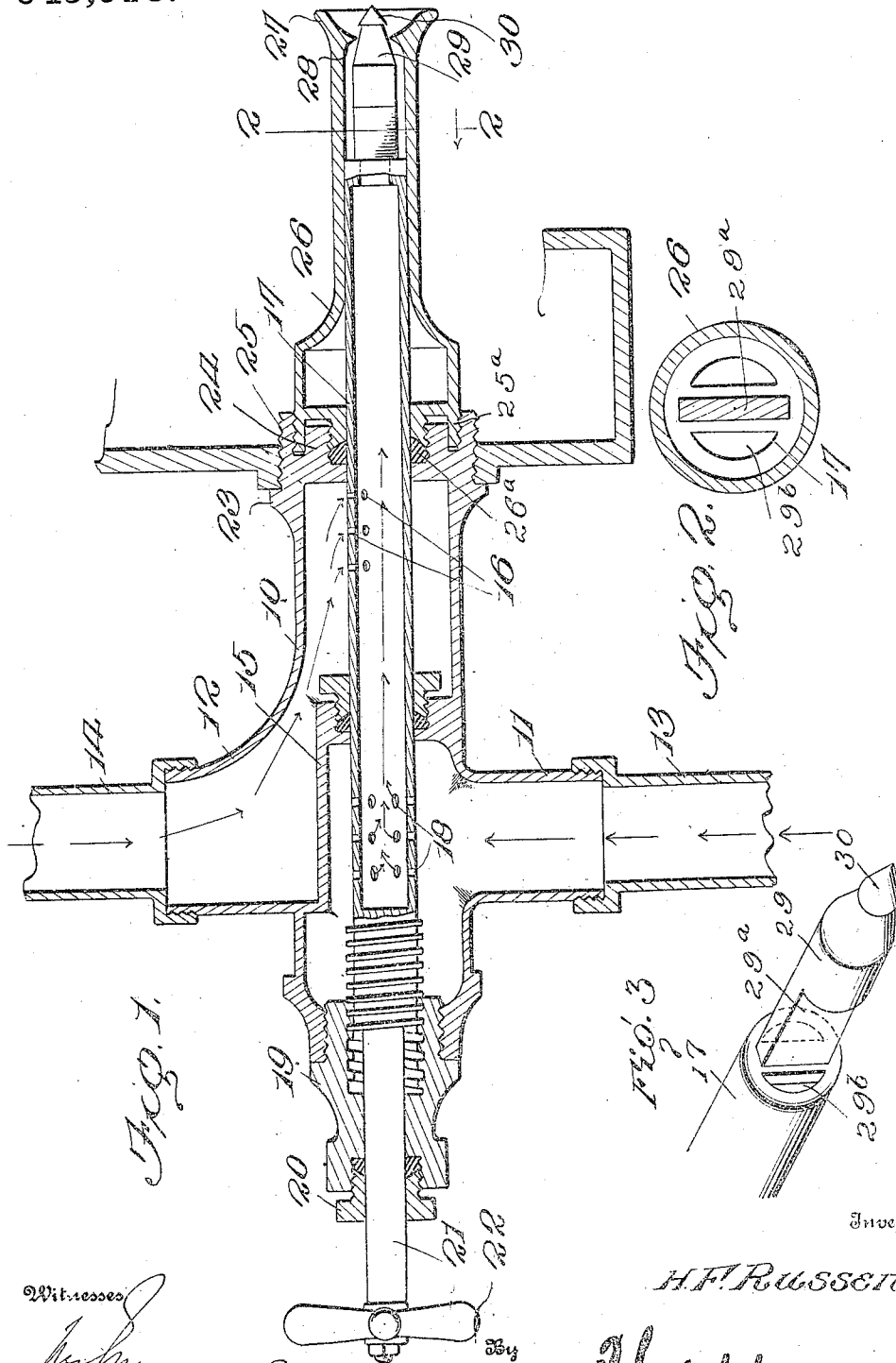


H. F. RUSSEN.
OIL BURNER.
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949,913.

Patented Feb. 22, 1910



Witnesses
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UNITED STATES PATENT OFFICE.

