Feb. 27, 1940. F. F. PULVER 2,191,585

VENDING MACHINE

Filed Aug. 22, 1936 3 Sheets-Sheet 1

Fig. 2.

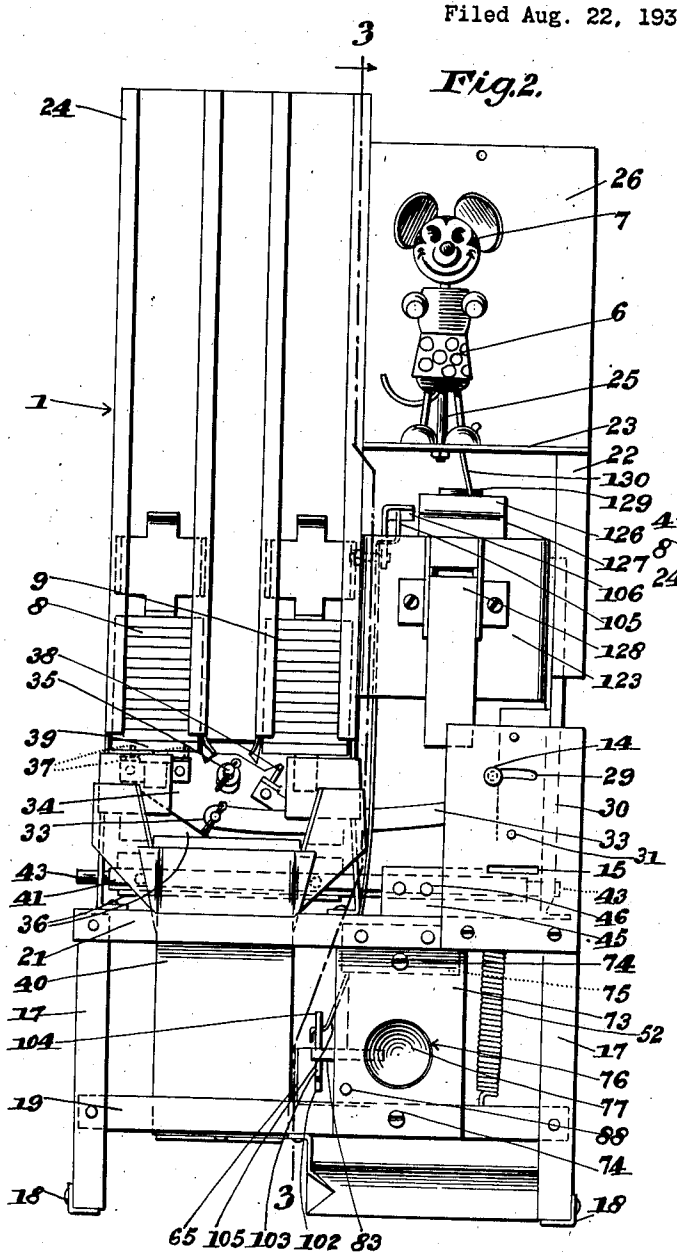
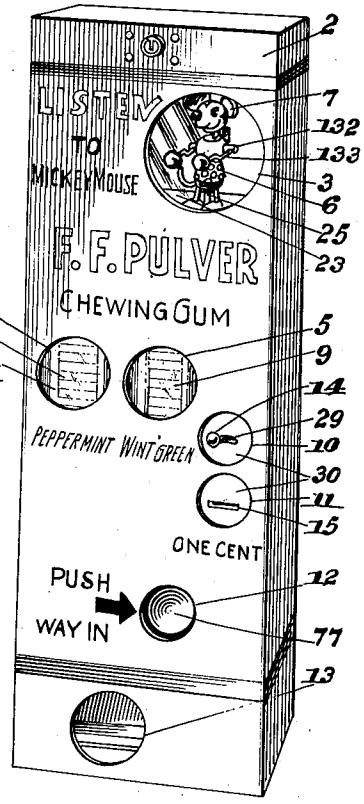


Fig. 1.



Inventor

Frank F. Pulver

By Munn, Anderson & Liddy

Attorneys

Feb. 27, 1940. F. F. PULVER 2,191,585

VENDING MACHINE

Filed Aug. 22, 1936 3 Sheets-Sheet 2

Fig.3.

