May 3, 1932. L. H. MORIN 1,856,780

DISPENSING MACHINE

Filed Nov. 19, 1929 3 Sheets-Sheet 1

Fig. 1.

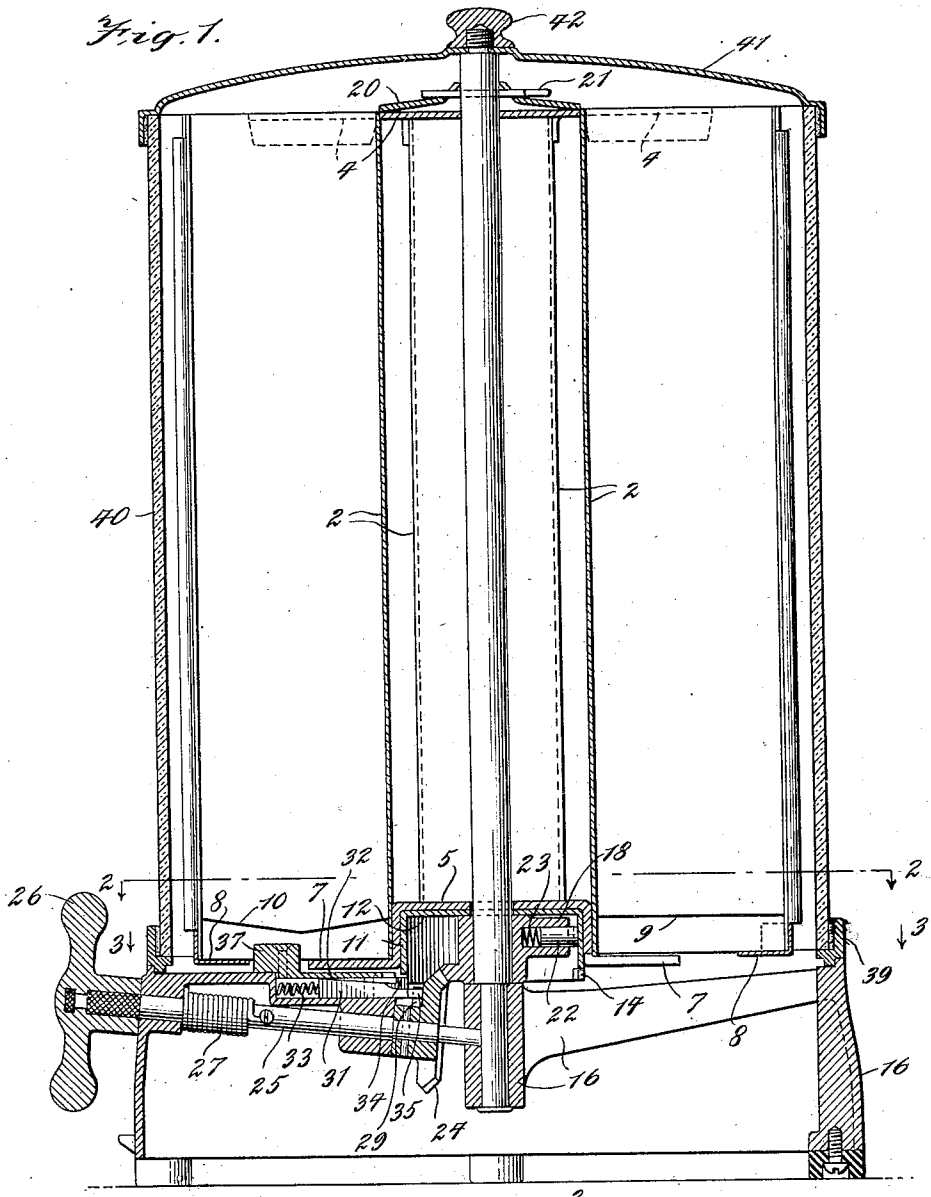
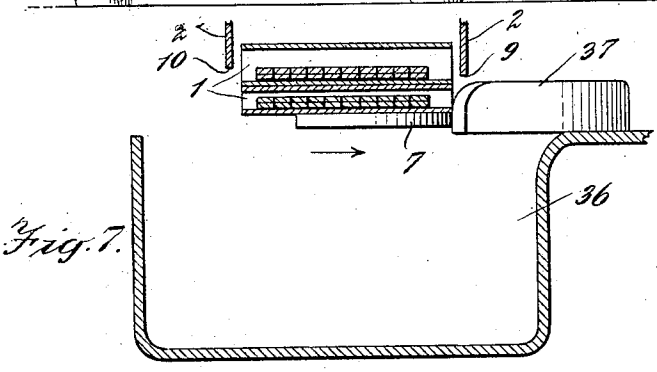


Fig. 7.



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DISPENSING MACHINE

Filed Nov. 19, 1929 3 Sheets-Sheet 2

Fig. 2.

