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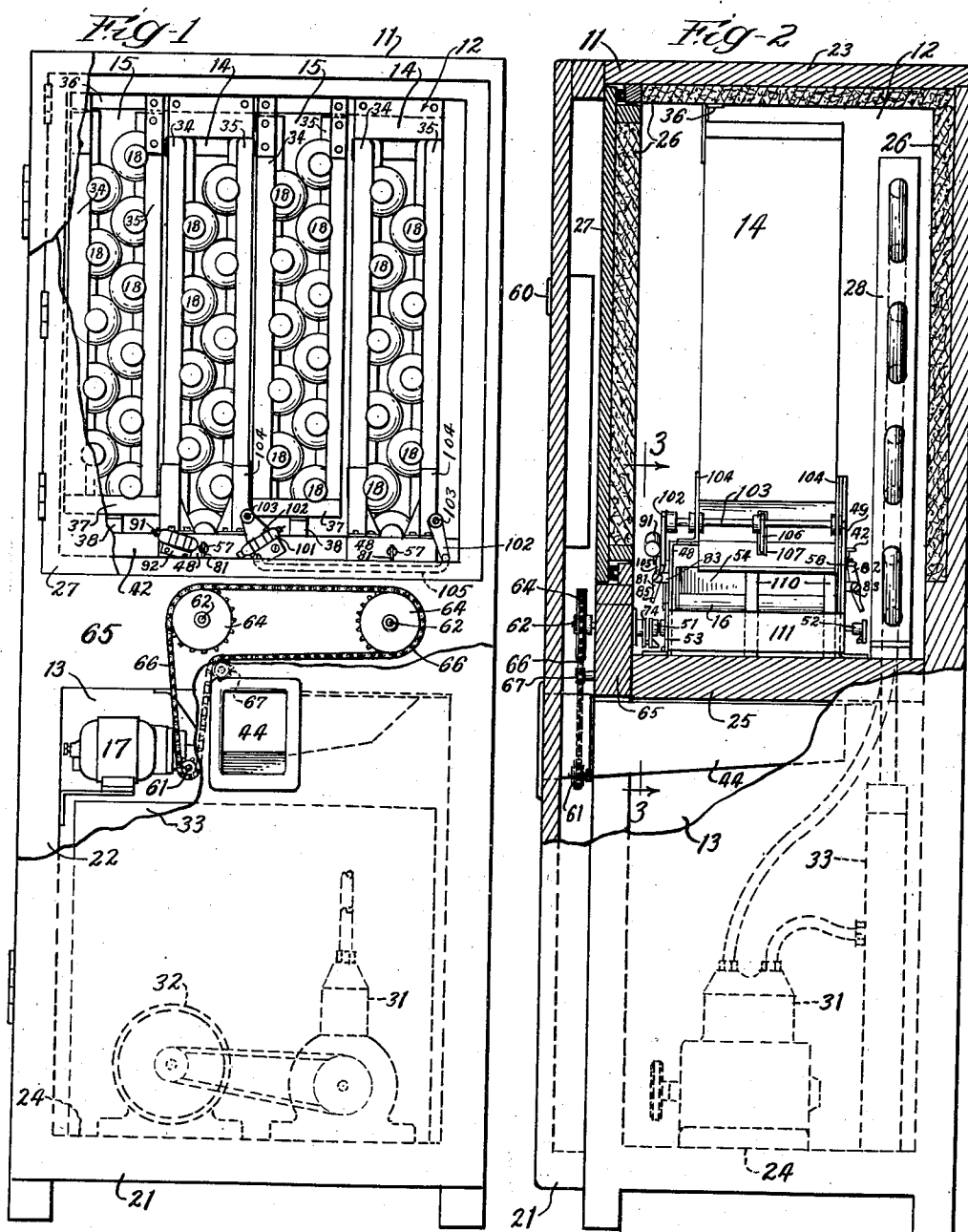
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2,308,532

