June 15, 1965 F. A. GASPARINI ETAL 3,189,218

DISPENSING APPARATUS

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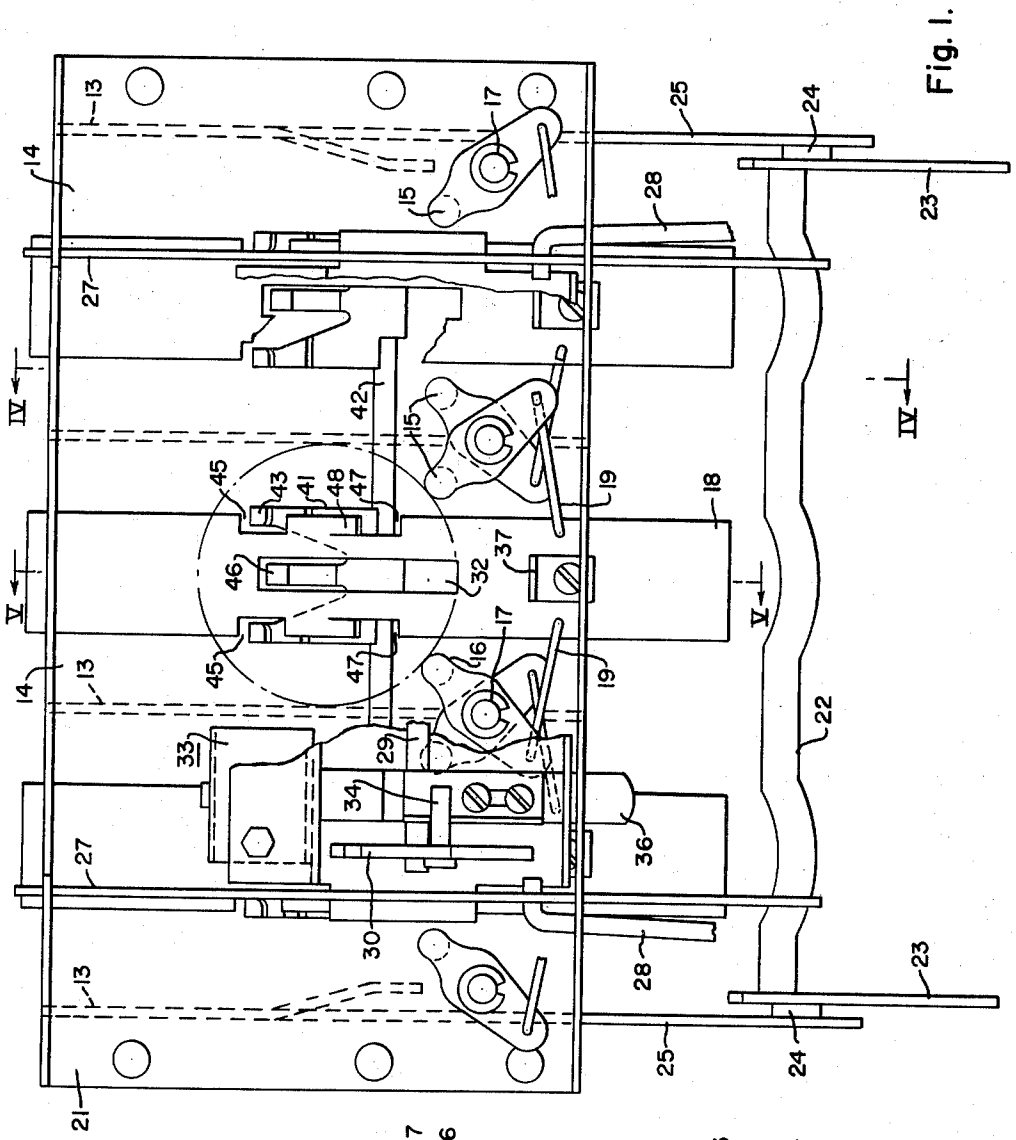


Fig. 1.

