

Sept. 17, 1946.

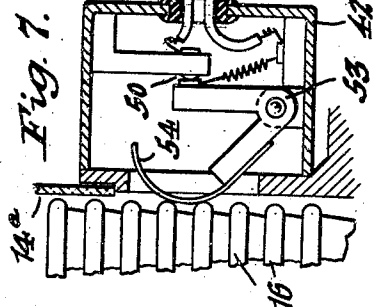
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2,407,968

CUP DISPENSING MECHANISM

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Fig. 2.

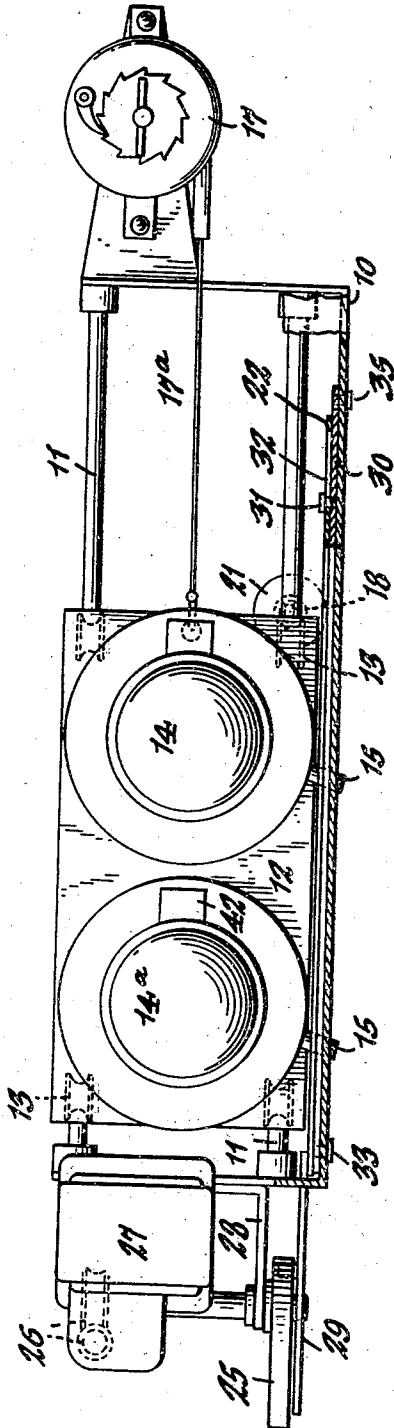
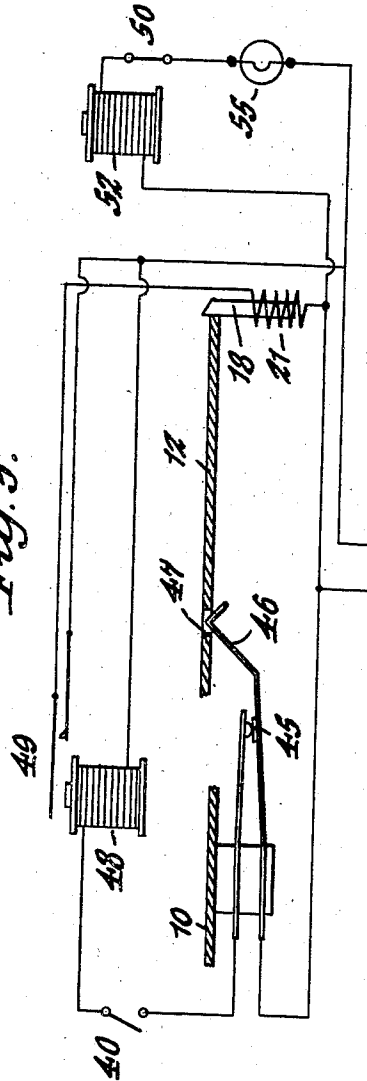


Fig. 5.



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Fig. 3.