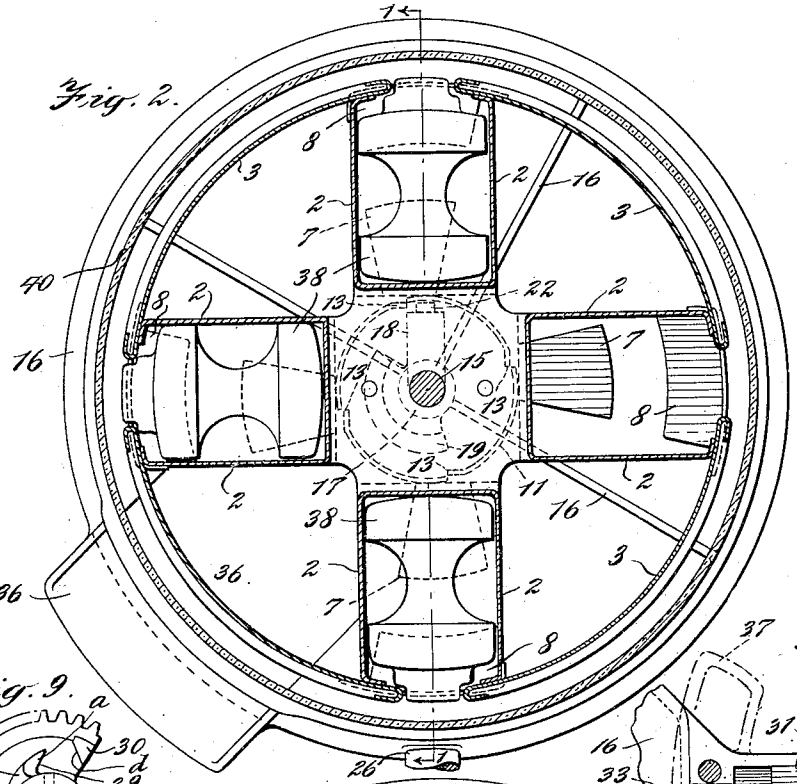


Fig. 9.

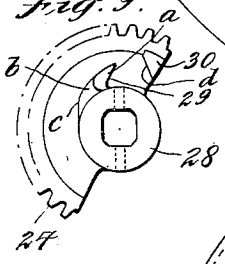


Fig. 8.

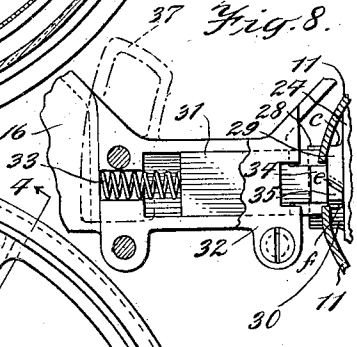
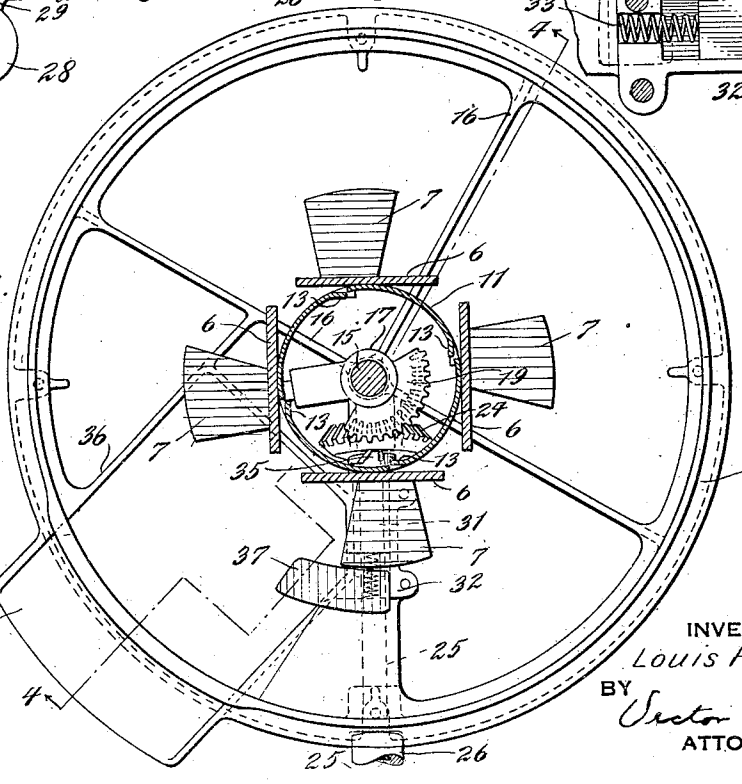


Fig. 3.



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May 3, 1932. L. H. MORIN 1,856,780.

DISPENSING MACHINE

Filed Nov. 19, 1929 3 Sheets-Sheet 3

Fig. 4.

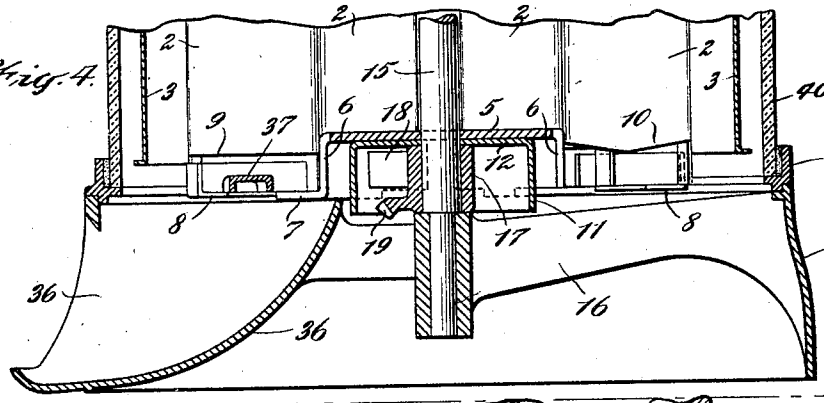


Fig. 5.

