May 15, 1923. 1,454,975

F. MARTINDELL

LIQUID FUEL BURNER

Filed June 24, 1920

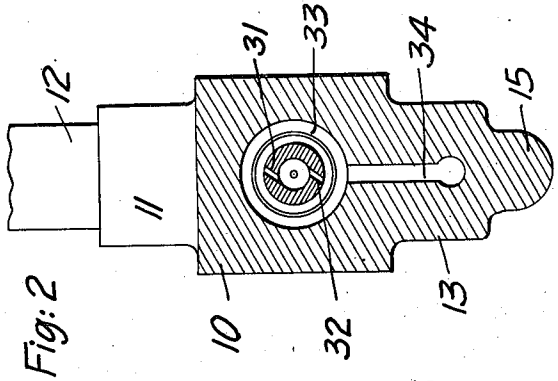


Fig: 2

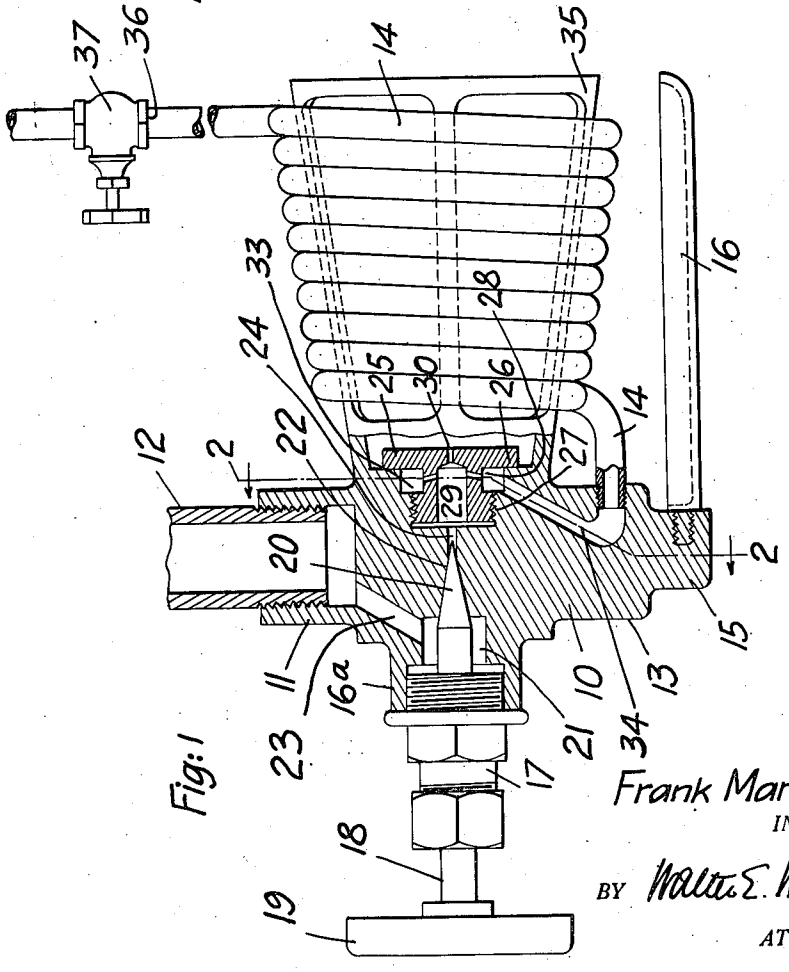


Fig: 1

Frank Martindell
INVENTOR.

BY Walter E. Woelheim
ATTORNEY.

Patented May 15, 1923. 1,454,975

UNITED STATES PATENT OFFICE.

FRANK MARTINDELL, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE ANTHONY COMPANY, OF LONG ISLAND CITY, NEW YORK, A CORPORATION OF NEW YORK.

LIQUID-FUEL BURNER.

Application filed June 24, 1920. Serial No. 391,455.

To all whom it may concern:

Be it known that I, FRANK MARTINDELL, a citizen of the United States, and a resident of Brooklyn, in the county of Queens and State of New York, have invented certain new and useful Improvements in Liquid-Fuel Burners, of which the following is a specification.

This invention relates to liquid fuel burners of the kind which are self-contained that is burners which generate their own atomizing agents for even the heaviest liquid fuels.

It is one of the objects of the invention to make one of these burners particularly applicable where no steam boiler, air compressor or air blower is available, even dispensing with the use of a fuel pump where the fire regulations do not prevent gravity flow.

Another object is to provide a liquid fuel burner with such safety devices as to make them particularly adapted for general house heating inasmuch as the constant attendance of a fireman can be eliminated.

Other objects of the invention are apparent in the following specifications, in which a preferred form of my burner is disclosed.

Principally stating, the burner is a combination of a liquid fuel burner of the steam atomizing type and a steam generator. This generator is an integral part of the burner and its sole purpose is to generate steam for atomizing the liquid fuel in the burner.

The source of heat for generating the steam is the combustion of the liquid fuel as atomized by the steam. The burner and the stem generator form together a unit which is a self-contained steam atomizing liquid fuel burner.

The invention is illustrated by means of the accompanying drawings in which—

Fig. 1 is a vertical longitudinal sectional view through the burner; and

Fig. 2 is a cross-sectional view along the plane of line 2—2 in Fig. 1.

Like characters of reference denote similar parts throughout the several views and the following specifications.

