May 3, 1966 E. SHERMAN 3,249,198

DISPENSING MACHINE

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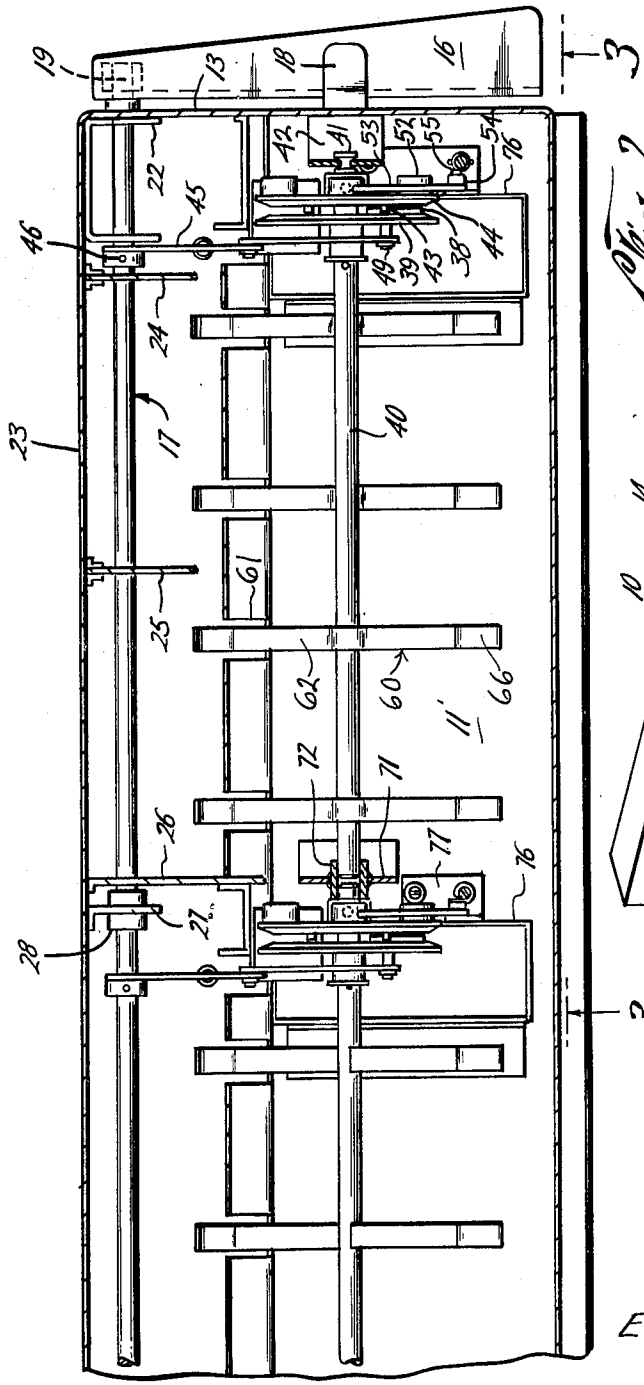


