

No. 742,460.

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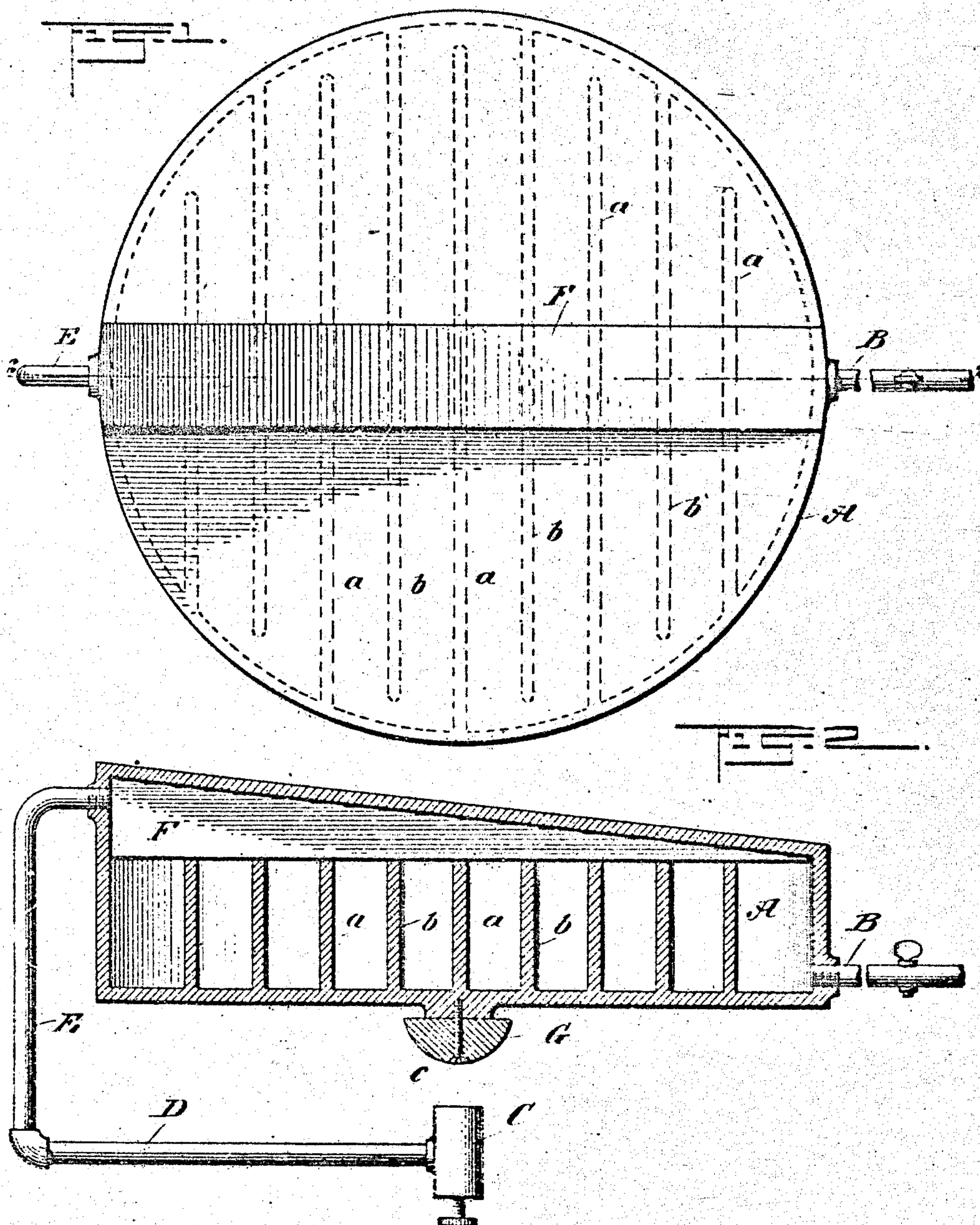
M. G. LEWIS.

LIQUID FUEL HEATER BURNER.