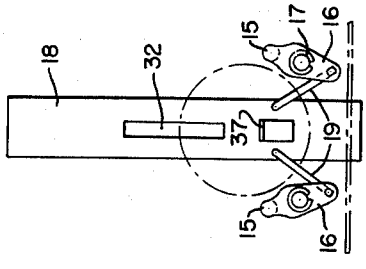


Fig. 2.

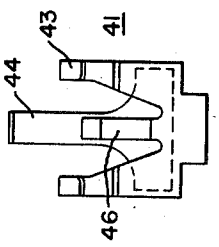


Fig. 3.

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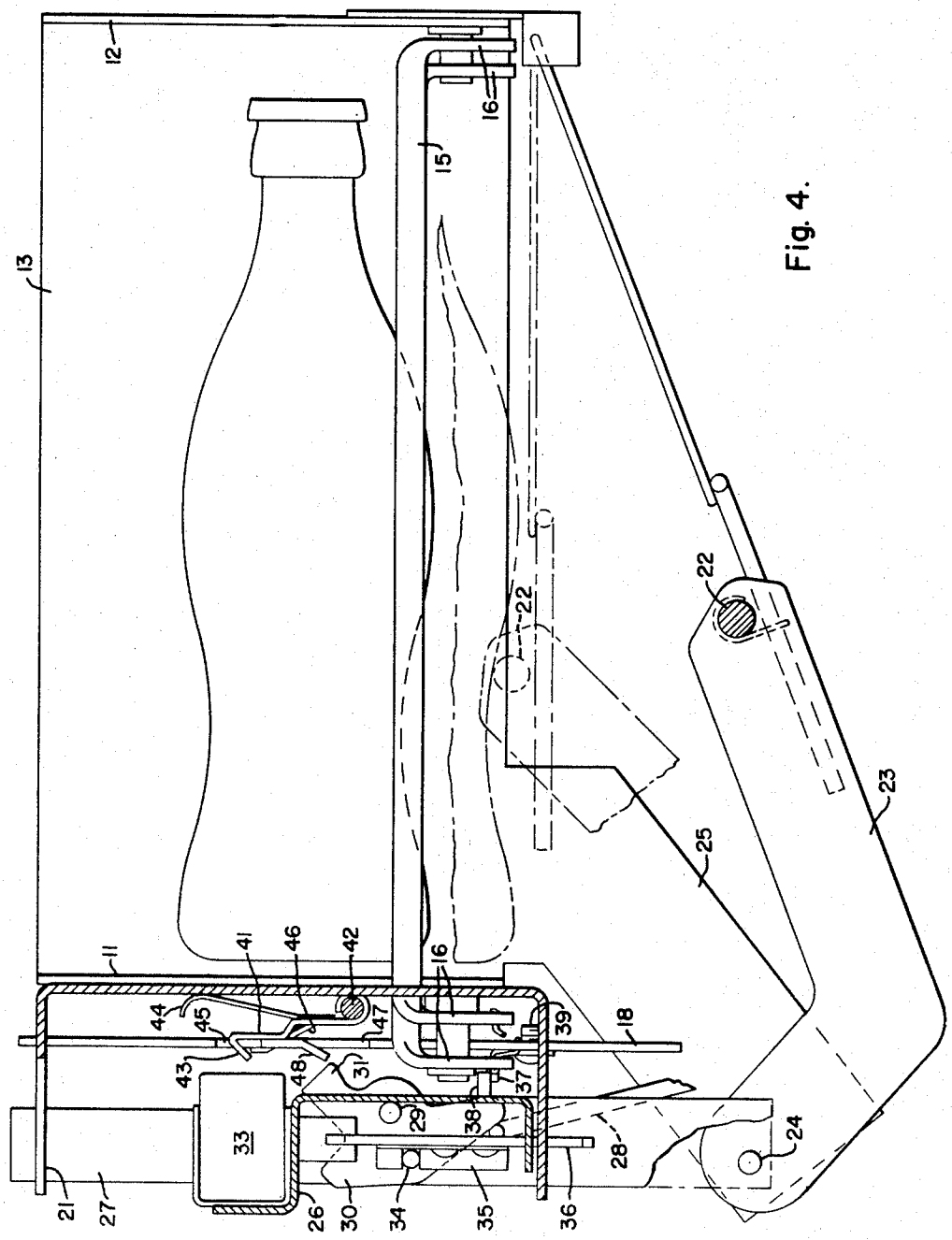


Fig. 4.

