Nov. 7, 1933. R. MÉNDEZ 1,933,992

CARBURETOR

Filed March 7, 1932

Fig. 1.

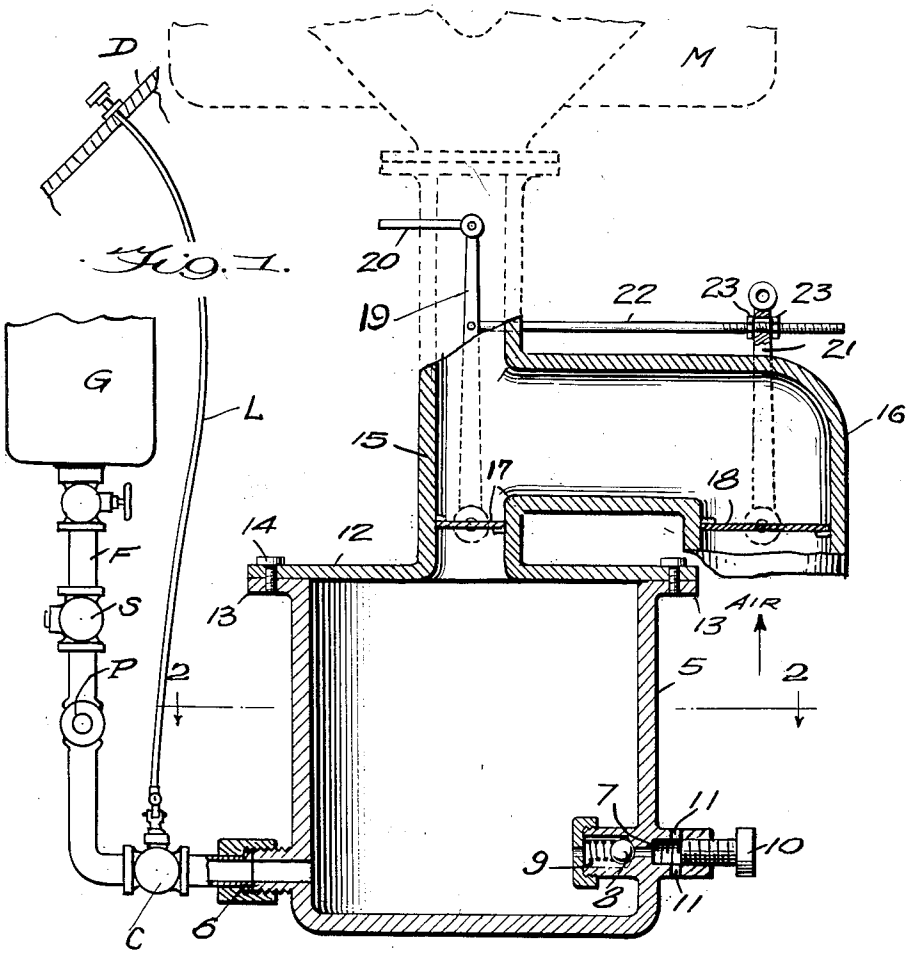
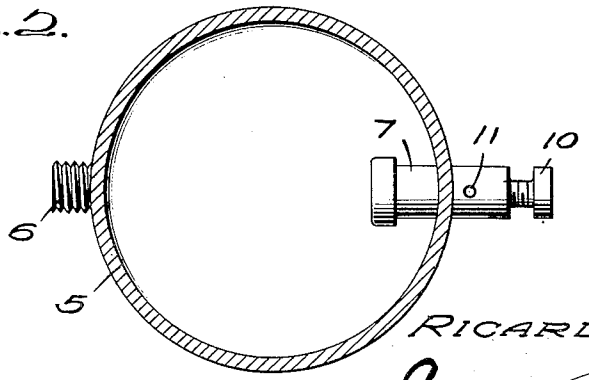


Fig. 2.



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CARBURETOR

Ricardo Méndez, Monterrey, Mexico

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1 Claim. (Cl. 48—180)

My invention relates to the use of natural gas and other similar gases as fuel for internal combustion engines and particularly the engines of motor vehicles as well as to a carburetor for enabling the efficient use of such gas with such engines.

The primary object of the invention is to provide a system and apparatus for burning natural or other gas as fuel in internal combustion engines.

Many attempts have been made in the past to produce a satisfactory substitute for gasoline as a fuel for internal combustion engines used in motor vehicles which will be cheaper than gasoline, but such attempts and experiments have consistently met with failure.

While the use of natural and other gases has been suggested for use as fuel in internal combustion engines and while some attempts have been made to use the same, I know of no device or process before the present invention which has successfully employed natural or other gas as fuel for multiple cylinder engines of motor vehicles or the like.

After careful studies of the physical characteristics of natural gas with regard to its compression and its calorific value as a fuel, I have carried out many experiments using this gas as a substitute for gasoline in internal combustion engines of motor vehicles.

In these experiments, substituting gas for gasoline, I have secured most satisfactory results, having found that the motor functioned fully as well if not better as regards the output of power and speed when using natural gas according to my invention as compared to its operation on gasoline, while showing a marked economy in the cost of the fuel consumed in favor of the gas, over any particular distance.

