

Sept. 2, 1924.

1,506,932

V. L. HUDSON

FUEL BURNER

Filed June 24, 1922

Fig. 1.

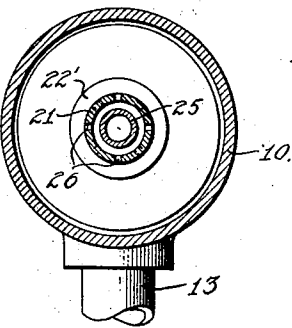
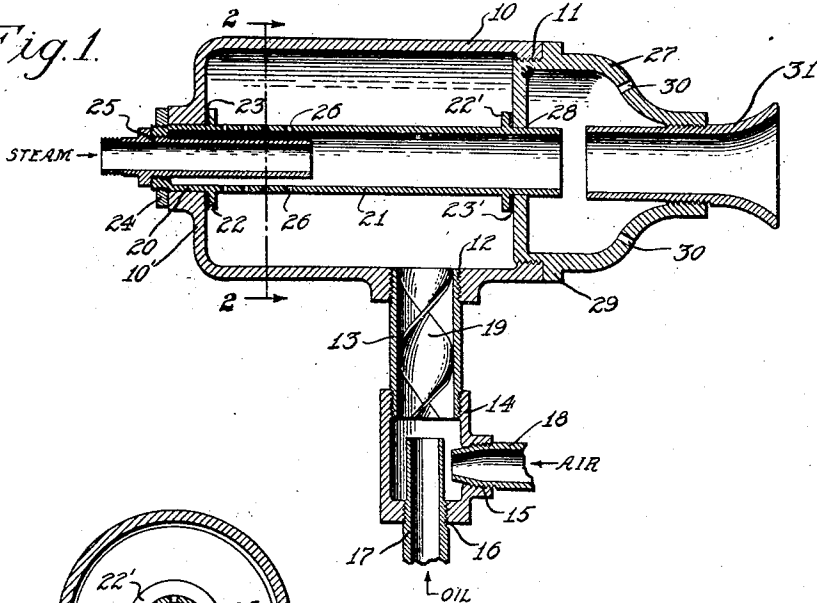


Fig. 2.

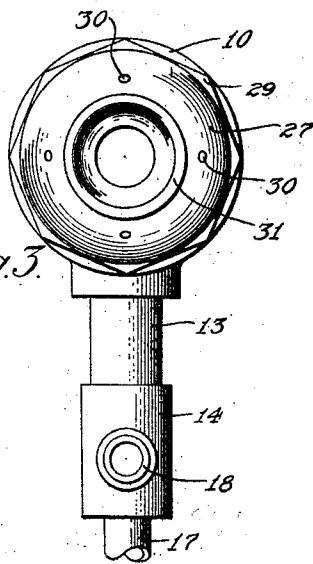


Fig. 3.

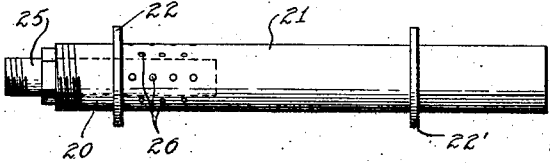


Fig. 4.

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UNITED STATES PATENT OFFICE.

VESTER L. HUDSON, OF ATLANTA, TEXAS.

FUEL BURNER.

Application filed June 24, 1922, Serial No. 570,684.

To all whom it may concern:

Be it known that I, VESTER L. HUDSON, a citizen of the United States, residing at Atlanta, in the county of Cass and State of Texas, have invented new and useful Improvements in Fuel Burners, of which the following is a specification.

This invention relates to fuel burners, and more particularly to burners of the injector type which utilize oil or other liquid as a fuel, and in which steam, preferably, furnishes the injecting force as well as the means in association with air for vaporizing the oil.

The burner of this invention is intended, particularly, for use in connection with steam boiler furnaces, and the invention has as its object the provision of a burner which is of compact, simple and inexpensive construction.

The invention seeks to provide a burner which will thoroughly mix the oil, steam and air before ignition; to insure thorough vaporizing of the oil and breaking up of the same preliminary to its ignition; to provide a burner having the several parts so related that the air and oil will be well commingled and the oil preliminarily broken up and volatilized by means of the heated air before the air and oil are associated with the steam.

A further object of the invention is to provide a burner which will subject the steam to a minimum of back pressure, thereby insuring operation of the burner when the steam pressure is very low.

Other objects of the invention which are more closely associated with the details of construction will become clear as the description proceeds in connection with the embodiment of the invention disclosed in the accompanying drawings and herein set forth in detail.

In the drawings,—

Fig. 1 is a longitudinal section of the burner,

Fig. 2 is a cross section on the line 2—2 of Fig. 1 looking in the direction of the arrows,

Fig. 3 is a rear end view, and

Fig. 4 is an elevational view of the final mixing tube.

