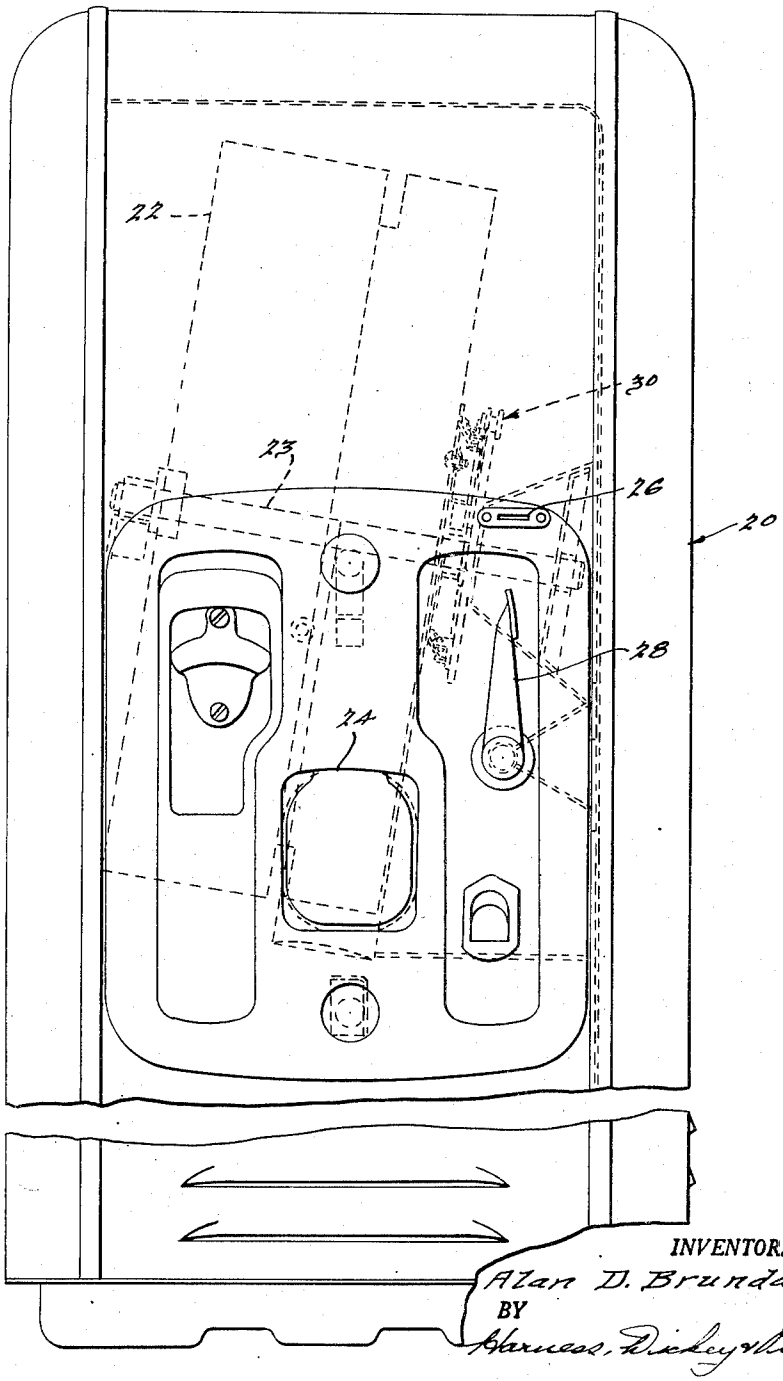
April 17, 1951 A. D. BRUNDAGE 2,549,168

INDEXING MECHANISM FOR BOTTLE DISPENSING MACHINES

Filed Aug. 31, 1946 5 Sheets-Sheet 1

FIG. 1.



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April 17, 1951 A. D. BRUNDAGE 2,549,168

