No. 630,580. Patented Aug. 8, 1899.

J. J. ANDERSON.

HYDROCARBON BURNER.

(Application filed May 10, 1899.)

(No Model.)

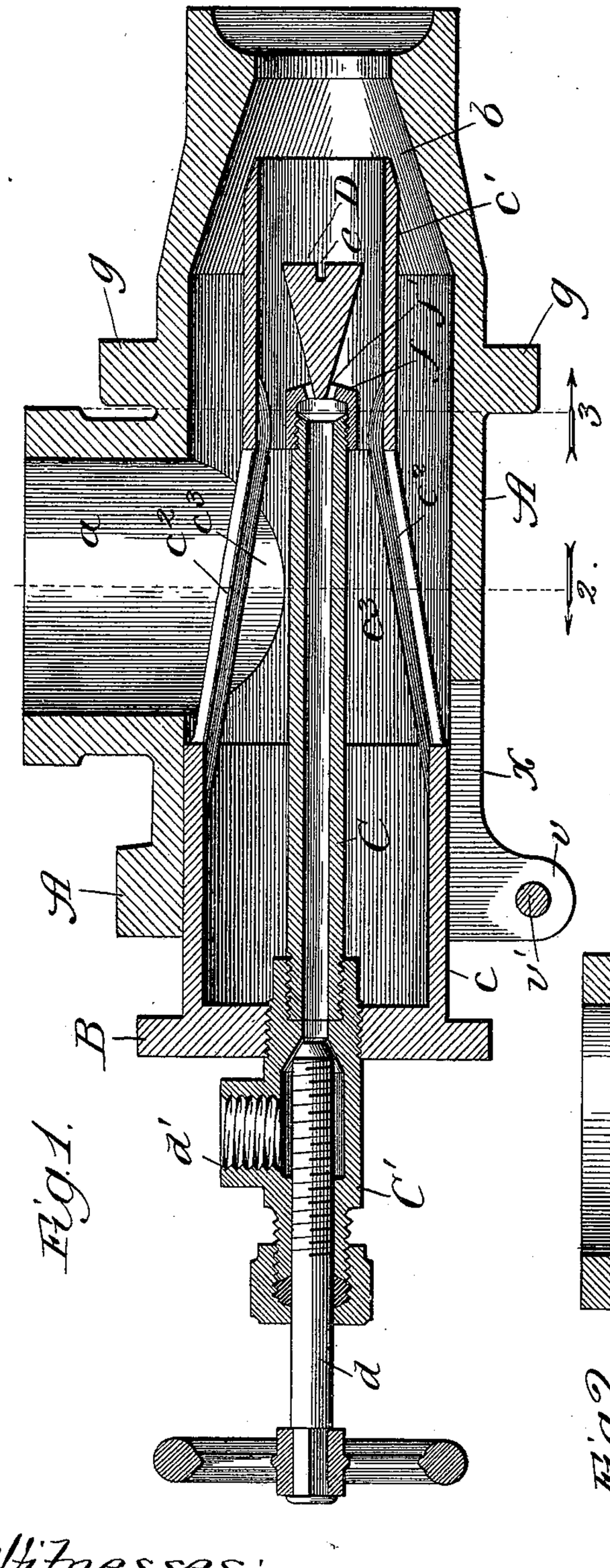

Fig. 1.

Fig. 3.

Fig. 2.

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HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 630,580, dated August 8, 1899.

Application filed May 10, 1899. Serial No. 716,266. (No model.)

To all whom it may concern:

Be it known that I, JAMES J. ANDERSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Hydrocarbon-Burners, of which the following is a specification.

My invention relates to an improved construction of hydrocarbon-burner of the kind employed for supplying a regulable quantity of hydrocarbon oil as fuel to a furnace through the medium of an air-blast which supplies the air for mixture with the hydrocarbon to enhance its combustion.

Referring to the accompanying drawings, Figure 1 is a view of my improved burner in longitudinal sectional elevation; Fig. 2, a section taken at the line 2 on Fig. 1 and viewed in the direction of the arrow, and Fig. 3 a section taken at the line 3 on Fig. 1 and viewed in the direction of the arrow.

A is the shell, open at its opposite ends and provided between them with a flanged opening *a* for connection with an air-blast. (Not shown.) Toward the discharge end of the shell it is outwardly tapering, as shown at *b*, for a purpose hereinafter described.

B is a species of tubular valve device comprising a cylindrical section *c*, slidingly fitting the outer end portion of the shell, which is slitted longitudinally, as shown at *x*, and provided at opposite sides of the slit with perforated ears *v* v' to receive a nut v' for tightening or clamping the shell about the section *c*, which is closed and flanged at its outer end, as shown, an inner end tubular section c' or head narrower than the section *c* and shown as beveled about its outer extremity, and an intermediate section c^2, provided with a circumferential series of longitudinal slots c^3 and shown tapering, which is its preferred form.

C is the oil-tube, extending from a T-head C′, screwed into the closed end of the section *c* and provided with a threaded nipple d' for connection with the supply of hydrocarbon fuel. Within the head C′ is confined a threaded needle-valve *d* for regulating the supply of the hydrocarbon to the inlet end of the tube C. The inner end of the oil-tube is covered by a cap *f*, provided with a circumferential series of apertures f' in its end, from which projects an outwardly-flaring or cone-shaped spreader-head D, shown as provided with a slot *e* in its end to receive a screw-driver by means of which to screw the cap *f* on the oil-tube.

