Dec. 13, 1932. P. P. SCHEURER 1,890,753

MERCHANDISE VENDING APPARATUS

Filed July 14, 1932 3 Sheets-Sheet 1

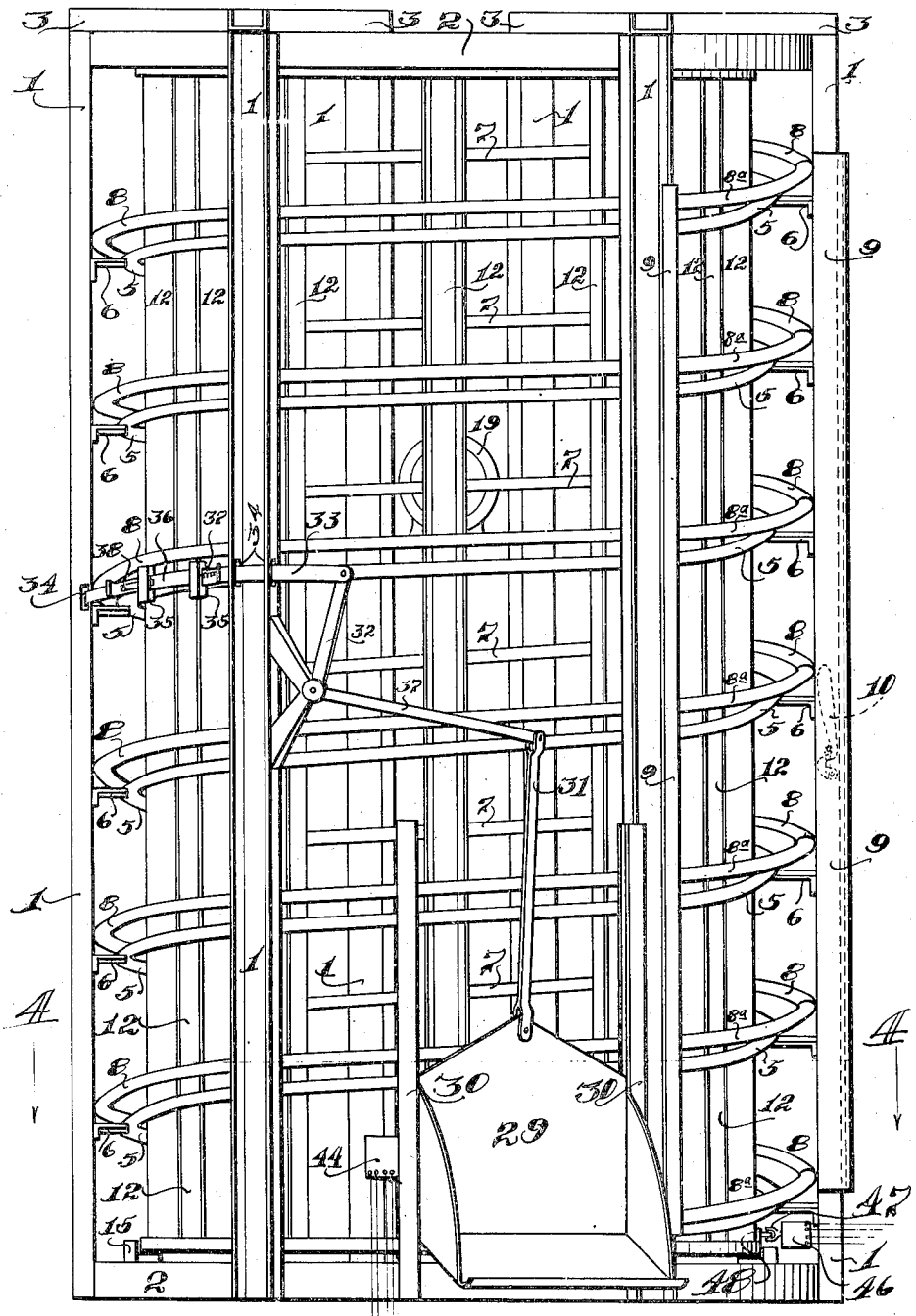


FIG. 1

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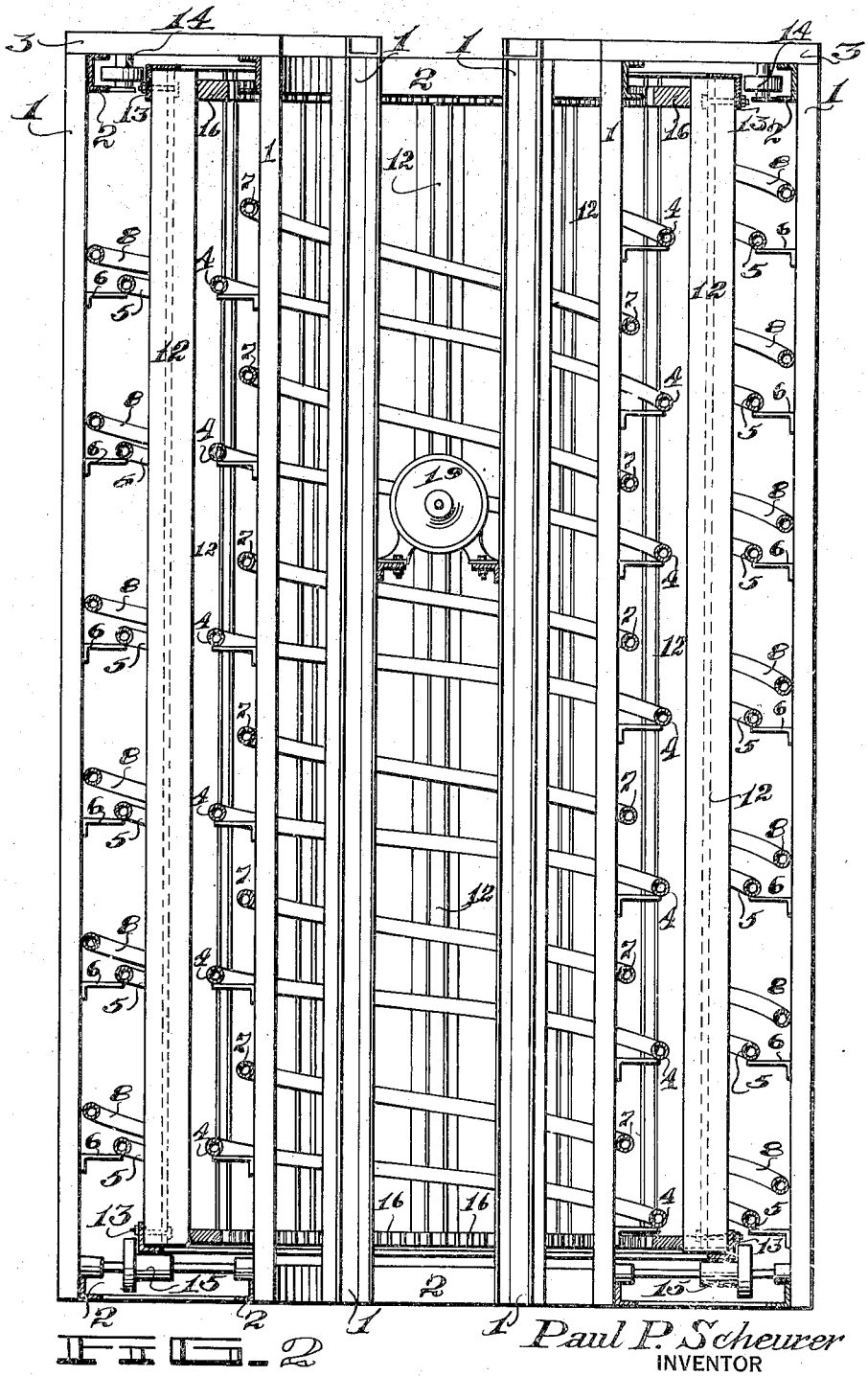