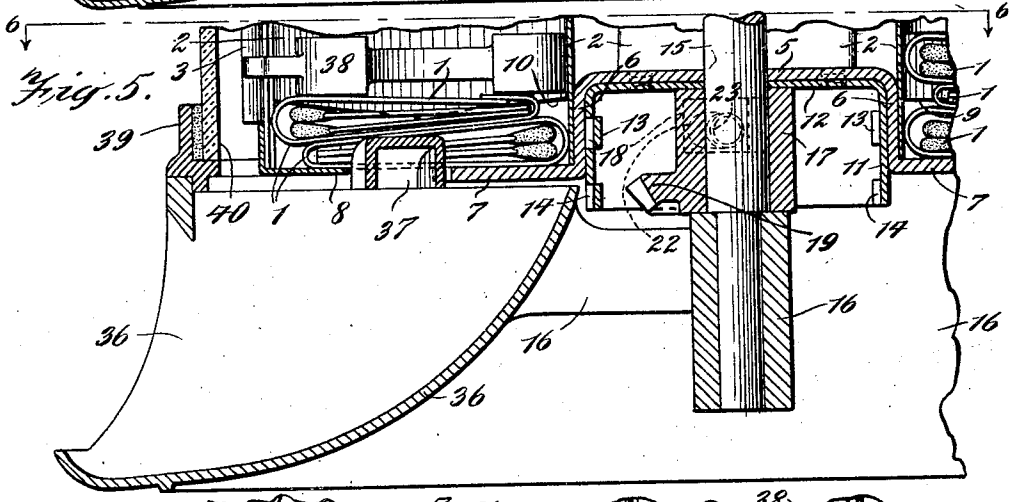
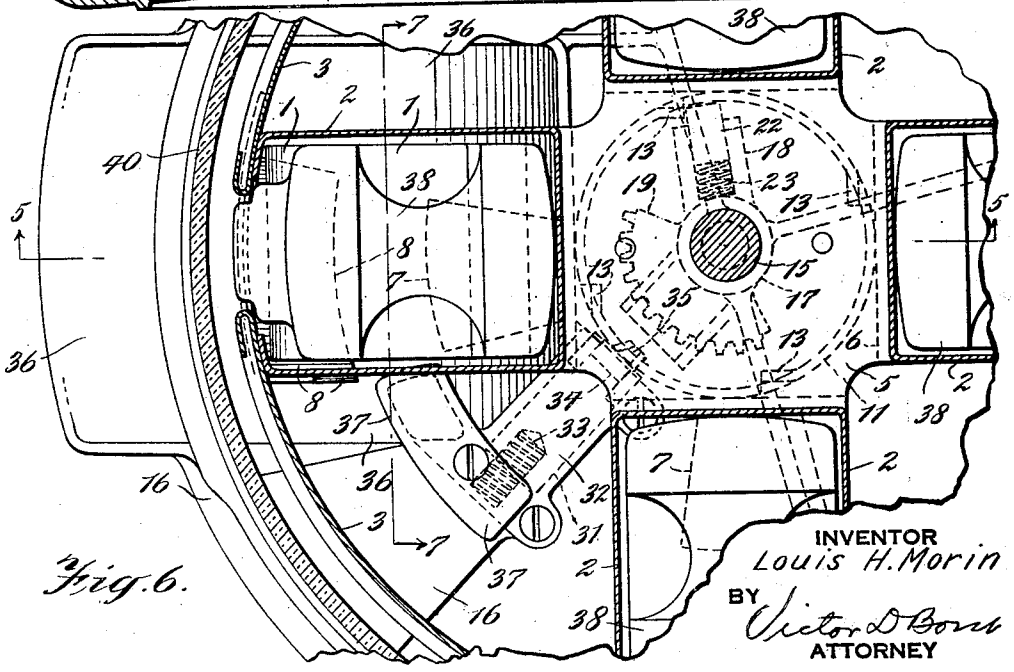


Fig. 6.



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Patented May 3, 1932

1,856,780

UNITED STATES PATENT OFFICE

LOUIS H. MORIN, OF NEW YORK, N. Y., ASSIGNOR TO DOEHLER VENDING MACHINES, INC., A CORPORATION OF NEW YORK

DISPENSING MACHINE

Application filed November 19, 1929. Serial No. 408,180.

This invention relates more particularly to dispensers of the type having an upright magazine rotatable on a vertical axis for delivering articles or packages at the bottom. The machine shown in the accompanying drawings is designed and constructed for dispensing packages of book matches one package at a time, but it should be obvious that this machine, either as shown or with slight alterations therein, could as well be used for dispensing other more or less similar articles. Also while the dispensing mechanism of the illustrated machine is without coin control, it is to be understood that some of the features thereof might be utilized in a coin controlled machine.

Among the objects of the invention are simplicity, economy, effectiveness, reliability, durability and other objects and advantages which will hereinafter appear.

The invention includes various features of construction and combinations of parts, as will appear from the following description of one embodiment thereof which is illustrated in the accompanying drawings. Following the description, the invention will be pointed out in claims. The illustrated embodiment of the invention will now be particularly described, with reference to the drawings, in which:

Fig. 1 is a central vertical section of a dispensing machine embodying the invention, on the line 1—1 of Fig. 2;

Fig. 2 is a horizontal section on the line 2—2 of Fig. 1, turned counter-clockwise to the extent of 90°;

Fig. 3 is a substantially similar section on the line 3—3 of Fig. 1, but with some of the operating parts in a different position;

Fig. 4 is a vertical section of the lower part of the machine on the zig-zag line 4—4 of Fig. 3;

Fig. 5 is a similar section somewhat enlarged taken substantially on the line 5—5 of Fig. 6 and with the delivery mechanism of the machine operated to the extent of substantially a half-way position;

Fig. 6 is a partial horizontal section as viewed from the line 6—6 of Fig. 5;

Fig. 7 (Sheet 1) is a partial vertical section on the line 7—7 of Fig. 6;

Fig. 8 (Sheet 2) is an an enlarged plan view partly in horizontal section of the magazine stopping and locking device which appears at the left of the center in Fig. 1;

Fig. 9 is a similarly enlarged outer end view of a segmental drive gear, together with the cams carried thereby, as viewed from the left in Fig. 1.