The burner may be secured in its operative position through perforations g' in a flange *g*, shown to be provided on the shell near its inner end.

With the burner in place, the air-blast in operation, and the hydrocarbon-supply opened to the tube C the force of the air entering the device B through the slots c^3 and that portion of the air under pressure which enters the shell A about the tubular head c' projects the oil from the apertures f', which are shown somewhat inclined to correspond with the inclination of the spreader D. The spreader attenuates the streams of hydrocarbon emerging from the apertures f' into a thin film and directs it in that condition across the path of air-pressure, passing through the tubular section c', wherein it is more or less confined and compressed, owing to the restriction about the passage afforded by the conical spreader, and thus the more forcibly and intimately mixed with the liquid fuel. This mixture on emerging from the discharge end of the section c' enters the restricted throat *b* of the shell A, the taper of which is opposite that of the spreader D. In this throat the mixture encounters that portion of the air-blast which has entered the shell about the section c' and which, owing to the restriction afforded by the taper *b*, is more or less confined and further compressed to enhance its combination with the air-and-hydrocarbon mixture discharging from the section c'.

From the foregoing description of my improved burner it will be seen that the hydrocarbon is subjected, in its course to the discharge, to two successive forcible admixtures with the air-supply. The blast of air in the peculiar arrangement afforded by my improved construction is so forcible that the flame of the burning fuel may be kept about two feet beyond the discharge end of the device and the circulation of air in the casing keeps it cool, thereby preventing the baking of oil in and consequent clogging of the ap-

ertures f', which commonly occurs when the air-blast is shut off in other burners known to me, as the result of heating the casing from the burning fuel.

By loosening the bolt v' the device B and with it the oil-tube and parts it carries may be adjusted bodily to bring the valve-head c' and spreader D nearer to or farther from the constricted space b in the shell, thereby decreasing in the one case and increasing in the other the passage for air about the section c' and the dimensions of the mixing-space b, and by bringing, through the adjustment referred to, the beveled end of the section c' against the tapering wall b in the shell the air-supply about that section may be entirely shut off, when of course the supply of hydrocarbon would be regulated at the needle-valve accordingly for diminishing the fire.

The oil-tube C may, by screwing and unscrewing it in its bearing in the outer end of the shell, be advanced or retracted to adjust accordingly the spreader D with relation to the tubular section c', and thereby regulate the dimensions of the chamber in that section ahead of the spreader for receiving and prolonging the confinement within it of the first oil-and-air mixture.

It is within my invention to employ steam instead of air for admixture with the hydrocarbon, and I intend that the appended claims shall be construed as including steam. Moreover, the construction shown and described may be variously modified without departure from my invention. Hence I do not limit it to the particular details of construction herein set forth.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a hydrocarbon-burner, the combination of the shell having an opening between its ends for connection with an air-blast, a tubular valve device supported within the shell and open between its ends to said air-blast opening, and an oil-tube supported within said valve device, apertured and provided with a spreader-head at its forward end and containing a regulating-valve for the hydrocarbon-supply, substantially as described.

2. In a hydrocarbon-burner, the combination of the shell having an opening between its ends for connection with an air-blast, and internally tapering toward its forward end, a tubular valve device supported within the shell and open between its ends to said air-blast opening, and an oil-tube supported within said valve device, apertured and provided with a spreader-head at its forward end and containing a regulating-valve for the hydrocarbon-supply, substantially as described.

3. In a hydrocarbon-burner, the combination of the shell having an opening between its ends for connection with an air-blast, a tubular valve device supported and longitudinally adjustable within the shell and open between its ends to said air-blast opening, and an oil-tube within and carried by said valve device, apertured and provided with a spreader at its forward end, and containing a regulating-valve for the hydrocarbon-supply, substantially as described.

4. In a hydrocarbon-burner, the combination of the shell having an opening between its ends for connection with an air-blast and internally tapering toward its forward end, a tubular valve device supported and longitudinally adjustable within the shell and open between its ends to said air-blast opening, and an oil-tube supported within said valve device, apertured and provided with a conical spreader-head at its forward end and containing a regulating-valve for the hydrocarbon-supply, substantially as described.

5. In a hydrocarbon-burner, the combination of the shell having an opening between its ends for connection with an air-blast, a tubular valve device supported within the shell and open between its ends to said air-blast opening, and an oil-tube adjustably supported within said valve device, apertured and provided with a spreader-head at its forward end, and containing a regulating-valve for the hydrocarbon-supply, substantially as described.

6. A hydrocarbon-burner comprising, in combination, a shell A having an opening a and provided toward its forward end with an internal taper b, a longitudinally-adjustable tubular valve device B having a circumferential series of openings c^3 and supported in said shell, and an oil-tube C adjustably supported in said valve device and provided with an apertured cap f carrying a conical spreader-head D and a regulating-valve d, substantially as described.

7. A hydrocarbon-burner comprising, in combination, a shell A having an opening a and provided toward its forward end with an internal taper b, a valve device B formed of the section c closed at its outer end and at which it is adjustably supported in said shell, the tapering section c^2 provided with openings c^3 and the section c', a T-head C' screwed into the closed end of said section c and provided with a nipple d' for connection with the supply of hydrocarbon, a valve d in said T-head, and an oil-tube C extending therefrom lengthwise in said valve device and carrying at its forward end an apertured cap f and a conical spreader-head D, the whole being constructed and arranged to operate substantially as described.

JAMES J. ANDERSON.

In presence of—
M. S. MACKENZIE,
R. T. SPENCER.