

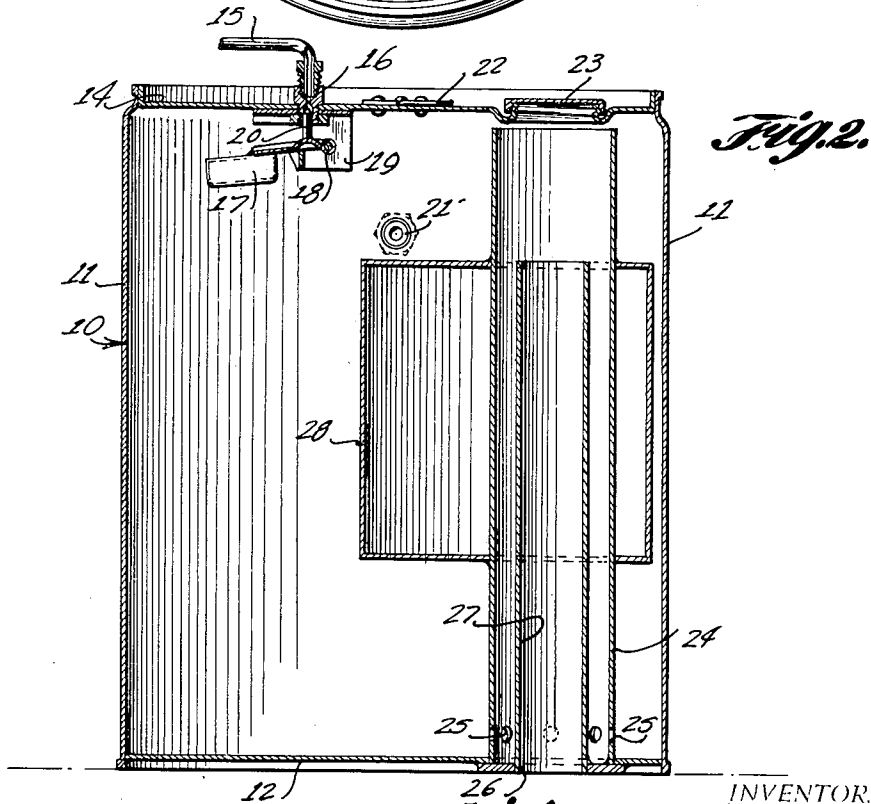
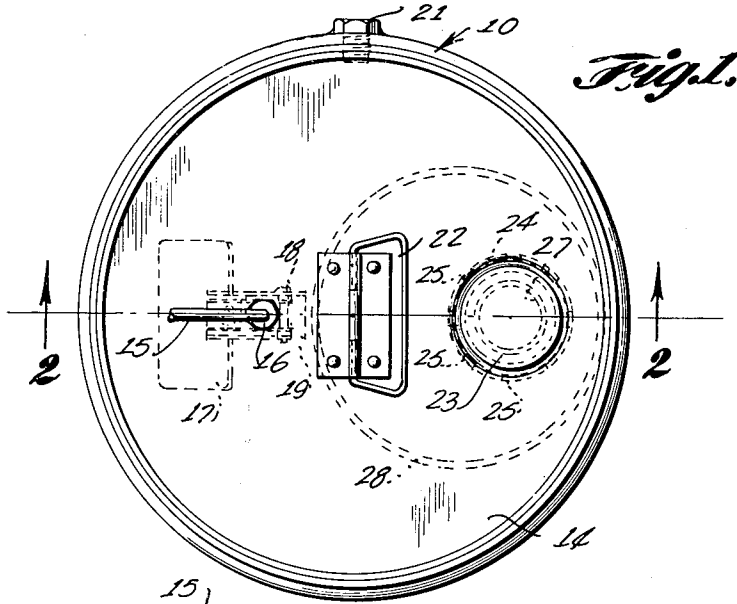
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FUEL PURIFIER

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FUEL PURIFIER

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4 Claims. (Cl. 210—51)

This invention relates to a fuel handling device, and more particularly to a device for mechanically separating water from fuel such as gasoline or petroleum oil.

The object of the invention is to provide a separator which will remove water from fluid such as petroleum oil or gasoline whereby the water will have no harmful effects on engines or the like.

Another object of the invention is to provide a separator which will remove condensed water from fuel that is to be supplied to engines, and wherein any sediment in the fuel will also settle out of the fuel so that engines or the like will not be harmed.

