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FUEL INJECTION MEANS FOR INTERNAL COMBUSTION ENGINES OF THE TYPE COMPRESSING A FUEL-AIR MIXTURE

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Fig. 1

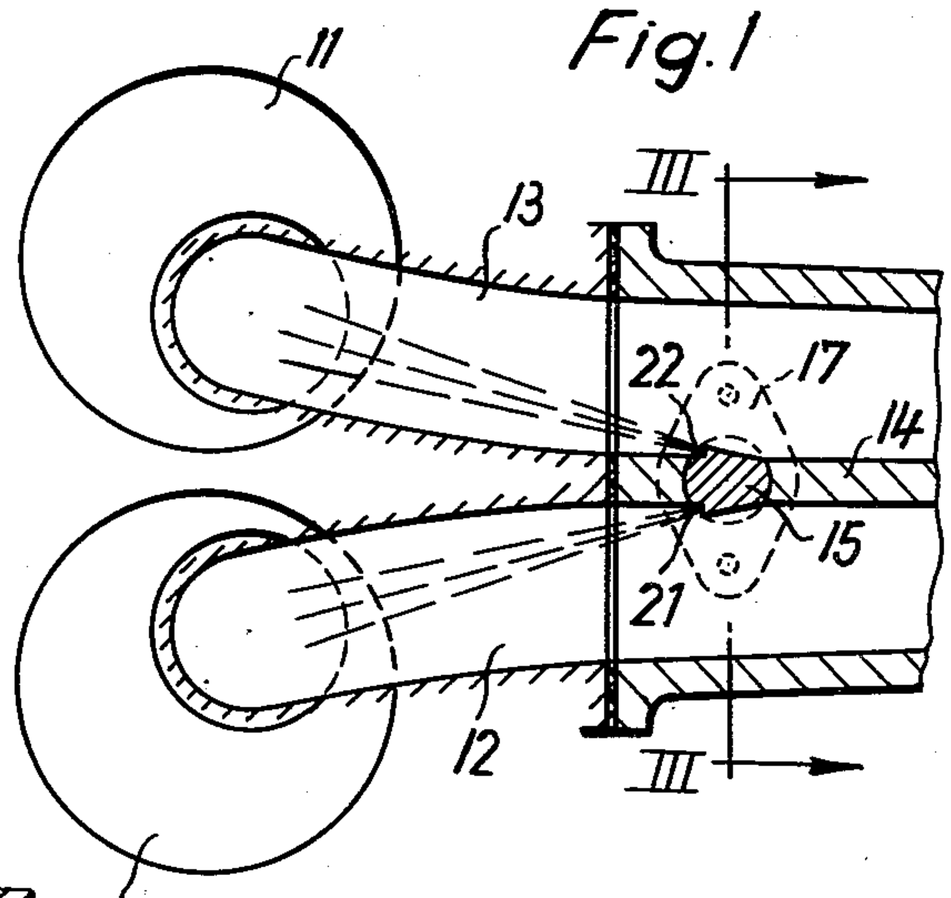

Fig. 3

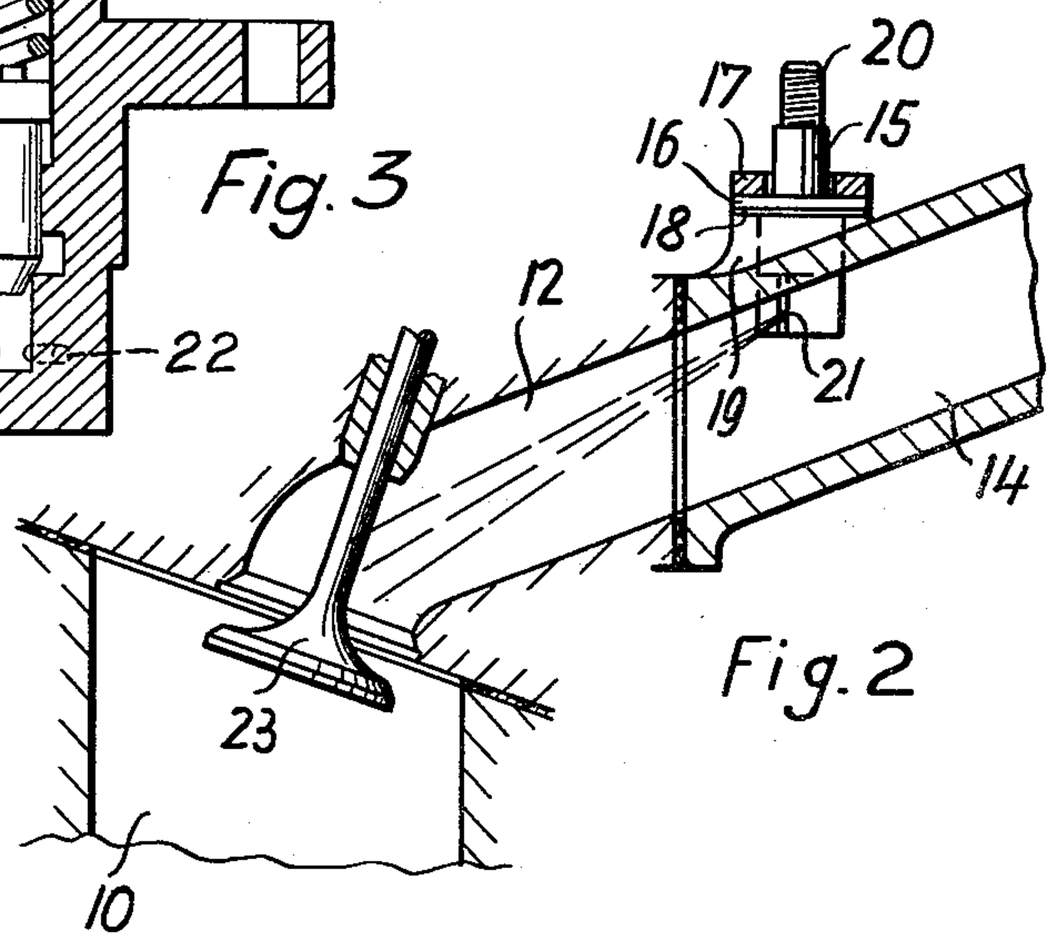

Fig. 2

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FUEL INJECTING MEANS FOR INTERNAL COMBUSTION ENGINES OF THE TYPE COMPRESSING A FUEL-AIR MIXTURE

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1 Claim. (Cl. 123—119)

My invention relates to fuel injecting means for an internal combustion engine of the type compressing a fuel-air-mixture. More particularly, it relates to means for injecting the fuel into the air intake conduits of such an engine.

It is the primary object of my invention to reduce the length of the fuel supply conduits and the numbers of fuel injecting members required and to render the quantities of fuel injected more uniform by eliminating vibrations in the fuel conduits.

Further objects of my invention will appear from a detailed description of a preferred embodiment of my invention following hereinafter with reference to the drawings. It is to be understood, however, that my invention is in no way limited to the details of such embodiment but is capable of numerous modifications within the scope of the appended claim and that the terms and phrases used in such detailed description have been chosen for purpose of explaining rather than that of restricting or limiting my invention.

In the drawings:

FIG. 1 is a plan view of the engine partly shown in section;

FIG. 2 is a side view, and

FIG. 3 is a cross-sectional view of the nozzle member taken substantially along the line III—III in FIGURE 1, but with the mounting elements removed for the sake of clarity.

The internal combustion engine to which my invention is applicable comprises at least two cylinders **10** and **11**, each cylinder having an air intake conduit **12**, or **13** respectively, and a valve, such as **23**, controlling the communication thereof with the cylinder. At least one wall is common to a pair of adjacent ones of the intake conduits and is disposed therebetween. In the embodiment shown this wall is the wall **14** disposed between the conduits **12** and **13**. This wall is provided with an aperture in which an injecting member formed by a nozzle member **15** is inserted. This injection member is provided with means for injecting fuel into both conduits of the pair **12**, **13**. For this purpose the nozzle member **15** has nozzle openings **21** and **22** directed into both conduits **12** and **13**. The nozzle member **15** is provided with a collar **16** which is held by a mounting flange **17** in position on a boss **19** formed on the casting including the conduits **12** and **13**, a gasket **18** being sealingly interposed between the flange **17** and the boss **19**.

