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APPARATUS FOR GENERATING HYDROGEN AND OXYGEN

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Fig. 2.

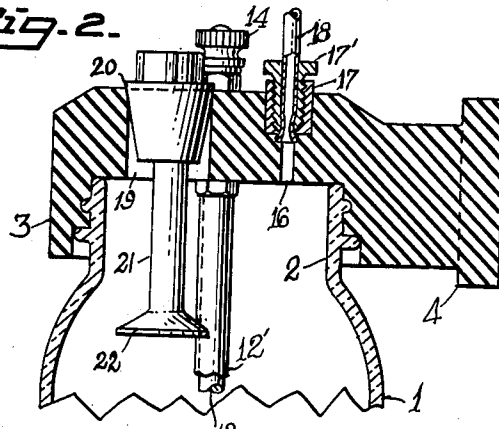


Fig. 1.

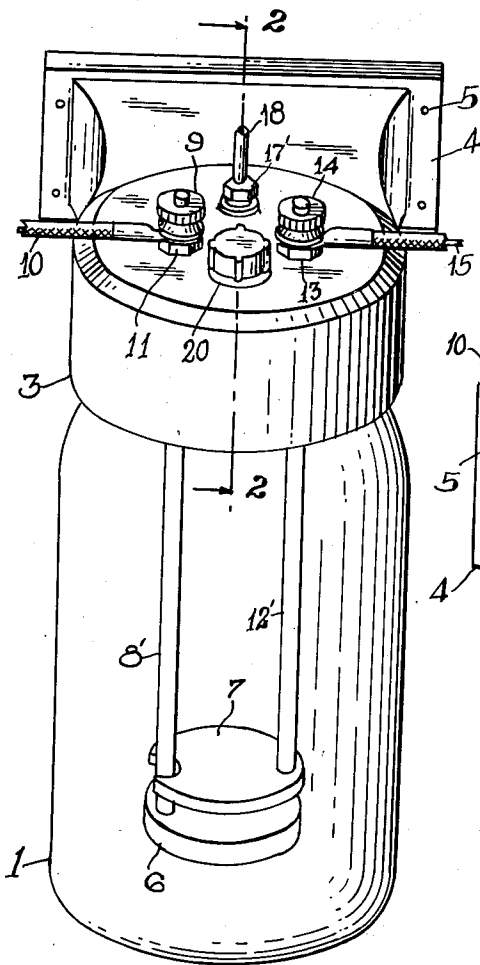
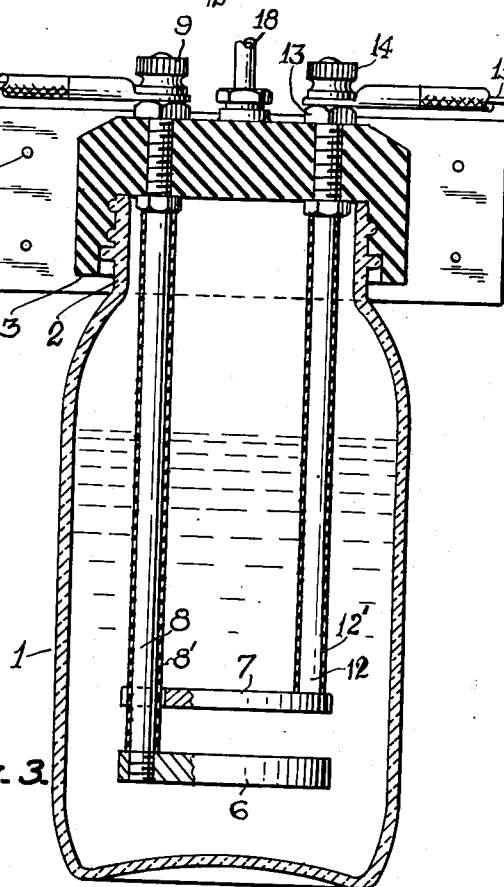


Fig. 3.



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APPARATUS FOR GENERATING HYDROGEN
AND OXYGEN

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2 Claims. (Cl. 204-278)

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This invention relates to improvements in motor energizers, and more particularly to apparatus for generating and supplying hydrogen and oxygen gases to an internal combustion engine.

