R. W. LAWTON.

HYDROCARBON BURNER.

APPLICATION FILED AUG. 28, 1912.

1,105,804. Patented Aug. 4, 1914.

Fig. 1.

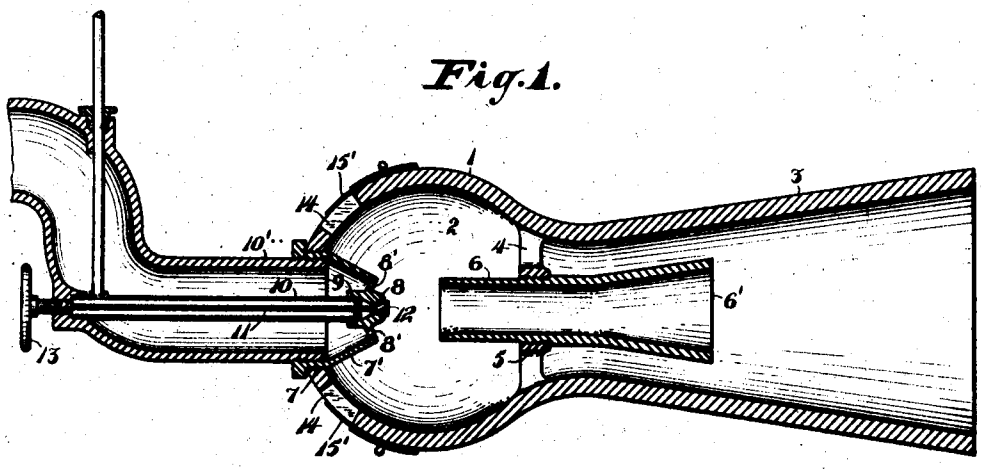


Fig. 2.

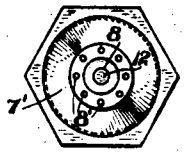


Fig. 3.

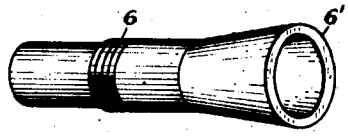
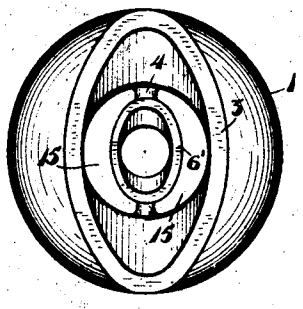


Fig. 4.



WITNESSES

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HYDROCARBON-BURNER.

1,105,804. Specification of Letters Patent. Patented Aug. 4, 1914.

Application filed August 28, 1912. Serial No. 717,585.

To all whom it may concern:

Be it known that I, ROBERT W. LAWTON, a citizen of the United States, residing at the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Hydrocarbon-Burners, of which the following is a specification.

The hereinafter described invention relates to an improved burner for the supplying of an atomized hydrocarbon mixture as a fuel to furnaces generally, the burner being of that type disclosed in United States Letters Patent No. 1,020,612, granted unto me under date of March 12, 1912, wherein takes place an intermixture of oil, steam and air; the object of the invention being to produce a better mixture of the steam, air and oil than is obtained by the use of the burner of Letters Patent No. 1,020,612, to secure a compact flame, to increase the volume of the flame and intensity of the heat thereof, to provide means whereby the flow of oil into the burner may be readily increased and decreased in accordance with the richness of the mixture desired, and to overcome the carbonizing of the working parts of the burner.

To comprehend the invention reference should be had to the accompanying sheet of drawings, wherein—

Figure 1 is a vertical longitudinal sectional view of the improved burner. Fig. 2 is a detail view of the nozzle and its adjustable tip. Fig. 3 is a perspective view of the ejector tube for directing the mixture within the bonnet of the burner. Fig. 4 is a front end elevation of the burner.

In the drawings, the numeral 1 is used to designate a base preferably of spherical form, the interior of which constitutes an air induction chamber 2. From the said base outwardly extends or projects a bonnet 3, which when the burner is applied to a furnace projects within the firing chamber thereof. The bonnet 3 is of tapering form, gradually enlarging toward the discharge end thereof, and to impart a fan shape to the flame projected therefrom the same is of elliptical shape in cross section.

