

April 2, 1929.

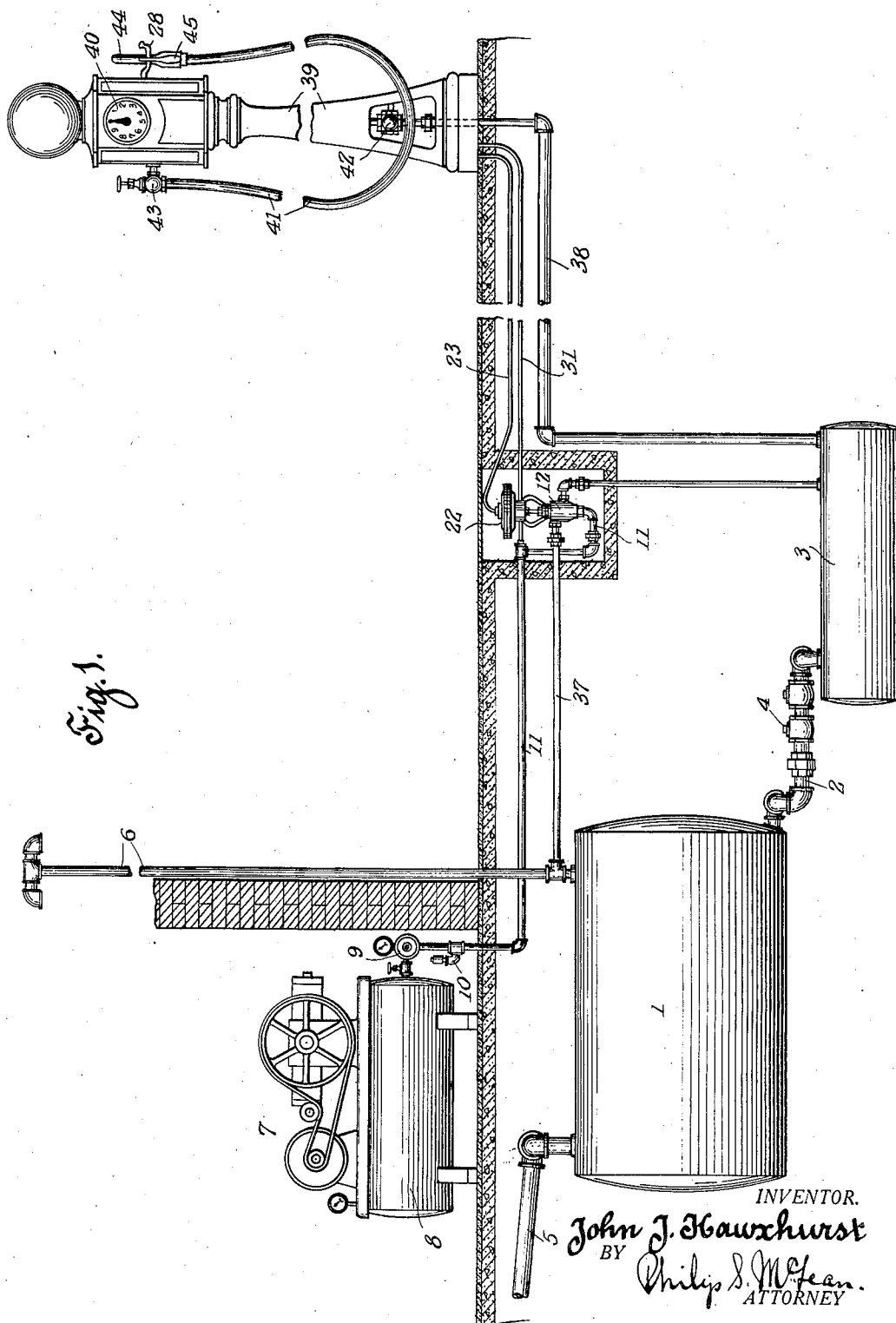
J. J. HAWXHURST

1,707,938

LIQUID SERVICE STATION

Filed Nov. 6, 1926

2 Sheets-Sheet 1



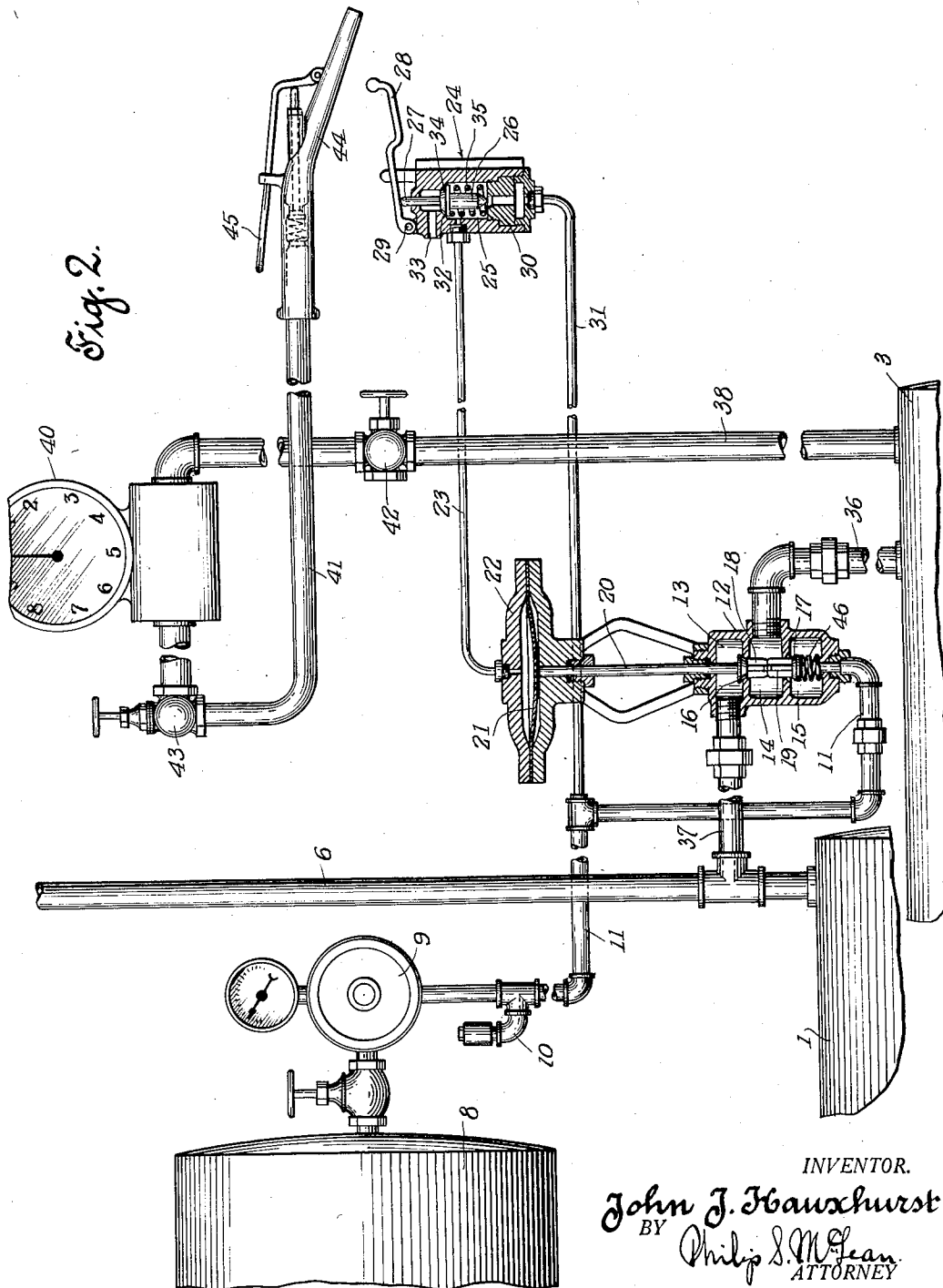
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UNITED STATES PATENT OFFICE.

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LIQUID-SERVICE STATION.

Application filed November 6, 1926. Serial No. 146,600.

The present invention relates to the dispensing of gasoline and the like and the objects of the invention are to provide service equipment for this purpose which will be ready at all times to deliver the exact amount of liquid required, which will be automatic in the delivery operation and which will be of relatively simple, entirely practical design.

The above and other desirable objects are attained in this invention by certain novel features of construction, combinations and relations of parts as hereinafter fully set forth and broadly claimed.

The drawings accompanying and forming a part of this specification illustrate a typical embodiment of the invention, Figure 1 being a broken side elevation of a complete one stand service station and Figure 2 being a broken enlarged view of the various valves and connections in the system.

As shown in these views, the liquid is stored in a main tank 1 and flows by gravity from the bottom of this tank by connection 2 to a smaller pressure tank 3. A check valve 4 is provided in this connection. The main tank is shown provided with a filling line 5 and with a vent line 6.

