Dec. 28, 1937. F. W. HOBAN 2,103,367

DISPENSING MACHINE

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Fig. 1.

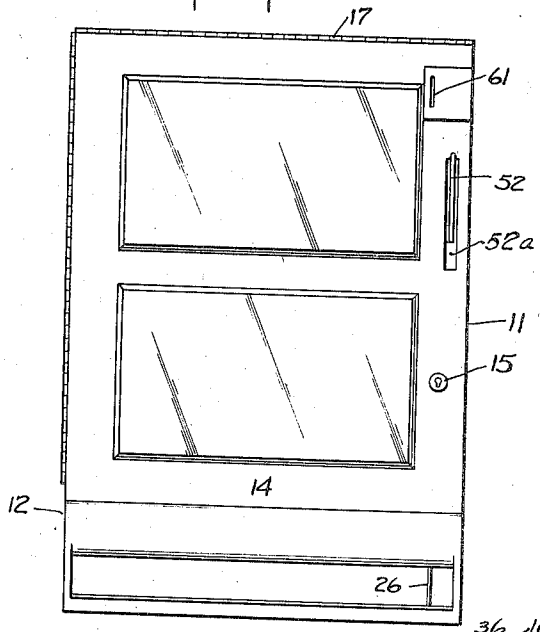


Fig. 2.

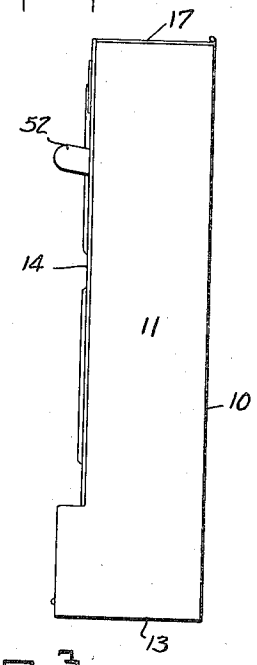


Fig. 3.

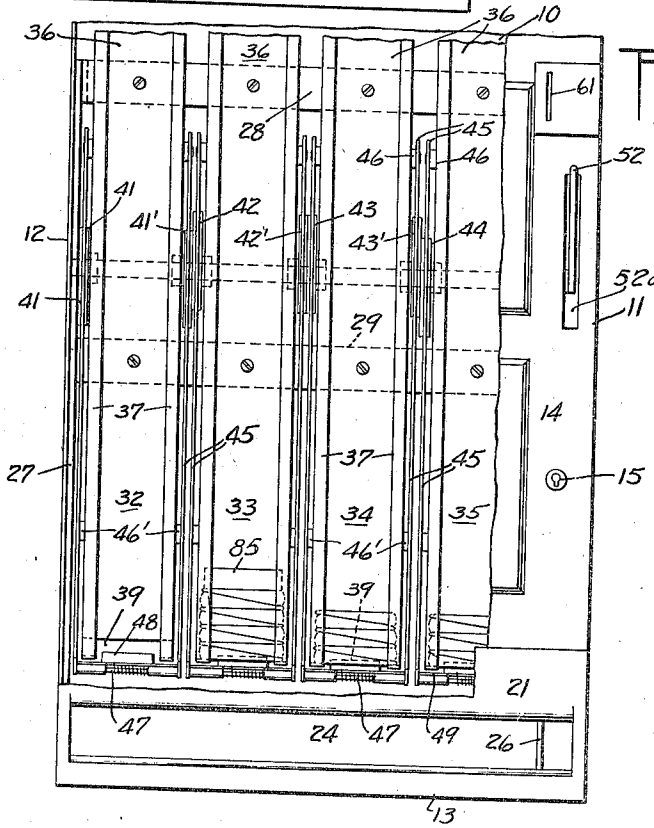
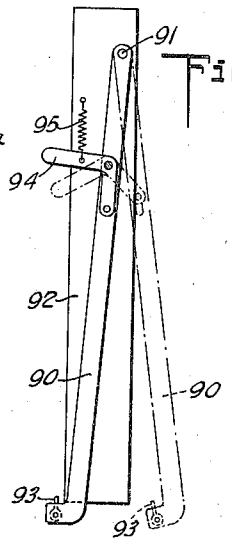


Fig. 13.