VENDING MACHINE

Filed Feb. 29, 1940

3 Sheets-Sheet 1



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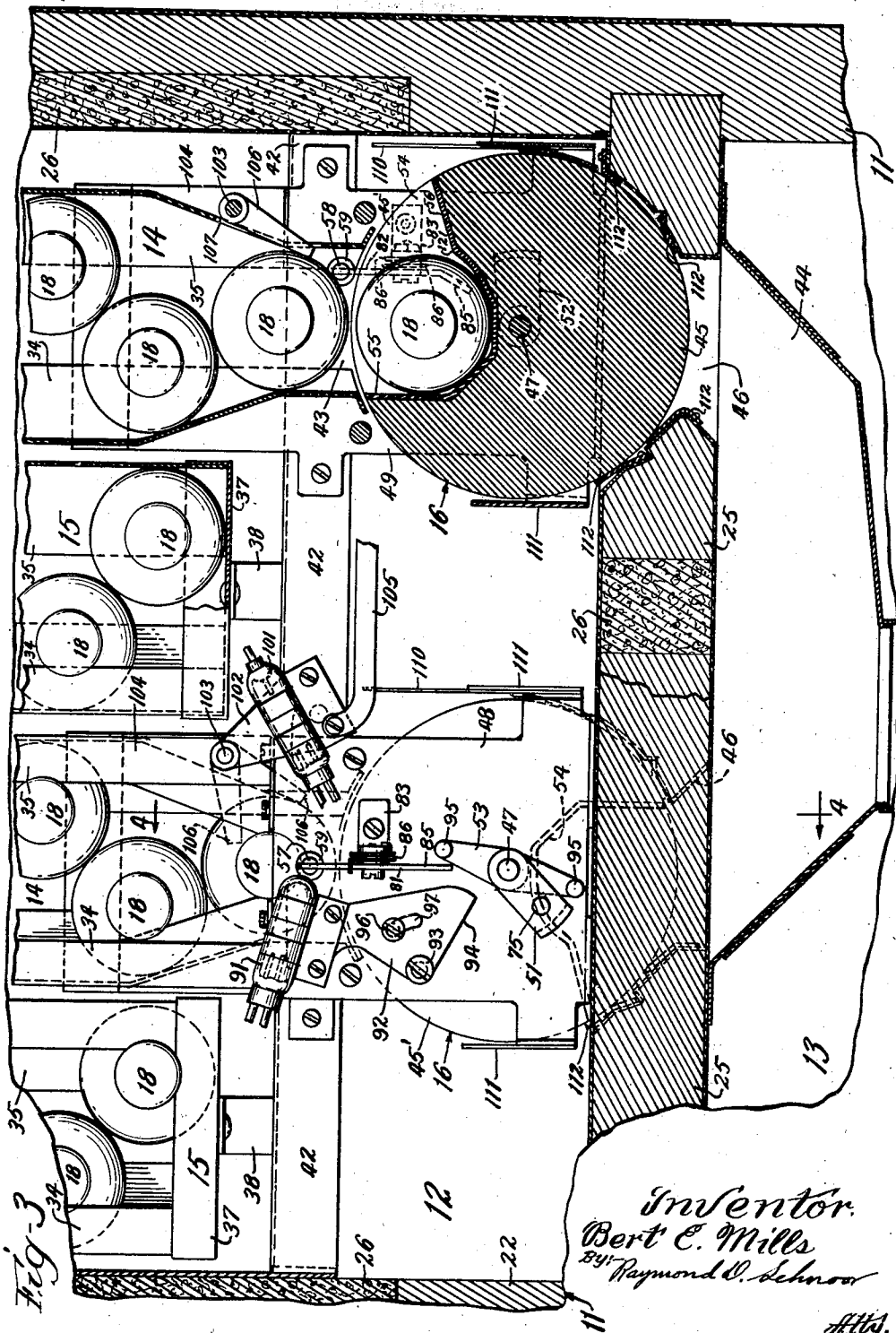
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