

J. R. DONNELLY.
 BURNER FOR SELF VAPORIZING TORCHES.
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997,278.

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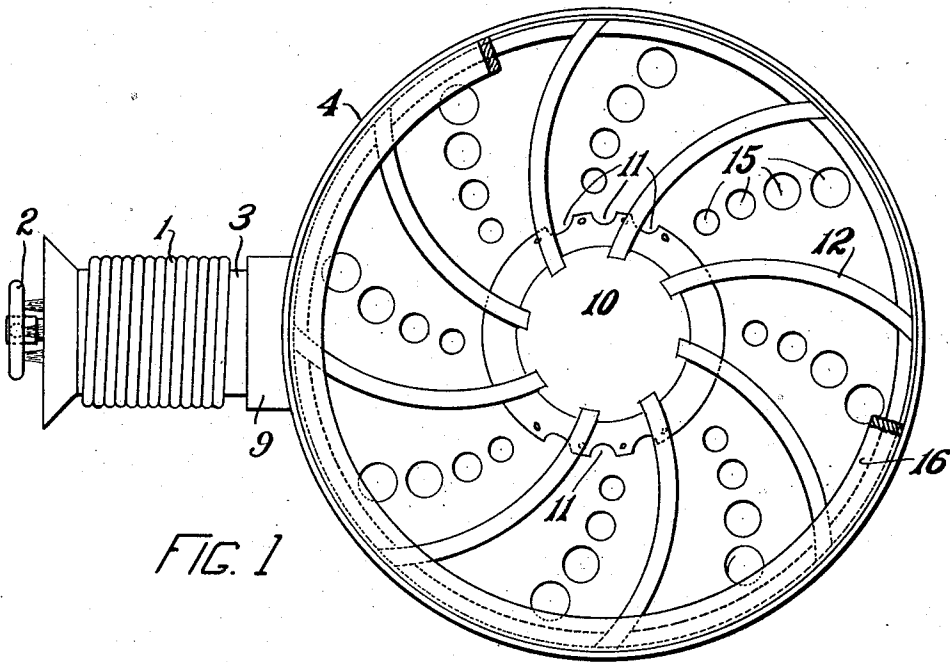


FIG. 1

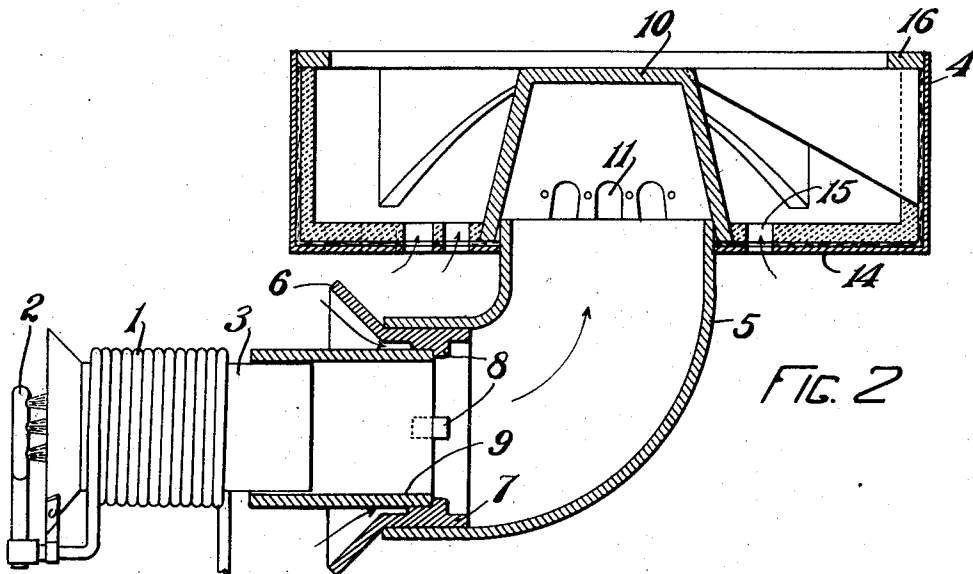


FIG. 2

WITNESSES
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UNITED STATES PATENT OFFICE.