In the embodiment of the invention shown in the drawings, packages of book matches 1 to be dispensed are stacked within substantially rectangular hollow vertical columns 2, which form guideways for these packages. These columns 2 are equidistantly spaced in a circular series and are shown as radially arranged with their longer transverse dimensions extending radially, for thereby facilitating the delivery of the match packages 1, which are turned alternately end for end in the stack. In the machine shown in the drawings, the magazine has four of these guide columns 2, at right angles to each other and rather widely spaced at the periphery of the magazine. Each of the columns 2 has its outer side at the periphery of the magazine, vertically slotted as shown, for the purpose of inspection and also for convenience in filling the magazine.

At the periphery of the magazine, the adjacent columns 2 are connected and firmly tied together by means of straps 3, which are shown as circularly arcuate plates extending from near the upper ends to near the lower ends of these columns. The upper ends of the columns 2 are firmly and rigidly tied together by means of a notched and flanged top plate 4 which leaves the upper ends of the columns 2 fully open and which has a central aperture to form an upper bearing for the magazine, which is rotatable on a vertical axis. The lower ends of the columns 2 are firmly and rigidly tied together by means of a bottom plate 5 which is centrally perforated in order to provide a lower bearing for the rotatable magazine. The central portion of this bottom plate 5 is spaced above the lower ends of the inner walls of the columns 2 and is provided with four rectangu-

larly arranged plate extensions 6 which extend down to the lower ends of these inner walls of the columns 2, to which they are firmly secured.

A flat horizontal spider arm 7 projects outwardly from the lower end of each of the down-turned plate parts 6 just below the lower end of the adjacent inner wall of the vertical column 2. This spider arm 7 constitutes the inner part of a divided bottom closure for the column 2. It will be noted that this spider arm 7 is of less width than the column 2 and that it is circularly or transversely offset relatively to the column in a counter-clockwise direction, so that thereby while this spider arm substantially closes the lower end of the column at one side, a downwardly opening slot of greater width is left at the other or clockwise side. Also it will be noted that the outer free end of this spider arm 7 is circularly rounded and that it terminates before it reaches the middle radially of the column 2.

An outer or peripheral bottom part is formed for the column 2 by means of a plate 8 the upper surface of which is level with the upper surface of the spider arm 7 and the inner circularly concave end of which is radially spaced from the outer end of the spider arm 7, thereby providing a rather wide circumferential slot radially between these two inner and outer bottom closure parts 7 and 8. This outer closure plate 8 has upturned flanges as shown, by means of which it is firmly secured to the lower end of the column 2. In operation, the magazine is designed to be rotated in a counter-clockwise direction as viewed from above. The lateral or wider side walls of each of the columns 2 have their lower ends cut away circumferentially in line with the slot provided between the spaced ends of the bottom closure parts 7 and 8.

The front or leading wall is shown as thus cut away along a straight horizontal line at 9, at a level just above that of the greatest thickness of a package 1 resting upon the divided bottom closure formed by the radially spaced parts 7 and 8. However, as will hereinafter appear, the dispensing mechanism would be similarly operable if only a slot should be cut in the lower edge of this wall in circumferential alignment with and of substantially the same width as the slot provided between the bottom closure parts 7 and 8. The other or rear side wall of the column 2 is shown as cut away at 10 throughout its width, to form a widely obtuse salient angle, thereby to provide above the bottom closure sections 7 and 8, a lateral escape slot for a lowermost package 1, regardless of whether its thicker end is at the front or at the rear in the column, while at the same time preventing the escape of the next package 1 above the lowermost, as shown in Fig. 5.

The magazine further includes as a part of its unitary construction, a bottom ring 11, which includes in the same piece therewith a centrally perforated upper end plate 12, which strengthens this ring 11 and forms therewith an inverted cylindrical cup. The top wall 12 of this ring 11 fits against the lower side of the magazine bottom plate 5 and the cylindrical periphery of this ring 11 itself fits closely against the inner surfaces of the downward extensions 6 of the bottom plate 5, and all of these parts are firmly secured together. All of the several parts of the above described rotatable magazine may be conveniently made from suitable sheet metal, such as steel, and these parts are all rigidly secured together, such as by means of spot welding.

The magazine bottom ring 11 is a combined driving and locking ring for the rotatable magazine. This ring and therefore the entire magazine, may be driven and rotated step-by-step in a counter-clockwise direction by means of four equidistantly spaced ratchet teeth 13, which are shown as punched inward from the cylindrical wall of this ring 11. The lower edge of this ring 11 projects below the lower surfaces of the spider arms 7 and is there provided with four equidistantly spaced rectangular or square-cornered notches 14, which provide for both positively stopping and locking the magazine at the termination of each quarter-turn step of its step-by-step rotative movement.

A central upright shaft 15, forming a journal for the rotatable magazine, is rigidly fixed at its lower end in a base frame 16, which may be a suitable casting, such as a zinc die-casting. A rocking operating member for the magazine has a sleeve or hub portion 17 pivoted on the shaft 15, and includes adjacent its upper end a radial pawl-carrying arm 18, and at its lower end further includes a bevel gear segment 19 having outwardly and downwardly directed inclined gear teeth. The lower end of the hub sleeve 17 rests upon the base frame 16, and the lower end of the magazine, which is shown as formed by the plate 12, rests upon the upper end of this hub sleeve 17, with the journal shaft 15 extending through the magazine and projecting above its top plate 4, by which together with the bottom plates 5 and 12, the magazine as a whole is journaled on this shaft 15, with the lower end of this magazine having a suitable clearance above the base frame 16.

