

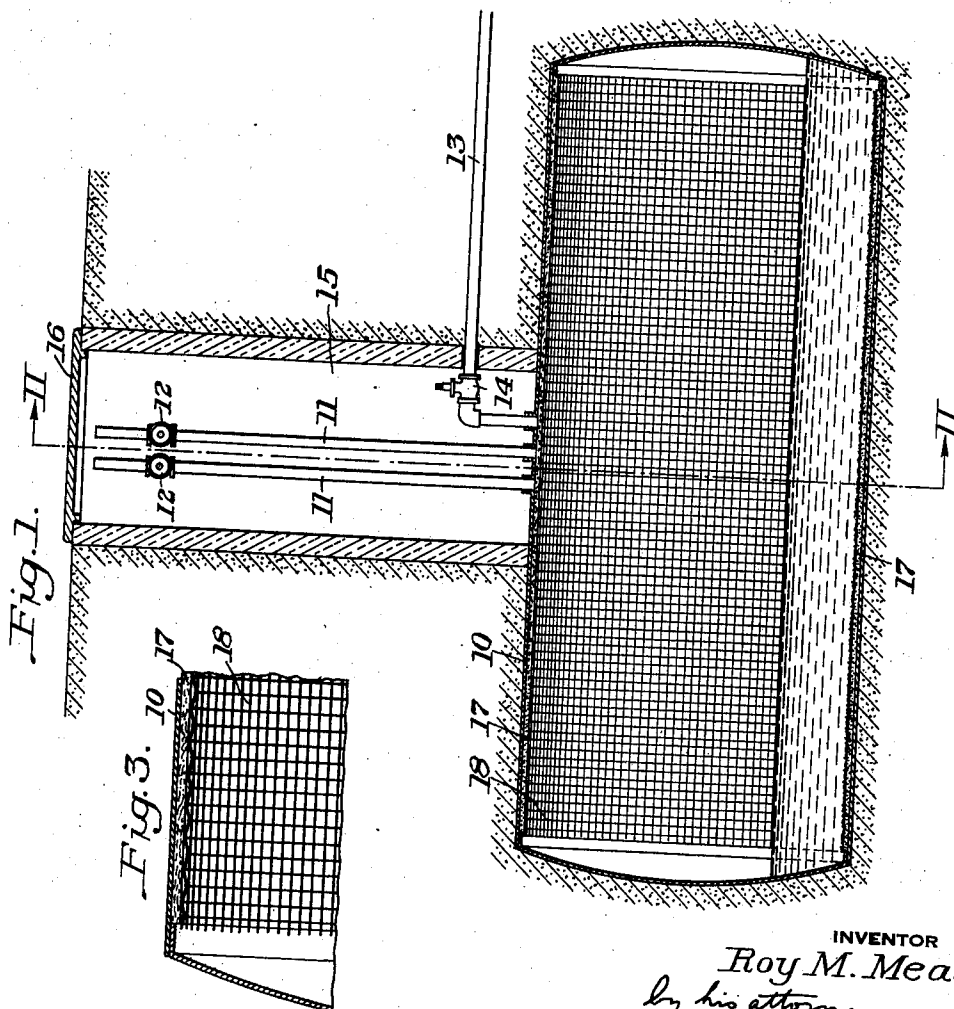
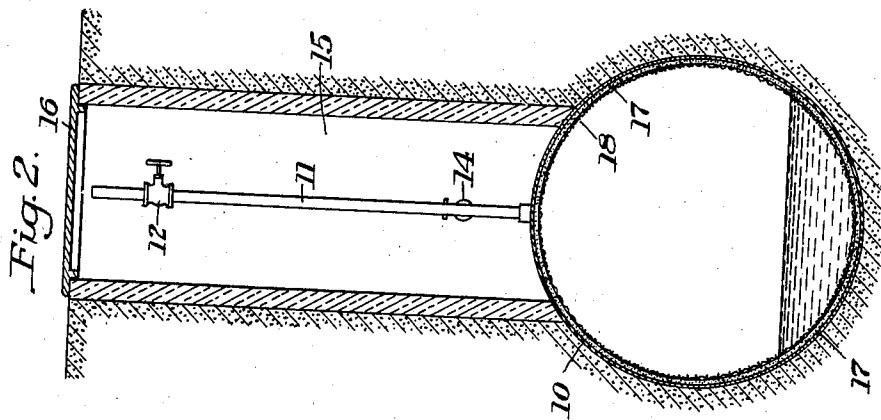
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GAS GENERATOR

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2,190,367

GAS GENERATOR

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2 Claims. (Cl. 62—1)

This invention relates to a system for supplying fuel gas to consumers remote from central distribution facilities.

