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 FUEL HUMIDIFIER FOR INTERNAL
 COMBUSTION ENGINES
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Fig. 1.

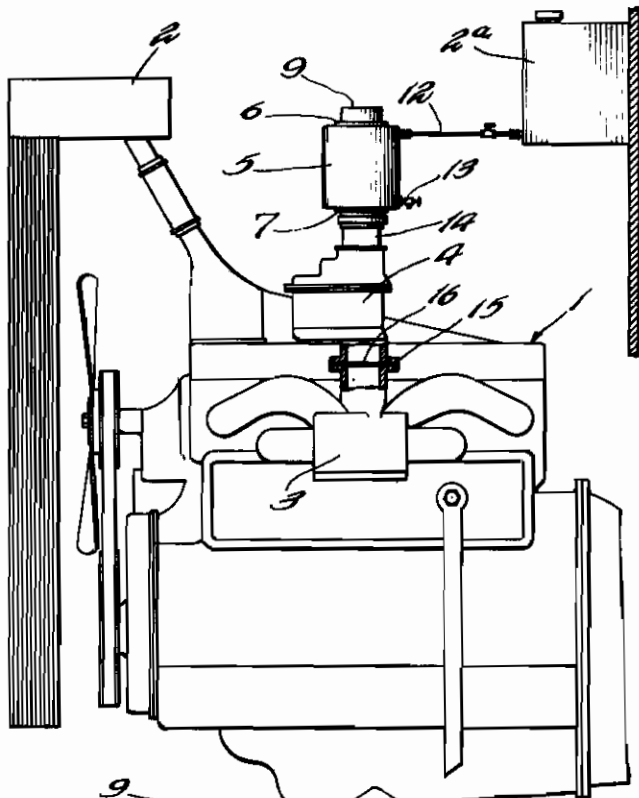
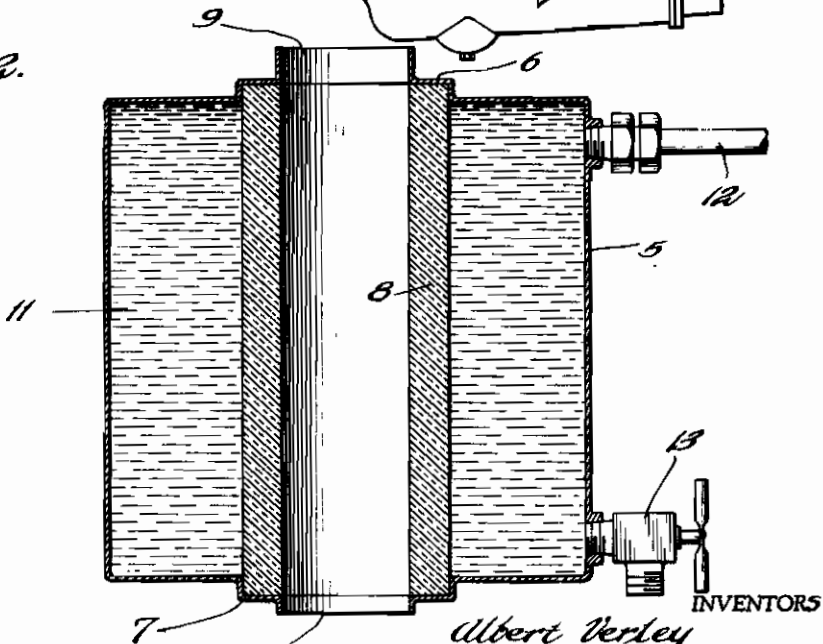


Fig. 2.



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ALIEN PROPERTY CUSTODIAN

FUEL HUMIDIFIER FOR INTERNAL COMBUSTION ENGINES

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Application filed May 12, 1941

This invention relates to an improved device for humidifying the gaseous component of the fuel admitted to an internal combustion engine.

