United States Patent

Burke

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[54] TANK FOR LIQUID FUEL

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[52] **U.S. Cl.** .....**220/86,** 137/43, 169/4, 220/63 A

[51] **Int. Cl.** **G05b**

[58] **Field of Search** .....244/135; 220/88 R, 86, 63 A, 220/15, 13, 9; 154/43.5; 117/68.5; 222/500; 137/43, 38; 169/4

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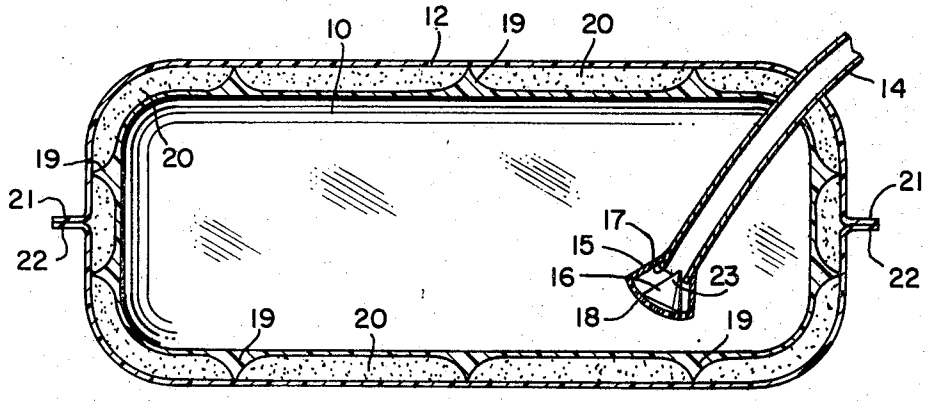
[57] **ABSTRACT**

An inner tank for containing liquid fuel; an outer, larger tank spaced from, and wholly enclosing, said inner tank; said tanks co-acting to define a chamber therebetween for receiving a fire-extinguishing, or fire-resisting material; a supply pipe leading into said inner tank, and an automatic valve for closing the inner end of said pipe to prevent outflow of the fuel through said pipe.

