

# UNITED STATES PATENT OFFICE.

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## MOTOR-FUEL.

1,361,153.

Specification of Letters Patent.

Patented Dec. 7, 1920.

No Drawing.

Application filed August 27, 1919. Serial No. 320,254.

*To all whom it may concern:*

Be it known that I, ALBERT HAYES, a citizen of the United States, residing at New York, in the county of New York, State of New York, have invented certain new and useful Improvements in Motor-Fuel, of which the following is a description.

My invention relates to motor fuels for use in explosion engines and for like purposes and has for its object to produce a stable, homogeneous liquid fuel, the constituents of which are not separated out at ordinary temperatures, and which is furthermore permanently non-stratifying having as its basis and principal constituents alcohol and kerosene or other petroleum distillate, which will be adapted for use in explosion engines of ordinary construction with carbureters such as are ordinarily used with gasolene, and will be adapted to produce with the usual admixture of air an explosive mixture as effective as or even more effective than the explosive mixture formed from gasolene.

With the above object in view my invention consists in the motor fuel hereinafter described and claimed.

It is well known that ethyl alcohol can be produced at a comparatively low cost and as it can be produced from any fermentable material there is practically no limit to the amount which can be produced while gasolene, being a product of petroleum, of which it forms only a part, is necessarily limited by the amount of petroleum produced, and while it is well known that alcohol is capable of being vaporized to form, with admixture of air, an explosive mixture, attempts to use it for this purpose with explosive engines of the ordinary type with carbureters such as are used for gasolene have not been successful. It has been thought that a mixture of alcohol with kerosene or other petroleum distillate should produce a satisfactory basis for an explosive mixture but in the attempt to make such a mixture it was found that alcohol and kerosene or other petroleum distillate would not mix in substantial proportions so as to form a stable, non-stratifying liquid. Attempts have been made without success to produce such a liquid by the addition of various liquids with the alcohol and petroleum distillate.

By my invention such a liquid is formed.

In carrying out my invention I take kerosene or other petroleum distillate preferably heavier than gasolene, though gasolene may be used, and mix with it ether in the proportion of about one part of ether to fifteen parts (preferably not more than sixteen or less than fourteen parts) of kerosene or other petroleum distillate, blending these constituents thoroughly by stirring or agitating, and add to this mixture from seven to twenty parts of benzol, blending these constituents as before, and then add from nine to seventy parts of alcohol, the alcohol being added slowly and blended with the mixture by stirring or agitating as it is added. The petroleum distillate with the ether forms a composition or mixture with which the alcohol readily blends or combines to form a liquid from which the constituents will not separate by standing or as a consequence of ordinary changes of temperature.

The motor fuel thus produced may vary widely in the proportion of alcohol to the other constituents and the proportion of benzol may be varied considerably depending somewhat on the flash point which the liquid mixture is to have, but the proportion of ether to petroleum distillate should not be varied materially from that stated. The alcohol and petroleum distillate together should form not less than three-fourths of the fuel.

The alcohol is preferably ordinary commercial ethyl alcohol of 95 per cent. or even less strength the 5 per cent. or more of water present blending readily with the mixture without detriment to its qualities as a basis for an explosive mixture and apparently with advantage.

Methyl alcohol may be used instead of ethyl alcohol with equally good results and doubtless there are other alcohols of sufficient volatility which would serve in this connection. In view of the fact, however, that ethyl alcohol is readily obtainable by the fermentation of a variety of waste products it will be more available than any other alcohol. Methyl ether may be used instead of the ordinary ethyl ether and other ethers may be used, the term "ether" as used herein being intended to include any ether.

The alcohol may be advantageously blended with the other constituents by

vaporizing it and introducing the vapor into the mixture of petroleum distillate, ether and benzol, but I do not herein claim this method of mixing such method forming the subject-matter of a separate application for patent filed July 14, 1919, Serial No. 310,536.

Having thus described my invention what I claim is:

10 1. A motor fuel comprising a petroleum distillate, an alcohol, benzol, and an ether, the constituents being homogeneously blended

15 2. The motor fuel claimed in claim 1 in which the petroleum distillate and the alcohol together form not less than three fourths of the whole.

20 3. The motor fuel claimed in claims 1 and 2 in which the proportion of the alcohol is greater than that of the petroleum distillate.

25 4. A motor fuel comprising a petroleum distillate, an alcohol, benzol, and an ether, the constituents being homogeneously blended in such a way as not to be separated out at ordinary temperatures.

5. A motor fuel comprising a petroleum

distillate, alcohol, benzol, and an ether, the constituents being homogeneously blended in such a way as not to be separated out at ordinary temperatures.

6. A motor fuel comprising gasolene, an alcohol, benzol, and an ether, the constituents being homogeneously blended in such a way as not to be separated out at ordinary temperatures.

7. A motor fuel comprising gasolene, alcohol, benzol, and an ether, the constituents being homogeneously blended in such a way as not to be separated out at ordinary temperatures.

8. A motor fuel comprising gasolene, an alcohol, benzol, and ether, the constituents being homogeneously blended in such a way as not to be separated out at ordinary temperatures.

9. A motor fuel comprising gasolene, alcohol, benzol, and ether, the constituents being homogeneously blended in such a way as not to be separated out at ordinary temperatures.

In testimony whereof I affix my signature this 22nd day of August, 1919.

ALBERT HAYES.