

Oct. 4, 1966

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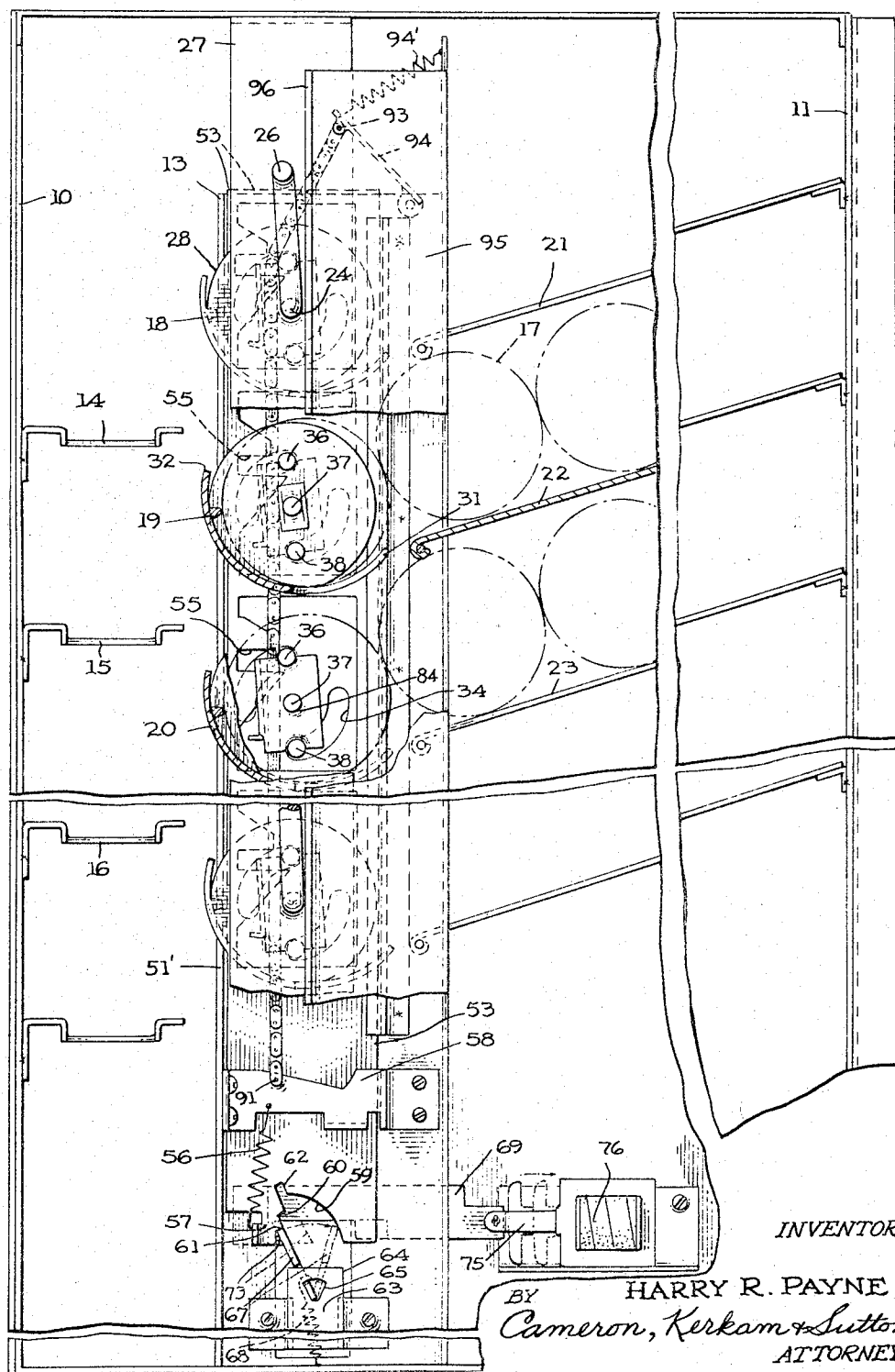
3,276,624

SLANT SHELF ROTARY RECEIVER DISPENSING MECHANISM

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FIG. 1.



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FIG. 2.