10 is a body of the burner. 11 is a tubular extension on one side of the body 10 threaded to receive an oil pipe 12. The opposite end of body 10 is provided with another extension 13 tapped on one side for a steam pipe 14. Extension 13 is further provided with a boss 15 to which is fastened an elongated bowl 16. Centrally between extensions 11 and 13, body 10 is extended at 16ª to receive a screw bonnet 17 into which a spindle 18 can be reciprocated. 19 is a suitable hand wheel affixed to the outer end of spindle 18. The innermost end of spindle 18 is provided with a long taper 20. 21 is a small chamber surrounding the spindle 18 just ahead of its tapered end 20 which is adapted to seat against the body 10 at 22. 23 is a passage connecting the chamber 21 with the oil supply pipe 12. 24 is a small orifice, controlled by tapered end 20 of spindle 18. Screwed into the body 10, opposite bonnet 17 and spindle 18, but in coaxial alignment therewith, is a plug 25. This plug is provided with a flange 26 to make a joint with body 19. 27 is a threaded part of plug 25 to engage a correspondingly threaded portion within body 10. The part of the plug 25 which is located between flange 26 and threaded part 27 is of a reduced diameter at 28. 29 is a hollow central chamber of plug 25 into which terminates orifice 24. 30 is an outlet opening from chamber 29 through plug 25. 31 and 32 are ducts through the reduced portion 28 of the plug terminating in the central chamber 29 and so positioned as to impinge the circumference of the central chamber 29 tangentially as shown in Fig. 2. They are further slightly inclined towards the outlet end. 33 is an annular chamber in body 10 surrounding the reduced part 28 of plug 25. 34 is a duct through the body connecting the chamber 33 with the steam pipe 14. Extending from the body 10 in a direction opposite to that of valve 18 is a hollow funnel-shaped structure 35. Wound around this structure in coil form is the steam pipe 14, the extreme end of which is threaded at 36 to receive a suitable regulating valve 37.

The operation of the device is as follows:

Oil enters the burner through supply pipe 12. Water is admitted into steam pipe 14 by way of regulating valve 37. While passing through pipe 14 the water is converted into steam, which enters the burner body 10, and thence through passage 34 and ducts 31 and 32 into the mixing chamber 29 where it meets the oil which is admitted into this chamber through orifice 24. In chamber 29 the liquid fuel is atomized by the steam which is given a whirling motion due to the tangential direction of the inlet orifices 31

and 32, and ejected from the burner through outlet 30. The atomized liquid fuel is then ignited and in passing through the funnel shaped structure 35 which supports the steam pipe 14, enough heat is absorbed to generate steam in the pipe 14 from the water admitted thereto, sufficient for continuing the atomization. The initial heat for starting the generation of steam to operate the burner is obtained by the combustion of liquid fuel in the bowl 16 which forms a part of the burner itself.

In burners of the kind heretofore in use, should the flame be extinguished for any reason such as too little air supply or excess air supply or temporary stoppage in the oil line, the liquid fuel would be injected into the fire box or furnace and within a very short time would create a gas of high explosive characteristics. In the burner disclosed in this invention, should the burner go out for any reason at all, the heat of combustion would be discontinued and almost instantly the generation of steam would stop, and water only would mix with the fuel inside the burner. The resulting mixture cannot be burned.

It is understood that various changes in the form, proportion and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention, as defined in the appended claims, so for instance, while I have shown the steam to be injected into the mixing chamber in a tangential manner, to thoroughly break up the oil and eject the same from the burner, this opening may also be drilled straight at right angles to the axis of the mixing chamber, inasmuch as the steam issuing therefrom would have such force and such expansive power that it would break up the oil into sufficiently fine particles to burn it regardless of any centrifugal action. Furthermore while I have shown an open bowl in connection with the burner, for the purpose of burning liquid fuel in the same for starting the generation of steam this bowl may be entirely omitted, and the same result achieved by applying heat to the steam coil by means of an ordinary blow torch or other suitable devices.

What I claim as new, is

1. In a steam generating liquid fuel burner, the combination of a body casing having a fuel supply connection, a discharge nozzle of substantially cylindrical shape screwed into the said body casing, the said nozzle having a cylindrical mixing chamber open at one end for the inlet of fuel, orifices at its side walls and a small outlet opening, a fuel regulating valve within the body casing and located between the said fuel supply connection and the said discharge nozzle, a circularly coiled pipe at the outlet end of the burner having one end connected to a valved water supply and the other end to the body casing, a duct within the body casing connecting the latter end of the coiled pipe with the said orifices in the discharge nozzle, and a fuel pan below the said coiled pipe, fastened to the body casing.

2. In a steam generating liquid fuel burner, the combination of a body casing having a fuel connection at one side and an extension at the other side, a fuel regulating valve interposed between the said sides, a discharge nozzle of substantially cylindrical shape screwed into the said body casing, the said nozzle having a cylindrical mixing chamber open at one end, small orifices in the side walls of the said chamber and a small outlet opening, a perforated funnel shaped extension of the body casing at the outlet and in axial alignment with the said discharge nozzle, a water pipe coiled around the said funnel shaped extension of the body casing, having one end connected to a suitable water supply and the other end fastened to the extension of the body casing opposite the fuel connection, a duct within the body casing connecting the said water pipe with the said small orifices of the discharge nozzle, and an open pan below the said water pipe and fastened to the said body casing, for the purpose specified.

In testimony whereof I have hereunto set my hand and seal in presence of two subscribing witnesses.

FRANK MARTINDELL. [L. S.]

Witnesses:

ALBERT W. MORSE,

MARY VAN DAM.