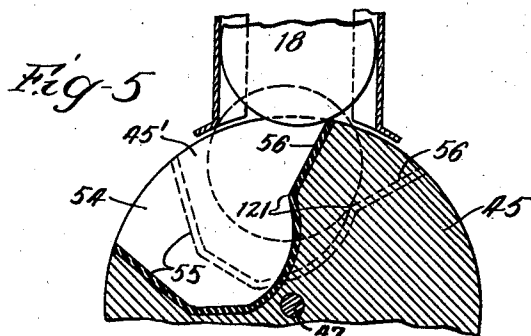
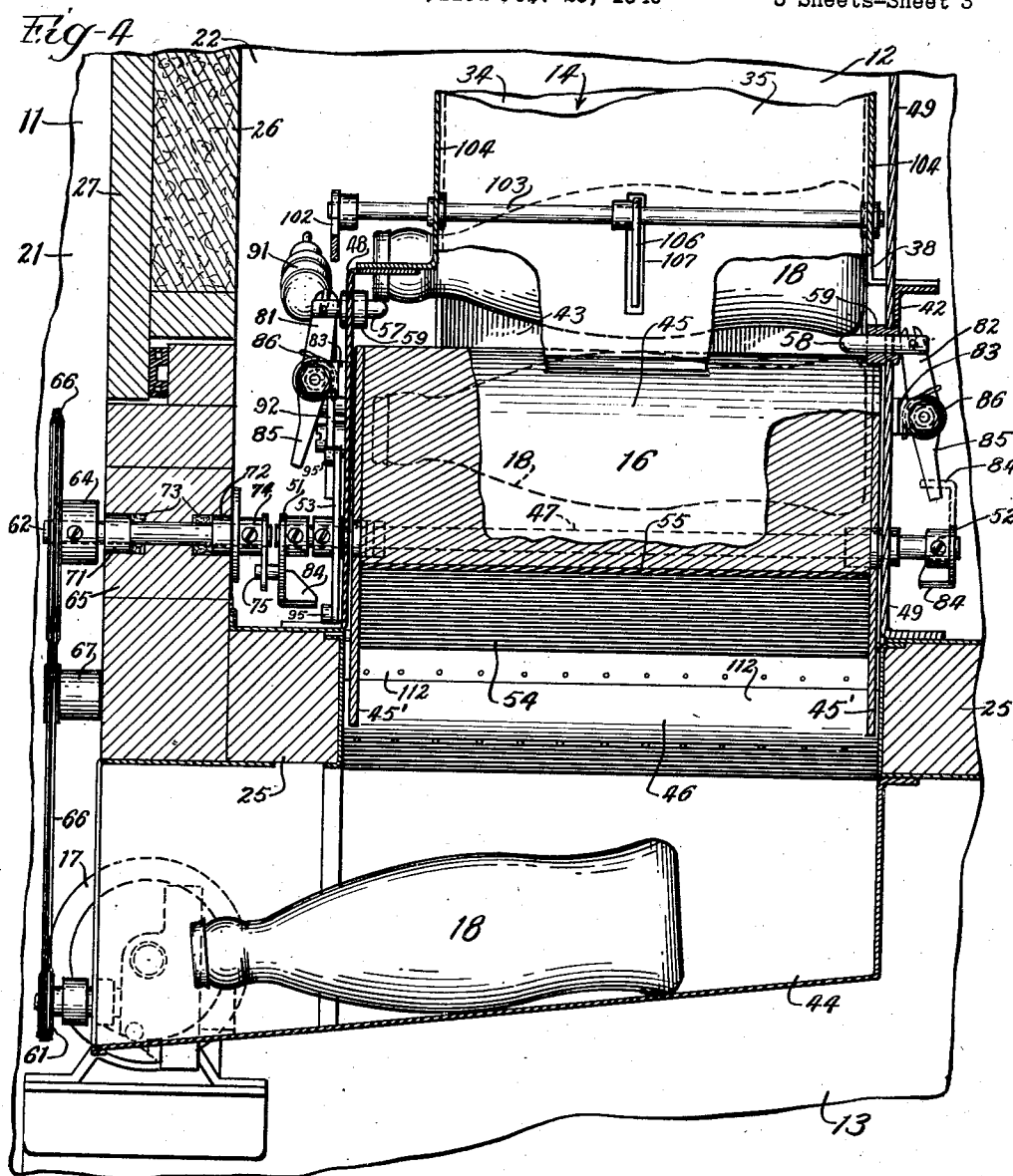
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UNITED STATES PATENT OFFICE

