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HYDROCARBON FUEL AND PROCESS OF MAKING SAME.

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This invention relates to hydrocarbon fuels particularly such as are used in internal combustion engines and also resides in the novel process of making such fuel. One of the main objects of the invention is to provide an improved fuel suitable for use in internal combustion engines; to permit the use of low grade gasoline or other hydrocarbons while eliminating the carbon deposits ordinarily resulting from the use of such fuels; the invention particularly contemplates obtaining these results by emulsifying in the fuel a desired percentage of water or other fluid in a very finely divided state; and further features of the invention reside in the manner of emulsifying the fuel, in the use of steam for obtaining in the resultant product the desired percentage of water so finely divided as to approach colloidal dimensions in size, and in such other novel features of process and product as will more fully hereinafter appear.

While various other substances may be employed in producing a hydrocarbon fuel within the scope of my invention, I will first describe the process in connection with emulsifying about ten per cent of water in gasoline using as an emulsifying agent a petroleum acid such as napthenic acid or sulphonic derivative of a napthene hydrocarbon. Taking for example one hundred parts of gasoline, ten parts of water and one part of the emulsifying agent, the latter is thoroughly dissolved in the gasoline and heated to a temperature which is preferably above that of the boiling point of water. The ten parts of water are admitted to the mixture in the form of steam preferably very dry steam, the mixture taking place in a high pressure cylinder such as the cylinder of a homogenizer of the type shown in the patent to Gaulin 756,953. For the purpose of obtaining a very thorough mixture of the gasoline with the water while the latter is in the form of steam, I preferably employ a steam injector of any well known construction, so that the steam under pressure will carry into the high pressure cylinder the desired proportion of gasoline with which there has already been mixed the emulsifying agent.

By this manner of mixing, the contents of the cylinder, prior to the application of high pressure in the cylinder, will be in a foam like condition. The application of pressure in the cylinder sufficient to condense the steam will result in producing a liquid fuel such as gasoline, in which the water is so finely dispersed that it may be said to contain particles of water of colloidal size. This results in a much more stable emulsion and also a more efficient fuel than where the water particles are of larger size.

Before being discharged from the cylinder the resultant mixture is preferably passed through a homogenizing valve and then through a cooling coil until the temperature is lowered sufficiently so that the mixture will remain in a liquid form at ordinary temperatures. While I have set forth the process wherein gasoline is mentioned as one of the substances, other forms of hydrocarbon oils such as the distillate obtained from cracking processes, kerosene or mixtures of various hydrocarbons could be used in place of the gasoline; also in place of the water there might be employed a mixture of water and alcohol and the emulsifying agent also varied to suit the particular requirements of the other fluids. By having the particles in the form of steam and then condensing them while distributed in the other liquid a product is obtained which is materially different from that obtained by ordinary mixing and my invention therefore resides in the product as well as in the process.

What I claim as my invention is:

1. A process for producing a fuel suitable for internal combustion engines, which consists in mixing a relatively light hydrocarbon oil with a sulphonic derivative of naphthenic acid as an amulsifying agent, heating the mixture, introducing steam thereinto and condensing the steam to produce colloidal particles of water dispersed in said mixture.

2. The process of producing a fuel suitable for internal combustion engines or the like, which comprises mixing a hydrocarbon oil with an oil soluble emulsifying agent, heating the mixture, introducing steam thereinto and condensing the steam to produce colloidal particles of water dispersed in said mixture in emulsified form.

3. The process of producing a fuel suitable for internal combustion engines or the like, which comprises injecting steam and hydrocarbon oil containing an oil-soluble dispersing agent into a high pressure cham-

ber, and maintaining the contents of the chamber at a temperature to condense the steam while finely dispersed in the oil.

4. The process of producing a fuel suitable for internal combustion engines, which comprises mixing a hydrocarbon oil with an emulsifying agent, heating the mixture and introducing it with predetermined quantities of steam into the chamber of a high pressure pump such as a homogenizer, liquifying the combination by pressure, homogenizing the resultant liquid and then cooling it while maintaining sufficient pressure to retain said mixture in liquid condition.

5. A process for producing a hydrocarbon fuel for internal combustion engines, consisting in mixing an oil soluble emulsifying agent, combustible at engine temperatures with a hydrocarbon oil, introducing water into the mixture to emulsify the water and oil, incorporating the water therein into a dispersed phase of the mixture, and the oil into a continuous phase.

6. A process of producing a hydrocarbon fuel for internal combustion engines, consisting in mixing a combustible oil soluble emulsifying agent with a relatively light gravity hydrocarbon oil, introducing water into the mixture to emulsify the water and oil, incorporating the water therein into a dispersed phase of the mixture, and the oil into a continuous phase.

7. A process of producing a hydrocarbon fuel for internal combustion engines, consisting in mixing a combustible oil soluble emulsifying agent with a hydrocarbon oil, introducing water into the mixture to emulsify the water and oil, incorporating the water therein into a dispersed phase of the mixture, and the oil into a continuous phase.

8. A process of producing a hydrocarbon fuel for internal combustion engines, consisting in mixing an oil soluble emulsifying agent with a hydrocarbon oil, introducing water in a vapor state into the mixture to emulsify the water and oil, incorporating the water therein into a dispersed phase of the emulsion, and the oil into a continuous phase.

9. A process of producing a hydrocarbon fuel, comprising mixing an emulsifying agent with a hydrocarbon oil, and in introducing water in an evaporated state at an elevated temperature into said mixture to emulsify the water and oil, incorporating the water therein into the dispersed phase of the mixture.

10. The process of producing a hydrocarbon fuel, comprising mixing an emulsifying agent with a hydrocarbon oil while the agent is in a heated condition, and admitting to the mixture a quantity of steam, said substances being subjected to pressure to emulsify the water and oil, incorporating the water in the dispersed phase of the mixture and the oil in the continuous phase.

11. A process for producing a fuel suitable for internal combustion engines, including mixing a relatively light hydrocarbon oil with a sulphonic derivative of hydrocarbon oil as a dispersing agent, heating the mixture, introducing steam thereto, and condensing the steam to produce colloidal particles of water dispersed in said mixture.

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