

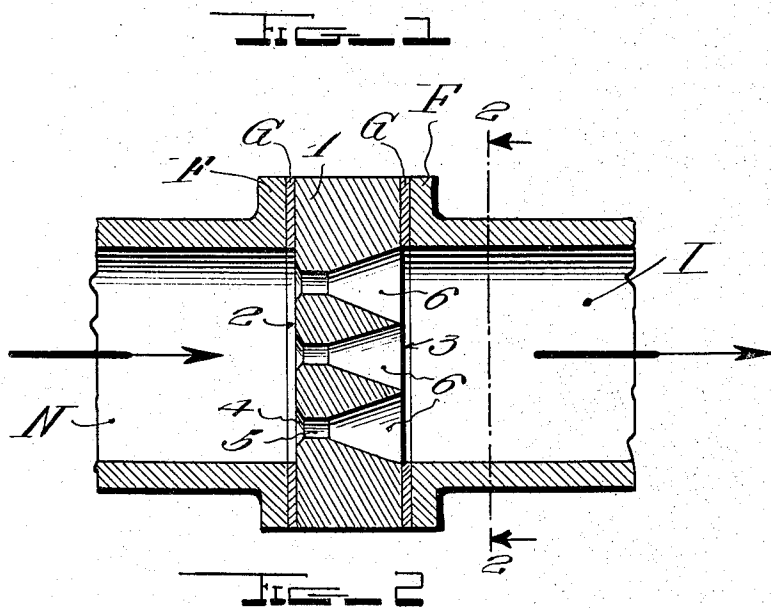
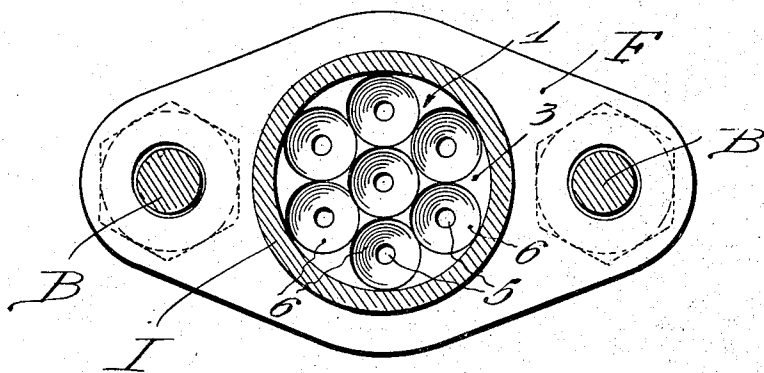
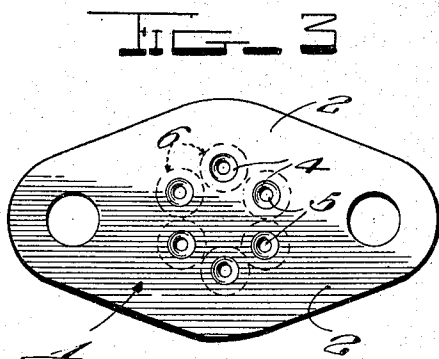
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E. W. PUFFER

FUEL AND AIR MIXER

Filed May 12, 1924



Witness

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UNITED STATES PATENT OFFICE.

EDMUND W. PUFFER, OF WAUKESHA, WISCONSIN.

FUEL AND AIR MIXER.

Application filed May 12, 1924. Serial No. 712,762.

To all whom it may concern:

Be it known that I, EDMUND W. PUFFER, a citizen of the United States, residing at Waukesha, in the county of Waukesha and State of Wisconsin, have invented certain new and useful Improvements in Fuel and Air Mixers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in devices adapted to be secured between the carbureter and intake manifold of a liquid fuel engine, for the purpose of promoting thorough mixture of the air and fuel vapor fed to the engine cylinders. I am aware that numerous devices have been designed for this general purpose, but it is the object of my invention to provide one of extreme simplicity, yet a device which will be unusually efficient for producing a most thorough mixture of the air and fuel vapor, thus effecting a saving in fuel, giving more power to the motor, practically preventing carbon deposits, and preventing any liquid fuel from passing the pistons and diluting the oil in the crank case.