Fig. 2

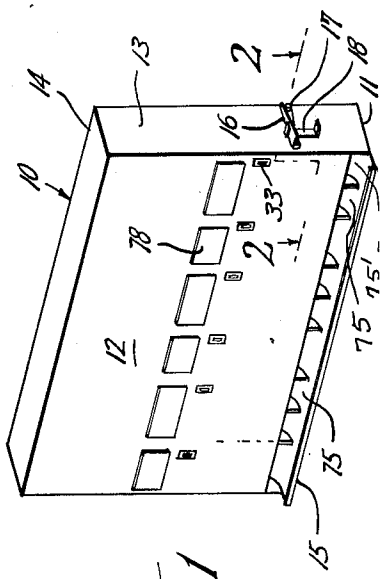


Fig. 1

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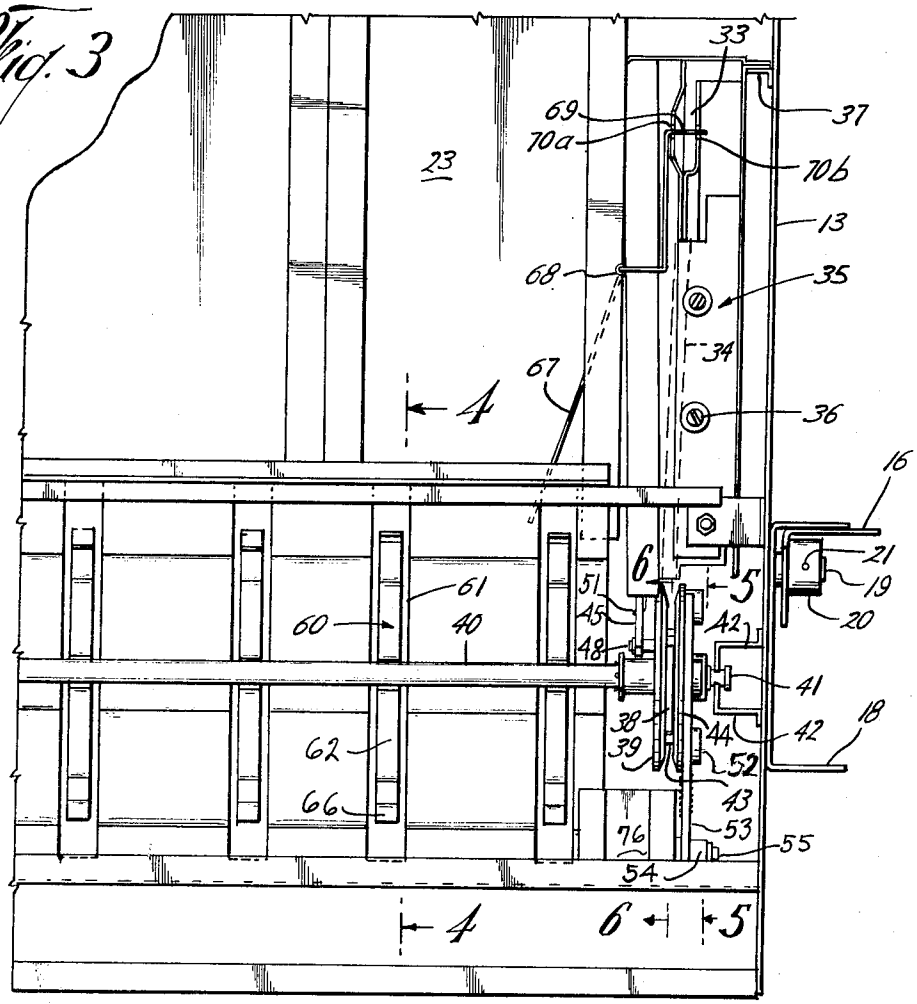
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DISPENSING MACHINE

