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MOTOR FUEL

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This invention relates to fuels intended for consumption in internal combustion engines, such for example as gasoline and kerosene. It is generally recognized that the cylinders of internal combustion engines are subjected to very severe conditions with respect to lubrication during the starting period, particularly in cold weather. At such times the crank case lubricating oil is at its highest viscosity and frequently the engine may be operated for several minutes before the lubricating oil is brought to the cylinder walls to furnish lubrication. It has frequently been shown that scoring of the cylinders results during this critical period before lubrication can be effected in the usual manner. It has heretofore been not an uncommon practice to add a certain amount of ordinary motor lubricating oil to motor fuel in order to improve the operating characteristics of the engine. Such oil has been added in amounts of from five to ten percent, and in some instances has resulted in the accumulation of residual material from the lubricating oil in the carburetor, causing the stoppage of the engine and requiring a cleaning of the carburetor. My invention is designed to overcome these disadvantages and it therefore comprises a motor fuel containing a small amount of a lubricant which is particularly effective and which may be added to the ordinary motor fuel in minute quantities. The motor fuel thus remains substantially uncontaminated and capable of producing even better results per volume compared with the unblended fuel.

According to my invention I incorporate in the motor fuel a small amount of a substance having a high lubricating value, such for example as a specially prepared oxidized paraffin wax which is substantially free from constituents insoluble in the motor fuel. These oxidized hydrocarbons have been found to have exceptional lubricating properties and have been found in general to greatly improve the lubricating value of ordinary lubricating oils by blending a small amount of these oil-soluble oxidized hydrocarbons in them. Although I prefer to use the material derived from the limited oxidation of paraffin wax for incorporating with the motor fuel, other oxidized hydrocarbons of the paraffin series, particularly of the more complex, higher boiling range, may be employed.

Without limiting my invention, but for the purpose of specifically illustrating the same, the following example is given:

A charge of crude scale paraffin wax, or if desired more refined wax, is placed in an enamel or aluminum vessel which is preferably jacketed or otherwise fitted to permit accurate control of the temperature of the contents. Air is introduced in fine streams near the bottom of the heated wax, maintained at temperatures between 260° and 330° F., preferably between 315 and 320° F. The oxidation is carried on until the acid value indicated by samples withdrawn for tests is found to be about 35 and preferably not to exceed 40. Upon cooling of this material it will solidify and will be found to have a light yellow color and when rubbed between the fingers has a greasy feeling.

This oxidized wax is now suitable for blending with motor fuel in any desired amount. Although ordinarily it is preferred to add not more than about two tenths of one percent of such oxidized wax to the motor fuel, the use of larger quantities is, of course, not precluded. The mixture of the oxidized wax with the motor fuel may be facilitated by the formation of master solutions consisting of gasoline containing ten per cent or more of the oxidized wax. If the oxidation has been carried out properly the oxidized material will be found to be completely soluble in the gasoline and will not deposit gummy or insoluble substances on standing. In some instances it may be found desirable to use only certain fractions of the oxidized wax and the invention may then be practiced by effecting a distillation of the oxidized material, preferably with a vacuum in order to avoid decomposition, and the desired cuts may be made during the course of the distillation. In any instance, the use of small amounts of oxidized wax, such for example as less than 1%, produces a fuel which will completely carburize under

the usual conditions without leaving residual material in the carburetor.

Instead of employing paraffin wax as the starting material, some of the heavier liquid or semi-liquid hydrocarbons of the paraffin series may be employed after suitable refining and purifying treatment, preferably with concentrated sulphuric acid. Oils thus refined have been found to readily oxidize to produce materials similar in character to that derived from the oxidation of paraffin wax.

The oxidized paraffins may also be separated by various methods well known in the art into mainly saponifiable constituents and unsaponifiable constituents, or in any other grouping of constituents desired, in order to incorporate a definite group of constituents into motor fuel and obtain the benefit of its lubricating value. The neutral saponifiable constituents have been found to be particularly valuable lubricants, although the retention of the acid constituents and partially oxidized wax are not detrimental; it is therefore preferable to employ the freshly oxidized wax consisting of a mixture of these substances.

It is also within the contemplation of my invention to add small amounts of such substances as the higher fatty acids, as for example stearic, palmitic and oleic acids. These substances are known to have high lubricating value when compounded with mineral oils and are beneficial when used alone or in combination with the other materials mentioned above.

Although fuels blended in accordance with my invention may be increased in anti-detonating properties, it is not intended to preclude the further blending of the fuel with other hydrocarbons having a high anti-knock value, such as the aromatic hydrocarbons or with anti-knock compounds, such as tetra-ethyl lead. The use of tetra-ethyl lead in motor fuel has in some instances been known to cause sticking of certain of the engine parts, and the incorporation of substances having a high lubricating value in accordance with my invention, therefore, has particular merit in overcoming such trouble.

Obviously many modifications and variations of the invention, as hereinbefore set forth, may be made without departing from the spirit and scope thereof, and therefore, only such limitations should be imposed as are indicated in the appended claims.

What I claim is:

1. A fuel for internal combustion engines comprising a liquid hydrocarbon fuel and a small proportion of oxidized paraffin wax which is completely soluble therein.

2. A fuel for internal combustion engines comprising a liquid hydrocarbon fuel and a small proportion of oxidized heavier liquid or semi-liquid hydrocarbons of the paraffin series which are completely soluble therein.

3. A fuel for internal combustion engines comprising a liquid hydrocarbon fuel and a small proportion of that fraction of oxidized paraffin wax which is sufficiently volatile to carburize with the fuel and which is completely soluble therein.

4. A fuel for internal combustion engines comprising a liquid hydrocarbon fuel and a small proportion of paraffin wax which has been oxidized in such manner as to form substantially no separation of gummy or insoluble materials upon blending with said fuel and permitting the mixture to stand.

5. A fuel for internal combustion engines comprising a liquid hydrocarbon fuel and less than one percent of oxidized heavier liquid or semi-liquid hydrocarbons of the paraffin series which are completely soluble therein.

6. A fuel for internal combustion engines comprising a liquid hydrocarbon fuel and less than 1% of paraffin wax which has been oxidized in such a manner as to form substantially no separation of gummy or insoluble materials upon blending with said fuel and permitting the mixture to stand.

In witness whereof I have hereunto set my hand this 14th day of December, 1927.

DANIEL STRYKER.