APPLICATION FILED OCT. 9. 1902.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

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L. H. Grote

INVENTOR

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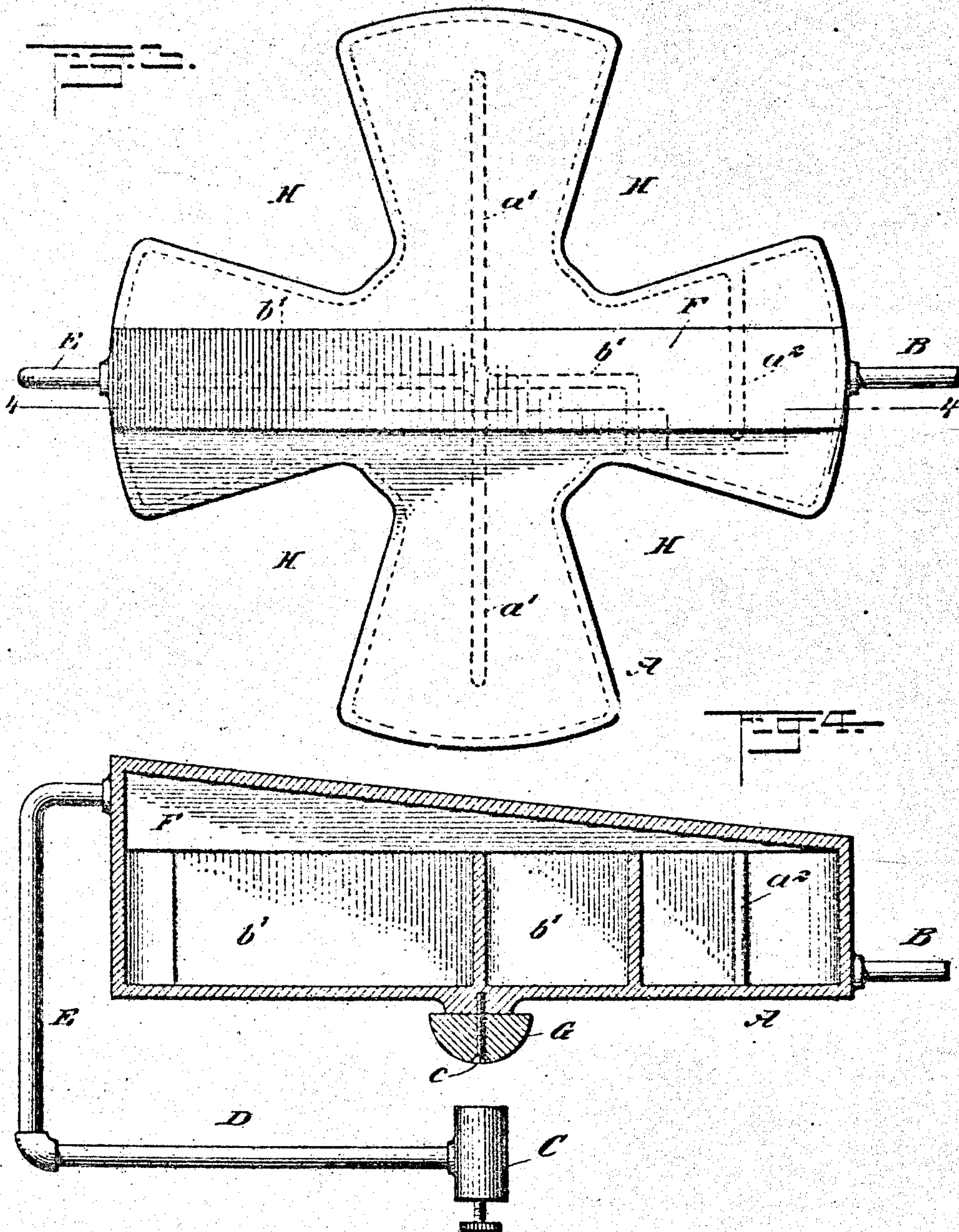
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UNITED STATES PATENT OFFICE.

MORTIMER G. LEWIS, OF NEW YORK, N. Y.

LIQUID-FUEL HEATER-BURNER.

SPECIFICATION forming part of Letters Patent No. 742,460, dated October 27, 1903.

Application filed October 9, 1902. Serial No. 126,432. (No model.)

To all whom it may concern:

Be it known that I, MORTIMER G. LEWIS, a citizen of the United States, residing at New York city, in the county and State of New York, have invented certain new and useful Improvements in Liquid-Fuel Heater-Burners, of which the following, taken in connection with the accompanying drawings and the letters of reference marked thereon, is a full, clear, and exact specification.