The nozzle member **15** has a single valve seat **24**, the space behind said valve seat communicating with each of the nozzle openings **21**, **22**. A single spring-biased valve **25** cooperates with said valve seat in the conventional manner, the pressure of the fuel supplied by an injection pump to the inlet port **20** of the nozzle member being operative to lift the fuel valve from its valve seat.

From the above description it will appear that a single injection member disposed within the partition wall between the individual intake conduits injects the fuel into said conduits. Compared with a fuel injecting system in which a plurality of injection nozzle members individually coordinated to the cylinders of the engine are connected with a common pump by a fuel supply manifold, my novel system has the advantage that the total length of the fuel supply pipes will be considerably reduced and that a smaller number of injecting elements is required and that the injection will be more uniform, since there are no differences in lengths of fuel conduits, no difference in the diameter of bores and no vibrations in the individual branch pipes of the fuel supply manifold.

Moreover, it will be appreciated that my novel system guarantees equality of the pressures of the fuel jets injected into both of the intake conduits **12** and **13**. If desired, however, I may provide the injection member **15** with a pair of fuel injecting valves, each coordinated to one of the nozzles **21** and **22**.

While the invention has been described in connection with a preferred embodiment thereof, it will be understood that it is capable of further modification, and this application is intended to cover any variations, uses, or adaptations of the invention following, in general, the principles of the invention and including such departures from the present disclosures as come within known or customary practice in the art to which the invention pertains, and as fall within the scope of the invention or the limits of the appended claim.

What I claim is:

In an internal combustion engine, the combination comprising a plurality of cylinders, each cylinder having an air intake conduit and a valve controlling the communication thereof with said cylinder, at least one wall being common to a pair of adjacent ones of said intake conduits and disposed therebetween, said wall being provided with an aperture, a nozzle member mounted within said aperture and having nozzle openings directed into both conduits of said pair for injecting fuel into both conduits, said nozzle member having a single valve seat, the space behind said valve seat communicating with each of said nozzle openings, a single spring-biased valve on said seat, and a fuel supply conduit communicating with said space.

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