

No. 756,493.

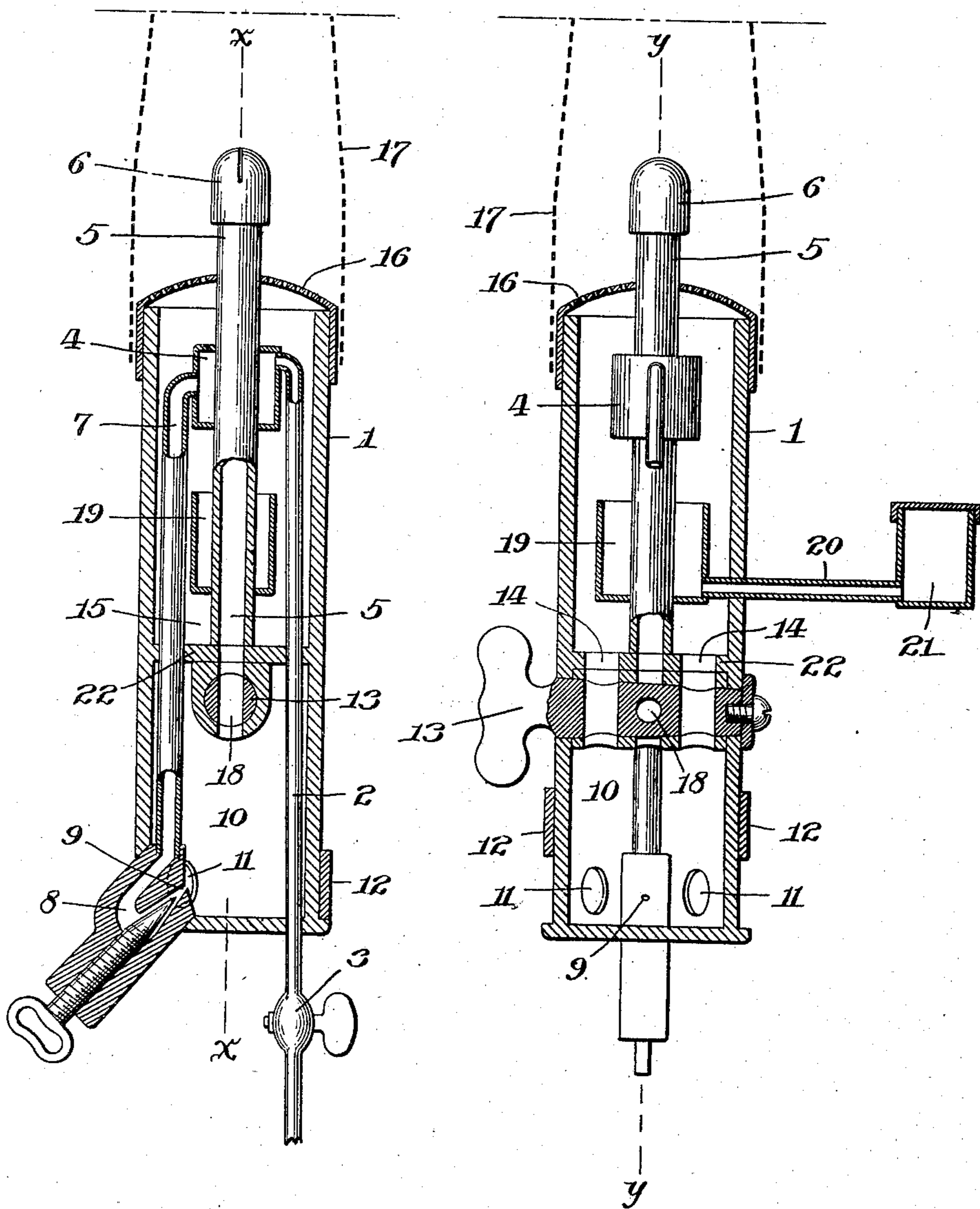
PATENTED APR. 5, 1904.

J. GRAHAM.
HYDROCARBON BURNER.
APPLICATION FILED NOV. 26, 1898.

NO MODEL.

Fig. 1.

Fig. 2.



WITNESSES:

Max Hofmann
George G. Ziegler

INVENTOR

John Graham
BY *W. H. Wasdale*

ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN GRAHAM, OF PHILADELPHIA, PENNSYLVANIA.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 756,493, dated April 5, 1904.

Application filed November 26, 1898. Serial No. 697,504. (No model.)

To all whom it may concern:

Be it known that I, JOHN GRAHAM, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Hydrocarbon-Burner, of which the following is a specification.

My invention relates to hydrocarbon-burners; and my object is to provide compact and efficient means for vaporizing hydrocarbon and conveying the same mixed or unmixed with air, as may be desired, to a suitable burner for its combustion. I attain this object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a view of my device with the casing, needle-valve, and cock in vertical section on the line *yy* of Fig. 2, the other parts in perspective. Fig. 2 is a similar view, the vertical section being the lines *xx* of Fig. 1, except that the cock 13 in the two views is in different positions.

Referring to the drawings, 1 is the outer casing or cylinder. The hydrocarbon-supply tube 2, controlled by a suitable cock 3, enters the bottom of the casing and extends upward to nearly the top of the casing, where it enters the vaporizing chamber or drum 4. This chamber or drum surrounds the heating-rod 5. Communicating also with the vaporizing chamber or drum 4 is the tube 7, which extends downward and communicates with the needle-valve 8. The cup or receptacle 19 is adapted to contain alcohol or gasoline or other similar volatile combustible fluid to be burned for the initial heating of the vaporizing chamber or drum in starting the operation of vaporization. Said alcohol or gasoline is introduced into receptacle 19 through the tube 20 from receptacle 21.

