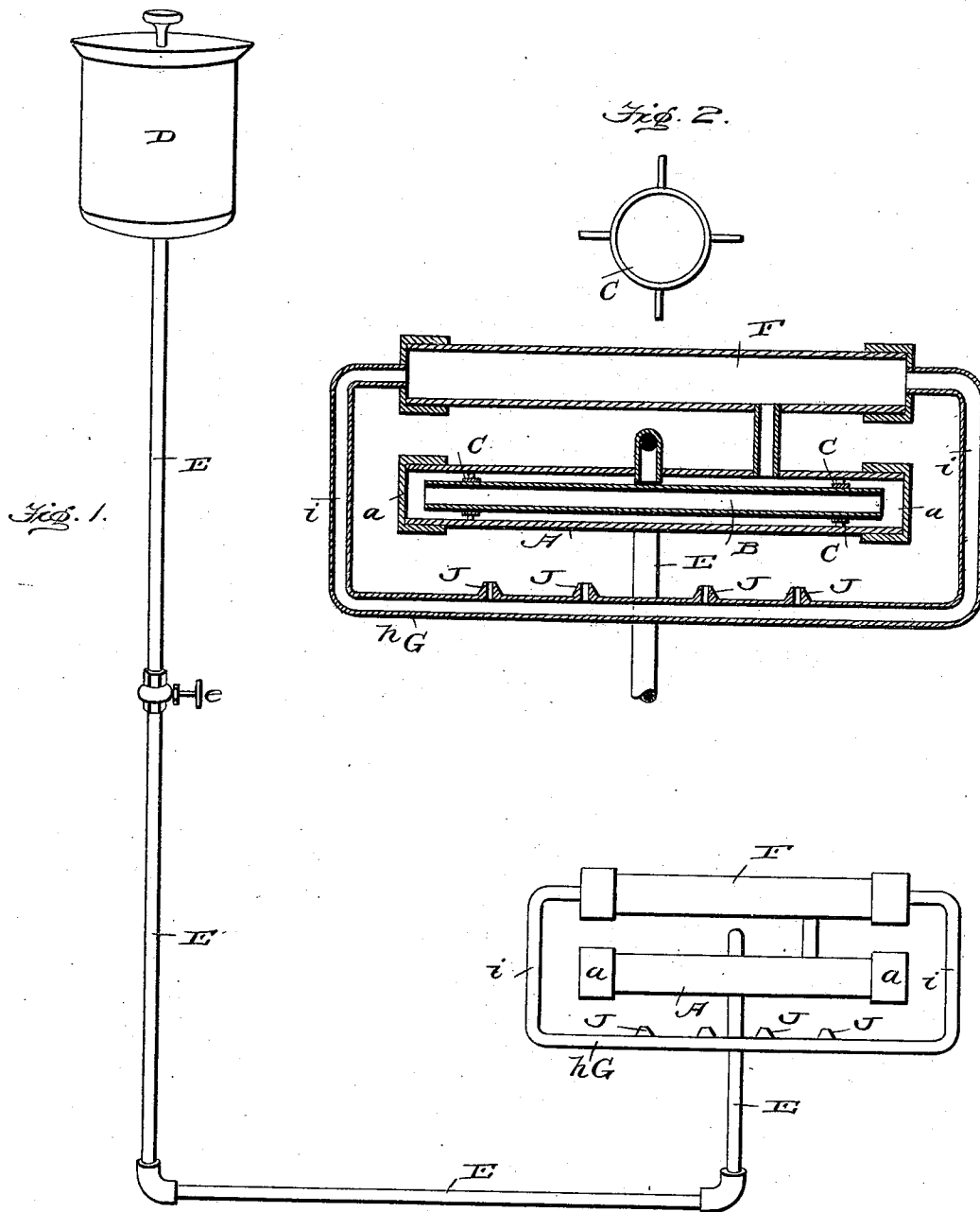


(No Model.)

D. W. COLE.
HYDROCARBON BURNER.

No. 512,245.

Patented Jan. 2, 1894.



Witnesses:

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UNITED STATES PATENT OFFICE.

DANIEL W. COLE, OF OTTAWA, KANSAS, ASSIGNOR TO WILLIAM W. DE WOLF, OF SAME PLACE.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 512,245, dated January 2, 1894.

Application filed August 3, 1893. Serial No. 482,300. (No model.)

To all whom it may concern:

Be it known that I, DANIEL W. COLE, a citizen of the United States, residing at Ottawa, in the county of Franklin and State of Kansas, have invented certain new and useful Improvements in Hydrocarbon-Burners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in hydrocarbon burners of that class which supplies a liquid hydrocarbon to a retort for the purpose of vaporizing the liquid and feeding it in a heated condition to the flame orifices or nipples of the burner; and the object in view is to provide a simple and inexpensive apparatus of this character for domestic and general heating purposes. To the accomplishment of these ends, I construct the burner with a retort having an internal spreading tube which is held in position within the retort in a manner to receive upon itself the liquid hydrocarbon supplied by a pipe from an elevated tank, whereby increased heating surface is provided within the retort, the liquid hydrocarbon is spread and diffused quickly over the heating surface, and the vapor can pass freely through the retort and its internal pipe. With this retort I combine a heating chamber which is situated above the same and connected thereto by a pipe through which the vaporized fuel from the retort can pass to said heating chamber, and to this latter chamber I connect or couple in any suitable way the ends of a bow-shaped pipe which extends below the retort and is provided, in its horizontal lower part, with a series of flame orifices or nipples to which the vaporized fuel, in a heated condition from the upper heating chamber, is supplied for consumption.