2,308,532

VENDING MACHINE

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Application February 29, 1940, Serial No. 321,455

8 Claims. (Cl. 312—36)

This invention relates in general to a vending machine and more particularly to such a device of the type adapted for vending or dispensing merchandise contained in bottles or other packages and wherein the packages may be stored in a refrigerated condition.

An important object of the invention is to provide such a machine which is particularly adapted for vending merchandise in packages which are relatively heavy, such as bottled liquids, without material interference from the weight of the packages and with a minimum of power.

A further object of the invention is to provide such a device in which the escape of cooled air from the refrigerating or cooling compartment is reduced to a minimum whether or not the machine is operated, so that a corresponding reduction in refrigerating costs is effected.

Other objects such as the economy of construction and efficiency of operation will be apparent as the invention is better understood from the following description, which, taken in connection with the accompanying drawings discloses an embodiment thereof.

Referring to the drawings:

Figure 1 is a front elevational view of a vending machine embodying the invention, portions of the front thereof being broken away to show details of construction.

Fig. 2 is a side elevational view of the device shown in Fig. 1 having portions thereof similarly broken away to show details and showing the device as viewed from the right in Fig. 1.

Fig. 3 is an enlarged sectional detail view in which parts are broken away to show details of construction, the view being taken substantially on line 3—3 in Fig. 2.

Fig. 4 is a vertical section taken substantially on line 4—4 in Fig. 3 illustrating features of construction and operation; and,

Fig. 5 is a diagrammatic view illustrating the control of the lowering of the packages as effected by the delivery devices.

To illustrate the invention, a cabinet 11 is shown, in which a cooling or insulated compartment 12 and a mechanism compartment 13 is formed, and in which duplicate vending magazines 14, similarly duplicated storage magazines 15, and duplicate delivery devices 16 are arranged and mechanically connected for operation by means of a motor 17, as will be later described, for vending packages 18 from the magazines 14. For illustrative purposes the packages 18 shown represent bottles containing liquid, such as a beverage and it will be obvious that the machine

may be adapted to vend any other similarly packaged product.

The cabinet illustrated is box-like and formed by four rectangularly arranged perpendicular walls including a front wall 21 which is hingedly connected to a side wall 22 to permit access to the compartments 12 and 13, suitable top and bottom walls 23 and 24, and a partition or dividing wall 25 separating the inclosure formed by the above-mentioned walls to form the compartments 12 and 13.

The compartment 12 may be insulated by means of laminations of insulating material 26 arranged about or mounted in the walls of the compartment and an inside door 27 may be provided to keep the compartment 12 closed, while access to the compartment 13 is permitted. The compartment 12 should be large enough to provide ample space for the magazines 14 and 15 and for the free circulation of air for cooling, and for the cooling unit 28 of a refrigeration apparatus when mechanical refrigeration is required.

The compartment 13 provides an inclosure for containing mechanical refrigeration apparatus, such as a compressor 31, a motor 32 therefor, and a condenser 33, whereby operation of the cooling unit 28 is sustained.

The vending magazines 14 and storage magazines 15 are formed between spaced perpendicularly mounted channel members 34 and 35 secured together and to the top wall 23 of the cabinet 11 by means of suitable plates or brackets and an angle strip 36 extending across the top of the magazines.

The width of the channel members 34 and 35 is proportioned in accordance with the length of the main body portion of the packages to be vended and they are spaced apart a distance exceeding the diameter of the package by fifty per cent to seventy-five per cent so that when stacked in the magazines the packages will be staggered as illustrated. This arrangement of the packages has the effect of retarding the response of the packages to the influence of gravity, reduces the height required for stacking a given number of packages, and permits of the loading of packages into the magazines from the front.

Bottom closures 37 are provided for closing the lower extremities of the storage magazines 15 and these are supported on brackets 38 arranged for attachment to an angle member 42 extending across the compartment 12 near the base of the

magazines and supported above the partition 25 as shown, Fig. 3.

The lower extremities of the channels 34 and 35 forming the vending magazines 14 are bent inwardly to form a narrow outlet opening 43 the width of which is only slightly greater than the largest diameter of the packages to be vended so that packages may be discharged therefrom one at a time and in substantially the same position.

One of the delivery devices 16 is arranged beneath or adjacent the outlet opening 43 of each one of the vending magazines 14 and in accordance with a feature of this invention controls the movement of packages from the magazine. In accordance with another feature of this invention, the delivery devices 16 are arranged to transmit the packages from the magazines 14 through a wall of the cabinet 11, such as the partition 25 therein, to a discharge chute 44 or the like from which they may be manually removed.

Accordingly, a substantially cylindrical rotor 45 is provided to form the delivery device 16 and arranged for controlling the outlet opening 43 of each one of the vending magazines 14 above described. These rotors 45 are also arranged to control or seal discharge openings 46 formed in the partition or wall 25 directly beneath the magazines and to deliver packages received from the magazines through this wall and into the discharge chute 44.

