

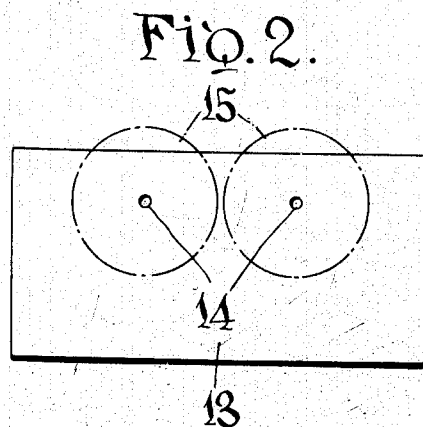
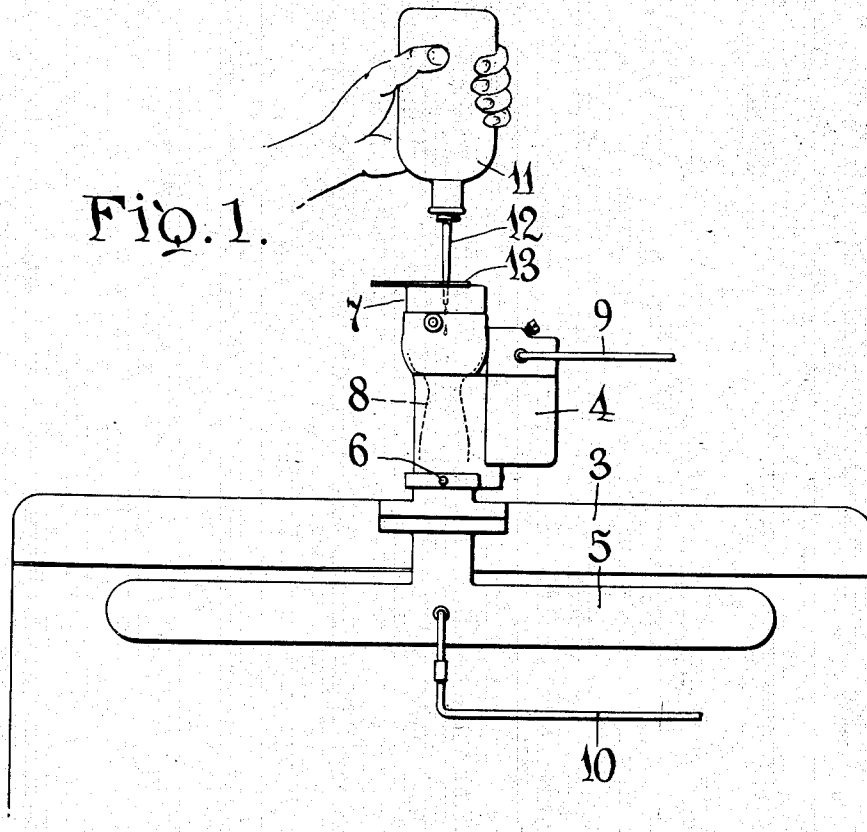
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METHOD OF REMOVING CARBON DEPOSITS FROM INTERNAL COMBUSTION ENGINES

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METHOD OF REMOVING CARBON DEPOSITS
FROM INTERNAL COMBUSTION ENGINESErnest A. Boesing, Long Beach, Calif., assignor to
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5 Claims. (Cl. 123—198)

The present invention relates to a method of removing carbon, gum and other deposits from internal combustion engines by the use of hydrogen peroxide solutions, and is a continuation in part of my co-pending application, Serial No. 305,186, filed November 18, 1939.

An object of my invention is to provide a simple and effective method of removing such deposits from internal combustion engines, the method being adapted to be carried out in a short period of time without the use of elaborate equipment, and being effective under all normal atmospheric conditions and on the various types and makes of engines.

Heretofore it has been proposed to introduce by diverse means relatively dilute solutions of hydrogen peroxide into the combustion chambers of engines operating under load conditions for the purposes of preventing carbon formation and increasing combustion efficiency. The present invention is contrary to these previous practices in that it contemplates a treatment for removal of deposits already formed, a treatment which does not require that any special feeding means be attached to the engine and which may be performed in a few minutes, making it practical to be carried out in any garage or service station. Furthermore, water or a water solution is not applied over a long period of time as was contemplated by the prior art, a practice which was highly conducive to corrosion of the engine parts.

These and other objects and advantages of the invention will become apparent from the following description made in conjunction with the accompanying drawing, wherein:

Fig. 1 is a fragmentary elevational view of an automobile engine upon which the invention is being practiced and one form of apparatus that may be employed; and

Fig. 2 is a plan view of a plate which may be used when treating a certain type of engine.

As shown in Fig. 1 the engine 3 may have a carburetor 4 from which a gasoline air mixture is passed through an intake manifold 5 into the combustion chambers. Conventionally a throttle valve 6 is provided in the intake passage between the mixing chamber of the carburetor and the manifold, and usually an air cleaner, not shown, is attached to the air intake 7 leading into the throat 8 of the carburetor. The fuel line leading to the carburetor is designated 9 and at 10 is shown a hose extending to the manifold from a suction operated windshield cleaner.

In practicing the present invention the engine having carbon deposits to be removed is either

at normal running temperature, or, if cold, is warmed up to this temperature. The throttle valve is closed, being preferably set by the hand control usually provided on automobiles, so that the engine will idle at approximately 300 to 1200 R. P. M. After removing the air cleaner from the intake 7 to expose the carburetor throat, one hand or other throttling means, such as a plate 13, is placed over the air inlet to restrict the in-rushing air until the engine begins to lope and slows down until it is just turning over. Of course, the carburetor throat is not entirely throttled off, and through the remaining space not covered by the hand or plate 13, or through an opening 15 which may be provided in the latter, a hydrogen peroxide solution is poured from a container 11 directly into the engine throat 8. Or, if desired, the hose 10 may be disconnected from the accessory and the contents of the bottle injected into the manifold through the hose.

