

June 21, 1927.

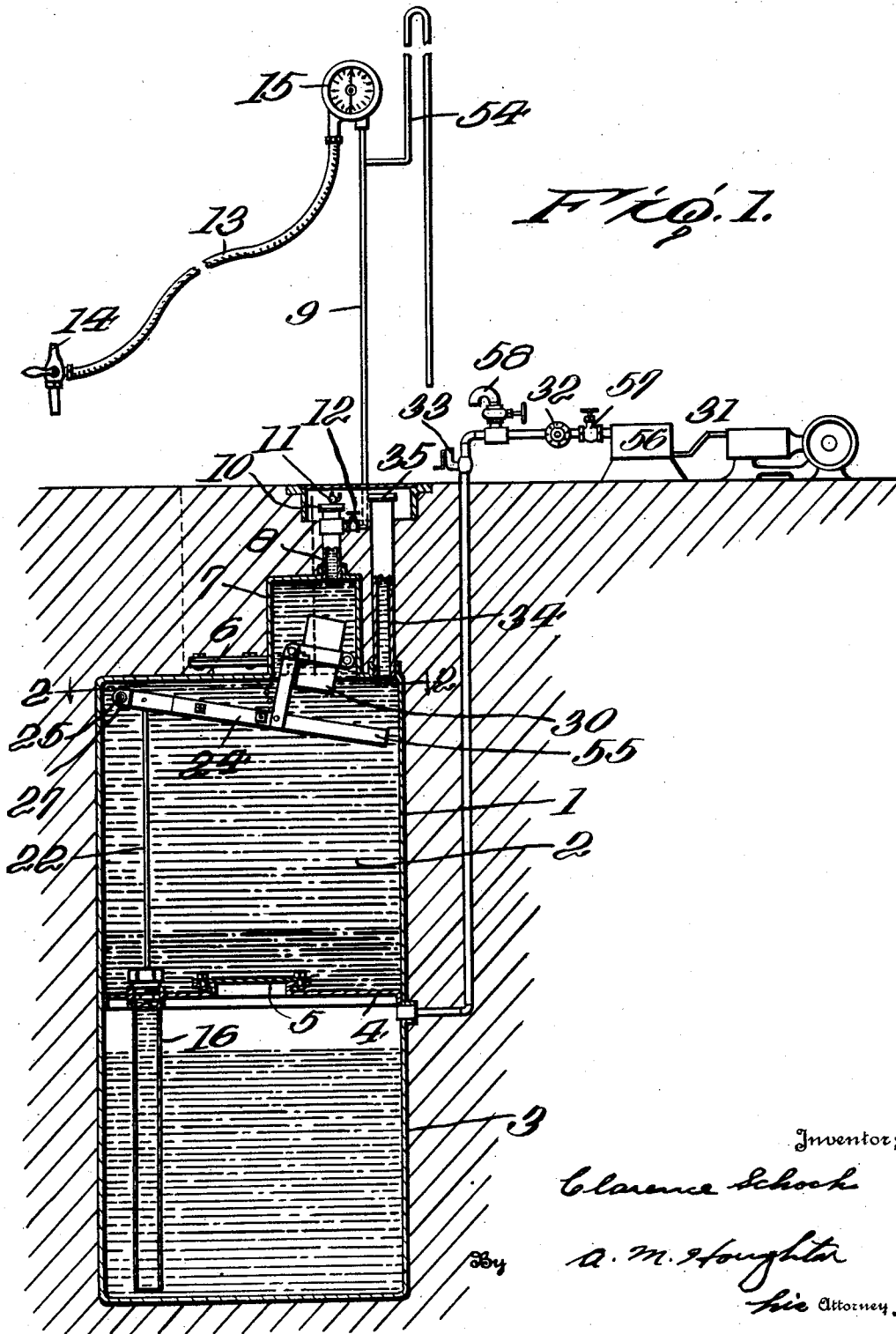
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1,633,458

GASOLINE DISPENSING SYSTEM

Filed March 6, 1924

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FIG. 2.

