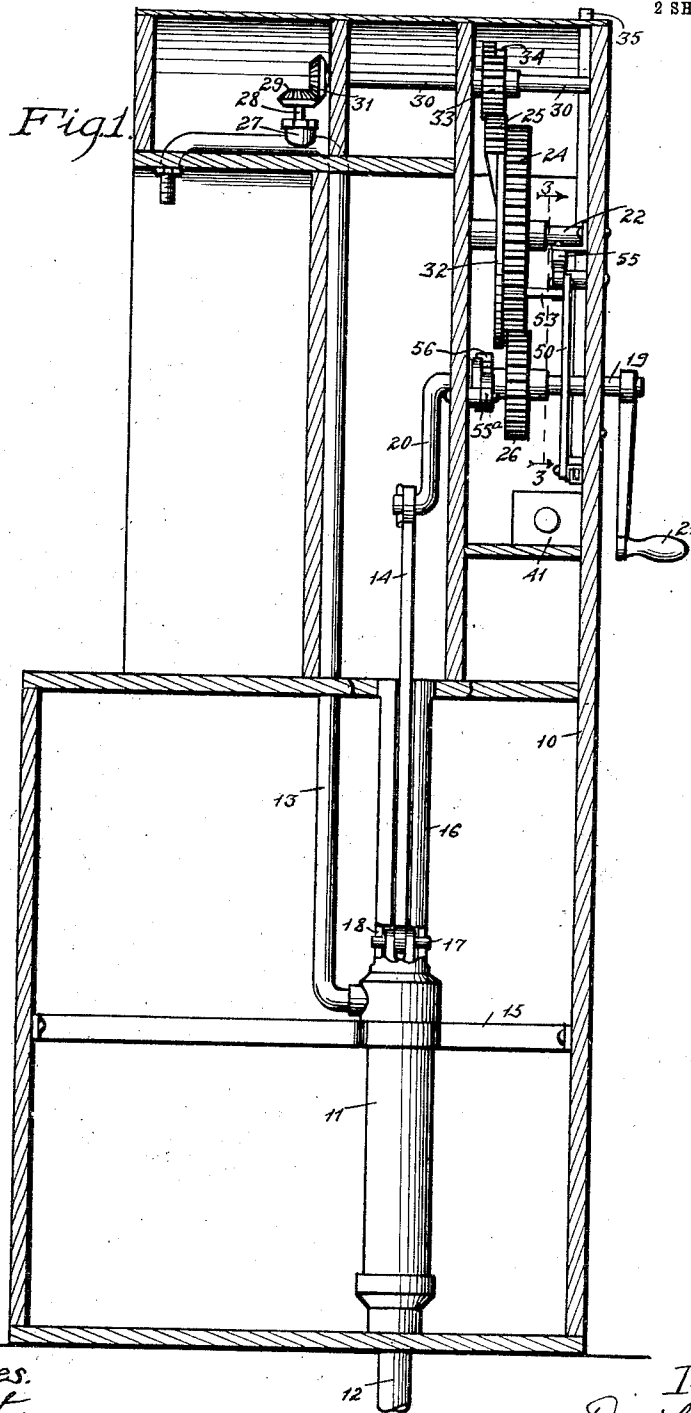


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LIQUID VENDING DEVICE.
APPLICATION FILED NOV. 15, 1911.

1,044,663.

Patented Nov. 19, 1912.

2 SHEETS—SHEET 1.



Witnesses.
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LIQUID-VENDING DEVICE.

1,044,663.

Specification of Letter Patent.

Patented Nov. 19, 1912.

Application filed November 15, 1911. Serial No. 660,457.

To all whom it may concern:

Be it known that I, DAVID KEPFORD, a citizen of the United States, residing at Early, in the county of Sac and State of Iowa, have invented a certain new and useful Liquid-Vending Device, of which the following is a specification.

The object of my invention is to provide a liquid vending machine so constructed and arranged that when a coin is placed in a receiving device certain mechanism may be operated and a predetermined amount of liquid delivered from the machine.