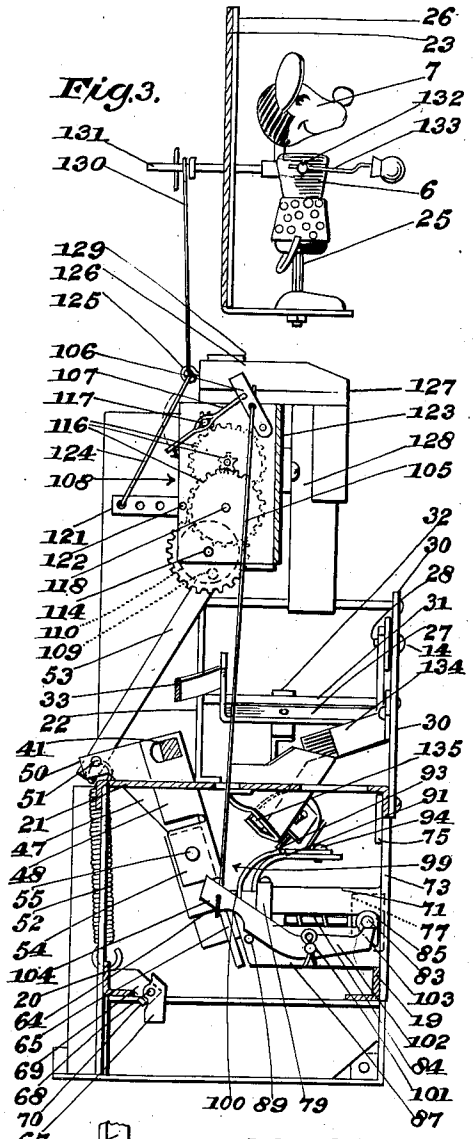


Fig.4.

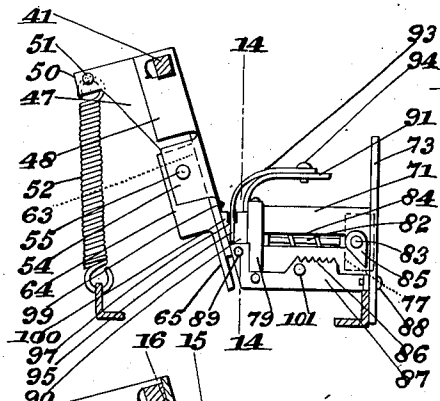


Fig.5.

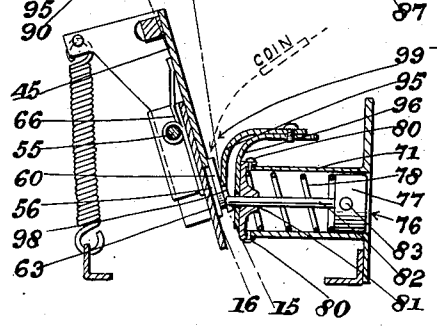


Fig.6.

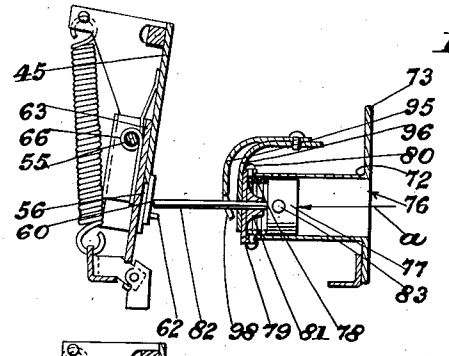


Fig.7.

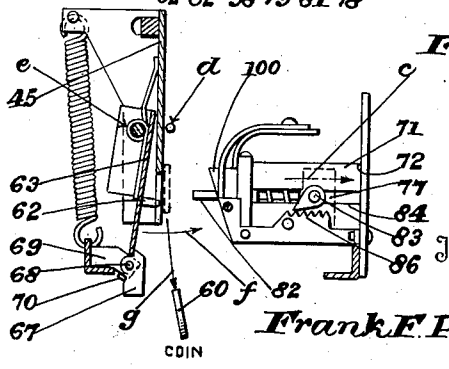


Fig.8.