It has been proposed heretofore to supply fuel gas to isolated consumers by delivering a liquefied hydrocarbon gas to a storage tank on the consumer's premises. There are several such gases which boil off at relatively low temperatures so that, when delivered to an underground storage tank, for example, they vaporize readily and build up a vapor pressure sufficient to deliver the vaporized gas to the burners of consuming devices.

One difficulty that has been experienced in systems of this kind is that the area of the body of liquid contained in the tank which is exposed to direct heat absorption from the surrounding earth decreases as the level of the liquid drops on consumption of the gas. The vapor pressure existing in the tank is thus considerably lower when the tank is empty than when it is practically full. It is an object of the present invention to overcome this difficulty and maintain a substantially constant vapor pressure in the storage tank regardless of whether it is nearly full or nearly empty. In one embodiment of the invention I provide a storage tank for liquefied gas with a lining composed of fibrous material having high capillary qualities. This lining is effective to draw liquid from the body thereof contained in the tank and raise it to a substantial elevation above the natural level of the liquid. I am thus enabled to maintain in contact with a substantial portion of the area of the tank wall, a blanket saturated with the liquefied gas, regardless of the level of the liquid in the tank. The liquid is thus subject to heating from the surrounding medium over a much greater area than it otherwise would be when nearly empty and as a result, a higher rate of evaporation is achieved and a substantially constant vapor pressure maintained.

The invention of which one specific form is described and claimed herein is claimed broadly in my copending application, Serial No. 194,180 for Gas generating apparatus showing another modification.

The following detailed description of one form of the invention is to be read in connection with the accompanying drawing illustrating a preferred embodiment. In the drawing:

Fig. 1 is a longitudinal sectional view taken through an underground storage tank embodying the invention;

Fig. 2 is a transverse sectional view along the line II—II of Fig. 1; and

Fig. 3 is a partial section similar to Fig. 1, to an enlarged scale.

Referring now in detail to the drawing, a storage tank 10 which may be of any desired construction, is provided with filling pipes 11 having control valves 12 therein. A gas offtake 13 is also connected to the tank and has a main shut-off valve 14 therein. The tank 10 is preferably buried below the frost line. The pipes 11 extend upwardly through a manhole 15 having a cover 16 thereon.

A lining 17 of a fibrous material extends around substantially the entire interior surface of the side wall of the tank. The lining may be composed of wool or cotton linters, asbestos fiber, rock wool or any like material not affected by the hydro-carbon such as propane or butane which is usually used in systems of the type described. The lining may conveniently take the form of a felted sheet shaped to conform to the contour of the tank and inserted therein while one of the heads of the tank remains separate from the body thereof. The lining may conveniently be held in position by a sheet of mesh 18 overlying the fibrous layer. If the mesh is bent up from the flat into cylindrical form, its natural spring or tendency to open or flatten out will be sufficient to hold the lining in contact with the side wall of the tank. Any suitable means may be employed in addition to secure the mesh to the tank wall.

The effect of the fibrous lining is to maintain in contact with substantially the entire inner surface of the side wall of the tank 10, a blanket saturated with liquefied gas. The capillary qualities of the lining material cause it to draw liquid from the body thereof contained in the tank upwardly around the inside of the tank wall. This blanket is in direct heat-exchange relation to the tank wall through which heat is absorbed from the surrounding earth to cause evaporation of the liquid. As a result, practically the entire area of the tank side wall is effective as a heat-exchange surface to cause evaporation of the liquid by reason of the heat absorbed through the tank wall from the surrounding earth. The effect of the fibrous lining is thus similar to that of maintaining the storage tank substantially full at all times. It would be impractical, for obvious reasons, to attempt the latter but the present invention achieves substantially the same result at only a slight additional cost.

It will be understood that the storage tank 10

is initially filled by connecting one of the pipes 11 to the discharge port of a tank car or truck and connecting the other pipe 11 to the supply tank above the level of the liquid therein. In this way, the tank 10 may be filled under pressure without necessity of closing the main valve 14 or shutting off the burners supplied therefrom.

While I have illustrated and described herein but a preferred form of the invention, changes in the construction disclosed may be made without departing from the spirit of the invention or the scope of the appended claims. The lining 17, for example, may cover only a part of the interior of the tank instead of the whole, if this provides sufficient evaporating surface.

I claim:

1. The combination with an underground tank

for storing liquefied fuel gas, of a lining in said tank composed of material having high capillary attraction, whereby to maintain liquefied gas in heat-exchange contact with the tank wall throughout an area thereof above the natural level of the liquid, and means interiorly of said lining for holding said lining in place against the interior surface of the tank wall.

2. A fuel supply system comprising an underground storage tank adapted to contain liquefied fuel gas for vaporization by absorption of heat from the surrounding earth, said tank having a lining of material having high capillary attraction whereby the liquid is maintained in heat-exchange contact with the tank wall over an area above the natural level of the liquid as said level falls on withdrawal of gas from the tank.

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