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IGNITER

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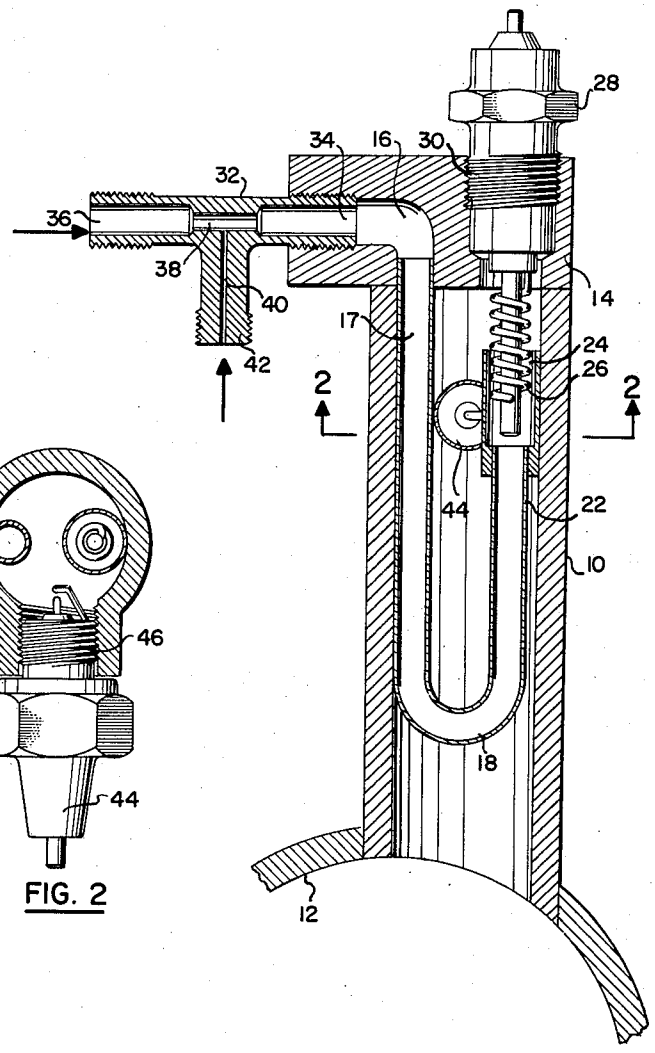


FIG. 1

FIG. 2

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1 Claim. (Cl. 60—39.82)

This invention relates to igniters for fuel burners and more especially to igniters which burn heavy fuel oil and are adapted to ignite fuel burners of gas engines which are supplied by heavy fuel oil.

Gas engines such as gas turbines and jet engines present problems in starting which are not present in other engines. Such engines must start under various interior pressures and temperatures and under a strong flow of the air or other gases which are to be heated to operate the engine. The ignition must be positive so that the fuel is ignited immediately when it enters the burner. Failure in the ignition passes fuel into the after parts of the engine where it may cause an explosion.

For example, gas turbines usually have a number of burners commonly known as flame tubes. Failure in the timely ignition in one of the flame tubes passes the unburned fuel oil into the after part of the engine. This fuel may then be ignited by the other flame tubes and may explode in the engine.

The seriousness of this problem is intensified where gas engines operate on low volatile fuel oil and where the igniters use fuel of the same type to avoid the need of a separate fuel supply.

It is an object of the invention to provide a positively acting igniter for burners.

It is another object of this invention to provide an igniter which burns low volatile fuel oil and which is adapted to ignite the burners of a gas engine fired by the same type of fuel oil.

Other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the annexed drawings, which illustrate a preferred embodiment, and wherein:

Fig. 1 is a sectional view of the igniter of this invention positioned on the flame tube of a gas turbine;

Fig. 2 is a sectional view on the line 2—2 of Fig. 1.

Referring now to the drawings for a description of the invention, the reference numeral **10** designates a metal tube which communicates at one end with a flame tube **12**. The other end of the tube **10** is closed by a metal block **14**. An angle bore **16** is formed in the block **14** which bore **16**, at its outlet end, connects with one leg **17** of a U-shaped metal tube **18** positioned in the tube **10**. The other leg **22** of the U-shaped tube **18** connects with a larger tube **24** which extends towards the block **14**. The tube **24** encloses one end of a heating element **26** of heating plug **28** which extends through a threaded opening **30** in the block **14**.

A T-shaped coupling **32** forms a carburator and connects at its outlet end **34** with the bore **16**. The inlet **36** end of the coupling **32** connects with the outlet end **34** thereof through a restricted pasage **38**. A smaller bore **40** connects the restricted passage **38** with a fuel inlet end **42** of the T-shaped coupling **32**.

A spark plug **44** projects through a screw threaded opening **46** into the tube **10** at a point adjacent the larger tube **24**.

In the operation of the device, the fuel inlet **42** of the coupling **32** is connected to a fuel reservoir (not shown) of diesel or fuel oil and the air inlet **36** to a supply of compressed air. The heating plug **28** and the spark plug **44** are then energized and the compressed air is admitted to the coupling **32** through the inlet **36**. This aspirates fuel from the reservoir through the tube **40** and mixes the fuel with the air to form a spray. The spray enters the U-shaped tube **18** and passes through tube **24** over the heating element **26** which vaporizes a portion of the fuel oil. This vapor is ignited by the spark plug **44** producing an initial flame in the igniter. This flame travels back to the tube **24** and extends downwardly in the tube **10** thereby heating and vaporizing the fuel spray in the U-shaped tube **18**. This vapor augments the flame at the mouth of the tube **24** and further heats the tube **18** when the flame is deflected by closure **14** over the tube and through the outlet of the housing into the combustion chamber. When the flame is started, the heater plug **28** and the spark plug **44** may be deenergized. The flame in the tube **10** will gradually become hotter and extend into the flame tube **12**.

The flame tube **12** already carries a strong flow of air. The fuel supply (not shown) of the flame tube **12** may now be turned on and will be ignited instantly by the hot flame shooting forth from the tube **10**.

It will be apparent from the above that this invention produces an igniter adapted to utilize a low volatile fuel and in a short period of time to produce a hot flame which will positively ignite a burner using similar fuel oil.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claim the invention may be practiced otherwise than as specifically described.

What is claimed is:

An ignition device adapted for the instantaneous combustion of reactants within a combustion chamber which comprises a housing having one open end in communication with the combustion chamber and a closed end disposed exteriorly thereof, said housing providing an elongate ignition chamber between said ends, supply means adjacent the closed end of and communicating with the housing for the admission of the air-fuel mixture, a generally U-shaped preheater tube within the housing and extending substantially the length thereof, said preheater tube having an inlet end in communication with said supply means and an open outlet end spaced axially from its inlet end, said outlet end of the tube providing a space with the closed end of the housing, heating means extending through the closed end of the housing and extending into the outlet end of the preheater tube for vaporizing the mixture and ignition means within the housing for igniting the vaporized mixture to produce a flame whereby said closed end of the housing provides a baffle to deflect the flame over th preheater tube and through its outlet end into the combustion chamber.

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