FIG. 2

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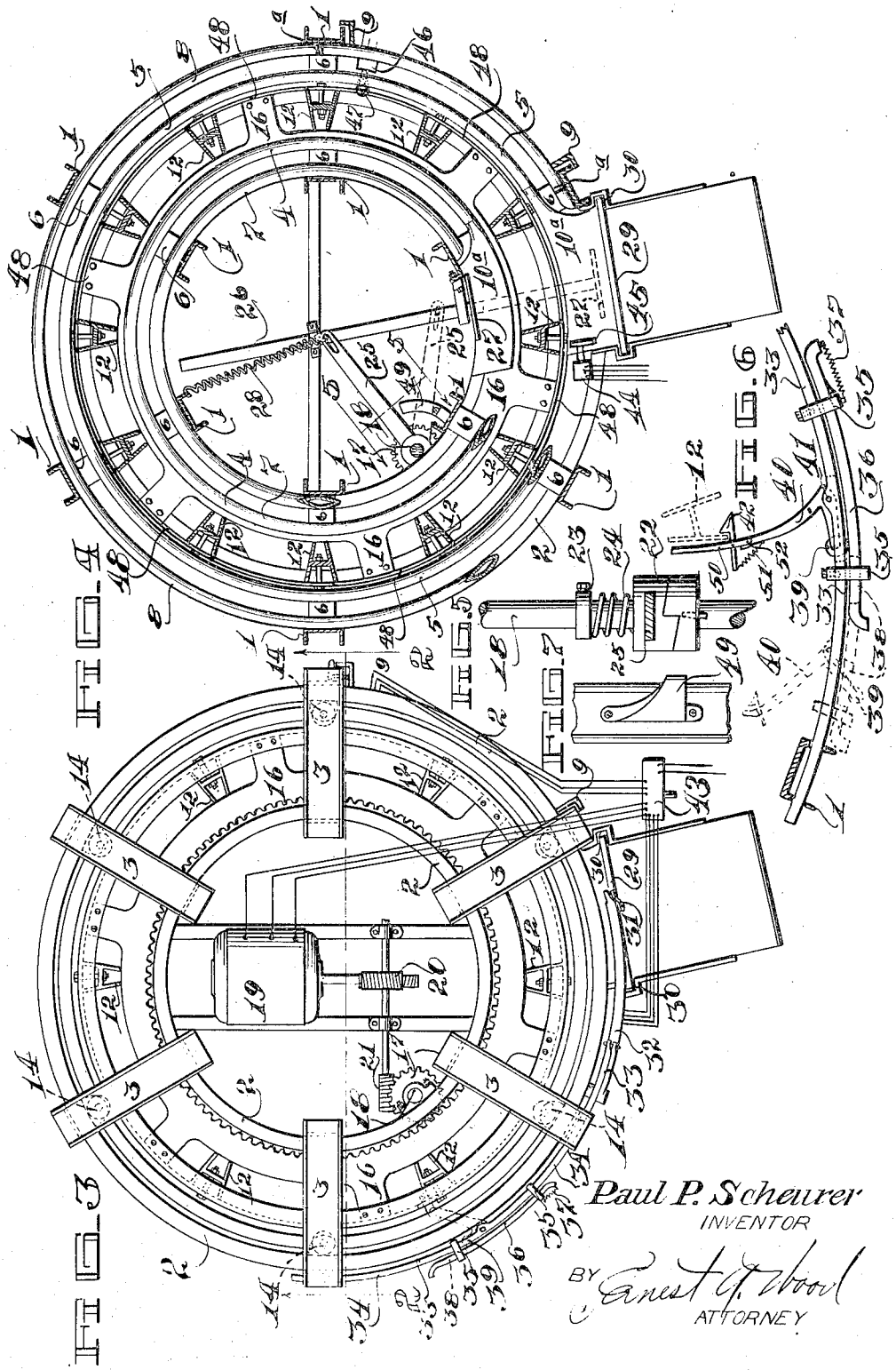


