Jan. 9, 1923. 1,441,438.

G. F. LEONHARDT.

VENDING MACHINE.

FILED NOV. 30, 1920.

3 SHEETS—SHEET 1.

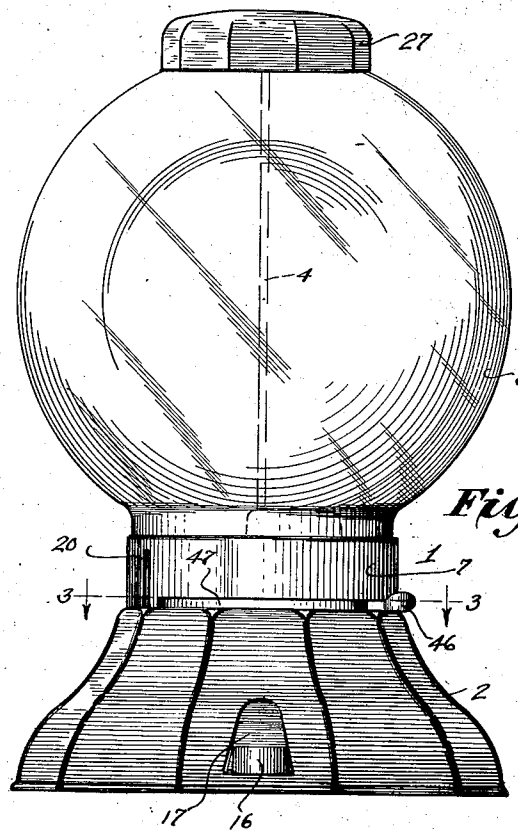


Fig 1.

Fig 6.

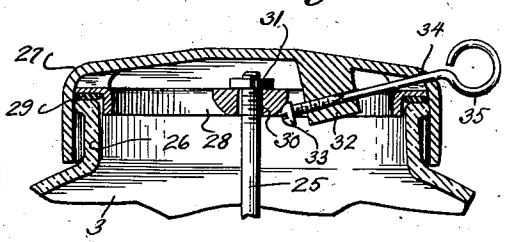
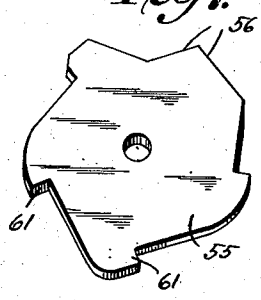


Fig 7.



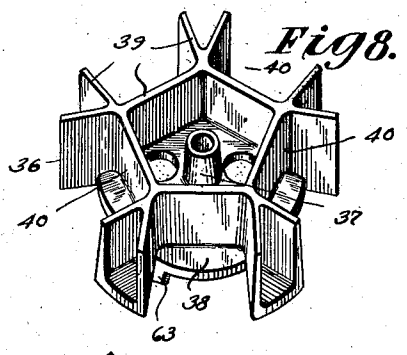


Fig 8.

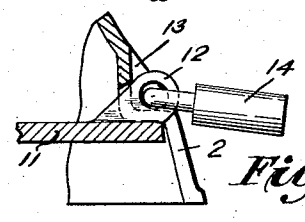


Fig 10.

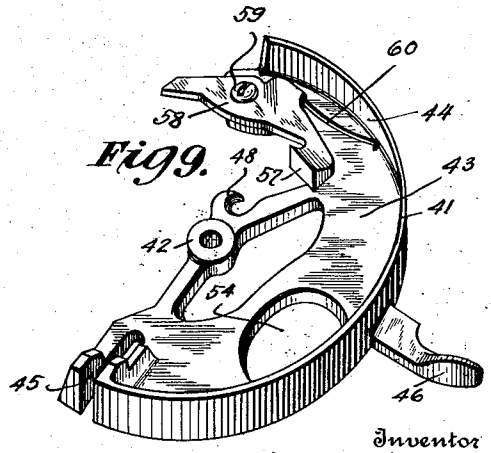


Fig 9.

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3 SHEETS—SHEET 2.

Fig3.

