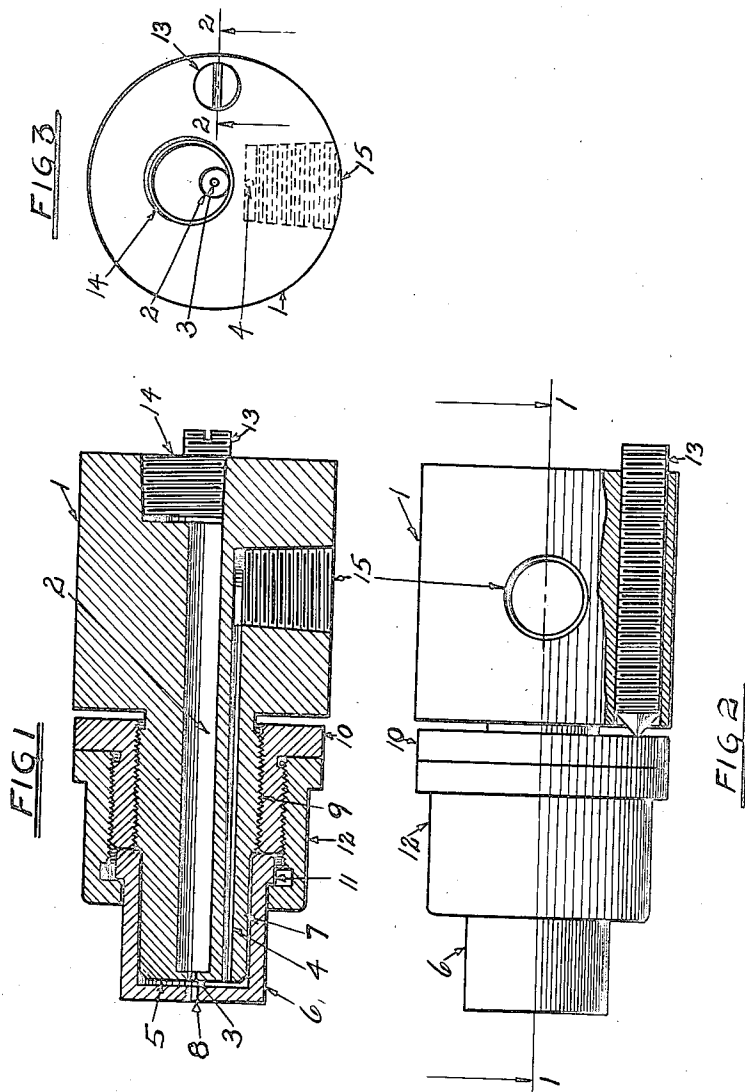


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R. F. METCALFE.
FUEL NOZZLE.
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FUEL NOZZLE.

Application filed July 25, 1919. Serial No. 313,421.

To all whom it may concern:

Be it known that I, ROBERT F. METCALFE, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented new and useful Improvements in Fuel Nozzles, of which the following is a specification.

This invention relates to fuel nozzles and consists in certain improvements in the construction thereof as will be hereinafter fully described and pointed out in the claims.

More particularly the invention relates to that type of fuel nozzles in which fuel is injected into a burner by a jet of compressed air acting on a liquid fuel.

The invention is illustrated in the accompanying drawings as follows:—

Fig. 1 shows a section on the line 1—1 in Fig. 2.

Fig. 2 a side elevation, partly in section, on the line 2—2 in Fig. 3.

Fig. 3 an end view of the nozzle.

1 marks the body of the nozzle. An air passage 2 extends through the body of the nozzle and terminates in an air jet 3. A fuel passage 4 is also arranged in the body 1 and terminates in a chamber 5, the chamber being formed between the walls of a cap 6 and the end of the body 1. The body adjacent to the front end has a cylindrical surface 7 and the cap 6 makes a close fit with this cylindrical surface so as to form a closure for the chamber 5. A jet opening 8 is formed in the end of the cap of the front wall of the chamber 5. This opening 8 forms a fuel mixture jet and is concentric with the air jet 3 and slightly larger than the air jet 3. I have found that an air jet opening 3 having .04 inch diameter operates well with a mixture jet opening 8 having .055 inch diameter.

The body is screw-threaded at 9 and a nut 10 is arranged on this screw thread and opposes the end of the cap 6. The rear end of the cap 6 is provided with a flange 11 which is engaged by the flange on a flange nut 12, the flange nut 12 being screwed on to the outer periphery of the nut 10. The nuts 10 and 12 are normally locked together so that by turning the combined nuts the cap 6 is moved outwardly or inwardly so as to vary the distance between the air and jet openings 3 and 8. The nuts may be locked in adjustment by a screw 13. Connection

with the air supply is made at 14 and a connection with the fuel supply at 15.

In the operation of the device air is delivered through the connection 14, passage 2 and jet opening 3. The passage of the air through the chamber 5 and out the jet opening 8 creates a reduction of pressure in the chamber 5 which induces a flow of fuel to this chamber. The air passing through the liquid which is drawn into the chamber 5 breaks it up and delivers it through the opening 8 in the form of a mist. By adjusting the distance between the openings the proportions of air and fuel delivered in the mixture may be very nicely adjusted so that exactly the proportions desired may be obtained. Further these proportions may be maintained with desired uniformity as the air is varied to vary the quantity. All that is necessary to vary the quantity of mixture is to vary the quantity of air delivered and this automatically takes care of the quantity of fuel.

What I claim as new is:—

1. In a fuel nozzle, the combination of a body having an air passage; a fixed jet opening leading from the air passage; a chamber formed in front of the air jet opening and having a mixture jet opening concentric with the air jet opening and spaced therefrom, the walls of the chamber adjacent to the openings being at approximately right angles to the axis of the jet; means for adjusting the distance between the jet openings; and means for supplying fuel to the chamber.

2. In a fuel nozzle, the combination of a body having an air passage; a fixed jet leading from the air passage, the end of the body having a cylindrical surface; a cap forming a sliding fit on the cylindrical surface and forming a chamber at the end of the body, said cap having a mixture jet opening through its end concentric with the air jet opening; a nut operating on the body and engaging the cap to adjust the distance between said jet openings; and means for supplying fuel to the chamber.

3. In a fuel nozzle, the combination of a body having an air passage and an air jet opening leading from the passage; a cylindrical surface near its front end and a screw threaded portion at the rear of the cylindrical surface; a cap forming a sliding fit

on the cylindrical surface, the cap forming a chamber at the end of the body and said cap having an opening through its end forming a mixture jet opening concentric with the air jet opening; a nut arranged on said screw thread on the body; a flanged nut on said nut engaging the cap, said nuts operating together to adjust the cap in both directions to vary the distance between the jets. 10

In testimony whereof I have hereunto set my hand.

ROBERT F. METCALFE.