The rotors 45 may be formed of wood or similar material having insulating properties and are mounted on and suitably secured for rotation with axially disposed shafts 47 having journal bearings in support brackets 48 and 49 arranged at the front and back ends respectively of the rotors 45 and attached to the wall 25 for supporting the rotors thereon and in the proper relationship with respect thereto.

The shaft 47 extends through and beyond the brackets 48 and 49 to receive release cams 51 and 52; one of which is located adjacent each end of the rotors, and a switch actuating crank 53 all of which may be secured to the shaft 47 in any suitable manner, such as by means of set screws as shown in Fig. 4.

A pocket 54 is formed in each one of the rotors 45 that is properly proportioned to receive one of the packages 18, as best shown in Figs. 3 and 5, each time the pocket is presented beneath the magazine by unidirectional rotation of the rotor 45. The pocket 54 extends between end plates 45' secured to the ends of the rotor and may be provided with a lining 55 of rubber or some other suitable cushioning material. The pocket 54 is made relatively wide at the periphery of the rotors so that a cam face 56 forming an inclined plane may be provided whereby movement of a package 18 into the pocket 54 as an incident to rotation of the rotor 45 may be controlled as indicated by the solid and dotted line positions of the pocket in Fig. 5.

Stop pins 57 are arranged at the front of the magazine 14 in position to engage under the lowermost package 18 in the magazine and a similar stop pin 58 is arranged at the back of the magazine to cooperate therewith. The stop pins 57 and 58 are arranged for axial movement in bush bearings 59 mounted in the support brackets 48 and 49 and to engage and hold the lowermost package in the magazine slightly above the rotor 45 during rotation thereof so as to relieve it of any perpendicular load while rotating, as illustrated in Fig. 3.

The pockets 54 are staggered in the rotors 45 for sequential presentation at the openings 46 and to the extent of 180 degrees as illustrated in Fig. 3 when coupled in pairs, so that one package will be delivered from one or the other of said rotors in response to each one-half revolution thereof.

To provide means for actuating the rotors 45 the motor 17 is illustrated. This motor may be electrically connected to operate in response to any suitable switch and subject to a coin mechanism indicated at 60 in Fig. 2. The motor 17 illustrated is of the high speed type and contains inclosed reducing gears whereby a sprocket 61 carried thereby is rotated at a relatively slow speed.

Jack shafts 62 each carrying a sprocket 64 whereby the shaft may be rotated are journaled in sealed bearings formed in a frame member 65 of the housing 11 in axial alignment with the shaft 47 of each one of the rotors 45, and a suitable endless chain 66 extending about the sprockets 61 and 64 and an idler sprocket 67 forms a drive connection.

Sealed bearings for the jack shafts 62 are provided to reduce or prevent the exchange of heat between the compartment 12 and the outside atmosphere and to provide such a bearing, end bushings 71 and 72 are shown in Fig. 4, carrying the shaft 62 adjacent the opposite faces of the frame member 65 and packed with a suitable sealing material 73.

Each shaft 62 extends from the inner face of the frame member 65 to receive a crank arm 74 which may be secured for rotation therewith by means of a set screw or the like. The end of the crank arm 74 may be bifurcated or apertured to receive a drive pin 75 which may be rigidly secured to the release cam 51 in position to engage the arm 74 upon assembly so that the shafts 47 and 62 are continuously connected for simultaneous rotation while assembled.

To facilitate operation of the stop pins 57 and 58 by means of the release cams 51 and 52, bell crank levers 81 and 82 are shown. These levers are pivoted in bearing brackets 83 secured to the support brackets 48 and 49, and are engaged at their upper ends with the stop pins as illustrated in Figs. 3 and 4. The depending ends of the levers 81 extend into the path of cam lips 84 formed on the release cams 51 and 52 and form cam levers 85 for cooperating therewith. The cams 51 and 52 are arranged with respect to the levers 85 so that the stop pins 57 and 58 will be simultaneously withdrawn from beneath a package 18 at the proper instant and against the yielding action of suitable coil springs 86 wrapped about the bearing for the levers and normally urging the stop pins into holding position as shown.