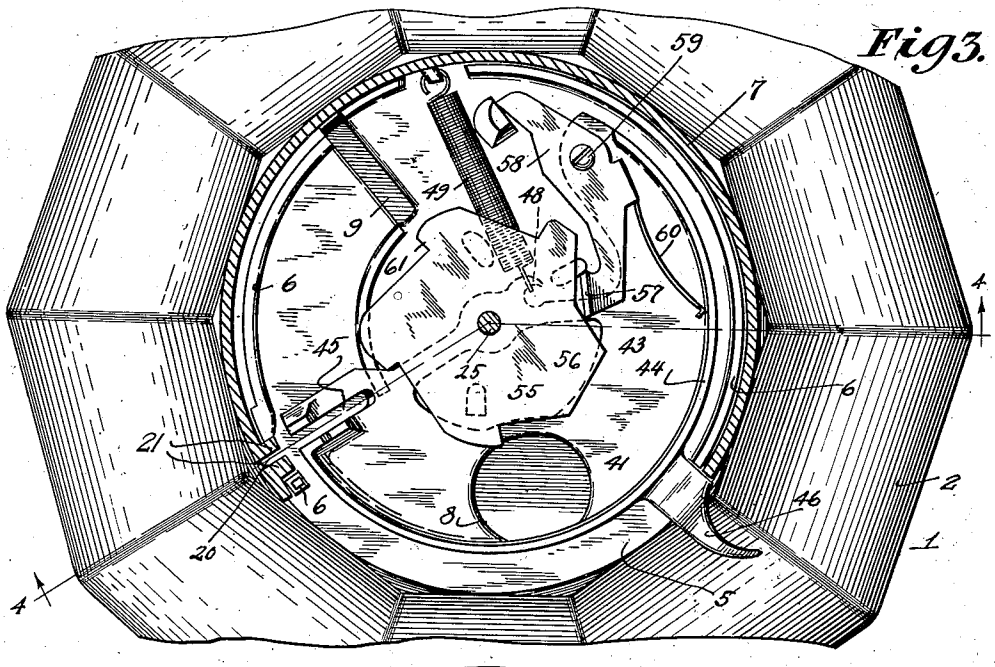
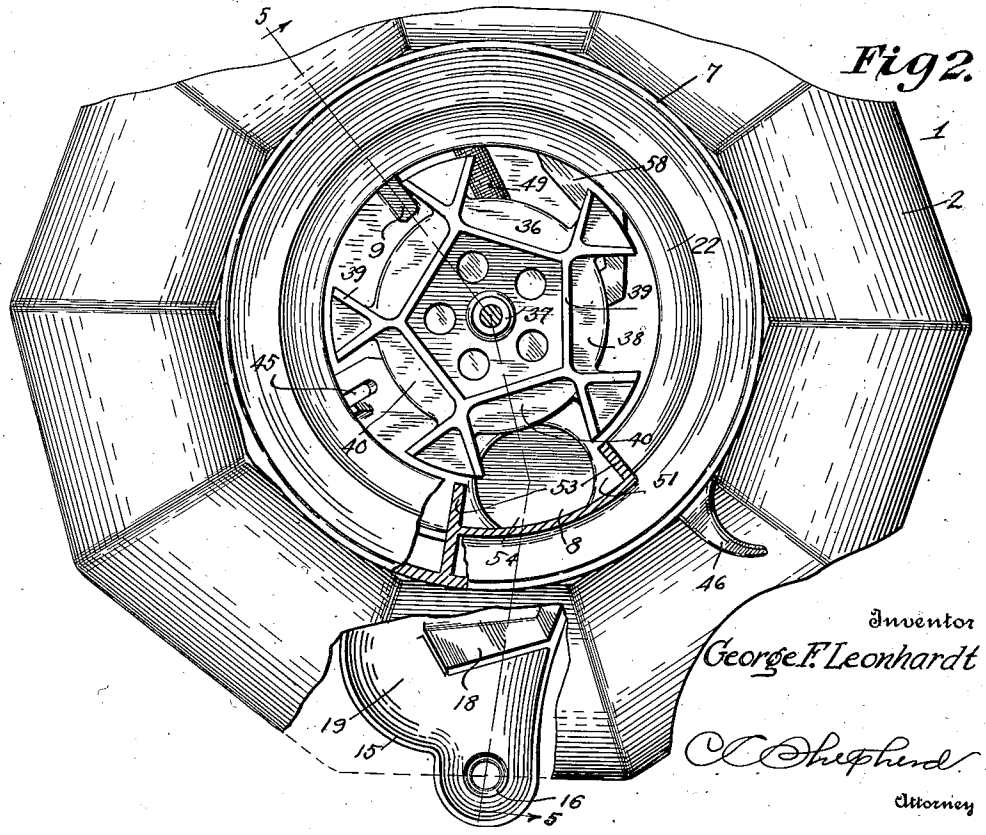