The invention comprises a shell or casing 10 having its forward end open and preferably internally threaded, as at 11. The shell has a side port 12 into which extends a nipple 13 forming a conduit for air and

oil. To the nipple 13 is secured a two-way coupling 14 having a lateral inlet opening 15 and an inlet opening 16. An oil pipe 17 is secured in the inlet 16 and projects through the coupling a substantial distance so as to extend across the open end of an air pipe 18 projecting through the opening 15. The pipe 18 is intended to be connected to a source of hot air from a furnace, the air being sucked through the pipe 18 by a steam jet injector associated with the burner in a manner later to be described. It will be observed that the air entering the port 15 impinges against the oil pipe 17 and thereby preliminarily heats the oil passing through this pipe. The air and oil commingle in the conduit 13 and are given a rotary or gyratory motion by means of a spiral vane 19 positioned in the conduit, whereby a thorough commingling of the air and oil and a partial preliminary volatilization of the oil by the heated air is insured.

The rear end of the shell 10 is provided with a relatively small opening 20, and into this opening extends the end of a final mixing tube 21 having a flange 22 abutting the rear wall 10' of the casing, a gasket 23 being positioned between the flange and casing wall to prevent leakage. The mixing tube may be held in position by means of a lock-nut 24 upon the exterior of the casing threaded upon the end of the tube. The interior of the tube is also threaded at its end to receive a steam jet nozzle 25 adapted to be connected to a suitable source of steam supply and extending a substantial distance through the mixing tube 21. The steam passing through the nozzle 25 serves as an injector jet, and surrounding the nozzle are a plurality of openings 26 in the mixing tube through which the commingled air and oil are drawn by means of the steam jet passing through the nozzle 25.

The forward end of the tube 21 extends into a bonnet 27 having an opening 28 in its rear wall to receive the end of the tube 21, the wall of the bonnet abutting a flange 22' upon the tube, and a gasket 23' being positioned between the wall and the flange. The bonnet 27 has a reduced threaded portion 28 cooperating with the threading 11 in the forward end of the shell, and, by means of a peripheral flange 29, closes the end of the shell. A plurality of cold air openings are formed in the bonnet so as to permit the commingled air, steam and oil in the tube

to receive a final blast of air. To insure proper induction of the air through the openings 30 a nozzle 31 is positioned in the forward end of the bonnet and extends into the bonnet a substantial distance so that its end is positioned slightly in front of the end of the mixing tube 21. The nozzle 31 is of greater diameter than the tube 21 so that the same exerts no back pressure upon the supply of fuel passing through the tube 21. It will be understood that as the fuel enters the nozzle 31 from the tube 21 the air is drawn through the openings 30 in the bonnet and is mixed with the fuel as it enters the nozzle.

It will be observed that the parts of the burner are detachably associated so that the burner may be readily cleaned, and emphasis is also laid upon the relative arrangement of parts. That is to say, thorough commingling of the air and oil and preliminary heating and partial volatilization of the oil is insured before the mixing of the oil with the steam, which completes the breaking up of the oil to prepare the same for ignition. I am aware that it is well known in the art to provide burners adapted for the use of air, steam and oil and the mixing of the same preparatory to ignition. However, so far as I am aware, there is no burner now in use or known in which the various constituents of the fuel are mixed during the several stages of the passage of the fuel elements through the burner in the manner in which my burner effects this operation.

It should be understood that various modifications may be made in the illustrated and described construction without departing from the scope of the invention, which is more definitely set forth in the following claims.

I claim:—

1. A burner of the class described comprising a casing, a mixing tube extending through said casing, a steam jet nozzle extending partially through said tube, said tube having a plurality of openings around said nozzle whereby liquid fuel may be drawn into said tube, a conduit communicating with the interior of said casing, an oil supply pipe communicating with said conduit, a hot air supply pipe connected with the conduit, and means in said conduit for mixing the oil and air as they pass therethrough, the steam jet issuing from

said nozzle being adapted to draw the commingled oil and air into said tube through the casing and to mix therewith.

2. A burner of the class described comprising a casing, a mixing tube extending through said casing, a steam jet nozzle extending partially through said tube, said tube having a plurality of openings around said nozzle whereby liquid fuel may be drawn into said tube, a conduit communicating with the interior of said casing, an oil supply pipe communicating with said conduit, a hot air supply pipe connected with the conduit, means in said conduit for mixing the oil and air as they pass therethrough, the steam jet issuing from said nozzle being adapted to draw the commingled oil and air into said tube through the casing and to mix therewith, a bonnet closing the forward end of said casing, the end of said tube projecting into said bonnet, said bonnet having a plurality of air inlet openings and a nozzle in said bonnet affording an outlet for the commingled steam, air and oil.

3. A burner of the class described comprising a casing, a mixing tube extending through said casing, a steam jet nozzle extending partially through said tube, said tube having inlet ports around said nozzle whereby liquid fuel may be drawn into the interior of said tube, a hot air supply pipe communicating with the interior of said casing, an oil supply pipe communicating with the interior of said casing, the hot air and oil passing through said pipes and commingling in said casing whereby the oil is preliminarily heated and partially volatilized and the steam jet issuing from said nozzle drawing the commingled air and oil through said inlet openings into the tube, and a discharge nozzle at the forward end of said tube.

4. A burner as specified in claim 3, said casing having a bonnet closing its forward end in which said discharge nozzle is positioned, said tube projecting into the bonnet, and said bonnet having a plurality of inlet openings whereby cold air may be commingled with the steam, hot air and oil before the mixture issues through said nozzle.

In testimony whereof I have hereunto set my hand.

VESTER L. HUDSON.