March 10, 1931. G. R. WEBBER 1,796,133

DISTRIBUTING DEVICE

Filed Jan. 9, 1928 4 Sheets-Sheet 1

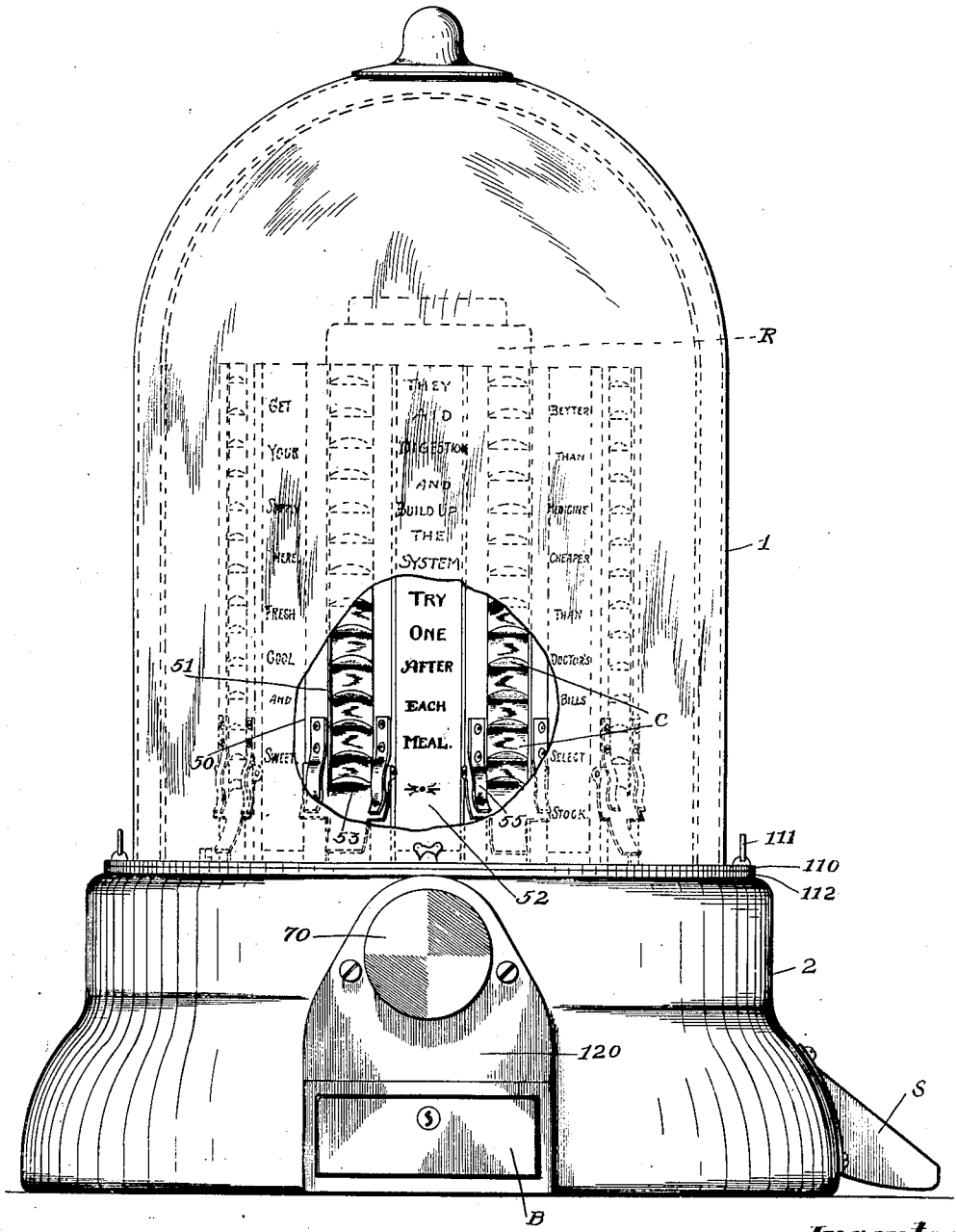


Fig. 1

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DISTRIBUTING DEVICE

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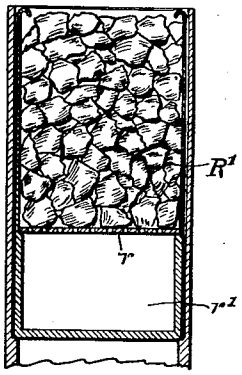


