

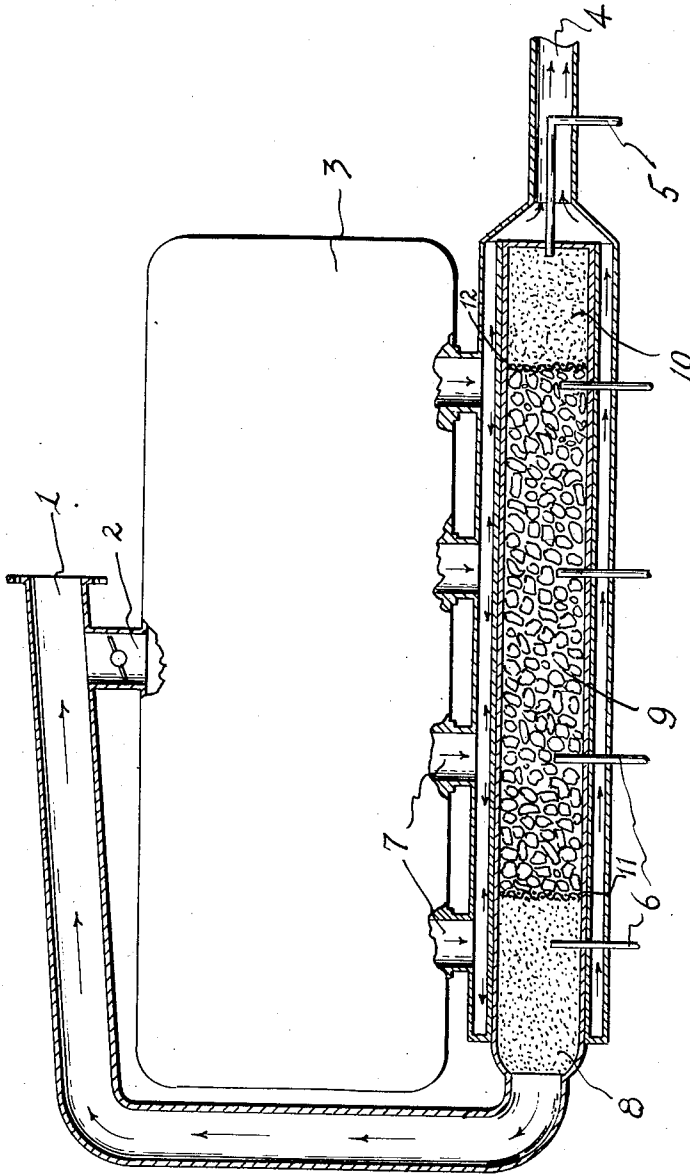
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GASIFICATION OF LIQUID FUELS

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GASIFICATION OF LIQUID FUELS.

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Many investigators have considered the question of supplying stationary or automobile explosion engines with heavy oils. The process which many of them have adopted could not be more simple; to decompose by heat the said heavy oils and carburet, by means of the gases produced, the air drawn in by the engine. Now the heavy oils produce, when they are broken up, gases having a high calorific value, but at the same time deposit a large amount of carbon which rapidly fouls the parts of the apparatus in which the said decomposition is obtained, for which reason it has not been possible to make practical use of the said process.

The object of the invention is to prevent the formation of these prejudicial deposits of carbon and for this purpose air and water are introduced into the liquid fuel vaporizer, heated to a high temperature, at the same time as the fuel, the quantities of these two substances being regulated in such a way that the carbon is partially burnt and converted into carbon monoxide, the result being obtained that approximately one quarter of the said carbon is oxidized by the water, which has been previously decomposed by heat into oxygen and hydrogen, and the remaining three quarters by the air.

It is clear that it is not necessary in the process according to the invention to employ water since the carbon may be removed by air alone although in this case full use is not made of the power contained in the fuel.

