Sept. 20, 1949. R. H. GODDARD 2,482,260

LIQUID FEEDING DEVICE

Original Filed May 20, 1944

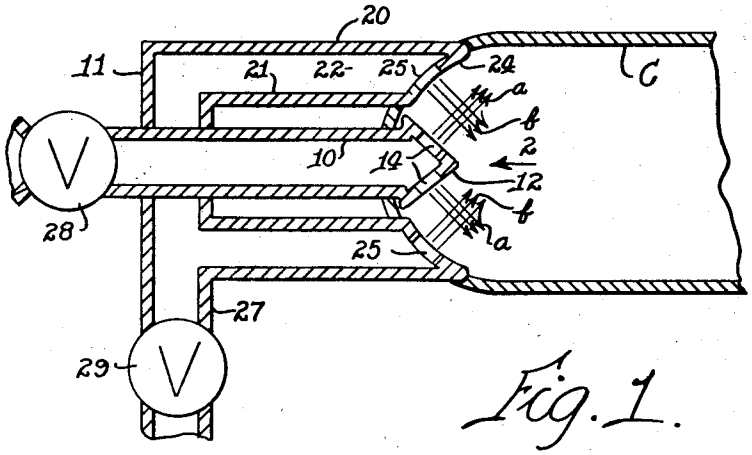

Fig. 1.

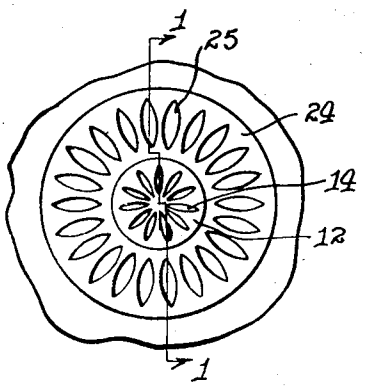

Fig. 2.

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LIQUID FEEDING DEVICE

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Original application May 20, 1944, Serial No. 536,558. Divided and this application March 22, 1946, Serial No. 656,316

1 Claim. (Cl. 299—143)

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This application is a division of original application Serial No. 536,558, filed by Robert H. Goddard on May 20, 1944, and relates to the improved liquid feeding device or spray nozzle shown but not claimed in said original application.

It is the general object of the invention to provide a liquid feeding device or spray nozzle of a new and improved construction and by the use of which improved results may be attained.

More specifically, the invention relates to a device by which two different combustion liquids may be fed simultaneously to a combustion chamber and may be effectively intermingled therein.

In the preferred form, the two liquids are sprayed substantially in radial planes, alternately disposed in an annular series, and furthermore the liquids are sprayed along lines which intersect substantially at 90° to each other.

The invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

A preferred form of the invention is shown in the drawings, in which

Fig. 1 is a sectional side elevation showing the improved liquid feeding device associated with a combustion chamber, the section being taken along the irregular line 1—1 in Fig. 2; and

Fig. 2 is a front elevation, looking in the direction of the arrow 2 in Fig. 1.

Referring to the drawings, the improved feeding device or spray nozzle is shown associated with a combustion chamber C and comprises an inner member 10 and an outer member 11.

The member 10 may be in the form of a hollow tube having a substantially conical end portion 12 provided with radially disposed slots 14.

The outer member 11 comprises an outer tube 20 and an inner tube 21 spaced from the outer tube 20 to provide an annular passage 22. The outer ends of the tubes 20 and 21 are connected by an annular end portion 24 provided with radially disposed slots 25. The end portion 24 is preferably concave. A supply pipe 27 is connected into the outer tube 20, and the usual shut-off valves 28 and 29 may be provided as shown.

Reference to Fig. 2 discloses that the slots 14 in the cone-shaped end 12 of the inner member 10 are disposed in radial planes which pass between adjacent slots 25 in the annular portion 24 of the outer member 11. The sprays from the inner slots 14 are directed outward, as indicated by the arrows *a*, while the sprays from the outer slots 25 are directed inward as indicated by the arrows *b*. The two different sets of sprays thus cross each other substantially at 90° and are disposed in radial planes which are alternately disposed in an annular series.

Two combustion liquids, such as gasoline and

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liquid oxygen, may thus be delivered to the combustion chamber C in such alternated and intersecting relations that extremely effective mixing and intermingling of the two liquids immediately takes place.

The improved feeding device or spray nozzle is extremely simple in construction and economical to manufacture and may be readily constructed of materials well adapted to resist high temperatures. If desired, the exposed surfaces of the cone 12 and the annular portion 24 of the outer member 11 may have protective coatings of any suitable heat-resistant material.

Having thus described the invention and the advantages thereof, it will be understood that the invention is not to be limited to the details herein disclosed, otherwise than as set forth in the claim, but that what is claimed is:

A liquid feeding device comprising an inner feeding element having a plurality of outwardly directed and radially elongated end feeding slots producing an expanding laminated liquid spray, a concentric outer feeding element having an annular series of inwardly directed and radially elongated end feeding slots producing a second and contracting laminated liquid spray intersecting said first spray in an annular locus, means to feed one combustion liquid to said inner feeding element and separate means to feed a different combustion liquid to said outer feeding element, and the radially elongated slots in the inner feeding element being positioned in radial planes alternately disposed with respect to the radial planes of the radially elongated slots in the outer annular series, whereby the spray laminations of said two series of slots are alternately disposed circumferentially and said liquids are effectively intermingled.

ESTHER C. GODDARD,
Executrix of the Last Will and Testament of Robert H. Goddard, Deceased.

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