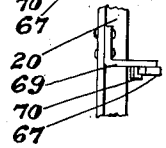
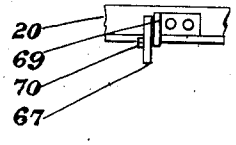


Fig.9.



Inventor

Frank F. Pulver

By Munn Anderson & Liddy

Attorneys

Feb. 27, 1940. F. F. PULVER 2,191,585

VENDING MACHINE

Filed Aug. 22, 1936 3 Sheets-Sheet 3

Fig. 10.

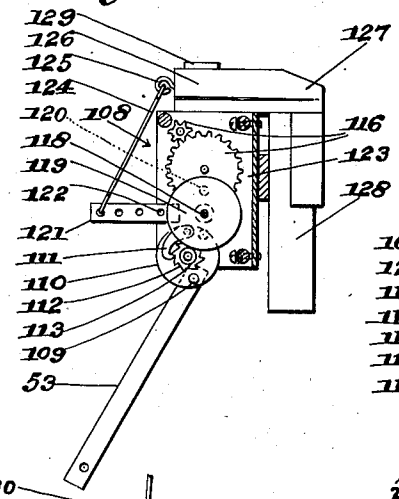


Fig. 11.

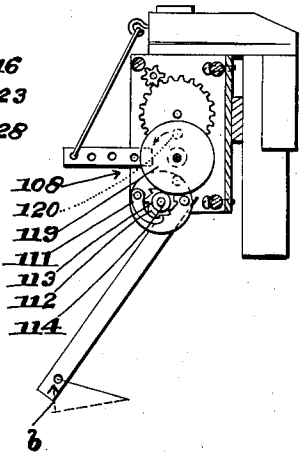


Fig. 12.

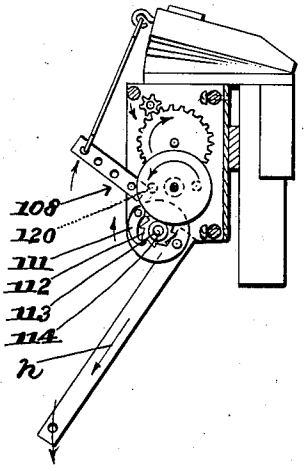


Fig. 13.

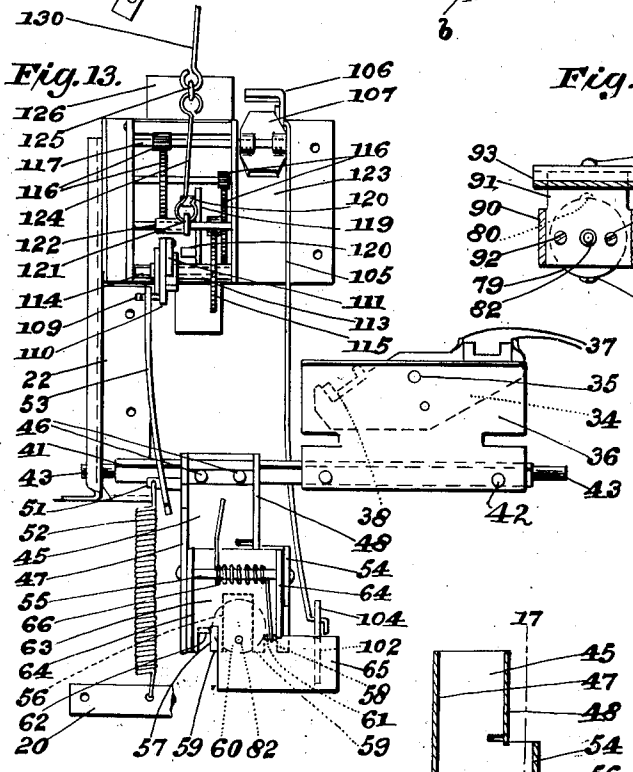


Fig. 14.

Fig. 15.

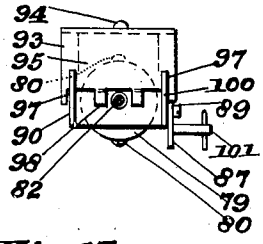


Fig. 17.

