

Sept. 4, 1928.

1,683,021

G. A. BROWN

OIL DISPENSING APPARATUS

Filed Sept. 3, 1927

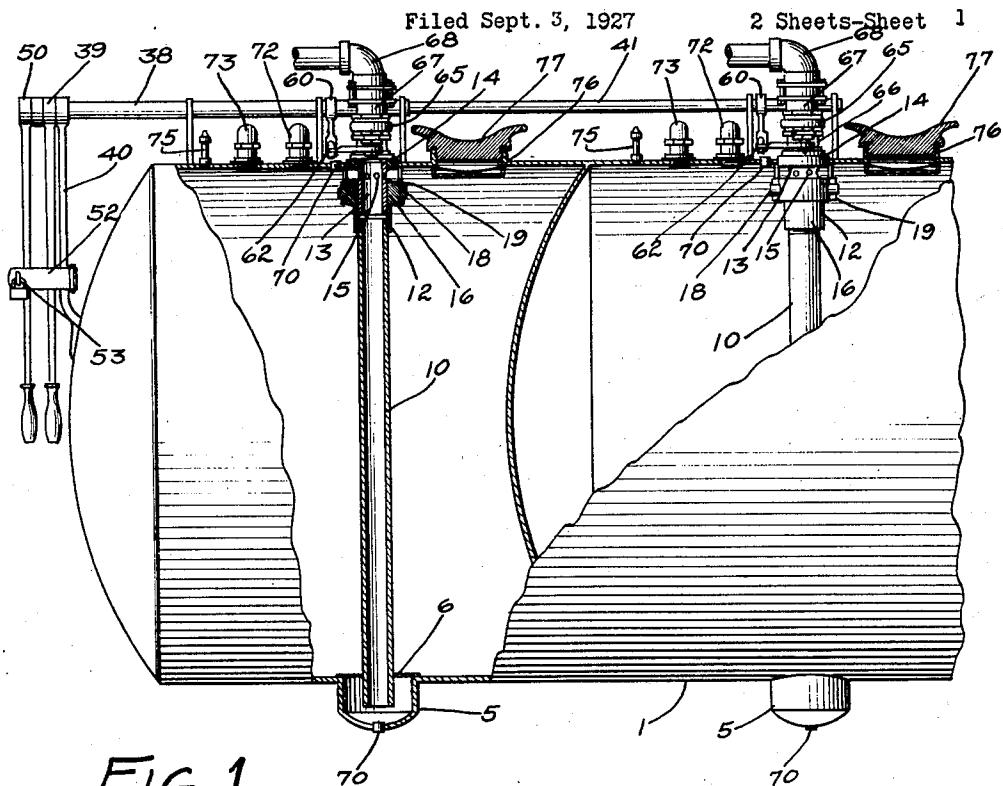
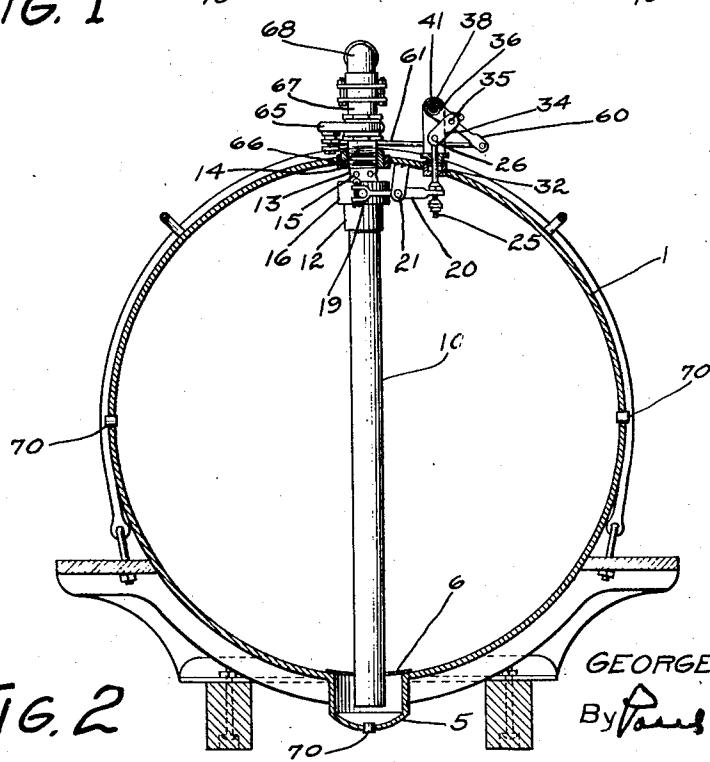