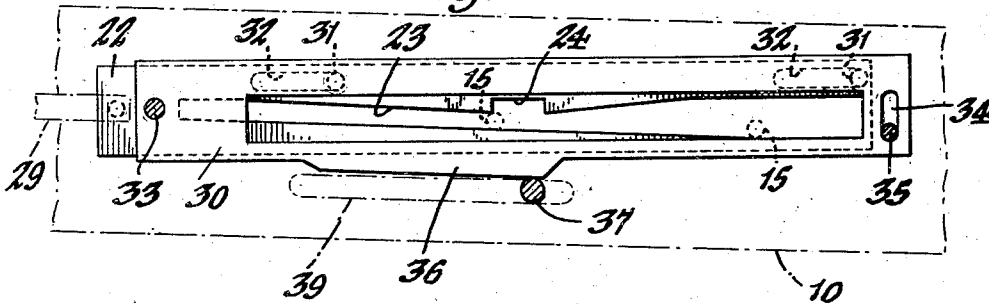
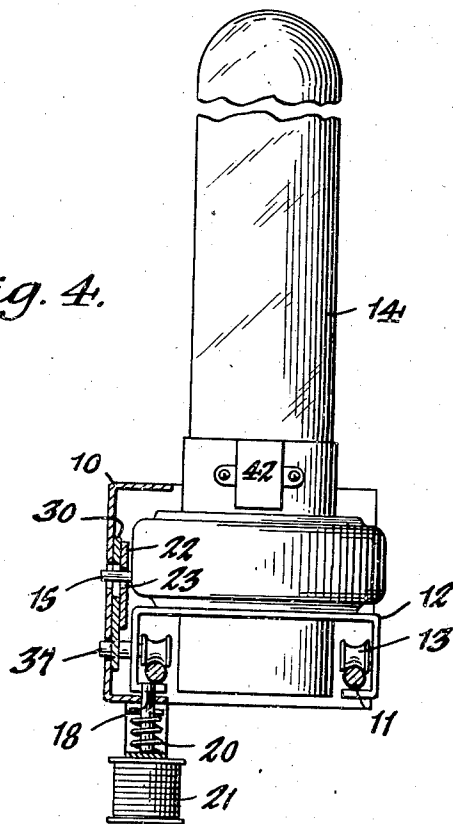


Fig. 4.



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UNITED STATES PATENT OFFICE

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CUP DISPENSING MECHANISM

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12 Claims. (Cl. 312-44)

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This invention relates generally to the art of dispensing but more particularly to certain new and useful improvements in magazine cup-dispensing mechanism designed for use with coin-operated beverage dispensing apparatus.

It has for one of its objects to provide a dispensing mechanism of this character having a plurality of cup magazines and so designed as to effect the emptying of one magazine and then automatically shifting it from cup-dispensing position while simultaneously presenting the next magazine to its cup-dispensing position.

Another object of the invention is to provide a multi-magazine cup dispenser which is fully automatic and reliable in operation, which is simple and inexpensive in construction, and which is composed of a minimum number of parts so constructed and arranged as to not get out of order or adjustment.

A further object is to provide electrically-controlled devices for governing the automatic shifting of the full magazine to its cup-dispensing position when the first-operated magazine has been emptied.

Other features of the invention reside in the construction and arrangement of parts herein-after described and particularly pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a front elevation, partly in section, of the cup dispensing mechanism embodying my invention. Figure 2 is a top plan view thereof, partly in section. Figure 3 is a side view of the companion slide and bar means for governing the actuation of the cup-dispensing magazine. Figure 4 is a cross section taken on line 4-4, Figure 1. Figure 5 is a diagrammatic view of the electrical connections for automatically controlling the mechanism. Figures 6 and 7 are enlarged sectional elevation views of the switch units employed, respectively, for governing the movement of the magazine-carriage from one position to another and for automatically rendering the dispensing apparatus inoperative when the last cup in the last-operative magazine has been emptied.

Similar characters of reference indicate corresponding parts throughout the several views.

This magazine cup-dispensing mechanism has been primarily designed for use with coin-operated beverage dispensing apparatus wherein a predetermined amount of the drink is poured into a dispensed cup upon the deposit of a coin.