A further object is to provide such a machine in connection with a pump and a storage tank so constructed that when the coin is placed in place in the machine the pump may then be operated to make a certain predetermined number of strokes, and to draw a certain predetermined amount of liquid from the storage tank or the like.

A further object is to provide a discharge tube and means for controlling the flow therefrom and to provide mechanism whereby a flow from the discharge tube is permitted while the pump is being operated and at no other time.

My invention consists in certain details in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawings, in which—

Figure 1 shows a central, vertical, sectional view of the liquid vending machine embodying my invention. Fig. 2 is a central, vertical, sectional view of said machine taken at right angles to the view shown in Fig. 1, and Fig. 3 shows a detail, sectional view taken on the line 3—3 of Fig. 1.

In the accompanying drawings, I have used the reference numeral 10 to indicate the walls of the casing in which my machine is contained. The walls 10 may be of any suitable material and may be varied in material and form to suit the circumstances of each case. Within the walls 10 of the casing is a pump of any suitable construction having an ordinary cylinder 11 with

which is connected a supply pipe 12 and a discharge pipe 13. Pivoted to the outer end of the piston rod is an arm 14. The cylinder 11 is mounted in the bracket 15 which is secured in turn to the walls 10. A tube 16 is connected with the upper end of the cylinder 11. The arm 14 and the piston rod are pivotally connected by means of the bolt 17 which extends to each end to points spaced apart from said rod and arm. The ends of the bolt 17 travel in oppositely located vertical slots 18 in the tube 16. By means of the guides formed by said vertical slots 18, the piston arm is held in a true path and is held against lateral movement with relation to the cylinder 11. The sides of the tube 16 are vertically slotted to permit lateral play of the arm 14.

Rotatably mounted in the wall 10 in a suitable position is a shaft 19, one end of which is bent to form a crank 20, the free end of which is pivotally mounted on the end of the arm 14. On the other end of the shaft 19 is a crank handle 21. The pump is operated by means of the crank handle 21 and the mechanism connected therewith as heretofore described. A shaft 22 is rotatably mounted in the wall 10 of the casing. Mounted on the shaft 22 is a wheel 23 which is of sufficient thickness for the construction now to be described. The outer circumference of the wheel 23 for part of its thickness only, is provided with teeth 24, and the other part of the outer circumference is smooth, as shown in Figs. 1 and 2, said smooth portion being indicated by the reference numeral 32. The smooth portion 32 is provided with teeth 25 over a short part thereof. On the shaft 19 is mounted a gear wheel 26 which is in mesh with the teeth 24. The pump cylinder is of such a size and the stroke of such a length, and the gear 26 and the wheel 23 are such a relative size that when a single revolution of the wheel 23 has taken place, the pump has been operated a sufficient number of strokes to draw a predetermined amount of liquid from a storage tank. Near the outer end of the discharge tube 13 is a valve 27 provided with a stem 28 on the end of which is a beveled

gear 29. The valve 27 may be of any desired construction whereby the purposes may be accomplished.

In order to open the valve 27 while the pump is in operation and to close the same when the pump is not being operated, I have provided the following mechanism: A shaft 30 is mounted in the wall 10. On one end of the shaft 30 is a beveled gear 31 in mesh with the beveled gear 29. Mounted on the shaft 30 is a pinion 33 which in one position of the rotation of the wheel 23 is in mesh with the teeth 25. The pinion 33 is provided at one portion of its circumference with the flat portion 34. The flat portion 34 extends over a part only of the thickness of the pinion 33 and as the wheel 23 and the pinion 33 revolves, the smooth portion 34 rests and slides upon the smooth portion 32. The teeth 25 are of greater width than the smooth portion 32 and when adjacent to the pinion 33 they engage the teeth thereon. The valve 27 and the mechanism connected therewith including the pinion 33 and the wheel 23 are so proportioned and arranged, that the valve 27 is closed during the time that the middle teeth 25 are in mesh with the pinion 33 and said valve is open when the smooth portion 34 slides upon the smooth portion 32. It will thus be seen that the valve 27 is open during the larger part of each revolution of the wheel 23.