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Fig. 3



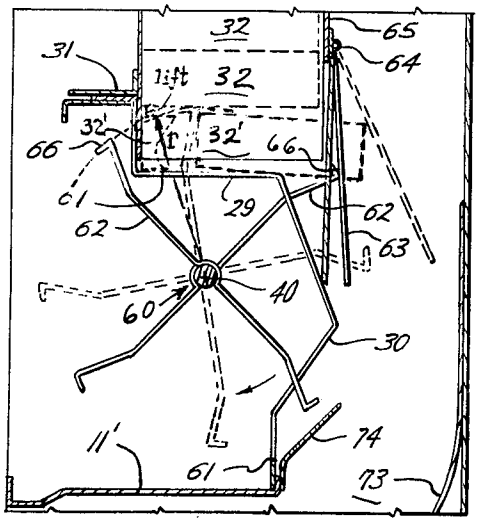


Fig. 4

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DISPENSING MACHINE

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Fig. 5

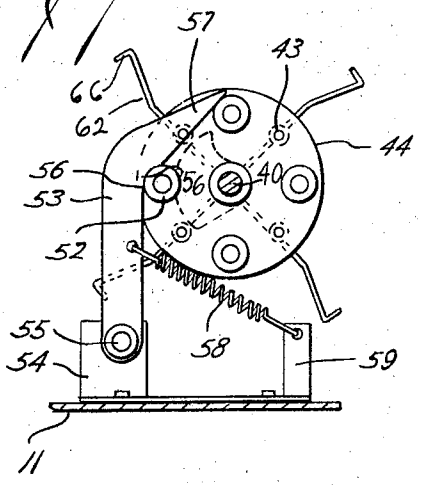


Fig. 6

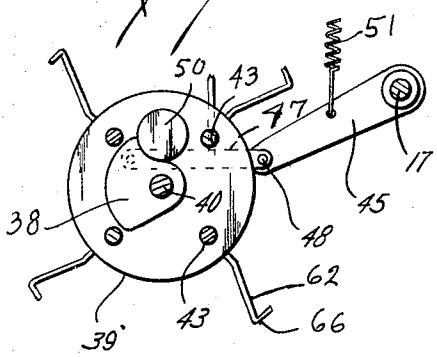


Fig. 8

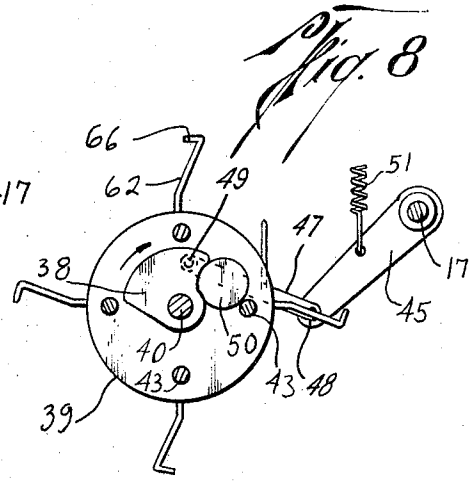


Fig. 7

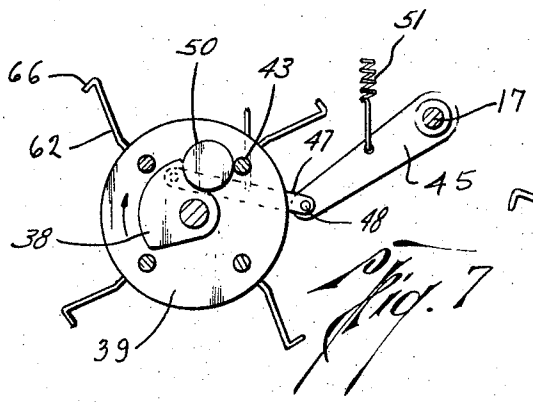
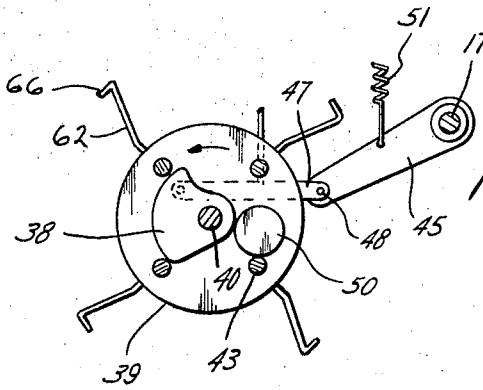


Fig. 9



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United States Patent Office 3,249,198 Patented May 3, 1966

3,249,198

DISPENSING MACHINE

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Filed Mar. 25, 1963, Ser. No. 267,623
1 Claim. (Cl. 194—85)

This invention relates to a coin operated dispensing machine adapted to dispense articles from a plurality of coin operated compartments in a single operation of the master lever of the machine.

