April 28, 1931. G. R. BARTLETT 1,802,324

LIQUID DISPENSING APPARATUS

Filed Nov. 25, 1927

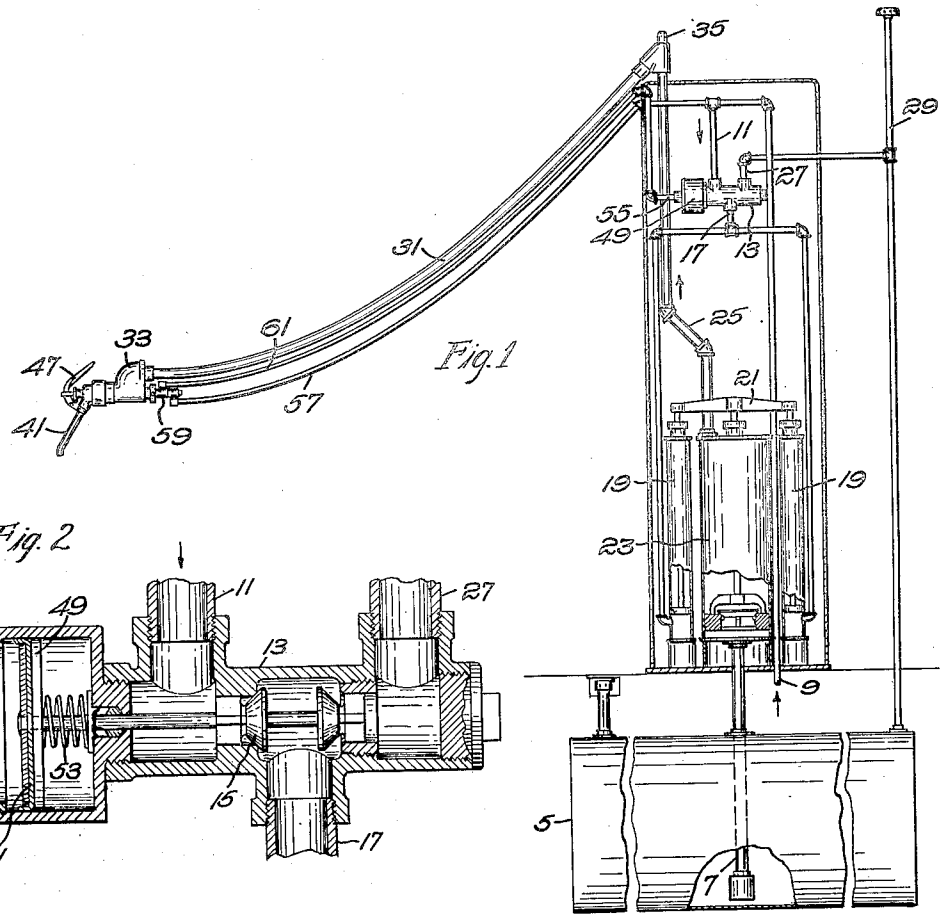


Fig. 1

Fig. 2

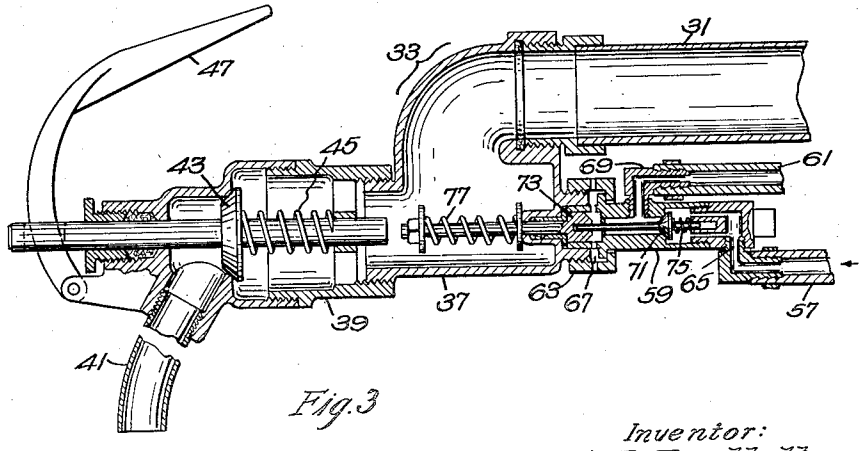


Fig. 3

Inventor:
Gad R. Bartlett,
by Emery, Booth, Janney & Varney
Attorneys.

