July 17, 1934. P. R. SCHREURS 1,967,133

GASIFIER AND MIXER

Filed April 23, 1931

FIG. 1.

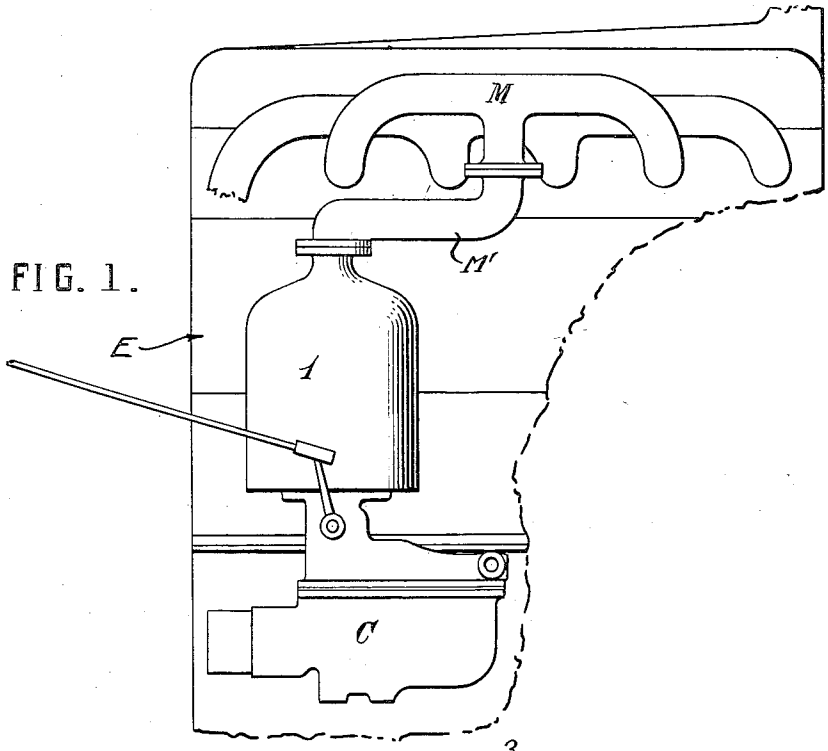


FIG. 2.

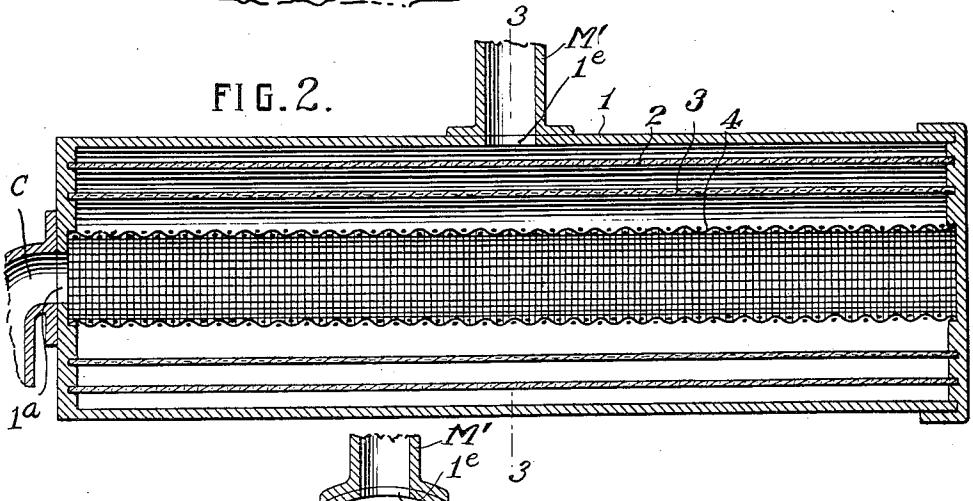
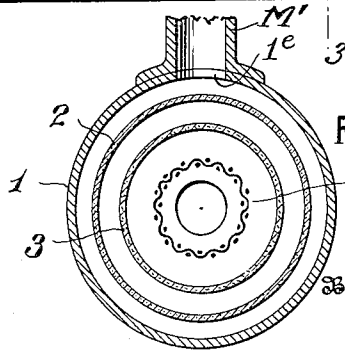


FIG. 3.