Fig2.



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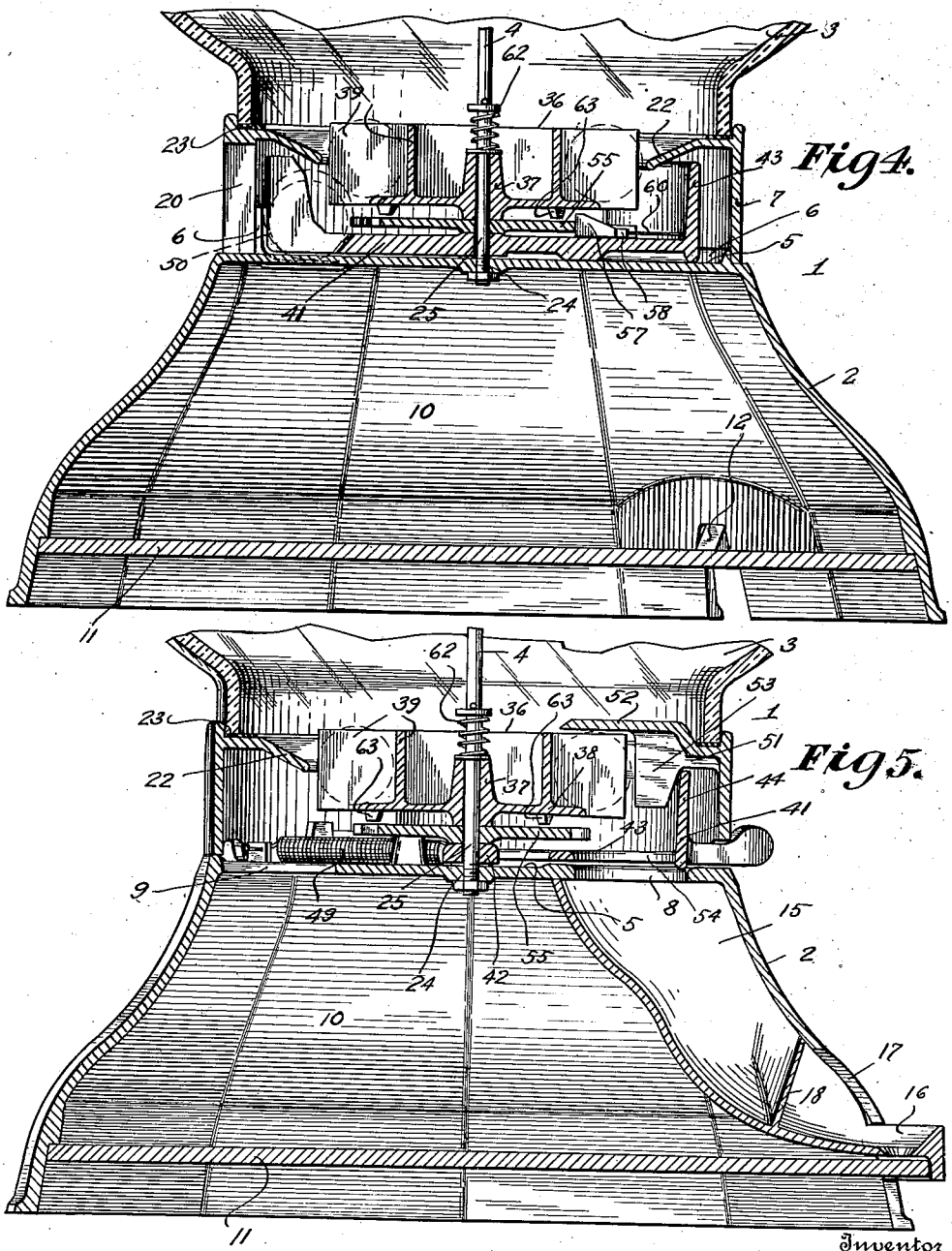


Fig 4.