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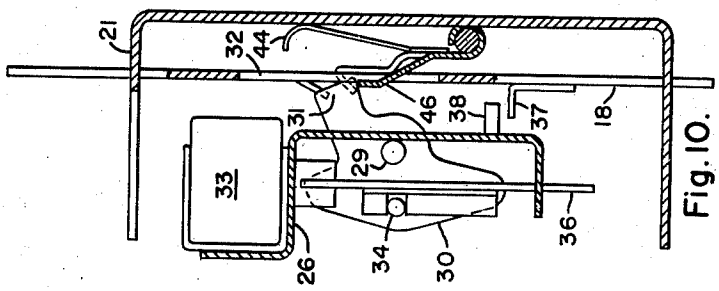


Fig. 10.

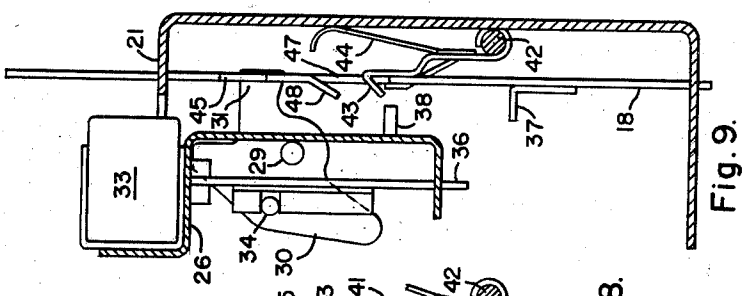


Fig. 9.

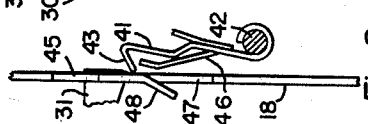


Fig. 8.

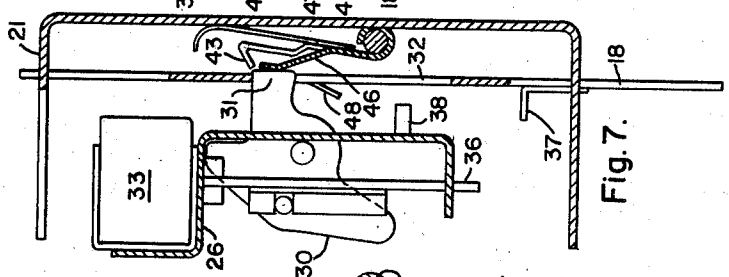


Fig. 7.



Fig. 6.

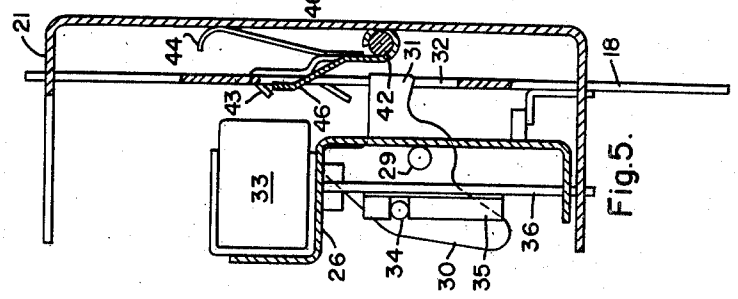


Fig. 5.