HENRY F. RUSSEN, OF FRANKLIN, MASSACHUSETTS.

OIL-BURNER.

949,913.

Specification of Letters Patent. Patented Feb. 22, 1910.

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To all whom it may concern:

Be it known that I, HENRY F. RUSSEN, citizen of the United States, residing at Franklin, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Oil-Burners, of which the following is a specification.

This invention relates to oil and gaseous fuel burners and has particular reference to an oil burner to be employed in connection with welding furnaces.

An object of this invention is to produce an oil burner which will produce a fine spray of the combined oil and air, or oil and steam, and to distribute the spray over a great area to increase the heating capacity of the burner, and thus obtain a higher temperature within the furnace in proportion to the amount of fuel consumed than in burners of common form now in use.

Another object of this invention is to construct a burner in which the oil and air will be more thoroughly mixed and which will thereby cause a uniform flame which is diffused throughout the furnace and which will prevent the excessive heating of any particular part thereof; thus eliminating to a great degree the expense in maintaining furnaces of this character by reason of the necessity of relining the same incident to the overheating and burning out of the brick.

The invention further aims to produce a burner of this character which is composed of few parts which can be economically manufactured, and one which may be maintained at less expense and with less care than burners heretofore employed and also aims to produce a burner which can be easily regulated.

For a full understanding of the invention reference is to be had to the following description and accompanying drawing in which:—

Figure 1 is a longitudinal section through the complete burner, Fig. 2 is a transverse section on the line 2—2 of Fig. 1. Fig. 3 is a detailed perspective view of the forward end of the valve-stem.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawing by the same reference characters.

Referring to the drawing, the numeral 10 designates an elongated casing which is of

cylindrical formation and which is provided adjacent its rear end with oppositely and laterally extended sections 11 and 12 to which are adapted to be attached the oil pipe 13 and the air pipe 14 respectively. The section 11 is terminated interiorly of the casing 10 in a chamber which is formed by means of a web 15 which is disposed in the casing 10 and which separates the section 11 from the section 12. The section 12 opens into the casing 10 to conduct the air from the pipe 14 directly into the casing 10 and to admit of the flow of the air into the forward end of the casing where the air passes through a plurality of ports 16 formed in the side of a hollow stem 17. The stem 17 is positioned longitudinally within the casing 10 and also extends through the oil chamber formed at the inner end of the section 11. A stem 17 is snugly fitted in an aperture formed in the web 15 and a tight joint is obtained by the provision of a suitable packing gland 15^a. The stem 17 is further provided with a plurality of openings 18, the same being formed within the oil chamber and provided for the purpose of connecting the interior of the stem 17 with the section 11.

The casing 10 is provided at its rear extremity with a cap 19 which is inserted therein and retained in threaded engagement therewith. The rear extremity of the stem 17 is engaged through the cap 19 in threaded engagement therewith, the threads carried by the cap and the stem being of a coarse pitch in order to impart to the stem 17 a longitudinal movement upon the rotation of the same. A stuffing-box 20 is carried by the cap 19 and surrounds the rear extremity of the stem 17 to prevent the passage of air or oil which would otherwise pass between the same. The stem 17 is actuated by a suitable hand-wheel 22 which is rigidly mounted upon the rear end of the same and within reach of the operator.

The forward end of the casing 10 is provided with an annular flange 23 which is formed exteriorly thereon and serves as an abutment for the outer face of a furnace, or the like, into which the improved burner is projected. Forwardly of the flange 23 the casing 10 is reduced as at 24 and carries an integrally formed sleeve 25 which is provided with a recess formed annularly in the outer face of the same for the reception of a threaded web 25^a which is carried integrally

upon the inner end of a nozzle 26. The web 25^a is provided with external threads which engage with internal threads formed upon the outer section of the sleeve 25 and forms a means for connecting the nozzle 26 to the casing 10 as well as to close the passage from the casing 10 to the interior of the nozzle 26 by forcing a packing gland 26^a into a suitable packing box formed in the outer end of the casing 10.