Fig 5.

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Patented Jan. 9, 1923. 1,441,438

UNITED STATES PATENT OFFICE.

GEORGE F. LEONHARDT, OF COLUMBUS, OHIO, ASSIGNOR TO ROBERT D. SIMPSON, OF COLUMBUS, OHIO.

VENDING MACHINE.

Application filed November 30, 1920. Serial No. 427,383.

To all whom it may concern:

Be it known that GEORGE F. LEONHARDT, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, has invented certain new and useful Improvements in Vending Machines, of which the following is a specification.

This invention relates particularly to improvements in vending machines, and has particular reference to machines of this character of the coin operated variety, the invention having for its primary object the provision of mechanism whereby through the use of but a single slot the machine will be capable of responding to coins of various denominations in order to deliver commodities or other merchandise in accordance with the purchasing power of the particular coin employed in a given operation for effecting the actuation of the machine.

It is desirable in the operation of various types of vending machines that mechanism be provided therein which will enable the machines to deliver a quantity of confection or other merchandise in accordance with the denomination of the coin inserted in the machine. Heretofore, most of the practical machines now to be found in common use, are so constructed that the same will receive only one denomination of coin, with the result that in order to secure a considerable amount of such merchandise, it has been necessary to repeatedly or successively insert after each independent operation of the machine, a number of coins of the required denomination necessary to effect the operation of the machine. This inconvenience and slowness in operation and other objectionable features, are overcome by the present invention, wherein the machine is provided with mechanism of novel, simple and improved construction whereby merchandise will be capable of being delivered in proportional quantity to the denomination and purchasing power of the coin employed.

With these and other objects in view, as will appear as the description proceeds, the invention accordingly consists in the novel features of construction, combinations of elements and arrangements of parts, hereinafter to be fully described and pointed out in the claims hereunto appended.

In the accompanying drawings, forming a part of this specification, and in which similar characters of reference denote like and corresponding parts throughout the several views thereof:

Figure 1 is a side elevation of the improved vending machine comprising the present invention.

Figure 2 is a top plan view of the base of the vending machine, the merchandise holder being omitted for the purpose of disclosing underlying parts.

Figure 3 is a horizontal sectional view taken on the plane disclosed by the line 3—3 of Figure 1.

Figure 4 is a vertical sectional view taken on the plane disclosed by the line 4—4 of Figure 3.

Figure 5 is a similar view taken along the line 5—5 of Figure 2.

Figure 6 is a detail sectional view disclosing the lock for uniting the merchandise holder with the base structure.

Figure 7 is a detail perspective view of the ratchet plate.

Figure 8 is a detail perspective view of the carrier member.

Figure 9 is a perspective view of the actuating member, and

Figure 10 is a detail sectional view disclosing the lock for the coin compartment.

Referring more particularly to the details of the invention and to the specific form of the latter disclosed in the drawings, the numeral 1 designates the vending machine in its entirety. Essentially, the machine includes a metallic base 2 of any suitable dimension and ornamental configuration, and upon which is mounted, in this instance, a merchandise container 3, which in this instance is in the form of a glass globe or bowl, in order that its contents may be readily viewed from an exterior standpoint, and a vertical connection 4 is arranged to pass axially and vertically between the base 2 and the container 3 in order that the latter elements may be readily secured in assembled relationship.