A spring friction washer 20 presses down at its periphery on the top plate 4 of the magazine and is anchored to the journal shaft 15 against rotative movement by means of a cotter pin 21, this cotter pin also holding the friction washer 20 down on the magazine top plate 4. The friction on the magazine produced by this spring washer 20 results in a more even and regular step-by-step rotative movement of the magazine. In order

to render it properly resilient this spring washer 20 is provided around its periphery with radial slots, which do not appear in the drawings.

The arm 18 of the rocking operating member 17 is tubular to provide a socket for a cylindrical pawl pin 22, the outer projecting end of which is pressed against the inner side of the ratchet ring 11 by a coiled thrust spring 23 seated in the bottom of this socket and pressing against the inner end of this pawl pin. It is obvious that should the operating member 17 be rocked back and forth to the extent of at least 90°, that at each such complete rocking movement, it would impart a quarter turn step of rotation to the magazine, and so on successively. As a matter of fact, and as will presently be described, this operating member 17 is to be thus rocked once at each operation of the machine to an extent of somewhat more than 90°, thereby to provide a normal condition of initial lost motion space between the outer end of the pawl pin 22 and the next adjacent ratchet tooth 13 which is to be engaged thereby for driving the ring 11, and therefore the magazine, forward in a counter-clockwise direction, this initial lost motion being utilized for a purpose which will presently appear.

The teeth of the bevel gear segment 19 are engaged by the teeth of a bevel drive gear segment 24 which is located below and forwardly from this bevel gear segment 19. The pitch-line radius of these two intermeshing gears 19 and 24 is the same, although the drive gear 24 is shown as having a few more gear teeth than the magazine-operating gear 19. Therefore, the ratio of these two gears is as one-to-one in the mechanism shown, although it would not necessarily need to be just that ratio of drive, provided of course other operating parts yet to be described were changed accordingly. The drive gear segment 24 is fixed on a handle shaft 25 which is shown as journaled in three bearings in the base frame 16. This handle shaft 25 is in a radial plane with the axis of the magazine journal shaft 15 and is shown as inclined slightly upward in an outward direction.

The outwardly projecting end of the handle shaft 25 has a handle knob 26 firmly fixed thereon, such as by casting the handle shaft 25 as an insert into the handle knob 26, as is indicated in Fig. 1. As will presently appear, the drive gear segment 24, together with its handle shaft 25 and handle knob 26, is permitted to have only somewhat more than 90° of to and fro rocking movement. The handle shaft 25 is to be manually rotated in a clockwise direction as viewed from the front of the machine and is returned to its original normal position by means of a torsion spring 27 on the handle shaft, having one of its ends connected thereto and having its other projecting end in engagement with an overlying wall of the base frame 16.

On its front side, which is the back of the gear, the drive gear segment 24 has a hub boss 28. This drive gear 24 carries two cams 29 and 30 which may be die-cast in the same piece therewith, as indicated. The cam 29 is a double cam, that is, having two cam faces. This cam 29 is integrally joined both to the adjacent face of the drive gear 24 and to its hub 28. This double-faced cam 29 has a front cam face and a peripheral cam face, and this cam 28 as viewed from the front (Fig. 9) appears to be in general of a hook shape with a radially overhanging abrupt end at the right. The front cam face begins at the abrupt or right end of this cam and comprises a wedge portion *a* which is inclined from the face of the gear forwardly and towards the left where it joins a front or outer flat cam face portion *b*. The wedge-shaped end *a* is an active or operating portion of the front cam face while the flat front face *b* of the cam rise is a holding portion. The other or peripheral cam face *c* of this cam 29 extends substantially in spiral form from the gear hub 28 towards the right and outward throughout the circumferential length of this cam 29.

The other cam 30 on the front face of this drive gear 24 is in the form of a forwardly projecting cam lug at the periphery of the gear, extending radially outward beyond the cam 29 and as a whole angularly spaced therefrom to a substantial extent towards the right (Fig. 9) or clockwise. This cam lug 30 has an active cam face *d* which is disposed in a plane parallel with the axis of the drive gear 24 and which inclines radially inward and towards the right or clockwise from a point radially outward or above the outer end of the cam 29 to a point radially inward therefrom, so that thereby this inclined cam face *d* has a radially overlapping relation with the adjacent ends of both of the cam faces *a* and *c* of the cam 29.

At the end of each step of rotative movement of the magazine, it is positively stopped and positively locked against rotative movement in either direction away from its normally inactive position, which is shown for this magazine not only in Figs. 1 and 2, but also in Figs. 3, 4 and 8. This result is accomplished by means of a locking device comprising a horizontal radially slidable latch bolt 31 which is guided in a housing formed in the upper side of the base frame 16, together with a cover plate 32 which is secured to a top plate of the base frame 16 by means of screws as shown in the drawings (Figs. 1, 3, 6 and 8). This magazine-locking latch bolt 31 is urged inwardly by a coiled thrust spring 33 interposed between the outer end of this latch bolt and the outer end wall of its housing in the base plate 16.

This latch bolt 31 projects inwardly beyond its housing and is there provided with an upwardly projecting substantially rectangular locking lug 34. In the normal position of rest of the magazine, this locking lug 34 is engaged in one of the stop notches 14 in the edge of the lower end of the magazine ring 11 (Figs. 1, 2, 3 and 8). It will be noted that there is some free space (Fig. 1) in this notch 14 above the top or upper end of this locking lug 34. The outer end of this latch bolt 31 which is engaged by the spring 33 is of sufficient vertical thickness substantially to fill and to have only a sliding fit in the housing formed by the base plate 16 and the cover plate 32.

