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HYDROCARBON EMULSION AND PROCESS OF MAKING SAME.

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To all whom it may concern:

Be it known that I, CHARLES B. BELKNAP, a citizen of the United States, residing in the city of Detroit, county of Wayne, and State of Michigan, have invented certain new and useful Improvements in Hydrocarbon Emulsions and Processes of Making Same, of which the following is a specification.

This invention relates to improvements in hydrocarbon emulsions and refers more particularly to a product which is adapted particularly as a motor fuel although in its broader aspects the product is capable of being used in connection with heating plants, power generating devices, etc.

Among the objects of the invention are to provide a product which consists essentially of an emulsion of hydrocarbon oil, water and an emulsifying agent which is readily oxidizable; to provide a product of the character referred to in which the water is preferably in the internal or discontinuous phase and in which the hydrocarbon forms the external or continuous phase; to produce a product which forms a relatively stable emulsion which will stand up in its original emulsified condition for a period of many weeks so as to be a practical commercial product; to provide an emulsion of the character referred to which will carry a relatively large percentage of water in the internal phase and which emulsion can be diluted with other hydrocarbons so that a relatively small amount of hydrocarbon treated need be emulsified; to provide an emulsifying agent which will permit of a relatively small portion of the emulsifying agent being used to carry a given percentage of water; to provide an emulsifying agent which itself contains an oxidizing substance so that the emulsion will not leave any residue. The invention also resides in the novel process of forming the emulsion, in the manner of corporating the oxidizing agent with the emulsifying agent and in such features of the product and process as will more fully hereinafter appear.

In previous attempts to make emulsions suitable for fuels in internal combustion engines difficulty has been encountered owing to the tendency of the emulsifying agent to dry out and form a deposit adjacent the intake valves and other parts which, while heated, were not sufficiently high in temperature to cause complete combustion of the emulsifying agent. One of the main features of the present invention is to overcome this difficulty and has resulted in the production of a motor fuel which will burn up clean in ordinary internal combustion engines such as are in use on automobiles or the like.

I have discovered that a successful emulsified motor fuel can be made in which the features above pointed out will be present and the advantages above pointed out be obtained in the commercial product. One method of making this motor fuel which I have successfully tried out and practiced is as follows: I first heated 300 grams of dry copper oleate so as to get it into a hot liquid form. I then dissolve 300 grams ammonium nitrate using only as much water as was necessary for complete solubility of the ammonium nitrate. This latter solution was also heated and the two hot solutions mixed and permitted to react for several minutes. The resultant mixture was then dissolved in 2½ gallons of ordinary commercial gasoline and well shaken after which there was added 2½ gallons of water in which there had been first mixed about 500 cc. of ammonia. This 50% mixture of water and gasoline and the other ingredients were then thoroughly mixed and run through an ordinary commercial Manton-Gaulin homogenizer at a pressure upwards of 2000 pounds per square inch and preferably as near 5000 pounds as it was possible to maintain with the machine used. The 5 gallons of resultant product contained approximately 50 per cent of water which was dispersed in the oil, the water being in the internal phase and very minutely divided owing to the action of the homogenizer. For use in the ordinary automobile engine, without making carburetor adjustments, it was found that from 5 to 10% of water gave the best results and the mixture having this amount of water was obtained by dissolving one gallon of the 50% mixture in from 5 to 9 additional gallons of gasoline. After running this mixture in an automobile engine for several hundred miles, it was found that the valves and other interior parts of the engine were free from any detrimental carbon or any other deposits and that there was also apparently complete combustion of the emulsifying agent.

It is understood that the invention is not

to be limited to the particular percentage of ingredients or necessarily the specific ingredients mentioned as long as the desired result is obtained. If the fuel is to be used for heavy duty engines instead of gasoline, it would be advisable to use cheaper commercial fuel such as crude oil, pressure distillate, etc. While I have mentioned ammonium nitrate as a proper oxidizing agent for the copper oleate emulsifying agent, the invention in its broader aspects is not limited to this particular oxidizing agent although it has been found to be very practical. It is to be noted that the ammonium nitrate is combined directly with the copper oleate before the latter is mixed with the gasoline and water. This has been found to be one practical way in which the ammonium nitrate can be incorporated without breaking up the emulsion but except as set forth in the claims, the invention is not necessarily limited to this manner of mixing.

I claim as my invention:

1. A liquid combustible fuel, comprising an emulsion of hydrocarbon oil, water and an emulsifying agent, said emulsifying agent containing an oxidizing substance.

2. A liquid combustible fuel, comprising an emulsion of hydrocarbon oil, water and an emulsifying agent, said emulsifying agent containing ammonium nitrate.

3. A liquid combustible fuel, comprising an emulsion of hydrocarbon oil, water and an emulsifying agent, said emulsifying agent having intimately mixed with it an oxidizing substance.

4. A liquid combustible fuel, comprising an emulsion of hydrocarbon oil, water and an emulsifying agent, said emulsifying agent having intimately mixed therewith ammonium nitrate.

5. A liquid combustible fuel, comprising a hydrocarbon oil having dissolved therein copper oleate and ammonium nitrate and containing a percentage of water dispersed in the internal phase of the solution.

6. A process of making a liquid combustible emulsified fuel consisting in mixing an emulsifying agent with an oxidizable agent, dissolving the same in hydrocarbon oil and mixing the resultant product with water to form a relatively permanent emulsion in which the oil forms the continuous and the water the discontinuous phase.

CHARLES B. BELKNAP.