of the shaft 28, and an extension 30 of this shaft may extend through the lower portion (or compartment) 21 to the base 31 of the machine.

The shaft 28 (although shown as round in cross-section) may be of any desired cross-section, and the shaft carries a headed stud 33, similar to the

headed stud 33<sup>b</sup> shown in Fig. 5 the head of which is engaged by the apertured inner end of a spiral spring 34 which is housed in an inverted drum-like member 35, having a hole 36 therein forming a bearing on the shaft 28. The outer end of the spiral spring may be secured to the wall of the drum-like member 35 by means of a bolt 37. The shaft 28 is stationary and may be rigidly secured in the cabinet 20 in any suitable manner. For example, one way of rigidly securing the shaft in the cabinet is the provision of a bushing in the floor of the cabinet and securing the lower end of the shaft in said bushing by a key or pin. The upper end of the shaft 28 is fixed to the spider 27, and between the top and bottom of the cabinet the shaft is fixed to the spider 29.

A flat disc 38, which is preferably perforate, is secured to the spring drum 35 and is supported on a suitable bushing 39 which has a hole therein engaging the shaft 28 and supported by a thrust bearing like 41<sup>b</sup> to be presently described. The disc 38 forms a rotary shelf for supporting articles to be vended and is of a diameter clearing the inner surface of the inner wall 32.

Beneath the disc 38 is a disc-like member 40 having a flanged rim which is secured to the inner wall 32 in any suitable manner, for example by riveting, spot welding, etc. The mid-portion of the member is cupped downwardly, as shown, to accommodate a thrust bearing 41 supporting the bushing 39 and the flat disc or turntable 38. The thrust bearing 41<sup>b</sup> is shown enlarged in Fig. 5 and consists of a lower disc having an annular race formed on the upper surface thereof. This disc has a hole formed therein to clear the shaft 28, and its outer diameter is such that it forms a press fit with the depression formed in the flanged disc member 40<sup>b</sup>. The thrust bearing has an upper disc-like portion with a downwardly facing annular race. The outer perimeter of this disc clears the depression formed in the disc-like member 40<sup>b</sup> and the center hole may also clear the shaft 28. Between the two members of the thrust bearing is a row of balls which are engaged by the races above referred to. The weight of the rotary shelf 38<sup>b</sup> is impressed upon the upper member of the thrust bearing via the bushing 39<sup>b</sup>.

Beneath and spaced apart from the turntable 38 is a turntable 38<sup>a</sup> provided with a like spiral spring housed in a drum 35<sup>a</sup>. A thrust bearing 41<sup>a</sup> for the turntable 38<sup>a</sup> is supported by the spider ring 29.

Above and spaced apart from the turntable 38 are several other turntables designated as 38<sup>b</sup>, 38<sup>c</sup>, 38<sup>d</sup>, 38<sup>e</sup> and 38<sup>f</sup>, supported respectively on thrust bearings 41<sup>b</sup>, 41<sup>c</sup>, 41<sup>d</sup>, 41<sup>e</sup> and 41<sup>f</sup>, supported in downwardly cupped mid-portions of flanged disc-like members 40<sup>b</sup>, 40<sup>c</sup>, 40<sup>d</sup>, 40<sup>e</sup> and 40<sup>f</sup>, like the member 40. These turntables, like the turntable 38, are provided respectively with spring drums 35<sup>b</sup>, 35<sup>c</sup>, 35<sup>d</sup>, 35<sup>e</sup> and 35<sup>f</sup>.

Secured to the lower surface of the flanged disc-like member 40<sup>b</sup> is a spiral strip 42 extending vertically downward and having a portion at right angles thereto spot welded or attached in any other suitable manner to the member 40<sup>b</sup>. The downwardly extending portion of the spiral strip 42 amply clears the upper surface of the turntable 38.

Referring to Figure 3, the outer end 42<sup>m</sup> of the spiral strip 42 is substantially tangent to the inner wall 32 at the point 42<sup>m</sup> (opposite the delivery opening to be presently described). The inner end 42<sup>o</sup> at a point adjacent to the spring drum 35 terminates in an almost right angled portion 43

which is secured to the convolution of the spiral designated by the numeral 42<sup>r</sup>.

It will be understood that the member 40<sup>b</sup> is welded or otherwise stationarily secured to the inner wall 32, therefore the spiral 42 is also stationary.