FIG. 1



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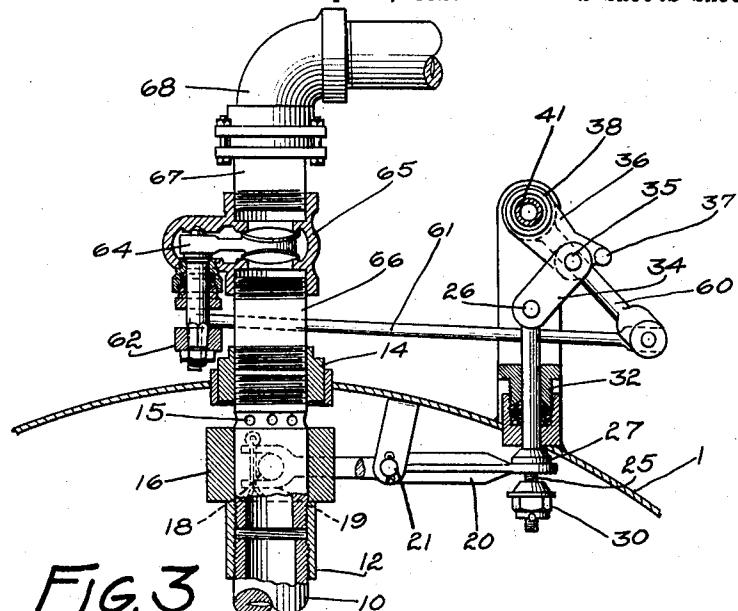


FIG. 3

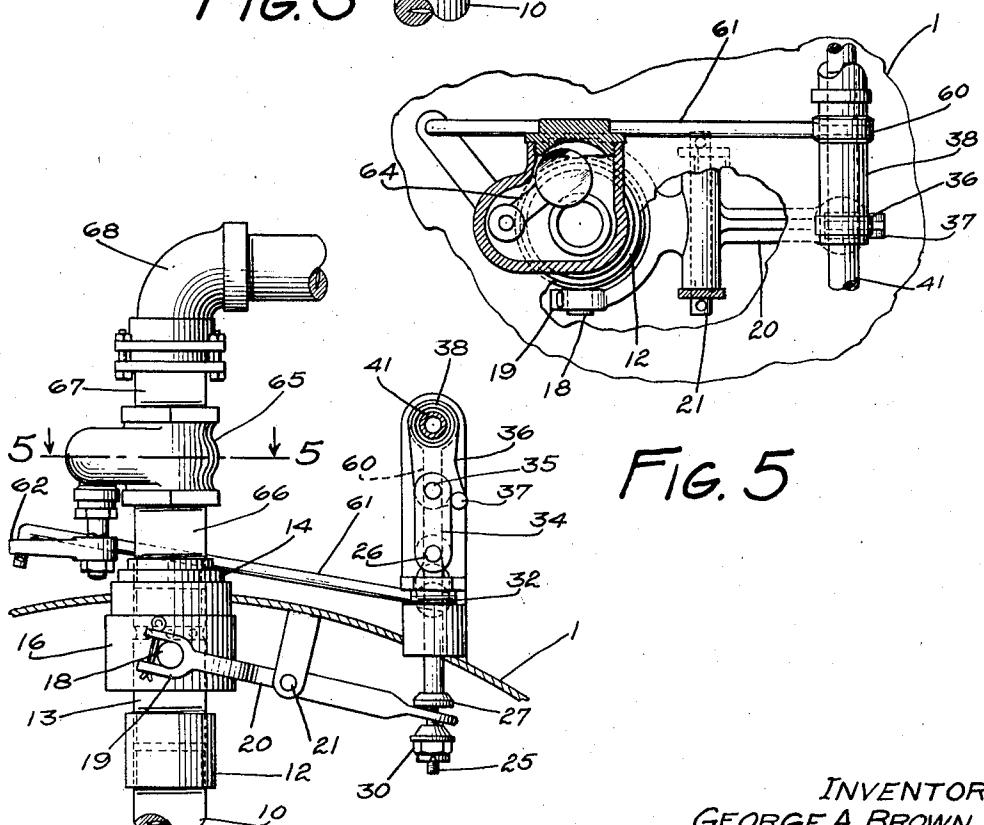


FIG. 4

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UNITED STATES PATENT OFFICE.