INDEXING MECHANISM FOR BOTTLE DISPENSING MACHINES

Filed Aug. 31, 1946

5 Sheets-Sheet 2

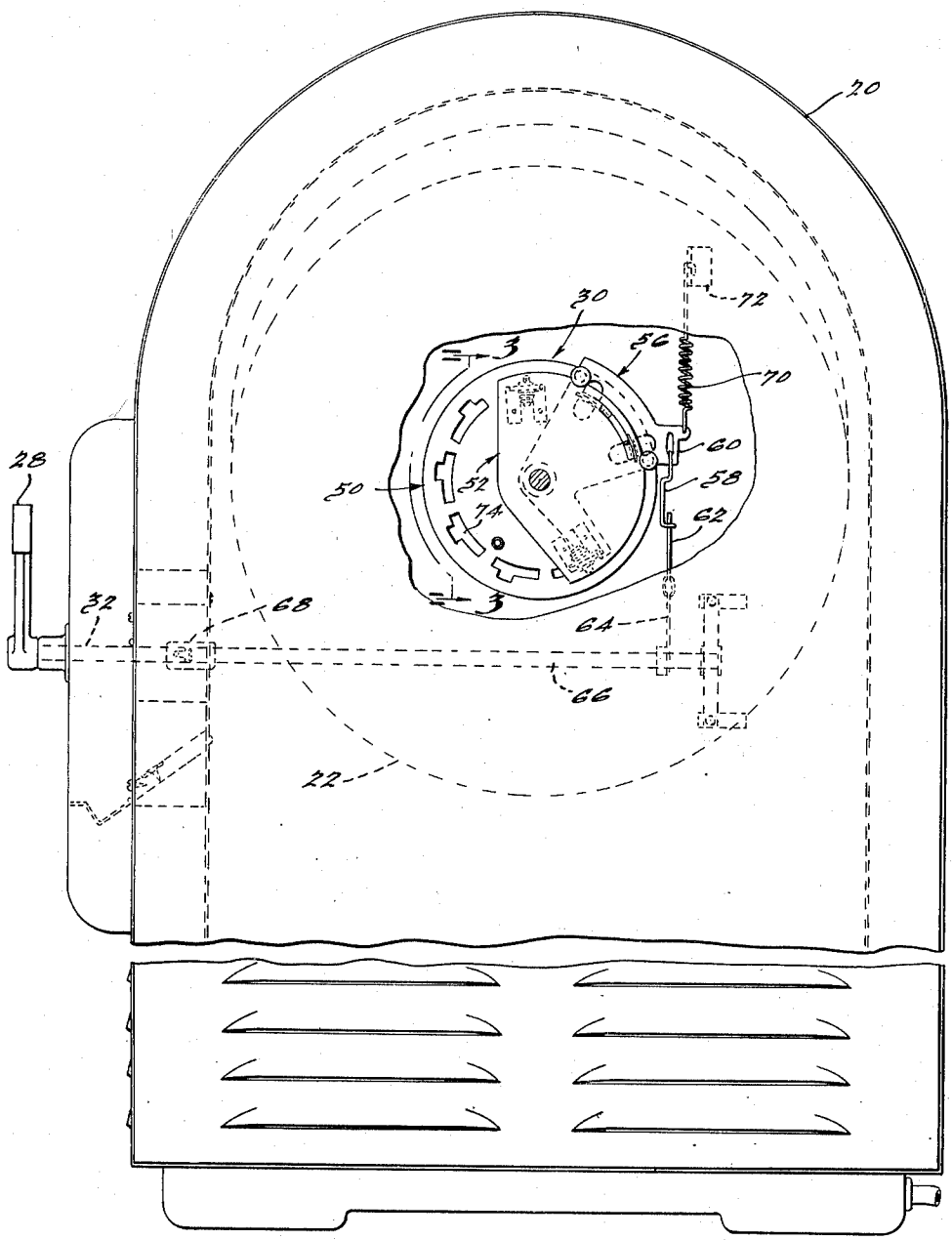


Fig. 2.

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INDEXING MECHANISM FOR BOTTLE DISPENSING MACHINES

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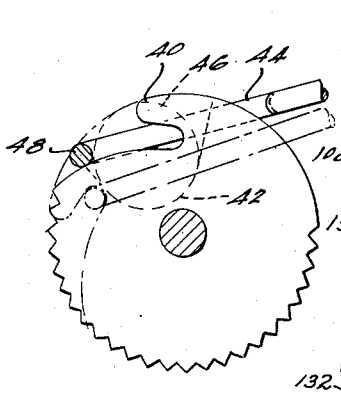


Fig. 16.

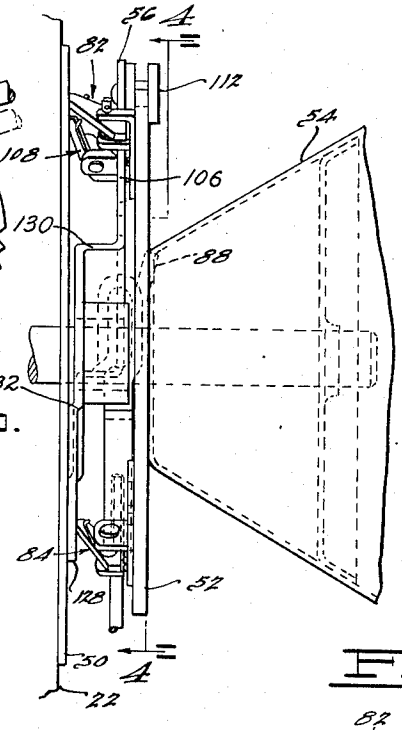


Fig. 3.