As its primary object the invention provides a dispensing machine whereby a purchaser may drop an operating coin into the respective compartment slot for each of several articles desired to be purchased and then operate the master lever a single time to obtain delivery of all of the selected articles.

It is another object of the invention to provide such a dispensing machine in which a deposited coin serves as the latching means or key in each compartment through which the operation of the single or master lever is transmitted through to the article delivering means.

It is a further object of this invention to provide a dispensing machine in which means is provided to prevent the insertion of a coin into any compartment which may be empty.

It is also another and most important object of this invention to provide such a dispensing machine in which means is provided to insure that only one article is dispensed from a compartment column upon each master handle operation, while the load of the other articles in a column is lifted above the bottom article so that it may be freely displaced sidewardly to fall downwardly to the delivery outlet.

It is also an object of this invention to provide such a dispensing machine which may deliver two or more articles, one from each of a compartment, responsive to the deposit of a single coin in the coin slot of the compartment.

It is an additional object of this invention to provide a dispensing machine of this class in which coins of different sizes may be deposited successively to interlock the master shaft and a particular line shaft section together.

Other and further objects will be apparent when the specification herein is considered in connection with the drawings in which:

FIG. 1 is a perspective view showing a complete machine embodying the principles of the invention;

FIG. 2 is a sectional plan view through an end compartment and part of an adjacent inner compartment, taken along line 2—2 of FIG. 1;

FIG. 3 is a longitudinal sectional elevation taken along line 3—3 of FIG. 2;

FIG. 4 is a transverse sectional elevation taken along line 4—4 of FIG. 3;

FIG. 5 is a transverse sectional elevation taken along line 5—5 of FIG. 3;

FIG. 6 is a transverse sectional elevation taken along line 6—6 of FIG. 3;

FIG. 7 is a view of the cam wheel shown in FIG. 6 in a subsequent position of coin operation with relation to the pins of the left shaft wheel pins, as best shown in FIGS. 2, 3, and 5;

FIG. 8 is a view of the cam wheel, coin, and lift shaft wheel pins in a subsequent stage of operation following the stage shown in FIG. 7; and

FIG. 9 is a view of the cam wheel, coin, and lift shaft wheel pins at the end of a master lever operation just before the master lever has been released.

Referring in detail to the drawings in which like reference numerals are assigned to like elements in the various views, a dispensing machine housing 10 is shown in FIG. 1 comprising a base 11, front or face panel 12, end panels 13 and top panel 14. The base 11 includes a delivery apron 15 from which delivered articles may be picked up. A master lever or operating handle 16 is also shown with one end rigidly mounted on a master shaft 17, the master lever to be rotated between the upper and lower stop arms of a stop channel 18 mounted on the end panel 13.

As shown in detail in FIGS. 2 and 3, the master lever or handle 16 comprises an angle with the vertically extending leg drilled near one end to fit over the reduced diameter end 19 of the master shaft 17. A retaining collar 20 then fits over the end 19 outwardly of the handle 16 to bear upon the vertical leg of the angle, a pin 21 being provided to pin the collar 20 to the shaft end 19 to complete the assembly of handle 16 and shaft 17.

As shown in FIG. 2, the master shaft 17 extends through the end panel 13, a support channel 22 mounted against a rear panel 23 of the housing 10, and a support angle 27 having a bushing bearing 28 therein in which the shaft 17 is journalled. At the other end of the housing 10 the shaft 17 is supported for rotation and affixed against longitudinal translation by suitable conventional means, not shown.

As shown in FIG. 4 each compartment has a base 29 spaced above a horizontal support plate 11' which is in turn spaced above the housing base 11. The rear end of the base 29 is thus supported above the plate 11' by the support panel 30 with the forward end of the base 29 being connected to the horizontally extending support structure 31 thereabove. The articles 32 to be dispensed are shown with the lowermost to be supported by the compartment base 29, and articles 32 are initially stacked one upon the other to the top of the housing.

