Dec. 9, 1924. 1,518,864

A G McGALIN

FLUID DISPENSING PUMP

Filed June 9, 1922

Fig. 1.

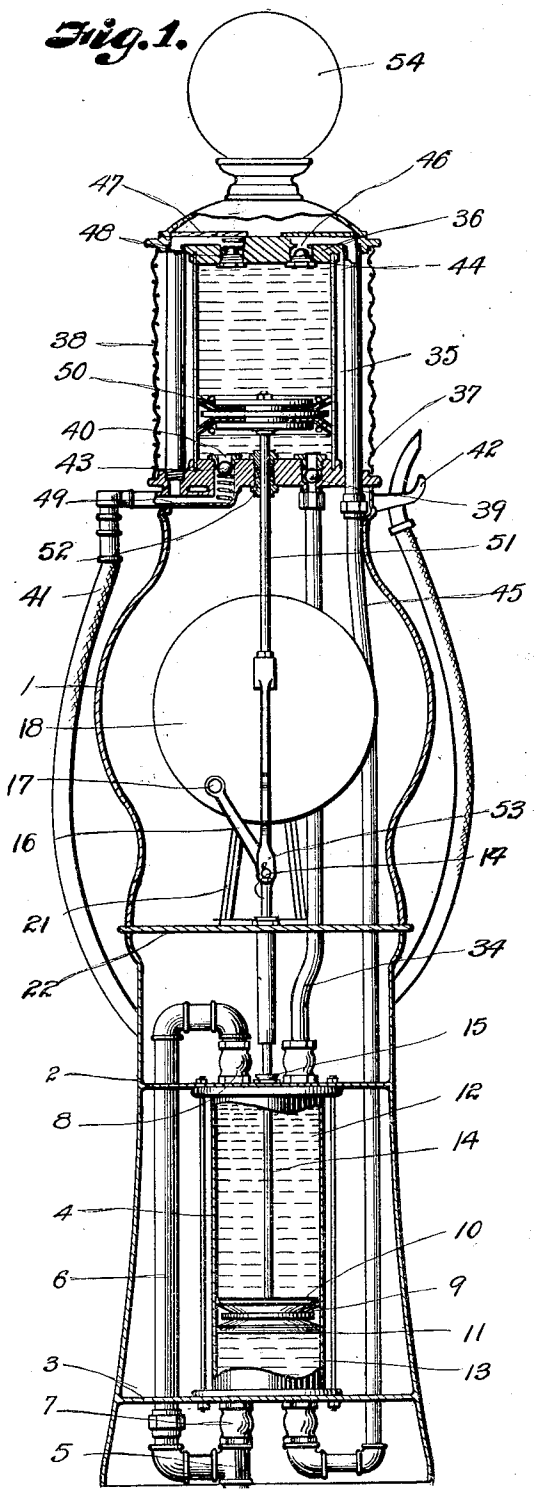
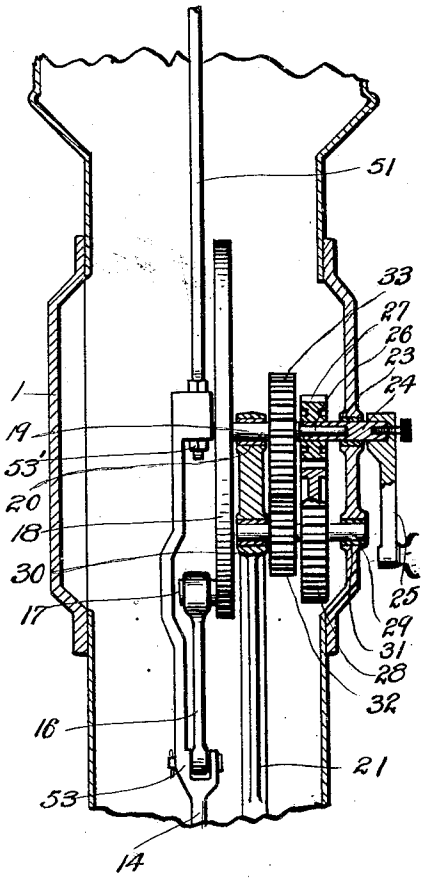


Fig. 2.



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FLUID-DISPENSING PUMP.

