

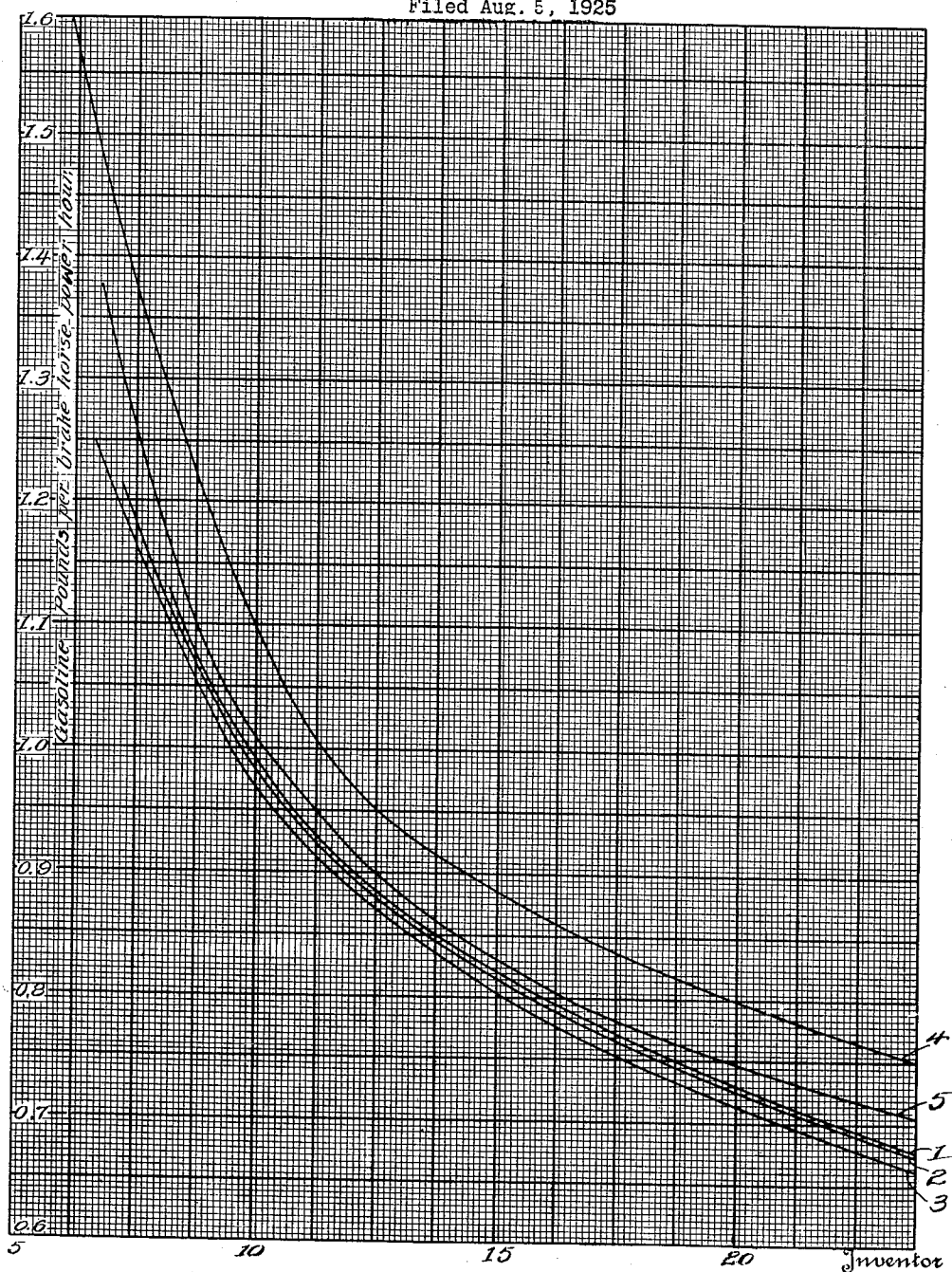
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MOTOR FUEL

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UNITED STATES PATENT OFFICE.

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MOTOR FUEL.

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Our invention relates broadly to means for increasing the effective power obtainable in internal combustion engines and more particularly to an improvement in motor fuels for internal combustion engines.

The object of our invention is to provide means for increasing the power and reducing the detonative effects of gasoline, or similarly used petroleum products when utilized as fuels for internal combustion engines.

