

July 20, 1937.

E. OLSON

2,087,293

ECCENTRIC FUEL NOZZLE

Filed May 28, 1936

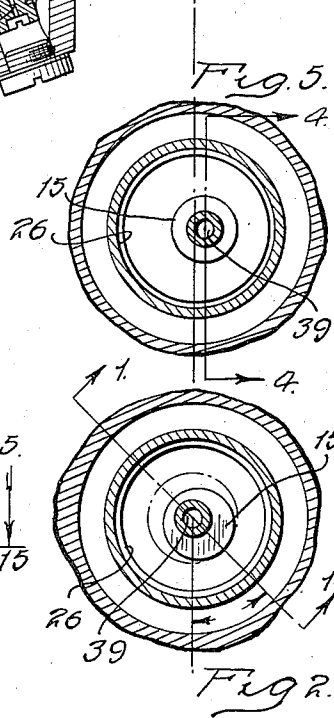
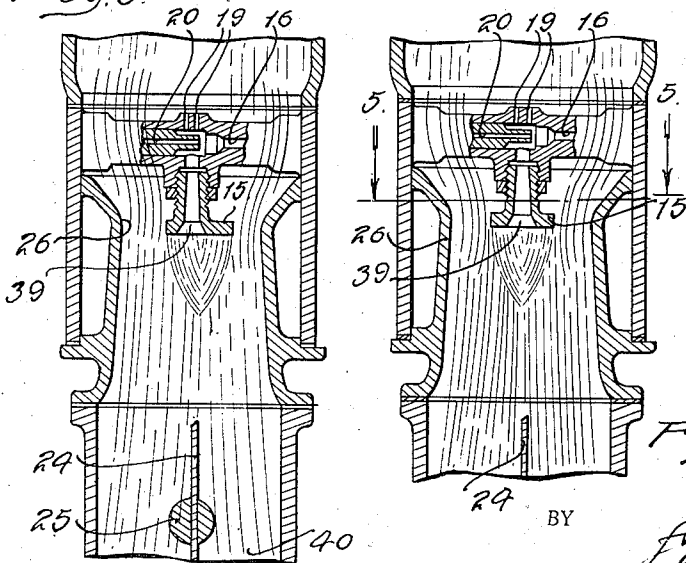
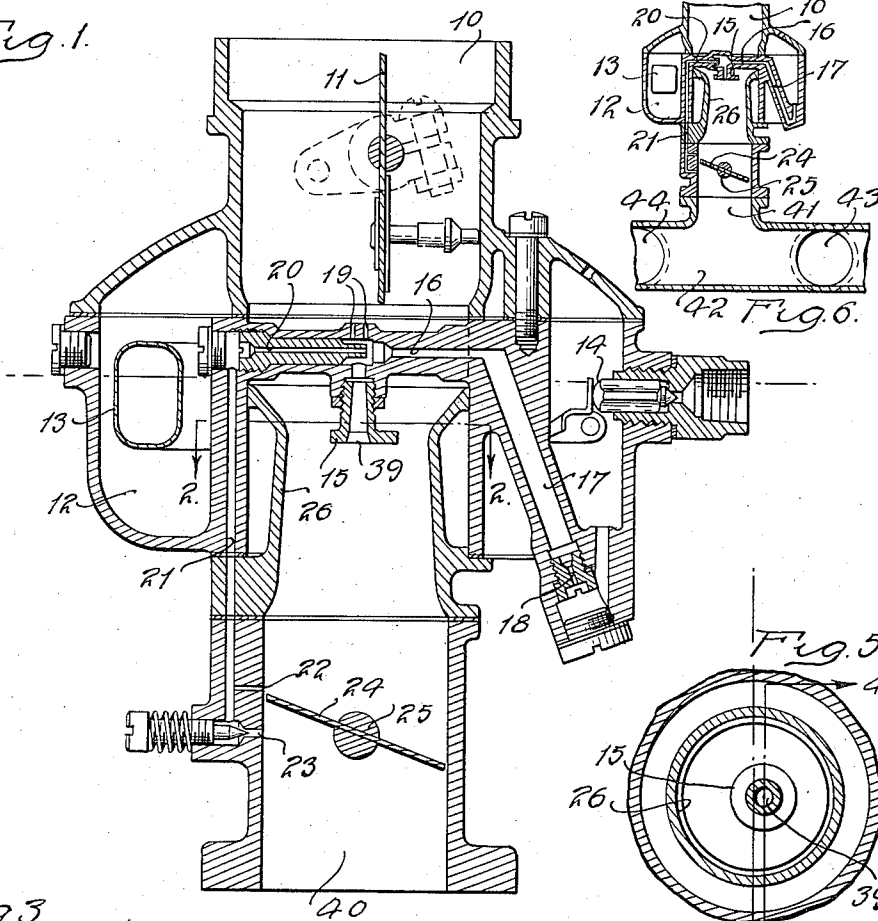


Fig. 4.

INVENTOR.

ELMER OLSON.