3 Claims, 2 Drawing Figures



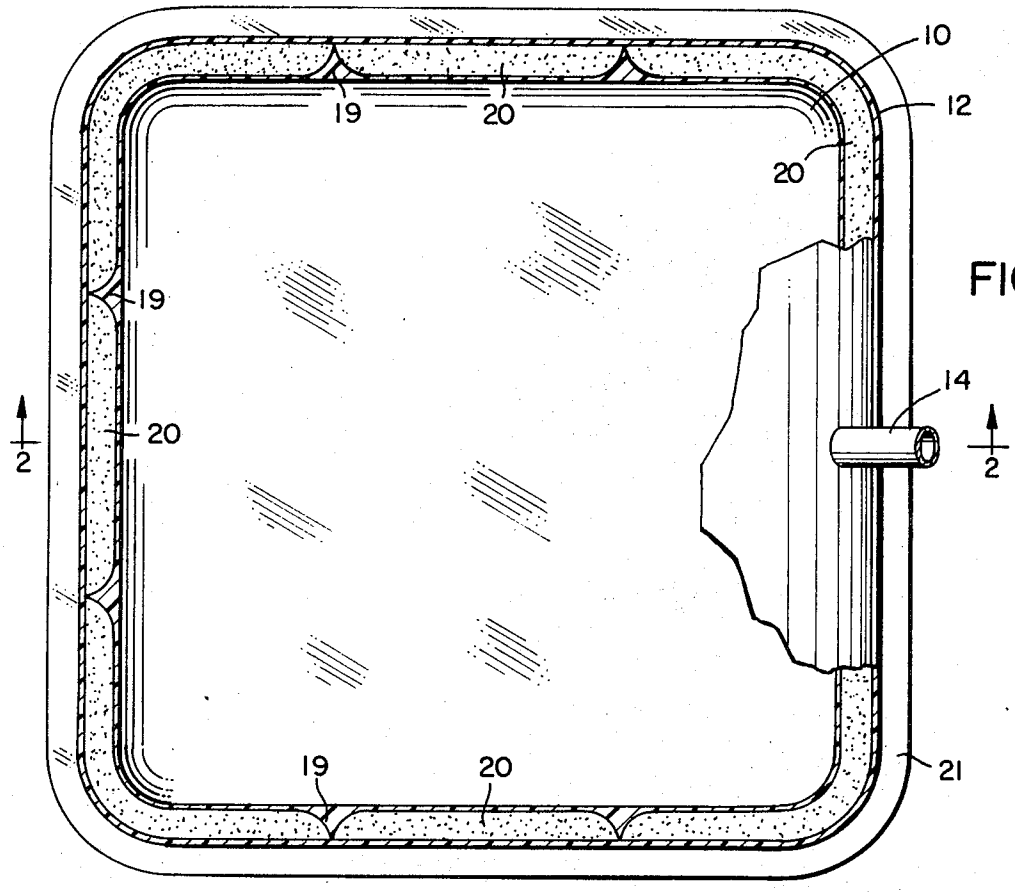


FIG. 1

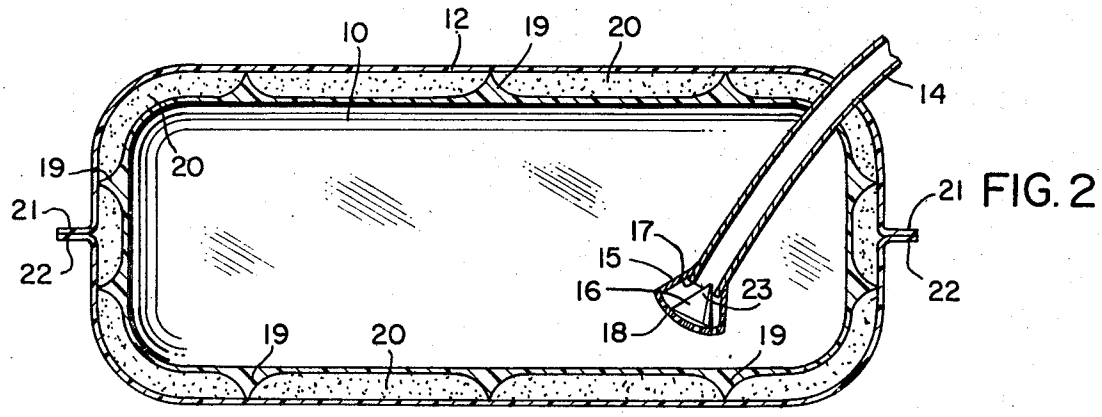


FIG. 2

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TANK FOR LIQUID FUEL

BACKGROUND

The "gas" tank of an automotive vehicle is usually made of metal, and, in case of an accident, the tank may be breached and a substantial quantity of the liquid fuel will escape. Another possibility is that the car may land on its side, or on its top so that the upper end of the fill-in pipe is moved to a position below the fuel liquid. In either case, there is danger that the spilled gas may be ignited with disastrous results.

THE INVENTION

The invention resides in making the fuel receiving tank out of one, of a number of available synthetic materials which, when molded, (or otherwise manufactured), produces a resilient, light and tough container and enclosing said inner tank within a larger, conventional tank; said tanks co-acting to produce a chamber which is adapted to contain a fire-extinguishing, or fire-retarding liquid which, in the event of an accident, will mix with spilled gas to prevent, or to minimize, combustion.

IN THE DRAWINGS

FIG. 1 is a view partly in section and partly in top plan, of a tank embodying my invention.

FIG. 2 is a sectional view looking in the direction of line 2— 2 on FIG. 1.

