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I. M. BITHER

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OIL BURNER NOZZLE HEAD ELEMENT

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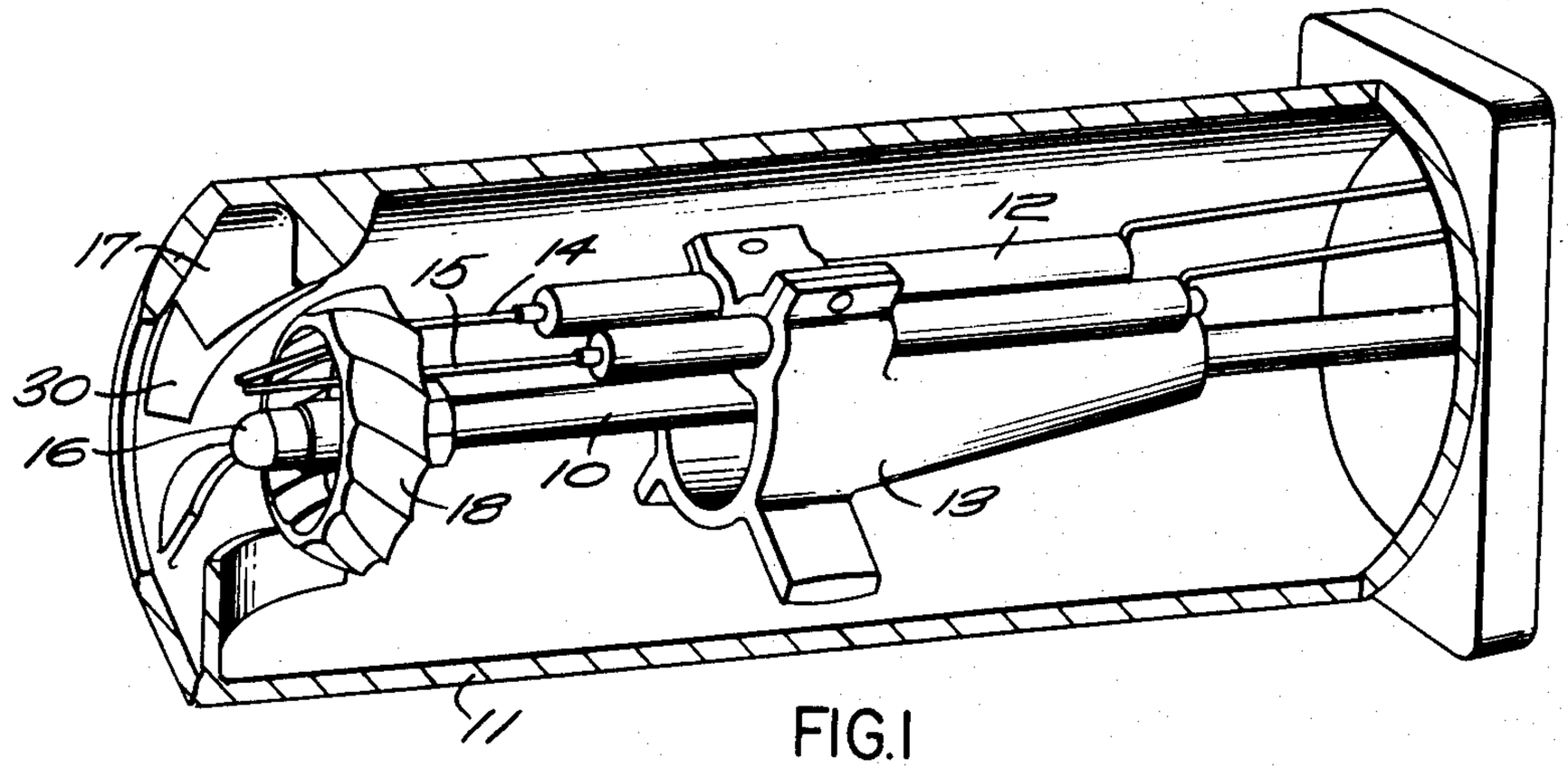

