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ERNST JOHANSEN, OF FALL RIVER, MASSACHUSETTS, ASSIGNOR TO NEW ENGLAND OIL REFINING COMPANY, OF FALL RIVER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

METHOD OF MAKING A NOVEL MOTOR FUEL.

No Drawing. Original application filed April 4, 1924, Serial No. 704,165. Divided and this application filed August 19, 1925. Serial No. 51,255.

The invention relates to a novel method of making a novel motor fuel.

It has been known for some time that certain organic metallic compounds, especially lead compounds, when added to motor fuels, such as certain commercial gasolines, render the vapors of the latter when mixed with air capable of much higher compression, than would otherwise be the case, before the mixture will detonate when ignited under pressure. In other words, by the use of gasoline thus treated, internal combustion motors can be run at a much higher compression than in the case of gasoline not so treated without the occurrence of the objectionable phenomenon known as "knocking", thus greatly increasing the power and efficiency of the engine.

The lead compounds heretofore used for this purpose are organic lead compounds produced by special synthetic processes widely differing from those employed in the refining of petroleum. The expense of producing these organic lead compounds is relatively high so that the price of the fuels to which these compounds have been added is considerably increased.

I have found that motor fuels containing organic metallic compounds may be readily and cheaply produced by the direct action of certain metallic oxides or compounds upon certain petroleum products. In this way, the desirable metal compounds are formed directly in the petroleum product or fuel and remain dissolved in the latter. The costly separate production of expensive synthetic metal compounds and their addition to the motor fuel, such as gasoline, are thus avoided.

In preparing my novel fuel I use the petroleum products known as "sour distillates", (see *Das Erdol* by Engler Hofer, 1911, vol. 3, page 871, foot note) obtained in the distillation of crude petroleum or intermediate petroleum products. These distillates are characterized by their ability to react with certain metallic compounds, for example certain metallic oxides, such as copper or lead oxides, or a solution of said oxides in an alkali solution, thereby forming metallic compounds that remain dissolved in the distillates. I expose these distillates to the action of said metallic com-

pounds or oxides, preferably using for this purpose either lead oxide or alkali plumbite, but do not limit myself to the use of these materials. A fraction of sour distillate, having a boiling range suitable for motor fuel, is first freed from the elementary sulphur therein contained in any suitable manner, for instance by redistillation. Previous to this or after, the distillate may be treated with a slight amount of sulphuric acid to improve the color and odor of the distillate, following this by washing with water. This however is optional. The product obtained by the redistillation is then agitated at ordinary temperature with lead oxide (litharge) either in dry form or dissolved in a solution of sodium or potassium hydroxide whereby a sodium or potassium plumbite is formed (alkali plumbite). The color of the distillate, which is generally water white, is by this treatment changed to yellow. If the dry lead oxide is used, any excess of lead oxide is first allowed to settle, whereupon the liquid product becomes perfectly clear and can be drawn off ready for use. If a solution of lead oxide in sodium or potassium hydroxide is used any excess thereof will separate and having been allowed to settle may be drawn off. I preferably use from one to three pounds of lead oxide per forty-two gallon barrel of distillate.

The clear settled yellow product containing up to one gram of lead per liter, or even more, is permanent under ordinary conditions, and can be used as a motor fuel for engines working with high compression. It can be used either pure or blended in any suitable proportions with gasoline or other motor fuels, such as benzol, alcohol or ether.

The novel motor fuel produced by the above method is believed to contain the lead in the form of addition compounds. The advantages of the novel fuel, besides those already mentioned, are low cost of production and simple manner of preparation, requiring no other apparatus or reagents than those universally used in the refining of petroleum products.

This application is a divisional application of my application Serial No. 704,165, filed April 4, 1924.

Claims.

1. A process of making a liquid fuel for internal combustion engines, which comprises treating sour distillates with a metallic oxide capable of forming, with sour distillate components, compounds soluble in the fuel.
2. A process of making a liquid fuel for internal combustion engines, which comprises treating sour distillates with lead oxide.
3. A process of making a liquid fuel for internal combustion engines, which comprises treating the sour distillates with a solution, in an alkali hydroxide, of a compound of a metal capable of forming, with sour distillate components, compounds soluble in said fuel.
4. A process of making a liquid fuel for internal combustion engines, which comprises treating the sour distillates with a solution, in an alkali hydroxide, of the oxide of a metal capable of forming, with sour distillate components, compounds soluble in said fuel.
5. A process of making a liquid fuel for internal combustion engines, which comprises treating sour distillates with lead oxide in an alkali hydroxide solution.
6. A process of making a liquid fuel for internal combustion engines, which comprises treating the sour distillates with a solution, in sodium hydroxide, of the oxide of a metal capable of forming, with sour distillate components, compounds soluble in said fuel.
7. A process of making a liquid fuel for internal combustion engines, which comprises treating sour distillates with lead oxide in sodium hydroxide.
8. A process of making a liquid fuel for internal combustion engines, which comprises freeing sour distillates from any elementary sulphur contained therein, and treating the product with a metallic oxide capable of forming, with sour distillate components, compounds soluble in the fuel.
9. A process of making a liquid fuel for internal combustion engines, which comprises freeing sour distillates from any elementary sulphur contained therein, and treating the product with lead oxide.
10. A process of making a liquid fuel for internal combustion engines, which comprises freeing sour distillates from any elementary sulphur contained therein, and treating the product with a solution, in an alkali hydroxide, of the oxide of a metal capable of forming, with sour distillate components, compounds soluble in said fuel.
11. A process of making a liquid fuel for internal combustion engines, which comprises freeing sour distillates from any elementary sulphur contained therein, and treating the product with a solution, in sodium hydroxide, of the oxide of a metal capable of forming, with sour distillate components, compounds soluble in said fuel.
12. A process of making a liquid fuel for internal combustion engines, which comprises freeing sour distillates from any elementary sulphur contained therein, and treating the product with lead oxide in a sodium hydroxide solution.
13. A process of making a liquid fuel for internal combustion engines, which comprises freeing sour distillates from any elementary sulphur they may contain; and treating the product with lead oxide in about the proportion of one to three pounds of lead oxide to forty-two gallons of said product.
14. A process of making a liquid fuel for internal combustion engines, which comprises freeing sour distillates from any elementary sulphur they may contain; treating the product with an excess of lead oxide; and separating the excess of lead oxide from the product.
15. A process of making a liquid fuel for internal combustion engines, which comprises freeing sour distillates from any elementary sulphur they may contain; treating the product with an excess of alkali metal plumbite; and separating the excess of alkali metal plumbite from the product.
16. A process of making a liquid fuel for internal combustion engines, which comprises freeing sour distillates from any elementary sulphur they may contain and treating the product with sulphuric acid; treating the product with an excess of lead oxide; and separating the excess of lead oxide from the product.
17. A process of making a liquid fuel for internal combustion engines, which comprises freeing sour distillates from any elementary sulphur they may contain and treating the product with sulphuric acid; treating the product with an excess of alkali metal plumbite; and separating the excess of alkali metal plumbite from the product.
- In testimony whereof, I have signed my name to this specification.
- ERNST JOHANSEN.