The base 2 is preferably of hollow construction and includes a flat upper surface 5, which constitutes a table, the latter being provided, adjacent to its periphery with arcuate upstanding ribs 6 which act as guides for the reception of the lower edges of a collar 7, the latter being arranged to seat upon the outer peripheral edges of the table 5 and to be positioned between said base and the merchandise container 3, the

provision of the ribs 6 enabling the collar 7 to be concentrically positioned upon said table with respect to the vertical axis of the machine. Also formed in the table 5 is a merchandise discharging opening 8 and a coin discharge slot 9, the latter opening into the hollow base of the machine which provides an internal coin compartment 10. This compartment is normally closed by means of a removable plate 11, which constitutes the bottom of the compartment, and as shown in Figure 10, the said plate 11 may be held in active position by being provided with an integral ear 12, which is suitably apertured and adapted to be aligned within the ears 13 provided upon the outer portion of the base 2, a padlock 14 being disposed so that its shackle may enter the apertures in the ears 12 and 13 to hold the plate 11 in its active position. Upon removal of said padlock, the compartment 10 is rendered accessible. Also, the interior of the compartment 10 is provided with a merchandise trough 15, which is situated in registration with the opening 8 so that merchandise dropped through said opening may pass downwardly by gravity through the trough and will be delivered to the pan 16 provided at the lower end of said trough, from which the merchandise may be removed from the machine. It will be observed that the pan 16 extends through an opening 17 provided in the base 2, and this opening is normally guarded by means of a baffle wall 18, which in this instance is formed integrally with the trough 15 and is so disposed that the same will resist surreptitious attempts to operate the machine by inserting an instrument into the discharge opening of the machine. It will be observed that the trough 15 is flared or increased in size at the point 19, so that the merchandise may readily pass around the wall 18 when being delivered to the pan 16.

The collar 7 is mounted vertically upon the table 5 and is provided with a coin receiving slot 20; this slot is provided with enlarged, spaced and radially projecting side walls 21, the latter in this instance being disposed so that the lower edges thereof will be confined between a pair of the ribs 6, whereby axial rotation on the part of the collar will be precluded. Also, the upper edge of the collar is provided with an inwardly projecting annular flange 22, upon which is seated a gasket 23, the latter being adapted to receive the lower edges of the merchandise container 3. It will be observed that the wall of the collar 7 is extended above the plane of the flange 22, so that undue lateral movement on the part of the merchandise container will be avoided.

To securely hold the collar 7 and the container 3 in secured relationship with the base 2, the table 5 is provided with an axially located threaded bore 24, which receives the threaded lower end of a securing stem 25, which passes axially and vertically through the machine 1 and which constitutes the main element of the connection 4. The upper end of the bowl or container 3 terminates in a reduced mouth portion 26, around which is concentrically positioned an ornamental cap 27. This cap cooperates with a fixed internal spider 28, between which and the upper end of the mouth portion 26 is interposed a gasket 29, said spider being provided with a centrally disposed opening 30, which receives the upper threaded end of the stem 25. In operation, the gasket 29 is properly positioned together with the spider 28 upon the upper portion of the merchandise container 3, and the stem 25 has its lower end properly fastened to the table 5. Obviously, by tightening the nut 31 provided upon the upper end of said stem, binding pressure may be created between the spider and the base 2, which will be sufficient to prevent relative separation between the base 2, the container 3 and the collar 7. Then, to prevent the nut 31 from being surreptitiously acted, the cap 27 is provided, which is adapted to cover the spider 28 and the open upper end of the container 3. As shown in Figure 6, the cap 27 is provided internally with a lug 32, which is provided with a threaded bore having adjustably mounted therein a headed screw 33. Also, the cap is provided with an opening 34 situated in alignment with the bore in the lug 32. By inserting a wire tool 35 in the opening 34, the inner end of said tool will be caused to engage with one end of a screw 33, so that the latter may be rotated. Then, by rotating the screw in a predetermined direction, the head thereof may be brought into firm frictional engagement with the under side of the hook of the spider 28 with sufficient pressure to enable the cap 27 to be securely held in its operative position. After the adjustment of the screw 33 has been effected, the tool 35 is removed, so that the cap can not be displaced by unauthorized persons.

