Oct. 4, 1932. H. R. BRAND 1,880,753

DISPENSING MECHANISM

Filed Nov. 30, 1928 2 Sheets-Sheet I

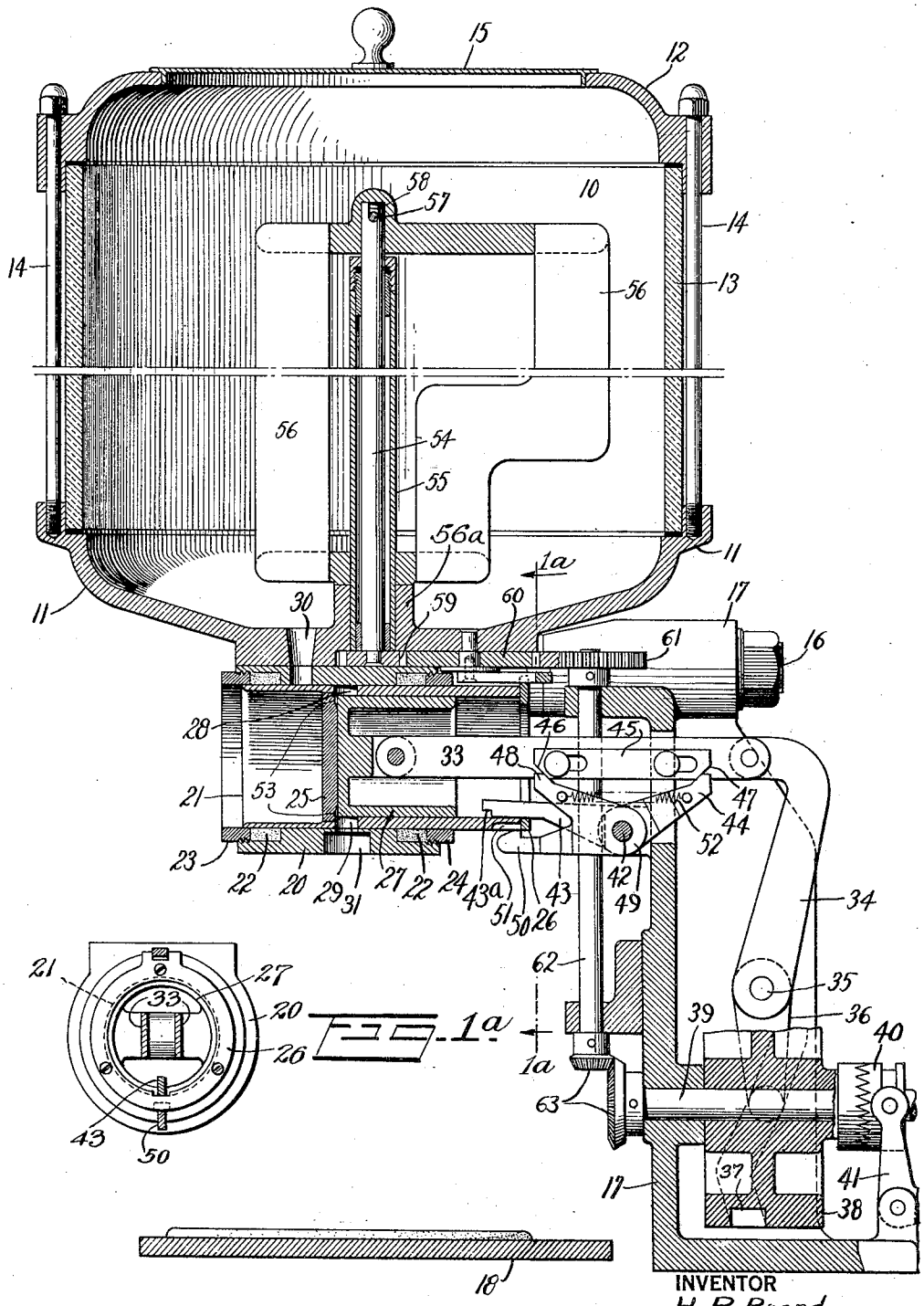


FIG. 1a

FIG. 1

INVENTOR
H. R. Brand
BY
ATTORNEY

Oct. 4, 1932. H. R. BRAND 1,880,753

DISPENSING MECHANISM

Filed Nov. 30, 1928 2 Sheets-Sheet 2

Fig. 2.

