June 2, 1959 J. M. REYNOLDS 2,889,074

BOTTLE DISPENSING MECHANISM

Filed Nov. 14, 1955 4 Sheets-Sheet 1

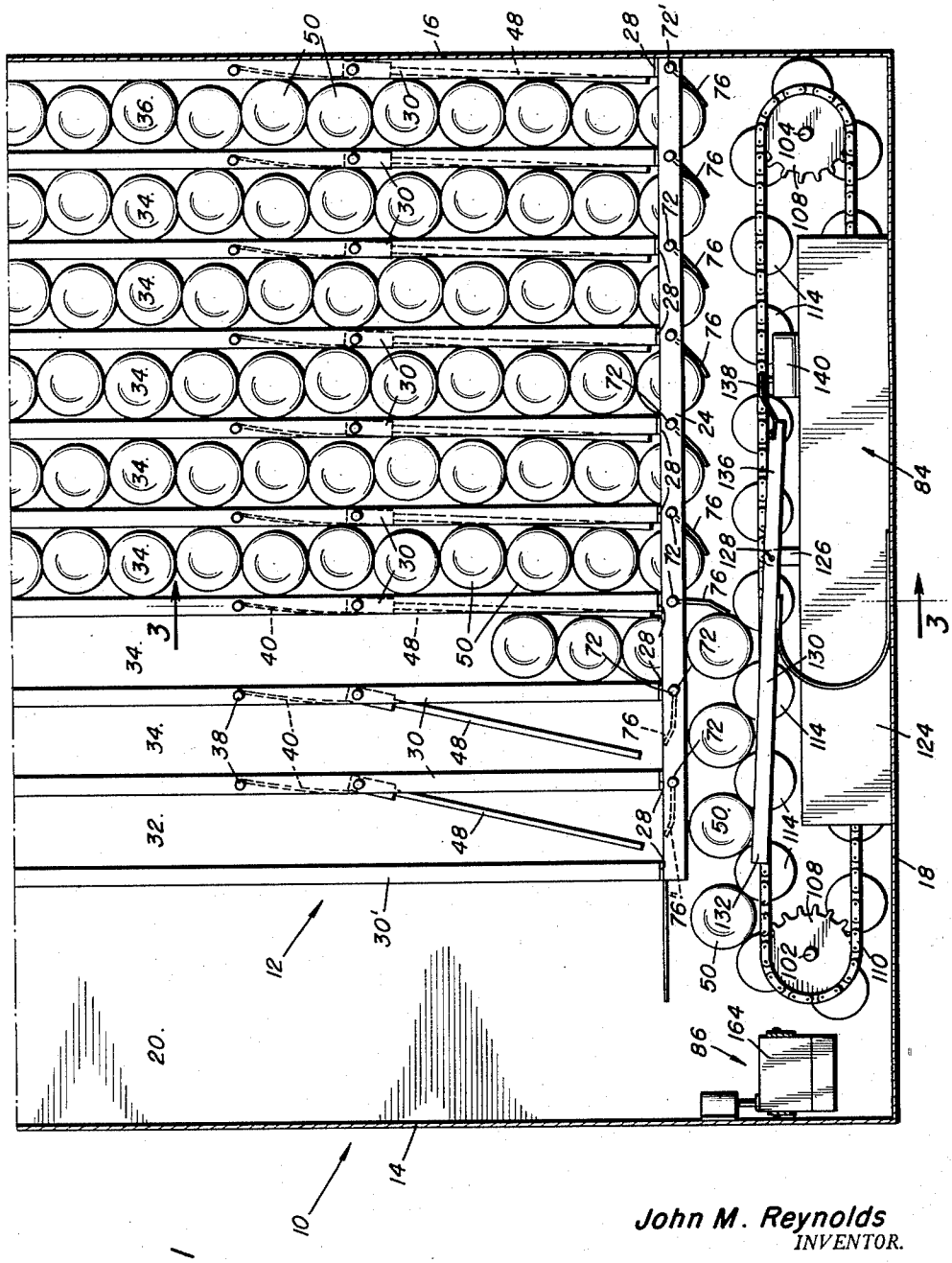


Fig. 1

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BOTTLE DISPENSING MECHANISM