Fig. 4

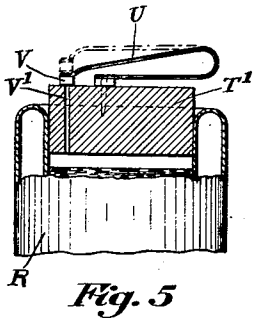


Fig. 5

Fig. 2

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DISTRIBUTING DEVICE

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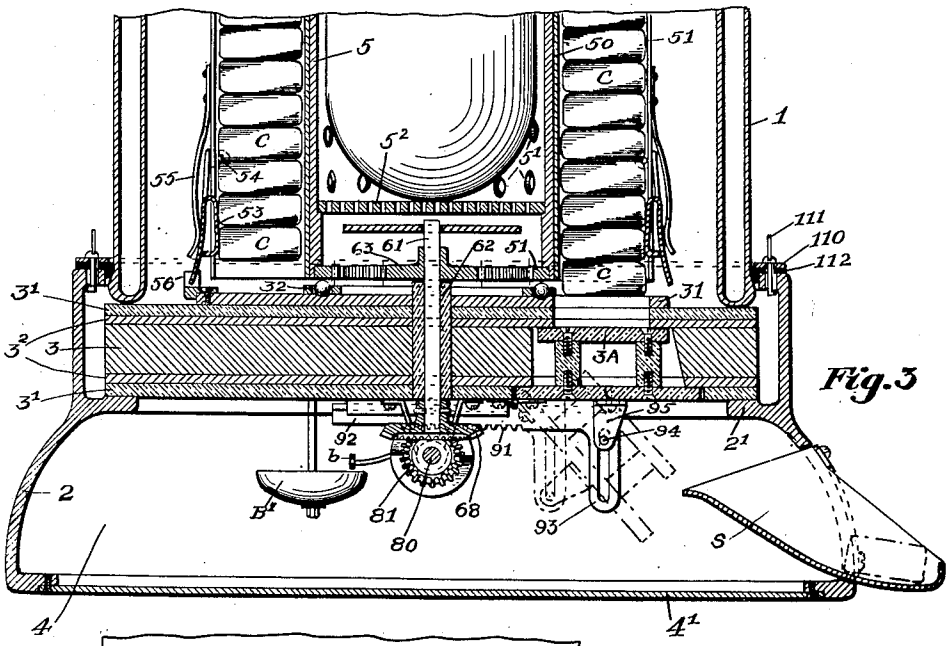