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OIL-DISPENSING APPARATUS.

Application filed September 3, 1927. Serial No. 217,405.

This invention relates to improvements in truck tanks principally used for delivering gasoline to service stations.

Objects of the invention are to provide a tank in which no drain faucets, valves or pipes, beneath the tank, are used; to provide siphon means in lieu of such drain pipes and faucets for emptying the tank; to provide means for preventing such overflow in the delivery line of the tank as might create a fire hazard; to provide means for equalizing pressures between the siphon tube and tank, either as the result of expansion of the liquid when heated or when air pressure is applied to obtain siphon action; to provide a tank having a plurality of compartments; to provide means accessible from one end of the tank for separately operating the siphon means in each compartment; to arrange such means to be locked by the same device; to provide means for creating a pressure within the tank to initiate siphon action; to provide a pressure relief valve; to provide an air intake valve which opens inwardly admitting air and permitting out-flow of the liquid; to provide means whereby the tank can be completely emptied; and generally to provide a reinforced rigid structure which will withstand all the strains to which the device is put in use.

Other objects are to provide means whereby no leakage from the tank can take place under any ordinary conditions of use, or when the tank is overturned. This is a valuable feature of the invention because leakage under almost every condition is a fire hazard.

Features of the invention include all the constructions, combinations and sub-combinations of the elements, including means whereby the device is automatically conditioned for siphon action upon opening of valves in the delivery line, along with mechanism for operating these two valves simultaneously.

Objects, features and advantages of the invention will be set forth in the description of the drawings forming a part of this application and in said drawings:

Figure 1 is a vertical longitudinal section through a plural compartment tank, each compartment being equipped with one of the devices claimed herein;

Figure 2 is a cross section through one of the compartments;

Figure 3 is an enlarged detail section of

the valve and valve operating mechanisms viewed in a manner similar to that of Figure 2, and showing the inner valve open;

Figure 4 is a view showing the inner valve closed, and showing the pivots of the links 60 vertically aligned; and

Figure 5 is a plan section on line 5—5 of Figure 4.

The numeral 1 designates a tank which in this instance is divided by partitions into 65 compartments. The bottom of each compartment has a drain sump 5 covered by a suitable strainer member 6.

Inasmuch as the mechanisms for all tanks are the same only one mechanism will be described in detail.

In order to dispense with the use of faucets, and of piping beneath the tank, and to generally reduce leakage to the minimum, a siphon device is provided by means of which 75 oil is delivered upwardly and outwardly from the top of the tank, into the service or delivery pipe, by siphon action, alone, except that this action is initiated by tank pressure. To this end, I provide a tube 10 vertically arranged and having its lower end passing through strainer member 6 and arranged in the drain sump 5. The upper end of this pipe is threaded and the threads are engaged with a coupling 12 as a valve stop. With 80 the coupling 12 is engaged a nipple 13 in turn threaded into a collar 14 of the tank, and having openings 15 or having a single port.

The series of radially arranged openings 15 85 function to equalize pressures between tank and pipe. To obtain siphon action, it is necessary to close the openings 15 in some manner, and for this purpose I provide a weighted valve 16, which is limited in open position 95 by the coupling 12. This valve, as a collar or sleeve, is provided with trunnions 18 with which are engaged the corresponding terminal forks 19 of the arms of the lever 20. The

lever 20 is suitably pivoted intermediately 100 at 21, in this instance to a bracket depending from the top inner side of the tank. The lever, at that side of its pivot opposite the valve 16, is bored, and a link 25 traverses the bore and is threaded to receive adjustable 105 stops. The stop 27 engages the threads above the lever, and a stop 30 engages the threads therebelow. The shank of the link loosely traverses the lever 20. The link 25 passes through a suitable bushing 32, and has 110

its upper end pivotally connected as at 26 to a link 34 which in turn is pivotally connected as at 35 with a crank arm 36 in turn secured to a tubular crank operating element 38 which is suitably journaled in brackets and extends rearwardly of the tank and is provided with an operating lever 39. The rear end of the element 38 is supported by a bracket 40 and extends rearwardly through this bracket to receive the arm 39. For each compartment a valve operating element similar to 38 is provided. Only two compartments have been illustrated and, therefore, only two valve operating elements have been shown, the second being designated 41. Both are tubular and pass through one another, the element 41 being of the smaller diameter and passing through and being rotatably supported by the element 38. An operating lever for the element 41 is indicated at 50. In this way all the operating levers are accessible from one position. The levers, when in their inoperative position, which corresponds to a closed position of the outer valve, lie in parallel relation and are locked by opposingly related arms 52 hinged at one end to the bracket 40 and brought together and padlocked as at 53, thus securing the levers in inoperative position, either against accidental displacement or tampering.