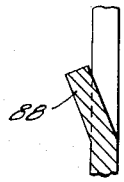


Fig. 18.

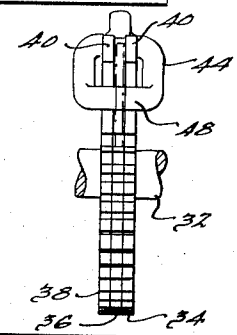


Fig. 17.

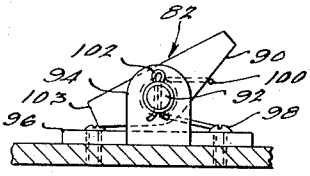


Fig. 10.

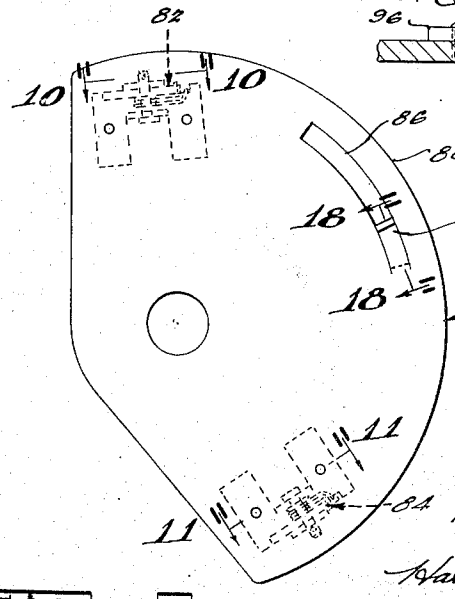


Fig. 9.

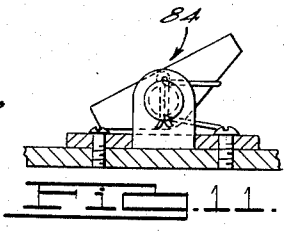


Fig. 11.

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April 17, 1951 A. D. BRUNDAGE 2,549,168

INDEXING MECHANISM FOR BOTTLE DISPENSING MACHINES

Filed Aug. 31, 1946 5 Sheets-Sheet 4

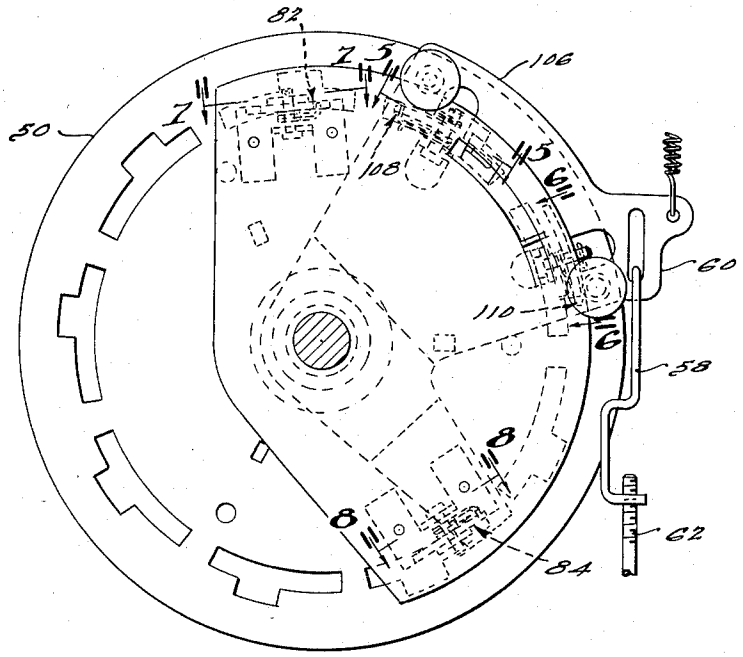


Fig. 4.

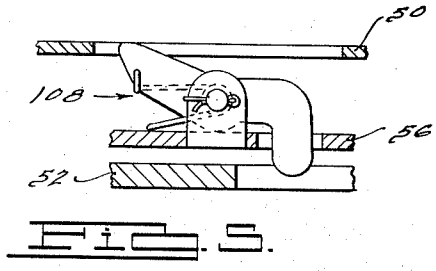


Fig. 5.