Where the motor 17 is operated subject to a coin control and through a holding switch means is provided for opening the motor circuit after a package has been delivered from one or the other of the rotors 45 and to provide such a means a mercury switch 91 is shown mounted on a bracket 92 pivotally supported on the support bracket 48 by means of a shoulder screw 93 and presenting a cam face 94 for engagement by pins 95 one of which is carried at each end of the switch actuating crank 53. A shoulder screw 96 extending through a radially formed slot 97 in the bracket 92 and engaged in the support bracket 48 limits the relative movement of the switch 91.

To provide means for opening the power circuit

of the motor 17 to prevent operation when the magazines 14 are empty a switch 101 of the mercury type is shown. This switch may be a double throw switch and arranged so that one circuit thereof, such as one dominating a control circuit or the power circuit of the motor 17, will normally remain closed while the other circuit will remain open until the switch is shifted to open the motor circuit and will then close to operate an empty signal or the like.

A swinging arm 102 is carried on a shaft 103 extending across the back of the channel member 35 of each one of the magazines 14 and rotatably supported adjacent each end in suitable frame plates 104 welded or otherwise secured to the channel member 35. These swinging arms 102 are attached to swing together by means of a link 105 extending between and connecting the arms, see Fig. 1, and the switch 101 may be attached to one or the other of these arms.

A gage finger 106 is secured to each one of the shafts 103 intermediate the ends thereof and to extend through an opening 107 in the channel member 35 into the magazine and for engagement by a package 18 held in the magazine and on the stop pins 57 and 58 thereof as shown at the right in Fig. 3.

Since the packages are released alternately one or the other of the arms 106 will be held by a package as long as any thereof remain in the magazines but when both magazines are empty the arms 106 will be permitted to move in a clockwise direction to the substantially horizontal position shown by dotted lines in the magazine to the left in Fig. 3.

Suitable guard strips 110 may be mounted adjacent the rotors 45 on frame plates 111 extending longitudinally with respect to the rotors whereby packages may be held against displacement from the pockets 54 prior to their arrival at the discharge opening 46.

To effectively seal the rotors 45 with respect to the dividing wall 25 sealing strips 112 of rubber or a similar material may be secured about the walls of the opening 46 and arranged to flex against the periphery of the rotor so as to cooperate therewith for sealing the opening against any material exchange of air while permitting rotation of the rotor for vending.

The strips 112 should be arranged so that the openings 46 are sealed in both stationary or idle positions of the rotors as shown in Fig. 3.

The magazines 14 are filled from the storage magazines 15 after being emptied and fresh bottles are filled into the storage magazines for cooling when a bottled beverage is being vended.

Each operation of the motor 17 as above described rotates the rotors 45 one-half revolution or 180 degrees reversing the position of the pockets 54 so that the pocket shown at the left in Fig. 3 will be in the top or receiving position while the pocket shown to the right will be at the bottom or in its delivery position after a single operation. Since a bottle is contained in the pocket at the right, that bottle will be delivered by the operation.

As the pocket 54 approaches the top rest position the stop pins 57 and 58 are withdrawn by the cams 51 and 52 as above described, dropping the lowermost bottle in the magazine onto the rotor 45 just prior to the position shown in Fig. 5. Further movement of the rotor permits the bottle to enter the pocket 54 subject to the controlled lowering effect of the cam face 56 co-operating with the round or peripheral surface

of the bottle until a hump 121 on the face 56 is passed, as indicated by the dotted line position in Fig. 5, after which the bottle is permitted to drop to the bottom of the pocket.

After a bottle has started to move into the pocket 54 the stop pins 57 and 58 are released and are returned to their holding positions by the springs 86 the instant the released bottle lowers to a non-obstructing position and will block further lowering movement of the bottles contained in the magazine and following that one thereof being deposited into the pocket 54 when the succeeding bottle engages the pins.

This operation is continued or repeated upon demand until the magazines 14 are emptied and is accompanied by the controlling action of the switches 91 and 101 as above described.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction, and arrangement of the parts without departing from the spirit and scope of the invention, or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

What I claim and desire to secure by Letters Patent is:

1. A vending machine of the character described comprising, a cabinet arranged to form an inclosure having a discharge opening in a wall thereof, a package magazine mounted within the inclosure, a discharge chute arranged exteriorly with respect to said wall, a package delivery device arranged between the magazine and the discharge chute, and means for actuating the delivery device to effect the delivery of packages from said magazine into the discharge chute, said package magazine being perpendicularly disposed so that packages contained therein will gravitate toward and into the delivery device and being wider by approximately fifty per cent or more than the diameter of the packages so as to arrange adjacent packages in staggered and somewhat wedging relationship in contact with each other whereby gravitational action is retarded.

