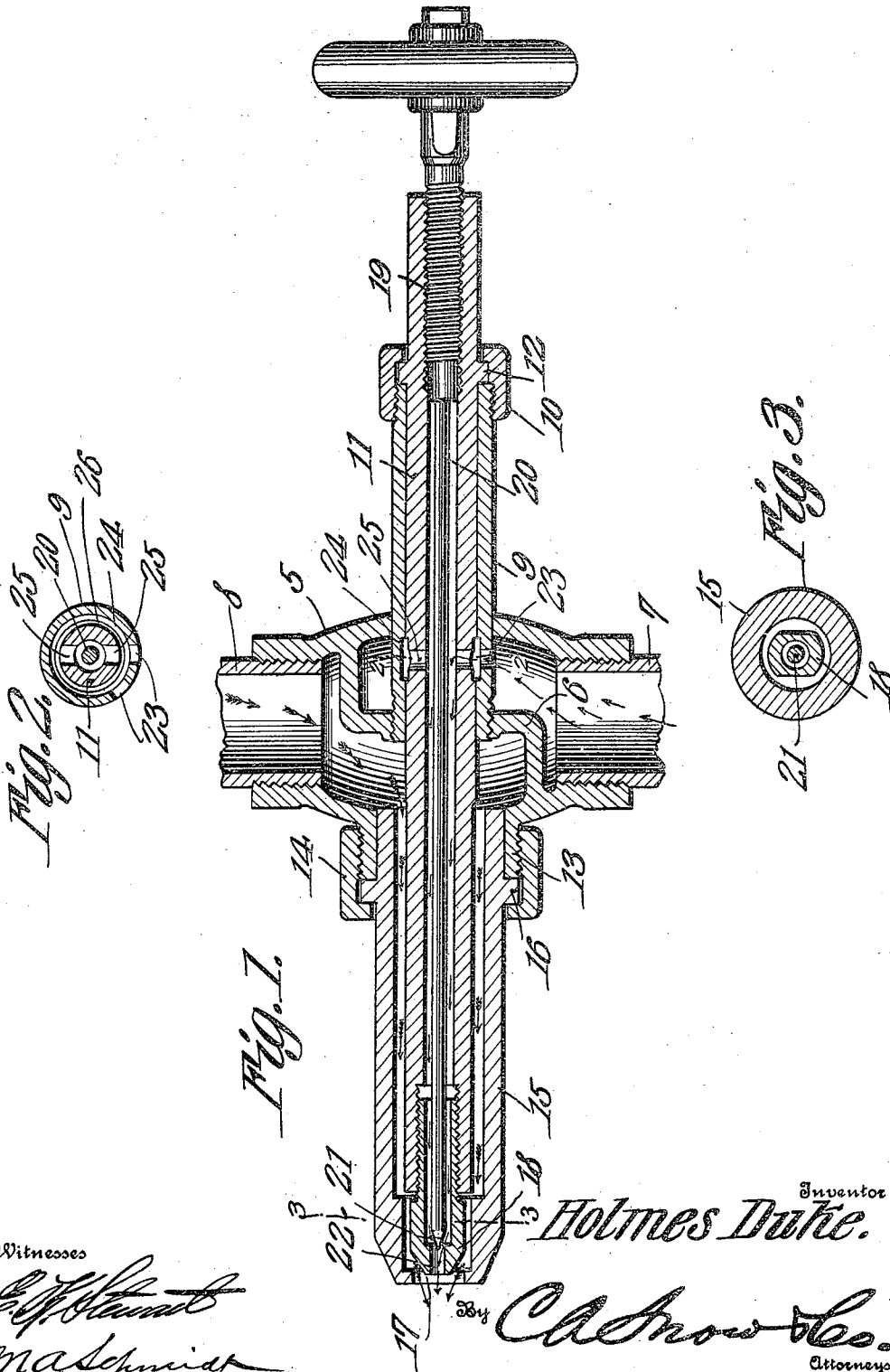


H. DUKE.
OIL BURNER.
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Witnesses
E. H. Stuart
M. Schmidt

Inventor
Holmes Duke.

C. Snow & Co.
Attorneys

UNITED STATES PATENT OFFICE.

HOLMES DUKE, OF BEAUMONT, TEXAS.

OIL-BURNER.

945,922.

Specification of Letters Patent.

Patented Jan. 11, 1910.

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To all whom it may concern:

Be it known that I, HOLMES DUKE, a citizen of the United States, residing at Beaumont, in the county of Jefferson and State of Texas, have invented a new and useful Oil-Burner, of which the following is a specification.

This invention relates to that class of liquid fuel burners known as injector burners, and more particularly a burner of this type designed to inject or spray oil and steam into the combustion chamber of the furnace.

The present invention has for its object to provide an improved nozzle structure, together with improved means for regulating the flow therefrom, and to this end it consists in a novel construction and arrangement of parts to be hereinafter described and claimed, reference being had to the drawing hereto annexed in which—

Figure 1 is a central longitudinal sectional view of the burner. Fig. 2 is a transverse section on the line 2—2 of Fig. 1. Fig. 3 is a transverse section on the line 3—3 of Fig. 1.

Referring to the drawing, 5 denotes a casing containing a partition 6 whereby it is divided into two chambers, one of said chambers being for the oil or other liquid fuel, and the other chamber for the injecting fluid which in the present instance is steam. To one end of the casing is connected an oil supply pipe 7, and to the other end a steam supply pipe 8.