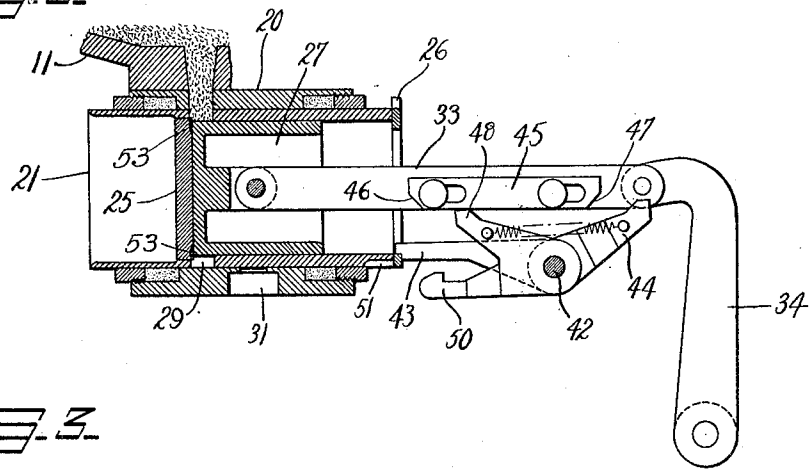


Fig. 3.

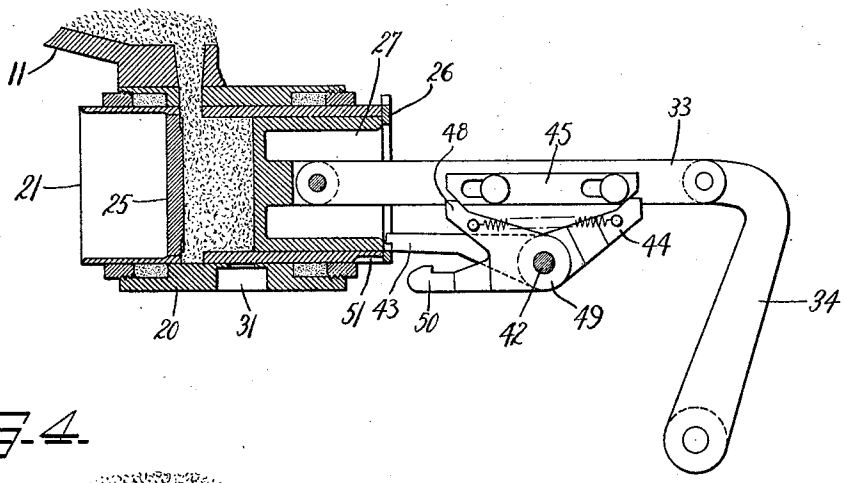
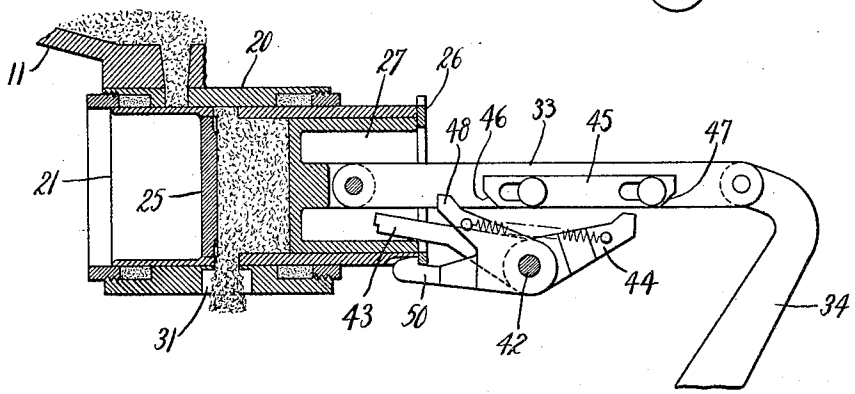


Fig. 4.



INVENTOR
H. R. Brand
BY
ATTORNEY

Patented Oct. 4, 1932

1,880,753

UNITED STATES PATENT OFFICE

HARRY RUSSELL BRAND, OF NEW YORK, N. Y.

DISPENSING MECHANISM

Application filed November 30, 1928. Serial No. 322,874.

My invention relates to dispensing mechanism and particularly to means for dispensing measured volumes of material from a suitable receptacle.

An object of the invention is to provide a valve mechanism which will withdraw a fluid from a reservoir in portions of uniform volume regardless of the head of fluid in the reservoir.