Devices have been suggested heretofore for adding water vapor to the air intake of a carburetor or for adding such vapor to the gas of an internal combustion engine but we have found that by commingling the intake air with the proper fineness and extent of water particles in their natural state, rather than merely adding steam or water vapor to the air, a maximum of efficiency in gasoline consumption is obtained. A corresponding efficiency should be obtainable by so commingling the gaseous fuel of a gas internal combustion engine.

Accordingly the primary object of this invention is to provide an apparatus and a method for humidifying the gaseous fuel medium, including air, delivered to an internal combustion engine by entraining water particles in said medium in their natural state, rather than merely in the form of vapor, and also distributing said particles throughout said medium in uniform particles.

Other and further objects of this invention will become more apparent as the same becomes better understood from an examination of the specification and claims.

Fig. 1 represents a side elevation of an internal combustion engine provided with a fuel humidifying device embodying this invention;

Fig. 2 is an enlarged fragmentary detail vertical sectional view of the humidifying device shown in Fig. 1.

Referring to the drawings more particularly, reference character 1 designates generally an internal combustion engine provided with a radiator 2, intake manifold 3 and carburetor 4.

A humidifier device, shown more in detail in Fig. 2, is provided with a sheet metal shell 5 shaped to provide opposed circular recessed shoulders 6 and 7 for centrally supporting a cylindrical porous porcelain member 8. The shoulders 6 and 7 surround openings in the shell 5, forming an inlet 9 and an outlet 10, respectively. The shell 5 cooperates with the outer wall of member 8 to form an annular water compartment 11.

Water to compartment 11 is supplied by a pipe connection 12 which may be connected to any suitable source such as tank 2a which preferably contains distilled water which will not clog the pores of porcelain member 8. Water may be drained from compartment 11 by opening a petcock 13 in shell 5.

In order that a maximum of efficiency may be obtained, we have found by extensive experiments that the porosity of member 8 is preferably between 25 and 35 but may be between 20 and 40. This particularity of porosity is essential to cause member 8 to permit streams of water to seep through its walls of such fineness as to

present beads of water on the inner surface of the proper fineness to be entrained in its natural state rather than merely as water vapor by the air drawn through from inlet 9 to outlet 10 as will be hereinafter apparent.

We have found that the internal surface of member 8 should be greater for engines of larger horse power than for engines of smaller horsepower. For a 20 horse power engine, we have found the following dimensions of member 8 to work very efficiently: 6" in length, 3" external diameter and 2" internal diameter.

The shell 5 is suitably connected by a coupling pipe 14, leading from outlet 10, to the inlet of the carburetor 4 and the latter has its outlet connected, through means of a coupling 15, to manifold 3. A fine wire screen 16 is provided between the flanges of coupling 15 so as to distribute the fine particles of water uniformly after they have been entrained in their natural state and after the gasoline has been commingled with the combined air and water to assure the particles of gasoline being combined and enveloped by the water particles.

By use of the fore-going device and apparatus, wherein the intake air is commingled with fine particles of water in its natural state and the fuel particles are themselves enveloped with a film of water, rather than merely with water vapor, we have actually obtained a decrease in fuel consumption of from 10% to 20%.

The quantity of water consumed by the use of the afore-described apparatus varies between 5% and 10% of the volume of gasoline consumed.

Our understanding of the underlying theory of the afore-described apparatus and its accomplishments is that the finely divided water particles form an emulsion with the particles of gasoline wherein the latter are protected by an external layer of water which prevents automatic premature combustion, due to compression heat, before the sparking point in the engine, and thus eliminates the retarding effect and waste of such combustion of any substantial part of the fuel charge and increases efficiency.

When water vapor or steam alone is combined with the fuel particles the latter are not individually and sufficiently protected by envelopment by a film of water so as to prevent the afore-said automatic premature combustion of any substantial part of the fuel charge and the afore-said efficiency is not accomplished.

We are aware that many changes may be made and details varied without departing from the principles of our invention and we therefore do not wish to be limited to the details shown or described.

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