The improvements further consist in the peculiar construction and combination of parts which will be hereinafter fully described and pointed out in the claims.

In the accompanying drawings, forming a part of this specification, I have illustrated the preferred embodiment of my improved hydrocarbon burner, in which—

Figure 1 is a perspective view, and Fig. 2 is a vertical longitudinal sectional view taken through the retort and the heating chamber.

Like letters of reference denote corresponding parts in both figures of the drawings, referring to which—

A designates the retort which consists of the long cylindrical tube having the closed ends *a, a*, and the internal concentric spreader tube B. This internal tube is of less diameter than the retort-tube A, and it is held therein in a fixed position, concentric with the retort-tube by means of the skeleton rings C, C, which are constructed to permit the vapor or liquid to pass freely through the tubes A, B, and around the internal tube B.

D is the elevated tank in which the liquid hydrocarbon is placed and E is the supply pipe which has one of its vertical branches connected to the lower part of the elevated supply tank while the other vertical arm of this supply pipe is connected to the top side of the retort-tube A in a position or manner for the liquid hydrocarbon to drop upon the internal diffusing tube B within the retort.

F is the upper heating chamber which is made in the form of a cylindrical tube situated above or immediately over the retort A, and the ends of this tube F are closed in any suitable way. I may close the ends of the tubes A, F, by means of screw-plugs that are designed to be screwed into the ends of the tubes, or these plugs may be welded into the ends of the tubes; but in lieu of plugs I may employ external caps as shown in the drawings which may be screwed or otherwise securely fastened onto the ends of the tubes A, F, the object being to very tightly close the ends of said tubes to obviate the escape or leakage of the vaporized fuel in any manner.

G is the bow shaped pipe that forms the burner, proper. This pipe is bent from a single continuous piece or length of tubing to form the lower horizontal branch *h* and the upright branches *i, i*, the pipe being arranged as shown in Fig. 1 of the drawings. The ends of the upright branches *i, i*, of the pipe G are securely fastened to the respective caps or plugs at the ends of the heating-chamber tube F so as to receive the hot vaporized fuel from the chamber in said tube F while

the lower horizontal branch *h* of this pipe G is arranged below the retort A and in close proximity thereto. In the upper side of this horizontal branch *h* of the bow shaped pipe I provide the flame orifices J. These orifices may be in the form of round or oblong holes cut in the upper side of the branch *h*, or tapered nipples may be secured to the upper side of the branch *h* of the bow-shaped pipe G.

In the vertical branch of the supply pipe E which is connected to the elevated tank is provided a regulating cock or valve *e* by which the flow of liquid hydrocarbon through the supply pipe E can be regulated so as to prevent flooding the retort A; and in connection with the tank I provide suitable indicating mechanism to indicate the quantity of liquid hydrocarbon that should be supplied to the retort to govern heating capacity of the burner.

This being the construction of my improved hydrocarbon burner, the operation may be briefly described as follows: A suitable pan or tray is placed underneath the burner and a quantity of liquid hydrocarbon is deposited therein, after which a lighted match or taper is applied to the liquid in the pan or tray and the heat thereby produced serves to heat the retort, the bow-shaped pipe G and the heating chamber tube F. The valve *e* is now opened to permit the liquid hydrocarbon to pass through the pipe E into the retort and upon the internal tube B therein, which causes the liquid to be quickly diffused over the heating surface in the retort and to vaporize such liquid which is free to pass through the tubes A, B, and from thence through the connection into the heating chamber F and thence through the branches *i, i*, to the flame orifices or jets J. The vaporized fuel is thus consumed at the flame orifices or jets J and as these jets are below the retort and the heating tube F a portion of the heat is utilized to maintain the retort and the tube F in their proper heated condition.

My burner is simple and durable in construction, efficient in operation, and cheap of manufacture. It can be used for cooking or other domestic purposes, or it can be used for heating purposes generally.

I am aware that changes in the form and proportion of parts and in the details of con-

struction can be made without departing from the spirit or sacrificing the advantages of my invention, and I therefore reserve the right to make such modifications and alterations as fairly fall within the scope of my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a hydrocarbon burner, the retort provided with an internal diffusing tube, in combination with an elevated tank, a supply pipe between the tank and retort and which delivers a liquid hydrocarbon upon said internal diffusing tube, and a bow-shaped pipe which receives from the retort and has its flame orifices below said retort, for the purposes described, substantially as set forth.

2. In a hydrocarbon burner, the retort having the closed ends and the internal diffusing tube arranged concentric within the retort and held in a fixed position therein by devices which permit of the free passage of liquid or vapor between the retort-shell and the diffusing tube, combined with an elevated tank, a supply pipe which conveys liquid hydrocarbon from said tank to the upper side of the diffusing tube within the retort, and a burner-pipe having its ends arranged to receive from the retort and provided with flame orifices below the retort, substantially as described.

3. In a hydrocarbon burner, the combination of a retort provided with an internal diffusing tube which is fixed therein concentric with the tube or shell, a heating chamber connected by an intermediate pipe with said retort, an elevated tank, a supply pipe arranged to convey liquid hydrocarbon from said tank to the upper side of the diffusing tube in the retort, and a bow-shaped pipe having its ends connected to the heating tube and provided with the flame orifices below the retort, substantially as and for the purposes described.

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

DANIEL W. ^{his} X COLE.
mark

Witnesses:

W. W. DE WOLF,
F. W. HECKROOT.