Figure 3

Figure 4

Figure 5

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This invention relates to coin controlled vending machines, and particularly to machines for vending small spherical articles, such as balls or marbles of gum, confections, or any other materials, or other small articles like nuts, etc.

The object of the invention is to provide an improved machine of this kind which is capable of being controlled by a plurality of coins of different denominations in a manner to eject a single ball or load of small articles for the value of each cent in the coin inserted into the machine.

A further object of the invention is to provide means for insuring, at each operation, the delivery or ejectment of the proper number of balls or loads corresponding to the value of the inserted coin.

A further object of the invention is to provide a machine of this kind in which the balls are ejected by a stroke or movement of the operating device in one direction, the machine being so arranged that upon any motion of the operating device in the retracting direction further ejectment of balls is prevented until another coin is inserted into the machine.

A further object of the invention is to safeguard the machine against improper manipulation by tilting it or turning it to an unnatural position, so as to prevent unauthorized persons from thereby obtaining balls from the machine without the insertion of the proper coin.

A further object of the invention is to provide a machine of this kind which cannot be tampered with by interlopers and which returns to the operator slugs or tokens inserted as a substitute for lawful coins.

A further object of the invention is to provide a machine of this kind in which the balls may be held in a large transparent reservoir likely to attract custom and are agitated by operation of the mechanism in a manner to insure continuous feed or supply of balls to the ejecting mechanism, so long as any are in the machine.
tacle closed and prevents it from being re-

moved from the pedestal except by an au-
thorized person.

The lower portion of the pedestal serves

as a reservoir to receive the coins intro-
duced into the device, after utilization of said coins
to actuate the control devices. Its bottom opening is closed by a door or cover 14 pro-
vided at one side with one or several tongues

15, two being shown, adapted to enter open-
ings in the wall of the casing. At its oppo-
site side the cover 14 is slotted radially to
receive a vertical rib 16 on the inner wall
of the casing. Said rib is provided with

18 an opening 17 to receive the hasp of a lock

18, in addition to which the cover may be
attached as at 19 to provide a lock cavity 20.

The wall 8 at the upper end of the casing
is of peculiar shape, being inclined from

front to rear, as shown in Fig. 2, and having
its rear portion cut away to form a circum-
ferentially extending opening or gate 21, as
shown in Fig. 3, thereby exposing through
said opening the ball transfer device 22.

25 Opening 21 is slightly wider, in a radial
direction, than the diameter of the largest
ball to be delivered. Consequently the balls
in the reservoir 3 always tend to roll from

the wall into and through the opening or
gate 21 and down upon or into the ball
transfer device. This latter device is pro-
vided with a central hub 23 rotateable mount-

ed upon a stub shaft 24 screwed into a cross
wall 25 attached by screws 26 to lugs or

brackets on the casing. As shown, the lower
portion of the central hub member 23 sur-
rounds a reduced portion of a circular rack
controlling member 27, hereinafter to be re-
ferred to. These parts, to wit, the ball

20 transfer device and the controlling member

27 might be integral with each other, but

for ease of construction and for purposes of
illustration have been shown as separate members connected by the pin 31, so as to

rotate together. The outer wall of member

23 extends upwardly and then outwardly
and has a horizontal flange 38 provided in its
periphery with a series of circumferentially

spaced recesses or pockets 29, five being

shown, and which recesses have curved ver-
tical walls 30, as shown in Fig. 2. Each

recess is large enough to receive a single ball

where large balls are to be discharged in-
dividually or a single load of smaller ar-

55 ticles like nuts, and the walls 30 prevent
the balls or other articles from escaping lat-
erally from said recesses after entering the
same, except as hereinafter noted.

