

Jan. 5, 1932.

H. G. WEBSTER

1,839,362

TREATMENT OF CRUDE OILS AND NATURAL GAS

Filed May 15, 1930

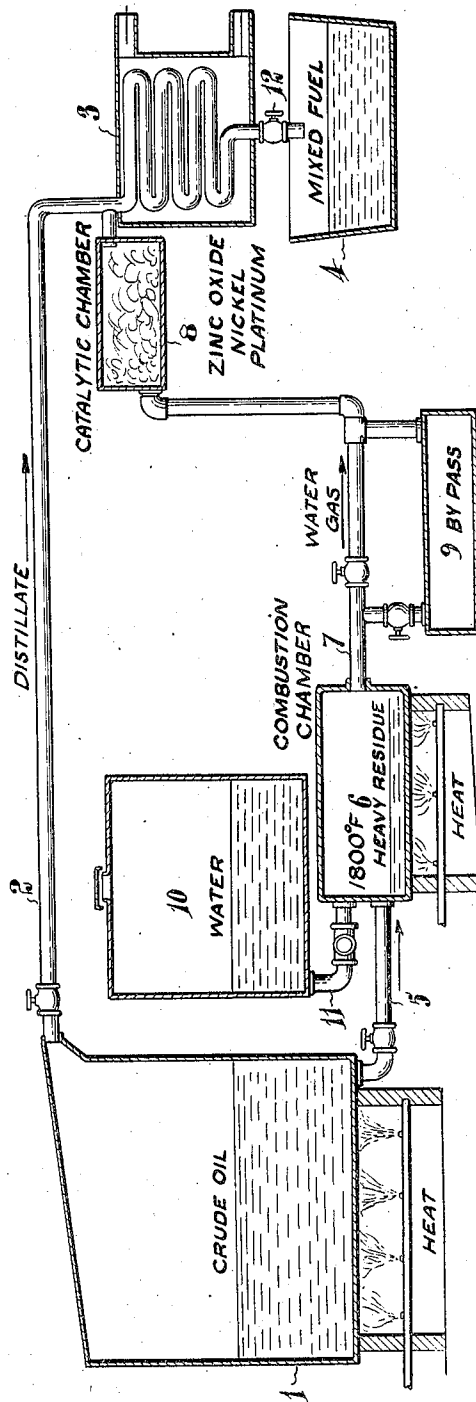


Fig. 1.

Inventor
H. G. Webster
by J. E. Mayhew
ATTY.

Patented Jan. 5, 1932

1,839,362

UNITED STATES PATENT OFFICE

HUGH G. WEBSTER, OF LONDON, ONTARIO, CANADA, ASSIGNOR OF ONE-HALF TO J. W. G. WINNETT, OF LONDON, ONTARIO, CANADA

TREATMENT OF CRUDE OILS AND NATURAL GAS

Application filed May 15, 1930. Serial No. 452,584.

This invention relates to the production of motor fuels from raw materials, such as crude mineral oils and natural gas, and my object is to devise a process which will result in the substantially complete conversion of the raw material into a useable fuel save perhaps for the saving of some fractions for lubricating oils.

The process is hereinafter described and is illustrated in the accompanying diagram in which 1 is a retort from which a pipe 2 leads to a condenser 3, which discharges to a tank 4.

From the bottom of the retort 1 a pipe 5 leads to the retort 6 from which a pipe 7 leads to the condenser 3. Between the condenser and the retort 6 a chamber 8 is located in the pipe 7. This chamber contains a suitable catalyst, such as nickel and platinized asbestos.

Forming a by-pass to the pipe 7 is a chamber 9 containing a catalyst such as iron oxide with a trace of nickel and chrome oxides. Valves are provided whereby more or less of the distilled vapors may be directed through the chamber. A water tank 10 is connected by a pipe 11 with the retort 6 to supply water thereto.

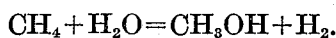
The process is as follows. In the retort 1 the crude oil is heated sufficiently to distill over the more volatile fractions down to the heptane. These are condensed and held in the tank 4. The heavier residue in the retort 1 is then passed to the retort 6 to which water is also admitted. The retort is kept at a temperature high enough to break up the residue into free carbon and hydrogen. The carbon unites with the oxygen of the water to form carbon monoxide freeing the hydrogen. The mixture of hydrogen and carbon monoxide passes through and over the catalyst in the chamber 8 to form methanol (methyl alcohol) according to the formula $2H_2 + CO = CH_3OH$. The reaction is facilitated by pressure which may be regulated by the valve 12 at the outlet from the condenser 3.

In case an excess of carbon is generated in the retort 6 the excess may be converted into carbon dioxide by passing the mixture of gases through the chamber 9 with a small

excess of steam. Thus a suitable balance of hydrogen and carbon monoxide may be maintained in the mixture.

The methanol is led through the condenser 3 and a mixture of the gasoline and methanol, forming a satisfactory fuel, obtained in the tank 4. Of course, the methanol can be separately condensed if desired. So also previously generated steam instead of water may be used in the retort 6.

If natural gas is to be treated it is passed directly to the retort 6 and the retort 1 and its connection with the condenser are dispensed with. The reaction in this case is



What I claim as my invention is:

1. A process of treating crude mineral oils which consists in distilling off the lighter fractions; breaking up the heavy residue by the application of heat into free carbon and hydrogen; reacting on the carbon with water vapor to form carbon monoxide; and synthesizing the carbon monoxide and hydrogen to form methanol and passing the distilled fractions and the methanol through a common condenser to form a mixed fuel.

2. A process of treating crude mineral oils and the like which consists in distilling off the lighter fractions and condensing them, breaking up the heavy residues into free carbon and hydrogen substantially free of fixed hydrocarbon gases, synthesizing the carbon and hydrogen to produce methanol, and condensing and mixing the distilled fractions and the methanol to form a mixed fuel.

3. A process of preparing a mixed fuel which consists of distilling off the lighter fractions of crude petroleum, breaking up the heavy residue by the application of a decomposition heat into free carbon and hydrogen, reacting on the carbon with water vapor to form carbon monoxide and hydrogen, and synthesizing the carbon monoxide and hydrogen to form volatile oxygenated hydrocarbon products in the presence of a catalyst of zinc oxide, nickel and platinized asbestos, and blending this product with the volatile distillate to form a mixed fuel.

4. A process of preparing a volatile com-

bustible liquid fuel from crude oil consisting of distilling off the normally volatile fraction, decomposing the heavy residue to elementary substances, forming oxygenated products thereof by catalytic synthesis with water vapor and blending the oxygenated products with the normally volatile crude oil fraction.

5. A process of converting crude oil entirely to a liquid fuel capable of operating an internal combustion engine, consisting of removing by fractionation the naturally volatile hydrocarbons, decomposing all of the residue of the crude oil to elementary substances, synthetically converting these substances with water vapor to a volatile combustible liquid and blending this liquid with the original fraction.

6. A liquid fuel, a conversion product of crude oil, the product consisting of a blend of the normally volatile distillate of the crude oil and a methanol-like product synthetically produced by decomposing the residue of the crude to elementary substances and catalytically combining with water vapor.

Signed at Toronto, Canada, this 9th day of May, 1930.

HUGH G. WEBSTER.