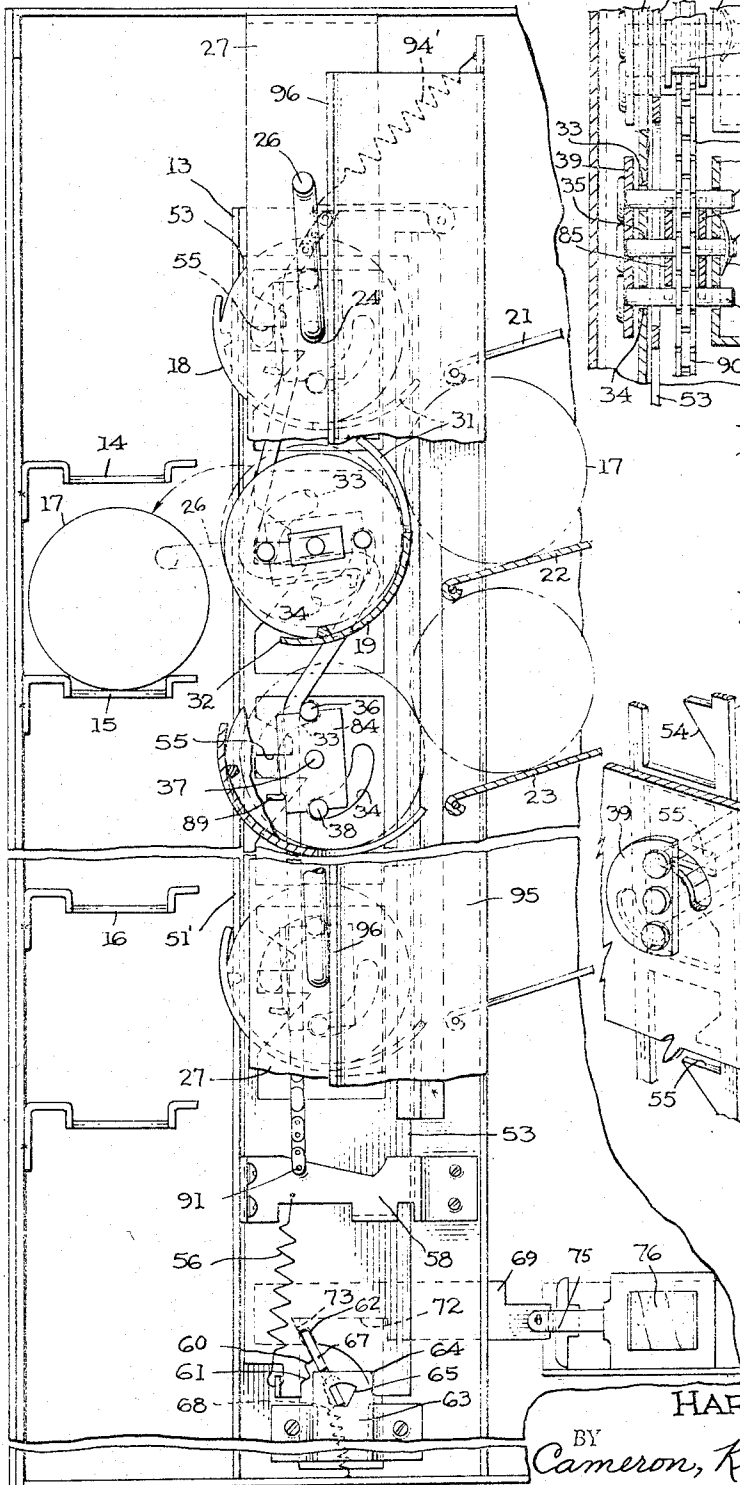
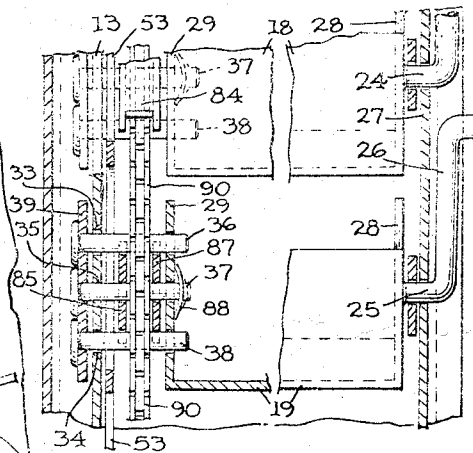
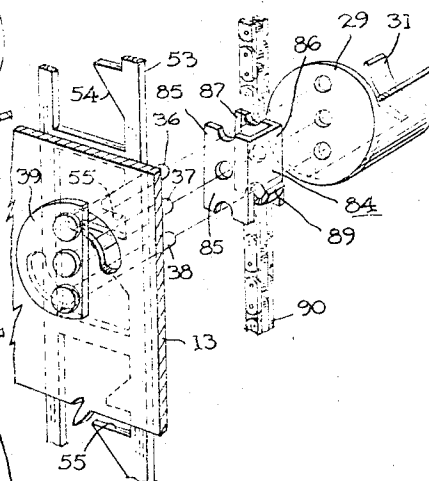


FIG. 3.