The embodiment shown in the drawings includes an inner tank **10**, and an outer tank **12** which encloses the inner tank. Inner tank **10** is made of any one of a number of available, synthetic materials which, when molded or otherwise processed, will produce a light, tough and resilient fuel tank. The inner tank is centered relative to the outer tank by spacers **19**. The outer tank is made in two sections which have peripheral flanges **21** and **22**. As shown in FIG. **2**, the outer tank is larger than the inner tank so as to provide a chamber therebetween, for containing fire-preventing or fire-retarding material **20**, such as carbontetrachloride, or the like. The outer tank is assembled over the inner tank by securing flanges **21** and **22** together in liquid-tight manner. Except for being made in two sections, the outer tank may be made of conventional materials and by any desired process. The discharge end **17** of pipe **14** is flared as at **15** to accommodate a stopper **16**. The upper end of pipe **14** is adapted to receive gas in the usual manner. The gas admitted into pipe **14** flows into inner tank **10** around the stopper **16** and through the holes **18** which are formed in flared portion **15**. The outer tank and spacers **19** serve to absorb much of the impact to which the outer tank is subjected. The resilient nature of the inner tank also absorbs some of the impact, as does the material **20** which surrounds the inner tank. This minimizes the chance of the inner tank being breached. But, if the impact is strong enough to breach the inner tank, the liquid fuel will at once mix with material **20** which will prevent, or retard, or minimize, the conflagration which would otherwise result.

The junction of the flared portion **15** with the cylindrical end of the pipe **14** forms a valve seat for receiving the conical stopper or valve **16**. It will be noted that the height of the flared portion **15** is less than the height

of the stopper **16** so that the apex **23** of the valve **16** always projects into the discharge end **17** of the pipe **14**. The stopper is movable from an open position as illustrated when the tank is in normal orientation to permit the liquid fuel to flow into the tank from the fill pipe discharge end **17** to a sealing position. Note that the apex **23** of the stopper positions within the discharge end **17**. When the tank is upset, the stopper **16** moves to its sealing position wherein the conical sides seat upon the discharge end **17** to prevent liquid flow therethrough.

If a vehicle is turned on its side, the stopper **16** will be entrained by the liquid flowing out through the pipe and will thus close the discharge end of the pipe. The intake end **17** of the pipe **14** is so placed that if the car is overturned, the flared end of pipe **14** will be close to, or above the level of, the liquid in the overturned position of the vehicle. In such case, the flow of liquid fuel will stop as soon as the level of the liquid in the tank is below the end of the pipe.

To guard against loss of the liquid **20**, should the tank become ripped or should it develop a leak, the anti-fire material can be in the form of a powder, or it can be made in the nature of a highly absorbent material saturated with the selected fire resistant material.

What I claim is:

1. In a tank for holding liquid fuel, the combination of
   - A. an inner tank for containing the liquid fuel, said inner tank being provided with a top and a bottom,
     1. said tank being provided with an opening in or near the said top;
   - B. an outer tank surrounding the inner tank and being peripherally spaced therefrom,
     1. said outer tank defining a chamber between the inner tank and the outer tank,
        - a. said chamber being filled with a fire retarding material,
     2. said outer tank being provided with an opening in registry with the said inner tank opening;
   - C. a fill pipe passing through the outer tank opening and the inner tank opening to admit liquid fuel into the inner tank,
     1. said fill pipe having a discharge end within the inner tank, said discharge end terminating near the bottom of the inner tank,
     2. said discharge end being provided with an apertured flared portion,
     3. a conical stopper operable within the flared portion from an open position to a sealing position,
        - a. said stopper having a height which is greater than the height of the flared portion,
        - b. said stopper having an apex which always projects into the discharge end of the fill pipe and being retained therein by the flared portion,
        - c. said stopper being in its said open position and allowing liquid fuel to pass into the inner tank from the fill pipe when the said tank top faces upwardly,
        - d. the conical surface of said stopper seating upon the discharge end of the fill pipe when the bottom of the inner tank faces upwardly,
          1. the said stopper moving to its said closed position to prevent liquid fuel from exiting the inner tank through the fill pipe.

2. The invention of claim 1 wherein the outer tank is fabricated in two sections, each section terminating in a peripheral flange, the said flanges being connected to form a complete, liquid tight, outer tank construction.

3. The invention of claim 2 wherein the inner tank is fabricated of resilient material and the outer tank is fabricated of non-resilient material.

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