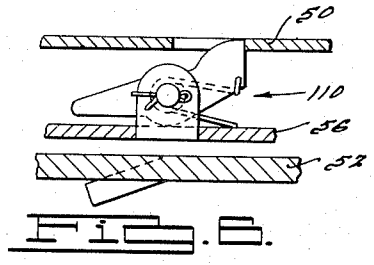


Fig. 6.

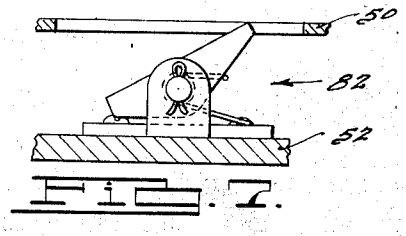


Fig. 7.

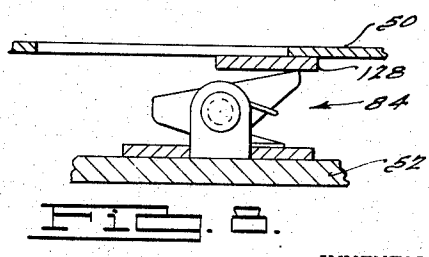


Fig. 8.

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INDEXING MECHANISM FOR BOTTLE DISPENSING MACHINES

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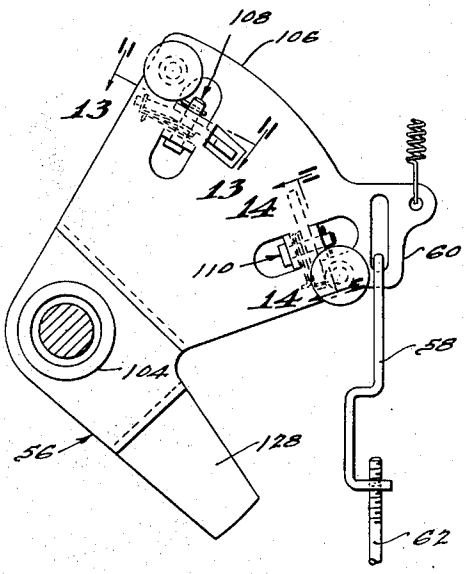


Fig. 12.

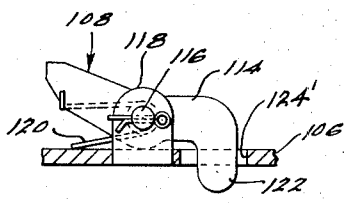


Fig. 13.

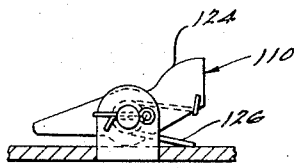


Fig. 14.

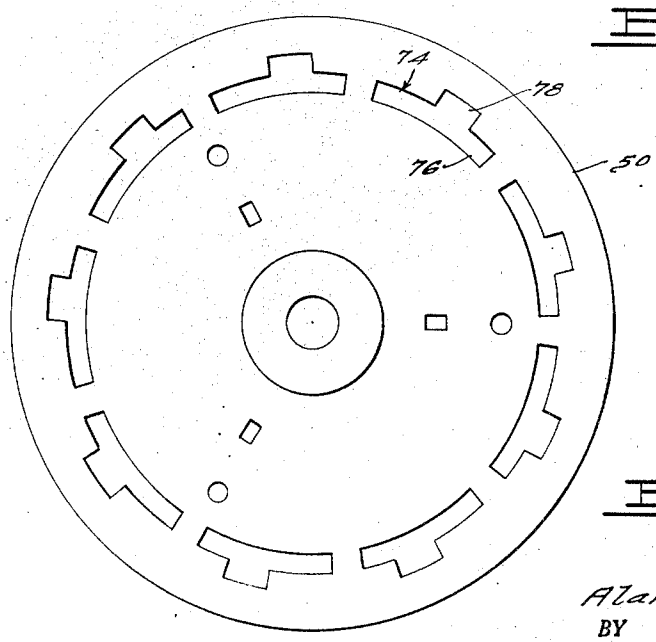


Fig. 15.

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Patented Apr. 17, 1951

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UNITED STATES PATENT OFFICE

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INDEXING MECHANISM FOR BOTTLE DISPENSING MACHINES

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Application August 31, 1946, Serial No. 694,284

9 Claims. (Cl. 74—142)

1

This invention relates to bottle dispensing machines and, more particularly, to an improved indexing mechanism having a particular utility as a means for controlling the movement of the bottle carrying drum employed in such dispensing machines.

It is an object of this invention to provide an improved indexing mechanism of the above generally indicated type which is positive in its action, and reliable and efficient in operation.

