Nov. 23, 1937. A. H. KLESA 2,099,742

REMOTE FEED FOR LIQUID FUEL

Filed Sept. 7, 1934 2 Sheets-Sheet 1

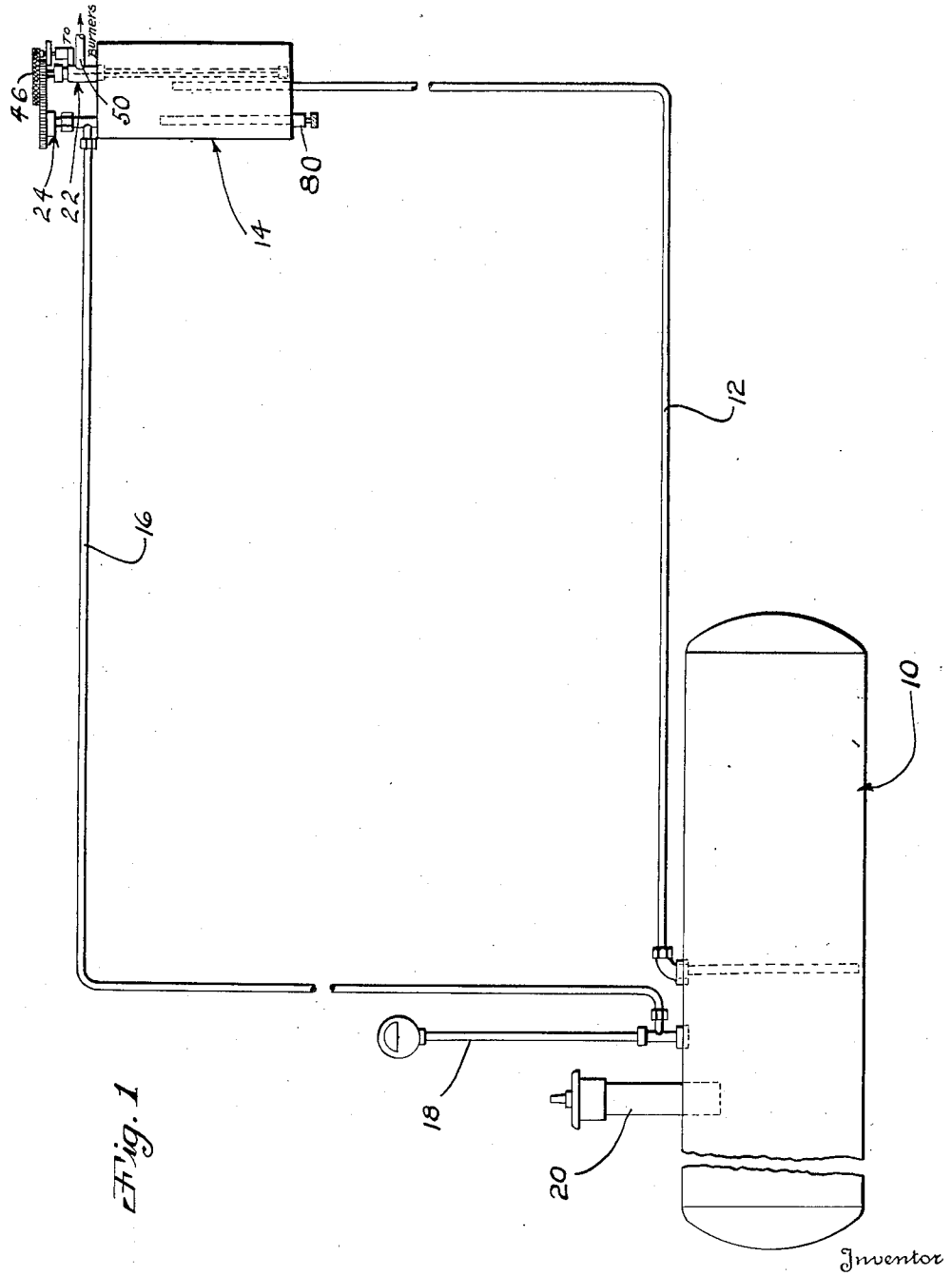


Fig. 1

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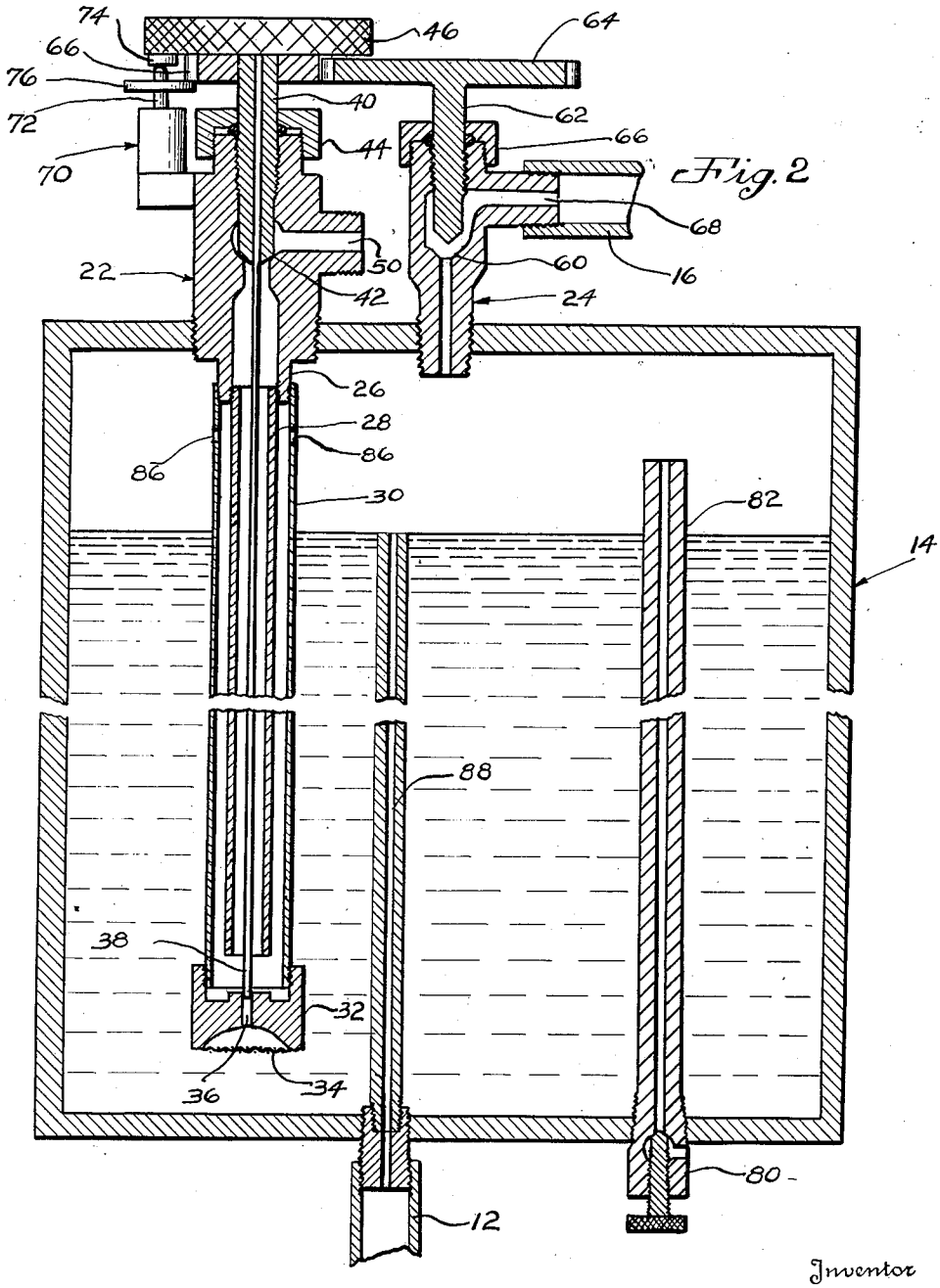


Fig. 2

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REMOTE FEED FOR LIQUID FUEL

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6 Claims. (Cl. 158—81)

This invention relates to forced feeds for liquid fuel and is more directly concerned with transporting fuel from a remote supply to mechanism adapted to function on the so-called "instant light" arrangement.