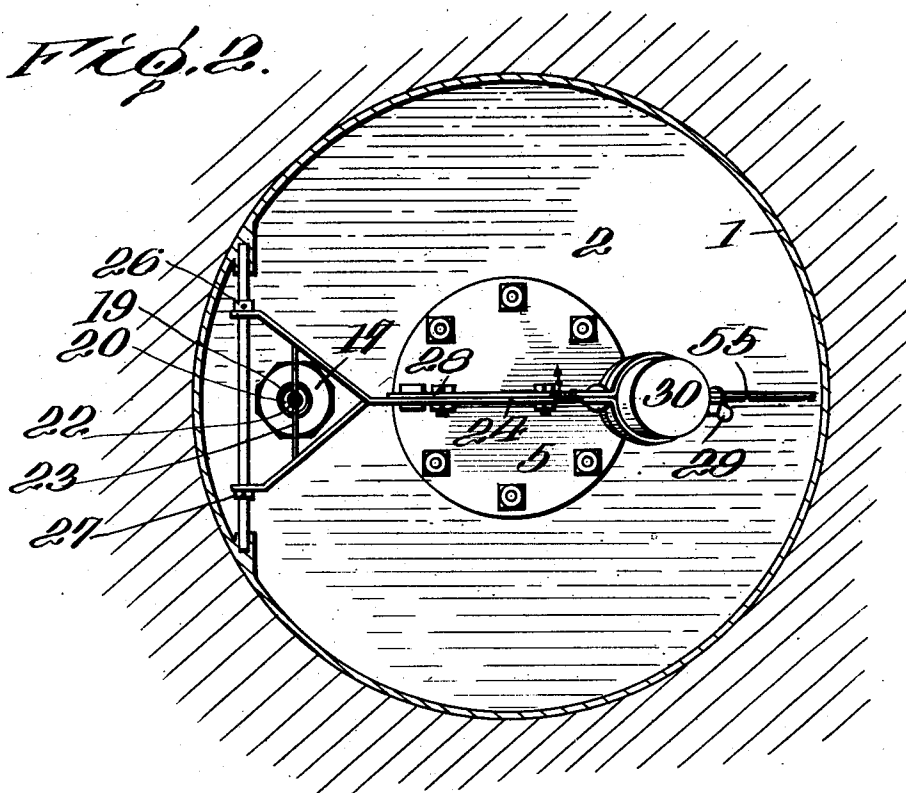
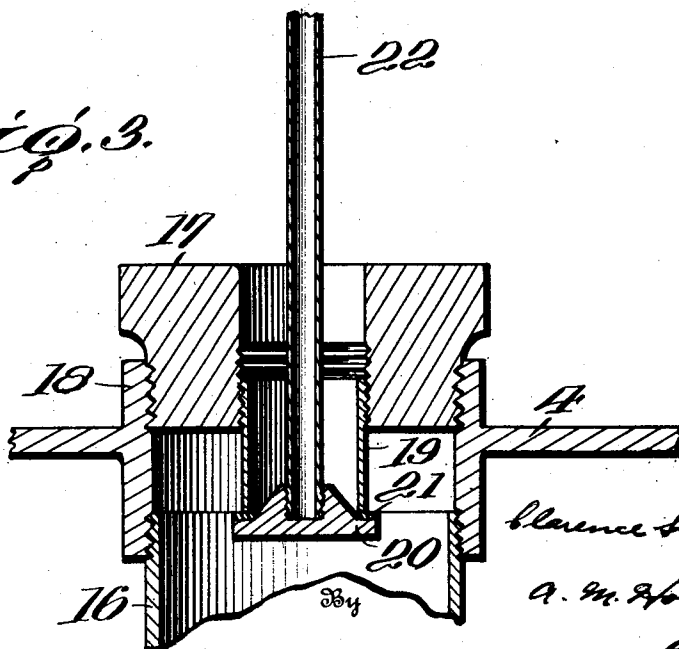


FIG. 3.