Another object is to provide such an improved indexing mechanism for moving a drum or other element between a plurality of positions which incorporates improved means holding the drum in each of the indexed positions and preventing movement therefrom either by directly engaging the drum or in any other manner other than by means of the indexing mechanism.

Another object of the invention is to provide an improved indexing mechanism for moving an element between a plurality of positions, which controls the movement of the element at all times with the result that there is no time before, during, or after the indexing operation, during which the element may be moved from one of said positions to another, in any manner other than by the indexing mechanism.

Other and more detailed objects will be apparent from a consideration of the following specification, the appended claims, and the accompanying drawings throughout the several views of which like reference characters designate like parts and wherein:

Figure 1 is a broken front elevational view of a bottle dispensing machine constructed in accordance with the invention;

Fig. 2 is a broken side elevational view of the structure of Fig. 1;

Fig. 3 is a broken sectional view on a larger scale, of the structure illustrated in Fig. 2, taken substantially along the line 3—3 thereof;

Fig. 4 is a sectional view of the structure illustrated in Fig. 3 and taken substantially along the line 4—4 thereof;

Figs. 5, 6, 7, and 8 are sectional views of the structure illustrated in Fig. 4 taken substantially along the lines 5—5, 6—6, 7—7, and 8—8 thereof, respectively;

Fig. 9 is an elevational view of the stationary pawl plate and the parts carried thereby;

Figs. 10 and 11 are sectional views of the structure illustrated in Fig. 9, taken substantially along the lines 10—10 and 11—11 thereof, respectively;

2

Fig. 12 is an elevational view of the movable pawl plate and the parts connected thereto;

Figs. 13 and 14 are sectional views of the structure illustrated in Fig. 12, taken substantially along the lines 13—13 and 14—14 thereof, respectively;

Fig. 15 is an elevational view of the index plate;

Fig. 16 is an elevational view of the coin controlled locking mechanism;

Fig. 17 is a side elevational view of the structure of Fig. 16; and

Fig. 18 is a sectional view of the structure illustrated in Fig. 9, taken substantially along the line 18—18 thereof.

Referring to Figs. 1 and 2 of the drawings, the bottle dispensing machine comprises a cabinet generally indicated at 20 which may be of any suitable construction, and the upper portion of which houses a generally cylindrical drum 22 in which are carried and stored the bottles which are to be dispensed by the machine. For soft drink applications, the upper portion of the cabinet housing the bottles of soft drinks is preferably cooled by a refrigerating unit (not shown) which may be of any conventional construction and may be housed in the lower portion of the cabinet 20.

In accordance with conventional practice, the drum 22 is rotatably supported in an inclined position by a shaft 23 extending axially thereof and having its ends supported at opposite sides of the cabinet 20, as illustrated in Fig. 1. The drum is so inclined to insure that continued operation of the machine will result in all of the bottles carried by the drum being dispensed through the chute 24 in the front of the machine. Also, in accordance with conventional practice, the machine is conditioned for operation by the insertion of a coin in the coin slot 26, and is operated by pivoting a hand lever 28 which is operatively connected to the drum 22 through an indexing mechanism generally indicated at 30 and which will be presently described.

The coin mechanism may be of any of a wide variety of suitable constructions and need not be described in detail herein. For the present purposes, it is sufficient to say that it includes means, illustrated in Figs. 16 and 17, for preventing the above described pivotal movement of the handle 28 in the absence of the above mentioned conditioning by a proper coin. Referring to Figs. 16 and 17, this means comprises a shaft 32 to which the handle 28 is secured at its outer end, and three generally circular plates 34, 36, and 38

which are fixed to the shaft 32 for rotation therewith. The outer plates 34 and 38 are relieved to provide generally tangentially directed hooks 40, and the central plate 36, adjacent the hooks 40, is formed to provide a coin receiving notch 42. A locking bar 44 has one end pivotally connected to the supporting frame of the coin mechanism and its other end deformed to provide a web portion 48 which is disposed generally parallel to the shaft 32 and rides on the periphery of the plates 34, 36, and 38. From the above description, it will be apparent that when there is no coin in the coin notch 42, rotary movement of the plates 34, 36, and 38, and, therefore, of the handle 28, will be limited by the engagement of the web 48 of the locking bar in the hooks 40 formed in the plates 34 and 38, as illustrated in broken lines in Fig. 16. However, when a coin, illustrated in broken lines in Fig. 16 and designated 46, is carried in the coin notch 42, movement of the handle 28 will cause the locking bar 44 to ride up around the periphery of the coin and pass over the hooks 40, thereby permitting full movement of the handle 28 and consequent rotation of the drum 22 by the operation of the indexing mechanism 30 mentioned above.