Figs. 3, 4 and 5 all show the parts in

position ready to receive a coin. Upon the

insertion of a coin into the machine the op-

erating handle is manipulated to cause ro-
tation of the ball transfer device 22 in the
direction indicated by the arrow A, Fig. 3,

thereby causing the pockets or recesses 29 to

pass in turn beneath the opening or gate 21

65 in wall 8, each receiving its own ball or load. To insure the filling of all pockets and pre-
vent the balls from arching or jamming in
the reservoir, which might otherwise occur,

suitable means is preferably provided for

agitating the balls. For this purpose the

transfer device 22 is provided with one or

a plurality of upwardly projecting pins 32,
(one being shown) extending up sufficiently

far to engage and move the balls. Wall 8

is also provided with a narrow slot 33 to per-
mit said pins to pass under the rear portion
of the same when the member 22 is rotated.

Suitable means is also provided for pre-
venting the balls or loads from escaping

radially from pockets 29 until they in turn
reach the discharge opening or outlet. This

means comprises a depending annular flange

or wall 34 of the casing, which lies closely

adjacent the periphery of member 22 and

which may extend down to a plate 35, as

shown.

While being moved around with the mem-

ber 22 the balls rest and roll upon the hori-

zontal plate or floor 35 suitably attached to

the casing. Beyond the far end of the opening

21 in the wall 8 floor 35 is provided with a recess 36 forming an outlet leading into a

trough or channel 37, which slants downwardly toward the front portion of the

80 casing and leads to a door or opening 38

therein. On the outside of the casing, in front of said opening, is a ball receiver or
cup 39 having its front wall 40 extending

upwardly to form a positive stop for the
balls, and having its side walls cut downwardly, as at 41, to enable the thumb and

finger to readily grasp the opposite sides
of the ball and lift it from the cup. If a

105 nickel has been inserted in the machine the

operating handle is caused to rotate

member 22 to rotate far enough to discharge five balls into the

trough 37. The outer one only of said

balls is exposed at the cup, the remaining

balls being piled upon the first in a column,

so that the operator removes them one by one.

The rotating mechanism for the ball trans-

fer device 22 is a horizontal shaft 42 jour-
nelled in suitable bearings in the wall 25 and

provided with a bevel gear 43 meshing with

a bevel gear 44 on the bottom of member

27. This shaft 43 extends to the outside

of the casing where it is provided with an op-
erating handle 45. Rotation of said handle in

120 the clockwise direction, Fig. 1, advances

member 22 to discharge a ball or balls, while
rotation of said handle in the opposite or re-
tracting direction restores the apparatus to

condition for another operation.

The coin for releasing the controlling ap-

paratus is inserted into a round opening 46

at the front of the casing. It rolls down

over the end of an inclined magnet 47 whose

lower end is above the outer end of the chan-
Consequently a slug of steel, iron or other magnetic material will cling to and roll down the magnet and be discharged into the cup 39. A proper coin, whether it be a penny or a nickel, drops vertically through a channel to a recess or seat 48 in a coin carrying disc 49 fixed to rotate with the shaft 42. Fig. 1 shows a coin in this position upon the shaft 42, is located a stationary pawl shaft 50 parallel with the shaft 42 and secured in suitable brackets or lugs 51 on the wall 25. On said shaft is rotatably mounted the hub of a value controlling or governing member 52 provided with one arm having a forwardly projecting tongue 53 lying opposite the periphery of the disc 49, and a second arm 54 having a lateral extension 55 (Fig. 5) lying above the periphery of the circular controlling rack 27. This arm 54 also lies directly beneath a gravity pawl 56 mounted to swing loosely in a vertical plane upon a post 57 carried by the wall 25. The toe portion 58 of said pawl also lies over the circular controlling rack 27 and extends inwardly beyond the teeth of the rack 55 to co-operate with the teeth of said rack, as will more fully appear. The hub of the value controlling member 52 is also provided with a depending third arm 59 passing through an opening in the wall 25 and lying opposite or in the plane of rotation of a co-operating arm 60 on the shaft 42.

Member 60 is not keyed to rotate continuously with its shaft 42 but is connected thereto by a suitable friction clutch or device. As shown, the arm 60 has a sleeve portion 61 rotatable on shaft 42 and pressed endwise against the hub of the disc 49 by a light pressure spring 62 surrounding the shaft 42 and lying between sleeve 61 and a cross pin 63 on the shaft 42, as shown in Fig. 2. The spring therefore rotates with the shaft, at times carrying with it the arm 60, as will appear.

