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LIQUID FUEL.

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To all whom it may concern:

Be it known that I, FRÉDÉRIC W. FERRER, a citizen of the Republic of France, and a resident of Redlands, in the county of San Bernardino and State of California, have invented certain new and useful Improvements in Liquid Fuel, of which the following is a specification.

This invention relates to a liquid fuel capable of being used alone, but preferably mixed with hydrocarbons such as gasolene, kerosene or the like.

An object of the invention is to provide a liquid fuel of greater power than those commonly in use in stoves and internal combustion engines.

This fuel is especially useful in internal combustion engines, and it is preferable, when so used, to mix it with the gasolene, kerosene or so-called distillate, so that the mixture will provide considerably more power than the gasolene or kerosene alone, but not so much power as though this new fuel were employed by itself.

The following substances are employed in making the fuel and I preferably use them in substantially the proportions given:

	Grammes.
Acetone	125
Camphor, $C_{10}H_{16}O$	5
Naphthalene, $C_{10}H_8$	5
Methyl alcohol, CH_3OH	180
Ether, $(C_2H_5)_2O$	135
Amylic alcohol, $C_5H_{11}OH$	40

The acetone, camphor and naphthalene are mixed together, and the mixture heated in order to melt the camphor and naphthalene. The heating may be effected, for example, by immersing the vessel containing the mixture in a vessel containing water or by employing a steam jacket, in a manner well understood in the art pertaining to the application of heat to various substances. While the heating is proceeding, it is preferable to stir the mixture. The mixture thus made is of about the consistency of milk and will hereinafter be termed "mixture A." Mixture A will be allowed to stand for twenty-four hours to cool.

The wood alcohol, ether and amylic alcohol are then mixed together to form a mixture which hereinafter will be termed "mixture B."

When mixture A has stood for approximately twenty-four hours, it will be mixed with mixture B to form the product sought. This product is practically a colorless liquid, highly explosive and capable of forming with hydrocarbon compounds, such as gasolene and kerosene, a highly explosive fuel useful in internal combustion engines and stoves.

It will, of course, be understood that the proportions given above may be varied to some extent, without departing from the spirit of the invention, but the proportions given are approximately those which I have discovered, after exhaustive experiments, to give the best results. The mixing together of some of the elements named in other proportions than those given above produces more or less unstable compounds.

In using the fuel above described, it is preferable to mix it with gasolene in the proportion of substantially 490 grammes, which is the weight made by combining the ingredients in the proportions given, with from 8 to 10 gallons of gasolene.

When the fuel is thus mixed with gasolene or other fuel hydrocarbons, and the mixture is employed in the internal combustion engines of motor vehicles, the carbureters on said engines should preferably be adjusted differently than when used with gasolene alone. For example, if one part of gasolene is employed to fifteen parts of air, the carbureter will be adjusted so that a mixture of gasolene and this new fuel will pass into the engine cylinders in the proportion of one part of the mixture to thirty parts of air. If the engine be employed on a flying machine, it is not necessary to adjust the carbureter, since it is very desirable to have the additional engine power produced by using the mixture of the new fuel and gasolene in the same ratio to the air as when the gasolene alone is employed. When this new fuel is employed, it is very important to keep the cylinders well lubricated.

The acetone, camphor and naphthalene produce a very hot flame when mixed with gasolene, kerosene or distillate, and the acetone has a purifying effect on impure fuel distillates. The camphor evaporates in the engine cylinders and slows up combustion of the charge, so that the explosion will not produce a hammerlike blow on the piston but will be of considerable duration so as to utilize to better advantage the expensive

forces of the gases evolved from the burning charge.

The wood alcohol, ether and amylic alcohol add to the power of the fuel and aid in keeping the engine cylinders and pistons free from carbon, which is absorbed.

I claim:

1. A liquid fuel comprising the following constituents in substantially the following proportions by weight:

Acetone	125
Camphor	5
Naphthalene	5
Methyl alcohol	180
Ether	135
Amylic alcohol	40

2. A liquid fuel adapted for use in an internal combustion engine, the fuel comprising a mixture of acetone, camphor, naphthalene, alcohol and ether, added to more than a like quantity of petroleum motor fuel.

3. A liquid fuel adapted for use in an internal combustion engine, the fuel comprising a mixture of acetone, alcohol, camphor, naphthalene and ether, the combined quantities of acetone, ether and alcohol being greater than the combined quantity of camphor and naphthalene.

Signed at Los Angeles, California, this 6th day of July, 1921.

FRÉDÉRIC W. FERRER.

Witnesses:
GEORGE H. HILES,
MARIE POWER.