FIG. 4.



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FIG. 5.

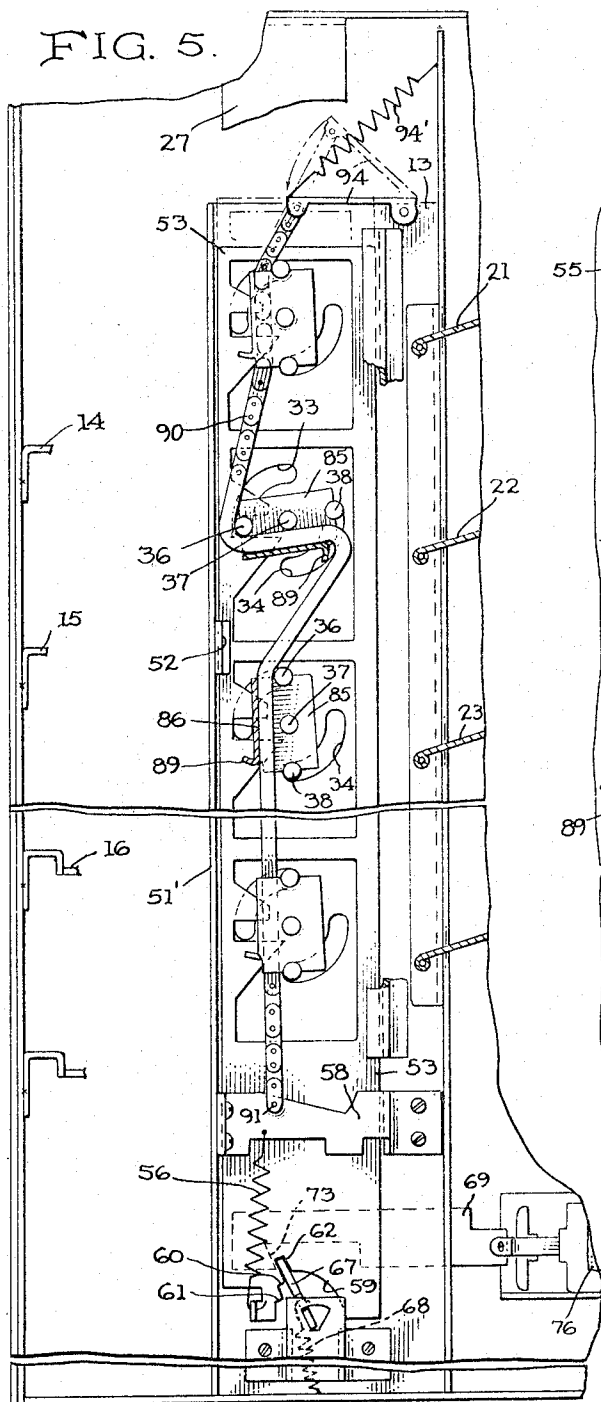
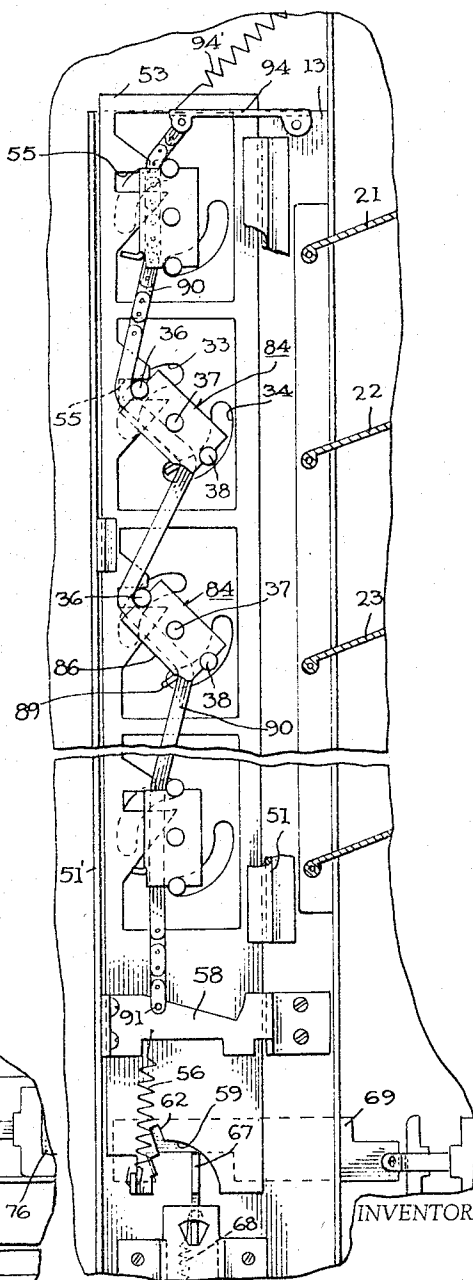