Fig. 3

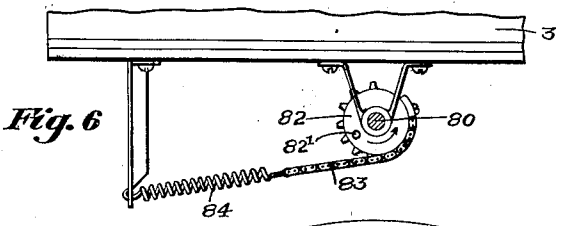


Fig. 6

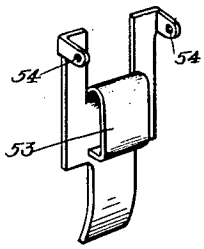


Fig. 9

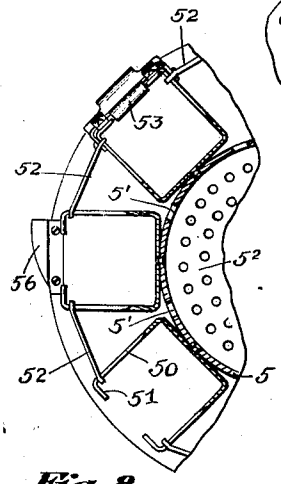


Fig. 8

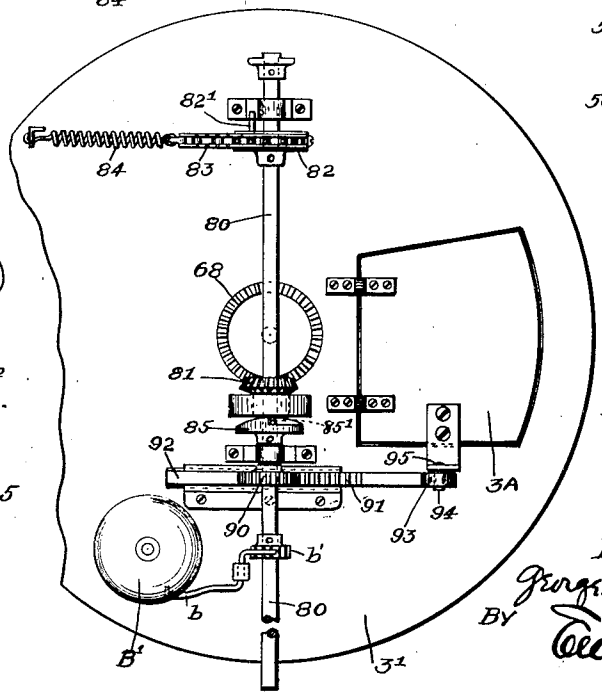


Fig. 7

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March 10, 1931. G. R. WEBBER 1,796,133

DISTRIBUTING DEVICE

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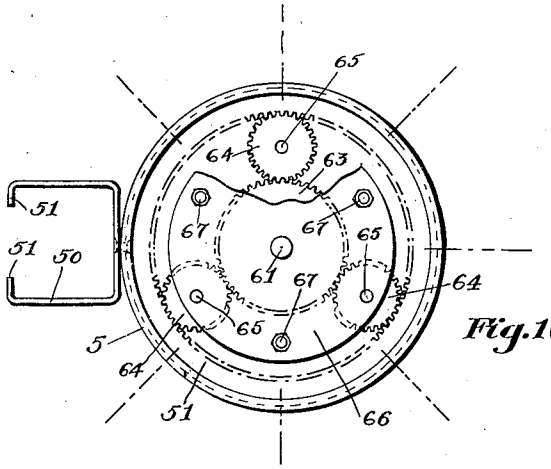


Fig. 10

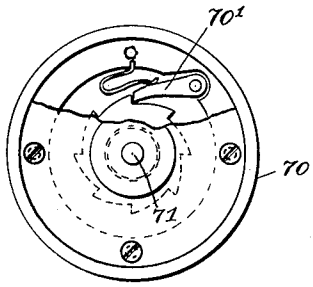


Fig. 11

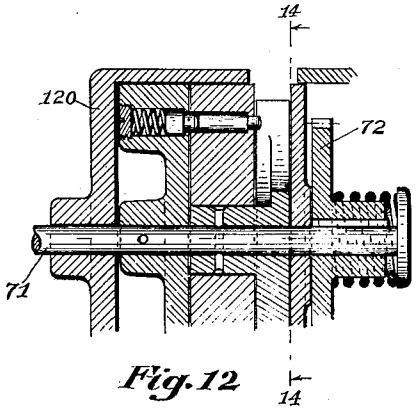


Fig. 12

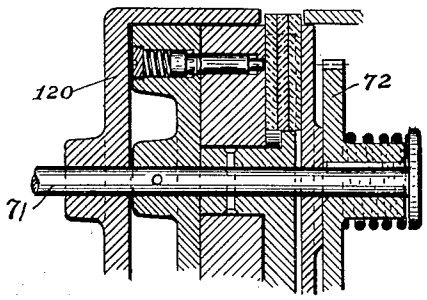


Fig. 13

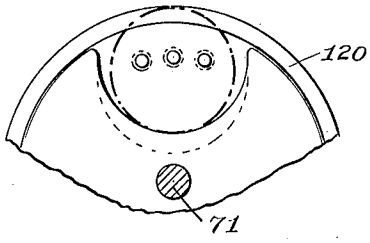


Fig. 14

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Patented Mar. 10, 1931

1,796,133

UNITED STATES PATENT OFFICE

GEORGE R. WEBBER, OF AUGUSTA, MAINE, ASSIGNOR TO POLAR VEND CORPORATION, OF AUGUSTA, MAINE, A CORPORATION OF MAINE

DISTRIBUTING DEVICE

Application filed January 9, 1928. Serial No. 245,347.