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Fig. 4.

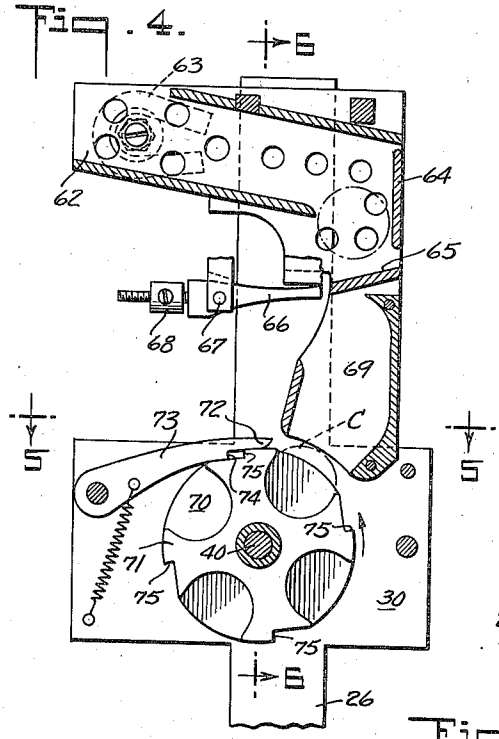


Fig. 7.

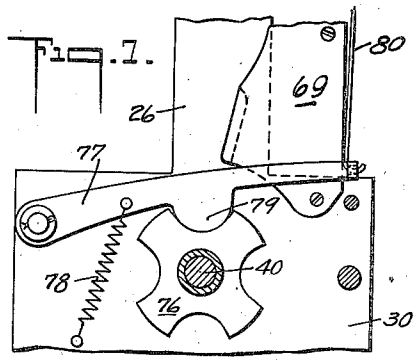


Fig. 6.

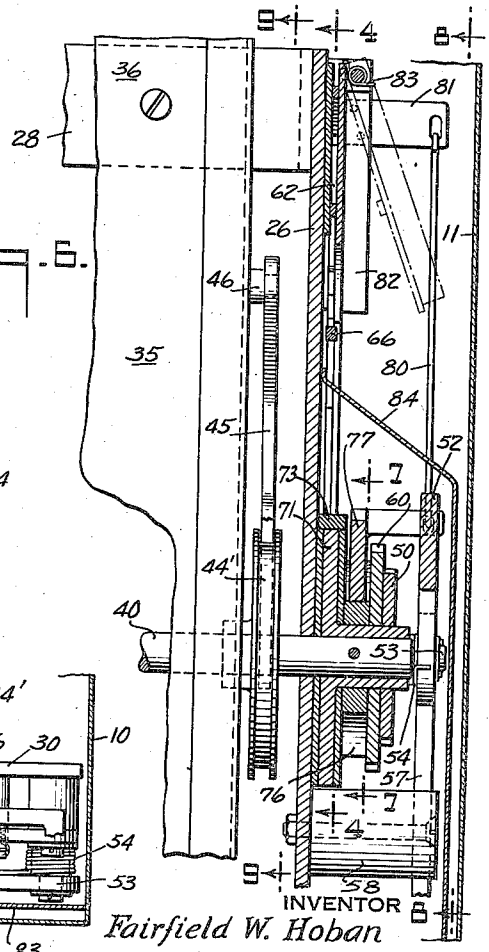
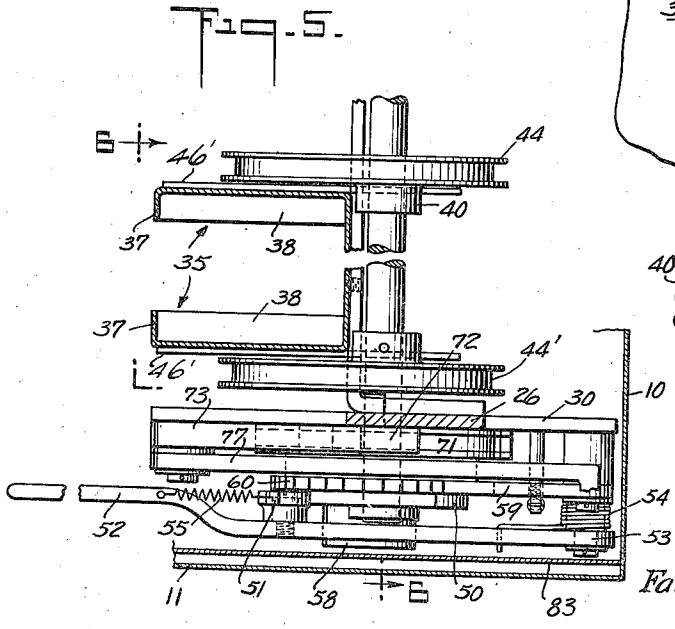