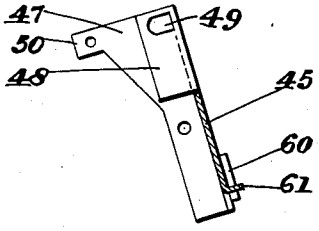


Fig. 16.

Inventor

Frank F. Pulver

By Munn, Anderson & Liddy

Attorneys

Patented Feb. 27, 1940 2,191,585

UNITED STATES PATENT OFFICE

2,191,585

VENDING MACHINE

Frank F. Pulver, St. Petersburg, Fla., assignor to Alliance Investment Corporation, Geneseo, N. Y., a corporation of Florida

Application August 22, 1936, Serial No. 97,446

3 Claims. (Cl. 312—35)

This invention relates to improvements in vending machines, and its objects are as follow:

First, to provide a vending machine wherein there is an improved windup mechanism for a sounding device which coacts with an image that is movable in part by the same mechanism.

Second, to provide for the simultaneous operation of the wind-up mechanism and the goods-dispensing plate, by the insertion of the proper coin and the full pushing in of the plunger.

Third, to provide a detent by which to hold the fly-fan of the wind-up mechanism back until the plunger has returned to its original position.

Other objects and advantages will appear in the following specification, reference being had to the accompanying drawings in which:

Figure 1 is a perspective view of the vending machine, particularly illustrating the outside casing.

Figure 2 is a front elevation of the vending mechanism, the casing being removed.

Figure 3 is a central, vertical section of the vending mechanism, taken on the line 3—3 of Fig. 2.

Figure 4 is a detail side elevation of the plunger device of the wind-up mechanism in the initial position, parts being in section.

Figure 5 is a sectional view of the plunger device illustrating a change in position of the parts upon the insertion of a coin.

Figure 6 is a sectional view of the plunger device illustrating the act of pushing the plunger.

Figure 7 is a partially sectional and elevational view illustrating the release of the coin upon the return of the plunger.

Figure 8 is a detail plan view of the plate latch.

Figure 9 is a front elevation of the plate latch.

Figure 10 is a side elevation of the wind-up mechanism motor in the initial position, matching Fig. 4, parts being in section.

Figure 11 is a similar view of the motor, showing it "wound" for an operation and matching Fig. 6 in position.

Figure 12 is a similar view of the motor, showing a position in its cycle of operation.

Figure 13 is a rear elevation of the wind-up mechanism.

Figure 14 is a vertical section taken on the line 14—14 of Fig. 4.

Figure 15 is a vertical section taken on the line 15—15 of Fig. 5.

Figure 16 is a vertical section taken on the line 16—16 of Fig. 5.

Figure 17 is a detail vertical section taken on the line 17—17 of Fig. 16.

In carrying out the invention, provision is made of a framework, generally designated 1 (Fig. 2), which is housed by a casing 2 (Fig. 1) of any desired design or construction. This casing has glazed windows 3, 4 and 5. The first window enables the purchaser to see the image 6 which has at least one movable part 7. The second and third windows show the stacks of vendible articles 8 and 9 which, in this instance, are small packages of chewing gum. Manifestly, the image 6 and the character of the vendible articles may be entirely different from those shown, without affecting the working of the invention.

The casing 2 has additional, but unglazed openings 10, 11, 12 and 13. The first of these makes the button 14 of a switch-over device accessible to the purchaser, which device, upon movement of the button to one side or the other, causes the switch-over device to release articles in one or the other of the stacks 8, 9. The second opening makes the coin slot 15 accessible; the third opening makes the plunger 77 accessible and the fourth opening enables the purchaser to reach in and remove the vended article. The front of the casing has any desired legends applied to it, those shown in the drawing (Fig. 1) merely being suggestive.

The framework 1 (Fig. 2) comprises at least four legs 17. These are connected at the bottom in pairs by angle irons 18. The two pairs of legs are connected by angle irons 19, 20, and all of the legs are further connected by a top plate 21 which has openings cut through it at necessary places in order to provide passages for those parts of the mechanism that go through. An upright 22, which actually consists of several parts, but functionally is one part, extends upwardly from a place of connection to the top plate 21, and partly carries a support 23 (Fig. 3) which is further carried by the guide member 24 (Fig. 2) in which the vendible articles are arranged in stacks.

