

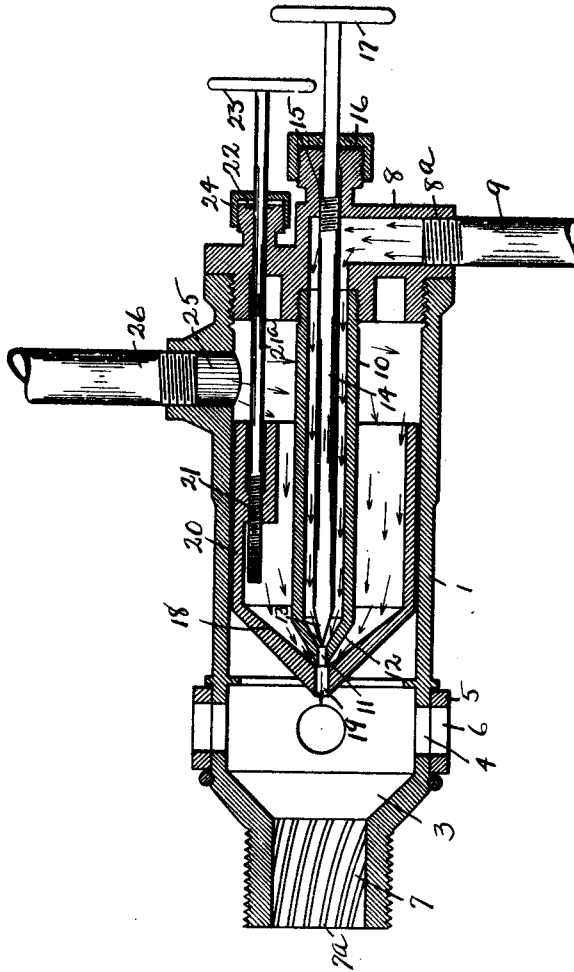
Feb. 27, 1923.

1,446,514

P. B. NORRIS

FLUID FUEL BURNER

Filed Jan. 13, 1920



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UNITED STATES PATENT OFFICE.

PAUL B. NORRIS, OF ROBINSON, ILLINOIS.

FLUID-FUEL BURNER.

Application filed January 13, 1920. Serial No. 351,112.

To all whom it may concern:

Be it known that I, PAUL B. NORRIS, a citizen of the United States, residing at Robinson, in the county of Crawford and State of Illinois, have invented new and useful Improvements in Fluid-Fuel Burners, of which the following is a specification.

This burner is designed to operate with either liquid fuel or gas and with an atomizing fluid in the form of either air or steam, preferably steam if liquid fuel is used.

The invention is illustrated in the accompanying drawing by a sectional view. The body 1 of the burner is provided with a mixing chamber 3 at its forward end with air openings 4. The air openings 4 are controlled by an annular shutter 5 with openings 6 which may be brought into and out of register with the openings 4. A nozzle 7 leads from the mixing chamber 3 and is provided with the spiral flutes 7^a which assist in breaking up the mixture.

The body 1 is provided with a head 8. This has an inlet passage 8^a into which a fuel pipe 9 extends. A fuel tube 10 extends from the passage 8^a and is arranged at the axis of the burner and terminates in a nozzle opening 11. The end of the tube 10 is tapered at 12 and a needle valve 13 operates on the opening 11. A stem 14 extends from the needle valve, the stem being provided with a screw 15 operating in the body and through a gland 16. The stem is provided with a handle 17 by means of which the needle valve may be readily adjusted.

An atomizing nozzle 18 has an opening 19 in alinement with the opening 11. The nozzle 18 has an extension 20 which is slidingly mounted in the body 1. A screw 21 operates in the extension 20 and is provided with a stem 21^a which is provided with a shoulder 22. The shoulder 22 is arranged in a gland 24 so that the stem 21^a may be locked against axial movement. The stem is provided with a handle 23 by means of which the screw 21 may be operated.

A passage 25 extends from the body 1 back of the extension 20 and a pipe 26 supplies the atomizing fluid—steam or air.

It will be noted that the atomizing fluid surrounds the fuel and is carried to the fuel through an annular nozzle formed by the tapered surfaces of the atomizing nozzle 18 and the surface 12. It will be noted that the passages for the fuel and the atomizing fluid are of large capacity to the point of restric-

tion at the nozzle so that the atomizing is accomplished with full fluid pressure thus breaking up the fuel with the greatest efficiency possible. Where liquid fuel is used and steam is used as the atomizing fuel it will be observed that the liquid is subjected to the heat of the steam for the entire length of the tube and this assists in the atomizing and vaporizing of the fuel.

It will also be observed that the mixture which is delivered from the nozzle 18 is not the burning mixture but that an added amount of air is drawn into the mixing chamber through the openings 4. This again permits of a reduction of the discharge of atomizing fuel so that it may be delivered with high velocity, thus giving full atomizing force and still permit of a full supply of air to give a perfect combustible mixture.

By adjusting the atomizing nozzle by means of a screw off-set from the axis full capacity of the atomizing nozzle is effected and the full length of the tube 10 may be exposed to the action of steam.

What I claim as new is:—

1. In a fluid fuel burner, the combination of a mixer having openings to the atmosphere; a burner nozzle leading from the mixing chamber; an atomizing nozzle leading into the mixer; a fuel nozzle discharging into the atomizing nozzle, the fuel nozzle being in alinement axially with the atomizing nozzle and placed to the rear thereof, the cross sectional area of the fuel nozzle projected coming directly within the cross sectional area within the walls of the atomizing nozzle; a screw operating on the atomizing nozzle to adjust it relatively to the fuel nozzle and as to its capacity; and means for locking the screw against axial movement.

2. In a fluid fuel burner, the combination of a mixer having openings to the atmosphere; a burner nozzle leading from the mixing chamber; an atomizing nozzle leading into the mixer; a fuel nozzle discharging into the atomizing nozzle; a screw operating on the atomizing nozzle to adjust it relatively to the fuel nozzle and as to its capacity; and means for locking the screw against axial movement, said screw being off-set from the axis of the burner.

3. In a fluid fuel burner, the combination of a body; an atomizing nozzle slidingly mounted in the body and having a nozzle opening with a tapered interior wall extending therefrom; a screw operating in the

atomizing nozzle; a stem on the screw locked against axial movement relatively to the body, the screw being adapted to adjust the atomizing nozzle axially of the body; and a contracted fuel nozzle discharging into the atomizing nozzle, said fuel nozzle being placed to the rear of and in alinement with the atomizing nozzle.

4. In a fluid fuel burner, the combination of a body; a head mounted on the body; a fuel passage leading into the head; a fuel tube leading from the head axially of the body and terminating in a fuel nozzle; a needle valve operating in the fuel nozzle and having a stem extending therefrom; a gland for the stem carried by the head; an atomizing nozzle slidingly mounted in the body; and a screw off-set from the axis of the body for operating the atomizing nozzle.

5. In a fluid fuel burner, the combination of a body; a head mounted on the body; a fuel passage leading into the head; a fuel tube leading from the head axially of the body and terminating in a fuel nozzle; a needle valve operating in the fuel nozzle and having a stem extending therefrom; a gland for the stem carried by the head; an atomizing nozzle slidingly mounted in the body; a screw off-set from the axis of the body for operating the atomizing nozzle; a mixer arranged in front of the atomizing nozzle and having openings extending through the walls thereof; a shutter operating on the openings; and a nozzle extending from the mixer.

In testimony whereof I have hereunto set my hand.

PAUL B. NORRIS.