Fig. 5.



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DISPENSING MACHINE

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Fig. 8.

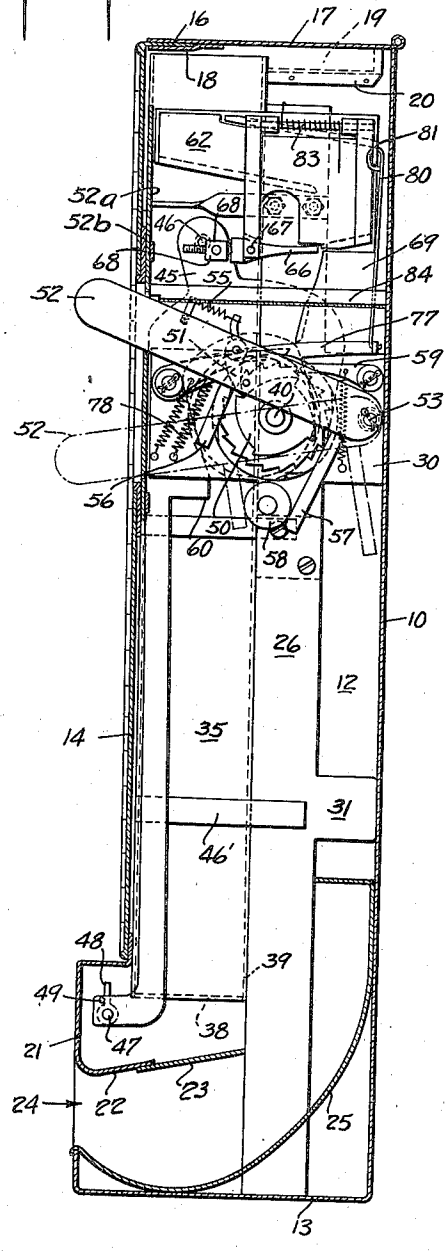
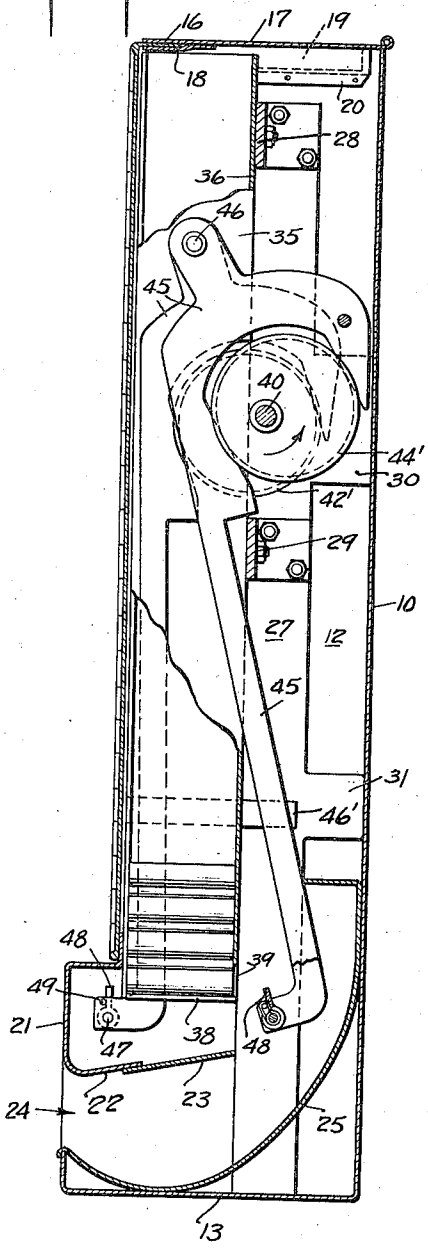


Fig. 9.



