Jan. 18, 1949. L. T. NEWMAN 2,459,715

VENDING APPARATUS

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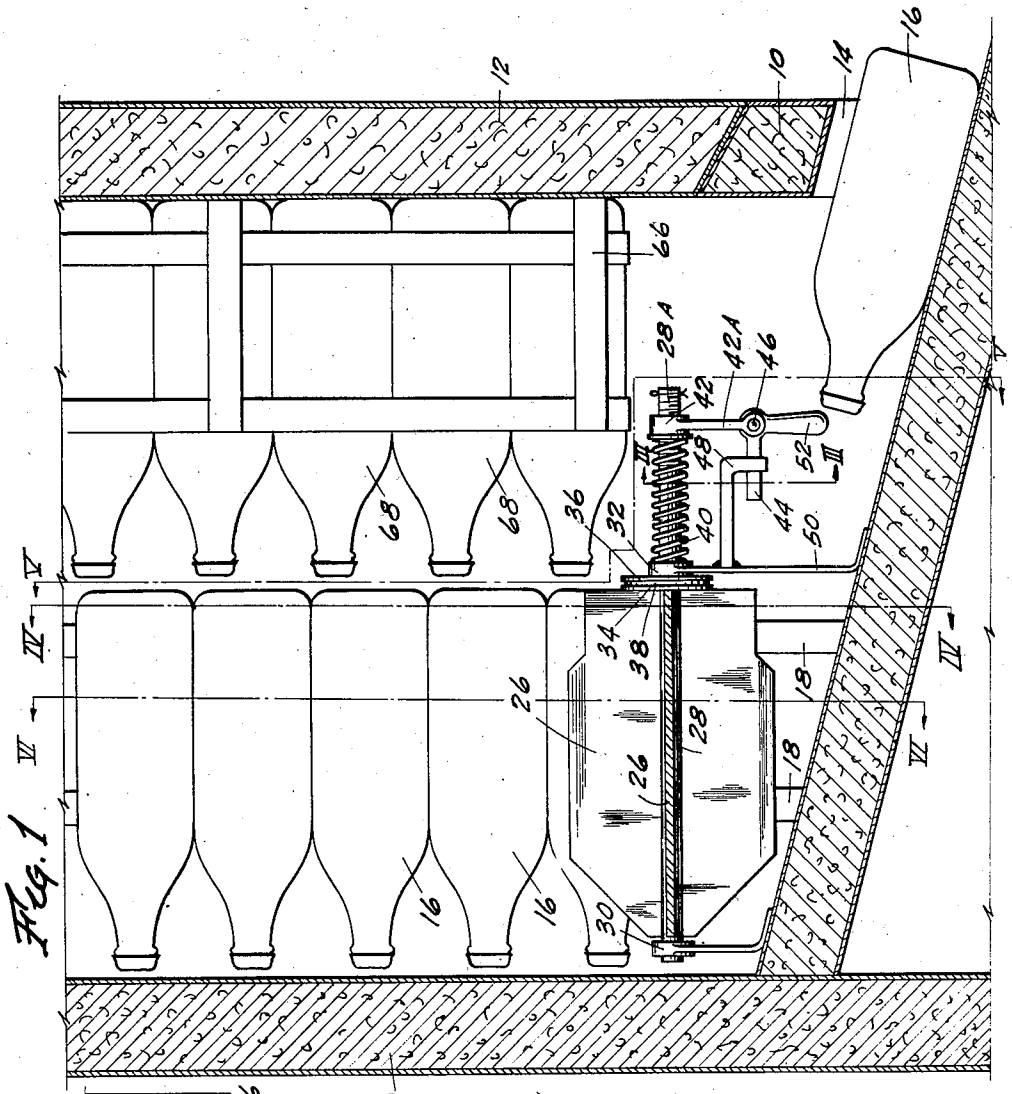


