UNITED STATES PATENT OFFICE.

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LIQUID FUEL.

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To all whom it may concern:

Be it known that I, JOSEPH BLACK, a citizen of the United States, residing at Santa Barbara, in the county of Santa Barbara and State of California, have invented a certain new and useful Improvement in Liquid Fuel, of which the following is a full, clear, and exact description.

This invention relates to liquid fuel for internal combustion engines, and has for its general object to provide a fuel which may be used as a substitute for gasolene; which, while capable of production at a cost below that of gasolene, will be more efficient than the latter in the matter of power-development, mileage per gallon, freedom from carbonization, and ease of starting, particularly in cold weather. I accomplish the foregoing objects in and through the composition of matter and the process of producing the same to be described and claimed hereinafter.

In the production of my fuel, I employ a base consisting of an aliphatic hydro-carbon having a hydromatic reading not exceeding 50° Baumé scale and which may in fact be as low as 7 to 14 on such scale. For this base, commercial kerosene, or what is known to the trade as "distillate," or even "stove oil" or "toppings," may be employed. Where kerosene is used, the procedure will be as follows:—I place within a still having water in the bottom thereof kerosene and commercial benzol in the proportions of 10 gallons of the former to one gallon of the latter. I then supply to the still, steam at a temperature of about 130° C., the steam being delivered into the water in the bottom of the still. The mixture of the hydro-carbon base and benzol will be distilled and the distillate will be collected to a point where the reading on the Baumé scale is approximately 50°, whereupon the operation may be cut or stopped. If 100 gallons of this 50° distillate is desired, it may be obtained by employing 125 gallons of the kerosene and 12½ gallons of the benzol, leaving about 37½ gallons of residue in the still. I then add to this 50° distillate 5 gallons of gasolene (preferably of at least 72° test), 16 ounces of commercial ether, 100 ounces of acetone, and 14 ounces of alcohol—preferably wood alcohol. The purpose of adding these ingredients is to lower the ignition point or flashing point, prevent the formation of carbon, and secure uniformity of ignition and of engine performance, without knocking; and the fuel thus obtained has proven to be more efficient than commercial gasolene and to ignite more easily in cold weather than the latter.

Where it is desired to utilize all of the kerosene base, the temperature of the steam admitted to the still will be raised to about 180° C., which will enable substantially complete distillation of the base to be secured. In such case, assuming that the same initial quantities of kerosene and benzol are used as before, there will be a total of 137½ gallons of distillate produced, 100 gallons of which would be about 50° Baumé, but for the lowering of the reading by the additional 37½ gallons. To render this distillate capable of successful use with internal combustion engines, I add to the same the amounts of gasolene, commercial ether, acetone, and alcohol, hereinbefore set forth for 100 gallons of 50° distillate. To overcome the lowering of the quality of the distillate due to the additional 37½ gallons, I increase, for this additional liquid, by 50%, the percentage of gasolene, ether, acetone, and alcohol over and above the percentage employed for the 100 gallons of 50° distillate. With this change in proportions, all of the kerosene base may be employed in the production of my fuel.

Where "distillate," "stove oil," or "toppings" are used as my base, I employ therewith the same proportions of benzol as in the case of kerosene, merely raising the temperature of the steam admitted to the still to a degree necessary to recover therefrom a distillate having a Baumé reading of about 50°. For this purpose, the temperature may be about 220°. The proportion of 50° distillate recovered from either of these other bases will be somewhat higher than in the case of kerosene, but the residue which remains will be worthless for the purposes for which my fuel is intended.

One of the objects of distilling the base and the commercial benzol is to produce a distillate with which the other ingredients will mix properly for the production of the fuel; another object is to secure in my fuel benzol in a practically commercially pure condition, thereby to prevent carbonization in the cylinders.

By employing steam admitted directly to

the still, and preferably to a body of water in the bottom of the latter, practically complete recovery of the products of distillation is assured; and the water of condensation from the steam can be and is readily separated and removed from the distillate.

The acetone serves to form a homogeneous and permanent mixture between the ether and the distillate; also between the alcohol and the distillate.

In practice, the ether is added to the acetone and mixed; then the alcohol is added to and admixed with this mixture. The mixture thus produced is added to the distillate and gasolene, and these ingredients may be efficiently, homogeneously and permanently mixed by passing air under pressure therethrough. The acetone acts as carrying or mixing medium between the ether and the alcohol on the one hand and the distillate and gasolene on the other hand and forms a permanent and homogeneous mixture.

Having thus described my invention, what I claim is:—

A liquid fuel in the form of a homogeneous and permanent mixture, consisting of 100 gallons of distillate produced by distilling a mixture of an aliphatic hydrocarbon liquid testing not to exceed 50° Bé. with approximately 10% benzol, said distillate having a higher gravity test than the aliphatic hydrocarbon, 5 gallons of gasolene, 16 ounces of ether, 100 ounces of acetone, and 14 ounces of alcohol.

In testimony whereof, I hereunto affix my signature.

JOSEPH BLACK.