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Fig. 10.

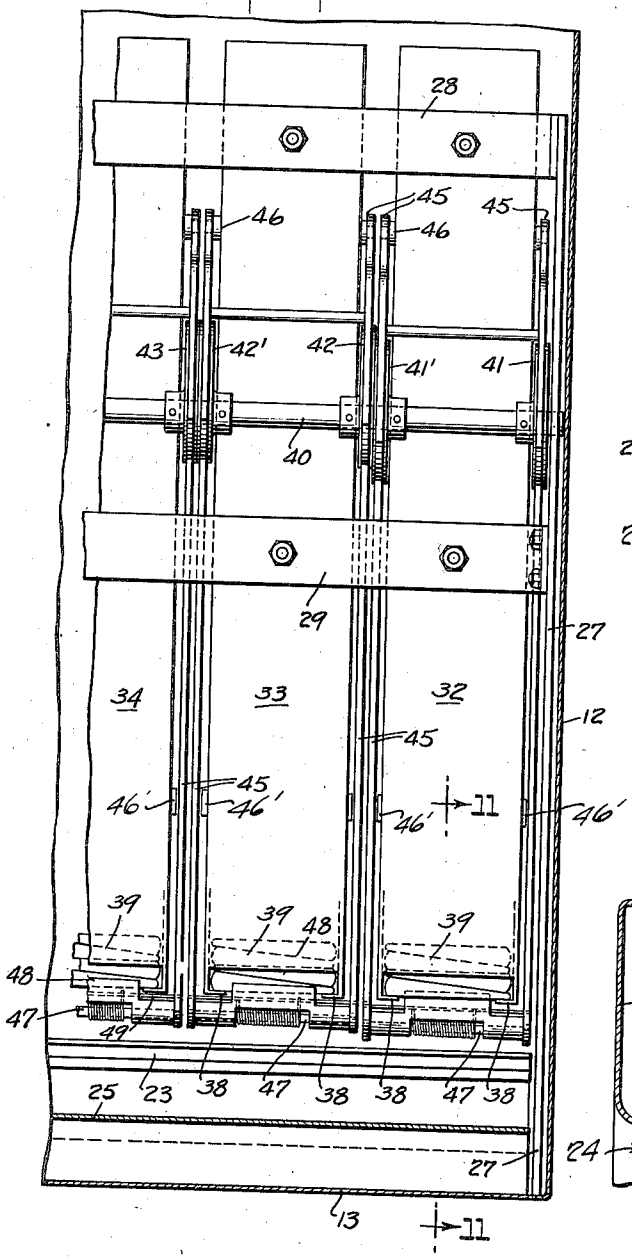


Fig. 11.

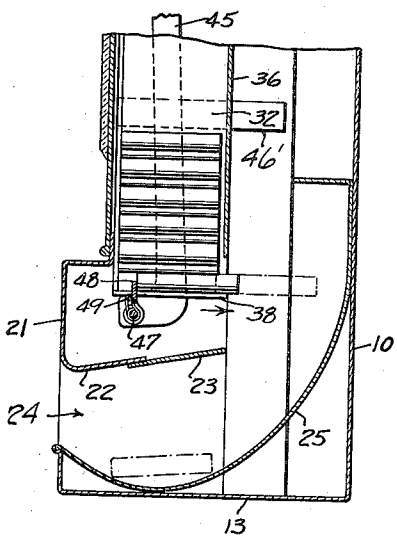
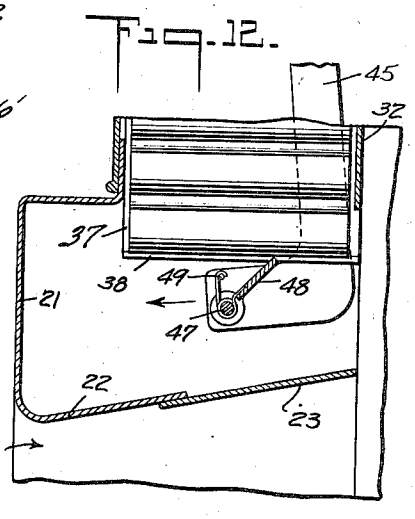


Fig. 12.