2. A vending machine of the character described comprising, a cabinet arranged to form an inclosure, a plurality of package magazines mounted within the inclosure, a discharge chute arranged exteriorly with respect to a wall of the inclosure, said wall having openings therein in register with said magazines, package delivery devices each arranged between a magazine and the discharge chute for transmitting packages from said magazines through the wall of the inclosure and into the discharge chute, and power operable means connected to and cooperating with the delivery devices that upon actuation of the delivery device packages are discharged alternately from the magazines.

3. A vending machine of the character described including a perpendicularly disposed magazine arranged to contain packages and having an outlet opening at the bottom thereof, a rotor arranged beneath said magazine having a pocket therein for receiving a package from the magazine for transmission to a discharge chute as an incident to rotary movement of the rotor, and stop means associated with the magazine and controlled in accordance with operation of said rotor whereby the weight of the packages contained in the magazine is supported during predetermined movement of said rotor.

4. A vending machine of the character de-

scribed including a perpendicularly disposed magazine arranged to contain packages and having an outlet opening at the bottom thereof, a rotor arranged beneath said magazine having a pocket therein for receiving a package from the magazine for transmission to a discharge chute as an incident to rotary movement of the rotor, stop means associated with the magazine and controlled in accordance with operation of said rotor whereby the weight of the packages contained in the magazine is supported during predetermined movement of said rotor, and release means coordinated with operation of said rotor whereby said stop means is withdrawn to permit a package to enter the pocket in said rotor while the pocket is moving into package receiving position.

5. A vending machine of the character described including a perpendicularly disposed magazine arranged to contain packages and having an outlet opening at the bottom thereof, a rotor arranged beneath said magazine having a pocket therein for receiving a package from the magazine for transmission to a discharge chute as an incident to rotary movement of the rotor, stop pins arranged to enter the magazine near the outlet opening therein and in opposed relationship for engaging the opposite ends of the lowermost package to support the packages in the magazine, and means for withdrawing said stop pins in coordination with movement of said rotor whereby the lowermost package in said magazine is released when the rotor is in package receiving position.

6. A vending machine of the character described including a perpendicularly disposed magazine arranged to contain packages and having an outlet opening at the bottom thereof, a rotor arranged beneath said magazine having a pocket therein for receiving a package from the magazine for transmission to a discharge chute as an incident to rotary movement of the rotor, stop pins arranged to enter the magazine near the outlet opening therein and in opposed relationship for engaging the opposite ends of the lowermost package to support the packages in the magazine, and means for withdrawing said

stop pins in coordination with movement of said rotor whereby the lowermost package, in said magazine is released when the rotor is in package receiving position, said means including cam devices carried with the rotor.

7. A vending machine of the character described comprising, a cabinet arranged to form an inclosure, a plurality of package magazines mounted within the inclosure, a discharge chute arranged exteriorly with respect to a wall of the inclosure, said wall having openings therein in register with said magazines, movable package delivery devices each arranged between a magazine and the discharge chute for transmitting packages from said magazines through the openings in the wall of the inclosure and into the discharge chute, said delivery devices each having a package receiving pocket therein and said devices being mounted with the pockets thereof opening in opposite directions so that when the pocket of one of said devices is in package receiving position the pocket of the other is in package discharging position, and power operable means connected to said delivery devices for simultaneous operation thereof, whereby the packages are discharged alternately from said magazines.

8. A vending machine of the character described including a perpendicularly disposed magazine arranged to contain packages of goods to be dispensed and having an outlet opening at the bottom thereof, a rotor arranged beneath said magazine having a pocket therein for receiving a package from the magazine for transmission to a discharge chute as an incident to rotary movement of the rotor, power means including an electric motor for operating said rotor to transfer a package from said magazine to said discharge chute and means for automatically de-energizing the motor upon completion of said discharging movement of the rotor, said means including a switch in the motor circuit and an actuating device connected to and movable with said rotor to actuate said switch and thereby break the motor circuit upon movement of the rotor to package discharging position.

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