Nov. 2, 1965 R. S. DENZER 3,215,239

COIN APPORTIONING DEVICE FOR VENDING MACHINES

Filed March 31, 1964

FIG. 1.

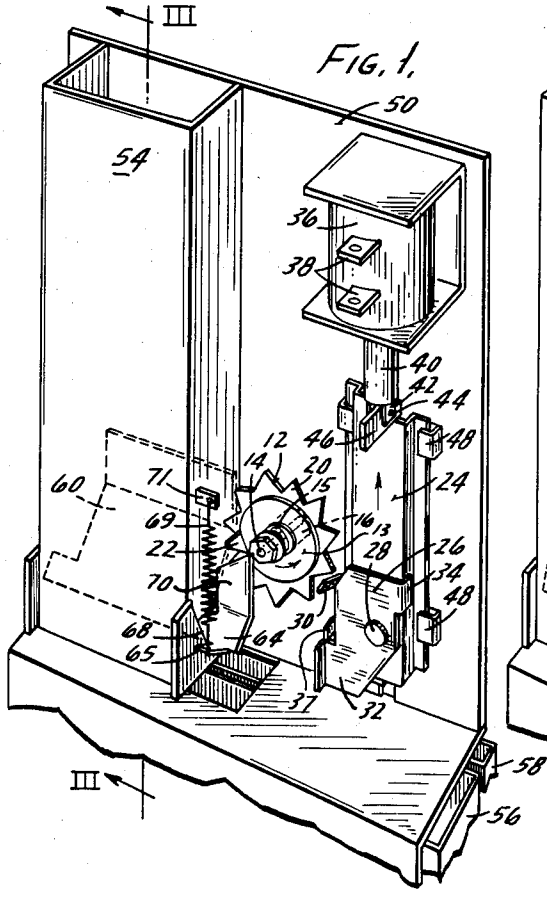


FIG. 2.

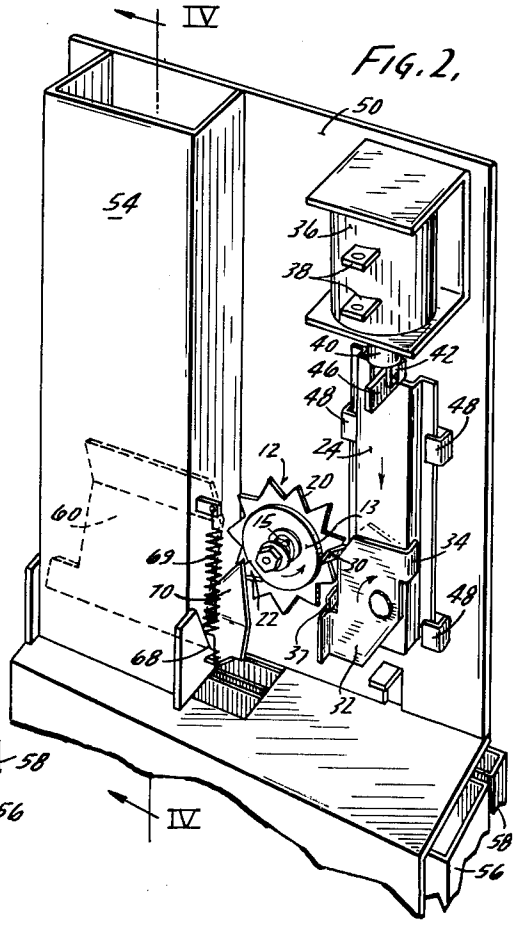


FIG. 3.

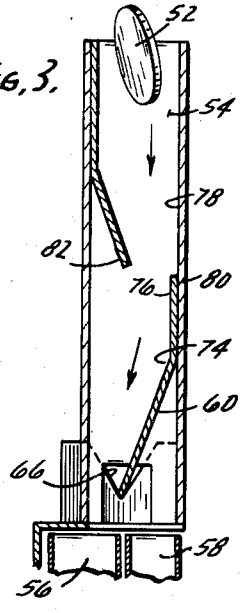


FIG. 4.

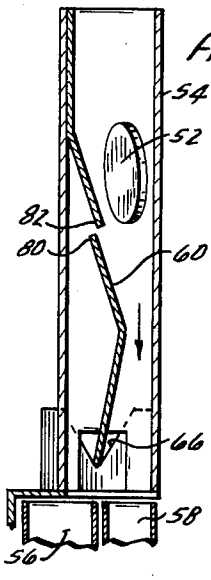
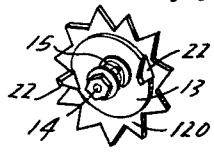


FIG. 5.



