

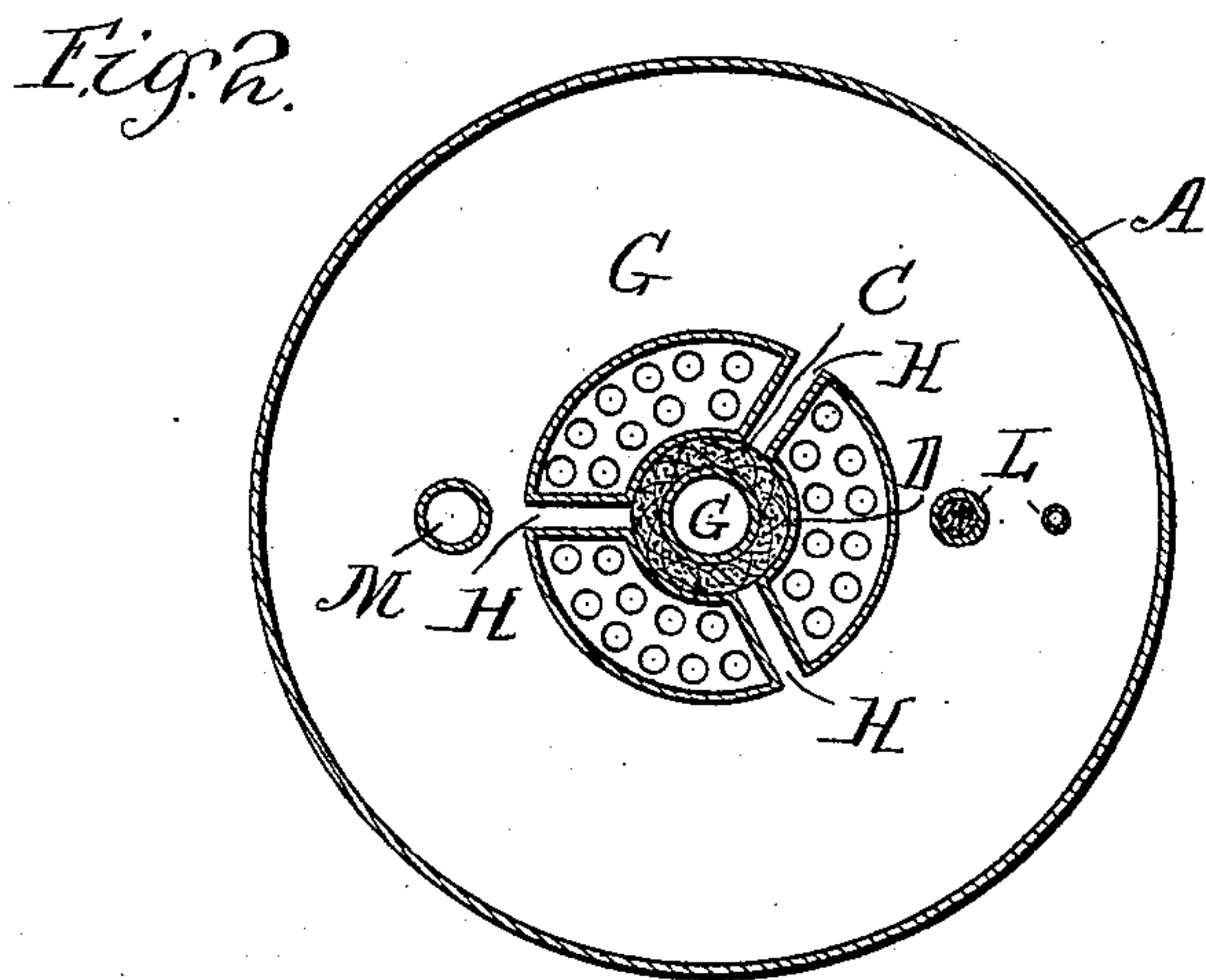
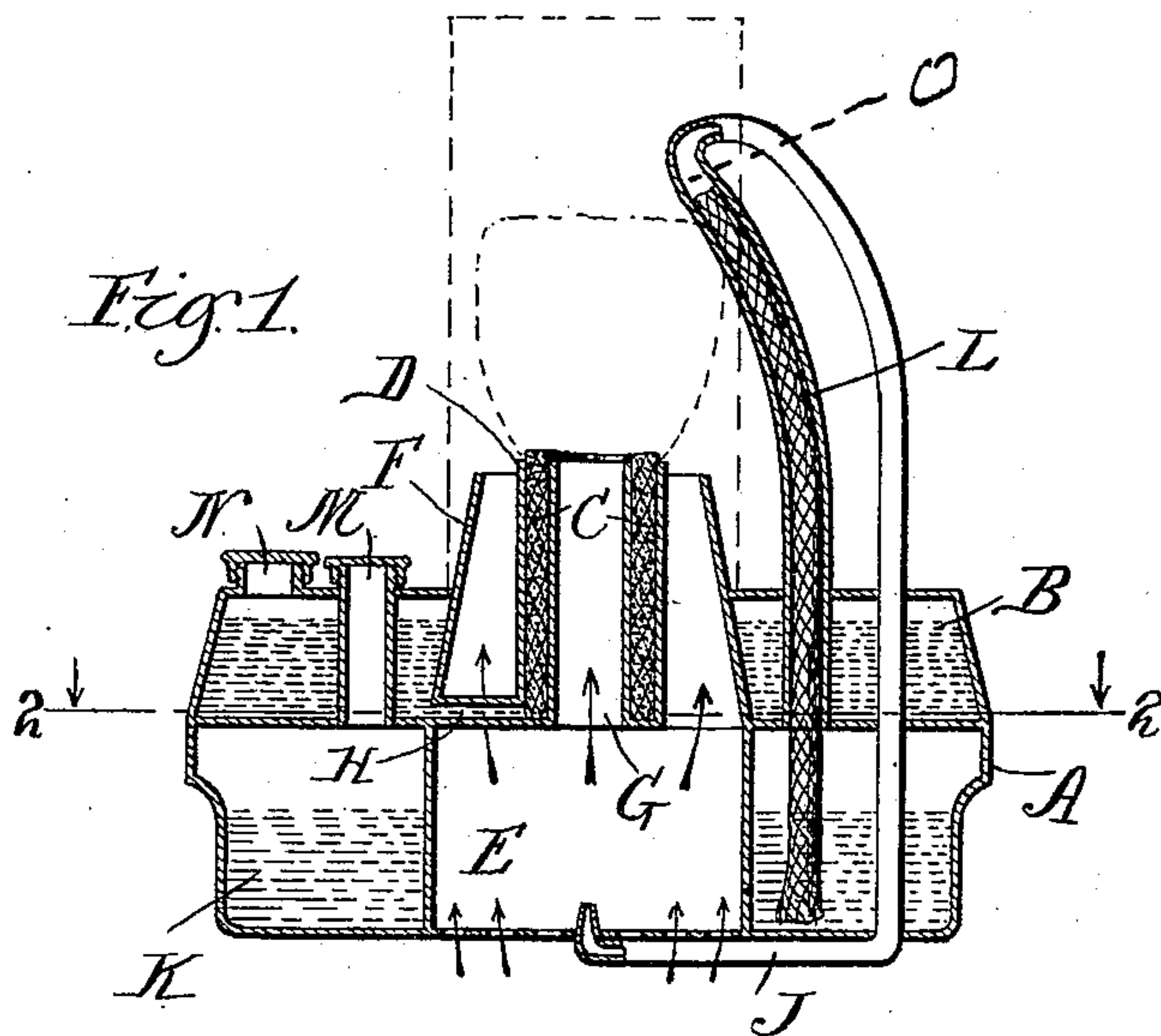
No. 618,660.