We have found that gasoline, and other similarly used petroleum products, when properly treated with carbon tetrachloride and employed as fuel in internal combustion engines, show an appreciable increase in the ordinarily available power and a marked decrease in detonative effect. The effect of carbon tetrachloride is to cushion the detonative effect of the explosive mixture, enabling the expansion of the gases to be utilized directly as forces against the pistons within the engine's cylinders. We have investigated various hydrocarbon fuels and have found that the most volatile hydrocarbon fuels require greater addition of carbon tetrachloride thereto. The carbon tetrachloride when added to the hydrocarbon fuel tends to retard combustion, but does not perceptibly hinder its completion.

We have found that the best effects are obtained by the addition of from 0.05% to 1.5% by volume of carbon tetrachloride to the hydrocarbon fuel.

Reference is made to the accompanying drawing which illustrates the result of our researches in the investigation of hydrocarbon fuel for internal combustion engines, to which have been added in different instances differing percentages of carbon tetrachloride by volume.

The investigations were conducted with gasoline as the hydrocarbon fuel for internal combustion engines. The gasoline was drawn from the same tank and treated at the same time under similar conditions with carbon tetrachloride.

In the accompanying drawing the brake horsepower developed by an internal combustion engine driven by hydrocarbon fuel with different percentages by volume of carbon tetrachloride added thereto has been illustrated.

Curve No. 1 shows the performance of an internal combustion engine and the brake horsepower developed thereby when 0.15%

by volume of carbon tetrachloride is added to the gasoline. Curve No. 2 shows the brake horsepower developed when 0.30% by volume of tetrachloride is added to the gasoline. Curve No. 3 shows the performance of the engine when 0.45% by volume of carbon tetrachloride is added to the gasoline. Curve No. 4 shows the results obtained by the addition of 1.00% by volume of carbon tetrachloride when added to the gasoline fuel. Curve No. 5 illustrates the brake horsepower developed when using gasoline as fuel without the add mixture of carbon tetrachloride. The best results were obtained with the mixture of 0.45% by volume of carbon tetrachloride and gasoline as illustrated in curve No. 3, 0.680 pounds of this fuel developed as much power as 0.724 pounds of gasoline. In curve No. 4 the mixture developed considerably less power than gasoline without the addition of carbon tetrachloride. The maximum effect with this gasoline is, therefore, approximately between the limits of 0.45% and 1.00%.

In comparing the results of the actual service and dynamometer tests, we find that the desired percentage range is from 0.05% to 1.5% by volume.

We have conducted many service tests on automobile engines utilizing our motor fuel where no change in carburetor adjustment has been made over the period of the test. The following demonstrations are cited as examples:

Dodge truck covering the same territory each day and with the same load, using Standard gasoline alternately with Standard gasoline containing 0.45% by volume of carbon tetrachloride; average mileage gain with treated gasoline, 4.1 miles per gallon.

Ford sedan, used for business purposes and covering approximately the same territory each week, using alternately Union gasoline and Union gasoline treated with 0.45% by volume of carbon tetrachloride; average mileage gain with treated gasoline, 3.9 miles per gallon.

Ford roadster, used for business purposes and driven on paved streets almost entirely, using Standard gasoline alternately with the same gasoline treated with 0.45% by volume of carbon tetrachloride; average mileage gain with treated gasoline, 3.8 miles per gallon.

Pilot touring car, used for pleasure pur-

poses and running on various grades of gasoline alternately with gasoline treated with 0.45% by volume of carbon tetrachloride; average mileage gain with treated gasoline,

5 3.5 miles per gallon.

Maxwell touring car, used for pleasure purposes, running on various grades of gasoline alternately with gasoline treated with 0.45% by volume of carbon tetrachloride;

10 average mileage gain with treated gasoline, 4.2 miles per gallon.

The above results were formed from carefully kept data.

The motors of the pilot touring car and

15 Ford roadster were kept under careful observation for a year. They ran remarkably free of carbon and evidences of corrosion.

The treated gasoline produces smoothness of operation and decidedly better pulling

20 power. The mileage gain more than offsets the cost of carbon tetrachloride used. Mechanical wear is considerably decreased by

suppression of detonation. The addition of carbon tetrachloride to the motor fuel sensibly quiets the action of the engine and permits easier starting of the motor. 25

While we have described our invention with particular reference to gasoline, we desire that it be understood that the carbon tetrachloride may be combined with any 30 hydrocarbon fuel or petroleum product used as a motor fuel for securing the advantageous results described herein.

What we claim as new and desire to secure by Letters Patent of the United States is: 35

A motor fuel comprising in combination a mixture of gasoline and 0.05% to 1.5% by volume of carbon tetrachloride, said carbon tetrachloride operating to suppress detonation in said motor fuel. 40

In testimony whereof we affix our signatures.

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