This indexing mechanism 30 generally comprises an index plate 50 (illustrated in Fig. 15) secured to the lower end of the drum 22 centrally thereof, a stationary pawl plate 52 (illustrated in Fig. 9) supported in spaced relation to the index plate 50 by a cone 54 which surrounds the lower end of the shaft 23 and also serves to support the lower end on the cabinet 20, and a movable pawl plate 56 (illustrated in Fig. 12) pivotally mounted on the shaft 23 intermediate the index plate 50 and the stationary pawl plate 52, as illustrated in Fig. 3. For connecting the movable plate 56 to the handle 28, a link 58, illustrated in Figs. 2 and 12, has its upper end connected to an outwardly extending projection 60 formed on the plate 56, and its lower end formed to provide a tapped opening therein for receiving the threaded upper end of a second link 62. The lower end of link 62 is connected to the outer end of a lever 64, the inner end of which is secured to a transversely extending shaft 66 for rotation therewith. The shaft 66 is coaxial with the shaft 32 upon which the handle 28 is mounted and is connected thereto for rotation therewith by a readily releasable connection generally indicated at 68 to facilitate assembly. The lever 64 is so positioned on the shaft 66 that pivotal movement of the handle 28 in a counterclockwise direction as viewed in Fig. 1 will pivot the outer end of the lever 64 downwardly and thus through the links 62 and 58, will exert a downward pull on the sector plate 56 and pivot it in a clockwise direction as viewed in Fig. 2. For returning the sector plate 56 to the position there illustrated, a spring 70 has its lower end connected to the projection 60 on the sector plate and its upper end secured to a bracket 72 mounted on the cabinet 20.

Considering the above mentioned plates in greater detail, the index plate 50 is circular in shape and provided with a plurality of apertures 74 equidistant radially from the center of the disk 50 and equally spaced circumferentially thereof. The apertures 74 are arcuately shaped and have a relatively long, radially inner portion 76 and a relatively short, radially outer portion 78 communicating therewith, the ends of each of which portions are generally radially disposed to provide surfaces on the index plate 50 adapted to be engaged by means carried by the stationary pawl plate 52 and the movable pawl plate 56 for controlling the movement of the drum 22 to which the index plate is attached.

The stationary pawl plate 52 has a stationary circular peripheral portion 80 which serves as a guide for the movable pawl plate 56 during its pivotal movement as hereinafter described. The plate 52 carries an upper pawl, generally indicated at 82 (illustrated in Fig. 10) which is radially spaced so as to engage within the inner portions 76 of the apertures 74 and which is disposed in the position illustrated in Figs. 3 and 4 in which it is adapted to engage at the clockwise ends of the inner portions 76, as viewed in Figure 4, to prevent counterclockwise rotation of the index plate 50. A second or lower pawl generally designated 84 (illustrated in Fig. 11) is also carried by the plate 52 and spaced circumferentially thereof from the pawl 82. The pawl 84 is oppositely directed and is adated to engage within the inner portions 76 at the counterclockwise ends thereof, as viewed in Figure 4, to prevent clockwise rotation of the index plate 50. Intermediate the pawls 82 and 84 and adjacent its outer periphery, the stationary pawl plate 52 is formed to provide an arcuately extending slot 86 terminating at its clockwise end as viewed in Fig. 9, at a tongue 88 struck outwardly from the plate 52 in a direction away from the index plate 50.

Since the pawls 82 and 84 may be identical except for the fact that they are oppositely directed, only the pawl 82, which is illustrated in Fig. 10, will be described in detail herein. A pawl bar 90 is pivoted generally centrally thereof on a pivot pin 92 supported in a pair of ears 94 integrally formed on a base 96 which is secured to the pawl plate 52 by a pair of screws 98. A spring 100 is coiled about the pivot pin 92 with one end engaging the base 96 and the other end engaging under the forward end of the pawl bar 90 to urge it into engagement with the index plate 50. The pivot pin 92 and the spring 100 are held in their assembled position by a cotter pin 102 extending through the outer end of the pivot pin. During assembly, the rear end 103 of the pawl bar engages the base 96 to limit the pivotal movement produced by the spring 100.

Referring to Fig. 12 the movable pawl plate 56 is generally L-shaped and has a hollow cylindrical portion 104 at its elbow which serves to pivotally mount the plate 56 on the shaft 23. The larger leg 106 of the pawl plate is sector-shaped and carries a pair of pawls 108 and 110 on its inner face or face adjacent the index plate 50. The sector-shaped leg 106 extends radially outwardly of the stationary pawl plate 52 and carries on its outer face a pair of rollers 112 which are channel-shaped as best shown in Fig. 3, for engaging and rolling along the circular periphery 80 of the pawl plate 52 during pivotal movement of the movable pawl plate 56.