Another object is to provide a valve which at each operation will withdraw by suction a measured portion from a reservoir and then positively discharge such portion.

A further object of the invention is to provide in association with the valve mechanism, means for agitating the contents of the reservoir so that the portions withdrawn from the reservoir will be of a substantially uniform specific gravity.

My invention is particularly adapted for use in an automatic griddle cake machine of the type disclosed in my co-pending application, Serial No. 299,582, filed August 14, 1928, and has for a specific object to provide means for withdrawing batter from a reservoir in portions of uniform volume and specific gravity and discharging the same upon a griddle.

With the above named objects in view and others which will appear hereinafter I shall now describe a preferred embodiment of my invention and shall thereafter point out the novelty and scope of the invention in the claims.

In the accompanying drawings:

Figure 1 is a view in vertical section through a batter reservoir equipped with my improved dispensing mechanism;

Figure 1*a* is a fragmental view in section taken on the line 1*a*—1*a* of Fig. 1; and

Figs. 2 to 4 respectively are fragmentary sectional views of the dispensing mechanism shown in successive positions.

As clearly shown in Fig. 1 the batter reservoir 10 comprises a base portion 11 and a top flange 12 which fit respectively upon opposite ends of a cylinder 13, the latter being preferably of glass. Headed tie rods 14 pass through lugs in the flange 12 and are screwed into lugs in the base portion 11, thus tying the parts together. A lid 15 serves to close an opening in the flange member 12 through which access may be had to the interior of the reservoir. The reservoir is secured by means of bolts 16 to a bracket 17 in such position as to overlie a griddle 18. The latter is preferably arranged to rotate with a step by step movement, by mechanism of the type fully illustrated in said copending application.

Secured to the bottom of the reservoir 10 is a cylindrical valve casing 20, the axis of the cylinder being transversely disposed with respect to the axis of the reservoir. A sleeve valve 21 is fitted to slide in the cylindrical casing. At each end of the casing there is a packing 22 of suitable material which is compressed by nuts 23 and 24 to provide a seal between the sleeve valve and the casing. The sleeve valve is provided with a transverse diaphragm 25 rigidly secured thereto and located at a short distance from the outer end of the valve, i. e., from the left hand end, as viewed in Fig. 1. The opposite end of the sleeve valve has a flange ring 26 secured thereto. This flange ring overlaps the inner wall of the sleeve valve forming a lip or shoulder. Within the sleeve valve is fitted a hollow or skirted piston valve 27 which slides between the lip of the flange ring 26 and the diaphragm 25. The piston valve is mechanically reciprocated with a stroke that is greater than that allowed between the diaphragm 25 and flange 26. Thus the piston has a certain amount of lost motion, but near the end of its forward stroke will advance the sleeve valve by bearing against the diaphragm 25 and near the end of its return stroke will withdraw the valve by bearing against the flange 26. As will be explained hereinafter, the lost motion of the piston 27 determines the volume of material withdrawn from the reservoir and delivered to the griddle.

In the top of the sleeve valve there is an inlet port 28 and at the bottom an outlet 29. These ports are immediately adjacent the diaphragm 25 on the piston side thereof. In the base portion 11 of the reservoir there is a port 30 which opens through the valve casing 20, and similarly in the bottom of the valve casing 20 there is a discharge port 31.

Ports 30 and 31 while disposed on opposite sides of the valve casing are nevertheless off set in the axial direction of the casing and their position in such that when the sleeve valve is moved by the plunger 27 to its extreme forward position, the port 28 will register with port 30, and when the sleeve valve is withdrawn to its extreme inner position the port 29 will register with the port 31.

A piston rod 33 connects the piston 27 to one arm 34 of a lever which is fulcrumed at 35 on the bracket 17. The other arm 36 of the lever carries a roller which engages a cam groove 37 in a drum cam 38. The latter is journaled upon a drive shaft 39 which rotates in a suitable bearing in the bracket 17. A clutch 40 is provided for coupling the cam 38 to the shaft 39 whenever desired, so as to cause the piston valve 27 to reciprocate and dispense batter from the reservoir 10. This clutch may be operated by any suitable means, such as a yoke lever 41, as shown in Fig. 1, to start and stop the dispensing valve.

