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METHOD AND MEANS FOR REMOVING
CARBON DEPOSITS

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This invention relates to the removal of carbon deposits from the piston heads and other parts of internal combustion engines, and its principal objects are to provide a composition of matter which may be employed to loosen the carbon deposit and a mode for removing the deposits. It has been found that furfuryl aldehyde and furfuryl alcohol are useful for this purpose either alone or in combination with a relatively low boiling point varnish remover, such as a mixture of benzol and alcohol. We have found that derivatives of furfuryl alcohol which have higher boiling points than either furfuryl aldehyde or furfuryl alcohol, and because of this higher boiling point they lend themselves better to the removal of carbon in certain applications, among which we might mention an application where other compounds are used in a composition having a low boiling point. By derivatives we mean compounds of constitution indicated by a substitution for one of the atoms or radicals in the furfuryl alcohol nucleus or an addition thereto, as contrasted with a method of manufacture employing furfuryl alcohol as a base.

Such compounds are pyromucic acid, alkyl furoates such as methyl and propyl furoates, furfuryl acetate and the corresponding esters with acids other than acetic, furfuryl furoate, and the corresponding hydrogenated compounds such as tetrahydro-furfuryl alcohol. These derivatives will include solid compounds which may be employed by forming solutions thereof with suitable solvents.

These compounds may be used alone or in a composition of matter which, preferably, includes a relatively low boiling point carbon remover, of which a mixture of benzol and alcohol is a common example, or benzol.

By way of example we may form a mixture of 50 parts by volume of methyl furoate, 25 parts benzol and 25 parts alcohol, which compounds are mutually soluble, and inject from 20 to 40 c. c. of this composition in the combustion chamber of each cylinder, preferably after the engine has been operated for a period so that the metal parts which are coated with carbon deposits are hot. The composition is permitted to act on the carbon deposits for a period of about 1 to 6 hours depending upon the nature of the carbon deposit, and then the engine is started and the loosened carbon is blown out of the exhaust. Or, if desired, the parts may be heated over a flame or otherwise, the carbon removing composition applied, and after the carbon binder is dissolved the carbon may be wiped from the carbon surfaces. The heating

accelerates the solvent action on the carbon and so reduces the period of solvent activity, but the solvent may be applied to the metal parts at ordinary temperature. The relatively low boiling point varnish remover assists in the solvent action and apparently assists in the activity of the higher boiling solvent by keeping it in mild agitation. It appears that the lower boiling varnish remover also assists in penetration when oil is present on the carbon deposit. For these reasons we prefer to use a lower boiling varnish remover with a heavier boiling compound, although the latter may be employed alone if desired.

We claim:

1. The method of removing carbon deposits from engine cylinders which comprises placing a derivative of furfuryl alcohol on the carbon deposit, and removing the deposit.

2. The method of removing carbon deposits from engine cylinders which comprises heating the engine cylinder, dissolving in the carbon deposit a derivative of furfuryl alcohol, and removing the deposit.

3. The method of removing carbon deposits from engine cylinders which comprises placing a mixture of a derivative of furfuryl alcohol, and a relatively low boiling varnish remover on the carbon deposit, and removing the deposit.

4. A composition of matter for removing carbon deposits which comprises a derivative of furfuryl alcohol and a relatively low boiling varnish remover.

5. A composition of matter for removing carbon deposits which comprises an alkyl furoate and a relatively low boiling varnish remover.

6. A composition of matter for removing carbon deposits which comprises methyl furoate and a relatively low boiling varnish remover.

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