My invention has relation to that general class of heater-burners in which liquid fuel is delivered to the burner under more or less pressure and is therein converted into gas or vapor, which issues from the burner-orifice and then mingling with the atmosphere is consumed for the production of heat, the flame keeping the vaporizing-chamber always heated, and thus insuring a constant supply of vapor or as so long as the burner is in operation.

My improvements are chiefly designed for use in connection with boilers, and especially with boilers such as are used on boats and other vehicles, but obviously they may be used in any other situation wherein they may be found advantageous.

The objects of my invention are to provide or produce a simple, cheap, and efficient burner of the class indicated wherein the vaporizing-chamber is provided with a series of internal partitions or baffle-plates which compel the incoming liquid to traverse the bottom of the vaporizing-chamber in different directions before it would be possible for it to find any outlet to the burner-orifice, the said baffle-plates or partitions being surmounted by a chamber open at the bottom into the interior of the vaporizing-chamber and above the baffle-plates to afford a channel through which the gas or vapor may flow from one side of the vaporizing-chamber to the other and to the burner-orifice at all times, to supply the bottom of the vaporizing-chamber with a novel and useful form of deflector or director for the impinging gas or vapor so as to distribute the flame to most advantage upon the lower surface of the vaporizing-chamber and at the same time insure a proper mixture of air with the issuing vapor to secure proper and economical consumption of fuel and production of heat, and

to construct the body of the vaporizing-chamber with wings or projecting portions which leave open spaces between them for the upward passage of flame at parts nearer the center than the outer margin of the vaporizing-chamber in order that when used under a boiler or similar vessel the central portions may be heated with equal effect as are the exterior portions.

To accomplish the foregoing objects and to secure other and further advantages in the matters of construction, operation, and use, my improvements involve certain new and useful arrangements or combinations of parts and peculiarities of construction as will be herein first fully described and then pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a plan or top view of a heater-burner made in cylindrical form with no vertical opening through the vaporizing-chamber. Fig. 2 is a vertical section and elevation on a plane through line 2 2 of Fig. 1. Fig. 3 is a plan or top view of a heater-burner constructed with wings, leaving open spaces between them and being otherwise constructed in accordance with my invention. Fig. 4 is a vertical section and elevation on the broken line 4 4 of Fig. 3.

In all the figures like letters of reference wherever they occur indicate corresponding parts.

The vaporizing-chamber is preferably made of cast-iron; but it might be made of other metal, and to secure the most satisfactory results the top and bottom and the interior partitions are preferably cast together—that is to say, they are by preference made in one piece.

A is the vaporizing-chamber, which may be of any desired size, depending upon the amount of liquid fuel to be vaporized or according to the desired capacity of the burner for heating.

B is the inlet-pipe for liquid fuel, which fuel is delivered to the interior of the vaporizing-chamber under considerable pressure and at or near the bottom of the vaporizing-chamber.

C is the piece through which the gas or vapor issues to be burned, this piece being connected with the vaporizing chamber through

5 suitable piping, as at D and E, and being located under the central part of the vaporizing-chamber. The pipe E is located opposite the inlet-pipe B and opens out of a chamber F, which communicates throughout its length with the upper part of the vaporizing-chamber whether the vaporizing-chamber be of the solid or winged or other pattern, the chamber F being located above the top of the vaporizing-chamber.