FIG. 3

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Patented Dec. 13, 1932 1,890,753

UNITED STATES PATENT OFFICE

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MERCHANDISE VENDING APPARATUS

Application filed July 14, 1932. Serial No. 622,431.

This invention relates to vending apparatus and has particular reference to automatic coin operated ice vending machines.

The principal object of the invention is to provide a novel combination of elements so constructed and arranged as to provide an automatic coin operated ice vending machine that will be simple in construction and absolutely positive in operation, that is, a machine in which the ice blocks cannot freeze together and wherein the ice will be given a positive mechanical motion.

Another object of the invention is to provide a novel means for moving the ice blocks along their supports and at the same time keep the individual pieces separated so as to prevent freezing together of same as stated. This feature gives the machine an accurate operation as the force of gravity is not depended upon entirely to move the ice toward the point of discharge.

Yet another object of the invention is to provide a novel means for operating the outlet door whereby the door will be opened and closed at the proper time to discharge ice, but cannot be forced open from the outside by any means other than that which is provided therefor, thus preventing any unlawful removal of the contents of the machine.

The invention further provides a safety switch of novel character which serves to stop the machine in the event the ice should become jammed when it is being discharged thru the door. In this way the mechanism of the device is safe-guarded from serious damage.

With the foregoing objects as paramount the invention has particular reference to its salient features of construction and arrangement of parts to be hereinafter described and illustrated in the accompanying drawings, wherein:

Fig. 1 is an outside view showing discharge door and its operating mechanism.

Fig. 2 is a vertical cross section on lines 2—2 of Figure 3.

Fig. 3 is a top view of Figure 1.

Fig. 4 is a transverse section on line 4—4, Fig. 1.

Fig. 5 is an enlarged view of the discharge clutch arrangement taken on lines 5—5 on Fig. 4 and

Fig. 6 is a top view of the door operating mechanism, and

Fig. 7 is a detail view of the clutch disengaging cam.

For the purpose of clarification it is pointed out that the invention herein described be placed preferably inside of a refrigerated enclosure having walls of some character of insulating material such as cork or the like, but the particular construction and method of insulating such a room or enclosure has no bearing on the invention.

Continuing with a more detailed description of the drawings, 1 designates the upright structural members which support the machine. Circular members 2 hold members 1 in spaced relationship and are disposed at the top and bottom of the structure and are aided in reinforcing the structure by braces 3. Slide rails 4 and 5, upon which the ice moves, are spirally disposed from the top of the machine to the bottom and are attached to upright member 1 by brackets 6. Each slide is one continuous piece from top to bottom and is preferably constructed of pipe or tubular material and the guide rail 7, disposed inwardly of the path of the ice is also spirally disposed from top to bottom and fastened to inside of the upright members 1. This guide rail is placed higher than the outside guide rail 8 so that when the machine is being charged, the contents will not be shoved over the inside guide rail 7. The outside guide rail 8 is broken at points *a* as shown in Figure 4 and sections 8*a* are not fastened to upright members 1 but are secured to angle members 9.

Angles 9 are arranged to slide vertically on members 1, and in so moving the sections 8*a* of guide rail 8 will be lowered to such extent that in their lowest position, sections 8*a* will rest upon brackets 6 in a plane with slide rails 4 and 5. When raised, sections 8*a* form a continuous spiral designated by characters 8 and 8*a* in Figure 1. This section of the outside movable guide rails comprises the loading section and due to the described adjustability of the guide rail section 8*a*, the

pitch of the helix will be considerably decreased as less clearance will be required for placing the contents upon rails 4 and 5. This loading section is raised and lowered by the eccentric lever 10 shown in dotted lines on Figure 1 as being mounted in the angle 9.