For controlling the above described mechanism by means of a coin, I have provided the following parts: Mounted in the upper portion of the walls 10 is a substantially vertical flat tube 35 of proper size to receive a coin of the desired denomination. Below the tube 35 is a box 36 which is provided with a hinged lid 37. In the hinged lid 37 is an opening 38 immediately below the tube 35 which receives the coin dropped through said tube. The box 36 is sufficiently narrow to hold the coin which is indicated in the drawing by the numeral 39 in upright position. The box 36 is of sufficient depth at the point under the tube 35 to properly hold the coin 39 when the lid 37 is closed. The end of the box 36 at the free end of the lid 37 is open. Beneath the box 36 is a coin receptacle 41. The other end of the box 36 is also open and inserted therein is a push device 42 whereby the coin 39 is pushed out of the box 36. Pivotally mounted at a suitable point is a bell crank lever 42^a at one end of one arm of which is formed a handle 43 which extends to a point outside the walls 10. The push device 42 is pivoted to the other arm of said bell crank lever. By moving the handle 43 downwardly the push device 42 is operated to force the coin 39 toward the free end of the lid 37 and out of the box 36. The box 36 is of less depth near the free end of the lid 37 than under the

tube 35, so that when the coin 39 is moved to the small end of said box the lid 37 is forced upwardly.

In order to move the push device 42 quickly and fully to its opposite limits of movement, I have mounted on a cross portion 44 of the frame of my device an extension coil spring 46. Mounted in said coil spring is a short rod 45. A link 47 is pivotally connected at one end with said short rod 45 and at the other end with the push device 42. The coil spring 46 is so located with relation to the push device 42 that at one limit of the movement of said push device, the link 47 extends upwardly and away from the box 36 and at the other limit of movement of the push device 42, the link 47 extends upwardly and toward the box 36. It will thus be seen that when the push device 42 passes the central point of its movement in either direction, the spring 46, the rod 45 and the link 47 tend to force the push device 42 quickly to the limit of its movement. In order to hold the push device 42 in a true path said push device travels on the pin 49, mounted in the sides of the box 36. For holding the arm 42 in its raised position, ready to move the coin 39, I have provided a contractible coil spring 57. To prevent the operation of the pump of the crank handle 21, in any direction except to turn the wheel 23 in the direction indicated by the arrow shown on said wheel, I have provided a ratchet 55^a on the shaft 19, and a double pawl 56 on the frame of the device.

In order to hold the pump normally locked and to release the same when a coin has been inserted in the device, and pushed out of the box 36, I have provided the following mechanism: Pivotaly secured to the lid 37 near its free end is an arm 50. Centrally pivoted on the frame of the device near the wheel 23 is a swinging pawl 51. Near one end of the swinging pawl 51 is formed a notch 52. Extending laterally from the wheel 23 is a lug 53 which in one position of the movement of the pawl 51 and of the wheel 23 is received in the notch 52 and engages said pawl. The upper end of the arm 50 is pivotally secured to one end of the pawl 51 near the notch 52, and is so arranged that when it is moved upwardly by the movement of the lid 37, it moves the pawl 51 out of engagement with the lug 53. Extending upwardly from the central part of the pawl 51 is a lug 54. For holding the pawl 51 in different positions of its movement, I have mounted on the casing a spring 55 in engagement with the lug 54. The spring 55 is bent to form alternate notches in which the lug 54 is received. When the pawl 51 is in horizontal position as shown in Fig. 2, with neither end raised, the lug 54 is held in one of the notches of the spring 55

When the end of the pawl 51 is raised by the arm 50, the lug 51 slides into another notch of the spring 55 and the pawl 51 is held by said spring in its then position.

5 When the pawl 51 is in its position last mentioned, and the wheel 23 is rotated in the direction indicated by the arrow in Fig. 2, the lug 53 engages the lower side of the pawl 51 and moves it to position where it will engage the notch 52 when the wheel 23 has made one complete revolution.