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3,189,218

DISPENSING APPARATUS

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Filed Feb. 25, 1963, Ser. No. 260,623
6 Claims. (Cl. 221—125)

This invention relates to a dispensing or vending machine, particularly a machine having a plurality of releasing or dispensing mechanisms for releasing or vending articles, and a common actuating mechanism for actuating the selected releasing mechanism. The actuating mechanism is provided with engaging elements, one for each releasing mechanism, the selected one of which is movable into registry or alignment with the associated releasing mechanism upon dispensing operation of the actuating mechanism.

The object of the invention is to make provision in such a machine to prevent unauthorized operation of the releasing mechanisms; more particularly to prevent operation of those releasing mechanisms which are not selected during a dispensing operation for the selected releasing mechanism.

In accordance with the present invention, each releasing mechanism is provided with a locking member which locks the same against operation, and which locking member has a part disposed in the path of movement of the associated engaging element so as to be moved into non-locking or releasing position by such engaging element upon movement of the actuating mechanism in dispensing operation.

The foregoing and other objects are effected by the invention as will be apparent from the following description and claims taken in connection with the accompanying drawings, forming a part of this application, in which:

FIG. 1 is a front elevational view of a bottle dispensing machine embodying the invention in rest or non-dispensing position;

FIG. 2 is a fragmentary front elevational view illustrating, somewhat diagrammatically, the bottle releasing mechanism in releasing position;

FIG. 3 is an elevational view of the locking member;

FIG. 4 is a vertical sectional view taken on the line IV—IV of FIG. 1, showing the apparatus in the rest or non-dispensing position;

FIGS. 5 to 9 are vertical sectional views showing the apparatus for actuating the releasing mechanisms, in successive positions attained in the course of a dispensing operation, FIGS. 5 to 7 being taken on the line V—V of FIG. 1, and FIGS. 8 and 9 being taken on the line IV—IV of FIG. 1; and

FIG. 10 is a vertical sectional view, generally similar to FIGS. 5 to 9, showing how a lifter is mechanically retracted by the locking member in the event that it has not been otherwise retracted.

Referring to the drawings in detail, there is shown a dispensing machine having a magazine structure comprising a front wall 11, a rear wall 12, and walls 13 extending between the front and rear walls to provide a plurality of magazines 14, there being three such magazines in the illustrated embodiment, each adapted to hold a vertical column of bottles of one-bottle width. At the lower end of each magazine 14, there is a bottle-releasing mechanism of any suitable type. The illustrated embodiment incorporates the one disclosed and claimed in the application of Meigs W. Newberry, Serial No. 7,509, filed February 4, 1960, now Patent No. 3,118,567 of January 21, 1964.

Each releasing or dispensing mechanism comprises two supporting and releasing rods 15 extending from front to rear and carried at the upper ends of levers 16 pivoted

about pivot pins 17. The releasing mechanism further comprises a vertically slidable plate 18 connected by links 19 to the lower ends of the levers 16 below the pivots 17. The rod operating plates 18 are vertically slidable through openings formed in the upper and lower flanges of a channel member 21 mounted on the front wall 11.

In FIGS. 1 and 4, each plate 18 is at the lower end of its travel and the rods 15 are in their bottle-supporting or non-dispensing position. To release the lowermost bottle from the column, the plate 18 is raised. During the first short portion of such upward movement, the links move the lower ends of the levers 16 slightly farther apart and the rods 15 move slightly toward each other. However, as the plate 18 moves upwardly beyond the position in which the links 19 are horizontal, the links draw the lower ends of the levers 16 toward each other and the rods 15 away from each other until, at the upper limit of its travel, the rods 15 are spaced sufficiently to permit the lowermost bottle to drop between the rods, as shown in FIG. 2. A lowering rod 22 moves upwardly into supporting engagement with the lowermost bottle at this time and then moves it gently downwardly to prevent the escape of the entire column of bottles as the plate 18 is lowered and moves the rods toward each other to engage and support the next to the lowermost bottle. The plate 18 continues downwardly to its lowermost or rest position, rotating the rods 15 to their normal or bottle-supporting position as shown in FIGS. 1 and 4. The rod 22 is mounted on the free or movable ends of levers 23, which are pivoted at 24 to extensions 25 of two walls 13. Since mechanism for moving the rod 22 and the levers 23 in proper timed relation to actuation of the rods 15 is already known and forms no part of the present invention, it is not shown here.

