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LIQUID FUEL TANK

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Fig. 1

Fig. 2
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Liquid Fuel Tank

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3 Claims. (Cl. 220—20)

My invention relates to tanks and particularly to a novel gasoline tank such as used by motor vehicles.

In the operation of motor driven vehicles, particularly buses and trucks, there is a constant loss arising from the escape of gasoline or other liquid fuel, amounting, in the aggregate, to a substantial sum. A cause for one of the largest items of loss is that of expansion of the fuel in the tank following a refilling. It is common practice when buses or trucks return to the garage to immediately fill the tanks. In cold weather, the tanks may contain a substantial amount of fuel, which, having been outdoors for a long period, is very cold; likewise, the fuel that is added to the tank is cold. Thus the temperature of the entire body of fuel within the tank may be 20 to 50 degrees below the temperature of the garage. It is customary to fill the tanks completely full; that is, to a point where the fuel can be seen in the neck of the filling opening. The vehicle is then housed over night in a relatively warm temperature and the thermal expansion of the fuel, sometimes equal to 2% of the volume, results in the discharge of several gallons of fuel through the vent opening in the cap. The same loss may occur where relatively cold fuel is delivered into the tank, the vehicle immediately starting on a trip in very hot weather.

I propose to obviate this difficulty by providing an expansion space in the upper part of the tank, the space being open to the interior of the tank through a relatively small opening. The size of the opening prevents the filling of the expansion space while the tank is being filled, but the liquid will slowly enter the space after the filling is completed and lower the level of fuel in the tank to an extent that will obviate loss by expansion.

The invention is useful also in connection with non-commercial vehicles in which similar losses occur, not only due to expansion, but due to splashing through the vent in the cap for the filling opening.

An example of a construction such as contemplated is shown in the drawing in which:

Fig. 1 is a plan view of a tank constructed in accordance with my invention, and;

Fig. 2 is a sectional view on the line 2—2 of Fig. 1.

In the drawing I have illustrated a conventional tank 10 having a filling neck 11 adapted to be closed by a vented cap, not shown. The tank may be of any desired shape to conform to the requirements in the particular case. Arranged within the upper portion of the tank is a transverse wall 12 joined by flanges 13 to the tank at its margins and carried around the corner in the filling opening by means of the U-shaped spacer 14, the respective joints being soldered or brazed. This serves to segregate the expansion space 15, a suitable vent pipe 16 leading into the neck 11. The wall 12 is preferably dished downwardly as indicated, in order to insure drainage. The expansion space is in open communication with the interior of the tank through a small opening 17 at the lowest point in the wall, a screen 18 overlying the opening. The capacity of the expansion space should be equal to at least 2% of the capacity of the tank, including the space within the neck.

In practice, the tank will be filled presumably up to the top of the neck. However, the opening 17 is of so small a diameter that the liquid will flow into the expansion space much more slowly than it is delivered from the filling hose. After the filling operation is complete, the liquid within the neck will gradually be lowered, due to the rising of the liquid through the opening 17 into the expansion space. This small amount will only partly fill the space and any expansion taking place thereafter, being slow, will be provided for by further filling of said expansion space.

Thus it will be impossible for an attendant to fill the tank so full that any liquid will be lost by expansion.

It will be understood that I have illustrated only one example of the numerous forms that the invention may take in adapting it to different types of liquid fuel containers, and I do not wish to be limited, except as indicated in the appended claims.

I claim:

1. A liquid fuel container comprising, in combination, a tank having a filling neck through the top wall thereof, an auxiliary chamber within the tank substantially below the top of the filling neck, a relatively small aperture in the lower wall of the auxiliary chamber to maintain the tank and the auxiliary chamber in open communication, and a constantly open vent leading from the upper portion of the auxiliary chamber to the atmosphere.

2. A liquid fuel container comprising, in combination, a tank having a filling neck through the top wall thereof, an auxiliary chamber within the tank and arranged wholly below the filling neck, a relatively small aperture in the lower portion of the auxiliary chamber to maintain the atmosphere.
tank and the auxiliary chamber in open communication, and a constantly open vent leading from the upper portion of the auxiliary chamber and terminating in the upper portion of the filling neck.

3. A liquid fuel container comprising, in combination, a tank having a fill opening through the top wall thereof, a wall extending horizontally across a portion of the tank beneath the top wall and spaced therefrom to provide an expansion chamber equal to at least 2% of the capacity of the tank, said horizontally extending wall having a relatively small aperture therein to maintain the tank and the expansion chamber in open communication, and a constantly open vent leading from the expansion chamber to the atmosphere.

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