The nozzle 26 comprises a cylindrical hollow member which is enlarged at its rear extremity and provided with the web 25^a as hereinbefore set forth, the intermediate portion of the nozzle 26 being snugly engaged over the forward end of the stem 17. The outer end of the nozzle 26 is flared as at 27 and is provided with an inwardly extended shoulder 28 which is annularly formed upon the nozzle 26 and adapted for engagement with a conical valve 29 formed upon the forward extremity of the stem 17. The conical valve 29 is carried upon the forward end of a web 29^a which is extended from the end of the stem 17, the valve 29 having a uniform cylindrical portion located rearwardly and adjacent the conical portion of the valve 29 which forms shoulders upon the opposite sides of the web 29^a and serves to deflect the oil and air which flow from openings 29^b formed through the forward wall of the stem 17. A conical bead 30 is formed upon the outer end of the valve 29 to form a second annular shoulder to further deflect the fuel from the nozzle 26.

It will be noted from Fig. 1 of the drawing that the bead 30 is located outwardly of the shoulder 28 and that the fuel which flows past the shoulder 28 and over the conical surface of the valve 29 is deflected by the bead 30 against the flared portion 27 of the nozzle 26 and is caused to spray into the furnace over a considerable area.

In the operation of the burner compressed air is introduced into the casing 10 through the pipe 14 and section 12 where it is forced through the openings 16 into the stem 17. From the stem 17 the air is forced through the openings 29^b and through the valve 29 and nozzle 26. This action of the air causes a suction within the rear end of the stem 17 whereupon oil from the pipe 13 and section 11 is drawn through the openings 18 into the stem and mixed with air. As the oil and air pass through the openings 29^b and strike the shoulders at the rear of the valve 29 the same are deflected outwardly against the inner wall of the nozzle 26 and caused to thoroughly combine when they are further carried past the shoulder 28 about the conical surface of the valve 29 and finally de-

flected against the flared portion 27 by the bead 30. It is thus observed that a tortuous passage is formed through the inner end of the burner whereupon the air and oil are caused to thoroughly mix and thus produce a fuel which is highly efficient as the same is provided with a large percentage of oxygen.

It is readily seen that a burner of this construction is composed of but few operative parts which are so formed as to co-act and to produce an efficient and readily operated burner which causes a complete atomizing of the oil and feeds the same forwardly in a uniform and widespread flame.

Having thus described the invention what is claimed as new is:—

1. A burner including a casing having oil and air inlets oppositely disposed therein, a stem longitudinally positioned centrally in said casing, a cap disposed in threaded engagement about said stem and carried by said casing, a stuffing-box disposed in said cap about said stem, a hand-wheel mounted upon the outer extremity of said stem, a sleeve formed on said casing at the forward end thereof, a nozzle detachably supported upon said sleeve and engaged about the forward extremity of said stem, a web positioned in said casing to form an oil chamber about the oil inlet, said stem being engaged through said web and having openings formed inwardly of the same, said stem also having ports formed intermediately of the same and opening into said casing, a conical valve carried upon the forward end of said stem, and a bead located upon the extremity of said valve, said stem having openings formed oppositely in the forward wall thereof rearwardly of said valve.

2. A burner including a casing, a nozzle carried by said casing, a hollow stem mounted in said casing and said nozzle for relative adjustment therein, a web positioned in said casing about said stem to form an oil chamber, openings formed in the sides of said stem to admit oil therein, said stem having ports formed intermediately thereof for communication with said casing, a conical valve located upon the forward end of said stem for coöperation with said nozzle, openings formed in said stem rearwardly of said valve, and means disposed in coöperative relation with the rear extremity of said stem for reciprocating said stem longitudinally to regulate said valve.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY F. RUSSEN. [L. S.]

Witnesses:

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