From this outer end the latch bolt 31 tapers inwardly on its upper side along a downward incline to the locking lug 34, so that this latch bolt is there thinner and is spaced below the inner end portion of the cover plate 32 (Fig. 1). This tapering shape of the latch bolt 31, together with the above noted free space above the locking lug 34 in the notches 14 of the magazine bottom ring 11, provides for the upward movement or lifting of the inner end of the latch bolt 31 while this slidable latch bolt has its locking lug 34 engaged in one of the stop notches 14, and the wedge-shaped latch bolt 31 will then rock upon its thicker outer end as a pivot. It will be noted that the inner end of the cover plate 32 is provided with a rectangular notch (Figs. 1 and 8) in order thereby to provide ample clearance for the locking lug 34 when the latch bolt 31 is slid forward in order to disengage this locking lug 34 from one of the stop notches 14 in the magazine bottom ring 11.

The latch bolt 31 at its inner end adjacent its lower side is provided with and terminates in a cam follower lug 35 which is in the path of movement of the drive gear cams 29 and 30 and is normally positioned between these cams and abuts against the adjacent plane or flat forward face of the drive gear 24 (Figs. 1, 3 and 8). This follower lug 35 on its respective sides horizontally is provided at the left with an inclined cam follower face *e* and at the right with an inclined cam follower face *f*. The left hand cam follower face *e* inclines towards the right both in a rearward direction and also in a radial direction and is substantially complementary to the normally closely adjacent cam wedge face *a* of the cam 29. The opposite or right hand face *f* of the cam follower lug 35 inclines only radially outward or upward towards the left and lies in a plane at right angles to the adjacent front face of the drive gear 24 and parallel with the axis of this gear, in order thereby to form an abrupt shoulder in this front to rear direction, this inclined face *f* being substantially complementary to the inclined cam face *d* on the cam lug 30.

Normally, under the influence of the return spring 27, the cam lug 30 on the drive gear 24 abuts against the cam follower projection 35, which thus serves as a back stop for all of the above described positively connected rocking parts, from the pawl-carrying arm 18 outward to the handle knob 26, thereby positively to limit the reverse movement of these connected parts. When the handle knob 26 is rotated in a clockwise direction, the cam wedge face *a* of the cam 29 is brought immediately into operating engagement with the inclined face *e* on the follower lug 35. By reason of its slightly hook shape, this cam face *a* of the cam 29, in cooperation with the complementary inclined face *e* on the follower 35, will hold this lug 35 down, to assure the maintenance of its engagement with the cam 29, and will push the latch bolt 31 outward until the inner end of the cam follower lug 35 then rides upon the flat front cam face *b* of the rotating cam 29. This forward sliding movement of the latch bolt 31 withdraws its locking lug 34 out of the stop notch 14 in the magazine ring 11, thereby unlocking this ring, together with the entire magazine, so the latter can be rotated.

During this unlocking operation, the magazine operating gear 19 is being rotated and the pawl 22 is taking up the above noted lost motion with the abrupt end of the next adjacent ratchet tooth 13 on the magazine ring 11. Accordingly, further rotation of the handle 26 will rotate this ring 11 and thereby the entire magazine. Further rotation of the cam 29 releases the follower lug 35, whereupon the latch bolt spring 33 presses the locking lug 34 against the periphery of the magazine ring 11. At the end of a quarter turn rotation of the magazine this locking lug 34 will snap into the next succeeding stop notch 14, thereby bringing the magazine to a stop and locking it at the next normal position of its intermittent step-by-step movement. It is obvious that the locking of the magazine ring 11 will stop the forward movement of the handle knob 26. When the handle knob 26 is released, then the handle spring 27 will return the handle together with all of its positively connected parts, including the drive gear 24 and the pawl 22, back to their original positions. During this reverse movement of these connected parts, the magazine is maintained in a locked condition against possible displacement.

It will be noted that the cam follower lug 35 is now in the return path of the cam 29. As this cam 29 moves reversely its peripheral spiral cam face *c* will ride under the follower lug 35 and lift it, together with the entire inner end of the latch bolt 31, the locking lug 34 of this latch bolt, which is engaged in a stop notch 14, then being moved

towards the top of this notch while it still remains engaged therein. Near the end of the reverse movement of this cam 29 the cam rise end of its outer cam face *c* passes beyond and releases the cam follower lug 35. Immediately after this the inclined cam face *d* on the cam lug 30 comes into engagement with the complementary inclined face *f* on the cam follower lug 35 and draws this lug 35 downward, together with the entire inner end of the latch bolt 31, so that the latter is now again in its original position, in the path of forward movement of the cam 29.

When the inner end of the latch bolt 31 has reached the limit of its downward movement, the cam face *d* of the cam lug 30 is still in engagement with the face *f* of the follower lug 35. This abutting of the cam lug 30 against the follower lug 34 brings all of the above described positively connected operating parts, from the handle 26 inwardly to the drive pawl 22, to a stop in their return movement and at their original positions. During this return movement of these parts, the drive pawl 22 has ridden over the next following ratchet tooth 13 and has passed beyond the abrupt end of this tooth to an extent for providing the lost motion which is utilized as above described for effecting the unlocking of the magazine ring 11 together with the magazine as a whole.

It will be noted from the drawings that a large right angular open space is left between the successive adjacent columns 2. This free space at the bottom of the magazine is there utilized for effecting the lateral ejection and free delivery of the packages 1. The normal locked position of the four rectangular columns 2 appears most clearly in Fig. 2 and is indicated in Fig. 3. A delivery chute 36 in the base frame 16 is conveniently located at the front of the machine at the left side of the handle knob 26, with its open upper end at a level just below the bottoms of the columns 2 and in line with the above noted large right angular open space provided between these columns in their normal position of rest.