Rails 4 and 5 terminate at their lower extremities into flat plates 10*a*, shown in Figure 4, as it is at this point that the ice is moved off of the rails, and out of the door by sliding rod 26 actuated by arm 25, shown in Figure 4 and which will be later described. The rod 26 has on its foremost end a plate 27 which contacts the article of merchandise to be delivered.

Disposed within the slide rails 4 and 5 are vertical pusher beams 12. This arrangement of spiral slide rails 4 and 5, guide rails 7 and 8 and vertical pusher members 12 form separate compartments for each individual article. Pusher members 12 are held in equally spaced relationship by circular angle members 13, shown at the top and bottom of the structure illustrated in Figure 2.

This combination of movable pushers is constrained to move in a circular path by rollers 14 at the top and the weight of the structure is carried by rollers 15 at the bottom which also serve as guides. On each extremity of this rotating pusher element is mounted a ring gear 16. These gears 16 are driven by pinion gears 17 shown in Figure 4 as being mounted on the opposite ends of a vertical shaft 18, which is driven from its center by motor 19 thru reduction gears 20 and 21 as apparent in Figure 3.

In the machine shown in the drawings, shaft 18 will make twelve revolutions to one revolution of the large ring gears 16. This ratio is essential as will be later explained in the course of description of operation. Mounted near the lower end of shaft 18 is a one way clutch 22, Figure 5. Collar 23 is adjustable to set the spring 24 to normally hold the clutch in engaged position. The arm 25 previously mentioned is a part of the sliding portion of the clutch 22, and is pivotally and slidably connected to discharge rod 26. A spring 28 is fastened to the push rod 26 and tends to normally hold it in the position shown in solid lines in Figure 4 until clutch 22, and arm 25 push it forward. Cam 49 disengages clutch 22 at proper time. A more complete description of this operation will be given later.

The door operating mechanism is shown in Figures 1, 3, and 6 wherein 29 designates the door which operates in vertical slides 30. Door 29 is connected to an arm 32 shown in Figure 1 by connecting link 31. The arm 32 is operated by mechanism shown in detail in Figure 6.

A flat circular bar 33 slides in openings 34 in the vertical members 1 of the machine and collars 35 are permanently fastened to bar 33 while a slide link 36 is free to slide in said collars 35. Spring 37 holds the sliding link 36 in normal position as shown in Figure 6. In the slide link 36 is an opening 38 in which roller 39 falls when link 36 is slid to the dotted position shown in Figure 6. A trigger 40 is pivotally mounted at 41 on bar 33, and mounted on the end thereof is a latch 42 which snaps around pusher 12 when said pusher approaches trigger 40 to move the door 29 open. This is a safety latch to prevent opening of the door from the outside by any means other than the coin box 43, which will be mentioned later.

Switch 44 shown in Figure 4 is a safety switch which will stop the machine in the event of ice becoming jammed against plate 45 shown in Figure 4. This of course is a safety device which would operate only in event of faulty operation of the mechanism and as protection to the mechanism in the event the merchandise should not be moved entirely out of the door 29.

Switch 46 shown in Figure 4 is a two way switch which operates in conjunction with a conventional coin box switch 43. Switch 46 has an actuating arm and roller 47 which is alternately moved in and out by bars 48 attached to the lower ends of pushers 12. A bar 48 is fastened between every other pair of pushers 12 at lower end as apparent in Figures 1 and 4, thus as the members 12 are rotated the switch roller 47 will be alternately pushed in and out. This switch is double acting as is likewise the switch in the coin box 43. The coin box starts the machine by making an electrical contact to switch 46 and the latter stops it after it has turned one twelfth of one revolution because actuating means of the switch 46 will be pushed in or moved out as the case may be, and thereby break the contact.

