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UNITED STATES PATENT OFFICE.

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MOTOR FUEL.

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To all whom it may concern:

Be it known that I, JOHN J. MURPHY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Motor Fuel, of which the following is a specification.

My present invention relates to improvements in fluid fuels, and has special reference to the production of a fuel fluid which will be suitable for use in power generators of an internal combustion type, as well as for use in other connections where an easily vaporizable fuel is desired which is capable of practically complete combustion and which therefore will leave little or no solid or condensible products of combustion.

One of the main objects that I have had in mind is to produce a uniformly burning fuel of the ordinary merchantable grades of materials without the necessity of special refining or blending operations, and in this connection I have sought to employ ordinary commercial grades of alcohol as an element of a fuel. It has long been known that the combustion of alcohol produces an intensely hot flame, but by itself its vaporizing characteristics require special consideration and treatment which has prevented alcohol by itself from becoming a fuel for internal combustion engines to any considerable extent. Again, commercial grades of alcohol contain appreciable quantities of water (5% or more) which interferes with the admixture of the alcohol with vaporizable materials having an oily nature. It has therefore been my object to compound a mixture of commercial materials in which the several elements will thoroughly dissolve and unite, and which will, as a whole when mixed, constitute a vaporizable fuel of uniform and dependable combustion characteristics. I attain the above objects by means of specific mixtures hereinafter set forth and described.

It will be noted that throughout the divers specific formulæ occur coal oil or kerosene, which is of too low a flashpoint or volatilization limit to be useful for fuel in internal combustion engines without special means for its use, benzole, and impure benzine, alcohol, and another ingredient, such as ether, or some substitute therefor, only a small proportion of which is used, but which is employed for easily controlling the gravity.

My discovery consists in ascertaining that a comparatively heavy petroleum derivative, such as coal oil or kerosene is capable of complete solution with commercial alcohol with a water content in the presence of divers quantities of benzole. All of the ingredients employed by me are of the ordinary commercial variety, and the mixture thereof can be made so as to produce a vaporizable fluid fuel at less cost than the divers combinations of petroleum oils, or petroleum oils and gas tar oils which have heretofore been offered to the public can be compounded. As an example of one formula involving my invention, I mix forty parts of coal oil or kerosene, forty parts of benzole, twenty parts of commercial alcohol and five parts of ether. As a variant of this formula, the mixture may be made of forty parts of kerosene, thirty of benzole, five of light petroleum, known on the market as "casing head," gasoline which is separated by distillation at temperatures between 110° and 168° Fahrenheit, five of ether and twenty of alcohol. Another formula consists of kerosene thirty parts, benzole thirty parts, alcohol forty parts and casing head ten parts. Again, a mixture may be made with casing head twenty parts, benzole forty parts, kerosene forty parts and alcohol twenty parts. With this formula not only commercial but a low proof commercial alcohol may preferably be employed. Again, a satisfactory fuel can be compounded of equal parts of kerosene, benzole and alcohol. Another formula involving the same principles for obtaining a satisfactory solution of various elements consists of kerosene forty parts, benzole twenty-seven parts, alcohol twenty-eight parts, to which is added two per cent of vanilline. Other formulæ involving the same principle are:

Kerosene, forty parts, naphtha, twenty parts, benzole, twenty parts, alcohol, twenty parts.

Kerosene, forty parts, gasoline, ten parts, naphtha, ten parts, alcohol, twenty parts, benzole, twenty parts, with two per cent assphtlein.

Alcohol, twenty parts, ether, five parts, benzole, thirty-five parts, kerosene, thirty-eight parts, with two parts assphtlein.

The assphtlein mentioned in the two foregoing formulæ may be either purchased, or compounded in the following manner: Take fusel oil which has been distilled and separated at temperatures between 234 and 238

degrees Fahrenheit, to which add a mixture of equal parts of alcohol 188 proof and benzole until the compound starts to turn blue.

The naphtha mentioned in the formulæ disclosed in this application is a relatively light petroleum separated by distillation between the temperatures 190° and 320° Fahrenheit. Gasoline is of the same general character and is separated by distillation between the temperatures of 158° and 364° Fahrenheit.

It will be seen from a careful perusal of the above formulæ that a single physical principle is employed in their compounding which is, broadly stated, a miscible association of a petroleum product of an oily nature, such as coal oil or kerosene with a commercial alcohol containing an appreciable quantity of water can be secured by bringing these substances together in the presence of an unrefined coal tar product, commercially known as "benzole" to form a fluid of the desired physical characteristics.

What I claim new is:

1. A fluid fuel consisting of coal oil forty parts, benzole forty parts, ether five parts and alcohol twenty parts.

2. A fluid fuel consisting of kerosene forty parts, benzole thirty parts, casing head gasoline as defined five parts, ether five parts and alcohol twenty parts.

3. A fluid fuel consisting of kerosene thirty parts, benzole thirty parts, alcohol forty parts and casing head gasoline as defined ten parts.

4. A fluid fuel consisting of casing head gasoline as defined twenty parts, benzole forty parts, kerosene forty parts and alcohol twenty parts.

5. A fluid fuel consisting of kerosene fifty parts, benzole fifty parts and alcohol fifty parts.

6. A fluid fuel consisting of kerosene forty parts, benzole twenty-seven parts, alcohol twenty-eight parts with two per cent vanilline.

7. A fluid fuel consisting of kerosene forty parts, naphtha twenty parts, benzole twenty parts and alcohol twenty parts

8. A fluid fuel consisting of kerosene forty parts, gasoline ten parts, naphtha ten parts, alcohol twenty parts, benzole twenty parts with two per cent assphtlein.

9. A fluid fuel consisting of alcohol twenty parts, ether five parts, benzole thirty-five parts, kerosene thirty-eight parts with two parts assphtlein.

Signed at Chicago, county of Cook and State of Illinois, this 3d day of July, 1922.

JNO. J. MURPHY.

Witnesses:
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