Prior to the present invention considerable development has taken place in employing liquid fuels, such as gasoline, so that they will burn instantaneously when discharged to provide light or heat. Before these developments it was substantially impossible to have gasoline burn directly to produce a brilliant light or high heat, due to the fact that the burner was not heated and because of the difficulty of instantaneously igniting gasoline unmixed with oxygen.

However the developments in advance of the present invention failed to provide a satisfactory arrangement for utilizing "instant light" burners with a remote fuel supply. It was necessary to place the large fuel supply tank quite close to the burner in order that the mixing valve could be directly associated with the main supply tank whereby the carry of mixed gasoline and air would be short to insure the desired character of the mixture. This arrangement of parts was obviously dangerous in many installations due to the proximity of the burner and the fuel supply, and in addition did not adapt itself to many installations in which it was extremely desirable for purposes of convenience, space or otherwise to place the fuel-supply tank at a station remote from the burner.

It is an object of the present invention to avoid and overcome the above and other difficulties of prior-known devices by the provision of an improved arrangement of parts which permit the "instant light" type of burner to be employed at any desired distance from the fuel supply.

A more particular object of the invention is to provide an "instant light" system with a remote main fuel tank and a novel auxiliary tank positioned near the burner.

Another object of the invention is the provision of a novel interlocked valve arrangement on the auxiliary tank which simultaneously opens up the gas line and shuts off the air line and upon opposite movement achieves the reverse operation.

The foregoing and other objects of the invention are achieved in the apparatus described hereafter and illustrated in the accompanying drawings, wherein

Fig. 1 is a diagrammatic view of the general arrangement of parts embodying the present invention;

Fig. 2 is a cross-sectional view taken on a vertical diametric section through the auxiliary tank seen in Fig. 1.

It should be appreciated that the principles of the invention are adapted for application in various ways, however in accordance with the patent statutes one well-known embodiment of the invention will be specifically described. In the drawings the numeral 10 indicates generally a main fuel-supply tank having a conduit 12 for conducting the liquid fuel to an auxiliary tank shown generally at 14. A conduit 16 is likewise provided to extend between the main fuel tank 10 and the auxiliary tank 14 and this conduit functions to conduct air or other gas under pressure between the tanks 10 and 14 as hereafter described. A pressure gauge 18 may be incorporated in the conduit 16, if this is desired. The main fuel tank 10 is adapted to be filled in any suitable manner as through the provision of a member 20.

In Fig. 2 the details of the auxiliary tank 14 have been illustrated as including an instant or mixing valve shown generally at 22 and an air valve 24. The "instant light" valve or mixing valve 22 is formed with a downwardly extending flange 26 into which is threaded a tube 28 with a second tube 30 threaded or otherwise secured to the outside of the flange 26. The tube 30 is closed at its lower end with a plug 32 which has a screen 34 covering an aperture 36 leading to the inside of the tube 30 as illustrated.

In order to seal the aperture 36 in plug 32 a wire or pin 38 is provided to extend slightly into the aperture 36 and the pin 38 is mounted in the valve stem 40, which normally effects a valve seal or cut-off as at 42 in the main body of the mixing valve 22. The usual packing cup 44 is employed to seal the valve stem 40 at its upper end with respect to the valve body 22. An operating knob 46 is secured at the top of the valve stem 40 so that the stem can be rotated to simultaneously move it towards or from the valve seal 42 and to likewise move the pin 38 into and out of substantially sealing fit with the aperture 36.

The valve seal 42 opens or closes a conduit 50 with respect to the inside of tube 28, as will be seen from the drawings, and the aperture 50 is connected with the instant burner which is of any standard type and which has not been shown.

The air valve 24 is placed adjacent the mixing valve 22 and comprises the standard valve seat 60 closed by valve stem 62, which has a threaded fit in the body of the air valve 24. The

usual packing cup 66 may likewise be employed. The valve stem 62 and the valve seat 60 permit the flow of air or other fluid under pressure to or from the interior of the tank 14 by way of a conduit 68 which is connected to the conduit 16 running back to the main fuel tank 10.