In operation, a coin is dropped in coin box 43, starting motor 19 which rotates the pushers 12 through the reduction gears 20 and 21, pinion gears 17 and ring gears 16. This rotary motion will continue until the roller 47 on switch 46 is moved either in or out and since it is a double acting switch, the motor 19 will stop. The next coin dropped in coin box 43 will again start the motor as above and the switch 46 will stop it. At the time the pushers 12 start moving, one of them is in contact with the trigger 40 as shown in dotted lines in Figure 6.

Therefore, bar 33 will be pulled along with pusher 12 until the sliding member 36 strikes one of the upright members 1, as in Figure 6, whereupon it stops moving while bar 33 continues until roller 39 rolls into opening 38 as previously explained and disengages trigger 40 from pusher 12, as shown in dotted lines in Figure 6. It is evident that while bar 33 is moving with pusher 12, it will be pulling door 29 open by means of arm 32 and link 31.

Consequently, when the trigger 40 is disengaged, door 29 falls shut by gravity, thus allowing the member 36 to be pulled back into normal position by spring 37 and again setting trigger 40 in position to snap the latch 42 onto the next pusher as it falls against it.

When latch 42 has snapped onto pusher 12 the door 29 cannot be opened by force applied thereto because the trigger 40 has a peculiar shaped end 50, as seen in Figure 6, which will not allow latch 42 to be pulled away from pusher 12, due to the binding action of the said end 50. This member 50 is pivoted on the trigger 40 at point 52, which is necessary in order that the machine may be reversed, while it is being recharged.

Continuing further with the description of operation when a coin is dropped in coin box 43 and the machine moves one twelfth of a revolution a piece of merchandise is advanced to a position in front of the door 29 and pushed out by means of the push rod 26 and plate 27.

As before explained, the shaft 18 makes one revolution for every piece of merchandise pushed thru the door 29. At the time coin box 43 is operated, clutch 22 is out of mesh and consequently the free part of clutch 22 and the arm 25 does not move until the shaft 18 has just about completed its revolution and the article has been moved in front of the door by pusher 12 and door has been opened. At this time the one way clutch 22 will have turned around until the free part thereof engages with the fixed portion. Therefore during this last part of the revolution of shaft 18 arm 25 will move with shaft and advance the merchandise thru the then opened door.

At the position of arm 25 and push rod 26 shown by dotted lines in Figure 4, the cam 49, Figure 5 which is placed so that the arm 25 will strike the inclined upper edge of said cam and free part of clutch 22 thereby disengaging said clutch and allowing spring 28 to pull the pusher arm 26 back to position shown in solid lines in Figure 4 through the medium of arm 25. It will be understood that the pushers 12 are moving in a circular manner simultaneously with a reciprocating motion of the pusher 26 but it will also be understood that since shaft 18 carries arm 25 for such a small portion of its revolution, the circular motion of the pushers 12 will be but a short distance and will not interfere with pusher 26.

The machine is loaded at the aforementioned loading section by lowering the sections 8*a* through the medium of the lever 10. This section is filled and the motor is reversed, by a switch not shown in the drawings, and the pushers 12 will advance the bulk of merchandise back up the slide rails and the section is again loaded and the machine reversed. This operation is continued until the machine is completely filled.

Manifestly, the construction shown is capable of considerable modification and such modification as is considered within the scope and meaning of the appended claims is also considered within the spirit and intent of the invention.

What is claimed is:

1. A machine for vending articles of merchandise including a continuous spirally arranged shelf having a point of discharge at its base, vertically arranged pusher members for moving the bulk of merchandise along said shelf, means for actuating said members, and means carried by said actuating means for intermittently projecting articles of merchandise singly through said point of discharge.

