March 13, 1928. 1,662,472

H. H. PULVER

VENDING MACHINE

Filed Oct. 28, 1922 2 Sheets-Sheet 1

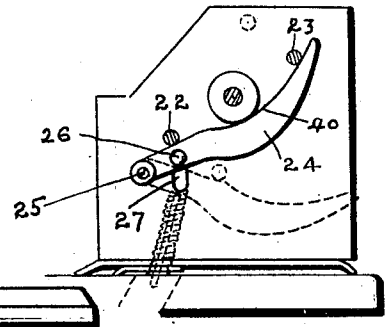



Fig. 2

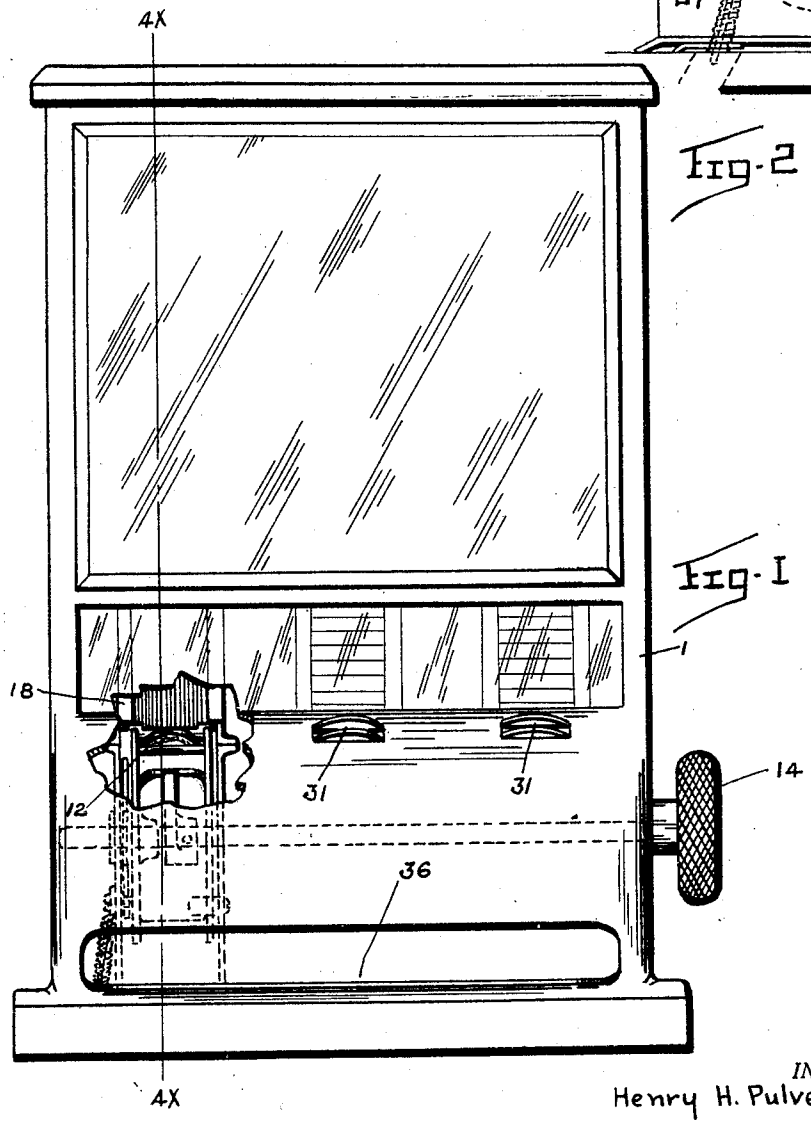



Fig. 1

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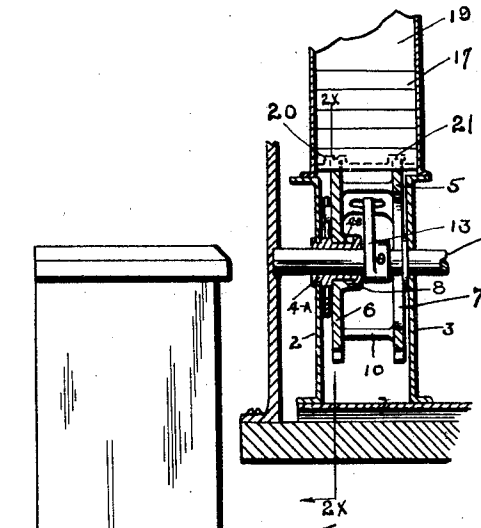