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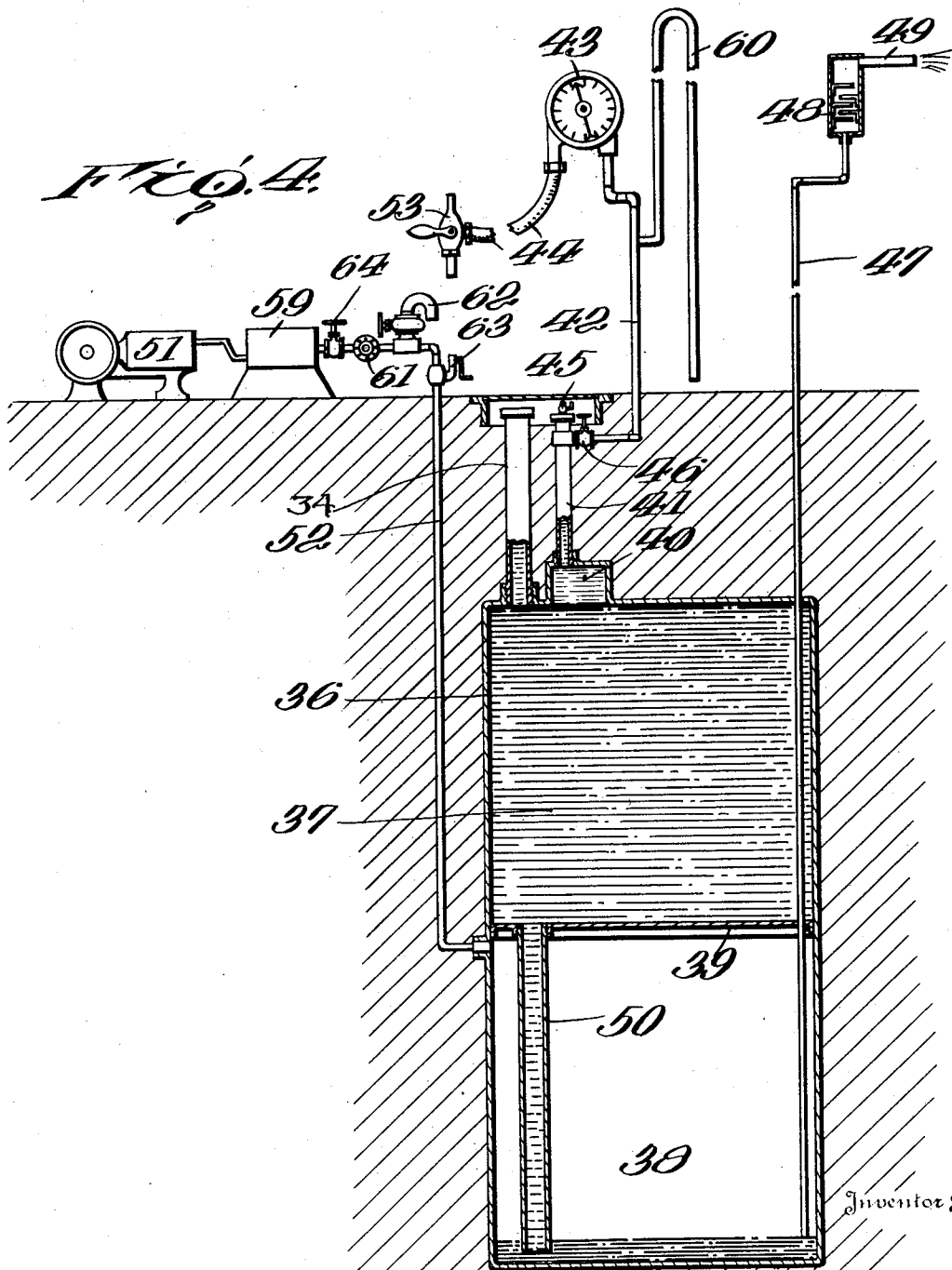
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

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GASOLINE-DISPENSING SYSTEM.

Application filed March 6, 1924. Serial No. 697,386.

This invention relates to a gasoline dispensing system adapted for installation at or adjacent the street curbing, and more particularly to a system comprising a tank provided with upper and lower compartments, or two superimposed tanks, containing gasoline and water respectively, in combination with means for introducing air under pressure to the lower compartment whereby the water is placed under pressure and serves to expel the gasoline from the upper compartment.