FIG. 6.



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SLANT SHELF ROTARY RECEIVER DISPENSING MECHANISM

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3 Claims. (Cl. 221-125)

This invention relates to superimposed vending machines of the type wherein a number of articles to be vended are arranged in superimposed groups of objects on slanting shelves one of each group of objects being normally disposed in a vending position in a rotary receiver and locked against removal which vending machine includes lock-out structure of the type described in my U.S. Patent No. 3,151,744, which permits the dispensing of but one article from one group of superimposed groups of articles for each cycle of operation of the machine.

The vending machine of the present concept provides a selective vending machine permitting the user to choose from a number of groups of articles one of the type of articles which the customer desires to purchase by depositing a coin and the machine includes lock-out mechanism which prevents the dispensing of more than one article for each coin deposited.

The vending machine of the present invention is particularly adapted to handle bottled beverages arranged in groups according to beverage; each group is supported on an inclined shelf; and the lock-out mechanism permits the dispensing of a single bottle from a selected shelf and prevents the dispensing of additional bottles during a cycle of the machine commenced by the deposit of a coin.

In the present dispensing mechanism each group of bottles is mounted on an inclined shelf so that the bottles are fed by gravity one at a time to the rotary receiver at the vending position and a divider is provided on the rotary receiver which prevents gravitational movement of all of the bottles on a shelf each time a single bottle is dispensed from the selected group of bottles to prevent dispensing of more than one bottle from the selected group of bottles.

The dispensing mechanism of the present invention includes a lock-out mechanism including a chain and common bar as described in my patent referred to above. A crank at each shelf operates the lock-out mechanism when the receiver is rotated preventing rotation of the receivers at the other shelves thus preventing removal of bottles from shelves other than the selected shelf.

It is therefore an object of this invention to provide novel rotary receiver mechanism for vending machines combined with the chain, lock-out plate or common bar and latch for the plate or common bar as described in by patent aforesaid.

Another object is to provide novel vending machines having superimposed vending stations including lock-out mechanism having an arrangement of a chain and plate or common bar together with a latch for the plate as described in my patent above identified.

Another object is to provide novel rotary receiver mechanism for such vending machines in novel combination with a lock-out chain and plate or common bar employed with a latch for the plate which latch is electrically released by the deposit of a coin and is returned to latching position by downward movement of the plate.

Other and further objects of the present invention will appear from the following description of an illustrative embodiment thereof.

The present invention is capable of various mechanical embodiments one of which is shown in the accompanying drawings and is described hereinafter to illustrate the present inventive concept. This illustrative embodiment

should in no way be construed as defining or limiting the invention.

In the accompanying drawings, in which like reference characters indicate like parts:

FIG. 1 is a front elevation, partly in section, of an illustrative embodiment of a bottle vending machine in accordance with the present invention;

FIG. 2 is a view of the embodiment of FIG. 1 showing the position of the several parts for dispensing at an upper shelf;

FIG. 3 is a partial elevational view partly in section as seen from the left in FIG. 1;

FIG. 4 is an expanded view of a part of the structure adjacent a rotary dispenser as seen from the left rear in FIG. 1 showing the chain and common bar;

FIG. 5 is a front elevation of the structure of FIG. 1 with the rotary receivers removed and the mechanism actuated for dispensing of a bottle from an upper shelf and showing the latch in position for return to latched position; and

FIG. 6 is a front elevation corresponding to that of FIG. 5 showing the position of the lock-out elements when an attempt is made to dispense two bottles at the same time.