It is to the support 23 that the image 6 is attached as at 25 (Fig. 2). The upright portion of the support 23 is faced with a mirror 26, which, in this instance, is a polished metal plate. The purpose of the mirror is to reflect the image and thereby to apparently increase the depth of the view.

The previously mentioned switch-over device does not form any part of the instant invention, but in order to enable the reader to intelligently follow this description it is briefly described thus: The button 14 is attached to a rocker 27 (Fig. 3) by means of a shank 28 that goes through an

arcuate slot 29 in a face plate 30. A small shaft 31 (Fig. 3) provides the pivot for the rocker 27, the ends of the shaft being secured to the upright 22 and the face plate 30. A coin guard 32 is fastened to the rocker. A link 33 is pivotally connected at its ends to the rocker 27 and to a switch plate 34 (Fig. 2). This plate is pivoted at 35 to what is herein known as the goods-dispensing plate 36. The switch plate carries a pair of pushers 37, 38, (Fig. 2) arranged in angled relationship to each other, one or the other of which is brought into operative position behind the lowermost article of the respective stack as the button 14 is moved into the left or right position in the slot 29. According to the present adjustment, the button is in the left-end position, and the pusher 37 is elevated to the operative position behind the lowermost article 39 in the stack 8 as the consequence. A forward rocking of the plate 36 will push the lowermost article out.

When the lowermost article 39 is displaced in the manner just indicated it falls into a chute 40 which directs the article to a place in the casing 2 (Fig. 1) immediately behind the opening 13. The purchaser reaches through the opening and withdraws the article. This ends the brief description of the switch-over device.

A rockable shaft 41 has the goods-dispensing plate 36 permanently secured to it at 42 (Fig. 13). This shaft is conveniently made square in cross section (Fig. 3), although not necessarily so, its ends 43 being rounded so as to turn in holes in the upright 22 and the portion 44 of the guide member 24 which thus provide journals. It is at this point that the wind-up mechanism is introduced and its construction is as follows: A back-plate 45 (Fig. 13) is secured to the shaft 41 as at 46. This back-plate has angled sides 47, 48 (Figs. 13 and 16) which are perforated at 49 (Fig. 17), to admit the shaft 41.

The angled side 47 has an extension 50 which provides an arm. Near its extremity this arm carries a pin 51 (Fig. 3) to which one end of each of a spring 52 and a link 53 are connected. The other end of the spring is anchored to the angle iron 20 and since the spring is contractile, it tends to keep the back-plate 45 in its normal forward position (Figs. 3, 4 and 5). A rocking of the plate 45 and of the shaft 41 which carries it, at the beginning of a vending operation, will be against the tension of the spring 52. This spring, when permitted, will restore the back-plate and shaft to the original position in completing the vending operation.

A third angled side 54 of the back plate 45 (Figs. 13 and 16) provides the support for one end of a pivot pin 55, the other end of the pin being supported by the angled side 47. The bottom edge of the back plate has an opening 56 cut into it (Fig. 16) and has other openings 57, 58 situated laterally of the opening 56. The various openings are spaced from each other by intervening tongues 59 which provide backings for the coin 60. The coin is supported upon rests 61, 62. The first of these is formed from the metal which is bent away from the plate 45 in producing the opening 58.

The other rest 62 is formed by similarly bending a portion of the metal of a spring plate 63. Both rests are bent forwardly, and the distance between their adjacent edges is gauged to be slightly less than the diameter of the coin 60 (Fig. 16) thereby supporting the coin against the backing tongues 59 as long as the rest 62 of the spring plate remains in position in the opening 57. The rest 62 is subject to being displaced from said opening, and that occurs when the spring plate 63 is swung on the pivot pin 55 to which it is attached by means of its angled sides 64.

As shown in Fig. 13 as well as Fig. 4 et seq., the spring plate 63 is housed between the angled sides of the back plate 45. The third angled side 54 of the latter is cut sufficiently short (Fig. 16) to provide ample room for a laterally extending detent 65 (Fig. 13). A light coil spring 66, wound around the pivot pin 55, has its opposite ends pressed against the respective plates 45, 63 (Fig. 5) so as to normally hold the two plates together. The spring plate 63 is adapted to be automatically swung on its pivot 55 toward the end of a vending operation (Fig. 7) because of its being detained by a plate latch 67.