My present invention is immediately concerned with the vending or distribution of perishable commodities or at least those deleteriously inclined. Such commodities involve by their very nature various difficulties in mechanical distribution. The thermal factor involved imposes difficulties heretofore considered insurmountable and which have thwarted attempts to proceed on previously accepted bases of distribution or mechanical sales.

Of these difficulties some of the most troublesome have been those of providing for refrigeration or thermal maintenance especially in connection with display visibility, the maintenance of temperature during dispensing, and the combination of display and vending features in such apparatus.

Following my inventive concept involved I am able to produce apparatus having all these desired factors and to produce machines adapted for serviced distribution and vending at reasonable cost and reliability.

As an illustrative embodiment I have shown in the accompanying drawings a machine embodying the principles in novel structure and detail and through such illustration I will describe my invention. In the drawings:—

Fig. 1 is a general view of a dispensing apparatus in accordance with my invention.

Fig. 2 is a vertically sectioned view of the same.

Fig. 3 is a sectional view of the lower part of the machine through the delivery.

Fig. 4 an ice tank type of cooler in section.

Fig. 5 a fragment partly in section of a carbondioxide cooling core.

Fig. 6 a detail of the return movement in side view.

Fig. 7 a partial plan of the lower side of the base top.

Fig. 8 a fragmentary section through the dispenser stacks.

Fig. 9 a detail of a stack latch.

Fig. 10 a sectional detail of the stack cylinder and drive.

Fig. 11 a detail of the operating knob, the cover being partially broken away.

Fig. 12 a partial central vertical section of the operating mechanism similar to that shown in Fig. 2, but on an enlarged scale.

Fig. 13 is a similar view showing it coin operated, and

Fig. 14 a fragmentary view in section of the coin control.

The type of machine illustrated is intended for the display, distribution or vending of small perishable articles. Specifically the small packages shown are yeast cakes and while the machine shown is capable of handling almost any commodity its capacities are well illustrated by such a use.

In fact mechanical merchandising is an art involving psychological as well as mechanical factors and the accomplishment of results or the attainment of a desired end may depend as well on subtle display as on exact mechanical thermo cell manipulations.

In the machine shown the entire display is visible from all sides through the transparent dome 1. This dome 1 is a double wall glass bell having an insulating space 11 exhausted and sealed with a proper degree of vacuum whereby the dome will maintain itself free from internal condensations which would be obstructive of the view of the display within. This feature of visibility is an important one. Insulating covers even of the dome type have been proposed and while visibility in display devices has been known to be desirable the actual possibilities of the transparent vacuum enclosure for a dispensing device was not deemed possible especially with refrigeration. In fact, the transparent thermo-dome is in itself a new device in the art. It will be further discussed later.

The base 2 of the machine is an annular casting having an internal flange 2^1 on which is supported a circular insulating floor or deck 3. Below this the base provides a chamber 4 sealed by a bottom plate 4^1. Within this is the actuating mechanism for dispensing and the coin box B when the machine is used with a coin control as at X in vending.

The deck or floor 3 as shown is made up of a main disc of Baltha wood faced with hard rubber 3^1 with an interposed layer of cork 3^2. To its upper face is blind screwed a plate 31 having an annular ball race 32. On this race

32 is supported an annular rack 51 which supports the cylindrical stack shell which I have generally indicated as 5. The stack shell 5 has spaced about it and carried by it a series of stack tubes 50 in which the product which in the example shown are cakes of yeast, are loaded from the top and through which they feed by gravity.

The floor disc 3 is provided with a trap door 3A through which a cake C may drop. The gravity stacks 50 have release stops 53 which drop a cake C which is carried around on the surface of the plate 31 until it reaches the trap 3A which automatically snaps open to discharge the cake C into the chute S and immediately closes.

The shell 5 is perforated as at 5^1 for air circulation as shown in Figs. 3 and 8, and is fitted with a perforated disc 5^2 constituting a chamber for a refrigerator of any type such as R (Fig. 2 or 5) or R^1 (Fig. 4). Such a refrigerating unit is therefore centrally disposed with respect to the perishable products to be protected and at the same time concealed from view so that it does not detract from the sales efficiency of the machine in its display effect and sales urge.