In hydraulic gasoline dispensing systems as heretofore used considerable danger attended the refilling of the storage tank inasmuch as the water, which had served to expel the gasoline, had to be drained off into an underground sewer. Frequently a considerable amount of gasoline was run into the sewer along with the water thereby promoting the peril of an explosion in the sewer, to say nothing of the waste of gasoline. Furthermore, in such systems each installation is practically an engineering problem in itself. The necessary head of water is obtained by placing a tank at a high level, and this tank must, of necessity, be placed in an adjoining building to prevent freezing of the water in winter. Furthermore, the drain must be in proximity to a sewer to allow for the carrying off of water when it is desired to refill the storage tank.

Air systems for expelling gasoline from a storage tank are likewise disadvantageous in that the air used to dispense the gasoline becomes saturated with gasoline vapor because of its close association with this volatile fluid. In such systems when the gasoline tank needs refilling it is necessary to expel this highly saturated air into the atmosphere with the attendant risk of fire.

It is the primary object of the present invention to dispose of the objectionable features of the hydraulic and air dispensing systems for gasoline.

A further object is to provide a system entirely self-contained, and one which is of simple construction.

A still further object is to so control the flow of gasoline that it is impossible to deliver water along with the gasoline when the storage tank is nearly empty.

Other and further objects will be apparent from the following description taken in connection with the drawings in which:—

Figure 1 is a view, partly in section, showing a preferred embodiment of the present invention in operation.

Figure 2 is a section taken along the line 2—2 of Figure 1 in the direction of the arrows.

Figure 3 is an enlarged sectional view showing the automatic float controlled shut-off valve.

Figure 4 is a view, partly in section, of a modified form of this invention in which the shut-off valve is eliminated.

Referring more particularly to the drawings:—

An elongated tank 1 is divided into upper and lower compartments 2 and 3 respectively by a partition 4 which is provided with a sealed manhole 5. A second sealed manhole 6 is formed in the upper end of the tank and adjacent thereto is a dome 7. A delivery pipe 8 extends from this dome and is connected, midway of its length, with a discharge pipe 9, and at its end with a screwthreaded airtight cap 10 carrying a petcock 11. Adjacent the connection of discharge pipe 9 with the delivery pipe 8 there is a manually operable valve 12. The discharge pipe 9 is formed with a branch fitting 54 comprising an inverted U-shaped pipe extending upwardly to a point high enough at the bend so that maximum air pressure permitted by the regulator and safety appliance cannot cause overflow. This pipe extends higher than the rest of the system and then downwardly. This pipe forms a vent which, in case of fire, will allow the escape of gases and vapor formed by heat in the storage tank and piping. A flexible hose 13 carries a discharge nozzle 14 provided with a quick acting valve to enable the operator to shut off the supply of gasoline at any desired time. A meter 15 of any well-known type is interposed between the discharge pipe 9 and hose 13 to measure the amount of gasoline being dispensed.

A tubular member 16 extends from the partition 4 into the lower compartment and terminates at a point adjacent the bottom

of the tank. The upper part of this member is provided with a valve shown in detail in Figure 3. This valve comprises a plug 17 adapted to be screwthreaded into the up-
 5 standing flange 18 of partition 4, and axially bored and screwthreaded for the reception of sleeve 19 extending below the lower face of such plug. Sleeve 19 serves as a seat for valve head 20 which has a washer 21 mount-
 10 ed thereon to prevent leakage when the valve is closed, as shown in Figure 3.

Actuation of the valve is effected by the reciprocation of stem 22, attached at one end to head 20 and at its other end to a
 15 cross member 23 shown in detail in Figure 2. The cross member extends between the forked projections of an arm 24. These forked projections are mounted for swinging movement upon a bar 25 fixed at its ends to
 20 tank 1, and are capable of movement therealong by means of adjustable collars 26 and 27. A second arm 28, provided with elongated slots (not shown) to permit of extension of the entire structure is fastened
 25 to arm 24 by means of bolts as shown. A third arm 55, forming a continuation of arm 24, extends to a point directly beneath the fill pipe 34 for a purpose to be later described. The outer end of arm 28 carries
 30 semi-circular bands adapted to be brought together by a wing nut 29 or equivalent means, and to grip a float 30 made of a material which will float in water but which is not buoyant in gasoline. This float, as
 35 shown in Figure 1, extends into dome 7.

