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COMPOSITION TO BE USED IN CONNECTION WITH ANTIKNOCK COMPOUNDS.

No Drawing.

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This invention relates to a substance or compound which may be used in connection with a so-called anti-knock compound for internal combustion engine fuels, for the purpose of rendering the anti-knock compound more suitable for use.

In the United States applications Serial Nos. 726,162 filed July 15, 1924 and 745,026 filed October 21, 1924, are described soluble metal compounds that may be added to motor fuels, such as benzene, alcohol, gasoline, etc., for the purpose of preventing knock even when such fuels are used in high compression internal combustion engines. These anti-knock compounds are iron compounds, such as iron carbonyl or iron acetyl acetate, or they may be metal compounds of carbonyl other than iron, such as nickel, cobalt molybdenum, etc. It has been found that while such soluble metal compounds are suitable to prevent knock, under certain conditions of operation it sometimes occurs that troubles are encountered or other objectionable results occur, apparently due to the fact that the anti-knock compounds of the metals used become decomposed or form compounds or substances of such a character that they interfere with the proper operation of the spark plugs, either short-circuiting the same or interfering with their normal operation. Also in some cases there appears to be a tendency for the metal compounds to deposit upon the parts of the motor, such as the valves, cylinder head or walls of the cylinder.

By the present invention, the difficulties and objections which sometimes arise from the use of anti-knock compounds containing metals may be avoided by adding a substance which either causes the metal compounds to be decomposed so that they will be easily removed from the combustion chamber or will become innocuous. The resulting constituents may become readily removable from the combustion chamber either by being converted into the form of a gas or they may be in the liquid form, or even in the form of finely divided solid substances of a somewhat non-adherent character. In carrying out this invention, the substance to be added to the anti-knock compound may be mixed with the anti-knock compound and the mixture introduced into

the liquid motor fuel, or the substance to overcome the difficulties of the anti-knock compound may be added directly to the fuel either before or after the anti-knock compound has been mixed therewith.

The following materials may be used to accomplish the desired results in connection with the anti-knock materials above mentioned. Halogenated hydrocarbons of the aliphatic or aromatic series may be used. Examples of such are aryl and alkyl fluorides, chlorides, bromides and iodides, whether of the mono- or di- or other polyforms. Other compounds suitable for this purpose are compounds of ammonia with halogens, such as ammonium chloride, ammonium bromide, etc., and the organic derivatives thereof, such as the aryl and alkyl substitution products. Among the latter may be mentioned methyl ammonium chloride, ethyl ammonium chloride, methyl ammonium bromide, ethyl ammonium bromide and di-methyl ammonium, as well as other di- and tri-derivatives thereof. These substances to be added to avoid troubles due to the use of the anti-knock compound may be used singly or in combination of two or more of the same. The amount of anti-knock compound that is to be added to the motor fuel to prevent knock varies from about two-tenths of one per cent, more or less, to a few per cent of the amount of the motor fuels. The amount of the substance to be added to overcome the difficulties due to the use of the anti-knock compound varies over quite wide ranges, but a substantially equivalent amount of this substance and the anti-knock compound may be used. For example, 100 parts of gasoline are mixed with 0.25 parts of iron carbonyl, 0.25 parts of ethylene chlorid and 0.37 parts of ethylene bromid or with 0.25 parts of iron carbonyl and 1.25 parts of carbon tetrachloride, or with 0.25 parts of iron carbonyl and 2.4 grams per litre of hexa-chlor-benzene (all parts being by volume).

I claim:

1. A composition comprising a liquid fuel, that has a metal carbonyl compound mixed therewith, and a compound soluble in the said fuel and containing a halogen.
2. A composition comprising a liquid fuel, that has a metal carbonyl mixed there-

with, and a compound soluble in the said fuel and containing a halogen and a hydrocarbon radical.

5 3. A composition comprising a liquid fuel, that has a metal carbonyl compound mixed therewith, and a haloid of an aliphatic hydrocarbon.

4. The composition comprising a liquid fuel, that has a metal carbonyl compound

mixed therewith, and an aliphatic hydrocarbon derivative of ammonium chloride. 10

5. A composition comprising a liquid fuel that has a metal carbonyl mixed therewith and methyl chloride.

In testimony whereof I have hereunto set 15 my hand.

WILHELM GAUS.