Assuming the shelf 38 to be empty and it is desired to re-load it, the service-man opens a hinged section of the wall 32, exposing a portion of the shelf outside the outer convolution of the spiral, and places a plurality of merchandise containers 44 thereon. He then rotates the shelf 38 in a direction shown by the dotted arrows; this moves the containers 44 around the spiral and at the same time winds the spring 34. As soon as the first plurality of containers are moved in, exposing a second portion of the shelf, the service-man can place additional containers thereon. The service-man continues to move the shelf in the direction of the dotted arrows, placing additional containers thereon until the first or end container, which he placed on the shelf, comes to rest against the right angled portion (or inner end) 43 of the spiral and a continuous series of containers extends therefrom, about the convolutions of the spiral, to the delivery exit 45. The act of turning the shelf in the direction of the dotted arrows not only distributed the containers around in the spiral as just described, but also effected the winding of the spring 34.

With the shelf 38 full and with the spring 34 fully wound, the latter constantly urges the shelf in the direction of the solid arrows and insures the successive delivery of each and every one of the containers on the shelf 38 to the delivery exit 45.

A similar spiral 42<sup>a</sup> secured to the bottom of the member 40 cooperates with containers 44<sup>a</sup> on the shelf 38<sup>a</sup>. The height of the spiral is of course greater, as the space between the shelf 38 and the shelf 38<sup>a</sup> is greater, and as pointed out above, the spiral extends downwardly from its support and amply clears the shelf below.

Likewise, spirals 42<sup>b</sup>, 42<sup>c</sup>, 42<sup>d</sup>, 42<sup>e</sup>, and 42<sup>f</sup>, respectively, secured to and extending downwardly from stationary members 40<sup>c</sup>, 40<sup>d</sup>, 40<sup>e</sup>, 40<sup>f</sup> and 40<sup>g</sup>, amply clear and cooperate with merchandise containers on the rotary shelves 38<sup>b</sup>, 38<sup>c</sup>, 38<sup>d</sup>, 38<sup>e</sup>, and 38<sup>f</sup>, respectively, and the latter may be loaded with merchandise in the same manner as described above in connection with the shelf 38.

As each shelf is loaded, its spring is automatically wound up and will act in the same manner to effect the delivery of the merchandise containers to the respective delivery exits.

The inner wall 32 of the cabinet may be provided with a closure top 46, which may be secured thereto in any suitable manner.

The delivery mechanism, generally referred to by the numeral 45, consists of a generally round section, Figures 4 and 5, with a central vertical hole 47 therein which is journaled on a hollow shaft 48. A generally U shaped cavity 49 is formed in this round section without top or bottom walls. The end container 50, due to the urge of the rotary shelf 38 and the action of the spiral 42, enters the cavity 49 and continues to rest on the shelf 38 until the delivery mechanism is operated, as will presently be described.

A second cavity 52 is formed in the delivery mechanism, the sides 53 and 54 of which are angular, with respect to each other, greater than 90°, and this cavity may be termed a "display niche." It also has a bottom wall, and a top wall, (not shown) but which are identical with the

5

bottom wall 55<sup>b</sup> and the top wall 56<sup>b</sup> of the cross-sectioned delivery mechanism just above the mechanism 45.

Within the display niche are lamps 57 and 58, which are preferably tubular in form, for illuminatingly displaying the sample container 60. A curved panel 59 of glass or transparent plastic is removably secured to the delivery exit body, in any suitable manner, for enclosing the sample container 60 and the lamps 57 and 58. A knob 61 is secured thereto for rotating the delivery mechanism body, as will presently be described.

Beneath the bottom wall of the delivery mechanism 45 is a circular platen 63, which may have formed integral therewith an arcuate cam 62 of a predetermined length. This cam cooperates with release bar cams in a manner to be presently described.

A bushing 64 forms a working fit on the shaft 48 and has a polygonal shank which fits aligned matching polygonal holes formed in the platen 63 and in the lower end of the hole 47, with the result that when the delivery mechanism is rotated to deliver an end container (50, for example) to the customer, by moving the knob 61 around to the position shown in Figure 4, the container, which was at the beginning of the operation positioned in the cavity 49 and resting on shelf 38, is by this movement, slid off the shelf 38 and onto the platen 63 (still positioned in the cavity 49). When the knob 61 reaches the position shown in Figure 4, the container 50 is in front and may be picked up by the customer.

