

UNITED STATES PATENT OFFICE

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METHOD AND MEANS FOR REMOVING CARBON DEPOSITS

No Drawing.

Application filed August 28, 1929. Serial No. 389,091.

This application relates to the removal of carbon deposits from the combustion chambers of internal combustion engines, and its principal objects are to employ compounds particularly suitable for this purpose and a process adapted to employ these compounds at their highest efficiency.

We have found that oxazines which are varnish removers are particularly useful in removing carbon deposits. These include compounds formed on the orthoxazine ring, metoxazine ring and paroxazine ring. Such compounds are u-phenyl a-methyl pentoxazoline, u-phenyl a-dimethyl y-methyl pentoxazoline, morpholine, 4-methyl morpholine and other methyl derivatives of morpholine, 4-ethyl morpholine and benzo morpholine. The best method of using these is to apply them to carbon coated parts which have been heated preferably to a temperature above 150° F., the optimum conditions for water cooled engines being at approximately the boiling point of water. We may also use with an oxazine a mixture of benzol and alcohol, or other low boiling varnish remover.

As a specific example we may use in an ordinary six cylinder engine 30 c. c. of a mixture comprising by volume 40 parts morpholine, 30 parts benzol, and 30 parts of ethyl alcohol. The engine is operated until the temperature of the metal parts of the combustion chamber is at least 150° F. when the mixture is injected or otherwise introduced into the cylinders and the engine stopped. The mixture is permitted to remain in the cylinders for about two hours, more or less, depending upon the nature of the carbon deposit, during which time the gummy binder is softened or dissolved. Then the engine is started and the loosened deposit is gradually blown out the exhaust.

When cleaning the parts by hand they may be heated, the solvent applied, and when the binder is softened the deposit may be wiped off.

It is within the scope of the present invention to employ any oxazine which is a varnish remover and to vary the proportions according to the compound used and the spe-

cific conditions, and the oxazine may be used alone.

We claim:—

1. The process of removing carbon deposits from the combustion chamber of an internal combustion engine which comprises applying to the carbon deposit an oxazine which removes varnish, and removing the carbon deposit.

2. The process of removing carbon deposits from the combustion chamber of an internal combustion engine which comprises heating the coated parts, applying to the carbon deposit an oxazine which removes varnish, and a low boiling varnish remover, and removing the carbon deposit.

3. The process of removing carbon deposits from the combustion chamber of an internal combustion engine which comprises heating the coated parts to above 150° F., applying to the carbon deposit morpholine, benzol and alcohol, and removing the carbon deposit.

4. A composition of matter for removing carbon deposits from internal combustion engines comprising an oxazine which removes varnish, and a low boiling varnish remover.

5. A composition of matter for removing carbon deposits from internal combustion engines comprising morpholine, benzol and alcohol.

In testimony whereof we affix our signatures.

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