This detention of the spring plate 63 exercises a drag on the back plate 45 which in the period of swinging of the spring plate is returning from a vending operation accomplished by the dispensing plate 36. The purpose of exercising the foregoing drag is to prevent the back plate 45 from slamming forwardly as would occur by the unrestricted action of the spring 52.

This plate latch hangs loosely from a pivot 68 on an angled bracket 69 which is fastened to the angle iron 20 (Figs. 8 and 9). A portion of the bracket is bent aside to form a stop 70 against which the latch 67 normally gravitates (Fig. 3), and against which it is forced by the forward pressure of the spring plate 63 when the latter returns with the back plate 45 (Fig. 7).

Immediately to the front of the double plate assemblage 45, 63 is a cylinder 71 (Fig. 3). The right or forward end of this cylinder is secured at 72, for example by welding, to a supporting plate 73. This plate is screwed at 74 (Fig. 2) to the angle iron 19 and an extension 75 of the top plate 21. The bore of the cylinder registers with a hole 76 in the front plate, through which the purchaser pushes with his finger (arrow *a*, Fig. 6) against the plunger 77 in the cylinder. The plunger is moved inwardly of the cylinder by finger pressure, and outwardly by the pressure of a spring 78 behind the plunger.

This spring rests against a closure cap 79 which is secured at 80 (Fig. 5) over the left or inward end of the cylinder 71. A boss 81 on the cap has a central bore to guide the stem 82 of the plunger. Said plunger has a lateral pin 83 (Fig. 5) that projects through a slot 84 in the adjacent side of the cylinder (Fig. 4) and then swingably carries a dog 85. Said dog coacts with an adjacently fixed rack 86 in preventing a premature return of the plunger 77 after the latter has been pushed in to begin a vending operation.

The rack 86 is part of a bracket 87 which is secured at 88 to the supporting plate 73, and at 89 (Figs. 4 and 14) to one of a pair of ears 90 on a lower throat plate 91. This plate is secured at 92, for example by screws, to the closure cap 79 (Fig. 14). The bracket 87 is thus rigidly held in position and it aids in bracing the cylinder 71. The lower throat plate has a hole (Fig. 6) in registration with the bore of the boss 81.

An upper throat plate 93 (Fig. 4) is secured at one end at 94 to the lower throat plate 91. The two plates are virtually a unit. They are formed with slightly different curvatures (Fig. 4) so as to space the upright portion 95 a slight distance from the upright portion 96 of the plate 91 (Fig. 5). The upright portion 95 is inter-

locked with the ears 90 by a notch arrangement 97 (Figs. 4 and 15). Said upright portion has a pair of tangs 98 (Figs. 5 and 15) which are bent forwardly in substantial parallelism to the normal pitch of the back plate 45. The space between the two throat plates is so gauged that the tip of the stem 82 will not project beyond tangs 98 when the latter are bent to their proper inclination. In other words, the throat 99 must be clear and unobstructed for the entrance of the coin 60.

The coin space is maintained by the ears 90. These project at 100 (Figs. 4 and 7) a sufficient distance to the rear side of the portion 95 to stop the back plate 45 in a position that will produce the coin space. The rests 61, 62 (Fig. 16) project into the coin space and initially support the coin in line with the plunger stem 82. The coin, being interposed between the swinging plate assemblage 45, 63, and the stem 82, converts a full inward push on the plunger 77 into a vending operation. If a slug with a center hole were inserted in place of the coin, the stem 82 would go through both said center hole and through the opening 56, and would merely turn the spring plate 63 on its pivot with no effect upon the vending mechanism.

A pin 101 (Fig. 4) on the side of the bracket 87 provides a mount for a lever 102 (Fig. 3). The forward end of this lever has a heel 103 which is adapted to be depressed by the lateral pin 83 when the plunger 77 is in its extreme forward position. The inward end 104 of the lever 102 is normally held up by the detent 65 (Figs. 3 and 13). The lever 102 is sufficiently out of balance to cause the left end 104 to drop slightly when the detent 65 is displaced from its position thereunder when the plunger 77 is pushed inwardly.