Filed Nov. 14, 1955 4 Sheets-Sheet 2

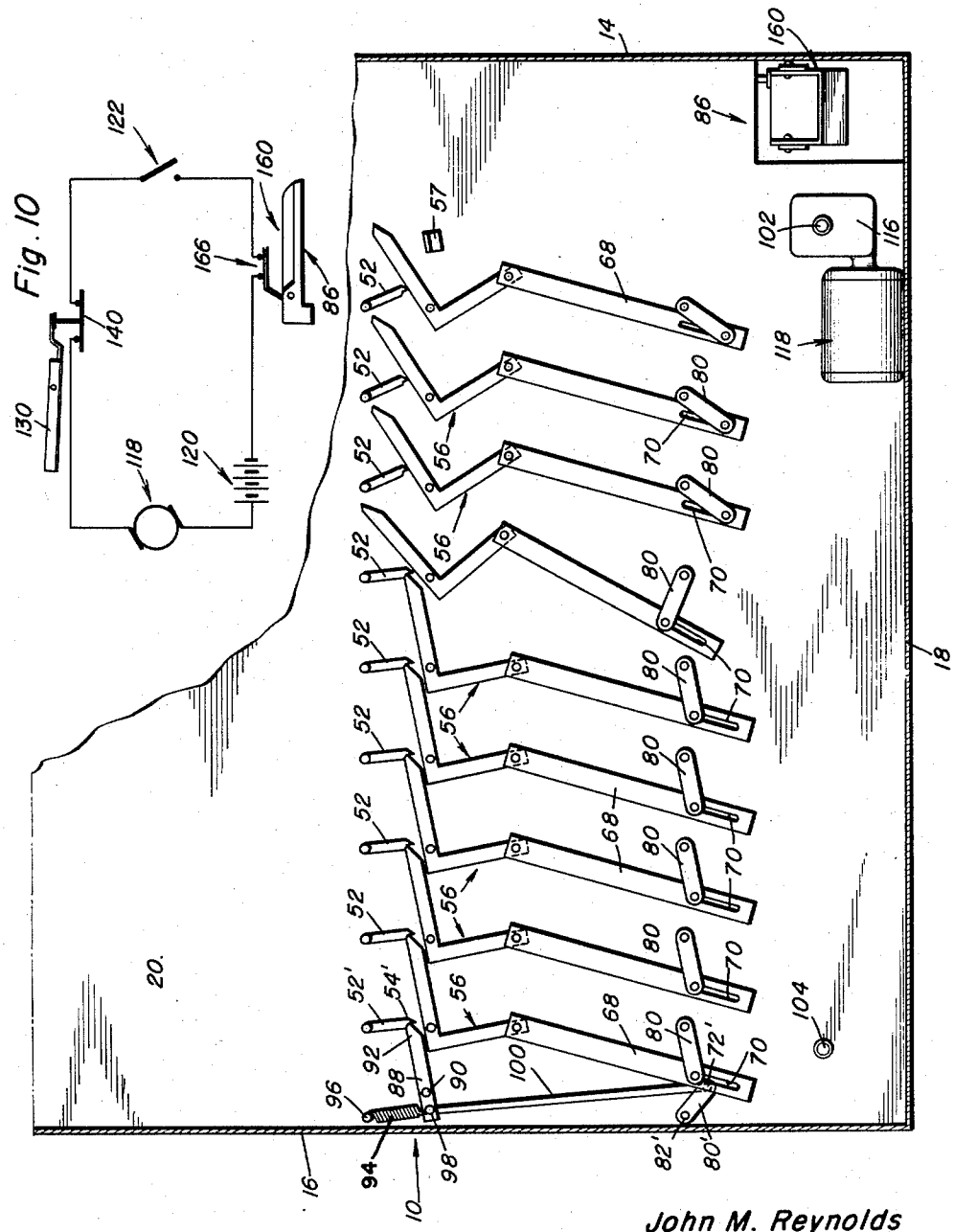


Fig. 2

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June 2, 1959 J. M. REYNOLDS 2,889,074