The vending machine includes an actuating mechanism common to the several releasing or dispensing mechanisms for operating the selected one of them. The mechanism includes a horizontally-extending, channel-shaped carriage 26 supported by two plates 27 which extend and are movable vertically through other slots in the horizontal flanges of the channel member 21. The plates 27 are moved up and down through links 28 by a suitable motor and connecting parts, which are not shown as they form no part of the present invention.

The carriage 26 carries a horizontal hinge shaft 29 on which there is pivotally mounted a lifter 30 for each plate 18. The lifter 30 includes a finger 31 extending through a slot in the carriage 26 and movable into a slot 32 in the plate 18 into vertical alignment or registry with the upper edge of the slot 32, so that when the carriage 26 is raised, the finger 31 moves into abutment with the upper edge of the slot 32 and moves the plate upwardly. The lifter 30 is rotated from its non-dispensing position shown in FIG. 4 to its operative position in FIG. 5 by energization of a solenoid 33. This is effected by means of a pin 34 carried by the lifter and extending through a recess in an angle piece 35 attached to a vertically extending plate 36 which is connected to and actuated by the solenoid 33.

To assure downward movement of all the plates 18 upon downward movement of the carriage 26, each plate is provided with an angle piece 37 having a horizontally extending tab disposed under a tab 38 struck out from the carriage 26. The angle piece may be fastened to the plate 18 by a screw 39 which also serves as a stop adapted to contact the lower flange of the channel member 21 to limit the downward movement of the plate 18.

In accordance with the present invention, each plate 18 is provided with a locking member 41 hinged at its lower end to a horizontal hinge shaft 42 fastened to the channel member 21. The locking member 41 comprises a rigid sheet metal piece having its lower end wrapped around

the hinge shaft 42 to hinge it thereto and at its upper end having two downwardly inclined tabs 43 to form hooks. The lock has a leaf spring 44 riveted thereto which bears against the channel member 21 and biases the locking member against the plate 18 to the left as seen in FIGS. 5 to 10. The spring is omitted in FIG. 1 to simplify the illustration.

The plate 18 is formed with two recesses 45 through which the tabs 43 extend in the rest position and the hooks formed by these tabs are adapted to engage the lower horizontal, or upwardly facing, edges of the recesses or notches 45 to lock the plate against upward movement.

The locking member 41 is further provided with an inclined finger 46 extending into the slot 32 in the path of the upward movement of the finger 31 during a dispensing operation, as shown in FIG. 3.

Each plate 18 is also formed with two recesses or notches 47 disposed directly below the recesses 45, and the portion of the plate immediately above each recess 47 is struck out to form tabs 48 extending in an inclined direction as shown in FIG. 4.

Operation

To dispense a bottle of the selected flavor, the solenoid 33 for the magazine containing the desired flavor is caused to be energized and the actuating mechanism is caused to be operated to raise the carriage 26 and the rod 22. This may be done by means of a suitable control. Controls of this nature are well-known and since the control itself forms no part of the present invention, it is not shown.

The solenoid, upon being energized, moves its armature upwardly, carrying the pin 34 upwardly with it and rotating the lifter 30 in clockwise direction (as seen on the drawing) from the position shown in FIG. 4 to the position shown in FIG. 5, causing the finger 31 to extend into the slot 32 of the plate 18. As the carriage 26 moves upwardly, carrying the finger 31 with it, the finger 31 moves into engagement with the inclined finger 46 of the locking member, as shown in FIG. 6, moving it to the right and withdrawing the tabs 43 from the recesses 45 in the plate 18. The finger 31 moves into abutment with the plate 18 at the upper edge of the slot 32, as shown in FIG. 7, and moves the same upwardly to release the lowermost bottle in the selected magazine, as described above. The engagement of the finger 31 with the inclined finger 46 keeps the tabs 43 out of the upper recesses 45 until the recesses have passed the tabs, and then as the finger 31 moves above the upper edge of the finger 46, the spring 44 moves the locking member slightly to the left until the tabs 43 abut the surface of the plate 18. Upon further upward movement of the plate 18, the tabs 43 are moved into the lower recesses 47 by the spring 44, as shown in FIG. 9.