The pressure for the liquid in the pressure tank is provided by a suitable air compressor such as that indicated at 7 having a compressed air tank 8 connected through a reducing valve 9 and safety valve 10 with a line 11 running to the automatic pressure control valve 12.

As shown in Figure 2 the control valve 12 consists of a valve casing divided into an upper vent chamber 13, a central flow chamber 14 and a lower pressure chamber 15. Communication between the upper and intermediate chamber is controlled by a downwardly seating valve 16 and flow between the intermediate and lower chamber is governed by an upwardly seating spring closed valve 17. These valves are shown as having guides 18, 19 at the backs of the same in opposed relation and abutting so as to hold the two valves spaced apart an extent such that when one valve is seated, the other will be automatically unseated.

The upper valve is the controlling one, being carried by a stem 20 which is acted on at the top by a diaphragm 21. This diaphragm is enclosed in a suitable chamber 22 to which

pressure is led by a connection 23. Flow through the line 23 is governed by a hook valve 24 shown in Figure 2 as embodying a casing having a central chamber 25 into which the line 23 centers, admission of pressure to this chamber being governed by a downwardly seating valve 26 having an upwardly extending stem 27 acted on by a nozzle supporting hook 28 pivoted on the casing at 29. Valve 26 cooperates with a seat 30 to which pressure is led from pressure line 11 by a connection 31.

A valve seat 32 is provided in the upper end of chamber 25 communicating with a vent 33 and valve 26 carries an upwardly facing valve shoulder 34 for engagement with this vent seat. A spring 35 is provided in the chamber 25 acting against the under side of the valve shoulder 34 to lift the valve when the delivery nozzle is removed from the hook.

The active pressure is transmitted from the intermediate chamber in the control valve to the pressure tank by a connection 36 and the vent chamber in the top of the control valve is connected with atmosphere by piping 37 shown as led to the foot of the vent line 6.

From the pressure line a liquid delivery line 38 extends to the delivery stand 39, the passage being completed through a meter 40 to the hose line 41. A shut-off valve 42 is shown provided in this delivery line at the base of the stand and a valve for the hose connection is shown at 43. The hose is shown provided with a valved delivery nozzle 44 operated by a hand grip 45. When not in use the nozzle is hung up by engaging the same over the valve hook 28, the handle of the nozzle valve being spaced from the barrel of the nozzle sufficiently to receive the hook after the manner indicated in Figure 1 in which position operation of the valve handle is prevented by the supporting hook, making impossible accidental operation of the nozzle valve.

The compressor operates automatically to maintain a predetermined pressure in the air tank 8 and in the connections leading to the diaphragm valve and the hook valve. Operation of the nozzle valve is prevented so long as the nozzle is suspended on its supporting hook. As soon, however, as the nozzle is removed from this hook the nozzle valve is free to be operated. The removal of the nozzle from the hook also renders the appa-

ratus fully ready to deliver liquid as soon as the nozzle valve is opened. This will be clear from Figure 2 which shows that upon removal of the nozzle from its hook, the valve 5 26 is lifted by spring 35, closing off the vent 33 and opening up pressure through lines 31 and 23 to the top of the diaphragm 21. The diaphragm forces the vent valve 16 to its seat and by this same action opens valve 17 permitting the pressure from line 11 to flow through the lower and intermediate chambers of the diaphragm valve and connection 36 into the pressure tank. The pressure thereby admitted to this tank forces liquid, as soon 15 as the nozzle valve is opened, up through the delivery line 38 past the meter and out through the delivery hose. This flow is then controlled entirely by the nozzle valve, which can be opened and closed at will, while off the hook. When delivery is completed, the nozzle is returned to its hook. The depression of the hook thus effected closes valve 26, shutting off the supply of pressure to the diaphragm and this same movement opens valve 25 34, relieving the pressure on the diaphragm by way of the vent 33.

The relief of pressure on the diaphragm enables the spring 46 to lift the lower control valve 17 which shuts off flow to the pressure tank and opens valve 16 so as to vent the pressure in the tank by way of vent connection 37 to the vent line 6. The relief of pressure from the pressure tank enables that tank to automatically refill itself by gravity flow 35 from the main tank so that upon the next service operation, the pressure will act upon a full tank of liquid and the flow therefore will be immediate. The check valve in the connection between the storage and pressure tank 40 automatically prevents any back-flow or loss of pressure from the pressure tank to the storage tank.

