

No. 767,509.

PATENTED AUG. 16, 1904.

C. F. WARNER.
HYDROCARBON BRAZING FURNACE.

APPLICATION FILED MAR. 17, 1904.

NO MODEL.

2 SHEETS—SHEET 2.

FIG. 3.

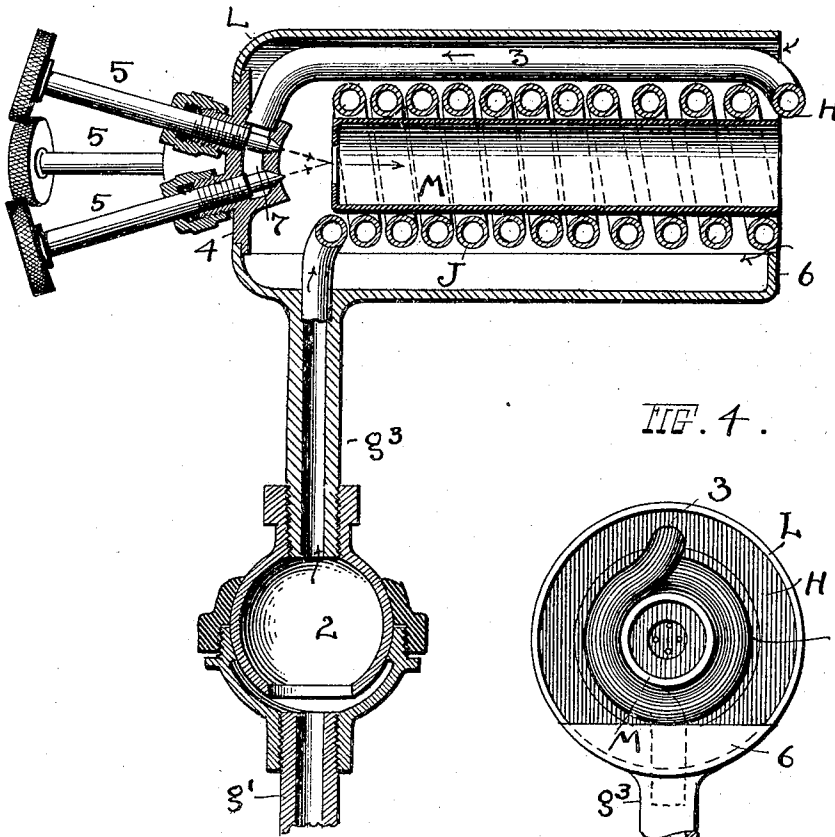


FIG. 4.

WITNESSES:

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HYDROCARBON BRAZING-FURNACE.

SPECIFICATION forming part of Letters Patent No. 767,509, dated August 16, 1904.

Application filed March 17, 1904. Serial No. 198,594. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. WARNER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Portable Hydrocarbon Brazing-Furnaces; and I do declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to a portable hydrocarbon brazing-furnace; and the invention consists in the construction of the furnace substantially as shown and described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of the furnace; and Fig. 2 is a side elevation thereof except at the top, which is sectioned vertically on line *xx*, Fig. 1. Fig. 3 is an enlarged sectional elevation of one of the several burners and its jointed support, and Fig. 4 is a front elevation of one of the burners.

The furnace as thus shown comprises a hearth-pan A at the top and a roller or wheeled base B at the bottom, upon which the liquid or oil tank C is fixed through its flanges *c*, secured to said base, and said tank has a lateral flange *c'* at its top, carrying the several posts D, which form the immediate supports of pan A and are rigidly fixed to said flange *c'* and pan A, so that practically a rigid and single framework or structure is built up with the parts A, B, C, and D, as just described.

Suitable pump mechanism (generally indicated by P) is employed to pump or force air into the top of the tank over the oil to sustain pressure, as is now well known in this art, and a pressure-indicator *d* shows the degree of pressure in the tank. An oil-supply pipe G enters the said tank from the top and is adapted to receive oil through its lower end and to convey the same to the several burners H by cross-pipe *g* and communicating pipes *g'*.