Mounted on a stud 42, carried by the bracket 17, is a lever 43, one arm of which is formed with a notch 43*a* adapted to engage the flange ring 26 when the sleeve valve has been moved to its outermost position (see Fig. 2). The other arm 44 of the lever is adapted to engage a cam plate 45 carried by the piston rod 33. This plate has pin-and-slot connection with the piston rod 33 and hence is allowed a limited movement in the axial direction of the piston rod. The plate 45 is provided at opposite ends with inclined cam faces 46 and 47 respectively. The arm 44 is adapted to be engaged by the cam face 47 while the cam face 46 is adapted to engage an arm 48 of a bell crank lever 49. The other arm of lever 49 terminates in a hook 50 which is adapted to hook under the flange ring 26. As clearly shown in the drawings, the sleeve valve 21 is formed with a slot 51 on its underside adjacent the flange ring 26, to receive the hook 50. A spring 52 connects the arm 48 to the arm 44, thus resiliently tying the two levers together.

The operation of the valve mechanism is as follows: Assuming the parts to be in the position shown by Fig. 1, which position they will occupy normally, the clutch 40 is thrown causing the cam 38 to rotate, and the latter will cause the piston to reciprocate. The piston will first move forward, or to the left as shown in the drawings, and by pressing against the diaphragm 25 will bring the port 28 into alinement with the port 30, as shown in Fig. 2. The batter from the reservoir may then flow down into the port 28, but will be prevented by the piston valve 27 from entering the sleeve valve 21. During the advance of the piston valve the plate 45 rode over and depressed the arm 48 stretching spring 52 and thereby exerting a downward pressure on the notched arm 43, so that as soon as the sleeve valve reached the end of its forward stroke and the flange ring 26 cleared the shoulder 43*a*, the arm 43 snapped into engagement with the flange ring, latching it in the position shown in Fig. 2. Thus latched the sleeve valve remains with its port 28 in register with port 30, while the piston valve is moving back on the initial portion of its return stroke. During the piston movement batter will be drawn into the sleeve valve by suction, entirely filling the space between diaphragm 25 and piston valve 27. By the time the piston reaches the position shown in Fig. 3, the arm 44 will be depressed by the cam face 47 of the plate 45, lifting the arm 43 out of engagement with the flange ring 26. The parts are now in the position shown in Fig. 3. Further movement of the piston will cause the sleeve valve to be retracted by engagement of the piston with the lip of the flange member 26. At the same time cam face 47 will swing the arm 43 upward sufficiently to ride upon the skirt of the piston valve and by reason of the spring 52 the hook 50 will be raised into position to engage the flange ring. When the piston reaches its inner position the port 29 is brought into alinement with the port 31 and the batter in the sleeve valve is then free to discharge through said alined ports. In this position, as shown in Fig. 4, the hook 50 enters the slot 51 and snaps into engagement with the flange ring 26, so that on the return stroke of the piston to the position shown in Fig. 1 the sleeve valve is latched against forward movement and the batter between the piston and the diaphragm 25 will be positively forced out by the advancing piston. To prevent trapping batter between the piston and the diaphragm 25 the inner face of the latter slightly overlaps the ports 28 and 29 and is formed with shallow recesses 53 leading to said ports.

In order to insure a perfect mixture of batter and to dispensing portions which will be uniform not only in volume but in quality as well, I provide an agitator within the reservoir which preferably is continuously driven by the shaft 39. Centrally disposed in the reservoir is a vertical shaft 54 journaled in a fixed sleeve 55. The latter is secured to and projects inwardly from a central boss 56*a* formed on the base portion 11 of the reservoir. Mounted to rotate on the sleeve 55 is the agitator, comprising a pair of paddle members 56 suitably connected together at the top and bottom, the lower portion resting upon the boss 56*a* while the upper portion is supported upon the upper end of the shaft 54 which projects from the sleeve 55. A pin 57 in the agitator engages a slot 58 in the shaft thus keying the agitator to the shaft. Obviously, the agitator may be withdrawn from the reservoir by simply lifting it out of engagement with the shaft 54

and the sleeve 55. The lower end of the shaft 54 projects through the base portion 11 and has keyed thereon a pinion 59 which, through an idler 60, is driven by a pinion 61. The latter is mounted on the upper end of a vertical shaft 62, suitably journaled in the bracket 17. The lower end of shaft 62 is operatively connected to the drive shaft 39 by a pair of bevel gears 63. Thus shafts 39 and 54 are geared together and the agitator is constantly revolved, keeping the batter properly stirred.

As explained in said copending application in which a griddle cake making and dispensing machine was fully described, this apparatus is particularly adapted for use in restaurants where cakes are made on order so that the dispensing mechanism is operated intermittently. It is desirable, however, that the agitator be operated continuously regardless of operation of the dispensing valve, so that the batter will always be in condition to be dispensed.