In case two articles are to be dispensed for one coin, a compartment may be divided by a partition wall 25 as best shown in FIG. 2, it being pointed out that the distance between the wall 24 and the wall 25 should be the same as the distance between the wall 25 and the wall 26 if the two articles to be dispensed for one coin are assumed to be identical. The mechanism by which the articles are dispensed will be described hereinbelow.

Referring now to FIGS. 1, 2, and 3, coin slots 33 are provided in the front panel 12 and guide channels 34 are provided from each slot through which a coin of predetermined size to operate with the mechanism therebelow is dropped. Such guide slot is cooperatively connected with a coin rejection mechanism 35 of conventional design, as covered in a number of patents to be identified herein.

Thus if a coin of size other than that designed to operate with the mechanism therebelow is dropped in the slot 33, it is rejected by the coin rejector 35 which is mounted on the front panel 12 by machine screws 36 just inwardly of the coin slot 33 and which is also supported by an angle bracket 37 from the end panel 13. For purposes of demonstration the guide channel 34 is designated diagrammatically by spaced apart parallel dotted lines passing downwardly through the coin rejector 35.

The coin falls on a cam 38 which is integrally formed with a cam wheel 39 mounted to rotate freely upon a lift shaft 40 having its end 41 adjacent the end panel 13 journalled for rotation in a channel bracket 42 mounted on the inner wall of the end panel 13. As the coin falls it is in spaced position from a pin 43 which extends from the inner face of a lift wheel 44, such lift wheel having four such pins at equal distance from the lift shaft axis and being equally angularly spaced apart.

Considering FIGS. 2 and 3 in connection with FIGS.

5–10, inclusive, when the master lever **16** is pivoted downwardly, the master shaft **17** pivots to depress the linkage **45** which is rigidly connected to the master shaft **17** by the pin **46**. The linkage **45** is pivotally connected to one end of a linkage **47** by a pin **48**, the other end of the linkage **47** being pivotally connected to the side of the cam wheel **39** on the opposite side thereof from the cam **38**, by means of a pin **49**. Thus when the master lever **16** rotates the shaft **17** to depress the linkage **45**, the linkage **47** pulls on the cam wheel **39** to rotate it clockwise as shown in FIGS. 7 and 8. This brings the coin **50** in contact with the pin **43** in advance thereof and then the two wheels **39** and **44** become locked together to rotate together until the end of master lever travel.

At the end of master lever travel when it contacts the lower leg of the stop channel **18**, the lever **16** is released and an extended spring **51**, connected at one end to the linkage **45** with its other end anchored to the housing, may then contract to its initial length to rotate the cam wheel **39** back to its initial position. When the linkage **45** is pulled upwardly it rotates the master shaft **17** back to initial position and returns the master lever **16** to initial position back in contact with the upper leg of the channel **18**. However, as best seen in FIG. 9, when the coin **50** is positioned as shown on the pin **43**, counterclockwise rotation of the cam wheel **39** and of the cam **38** with relation to the coin **50**, and with relation to the lift shaft wheel **44**, does not cause it to rotate and leaves the coin **50** as shown positioned on the pin **43**.

When the coin **50** and pin **43** arrive at the position shown in FIG. 9, a roller **52**, on the opposite side of the lift shaft wheel **44** from the pin **43**, has arrived at the position shown in FIG. 5, there being four such rollers on the lift shaft wheel **44** equally spaced from the lift shaft axis and equally angularly spaced apart. A latch **53**, pivotally mounted on a pin **55** journalled in a bracket **54** upstanding from the base **11**, has an indentation **56** therein to fit upon a roller **52** to latch the lift shaft **40** against further rotation, a prong **57** also being included to bear upon the roller next adjacent above the latched roller **52**. A spring **58** is connected at one end to a bracket **59** and at the other end to the latch **53** to urge the latch **53** to rotate clockwise, and thus to maintain the wheel **44** latched at the end of each operation.