My experiments and observations have shown that,

1. Due to its capacity for compression, gas can be stored in great quantities in a very small space without adding any appreciable weight, thereby making gas as fuel for aeroplanes and boats as well as motor vehicles highly desirable since quantities sufficient for traveling great distances can be stored in such a restricted space.

2. Due to the nature of gas, the carburetor required to form the combustible mixture can be greatly simplified as compared to carburetors used on gasoline engines, thereby eliminating one of the chief sources of motor trouble.

3. Due to the composition of gas, the carbon deposited by its burning is negligible as compared with the carbon produced by gasoline.

4. Due to the characteristics of gas, no heating apparatus is ever required to facilitate starting of the engine in cold places.

5. The cost of gas consumed per horse power hour or over a given distance traveled is considerably less than the cost of gasoline for the same time or distance.

The apparatus employed in carrying out the objects of the present invention, the provision of means for successfully employing gas either natural or manufactured as a fuel for internal combustion engines will be readily understood from the following detailed description of the invention when read in conjunction with the accompanying drawing in which:

Figure 1 is a diagrammatic view of the invention with a vertical sectional view of a preferred form of the carburetor employed therewith, and

Figure 2 is a horizontal sectional view taken on the line 2—2 of Figure 1.

Referring now more specifically to the drawing, wherein like numerals refer to like parts throughout the same, 5 indicates a cup-shaped bowl or fuel receptacle of the carburetor. 6 indicates a gas intake including a threaded nipple to which is connected a feed line F leading from a source of supply G of gas under pressure, there being a safety check-valve S and a pressure regulating valve P in said feed line to supply the gas to said carburetor at a proper and constant pressure.

An auxiliary air intake 7 also leads into the bowl 5, there being a check valve 8 normally seated by a spring 9 to prevent the escape of gas through the air inlet. The admission of air through the inlet 7 is controlled by a metering screw 10 which regulates the size of passages 11 leading from the atmosphere to the inlet opening 7.

The bowl or receptacle 5 is provided with a top or cover 12 secured to a marginal flange 13 at the top thereof by screws 14. This cover 12 is formed with a tubular duct 15 opening into the bowl 5 at one end and adapted to have its other end secured to the intake manifold M of the engine (shown dotted), for the purpose of delivering the combustible mixture of gas and air to the engine. The duct 15 is provided with an air inlet duct 16 leading into the same above its juncture with the cover plate 12.

It will be noted that the diameter of the air inlet duct 16 is considerably larger than that of the duct 15 so as to permit a greater propor-

tion of air than gas to enter the cylinders of the motor.

Butterfly valves 17 and 18 are provided in the ducts 15 and 16 respectively, for controlling the passage of gas and air therethrough, the valve 17 being operated by an arm 19 connected at one end to the axle of the valve 17 and at its other end to the throttle rod 20 so that operation of the throttle will open or close the butterfly valve 17. An operating arm 21 for the valve 18 is adjustably connected by a rod 22 to the arm 19 so that operation of the throttle to open or close the valve 17 will result in a proportionate opening or closing of the air inlet valve 18.

The proportionate relation of the valves 17 and 18 may be adjusted by longitudinal adjustment of the nuts 23—23 on the threaded end of the rod 22. If desired, the air inlet duct may be placed in proximity to the exhaust pipe of the engine although this is not necessary.

My experiments have shown that the invention operates satisfactorily with tank pressures from 250 pounds per square inch up, although there is no reason to believe that the same will not operate satisfactorily at all pressures possible.

In operation gas from the pressure regulating valve P enters the bowl 5 through the inlet 6 where it is mixed with a small amount of air drawn in through the inlet 7. A gas pressure of a few ounces has been found to operate satisfactorily. This mixture then passes into the duct 15 where a second mixing with a regulated amount of air entering through the duct 16 takes place. The final mixture then passes into the intake manifold and the respective cylinders of the engine as will be readily understood. A cut off valve C operated from the dash D by a flexible shaft L is provided in the feed line F.

At slow speeds the supply of air to the chamber 5 will be less than at high speeds due to the difference in suction in the manifold at different speeds. I have found that the proportion of air to gas can be varied from approximately 70 per cent air and 30 per cent gas to 80 per cent air and 20 per cent gas with good results, although these figures are not to be regarded as rigid limits.

If desired, my invention may be applied to motors so as to use either gasoline or natural gas for fuel by providing two carburetors, one for gasoline and one for gas together with means for cutting either one or the other off at the will of the operator.

It will readily be seen that my invention will be adaptable to all internal combustion engines without altering the same in any way and it will also be understood that I do not limit myself to the precise form of the invention as shown and described but that various changes in the details of construction and operation may be resorted to without departing from the spirit of the invention within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

In a mixer for utilizing hydrocarbon gas as a fuel for internal combustion engines, a mixing bowl, a gas inlet connection at one side of said bowl, an air inlet opposite said gas inlet, a spring seated inwardly opening check valve normally closing said air inlet, a metering device for regulating the size of said air inlet, a cover plate for said mixing bowl, a gas duct carried by said cover leading from said bowl to the intake manifold of an engine, an air inlet connection opening into the duct intermediate the ends thereof, a butterfly valve in said duct between said bowl and air inlet connection, a butterfly valve in said last mentioned air inlet, and means for operating said valves in unison.

RICARDO MÉNDEZ.