March 19, 1963 S. J. DVORACHEK 3,081,730

UNDER WATER VENTING SYSTEM FOR MARINE FUEL TANKS

Filed Sept. 4, 1958

FIG. 1

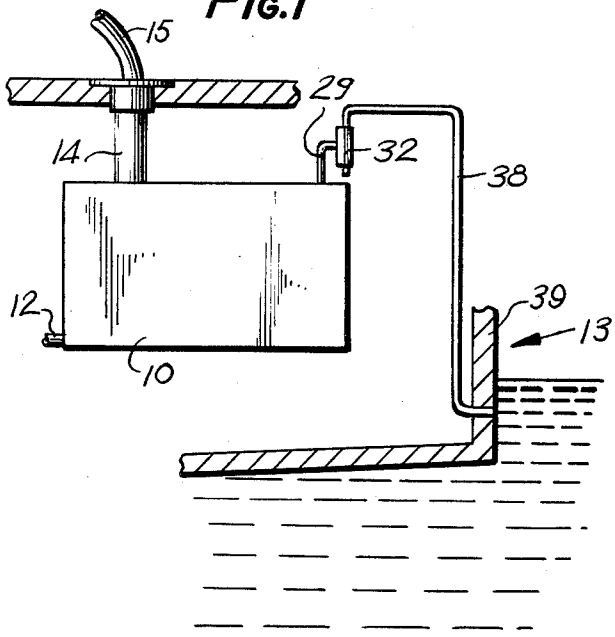


FIG. 2

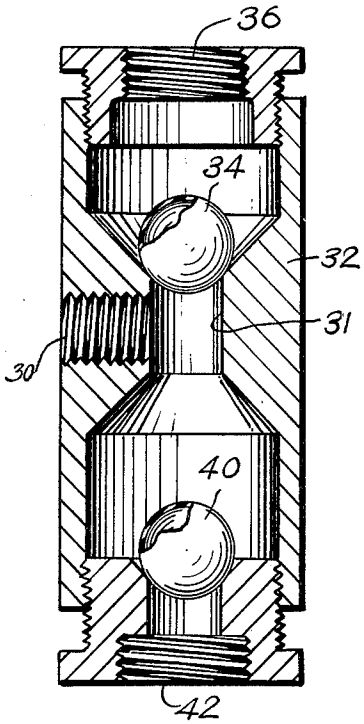


FIG. 3

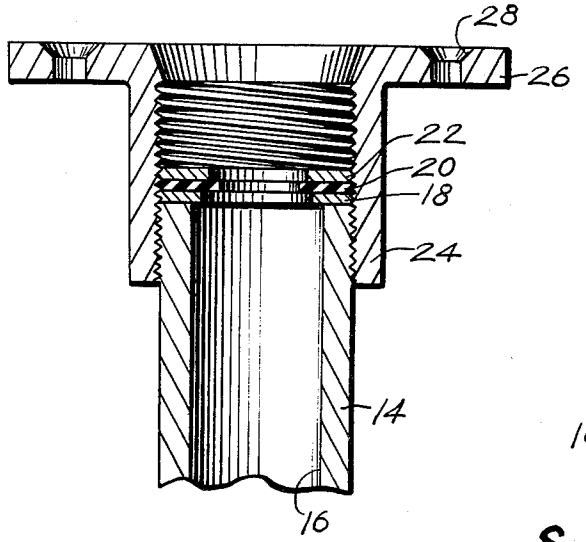
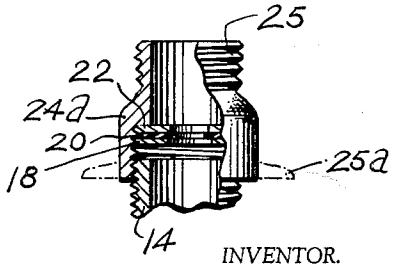


FIG. 4



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UNDER WATER VENTING SYSTEM FOR MARINE FUEL TANKS

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This invention relates to boats and more particularly to motor boats.

It is an object of the present invention to provide a venting system for fuel tanks of motor boats that will effectively prevent fire and explosions that might otherwise result from improper disposal of highly volatile gases in the vicinity of the boat during the filling of the fuel tank.

Another object of the present invention is to provide a venting system of the above type for marine fuel tanks that will effectively discharge all volatile vapors beneath the surface of the water as the fuel tank is being filled, and will further allow fresh air to be drawn into the tank to replace the fuel as it is consumed, while preventing water from being drawn into the tank.

Other objects of the invention are to provide a venting system for marine fuel tanks bearing the above objects in mind which is of simple construction, has a minimum number of parts, is inexpensive to manufacture, and is efficient in operation.