The base 1 is provided interiorly with a rib or bridge piece 4 formed with a screw threaded bore 5, into which screws the exteriorly threaded tubular end section 6 of an ejector tube, which inner end of said tube projects into air induction chamber 2 of the base 1 to within a short distance of the jet nozzle and in longitudinal alinement therewith, the outer end section 6′ of said ejector tube projecting within the bonnet 3 and is gradually outwardly inclined and of elliptical form to correspond with the shape of the said bonnet.

Within the base 1 is screwed or otherwise secured the stem 7 of a conical shaped nozzle 7′, for spraying oil and steam through the chamber 2 of the base into the ejector tube. The said nozzle is formed with a central opening or outlet 8, which is gradually outwardly flared, and is further provided with a series of circumferentially disposed inwardly inclined passageways or openings 8′ which surround the outlet opening 8. The conical nozzle is provided with a rearwardly extended interiorly screw-threaded circular wall 9, into which is screwed the inner end of an oil supply pipe 10, which pipe is surrounded by a steam supply pipe 10′, which screws into the interiorly threaded end of the nozzle stem 7. Within the oil supply pipe is fitted an adjustable rod 11, which connects with the cone valve 12 seated in the flaring outlet 8 of the nozzle 7′, and the said rod 11 is moved longitudinally within the oil pipe 10 in order to adjust the valve 12 by means of the adjusting hand wheel 13. By means of the adjustable valve 12 for the nozzle outlet 8, the oil discharge from the nozzle 7′ may be readily controlled for securing the proper admixture of oil and steam and to regulate the intensity of the flame.

The base 1 is provided with one or more air inlets 14, through which air is drawn into the chamber 2 for supplying the requisite oxygen to the mixture as drawn into the ejector tube, which mixture is forced under pressure into and through said tube for ignition at the outer end thereof within the bonnet 3. The suction created by the mixture flowing through the ejector tube draws air into the chamber 2 through the air inlets 14, such air as does not intermix with the atomized carbonaceous mixture flowing into the ejector tube passes into the bonnet 3 through the passage-ways 15 formed by the bridge-piece 4 for supplying the necessary oxygen for proper combustion. Preferably, the air inlets 14 are controlled by the adjustable dampers 15′, so that the quantity of air drawn into the chamber 2 may be regu-

lated as desired and properly proportioned in accordance with the intensity of the flame.

In operation, the oil and steam are injected under pressure in an atomized form into the ejector tube in alinement with the discharge nozzle 7', during their stream flow through the air induction chamber 2 absorbing a portion of the air entering said chamber through the air inlets 14, the suction caused by the stream ejected from the ejector tube drawing air from the chamber 2 into the bonnet 3, which intermingles with the discharging stream for insuring proper combustion. The intermixed oil and steam discharge from the ejector tube in a compact form and as the point of ignition for the liquid fuel is at a point remote from the discharge nozzle of the burner, the carbonizing of the discharge nozzle is obviated.

By the use of the described burner complete atomization of the oil results, the intensity of the flame is augmented, a more compact flame is produced, carbonizing of the nozzle is avoided, and perfect combustion is provided for.

Having thus described the invention what is claimed as new and desired to be protected by Letters Patent is—

In a hydrocarbon burner, the combination with a base of substantially spherical form, provided with an interior air induction chamber, of an outwardly flaring bonnet projected therefrom, a bridge piece situated within the said base adjacent the rear end portion of the bonnet, an ejector tube supported by said bridge piece to project partly within the bonnet and partly within the air induction chamber of the base, controlled air inlets within the base, a discharge nozzle secured to the said base and within the air induction chamber thereof, a steam supply pipe connected with said nozzle, an oil supply pipe situated within the steam pipe and connected at its forward end to the nozzle and in line with the outlet orifice thereof, an adjustable stem working within the oil supply pipe and carrying at its forward end a valve for controlling the outlet orifice of the nozzle, the discharge nozzle being provided with inclined steam outlets for delivering steam into the induction chamber of the base at an angle to the oil stream, the oil and steam nozzle terminating within the induction chamber of the base in line with and adjacent the ejector tube.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT W. LAWTON.

Witnesses:
N. A. ACKER,
D. B. RICHARDS.