BOTTLE DISPENSING MECHANISM

Filed Nov. 14, 1955 4 Sheets-Sheet 3

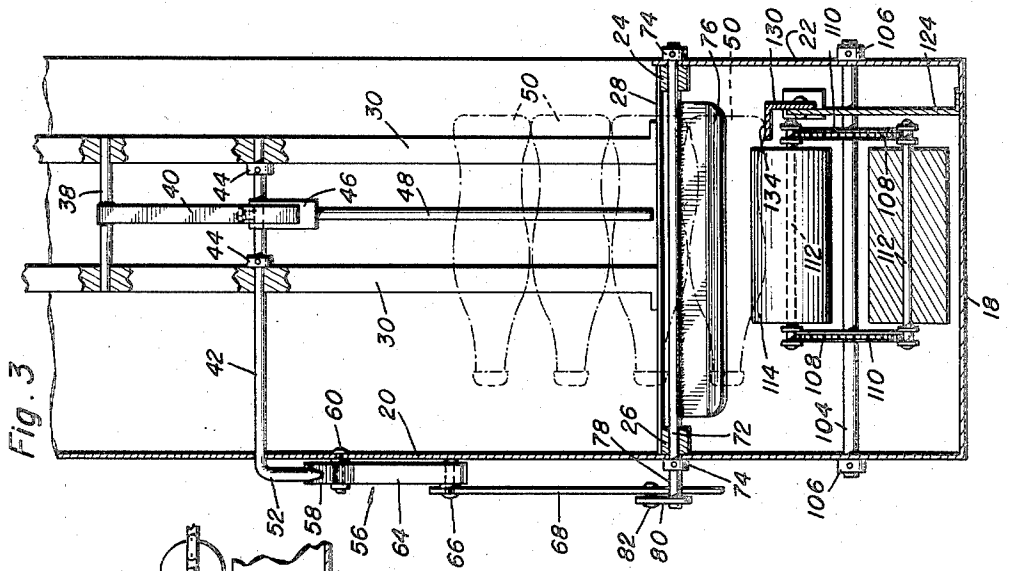


Fig. 3

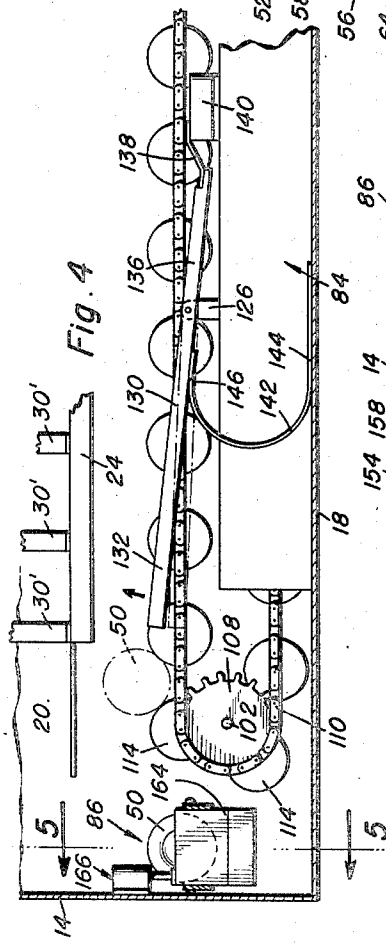


Fig. 4

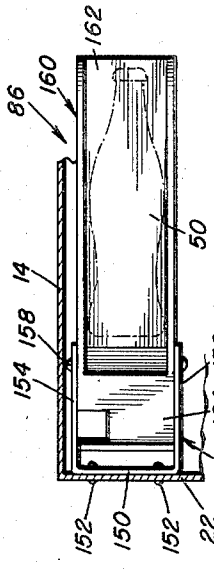


Fig. 6

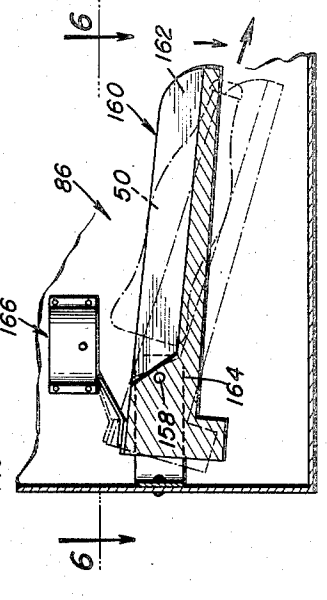


Fig. 5