What is claimed is:

1. Liquid dispensing apparatus comprising 45 a storage tank, a pressure tank supplied therefrom through a non-return gravity flow connection, a liquid delivery line extending from the pressure tank, pressure supply means and connections from said pressure 50 supply means to the pressure tank, including valve mechanism operable either to vent the pressure tank and cut off flow of pressure thereto or to close the vent and admit pressure to the pressure tank, the liquid delivery 55 line terminating in a delivery nozzle and a support for said nozzle controlling the valve mechanism for venting and admitting pressure to the pressure tank, said delivery nozzle having a delivery valve, said delivery valve 60 and the nozzle support having interlocking engagement to prevent operation of said delivery valve when the nozzle is on its support.

2. In liquid dispensing apparatus, a valved 65 delivery nozzle having an actuating handle,

a support for said nozzle having an interlocking engagement with said handle to prevent operation of the delivery nozzle when said nozzle is on the support and means controlled by said support to prevent liquid delivery 70 when the nozzle is on the support and to enable liquid delivery under control of the nozzle valve when the nozzle is removed from the support.

3. In liquid delivery apparatus, a delivery 75 hose terminating in a nozzle having a manually operable valve, a hook for the support of said nozzle having an interlocking relation with the nozzle valve to prevent operation of the same when the nozzle is on the hook 80 and mechanism governed by said hook for controlling the delivery of liquid to the hose.

4. In liquid delivery apparatus, the combination of a liquid storage tank, a pressure tank supplied therefrom, a liquid delivery 85 line extending from said pressure tank and terminating in a delivery nozzle, pressure supply means, connections from said pressure supply means to the pressure tank and including valve mechanism operable either to 90 vent the pressure tanks and cut off pressure thereto or to close the vent and admit pressure to the pressure tank, a support for the delivery nozzle and means controlled by said support upon removal of the delivery nozzle 95 therefrom to actuate the valve mechanism to close the vent and admit pressure to the pressure tank, whereby to automatically supply liquid under pressure in the delivery line upon the removal of the delivery nozzle from 100 the support.

5. In liquid delivery apparatus, the combination of a liquid storage tank, a pressure tank supplied therefrom, a liquid delivery 105 line extending from said pressure tank and terminating in a delivery nozzle, pressure supply means, connections from said pressure supply means to the pressure tank and including valve mechanism operable either to 110 vent the pressure tank and cut off pressure thereto or to close the vent and admit pressure to the pressure tank, a support for the delivery nozzle and means controlled by said support upon removal of the delivery nozzle 115 therefrom to actuate the valve mechanism to close the vent and admit pressure to the pressure tank, whereby to automatically supply liquid under pressure in the delivery line upon the removal of the delivery nozzle from 120 the support, said means including a pressure operated device for actuating the valve mechanism and pressure governing means for said pressure actuated device directly operated by the nozzle support.

6. In liquid dispensing apparatus, the combination of a storage tank and a pressure tank receiving liquid therefrom, a liquid delivery line extending from the pressure tank and terminating in a delivery hose having a 125 manually operable nozzle valve, means for 130

creating pressure on the liquid in the pressure tank to enable discharge of the liquid under control of the nozzle valve, a support for the nozzle having an interlocking relation with the nozzle valve to prevent operation of the latter when the nozzle is on the support and mechanism governed by said nozzle support for controlling the means for creating the delivery pressure in the pressure tank.

7. Liquid dispensing apparatus, comprising in combination a storage tank, a pressure tank receiving liquid therefrom, a liquid delivery line extending from the pressure tank and terminating in a delivery hose, means for creating pressure on the liquid in the pressure tank to force flow of the same through the delivery line and hose, a movable support for the discharge end of the hose, and mechanism controlled by said movable support to relieve the liquid in the pressure tank of pressure when the hose is hung upon the movable support.

8. Liquid dispensing apparatus, comprising in combination a liquid supply tank, a

liquid delivery line extending from said tank and terminating in a delivery hose having a manually operable nozzle valve, a flow meter in said delivery line, a movable hose support yieldable to the weight of the hose, means for forcing a pressure flow of liquid through the delivery line under control of the nozzle valve and control mechanism operable by the hose support upon the restoration of the nozzle to supported relation therewith to discontinue operation of the pressure flow inducing means.

9. In liquid dispensing apparatus, a liquid delivery hose terminating in a nozzle having a manually operable valve, a movable hook for the support of said hose nozzle, means cooperating with the nozzle valve to prevent manual operation of the same when the nozzle is in its supported relation on the hook and mechanism governed by the hook for controlling the delivery of liquid to the hose.

In witness whereof, I have hereunto set my hand this 1st day of Nov., 1926.

JOHN J. HAWXHURST.