Fig. 1

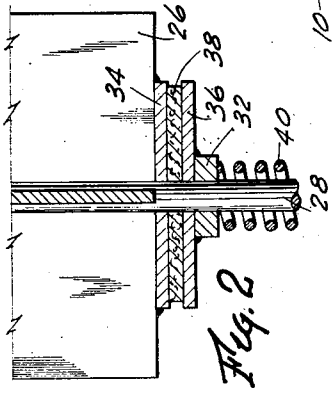


Fig. 2

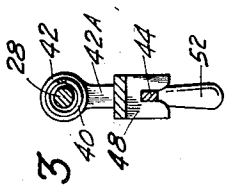


Fig. 3

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Fig. 4

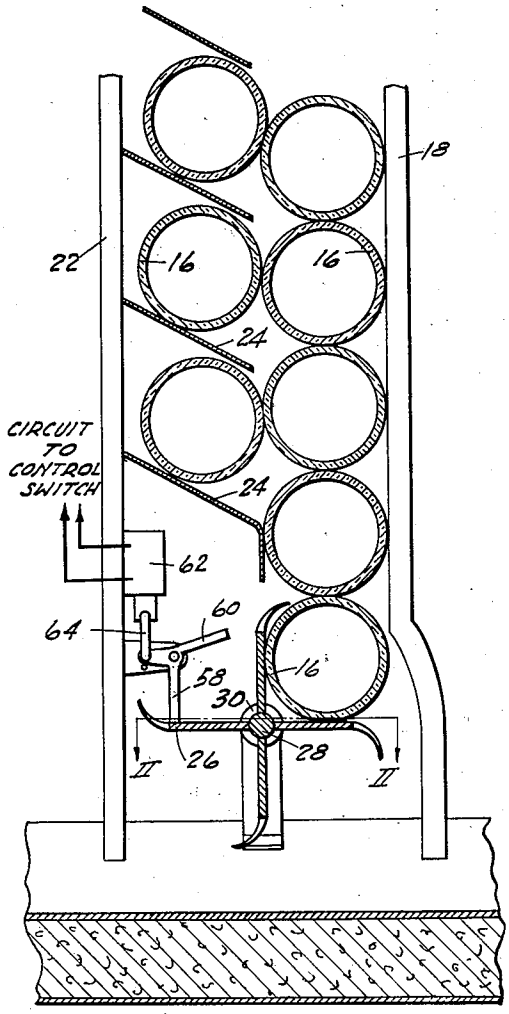
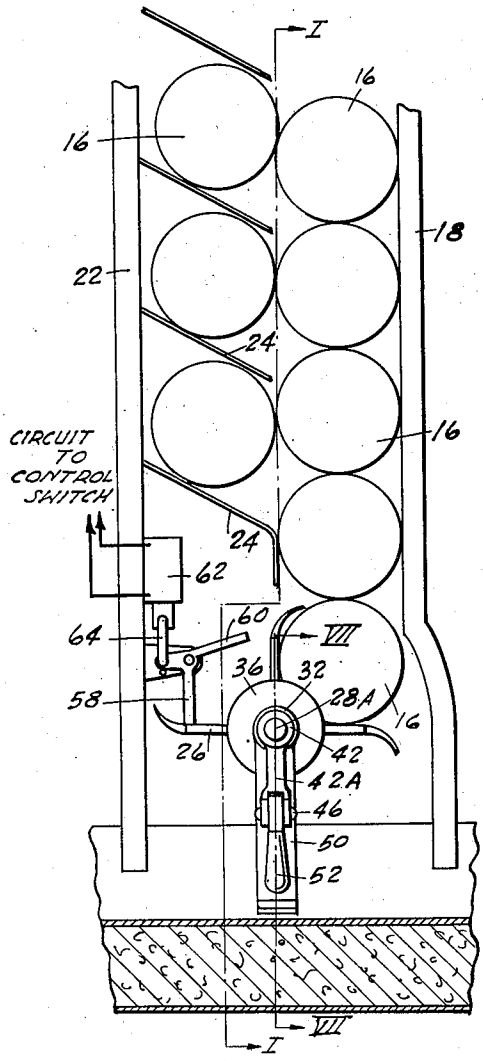