The machine is manually operated by means of the hand knob 70, and such actuation is transmitted to the stack shell by means of a vertical drive shaft 61 journaled in a tubular bearing 62 in the axis of the stack shell 5. The bearing 62 is mounted in the center of the floor disc 3 and at its upper end affords a bearing for the gear 63 which is pinned to the shaft 61. The gear 63 drives the internal gear 51 through three smaller interposed gears 64 on the shafts 65 (Fig. 10) which have bearing at their lower ends in the plate 31 and at their upper ends in plate 66 supported by and spaced from the plate 31 by the posts 67. This provides for a concealed internal actuation (step by step) of the display stacks and at the time leaves the stack shell 5 internally free for use as a refrigerant chamber as before described.

Before proceeding to a detailed description of the various structures involved, I will briefly describe the operation of the parts heretofore generally described. In this it is necessary to bear in mind the three-fold general functions of the machine so far indicated, that is, display, dispensing and refrigeration. I am for the present disregarding vending and coin control which will be dealt with later. As regards these three functions, it will be noted that they are combinative, that is, dispensing, display-refrigerated dispensing, and display dispensing. For the present discussion the axis shaft 61 may be regarded as merely rotatable from the operating knob 70 at the base of the machine, intermediate connections being left for later description.

It will be supposed that the machine has been serviced, its refrigerating unit R or R^1 in place and functioning, its stacks 50 filled (with yeast cakes C or other product) and all suitably displayed to the public as an attractive and convenient supply of the product.

Upon the rotation of the hand knob 70, the shell 5 is turned through a part of a revolution, and with it the entire display and supply rotated so that a stack 50 is brought over the trap 3A through which it is discharged into the delivery chute S and thus to the customer.

It is to be generally noted that in such operation the lowermost cake C has been separated from its stack so that it is itself fully exposed to the standard temperature of the enclosure, especially as to its upper side which had been previously in contact with that of the cake next above it in stack assembly.

Furthermore, the next cake to it which will be next brought in circuit for delivery has its bottom face exposed to the enclosure temperature so that prior to bottom surface contact with the plate 31, it will have a chance for individual thermal readjustment. This provides for a shift of faces of contact for the cake C.

Again, as to the individual stacks as regards their successive alignments with the trap 3A, although the action of this trap is almost instantaneous it does of necessity admit air of higher temperature than that of the chamber of the machine. This has heretofore been considered so serious that a lock or caisson system had been thought necessary. I am able, however, by successive discharges from a series of chutes 50 to compensate within the chamber for any warm air penetration of the stack while it is over the open trap. Also, the very rotation of the stack is circulative. The stack structure is such that it constitutes almost a fan member of intermittent rotation but definitely circulative.

The admitted air is therefore distributed and its temperature neutralized or usually diluted by the colder chamber air. In this way a very constant thermal level is maintained so that the refrigerant has only to provide a slight adjustive contribution to the maintenance of the desired temperature to be maintained.

In such a device the problem as I have conceived it is one of rather delicate constant adjusting rather than of sudden or extreme readjustment. As a result I am able to provide for bi-weekly or even weekly servicing which makes possible commercial distribution of commodities tending to deteriorate if not actually of a perishable nature.

The general structure and operation understood, we may now consider the more de-

tailed structure as it contains many novel features of general utility in devices of the several classes referred to and for many of which I desire protection whether singly or in combination.

The base as before described is an annular casting somewhat flaring at its lower part and cylindric at its upper part. The base is provided with an insulated deck 3 heretofore described, through which passes the vertical operating shaft 61 which rotates the stack shell 5 in the dispensing operation. The vertical shaft 61 is driven by a beveled gear 68 from an intermeshing gear 81 on a horizontal drive shaft 80 which extends to what may be termed the front of the machine where it enters a housing 120 which is attached to the front of the base 2 as indicated in Figs. 1 and 2, and closes an opening in front of the base 2 through which opening the shaft 80 projects. On this housing 120 is mounted the operating knob 70 previously referred to and in it is located coin control apparatus when the machine is used as a vending machine.