ATTORNEY

UNITED STATES PATENT OFFICE

2,087,293

ECCENTRIC FUEL NOZZLE

Elmer Olson, Ferndale, Mich., assignor to Milton
E. Chandler, Detroit, Mich.

Application May 28, 1936, Serial No. 82,228

3 Claims. (Cl. 123—119)

The object of this invention is to correct distribution errors in an internal combustion engine inlet manifold by placing the fuel nozzle eccentric with reference to the venturi.

I have discovered that the well-known lack of uniform distribution in an inlet manifold may be corrected by an eccentric discharge of fuel into the air stream provided the required correction is not very large.

Alternatively I have discovered that if the fuel is discharged into the center of the air stream, but if the flange surrounding the fuel nozzle opening is eccentric, the air flow is distorted and a similar result is obtained.

Figure 1 shows a cross-sectional elevation taken on plane 1—1 of Figure 2.

Figure 2 is a cross-sectional plan view taken on plane 2—2 of Figure 1.

Figure 3 corresponds to Figure 1 and also shows the effect of the air stream of the eccentric fuel nozzle.

Figure 4 shows a cross-sectional elevation taken on plane 4—4 of Figure 5 and shows an alternative construction.

Figure 5 shows a cross-sectional plan view taken on plane 5—5 of Figure 4.

Figure 6 shows the carburetor on the manifold.

In the figures, 10 is the air entrance, 11 is the choke valve, 12 is the float chamber, 13 is the float, 14 is the float valve, 15 is the eccentric nozzle which is supplied with fuel from a fuel passage 16, which communicates with an inclined and relatively large fuel passage 17 through a restriction 18, with the float chamber 12. 19 refers to air vents which aspirate the fuel issuing from 16 before it discharges out of the eccentric nozzle 15.

20 is the low speed fuel passage which conveys fuel from 16 and air from 19 to the low speed fuel by-pass 21, which discharges fuel through the outlet 23 into a mixture outlet 40 on the engine side of a throttle 24 mounted on a throttle rod 25.

The addition of a fuel outlet 22 permits the transition from the low speed fuel by-pass 21 to the operation of the main fuel nozzle 15 to be made smoothly. These various passages are no part of the present invention.

The eccentric nozzle 15 is located eccentrically with reference to the venturi 26. That is to say, the fuel outlet passage 39 is concentric with reference to the venturi 26. The outside wall or flange of the eccentric nozzle 15 throws the stream of atomized fuel and air eccentric of the

air stream, as shown in Figures 2, 3, and 5. By arranging so that the direction of the eccentricity with reference to the axis of the throttle 25 can be varied, I have discovered that it is possible to correct to a great extent the lack of uniform distribution in the manifolds of multi-cylinder internal combustion engines. The great advantage of this method is that I can fit a carburetor to an engine with much less time than is necessary when no means are available for varying the distribution and for cancelling out the non-uniformity of distribution in the inlet manifold which is inherent in the design of practically all intake manifolds.

If an attempt is made to correct the lack of uniformity by making changes in the inlet manifold thousands of dollars are spent in patterns and in machining castings before a desirable or less objectionable distribution manifold is perfected. For a comparatively few cents an eccentric nozzle such as 15 can be made and changed to suit, and the direction of eccentricity varied and the degree of eccentricity varied until such time as the lack of uniformity of distribution produced by the eccentric nozzle 15 cancels out the lack of uniformity and distribution inherent in the inlet manifold design.

In Figure 4 the nozzle itself appears to be concentric with reference to the Venturi tube, 26, but actually in the plan view shown in Figure 5 the fuel nozzle 39, having a concentric flange 5, is shown located eccentrically with reference to the throat of the venturi 26. By shifting the nozzle off center the distribution may be corrected to any desired degree.

In Figure 6, 41 is the inlet to the manifold 42 to which the carburetor is bolted. 43 and 44 are two of the mixture outlets leading from the manifold.

What I have discovered is that if I make a nozzle which is eccentric to the air stream the fuel will follow the eccentricity of the nozzle and permit me to place the fuel in any location in the mixing chamber in relation to the outlet past the throttle. The principal advantage is secured when the throttle is wide open.

What I claim is:

1. A carburetor having an air entrance, a mixture chamber of Venturi form, a fuel nozzle discharging therein along an axis parallel to that of the venturi, a mixture outlet separated from said mixture chamber and having a throttle valve therein whereby the flow around the nozzle is independent of the position of the throttle valve, means located in the throat of

the venturi around the outlet from the fuel nozzle for causing an unsymmetrical flow around the nozzle to control the distribution of the fuel in said mixture outlet.

- 5 2. A carburetor as set forth in claim 1 in which there is a flange which forms the lip of the fuel nozzle, said flange being unsymmetrically located in the throat of said venturi.

3. A carburetor as set forth in claim 1 in which there is a flange which forms the lip of said fuel nozzle, said flange being arranged concentrically around the nozzle but eccentrically located within the throat of the venturi.

ELMER OLSON.