The present invention embodies novel apparatus for use with vehicle engines by which hydrogen and oxygen may be produced by electrolysis through the decomposition of water. The electrical current for the electrolytic decomposition is obtained from the conventional electric system of a vehicle, and as the hydrogen and oxygen gases are produced they are automatically supplied by the force of suction to the combustion chambers of the vehicle engine.

An object of the present invention is to provide apparatus of the kind characterized which is adapted to generate oxygen and hydrogen at a constant rate, thereby insuring a uniform and constant flow of such gases to the vehicle engine during the operation thereof.

Another object of my invention is to provide apparatus of the kind characterized which is capable of generating hydrogen and oxygen at a constant rate irrespective of the level of the electrolyte, and wherein the electrodes are so arranged that a high degree of turbulence is maintained to enhance the rate of evolution of the gases to cause them to contain moisture and to effect a thorough mixing prior to their entering the engine.

Other and further objects of my invention will be pointed out hereinafter, or will be indicated in the appended claims or will be obvious to one skilled in the art upon an understanding of the present disclosure. For the purpose of this application I have elected to show herein certain forms and details of a motor energizer representative of my invention; it is to be understood, however, that the embodiment of my invention herein shown and described is for the purpose of illustration only and that therefore it is not to be regarded as exhaustive of the variations of the invention.

In the accompanying drawings

Fig. 1 is a perspective view of a hydrogen and oxygen generator embodying the preferred principles of my invention;

Fig. 2 is a sectional view taken on the line 3-3 of Fig. 1; and

Fig. 3 is a vertical sectional view taken centrally through the generator, at approximately right angles to the view shown in Fig. 2.

Referring to the drawings the numeral 1 designates a suitable liquid container, made preferably from glass, and having a threaded neck portion 2.

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Closing the opening in the neck portion of the container 1 is a flanged top 3 which is internally threaded to permit its convenient and secure attachment to the said neck portion. The top 3 is made from rubber or other suitable insulating material, and forming an integral part of such top is a bracket portion 4 having openings 5 to accommodate bolts or screws (not shown) for its attachment to a supporting structure on a vehicle. The bracket portion 4 supports the top 3, and suspended from the latter is the container 1 within which other parts of the apparatus are arranged and supported.

The electrodes, comprising the cathode 6 of hard carbon at which hydrogen is generated and the anode 7 of Monel metal or other suitable material at which oxygen is generated, are located above but near the bottom of the container 1 in horizontal spaced positions, superimposed one above the other. The cathode and anode are disc-like in shape, thereby providing large surfaces which are exposed to the electrolyte in the container. Supported by the top 3 is a rigid metal lead 8 which is electrically connected and suitably secured at its lower end to the cathode 6. The metal lead 8 passes through an oversize opening in the anode 7 without contacting the latter, and the upper end portion of such lead extends above the top and is suitably threaded to permit a clamping nut 9 to engage therewith for the purpose of securing a lead wire 10 to the said metal lead. A lock nut 11 screwed on the upper threaded end portion of the metal lead 8 provides an abutment against which the lead wire 10 may be securely clamped when the clamping nut 9 is adjusted downwardly on the said threaded end portion of the metal lead.

Supported on the top 3 is a rigid metal lead 12 which is electrically connected and suitably secured at its lower end to the anode 7. The upper end portion of the metal lead 12 extends through and above the top 3, and suitable threads are formed on that upper end portion of the metal lead which extends above the top, thereby permitting the attachment of a lock nut 13 and a clamping nut 14, the latter being adapted to securely clamp a lead wire 15 against the lock nut after such wire has been electrically connected and attached to the metal lead 12. The lead wire 15 is grounded in the usual manner. The lead wire 10 which electrically connects the battery (not shown) and the cathode 6 is at the negative side of the electrical system, while the lead wire 15 which is grounded and electrically connected to the anode 7 is at the positive

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side of such electrical system. About the lead 8 and extending from the cathode 6 to the top 3 is a suitable impermeable insulating tube or sleeve 8'; and a similar insulating tube or sleeve 12' encases the lead 12.