The partition 6 is formed with a threaded opening into which is screwed a bonnet 9 which projects through an opening in the casing to the outside thereof, and has its outer end screw-threaded to receive a coupling-nut 10. This coupling nut secures within the bonnet a tube 11, said tube having a shoulder 12 which abuts against the outer edge of the bonnet, and is engaged by the coupling nut 12.

On the side of the casing 5 opposite that from which the bonnet 9 projects, said casing is formed with a neck 13 which is screw-threaded to receive a coupling nut 14, said nut being employed for securing a nozzle tube 15 to the casing. This tube extends into the neck 13 and is formed with a shoulder 16 engaging the outer end thereof, and by means of the coupling nut 14 engageable with the shoulder, the tube is coupled to the casing. The outer end of the tube 15 has a

discharge orifice 17, and its inner end communicates with the steam chamber of the casing 5.

The tube 11 extends lengthwise and centrally through the tube 15, and adjacent to the discharge orifice 17 is fitted with a tip 18 through which the oil is discharged. That end of the tube 11 to which the tip is applied has a screw-threaded counterbore into which the tip screws, whereby it is made adjustable toward and from the discharge orifice 17. That end of the tube 11 opposite the discharge end thereof has its bore screw-threaded as indicated at 19 into which screws the threaded portion of the stem 20 of a needle valve 21 having for its seat the discharge orifice 22 of the tip 18. By means of this valve the amount of fuel can be regulated and it may also be shut off. Inasmuch as the tip 18 is adjustable toward and from the discharge orifice 17, the injecting fluid can be controlled by manipulating the tip. The outer end of the tip is made cone-shaped and is adapted to extend partially into the orifice 17, by reason of which it will be apparent that when the tip is moved outwardly the area of said orifice is decreased, and when the tip is moved inwardly, said area is increased, thus letting a smaller or greater quantity of steam escape from the orifice.

That portion of the bonnet 9 which is located within the casing 5, is formed with ports 23 which communicate with a groove 24 extending circumferentially around the bore of the bonnet. In the plane of this groove, the tube 11 has ports 25, and in the plane of the last mentioned ports, the outer surface of the tube has a circumferential groove 26 in order that a more free flow of oil may be had. Two ports 23 are provided in order that the flow of oil may not be obstructed in case of one of the ports becoming clogged up. The flow of oil is through the ports 23 into the groove 24, and from said groove through the ports 25 into the bore of the tube 11, and through said bore to the tip 18 and out of the orifice 22 thereof through the orifice 17 where it meets a jet of steam, and is atomized and sprayed into the furnace. The tubes 11 and 15 are spaced from each other sufficiently to permit the steam to pass therebetween to the orifice 17. That portion of the bore of the tube 15 in which the tip 18 extends is contracted. The tip is flattened on opposite sides to permit

the application of a wrench for making the hereindescribed adjustment.

- That portion of the tube 11 extending through the bonnet 9 has a close fit therewith so as to prevent the escape of oil and steam. The other portion of the tube 11 has a slightly reduced diameter in order that said tube may be passed readily through the bonnet upon assembling the parts.
- By the structure herein described, an injector nozzle is had which is simple in structure, and devoid of complicated parts, the parts being so arranged that they may be readily assembled, and by the herein described means for regulating the flow of the fuel as well as the injecting fluid, a burner is had which is highly efficient, and which effectually serves the purpose for which it is designed.
- The shoulders 12 and 16 are so located that they determine the correct relative position of the tubes 11 and 13, which greatly facilitates the assembly of the parts.

What is claimed is:

1. In a liquid fuel burner, a casing containing a partition, and having a fuel inlet on one side thereof, and an inlet for injecting fluid on the other side thereof, a bonnet connected to the partition on the fuel inlet side, and having a port communicating therewith, a tube mounted in the bore of the bonnet, and having a port communicating with the port thereof, an adjustable tip on the discharge end of the tube, a valve controlling the discharge from the tip, and a nozzle projecting from the casing, and communicating with the injecting fluid inlet side thereof, the aforesaid tube extending into the nozzle, and having its tip located adjacent to the discharge orifice thereof.
2. A liquid fuel burner comprising a casing containing a partition, and having an inlet for the fuel on one side of the partition, and an inlet for injecting fluid on the

other side thereof, a bonnet connected to the partition on the fuel inlet side of the casing and having a port communicating therewith, the bore of the bonnet in the plane of the port being grooved, a tube mounted in the bore of the bonnet, and having a port in the plane of the aforesaid groove, a valve controlling the discharge end of the tube, and a nozzle projecting from the casing, and communicating with the injecting fluid inlet side thereof, the aforesaid tube extending into said nozzle and having its discharge end located adjacent to the discharge orifice of the nozzle.

3. In a liquid fuel burner, a casing containing a partition, and having an inlet for the fuel on one side thereof, an inlet for injecting fluid on the other side, a bonnet connected to the partition, and projecting from the casing on one side thereof, said bonnet having a port communicating with one of the inlets of the casing, a tube mounted in the bore of the bonnet, and having a port communicating with the port thereof, a shoulder on the tube engageable with the outer end of the bonnet, means for clamping said shoulder against said end of the bonnet, a neck on the opposite side of the casing, a nozzle extending into the neck, and communicating with the other inlet of the casing, the aforesaid tube extending into the nozzle, and having its discharge end adjacent to the discharge end of the nozzle, a shoulder on the nozzle engageable with the outer end of the neck, and means for clamping said shoulder against the end of the neck.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

HOLMES DUKE.

Witnesses:

E. HUME TALBERT,
E. C. SCHLADT.