A further object of the invention is to provide a separating device which is extremely simple and inexpensive to manufacture.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this application, and in which like numerals are used to designate like parts throughout the same:

Figure 1 is a top plan view of the petroleum purifier, constructed according to the present invention.

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

Referring in detail to the drawings, the numeral 10 designates a container or housing which can be made of any suitable material such as metal, and the housing 10 includes an annular side wall 11 and a horizontally disposed bottom wall 12. Arranged in spaced parallel relation above the bottom wall 12 is a top member 14, and there is provided a conduit 15 for supplying fuel such as oil or gasoline from a suitable source of supply. The fuel line 15 may convey fuel that has some sediment or water admixed therewith, and the purpose of the present invention is to provide a means for separating any such water from the fuel so that the fuel fed to a burner or engine will not be harmed by the affects of the water therein.

The conduit 15 leads to a fitting 16 which is connected to the top member 14, and a float member 17 is arranged within the housing 10 for controlling flow of material from the conduit 15 into the housing. The float member 17 is pivotally connected to a bracket 19 by means of a pin 18, and the float member 17 is adapted to actuate a needle valve 20 which is mounted for movement into and out of blocking engagement with the conduit 15. Thus, when the level of liquid in the container 10 drops below a predetermined level the float member 17 will pivot downwardly whereby the needle valve 20 will move downwardly to permit fuel to flow into the container 10 through the conduit 15 and after the fuel has reached the predetermined level the float member 17 will be lifted to cause the valve 20 to close the conduit 15.

The side wall 11 of the housing is provided with an outlet opening 21 through which pure fuel or oil free from water is adapted to pass, and it will be seen that the opening 21 is in the upper portion of the side wall 11. A handle 22 may be connected to the top member 14 for

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facilitating the carrying of the device from place to place, and a cap or lid 23 may be provided in the top member 14 so as to permit the device to be cleaned or repaired if necessary.

Arranged within the housing 10 is a vertically disposed tube 24 which has a plurality of apertures or openings 25 in its lower end. Water that may be present in the housing 10 will sink to the bottom due to the difference in specific gravity between the water and the petroleum, and this water will pass through the apertures 25 in the bottom of the tube 24. Arranged in concentric relation within the tube 24 is a vertically disposed pipe 27, and an opening 26 is arranged in the bottom wall 12 for the discharge therethrough of water that has been separated from the gasoline or oil. It will be seen that the opening 26 registers with the bottom of the pipe 27 and the upper end of the pipe 27 is below the outlet opening 21 and the upper end of the pipe 27 is also lower than the top of the tube 24. A casing 28 is arranged within the housing 10, and the casing 28 provides a blister-like member for a purpose to be later described. The casing 28 is below the outlet opening 21 through which the purified fuel passes.

From the foregoing it is apparent that a device has been provided which will effectively separate two liquids such as water and oil or gasoline. Thus, the incoming supply of material such as a mixture of gasoline and water may be fed from a suitable source of supply through the conduit 15 to the container 10. After the level of liquid in the container 10 exceeds a predetermined level, the float member 17 will be lifted to thereby move the valve 20 into blocking engagement with the conduit 15 so that no more fuel will enter the container 10, until the level again drops. The water will sink to the bottom of the housing 10 due to the difference in specific gravity between the water and oil and this water will pass through the apertures 25, then up between the space between the tube 24 and pipe 27 and this water will enter the open top of the pipe 27 and pass down through the pipe 27 out through the opening 26 where it can be discharged to any suitable source. The purified fuel or oil will pass out through the opening 21.

By providing the float member 17, the purifier is automatic in its operation. The separator of the present invention is especially suitable for extracting water from fuel systems of stationary engines and it can also be adapted for use in oil burner heating systems in homes, factories and the like.