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COIN APPORTIONING DEVICE FOR VENDING MACHINES

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9 Claims. (Cl. 194—1)

This invention relates to a coin apportioning device for vending machines. The present application is a continuation in part of my application 242,734, filed December 6, 1962, now abandoned.

It is known practice to provide a vending machine with separate coin boxes into which coins are apportioned in accordance with agreed distribution of receipts between the concern that supplies the vended product and the concern which gives space to the machine. The present invention represents a novel and improved means which is compact and operable with precision in limited space to make the requisite distribution of coins.

As shown, the deflector is biased to direct the coin toward the box which receives the larger percentage. It is an important feature of the invention that the deflector is fulcrumed at its lower end with its free end projecting upwardly in opposition to the movement of the coin so that the impact of the coin acts to hold the deflector in its adjusted position instead of tending to displace it. Thus the deflector requires only power enough to move its free end across the chute, since the actuating means does not have to resist coin impact.

A counting wheel which is disposed outside of the coin chute is interchangeable with other counting wheels and serves as a means of predetermining the percentages of coins allocated to the respective receivers. An arm of the deflector projects outwardly from the chute into the path of cam means carried by the wheel. In the instant exemplification, the wheel is operated by a solenoid which receives an impulse from a counting switch located in the path of the coin, or operated by a plunger manipulated by the operator, or by an electric eye, or otherwise. Since the switch is not a feature of the present invention, it is not illustrated. The counting wheel is in the nature of a ratchet. The solenoid armature actuates a pawl to rotate the wheels. Operation of the wheel preferably occurs when the solenoid is energized and the pawl moves into engagement with another tooth of the ratchet on the return stroke of the solenoid armature.

Instead of mounting the deflector on trunnions, a nearly frictionless mounting is provided by positioning the lower margins of the deflector in bearing channels or notches which can be formed in the reinforced side walls of the coin chute. In the instant device, an integral portion of the deflector portion so mounted projects from the coin chute and is extended into the path of the ratchet counting wheel to be engaged by the cam or cams carried thereby.

In the drawings:

FIG. 1 is a view in perspective fragmentarily showing apportioning mechanism embodying the invention, the parts being illustrated as of the commencement of the power stroke of the solenoid.

FIG. 2 is a view similar to FIG. 1 showing the parts as they appear on the return stroke of the solenoid and while the deflector is still displaced by the ratchet wheel cam.

FIG. 3 is a view taken in section on the line III—III of FIG. 1.

FIG. 4 is a view taken in section on the line IV—IV of FIG. 2.

FIG. 5 is a fragmentary detail view shownig a modified

counting wheel having two cams instead of one and exemplifying a wheel interchangeable with that shown in FIGS. 1 and 2 when the coin ratio is to be changed.

No coin control mechanism is illustrated, since the device is usable with any desired vending equipment. The coin chute **6** is intended only to indicate one of the many arrangements possible for delivering coins by gravity to the apportioning device to be counted and deflected into the coin receivers **8** and **10**, or otherwise. The receivers as shown comprise boxes whose proximate walls partition the receiving compartments. However, the invention is not concerned with details of the disposition of the coins after they leave the apportioner.

Counting is done by the stepped advance of a ratchet wheel **12** so mounted on a pin **16** that it can readily be interchanged with other ratchet wheels. On its face it carries a disk **13** having one or more peripheral projections turned upwardly at right angles to the ratchet wheel to form cams **22** for actuating the deflector in a manner hereinafter described. A compression spring **15** seats against disk **13**. The ratchet turns so very easily that a slight degree of friction provided by the pressure of spring **15** is desirable to hold the ratchet in the position to which it is stepped by the impulse-actuated solenoid and pawl device hereinafter referred to.

Laterally adjacent the wheel is an actuator which comprises a slide **24** conveniently fabricated as a channel and having a pawl lever **26** pivoted thereto at **28**. The pawl finger **30** is positioned to engage successive teeth **20** on the counting wheel **12**. The weight of arm **32** biases the pawl **26** toward a position in which pawl finger **30** will engage the ratchet. Another finger **34** engages the side of the slide member **24** to serve as a positioning step. Still another finger **37** at the outer end of the pawl lever **26** is so disposed that in the upwardly advanced position of the slide **24**, the finger **37** will lie in the path of one of the teeth of the ratchet wheel to prevent overrun.