An opening 16 extending through the top 3 provides an outlet for the gases from the interior of the container 1. A metal tubular insert 17 extending into and secured within the opening 16 is provided with internal threads which permit the attachment thereto of a threaded tubular fitting 17'. A pipe 18 connected to the fitting 17 provides means for conveying the gases and vapors generated in the container 1 to the engine intake.

A large opening 19 in the top 3 permits liquid in suitable amounts to be admitted to the container to replace that consumed in the operation of the apparatus. The opening 19 is normally closed by a manually removable rubber plug 20 which also provides safety means preventing pressures in the container from increasing to the breaking point should back-fire from the engine discharge gas in a reverse direction through the pipe 18 and into the container. The plug 20 will be automatically expelled from the opening 19 when the pressure in the container reaches a predetermined limit. Connected to the plug 20 is an elongated slender member 21 which has an enlarged cup-shaped member 22 at its lower end. The enlarged member 22 may be temporarily deformed to permit its being forced through the opening 19 when the various parts of the apparatus are assembled, but thereafter upon the said enlarged member resuming its normal shape, it will serve as stop means to prevent the plug 20 from becoming disconnected from the top 3 when it is expelled from the opening. Since the elongated member 21 and the enlarged cup-shaped member 22 are sufficiently heavy to exert a downward pull on the plug 20 after the latter has been expelled from the opening 19, the said plug will automatically resume its normal position closing the said opening after the pressure in the container is relieved. The partial vacuum in the container occasioned by the resumed normal operation of the apparatus will exert a downward pull on the plug sufficient to completely close the opening.

A suitable chemical substance, preferably sodium hydroxide, is added to the water in the container in order to provide an electrolyte which will effectively promote and make possible the electrolytic process. When the direct current passes through the electrolyte, hydrogen is generated at one electrode and oxygen at the other; the volume of hydrogen being twice that of the oxygen. Considerable turbulence is caused in the electrolyte when the gases are being generated, and since hydrogen is generated in a greater volume than the oxygen, the cathode is arranged below the anode, thereby providing a maximum of turbulence within the electrolyte.

Direct current of low voltage is required for the electrolysis, and it is supplied by the battery or the conventional electrical system on the vehicle.

Adding the explosive mixture of hydrogen and oxygen to the gasoline in the combustion chambers of an engine induces easier starting, more complete combustion of the fuel, less detonation

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resulting in more power, smoother running, and less fuel consumption on any type of internal combustion engine equipped with the present invention. The present invention makes it possible to use a gasoline having a low octane rating, this being possible because there is added in the combustion chambers of an engine a mixture of gases which when combined are highly combustible. The present invention makes it possible for a vehicle owner to reduce his operating costs and at the same time increase the efficiency and the performance of his vehicle engine, one of the purposes of the present invention being to eliminate carbon deposits in the engine.

What I claim is:

1. Apparatus for generating and supplying hydrogen and oxygen gases to an engine comprising an electrolyte container having a top opening, a top closure of insulating material closing the top opening of the container and having a gas outlet opening therein, a releasable plug closing the opening in the top closure and having a depending extension of substantially smaller cross-sectional diameter than the said opening and having also a temporarily deformable enlargement at the lower end of the extension, the said enlargement being normally greater in width than the diameter of the opening in the top closure, two spaced electrical conductors suspended in the container from the top, a cathode plate supported by one of the conductors in a substantially horizontal position above but adjacent the bottom of the container, an anode plate supported in a substantially horizontal position by the other conductor, the said cathode and anode plates being arranged in spaced superimposed adjacent positions with respect to one another, and a tubular conduit connected to the interior of the container for conveying hydrogen and oxygen gases therefrom.

2. Apparatus for generating and supplying hydrogen and oxygen gases to an engine comprising an electrolyte container having a top opening, a top closure of insulating material, the said top closure having an opening, a releasable plug closing the opening in the closure and having a depending extension and an enlargement on the lower end of the extension of larger diameter than the diameter of the opening in the top closure, two electrical conductors suspended in the container from the top, a cathode plate supported by one of the conductors in a substantially horizontal position above and adjacent the bottom of the container, an anode plate supported by the other conductor in a substantially horizontal position in the container adjacent the bottom thereof, the said plates being arranged in superimposed positions one above the other, the upper plate having a hole through which the conductor connected to the lower plate extends, and means for conducting gases from the interior of the container.

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