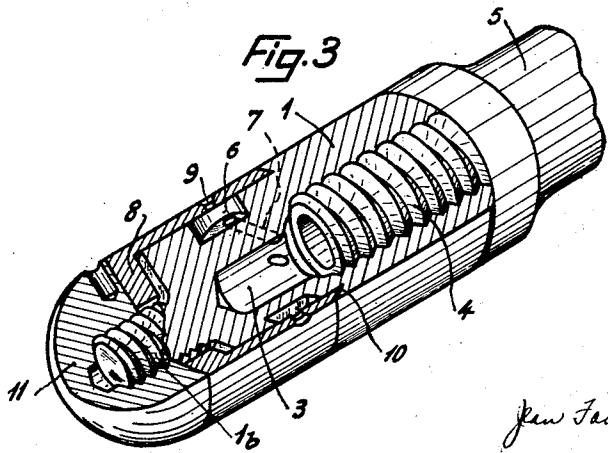
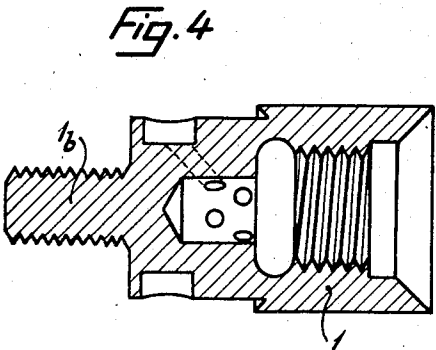
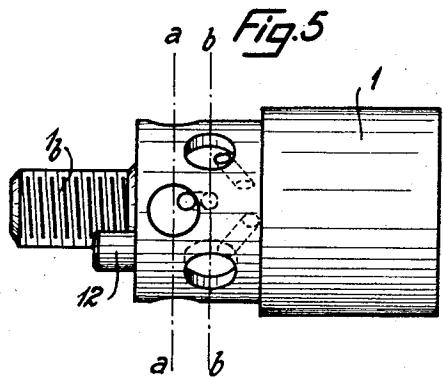
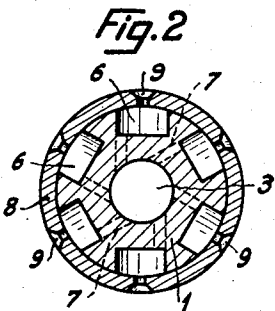
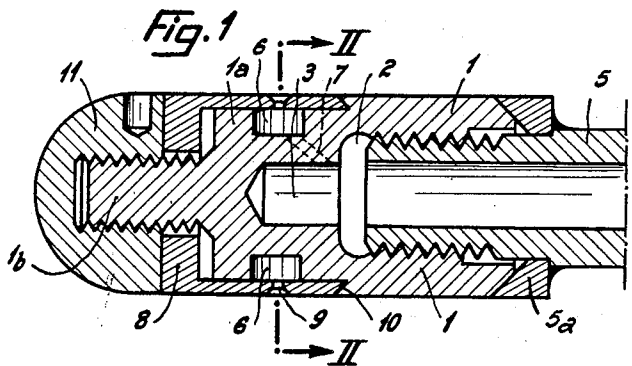


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ATOMIZER INJECTOR
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ATOMIZER INJECTOR

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3 Claims. (Cl. 299-120)

1

The present invention relates to an atomizer injector suitable for the atomization of a liquid in a gas and more especially for the atomization and/or the combustion of liquid fuels or carburants in air, the device also being capable of acting as a burner.

The known devices of this type comprise a hollow body provided with a liquid intake cavity and an atomization nozzle situated in alignment with the said cavity. The atomization is therefore axial in relation to the cavity and the atomized liquid forms, on leaving the device, a conical stream coaxial with the cavity.

The device forming the subject of the invention comprises a number of atomization holes situated in ring formation around the intake cavity and thus forming a number of conical streams which are directed radially in relation to the said cavity. Preferably, each of the atomizing holes is formed in the outlet of a small chamber of a shape developed by revolution about an axis perpendicular to the axis of the cavity, that is to say, radial, and these chambers arranged in a ring about the axis of the cavity communicate with the latter through inclined channels which impart to the liquid a tangential velocity component in relation to the said chambers.

A very simple construction is that in which the chambers are formed in the cylindrical cut-away surface of the body containing the intake cavity, the said cut-away part then being covered by a bush or sleeve locked against the shoulder and having formed therein radial atomization holes corresponding to the various chambers.

In this construction, inclined but tangential channels can readily be formed in the chambers after the latter have been formed, the said channels forming a communication between the chambers and the intake cavities.

The description which follows with reference to the accompanying drawings, which are given by way of nonlimitative example, will enable the manner in which the invention can be carried into effect to be readily understood, the details appearing both from the drawings and from the text naturally forming part of the said invention.

Figure 1 is an axial section through a constructional form of an atomizer according to the invention.