Referring now to the several figures, the bottle dispensing mechanism of the present invention includes four vertically disposed side plates 10 and 11, front plate 12 and back plate 13. Side plate 10 supports any desired number of spaced platform members 14, 15 and 16 which provide dispensing or vending stations for the articles to be dispensed or sold such as the bottles generally indicated at 17. Platforms 14, 15 and 16 slant downwardly to a common receiver, not shown. Adjacent platforms 14, 15 and 16 are rotary receivers 18, 19 and 20, respectively, adjacent to shelf members 21, 22 and 23, respectively, which extend laterally therefrom and in an upward direction to receive and store as many of the bottles 17 as may be desired so that the bottles 17 roll downwardly under the force of gravity into the receivers 18, 19 and 20 and into position to be dispensed.

A common vertical plate 27 is provided adjacent the front of the mechanism and passes adjacent each of the platform members 14, 15 and 16 and receives shafts 24 and 25 for rotation, shaft 24 supporting rotary receiver 18 and shaft 25 supporting rotary receiver 19. A manually actuatable crank such as crank 26 is provided for each such shaft. All of the rotary receivers are of similar construction and are provided with end walls 28 and 29 connected by a partially cylindrical body portion 30 having outboardly extending lips 31 and 32.

The dispensing mechanism is the same for each of the dispensing stations and will be described with respect to one such station, the station provided by platform member 15 and rotary receiver 19. Referring now more particularly to FIGS. 3 and 4, back plate 13 is arcuately slotted at 33 and 34 and bored at 35 the center of slots 33 and 34 to receive pins 36, 37 and 38 which are mounted on and through plate 39, pins 36 and 38 passing through the arcuate slots and pin 37 passing through hole 35. All the pins pass through end 29 of rotary receiver 19. Pin 37 with shaft 25 form the axis of rotation of receiver 19.

Thus, when crank 26 for shaft 25 is rotated by the user of the mechanism, rotary receiver 19 will be rotated in counterclockwise direction as seen in FIG. 2 to a position such that the bottle 17 therein will roll onto platform 15 and from there slide to dispensing position, lip permitting the bottle to roll from the receiver and lip interposing a barrier preventing the next bottle 17 from rolling into the receiver and onto platform 15 and from entering the dispensing position to prevent more than one bottle from being dispensed during a single cycle of the machine.

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A front plate 95 is positioned adjacent cranks 26 and has an upstanding edge 96 extending along cranks 26 in their normal vertical position to prevent rotation of cranks 26, except in counterclockwise direction as seen in FIGS. 1 and 2 and to limit rotation thereof to 180°.

The lock-out mechanism is provided to prevent the rotation of more than one rotary receiver during a cycle of the mechanism. The lock-out mechanism is best seen in FIGS. 3, 4, 5 and 6. It will be seen that the construction is the same for each dispensing station and so will be described only with respect to one rotary receiver 19. Pins 36 and 38, above described, are arranged to lie in the upper and lower extremities of slots 33 and 34, respectively, and in a vertical line when crank 26 is in its raised position with rotary receiver 29 opening upwardly to retain a bottle 17 therein.

Outwardly and inwardly extending cleats 51 are mounted on member 13 forming guides and correspondingly shaped plates 52 are suitably secured to outturned edge 51' of member 13. A common bar or plate member 53 is mounted for vertical movement in the guides formed by cleats 51 and 52 and is suitably cut away at 54 at each dispensing station to permit free rotation of pins 36 and 38 when plate 53 is in its raised position. Each opening 54 is provided with a notch 55 which is engaged by the adjacent pin 36 when rotated to move member 53 downwardly. A spring 56 connects to bar 53 at 57 and to cross plate 58 to urge bar 53 toward its upper or raised position.

