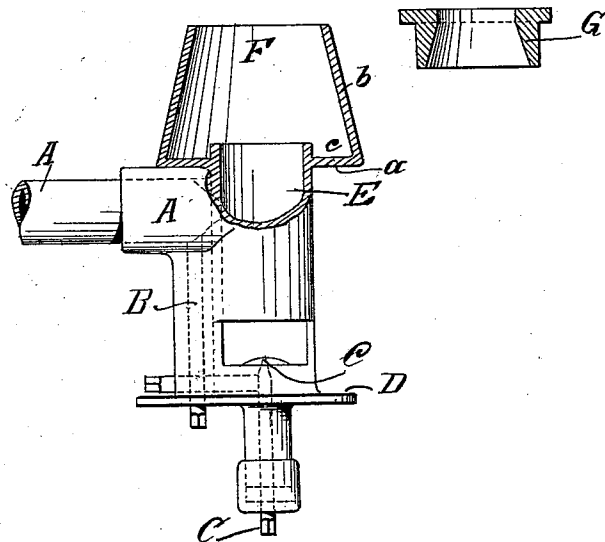


(No Model.)

J. H. MATHEWS.
HYDROCARBON BURNER.

No. 543,037.

Patented July 23, 1895.



WITNESSES

E. G. Lane.

Burt H. Miller

INVENTOR

Joseph H. Mathews

By W. K. Miller

Attorney

UNITED STATES PATENT OFFICE.

JOSEPH H. MATHEWS, OF CANTON, OHIO.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 543,037, dated July 23, 1895.

Application filed February 6, 1893. Renewed December 19, 1894. Serial No. 532,372. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH H. MATHEWS, a citizen of the United States, and a resident of Canton, county of Stark, State of Ohio, have

invented a new and useful Improvement in Hydrocarbon-Burners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, making part of this specification.

My invention relates to improvements in hydrocarbon-burners; the object of which is to provide a burner that will work under great pressure to produce an interior heat for smelting purposes, the flame of which is not liable to be extinguished or go out, that does not require a sub-light, and that will not burn the gas inside the burner.

With this object in view my invention consists of certain features of construction and combination of parts, as will be hereinafter described, and pointed out in the claims.

The drawing is a view with a portion cut away to show the upper end of the gas-pipe and the form of the top chamber. In this figure is shown a reducer adapted to the top portion of the burner.

Referring to the drawing, A represents a supply-pipe, through which the supply of hydrocarbon flows from the place of supply to the injector A'. Under a high pressure a quantity is allowed to flow through the tube B and pin-valve C into the pan D, formed about the lower portion of the burner. This overflow of hydrocarbon is fired to heat the burner to such a degree as to cause it to atomize the hydrocarbon which will flow through the valve C into the mixing-chamber E E. I wish to call particular attention to the form and structure of the chamber F, as it is upon this particular feature that the success of the burner depends. At a distance below the upper end of the mixing-chamber E, which is projected into the burner-chamber F, is projected a flange portion *a*, that forms the bottom of the chamber. From the outer edge of this bottom *a* is projected upwardly the side or wall *b* on converging lines, as shown, thus forming a truncated conical chamber having a top opening that is of a less diame-

ter than the bottom portion, but larger than the upper end of the mixing-chamber E.

In operation the gas flows with great force from the upper end of the mixing-chamber in a compact form, enlarging but little as it passes out of the chamber, at which point it is ignited, no gas burning in the chamber when the burner is in full operation. The flow of the gas through the burner at such great speed the air is drawn from the lower corner portion *c*, forming a partial vacuum, which in turn causes a counter-current of air to flow a distance down against the inside of the wall *b* between the wall and the upward flow of gas, that will turn and take into the gas at a point below the point of combustion, by which an additional amount of oxygen is supplied to enrich the gas with heating quality and to absolutely prevent the extinguishment of the flame so long as there is a supply of hydrocarbon.

This burner is adapted solely for producing intense heat for smelting metals and kindred purposes to be used under crucibles in smelting-furnaces.

The intensity of this burner may be reduced by placing the reducing-ring in cap G in the upper end of the chamber F.

Having thus fully described the nature and object of my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination in a hydro-carbon burner of the mixing chamber E, the lateral injector A' and pipe leading from a hydro-carbon supply, by which fluid hydro-carbon may be injected into the chamber E under pressure, and the truncated conical chamber F, formed integral with the chamber E and the mixing chamber near its bottom having openings for the admission of air to support combustion, substantially as specified.

2. The combination in a hydrocarbon burner, of the mixing chamber E, the truncated conical burning chamber F, at the upper end thereof the lateral injector A' for injecting hydrocarbon under pressure into the mixing chamber, the tube B, valve C and pan D, whereby a hydrocarbon in regulated quantity may be admitted to the pan and fired to

heat the mixing chamber so as to vaporize the hydrocarbon in said chamber, substantially as specified.

3. The combination in a hydrocarbon
5 burner of the truncated conical chamber F, the mixing chamber E, projected a distance into said chamber, a pipe A, leading from a hydrocarbon supply to the vaporizing chamber A', a pipe leading from said vaporizing

chamber to the mixing chamber and valve C, to whereby the flow of vaporized hydrocarbon into the mixing chamber may be regulated.

In testimony whereof I have hereunto set my hand this 4th day of February, A. D. 1893.

JOSEPH H. MATHEWS.

Witnesses:

W. K. MILLER,

BURT. A. MILLER.