Patented Apr. 28, 1931

1,802,324

UNITED STATES PATENT OFFICE

GAD R. BARTLETT, OF BRYANTVILLE, MASSACHUSETTS

LIQUID-DISPENSING APPARATUS

Application filed November 25, 1927. Serial No. 235,411.

This invention relates to liquid dispensing apparatus and finds a particular application to apparatus utilized to deliver gasoline to motor vehicles and the like. The object is to provide an improved device of the kind wherein fluid under pressure, for instance, compressed air, is used to deliver the gasoline, the operation of the device being controlled from the local point of delivery, for example, the dispensing nozzle at the end of the customary flexible hose through which the gasoline is delivered directly to the fuel tank of the motor car.

My invention will be well understood by reference to the following detailed description of the illustrative embodiment thereof shown by way of example in the accompanying drawings, wherein:

Fig. 1 is a part elevation, part vertical section of a dispensing apparatus embodying my invention;

Fig. 2 is a central vertical section through a servomotor and the valve controlled thereby; and

Fig. 3 is a central vertical section through the dispensing head.

Referring to the drawings, the gasoline is delivered from a suitable supply tank 5, herein illustrated as an underground tank, through the dip tube 7. Air or other fluid under pressure received from any suitable source at the pipe 9 is utilized to force the gasoline from the tank and herein this is effected by means of a suitable mechanical pump operated by the fluid under pressure, the admission of which to the pump is controlled by a suitable valve shown in detail in Fig. 2. Air from the pipe 9 enters through the branch pipe 11 to the valve casing 13 which is formed with seats for the valve 15, herein shown as of the double-headed type. If the valve is shifted to the right, viewing Fig. 2, fluid may pass from the pipe 11 through the valve casing to the pipe 17 and is admitted to the cylinders 19 (Fig. 1) in which work pistons connected by a cross-head 21 to which is connected the piston of a pump cylinder 23. When the air pressure forces the pistons in cylinders 19 upward the piston of pump cylinder 23 is also raised and any liquid above the same will be expelled or pumped out through pipe 25 and at the same time a fresh supply will be drawn into the cylinder. If the controlling valve 15 is then shifted to the position shown in Fig. 2, supply of air through the pipe 11 is interrupted, the cylinders 19 exhaust through pipe 17, valve casing 13 and exhaust pipe 27, which is connected to the vent pipe 29. The pistons return by gravity and in this movement the liquid below the piston in cylinder 23 is transferred to the upper side thereof through a valve in the customary manner and the apparatus is ready for the next pumping operation. The pipe 25 into which the liquid is pumped from cylinder 23 may communicate by means of a flexible hose 31 with the portable dispensing head 33. The liquid conducting passage comprising the pipes 25 and the hose 31 is preferably provided with an air intake at its effectively highest point at 35 to permit draining of the hose 31 in a manner to be described.

The dispensing head 33 may be of the construction shown in detail in Fig. 3 and is there illustrated as comprising a hollow body 37 having a lateral inlet communicating with the hose 31 and an outlet to which it attached a valve casing 39 constituting a dispensing nozzle proper and having a dispensing spout 41. The valve casing 39 houses the dispensing valve 43 normally closed against its seat by spring 45 and the stem of this valve may project to the exterior of the casing for operation by means of a pivoted lever handle 47 which is so arranged that the nozzle and the handle may be encircled by the hand, a closing or gripping movement of the hand thereabout opening valve 43 and permitting liquid to flow out through spout 41.

