

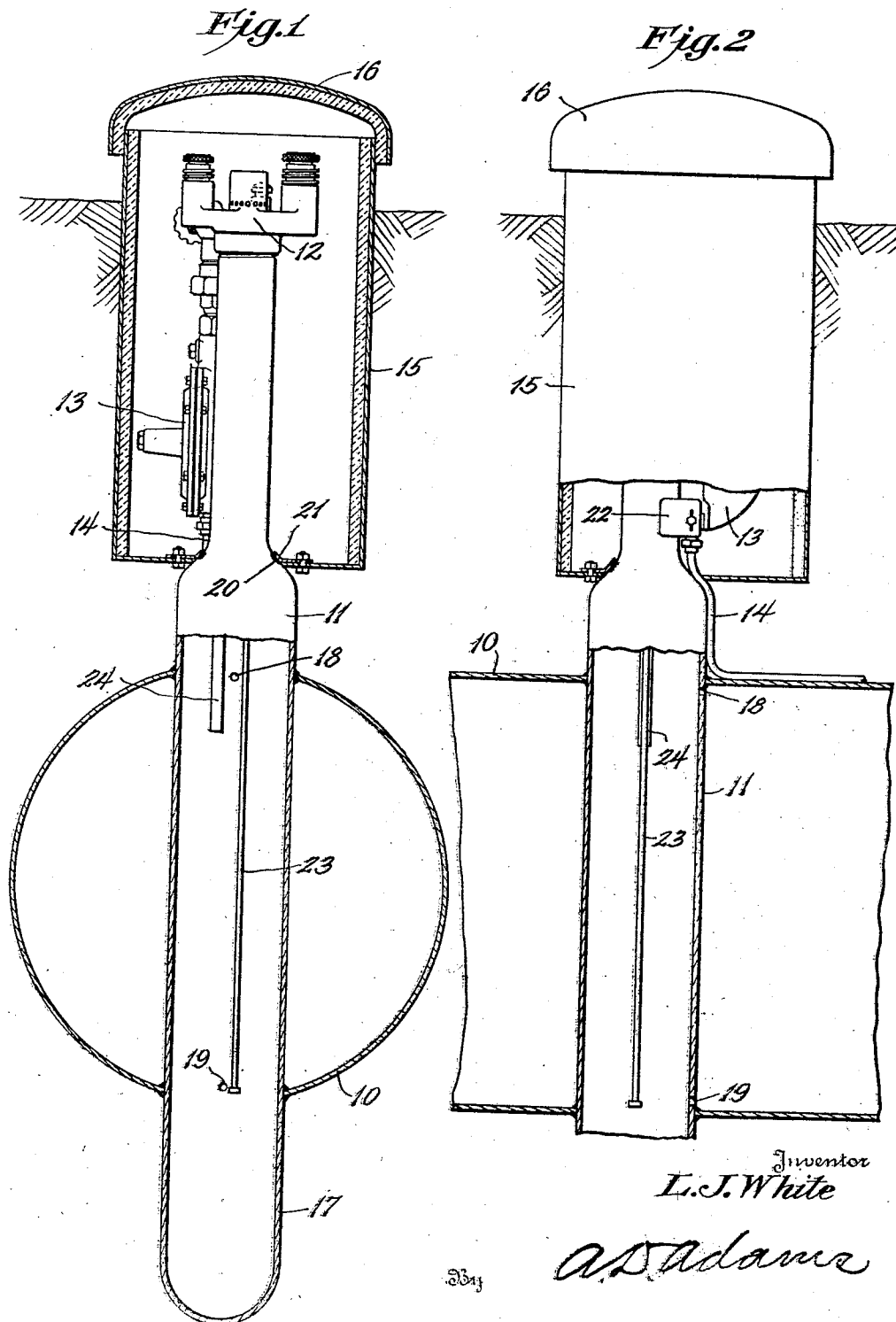
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LIQUEFIED GAS DISPENSING SYSTEM

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LIQUEFIED GAS DISPENSING SYSTEM

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5 Claims. (Cl. 62—1)

This invention relates to liquefied gas dispensing systems of the general type disclosed in Patents 2,121,673 and 2,121,675, both of which disclose an underground storage tank from which vaporized liquefied petroleum gas is dispensed through different types of dispensing appurtenances including a pressure reducing regulator. This invention aims to provide an improved system having novel means for supplying supplemental vaporizing heat to the liquefied gas in the tank. More specifically it aims to provide a system having a riser or standpipe connected to the storage tank and an extension of the standpipe below the bottom of the tank arranged in heat absorbing relation with the surrounding earth, whereby it absorbs heat and delivers it directly to the liquid gas within the standpipe.

Other aims and advantages of the invention will appear in the specification, when considered in connection with the accompanying drawing, wherein;

Figure 1 is a vertical sectional view, partly in elevation, of a system embodying the invention; and

Figure 2 is a fragmentary vertical sectional view, partly in elevation, taken at right angles to the section in Fig. 1.

Referring particularly to the drawing, the general type of system there shown is disclosed in Patent 2,121,675. It embodies a storage tank 10 having a standpipe 11 to which a combination gas dispensing unit or multiple valved head 12 is connected at its upper end and from this fitting or unit gas is delivered through an ordinary pressure reducing regulator 13 to a service pipe 14. The dispensing appurtenances, including the regulator, are housed within a heat insulated protecting casing 15 having a removable cover 16 and this casing is usually partially buried in the ground to afford easy access to the fittings for servicing the tank.