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Patented Dec. 28, 1937 2,103,367

UNITED STATES PATENT OFFICE

2,103,367

DISPENSING MACHINE

Fairfield William Hoban, New York, N. Y., assignor to Stewart & McGuire, Inc., New York, N. Y., a corporation of New York

Application May 31, 1935, Serial No. 24,402

13 Claims. (Cl. 312—69)

The present invention relates to dispensing machines.

The dispensing machines forming the subject matter of the present improvements are of a type particularly useful in vending or dispensing articles one at a time from a plurality of magazines, in sequence. Where all the articles to be dispensed are identical, such, for example, as packages of matches, cigarettes, razor blades, gum, etc., it is possible to use a number of stacks or magazines side by side and remove one such article at a time from the magazine in succession. This conserves space and makes the machine more compact, and insures that an adequate reserve of articles may be kept in each magazine.

The present invention contemplates that a single operating means will be operated a step at a time and at each such manipulation will dispense one article from a certain magazine and carry the dispensing devices associated with the other magazines through idle steps (in their respective cycles of operation), placing one such device in a position such that, on the next manipulation of the operating means, an article will be dispensed from the corresponding magazine.

A further object of the present invention is to so arrange the operating mechanism that it is behind the magazines whereby the magazines are free of obstructions and their refilling is easily accomplished.

Suitable coin control mehanism is provided so that the dispensing mechanism may be freed for one operation and locked against another operation.

Other and further objects of the present invention will appear as the description proceeds.

The accompanying drawings show, for purposes of illustration, two of the many embodiments in which the invention may take form, it being understood that the drawings are illustrative of the invention rather than limiting the same.

In these drawings:

Figs. 1 and 2 are front and side elevational views of the dispensing machine;

Fig. 3 is a front elevational view of the machine at a larger scale, parts being broken away to show the storage magazines for articles to be dispensed;

Fig. 4 is a vertical sectional view on the line 4—4 of Figure 6, illustrating the coin controlled release;

Fig. 5 is a horizontal sectional view on the line 5—5 of Figure 4 illustrating a portion of the operating mechanism;

Fig. 6 is a vertical sectional view on the line 6—6 of Figures 4 and 5;

Fig. 7 is a fragmentary sectional view on the line 7—7 of Figure 6 showing stop mechanism;

Fig. 8 is a vertical section on the line 8—8 of Figure 6 illustrating the operating mechanism;

Fig. 9 is a vertical sectional view on the line 9—9 of Figure 6;

Fig. 10 is a rear elevational view of the storage magazines and ejectors;

Figs. 11 and 12 are fragmentary sectional views on the line 11—11 of Figure 10 illustrating the ejectors; and

Fig. 13 illustrates a fragment of a dispensing machine having one magazine and a single ejector.

The cabinet for enclosing the mechanism has a back wall 10, side walls 11 and 12, and a bottom wall 13. The front hinged panel 14 is provided with a lock 15 and a rearwardly extending flange 16. The top of the cabinet 17 is hinged as indicated, and has a plate 18 spaced to receive the flange 16. It also has side flanges 19 to enter behind plates 20 carried by the side walls 11 and 12, thereby interlocking the cabinet walls. The lower front part of the cabinet has a front piece 21 bent back at 22 and provided with an extension 23 to form the upper wall of a discharge opening 24. A bent sheet metal member 25 forms the bottom wall of this opening.

The frame work of the machine has two vertical end members 26 and 27 and two cross members 28 and 29. The end members have rearwardly extending spacers 30 and 31 to engage the back wall of the cabinet, and their lower ends pass down through holes in the member 25 and rest on the bottom of the cabinet. The stationary chutes or magazines for articles to be dispensed are here shown as four in number at 32, 33, 34, and 35, respectively. These magazines are in the form of vertical channels with rear walls 36 secured to the cross pieces 28 and 29, inwardly facing front flanges 37 and bottom flanges 38. The lower part of the back wall 36 is cut away, as indicated at 39. (Fig. 10). It will, of course, be understood that these magazines will be designed to accommodate the particular article to be dispensed by the machine.