In use the housing 10 may first be filled with water to the top of the water exhaust pipe 27 and this is the highest level to which the water can rise. The water from the tank 10 escapes through the openings 25 at the bottom of the tube 24 and drains out over the top of the pipe 27. As fuel enters the purifier through the float controlled inlet valve, the fuel displaces its weight in water so that the water is forced through the ports 25 at the bottom of the tube or baffle 24 and over the top of the exhaust pipe 27. Due to the difference in specific gravity of the fuel and water, a greater volume of fuel is retained than the volume of the water displaced to cause the fuel to rise until the float 17 is actuated closing the fuel inlet valve. As fuel is drawn out of the purifier through the fuel outlet 21, the level of the fuel drops causing the float 17 to lower and this opens the fuel inlet conduit 15 permitting more fuel to enter the purifier. In the event that water is admitted through the fuel inlet valve, the water falls to the bottom of the purifier and displaces approximately two-thirds of its volume through the ports 25 at the bottom of the tube 24 until the fuel is again admitted through the fuel inlet valve to maintain the level of fuel above the fuel outlet 21. In the event that only water is admitted through

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the fuel inlet 15, and fuel is drawn off through the outlet 21, the level of the fuel will drop below the outlet 21 but the water will not rise to this level which is above the top of the exhaust pipe 27 so that water will be prevented from entering into the fuel system. The purpose of the blister or casing 28 which surrounds the tube 24 is to take up space that would otherwise be occupied by fuel and since this fuel would be below the fuel outlet 21 the casing 28 serves as a fuel conservation measure and the size of the casing can be of any desired size that will permit the water and sediment to pass to the bottom of the housing.

In below freezing temperatures the purifier may be filled with an ethylene glycol solution which can be periodically checked so that the parts will not break or crack during freezing weather. Also, alcohol can be added to the device to help thaw out any ice that may form from low temperature conditions causing the water to freeze.

It is to be understood that the present invention is directed to a device which will separate water from fuel such as gasoline or petroleum oil so that the water will have no harmful affects on engines or hte like.

I claim:

1. In a liquid separator, a housing including a vertically disposed side wall, a horizontally disposed bottom wall, and a horizontally disposed top member, a conduit connected to said top member for supplying liquid from a source of supply to said housing, there being an outlet opening in said side wall for the egress therethrough of liquid, a vertically disposed tube positioned in said housing and having its lower end connected to said bottom wall, there being a plurality of apertures in the lower portion of said tube, a vertically disposed pipe positioned within said tube and having its upper end spaced below said outlet opening in said side wall and below the top of said tube, there being an opening in said bottom wall communicating with said pipe for the egress therethrough of liquid.

2. The apparatus as described in claim 1, and further including an enlarged casing secured to the outer surface of said tube and positioned below the outlet opening in said side wall.

3. In a liquid separator, a housing including a vertically disposed side wall, a horizontally disposed bottom wall, and a horizontally disposed top member, a conduit connected to said top member for supplying liquid from a source of supply to said housing, there being an outlet opening in said side wall for the egress therethrough of liquid, a vertically disposed tube positioned in said housing and having its lower end connected to said bottom wall, there being a plurality of apertures in the lower portion of said tube, a vertically disposed pipe positioned

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within said tube and having its upper end spaced below the outlet opening in said wall and below the top of said tube, there being an opening in said bottom wall communicating with said pipe for the egress therethrough of liquid, the opening in said bottom wall adapted to have water flow therethrough, and the opening in said side wall adapted to have liquid free of water flow therethrough, an enlarged casing secured to the outer surface of said tube and positioned below the outlet opening in said side wall, a valve for controlling admission of liquid into said housing from said conduit, and a float for controlling said valve.

4. A liquid separator comprising a housing including a vertically disposed annular side wall, a horizontally disposed bottom wall, and a horizontally disposed top member having a fitting therein, a conduit connected to the fitting on said top member for supplying liquid from a source of supply to said housing, a cap detachably connected to said top member, there being an outlet opening in said side wall arranged adjacent the upper end thereof for the egress therethrough of liquid, a vertically disposed tube positioned in said housing and having its lower end connected to said bottom wall, there being a plurality of spaced apart apertures in the lower portion of said tube, a vertically disposed pipe of smaller diameter than said tube positioned within said tube and having its upper end spaced below the outlet opening in said side wall and below the top of said tube, there being an opening in said bottom wall communicating with said pipe for the egress therethrough of liquid, the opening in said bottom wall adapted to have water flow therethrough, and the opening in said side wall adapted to have liquid free of water flow therethrough, an enlarged casing secured to the outer surface of said tube and positioned below the outlet opening in said side wall, said casing having its side and ends closed, a valve for controlling admission of liquid into said housing from said conduit, said valve being mounted for movement into and out of closing relation with respect to said conduit, a bracket in said housing, and a float pivotally connected to said bracket for controlling said valve, the top of said pipe lying in the same plane as the top of said casing.

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