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BURNER FOR SELF-VAPORIZING TORCHES.

997,278.

Specification of Letters Patent.

Patented July 11, 1911.

Application filed April 8, 1910. Serial No. 554,106.

To all whom it may concern:

Be it known that I, JOHN R. DONNELLY, a citizen of the United States, residing at Portland, county of Cumberland, State of Maine, have invented certain new and useful Improvements in Burners for Self-Vaporizing Torches, of which the following is a specification.

This invention relates to the burning of a hydrocarbon and particularly to the secondary combustion of a burning hydrocarbon vapor.

In the use of a hydrocarbon torch in which liquid fuel is volatilized in a vaporizing coil by the heat of its own flame, it is found difficult to apply the heat generated in certain usages, and further it has been found that in running upon a low blast there is a waste of potential heat units due to lack of complete combustion as well as in the delivery of the heat generated.

It is the object of my present invention to overcome these difficulties and to provide means for a suitable delivery of heat as well as for making possible a maximum heat generation upon a minimum consumption of fuel. To this end, I have provided for a secondary burning of the volatilized and ignited fuel by which I secure not only a complete combustion and a maximum generation of heat but a suitable delivery of the heat to the work.

My invention is capable of a general application and it will be apparent to those skilled in the art how it may be adapted to other uses from any example shown.

As illustrative of my invention I shall describe in the following specification a burner especially adapted for use in such work as boiler heating. This embodiment is shown in the drawings in a form which I find well adapted to practical use.

In the description like reference numerals are correspondingly employed throughout to indicate corresponding parts and in the drawings:—Figure 1 is a plan view of a burner for boiler heating embodying my invention, and Fig. 2 is a central vertical section of my burner.

1 is the vaporizing coil of a hydrocarbon burner having a discharge nipple 2 for directing into the bushing 3 a blast of hydrocarbon vapor which, mixed with air, is ignited and discharged from the end of the bushing 3.

4 is a casing preferably circular in form and having an elbow 5 which enters it centrally of its bottom. On the outer end of the elbow 5 is a flaring receiver 6 having a cylindric bearing 7 which fits within the end of the elbow 5.

8 are ears within the bearing 7 against which a cylinder 9 is centered. The bushing 3 of the torch fits loosely within the outer end of the cylinder 9 to permit an intake of air.

Above the upper end of the elbow 5 is a cap 10 preferably in the form of a truncated cone and notched on its lower edge as at 11.

12 are radial wings, preferably of a right angle triangle shape and preferably slightly dished or curved in the line of their major altitude. These radial wings 12 are laid up resting with the point formed by the acute angle of the shorter side against the bottom of the casing 4 and with the shorter side against the cylindric wall of the casing. This leaves the longer side substantially horizontal and parallel with the bottom of the casing as the point of the other acute angle, *i. e.*, that at the end of the longer side is rested against the upper end of the cap 10. The upper sides of the wings 12 are substantially level with the top of the cap 10 so that the burner presents a substantial flat radiating surface.

In building up the burner I preferably line the casing 4, which may be of sheet metal, with asbestos. I then lay in the radial wings 12 in symmetrical radiation from the cap 10 and with their curves similarly disposed to form a whirl. I then line the portion of the walls between the ends of the wings with cement, preferably a high per cent. magnesia mixture. This forms a hardening a socketed supporting of the wing ends in the wall itself.

The bottom 14 of the casing is preferably perforated, as at 15, in radiating groups so as to open the same between the wings 12. The bottom is lined with a cement coating similar to that of the walls.

The cap 10 and the wings 12 are preferably made of graphite or material of like properties.

16 is an inwardly turned ring or flange of cast iron or other suitable material which protects the edge of the cement lining and baffles inwardly the edges of the frame from the burner.