The dispensing mechanism employs a single, transversely disposed operating shaft 40 adapted to be turned counter-clockwise 90° at a time by mechanism to be described. This shaft carries four pairs of circular cams, or eccentrics, 41—41', 42—42', 43—43', and 44—44', placed adjacent the side walls of the magazines. These cams are ac-

curately timed to be 90° apart. If the machine has a different number of magazines the number of cams, their angular relation and the amount the shaft is turned per step, will be adjusted accordingly in the design.

Each of the magazines pivotally supports two swinging arms **45** at **46**. These arms are arranged in pairs and are held in position by guides **46'** carried by the magazines, and each pair of arms carries, at their lower ends, a shaft **47** on which a spring pressed finger **48** is mounted. The finger can yield when the arms are moved to the left (as shown in Figure 12) and abuts a stop **49** when the arms are moved to the right (as shown in Figure 11). The arms are shaped, as indicated in Figure 9 to embrace the corresponding cams so that each pair of arms may be swung back and forth in unison by the cams.

The cams are so timed that at each quarter turn of the shaft one set of arms is shifted from the front toward the rear position and hence an article, such as a book of matches is pushed out of or ejected from the bottom of the corresponding magazine. This is illustrated in Figure 11.

While the arrangement of eccentric cams on a shaft and bifurcated swinging followers is illustrated for the purpose of showing a form of mechanism for swinging the arms **45** back and forth on the desired sequence, it is of course understood that various other mechanisms may be employed to effect the sequential operation.

The shaft **40** extends beyond the right hand frame member **26** where it is provided with ratchet wheel **50** having four teeth, cooperable with a pawl **51** carried by an operating lever **52** pivoted at **53** to the frame. The lever is urged to the up position by a coiled spring **54** and the pawl **51** pressed into engagement with the ratchet wheel **50** by a spring **55**. The movement of the lever is limited by arms **56** and **57** fixedly carried thereby and adapted to engage a rubber bumper **58**. The lever **52** extends through a reciprocable slot closer **52*a*** carried by a front plate **52*b*** which is supported by the frame behind the front of the casing. Each time the lever is depressed the shaft **40** is given a quarter turn in a counter-clockwise direction. Retrograde movement of substantial amount is prevented by a retaining pawl **59** riding on a ratchet wheel **60**.

Where the dispensing mechanism above described is designed for use as a vendor, suitable coin-operated mechanism is employed. This will now be described.

The front of the cabinet is provided with a coin opening **61** in line with a coin chute **62** which inclines downwardly toward the rear of the cabinet as clearly shown in Fig. 4. It may be provided with a magnet **63** to stop magnetic slugs. The coin rolls down to a stop plate **64**, then falls down to a platform **65**, and rolls forward onto a scale **66** pivoted at **67** on a scavenger **82** and balanced at **68**. The reversal of motion of the coin in the U-shaped coin guide makes it certain that any impetus given the coin by pushing it into the coin opening is absorbed before the coin reaches the scale.

If the coin is of the proper weight it will tip the scale and roll into the chute **69** and then pass into one of the four coin receiving pockets **70** on a disc **71** pinned to the shaft **40** and secured to the ratchet wheels **50** and **60**. If one now presses down on the lever **52**, the coin C will be brought against the nose **72** of a locking pawl **73** which is spring pressed against the face of the disc **71**. The coin lifts the pawl **73** a sufficient amount to raise the shoulder **74** above the notch **75** on the disc **71**. The shaft may then be turned a quarter of a revolution whereupon the shoulder **74** engages with another notch **75** and stops the turning of the shaft.