It will be clear from the above description that I have provided a valve mechanism for dispensing fluid material in which the fluid head is not a factor, for gravity alone is not depended upon to fill the measuring valve. Whether the reservoir is partly filled or almost empty, each retraction of the piston 27 will withdraw a measured amount of batter from the reservoir by suction and upon the return stroke of the piston said measured amount will be positively forced out and deposited upon the griddle.

While I have described in detail a specific embodiment of my invention it will be understood that this has been done by way of illustration and does not constitute a limitation of my invention, either as to construction or as to the kind of material dispensed. Obviously many changes may be made in form, construction and arrangement of parts without departing from the scope of my invention as pointed out in the claims.

I claim:

1. A dispensing mechanism comprising a fluid reservoir, a measuring valve alternately movable between an in-take position in communication with the reservoir and a discharge position, a piston reciprocable in the valve to draw fluid from the reservoir when the valve is in in-take position and to displace fluid from the valve when the valve is in discharge position, and means providing positive engagement of the valve by the piston during a part of each stroke thereof to move the valve positively from one to the other of said positions, said means comprising fixed co-engaging surfaces on the valve and the piston respectively.

2. A dispensing mechanism comprising a fluid reservoir, a measuring valve alternately movable between an in-take position in communication with the reservoir and a discharge position, a piston reciprocable in the valve to draw fluid from the reservoir when the valve is in in-take position and to displace fluid from the valve when the valve is in discharge position, means providing positive engagement of the valve by the piston during a part of each stroke thereof to move the valve positively from one to the other of said positions, said means comprising fixed co-engaging shoulders on the valve and the piston respectively and means for holding the valve stationary during the rest of each piston stroke.

3. A dispensing mechanism comprising a fluid reservoir, a measuring valve alternately movable between an in-take position in communication with the reservoir and a discharge position, a piston reciprocable in the valve to draw fluid from the reservoir when the valve is in in-take position and to displace fluid from the valve when the valve is in discharge position, and latch mechanism for holding the valve stationary in each of said positions, and means for releasing the latch mechanism in timed relation to movements of the piston.

4. A dispensing mechanism comprising a casing formed with an inlet port and an outlet port, a valve slidable in the casing to alternately uncover said ports, a piston in the casing and adapted to slide the valve but having lost motion with respect to the valve, and positive latching means for holding the valve stationary during lost motion of the piston.

5. A dispensing mechanism comprising a casing formed with an inlet port and an outlet port, a sleeve valve slidable in the casing to uncover said ports alternately, a piston in the valve and adapted to slide the latter, the piston having lost motion in the valve, and positive latching means for holding the valve stationary during lost motion of the piston.

6. A dispensing mechanism comprising a cylindrical casing formed with an inlet port and an outlet port, a transverse diaphragm slidable in the casing, a piston reciprocable in the casing and adapted to move the diaphragm from one port to the other and vice versa, said piston having lost motion with respect to the diaphragm, and positive latching means for holding the diaphragm stationary during lost motion of the piston.

7. A dispensing mechanism comprising a casing formed with an inlet and an outlet port, a sleeve valve slidable in the casing, a transverse diaphragm in the sleeve valve, a stop on the valve spaced from the diaphragm, a piston in the valve adapted to reciprocate the same by alternately bearing against said diaphragm and said stop but having lost motion therebetween, the valve being apertured adjacent the diaphragm and on the piston side thereof to register alternately with the inlet and outlet ports at opposite extreme

movements of the valve, and means for holding the valve stationary during lost motion of the piston.

8. A dispensing mechanism comprising a casing formed with an inlet and an outlet port, a sleeve valve slidable in the casing, a transverse diaphragm in the sleeve valve, a stop on the valve spaced from the diaphragm, a piston in the valve adapted to reciprocate the same by alternately bearing against said diaphragm and said stop but having lost motion therebetween, the valve having ports adapted to register alternately with said inlet and outlet ports at opposite extreme movements of the valve, and means for holding the valve stationary during lost motion of the piston.

9. A dispensing mechanism comprising a casing formed with an inlet port and an outlet port, a sleeve valve slidable in the casing, a transverse diaphragm in the sleeve valve, a stop on the valve spaced from the diaphragm, a piston in the valve adapted to reciprocate the same by alternately bearing against said diaphragm and said stop, but having lost motion therebetween, the valve having ports adapted to register alternately with said inlet and outlet ports at opposite extreme movements of the valve, and latch mechanism controlled by the piston for holding the valve against movement during said lost motion.