FIG.1

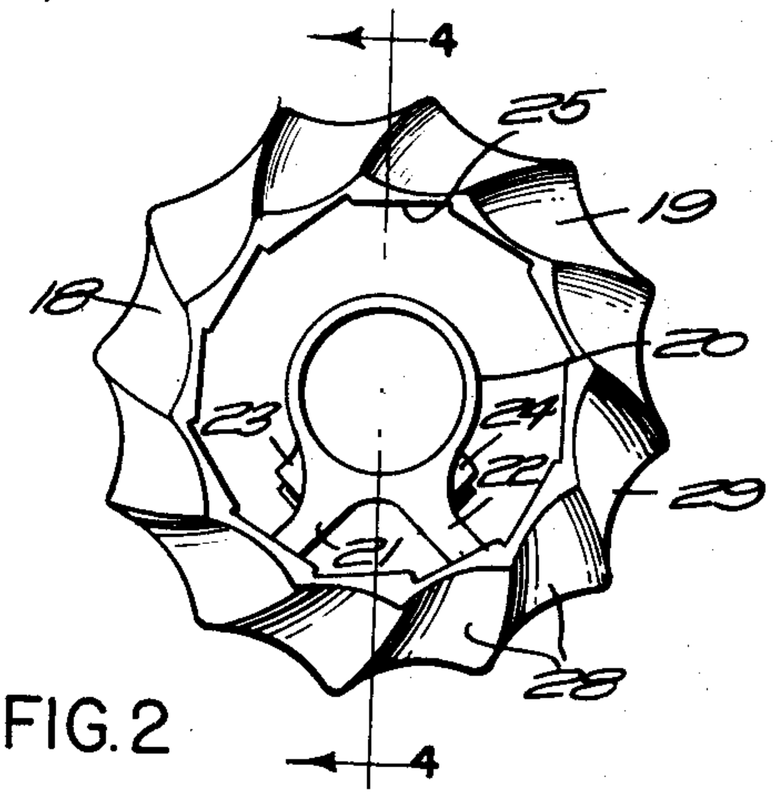

FIG.2

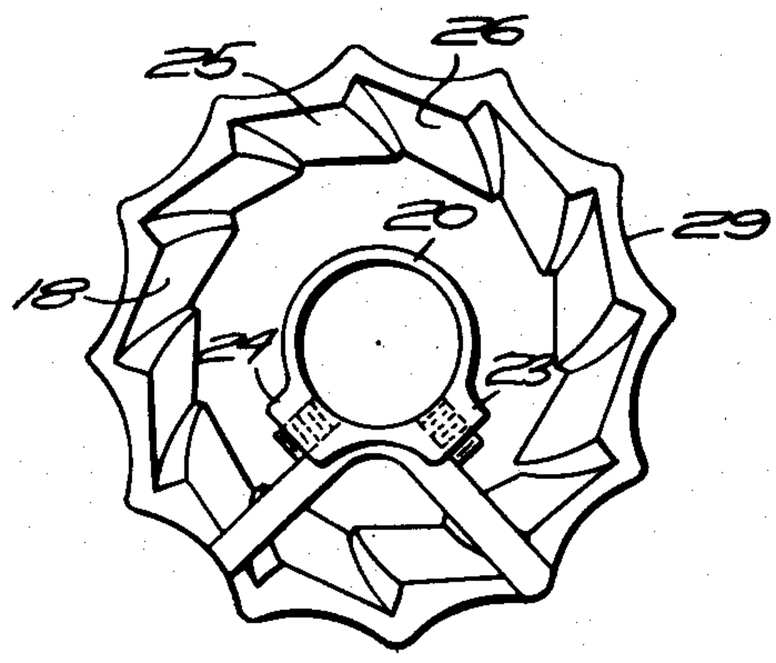

FIG.3

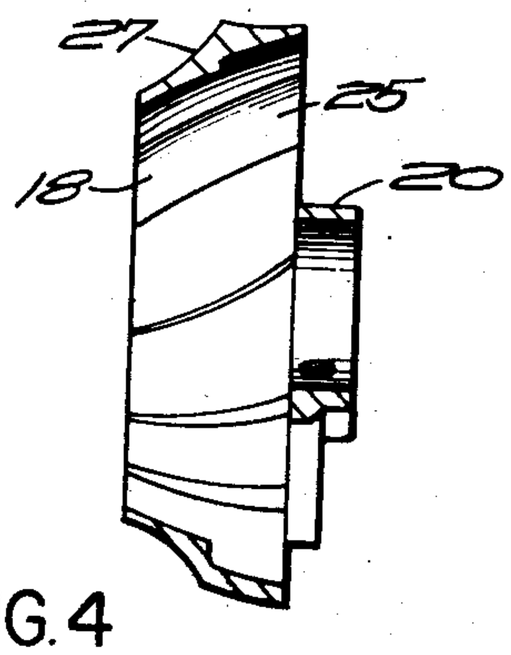

FIG.4

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OIL BURNER NOZZLE HEAD ELEMENT

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1 Claim. (Cl. 158—76)

1

The present invention relates to oil burner installations, and has particular reference to a novel head element for an oil burner nozzle.