As soon as the delivery mechanism is returned to its normal position, which is the position shown in Figure 3, the succeeding container, due to rotative urge of the spring 34 on the shelf 38, as described above, passes into the cavity 49 and is ready to be delivered when the delivery mechanism is again turned to the left. Due to the presence of the fixed spiral 42, this action may continue until the last container on the shelf 38 is delivered.

The other delivery mechanism 45 associated with the other shelves are substantially the same (except for height) and they all operate in the same manner, therefore they are given the same numerals as the one described above with an additional letter corresponding to that of the shelf with which the delivery mechanism is associated. For example, the parts of the delivery mechanism associated with the shelf 38<sup>a</sup> have the letter "a" added to the numeral, etc.

A modified form of the delivery mechanism 45<sup>x</sup> is shown in Figure 13, wherein the rotative portion consists of a solid cylinder having a single open ended cavity 49<sup>x</sup> formed therein, and the illuminated display niche is eliminated. The wall portion 65 may, if desired, carry decorative effects. A knob 61<sup>x</sup> is provided for rotating the delivery mechanism, and an arcuate cam lip 62<sup>x</sup> is provided for determining whether or not said mechanism may be rotated, as will be hereinafter explained.

Referring now to Figures 6 to 12, inclusive, and 14, a stepped bar member 66 has a comparatively shallow channel 67, and a deeper channel 68 formed therein. The channel 67 lies between longitudinal walls 69 and 70, and the longitudinal walls 70 and 71 define the channel 68. Lateral aligned slots 72, 73, and 74 are formed respectively in the walls 69, 70, and 71. In Figures 6 and 7, a set of similar slots are shown at 72<sup>a</sup>, 73<sup>a</sup>, and 74<sup>a</sup>, below the slots 72, 73, and 74, a distance equal to the distance between the cam lip

6

62 and the cam lip 62<sup>a</sup> (Figure 2). Other sets of slots 72<sup>b</sup>, 73<sup>b</sup> and 74<sup>b</sup>; 72<sup>c</sup>, 73<sup>c</sup>, and 74<sup>c</sup>, etc., are provided to receive the cam lips 62<sup>b</sup>, 62<sup>c</sup>, etc.

The stepped bar member 66 is positioned vertically with the slots above referred to in positions where the cams 62, 62<sup>a</sup>, 62<sup>b</sup>, 62<sup>c</sup>, etc., may enter them. This position may best be seen in Fig. 3.

Within the channel 67 is a plurality of bars 75 having beveled ends 76 and 77. These bars are of lengths corresponding to the distances between the cam lips 62, 62<sup>a</sup>, 62<sup>b</sup>, 62<sup>c</sup>, etc., and are so proportioned that when any one cam lip is positioned between the adjacent ends of any two bars, the entire length of the channel is filled up and no other cam lip can enter between any of the other bars 75. The beveled ends facilitate the entrance of a cam lip between the adjacent ends of the two bars with which it cooperates (when no other cam lip is between any other bars).

Within the channel 68 are price bars 78, 79, 80, 81, and 82, the lower ends of which terminate adjacent to a cross-slot 83 formed in the lateral extension 66<sup>a</sup> of the bar member 66 at the bottom of, and at a right angle to, the channel 68. A positionable bar member 84 is mounted in the slot 83 and has a slot 85 formed therein which is normally beneath the lower end of the wall 71. The positionable bar member 84 may be connected to a suitable coin mechanism (not shown) which positions the member 84 in accordance with the value of the money inserted. For example, if 5¢ is inserted, the coin mechanism would move the member to bring its slot 85 below the price bar 82; 10¢ would cause the slot to align with the price bar 81; 15¢ would align it with price bar 80; 20¢ would align it with price bar 79; and 25¢ would align it with the price bar 78.

The price bars 78 to 82, inclusive, are urged upwardly by spring means (not shown), and the lower ends thereof clear the positionable member by a few thousandths of an inch permitting it to be moved freely by the coin mechanism. It is obvious that if the positionable member 84 is moved to a point where the slot 85 is positioned below the price bar 82 (which is described above as the 5¢ bar), the price bar may be moved downwardly against the urge of the spring means referred to above, and its lower end will enter said slot. It is also obvious that none of the other price bars can be moved down because they would encounter solid portions of the positionable member.

