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MOTOR FUEL AND PROCESS OF MAKING SAME.

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This invention relates to motor fuels and process of making same and refers more particularly to motor fuels made from "topped" crude petroleum oil. It is known in the art that hydrocarbons heavier than gasoline, as for example kerosene and gas oil obtained from the fractional distillation of crude petroleum, contain more power for use in explosive engines than does the so-called gasoline cut. There have, however, heretofore been inherent difficulties which have prevented the utilization of these heavier fuels for explosions in internal combustion engines. First, the use of these heavy fuels tends to carbonize the engine so that in a relatively short time the carbon must be removed from the cylinders, and secondly, the fuel has such a high initial point that it will not act efficiently to drive the engine and this is particularly noticeable when the engine is idling down. The addition to the heavier cuts from the petroleum oil of the lighter ends such as the gasoline like bodies will lower the initial vaporizing point but will not prevent the decomposition of the carbon on the cylinder walls.

To increase the output of gasoline, so-called cracking processes have been developed by which the heavier ends for example kerosene and gasoline are subjected to heat and pressure to break down the hydrocarbons and convert a substantial portion thereof into gasoline or gasoline like bodies. These pressure cracking processes are, however, relatively expensive in operation particularly in the consumption of fuel and in the necessity of redistillation and various other steps in the refining process. Without cracking the kerosene and gas oil into gasoline like bodies, these heavier cuts are to all intents and purposes practically useless in internal combustion engines such as those used in automobiles.

The object of the present invention is to utilize the heavier distillates obtained from the crude petroleum such as the kerosene and gas oil cuts without the necessity of previously cracking them into gasoline. Another object of the invention is to utilize the gasoline, kerosene and gas oil constituents of crude petroleum simply by "topping" the crude to a sufficient extent to obtain these cuts and then treating the distillates from this "topped" crude petroleum in accordance with the present invention. It is also in-

tended to utilize the distillates obtained from this topped crude as motor fuels without the necessity of subjecting it to the usual caustic soda, sulphuric acid and water treatments. The present invention also produces a motor fuel which will not carbonize the cylinders and which has more power than ordinary gasoline. The foregoing objects are obtained by forming a relatively permanent emulsion of the distillates of this topped crude, water and an emulsifying agent. Inasmuch as it is desirable to obtain as perfect combustion as possible, an oxidizing agent may be added to the motor fuel to facilitate combustion which oxidizing agent is insoluble in water. To further insure a permanent emulsion, the mixture may be passed through a homogenizer under relatively high pressure. The following method may be utilized in carrying out the process: A crude petroleum oil, say from a Kansas field, containing 15% of gasoline, 5% of kerosene and 15 to 20% of gas oil is put in a still and fractionally distilled until the gasoline, kerosene and all or a substantial portion of the gas oil constituents have vaporized and passed over the goose-neck into the condenser. In order to obviate any tendency of these constituents to stratify, the oil may be so distilled that the gasoline, kerosene and gas oil cuts will all come over at substantially the same time. Care should be taken to avoid mechanically carrying over as much of the heavy ends as possible. To this composite distillate is now added an emulsifying agent, as for example 1% of a saturated cyclic hydrocarbon or a derivative thereof as crude naphthenic acid. To this is added water, say from 5% to 10% so as to form an emulsion in which the water may be in the internal phase and the oil and emulsifier in the external phase. If desired, these ingredients may be forced through a homogenizer under pressure of from 500 to 5000 pounds in order to more finely subdivide the particles and thereby more readily form a permanent emulsion. It may not be necessary to use the homogenizer as we have ascertained in practice that an emulsion formed as above stated merely by mechanical shaking will form a relatively permanent emulsion. The emulsion so formed is characterized by its ability to stand cold weather inasmuch as an emulsion formed in this manner did not freeze the water or precipi-

tate it out at temperatures considerably below freezing.

It may be desirable to add an oxidizing agent, soluble in water, to water before the water is mixed with the oil. Such an oxidizing agent might be potassium chlorate. The addition of this oxidizing agent would tend to facilitate more perfect combustion and thus obtain more mileage to a gallon of fuel than otherwise.

In certain cases it may be desirable to add to the oil before emulsification, some very light constituents, as for example casing-head gasoline obtained from natural gas, which when blended to the extent of say 10% or more will give a lower initial boiling point to the motor fuel.

As an illustrative example of my invention I submit the following:

The distillates obtained from topped crude of 50 gravity consisting of a mixture of gasoline, kerosene and gas oil just as it was fractionally distilled from crude petroleum was emulsified with 3 to 5% of water by merely mechanically shaking the constituents together and then utilized to operate an internal combustion engine. About 10% of 88° petroleum naphtha was added to insure a sufficiently low initial boiling point. This emulsified motor fuel not only produced more mileage to the gallon than would gasoline under like conditions but the exhaust was entirely free from smoke and apparently practically no carbon was being deposited in the cylinders. The fuel had ample power and no difficulty at all was experienced in starting the engine, or in other words obtaining the initial combustion.

This motor fuel is of a whitish color and there is no tendency at all for the water to separate out, the emulsion standing up over an extended period of time without separation of the constituents.

We claim as our invention:

1. A fuel for internal combustion engines comprising a relatively permanent emulsion of naphthenic acid, water and distillates comprising a mixture of the gasoline, kerosene and gas oil content of crude petroleum, the water being in the dispersed phase and the oil in the continuous phase, the distillates being in excess of 70% in the final product by volume.

2. A fuel for internal combustion engines comprising a relatively permanent emulsion of a relatively minor amount of naphthenic acid as an emulsifying agent, water and liquid hydrocarbon distillates comprising the gasoline, kerosene and gas oil content of crude petroleum, the surface tensions of the oil and water being so altered as to maintain the water in the dispersed phase in the liquid oil, and the oil in the continuous phase, the latter constituting in excess of 70% of the final product, by volume.

3. A fuel for internal combustion engines comprising an emulsion of naphthenic acid the crude gasoline, kerosene and gas oil content of crude petroleum blended with casinghead gasoline, the water being maintained in the emulsion in the dispersed phase, the distillate oil mixture being in excess of 70% by volume, in the final product.

4. A fuel for internal combustion engines comprising a relatively permanent emulsion of hydrocarbon oil comprising gasoline, kerosene and the gas oil cuts of crude petroleum with water and naphthenic acid with a relatively small admixture of a light gravity hydrocarbon and oxidizing agent, the hydrocarbon being in excess of 70% by volume in the final product.

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