This delivery chute 36, as will be noted, is of rather large dimensions transversely, being of considerably greater width than the width of one of the columns 2 (Fig. 6). This large delivery chute thus provides ample free space for a package 1 to escape and freely fall away from the lower end of a column 2, regardless of any particular position or course that the package may tend to take in falling away from the bottom of the column 2 from which it has been ejected and down through the chute. This chute is shown as of substantially right angular shape at its upper end, with vertical side walls and a downwardly and outwardly concavely curved bottom wall, the outwardly projecting lower end of this chute being shaped to form a convenient reception cup. This entire delivery chute 36 may be cast in the same piece with the base frame 16, as shown.

A stationary ejector lug 37 is mounted upon and projects above the top of the base frame 16 at the right hand side of the top of the delivery chute 36, over which it projects, but leaving the major portion of the top of this chute open. For convenience in manufacture, the latch bolt cover plate 32 and the ejector lug 37 are shown as cast in the same piece. This ejector lug 37 is arcuate and located in line circumferentially with the similarly arcuate open space between the inner and outer parts 7 and 8 of the column bottoms, above which this lug 37 projects substantially to the extent of the thickness of a single package 1. The top of the projecting end of this ejector lug is shown (Figs. 5 and 7) as rounded, so that it will not catch upon but will ride under the second package from the bottom in a stack of these packages in a column 2.

At about the middle of a step of rotative movement of the magazine, one of its columns 2, while continuing its movement, will be brought directly over the open top of the delivery chute 36 (Figs. 5 and 6). The projecting end of the ejector lug 37 will then be substantially in contact with the lowermost package in the column. As this column continues to move, this lowermost package will be held stationary by the ejector lug 37 while the column bottom parts 7 and 8 by which this package, as well as those above it, is supported will move out from beneath it. During this package-ejecting operation the lower end 10 of the rear wall of the column 2 moves with a safe clearance above the upper side of this lowermost package which is being delivered but carries along with it the next package above, as well as the entire stack of packages 1 in this column 2. Also at this time this moving stack of packages will rest upon and be supported by the circularly elongated flat upper surface of the ejector lug 37, which is shown as of a length almost equal to the width of a column 2.

At the completion of this delivery movement of the magazine, this stack of packages from which one has just been delivered will rest upon and be supported by the top of the ejector lug 37, as will be evident from Figs. 1, 2 and 3. As soon as this stack of packages is moved clear of the right hand end of the ejector lug 37, at the next delivery operation, it will drop down upon the column bottom plates 7 and 8, so that another package may in like manner be ejected and delivered from the bottom of this same column when it again comes around to the ejector lug 37. The same is true, of course, of each of the four columns 2, so that thereby a package 1 will be delivered at each of the quarter turn steps of movement of the magazine.

The downward sliding movement of the packages 1 in the columns 2 is assisted by individual follower weights 38, which are particularly helpful when the stacks become low. These weights have reduced handle extensions projecting out through the vertical slots in the outer walls of the columns 2, for the convenient removal of these weights in refilling the columns from the top.

The ejector lug 37 is desirably of an arcuate length, as shown, for supporting only a single stack of packages, since the lowermost package in a column 2 passing over this lug has frictional sliding engagement therewith while this ejector lug 37 is supporting the entire stack of packages and its follower weight 38. However, so far as the delivery operation is concerned, this lug 37 could be made very much longer in the counter-clockwise direction of its arcuate extension. In fact, it could be extended circularly entirely around to the opposite or left hand wall of the top of the delivery chute 36, but not there to project over the delivery chute 36, which should be left clear and open for an ejected package to drop into it. In any case, as soon as a stack of packages is carried beyond the end of the ejector lug 37, this stack will drop upon the column bottom walls 7 and 8, with the lowermost package then in position to be ejected. In the construction shown, the stacks of packages 1 are supported on the inner and outer bottom parts 7 and 8 of the columns 2 and carried around without friction.

The inner bottom parts 7 of the columns 2 are formed on the magazine central bottom plate 5 as a matter of convenience and economy in manufacture. However, it should be obvious that similar inner bottom parts for the columns 2 might be differently constructed. For example, such inner bottom closure parts could be constructed in a manner substantially similar to the outer bottom closure plates 8.

For completing the dispensing machine of this invention in a commercial and workmanlike manner, a removable unitary protecting and finishing cover is provided for the entire rotatable magazine. This cover comprises a flanged base ring 39 firmly secured by means of an adhesive on the lower end of a glass cylinder 40 which has a flanged sheet metal top cover 41 similarly firmly secured on its upper end. The magazine journal shaft 15 has a reduced screw threaded end projecting through a central aperture in the cover top 41, upon which is a cap nut 42, so that the entire magazine cover is securely held in place with its flanged bottom ring 39 in engagement with a circular rim formed around the top of the base frame 16, as shown.

Rubber buttons 43 around the bottom of the base frame 16 and secured thereto by screws as shown, provide suitable feet for the machine.

It is believed that the operation of this dispensing machine, as a whole and as to its several operating parts, has been already fully described.

It is obvious that various modifications may be made in the construction shown in the drawings and above particularly described, within the principle and scope of the invention as defined in the appended claims.

I claim:

1. In a dispenser having a dispensing mechanism including a rotatable part to be driven and also having a rotatable driving member provided with an operating handle, the combination of step-by-step operating mechanism forming an operating connection between the said rotatable handle member and rotatable part comprising a rocking driving member positively connected to the rotatable handle member and having a one-way pawl-and-ratchet driving connection to the said rotatable part of the dispensing mechanism, a positively acting releasable locking device engageable with the said rotatable part of the dispensing mechanism for stopping the latter at the termination of each step of its rotative movement, and operating means for the said locking device connected to the said rotatable handle member, the said locking device comprising an automatically engaging slidable spring-pressed latch bolt mounted for transverse movement at its engaging end in a plane parallel with the axis of the said rotatable member of the dispensing mechanism, and the said operating means for the locking device comprising a double-faced cam mounted to rock to and fro past the said latch bolt so that one face of this cam will push back the latch bolt to its disengaged position and the other face of this cam will push the latch bolt aside and pass it in the return movement of the cam.