Fig-5

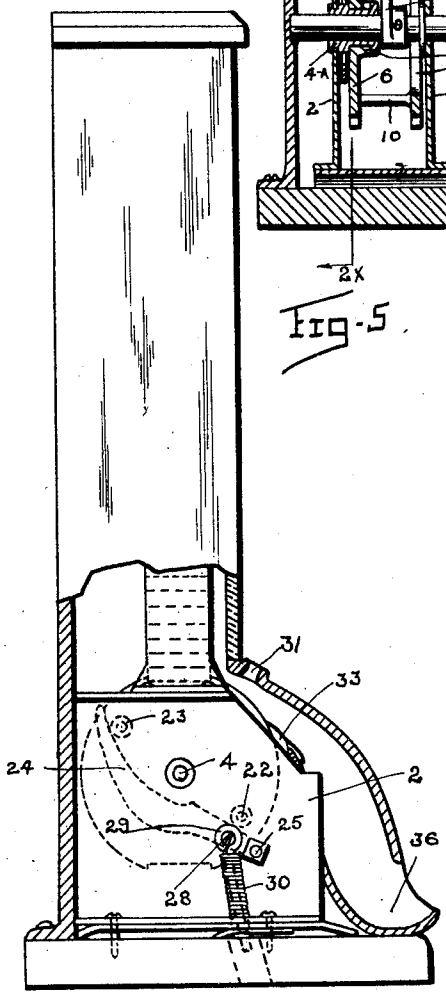



Fig-3

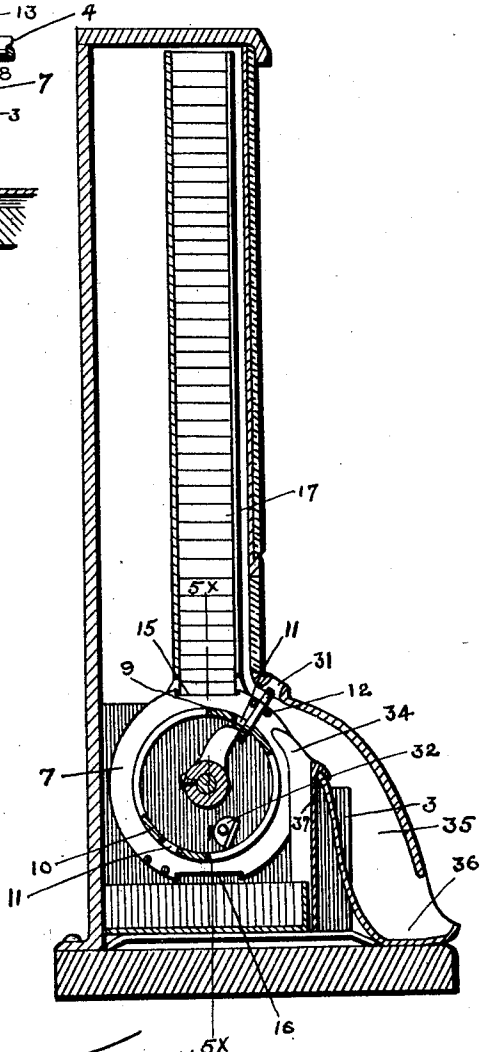



Fig-4

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Patented Mar. 13, 1928. 1,662,472

# UNITED STATES PATENT OFFICE.

HENRY H. PULVER, OF ROCHESTER, NEW YORK, ASSIGNOR OF ONE-FOURTH TO JOSEPH G. BIEHLER, ONE-FOURTH TO EDWARD A. PULVER, AND ONE-FOURTH TO LIBBIE H. PULVER, ALL OF ROCHESTER, NEW YORK.