Referring now to FIGS. 2, 3, and 4, the lift shaft **40** is shown having lifting wheels **60** rigidly mounted thereon at longitudinally spaced apart distances therealong to rotate through slots **61** provided in the compartment base **29**. As many such lifting wheels **60** are provided as may be required to adequately lift the article dispensed from any particular compartment. Each lift wheel has fingered spokes or fingers **62** of equal radial length and shaped as shown extending therefrom, and with the lift shaft **40** in latched position the fingers **62** occupy positions just counter-clockwise of the positions shown in full lines in FIG. 4.

A flap **63** is hingedly connected at **64** to the rear plate **65** of the compartment and in inoperative position the lower edge of the flap **63** rests upon the support panel **30** to enclose the lower articles **32**. When rotation of the lift shaft wheel **44** commences a leading finger **62** is urged against the flap **63** to start forcing it to open and a following finger approaches the forward part of a slot **61**.

As rotation continues the following finger **62** comes into contact with the forward end of the lowermost article of the column of articles in the compartment and starts forcing it rearwardly. At this point the weight of the column of articles stacked above the lowermost article **32**, in position designated by the reference numeral **32'**, is changed from being supported by such lowermost article to being supported by the foot **66** of the following finger **62**, as predetermined by the radius *r* and the verticle height between the support base **29** and the axis of the lift shaft **40**. The article in lowermost position **32'** is then displaced rearwardly until it contacts the flap **63**, and together with the

leading finger it urges the flap **63** further open. The lowermost article can now be slid rearwardly with ease solely by the side thrust of the following finger thereagainst as now the foot **66** of the following finger **62** bears upwardly against the underside of the article immediately above the lowermost article being ejected. Thus the following finger supports the whole column of articles by virtue of this contact and the leading finger **62** moves out of contact with the flap **63**, while the lowermost article **32** urges the flap **63** further open, as shown in dotted lines in FIG. 4. Finally as the following finger rotates past top center and starts downwardly to the right the column of articles descends accordingly until the base **29** supports the column of articles. As an article is ejected it falls down a chute **73** including the finger guard and guide plate **74** and slides out through a delivery opening **75** onto the dispensing apron **13** to be picked up by the purchaser.

When a compartment becomes completely empty a spring **67** which is suitably pivoted at **68**, as to a support wall **24** indicated in FIG. 2 but not shown in FIG. 3, is so weighted that the top portion thereof above the pivot **68** moves clockwise to position a latching prong **69** at the top of the spring **67** to enter into openings **70***a* and **70***b* in the lips forming the opposed side of the coin slot **33**. Thus the coin slot is closed to the insertion of further coins, giving warning that the compartment operated by the particular closed coin slot is empty.

At approximately a point below the division wall **26** between two compartments an angle bracket **71** is mounted to extend upwardly from the base **11** to mount a journal bearing cylinder **72** which extends equally on either side of the vertical leg of the bracket **71**. The ends of adjacent aligned lift shafts **40** are journalled in the opposite sides of such cylinder **72**, and thus there is provided one lift shaft **40** for each compartment. In the event a customer may look at the various types of items and prices thereof in the various compartments, as designated by the plaques **78** and make several selections by dropping the designated coin in several respective slots, while other slots are not selected, only those lift shafts **40** will turn to deliver articles as have their lift shaft wheels locked to the adjacent master lever operated cam wheel by the insertion of the proper coin in the proper coin slot. For this reason, selectivity has been made possible by providing a separate lift shaft **40** for each compartment. Thus, if no coin has been inserted in a particular compartment slot, when the master lever is operated, the cam wheel on the lift shaft will be rotated but the lift shaft itself will not be engaged to rotate therewith.