A wire 105 extends up from the end 104 to the detent 106 of the fly-fan 107 of the motor generally designated 108 (Fig. 3). This motor is an inseparable part of the improved wind-up mechanism. This mechanism comprises all of the active parts already described in connection with Fig. 3, and the views depending thereon. In order that the motor may be understood, attention is directed to Figs. 10 to 13 for the construction.

The previously mentioned link 53 is connected at its upper end to the wrist pin 109 of a dog disk 110, which carries a pivoted dog 111. The dog is so formed that gravity may be depended upon to keep it swung inwardly toward a ratchet wheel 112, or if this fails, it may be pressed upon by a light spring (not shown). Said ratchet wheel is fixed on one end of an arbor 113 (Fig. 13) which is loose on a shaft 114 and with respect to which the dog disk 110 can turn independently. The arbor carries a master gear 115 which is the beginning of a gear train 116 that ends at the shaft 117 of the fly fan 107. This train consists of successive increases in ratio so that a slight angular motion of the arbor 113 results in a rate of rotation of the shaft 117 which is high enough to cause the fly fan to beat the air sufficiently rapidly to exercise a desired governing effect upon the motor.

One of the intermediate shafts 118 (Fig. 10) of the gear train has a pin disk 119 affixed to it. This disk has one or more pins 120 (two being shown) projecting from one of its side faces. These pins are intended to periodically strike the short end of an arm 121 that is pivoted at 122 to the motor frame 123. A wire link 124 extends from the arm 121 to a connector 125 on the movable section 126 of a bellows 127. This bellows may be of any known construction, and it may comprise any equivalent contrivance for producing an impulse (a puff of air in this instance) for the working of a sounding device 128. Said device is here shown in the form of a whistle (Fig. 2) which will emit a sound every time the bellows is worked by the passage of a pin 120 across the inner end of the arm 121.

The function of said arm is to lift the movable section 126. A weight 129 returns the latter to its closed position and it is upon this return that a puff of air is driven through the whistle 128. Simultaneously with the foregoing lifting of the movable section 126, a second wire link 130, also joined with the connector 125 (Fig. 3) turns the movable part 7 of the image 6. Said movable part is carried by the short arm of a bell crank 131 to the long arm of which the link 130 is connected, as shown. The pivot 132 of the bell crank carries headed wires 133 which simulate the arms of the image. The sounding of the whistle 128 is accompanied by a dipping of the arms and the head 7, the resulting animation of the image adding to the interest of the purchaser. Collectively, this is an advertising contrivance.

With this conclusion of the description of the motor, attention is directed again to the coin slot 15 (Fig. 1). This has a trough 134 (Fig. 3) communicating with it. The trough is directed toward the coin throat 99 so that the coin takes the path indicated in dotted lines in Fig. 5 when inserted at the coin slot. One side of the coin trough 134 is partially formed by one pole of a horse-shoe magnet 135 (Fig. 3). The purpose of this magnet is to deflect iron and similar magnetic slugs.

The operation is readily understood. As recently stated, a coin inserted at the coin slot 15 (Fig. 1) takes the path indicated by dotted lines in Fig. 5, and ends in the full-line resting position upon the rests 61, 62 (Fig. 16). The purchaser now pushes the plunger 77 with one finger (arrow *a*, Fig. 6). Functionally, the plunger 77 and its stem 82 are one. The push is imparted to the abuttably positioned coin 60 by the stem 82, and it results in swinging the plate assemblage 45, 63 from the position in Fig. 5 to the position in Fig. 6. As is presently seen, the plate 45 thus becomes the active part of the wind-up mechanism that is coupled to the motor 108.

The elevation of the arm 50 puts the spring 52 under tension and at the same time moves the link 53 from the position in Fig. 10 to the position in Fig. 11, the arc of movement being indicated at *b*, in Fig. 11. The dog 111 of the motor 108 is thus moved to a new position in reference to the ratchet 112 (Fig. 11). The movement of the lateral pin 83 from its position over the heel 103 (Fig. 3) enables the inward end 104 of the lever 102 to drop. The detent 106 thus falls from its unobstructing position (Fig. 3) to an obstructing position against the fly-fan 107, where it remains until the plunger 77 returns to its original position.

