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FUEL MIXTURE CONTAINING OXIDIZED PETROLEUM PRODUCTS.

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To all whom it may concern:

Be it known that I, HARRY M. WEBER, a citizen of the United States, residing at Caldwell, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Fuel Mixtures Containing Oxidized Petroleum Products, of which the following is a specification.

This invention relates to fuel mixtures containing oxidized petroleum products and relates particularly to volatile liquid fuels containing the products of partial oxidation of petroleum and especially cracked and oxidized petroleum material.

The invention in the preferred form is concerned with mixtures of such oxidized petroleum material with other combustible liquids such as benzol, alcohol, acetone, ether and the like.

The following procedure will serve to illustrate the invention but it should be understood that the data furnished are simply for purposes of illustration and that variations may be made within wide limits without departure from the spirit of the invention.

Thus a petroleum oil, which may be either light or heavy oil and which in the present instance is kerosene, is cracked by passing through a cracking tube at a temperature of between about 538 and 593° C. The cracked material is admixed with air insufficient in amount for complete combustion in fact being adequate only to oxidize the cracked material only to a limited extent. The mixture of air and cracked petroleum is passed through a mass of vanadium oxide catalyst, placed in a U-tube and heated in a bath of molten lead. The temperature of the bath is about 427–443° C. The material leaving the catalytic mass is passed through a condenser and an oil is obtained which in the present case showed the following distillation points:

Per cent.	Run A.	Run B.
10	123° C.	133° C.
20	140° C.	144° C.
30	155° C.	158° C.
40	165° C.	172° C.
50	179° C.	182° C.
60	195° C.	202° C.
70	208° C.	217° C.
80	216° C.	231° C.
90	234° C.	253° C.
95	262° C.	265° C.

Using the distillate of oxidized oil obtained up to 180° C. a series of motor fuel mixtures were prepared containing ethyl or denatured alcohol in which it was found the distillate of oxidized hydrocarbons exhibited a behavior substantially differing from ordinary gasoline.

Commercial gasoline and ordinary denatured alcohol do not readily mix for example in equal proportion. An overwhelming amount of alcohol will dissolve gasoline, for example 5 parts of denatured alcohol to 1 part of gasoline the proportions being by volume. Gasoline in excess does not dissolve alcohol readily.

In contrast to this the oxidized distillate ranging up to 180° C. in boiling point when mixed with denatured alcohol at room temperature was found to be miscible in all proportions. Even though the denatured alcohol contained a small amount of water the mixtures obtained were quite clear at room temperature. The addition of a small quantity of commercial gasoline caused separation of the liquid into two layers unless the alcohol was present in excess. I found that when 4 parts of alcohol to 1 part of ordinary gasoline was added to the oxidized distillate that separation did not take place and the mixture could be diluted with the oxidized distillate considerably. Equal parts of gasoline, oxidized distillate and denatured alcohol separate into two layers but the addition of one-half part of benzol causes the mixture to become miscible and it is possible to dilute this mixture to a considerable degree with alcohol without causing separation. When the gasoline content of a mixture of the oxidized distillate, gasoline and alcohol is increased a corresponding increase in the benzol used must be made in order to obtain a clear solution. The oxidized material boiling up to 180° C. may be mixed in all proportions with methyl alcohol or acetone. Also it may be mixed with carbon bisulphide or petroleum ether. Naphthalene dissolves in it readily.

A heavier distillate of oxidized oil whose boiling point ranges from 180–265° C. also was found to be miscible with denatured alcohol. The oxidized heavy distillate could be mixed readily with ordinary commercial gasoline without separation, for example 1 part of the former to 4 parts by volume of the latter. A similar mixture with pressure still gasoline proved to be entirely

miscible. One part of the oxidized heavier distillate, 3 parts of pressure still gasoline and 1 part of benzol were miscible. One part of oxidized heavy distillate, 1 part of benzol and 1 part of denatured alcohol were miscible.

The present invention therefore enables mixtures of alcohol such as methyl and ethyl alcohols and denatured alcohol and the like to be used as to form a substantial part of a volatile fuel mixture as a blend with oxidized gasoline or kerosene or similar oxidized distillates as aforesaid. In like manner isopropyl alcohol, acetone, ether, carbon bisulphide and various other volatile inflammable liquids may be added or incorporated with the oxidized material with or without any of the other fuel constituents aforesaid.

The oxidized material has the advantage that it is less liable to cause knocking in an internal combustion engine than is the case with the unoxidized hydrocarbons from which the oxidized material is obtained. This coupled with its miscibility with alcohol enables the production of motor fuels which have a power or energy value capable of giving a more substantial mileage per gallon than alcohol and having better qualities of ignitability and the like. The oxidized products which are obtained by treating cracked petroleum material and which are miscible with alcohol are I believe better fuels than mixtures of ordinary gasoline or kerosene with alcohol wherein the condition of miscibility is brought about by the addition of a third liquid. The latter fuels carry what may be termed incompatible substances and in the present invention compatible bodies may be brought together to form an alcohol containing fuel of notable value.

From the foregoing it will be clear that ethyl alcohol more particularly in its commercially available form that is denatured alcohol will dissolve a certain relatively small amount of ordinary natural gasoline but on the other hand that such gasoline will not dissolve alcohol in like manner. Hence if the problem in hand is to produce a fuel containing only a moderate amount of denatured alcohol, say 20 per cent up to 50 per cent natural gasoline and natural kerosene cannot be employed to make a miscible fuel without the addition of a third ingredient or blending agent. In the present invention a fuel can be made without seeking such a third constituent, a fuel being simply prepared by mixing the alcohol and miscible oxidized products as aforesaid in desired proportions. Hence mixtures consisting for example of 20 to 50 per cent of alcohol, the balance being substantially oxidized petroleum, preferably cracked oxidized petroleum may be made easily, simply and cheaply, affording fuels of good power value readily ignitible and possessing reduced tendency to engine knocking. There is no occasion to add an extraneous blending agent to bring about the miscibility of these two ingredients.

By the term "oxidized paraffin" as used hereinafter in the claims it is intended to include the alcohols, ether, acetone and their equivalents which are set forth above as capable of use with the petroleum products in making motor fuels.

What I claim is:—

1. A liquid fuel comprising alcohol and miscible cracked and oxidized petroleum hydrocarbons.

2. A motor fuel comprising denatured alcohol and miscible oxidized kerosene.

3. A fuel mixture comprising a miscible light volatile oxidized petroleum spirit, denatured alcohol and other volatile fuel constituents.

4. A liquid fuel comprising miscible cracked oxidized petroleum material boiling up to about 180° C. admixed with approximately an equal volume of denatured alcohol.

5. A motor fuel comprising not in excess of 50 per cent of denatured alcohol incorporated with miscible oxidized petroleum substantially devoid of extraneous material serving as a blending agent.

6. A motor fuel comprising not to exceed about 50 per cent of denatured alcohol incorporated with cracked oxidized liquid fuel of petroleum origin, the mixture being miscible without the addition of extraneous blending agents.

7. A motor fuel containing an oxidized petroleum product and an oxidized paraffin.

8. A motor fuel containing an oxidized product from cracked petroleum and an oxidized paraffin.

HARRY M. WEBER.