In accordance with my invention I provide means located at the dispensing head 33 for controlling the supply of liquid thereto and herein (see Fig. 2) I have illustrated the control valve 15 as being operated by a suitable servomotor actuated by compressed air, this servomotor herein taking the form of the cylinder 49 attached to the valve casing 13 and having a piston 51 therein, normally pressed to the left by the spring 53 to main-

tain the valve 15 in the position shown in Fig. 2 in which the supply of fluid to the pump is cut off but which may be operated against the force of the spring by compressed air admitted through pipe 55. Compressed air to operate the servomotor is taken through a branch from the main supply pipe 9, through a flexible tube 57, to a valve casing 59 located at the dispensing head 33, back through tube 61 to the pipe 55.

The valve casing 59 receives suitable valve mechanism controlling the supply of pressure fluid to the servomotor and is here shown as detachably secured by means of coupling 63 to a suitable boss on the body member 37 of the head in alignment with the valve 43. The valve mechanism may comprise a suitable intake port 65 in communication with tube 57, exhaust ports 67 and a port 69 in communication with the tube 61 leading to the servomotor, which last port is adapted to be placed in communication alternatively with the intake and the exhaust ports. These ports are herein shown as controlled by a double valve, here shown as formed in two parts for constructional reasons, the spaced valve heads 71 and 73 cooperating with their respective seats as shown. In the position shown both the valve heads 71 and 73 are held to the left under the influence of their respective springs 75 and 77 and the valve 71 cuts off the supply of pressure fluid from the intake port 65 while the port 69 which is in communication with the cylinder 49 of the servomotor is in communication with the exhaust port 63, exhausting any pressure fluid therefrom and permitting spring 63 to return the piston to the position of Fig. 2 so that no pressure fluid is admitted to the liquid pumping apparatus. Now, if the valves are shifted bodily to the right, valve 73 will close off the exhaust port and valve 71 will leave its seat to place the intake port in communication with the cylinder of the servomotor, permitting pressure fluid to flow therefrom to operate the main valve 15.

By placing the valve mechanism which has just been described at the dispensing head 33 control of the mechanism at the point of discharge, for instance, by the operator who is actually engaged in the operation of inserting the nozzle 41 into the fuel tank of an automobile, is provided for, and the parts may be so arranged that this control may be effected without bodily shifting of the operator's hand such as would be required if he had to perform in succession clearly distinct manipulative acts. In the form of the invention illustrated the operation of the control valve for the servomotor is effected mechanically on the operation of the handle 47 which works the dispensing valve 43. Herein the stem of valve 73 projects into the hollow body 37 and is presented in opposition to and in axial alignment with the stem of valve 43. In the latter part of the opening movement of the latter valve the control valves in head 59 are shifted to the right in Fig. 3, and when pressure on the lever handle 47 is released to permit the closing of valve 43, the control valves return to their initial position to cut off the supply of pressure fluid and exhaust the servomotor cylinder prior to the complete closure of the dispensing valve. This timing is effected by the provision of suitable lost motion between the stem of valve 43 and the stem of valve 71, as illustrated in the drawing. This timing of the operation of the device is obviously of considerable importance in the smooth and effective operation of the mechanism. It furthermore permits the draining of the hose 31 after the pumping action has ceased while the dispensing valve 43 is still open, air being admitted at 35 to permit the gasoline to drain out by gravity through the hose.

I have described in detail an illustrative form of my invention as embodied in an apparatus having a mechanical liquid pump driven by fluid under pressure as shown by way of example in the drawings in order that the operation of that particular form might be well understood. Obviously, however, the invention is not limited to the particular type of mechanism shown or to the mechanical details of construction embodied therein, but will find an extended application in widely varying forms.

What I claim as new and desire to secure by Letters Patent I shall define in the following claims:

1. Liquid dispensing apparatus comprising a liquid supply tank, a source of fluid under pressure, means to render such fluid effective to deliver liquid from the tank, a servomotor itself operated by such fluid for controlling said means, a remote dispensing head having a pipe connection to said tank including a dispensing valve, a conduit leading through the head for supplying fluid to said servomotor, and valve means to control the flow of fluid through the conduit and means for operating said valves located on said head and in position to be grasped with said head by a hand of an operator, said means correlated to the valves to effect the sequential operation of one valve after another by a movement of said hand in its single grasping position.