In the upward movement of the slide **24**, the pawl finger **30** engages a tooth **20** to rotate the wheel **12** as shown in FIG. 1. Since the movement of the slide effected by the solenoid may be quite abrupt, the wheel **12** might advance more than one tooth but for the fact that the pawl finger **37** is moved into the path of a tooth other than that actuated by the pawl, thus blocking the ratchet wheel from advancing through an angle greater than that represented by a single tooth advance. On the downward movement of the slide **24**, the pawl readily clears the ratchet wheel, the wheel being frictionally held against retrogressive rotation.

Solenoid **36** has electrical connections **38** to receive impulses from any source. In the art, coin operated switches and plunger actuated switches and electric-eye switches are used to provide such impulses as each coin traverses whatever path is provided in the machine. The solenoid armature **40** is provided at its end with a clevis **42** connected by pin **44** with an arm **46** which may be made integrally from the material of the channel which here constitutes the slide **24**. Lugs **48** integral with the wall **50** provide ways in which the slide **24** is reciprocable between the retracted position of FIG. 1 and the advanced position of FIG. 2.

The coin **52** traversing the machine is delivered downwardly through the coin chute **54** for delivery into one of the two receiving containers **56** or **58**. The deflector **60** is provided near its lower end with laterally projecting arms at **62** and **64** which rest in bearings formed by cutting V-shaped notches at **66** and **68**, respectively, in the side walls of the coin chute **54** or other supports. The external part of arm **64** is extended upwardly at **70** into the path of one or more cams **22** projecting from the face of the interchangeable ratchet-toothed counting

wheel 12. In FIG. 1 and FIG. 2, a counting wheel having one cam 22 is shown. The interchangeable counting wheel 120 shown in FIG. 5 has two cams 22 projecting from its forward face.

The deflector 60 preferably has a slight bend at 74. Its upper extremity 76 lies flat against the side wall portion 78 of the coin chute 54 when the deflector is in the position of FIGS. 1 and 3. When the coin 52 descends through the chute, it is guided by the deflector into the coin box 56. This is the normal position of the deflector, to which it is biased both by gravity and by spring 69. The spring has an anchorage to lug 65 formed on arm 64 of the deflector. At its upper end, the spring has a fixed anchorage 71 provided by means of a lug formed on one of the walls of the chute. Since the position in which the deflector is shown in FIGS. 1 and 3 is its normal position, the coin box 56 from which coins are deflected in the normal deflector position is the larger of the two coin boxes.

When a cam 22 engages the arm 70 to move the deflector from the position of FIG. 1 and FIG. 3 to the position of FIG. 2 and FIG. 4, the free end portion 80 of the deflector moves across the coin chute to be behind the baffle 82 so that the descending coin is now directed into the coin box or receiver 58. Assuming that the solenoid gets one impulse from each coin and assuming that the ratchet wheel has eleven teeth and that there is but one cam 22 thereon, there will be ten coins deflected into the receiver 56 for every one that is deflected into receiver 58. The wheel 120 shown in FIG. 5 is provided with two cams. Hence, when this is used, the box 58 will get two coins for every nine delivered into box 56. Obviously, the percentage can be changed at will by varying the number of ratchet teeth on the counting wheel or the number of cams carried by its face, or both.

It will be noted that in both positions of the deflector 60 the impact of the coin descending through the chute is directed against the face of the deflector in a direction to hold the deflector in its adjusted position. Thus an extremely light power source is practicable for shifting the deflector since the power source does not need to withstand the impact of the coin but is used merely to tilt the deflector through a very slight angle on bearing supports which are virtually frictionless.

The pawl means for preventing overrun and for resisting backward movement of the ratchet wheel during return of the solenoid is shown in FIGS. 1 and 2.

I claim:

1. In a coin apportioning device having separate and removable proximate coin receivers with wall means therebetween, chute means terminating at said receivers for delivering successive descending coins by gravity toward said wall means, and a deflector having pivot means at opposite sides of the path of coins descending through the chute means and approaching the respective receivers said deflector having portions engaged with said pivot means and having a free end portion operable about said pivot means from one side of the chute means to the other, the free end portion of the deflector being movable across the path of a coin descending through said chute means toward said pivot means, the deflector determining the receiver into which the coin will be delivered and an intermediate part of the deflector being engaged by the descending coin at a point such that the impact of the coin tends to maintain the deflector in the position in which it is disposed when struck by the coin.