## VENDING MACHINE.

Application filed October 28, 1922. Serial No. 597,526.

The object of this invention is to provide a new and improved type of vending machine.

This and other objects of this invention will be fully illustrated in the drawing, described in the specification and pointed out in the claims at the end thereof.

In the accompanying drawing:

Figure 1 is a front elevation of the improved vending machine.

Figure 2 is a vertical sectional view of a part of the operating mechanism, the section being taken on the line $2^X$—$2^X$ of Figure 5.

Figure 3 is a side elevation of the vending machine with a portion of the machine broken away and shown in section.

Figure 4 is a vertical sectional view of the vending machine, the section being taken on the line $4^X$—$4^X$ of Figure 1.

Figure 5 is a transverse vertical sectional view of the operating mechanism of the vending machine, the section being taken on the line $5^X$—$5^X$ of Figure 4.

In the several figures of the drawings like reference numerals indicate like parts.

Vending machines are used for the purpose of dispensing small inexpensive articles such as candy, chewing gum and many other commodities preferably such that can be sold for a cent. The machines are usually mounted in places where the public is mose likely to use them because of the convenience which they offer when there is not a store or stand in the immediate vicinity where the same article can be purchased. Because they are not attended a vending machine is usually subjected to much abuse especially by children who make a practice of playing with the mechanism which sooner or later is apt to put it out of commission. It is, therefore, essential in the construction of a vending machine that the mechanism is not only durable but is also fool proof so that no matter how much the machine is abused and tampered with the mechanism will not get out of order.

In the construction of the vending machine forming the subject matter of the present invention this has been given the main consideration with the result that a simple, rugged and infallible operating mechanism has been created.

The mechanism of the machine is surrounded by a suitable housing or casing 1. This mechanism comprises a pair of upright plates 2 and 3 having suitable bearings provided therein in which the shaft 4 is adapted to freely rotate. The bearing in the upright 2 comprises a bushing $4^A$ which is suitably anchored in the upright 2 and projects toward the upright 3. Mounted to freely rotate on the bushing $4^A$ between the uprights 2 and 3 is the feed wheel 5. This feed wheel is made up of a pair of circular flanges 6 and 7 of which the flange 6 has a central 8 hub formed thereon which is mounted to rotate in the groove $4^B$ provided in the periphery of the bushing $4^A$, so that the feed wheel 5 is entirely supported on this bushing and can rotate independently of the shaft 4 without any possible frictional interference between it and the shaft.

The flange 7 is formed by a vertical flat ring which is connected with the flange 6 by the ribs 9 and 10 that hold the flange concentrically to the bushing and shaft 4. The ribs 9 and 10 are located diametrically opposite to each other and each of them has a slot 11 provided therein. The slots 11 are parallel to the shaft 4 and are each adapted to have a coin inserted therein when it is opposite the slot 31. For this purpose the slots 11 are made slightly shorter than the diameter of the coin so as not to let the coin pass therethru but hold it in place therein for a purpose that will presently appear. On both sides of each of the slots 11 is provided a pin 12 which form ledges that help to support the coin in place in the slots and hold it radially to the shaft 4 as illustrated in Figure 4. These pins are supported between the flanges 6 and 7, being suitably fastened therein.

On the shaft 4 and centrally of the flanges 6 and 7 is keyed or otherwise suitably fastened the dog 13. This dog projects radially of the shaft 4 and rotates with it on the rotation of the handle 14 provided on the end of the shaft on the outside of the casing 1. The dog 13 is made to rotate freely within the ribs 9 and 10 of the wheel 5.

The flanges 6 and 7 are provided with a pair of rectangular notches 15 and 16 at diametrically opposite points on the periphery. The notches 15 and 16 of both of the

flanges are adapted successively to be placed under the vertical magazine 17 as will hereinafter be described.

