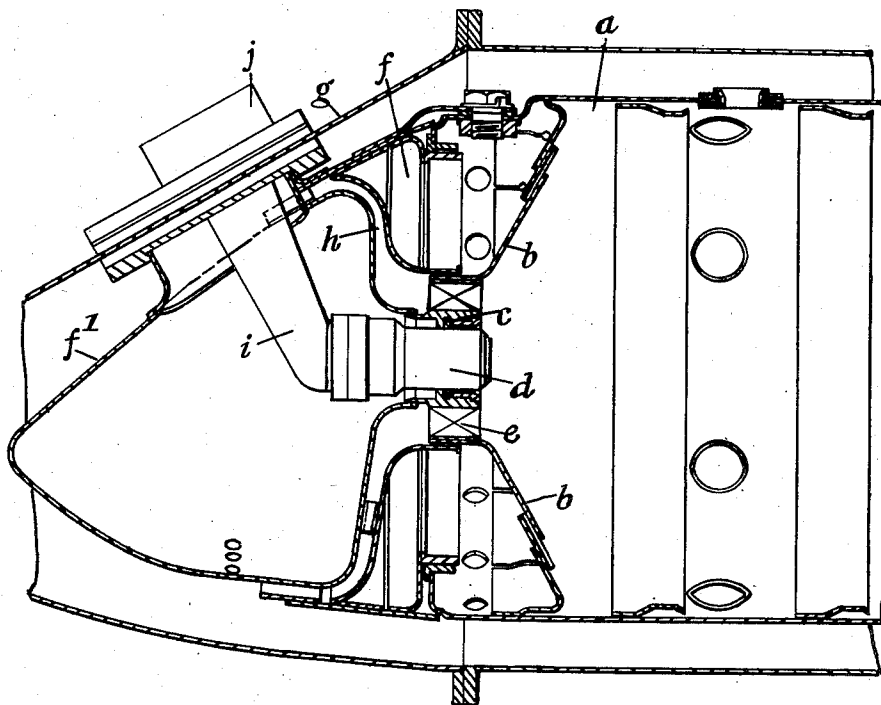


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COMBUSTION CHAMBERS FOR JET PROPULSION ENGINES, GAS
TURBINES, OR OTHER APPARATUS
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COMBUSTION CHAMBERS FOR JET PROPULSION ENGINES, GAS TURBINES, OR OTHER APPARATUS

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1 Claim. (Cl. 158—4)

This invention relates to liquid fuel combustion chambers for jet-propulsion engines, gas turbines or other apparatus such as air heaters, comprising a single combustion chamber, or a number of similar combustion chambers grouped in annular form, and of the kind in which there is provided on the axis of the combustion chamber (or each chamber) at its fuel-entrance end a fuel supply nozzle which is surrounded by an annular air passage.

The object of the invention is to provide improved means for gathering air supplied by a blower to a surrounding air jacket and conveying it to the annular passage around the nozzle.

A combustion chamber in accordance with the invention has combined with its entrance end a nose piece shaped to form an air passage of such form that its outlet is of smaller diameter than its inlet, the passage being adapted to divert a quantity of air from the air jacket to the annular air passage around the fuel nozzle.

The accompanying drawing is a sectional side elevation of a combustion chamber provided with the invention.

Referring to the drawing, the combustion chamber *a* there shown is constructed from sheet metal and is of substantially cylindrical form. The entrance end of the combustion chamber is closed by a dished metal disc *b* which at its center is provided with a socket *c* for supporting the fuel injection nozzle *d*, and shaped to form an annular air passage *e* which preferably includes air swirling vanes. Also this end of the combustion chamber is extended to form a part *f* of a hollow sheet metal nose piece, the other part *f*¹ of the nose piece being also a sheet metal construction, and being of substantially conical or semi-ellipsoidal shape.

The combustion chamber and nose piece are contained in a sheet metal enclosure *g* forming an air jacket the configuration of which corresponds with that of the said contained parts, its entrance end to be connected by a duct to a blower, being of relatively small diameter.

The adjacent end faces of the two parts *f*, *f*¹ of the nose piece are shaped to form between them an air passage *h* having its inlet at the outer circumference of the nose piece, and its outlet coincident with the passage *e*. Also the inlet is directed upstream relatively to the air in the jacket. The shape and position of the inlet end is such that it can gather from the air stream in the jacket the quantity of air required to be diverted to the annular passage around the fuel nozzle. The said end faces of the parts *f*, *f*¹ are suitably shaped as shown so that the

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passage formed between them can convey the diverted air with a minimum of energy loss.

Fuel is conveyed to the nozzle by a pipe *i* contained in the nose part *f*¹, the said pipe extending from a fitting *j* on the air jacket to which is attached a feed pipe (not shown).

The invention minimises the obstructive effect that the fuel supply pipe *i* would otherwise have on the air supplied to the combustion chamber *a* through the annular air passage *e* around the fuel nozzle *d*. By the invention this air is collected over an annular area of large external and internal diameters at the inlet end of the air passage *h* and delivered over an annular area of considerably smaller external and internal diameters to the annular air passage *e*. Due to the large external and internal diameters of the annular area over which this air is collected, the obstructive effect of the fuel supply pipe is relatively small. Moreover, as the collected air is delivered to the annular air passage *e* over an annular area which is of considerably smaller external and internal diameters than the annular air-collecting area, and which is unobstructed by the fuel supply pipe *i*, it follows that the velocity of the air increases as it approaches the annular air passage *e*, and that the air entering this passage is unaffected by the fuel supply pipe.

The invention is applicable in essentially the same manner to a number of similar combustion chambers arranged in annular form around a central axis in which each chamber is surrounded by its own air jacket, or in which the assembly of combustion chambers is surrounded by inner and outer sheet metal walls forming an air jacket common to all the combustion chambers.

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

An air-jacketed combustion chamber having in combination with an air entrance at one end of the chamber, a coaxially arranged fuel nozzle surrounded by an annular air passage, and a hollow air-directing nose of progressively varying diameter extending from the air-entrance end of the chamber with the larger end of the nose adjacent to the said end of the chamber, the said nose being composed of a pair of hollow parts having adjacent faces shaped to provide through the nose a second annular air passage which has an air inlet end around the nose at a position between the ends of the nose, and an outlet end of smaller external diameter than the inlet end in communication with the first mentioned annular air passage around the fuel nozzle, so that some of the air flowing over the nose enters the second air passage and flows therethrough to the first mentioned air passage.

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