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June 2, 1959 J. M. REYNOLDS 2,889,074

BOTTLE DISPENSING MECHANISM

Filed Nov. 14, 1955 4 Sheets-Sheet 4

Fig. 9

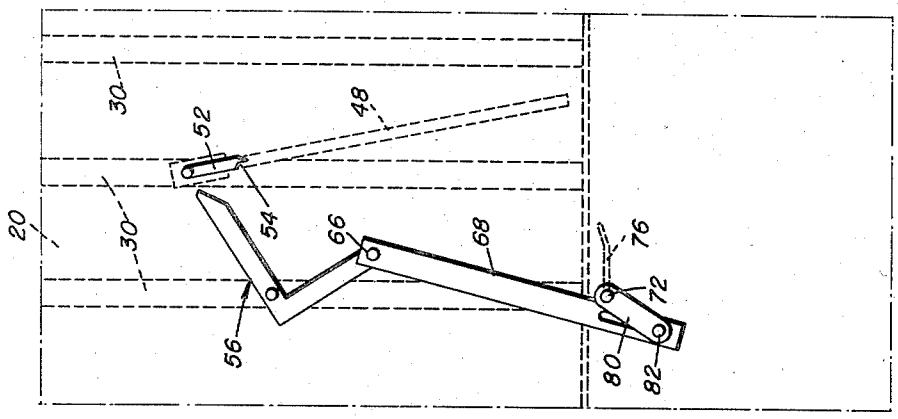


Fig. 8

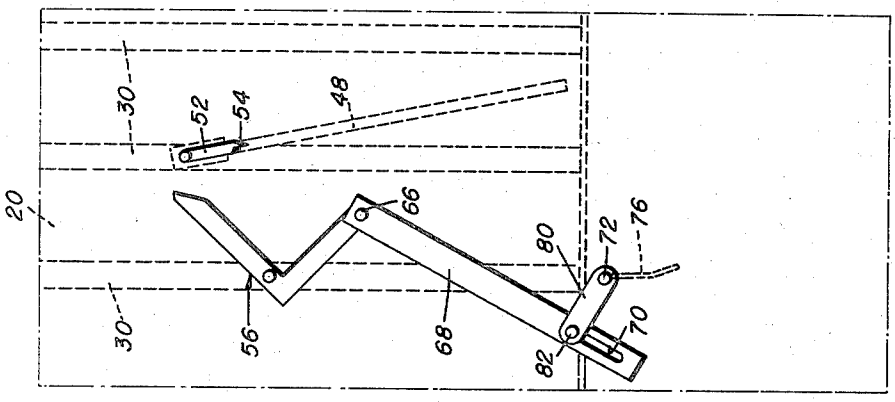
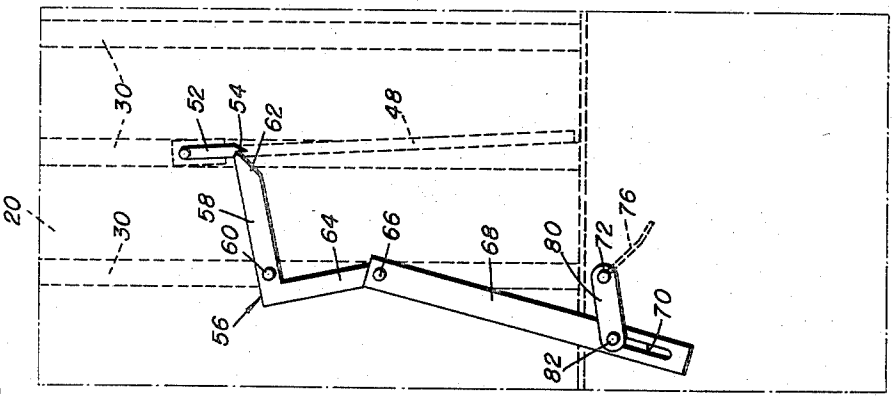