The container 11 may comprise a glass bottle preferably provided with a small metal tube 12 inserted by a rubber stopper or other closure device and which may control the rate of flow of the solution. The rate does not seem to be critical within reasonable limits, but I prefer to empty the contents of the bottle into the engine intake over a restricted period of time, say over two minutes. A quantity of 150 c.c. of 30% hydrogen peroxide has been found to be sufficient for treating conventional automobile engines, it being understood that greater or lesser quantities may be used for very large or very small engines, and also that the quantity may be increased or decreased, respectively, when using less or more concentrated peroxide solutions.

After all of the solution has entered the carburetor, the restriction of air is preferably continued for an additional minute or so to allow any liquid remaining within the manifold system to evaporate. Thereafter the carburetor throat is uncovered, the throttle set for normal idling, the air cleaner replaced, thereby completing the treatment. The motor may now be moderately accelerated, by stepping on the foot throttle several times in the case of a conventional automobile engine, and it will usually be found that black smoke or brown lead dust will be expelled from the exhaust pipe. The motor "ping" present when a motor has excessive carbon deposits, will be gone, and, in general, the motor performance will be noticeably improved. The condition of sticky valves, caused by gum deposits on the valve stems, is usually remedied and spark plugs are

cleaned, improving slow speed performance and idling.

In the case of engines having twin carburetor throats, such as conventional eight cylinder automobile engines, the peroxide solution should be distributed substantially equally between the two throats. This can be accomplished by moving the tube 12 first to one and then to the other side of the carburetor intake opening for equal periods of time. Or the plate 13 may, as shown in Fig. 2, be provided with two small openings 14 for receiving the tube 12 and spaced about so as to overlie the twin carburetor throats which are indicated schematically in Fig. 2 by broken lines 15. The tube 12 may be inserted in each of the openings while approximately half of the bottle's contents is emptied into the throat therebeneath. If desired, the plate may be made of "Lucite" or other transparent material to permit inspection and to insure alignment of the openings 14 with the carburetor throats. When the plate is used on a carburetor having only one throat, of course either opening 14 may be used.

While I have referred hereinbefore to a rate of injection of two minutes for 150 c. c. of solution, wide variations are permissible; for example, the flow may be so restricted as to extend over periods of time varying from 1 to 5 minutes without impairing the success of the operations. Variations may also be made in the quantity of solution employed, but I have found that in practically all cases of automobile engines 150 c. c. represents a satisfactory amount. As regards the strength or concentration of the peroxide solution, high concentrations, such as those now marketed and sold by the manufacturers, of up to about 45% by weight may be used satisfactorily and I prefer to use the conventional 30% or 100 volume solution. Such concentrated solutions are satisfactory because they have higher intrinsic energy content, contain less water to be evaporated, and require less container space. Very weak or unconcentrated solutions, even though used in large quantities, may be ineffective for carbon removal.

With reference to the degree of air-flow restriction, it is satisfactory to throttle the motor down to a point where it begins to lope and jerk, i. e., to a slow idling speed. The more the opening is restricted, the greater the absolute pressure within the manifold, the higher the compression end-temperature. Engines have been treated with as low a pressure differential as 1" of mercury; i. e., a practically equal to atmospheric pressure.

Under high temperature conditions, as for example when treatment is being carried out in a warm climate, or in a heated room, or where the intake manifold is heated by extraneous means, such as by a blow-torch, the process may be car-

ried out successfully without restricting the engine intake other than by closing the throttle valve so that the engine is operating at normal idling speed at the time the concentrated hydrogen peroxide solution is injected into the manifold.

I claim:

1. A method of removing carbon, gum and other deposits from an internal combustion engine, comprising operating the engine under idling conditions and at substantially closed throttle, throttling the air inlet of the carburetor to cause the engine to operate at a substantially minimum speed, and while so operating introducing into said air inlet in a restricted period of time a quantity of concentrated solution of hydrogen peroxide.

2. A method of removing carbon, gum and other deposits from an internal combustion engine, comprising operating the engine under idling conditions and at substantially closed throttle, throttling the air inlet of the carburetor to cause the engine to operate at a substantially minimum speed, and while so operating introducing into said air inlet in a restricted period of time a quantity of concentrated solution of hydrogen peroxide, and of maintaining the throttled condition of said air inlet until said solution has passed into the combustion chambers of the engine.

3. A method of removing carbon, gum and other deposits from an internal combustion engine, comprising operating the engine under idling conditions and at substantially closed throttle, throttling the air inlet of the carburetor to cause the engine to operate at substantially minimum speed, and while so operating injecting into the intake manifold of the engine in a restricted period of time a predetermined quantity of a concentrated solution of hydrogen peroxide.

4. A method of removing carbon, gum and other deposits from an internal combustion engine, comprising operating the engine under idling conditions and at substantially closed throttle, and while so operating introducing into the intake manifold of the engine in a restricted period of time a quantity of a concentrated solution of hydrogen peroxide.

5. A method of removing carbon, gum and other deposits from an internal combustion engine, comprising operating the engine under idling conditions and at substantially closed throttle, supplying heat to the intake manifold to raise its temperature above a normal operating temperature, and while so operating introducing into the air inlet in a restricted period of time a quantity of concentrated solution of hydrogen peroxide.

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