Fig. 5



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Fig. 6

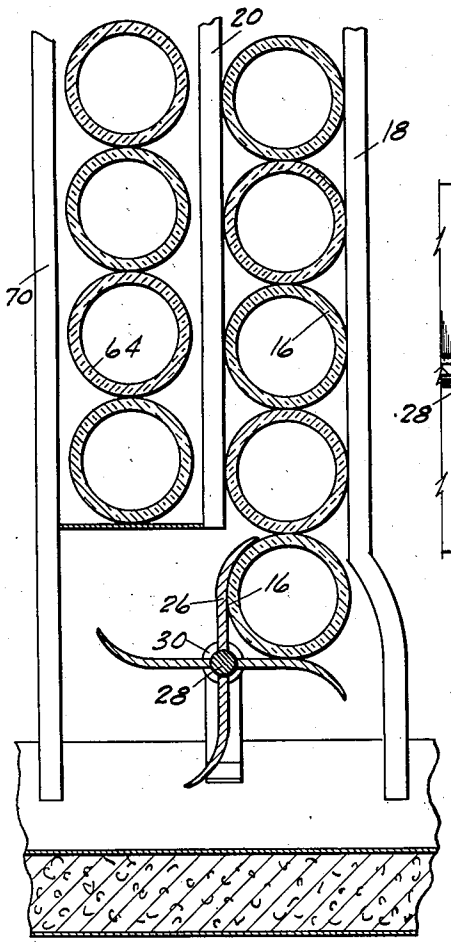
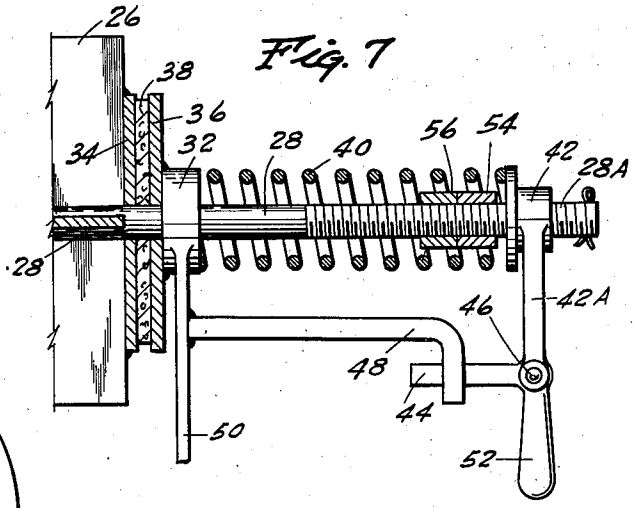


Fig. 7



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UNITED STATES PATENT OFFICE

2,459,715

VENDING APPARATUS

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7 Claims. (Cl. 312—48)

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This invention relates to vending apparatus in which a plurality of articles are supported in superposed relation in a column for successive release and has particular reference to supporting means which is adapted to smoothly and evenly control the lowering of the articles and effect their successive release.

The primary object of the invention is to support a column of articles in such manner that the weight of the articles tends to effect their discharge and to so retard the movement of a supporting element adapted to lower the articles and effect their release singly, that the articles will be smoothly lowered and the element stopped after each release, substantially without shock.

A further object is to provide such a mechanism, in which the resistance of the supporting element decreases in proportion to the decrease in weight of the supported cloumn.

A further object is to provide a gravity actuated supporting and discharging mechanism for a column of articles, which retards the lowering of the articles and which progressively decreases in resistance in proportion to the decrease in the number of articles within the column.

A further object is to provide latching means for an element adapted to support a column of articles, which latching means is normally releasable to allow lowering movement and discharge of the articles successively, in which discharge movement of said element reestablishes engagement of said latching means during said discharge and prevents discharge of more than a single article for each latch release.

The means by which the foregoing and other objects are accomplished and the manner of their accomplishment will readily be understood from the following specification on reference to the accompanying drawings in which:

Fig. 1 is an elevation view of a fragmentary portion of a vending machine in accordance with my invention, taken on the stepped line I—I of Fig. 5.

Fig. 2 is a fragmentary sectional plan taken on the line II—II of Fig. 4, showing a fragmentary portion of the supporting and lowering element and means for braking the turning movement of this element.

Fig. 3 is a sectional elevation taken on the line III—III of Fig. 1.

Fig. 4 is a transverse sectional elevation taken on the line IV—IV of Fig. 1, showing a delivery column with a rotary supporting and delivery element there below and an auxiliary magazine feeding into the delivery column.

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Fig. 5 is a corresponding elevation taken as on the stepped line V—V of Fig. 1.

Fig. 6 is a transverse sectional elevation taken as on the line VI—VI of Fig. 1, showing a delivery column with a rotary delivery element there below and a storage magazine adjacent the delivery column.

Fig. 7 is an enlarged sectional elevation taken on the line VII—VII of Fig. 5, showing a fragmentary portion of the delivery element and its retarding mechanism therefor.