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To all whom it may concern:

Be it known that I, A G McGALIN, a citizen of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in Fluid-Dispensing Pumps; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to fluid dispensing pumps particularly applicable for use in dispensing gasoline at the so-called "filling stations" and the primary object of the invention is to provide a measuring pump which may be continuously operated to discharge a given quantity of liquid, for example, gasoline, for each complete movement of the piston.

It is one of the purposes of my invention to simplify the measuring dispensing pump construction so that the pump may be caused to discharge a given quantity of gasoline for each alternating movement of the piston. That is, on the forward stroke of the piston, a given quantity of gasoline will be discharged and on the return movement of the piston, a like quantity will be discharged, thereby insuring a continuous stream of liquid from the pump during the time that the piston mechanism is being operated.

To this end I prefer to drive the piston from a crank and gear mechanism, the construction being such that it will not be necessary to reverse the direction of the cranking device in order to fill up the measuring chamber. When one side of the measuring chamber is discharging, the other side will be filling, the piston being a double-acting one. This is an important feature of my invention as it facilitates the dispensing of the gasoline in a more satisfactory manner than is accomplished by known types of pumps now on the market.

In general appearance the pump may follow that of the ordinary dispensing pump and it may combine the advantages of a visible and blind pump. The usual pump stand will be above the ground with the crank easily accessible.

The general construction of the device as well as the novel details of the parts included in the illustrated embodiment of the invention will be well understood by reference to the following description in connection with the accompanying drawings, in which—

Fig. 1 is a view partly in longitudinal section and partly in elevation of a dispensing pump mechanism constructed in accordance with my invention, and

Fig. 2 is a view of the gearing mechanism for operating the pump piston, parts being shown in section.

Referring now to the drawings,

1 designates a pump stand which may be of any appropriate construction and at the lower part of the pump stand are shown two cylinder supports 2 and 3, to which are secured the respective ends of a measuring chamber or cylinder 4. The bottom of the measuring chamber or cylinder 4 communicates with an inlet pipe 5, the pipe communicating with a source of supply as, for example, a tank which may be submerged in the ground, as is well understood.

The top of the cylinder 4 communicates with the pipe 5 through a branch pipe 6. An inwardly opening check valve 7 is provided in the pipe 5, which opens to permit fluid to pass into the lower part of the cylinder 1 but which will close under the pressure from the cylinder. A check valve 8 is provided in the pipe 6, which will operate to allow fluid to pass into the cylinder but which will seat when pressure is exerted against it from the cylinder so that liquid from the cylinder may not pass back into the pipe 6. The construction of these check valves is well understood so it is thought unnecessary to illustrate them in detail here.

Working in the cylinder or measuring chamber 4 is a double-acting piston 9, having piston leathers 10 and 11 working in opposite directions to seal off the upper portion 12 from the lower portion 13, thus dividing the cylinder into an upper chamber and a lower chamber, the purpose of which will be presently explained.

The piston 9 is provided with a piston rod 14, passing through a stuffing box 15 in the top of the cylinder 4 and connected to a link 16, carried by the wrist pin 17 on the disk 18. The disk 18 is provided with a stub shaft 19 mounted in a bearing 20 in the standard 21 supported by the plate 22 in the stand 1. The stand is also provided with a

bearing 23, in which is a crank shaft 24 extending through the stand and carrying a hand crank 25, whereby the shaft 24 can be rotated. The shaft 24 is recessed to receive the restricted end or pin 26, constituting the end of the shaft 19 so that the end of the shaft 24 constitutes a bearing for the end of the shaft 19.

The shaft 24 carries a pinion gear 27, which meshes with a gear 28 on a shaft 29 in bearings 30 and 31 in the standard 21 and stand 1 respectively. The shaft 29 also carries a pinion gear 32, which meshes with a gear 33 rigid on the shaft 19 which carries a disk 18. Therefore, the train of gears just described are so arranged that when the crank shaft 24 is rotated, motion will be imparted to the shaft 19 through the train, the ratio of the gears being shown as about four to 1.

When the disk 18 is rotated, obviously a reciprocatory motion will be imparted to the piston 9. When the piston moves up, it will draw liquid through the pipe 5 into the lower portion 13 of the cylinder 4; it cannot force the liquid out through the pipe 6 because the valve 8 will prevent it. The upward movement of the piston 9, however, will force the liquid above it through the pipe 34, connected to the top of the cylinder 4 and discharge it into the bottom of the cylinder 35 supported by and constituting part of the stand 1.