The price bars all have slots formed therein, spaced to correspond to the distances between the cam lips 62, 62<sup>a</sup>, 62<sup>b</sup>, 62<sup>c</sup>, etc. (Figure 2). It will be noted in Figure 8, that these slots are staggered to prevent interference, slots 86, 88, and 90, in bars 78, 80, and 82 being aligned, and slots 87 and 89, in bars 79 and 81 being out of alignment with slots 86, 88, and 90, but in alignment with each other.

Referring now to Figure 11, a removable key 91 is shown. It consists of a rectangular block 92 having a beveled face 93 formed thereon, and integral with and extending rearwardly from the block is a rectangular tongue 94. This tongue is positioned on the vertical center line of the block and is therefore adapted to be positioned in any slot 88 in the price bar 80 (described above as the 15¢ bar). If more than one shelf in the vending machine carried 15¢ merchandise, the same number of keys 91 may be placed in engagement with corresponding slots in the 15¢ price bar 80.

7

One is shown in Figure 8 positioned between the wall slots 73<sup>a</sup> and 74<sup>a</sup>.

In Figures 6 and 7, the positionable member 84 is shown with its slot 85 below the price bar 80, due to the fact that 15¢ was inserted in the machine. The cam lip 62<sup>a</sup> (on the bottom delivery mechanism, as the latter is turned) enters the slot 72<sup>a</sup> and first engages the beveled surfaces of the adjacent bars 75, cams them apart and passes between them—thus locking out all of the other cam lips. As the delivery mechanism is rotated further, the cam lip 62<sup>a</sup> engages the beveled face 93 of the key 91, and forces the price bar 80, with which the key 91 is associated, downwardly and causes the lower end of the price bar 80 to enter the slot 85 in the positionable member 84. The delivery mechanism is turned further until the cavity 49 containing the merchandise is accessible, and the customer may remove the same.

It will also be noted that a key 91 is associated with the delivery mechanism carrying the cam lip 62<sup>a</sup>, therefore if the purchaser, after depositing 15¢, decided to choose that merchandise, he could obtain it by operating that delivery mechanism in the same manner.

In Figure 12 are shown other keys to be associated with other price bars. First is key 95 having a beveled face 96, and a rectangular boss 97, positioned to engage notches 86 in the 25¢ price bar only. Next is key 98 having a beveled face 99 and a rectangular boss 100, positioned to engage only notches 90 in the 5¢ price bar 82. The third key 101 in this group has a beveled face 102 and a rectangular boss 103, adapted to engage only notches 89 in the 10¢ price bar 81. A key 104 has a beveled face 105 and a rectangular boss 106 adapted only to engage notches 87 in the 20¢ price bar 79.

With the above described keys 91, 95, 98, 101 and 104, several priced shelves of merchandise may be carried in the machine and the price bars may be "keyed up" in accordance with the prices. The keys are positioned in the channel 68, above the price bars as seen in Figure 9, and are retained therein by removable cover plates 107, which also retain the bars 75 therein.

Although I have shown and described my new and improved vending machine as vending drinks in containers or bottles, it must be understood that the machine will vend liquids or any other kinds of commodities packaged in any desired manner, and I intend to use the machine for vending said commodities.

It will also be understood that many changes may be made in the arrangements shown and described without departing from the scope of the invention as set forth in the appended claims. I claim:

1. In a vending machine for packages or containers, a casing, a rotary shelf mounted in said casing, a delivery exit, a plate above and spaced apart from said shelf, said plate being fixedly secured in said casing, a spiral member formed of a strip secured to said plate in edgewise relation, said strip having its bottom edges clearing said shelf and forming therewith a spiral passage, and means constantly applying a rotative urge to said shelf in a direction in which the radius vector of the spiral increases.

2. In a vending machine for packages or containers, a casing, a vertical shaft mounted in said casing and secured against rotation, a shelf in said casing rotatably mounted on said shaft, a delivery exit, a plate rigidly secured to said

8

casing in spaced parallel relation above said shelf, a spiral member secured in depending relation to said plate and having its lower limits clearing said shelf, said member lying in a plane parallel to said shelf and forming therewith a spiral passage along which the containers may be guided, and a spiral spring positioned on and having its outer end secured to said shelf, the inner end of said spring being secured to said fixed shaft, said spring being adapted to constantly apply a rotative urge to said shelf in the direction in which the convolutions of said passage increase in radius.