Rotatably mounted about the lower end of the stem 25 and in communication with the open lower end of the container 3, is a rotatable carrier 36, which is formed to include a hub 37, and a base 38, from which project upstanding walls 39, said walls being so distributed that the outer portions of the carrier will comprise a plurality of merchandise receiving pockets 40, into which merchandise is permitted to drop in specified amounts by gravity from the container 3, and since the pockets 40 are in open communication with said container, it follows that the pockets 40 will be constantly filled with merchandise so long as the container 3 is properly supplied with the materials to

be vended. Of course, the character of the merchandise handled by the machine may widely vary, but in this specific instance, the machine is adapted to distribute spherical confections in the nature of candy coated chewing gum balls, the latter being of uniform diameter and by reason of such uniform size are admirably adapted for vending machine purposes. It will be observed that the flange 22 is so disposed that the inner edge of the same will be situated substantially intermediately of the height of the pockets 40, and hence said flange will serve to retain the merchandise within the pockets 40, and to prevent accidental displacement thereof, the diameter of the carrier being such that the same may freely rotate within the fixed flange 22.

In order to remove the merchandise from the pockets 40 and to deliver the same in predetermined quantities to the pan 16, use is made of an actuating member 41. This member is shown in detail in Figure 9, and consists of a centrally disposed hub 42, which is arranged to be received by and to rotate axially about the lower end of the stem 25. In addition, the member 41 includes a horizontally disposed web 43 and an upstanding peripheral wall 44, the latter being formed at one end with a coin receiving slot 45, which is capable of registering with the slot 20 provided in the collar 7. Also, projecting outwardly and radially from the wall 44 is a finger hook 46, which is adapted to operate within an arcuate slot 47 provided in the collar 7. Normally, the slot 45 is maintained in registration with the slot 20 by providing the web 43 with a hook 48 with which is connected one end of a coiled spring 49, the other end of said spring being connected with a fixed part of the base 2. Thus, since the spring is connected with the actuating member concentrically of the axis of rotation of the latter, it follows that said member will be normally rotated under the influence of the spring 49 until its rotation is limited by the engagement of the hook 46 with one of the end walls of the slot 47, and when this engagement occurs, the slots 20 and 47 will be automatically aligned for registration. Then, to operate the machine so as to effect the discharge of the contents of but one of the pockets 40, a coin of small denomination, say for example a one cent piece, is inserted through the slot 20 so that the same will be received within the longer or broader slot 45, substantially after the manner disclosed by the dotted lines 50, shown in Figure 4. When the coin has been thus positioned, the hook 46 is manually grasped and is drawn toward the other end of the arcuate slot 47, thereby turning the actuating member 41 about its axis 25. It will be apparent that when the penny 50 is positioned in the manner described, the upper edge thereof will engage one of the lower edges of a wall forming a part of one of the pockets 40, thereby establishing a mechanical connection between the actuating member 41 and the carrier 36, causing said carrier to move or rotate in unison with the actuating member. When the hook 46 reaches the opposite end of the slot 47, the coin slot 45 will register with the slot 9 provided in the table 5, so that when the hook is released, the coin will gravitate through the slot 9 and into the compartment 10, thus permitting the actuating member to rotate to its initial starting position under the influence of the spring 49, with the coin discharged therefrom and hence without disturbing the position of the carrier 36, which becomes disconnected from the actuating member when the coin is released.

It will be observed upon reference to Figures 2 and 5, that the collar 7 is provided with an integral housing member 51, which includes an upper horizontal wall 52 so disposed and proportioned that the same will project over the pocket 40 positioned thereunder, and said housing member is also provided with depending integral side walls 53, spaced apart a distance substantially equalling the width of any one of the pockets 40. The construction and position of the housing member 51 is such that when the carrier is rotated in unison with the actuating member, a filled pocket of the carrier will be moved so that the same will be positioned in registration with the housing 51, and this registration may be timed by the length of the slot 47 and the position of the discharge slot 9. The web 43 of the actuating member is provided with a discharge opening 54, which is normally positioned, as shown in Figure 2, so as to lie in registration with the housing 51; hence, it will be apparent that when the actuating member is rotated by having a coin placed therein, the opening 54 will be moved out of registration with said housing, thus allowing merchandise, positioned within said housing by the rotation of the carrier, to be supported upon the web 43, while the actuating member is moved toward its coin discharging position. After the coin has been discharged and the actuating member permitted to return to its normal position by the influence of the spring 49, it will be obvious that the opening 54 will again be brought into registration with the housing 51, thus allowing the merchandise within said housing to drop through the discharge opening 8 formed in the table 5, since the openings 8 and 54 are so positioned that the same will coincide when the actuating member assumes its normal position. From this construction, the operation is such that the coin must first be discharged into the compartment 10 before the mer-