A similar pressure spring 64 surrounds the shaft 50 and is located between one of the lugs 51 and the end of sleeve 52 so as to tend to hold the value controlling member stationary in whatever position it may be and prevent it from moving except by force sufficient to overcome the friction of said spring. Preferably one end of said spring abuts a washer 64a having a tongue 64b entering an opening in the casing to prevent it from turning. This arrangement prevents any tendency to twist the coil which might thereby produce a reacting effect upon the member 52 and turn it slightly backward after a coin passes its arm 53 and thereby affect its otherwise accurate setting.

The circular controlling rack 27 has a plain outer peripheral portion 65 on which the portion 55 of the value controlling member can ride, and adjacent thereto a circular governing portion 66 for cooperation with the toe 58 of the gravity pawl 56. This circular portion 66 comprises a blank or plain portion 67 at one level, and which for example may be the same level as that of the peripheral portion 65, a short toothed portion 68 located at a slightly higher level, whose angular value in the circle is equal to substantially the width of a single pocket 29, a longer toothed portion 69, located at a still higher level and whose angular value in the circle is equal to the width of four of the pockets 29, and finally a stop 70 which extends up beyond the higher teeth 69.

Figs. 1 and 8 show the parts in the position just after inserting a coin $a$, which has dropped to its position in its seat 48 in the disc 49. The tongue 53 of the value controlling member is in contact with the periphery of said disc and the arm 54 of said member either rides upon or is closely adjacent the plain peripheral portion 65 of the circular rack member. Pawl 56 rests upon arm 54 and its extreme end is below the level of the lower set of teeth 68. The operating handle 45 is turned in a clockwise direction, Fig. 1, thereby rotating the circular rack in a counter-clockwise direction, Fig. 5. The rotation of said shaft also carries with it in a clockwise direction, Fig. 6, the arm 60, moving said arm away from the arm 59 until it strikes the abutment 71 at the end of the opening or slot in the plate 25 through which said arm projects. During further rotation of the shaft in the clockwise direction arm 60 remains stationary. Rotation of said shaft also carries the coin in the disc 49 past the tongue 53 of the value controlling member. The cavity or seat 48 in the disc 49 is shallower or of less depth than the diameter of the smallest coin intended to be used with the machine. In the particular machine shown, adapted for use with pennies and nickels, this seat is shallower than the diameter of the penny, which therefore projects slightly beyond the periphery of the disc 49. As said penny moves past the tongue 53, it pushes said tongue out of the way, turning the member 52 in a clock-wise direction, Figs. 6, 7, and 8, and setting said member in a position corresponding to the coin, and in which position it is held by the spring 64. If a penny is in the seat said member will be turned just far enough to raise the end of the pawl 56 slightly above the upper ends of the teeth of the lower rack section 68. Consequently the shaft 42 can be rotated until the vertical shoulder 72 between the teeth 68 and 69 abuts the end of the pawl, as shown in Fig. 7, thereby preventing any further motion of the operating handle in the clockwise direction. When this position is reached the ball transfer device 22 has rotated just far enough to bring the first one of the pockets 29 over the outlet 36 to 130.
the discharge chute 37, and a single ball is therefore ejected from the machine into the cup 39. The mechanism cannot be turned further in the ejecting direction until it has been rotated fully back to its initial position and another coin inserted in the coin receiving disc.

If a nickel is inserted into the disc, said nickel in passing the value controlling member 52 turns and sets the same sufficiently to raise the end of the pawl 56 slightly above the upper end of the teeth 69. Consequently the operating handle can be turned a full stroke in the clockwise direction until the stop 70 abuts the pawl, as shown in Fig. 6. This motion brings each one of the five pockets in member 22 in order over the exit 36, so that five balls in order are discharged into said pocket. A portion of the wall 8, indicated at 73, Fig. 3, lies over the exit 36 and prevents any balls from leaving the reservoir except as they may be conveyed to the exit by the pockets 29.