It should be understood that it is the plan of this invention to use kerosene or like heavy hydrocarbon oil, which cannot be vaporized or ignited at low temperatures. Hence I have

conceived the idea of facilitating the heating of the oil before it reaches the generators and promoting the heating thereof by placing the pipes *g* and *g'* within the pan A, over the bottom thereof, and building the fire-brick hearth *a* over the same. These bricks become intensely hot as the furnace is used and impart their heat to the said pipes, so that when the oil reaches the generators it is already in a state to be vaporized, if, indeed, vapor has not already been formed.

From pipes *g'* the oil or vapor flows through the short upright supporting-pipe *g''*, Fig. 3, to generating-coil J. The said upright-pipe connections *g''* contain a universal point 2, so constructed that it will hold the burner at any inclination or position to which it may be turned and whereby the burner may be bodily swung to right or left or moved in any other position within the limits of joint 2. This adjustment is particularly desirable for concentrating the fire or flame on the several burners at a given point or for more or less spreading the flame, as may be desired. In any event it gives the operator complete control of the position of the burners. The oil or vapor having reached generator-coil J, it passes into said coil at its cool end and leaves at its hot or superheated end, from which there is a pipe-stem 3 extending to the rear of the burner and discharging into valve-supporting head 4 in the end of casing or shell L.

Another material improvement is the arrangement for heating the air which supplies combustion, whereby I get very much better results than is possible by cold air. Hence I have constructed my burners each with a shell or casing L, which is closed all around and at its ends to exclude air, except at its front and top, where the heat is greatest and through which I draw the air for supplying combustion, as indicated by arrows. The air enters in front of separate head or plate 4, removably fixed in the end of casing L, and several valves 5 are supported and seated in said head and located to focus the vapor jetted therefrom at a meeting-point approximately at or in the end of burner-tube M within coil J.

The said tube M has its inner end closed, with a flange all around, except at its center, through which the superheated vapor and the heated air enter and are commingled at such high temperature that not only a perfect combustion is obtained, but a much greater volume of heat with a smaller supply of pure vapor than is possible with cold air.

As here shown, there are four several burners H over the hearth *a*, and each burner-casing L is provided with a lip 6 across its front and is otherwise closed against escape of liquid, so that it also constitutes an initial heating basin or pan for starting the generator. The said casing L may be in one or two parts, as convenience may suggest.

It will be observed that valve-supporting head 4 has an internal chamber 7, entered by return-pipe 3, for the vapor and open to all the vapor-orifices controlled by said valves, and two or more valves may be used, as desired. By using a plurality of valves with impinging jets I obtain a greatly-improved admixture of vapor and air over a single jet having necessarily a comparatively large outlet and under the pressure throwing its vapor in a stream into the burner-tube. By my means the jets of vapor are finer, and hence more easily mixed and commingled with air, and as both air and vapor are at high temperatures combustion begins at the initial end of the tube, and by the time the discharge end is reached the flame is white and of the greatest intensity and combustion is absolutely complete. The manner of heating the oil and superheating

the vapor, as well as the heating of the air within shell or casing L, contribute to this greatly-improved result.

What I claim is—

1. In a portable hydrocarbon brazing-furnace, a furnace structure comprising a suitable base, an oil-reservoir fixed upon said base and having a lateral flange at its top, a hearth-pan and posts supporting said pan and fixed to said lateral flange of the reservoir, substantially as described.

2. In hydrocarbon-burners, a generator-coil and a casing closed about the side and rear end of said coil and provided with a lip at its front end, said casing having a liquid-tight bottom portion, whereby the casing is made to serve also for initial heating purposes, substantially as described.

3. In a brazing-furnace, a suitable hearth, in combination with a series of burners radially disposed about the center of said hearth and supports on which said burners are adapted to be turned and tilted, a coil-generator about each of said burners and a casing about the said generator provided with a bottom constructed to receive liquid for initial heating purposes, substantially as described.

In testimony whereof I sign this specification, in the presence of two witnesses, this 25th day of February, 1904.

CHARLES F. WARNER.

Witnesses:

H. T. FISHER,
R. B. MOSER.