Fig. 7



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BOTTLE DISPENSING MECHANISM

John M. Reynolds, Paragould, Ark.

Application November 14, 1955, Serial No. 546,493

2 Claims. (Cl. 221—108)

This invention relates generally to vending machines and is more particularly directed to gravity operated bottle dispensing mechanism including a plurality of linearly related bottle magazines in which the emptying of an adjacent forward bottle magazine provides the automatic subsequent emptying of the next succeeding bottle magazine.

A further object of invention in conformance with the set forth above is to provide a bottle dispensing mechanism of the character set for which includes bottle conveying means in conjunction with bottle activated switch means for permitting operation of the conveying means and wherein said switch means is automatically cut out when the bottle magazines are emptied.

A still further object of invention in conformance with that set forth above is to provide a bottle dispensing mechanism of the character set forth which includes a counterbalanced switch actuating bottle dispensing chute means for automatically stopping movement of the conveyor means upon dispensing of each bottle.

And yet another object of invention in conformance with that set forth above is to provide a bottle dispensing mechanism of the character set forth which is readily and economically manufactured, positively acting and highly efficient, easily maintained and used and readily acceptable for the purpose intended.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a side elevational view of the novel bottle dispensing mechanism when removed from a refrigerating container;

Figure 2 is a side elevational view of the novel bottle dispensing mechanism as viewed from the side opposite that of Figure 1;

Figure 3 is an enlarged sectional view taken substantially on line 3—3 of Figure 1;

Figure 4 is a fragmentary side elevational view from a portion of Figure 1 showing the automatic cutout switch mechanism in operation after the bottle magazines have been emptied;

Figure 5 is a fragmentary sectional view taken substantially on line 5—5 of Figure 4 showing the disposition of a bottle in the switch actuating dispensing chute;

Figure 6 is a top plan view taken substantially on line 6—6 of Figure 5;

Figures 7, 8 and 9 are in an enlarged side elevational view through a portion of the bottle dispensing mechanism respectively showing the position assumed by the cooperating parts when a forward bottle dispensing magazine is emptied and the next succeeding bottle magazine is permitted to dispense bottles; and,

Figure 10 is a wiring diagram showing the drive motor, source of potential and various cooperating switches for actuating said motor.

Indicated generally at 10 is a fragmentary portion of a casing or housing for the novel gravity operated bottle dispensing mechanism 12, said casing including front and rear wall portions 14 and 16, respectively, suitably secured to a bottom member 18. The housing or casing may include a side wall member 20 and a fragmentary opposite side wall portion 22 which permits access to the various bottle magazines to be subsequently described for the purpose of loading the same, removing jams, maintenance, etc.

