A liquid atomizing device in which a tubular body is open at both ends and has inclined blades mounted within one end to impart a swirling motion to air passing through the body. Fuel is supplied through passages which open on to the downstream edges of the blades, with the fuel being injected transversely into the swirling airstream.

2 Claims, 3 Drawing Figures
LIQUID ATOMIZING DEVICES

BACKGROUND OF THE INVENTION

This invention relates to a liquid atomizing device intended particularly for use in the burners of gas turbine engines.

SUMMARY OF THE INVENTION

A liquid atomizing device in accordance with the invention comprises a tubular body through which air is caused to flow in use, an air swirler at the downstream end of said body including a plurality of blades inclined to the axis of said body, a plurality of passages being formed in said blades and extending adjacent the respective trailing edges thereof, each such passage communicating with one or more transverse holes in the associated blade, and passage means whereby liquid can be supplied to said passages, with the arrangement being such that in use, liquid supplied to said passages is injected transversely into the swirling air stream through said holes.

BRIEF DESCRIPTION OF THE DRAWINGS

An example of the invention is shown in the accompanying drawings in which

FIG. 1 is a view of a liquid atomizing device in accordance with the invention, the view being partially in longitudinal section,

FIG. 2 is an end view of the device, also partially in section and

FIG. 3 is a developed cross-section on line 3—3 in FIG. 2.

DETAILED DESCRIPTION OF THE DRAWINGS

The device shown includes a tubular body 10 comprising an outer sleeve 11 and an inner sleeve 12 between which there is defined an annular passage means 13 communicating with an inlet 14 in a support 15 for the body 10. At the end of the body remote from the support 15 (i.e., the end which will be downstream in use), there is an air swirler 16 comprising a plurality of blades 17 which are inclined to the axis of the body 10 so that air flowing through the body 10 is given a swirling motion thereby to create a conically expanding air flow pattern immediately downstream of the body.

Each of the blades 17 is formed with a drilling 18 extending adjacent the trailing edge of the associated blade with such drilling communicating at its outer end with the annular passage 13. One or more cross bores 19 is or are formed in each of the blades 17 to communicate with the drilling 18 therein. In the example shown, there are three such cross bores in each blade and these open onto the face of the blade which will, in use, be at high pressure, as will be evident from FIG. 3.

Thus, in use, liquid is injected into the swirling air stream through the holes formed by the cross bores 19. It is intended that such an arrangement will be effective in atomizing the liquid over a wide range of liquid supply pressures and air flow rates through the body 10. Such a characteristic is required in the burners of a gas turbine engine to ensure effective atomization during starting when the fuel pressure is low and the air flow rate through the body 10 will similarly be low.

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

1. A liquid fuel atomizing device for positioning in an airstream, comprising a tubular body which is open at both ends and through which air is caused to flow in use, an air swirler at the downstream end of said body including a plurality of blades inclined to the axis of said body, a plurality of passages being formed in said blades and extending adjacent the respective trailing edges thereof, a hole opening onto the face of each blade which is, in use, at high pressure, said passages communicating with said holes, and passage means whereby liquid fuel can be supplied to said passages, the arrangement being such that in use, liquid fuel supplied to said passages is injected transversely into the swirling airstream through said holes, the body comprising an outer sleeve and an inner sleeve which between them define said passage means.

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2. The device as claimed in claim 1 in which each said passage communicates at its outer end with the said passage means.