The magazine 17 is supported between the upright plates 2 and 3 at the top thereof so that the wheel 5 can slightly project into the end of the magazine. The magazine is made up of a vertical rectangular tube of which the front is cut away leaving a small flange 18 on each side thereof. The magazine is filled by stacking the articles to be vended into the magazine and this is facilitated by the open front of the magazine because the person filling the machine can take a quantity of the articles between the fingers of one hand and slide the articles into the magazine from the top, keeping hold of the packages thru the open front of the magazine until the package at the bottom rests in the rectangular notches in the periphery of the flanges 6 and 7.

The back 19 of the magazine has a pair of notches 20 and 21 cut into the lower end thereof into which the flanges 6 and 7 respectively are adapted to project. At the front of the magazine the vertical flanges 18 of the magazine are cut short of the flanges 6 and 7 of the wheel 5, leaving a clearance between them for the packages in the magazine to pass out at this point below the flanges 18 on the rotation of the wheel 5, see Figure 1.

Mounted on the left hand side of the wheel 5 are a pair of rollers 22 and 23. These rollers are diametrically in line with the shaft 4 and are equally spaced from it as illustrated in Figures 2 and 3. These rollers are held in a predetermined angular line with the shaft 4 by means of the spring pressed arm 24. This arm is pivoted to the inside of the vertical plate 2 on the stud 25. At a short distance from the stud the arm 24 has a pin 26 mounted thereon and this pin is adapted to project through the slot 27 from the inside to the outside of the vertical plate 2. On the outer end the pin 26 has a head 28 formed on it for the purpose of holding a downwardly projecting lug 29 in place on the pin. This lug projects into the expansion coil spring 30 on the base of the machine, being suitably held in place thereon.

The action of the spring 30 normally forces the arm 24 upwardly against the rollers 22 and 23, and holds them in an angular line with the base of the machine so that the wheel is held against rotation with the rectangular grooves 15 in the flanges 6 and 7 at the top of the wheel and the grooves 16 at the bottom of the wheel or vice versa. This places the rectangular notches at the top in the flanges of the wheel at the bottom of the magazine 17 so that the lowermost package in the magazine rests in the rectangular notches in the periphery of the flanges of the wheel.

To operate the vending machine the wheel 5 must be rotated. For this purpose a connection between the shaft 4 and the wheel 5 must be established. This is done through the medium of the coin that is inserted into the machine by the person wishing to purchase one of the articles vended by the machine. This coin is inserted through a suitable slot 31 in the casing of the machine into the slots 11 provided between the flanges 6 and 7 of the wheel 5 one of which is normally held in line with the slot 31 in the casing. The coin is held in place in the slot 11 and rests against the pins 12. This allows a portion of the coin to project into the inside of the wheel. The coin thus forms a temporary inwardly projecting lug with which the outer end of the dog 13 is adapted to engage on the rotation of the handle 14 to operate the vending machine after a coin has been inserted into it as above pointed out. The dog is rotated alone until it is brought in contact with the coin inserted in the wheel.

On the further rotation of the dog 13 by the shaft 4 and handle 14, the wheel 5 is rotated by the dog forcing the coin held in the slot of the wheel ahead of it. The wheel is rotated in this manner against the force of the expansion spring 30 which forces the lever or arm 24 against the rollers 22 and 23. On the rotation of the wheel by means of the dog 13 the roller 22 is thus forced against the top of the arm 24 which it depresses against the force of the spring 30. This takes place until the roller 22 has been forced past the dead center of the wheel 5. After that the pressure of the expansion spring operates to push up on the roller 22 and in so doing it advances the wheel in the direction of the movement given to the wheel by the dog 13. The force with which this is done increases the speed of the wheel and carries it through the rest of a half turn and this without further motion given to it by the dog 13. To make the coin disengage itself from the slot in the wheel and prevent its sticking therein a lug 32 is mounted on the inside of the vertical plate 3. This lug projects into the inside of the wheel from one side thereof and into the path of the coin that projects into the inside of the wheel from the periphery thereof. As illustrated in Figure 4 the lug 32 has an inclined surface which it presents to the edge of the coin when the coin is brought in contact with it. As the coin is thus moved past the lug 32 by the coin wheel, the edge of the lug acts as a cam surface and gradually forces the coin away from the outer end of the dog 13. When this is done the coin is no longer held tight in the coin wheel so that the coin drops out of the slot 11.