Inventor

Paul R. Schreurs

By Alexander Ewell

Attorney

Patented July 17, 1934 1,967,133

UNITED STATES PATENT OFFICE

1,967,133

GASIFIER AND MIXER

Paul R. Schreurs, Muscatine, Iowa

Application April 23, 1931, Serial No. 532,385

2 Claims. (Cl. 48—180)

This invention is a novel apparatus for producing a dry gas from light hydrocarbons such as gasoline for use in internal combustion engines. The apparatus in brief comprises means, such as a carburetor for producing a mixture of atomized or vaporized gasoline and air; a compartment containing a medium adapted to permit the passage of dry gas but preventing the passage of unvaporized particles, means for introducing the mixture into the compartment and for withdrawing the gas through the said medium, the medium permitting the dry gaseous component of the mixture to pass, but preventing the passage of any ungasified component of the mixture.

In the best apparatus now known for carbureting air or forming explosive mixtures for use in internal combustion engines and the like, a very large percentage of B. t. u. in light fuel hydrocarbons, such as gasoline, is wasted or lost, and many attempts have been made to increase the efficiency of the explosive mixtures of air and hydrocarbon vapors particularly when employed as fuel for internal combustion engines. In so-called very "efficient" carburetors from 25% to 40% B. t. u. are utilized, and with the most efficient of the present known carburetors, mixers or gasifiers, heretofore produced or now on the market for use in connection with internal combustion engines and the like, there is a loss of 70% B. t. u. of the gasoline used.

In various forms of carburetors or fuel mixers, gasoline has been atomized or vaporized and mixed with air and passed through screens or baffles to thoroughly commingle the mixture; in others the mixture has been injected into additional air and mixed therewith before being introduced into the engine cylinders. None of the devices heretofore used accomplishes or produces complete gasification of the hydrocarbons as is evidenced by the contamination of the lubricating oils used in the cylinders, and by the deposit of carbon in the cylinders, such contamination necessitating frequent renewal of the oil and frequent cleaning or burning out of the carbon in the cylinders.

After long experience with the manufacture and design of carburetors and efforts to increase their efficiency, I have discovered that light hydrocarbons such as gasoline, can be converted into a practically dry pure cool explosive gas by passing a gaseous mixture through a medium impermeable to unvaporized particles but permeable by pure dry gas, I can obtain an absolutely dry, cool, pure gas without the application of heat.

Such gas is practically the same as the gas derived by the contact of air with the surface of gasoline in the open and is highly explosive if confined. In practice I prefer to produce the gas at a point closely adjacent the point of utilization thereof, and when used for fuel for internal combustion engines to produce the gas only when and as is required by the engine in which it is to be used. Where the gas is to be used for heating or lighting purposes it can be produced and stored in a holder such as commonly employed in gas factories.

In the drawing I have shown apparatus embodying the invention particularly designed for use in connection with automobiles, and to enable others to understand and utilize the invention I will explain the same in connection therewith.

In said drawing:

Fig. 1 is a side elevation of an apparatus for producing pure gas for use in internal combustion engines;

Fig. 2 is a detail sectional view of a modification of the gasifier;

Fig. 3 is a tranverse section of the gasifier on the line 3—3, Fig. 2.

In the drawing, E indicates part of an internal combustion engine of ordinary construction having a plurality of cylinders to which the fuel is admitted through a manifold M in the usual manner. C designates a carburetor, such as is commonly used on automobiles, adapted to finely atomize or disseminate gasoline in the air passing through the carburetor, and which is provided with a float or other suitable means to prevent an overflow or oversupply of gasoline. I intend to include herein under the term gasoline any other suitable light hydrocarbon. The engine manifold, and carburetor may be of any suitable type, and the particular construction thereof is not claimed herein.

Between the outlet of the carburetor C and the inlet of the manifold M, I provide what I shall for convenience herein term a "gasifier", whereby the vaporized or atomized gasoline is converted into a dry pure gas. This gasifier comprises a hollow body 1 preferably of much greater internal cubical capacity than the carburetor outlet so that the velocity of the mixture introduced into the gasifier from the carburetor will be slowed up in the gasifier because of the increased total cross sectional area

of the passages therethrough. The inlet 1*a* of the gasifier is connected with the outlet of the carburetor and the outlet 1*e* of the gasifier is connected with the inlet of the manifold by a pipe *m'*.