For the purposes of the present application the coin control mechanism may be considered as of any desired type so that details in regard to such mechanism are not necessary. It will be understood that such mechanism will provide suitable control connection between the knob 70 and its shaft 71 and the gear 72 which meshes with the gear 73 on the shaft 80. The operating knob 70 has a pawl and ratchet drive 70^1 (Fig. 11) for the shaft 71 and the shaft 80 is in effect a rock shaft, its return after each actuation being effected by a drum 82 on which is partially wound a chain 83 attached to the spring 84 which is anchored to the inside of the base 2. (Figs. 6 and 7).

The pinion 81 is loose on the shaft 80 and driven by a cam disc 85 which provides for a step by step rotation of the vertical drive shaft 61 of the stack shell. On the shaft 80 is also mounted a pinion 90 operating a rack 91 on a slide 92. The slide 92 has a slotted depending arm 93 to which the trap 3A is connected by a stud 94 on a bracket 95. As the slide 92 is withdrawn by a pinion 90, the stud 94 travels down in the slot of the bracket 93 until the top level of the trap 3A is aligned with the chute S so that the cakes C will be discharged directly into that chute from which they may be removed by the purchaser. In this delivery announcement is conveniently made by a small bell B^1 struck by a tapper b tripped by a star wheel b^1 on the rear end of the shaft 80. The trap 3A is closed immediately upon each full actuation by the action of the return spring 84 so that the discharge opening is closed as promptly as possible consistent with full delivery.

I have heretofore in the description of the general construction described the mounting and drive of the rack carrying shell 5 and pointed out how by reason of its bottom support and drive there is provided an internal refrigerating chamber for the cooling unit R. About the shell are disposed the tubular stacks 50 which are opened on their outer faces to expose the edges of the cakes C when loaded therein. The stacks 50 are sheet metal racks comprising a back, two sides, and inturned lips 51 which hold the cakes in the usual manner while exposed through the outer face opening as before described. The radial spacing of the racks 50 on the shell 5 leaves gaps which afford vertical ventilation and provide a space for plates 52 which may be utilized for display advertising thus increasing the sales efficiency of the machine and through an appearance of continuity adds to the attractiveness of the display. On the open front of each of the racks 50 adjacent the bottom thereof is the release stop or presser member 53 which is pivoted to the sides of the tube at 54 (Fig. 9) and held down by the spring 55. This presser member bears between the lips 51 and is so disposed as to press upon the second and third cake from the bottom of the stack (this including the bottom cake which is on its orbital movement to the delivery trap 3A). This presser 53 is tripped immediately after the bottom cake is dropped through the trap 3A. This is accomplished by the engagement of the presser 53 by the cam 56 (Fig. 8) on the base of the machine. As the stack moves past this cam, the presser 53 is pushed outwardly allowing the entire stack to drop until the bottom cake comes in contact with the surface of the plate 31 over which it continues to ride until its stack is brought into alignment with the trap 3A.

In the machine shown and as before described provision is made for definite refrigeration, as such a commodity as a yeast cake unless very frequently serviced, requires a strict maintenance of temperatures. For many commodities where thermal maintenance is not so important, actual refrigeration may not be needed in a machine as perfectly insulated as that herein shown. However, refrigeration is an important factor in such a machine and this may be very easily provided by the utilization of the refrigerating chamber within the shell 5. I have indicated at R a flash preferably a vacuum flask containing carbon dioxide closed by a stopper T. This may be a porous stopper as indicated in Fig. 2 in which case the porosity is of such a character as to permit a very slight constant escape of the carbon dioxide which lowers the temperature on gasification. Where a more definite control is employed, I use an impervious closure T^1 (Fig. 5) having a thermostatic loop U carrying a valve V adapted to seat in a vent V^1. In this way a more

definite control may be effected with more certain maintenance of temperature.

As an al ernative method of refrigeration, the dispenser may be cooled by an ordinary ice tank as indicated at R^1 in Fig. 4. This may be a simple can with a perforated partition r for supporting the ice below which is left a chamber r^1 in which the drip water is held un il the machine is serviced.

I have heretofore pointed out the importance of visibility of the articles to be dispensed and the display of the same and the importance of these as sales factors. The difficulty of doing this and doing it in an insula ed dispenser is obvious and the difficulty of doing so in a refrigerated dispenser is even more so.

It will be understood that any condensation on the inside of any transparent wall not only obscures the view of the interior but detracts materially from the appeal of the display if not being absolutely suggestive of an undesirable condition. In this connection the construc ion of my dome member 1 is of very great importance.