The pawl 108 is disposed to engage within the inner portions 76 of the apertures 74 in the index plate and is directed to engage at the counterclockwise end thereof to prevent clockwise rotation of the index plate 50. Referring to Fig. 13, the pawl 108 comprises a pawl bar 114 pivotally mounted on a transversely extending pin 116 supported in a pair of tabs 118 struck inwardly from the sector 106. A spring 120, similar to the spring 100 of the pawl 82, urges one end of the pawl bar 114 into engagement with the index plate and the opposite end 122 of the pawl bar is turned at right angles and projects outwardly through an opening 124' provided in the sector

plate 56. During movement of the movable pawl plate 56 this outwardly projecting end 122 rides in the slot 86 in the stationary pawl plate during the first phase of the movement and later rides up on the tongue 88 at the end of slot 86 and thereby disengages the pawl 108 from the index plate.

The pawl 110 is spaced circumferentially of the sector 106 from the pawl 108 and is spaced radially outwardly of the latter such that it engages in the outer portions 78 of the apertures 74 and is directed to engage at the clockwise ends thereof. The pawl 110 is generally similar to the pawl 108 but differs from the latter in that the pawl bar 124 does not extend through the sector 106 of the plate 56 but engages the latter to limit the pivotal movement of the pawl bar under the influence of the spring 126. The pawl 110 is the driving pawl and engages the index plate 50 at the clockwise end of the aperture portion 78 during pivotal movement of the handle 28 in a counterclockwise direction as viewed in Figure 1.

The other end 128 of the L-shaped movable plate 56 is adapted to slide along the outer face of the index plate 50, as is best seen in Fig. 3, and is so proportioned that it may move in between the pawl 84 and the index plate 50 as is most clearly shown in Fig. 8. Referring to Fig. 3, the arms 106 and 128 of the movable plate 56 are offset as indicated at 130 and 132 respectively to dispose the arm 106 adjacent the stationary plate 52 upon which it guides, and the arm 128 adjacent the index plate 50 along which it moves.

The above described indexing mechanism functions in the following manner. When the drum 22 is in one of the plurality of indexed positions and the handle 28 is released permitting the spring 70 to return the movable pawl plate 56 to the starting position, the various elements will assume the relative positions illustrated in Fig. 4. With the various parts in this position, Figs. 5, 6, 7, and 8 illustrate the positions assumed by the pawls 108, 110, 82 and 84, respectively. From a consideration of these sectional views it will be seen that the pawl 82 is in position to engage the index plate to prevent counterclockwise rotation thereof as viewed in Figure 4, and that the arm 128 of the movable pawl plate 56 has moved between the pawl 84 and the index plate 50 thereby holding the latter pawl out of engagement. It will also be noted that the driving pawl 110 is in engagement with the plate 50 in readiness to drive the latter to another indexed position upon movement of the handle 28. The remaining pawl 108, as will be seen from Fig. 5 is in position to engage the index plate to prevent clockwise rotation thereof, again as viewed in Fig. 4, relative to the pawl plate 56. Movement of the pawl plate 56 in a clockwise direction is in turn limited by the above described engagement of the locking bar 44 with the hooks 40 as illustrated in broken lines in Fig. 16, the movable plate being connected to the hooks through the above described links 58, and 62, lever 64, shafts 66 and 32, and plates 34 and 38.

The machine is conditioned for indexing the drum to another position by inserting a coin in the coin mechanism which functions as described above to permit the handle 28 to pivot the movable pawl plate. During this movement, the drum is held against rotation relative to the movable pawl plate 56 by engagement of the driving pawl 110 and the oppositely directed pawl 108, both of which are carried on the plate 56. In the early stages of this pivotal movement of the plate 56, the arm 128 carried thereby, moves from between the pawl 84 and the index plate 50 thereby permitting the pawl 84 to engage in the next aperture 74 in the index plate and thus provide a positive stop when the drum has reached the new index position. Subsequently, the pawl 108 is disengaged by the cam action of the end 122 thereof riding up on the tongue 88. Referring to Figure 7, it will be appreciated that the pawl 82 will not interfere with this movement of the index plate 50 since during relative movement of the plate to the right as there viewed, the portion of the plate 50 intermediate the apertures 74 will ride over the back of the pawl and press it out of the way in a ratchet-type action. When the new indexed position is reached, the pawl 82 will again snap into the relative position illustrated in Fig. 7 and again serve to prevent counterclockwise rotation of index plate as viewed in Fig. 4. While the handle 28 is held in the depressed position, it will therefore be seen that the drum and index plate are held against rotation in either direction by the engagement of the pawls 82 and 84.

