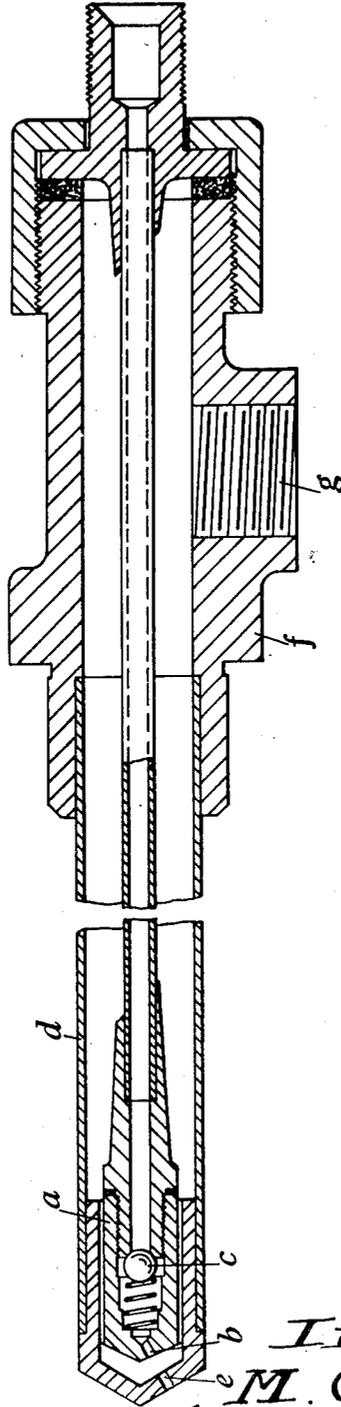


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LIQUID FUEL INJECTION MEANS FOR
INTERNAL-COMBUSTION ENGINES
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LIQUID FUEL INJECTION MEANS FOR INTERNAL-COMBUSTION ENGINES

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1 Claim. (Cl. 299—107.1)

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This invention relates to liquid fuel injection means of the kind comprising a nozzle or nozzles through which measured quantities of petrol or other like liquid fuel are injected by a pump into the induction pipe or cylinder or cylinders of an internal combustion engine. Ordinarily the orifice of the nozzle is controlled by a spring-loaded closure member, and both the closure member and its seating are made from metal. Difficulty has been found in ensuring proper closing of the said member on its seating owing to the depositing of minute solid particles thereon or on the seating from the liquid or other source. A result of this condition is that when the engine is running with the throttle valve closed or nearly closed, the partial vacuum in the induction pipe, (or in the cylinder or cylinders) causes undesired fuel flow through the improperly closed nozzle or nozzles, with consequent defective running of the engine and wastage of fuel, especially at idling speeds.

The object of the present invention is to enable the undesirable condition above mentioned to be avoided in a convenient and satisfactory manner.

The invention comprises the combination with the liquid fuel delivery nozzle, or each such nozzle, of an air or other gas chamber situated around and enclosing the nozzle outlet, and having a constantly open discharge orifice or orifices spaced from and in advance of the nozzle outlet, and means for maintaining at all times in the said chamber an air or other gas pressure which is independent of the air required for combustion of the fuel delivered by the nozzle, and which is sufficiently in excess of the engine intake pressure to prevent fuel from being drawn through the nozzle outlet.

The accompanying drawing is a sectional side elevation of liquid fuel injecting means embodying the invention.

In the drawing *a* indicates a nozzle, or one of a plurality of nozzles, through which measured quantities of petrol or other like liquid fuel can be injected by a pump into the induction pipe or cylinder of an internal combustion engine. The nozzle *a* is provided at its front end with a liquid fuel discharge orifice *b*, and contains a spring-loaded closure member *c* past which the liquid fuel to flow to the discharge orifice. In carrying the invention into effect as shown, the nozzle *a* is enclosed by a sleeve *d* forming an air or other gas chamber around and at the front end of the nozzle, the sleeve being formed at its front end with a constantly open discharge orifice or orifices as *e*. The interior of the sleeve *d* is kept at all times filled with air or other gas (which may be engine exhaust gas) at a pressure which is independent of the air required for combustion of the

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fuel delivered by the nozzle *a*, and which is sufficiently in excess of the lowest pressure which may exist in the engine induction pipe or cylinder (as when the throttle valve is fully closed) to prevent the extraction of liquid fuel through the fuel nozzle by suction, in the event of the nozzle closure member *c* being imperfectly closed. The desired preponderance of pressure in the interior of the sleeve *d* may be obtained by suitably dimensioning its volume and/or its discharge orifice or orifices as *e*, in which case the rear end of the sleeve may be in free communication with the outer atmosphere. When engine exhaust gas is supplied to the interior of the sleeve *d*, the pressure of this gas may be sufficient to serve the desired purpose. But it may be preferable to employ a small air or other gas compressor or blower adapted to maintain the desired pressure in the sleeve *d*. In any case the rear end of the sleeve *d* may be secured to a hollow fitting *f* having a laterally arranged inlet opening *g* for the air or other gas. It will be understood, however, that the amount of air or other gas which can pass from the interior of the sleeve *d* to the induction pipe or cylinder is not sufficient materially to affect the normal action of the engine.

The invention is not, however, limited to the example described as the form of the nozzle and sleeve may be varied to suit requirements.

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

Liquid fuel injection means for an internal combustion engine, comprising the combination with a liquid fuel delivery nozzle having an outlet at one end, of a gas chamber situated around and enclosing the nozzle outlet, and having at least one constantly open discharge orifice spaced from and at the outer side of the nozzle outlet, and means for maintaining at all times in the said chamber a gas pressure which is independent of the air required for combustion of the fuel delivered by the nozzle, and which is sufficiently in excess of the engine intake pressure to prevent fuel from being drawn through the nozzle outlet.

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