The operation of my device is as follows: After the necessary heating of rod 5 and the vaporizing chamber or drum 4 by the combustion of alcohol or gasoline in receptacle 19 the hydrocarbon is introduced through tube 2 into said vaporizing chamber or drum 4, where it becomes vaporized and proceeds through tube 7 to the needle-valve 8, through the vent 9, into the mixing-chamber 10, where it is mixed with air entering through aper-

tures 11, the required inflow of air being regulated by the sliding collar 12 to open or close the apertures 11. The vapor mixed with air then rises and passes through the openings 14 of diaphragm 22 into the superheating-chamber 15, where it becomes further heated by contact with the outside of vaporizing chamber or drum 4 and heating-rod 5. It then passes through the gauze or perforated cap 16 to burn above the same to heat the incandescent mantle, (indicated by the dotted lines 17.)

It will be noted that the heating-rod 5 is shown in the drawings as tubular in form; but it is not essential that it should be so to form a complete and operative device as thus far described. Where it is not desired to employ the alternative burner 6, the rod may be solid and may terminate at the vaporizing chamber or drum 4, and the cock 13 may be dispensed with, there being then only the two apertures 14 in diaphragm 22. The advantage, however, in using the tubular heating-rod 5 and the other construction as shown in the drawings is as follows: In case of breaking the mantle or for any other reason it becomes desirable the vapor may be turned into the said heating-tube and burned at tip 6, the construction and operation being as follows: The tube 5 is provided at its upper end with the burner-tip 6 and extending downward opens through diaphragm 22. Beneath this diaphragm is the cock 13, provided with a central opening 18 corresponding with the interior of tube 5, and at right angles with said opening 18 and on either side thereof the openings corresponding with the openings 14 of diaphragm 22. When the vapor is to be burned at the burner-tip 6 without a mantle, the cock 13 is turned to the position shown in section in Fig. 1, thereby closing the apertures 14 to shut off communication between chambers 10 and 15 and opening communication between chamber 10 and the tube 5 through aperture 18. The vapor will then pass from chamber 10 through tube 5 to burner-tip 6, in which case, little or no air being required to mix with the vapor, the aperture 11 may be nearly or entirely closed by adjustment of collar 12. When the vapor is

to be burned at the gauze burner to heat the mantle, the cock is turned to the position shown in Fig. 2.

It is obvious that after sufficiently heating
5 the vaporizing chamber or drum 4 and heating rod or tube 5 by the temporary burning of alcohol or gasolene in the receptacle 19 the burning of the vapor itself at the gauze burner and about the heating-tube and burner-
10 tip or the burning of the vapor at the tip itself will impart sufficient heat to the said heating rod or tube, which will communicate the same to the vaporizing chamber or drum 4 to continue the vaporization of the hydrocarbon
15 entering it from tube 2.

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

1. In a hydrocarbon-burner, the combination of a hollow member, a burner-cap surmounting the same, a vaporizing-drum suspended within the hollow member, a vertically-disposed heat-conducting member projecting through the vaporizing-drum and burner-cap, an oil-supply tube delivering to
25 the vaporizing-drum and a vapor-discharge pipe leading from the vaporizing-drum to the lower portion of the hollow member and discharging upwardly therein as means for delivering the vapor from the drum mixed
30 with air to the burner-cap.

2. In a hydrocarbon-burner, the combination of a hollow member, a burner-gauze surmounting the same, a vaporizing-drum suspended within the hollow member, a heat-conducting member connected with the vaporizing-drum and projecting through the burner-gauze, and regulatable means for delivering the vapor from the vaporizing-drum to the lower part of the hollow member, substantially as described.
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3. In a hydrocarbon-burner, the combination of a hollow member, a burner-gauze surmounting the same, a vaporizing-drum suspended within the hollow member, a heat-conducting member connected with the vaporizing-drum and projecting through the burner-gauze, regulatable means for delivering the

vapor from the vaporizing-drum to the lower part of the hollow member, adjustable air-intake means in the lower part of said hollow member and means for conducting the vapor mixed with air to the burner-gauze. 50

4. In a hydrocarbon-burner, the combination of a mixing-chamber, a superheating-chamber, a vaporizing-chamber within the superheating-chamber, a tube leading from the vaporizing-chamber and discharging into the mixing-chamber, and a heating-tube provided with a burner-tip and extending through the vaporizing-chamber and communicating with
60 the mixing-chamber, substantially as described.

5. In a hydrocarbon-burner, the combination of a mixing-chamber, a superheating-chamber, a vaporizing-chamber within the superheating-chamber, a tube leading from the vaporizing-chamber and discharging into the mixing-chamber, a heating-tube provided with a burner-tip and extending through the vaporizing-chamber and communicating with the
70 mixing-chamber, and means within the superheating-chamber for the initial heating of the vaporizing-chamber, substantially as described.

6. In a hydrocarbon-burner, the combination of a mixing-chamber, a superheating-chamber having communication therewith, the vaporizing-chamber within the superheating-chamber, a burner-gauze surmounting the superheating-chamber, a tube leading from
80 the vaporizing-chamber and discharging into the mixing-chamber, a heating-tube provided with a burner-tip and extending through the vaporizing-chamber and burner-gauze and communicating with the mixing-chamber, and
85 manually-operative means for closing communication between the mixing-chamber and the superheating-chamber and opening communication between the mixing-chamber and the heat-tube and vice versa.

JOHN GRAHAM.

Witnesses:

JOHN WRIGHT REEVE, Jr.,
JNO. STOKES ADAMS.