An air compressor of conventional construction as shown at 31 is provided with an air storage tank 56, an air supply shut-off
 40 valve 57, pressure regulator 32, an air release valve 58, and a safety valve 33 in the line of piping between the compressor and the upper part of compartment 3.

In operation, a quantity of water, sufficient to fill the lower compartment 3 and
 45 the lower part of compartment 2, is introduced through 34. Next, valve 12 is closed to prevent the gasoline in pipe 9 and hose 13 from flowing back into the tank, and pet-cock 11 is opened to permit the escape of
 50 air when the upper compartment is filled with gasoline. Gasoline is then poured into the tank through the fill pipe 34 until it reaches a level close to the mouth of the pipe. Airtight cap 35 is then replaced, pet-
 55 cock 11 closed, and valve 12 opened. Compressed air is then forced into compartment 3 forcing the water therein up through tube 16 and into compartment 2, the communicating valve being open. The volatile liquid
 60 is thereby forced out through pipes 8 and 9, meter 15 and hose 13. As the supply of gasoline diminishes water will rise in compartment 2 until it finally reaches float 30. The float being buoyant in water rises and
 65 moves rod 22 upwardly, thus drawing the

head of valve 20 to its seat and preventing the further forcing of water into compartment 2. When it is desired to refill the tank with gasoline it is only necessary to
 70 close valve 12, open pet-cock 11, and push down the float 30 by means of a rod inserted through fill pipe 34 to open the valve and permit the water in compartment 2 to flow
 75 back into the lower compartment. It is thus seen that the water used for forcing the gasoline out of the system can be used again and again without addition or replacement.

The safety air valve 33 insures against a dangerous pressure in compartment 3, and the valve operated by float 30 makes it im-
 80 possible to dispense water when the supply of gasoline is exhausted.

Referring to the modified form of tank shown in Figure 4:—

A tank 36 is divided into upper and lower
 85 compartments 37 and 38 by a partition member 39, the upper part of tank 36 being formed with a dome 40, delivery pipe 41, discharge pipe 42, meter 43, branch fitting
 90 60, and flexible hose 44, all as described in the preferred form of the present invention. A similar pet-cock 45 is mounted in the airtight cap on delivery pipe 41, and likewise a manual valve 46 is interposed between the
 95 delivery pipe and discharge pipe 42, all as previously described and for the same purpose. In this case a pipe 47, connected at one end to a box 48, and situated at a point from ten to twenty feet above the level of
 100 the ground, extends down into the lower portion of the compartment 38. The air pressure in the system should not be sufficient to force the water in pipe 47 higher than the bottom of box 48. For this purpose the
 105 safety valve is accordingly set to prevent excess pressure in the system. A tube 50, communicating with the compartment 37 through partition 39, extends downward into chamber 38 to a point below the lower end
 110 of pipe 47.

In operation, air is introduced into compartment 38 from compressor 51 through
 115 pipe 52. The water in compartment 38 is forced through tube 50 and into the gasoline compartment 37 thereby forcing the gasoline out through pipes 41, 42, meter 43, and flexible hose 44. As in the preferred form of
 120 invention the outlet nozzle is provided with a quick acting valve 53. The compartments of the tank are so proportioned that when the gasoline has reached a predetermined level in compartment 37, preferably at the base of dome 40, the lower end of pipe 47
 125 becomes uncovered. Being no longer immersed in the water, a further introduction of compressed air passes out through pipe 47, any water remaining in such pipe being prevented from escaping by the baffles in
 130 box 48. When air finally escapes through pipe 47 it will carry some atomized water

with it. The baffle plates in box 48 are designed to stop the water yet to permit the air to escape.

The end of tube 50 being lower than the end of pipe 47, is under water when pipe 47 is uncovered, and an effective seal is thereby produced, preventing the blowing of air through the dispensing portion of the system. Since the air pressure in compartment 38 cannot be further increased it is apparent that no more gasoline can be discharged until the storage tank has been refilled, nor can any water or air be discharged through the system.