10 Within the chamber A are a number of partitions a a, &c., and b b, &c. In the cylindrical form of vaporizing-chamber these partitions extend across the line between the inlet and outlet, terminating alternately near to the vertical walls of the chamber to compel any liquid which might otherwise traverse the vaporizing-chamber directly to flow by circuitous routes back and forth across the bottom of the chamber before it can reach the inlet. In the form of chamber shown in Fig. 3 the interior partitions a' a', b' b', and c' are arranged so as to compel the incoming liquid to traverse the bottom of the several wings before it could escape at the outlet. In these burners having these internal partitions it has been found necessary to provide a free escape for the vapor at points above the partitions in order to prevent the gas in the vaporizing-chamber from forcing the oil or liquid before it and out through the outlet, and to accomplish this it has heretofore been proposed to form notches in the tops of the several partitions. These notches are somewhat difficult and expensive to make, and they do not afford the ready escape for gas and vapor and insurance against possible outflow of oil, as is necessary and desirable. According to one part of my present invention I provide the top of the vaporizing surrounding chamber with a chamber F, located above the internal partitions, the interior of this chamber F being open at bottom, and therefore, in communication with the interior of the vaporizing-chamber A. This chamber F should be comparatively narrow, but yet of sufficient extent to freely receive all the gas or vapor arising from the oil while the burner is in operation. The top of the chamber F inclines from the vertical wall near the inlet up to its other extremity, where the outlet-pipe E is applied. This construction affords a chamber gradually increasing in capacity from the point of inlet to the point of outlet, so that no matter how the burner may be tipped or rocked, as on a boat or other vehicle, it will not be possible for the gas to force any oil out through the outlet. The communication of the outlet-pipe with the interior space is also thus placed at a point sufficiently elevated, so that no probable tipping or rocking of the burner will allow any oil or liquid fuel to naturally flow to the outlet-pipe while the burner is in operation.

I apply to the bottom of the vaporizing-chamber a metallic block G, of substantially

hemispherical form. This extends beyond an enlargement formed on the base of the vaporizing-chamber and is preferably secured in place by a removable screw, as c.

The chamber F and the deflector G are intended to be applied to the vaporizing-chamber, of whatever exterior form that may be. In the form of vaporizing-chamber shown in Figs. 1 and 2 I have found that if it be made large enough for use under steam-boilers, for instance, the flame passes up around the vaporizing-chamber and out through the exterior tubes of the boiler, leaving the interior tubes practically free of flame, or if the boiler or other vessel has no tubes then the central portion of the bottom of the vessel is not struck by the flame. Narrow channels or passage-ways through the vaporizing-chamber have been found wholly inadequate to produce the desirable uniform distribution of flame upon the bottom of the vessel located over the heater. Therefore I make the vaporizing-chamber with four or more radial wings, as shown in Fig. 3, extending from a common central part and leaving open spaces, as at H H, between them. The wings are hollow and constitute portions of the vaporizing-chamber, communicating with the central portion of said chamber. The open spaces between the wings may be made of greater or less extent in proportion to the wings, according to the work required of them. They permit a portion of the flame to pass up between them and near to the center of the burner, and the wings compel the remaining portions to move farther away from the center before they can reach the bottom of the boiler or other vessel. This construction also enables me to reduce the size of the flame as occasion may require without concentrating it against any particular point of the bottom of the object to be heated. The radiating-wings are gradually widened from their inner to their outer ends, as indicated, so that at their outer portions they afford more room for the expansion of their contents than at their inner portions and more exterior surface to be heated. Thus when the flame is greatly increased the burner responds in furnishing a correspondingly-increased capacity for vaporization of the liquid fuel.

The improved burner may be mounted in connection with the object to be heated in any manner desired.

Being constructed and arranged substantially in accordance with the foregoing explanations the improvements have been found to answer all the purposes or objects of the invention hereinbefore alluded to.

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

1. In a burner of the character herein set forth, the vaporizing-chamber supplied with a number of interior partitions located between the inlet and outlet, said vaporizing-

chamber being surmounted by a second chamber communicating with the interior of the vaporizing-chamber and affording a free passage for gas or vapor above the partitions and above the top of the vaporizing-chamber, for the purposes set forth.

2. In a burner of the character herein set forth, the vaporizing-chamber supplied with a number of interior partitions located between the inlet and outlet, said partitions being surmounted by a chamber communicating with the interior of the vaporizing-chamber and of which the top is inclined upwardly from a point above the fuel-inlet to the position of the outlet, the parts being combined and arranged substantially as and for the purposes set forth.

3. In a burner of the character herein set forth, the vaporizing-chamber having a number of hollow wings radially arranged and projecting from and communicating with the

common central portion, leaving open spaces between the said wings for passage of flame, the wings being gradually widened from their inner to their outer ends, substantially as shown and for the purposes set forth.

4. In a burner of the character herein set forth, the combination with the vaporizing-chamber having radial wings projecting from a common central portion and leaving open spaces between the wings for the passage of flame, of internal partitions extending into the wings, substantially in the manner and for the purposes set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

MORTIMER G. LEWIS.

Witnesses:

C. SEDGWICK,
WORTH OSGOOD.