A novel feature of the invention is to provide the valve stem 62 with a gear 64 which cooperates with a gear 66 secured to the valve stem 40 of the mixing valve 22. By this relation of parts when the operating knob 46 is turned to open valve 22, valve 24 will be closed and vice versa. The operation of these parts will be hereafter described.

For the purpose of providing an "instant light" the valve 22 must be open very slightly both at the seal 42 and at the aperture 36, and to this end a spring stop shown generally at 70 is provided. This stop includes a plunger 72 which is urged upwardly against a cam stop 74 in such a manner that the valve 22 can only be opened ¼ turn without pushing down on the plunger 72, which may be facilitated by incorporating a flange 76 on the plunger. Once the burner has warmed up sufficiently the valve 22 can be completely opened. The turning movement of the operating knob 46 in the opposite direction will not cause the plunger 72 to function as a stop in that the pin will ride up the tapered cam surface of the stop 74 and fall off the shouldered end thereof.

In the operation of the device liquid fuel, such as gasoline, is placed in the main tank 10 by way of the member 20 and air under pressure is supplied to the tank so that gasoline will be forced to the auxiliary tank 14 thereby. When the charging of the auxiliary tank is being done the air valve 24 should naturally be closed and any air in the tank 14 can be drained therefrom by way of the relief valve 80 which includes the stand pipe 82. The valve 80 may also in use of the apparatus serve as a gasoline drain for filling lanterns etc. In using the valve 80 for filling lanterns, etc., it will be understood that the air valve 24 must be closed. When the valve 80 is first opened only air trapped in the top of the auxiliary tank 14 may escape from the valve thereby allowing the level of the liquid fuel in the tank to rise until the liquid fuel is likewise drawn or actually forced out of the pipe 82 and valve 80 as desired. When the auxiliary tank 14 has been filled the device is ready for operation and air pressure is built up in the auxiliary tank by closing the gasoline valve and allowing the pressure from the main tank 10 to flow to the auxiliary tank by way of conduit 16 and air valve 24. The operating knob 46 will then be turned to open the mixing valve 22 about ¼ turn, which will likewise remove the pin 38 very slightly from the aperture 36 so that gasoline will flood up into the tube 30. Air under pressure in the tank 14 will simultaneously enter through the apertures 86 formed in the tube 30 and flow down between the tubes 28 and 30. This air will mix with the gasoline and be carried up by the air pressure through the tube 28 past the valve seal 42 out through conduit 50 to the instant burner where it will flame to a brilliant blue light or heat due to the combined air and gasoline mixture. Once the burner has been warmed up the spring stop 70 will be pushed down to allow the cam 74 on the operating knob 46 to be turned on past the stop which will permit the mixing valve to be completely opened. This complete opening of the mixing valve will completely shut the air valve 24 through the cooperating gears 64 and 66. The complete opening of the mixing valve 22 removes the end of the pin 38 from the aperture 36 so that the flow of liquid through the aperture is more than sufficient to meet the demands of the burner. As a result, the gasoline or other liquid fuel tends to seek the same level in tube 30 as the liquid outside the tube. Thus, substantially pure gasoline unmixed with air will be thereafter passed to the warm burner which will volatilize the fuel so that it will still burn to provide the desired light and heat without premixing with air. It will be understood that once the system is operating, as just described, to pass only gasoline or other liquid fuel to the burner and the air valve 24 is closed that the air under pressure in the main tank 10 forces the liquid fuel from the main tank to the auxiliary tank 14 as the fuel is withdrawn from the auxiliary tank and used.

When it is desired to shut off the burner the operating knob 46 will merely be turned to close the mixing valve 22 which will simultaneously shut off the gasoline and again open the air valve 24, thereby providing a supply of air under pressure in the top of chamber 14 ready for the next "instant light" operation. The excess gasoline in the auxiliary tank 14 will flow by gravity out the overflow and supply pipe 88 associated with the gasoline conduit 12. In starting the next "instant light" operation the operating valve 46 will be opened the ordinary ¼ turn approximately, which position the spring stop 70 will catch on the cam 74 and a combined mixture of air and gasoline will be forced out to burn. As above described the parts will be left in this position until the burner has warmed up, at which time the operating knob 46 will be turned to completely open the mixing valve 22 and to close the air valve 24.