The air compressor 51 has connected therewith a storage tank 59. In the line of piping immediately beyond this tank is a manually operated valve 64 to cut off the supply of air to the system when not in use. A pressure regulator 61 of any approved type is interposed between valve 64 and an air release valve 62 adapted to be manually operated to allow the escape of air from the system when the storage tank is being refilled with gasoline. An automatic safety valve 63 is also provided to insure against excessive pressure in the storage tank for gasoline, by regulating the pressure in compartment 38.

Having described the present invention what is claimed is:—

1. A dispensing system for gasoline comprising superimposed tanks in communication, means for supplying gasoline to the upper tank, a fluid heavier than gasoline contained in the lower tank, and means for forcing the heavier fluid into the upper tank to displace the gasoline therefrom comprising a device for supplying air under pressure to the lower tank.

2. In a dispensing system a gasoline receptacle, a water receptacle at a lower level than said gasoline receptacle, a pipe connecting the lower portions of said receptacles, and air pressure means for forcing water from the lower receptacle into the upper receptacle, said means being adapted to automatically maintain a uniform pressure.

3. A dispensing system comprising a tank, a partition separating said tank into upper and lower compartments, a tubular member in said lower compartment communicating with said upper compartment, liquids of different specific gravity in said upper and lower compartments respectively, and means for forcing air under pressure into said lower compartment whereby the liquid in said lower compartment is forced through said tubular member into the said upper compartment thereby expelling the liquid from said upper compartment.

4. A dispensing system comprising a tank, a partition dividing said tank into upper and lower compartments, a dome extending

from the upper compartment of said tank, a float pivotally mounted in said upper compartment and adapted to be received within said dome, said float being adapted to actuate a valve for regulating communication between said upper and lower compartments, a discharge pipe rising from said dome, a delivery pipe connected at one end to said discharge pipe, a valve for maintaining a column of fluid in said delivery pipe and above the upper end of said discharge pipe at all times.

5. A gasoline dispensing system comprising a tank, a partition dividing said tank into upper and lower compartments, a float in said upper compartment, a tubular member in said lower compartment extending to a point adjacent the bottom thereof and communicating with the said upper compartment, a valve in said tubular member, a connection between the valve and float whereby the said valve opens and closes with the fall and rise of said float.

6. In combination with a tank, a partition dividing said tank into upper and lower compartments, a tubular member communicating with both the upper and lower compartments, and extending to a point adjacent the bottom of said lower compartment, a valve in said tubular member, a float in said upper compartment, said float being buoyant in water but gravitating in gasoline, and means connecting said float and valve whereby when the float is in buoyant position the said valve is closed.

7. A dispensing system comprising a tank, a partition separating said tank into upper and lower compartments adapted to respectively contain liquids of different specific gravity, a tubular member in said lower compartment communicating with said upper compartment, and means for forcing compressed air into said lower compartment whereby the liquid in said lower compartment is forced into the said upper compartment thereby expelling the liquid in said upper compartment, together with means for relieving the dispensing pressure upon the liquid in said upper compartment when it is nearly exhausted.

8. A dispensing system comprising a tank, a partition dividing said tank into upper and lower compartments adapted to respectively contain liquids of different specific gravity, a dome extending from the upper compartment of said tank, a float pivotally mounted in said upper compartment and adapted to be received within said dome, a pipe connecting the lower portions of said compartments, a valve in said pipe operated by movement of said float to open and close the communicating opening between said compartments, the said float being adapted to rise in one liquid and to sink in the other, in combination with means

for forcing the liquid in the lower compartment into the upper compartment, and thereby dispensing the liquid in the upper compartment.

- 5 9. In a dispensing system a gasoline receptacle, a water receptacle at a lower level than said gasoline receptacle, piping connecting the lower portions of said receptacles and adapted to convey water from

the lower to the upper receptacle for dispensing gasoline therefrom, and means in 10 communication with one of said receptacles for cutting off communication between said receptacles when a predetermined quantity of gasoline has been dispensed.

15 In testimony whereof, I have hereunto affixed my signature.

CLARENCE SCHOCK.