The principal object of the invention is to provide a head element for an oil burner nozzle which increases the efficiency of combustion.

Another object of the invention is to provide an oil burner nozzle head element which produces a thorough combustion mixture of air and atomized oil.

A further object of the invention is to divide the burner air supply into a primary and a secondary air stream for progressively atomizing and mixing with the oil from the burner nozzle.

An additional object of the invention is to impart a whirling rotation to a primary and a secondary air stream, whereby the streams impact the oil spray and produce a uniform dispersion of the oil in the combustion air.

With the above and other objects and advantageous features in view, the invention consists of a novel arrangement of parts more fully disclosed in the detailed description following, in conjunction with the accompanying drawings, and more specifically defined in the claim appended thereto.

In the drawings,

Fig. 1 is a perspective view of an oil burner, partly broken away;

Fig. 2 is a front elevation of the novel oil burner nozzle head element;

Fig. 3 is a rear view of Fig. 2; and

Fig. 4 is a transverse section on the line 4—4 of Fig. 2.

It has been found desirable to provide an oil burner nozzle with a head element which is interposed in the path of the combustion air and which divides the combustion air into two whirling conical streams, one whirling air stream being compressed to build up a static pressure differential and to impact into the oil stream to disperse and vaporize the oil and to provide a primary mixture, and the other whirling air stream flowing across the primary mixture to further disperse and atomize the oil and thus produce a resulting uniform air-oil combustible mixture. The resulting combustion is hotter, and has a higher CO_2 content, whereby less oil is required for a given heating demand and a lower stock temperature and greater heating efficiency results.

2

Referring to the drawings, which illustrate the novel head element as applied to a conventional oil burner nozzle with turbulator, the nozzle pipe 10 is centrally mounted in the draft tube 11 which receives air from the usual blower housing, not shown. The electrode assembly 12 is mounted in an insulating support 13, the electrodes 14, 15 being positioned adjacent the nozzle tip 16. The draft tube has a turbulator 17 at the forward end, and a head element 18 of novel construction is mounted on the nozzle pipe 10 adjacent the nozzle tip, as illustrated.

The head element 18 includes an outer annular shell 19 of tapered shape, which has a central support ring 20 secured thereto, as by legs 21, 22 which are positioned adjacent the lower portion of the shell, and have set screw bosses 23, 24 for receiving set screws for locking the head element support ring to the nozzle pipe, the lower positioning of the legs 21, 22 providing an ample open annular space greater than a half-circle for the electrodes 14, 15. The inner surface 25 of the shell 19 has a number of spiral air flow guide vanes 26 which taper down in contact overlapping block relation as illustrated to provide converging whirl guides which serve to compress the entering air and impact a whirling motion to the compressed air flow, whereby the whirling air impacts the expanding oil spray from the nozzle tip and produces a primary mixture of atomized oil and air.

The outer surface 27 of the shell 19 has a number of spiral air flow guide vanes 28 which taper down and converge as illustrated, and intermediate of arcuate troughs formed as indicated by the reference numeral 29 to produce a whirling outer cone of secondary air which flows into and across the primary mixture to produce a thorough oil dispersion in the combustion air, the dispersion being further whirled as it passes through the turbulator vanes 30.

The novel head element thus separates the combustion air stream into a primary whirling stream having a relatively high pressure, which impacts the oil spray to produce a primary air-oil mixture, and a secondary whirling stream which mixes with the primary air-oil mixture to complete a thorough dispersion of the oil in the combustion air, whereby a more rapid and a hotter burning results.

Although I have described a specific construc-

tional embodiment of my invention, it is obvious that changes in the size, shape and arrangement of the parts may be made to accord with different oil burner nozzle shapes and requirements, without departing from the spirit and the scope of the invention as defined in the appended claim.

I claim:

A head element for an oil burner nozzle, comprising an outer annular tapered shell, a central support ring, and legs extended from said ring and secured to said shell, the inner surface of the shell having converging spiral air flow guide vanes in contact overlapping block relation, the outer surface of said shell having converging spiral flow guide vanes separated by arcuate troughs.

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