By the above-described relation of mechanism an improved "instant light" system is provided in which the main fuel supply tank can be positioned at any remote distance. The system provides an auxiliary tank for mixing fuel and air and for automatically taking care of the initial mixing of these ingredients until the burner is warm enough to burn the fuel without further premixing the fuel and air. At this time pure gasoline can be supplied with the auxiliary tank being reset automatically when the burner is shut off so that the burner can be re-lit at any time with the desired initial charging of mixed air and gasoline. The improved system removes the danger of having the main fuel supply immediately adjacent the burner and likewise allows the various parts of the system to be placed where most convenient or accessible.

It should be appreciated that the invention has been described and illustrated in detail, however the scope of the invention is not limited thereby or thereto but is defined in the appended claims.

What I claim is:

1. A tank for use in a liquid-fuel system, which tank contains liquid fuel and air under pressure, a mixing valve in the tank for comingling the liquid fuel and air under pressure, an air valve for controlling the supply of air to the tank and gear means for coordinating the action of the mixing valve and the air valve so that the mixing valve will be open completely when the air valve is shut and vice versa, and so both valves may be partially open at the same time.

2. A tank for use in a liquid-fuel system, which tank contains liquid fuel and air under pressure, a mixing valve in the tank for co-mingling the liquid fuel and air under pressure, an air

valve for controlling the supply of air to the tank, and means for coordinating the action of the mixing valve and the air valve so that the mixing valve will be open completely when the air valve is shut and vice versa.

3. A tank for use in a liquid-fuel system, which tank contains liquid fuel and air under pressure, a mixing valve in the tank for co-mingling the liquid fuel and air under pressure, an air valve for controlling the supply of air to the tank, and means for coordinating the action of the mixing valve and the air valve so that the mixing valve will be open completely when the air valve is shut and vice versa, and a standpipe in the tank through which the liquid fuel is supplied to the tank.

4. A fuel supply system including a main tank containing liquid fuel and air under pressure, an auxiliary tank remote from the main tank, a conduit connecting the lower portion of the main tank with the lower portion of the auxiliary tank, a conduit connecting the upper portion of the main tank with the upper portion of the auxiliary tank, a conduit extending from the auxiliary tank to the place where the fuel is to be used, a mixing valve in the auxiliary tank and connected to the last-named conduit, said mixing valve being constructed and arranged when partly open to mix and pass the liquid fuel and air and when fully open to pass liquid fuel only, an air valve in the conduit connecting the upper portions of the tanks, and means for closing the air valve when the mixing valve is fully open and opening the air valve when the mixing valve is not fully open.

5. A fuel supply system comprising a tank, a conduit for supplying liquid fuel under pressure to the lower portion of the tank, a conduit for supplying air under pressure to the upper portion of the tank, a conduit extending from the tank to the place where the fuel is to be used, a mixing valve in the tank and controlling the passage of fluids through the last-named conduit, said valve being constructed and arranged to mix and pass the air and liquid fuel when the valve is partly open, said valve passing only liquid fuel when fully open, an air valve in the conduit for supplying air under pressure to the upper portion of the tank, and means for simultaneously opening one valve and closing the other.

6. A fuel supply system including a main fuel tank containing liquid fuel and air under pressure, an auxiliary fuel tank remote from the main tank, a gaseous pressure conduit connecting the tanks, a second conduit connecting the tanks and adapted to pass liquid fuel between the tanks, a gas valve in the gaseous pressure conduit adjacent the auxiliary tank, a mixing valve associated with the auxiliary tank and constructed and arranged when partly open to pass a mixture of liquid fuel and gas under pressure to the place where the fuel is to be used, and means for simultaneously fully opening the mixing valve and thereby closing the gas valve and vice versa.

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