Referring now to the drawings in which the various parts are indicated by numerals, 10 are fragmentary portions of the walls of a case, within which the apparatus may be enclosed. The case has an access door 12, and a delivery opening 14 through which the articles 16 are discharged. Where the articles, as bottles of beverages are to be cooled, suitable cooling means may be provided, but such means forming no part of the present invention per se, is not here shown.

The articles 16 are carried in a vertically disposed magazine, and confined between vertically disposed side members 18 and 20 in a single column in which the articles are superposed as in Fig. 6 or may be confined as in Figs. 4 and 5, in a double column by side members 18 and 22 with the articles superposed in one column and in the other separated by inclined shelves 24 feeding into the superposed article column as that column recedes in dispensing progressively, below the shelves 24. In either from the magazine has an open side, facing away from the wall to which it is adjacent and is refilled through this side when the access door 12 is open.

Disposed below the columns of superposed bottles is a rotary element having blades 26 which radiate from a central shaft 28. The shaft 28 is journalled in bearings 30 and 32, and projects beyond the latter bearing, the projecting end 28A being threaded, and extending toward the opening for the door 12 through which opening when the door is open it is readily accessible. Integrally secured as by welding to the shaft 28 and blades 26 is a disc 34. A complementary disc 36 is similarly secured to the bearing 32. A disc 38 of brake lining or like material is preferably disposed between the discs 34 and 36 and may be secured to one or the other thereof should it be so desired. A compression spring 40 is disposed on the threaded end 28A of the shaft and against the bearing 32, the spring being compressed against the bearing by a nut 42.

The nut 42 has a laterally extending arm 42A provided at its outer end with a blade 44 which

is hingedly attached to the arm 42A by a pivot pin 46. The blade is adapted for slidable engagement with a forked bracket 48 rigidly carried by a support 50 for the bearing 32. Preferably the blade 44 has an integrally attached handle 52 by which it may be manipulated, to release it from engagement with the bracket 48, the handle then serving as a handle for the nut arm, through which the nut may be reset. Resetting movement of the nut is limited by a threaded sleeve or stop 54, Fig. 7. The stop 54 is locked in desired position by a complementary lock nut 56. The pitch of the shaft threads is so established with relation to the weight of the articles and the tension of the spring that the turn of the shaft necessary to release an article and corresponding reduction of the weight of the column of articles supported by the blades effect a corresponding reduction in the frictional resistance of the discs and brake lining to the turning movement of the blades.

The rotary element and its blades 26 are releasably held against turning by a latch 58 which engages the blades successively, the latch including a bell crank arm portion 60 which is swung into the path of the released blade as the latch releases the blade, and must again restore the latch to position for engagement by the next blade in succession, before the released blade can complete its movement.

The latch 58 is manually released in any desired manner as by closure of an electric circuit to a solenoid 62 which is coupled through linkage 64 to the latch.

Where the machine is used for vending bottled beverages which should be cold when dispensed, a storage rack of equal capacity with the magazine is preferably also provided, in order that on exhaustion of the magazine it may be refilled with cold bottles and no waiting period be necessary before dispensing can be resumed. The storage rack 66 for these additional bottles or other articles 68, may be carried as in Fig. 1 by the access door 12, or a storage rack may be formed by the side members 20 and additional side members 70 as in Fig. 6. Preferably both types of the storage rack are open on the side facing away from the door or wall, both for filling, and for the removal of the articles to replace those discharged from the magazine, which likewise is open on the side away from the wall for refilling. All are so constructed and mounted that they are accessible when the access door 12 is opened.

In use the rotary element is latched by engagement of the latch arm 58 with a blade 26 of the element and the articles 16 are successively stacked, through the open side of the magazine, in superposed relation supported by the latched element. The blade 44 of the nut arm 42A is disengaged from the forked arm 48 and the nut tightened against the spring 40 until cooperative action of the brake members 34, 36 supports the superposed column of articles 16 with the latch released. The nut is then backed off easing the brake tension until the element turns slowly under the weight of the column and allows the column to descend at desired speed, after which the nut is latched against turning by reengagement of the blade 44 with the forked arm 48. When the proper nut positioning is determined the stop sleeve 54 is set up loosely against the nut and the lock nut 56 clamped against the sleeve. If the sleeve and nut are rendered inaccessible by the spring the nut may be removed, counting the turns necessary for removal, the spring is removed, the nut replaced with the same number of turns and the stop sleeve and lock nut set up against it. The nut is again removed, the spring and nut replaced, the stop sleeve then determining the nut position. From time to time as the braking members wear and braking resistance lessens the stop sleeve 54 may be shifted and the nut 42 tightened.