To insure that the shaft is in exactly the proper position to receive the coin, the shaft is also provided with a four notch cam **76** (Figure 7) against which an arm **77** is held by a spring **78**. This arm has a lug **79** to fit the notches in the cam **76** and the spring is strong enough to seat the lug in the notch and turn the shaft back a slight amount, as indicated by the spacing of the parts **74** and **75** in Figure 4. The rear end of the arm **77** is provided with a link **80** which extends up to a lateral extension **81** carried by the scavenging device **82** indicated in Figure 6. When the operating lever is pressed down to bring the notch **75** toward the shoulder **74** the coin chute is opened against the tension spring **83** each time one starts to operate the dispensing apparatus, and allows undersize or underweight coins, slugs, and the like to fall out of the chute and off the scale. These strike a shield **84** which covers the operating mechanism and pass down adjacent the side of the cabinet into the merchandise trough and are returned to the operator.

A dummy **85** larger than the articles being dispensed may be placed on top of the articles in one magazine and when the supply of merchandise is exhausted, the dummy stops the machine. It is too high to pass out through the opening **39**.

From the foregoing it will be apparent that a very compact and serviceable vending and dispensing machine has been provided for the purpose of mechanically merchandising identical articles from a number of magazines one at a time.

In the arrangement shown in Fig. 13, arms **90** are pivoted at **91** to a magazine **92**. The arms carry a spring-pressed finger **93** similar to finger **48**. A depressible bell crank lever **94** may be used to operate the arms to eject an article from the magazine, as indicated in dotted lines, and a coiled spring **95** employed to return the ejector to the front position.

It is obvious that the invention may be embodied in many forms and constructions, and I wish it to be understood that the particular forms shown are but two of the many forms. Various modifications and changes being possible, I do not otherwise limit myself in any way with respect thereto.

What is claimed is:

1. A dispensing device having a plurality of storage magazines arranged side by side, a reciprocatory element movable underneath each magazine for removing the lowermost article from the corresponding magazine, actuating means for positively shifting each reciprocatory element in each direction, said means extending upwardly alongside the corresponding magazines, and a transversely extending unitary step by step operator for all of said actuating means and movable only when all the reciprocatory elements are free to move, the operator being disposed above the bottoms of the magazines and connected to the actuating means so that at each step only one reciprocatory element engages an article to remove it.

2. A dispensing device having a plurality of magazines for the storage of articles to be dispensed, a reciprocatory element below each magazine for removing the lowermost article from

the corresponding magazine, a rotary cam for positively shifting each reciprocatory element in each direction, a common operating shaft to which the cams are connected, the shaft extending transversely of the magazines and being mounted in bearings fixed relative to the magazines, and means to operate the shaft step by step, the cams being timed so that one reciprocatory element functions to remove an article at each step the shaft is turned.

3. In a dispensing machine a plurality of storage magazines arranged side by side, each adapted to contain a stack of articles to be dispensed, an oscillatory arm cooperatively associated with each magazine for removing an article therefrom on alternate movements of said arm, a common operating shaft extending transversely of the magazines and mounted in bearings fixed relative to the magazines, means for turning the shaft step by step a partial revolution, and a connection between each arm and the shaft for positively moving the arm back and forth at each complete revolution of the shaft, whereby the shaft may be turned only when all the arms are free to move the connections being timed so that only one arm functions to remove an article for each step of the shaft operating means.

4. A dispensing device having an operating shaft, means to turn the shaft step by step, a plurality of cams carried by the shaft, the number corresponding with the number of steps to complete a revolution of the shaft, the cams being angularly displaced from one another an equal amount, a magazine corresponding with each cam, and an oscillatory follower for each cam and movable in both directions thereby, each follower carrying a device for removing one article from the magazine for each rotation of the corresponding cam.

5. A dispensing device having an operating shaft, means to turn the shaft step by step, a plurality of cams carried by the shaft, the number corresponding with the number of steps to complete a revolution of the shaft, the cams being angularly displaced from one another an equal amount, a magazine corresponding with each cam, and an oscillatory follower for each cam and movable in both directions thereby, each follower being pivoted adjacent the upper end of the corresponding magazine and carrying a device movable past the lower end thereof for removing one article from the magazine for each rotation of the corresponding cam.