chandise will be delivered to the outlet trough 15, a feature of construction which insures the delivery of the coin before the final delivery of the purchased commodity. It will be observed that the peripheral wall 44 of the actuating member is so disposed as to cover the arcuate slot 47 irrespective of the positions the actuating member may assume, a feature which precludes "picking" of the actuating mechanism of the machine.

Another important feature to be found in the present invention resides in the construction whereby a graduated or proportional quantity of merchandise may be delivered in accordance with the denomination of coin inserted into the machine, the construction of the machine allowing a plurality of coins to be used to effect its actuation and to permit of the delivery of commodities in accordance with the value of the coin used. This is primarily accomplished by providing the machine with a ratchet plate 55, which is located between the carrier and the actuating member 41. This ratchet plate is carried by the stem 25 and has its periphery formed with reversely beveled surfaces 56, which are normally disposed so as to engage with the shoe end 57 of a pivoted pawl 58, which is carried about a vertically disposed screw 59 connected with the web 43 of the actuating member 41, the construction being such that the pawl 58 will lie upon the upper surface of the web 43 and will rotate in unison, therefore, with the actuating member 41. In this instance, the shoe end 57 of the pawl is maintained in engagement with the surfaces 56 by means of a leaf spring or its equivalent 60. Also, the periphery of the ratchet plate 55 is provided with four ratchet teeth 61 which are normally disposed so as to be out of engagement with the pawl 58. Undue rotation on the part of the carrier 36 and the ratchet plate is prevented by providing the stem with a coiled spring 62, which presses upon the hub of the carrier and the plate 55 with sufficient pressure to prevent undue rotation on the part of said plate and carrier.

Upon reference to Figure 4, it will be observed that the ratchet plate is of such diameter that when a one cent piece is inserted into the slot 45, the periphery of the coin will be spaced from the periphery of the ratchet plate 55; hence it follows that when the actuating member is oscillated with a one cent piece positioned therein, no motion will be imparted to the ratchet plate. In this connection, attention is also invited to the construction of the reversely disposed surfaces 56, which are so formed as to permit the pawl 58 to pivotally engage the same without turning or disturbing the fixed position of the ratchet plate. Thus, if the actuating member is merely idly actuated, no motion will be imparted to the carrier on account of the lack of a mechanical connection between the actuating member and carrier, and also, the ratchet plate will be retained against rotation by the lack of connection afforded by a coin between the actuating member and ratchet plate and also by virtue of the reversely disposed surfaces 56. However, when a coin of larger denomination, such for example as the common nickel, is inserted within the slot 45, the larger size of the coin will enable the same to engage with the periphery of the ratchet plate 55, as well as with the lower corner of one of the carrier walls 39. This engagement between the periphery of the ratchet plate and the coin is positively secured by the provision of the rib 6, which serves to distinctly define the space in which the coin will travel; thus, by the provision of the inner wall of the rib, the rotation of both the ratchet plate and the carrier is effected. When the carrier member reaches its extreme of movement the larger coin is discharged into the compartment 10 in the usual manner; also, the carrier itself is operated by a given operation of the actuating member to discharge the contents of one of its pockets. When a larger coin, or a coin of greater value has been inserted in the machine, it is necessary that the commodities discharged from the machine shall be in proportion to the value of the coin. This delivery is accomplished by the rotation of the ratchet plate with the larger coin. This rotation of said plate results in moving the reversely disposed surfaces 56 out of engagement with the pawl 58, so that when the hook returns to its initial position, the said plate will be so located as to permit of registration between the pawl 58 and the ratchet teeth 61. It then follows that by successive operations of the hook and actuating member, the pawl will have its shoe end brought into engagement with the ratchet teeth 61 and with spaced projections 63 formed upon the under surface of the carrier base 38, said projections being so positioned as to register with the shoulders of the teeth 61, whereby the pawl may simultaneously engage with the teeth 61 and the projections 63 so as to rotate the carrier and the ratchet plate together. It will be manifest that when the surfaces 56 again register with the pawl 58, further rotative movement on the part of the carrier and plate will be precluded or until another coin is inserted in the machine.