In this instance, the standpipe 11 is shown as extending entirely through the tank and has a projecting lower end 17 to act as an additional heat exchanging element to supplement the vaporizing heat supplied to the tank and the liquid gas within the standpipe. The projection is shown as being closed at its lower end and the standpipe has openings 18 and 19 at the top and bottom portions of the tank to permit the liquid in the tank to find its level. These openings may have excess flow check valves in them as disclosed in my application, Serial No. 176,842, filed Nov. 27, 1937.

The upper end portion of the standpipe 11 is

shown as being reduced in diameter and the protecting casing 15 is conveniently secured to its neck portion 20 by means of suitable welded-on brackets 21. It is contemplated however, that the reduced upper end may be connected to the enlarged lower portion by means of an ordinary flanged coupling. The reduced upper portion is also shown as having an integral bracket 22 to which the regulator is secured in substantially the same manner shown in the aforesaid patents.

While the particular dispensing appurtenances employed in this system do not form any part of the present invention, it will be understood that the multiple valved fitting 12 embodies every essential element shown in the aforesaid Patent No. 2,121,675. In this instance, however, the liquid level gauge is of the slip-tube type instead of the float operated type; although, it is to be understood that a float operated gauge may be employed by confining the float within the standpipe in the same as disclosed in my aforesaid application Ser. No. 176,842, filed Nov. 27, 1937.

In Fig. 1 the usual type of slip-tube 23 is shown as extending into the standpipe within the tank. The other tube 24 projecting into the top portion of the tank is the dip-tube which prevents overfilling the tank. However, it is contemplated that the dip-tube may be dispensed with by locating the opening 18 at the maximum liquid level, so that gas will be trapped in the tank above that point during the filling operation. This is a feature however, which forms no part of the present invention.

It will be understood that the storage tank is buried in the ground below the maximum frost line. Likewise the service pipe 14 leads downwardly from the insulated protecting casing in contact with the standpipe, thence, in contact with the tank, so that it will absorb some heat from the tank and insure revaporization of any condensed gas which may form in the service pipe and run back down to its lowest level, it being understood that the boiling point of the condensate at the low pressure existing in the service pipe is lower than that of the liquid in the storage tank.

Under normal operating conditions the tank will absorb sufficient heat from the earth to maintain a constant supply of vaporized gas in cold climates. However, it is highly desirable to supplement the heat normally supplied by the surrounding earth to the tank walls. Consequently, the heat exchanger on the lower end of the standpipe serves to supplement the normal supply of earth's heat to the contents of the tank and

applies it where it is most needed. That is to say, the additional heat absorbed by the heat exchanger is applied directly to the trapped liquefied gas in the standpipe and insures its proper vaporization while some of it is dissipated to the contents of the tank outside the standpipe.

From the foregoing description it will be seen that the system is very simple in its construction and it is easy to manufacture and install. It requires no separate heat exchanger to be connected to the tank. The standpipe can be easily welded in two openings provided for that purpose during the assembling operation. In fact, the systems can be pre-assembled at the factory and can be shipped reasonable distances to points of installation.

Obviously, the present invention is not restricted to the particular embodiment thereof herein shown and described. Moreover, it is not indispensable that all the features of the invention be used conjointly, since they may be employed advantageously in various combinations and sub-combinations.

I claim:

1. In a liquefied gas dispensing system of the character described, a pressure storage tank for the liquefied gas adapted to be buried in the ground; a standpipe connected to and extending above and below the tank; said standpipe having openings therein communicating with the interior of the tank near the top and bottom thereof to permit liquid in the tank to establish its level in the standpipe; and means to dispense gas from the upper end of the standpipe.

2. In a liquefied gas dispensing system of the character described, a pressure storage tank for the liquefied gas adapted to be buried in the ground; a standpipe connected to and extending above and below the tank and having at least one opening communicating with the tank permitting liquefied gas to flow into the bottom portion of the standpipe; dispensing appurtenances, including a pressure reducing regulator, connected to the upper portion of the standpipe; and a service pipe connected to the pressure reducing regulator and extending downwardly and

outwardly therefrom in close proximity to the standpipe and the tank.

3. In a liquefied gas dispensing system of the character described, a pressure storage tank for the liquefied gas adapted to be buried in the ground; a standpipe connected to and extending above and below the tank; said standpipe having openings therein communicating with the interior of the tank near the top and bottom thereof to permit liquid in the tank to establish its level in the standpipe; dispensing appurtenances, including a pressure reducing regulator connected to the standpipe; and a service pipe connected to the pressure reducing regulator and extending downwardly and outwardly therefrom in close proximity to the standpipe and the tank.

4. In a liquefied gas dispensing system of the character described, a pressure storage tank for the liquefied gas adapted to be buried in the ground; a standpipe connected to and extending above and below the tank and communicating with the tank to maintain a liquid level in the standpipe substantially the same as that in the tank; dispensing appurtenances, including a pressure reducing regulator, connected to the upper portion of the standpipe; a service pipe connected to the pressure reducing regulator; and an insulated protecting casing surrounding the appurtenances and supported by the standpipe.

5. A gas generating and dispensing system comprising in combination, an underground pressure storage tank adapted to be partially filled with liquefied gas; filling and gas dispensing means connected to the tank; an enlarged heat exchanging and gas delivering conduit within the tank extending below the bottom wall to absorb heat from the earth below the bottom of the tank, said conduit communicating with the liquid at the bottom of the tank and with the vapor space near the top of the tank and constituting a mixing and vaporizing chamber whereby to deliver vapor of substantially uniform B. t. u. content through said gas dispensing means.

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