The air and water may enter the vaporizer through the same duct as the liquid fuel or through other independent ducts, and the said vaporizer may be heated electrically, with a suitable lamp, by red hot carbon, by means of the exhaust gases of the engine or by the combination of two or more of these means.

The process may be carried out, for example, by combining the first and the fourth of the means indicated.

By means of the process according to the invention both mineral and vegetable oils may be gasified and it is based on the same reactions which take place for obtaining those gases called poor gases and water gases from any solid fuel, with the sole difference of the preliminary decomposition by heat of the liquid fuels gasified by the process according to the invention.

I have found the following method particularly suitable for carrying the process according to the invention into effect.

This method consists in making use of a vaporizer having double walls between which circulate the exhaust gases of the engine; this vaporizer is filled with carbon, and a small current of air is led to it which is obtained by means of the suction of the engine.

The fuel mixed with air passes into the internal chamber of the vaporizer, this mixture passing previously through a tube with which the apparatus is provided, from which the result is obtained that when the latter is working the fuel enters the said internal chamber in a vaporized condition.

In order to obtain the necessary temperature the engine is previously started up with gasoline for the purpose of warming by the exhaust gases the carbon which has been placed in the internal chamber of the apparatus. This rise in temperature together with the current of air causes the carbon to become rapidly red hot and this is the moment to commence to introduce into the vaporizer the desired liquid fuel, the supply of gasoline to the engine being cut off at the same time.

The vaporizer is naturally provided with a pipe leading the gases produced to the engine.

The figure shows one specific embodiment of the invention.

1 is the intake manifold of the engine, leading to a carburetor. 2 is a bi-pass which leads directly to the engine. 7 is the exhaust ports of the engine. 3. 4 is the exhaust pipe. 9 illustrates a body of carbon employed in the device. 10 is a preheating and vaporizing chamber for the oil which enters through 5. 8 is a filtering chamber for separating out the carbon formed by the decomposition of the oil. 12 and 11 are separating screens. 6 are air inlet pipes.

The operation will be clear from the preceding description. Oil alone or with steam, water or air is introduced through 5, is vaporized in 10 and decomposed in 9. Any carbon which passes with the gases through screen 11 is filtered out in section 8. The oxidizing gas, such as steam, air or water, which is introduced through 5 will burn out any carbon formed through decom-

position of the fuel. Additional air, water or steam may be introduced through 6 to aid in the combustion of the carbon.

5 In order to assist the decomposition of the heavy fuels the carbon may be mixed with ordinary catalytic agents which lower the temperature of decomposition of the said fuels.

10 For some of these, such as certain vegetable oils in particular, it is not necessary to put in carbon since it is sufficient to obtain their decomposition with the temperature of the exhaust gases, if the internal chamber is filled with hydrogenizing and dehydrating 15 catalyzers, such as magnesia and catalytic copper.

What I claim is:

1. The method of gasifying heavy liquid fuels for internal combustion engines which 20 consists in raising to a red heat a mass of carbon by the heat of the exhaust gases, aspirating air through the said mass by the suction of the engine so that it is partially burned with any deposited carbon and the 25 temperature of the mass thereby maintained, and introducing liquid fuel which has been

vapourized by the heat of the exhaust into the carbon mass thus heated, the air and vapourized fuel being introduced separately 30 into the said mass.

2. In combination with an internal combustion engine, an exhaust manifold, a chamber disposed therein and longitudinally 35 surrounded thereby, said chamber having a gas outlet at one end thereof, means connecting said outlet with the inlet manifold of said engine, means at the other end of said chamber to introduce oil thereto, screens disposed in said chamber spaced 40 from each end thereof to define three spaces or zones, a mass of carbon filling the middle space or zone defined by the screens, pipe means communicating with the said 45 middle space or zone, and pipe means communicating with the end space or zone nearest the gas outlet from the chamber, whereby gas may be introduced into said spaces or zones.

In testimony whereof I have signed my name to this specification.

ANTONIO VELAZQUEZ DIAZ.