In the preferred construction of the cup-dispensing mechanism shown in the drawings, the same consists of a rectangular-like frame struc-

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ture 10 upon which the various working parts in the mechanism are mounted, its lower portion having supported thereon a pair of longitudinally-extending rods or tracks 11 on which a cup magazine carriage 12 is guided through the medium of rollers 13 on such tracks for movement relative to the frame to different cup-dispensing positions. Rising from and mounted in spaced longitudinal relation on this carriage are cup-dispensing magazines 14, 14^a of ordinary construction, each being provided with a radial arm or trigger 15 projecting therefrom for actuation to a cup-releasing position. The cups 16 are disposed in nested relation in each magazine to be dispensed one at a time as the arm 15 is actuated. By way of example, two of such cup magazines are shown in the drawings, the mechanism being designed to effect the emptying of the magazine 14 first and thereupon shifting the carriage to bring the magazine 14^a into the former position occupied by the first magazine to permit the dispensing of cups therefrom. As the magazines are emptied they may be replenished or recharged.

The magazine carriage 12, after the first magazine 14 is emptied of its cups, is adapted to be shifted to the right, viewing Figure 1, to bring the magazine 14^a into the same position previously occupied by the companion magazine and bringing the latter to the position shown by dotted lines in said figure, and for this purpose a spring-powered winch 17 or the like is mounted at the right hand end of the frame 10 and connected to the corresponding end of the carriage by a link 17^a. The carriage is normally held in its retracted position by a displaceable latch 18 which is guided for vertical movement in a suitable bracket 19 depending from the frame and which is adapted in its latched position to abut against the front end of the carrier in the manner shown by dotted lines in Figure 1. A spring 20 applied to this latch normally urges it upwardly to its latched position. By preference, this latch constitutes the plunger of a solenoid 21 so that when the latter is energized in the manner hereinafter described the latch is depressed or released and the carriage projected by the spring-powered winch 17 to its right hand position. When the second magazine has been emptied of its cups, then the carriage may be returned manually to its initial position ready to start the dispensing of cups from the first magazine.

Means are provided for actuating the cup-dispensing triggers 15 in such a fashion that the trigger of the magazine 14 is rendered operative until all the cups therein have been dispensed

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while the trigger of the companion magazine 14^a is inoperative until the first-named magazine is empty at which time the magazine carriage 12 is actuated to shift the empty magazine out of its dispensing position and bring the second-named or full magazine into the dispensing position formerly occupied by the empty magazine. The means for actuating the magazine-triggers and controlling the presentation of the magazine to and from their cup-dispensing positions are preferably constructed as follows:

Guided for longitudinal movement between the frame 10 and one side of the carriage 12 is a reciprocating trigger-actuating slide 22 having a longitudinal slot 23 therein provided in its upper edge and intermediate the ends thereof with a notch 24 with which the trigger 15 of each magazine is adapted to register when in cup-dispensing position, so that upon reciprocation of the slide the trigger is actuated to dispense a cup from the operatively positioned magazine. This slide is also adapted to swing vertically sufficiently to bring its notch 24 clear of operative register with the triggers during the movement of the carriage 12 in one direction or the other, as when shifting it automatically to bring the first magazine 14 to its inoperative position and the second magazine 14^a to its operative position and vice versa, during which times the triggers register with the companion portions of the slide-slot 23. While any suitable means may be employed for reciprocating the slide 22 to dispense a cup from the magazine, that shown in the drawings, by way of example, consists of a heart-shaped cam 25 driven by suitable gearing 26 from an electric motor 27 mounted on a bracket 28 secured to one end of the frame 10, and a link 29 connected at one end to the slide and having a roller 29^a at its other end traversing the groove of the cam, as shown in Figure 1.

Disposed alongside and in contiguous relation to the outer face of the reciprocating and vertically-displaceable slide 22 is a combined guide and pivoted actuator bar or member 30 for guiding the slide during its reciprocation and for governing its displacing movements to bring the notch 24 thereof into and out of register with the trigger of one or the other of the cup magazines. This bar is substantially coextensive with the slide and at its opposite upper ends has transverse studs 31 thereon which engage companion longitudinal guide slots 32 in the corresponding ends of the slide for guiding the latter during its reciprocation. At one end thereof the bar 30 is connected to the frame by a horizontal pivot-stud 33 while its opposite end has an arcuate slot 34 therein engaging a guide pin 35 secured to the frame and whereby such bar is capable of a limited vertically-swinging movement relative to the frame and for compelling a like movement to be transmitted to the reciprocating slide. Along its lower edge this bar has a cam 36 which is adapted to be engaged at a predetermined time in the movement of the carriage 12 by a tappet pin 37 projecting from the latter and in the path of such cam to thereby raise the bar 30 upwardly and accordingly lift the companion slide 22 therewith to release its notch 24 from operative engagement with the alining trigger 15 of the cup magazine 14 and into register with the slide-slot 23. The tappet pin 37 is so located on the magazine carrier that when the first magazine 14 is in cup-dispensing position, such pin is disposed to the left of the bar-cam 36, viewing Figure 1, whereby, upon release of the latch 18 from the carriage,