A pair of oppositely disposed parallel longitudinally extending elements 24 and 26 are suitably secured to opposite inner side wall portions of the side walls 20 and 22, and support thereupon pairs of longitudinally spaced elongated support strip elements 28. Each of the support strips 28 has intermediately secured thereon a pair of spaced upwardly extending elongated strip elements 30 supported in any suitable manner, the strip elements 30 defining a plurality of longitudinally extending linearly related bottle magazines including a forward bottle magazine 32 and succeeding intermediate bottle magazines 34, and a rear bottle magazine 36. Each of the pairs of vertical support strips 30, with the exception of the forwardmost strips 30', (see Fig. 1), include an upper transverse support shaft 38 having fixedly secured thereto in any suitable manner a downwardly depending leaf spring member 40 with its lower extremity extending below the axis of oscillation of a transverse pivot shaft 42 which extends transversely between the various pairs of support elements 30 being retained in a substantially fixed position by means of suitable collar elements 44 secured on said shaft 42, said shaft having integrally secured and rotatable therewith an enlarged spring engaging portion 46 engageable with the leaf spring 40, said spring engaging portion 46 terminating in an elongated bottle engaging element 48 which is normally urged by the spring element or rod 40 into the bottle magazine forward thereof as seen in forward bottle magazine 32 in Figure 1, for example, and which is retained in a rearward position by the bottles 50 as seen in the rear bottle magazine 36, for example.

The shaft 42 extends through the side wall 20 and terminates in right angularly related end portion 52 depending substantially parallel to the side wall 20, said portion or dog 52 terminating in a lower rearwardly opening notch portion 54. Pivotally supported and depending at rearwardly spaced relationship from each of the portions 52 of the shaft 42 by L-shaped latch lever elements or bell cranks 56 which include one leg 58 secured by means of a suitable pivot element 60, said leg 58 having a distal end portion 62 engageable in the rearwardly disposed notch 54 of the shaft portion 52, see Fig. 7 for example, the other end 64 of the lever 56 being pivotally connected by means of a suitable pivot element 66 to an elongated lever element or link 68, said lever element 68 including an elongated lost motion slot 70 at the end opposite that and which is pivoted to the pivot element 66.

Extending transversely beneath the strip elements 30 and through oppositely aligned apertured portions in the strip elements 24 and 26 are support shafts 72 which may be secured in place by means of suitable collar elements 74 secured thereon, see Fig. 3, said shaft 72 having fixedly secured thereon a radially extending elongated transverse bottle stop plate 76 which normally extends in engagement with the lowermost bottle 50 in a bottle magazine, from which bottles are not being dispensed, see Fig. 1, the shaft 72 including an end portion 78 extending through the side wall 20 and fixedly secured to one end of an arm 80, the other end of the arm 80 being pivotally secured by means of a suitable pivot pin 82 to the elongated lost motion slot 70 at the end of the lever 68.

It will be noted in Figure 2, that a lateral abutment ele-

ment 57 is secured in any suitable manner on the side wall 20 in the path of rotation of the leg 58 thereof for preventing excessive counter-clockwise rotation of the forwardmost L-shaped latch lever element 56 when the forward bottle magazine 32 is loaded or has bottles contained therein.

It will be noted in Figures 1 and 2 that a stop plate 76'' is provided beneath the forwardmost bottle magazine 32. The purpose of this stop plate 76'' is to tend to direct the bottles dispensed from the forward magazine toward the forwardmost strips 30', and to prevent a succeeding bottle from jamming between a bottle dispensed from the magazine 32' and the conveyor passing therebeneath the stop plate 76'' cooperates with a support shaft 72, lever element 56 and elongated lever 68 and arm 80, however, no pivot shaft 42 with the end portion 52 will be utilized therewith. Since the bottles from magazine 32 will be free to be immediately dispensed when the apparatus is actuated in a manner to subsequently become apparent.