2. In a coin apportioning device having separate coin receivers, chute means for delivering successive descending coins by gravity toward said receivers, and a deflector having pivot means near the respective receivers and having a free end portion operable about said pivot means from one side of the chute means to the other, the free end portions of the deflector being movable across the path of a coin descending through said chute toward said pivot means, the deflector determining the receiver into which the coin will be delivered and an intermediate part of the deflector being engaged by the descending coin at a point such that the impact of the coin tends to maintain the deflector in the position in which it is disposed when struck by the coin, said pivot means comprising members having laterally opposed notches at opposite sides of the path of coin descent through the chute and constituting said pivot means, said deflector having portions pivoted in respective notches and extending upwardly from said portions toward said free deflector end.

3. In a coin apportioning device according to claim 2, an extension arm connected with one of said deflector portions, and a counting wheel having cam means disposed to engage said arm in the course of rotation of the wheel, and means for rotating the wheel in predetermined increments related to the number of coins traversing the chute.

4. A coin apportioning device according to claim 3 in which the chute is provided with openings through which project deflector portions pivoted in respective notches, the said members constituting reinforcement for said chute adjacent said openings and the said extension arm and counting wheel being outside of the chute.

5. In an apportioning device for descending coins and having coin receiver means provided with separate coin receiving compartments and an intervening partition, a chute leading to said means for delivering successive descending coins by gravity toward said means, and a deflector having pivot means at opposite sides of the chute adjacent said partition, said deflector having a lower marginal portion bearing in said means and spanning the chute in substantial alignment with the partition, said deflector having a free end portion above the pivot means and operable about the pivot means from one side of the chute to the other, means for oscillating said deflector about said pivot means, said deflector being provided between said pivot means and its said free end with an angle above which a portion of said deflector rests against said one side of the chute in one deflector position.

6. A coin apportioning device according to claim 5 in which said chute includes a baffle projecting from the said other side of the chute and beneath which the free end of the deflector is disposed in another position of said deflector.

7. A coin apportioning device according to claim 6 in which said deflector is biased toward the first mentioned position, the means for actuating the deflector comprising means for oscillating the deflector in opposition to its said bias during movement of a coin toward said deflector.

8. In a coin apportioning device having separate coin receivers, chute means for delivering successive descending coins by gravity toward said receiver, and a deflector having pivot means near the respective receivers and having a free end portion operable about said pivot means from one side of the chute to the other, the free end of the deflector being movable across the path of the coin descending through said chute toward said pivot means, the deflector determining the receiver into which the coin will be delivered and an intermediate part of the deflector being engaged by the descending coin at a point such that the impact of the coin tends to maintain the deflector in the position in which it is disposed when struck by the coin, electrical impulse actuated means for shifting said deflector free end portion from one side of the chute to the other after the passage of a predetermined number of coins, said means including a solenoid actuated pawl, a ratchet with which said pawl interacts, means for transmitting motion from the ratchet to the deflector, and complementary means on the pawl and ratchet for resisting overrun of said ratchet.

9. A coin apportioning device comprising the combination with a coin chute, of a plurality of receivers, and means for directing a coin traversing said chute into a predetermined receiver and comprising a deflector mount-

ed in the path of such coins and movable from a first position in which a coin is deflected into one of said receivers to a second position in which a coin is deflected into another of said receivers, a cam follower connected with the deflector, a ratchet wheel having a series of ratchet teeth and having cam means positioned for engagement with the cam follower for the movement of said deflector from said first position to said second position, a solenoid having an armature, a pawl connected with said armature to receive motion therefrom and positioned from engagement with successive teeth of the ratchet wheel for the stepped advance of the ratchet wheel in successive energizations of the solenoid, said pawl having stop means

which, in each such engagement of the pawl with a tooth of the ratchet wheel, will be positioned in the path of a different tooth of the ratchet wheel for limiting ratchet wheel advance to a single step.

References Cited by the Examiner

UNITED STATES PATENTS

1,159,298	11/15	Valdettaro.
2,082,708	6/37	Maitland.

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