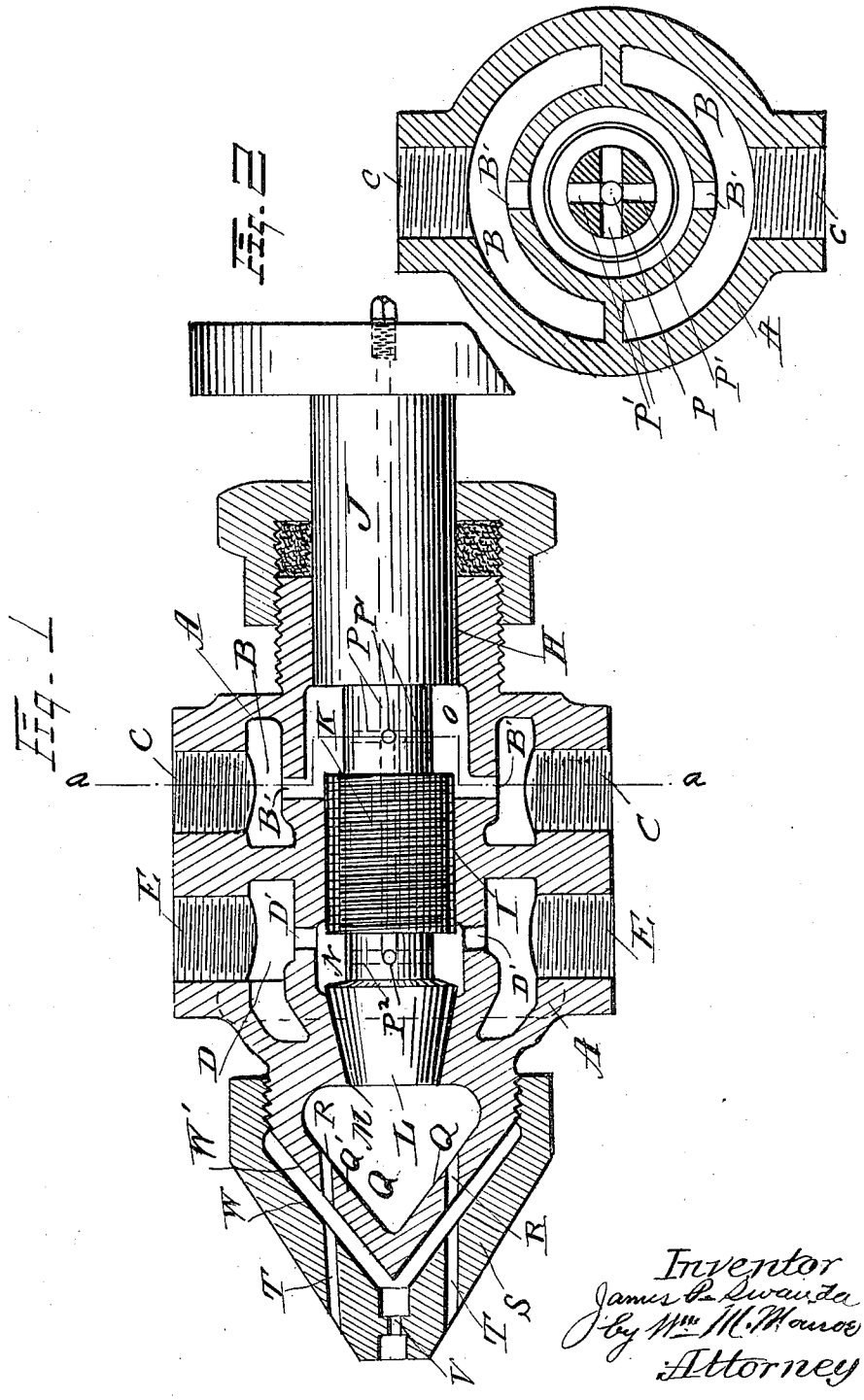
J. P. SWANDA.

FUEL OIL BURNER.

APPLICATION FILED JULY 7, 1919.

1,402,268. Patented Jan. 3, 1922.



UNITED STATES PATENT OFFICE.

JAMES P. SWANDA, OF CLEVELAND, OHIO.

FUEL-OIL BURNER.

1,402,268. Specification of Letters Patent. Patented Jan. 3, 1922.

Application filed July 7, 1919. Serial No. 309,156.

To all whom it may concern:

Be it known that I, JAMES P. SWANDA, a citizen of the United States, and resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Fuel-Oil Burners, of which I hereby declare the following to be a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

The objects of the invention are to provide an improved form of burner for gas or fuel oil of all kinds in which a forced draft of air or steam is employed and in which the fuel gas and oil are thoroughly commingled with the steam or air, before entering the burner nozzle, and is thence discharged into the furnace through adjustable openings or passages.