3. In a vending machine for packages or containers, a round casing, a fixed vertical shaft centrally located therein, a disc-like shelf rotatably mounted on said shaft and adapted to support a plurality of said containers, a delivery exit, a disc-like member above and spaced apart from said shelf, said member being fixedly secured to said casing, a spiral member depending from and secured to said disc-like member and having its axis concentric with said shaft, said spiral member having its lower edges clearing said shelf, said spiral member and said shelf conjointly forming a spiral guideway for said containers, and spring means secured to said shelf and constantly urging the latter in a direction to cause said containers to traverse said passage outwardly to said exit.

4. In a vending machine for packages or containers, a round casing, a vertical shaft centrally located therein, a thrust bearing rigidly supported on said shaft, a disc-like shelf rotatably carried on said shaft and supported by said thrust bearing and adapted to support a plurality of said containers, a discharge exit, a fixed plate secured within said casing in spaced parallel relation above said shelf, a spiral member secured in depending relation to said plate and having its lower edges clearing said shelf, said member and said shelf conjointly forming a spiral guideway for said containers, the outer extremity of said guideway terminating at said delivery exit, a spring drum journaled on said shaft and secured to said shelf, a spiral spring within said drum with its inner end secured to said shaft and its outer end secured to said drum for urging said shelf in a direction in which the radius vector of the spiral member increases.

5. In a vending machine for packages or containers, a cylindrical cabinet, a fixed central vertical shaft therein, a series of spaced disc-like shelves rotatably carried on said shaft, individual spring means for each shelf, each being adapted to urge its shelf in a predetermined direction, fixed means above each shelf and forming therewith a spiral guide-way the radii of the convolutions of which increase in said direction, whereby containers on said shelves are, due to the urge on said shelves, advanced outwardly along said guide-way, and a delivery mechanism for each of said shelves having a cavity adapted to receive containers from the largest convolution of said guide-way.

6. In a vending machine for packages or containers, an upright cylindrical cabinet, a fixed central vertical shaft therein, several disc-like shelves rotatably carried on said shaft in spaced relation to each other, a fixed support below each of said shelves, a thrust bearing carried on each of said supports, an additional fixed support above and spaced apart from the uppermost of said shelves, spiral means depending from each of said supports, except the lowest

9

one, toward the shelf immediately below it and forming therewith spiral guide-ways for said containers, a delivery exit at the outer terminus of each of said guide-ways, and means on each shelf for constantly urging said shelves in the direction of the terminus of its guide-way.

7. In a vending machine for packages or containers, a vertical cylindrical cabinet, a fixed central vertical shaft therein, a plurality of circular shelves rotatively mounted on said shaft in spaced relation to one another, a plurality of delivery exits on said cabinet, one exit being provided for each shelf, said exits each being comprised of a vertical cylinder extending through the wall of said cabinet and having a cavity therein normally positioned within said cabinet and adapted to be rotated to a position where said cavity is outside said cabinet, and means individual to each shelf for urging said containers to the respective delivery exits, said means including an individual spiral spring mounted on and having its outer end secured to one of said shelves, and having its inner end connected to said shaft, and individual spiral guide means above each shelf forming therewith a spiral passage, the terminus of which is adjacent to the respective delivery exit.

8. In a vending machine for packages or containers, a vertical cylindrical cabinet, a fixed central vertical shaft therein, a plurality of spaced circular shelves rotatively mounted on said shaft,

10

a plurality of delivery exits on said cabinet, one of said exits for each shelf, and means partly on each of said shelves and partly fixed above in uniform spaced relation with each shelf for urging said containers to their respective delivery exits, said means partly on each shelf comprising an individual spiral spring mounted on and having its outer end secured to said shelf and its inner end fixed to the shaft, and the means partly fixed above each shelf comprising a stationary spiral strip above each shelf having its terminus diametrically opposite the delivery exit for said shelf.

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## REFERENCES CITED

The following references are of record in the file of this patent:

## UNITED STATES PATENTS

| Number    | Name      | Date          |
|-----------|-----------|---------------|
| 1,820,671 | McCormick | Aug. 25, 1931 |
| 1,969,401 | Goodin    | Aug. 7, 1934  |
| 1,715,667 | Metric    | June 4, 1929  |
| 2,124,500 | Taylor    | July 19, 1938 |
| 1,173,720 | Hughes    | Feb. 29, 1916 |
| 2,103,391 | Scofield  | Dec. 28, 1937 |
| 2,113,386 | Schneider | Apr. 5, 1938  |
| 2,288,759 | Welton    | July 7, 1942  |