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the advance of the latter by the spring-powered winch 17 causes the pin to immediately encounter the cam edge 36 and raise the bar 30 to the position shown in Figure 3. The length of the cam is substantially equal to that of the spacing between the axial centers of the two magazines, so that when the carrier advances a like distance to bring the emptied magazine 14 out of and the companion full magazine 14^a into cup-dispensing position, the tappet pin clears the cam and the bar 30 and slide 22 jointly drop by gravity to their initial, substantially horizontal position with the notch 24 of the slide in operative relation with the trigger 15 to cause a cup to be dispensed from said magazine 14^a during each reciprocation of the slide. The frame 10 has longitudinal slots 38, 39 therein in register with the trigger and tappet pin, respectively.

The means provided for automatically effecting the release of the carriage-holding latch 18 to cause the spring-propulsion of the carriage 12 in a direction to bring the magazine 14 out of and the magazine 14^a into cup-dispensing position is governed by a switch 40 included in the circuit of the latch-controlling solenoid 21. The movable element of this switch is applied to one arm of a vertically-swinging bell crank lever 41 mounted in a housing 42 disposed alongside the lower portion of the cup magazine 14 and having a feeler element 43 on its other arm projecting through an opening 44 in such housing for wiping engagement with the cup-rims, as shown in Figure 6. The lever 41 is normally urged to pivot to its switch-closing position but as long as a cup remains in the magazine the lever is held thereby in its switch-opening position. By this construction, when the last cup in the magazine 14 has been dispensed therefrom, the switch 43 is automatically closed to energize the solenoid and cause the latch 18 to be retracted from its latching position and the carriage to be propelled by the spring-powered winch 17 to bring the magazine 14^a into cup-dispensing position and its trigger 15 into register with the slide-notch 24. Attached to the underside of the frame 10 is a switch 45 having an operating finger 46 normally urged upwardly for entry into an opening 47 in the bottom of the carriage 12, and in which position such switch is closed. This switch is connected in series with the dispensing switch 40 and with the coil of a relay 48, so that when the dispensing switch is closed the circuit is closed through the relay, its points 49 are closed and the latch-solenoid 21 is energized to release the latch 18. When the carriage is thus moved, the switch 45 is opened and the relay 48 and solenoid are de-energized.

A switch 50 is mounted in a housing 42 of the magazine 14^a for the purpose of opening the circuit of a relay magnet 52 of the coin mechanism of the dispensing apparatus when the last cup has been dispensed, and thereby prevent the introduction of further coins and render such apparatus inoperative until again supplied with cups. As long as there are cups in the magazine, this switch is closed and its movable element is applied to one arm of a bell crank lever 53, the other arm of the latter having a cup-engaging feeler 54, which, when the last cup is dispensed, causes the bell crank to pivot to its switch-opening position. The deposit of a coin initiates the operation of the dispensing apparatus to dispense a cup and when the last cup is dispensed, the circuit through the relay 52 is opened to cause the initiation of a mechanism to obstruct the coin

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passage and prevent the entrance of further coins. If desired, a signal lamp 55 may be included in this switch circuit to indicate that the cup-magazine is empty.

While manifestly simple and compact in construction, this multi-magazine cup dispenser is positive and reliable in operation, and enables an emptied magazine to be refilled without interfering with the dispensing operation of the companion magazine.

I claim as my invention:

1. An apparatus of the character described, comprising a frame, a carriage guided on said frame and having a plurality of cup-dispensing magazines mounted thereon and adapted for movement to bring such magazines from and to a cup-dispensing position, means successively operatively engageable with means on the magazines when in dispensing position for releasing cups therefrom until empty, means governed by the movement of the carriage and correlated with said means engageable with the cup-releasing means for rendering the same inoperative on the releasing means on one of the magazines and operative on the other, and means operatively connected to said carriage for actuating it in a direction to bring the emptied magazine out of and the succeeding full magazine into dispensing position and to move the means engageable with the cup releasing means into inoperative relation with the releasing means on the empty magazine after the last cup has been released from such emptied magazine and thereafter permit the engageable means to engage the cup-releasing means on the full magazine.