The practical operation of my improved liquid vending-machine is as follows: The machine is normally locked against operation by the pawl 51 and the lug 53. It cannot be set in motion until a coin has been dropped through the tube 35 into the box 36. When the coin is in said box, the lever 43 is moved and the coin is forced out of the box into the receptacle 41. As the coin is moved toward the free end of the lid 37 that end is raised and the arm raises the pawl 51 out of engagement with the lug 53. The pawl is held in its position out of said engagement by the notches of the spring 55. The operator can at his leisure turn the crank handle 21 and pump liquid from the storage tank into the discharge pipe 13. As the wheel 23 moves in the direction indicated by the arrow, indicated in Fig. 2, the lug 53 passes under the lower end of the pawl 51 and moves said pawl to position where it will engage the lug 53. After one full revolution of the wheel 23, the lug 53 engages the notch 52 in the pawl 51 and the machine is then locked until another coin is inserted in the tube 35. The parts are so proportioned and arranged that during one revolution of the wheel 23 a predetermined amount of liquid will be moved by the pump. The parts are also so proportioned and arranged that when the wheel 23 is locked the middle ones of the teeth 25 are in mesh with the pinion 33 and the valve 27 is closed. As the wheel 23 is revolved, the valve 27 is opened by means of the mechanism hereinbefore described, and is held open while the smooth portion 34 slides on the smooth portion 32. When the wheel 23 reaches the proper point of its movement, the teeth 25 are engaged by the teeth on the pinion 33 adjacent to the smooth part 34 and the valve 27 is closed when the lug 53 is again engaged by the pawl 51.

My improved liquid vending machine may be used for many purposes, but is especially designed for the sale of gasoline to automobile drivers. It has many advantages among which are its adaptability for use with a storage tank of any size. Another advantage lies in the construction of the parts whereby the outlet valve is open when the pump is in operation and is closed when the pump is locked.

I claim as my invention;

1. In a device of the class described, a frame, a pump, a shaft, a crank arm thereon operatively connected with said pump, a gear wheel on said shaft, a second shaft, a gear wheel thereon in mesh with said first gear wheel, an arm on said second gear wheel, a pawl centrally pivoted on said frame and hanging normally in horizontal position, said pawl being provided with a notch designed to receive and engage said arm.

2. In a device of the class described, a frame, a pump, a shaft, a crank arm thereon operatively connected with said pump, a gear wheel on said shaft, a second shaft, a gear wheel thereon in mesh with said first gear wheel, an arm on said second gear wheel, a pawl centrally pivoted on said frame and hanging normally in horizontal position, said pawl being provided with a notch designed to receive and engage said arm, a lug on said pawl, a spring fixed on said frame provided with notches designed to receive said lug in different positions of the movement of the pawl.

3. In a device of the class described, a frame, a pump, a shaft, a crank arm thereon operatively connected with said pump, a gear wheel on said shaft, a second shaft, a gear wheel thereon in mesh with said first gear wheel, an arm on said second gear wheel, a pawl centrally pivoted on said frame and hanging normally in horizontal position, said pawl being provided with a notch designed to receive and engage said arm, a lug on said pawl, a spring fixed on said frame provided with notches designed to receive said lug in different positions of the movement of the pawl, means for moving said pawl away from position in engagement with said arm.

4. In a device of the class described, a frame, a pump, a shaft, a crank arm thereon operatively connected with said pump, a gear wheel on said shaft, a second shaft, a gear wheel thereon in mesh with said first gear wheel, an arm on said second gear wheel, a pawl centrally pivoted on said frame and hanging normally in horizontal position, said pawl being provided with a notch designed to receive and engage said arm, a lug on said pawl, a spring fixed on said frame provided with notches designed to receive said lug in different positions of the movement of the pawl, means for moving said pawl away from position in engagement with said arm, and means for rotating said first shaft.

5. In a device of the class described, a frame, a pump, a shaft, a crank arm thereon operatively connected with said pump, a gear wheel on said shaft, a second shaft, a gear wheel thereon in mesh with said first

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gear wheel, an arm on said second gear wheel, a pawl centrally pivoted on said frame and hanging normally in horizontal position, said pawl being provided with a notch designed to receive and engage said
5 arm, a discharge pipe, a valve therein, means whereby said valve is opened when the pump is being operated, and closed when the pump is not being operated.
Des Moines, Iowa, August 17, 1911.
DAVID KEPFORD.
Witnesses:
W. P. BAIR,
M. WALLACE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."