When the carriage 23 reaches the upper limit of its travel, or shortly thereafter, the solenoid 33 is de-energized, permitting the lifter 30 to be retracted, by the weight of the solenoid armature or by any suitable force, and to retract the finger 31 from the slot 32. As the carriage 26 moves downwardly, the plate 18 may first remain stationary, due to the spring force of the locking member 41 thereon, but soon the tab 38 engages the tab of the angle piece 37 and moves the plate downwardly. The tabs 48 of the plate 18 engage the tabs 43 of the locking member, moving the same to the right out of the recesses 47. As the plate 18 approaches the lower end of its travel, the tabs 43 are moved into the recesses 45 by the spring 44, thereby again locking the plate 18 against upward movement until the next dispensing operation in which the same plate 18 is selected.

During the dispensing operation, the plates 18 other than the selected plate 18 remain locked against upward movement by the hooks of the locking member in locking relation to the horizontal edges of the plate at the lower side of the recesses 45, as shown in FIG. 4. Thus, there is provided protection against unauthorized raising of a non-selected plate 18 to obtain a bottle other than the one that is selected and paid for. This provides protection particularly against the possibility of raising the plate to obtain an unauthorized bottle by unplugging the electric cord of the machine at the time that the carriage is adjacent the upper end of its travel. When the carriage is adjacent the lower end of its travel, the raising of all the plates 18 is prevented by engagement of the tabs 38 with the tabs of the angle pieces 37.

In the event that the lifter 30 should fail to return to its retracted position upon de-energization of the solenoid, due either to residual magnetism in the solenoid or to friction or binding, the finger 31 moves into abutment with the upper edge of the finger 46, as shown in FIG. 10, whereupon continued downward movement of the carriage 26 mechanically actuates the lifter in counterclockwise direction to its retracted position. The recesses 47, in receiving the tabs 43, permit the locking member 41 to move sufficiently to the left to position the finger 46 in the path of the finger 31 to effect the action just mentioned.

While the invention has been shown in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof.

What is claimed is:

1. A dispensing machine comprising
a magazine structure for retaining articles to be dispensed,
a plurality of releasing mechanisms for releasing articles from said magazine structure,
a reciprocable carriage for operating a selected one of said releasing mechanisms,
a plurality of engaging elements carried by said carriage and having portions movable into driving relation to said releasing mechanisms respectively,
a locking member for locking each releasing mechanism against movement,
each engaging element and the locking member associated therewith being mounted in said relation to each other that said engaging element, upon movement into driving relation to its associated releasing mechanism, moves said locking member out of locking relation to said releasing mechanism.

2. A dispensing machine comprising
a magazine structure for retaining articles to be dispensed,
a plurality of releasing mechanisms for releasing articles from said magazine structure,
each releasing mechanism including a vertically movable plate and operated to dispensing position upon upward movement of such plate and to non-dispensing or article-supporting position upon downward movement of said plate,
a vertically reciprocable carriage for operating a selected one of said releasing mechanisms,
a plurality of engaging elements carried by said carriage and each having a portion movable into registering relation with its associated plate, and
a locking member for locking each plate against upward movement,
each engaging element and the locking member associated therewith being mounted in such relation to each other that said engaging element, upon movement into driving relation to its associated plate, moves said locking member out of locking relation to said plate.