The invention comprises separate annular chambers having a common axis which are supplied with fuel and steam or air under pressure and an axially movable valve the stem of which is hollow and is supplied with the fuel and steam or air through lateral openings a common casing enclosing the whole and a commingling chamber is positioned in advance of the valve in which the mixture of fuel and steam or air under pressure is completely commingled by impinging upon the walls of the chamber in a thin stream which returns upon and intersects itself until it escapes from outlet openings provided for it.

The invention is designed to provide means for twice commingling the streams of fuel and gas or air and to provide a burner nozzle capable of fine adjustment.

The invention is hereinafter further described, shown in the accompanying drawings and specifically pointed out in the claims.

In the accompanying drawings, Fig. 1 is a longitudinal central section of the device; Fig. 2 is a transverse section on line *a—a*, Fig. 1, in these views A represents a casing provided with the annular chamber B therein, into which openings for air or gas supply lead and are diametrically opposed at C, C; a similar chamber D for steam or air under pressure is provided with similar inlet openings E, E.

The casing is provided with two axial openings H and L in which the valve stem is seated. This stem is movable longitudinally upon the bearings, one of them I, being central and screw threaded and engaged by screw threads K, upon the valve stem.

L is a taper valve which is seated upon a taper seat M. The screw threaded portion of the valve stem is positioned preferably intermediate of the chambers B and D and annular chambers N and O, one on each side of said central bearing communicate respectively with the chambers B and D, through openings B′ and D′ and with a longitudinal opening P in the valve stem through radial openings P′ P^2 thus admitting the compressed steam or air from the chamber D, through the valve stem into the chamber B, where the fuel oil or gas is commingled with the steam or air prior to delivering from the valve L.

At the extremity of the casing a conical chamber Q receives the commingled fuel and it impinges against the conical sides Q′ of this chamber in the form of a thin sheet whence it rebounds and meeting the entering steam is thoroughly and minutely broken and converted into a fine mist or substantially atomized form if the fuel oil is crude oil or completely vaporized if the fuel oil is gasoline and put into perfect condition for burning at the nozzle.

The commingled fuel is then projected through the longitudinal spaced openings R R. To regulate the delivery of commingled fuel through the openings R, a cap valve S, is mounted over the conical extremity of the chamber Q and is longitudinally adjustable thereover at S and is also rotatable upon the screw threads. Longitudinal openings T in this cap valve register with the openings R or by turning the cap the openings can be partially or entirely cut off.

Also a central jet opening V is preferably employed. The openings R and T are preferably inclined towards the axis of the burner so that the jets impinge upon each other. The inner face W of the cap and the outer face W′ of the chamber Q are normally separated when the cap is in position so that the fuel can pass to the central opening if the outer jet openings T, T, are partially closed to the inner jet openings R, R. A closure is employed at the extremity of the stem J.

Having described the invention what I claim as new and desire to secure by Letters Patent is:

1. In a burner a casing provided with a central opening and spaced annular chambers thereabout said chambers provided with inlet openings for fuel oil or gas and compressed air or steam respectively, a valve in said central opening and an axial stem therefor, said stem being provided with an axial opening and with separate sets of radial openings communicating respectively with said annular chamber and central openings, mixing chamber in advance of said valve said mixing chamber provided with a seat for said valve at one side and with spaced longitudinal jet openings at the other side and an adjustable cap for said mixing chamber provided with longitudinal jet openings adapted to register with the jet openings in said mixing chamber and with a central longitudinal jet opening.

2. In a burner, a casing provided with a central opening and lateral openings communicating therewith, a valve and valve stem in said central opening, an axial opening in said stem communicating with said lateral openings in said casing, a closed mixing chamber in advance of said valve stem, a valve seat in said mixing chamber, said mixing chamber being provided with longitudinal jet orifices in its walls, and a cap adjustably and rotatably secured upon said chamber, said cap being provided with longitudinal jet orifices adapted to register with said jet orifices in said mixing chamber.

3. In a burner, a casing provided with a central longitudinal opening, a valve and valve stem in said opening, annular chambers in said casing communicating with said central opening, said chambers being provided with inlet openings for supplying fuel and air or steam respectively thereto, said valve stem being provided with an axial opening and with sets of radial openings communicating with said respective annular chambers, a mixing chamber in which said valve is seated, said chamber being provided with longitudinal jet openings, and additional means for controlling the passage of commingled fuel through said openings.

4. In a burner for fuel oil or gas and steam or compressed air, a casing, annular chambers therein, said chambers being provided with inlet openings for fuel and air or steam respectively, said casing being provided with a longitudinal opening, a closed mixing chamber at the extremity of said casing, a valve and stem in said central opening, said stem being provided with internal openings communicating respectively with said annular chambers, said mixing chamber being provided with inclined longitudinal openings, and a cap adjustable on said casing longitudinally and circumferentially thereof, said cap being provided with inclined jet openings adapted to be aligned with the jet openings in said mixing chamber.

In testimony whereof, I hereunto set my hand this 25th day of June 1919.

JAMES P. SWANDA.

In presence of—
WM. M. MONROE,
ROBERT A. CASTNER.