The cylinder 35 may consist of the upper and lower heads 36 and 37 with a transparent circular wall fastened thereto, as shown, so that the contents of the cylinder 35 will be visible. The wall will preferably be of glass and it may be protected by a screen 38, as seen in Fig. 1. These are immaterial details, however.

The pipe 34 is provided with a check valve 39, which will open in the direction of the cylinder 36 but which will close when pressure is applied from above.

The bottom head 37 of the cylinder is also provided with an outlet 40, to which is connected a flexible hose or pipe 41, as will be well understood, with a suitable nozzle to supply the motor vehicle tanks with gasoline. The nozzle may be normally held on a bracket 42 when the pump is not in operation. The outlet 40 is provided with an outwardly opening check valve 43, as clearly seen in Fig. 1.

The upper head 36 is provided with an inwardly opening check valve 44 in the end of the pipe 45, which connects with a discharge orifice 46. The valve 44 will open when liquid is supplied from the chamber 13 to the pipe 45 but it will be closed against back pressure. The top or upper head 36 is provided with a discharge orifice 47, in which is an outwardly opening check valve 48 and a pipe leading from the orifice 47 to the discharge conduit or pipe 49 which communicates the hose 41 with the discharge orifice 40.

There is a double-acting piston 50 in the cylinder 35 and it has a piston rod 51 passing through the stuffing box 52 in the lower head 37 and adjustably connected to the yoke-shaped upper end 53 of the rod 14 by an adjusting nut 53′, in effect providing a fixed relation between the pistons 9 and 50. Therefore, when the piston 9 moves upwardly, the piston 50 will move upwardly and vice versa.

In the top of the stand I may provide a sign or transparent, translucent or semi-opaque globe 54, within which may be an electric light to make an attractive sign. This, however, is not a necessary part of my invention, the essential parts of the invention residing in the peculiar manner of operating the pump as well as the constructions thereof and their relation one to the other.

When the parts are assembled and the operator turns a crank, the pistons 9 and 50 will be raised. Assuming that the chambers or cylinders on both sides of the pistons are supplied with oil, the upward movements of the two pistons will result in drawing oil from the supply tank through pipe 5 into the chamber 13 and expelling oil from the upper side of the piston 50 through the orifice 47 into the conduit 49 through the pipe or hose 41 to the receptacle to receive it. At the same time that the piston 50 is moving to oil discharging position, it is also assisting the piston 9 to move the volume of oil from the chamber 12 through pipe 34 into the lower portion of the cylinder 35. When the piston 50 is moving upwardly, the check valve 36 is obviously closed, as is also the check valve 8. Therefore, it will be seen that as the oil is being expelled from the top side of the piston 50, an equal quantity of oil is being introduced into the lower side of the chamber, that is, below the piston 50. As the crank continues to turn the disk 18, the direction of movement of the pistons will be reversed through the link 16. On the downward strokes of the pistons the check valve 36 will be closed, the check valve 7 will be closed, oil will be drawn through part of the pipe 5, through pipe 6 and into the chamber 12 because the check valve 8 will unseat. The check valve 36 will unseat on the downward movement of the piston 9 so that oil will be forced from the chamber 13 into the chamber above the piston 50. As the piston 50 moves downward, the valve 43 is unseating so that liquid is being expelled from the cylinder 35 through the conduit 49 into the hose 41. These continuous alternating operations of receiving and expelling the gasoline will continue so long as the gearing is operated by the crank.

It will be apparent in view of the forego-

ing that no lost motion will occur nor will there be any necessity for reversing the rotative movement of the crank in order to refill the dispensing chamber, it being understood that the cylinder 4 is a supplying cylinder and the cylinder 35 is a dispensing cylinder, there being two chambers in it, one on each side of the piston 50 and by way of example, the capacity of the cylinder 35 may be such that at each rectilineal movement of the piston, one gallon of gasoline will be discharged from the cylinder 35 or two gallons for a complete reciprocation. Of course, these proportions are only illustrative as the pump obviously could be made to discharge any quantity of liquid for a given movement of the piston.