The lug is located near the lower end of the wheel so that when the coin comes in contact with it, it knocks it loose from the

slot and away from the dog 13 with which it makes contact so that the coin will drop out of the slot in the wheel into a suitable container or coin receptacle provided below the wheel 5. When the coin has dropped out of the wheel 5 the connection between the dog 13 and the wheel is severed and the further rotation of the wheel is secured only by the pressure of the arm 24 against the roller 22 after the roller has passed the lower dead center of the wheel and this takes place just after the coin has been knocked out of the wheel as above pointed out.

The wheel is rotated by the arm until one half of a complete revolution has been made by it. The movement is arrested by the arm 24 as soon as the roller 23 located on the wheel diametrically opposite to the roller 22 makes contact with the arm at the point from which the roller 22 originally started its movement. Thus while the roller 22 moves down and past the dead center of the wheel at the bottom, the roller 23 moves up and over the dead center of the wheel at the top which finally brings both of the rollers 22 and 23 into a position which is diametrically opposite to that which they had previously occupied. In this way a reversal of the position of the rollers 22 and 23 takes place every time the machine is operated. The momentum of the wheel given to it by the action of the expansion of the spring 30 through the lever 24 is not great enough to again depress the arm 24 through the roller 23 so that the arm forms a stop for the roller 23 which arrests the movement of the wheel.

During the movement of the wheel 5 as above pointed out the rectangular notches 15, 15 in the flanges 6 and 7 of the wheel are moved from the extreme top of the wheel while the corresponding notches 16, 16 in the flanges of the wheel are moved from the bottom to the top of the wheel so that a reversal of the position of the notches 15 and 16 takes place at the same time the position of the rollers 22 and 23 is reversed. As previously described one pair of notches 15, 15 or 16, 16 is normally placed directly at the bottom of the magazine 17. The article or package at the bottom of the magazine thus rests directly in these grooves and when the wheel is rotated as above pointed out it takes the lowermost of these articles with it and pulls it out from under the stack of the remaining articles contained in the magazine. This is possible because the vertical flanges 18, 18 at each side of the magazine are cut away at the bottom to allow the article at the bottom of the magazine to slide out therefrom at the front thereof. The rear of the magazine slightly projects between the flanges 6 and 7 of the wheel so that the article cannot slide out through the rear of the magazine.

When the wheel is turned to dispense one of the articles contained in the magazine, the article is carried forward by the wheel until it reaches the stripper plates 33 and 34. The ends of these plates project between the flanges 6 and 7 of the wheel so that as the article is carried forward it slides onto the stripper plates which operate to move the article away from the wheel and out of the rectangular notches in the flanges thereof. As soon as this is done the article drops by force of gravity through the duct 35 into the trough 36 where it may be picked up by the person operating the machine.

The coin which has been inserted into the machine to make it operate is carried down between the stripper plates 33 and 34 which for this reason are spaced apart between the flanges 6 and 7 so as not to obstruct the passage of the coin between the stripper plates. In order to prevent the coin from dropping into the trough 36 a partition 37 is provided between the stripper plates 33 and 34 so as to form a vertical channel with them and properly guide the coin into the coin receptacle below the wheel 5 after the coin has been released from the wheel.

As will be seen from an inspection of Figures 2 and 3 the outer portion of the arm 24 is curved forming a depression 40 therein. When, therefore, the rollers 22 and 23 depress the arm they first ride up on the straight section of the arm until they reach their lowermost point on the flange 6 of the wheel. At this point the rollers begin to ride down the curved portion of the arm. The inclined or curved surface of this portion of the arm quickly shifts the direction in which the force of the arm is applied to the periphery of the roller and in doing so operates to force the roller forwardly and assists in rotating the wheel as soon as the roller has passed the lower dead center of the wheel.

The mechanism for turning the wheel remains the same and operates to move one carrier in place under the magazine while the other is withdrawn from under it to deliver one of the articles contained therein.

