April 24, 1945. G. K. WILSON 2,374,517

FUEL ATOMIZER

Filed Aug. 13, 1943

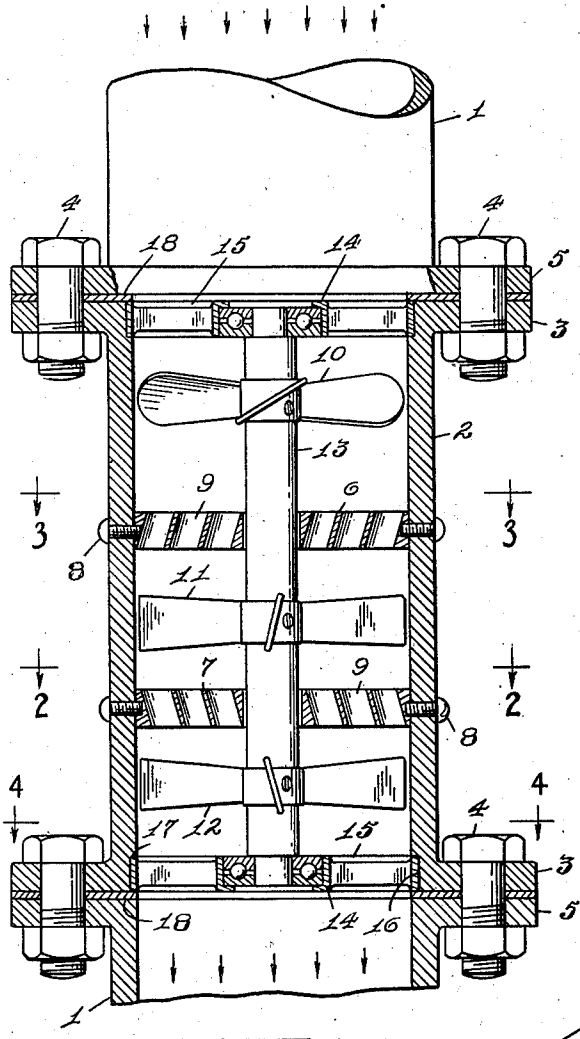



Fig. 1.

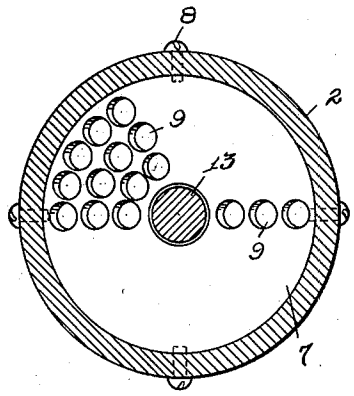



Fig. 2.

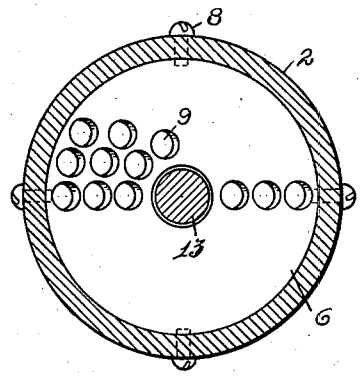



Fig. 3.

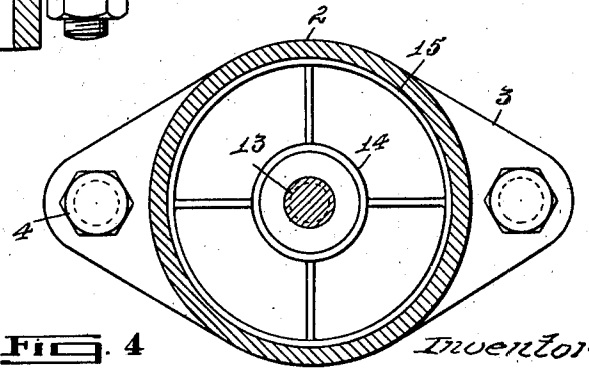



Fig. 4

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# UNITED STATES PATENT OFFICE

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## FUEL ATOMIZER

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Application August 13, 1943, Serial No. 498,602

2 Claims. (Cl. 48—180)

The invention relates to improvements in fuel atomizers as described in the present specification and shown in the accompanying drawing that forms a part of the same.

The invention concerns particularly the atomizing of fuel in internal combustion engines and has for its object the breaking up of the fuel to the greatest possible extent prior to introduction to the intake manifold, whereby to increase the intimate and homogeneous mixture of gasoline and air, and thus increase the efficiency of the engine as well as making for a great increase in the mileage obtainable from a given quantity of gasoline.

The invention consists in the provision of two or more perforated partitions interposed in the fuel line between the carburettor and the intake manifold of the engine in spaced relation to one another and a series of fans alternately arranged in relation to said partitions whereby the gas is drawn successively through the perforated partitions and fed to the intake manifold in an extremely fine vapor, the perforations in the successive partitions being oppositely directed in relation to those of the last preceeding partition and the pitch of the different fans varying somewhat, whereby to cause the gas to be agitated to the greatest possible extent.