From the foregoing description, taken in conjunction with the accompanying drawings, it will be apparent that the present invention provides a vending machine wherein the objects of the invention and all of the advantageous features of construction above pointed out are, among others, present. The machine embodies a simple organization of working parts, which are

strong and substantial in construction and are not likely to become out of order or to occasion repair or attention. Minute adjustments are eliminated throughout the machine and attention has been particularly given to the design of each part so that strength and durability will be provided for the purpose of enabling the machine to withstand the relative rough usage of practical service. By its construction the machine is enabled not only to efficiently handle coins of but a single denomination, but is capable of handling coins of multiple denominations and to deliver commodities in accordance with the value of each coin used; moreover, common actuating devices are provided for the coins of various denominations and hence simplicity in the construction and design of the machine is preserved and complication eliminated. It will be understood that when a one cent piece is inserted in the machine, the hook 46 is given a complete turn to effect the operation of the machine the full length and back of the slot 47, and when a five cent piece is employed the hook is given five successive oscillations to deliver commodities in accordance with the value of the coin. It will also be observed that by the provision of the reversely inclined surfaces 56, the pawl 58 will be prevented from engaging with the projection 63 of the carrier, since the surfaces 56 are of such form that said pawl will be pivotally moved to clear the projections when the plate 55 occupies its normal position. It is believed from the foregoing that the operation, construction and advantages of the machine will be readily apparent to those versed in the art, and therefore a more extended explanation has been accordingly omitted.

What is claimed is:

1. In a vending machine, a base, a merchandise container mounted upon said base, a carrier disposed in communication with the discharge end of said container, an actuating member for moving said carrier to a discharging position, said member including a coin socket situated when the coin is inserted therein to cause said coin to register with said actuating member, whereby upon the rotation of said member, said carrier will be moved in unison therewith, a ratchet plate cooperative with said carrier and actuating member, said ratchet plate being disposed so that the coins of small size will be out of engagement therewith, and coins of larger size will be disposed to be capable of simultaneously engaging with said carrier and plate to effect the rotation of the latter in unison with said member, and means automatically operative subsequent to the rotation of said plate to permit said carrier to be successively rotated a predetermined distance by said actuating member.

2. In a vending machine, a base, a container supported in conjunction with said base, a carrier rotatably supported from said base and disposed to receive commodities discharged from said container, means for moving said carrier to discharge the contents thereof, including a pivotally mounted actuating member having a coin socket formed therein, said socket being disposed to receive coins of varying size and to enable a coin-positioned therein to register with said carrier in order that the latter may be rotated in unison with said member, a housing operative upon predetermined rotation of said carrier to receive successively the commodities of the latter, said actuating member being provided with a discharge opening capable when said member assumes a normal position of registering with said housing and with the discharge outlet of said machine, whereby the commodities positioned within said housing may be released therefrom, a spring operative to return said member to its normal position, a ratchet plate having a plurality of ratchet teeth provided in its periphery and with an idle surface, a spring pressed detent pivotally carried by said actuating member and normally disposed in engagement with the idle surface of said plate, said plate being formed so that when a coin of predetermined size is positioned within said socket, said coin will engage with said plate to cause the latter to rotate in unison with said carrier and whereby the ratchet teeth of said plate will be caused to register with said detent to permit the ratchet plate to be rotated by successive operations of the actuating member and projections depending from said carrier and capable of engaging with said detent when the latter engages with said ratchet teeth.

In testimony whereof I affix my signature.

GEORGE F. LEONHARDT.