I claim:

1. In a vending machine, the combination of a magazine, a wheel comprising a pair of flanges mounted to rotate below said magazine, said flanges being connected together by horizontal ribs, each of said ribs having a slot provided therein, a shaft on which said wheel is mounted to freely rotate, a dog keyed to said shaft between said flanges of said wheel, the slots in said ribs being adapted to receive the coin forming a shoulder below said ribs and between said flanges said dog being adapted to make engagement with the shoulder formed by a coin and rotate said wheel on the rotation of such shaft, notches provided in the periphery of said flange adapted to receive, support and con-

vey the articles vended by said vending machine at each turning of said wheel.

2. In a vending machine, the combination of a magazine, a wheel comprising a pair of flanges mounted to rotate below said magazine, means provided on said flanges for supporting and carrying articles delivered from said magazine, said flanges being connected together by horizontal ribs, each of said ribs having a slot formed therein, a pair of pins mounted between said flanges above each of said ribs one on each side of the slots therein and forming supports parallel to the sides of the slots, the slots in said ribs being located below said pins and adapted to support a coin and hold it to project between said flanges to form a shoulder, a dog mounted to rotate independently within said wheel and between said flanges said dog being adapted to engage the coin carried by said wheel and rotate said wheel on the rotation of said dog.

3. In a vending machine, the combination of a pair of vertical sides, a shaft mounted to rotate between said vertical sides, a wheel mounted to rotate on said shaft, a dog keyed to said shaft, means to support a coin on said wheel, said dog being adapted to engage the coin to turn said wheel, a spring pressed arm pivoted on one of said vertical sides, a portion of said arm being straight and the remainder of said arm being curved, a pair of rollers mounted on the side of said wheel, said spring pressed arm being forced against said rollers, said rollers being adapted to first ride over the straight surface of said spring pressed arm on the rotation of said wheel by said dog, and then ride down the curved portion of said lever to force said roller forwardly after a predetermined position thereof and means provided on said wheel to pick up an article and carry it to a predetermined position on the rotation of said wheel.

4. In a vending machine, the combination of an upright, a stationary bushing mounted in one of said uprights, an annular channel formed on the outside of said bushing, a shaft mounted to rotate in said bushing, a dog keyed to said shaft adjacent to said bushing, a feed wheel mounted to independently rotate on the periphery of said bushing within said annular channel, means provided on said feed wheel to support a coin thereon and hold it projected into the path of said dog, said feed wheel being adapted to be rotated on the rotation of said shaft by the engagement of said dog with a coin held in place in said feed wheel.

5. In a vending machine, the combination of an upright, a bushing mounted stationary in said upright, a shaft mounted to freely rotate in said bushing, a dog keyed to said shaft adjacent to said bushing, a bearing formed on the periphery of said bushing, a feed wheel mounted to independently rotate on the bearing of said bushing, a collar on the outside of said bearing to prevent frictional contact of said feed wheel with said dog, means adapted to support a coin in said feed wheel and hold it projected into the path of said dog and form a shoulder on said feed wheel through which said feed wheel can be rotated on the engagement therewith by said dog.

6. In a vending machine, the combination of a shaft, a stationary bushing adapted to form bearing for said shaft, said bushing having an annular channel formed on the periphery thereof, a feed wheel mounted to rotate on said bushing in said annular channel, said feed wheel having means to carry a coin, means carried by said shaft to engage the coin carried by said feed wheel to connect said shaft with said feed wheel, to give said feed wheel additional movement, means to automatically continue said movement into a predetermined position, and means on said feed wheel to receive an article, the said feed wheel being constructed to drop the coin and article at different predetermined points during the rotation of said feed wheel.

7. The combination in a vending machine of a combined coin wheel and feeding wheel comprising a pair of flanges, ribs having slots formed in them, said ribs connecting said flanges, a coin adapted to be supported in the slots of said ribs, supports provided on the periphery of said combined coin wheel and feeding wheel adapted to receive articles to be vended by said vending machine, a dog mounted to idly rotate within said feeding wheel and said coin wheel, said dog being adapted to rotate said coin and feeding wheel on the insertion of a coin that will connect said dog with said feeding wheel.

In testimony whereof I affix my signature.

HENRY H. PULVER.