Within the gasifier body is a tubular partition 2 which is practically impermeable to fluid or unvaporized molecules but permeable by pure air or gas. The partition 2 may be made of any suitable natural or artificial material, or composition, but I prefer to use a metal fabric having a mesh of approximately 300 to 400 mesh and sufficiently fine and close as to prevent passage of unvaporized fluid particles therethrough, but allow the passage of molecules of air and hydrocarbon in the form of pure dry gas. Such medium should be so arranged in the vessel 1 that unvaporized fluid cannot pass around the edges thereof.

Preferably I also place within the gasifier body and between the medium or mediums 2 and the inlet of the gasifier a filter 3 which may be of chamois skin or any suitable material, adapted to cause a very fine dissemination of the mixture admitted into the gasifier and bring the air and carbon particles into close contact. This filter or filters should be so fitted and secured within the gasifier body as to prevent the passage of any of the gaseous mixture around the edges thereof.

Preferably I also place a screen or screens 4, which may be made of woven wire, between the inlet of the gasifier and the filter 3, such screens arresting any foreign matters which might tend to choke the filter and medium, and assisting in further disseminating and distributing the mixture of atomized or vaporized gas and air entering the gasifier from the carburetor.

The minute particles of unvaporized or atomized hydrocarbon which pass through the screen 4 will be retarded by the filter 3 and spread thereupon, and will be broken by the air before passing through the filter. Any unvaporized or uncombined particles of hydrocarbon passing through the filter will be retained on the surface of the medium 3 until they break up and vaporize and mix with air molecules in the form of a mixed gas so fine that it can pass through the medium, the mixed gas that passes through the medium is a pure dry cool gas.

The area of the screens, filters and separating medium should be such as will enable all the demands of the engine to be supplied when operating under the greatest load; and preferably such as will reduce the velocity of the air and gas passing through the gasifier as compared with the velocity of the mixture entering the gasifier from the carburetor. Additional screens or filters and mediums may be placed in the gasifier if desired as a matter of precaution or safety in case of accidental rupture of one of the screens, or filters, or mediums.

While in the drawing the carburetor is shown closely adjacent the manifold, the carburetor or device for producing the mixture of air and hydrocarbon vapor could be placed remote from the engine or manifold, for example it could be located adjacent the tank at the rear of the vehicle. The gasifier could also be located remote from the carburetor or the manifold by simply elongating the conduits connecting the carburetor with the gasifier, and/or the gasifier with the manifold. An anti-backfiring screen may be placed in the conduit between the gasifier and the manifold, and if desired a relief valve might be placed in such conduit to relieve any excess pressure.

The gas is of high power and can be easily ignited and as applied to internal combustion engines is preferably produced only as used: if it should be desired to store the gas an expansible holder should be provided therefor.

I have placed such a gasifier between the usual carburetor and the manifold of a well known commercial automobile and operated it for long distances and under all conditions of service producing an actual increase in mileage from 17 miles per gallon of gasoline with the carburetor connected to the manifold in the ordinary manner, to 37 miles per gallon with the gasifier interposed between the carburetor and the manifold as above described; also the temperature of the engine was materially reduced so that very little water was evaporated in the radiator compared to what was ordinarily required; also the efficiency and power of the engine was greatly increased and the motor could be started in "high" without any jerking, or loading the engine with heavy gases which will not explode, and the engine will clear itself and not choke or flood, something impossible to do with the engine using the ordinary carburetor. With my gas producer applied thereto a four cylinder engine operates as smoothly as a steam engine. Furthermore, the oil in the engine cylinders was not contaminated by carbon or gases, and therefore the engine operates more easily because of uniform lubrication and because of the maintenance of such, no carbon was deposited in the cylinders and no impurities carried over with the gas, and the film of oil in the cylinder and around the pistons prevents loss of power by leakage of gas around the cylinders during the compression and explosion strokes, such leakage of gas escaping into the crank case and impairing the quality of the lubricating oil.

I claim:—

1. For an internal combustion engine, a gasifier comprising a tubular vessel adapted to be interposed between the carburetor and manifold inlet; a tubular partition in the vessel including a medium impermeable by unvaporized particles but permeable by gas, and a tubular screen in said vessel within the partition.

2. A gasifier for internal combustion engines; comprising a vessel adapted to be interposed between the carburetor and manifold, a tubular partition in the vessel including a medium impermeable by liquid particles but permeable by gas, a tubular filter within the partition and between the medium and the inlet of the gasifier; and a tubular screen within the filter and between it and the gasifier inlet.

PAUL R. SCHREURS.