2. Liquid dispensing apparatus comprising a liquid supply tank, a source of fluid under pressure, means to render such fluid effective to deliver liquid from the tank, a servomotor itself operated by such fluid for controlling said means, a remote dispensing head having a pipe connection to said tank and including a dispensing valve, a conduit leading through the head for supplying fluid to said servomotor, valve means to control

the flow of fluid through the conduit, and means for mechanically moving the same consequently to the movements of said dispensing valve, the latter having lost motion with respect to said valve means.

3. Liquid dispensing apparatus comprising a liquid supply tank, a source of fluid under pressure, means to render such fluid effective to deliver liquid from the tank, a servomotor itself operated by such fluid for controlling said means, a portable dispensing head having a hose connection with the apparatus, a dispensing valve at said head, a conduit for pressure fluid extending along the hose and through the head to supply fluid to the servomotor, valve means at the head to control the flow of fluid through the conduit and means for operating said valves located on said head and positioned to be grasped with said head by a hand of an operator, said means correlated to the valves to effect the sequential operation of one valve after another by a movement of said hand in its single grasping position.

4. A dispensing head having liquid inlet and outlet ports, a valve controlling the latter, said head also comprising the casing of a three-way valve having inlet and exhaust ports and a third port alternately in communication therewith, a valve controlling said ports and means for operating said valves located on said head and positioned to be grasped with said head by a hand of an operator, said means correlated to the valves to effect the sequential operation of one valve after another by a movement of said hand in its single grasping position.

5. A dispensing head having liquid inlet and outlet ports, a valve controlling the latter, said head also comprising the casing of a three-way valve having inlet and exhaust ports and a third port alternatively in communication therewith, a valve controlling said ports and normally biased to close said intake port, a lever handle for opening said first valve located to permit the same and a part of the head to be received by the hand in an encircling grasp, said latter valve located for operation against its biasing means by the closing movement of the hand effective to open the first valve during the latter part of such movement.

6. A dispensing head having liquid inlet and outlet ports, a valve controlling the latter, said head also comprising the casing of a three-way valve having inlet and exhaust ports and a third port alternatively in communication therewith, a valve controlling said ports and normally biased to close said intake port, a handle for opening the first valve, and a part moving with said first valve and in its movement mechanically engaging and operating said second valve but having lost motion with respect thereto.

7. A dispensing head comprising a hollow body having a lateral inlet providing for the attachment of a liquid conduit thereto and an outlet, a valve casing secured at the outlet having a manually operable valve therein, the stem thereof projecting into said hollow body, a three-way valve casing secured to said body opposite the outlet, and a valve therein having a stem projecting into the hollow body and presented in axial alignment with and in spaced relation to the stem of said first mentioned valve.

8. Liquid dispensing apparatus comprising a liquid supply tank, a source of fluid under pressure, a dispensing head, a liquid conduit between said tank and head having an air inlet at the effectively highest point thereof, an outlet valve in the head, means to render the fluid under pressure effective to deliver liquid from the tank through said conduit including a fluid controlling valve at the head and arranged to be moved to initiate the dispensing action during the opening movement of said outlet valve and returning to position to intermit such action prior to complete closure thereof.

9. Liquid dispensing apparatus comprising a liquid supply tank, means for controllably discharging liquid therefrom comprising a valve means, the movement of which from one position to another starts and stops the discharging action, a pressure-fluid-operated servomotor for operating the valve means, a portable dispensing head comprising a dispensing valve having an operating handle and a control valve mechanism at the head for controlling the supply of fluid to said servomotor constructed to be actuated sequentially to the operation of said dispensing valve on movement of said handle.

10. Liquid dispensing apparatus comprising a liquid supply tank, means for controllably discharging liquid therefrom comprising a valve means, the movement of which from one position to another starts and stops the discharging action, a pressure-fluid-operated servomotor for operating the valve means, a portable dispensing head comprising a dispensing valve having an operating handle and a control valve mechanism at the head for controlling the supply of fluid to said servomotor constructed to be actuated sequentially to the operation of said dispensing valve on movement of said handle and arranged to move to intermit the operation of said servomotor prior to complete closure of the dispensing valve.

In testimony whereof, I have signed my name to this specification.

GAD R. BARTLETT.