What I claim and desire to secure by Letters-Patent is:

1. In a fluid dispensing device, a transparent dispensing cylinder having sets of alternately opening and closing inlet and outlet ports at opposite ends thereof, a piston in the transparent cylinder to indicate the amount of fluid received in one end of the cylinder and the quantity of fluid remaining in the other end of the cylinder, a supply cylinder having communication with a source of supply and discharging into the opposite ends of the first named cylinder, the supply cylinder having a piston therein dividing it into two end spaces, the end space of the supply cylinder being in series with the end spaces of the dispensing cylinder, means rigidly connecting the two pistons together and a gear train operable in either direction for operating the pistons.

2. In a fluid dispensing device a dispensing cylinder having sets of alternately opening and closing inlet and outlet ports at opposite ends, a double acting piston in said cylinder, dividing the cylinder into two compartments and having movement to discharge measured quantities of fluid from one compartment when fluid is flowing into the other compartment and a double acting pump having connections with opposite ends of the dispensing device to fill the compartment on one side of the piston when fluid is discharging from the opposite side of the piston.

3. In a fluid dispensing device, a dispensing cylinder having sets of alternately opening and closing inlet and outlet ports at opposite ends thereof, a double-acting piston in said cylinder having movement to discharge measured quantities of fluid from alternate sides of the piston during the reciprocatory movements thereof, a supply cylinder having communication with a source of supply and discharging into opposite ends of the first named cylinder, a piston in the supply cylinder, means for rigidly connecting the two pistons together, and means for operating the pistons.

4. In a fluid dispensing device, a dispensing cylinder having sets of alternately opening and closing inlet and outlet ports at opposite ends thereof, a double-acting piston in said cylinder having movement to discharge measured quantities of fluid from alternate sides of the piston during the reciprocatory movements thereof, a supply cylinder having communication with a source of supply and discharging into opposite ends of the first named cylinder, a piston in the supply cylinder, means for rigidly connecting the two pistons together, and a gear train operable in either direction for operating the pistons.

5. In a fluid dispensing device, a dispensing cylinder having sets of alternately opening and closing inlet and outlet ports at opposite ends thereof, a double-acting piston in said cylinder having movement to discharge measured quantities of fluid from alternate sides of the piston during the reciprocatory movements thereof, a supply cylinder having communication with a source of supply and discharging into opposite ends of the first named cylinder, a piston in the supply cylinder, means for rigidly connecting the two pistons together, and a gear train including a disk, a pin eccentrically mounted on the disk, a link connected to the pin, and means for connecting one end of the link to the connecting means for the pistons whereby a rotative movement imparted to the disk in either direction will cause a reciprocatory motion of the pistons in unison.

6. In a fluid dispensing device, a pair of cylinders, one of which is a fluid supply cylinder and the other a fluid dispensing cylinder, the fluid dispensing cylinder having alternately opening and closing ports at its respective ends, means for connecting the opposite ends of the supply cylinder to like ends of the dispensing cylinder, pistons in the two cylinders, means for connecting them to cause them to work in unison, and means for operating said pistons.

7. In a fluid dispensing device, a pair of cylinders, one of which is a fluid supply cylinder and the other a fluid dispensing cylinder, the fluid dispensing cylinder having alternately opening and closing ports at its respective ends, means for connecting the opposite ends of the supply cylinder to like ends of the dispensing cylinder, pistons in the two cylinders, means for connecting them to cause them to work in unison, and a gear train operatively connected to the piston connecting means and so associated therewith that the pistons will be reciprocated when the gear train is operated in either direction.

8. In a fluid dispensing device a pair of cylinders, one of which is a pumping cylin-

der and the other a fluid dispensing cylinder, the fluid dispensing cylinder having alternately opening and closing ports in its respective ends connected to a common outlet, the dispensing cylinder communicating at its respective ends with the pump and a reciprocatory piston in the dispensing cylinder movable to vary fluid compartments on opposite sides thereof, so that the compartment on one side of the piston will be enlarging to take in fluid when the compartment on the other side of the piston is contracting to dispense fluid and means associated with the pump for feeding fluid into the dispensing cylinder at a rate to maintain the enlarging chamber filled during the movement of the piston in the dispensing cylinder.

In testimony whereof I affix my signature.

A G McGALIN.