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APPARATUS FOR STORING AND FEEDING HYDROCARBON LIQUIDS.

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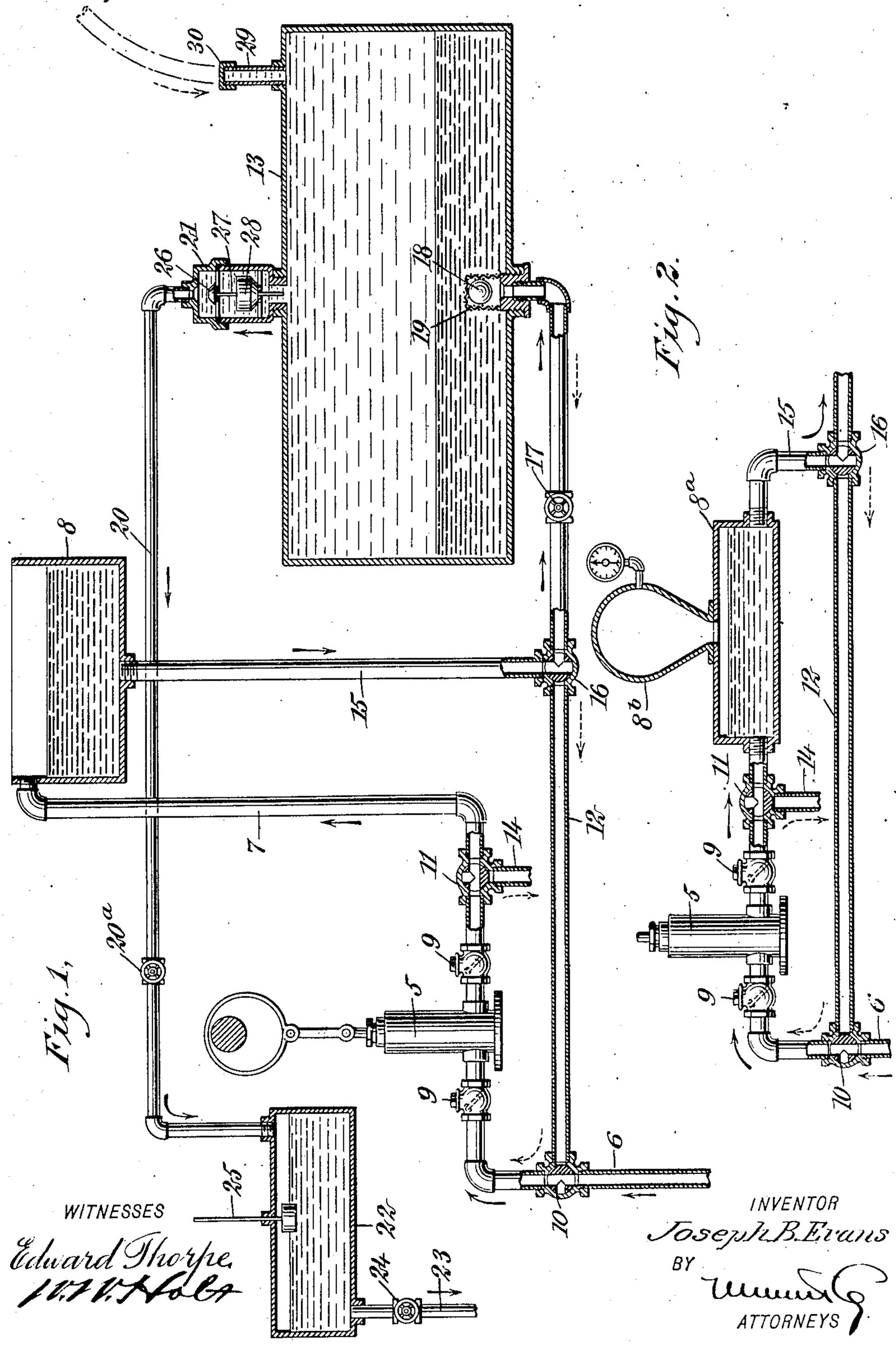

Fig. 1.

Fig. 2.

WITNESSES

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Application filed October 2, 1907. Serial No. 395,496.

To all whom it may concern:

Be it known that I, JOSEPH B. EVANS, a citizen of the United States, and a resident of Selma, in the county of Dallas and State of Alabama, have invented a new and Improved Apparatus for Storing and Feeding Hydrocarbon Liquids, of which the following is a full, clear, and exact description.

This invention is an improved apparatus for storing and feeding hydrocarbon liquids, especially such volatile liquids as gasolene used as the motive agent in internal combustion engines.

The apparatus is primarily designed to be used in motor boats, in which connection it is desirable that the supply tank at all times remain full, not only by reason of the fact that a free surface of gasolene or the like is conducive of evaporation, but also that the danger of explosion is augmented by the confined gas; the evaporation of this gas being facilitated in a rough sea by the sloshing of the liquid in the unfilled tank. By my invention the loss by evaporation is not appreciable and the danger of explosion materially lessened, also such water as the gasolene contains when introduced in the tank is separated therefrom.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in both views.

Figure 1 is a diagrammatic view partly in section, illustrating the preferred form of the invention; and Fig. 2 is a view partly in section, illustrating a modified feature of the invention.