3. A dispensing machine comprising
a magazine structure for retaining articles to be dispensed,
a plurality of releasing mechanisms for releasing articles from said magazine structure,
each releasing mechanism including a vertically movable plate having a slot therein and operated to dispensing position upon upward movement of said

plate and to non-dispensing or article-supporting position upon downward movement of said plate,

a vertically reciprocable carriage for operating a selected one of said releasing mechanisms,

a plurality of engaging elements carried by said carriage and each having a portion movable into the slot of one of said plates, and

a locking member for locking each plate against upward movement,

said locking member having a part disposed in the path of upward movement of said engaging element when extending into the slot of its associated plate and moving the locking member out of locking relation to said plate upon such upward movement of said engaging element.

4. A dispensing machine comprising

a plurality of article releasing mechanisms,

a reciprocable carriage movable in a first direction and in the opposite direction to effect operation of a selected one of said releasing mechanisms,

an engaging element pivoted on said carriage for each releasing mechanism,

each engaging element having a finger and a solenoid for moving the same from a retracted position to a position in which said finger projects into driving relation with the associated releasing mechanism,

and a locking member for each releasing mechanism for locking the same against operation,

said locking member having a part disposed in the path of movement of the finger of said engaging element when projected therefrom and moving the locking member out of locking relation to the associated releasing mechanism upon movement of said projecting finger in first direction but upon movement of said projecting finger in the opposite direction being unyieldable and causing pivoted movement of said engaging element in the direction toward its retracted position.

5. A dispensing machine comprising

a magazine structure for retaining articles to be dispensed,

a plurality of dispensing mechanisms for dispensing articles from said magazine structure,

each dispensing mechanism including a vertically movable plate having a slot therein and operated to dispensing position upon upward movement of said plate and to non-dispensing position upon downward movement of said plate,

a vertically reciprocable carriage for operating a selected one of said dispensing mechanisms,

an engaging element pivoted on said carriage for each dispensing mechanism,

each engaging element having a finger and a solenoid for moving the finger from a retracted position to a position in which it projects into the slot of its associated plate, and

a locking member for each plate for locking the same against upward movement,

said locking member being pivoted to a stationary structure and projecting upwardly from the pivot, and having a hook adapted to engage an upwardly facing edge of said plate when the plate is in its lowermost position to lock the plate against upward movement,

said locking member also having a part disposed in the path of movement of said finger into engagement with the upper edge of said slot, the locking member being moved out of locking engagement with said plate upon such movement of said finger.

6. A dispensing machine comprising

a magazine structure for retaining articles to be dispensed,

a plurality of dispensing mechanisms for dispensing articles from said magazine structure,

each dispensing mechanism including a vertically movable plate having a slot therein and operated to dispensing position upon upward movement of said plate and to non-dispensing position upon downward movement of said plate,

a vertically reciprocable carriage for operating a selected one of said dispensing mechanisms,

an engaging element pivoted on said carriage for each dispensing mechanism,

each engaging element having a finger and a solenoid for moving the finger from a retracted position to a position in which it projects into the slot of its associated plate, and

a locking member for each plate for locking the same against upward movement,

said locking member being pivoted to a stationary structure and projecting upwardly from the pivot, and having a hook adapted to engage an upwardly facing edge of said plate when the plate is in its lowermost position to lock the plate against upward movement,

said locking member also having a part disposed in the path of movement of said finger into engagement with the upper edge of said slot, the locking member being moved out of locking engagement with said plate upon such movement of said finger,

said plate having a recess disposed directly below said upwardly facing edge for receiving said hook upon movement of said plate to its uppermost position,

camming means for moving said hook out of said recess upon downward movement of said plate,

said part, when said hook is disposed in said recess, being disposed in the path of downward movement of said finger, whereby said engaging element is rotated to retract said finger upon engagement with said part in the event that the finger is not previously retracted.

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Dedication

3,189,218.—*Francis A. Gasparini* and *John A. Gormley*, Springfield, Mass. DISPENSING APPARATUS. Patent dated June 15, 1965. Dedication filed Oct. 7, 1974, by the assignee, *The Vendo Company.*

Hereby dedicates to the Public the entire remaining term of said patent. [*Official Gazette May 6, 1975.*]