A lever 60 is mounted on and movable by the tubular element 38, and this lever 60 is connected by a link 61 with the operating handle or lever 62 of a quick opening throttle valve, the casing of which is indicated at 65, and which is connected at its lower side to nipple 66, and is thus in communication with tube 10. The handle or lever 62 passes through suitable bushings in the casing and has at its opposite end secured a valve member 64 which carries the double wedge disks, engaging with the tapered seats. This is a preferred form of valve but its construction forms no part of the present invention. It simply controls outlet from the tube 10. This valve is connected on that side opposite the nipple 14 with a nipple 67 as part of a standard swivel elbow generally indicated at 68, the construction of this elbow forms no part of the present invention. The delivery hose or pipe is connected directly to the free end of this elbow or coupling.

Fusible plugs 70 fill vent openings. The plugs are arranged diametrically in pairs. Three of the plugs being arranged in the sides of each tank compartment proper and the fourth being arranged in the bottom of the drain sump. A safety blow-off valve 72 is provided at the top of each compartment and an air inlet check valve 73 is also provided. Fluid under compression is introduced into each compartment through a valve 75. The construction of this valve 75 is not shown. It may be of any preferred type, such as a tire valve. A filler opening 76 for each com-

partment is closed by a suitable cap 77, and a strainer member 78 surrounds the filler opening at the inner side.

The present device is also adapted to function to automatically open the outer valve when the tank is over-turned, and lies in an upside down position, or in any position in which gravity can act on the sleeve or inner valve. Another important feature of the invention includes means by which if the outer valve is inadvertently left open, it will be automatically closed as the result of motions of the vehicle upon which the tank is mounted. For this purpose, the lever 36 is provided with a projection 37 which engages laterally against the link 34 to limit movement of the links in a direction toward the left as viewed in Figure 4. The element 36 engages in such a manner that when the outer valve is completely open the axis of rotation of the elements 38 and 41, the axis of the pivot 35, and axis of the pivot 26, will be vertically aligned. It will thus be seen that any force acting to slightly disalign the pivot 35 in a direction towards the right as viewed in Figure 4, will permit the weighted sleeve valve to act in a manner to continue this disalignment toward the right, and eventually cause the links to assume the position shown in Figure 3 in which the outer valve is closed. Therefore, the outer valve inadvertently left open cannot long remain so, after the vehicle is in motion.

The device thus provides means whereby gravity will act, when the tank is in upright position, to open the inner and close the outer valve and, on the other hand, when the tank is upside down, or in any position in which gravity can act on the inner valve, the inner valve will be closed and the outer valve opened. Therefore, when the tank is in upright position and the outer valve is closed by hand, the valve which controls the vent openings in the siphon tube will be exposed or opened, in this instance by the downward movement of the valve. On the other hand, if when the tank is in upright position, on a vehicle and if the operator should fail to close the outer valve, the toggle lock will be broken by the natural joggling motion of the vehicle with the result that the weighted inner valve will fall and cause the outer valve to close. What may be termed a fool-proof construction is thus provided which will prevent emptying of the tank when it is over-turned; will prevent leaking of the tank through the delivery pipe at all times; and will cause the tank to be automatically vented through the delivery pipes 10, if over-turned.

The tanks of the present type are ordinarily mounted upon a truck chassis, Figure 2 shows a view of one way of mounting. Inasmuch as the mounting forms no part of the invention, the elements are not described in detail.

Operation.

The compartments of the tank having been filled, let it be supposed that we wish to withdraw some liquid. We first create a pressure in a compartment by introduction of compressed air through the coupling 75. The pressure is equalized within the tank and tube 10, by means of the ports 15. One of the levers, like 39, is operated to cause rotation of one of the tubular members, either 38 or 41, and open the outer valve 65. This causes the inner or sleeve valve to close the equalizing ports 15. Siphon action is initiated and discharge from the tank, through the tube 10, takes place.

