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UNITED STATES PATENT OFFICE.

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AEROPLANE MOTOR FUEL.

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To all whom it may concern:

Be it known that I, ARTHUR A. BACKHAUS, of Baltimore, in the State of Maryland, have invented a certain new and useful Improvement in Aeroplane Motor Fuel, and do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates particularly to fuels designed to be used in aeroplane motors, but is applicable for use in internal combustion motors of all kinds used in flying or for other purposes.

The object of my invention is to provide a fuel which is especially adapted for use in aeroplanes, although it is also applicable for use in internal combustion engines in general.

It is necessary that fuels which are to be used in aeroplane motors shall have great dependability, inasmuch as any uncertainty in the operation of the aeroplane, by reason of variability in the character of the fuel or failure of the fuel to perform its intended work, may bring about disastrous consequences.

For this reason, it is desirable to avoid using in such fuels large percentages of petroleum products, inasmuch as commercial petroleum products do not ordinarily have a constant composition, and are usually comprised of varying quantities of a number of different constitutents.

It is, therefore, the object of my invention to provide an aeroplane fuel avoiding these disadvantages and taking into account the circumstances above referred to.

Still a further object of my invention is to provide fuels of the above character by the use of benzol, and the constituents of which are chosen in such a manner as to obviate any tendency of the benzol to crystallize out at the range of atmospheric temperatures to which aeroplane motors are subjected at the varying altitudes in which aeroplanes operate.

Further objects of my invention will appear from the detailed description thereof contained hereinafter.

While my invention is capable of being carried out in different ways, for the purpose of illustration I shall describe only certain ways of carrying out the same herein.

For example, a fuel made in accordance with my invention may be comprised of: 40 parts by volume of ethyl alcohol, 30 parts by volume of benzol, 30 parts by volume of gasolene or naphtha having a specific gravity of from 52° Bé. to 66° Bé.

The percentages of the above constituents may vary to some extent, if desired. For example, the alcohol may vary from 40 to 60%, the benzol from 25 to 35%, and the gasoline or naphtha from 30 to 50%, although I have obtained the best results by the specific composition above given.

In making the composition I use alcohol having a strength of about 98% or higher, or absolute alcohol, that is alcohol having a strength of at least 99%. By using an alcohol having a strength of about 98% or higher, the benzol will be retained in liquid form in the fuel mixture and will not crystallize out even when subjected to the very low temperatures found at high altitudes.

Instead of the ethyl alcohol, however, I may use methyl alcohol or butyl alcohol or any lower monohydric aliphatic alcohol, that is to say, any monohydric alcohol the boiling point of which falls within or is in the neighborhood of the range of boiling points of the petroleum distillates generally used in motor fuels, and instead of the benzol I may use toluol.

Aeroplane fuels made in the manner described above can be used with greatest reliability in the operation of aeroplanes, notwithstanding the varied atmospheric conditions to which aeroplane motors are subjected.

Furthermore, the percentage of light petroleum distillate, that is gasolene or naphtha, therein is sufficiently low to prevent the variations in the composition thereof from having any appreciable effect upon the operation of internal combustion engines operated thereby.

Nevertheless, all of these fuels are of such a nature that they may be readily used in internal combustion engines generally, whether used for operating aeroplanes or not.

While I have described my invention above in detail, I wish it to be understood that many changes may be made therein without departing from the spirit thereof.

I claim:

1. A fuel comprising a petroleum distillate, an aliphatic lower monohydric alcohol having a strength above about 98%,

and an aromatic hydrocarbon adapted to blend the other constituents.

2. A fuel comprising a petroleum distillate, ethyl alcohol having a strength above about 98%, and an aromatic hydrocarbon adapted to blend the other constituents.

3. A fuel comprising a petroleum distillate, absolute ethyl alcohol, and an aromatic hydrocarbon adapted to blend the other constituents.

4. A fuel comprising a petroleum distillate, an aliphatic lower monohydric alcohol having a strength above about 98%, and benzol adapted to blend the other constituents.

5. A fuel comprising a petroleum distillate, ethyl alcohol having a strength above about 98%, and benzol adapted to blend the other constituents.

6. A fuel comprising a petroleum distillate, absolute ethyl alcohol, and benzol adapted to blend the other constituents.

7. A fuel composed of gasolene, an aliphatic lower monohydric alcohol having a strength above about 98%, and an aromatic hydrocarbon adapted to blend the other constituents.

8. A fuel composed of gasolene, ethyl alcohol having a strength above about 98%, and an aromatic hydrocarbon adapted to blend the other constituents.

9. A fuel composed of a major proportion of gasoline, ethyl alcohol having a strength above about 98%, and a small proportion of aromatic hydrocarbon adapted to blend the other constituents.

10. A fuel comprising from 40 to 60% ethyl alcohol having a strength above about 98%, benzol from 25 to 35%, and gasoline from 30 to 50%.

11. A fuel comprising a major proportion of gasoline, a small proportion of benzol and below 45% of ethyl alcohol having a strength above about 98%.

12. A fuel comprising a major portion of gasolene, ethyl alcohol, and benzol below 30% adapted to blend the other constituents.

13. A motor fuel consisting of a solution of a light petroleum distillate, benzol and alcohol having a chill point of substantially —32° Fahrenheit.

14. A motor fuel consisting of a petroleum product volatile at ordinary motor temperatures, benzol or an equivalent coal tar distillate and alcohol in solution, without other mutual solvent or blending agent, and substantially free from water.

In testimony that I claim the foregoing I have hereunto set my hand.

ARTHUR A. BACKHAUS.

Witnesses:

JOHN P. GISCHEL,
ARTHUR WRIGHT.