A conventional coin box **76** is located below each lift shaft wheel **44** of a size to receive the amount of coins required to be deposited to empty the compartment served. Such coin boxes **76** are connected to the base **11** by suitable brackets **77**. A coin **50** falls from position on a pin **43** as shown in FIG. 9 into the coin box **76** therebelow each time the lift shaft wheel **44** is engaged by a next deposited coin to set the lift shaft wheel **44** thereabove in rotation. After a compartment shows that it is emptied the coin box may be removed through an opening **75'** adjacent an article discharge opening **75**.

The invention has a wide multiplicity of usages in vending a wide range of articles which may be sold singly for a single coin, or in multiples for a single coin or which may be sold singly or in multiples for a plurality of coins deposited in manner to fit into the cam carried by the cam wheel. It also has utility where a series of related articles may be naeded in part or in whole to complete a purchase. It has application to the purchase of groceries, cigarettes, mechanical parts, electrical appliances, and the widest variety of types or units, whether there may be needed one or more of each type, or whether the purchaser may have at hand part of related articles, and may desire to select those other articles to complete any specific requirement.

It is obvious that the interlocking of the cam wheel and

the lift shaft wheel can be accomplished by the use of more than one coin dependent upon the shape of the cam **38**. In other words the relationship of the shape of the cam with relation to its spacing from the pin **43** next adjacent thereto can be such that it may require the deposit of two or more coins in a cam of certain configuration to effect cooperative driving connection between the cam and the next adjacent pin **43** in manner to cause the cam wheel to rotate the lift shaft wheel. In this regard, it is pointed out that if such a cam is designed to operate with coins of various sizes, it will be necessary for the depositor to deposit the coins in proper sequence to fit in a respective cam surface designed to receive such variously sized coins. On the other hand, it is obvious that a cam can be designed to operate under this theory by two or more coins of the same size in which case there will be no need for a depositer to know the sequence of coin deposit.

The invention, adapted to be constructed in various ways, as regards the structural combinations to accomplish its functions, is thus not to be limited by the exact combination of structures hereinabove disclosed, but other structures and combinations thereof are included as well as may fall within the broad spirit of the invention and within the broad scope of interpretation claimed for and merited by the appended claim.

What is claimed is:

A dispensing machine including a housing having a housing base and vertically separated compartments having bases spaced above the housing base to support articles to be dispensed, said housing providing delivery means to channelize article delivery to the exterior, a master shaft extending longitudinally through said housing, and a master lever connected thereto externally of said housing to be manipulated to rotate said master shaft a predetermined angular distance upon each operation thereof, a plurality of aligned, separately rotatable lift shafts disposed in said housing parallel to said master shaft, each lift shaft having a first wheel affixed thereto with pins extending therefrom on one side and rollers mounted on the opposite side, said pins and said rollers being of the same

number and said rollers and said pins being equally radially spaced from said shaft axis and being equally angularly spaced apart upon said first wheel, a latch prong pivotally mounted adjacent each first wheel, and means normally yieldably urging each latch prong into contact with two successive rollers of each first wheel when in latched position, a second wheel with a cam thereon mounted to rotate upon said lift shaft with said cam facing said pins, a coin slot in each compartment through which a coin may be dropped upon said cam, a coin box for each compartment, lever means connecting said second wheel and said master shaft and operated thereby to rotate said second wheel and cam to position said coin against a pin and to rotate said first and second wheels thereafter to position said coin and the pin in contact therewith whereby at the beginning of a succeeding first wheel rotation said coin falls in said coin box, lifting means on said lift shaft including a plurality of fingers equally radially extending from the lift shaft axis and equally angularly spaced apart, with a tangential foot outermost, whereby, upon each first wheel rotation, the foot of a finger moving through a slot provided in said compartment base supports a respective next-to-lowermost article of a column of articles in a compartment and sidewardly contacts a respective lowermost article first to move it in the direction of wheel rotation into position to fall downwardly through said delivery means while meantime said next to lowermost article becomes lowermost.

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