This member consists of an external and internal dome sealed together at their lower edges and with the walls preferably brought in parallelism throughout. The dome form is preferable even though difficult to make, but is a commercially producable form and one of great attractiveness and efficiency. The space between the walls is exhausted as to its air so as to produce as complete a vacuum as possible. This is not only a matter of its efficiency as an insulating wall but is also important in the avoidance of condensations on the inside of the inner wall. The dome may be attached in any convenient manner as by a clamping ring 110 held by keys 111 interlocked with the upper edge of the base 2 within which the lower edge of the dome 1 rests. The dome 1 rests on the surface of the member 3 and is insulated by it and by an insulating ring 112 which keeps it from contact with the metal of the base.

The mechanical operation as heretofore suggested is by hand actuation of the knob 70 which through the shaft 71, gears 72 and 73 rocks the shaft 80 against the action of the spring 84. This turns the shaft 61 and rotates the stacks 50 one step, bringing the bottom yeast cake of the registering stack in line with the trap 3A which at the same time is opened through the pinion 90 and the rack 91 which moves the slide 92 to open the trap as heretofore described. This movement is limited by the driving cam 85 which with its cooperating spring pressed stud 85^1 release when the partial rotation of the shaft 80 is stopped by the limitation of movement imposed by the stop pin 82^1. The spring 84 then pulls on the chain 83 to rotate the drum 82 thus returning the shaft 80 to its original position.

In this operation, it is to be noted that the stacks 50 are successively moved up to and away from the trap 3A so that no stack is directly exposed to atmospheric temperature except for the moment of delivery. Furthermore, due to the location of the cam 56, the bottom cake of the stack from which delivery has last been made is dropped so that the stack is immediately unsealed at its bottom and thus exposed to the maintained low temperature of the chamber. Furthermore, it is to be noted that any air penetrating from the outside is given no opportunity to work up through the stack but is circulated by the rotation of the stack itself so that any warm pockets are avoided and the air of the chamber kept uniform or uniformly mixed and distributed not only by the normal tendency of the warmer air to rise and the cooler air to be displaced, but by the circulatory movement induced by the stack itself. This is not only a factor of efficiency in the refrigeration as such, but tends to prevent any localization of moisture due to less favorable exposures of the machine at one side than at another. Such circulation might, of course, be provided for by special apparatus but I find that my circular stack operates in itself in a highly efficient manner and that no other parts are needed to produce the results.

The machine illustrated is as before explained merely described as intended for use in dispensing yeast cakes in order that the reason for the construction of certain parts will be made more clear. However, much of the mechanism even though detailed is of general utility in this art as will be indicated in the claims. While desirable, much of this detail may be varied and equivalents substituted. For example, the rock shaft 80 may be extended through and beyond the rear side of the casing, as shown in Fig. 2, to permit the clerk to operate the machine without reference to the coin lock and operating knob 70, where the machine is simply used as a dispensing and refrigerating unit without reference to coin-controlled vending. For such purpose, any detachable handle fitting the projecting rear end of the rock shaft may be used to rock said shaft. Furthermore, and as at first pointed out, the machine considered as illustrative in its broadest sense has certain broad features each capable of independent use but all importantly related in actual combinations. Such broad combinations are therefore also indicated in the claims.

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

1. In a distributing machine, and intermittently revoluble article magazine, a delivery member cooperative therewith, a ring gear carried by said magazine, a drive shaft disposed axially of said ring gear and operatively connected therewith, an operating member a rock shaft actuated therefrom, a spring re-

turn for said rock shaft, an intermediate shaft having a pawl and ratchet drive with said rock shaft and itself operatively connected with said magazine drive shaft, and a shaft driven from said intermediate shaft and carrying said delivery member.

2. In a distributing machine, and intermittently revoluble article magazine, a delivery member cooperative therewith, a coin-controlled operating shaft and a free operating shaft each independently dominant upon said magazine and delivery mechanism, said shafts alined with each other, the coin-controlled shaft provided with a rigidly attached operating handle and the free shaft provided with a detachable and removable operating handle, and motion transmitting connections between said shafts and said magazine and delivery member.

In testimony whereof I affix my signature.

GEORGE R. WEBBER.