6. In a dispensing machine, a vertically disposed magazine, the magazine having bottom elements to support a stack of articles to be dispensed and having an open side near the bottom through which the article may be removed, swinging arms pivoted at their upper ends to the magazine, a cross member carried by the arms for movement back and forth under the magazine, a foldable finger on the cross member for moving the article out of the magazine when the arms are swung in one direction and to fold under the stack when the arms are swung in the other direction, a transverse shaft, shaft bearings fixed relative to the magazine, and cams carried by the shaft and operatively engaging the arms for positively swinging the arms back and forth.

7. In a dispensing machine, a plurality of vertically disposed magazines, each magazine having bottom elements to support a stack of articles to be dispensed and having an open side near the bottom through which the article may be removed, swinging arms pivoted at their upper ends to each magazine, a cross member carried by each pair of arms for movement back and forth under the corresponding magazine, a foldable finger on each cross member for moving the article out of the magazine when the arms are swung in one direction and to fold under the stack when the arms are swung in the other direction, a transverse shaft, shaft bearings fixed relative to the magazines, and cams carried by the shaft for positively swinging the arms back and forth, the cams being timed so that the articles are dispensed from one magazine after another.

8. A dispensing machine having a frame with vertical end members and horizontal connecting members, a plurality of vertically extending magazines secured to the horizontal members of the frame the magazines being spaced apart, a horizontal shaft supported behind the magazines, step by step means to turn the shaft a partial revolution, cams carried by the shaft and entering the spaces between the magazines, oscillatory arms pivoted to the magazines and engaging the cams to be swung back and forth by the cams, and devices carried by the lower end of the arms for removing the articles from the magazines, the cams being timed so that one cam actuates the corresponding arm to remove an article from the corresponding magazine for each step the shaft is advanced.

9. A dispensing machine having a horizontal operating shaft, means for turning the shaft step by step to complete a cycle of operations in one revolution, a plurality of pairs of cams carried by the shaft, the pairs of cams being angularly spaced, from one another an equal amount, vertical storage magazines for articles to be dispensed, each magazine being placed between the cams of a pair, rockable arms pivoted to each magazine and operable back and forth by the cams, and a foldable finger carried by the free ends of the arms of each pair, each finger being movable past the lower end of the corresponding magazine to remove an article therefrom when the arms are swung in one direction and being foldable under the stack when the arms are swung in the other direction.

10. In a dispensing machine, the combination with a vertically disposed magazine adapted to receive a stack of articles to be dispensed and having article supporting means at the bottom and an opening through which the lowermost article may be discharged, of an arm pivotally supported at its upper end and carrying a finger at its lower end adapted to traverse the bottom of the magazine and push an article out through the opening, arm swinging means to positively swing the arm back and forth, and means for locking the last-mentioned means against movement whenever the arm is not free to move.

11. In a dispensing machine, the combination with a vertically disposed magazine adapted to receive a stack of articles to be dispensed and having article supporting means at the bottom and an opening through which the lowermost article may be discharged, of a pair of arms, fixed pivots for the upper ends of the arms, the arms carrying a pivoted finger at their lower ends adapted to traverse the bottom of the magazine and push an article out through the opening when the arms are swung in one direction and to fold under the stack when the arms are swung in the other direction, and means to swing the arms back and forth.

12. In a dispensing machine, the combina-

tion with a vertically disposed magazine adapted to receive a stack of articles to be dispensed and having article supporting means at the bottom and an opening through which the lowermost article may be discharged, of a pair of arms pivotally supported at their upper ends to the opposite sides of the magazine, means operating on both arms to swing them back and forth, the lower ends of the arms extending below the bottom of the magazine and carrying a transverse shaft, and a shaft carried spring adapted to traverse the bottom of the magazine and push an article out through the opening when the arms are swung in one direction and to fold under the stack when the arms are swung in the other direction.

13. In a dispensing machine, the combination with a vertically disposed magazine adapted to receive a stack of articles to be dispensed and having article supporting means at the bottom and an opening through which the lowermost article may be discharged, of a pair of arms pivotally supported at their upper ends to the opposite sides of the magazine, rotatable cams acting on the arms to swing them back and forth, the lower ends of the arms extending below the bottom of the magazine and carrying a transverse shaft, and a shaft carried finger adapted to traverse the bottom of the magazine and push an article out through the opening when the arms are swung in one direction and to fold under the stack when the arms are swung in the other direction.

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