2. A machine for vending articles of merchandise including a continuous spirally arranged shelf comprised of equi-distantly spaced rails having a point of discharge at their lower ends, a series of merchandise advancing and spacing members disposed in vertically parallel relationship intermediate said rails, means for collectively rotating said members at predetermined intervals to progressively advance the bulk of merchandise toward the point of discharge of said machine, means for ejecting articles of merchandise singly from the machine at said point of discharge, and means for actuating said advancing members and the ejecting means.

3. A machine for vending articles of merchandise including a spirally arranged series of spaced, merchandise supporting rails and a series of merchandise spacing and advancing members disposed in spaced, vertical parallel relationship intermediate said rails, means for imparting rotary motion to said advancing members and means operative by said last named means at predetermined intervals for projecting articles of merchandise singly out of said machine.

4. A machine for dispensing articles of merchandise including spiral means for supporting articles of merchandise, means for spacing said articles one from the other and for advancing the bulk of merchandise down said spiral supporting means toward an outlet opening in said machine, means for rotating said advancing means, means for intermittently starting and stopping said latter means and means actuated by said rotating means for urging articles singly through said outlet opening at right angles to the path of movement of said merchandise on said spiral supporting means.

5. A machine for dispensing articles of merchandise including a housing having a discharge opening, a closure for said opening, a shelf within said housing composed of spaced spirally arranged rails having their

lower ends alined with said opening, merchandise spacing and advancing means between said rails, a centrally arranged rotary member for imparting rotary movement to said advancing means, means for driving said latter means at successive intervals, means actuated by said driving means for discharging articles of merchandise singly through said opening, and means actuated by the advancing means for intermittently operating said closure to permit discharge of articles through the opening.

6. A machine for dispensing articles of merchandise including a series of spaced apart rails defining a merchandise support and arranged in spiral relationship, a multiplicity of circularly arranged and vertically disposed merchandise spacing and advancing members adjacent said rail, means arranged within the spiral defined by said rails for imparting rotary motion to said advancing means and means operated by said last named means for singly ejecting articles of merchandise from said machine.

7. A machine of the character described comprising a housing having a discharge opening, a pair of spaced spirally arranged article supporting rails within said housing and having their lower ends alined with said opening, a plurality of vertically arranged article spacing and advancing means between said rails, means for intermittently actuating said advancing means and thereby advancing the articles toward said discharge opening, means for ejecting the articles through said discharge opening, and means for operating said advancing and ejecting means.

8. A machine of the character described comprising a housing having a discharge opening, a closure for said opening, a pair of spaced spirally arranged article supporting rails within said housing and having their lower ends alined with said opening, movable article spacing and advancing means between said rails, means actuated by the advancing means for operating said closure, means for ejecting the articles singly through said discharge opening, and power means for operating the advancing and ejecting means.

9. In a machine for dispensing articles of merchandise including a spirally arranged merchandise support, a plurality of circularly arranged and vertically disposed merchandise spacing and advancing members adjacent to said support, means arranged within the spiral defined by said support for imparting rotary motion to said advancing means, and means operated by said last named means for singly ejecting articles of merchandise from said machine.

10. A machine for vending articles of merchandise including a spirally arranged supporting means having a point of discharge at its base, vertically arranged pusher members for moving the bulk of merchandise along said supporting means and toward said discharge, means for ejecting articles of merchandise singly through said discharge and reversible power means for actuating the pusher members and ejecting means in one direction for discharging articles from the machine and for actuating the pusher members in the opposite direction independent of the ejecting means whereby to load the machine.

11. A machine for dispensing articles of merchandise including a spirally arranged article support having a series of loading levels, a guide member cooperating with said support for normally retaining said articles upon the latter, said guide member being provided with a movable section adjacent each of said loading levels, said sections being vertically aligned with respect to each other, and means connecting said sections whereby to permit the latter to be moved as a unit manually toward and away from the article support to allow loading of articles on said support at said loading levels.

In testimony whereof I affix my signature.

PAUL P. SCHEURER.