Common bar or plate 53 is provided adjacent its lower end with a cam surface 59 which has formed therein latch shoulders 60 and 61 and a vertically extending portion 62. A pair of opposed plates 63 and 64 are secured on opposite sides of the lower extremity of frame member 13 and are provided with opposed triangularly shaped openings such as 65, to receive a latch 67 which is urged by spring 68 to either its extreme left-hand position or its extreme right-hand position, as seen in FIG. 1. When plate 53 is in its raised position latch 67 normally engages shoulder 61 to prevent downward movement of member 53.

A latch actuating member 69 is mounted for reciprocating movement in suitable brackets, not shown, mounted on member 13 and member 69 is cut away at 72 to provide shoulder 73, the shoulder 73 engaging latch 67 to move the same against the action of spring 68. Member 69 is connected to rod 75 of a suitable solenoid 76 which is mounted beneath the lowest dispensing action.

When the user of the dispensing mechanism deposits a coin therein solenoid 76 is energized moving member 69 to the right to bring shoulder 73 into engagement with latch 67 to move latch 67 to the extreme right-hand position to release plate 53 for downward movement. Solenoid 76 is then dennergized and member 69 returns to its starting position without moving latch member 67 from the position it has assumed against cam surface 59. Thereafter, when plate 53 moves downwardly during a dispensing operation, as will appear more fully hereinafter, cam surface 59 bearing against latch 67 moves latch 67 in counterclockwise rotation as seen in FIG. 6 to the position seen in FIG. 5 and upon raising of plate 53 at the end of the dispensing operation latch 67 first engages shoulder 60 and then engages shoulder 61 to prevent more than one downward movement of plate 53 for a dispensing cycle to prevent the dispensing of more than one bottle during each cycle of operation of the mechanism.

As will be seen in the several figures, a box member 84 is provided for each dispensing level and comprises a side plate 85 extending between pins 36 and 38 and mounted on pivot 37; a side wall or partition 86 extending from plate 85; and a second side plate 87 extending between pins 36 and 38 and around pivot 37 and formed integrally with wall 86. Box member 84 is secured to pivot 37 by any suitable means such as a spring clip 88.

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Wall 86 is provided with an outturned lip portion 89 for reasons which will appear more fully hereinafter.

A flexible non-extensible member or chain 90 is secured at 91 to crosspiece 58 which extends over the common bar 53 and is spaced therefrom and is mounted on member 13. Chain 90 passes through each of the box members 84 within wall 86 and between walls 85 and 87 and pins 36 and 38 and pivot 37. The other extremity of chain 90 is secured at 93 to a pivot member 94 which is pivoted on member 13. As will be noted from FIGS. 5 and 6, chain 90 is provided with sufficient slack so as to permit one box member 84 only to be rotated approximately 90° from its normal vertical position when a rotary receiver is rotated to dispense a bottle. Outturned portion 89 of each box member 84 bears against chain 90 when box member 84 is rotated to prevent bending of chain 90 and box member 84. Spring 94' acting on pivot member 94 takes up the slack in chain 90.

The function of common bar 53 in its downward movement under the action of a pin 36 rotating with receiver 19 is to return latch 67 to position to engage either shoulder 60 or 61 in plate 53 when receiver 19 is in dispensing position to lock the mechanism and prevent re-rotation of that receiver or rotation of any other receiver.

As seen in FIG. 5, when plate 53 is in its lowermost position chain 90 is taut by reason of the rotation of box member 84 at the dispensing level and no other receiver can be rotated since an attempt to do so would bring pin 36 of that receiver into engagement with the taut chain 90 and prevent further rotation thereof thus locking that receiver against rotation.

After deposit of the coin, should the user attempt to open more than one gate at the same time, as seen in FIG. 6, the partial rotations of the box members 84 associated with the partially rotated receivers will take the slack out of chain 90 and chain 90 will become taut. Common bar 53 will be moved downwardly only a short distance and the partially rotated receivers will be locked against further opening by chain 90. No other receiver can be rotated because the associated pin 36 will engage the taut chain 90 and lock that receiver against rotation.

In the situation illustrated in FIG. 6, the user can release one of the receivers to supply slack to chain 90 and the other receiver can then be fully rotated to dispense a bottle. This will then move plate 53 downwardly and return latch 67 to position to engage shoulder 60 or 61 to prevent release of the rotated receiver and the rotation of another receiver to obtain more than one bottle for a single deposited coin.