When the bottles are emptied from the forwardmost bottle magazines 32 and 34, the lever elements 48 will have pivoted forwardly or to the left, this movement results in an accompanying forward movement of the rod portion 52, see Figs. 7 through 9, swinging the notch portion 54 away from the distal end 62 of the leg 58 of the L-shaped lever 56 whereupon the weight of the bottles on the next succeeding bottle magazine and the stop 76 therebeneath will be moved downwardly into the position shown in Figure 8, and when the bottle magazine succeeding the one just mentioned is permitted to dispense bottles in the manner heretofore described, the stop element 76 will assume the position shown in Figure 9 by virtue of the passing of bottles from the rear portion of the dispensing mechanism forward on the conveyor assembly 84 and onto a bottle chute assembly 86 to be subsequently described.

Thus it will be apparent that each of the bottle magazines progressing from the forward magazine 32 to the intermediate magazines 34 will be automatically emptied through the actuation of the heretofore described structure, and after the next to last intermediate bottle magazine 34 has been emptied the shaft portion 52' thereof, see Fig. 2, cooperates with the lever element 88 intermediately pivoted at 90 and having one end portion 92 lockingly engageable with the notch portion 54' of the shaft end 52', the other end of the lever element 88 being secured to one end of a tension spring element 94 which has its other end suitably and fixedly secured at 96 on the side wall 20. Pivotally secured at 98 at the same end of the lever 88 as the spring 94 is secured is a depending rod element 100 which is pivotally secured to the shaft 72' of the transverse stop member 76', see Fig. 1, of the rearmost bottle magazine 36, said shaft 72' being fixedly secured to a link element 80' pivotally secured at 82' on the side wall 20. The bottles in the magazine 36 will each individually be of a sufficient weight to overcome the tension spring 94, and said tension spring 94 will be of sufficient strength to pull the lever 88 back into the position shown in Figure 2 when the machine is empty, thus preparing the dispensing mechanism for reloading and subsequent movement of the shaft portion 52' into an overlying locking engagement with the end portion 92 of the lever 88.

The conveyor assembly 88 comprises forward and rear shaft members 102 and 104 extending transversely between opposite portions of the side walls 20 and 22 being secured thereon by means of suitable collar elements 106, the shafts having secured thereon transversely spaced sprockets 108 rotatable with said shafts and having journaled thereon endless link chain members 110, of any suitable character, which have extending therebetween in suitable spaced relationship for receiving the bottles 50, see Fig. 1, a plurality of shafts 112 which carry thereon roller elements 114, said roller elements being of any suitable material such as rubber, wood, etc.

The shaft 102, see Fig. 2, is connected by means of a suitable transmission case 116 to any conventional power means such as an electric motor 118 which is driven by a suitable source of electrical energy 120, said motor 118 being normally operated by a coin actuated switch 122, see Fig. 10.

A vertically extending support plate 124 is suitably secured in parallel spaced relationship to the side wall 22, and includes an upwardly extending intermediate pivot portion 126 pivotally supporting on a suitable pivot element 128 a switch actuating lever 130 which normally has its end 132 extending in the line of movement of the conveyor assembly 84, whereby the bottles 50 will engage a horizontal flange portion 134 thereof, see Fig. 3, the weight of the bottles 50 being sufficient to urge the end portion 132 downwardly raising the opposite or shorter end portion 136 upwardly whereby a suitable bracket element 138 on the end 136 will be urged out of engagement with a micro switch element 140, of any suitable character, said switch 140 normally being closed and in the position shown in Figure 1, and being opened as shown in the position of Figure 4. The switch as shown in Fig. 4 is open by virtue of a U-shaped spring element 142 having a lower leg 144 secured in any suitable manner on the bottom 18 of the casing, the upper leg 146 thereof engaging the underside of the switch actuating lever 130, and being strong enough to urge the lever into a switch opening position as shown in Fig. 4 when the bottles 50 are no longer in engagement with the end portion 132 of the lever.