After the coins pass the member 52 they drop from the disc to the bottom of the casing, as will be readily understood.

Let us now assume the parts in either of the positions shown in Figs. 6 and 7, that is, after an ejection stroke to discharge either five balls or one ball. Before the machine can be again operated the parts must be restored to their original position, shown in Fig. 8, by rotation of the operating handle 45 in the counter-clockwise direction.

Fig. 1. The first backward motion of said handle, through the friction spring 62 turns the arm 60 in a counter clockwise direction, Figs. 6 and 7, and as the camming effect of arm 60 imparted to it by friction through the spring 62 is greater than the frictional resistance of the spring 64 the first rotation of the operating lever causes the arm 60 to engage arm 59 and turn the value controlling member 52 in the backward direction until it reaches the position shown in Fig. 8. This motion leaves the gravity pawl 56 resting loosely upon the rack teeth, so that during the backward rotation of the circular rack member the pawl drags over the teeth, thereby preventing any rotation of the operating handle in the ejecting direction until the value controlling member has been again lifted and set to elevate and positively hold the pawl out of engagement with the rack teeth. This arrangement, therefore, requires the operator to completely turn the operating handle in the backward direction to initial position.

It will, of course, be understood that if the operating handle is turned from the initial position in the ejecting direction without inserting a proper coin the ball transfer device will be rotated only until the pawl strikes the abutment of shoulder 72 in ad-

vance of the lower set of teeth 68, thereby stopping the transfer device before a ball is ejected from the machine. Furthermore, if a proper coin is inserted into the machine, said coin cannot reach the coin receiving reservoir in the bottom of the machine except by passing and operating the value controlling member 52. For example, if a coin is inserted into the opening 46 before the operating handle has been retracted, said coin 75 will lodge upon a plain portion of the periphery of the disc 49, remaining there until the operating handle is fully retracted, when it will enter its proper seat in the disc ready for actuation of the value controlling member when the handle is turned in the ejection direction.

Suitable means is also provided for preventing unauthorized manipulation of the machine by bodily tilting or turning the entire machine to lie on its left side Fig. 1. Fig. 9 represents the position of the controlling parts when the machine is turned to such a position. Without special provision the pawl 56 in this position would hang down vertically so that its end portion would be out of range of the rack teeth 68 and 69 thereby enabling the operating handle to be rotated freely back and forth, which might discharge balls from the machine if the reservoir were full. To prevent such operation the pawl carries a counter weight 74 pivoted at 75 to said pawl at a point remote from its pivot 76, so that the heavy portion of the counter weight lies between the pivot 75 and the pivotal connection 76 of the pawl to its post.

Consequently when the machine is tilted to abnormal position, as described, the counterweight drops down to the position shown in Fig. 9 and wedges in between the pawl and a portion of the wall 85, thereby preventing movement of the pawl away from the blank portion 56 of the circular rack.

What I claim is:

1. Apparatus of the class described, comprising a load moving device oscillatable about a center and provided with a series of pockets nonsymmetrically disposed about said center, and actuating means therefor controllable by coins of different denominations and adapted when operated to produce varying movement of said device in one direction from a definite normal position to thereby advance to the delivery point a number of loads corresponding to the value of the coin.

2. Apparatus of the class described, comprising a load moving device oscillatable about a center and provided with a series of pockets nonsymmetrically disposed about said center, actuating means therefor controllable by coins of different denominations, a plurality of stops adapted to limit the movement of said device in one direction,
and means affected by the operating coin and adapted to engage one or the other of said stops according to the value of the coin to thereby regulate the number of pockets reaching the delivery point.

3. Apparatus of the class described, comprising a load moving device having oscillating movement about a center and provided with a series of load receiving pockets nonsymmetrically disposed about said center, means oscillating therewith and provided with a plurality of spaced stops, a pivoted pawl stationary relative to said oscillating means and adapted in different positions to engage various one of said stops and coin controlled operating mechanism for said device adapted when operated to vary the setting of said pawl to thereby regulate the extent of the advancing movement of said device.