The internal combustion engine which is used for driving the boat also drives a force pump 5, the said pump being connected with a pipe 6 leading from the sea and discharging through a pipe 7 into a water pressure tank 8, the usual check valves 9 being provided in the length of the pipes 6 and 7 at the opposite sides of the pump. The pipes 6 and 7 are also provided with three-way valves 10 and 11, respectively; the valve 10 connecting with a pipe 12 passing to and connecting at the bottom of a fuel supply tank 13, and the valve 11 connecting with a discharge pipe 14 leading to the sea.

The water pressure tank 8 discharges through a pipe 15 and thence into the supply tank through a portion of the pipe 12, the connection between these pipes being effected by a three-way controlling valve 16, that portion of the pipe 12 intermediate the three-way valve 16 and the supply tank being further provided with a manually-operated valve 17. The communication between the supply tank and the pipe 12 is automatically controlled by a valve 18, preferably in the nature of a ball, arranged within the tank and confined over its seat by any suitable cage 19. This ball is of such specific gravity as to float in water, but readily sink and be seated in such hydrocarbon liquids as gasolene. A discharge pipe 20 having a valve 20^a connects with the supply tank through a valve-casing 21, and leads to a small auxiliary tank 22, the latter being provided with a discharge pipe 23 leading to the engine, and having a controlling valve 24. The auxiliary tank is also provided with a float gage 25 indicating the level of the fuel supply therein. The stem of this gage fits its bearing in the top of the tank with sufficient play to allow the tank proper vent and at the same time prevent undue friction.

The valve casing 21 carries a valve for automatically governing the flow through the discharge pipe, which comprises a valve head 26 having a stem 27 retained in an upright position by suitable guides, and a float 28 secured to the stem, of such specific gravity as to drop with the valve in a liquid such as gasolene but buoyantly force the valve head 26 to its seat and thus cut off the discharge when submerged in water.

The supply tank 13 has the usual filling plug or pipe 29 normally covered by a cap 30. When this cap is removed the coupling of the gasolene hose may be threaded directly to the pipe 29 as indicated in dotted outline. With the three-way valve 16 in the position shown in Fig. 1 and the valve 17 open, the gasolene is admitted to the auxiliary tank by opening the valve 20^a; this passage of the gasolene being caused by the gravity pressure of the water in the tank 8, the said water, as the gasolene flows to the auxiliary tank, being introduced into the supply tank, thus keeping the latter at all times filled. After repeated fillings of the auxiliary tank sufficient to exhaust the gasolene from the supply tank, the water level in the latter rises to the float 28, raising the same and seating the valve, thus cutting off the discharge of the water into the auxiliary tank. During this period the water in the tank 8 is replenished as it becomes exhausted by the operation of the pump 5; the three-way valves 10 and 12 at

this time being turned to blanket the pipes 12 and 14 respectively.

On filling the supply tank 13 with fuel, a hose usually leading from the barrel of gasolene is attached to the pipe 29 in the manner heretofore stated. The three-way valves 10 and 16 are then turned to connect the supply tank directly with the pump through the pipe 12, and the three-way valve 11 is turned to pass the water from the pump through the pipe 14 back to the sea, the valve 20^a at this time being closed. On now starting the pump 5 the water will be drawn from the supply tank and the gasolene will be sucked through the hose to take its place until the level of the water passes to the ball-valve 18, when the latter will seat and prevent the passage of the gasolene to the pump. On now again shifting the three-way valves to the position as illustrated in Fig. 1, the fuel may be forced from the supply tank into the auxiliary tank until exhausted.

In the modification of my improvement shown in Fig. 2, the construction is essentially the same, except in the matter of the pressure tank 8 which, instead of being located at a higher elevation than the supply tank and forcing the water therein under the action of gravity, is replaced by a tank 8^a having an air chamber 8^b, whereby the water will be delivered to the supply tank by the pressure of the confined air.

It is thus seen that I have provided an apparatus which will at all times maintain the supply tank in a filled condition, obviating the loss of the fuel by evaporation and also to a considerable extent minimizing the danger of explosion. It will be further noted that by reason of drawing the fuel from the supply tank from its top, such water as may be introduced with the gasolene through the filling opening will drop to the water level and not pass to the engine as in the usual arrangement.

The invention as shown while being the preferred construction and arrangement of my improved apparatus is susceptible to modifications other than that illustrated, and I consider I am entitled to such changes as fall within the scope of the appended claims.

Having thus described my invention I claim as new and desire to secure by Letters Patent:

1. In an apparatus of the character described, a supply tank adapted to contain a hydrocarbon liquid, a discharge pipe leading from the upper portion of said tank, a pump, a feed pipe leading to the pump, a water pressure tank, a supply pipe leading from the pump to the water pressure tank, a discharge pipe connecting with said supply pipe, a pipe connecting the pump feed pipe with the lower portion of the supply tank, a discharge pipe leading from the water pressure tank and connecting with the last-named pipe, and three-way valves arranged at the connection of each pipe with another pipe, whereby the water from the pump may be delivered to the water pressure tank and thence to the supply tank, or may be pumped by the said pump from the supply tank through the last-named discharge pipe.

2. In an apparatus of the character described, the combination of a supply tank adapted to contain a hydrocarbon liquid and having a discharge at the upper portion thereof, a water pressure tank, a pump, a feed pipe leading to the pump, a supply pipe leading from the pump to the water pressure tank, a discharge pipe leading from the water pressure tank to the lower portion of the supply tank, and a pipe connecting the last mentioned pipe with the pump feed pipe and having valves for establishing communication between the supply tank and said pump feed pipe, whereby the water may be pumped from the supply tank directly to the water pressure tank.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH B. EVANS.

Witnesses:
W. W. HOLT,
EVERARD B. MARSHALL.