10. A dispensing mechanism comprising a casing formed with an inlet port and an outlet port, a sleeve valve slidable in the casing, a transverse diaphragm in the sleeve valve, a stop on the valve spaced from the diaphragm, a piston in the valve adapted to reciprocate the same by alternately bearing against said diaphragm and said stop but having lost motion therebetween, the valve having ports adapted to register alternately with said inlet and outlet ports at opposite extreme movements of the valve, latch mechanism for holding the valve stationary, and cam means connected with the piston for applying the latch mechanism at the end of each stroke of the valve, and releasing the latch mechanism at the end of the lost motion interval of each piston stroke.

11. A dispensing mechanism comprising a cylinder formed with an inlet port and an outlet port, a piston reciprocable in the cylinder with a stroke greater than the axial distance between said ports, a sleeve valve interposed between the piston and the cylinder, said sleeve valve having a transverse wall adapted to be engaged by the piston during a part of one stroke thereof and having also a flange adapted to be engaged by the piston during a part of the opposite stroke thereof, the valve being formed with an inlet port and an outlet port immediately adjacent the inner face of the wall, the spacing of the wall and flange being such that at the end of one stroke of the piston the inlet ports of the casing and the valve will be brought into registry and at the end of the opposite stroke the outlet ports will be brought into registry, a latch for holding the valve in inlet position during lost motion of the piston away from said wall, a second latch for holding the valve in outlet position during lost motion of the piston toward said wall, and cam means operating said latches in timed relation to the movement of the piston.

12. A dispensing mechanism comprising a cylinder formed with an inlet port and an outlet port, a piston reciprocable in the cylinder with a stroke greater than the axial distance between said ports, a sleeve valve interposed between the piston and the cylinder, said sleeve valve having a transverse wall adapted to be engaged by the piston during a part of one stroke thereof and having also a flange adapted to be engaged by the piston during a part of the opposite stroke thereof, the valve being formed with an inlet port and an outlet port immediately adjacent the inner face of the wall, the spacing of the wall and flange being such that at the end of one stroke of the piston the inlet ports of the casing and the valve will be brought into registry and at the end of the opposite stroke the outlet ports will be brought into registry, a pair of latch levers adapted respectively to hold the valve during lost motion of the piston, a spring urging the levers into latching position, and means for positively releasing said latches alternately in timed relation to the movement of the piston.

13. A dispensing mechanism comprising a casing formed with an inlet port and outlet port, a sleeve valve slidable in the casing, a transverse diaphragm in the valve, a flange also carried by the valve, a piston in the valve having lost motion between the diaphragm and the flange, the valve being formed with ports adjacent the diaphragm and adapted to register alternately with said inlet and outlet ports, the valve being moved by said piston to register with said ports, latch levers adapted to engage the valve and hold the same against movement during lost motion of the piston, a piston rod for actuating the piston, and a cam on the piston rod adapted to engage the latch levers and effect positive release thereof in timed relation to the movement of the piston.

14. A dispensing mechanism comprising a fluid reservoir, a measuring valve alternately movable between an intake position in communication with the reservoir and a discharge position, a piston reciprocable in the valve to draw fluid from the reservoir when the valve is in intake position and to displace the fluid from the valve when the latter is in discharge position, means providing positive engagement of the valve by the piston during a part of each stroke thereof to move the

valve positively from one to the other of said positions, said means comprising fixed co-engaging shoulders on the valve and the piston respectively, a piston operating means, a drive shaft, and a clutch for operatively connecting the piston operating means to the drive shaft at will.

15. A dispensing mechanism comprising a fluid reservoir, a measuring valve alternately movable between an intake position in communication with the reservoir and a discharge position, a piston reciprocable in the valve to draw fluid from the reservoir when the valve is in in-take position and to displace the fluid from the valve when the latter is in discharge position, means on the valve engaging the piston during a fixed part of each stroke thereof to move the valve from one to the other of said positions, a piston operating means, a drive shaft, a clutch for operatively connecting the piston operating means to the drive shaft at will, an agitator in the reservoir, and means operatively connecting the agitator to the drive shaft to cause continuous agitation of the fluid in the reservoir.

In testimony whereof, I have signed this specification.

HARRY RUSSELL BRAND.