When the handle 28 is released, the spring 70 returns the pawl plate 56 and with it the handle 28, to the positions illustrated in Figs. 4 and 1, respectively. The various parts are then in the starting position described in detail above in which the pawl 84 is held out of engagement by the arm 128 and the index plate is held against rotation by the pawls 82 and 108 and the driving pawl 110 is again engaged as illustrated in Fig. 6, in readiness for a repetition of the indexing operation.

While only one specific embodiment of the invention has been illustrated and described in detail, it will be apparent to those skilled in the art that numerous modifications and changes may be made without departing from the generic spirit of the invention and from the scope of the appended claims.

What is claimed is:

1. In a bottle dispensing machine, a drum, a shaft rotatably supporting said drum, an index plate secured to said drum, a stationary pawl plate supported in spaced relation to said index plate and carrying a pair of pawls, one of said pawls engaging said index plate to prevent reverse rotation of said drum, a movable pawl plate pivotally mounted on said shaft intermediate said stationary pawl plate and said index plate and carrying a pair of pawls, means for moving said movable pawl plate between a first position and a second position for driving said drum in a forward direction, one of said last named pair of pawls engaging said index plate during the just described movement of said movable pawl plate and serving as a driving pawl, the other of said first named pair of pawls engaging said index plate when said movable pawl plate is in said second position to prevent forward rotation of said drum, said movable pawl plate when in said first position being effective to hold said last mentioned pawl out of engagement with said index plate, and means operable when said movable pawl plate is in said first position for preventing forward rotation of said drum.

2. The combination of claim 1, wherein said last named means includes the other of said last named pair of pawls and means normally preventing movement of said movable pawl plate from said first position to said second position.

3. The combination of claim 1, wherein said last named means includes coin controlled means

normally preventing movement of said movable pawl plate from said first position to said second position.

4. The combination of claim 1, and spring means effective when said movable pawl plate is moved from said first position to resiliently urge said movable pawl plate toward said first position.

5. In a bottle dispensing machine having a drum, an indexing mechanism for moving said drum between a plurality of positions comprising an index plate connected to said drum for rotation therewith, stationary means supporting a first pawl and a second pawl for engagement with said index plate, movable means supporting a third pawl and a fourth pawl for engagement with said index plate and movable between a first position and a second position to drive said drum in a forward direction, said first pawl engaging said index plate when said drum is in one of said plurality of positions to prevent reverse rotation of said drum, said second pawl engaging said index plate when said movable means is in said second position to prevent forward rotation of said drum and being held out of engagement with said index plate when said movable means is in said first position, said third pawl having a driving engagement with said index plate during movement of said movable means from said first position to said second position, and means including said fourth pawl for engaging said index plate when said movable means is in said first position to prevent forward rotation of said drum.

6. The combination of claim 5 and resilient means associated with each of said pawls and urging the latter into engagement with said index plate.

7. An indexing mechanism for moving an element between a plurality of positions including a member operatively connected to said element and having a plurality of angularly spaced abutting surfaces formed thereon, means operable in each of said positions to engage said member to prevent movement of said element in one direction, driving means including a pivotally mounted plate operable upon movement from a first position to a second position to engage said member and move said element in the opposite direction to another of said plurality of positions, releasable means carried by said plate and normally operable to engage said member to limit movement of said element relative to said plate in said opposite direction, and means adapted to engage said member to prevent rotation of said element in said opposite direction, said plate being effective when in said first position to interfere with said last named means and operating during movement from said first position to said second position to free said last named means and subsequently disengage said releasable means.

8. The combination of claim 7 and means including a coin releasable locking mechanism for normally preventing movement of said plate from said first position to said second position.

9. An indexing mechanism for moving an element between a plurality of indexed positions comprising an index plate secured to said element and having a plurality of angularly spaced apertures, a shaft rotatably supporting said index plate, a stationary pawl plate disposed generally parallel and in spaced relation to said index plate, a movable pawl plate pivotally mounted on said shaft and movable between a first position and a second position to move said index plate from one of said indexed positions to another, a pair of stationary pawls carried by said stationary pawl plate, a pair of movable pawls carried by said movable pawl plate, and means including one of said movable pawls operable when said movable pawl plate is in said first position for preventing movement of said index plate from said indexed positions.

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