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The operation of my device is as follows: Supposing that the coils 1 of the burner are suitably connected with a fuel supply and the burner started at its full speed. The torch will deliver a flame from the bushing 3 which will be (in the case of my own burner) at a temperature of from 2800° to 3000° Fahrenheit. This will require in my burner a consumption of from four to five quarts of fuel per hour.

I find in practice that after the cap 10 and wing 12 are raised substantially to the temperature of the flame of my vaporizing torch that I can cut down my fuel supply without diminishing the heat in my burner. By timing my fuel consumption and testing the heat of the flame by a wire having a known fusing point experiment seems to show that for a burner requiring a consumption of from four to five quarts of fuel per hour for a temperature of from twenty-eight hundred to three thousand degrees Fahrenheit that I can reduce the fuel supply so that my burner will only consume about three pints per hour without reducing the original temperature of the ultimate combustion. I am, therefore, able to accomplish the results desired of my burner at a greatly reduced fuel consumption. I, furthermore, get the benefit of a more advantageous delivery of the heat to the surfaces to be heated as it will be readily seen that a direct blast of flame under a tubular boiler must result in unequal heating of the flues or pipes, while my secondary burner may be fitted to the area to be heated so as to receive a uniform distribution of heat thereon.

Various modifications may obviously be made in the construction and operation of my device and in its adaptation to various usages, all without departing from the spirit of my invention if within the limits of the appended claims.

What I, therefore, claim and desire to secure by Letters Patent is:—

1. A burner for hydrocarbon vapor comprising a casing, a flame flue centrally entering the bottom of the same, a perforated cap in said casing above said flue and radial wings set between said cap and the wall of said casing.

2. A burner for hydrocarbon vapor comprising a circular casing, a flame flue centrally entering the bottom of the same, a perforated cap in said casing above said flue and radial wings set between said cap and the wall of said casing and having their lower edges sloped upwardly toward the top of said cap, the bottom of said casing being perforated between said wings.

3. A burner for a hydrocarbon torch com-

prising a circular casing, a flame flue centrally entering the bottom of the same, a perforated cap in said casing above said flue and triangularly shaped radial wings set between said cap and the wall of said casing with their upper edges parallel to the casing bottom, said bottom of said casing being perforated between said wings.

4. In combination, a self vaporizing hydrocarbon torch, a casing, a flame flue from said torch to said casing, a perforated cap in said casing above said flue and radial wings between said cap and the wall of said casing, the bottom of said casing being perforated between said wings.

5. In combination, a self vaporizing hydrocarbon torch having a combustion bushing, a casing, a flame flue from said bushing to said casing, a perforated cap in said casing above said flue and radial wings between said cap and the wall of said casing, the bottom of said casing being perforated between said wings.

6. In combination, a self vaporizing hydrocarbon torch having a combustion bushing, a casing, a flame flue, said bushing entering said flue and having air intake openings about its point of entry, a perforated cap in said casing above said flue and radial wings between said cap and the wall of said casing, the bottom of said casing being perforated between said wings.

7. In combination, a self vaporizing hydrocarbon torch having a primary combustion bushing, a secondary combustion casing and a flame flue from said bushing to said casing, and refractory material disposed within said casing forming tortuous spaces therebetween walled by said material.

8. In combination a self vaporizing hydrocarbon torch having a primary combustion bushing and a secondary combustion casing associated therewith, and having an air intake and refractory material disposed within said casing forming tortuous spaces therebetween walled by said material.

9. In combination, a self vaporizing hydrocarbon torch having a primary combustion bushing, a secondary combustion casing, a flame flue leading to said casing and connecting with said bushing and having an air intake opening at its point of connection, and refractory material disposed within said casing forming tortuous spaces therebetween walled by said material.

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

JOHN RICHARD DONNELLY.

Witnesses:

HOWARD R. IVES,
HARRY POPKINS.