Figure 2 is a section therethrough along the line II-II.

Figure 3 is a fragmentary perspective view thereof, and

2

Figures 4 and 5 show respectively, in axial section and in elevation, the detail of a modified construction comprising two rings of atomizing holes.

The device shown in Figures 1 to 3 comprises a body 1 of general cylindrical form, having formed along its axis an intake cavity 2, 3 and adapted to be screwed on to the end 4 of the pipe 5 through which the liquid to be atomized arrives.

The forward portion 1a of the body 1 is cut away in such manner as to have a smaller diameter than the rear portion of the said body. Formed in the said cut-away portion are small cylindrical chambers 6, the axes of which are perpendicular to the axis of the body 1 and of the cavity 2, 3 that is to say, they are radially directed. Each of these chambers communicates with the cavity 2, 3 through an inclined channel 7 eccentric in relation to the said chambers, so that the liquid coming from the cavity 2, 3 and entering each of the chambers through the corresponding channels is given a whirling motion around the axis of the chamber. Owing to the inclination of the channels 7, they can readily be formed within each chamber.

The forward portion 1a of the body 1 comprises a screw-threaded nose 1b, on which there is fitted a sleeve 8 having radial atomization holes 9 disposed in ring formation and each situated on the axis of one of the chambers 6. The sleeve 8 is locked against the shoulder 10 of the body 1 by a nut 11 screwed on to the nose 1b. No packing is required at 10, the locking action exerted by the nut 11 being sufficient, especially if the shoulder 10 is bevelled as shown in the drawings. Similarly, the locking of the body 1 on the flange 5a of the intake pipe 5 can be effected without any packing. A device is thus obtained which comprises no packing.

During operation, the liquid under pressure arrives through the pipe 5, passes through the channels 7 into the chambers 6, whirls in these chambers and leaves by way of the orifices 9, thus forming about the device a number of conical streams corresponding to the number of holes 9 and the axes of which are radial. The angles at the apex of these conical streams are small (for example 10°) at low feed pressures and increased progressively when the feed pressure increases.

The delivery is determined by the feed pressure and is substantially proportional thereto in the low-pressure range.

3

An excellent atomization may be obtained at low pressures, for example, 0.2 kg. per cm.² in the case of petrol.

The atomization remains good with heavier fuels provided only that the pressure is increased.

An excellent atomization has thus been obtained with kerosene and even with diesel oil.

When in use, the device is so disposed that the axis of the cavity 2,3 is parallel to the axis of the duct in which the air to be carburetted circulates, or is preferably coincident therewith. The conical streams formed by the atomized liquid thus have their axes perpendicular to the displacement of the air while occupying almost all the cross-sectional area through which the air passes, which is beneficial to the formation of a perfectly homogeneous carburetted mixture.

The atomized fuel may be burnt directly in the air at the outlet from the holes 9 or the carburetted air may be passed towards the chambers in which the combustion takes place (in the case of pulse-jets, for example).

Naturally, the number of chambers 6 and atomization holes 9 may vary within wide limits. Figures 1 to 3 show a construction comprising six chambers and six holes 9, but this is only an example.

In the modified construction shown in Figures 4 and 5, the chambers 6 are formed in two different rings, the plane containing the axes of the chambers of one ring being at *aa*, while that containing the axes of another ring are at *bb*. Each ring comprises four chambers, and the chambers are quincuncially arranged from one ring to the other.

The sleeve (not shown), which is similar to the sleeve 8 previously described, naturally comprises two rings of atomization holes disposed in the same manner as the chambers 6. There is shown in Figure 5 a stud 12 which engages in an orifice in the sleeve and serves to fix the exact position of the latter in order that the atomization orifices therein may lie exactly opposite the corresponding chambers.

4

Naturally, modifications may be made in the injector hereinbefore described, notably by substitution of equivalent technical means, without departing from the scope of the present invention.

What we claim is:

1. An atomizer injector comprising a body of general cylindrical form, a portion of reduced diameter forming part of said body, a shoulder formed between said reduced portion and the adjacent portion of said body, an axial intake cavity in said body, a plurality of chambers in annular formation in the surface of the reduced portion and in communication with the intake cavity, a sleeve covering said reduced portion, means locking said sleeve against said shoulder, radial atomization holes in said sleeve one at the outlet of each chamber and means for fixing the exact position of the sleeve relative to the body so that the atomization holes in the sleeve may be correctly positioned relative to the chambers in the body.

2. An atomizer injector as claimed in claim 1, wherein the chambers are cylindrical in shape and are formed in two different rings, the plane containing the axes of one ring of chambers being parallel to and displaced from the plane containing the axes of the other ring of chambers.

3. An atomizer injector as claimed in claim 1, wherein the locking means for the sleeve include a screw-threaded extension of the body containing the intake cavity, and a nut screwed on said extension.

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