2. An apparatus of the character described, comprising a frame, a carriage guided on said frame and having a plurality of cup-dispensing magazines mounted thereon and adapted for movement to bring such magazines from and to a cup-dispensing position, each of said magazines having a cup-releasing actuating trigger therefor, trigger-engaging means successively engageable with said magazine-triggers and displaceable from and to coupling engagement therewith, and means operatively connected to said trigger-engaging means and governed by the movement of the carriage for displacing such trigger-engaging means out of engagement with one of the magazine-triggers and into operative engagement with the trigger of another magazine when the first magazine is empty of cups.

3. An apparatus of the character described, comprising a frame, a carriage guided on said frame and having a plurality of cup-dispensing magazines mounted thereon and adapted for movement to bring such magazines from and to a cup-dispensing position, each of said magazines having an actuating trigger therefor, means common to and releasably engageable at predetermined times with the magazine-triggers for actuating them to dispense cups, and means on said carriage and frame for governing the displacement of the trigger-actuating means to a released position from one of the magazine-triggers and into coupling engagement with the trigger of another magazine when the carriage is moved to bring the first magazine out of and the next magazine into cup-dispensing position when said first magazine is empty of cups.

4. An apparatus of the character described, comprising a frame, a carriage guided on said frame and having a plurality of cup-dispensing magazines movable from and to a cup-dispensing position, each of said magazines having an

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actuating trigger therefor, combined reciprocating and vertically-displaceable means guided for movement relative to the carriage and successively releasably engageable with the magazine triggers to actuate them to dispense cups, and complementary means disposed in correlation with said carriage and said combined means for governing the displacement of the latter to release it from engagement with the trigger of the magazine in cup-dispensing position and into coupling engagement with the next magazine when the carriage is moved to bring the first-named magazine out of dispensing position and the second-named magazine into dispensing position when said first-named magazine is empty of cups.

5. An apparatus of the character described, comprising a frame, a carriage guided on said frame and having cup-dispensing magazines thereon each having an actuating trigger therefor, means operatively connected to said carriage for constantly urging it in a direction to bring the first of the magazines out of and the second into cup-dispensing position, means for releasably latching the carriage in its initial cup-dispensing position, actuating means for releasable coupling engagement with the trigger of a magazine when in its operative position to dispense cups therefrom, means operatively connected to said latch for actuating it to its released position at a predetermined time in the cup-dispensing condition of the first magazine, and means correlated with the trigger-actuating means and initiated by the movement of the carriage for releasing the former from coupling engagement with the trigger of the first magazine and permitting it to move into coupling engagement with the trigger of the second magazine when said first magazine is empty of cups.

6. An apparatus of the character described, comprising a frame, a carriage guided on said frame and having cup-dispensing magazines thereon each having an actuating trigger therefor, means operatively connected to said carriage for constantly urging it in a direction to bring the first of the magazines out of and the second into cup-dispensing position, means for releasably latching the carriage in its initial cup-dispensing position, actuating means for releasable coupling engagement with the trigger of a magazine when in its operative position to dispense cups therefrom, means disposed in cup-engaging relation to the first magazine and operatively connected to said latch for actuating it to its released position when the last cup in such magazine has been dispensed, and complementary means disposed in correlation with means on said carriage and said trigger-actuating means and initiated by the movement of the carriage, when released, for releasing the trigger-actuating means from coupling engagement with the trigger of the first magazine and into registering coupling engagement with the trigger of the second magazine when said first magazine is empty of cups.

7. An apparatus of the character described, comprising a frame, a carriage guided on said frame and having cup-dispensing magazines thereon each having an actuating trigger therefor, means operatively connected to said carriage for constantly urging it in a direction to bring the first of the magazines out of and the second into cup-dispensing position, means for releasably latching the carriage in its initial cup-dispensing position, reciprocating means disposed

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parallel to the carriage for releasable coupling engagement with the trigger of a magazine when in its operative position to dispense cups therefrom, means connected to said trigger coupling means for reciprocating the same, a laterally displaceable member disposed alongside said reciprocating trigger coupling means and provided with means constituting a guide therefor, and means on said carriage and engageable with said displaceable member for actuating it to a position to release the reciprocating means from coupling engagement with the magazine-trigger during the movement of the carriage from one cup-dispensing position to the other when the magazine in operative position is empty of cups.