4. Apparatus for controlling the movement of a load transferring device, comprising oscillating means adapted for cooperation with said device and provided with a plurality of spaced stops, a pivoted pawl stationary relative to said oscillating means and adapted to limit movement of said member in one direction, a series of stops co-operating with said pawl and adapted to limit movement of said member in the ejection direction, and coin controlled means for actuating said member and adapted to vary the setting of said pawl according to the value of the operating coin to thereby cause said pawl to engage the proper one of said stop devices, and means whereby reverse operation of said coin controlled means restores the pawl to co-operating relation with its rack.

7. Apparatus for controlling the movement of a load transferring device, comprising an oscillating member adapted for cooperation with said device and provided with a series of rack teeth terminating in a stop, a relatively stationary pivoted pawl co-operating therewith, coin controlled operating means for said member, means whereby the coin upon movement of said operating means in one direction adjusts the pawl into position to engage said stop, and means whereby movement of said operating means in the other direction releases said pawl and allows movement thereof into operating relation with said rack teeth.

8. Apparatus for controlling the movement of a load transferring device, comprising an oscillating member adapted for cooperation with said device and provided with a plurality of separate series of rack teeth each terminating in a stop, a relatively stationary pivoted pawl co-operating therewith, coin controlled operating means for said member, and means whereby the coin upon movement of said operating means in one direction adjusts said pawl to engage one of said stops according to the value of the operating coin and whereby movement of said operating means in the other direction releases said pawl and allows movement thereof into co-operating relation with said rack teeth.

9. Apparatus for controlling the movement of a load transferring device, comprising an oscillating member adapted for cooperation with said device and provided with a series of rack teeth terminating in a stop, a relatively stationary pivoted pawl co-operating therewith, coin controlled operating means for said member, means whereby the coin upon movement of said operating means in one direction adjusts the pawl into position to engage said stop, means whereby movement of said operating means in the other direction releases said pawl and allows movement thereof into operating relation with said rack teeth, and means co-operating with said pawl and adapted to prevent the same from being withdrawn from co-operating relation with said rack teeth when the apparatus as a whole is turned out of its normal position.

10. Apparatus for controlling the movement of a load transferring device, comprising an oscillating member adapted for cooperation with said device and provided with a plurality of separate series of rack teeth each terminating in a stop, a relatively stationary pivoted pawl co-operating therewith, coin controlled operating means for said member, means whereby the coin upon
movement of said operating means in one direction adjusts said pawl to engage one of said stops according to the value of the operating coin and whereby movement of said operating means in the other direction releases said pawl and allows movement thereof into co-operating relation with said rack teeth, and means co-operating with said pawl and adapted to prevent the same from being withdrawn from co-operating relation with said rack teeth when the apparatus as a whole is turned out of its normal position.

11. Apparatus for controlling the movement of a load transferring device, comprising an oscillating member adapted for co-operation with said device and provided with a rack, a relatively stationary pawl co-operating with said rack and normally preventing rotation thereof in one direction, coin controlled means for adjusting the relation of the pawl relative to the rack, and means whereby backward rotation of said rack releases the pawl and allows movement thereof to normal co-operating relation with said rack.

12. Apparatus of the class described, comprising a rack oscillatable about a center and provided with a plurality of load receiving pockets non-symmetrically spaced about said center, a rack oscillatable therewith, a pawl co-operating with said rack to normally prevent oscillation thereof, said rack having stop portions stepped at different positions, and coin controlled means adapted to vary the setting of said pawl relative to the different stop portions of the rack in accordance with the value of the coin.