Thus when the switch 140, see Fig. 10, is urged to an open position, although a coin actuates the switch mechanism 122, current cannot flow in the circuit to the motor 118 and accordingly the conveyor assembly 84 will not be operated.

The chute assembly 86 includes a support bracket 148 suitably secured by means of a web portion 150 by means of suitable fasteners 152, and includes a pair of oppositely disposed pivot support leg members 154 and 156 extending horizontally forward of the roller members 114 of the conveyor assembly 84, and supporting therebetween on a suitable pivot pin 158 a substantially balanced chute element 160 having a bottle receiving portion 162 at one end, and a substantially weighted portion 164 at the other end, the chute 160 being pivotal about the pin 158, see Figs. 5 and 6, and operative to engage a suitable micro switch 166, of any suitable character, which is actuated when the dispensing assembly assumes the position shown by the phantom lines of Fig. 5, and accordingly the switch 166 is also operative to open the circuit shown in Figure 10 whereby the conveyor assembly 84 will not be operated by the motor 118 until another coin is utilized for actuating the coin actuated switch 122.

As shown in Figure 10 the circuit containing source 120 and motor 118 is rendered operative upon closing the normally open, coin actuated switch 122. If switches 120 and 166 are in the closed position, the motor 118 will be energized. However, during the functioning of the bottle dispensing mechanism, when either or both of switches 140 and 166 become opened, by actuating levers 130 or 160, the circuit is immediately interrupted and opens so that the motor can no longer function.

Various positions or directional terms such as "front," "rear," "top," "bottom," etc. are utilized here and have only a relative connotation to aid in describing the device and are not intended to require any particular orientation with respect to any external elements.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and de-

scribed, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. In a bottle dispensing mechanism, a plurality of parallel open ended and successively unloaded bottle magazines, bottle stops extending at least partially across the open lower ends of said magazines to retain the bottles therein, each stop comprising a plate, a shaft extending transversely of said magazines at the lower end of a first magazine, one of said plates secured to said shaft, an endless conveyor located below said magazines and having pockets in which bottles from said magazines are adapted to be gravity lowered, a dispensing chute extending transversely across the end of said endless conveyor for receiving bottles from said conveyor, means mounting said dispensing chute for pivotal movement in order to unload the bottle therefrom, electrically operated means for actuating said endless conveyor, a switch mounted adjacent to said pivoted dispensing chute and actuated by said dispensing chute in response to pivotal motion of said dispensing chute in order to control said endless conveyor actuating means so as to stop said endless conveyor when a single bottle is discharged from said dispensing chute, releasable means for retaining said plate in the first magazine closing position, said releasable means comprising an arm secured to one end of said shaft, a bellcrank, a link pivoted to one end of said bellcrank, said link having a slot at its opposite end, means in said slot slidingly connecting said arm to said link, a dog with which the opposite end of said bell crank is engageable thereby holding said link, arm and bell crank in a first position at which said plate extends at least partially across the open end of the first magazine, means in a second of said magazines and contacted by the bottles therein for retaining said dog in the bell crank engaging position, said dog retaining means comprising a second shaft extending transversely of said second magazine and mounted for oscillation, said dog being fixed to said second shaft, a rod attached to said second shaft and protruding laterally thereof and against which the bottles in the second magazine are adapted to rest, and a spring reacting on said rod and yieldingly pushing said rod in a direction opposite to that which the bottles force said rod and in a direction to release said dog from said bell crank whence the bottles in the first magazine push said stop plate, link, arm and bell crank to a new position and open the bottom of said first magazine and enable the bottles therein to be discharged onto said endless conveyor.

2. The bottle dispensing mechanism of claim 1 wherein said spring is disposed between the sides of said second magazine, said rod has an enlarged spring engaging portion against which said spring bears, and said magazines are vertical with said rod being pivotable to an angulated position with respect thereto when the last bottle from the magazine has been discharged therefrom.

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