The lock-out mechanism operates to prevent the dispensing of more than one bottle for each cycle of operation of the dispensing mechanism. When a coin is deposited in the machine solenoid 76 is energized moving the latch member 67 to the right as seen in FIG. 6 into position against cam surface 59 releasing plate 53 for downward movement. Assume that the chosen bottle is selected at platform 15. Rotation of receiver 19 rotates lip 31 in a counterclockwise direction to prevent another bottle from feeding into receiver 19 from its shelf 22.

Rotation of receiver 19 rotates its pins 36 and 38 and its box 84 in a counterclockwise direction (FIGS. 5 and 6) and pin 36 enters adjacent notch 55 and moves plate 53 downwardly. Movement of plate 53 downwardly moves surface 59 downwardly moving latch 57 to position shown in FIG. 5. Chain 90 is drawn to a taut position adjacent the others of pins 36. Thus, at all but the dispensing station, rotation of cranks 26 is prevented which, in turn, prevents rotation of the receivers at other than the selected station.

After the selected bottle has been dispensed crank 26 is released and pins 36 and 38 of the corresponding receiver are rotated in a clockwise direction by plate 53 which is raised by action of spring 56. Latch 67, which

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was moved by cam surface 59 and spring 68 to the position shown in FIG. 5 during the downward movement of plate 53, drops progressively against shoulder 60 and then against shoulder 61 as plate 53 is raised to prevent any of the other receivers from being rotated. By the time there is sufficient slack in chain 90 to free pins 36 for rotation, latch 67 is engaged against shoulder 60 so that plate 53 cannot be moved downwardly and all of the receivers at the dispensing stations are locked against rotation.

As noted above solenoid 76 is energized by the customer placing a coin in the dispensing mechanism through any suitable and well known circuit such as that shown in U.S. Patent No. 2,875,922. Thereafter the customer rotates the selected crank 26 and the mechanism operates in the manner above-described to prevent dispensing of more than one bottle for a cycle of operation of the machine.

It should now be apparent that the present invention in every way satisfies the several objectives described above.

Changes in or modifications to the above-described illustrative embodiment of this invention may now be suggested to those skilled in the art without departing from the present inventive concept. Reference should therefore be had to the appended claims to cover the scope of this invention.

What is claimed is:

1. A vending machine comprising a plurality of spaced vertically disposed slanting shelves, a rotary receiver adjacent the lower end of each of said shelves, means for rotating each of said receivers, a pair of spaced pins extending from each of said receivers for rotation therewith normally lying in a vertically disposed line, a flexible non-extensible normally slack element extending past said pins for engagement by at least one pin of a pair of said pairs of pins upon rotation of one of said receivers to remove slack from said element, a plate mounted for reciprocal movement, a recess in said plate for receiving said pairs of pins, a notch in the wall of each of said recesses receiving one pin of one of said pairs of pins upon rotation of one of said receivers for movement of said plate, latch means cooperating with at least one latch shoulder within said plate normally preventing movement of a said plate, a lip on each of said receivers blocking the adjacent one of said shelves when said receiver is rotated, said means for rotating each of said receivers comprising a shaft secured to one of said end walls, a crank mounted on said

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shaft and a plate extending parallel and adjacent to said crank limiting the direction and amount of rotation of said cranks, a plate extending parallel and adjacent to said cranks limiting the direction and amount of rotation of said cranks.

2. A vending machine comprising a plurality of spaced vertically disposed slanting shelves, a rotary receiver adjacent the lower end of each of said shelves, means for rotating each of said receivers, a pair of spaced pins extending from each of said receivers for rotation therewith normally lying in a vertically disposed line, a flexible non-extensible normally slack element extending past said pins for engagement by at least one pin of a pair of said pairs of pins upon rotation of one of said receivers to remove slack from said element, a plate mounted for reciprocal movement, a recess in said plate for receiving each of said pairs of pins, a notch in the wall of each of said recesses receiving one pin of one of said pairs of pins upon rotation of one of said receivers for movement of said plate, latch means cooperating with at least one latch shoulder within said plate normally preventing movement of said plate, a lip on each of said receivers blocking the adjacent one of said shelves when said receiver is rotated, and resilient means for removing slack from said flexible non-extensible element comprising a pivoted arm secured to an end of said element and spring means rotating said arm away from said element.

3. A vending machine as described in claim 2 including a downwardly slanting platform spaced from and adjacent to each of said rotary receivers and opposite the adjacent one of said shelves.

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