Release of the rotary element is effected by displacing the latch arm 58 from the blade 26, as by actuation of the solenoid 62. This action shifts the bell crank arm 60 of the latch into the path of the released blade 26 which cannot complete its movement until the latch arm is shifted back into position to engage and stop the next blade.

As dispensing proceeds, the weight of the column of articles decreases. Concurrently the shaft 28 unscrews from the nut 42 shifting the nut outward along the shaft, lessening the compression of the spring 40 and reducing the braking resistance in conformity to such weight decrease, and accomplishing substantially uniform lowering speed of the columns.

After the magazine is emptied, or at any time prior to emptying, the magazine may be refilled and the original braking conditions be restored by unlatching the nut 42 and tightening it against the compression spring 40 until such tightening is stopped by the stop sleeve 54, and then relatching the nut. If a storage rack is provided, the magazine is preferably filled from this rack and the rack subsequently filled.

It will be understood that the detail of the parts may be varied from without departing from my invention, particularly the details of the latch and the operating means therefor, and of the means which prevents turning of the nut, which as shown provides for latching after each full turn, but which by the addition of more arms 42A and blades 44, or otherwise, might be held in additional positions.

It will further be understood that while the drawings show and specification describes a single magazine and release therefor, any number of such magazines and related releases may be associated and if desired housed in a single casing.

I claim:

1. In a vending machine which includes a magazine for holding a column of superposed articles, a rotary element journalled below said magazine, and releasable means for latching said element against rotation, said element including blades shiftable by rotation of said element into article supporting relation beneath said column, means for frictionally resisting turning movement of said element, and means responsive to said turning movement for progressively reducing said frictional resistance.

2. In a vending machine which includes a magazine for holding a column of superposed articles, a rotary element disposed below said magazine, and means journalling said element, and releasable means for latching said element against rotation; said element including blades turnable by rotation of said element successively into article supporting relation beneath said column; means for frictionally resisting turning movement of said element, including cooperative braking members respectively secured to said element and said journalling means, a brake lining interposed between said members, a compression spring urging said braking members into braking contact; and means responsive to said turning

movement for progressively reducing said frictional resistance.

3. In a vending machine, which includes a magazine for holding a column of superposed articles, a rotary element disposed below said magazine, means journalling said element, and means releasably latching said element against rotation; said element including blades shiftable by rotation of said element into article supporting relation beneath said column; means for frictionally resisting turning movement of said element, including cooperative braking members respectively carried by said element and said journalling means, a brake lining interposed between said members, a compression spring urging said braking members into braking contact, means for adjusting the tension of said spring and responsive to said turning movement for progressively reducing said frictional resistance.

4. In a vending machine, which includes a magazine for holding a column of superposed articles, a rotary element including a shaft and blades, disposed below said magazine, and supporting said column, bearings journalling said shaft and releasable means for latching said element against rotation; braking members respectively carried by said element and one of said bearings, cooperating to resist turning movement of said element under the weight of said column, said shaft extending beyond said bearing and said braking members carried thereby and said extension being threaded, a compression spring and a nut disposed on said extension, said nut compressing said spring against said bearing and holding said braking members in braking contact resisting rotation of said element under column weight, means holding said nut against turning during rotation of said shaft, said shaft threading being pitched to unwind from said nut and relieve compression of said spring.

5. A vending machine assembly in accordance with claim 4, in which an adjustable stop is mounted on said shaft inward of said nut to limit compressive movement of said nut against said spring.

6. In a vending machine which includes a magazine for holding a plurality of articles for successive gravity discharge, a rotary element journalled adjacent the discharge end of said magazine, and releasable means for latching said element against rotation, said element including blades shiftable by rotation of said element into restraining relation with respect to said articles, means for frictionally resisting turning movement of said element, and means responsive to said turning movement for progressively reducing said frictional resistance.

7. In a vending machine which includes a magazine for holding a plurality of articles for successive gravity discharge, a rotary element journalled adjacent the discharge end of said magazine, and releasable means for latching said element against rotation, said element including blades shiftable by rotation of said element into restraining engagement with said articles, means for frictionally resisting turning movement of said element, means for adjusting said frictional resistance, and means responsive to said turning movement for progressively reducing said frictional resistance.

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