With the foregoing in view, the invention resides in the novel subject matter hereinafter described and claimed, the description being supplemented by the accompanying drawing.

Figure 1 is a longitudinal sectional view of the outlet neck of a carbureter, the inlet end of an intake manifold, and the invention secured between the two.

Figure 2 is a transverse sectional view as indicated by line 2—2 of Fig. 1.

Figure 3 is an elevation of the invention looking in the opposite direction from Fig. 2.

In the drawing, N designates a carbureter outlet neck, I has reference to the intake manifold, F refers to the usual attaching flanges of the carbureter and manifold, and B designates the bolts passing through said flanges.

My invention which is secured between the neck N and intake manifold I, comprises a thick, solid block 1 which is preferably a casting having the same outline as the flanges F, said block having opposite flat sides 2 and 3, between which and the flanges F, appropriate gaskets G are preferably used. These gaskets are of well known form

and are provided with openings alining with bolt holes in the block 1 and the flanges F, so that the bolts B may pass through all parts and tightly clamp them together.

A plurality of gas conducting openings are formed through the block 1, said openings having small inlet ends and being gradually increased in diameter toward their outlet ends. Thus, all air and fuel vapor passing through the openings may gradually expand as it reaches the discharge ends thereof and such expansion promotes thorough mixture of the vapor and air, to produce a highly volatile gas for passage to the engine cylinders. In the construction shown, the openings above referred to decrease in diameter from the carbureter side 2 of the block 1, for short distances compared with the length of the openings, as indicated at 4. Then, for short distances, the openings have uniform diameters 5, and from these diameters, the openings gradually increase in diameter as indicated at 6, so as to provide funnel-shaped discharge ends. The gas and air drawn from the carbureter through the openings, is compressed by the tapered inlets 4 thereof, bringing the atoms of fuel vapor and the air into most intimate contact. Then, as this compressed mixture is drawn through the flared outlet ends 6 of the openings, it gradually expands and such thorough mixing takes place that a relatively dry gas is fed to the engine cylinders. This gas adds greatly to the efficiency of the engine, and as it is rather dry, no liquid fuel accumulates along the walls of the intake manifold, with the danger of back-firing. Moreover, no liquid fuel reaches the engine cylinders to form carbon deposits therein or to leak past the pistons and seriously dilute the lubricating oil in the crank case. Furthermore, overheating of the engine is prevented by supplying the proper fuel mixture thereto, and much better results may be obtained in every way. For instance, ordinary four cylinder motors can be operated in high gear without "bucking" or back-firing, when only propelling an automobile at about two miles per hour, and from this slow speed, in high gear, rapid acceleration may be obtained to maximum speed considerably greater than possible with the ordinary carburetion. Hence, the invention is not only well adapted for use with automobiles for general purposes,

but is particularly advantageous on racing machines and in connection with all sorts of aircraft.

Excellent results have been obtained from the exact details disclosed, and these details are therefore preferably followed, but within the scope of the invention as claimed, numerous minor changes may be made.

I claim:

10 A fuel and air mixing attachment comprising a single solid elongated block adapted to be secured between the usual carbureter and intake manifold and having opposite closely spaced flat sides, said block being formed with bolt holes in its ends from
15 one flat side to the other and also having a plurality of fuel conducting openings from

said one flat side to the other, said openings decreasing in diameter from their inlet ends for short distances to compress the air
20 and fuel vapor drawn therethrough, being then of uniform diameter throughout short portions of their lengths, and then gradually increasing in diameter to their outlet ends to cause gradual expansion of the air
25 and fuel vapor, promoting thorough mixture thereof, said openings forming the sole fuel conducting means from the carbureter side of the block to the manifold side thereof, said block being imperforate with the
30 exception of said bolt holes and openings.

In testimony whereof I have hereunto affixed my signature.

EDMUND W. PUFFER.