8. In a device of the character described, a movable carriage having a pair of cup magazines thereon each having an actuating trigger for dispensing cups therefrom, a reciprocating slide disposed alongside said carriage for movement relative thereto in substantially vertical and horizontal planes and having a longitudinal trigger-receiving slot therein including a trigger-coupling notch in one edge thereof, and means initiated by the movement of the carriage for displacing said slide vertically to bring the notch thereof out of coupling engagement with the trigger of one of the magazines and into coupling engagement with the trigger of the other magazine at predetermined times in the movement of said carriage when said one magazine is emptied of cups.

9. In a device of the character described, a movable carriage having a pair of cup magazines thereon each having an actuating trigger for dispensing cups therefrom, a reciprocating slide disposed alongside said carriage for movement relative thereto in substantially vertical and horizontal planes and having a longitudinal trigger-receiving slot therein including a trigger-coupling notch in one edge thereof, a pivoted member disposed alongside and substantially coextensive with said slide and operatively connected to the latter for guiding the same during its reciprocating movement and compelling the displacement thereof during the pivoting movement of said member, and complementary inter-engaging means on said carriage and said pivoted member for causing the joint displacement of the latter and said slide to bring the notch of the latter out of coupling engagement with the trigger of one of the magazines and into coupling engagement with the trigger of the other magazine at predetermined times in the movement of said carriage when said one magazine is emptied of cups.

10. In a device of the character described, a movable carriage having a pair of cup magazines thereon each having an actuating trigger for dispensing cups therefrom, means for urging said carriage in a direction to bring one of the magazines out of dispensing position and the other into dispensing position, a releasable latch for retaining the carriage in its initial retracted position wherein the first magazine is in dispensing position, actuating means successively engage-

able with the triggers of said magazines when in dispensing position for releasing cups from the magazines until empty, means governed by the movement of the carriage and correlated with said actuating means for rendering the same inoperative on one of the magazines and operative on the other, and means in correlation with the first operative magazine and said latch for rendering the latter operative to release the carriage when the last cup has been dispensed from such magazine.

11. In a device of the character described, a carriage having a pair of cup magazines thereon each having an actuating trigger for dispensing cups therefrom, a reciprocating slide disposed alongside said carriage for movement relative thereto in substantially vertical and horizontal planes and having a longitudinal trigger-receiving slot therein including a trigger-coupling notch in one edge thereof, means operatively connected to said carriage for actuating it in a direction to bring the first-emptied magazine out of and the full magazine into dispensing position after the last cup has been released from such emptied magazine, a latch for retaining the carriage in its initial position wherein the first-named magazine is in cup-dispensing position, means in correlation with such first-named magazine and said latch for rendering the latter operative to release the carriage when the last cup has been dispensed therefrom, and means initiated by the movement of the carriage for displacing said slide vertically to bring the notch thereof out of coupling engagement with the trigger of the first-named magazine and into coupling engagement with the trigger of the full magazine.

12. An apparatus of the character described, comprising a frame, a carriage guided on said frame and having a plurality of cup-dispensing magazines mounted thereon and adapted for movement to bring such magazines from and to a cup-dispensing position, means successively engageable with means on the magazines when in dispensing position for releasing cups therefrom until empty, means operatively connected to said carriage for actuating it in a direction to bring the emptied magazine out of and the succeeding full magazine into dispensing position after the last cup has been released from such emptied magazine, a latch for retaining the carriage in its initial position wherein one of the magazines is in cup-dispensing position, means in correlation with such last-named magazine and said latch for rendering the latter operative to release the carriage when the last cup has been dispensed therefrom, an actuatable member constituting part of a coin mechanism and normally positioned to render such mechanism operative, and means in correlation with the other of said magazines and said actuatable member for actuating the latter to a position for rendering the coin mechanism inoperative when the last cup has been dispensed therefrom.

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