13. Apparatus of the class described, comprising a load transfer device oscillatable about a center and provided with a plurality of load receiving pockets non-symmetrically spaced about said center, a rack oscillatable therewith, a pawl co-operating with said rack to normally prevent oscillation thereof, said rack having stop portions stepped at different positions, coin controlled means adapted to vary the setting of said pawl relative to the different stop portions of the rack in accordance with the value of the coin, and means whereby upon backward turning of the rack the pawl is released and allowed to move to normal co-operating relation therefore.

15. Apparatus of the class described, comprising a load transfer device oscillatable about a center and provided with a plurality of load receiving pockets non-symmetrically spaced about said center, a rack oscillatable therewith and provided with a plurality of stops stepped at different positions, a pawl co-operating with said rack and stops and normally preventing oscillation of said device, a member movable to different positions in which the setting of said pawl relative to the stops is varied, and coin controlled means for determining the position of said member.

16. Apparatus for controlling the movement of a load transferring device, comprising oscillatable means adapted for co-operation with said device and including a rack, a horizontal shaft for operating the same provided with a coin receiving disc, a pawl co-operating with said rack and so arranged that a coin in said disc upon operation of said horizontal shaft will adjust the setting of said pawl relative to the rack.

17. Apparatus for controlling the movement of a load transferring device comprising oscillatable means adapted for co-operation with said device and including a rack, a horizontal shaft for operating the same and provided with a coin receiving disc, a pawl co-operating with said rack and so arranged that a coin in said disc upon operation of said horizontal shaft will adjust the setting of said pawl with relation to the rack.

18. Apparatus for controlling the movement of a load transferring device, comprising oscillatable means adapted for co-operation with said device and including a rack, a horizontal shaft for operating the same and provided with a coin receiving disc, a pawl co-operating with said rack and stop, a movable member adapted when operated to adjust the relation of said pawl relative to said rack and stop, a rack terminating in a stop, a pawl co-operating with said rack and stop, a movable member adapted to adjust the relation of said pawl relative to said rack and stop, a rack oscillatable means, and a coin receiving disc actuated by said horizontal shaft for operating said movable member to adjust said pawl.

19. Apparatus for controlling the movement of a load transferring device, comprising oscillatable means adapted for co-operation with said device and including a rack, a horizontal shaft for operating the same and provided with a rack terminating in a stop, a pawl co-operating with said rack and stop, a movable member adapted to adjust the relation of said pawl relative to said rack and stop, a rack oscillatable means, and a coin receiving disc actuated by said horizontal shaft for operating said movable member to adjust said pawl.
member adapted when operated to adjust the relation of said pawl relative to said rack and stop, a horizontal shaft for operating said oscillatable means, a coin receiving disc actuated by said horizontal shaft for operating said member to adjust said pawl, and friction means controlled by said horizontal shaft and adapted upon reverse operation thereof to restore the pawl to co-operating relation with the rack.

20. Apparatus for controlling the movement of a load transferring device, comprising oscillatable means adapted for co-operation with said device and provided with a rack having stepped portions each terminating in a stop, a pivoted pawl co-operating therewith, a movable member adapted when operated to adjust the setting of said pawl relative to the stepped portions of said rack, and coin controlled means for operating said member.

21. Apparatus for controlling the movement of a load transferring device, comprising oscillatable means adapted for co-operation with said device and provided with a rack having stepped portions each terminating in a stop, a pivoted pawl co-operating therewith, a movable member adapted when operated to adjust the setting of said pawl relative to the stepped portions of said rack, a horizontal shaft for operating said transfer device, and a coin receiving member operated by said shaft and adapted to actuate said pawl operating member.

22. Apparatus for controlling the movement of a load transferring device, comprising oscillatable means adapted for co-operation with said device and provided with a rack having stepped portions each terminating in a stop, a pivoted pawl co-operating therewith, a movable member adapted when operated to adjust the setting of said pawl relative to the stepped portions of said rack, a horizontal shaft for operating said transfer device, a coin receiving member operated by said shaft and adapted to actuate said pawl operating member, and means whereby upon backward rotation of said rack the pawl is restored to co-operating relation therewith.

In testimony whereof I affix my signature.

FRANCIS M. CASE.