2. In a dispenser having a dispensing mechanism including a rotatable part to be driven and also having a rotatable driving member provided with an operating handle, the combination of step-by-step operating mechanism forming an operating connection between the said rotatable handle member and rotatable part comprising a rocking driving member positively connected to the rotatable handle member and having a one-way pawl-and-ratchet driving connection to the said rotatable part of the dispensing mechanism, a positively acting releasable locking device engageable with the said rotatable part of the dispensing mechanism for stopping the latter at the termination of each step of its rotative movement, and operating means for the said locking device connected to the said rotatable handle member, the said locking device comprising an automatically engaging slidable spring-pressed latch bolt mounted for transverse movement at its engaging end in a plane parallel with the axis

of the said rotatable member of the dispensing mechanism, and the said operating means for the locking device comprising a double-faced cam mounted on the handle member to rock to and fro past the said latch bolt so that one face of this cam will push back the latch bolt to its disengaged position and the other face of this cam will push the latch bolt aside and pass it in the return movement of the cam, in combination with a second cam carried by the said handle member for restoring the latch bolt to its original lateral position during the final part of the return movement of both cams together with the handle member.

3. The invention defined in claim 2, in which the said latch bolt forms a forward stop for the dispensing mechanism which it also locks against reverse movement and also through the said pawl-and-ratchet device forms a forward stop for the said handle member, and the said latch bolt also forming a reverse stop for the said rocking driving member and for the handle member through the engagement of this latch bolt by the said second cam in the reverse movement of the latter.

4. In an article dispenser, the combination of a base frame, an upright axis shaft having its lower end fixed in the base frame, a toothed bevel gear journaled on the shaft immediately above the base frame, an upright magazine journaled on the shaft above the said gear and including a ring surrounding the latter, the said ring being provided at its inside with a circular series of equidistantly spaced ratchet teeth, an outwardly spring-pressed driving pawl carried by the said gear to rock therewith into engagement with the successive ratchet teeth for thereby imparting step-by-step rotation to the magazine, a manually operable transverse handle shaft journaled in the base frame in a plane radial to the upright axis shaft of the magazine, a toothed bevel drive gear fixed on the handle shaft in engagement with the said gear on the upright shaft, a series of circularly equidistantly spaced locking recesses being provided in the periphery of the said ring, these recesses being equal in number to the said ratchet teeth, an inwardly spring-pressed locking member mounted on the base frame at the outer side of the said ring to ride upon the outer side of the latter and snap into any one of the said recesses thereby to stop the forward movement of the magazine and to lock it against displacement in either direction at the termination of a step of its rotative movement and thus also limiting the further forward rotation of the handle shaft by reason of the interengaged gears together with the engagement of the said driving pawl with one of the ratchet teeth on the ring, a return spring for the handle shaft and gears and driving pawl, means forming a back stop for the driving pawl only after this pawl has passed reversely over and to a distance beyond the next succeeding ratchet tooth on the ring thereby to provide initial lost motion in the next succeeding forward driving movement of this pawl, and means operating while this lost motion is being taken up to release the said locking member so as thereby to permit a forward step of movement of the magazine.

5. The invention defined in claim 4, in which the said means for releasing the locking member includes a cam carried by the said drive gear, and in which the said back stop includes a limiting lug also carried by the said drive gear.

6. The invention defined in claim 4, in which the said locking member is a radially slidable latch bolt spring-pressed inwardly to its locking position and mounted in the base frame so that its locking end may be lifted while it is in locking engagement with one of the said locking recesses in the magazine ring, the inner end of the said latch bolt being provided with an inwardly projecting lug shaped to form a cam follower, the said releasing means for the latch bolt comprising a cam projecting from the adjacent front face of the said drive gear and having a front cam face normally positioned for immediately engaging with the said cam follower end of the latch bolt for sliding the latter outward to its disengaged position and also having a peripheral cam face which in the reverse movement of the cam engages beneath the said cam follower end and lifts this end of the latch bolt so that thereby the said cam may return to its original normal position, and the said back stop comprising a forwardly projecting cam lug on the periphery of the adjacent front face of the said drive gear having an inwardly inclined inner cam face to engage over the top of the said cam follower lug thereby to move the engaged latch bolt downward with its cam follower end again immediately in the path of forward movement of the said bolt-releasing cam during the final part of the return movement of the drive gear, this return movement being stopped when the locking end of the said latch bolt reaches its downward limit of movement while the said cam lug is still in engagement with its inwardly projecting follower end.

7. In an article dispenser, the combination of an upright delivery magazine rotatable on a vertical axis comprising a circular series of equidistantly spaced hollow columns provided with a bottom closure, the lower end of each such column being cut away laterally along circumferential lines to provide open spaces above the bottom closure and the said bottom closure being divided along circumferential lines into inner and outer radially separated parts so as to leave a slot be-

tween such bottom parts, a base frame upon which the magazine is mounted for rotative movement, and a stationary upwardly projecting ejector lug rigidly carried by the base frame to project above the said magazine bottom in line with the said open spaces and slots so that thereby upon rotation of the magazine packages will be successively pushed out into the open spaces between the said columns.

In witness whereof, I hereunto subscribe my signature.

LOUIS H. MORIN.