For other objects and for a better understanding of the invention, reference may be had to the following detailed description taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a fragmentary longitudinal cross-sectional view of a boat provided with a venting system made in accordance with the present invention;

FIGURE 2 is an enlarged longitudinal cross-sectional view of a control valve forming a part of the present invention;

FIGURE 3 is an enlarged fragmentary longitudinal cross-sectional view of a filler pipe assembly forming another part of the present invention; and

FIGURE 4 is a fragmentary side elevational view, partly in section, of a slightly modified form of the filler pipe assembly.

Referring now more in detail to the drawing, and more particularly to FIGURE 1 thereof, a fuel system made in accordance with the present invention is shown to include a fuel tank **10** that has a fuel supply line **12** communicating with the power plant of the vessel **13**. The fuel tank **10** also is provided with a filler pipe **14** through which fuel may be supplied from a nozzle **15** during the fueling of the vessel. A flat metallic ring **18**, a flat resilient seal ring **20**, and a flat ring **22** are supported in stacked relationship upon the upper end of the filler pipe **14**, by being threaded into a fitting which is threaded externally on the filler pipe **14**. The upper ring **22** has a central opening of only slightly larger diameter than the nozzle **15**, the resilient seal ring **20** has a central opening of slightly smaller diameter than the nozzle **15**, and the lowermost ring **18** has a central opening of slightly larger diameter than the central opening of the upper ring **22**. The fitting **24** has a mounting flange **26** by which it is secured to the deck of the boat by means of screws passing through openings **28** in the flange and, when the nozzle **15** is inserted through the openings in the rings, the inner edge of the seal ring engages the outer surface of the nozzle and seals the space between the nozzle and the inside of a fuel pipe **14**. This effectively prevents the escape of vapors outwardly through the filler pipe **14** during the fueling of the vessel, while the metallic rings further prevent formation and discharge of static charges that might cause explosion or fire.

As is well known to those skilled in the art, it is necessary to provide a vent for allowing vapors contained within the tank **10** to pass outwardly during the filling of the tank with fuel, since the vapors would otherwise be compressed and present a constant hazard. In accordance with the present invention, such venting is provided for by means of a vent duct **29** connected to the top of the tank **10** communicating at one end with the interior thereof, and with its opposite end communicating with the inlet **30** and central passageway **31** of a control valve unit **32**. A normally closed check valve member **34** allows the outward flow of displaced vapor from the common passageway **31** into the outlet **36** that is connected to a vent pipe **38** passing through the hull **39** of the vessel below the water line thereof so as to discharge into the water. The opposite end of the common passageway **31** within the control member **32** is provided with a normally closed check valve member **40** that allows fresh air to flow into the common passageway **31** and into the interior of the tank **10** in response to negative pressure therewithin created by the drawing of fuel outwardly through the fuel supply line **12** during the operation of the power plant.

The operation of this system will now be readily understood. As a nozzle **15** is inserted into the filler pipe **14** during the fueling of the tank **10**, the space between the nozzle and the filler pipe is sealed so that any vapors that are forced outwardly through the vent **29**, by the newly received fuel are automatically vented into the water through the vent pipe **38**, by means of the opening of the check valve **34**, while the other check valve **40** remains closed. After the filter pipe is closed, the fuel leaving the tank **10** creates a negative pressure therewithin which is relieved by fresh air passing into the common passageway **31** and vent duct **29** by the opening of the check valve **40**, while the check valve **34** remains closed.

In FIGURE 4 of the drawing, a slightly modified form of filler pipe construction is shown to include a different type of fitting **24***a* that is threadedly secured to the upper end of the filler pipe **14** and provided with a threaded neck **25** to which the filler pipe **15** may be threadedly connected, if so desired. This fitting may also be provided with a mounting flange **25***a* to secure it to the deck of the vessel and to prevent movement or displacement thereof during use.

While various changes may be made in the detail construction, it shall be understood that such changes shall be within the spirit and scope of the present invention as defined by the appended claims.

What I claim as new and desire to protect by Letters Patent of the United States is:

1. A marine fuel system comprising in combination, a fuel tank, a filler pipe leading into the tank for admission of fuel, a resilient seal ring mounted on said filler pipe, said seal ring projecting inwardly and having means forming an opening for sealing the space between the filler nozzle and the filler pipe against the escape of fuel and vapors during the admission of fuel into the tank, seal ring retaining means engaging both sides of said seal ring and engaging said filler pipe, a fuel discharge line leading from said tank, a control valve having a vapor outlet port for discharging vapors and an air inlet port for admitting air, a vent pipe connecting said control valve to the upper part of said tank, a vapor discharge pipe connected to said vapor outlet port and terminating remotely from the fuel system, and check valve means in said control valve preventing outward flow through said air inlet port and inward flow through said vapor outlet port.

2. The fuel system as defined in claim 1, wherein said seal ring retaining means comprises a pair of threaded metal rings sandwiching said seal ring at the seal ring

periphery and said filler pipe is provided with internal threads engaged by said metal rings.

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