It will be noted that when the outer valve is fully open, the axis of the tubular elements 38 and 41, the axis of the pivot 35, and the axis of the pivot 26 are aligned vertically. Furthermore, it will be noted that the stop 37 engages the link 34 so that this alignment is always obtained when the outer valve is in its wide open position or when the sleeve valve is in fully closed position. The mechanism is thus positioned so that if the operator fails to close the outer valve, the natural vibrational motion of the vehicle will cause one of the pivotal points to become disaligned, that is the point 35, and when this happens, the weight of the sleeve valve will operate to positively automatically close the outer valve.

I claim as my invention:

1. A tank having a siphon tube having its delivery end projecting through the tank, and having a port within the tank and above the intake end of the tube, a valve for controlling the discharge through the tube at the outer side of the tank, a valve for closing said port, and connections between the valves whereby gravity action of the inner valve to open the port will cause the outer valve to close.

2. A tank having a siphon tube having its delivery end projecting through the tank having a port within the tank adjacent that side of the tank which is normally uppermost, a valve for controlling the discharge through the tube at the outer side of the tank, a valve reciprocal upon the tube to close said port, and connections between the valves whereby when the outer valve is closed the inner valve will open said port.

3. A tank having a siphon tube having its delivery end projecting through the tank, and having a port within the tank and above the intake end of the tube, a valve for controlling the discharge through the tube at the outer side of the tank, a valve to close the port, and connections between the valves whereby the opening of the outer valve will cause the inner valve to close the port.

4. A tank having a siphon tube having its delivery end projecting through the top of the tank, and having a port within the tank

and above the intake end of the tube, a valve 65 for controlling the discharge through the tube at the outer side of the tank, a valve to close the port, and connections between the valves whereby gravity action of the inner valve to open the port will cause the outer 70 valve to close.

5. A tank having a siphon tube traversing the tank to deliver from its top, said tube having a port within and adjacent the upper side of the tank, a valve at the outer side of the tank for controlling flow through the tube, a valve adapted to open or close the port, a lever for translating the inner valve, a link connected with the lever and sealingly slideable in the tank wall and projecting at the 80 outer side, a valve operating member having links connecting it with said first mentioned link and with said outer valve, the arrangement being such that when the outer valve is manually moved to open position, the inner 85 valve closes the port and the arrangement further being such that the weight of the inner valve opens the port and automatically closes the outer valve.

6. A tank having as the sole means for emptying it, a siphon tube having its intake end adjacent the bottom of the tank and having its delivery end projecting through and above the tank, said pipe having a port within the tank adjacent that side of the tank 95 which is normally uppermost, a valve for controlling discharge through the tube at the outer side of the tank, an inner gravity operable valve adapted to close the port, and connections between the valve, such that the action of gravity of the inner valve to open the port will cause the outer valve to close and such that when the tank is upturned the gravity action of the inner valve to close the port will open the outer valve. 105

7. A tank having as the sole means for emptying it, a siphon tube having its intake end adjacent the bottom of the tank and having its delivery end projecting through and above the tank, said pipe having a port within the tank adjacent that side of the tank 110 which is normally uppermost, a valve for controlling discharge through the tube at the outer side of the tank, an inner gravity operable valve adapted to close the port, and connections between the valve such that the action of gravity of the inner valve to open the port will cause the outer valve to close and such that when the tank is upturned the gravity action of the inner valve to close the port will open the outer valve. 115

8. A tank having as the sole means for emptying it, a siphon tube having its intake end adjacent the bottom of the tank and having its delivery end projecting through and above the tank, said pipe having a port within the tank adjacent that side of the tank 120 which is normally uppermost, a valve for controlling discharge through the tube at the outer side of the tank, an inner gravity operable valve adapted to close the port, and connections between the valve such that the action of gravity of the inner valve to open the port will open the outer valve, the said tank having a well lying outwardly beyond the outer surface of the tank, and the intake end of said siphon tube being arranged within the well, whereby when the tank is upturned no oil, or very little oil, will escape through the siphon tube, but whereby pressure within the tank is relieved. 125

8. A tank having a siphon tube having its delivery end projecting through the tank and having a port within the tank adjacent that wall of the tank opposite the intake end of the tube, a valve for controlling discharge through the tube at the outer side of the tank, an inner sleeve valve slidable upon the tube and of substantial weight, and arranged to open and close the port, and connections be- tween the valves whereby gravity action of the inner valve in one direction will open the port and cause the outer valve to close, and whereby when the tank is upturned the gravity action of the inner valve to close operates the outer valve to open it.

In witness whereof, I have hereunto set my hand this 29th day of August, 1927.

GEORGE A. BROWN.