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S. B. CALDWELL

CHARGE HYDRATOR

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Fig. 1.

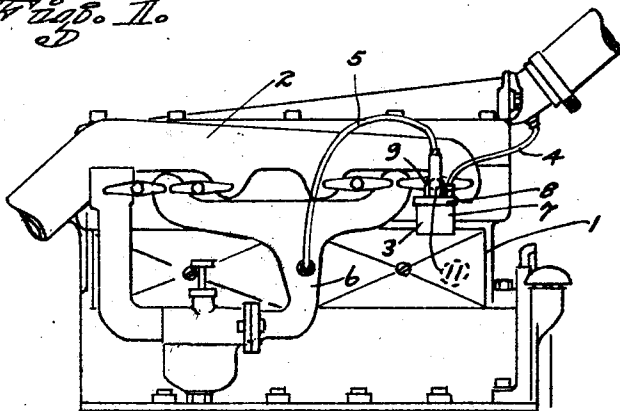
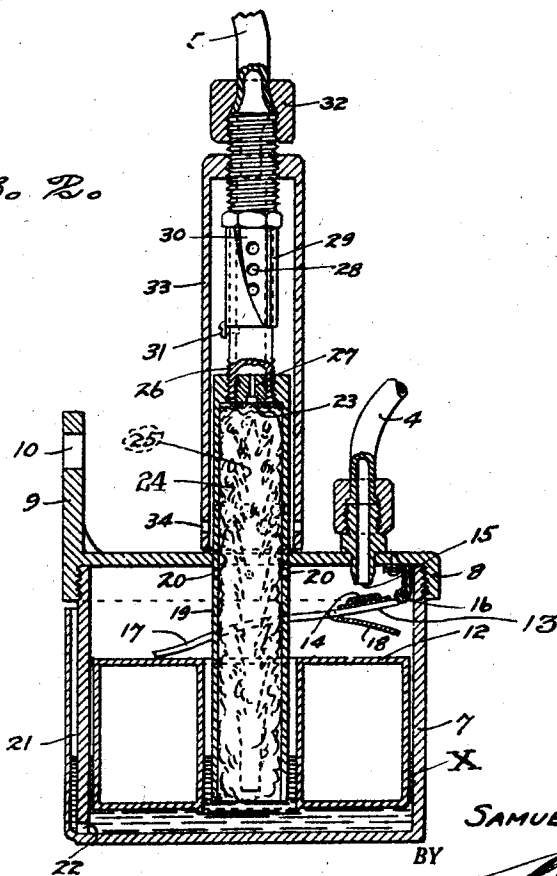


Fig. 2.



INVENTOR.
SAMUEL B. CALDWELL

BY *Wm. H. Co.*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

SAMUEL B. CALDWELL, OF OAKLAND, CALIFORNIA.

CHARGE HYDRATOR.

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This invention relates to internal combustion engine charge modifying apparatus, and specifically to such apparatus adapted to feed aqueous moisture to the charge to obtain the beneficial results of such practice as is well understood.

The objects of my invention are to provide improved means for carrying out the practice, also such apparatus which will be automatic in its action and provide for complete control of operation, also which will be simple, durable and easy to install on any engine.

My invention is illustrated in the accompanying drawing, in which—

Figure 1 is a side view of the forward end of an automobile power plant with my apparatus in place and arranged to receive water from the cooling system and deliver it under control to the intake manifold, and

Figure 2 is an enlarged sectional view of the apparatus proper showing all the cooperating features.

In further detail 1 represents an automobile engine, 2 the exhaust manifold with my apparatus 3 secured thereto and connected by a small pipe 4 with the water circulation system preferably near the radiator at a high point so as to receive water as free from sediment as possible and by another pipe 5 to deliver a controlled mixture of air and water to the intake manifold 6 through the suction created by the engine at the intake strokes of the pistons.

The apparatus comprises a cup-like body 7 having a threaded lid 8 and preferably on the lid is a lug 9 having a bolt hole 10 by means of which the device is bolted directly to one of the exhaust manifold studs 11 as shown in Figure 1. This lug 9 is made projecting vertically as shown, the object being to provide attaching means by which the cup 7 will be supported in the position shown so that an annular float 12 within the cup will be free to rise and fall vertically on the water X to close off the pipe 4 by means of a hinged valve 13 fitted with a soft disk 14 adapted to seat against the nipple 15 connected with the water pipe 4.

The valve is suitably hinged at 16 and has spring arms 17 and 18 extending by contact with the ascending float so that the pipe 4 will be closed off when a predetermined amount of water has flowed into the cup from the circulating system.

Extending vertically through an opening in the center of the float is a tube 19 terminating above the bottom of the cup and having several small air holes 20 drilled through it just under the lid as shown, and on the outside of the cup is a vertically arranged air receiving tube 21 open to atmosphere at its upper end and communicating with the interior of the cup at its lower end at 22.

At the upper end of the tube 19 is a wire gauze screen 23 seated against a shoulder as shown and below the screen is positioned a sponge 24 wrapped loosely around a sustaining fin or spine 25 of metal of any form adapted to prevent the sponge sagging limply to the bottom when wet with hot water. The sponge 24 can be replaced by other suitable fibrous or capillary material or a soft cloth properly supported to prevent it from wadding up.

Above the gauze an extension tube 26 is screwed into the end of tube 19 and threaded carrying at its lower end a nipple 27 having a small central hole of a caliber dependent on the service required of the apparatus, the proper nipple being selected for a given engine capacity.

Above the nipple 27 the extension tube 26 has several perforations 28 and the tube is surrounded by a sleeve 29 having a slanted notch 30 and adapted for turning upon the extension to shut off the holes 28 progressively and for being locked by a small screw 31.

The upper end of the extension is threaded to receive the coupling 32 of the pipe 5 and also screwed on the threaded end of the extension is a larger tube 33 spacedly covering the tubes 19 and 26 down to the lid 8, and at the lower end of this larger tube 33 is a series of holes 34 for freely admitting air.

In operation the cup is kept partly filled with water up to a level determined by the float and valve, and the sponge becomes moistened therewith.

The engine creates a partial vacuum in the pipe 5 which draws air through the wet sponge from the air space above the float supplied by bubbles from the lower end of air tube 21, the air passing through holes 20 in tube 19.

This air is drawn into the sponge at a point about half way up and carries the

moisture with it and which is constantly renewed by the capillarity of the sponge from below.

The amount of water drawn from the sponge is determined by the size of the opening in nipple 27 and just above that point the moisture is broken up by air drawn in through openings 28 which communicate with the outer atmosphere through holes 34.

The efficacy of the device depends on the proper selection of nipple 27 and the setting of the openings 28 and once this is determined for a given engine the action is entirely automatic, except for an occasional cleaning of the sponge.

On account of the attaching lug 9 being on the lid 8 of the cup, the latter is always free to be unscrewed for cleaning the sponge or valve, etc., without in any way disturbing the piping to the engine or the setting of the adjustments.

I claim:—

1. In an internal combustion engine having a water circulation, a receptacle connected to receive water therefrom, a sponge immersed therein, automatic means for controlling the amount of water within the receptacle, means for mixing air with the water, and means for delivering the admixture to the intake manifold of the engine after drawing the air through the said sponge.

2. In an internal combustion engine having water circulation, a receptacle connected to receive water therefrom, a capillary device immersed therein, automatic means for controlling the amount of water within the receptacle, means for mixing air with the water and means for delivering the admixture to the intake manifold of the engine after drawing the air through said capillary device.

SAMUEL B. CALDWELL.