In describing the invention reference will be made to the accompanying drawing, in which:

Figure 1 is a central longitudinal sectional view through that portion of the fuel line lying between the carburettor and the intake manifold, showing the invention applied thereto.

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

Figure 3 is a cross sectional view taken on the line 3—3 of Figure 1.

Figure 4 is a cross sectional view taken on the line 4—4 of Figure 1.

Like numerals of reference indicate corresponding parts in the various figures.

Referring to the drawing 1 indicates the fuel pipe leading downwardly from the carburettor to the intake manifold.

Interposed in the fuel pipe is a mixing chamber 2 comprising a tubular casing provided with flanges 3 at the ends thereof adapted to be secured by bolts 4 to the corresponding flanges 5 carried on the opposed ends of the fuel pipe.

6 and 7 are apertured partitions in the form of circular discs located intermediate the length of the mixing chamber 2 in spaced relation to one another and secured to the surrounding wall of the chamber by screws 5, or by any other satisfactory means.

Each of the discs 6 and 7 is provided throughout its surface with apertures 9. These apertures are bored at an acute angle in relation to the faces of the discs and the perforations of one disc are oppositely directed in relation to those of the other disc whereby the gas will be thrown from one side of the mixing chamber to the other side in its progress to the intake manifold.

10, 11 and 12 are fans alternately arranged with respect to the perforated discs 6 and 7, the fan 10 being positioned between the carburettor and the disc 6 in spaced relation to the said disc; the fan 11 being located midway between the said discs 6 and 7, and the fan 12 being located slightly beyond the disc 7.

The vanes, or blades, of the fan 10 are preferably pitched at an angle of approximately twenty degrees while the blades of the fans 11 and 12, which may be termed beaters, have a pitch of approximately seventy-five degrees.

The fans 10, 11 and 12 are fixedly mounted on a shaft 13 which extends longitudinally through the mixing chamber and through the discs 6 and 7. This shaft 13 is supported at its opposite ends in the hubs 14 of wheel-like brackets, which latter have their rims 15 secured in any desired manner to the wall of the mixing chamber. For purposes of illustration these brackets are shown as having their rims 15 fitting within annular grooves 16 in the inner face of the casing 2 and held against movement longitudinally of such casing between the shoulders 17 at the bottoms of said grooves and rings 18 located between the flanges 3 and 5 at the respective ends of the casing.

In the operation of the invention the gas flowing from the carburettor is drawn downwardly into the mixing chamber by the action of the fan 10 towards the face of the perforated disc 6, which latter has the effect of retarding the flow and causing the gas to back up against the pressure created by the fan. As the pressure imposed by the fan is in a straight line substantially centrally of the mixing chamber and as the gas has become banked throughout the whole surface of the disc this central pressure on the banked gas will cause turbulation of the gas before it passes through the apertures in the disc. As the openings 9 in the disc 6 are bored at an acute angle the gas passing therethrough will be directed towards one side of the chamber but the action of the fan 11 will be to cause further turbulation of the gas by drawing it back to a

straight line and impelling it towards the disc 7 into contact with the gas which has previously passed to this point and has had its progress retarded by the said disc 7 and which as a consequence has become banked over the surface of said plate. The pressure of the oncoming gas causes great turbulation of the mass at this point. In the meantime the gas which has accumulated over the surface of the disc 7 passes through the openings in said disc in a direction opposite to that taken previously in its passage through the disc 6, whereupon the fan 12 causes further turbulation of the said gas and provides for its delivery to the intake manifold.

As the apertures in one disc extend in the opposite direction to those in the other disc it will be obvious that the gas will be thrown from side to side of the chamber in its progress therethrough and the resultant agitation together with the turbulation caused by the straight pressure from the fans on the banked gas will result in the gas being thoroughly atomized at the time of delivery to the manifold.

While the mixing chamber 2 has been described herein as being interposed in the feed line between the carburettor and the intake manifold it is of course to be understood that it may be formed as a part of the carburettor.

While I have illustrated and described the present preferred form of construction for carrying out my invention, this is capable of variation and modification without departing from the spirit of the invention, I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

What I claim is:

1. A fuel atomizer comprising a cylindrical chamber, a revoluble shaft extending longitudinally within said chamber and supported at its opposite ends in fixed apertured brackets, a plurality of fans fixed to said shaft in spaced relation to one another, and a plurality of fixed apertured partitions loosely encircling said shaft and alternating with said fans between the endmost fans, the apertures in said partitions being bored at other than right angles to the faces of the partitions and the apertures in the successive partitions being oppositely directed in relation to those of the last preceding partition.

2. A fuel atomizer according to claim 1 in which the blades of the fan at the inlet end of the chamber are pitched at an angle of approximately twenty degrees and the blades of the remaining fans are pitched at an angle of approximately seventy-five degrees.

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