Having pushed the plunger 77 all the way in (Fig. 6), the purchaser withdraws his finger. The spring 78 (Fig. 5) forces the plunger forwardly (arrow *c*, Fig. 7). In pushing the plunger all the way in, as just stated, the pivot 55 of the spring plate 63 is shifted from the position *d* (Fig. 7), which matches the position in Fig. 4, to the position *e* (Fig. 7). The spring plate 63, which would not be intercepted by the plate latch 67 if swung from the pivot position *d*, is now detained by said latch.

As the back-plate 45 begins and continues its

forward motion (arrow *f*, Fig. 7) the spring plate lags behind, incidentally exercising a drag on the back plate. This withdraws the rest 62 from beside the coin 60, letting the letter fall (arrow g, Fig. 7). The spring plate 63 stays in its detained position virtually during the entire return motion of the back plate. Inasmuch as the return of the plunger 77 is very rapid after the finger pressure has been released therefrom, it follows that the lateral pin 83 acts upon the heel 103 to raise the detent 106 from the fly-fan 107 approximately at the very beginning of the return movement of the back plate 45.

The spring 52 simultaneously returns the back-plate and pulls down on the link 53 (arrow *h*, Fig. 12). This causes the operation of the gear train. The fly-fan 107 governs the gear train and moderates the return motion of the back plate. As the gear train works, the pins 120 successively rock the arm 121. Sounds are emitted from the whistle 123 simultaneously with the animation of parts of the image 6.

The rocking of the shaft 41 by the initial push of the plunger 77 (Fig. 6) also rocks the dispensing plate 36. The function of this plate, as previously brought out, is to displace one of the articles 39 (Fig. 2). There is a simultaneous operation of the wind-up mechanism comprising all of the movable parts in Fig. 13, and the goods-dispensing plate 36.

As indicated before, the sole function of the dog 85 and the rack 86 is to prevent less than a full inward stroke of the plunger 77. If the purchaser should release the plunger after having pushed it only part way, the dog 85 will brace itself against the rack and hold the plunger in a stopped position. It will be necessary to push the plunger all the way to make the dog clear the rack, and this is necessary in order to bring about a vending operation.

I claim:

1. In a vending machine, means to support a stack of vendible articles, a goods-dispensing plate disposed adjacent an end of said stack and having means by which to displace a vendible article from said stack upon movement of said plate, a turnable shaft from which the dispensing plate is pendent, coin controlled means for turning the shaft, including a back plate also pendent from the shaft in laterally offset relationship to the dispensing plate, a spring connected to the back plate being put under supertension by a coin-controlled movement in one direction of the back plate, and means exercising a drag on the back plate upon its return movement by action of said spring.

2. In a vending machine, means to support a stack of vendible articles, a goods-dispensing plate disposed adjacent an end of said stack and having means by which to displace a vendible article from said stack upon movement of said plate, a turnable shaft from which the dispensing plate is pendent, coin controlled means for turning the shaft, including a back plate, also pendent from the shaft in laterally offest relationship to the dispensing plate, a spring connected to the back plate being put under supertension by a coin-controlled movement in one direction of the back plate, an element loosely carried by the back plate, and means engaged by said element at the end of movement of the back plate in said one direction, thus to exercise a drag on the back plate upon its return movement.

3. In a vending machine, means to support a stack of vendible articles, a goods-dispensing plate disposed adjacent an end of said stack and having means by which to displace a vendible article from said stack upon movement of said plate, a turnable shaft from which the dispensing plate is pendent, coin controlled means for turning the shaft, including a back plate also pendent from the shaft in laterally offset relationship to the dispensing plate, a spring connected to the back plate being put under supertension by a coin-controlled movement in one direction of the back plate, an element loosely pivoted to the back plate, a spring tending to keep said element pressed against the back plate, and a dog to intercept said element at the end of movement of the back plate in said one direction, displacing said element from the back plate against the tension of the respective spring upon its return movement and exercising a drag on said back plate.

FRANK F. PULVER.