Patented Jan. 31, 1899.

E. & E. E. GRAY.
LAMP.

(Application filed Aug. 21, 1897.)

(No Model.)



Witnesses.

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UNITED STATES PATENT OFFICE.

ELISHA GRAY AND EDWARD E. GRAY, OF HIGHLAND PARK, ILLINOIS.

LAMP.

SPECIFICATION forming part of Letters Patent No. 618,660, dated January 31, 1899.

Application filed August 21, 1897. Serial No. 649,091. (No model.)

To all whom it may concern:

Be it known that we, ELISHA GRAY and EDWARD E. GRAY, citizens of the United States, residing at Highland Park, in the county of Lake and State of Illinois, have invented a new and useful Improvement in Lamps, of which the following is a specification.

This invention relates to lamps.

The object of the invention is to provide a lamp, and particularly a lamp of the forced-draft type, wherein the draft-current is supplied to the burner or flame in a simple and efficient manner.

The further objects of the invention will appear more fully hereinafter.

The invention consists in the construction, combination, location, and arrangement of parts, all as will be more fully hereinafter set forth, as shown in the accompanying drawings, and finally specifically pointed out in the appended claims.

Referring to the accompanying drawings and to the views and reference signs appearing thereon, Figure 1 is a view in vertical central section of a lamp constructed in accordance with the principles of the invention. Fig. 2 is a horizontal sectional view of the same on the line 2 2, Fig. 1, looking in the direction of the arrows.

In the construction of lamps, and particularly lamps of the forced-draft variety, we have found that by arranging a tube or jet of very fine bore in the duct or passage through which the air is supplied to the burner and by delivering through said jet or tube a fine stream of air, gas, steam, vapor, or the like the entire column of draft-air contained in said duct or passage is set in motion in a direction tending to force the same through and around the burner or flame in the same manner as in the case of mechanically-operating apparatus for creating a forced draft. In other words, the fine jet or stream of air, gas, steam, or vapor forced through the capillary tube or jet and delivered into the draft duct or passage acts after the manner of a motor to set in motion and to give impetus to the column of draft-air contained in or carried through such duct or passage. We have found that air forced through a capillary tube in a fine jet or stream will serve the desired purpose. Equally good results may be

obtained by employing a fine stream or jet of steam, air, gas, or vapor generated in any suitable or convenient manner, it being understood that the fine stream or jet forced through the capillary tube of fine bore is not depended upon to feed the flame, and hence the particular medium employed for the fine jet or stream does not constitute the essence of the invention. It is also found that a forced vapor-draft is much more effective when located beneath the burner than when it is located near the top of or above the burner and that when located beneath a forced air-draft of but small volume is equal to a forced draft of many times the quantity of air when located near the top of or above the burner. When the forced air-draft is located below the burner, it operates upon comparatively cold air, which therefore is in condensed form; but when a given quantity of this cold air passes through or around the burner and is thereby heated it greatly expands and occupies a much larger space, and therefore if the forced draft is applied to this expanded air the draft has to operate through a larger space to set in motion the same amount of air as occupied a much smaller space when cool before passing to the burner and which in this latter state can be influenced by a much smaller forced draft.

In the drawings, A designates the body of a lamp, which is divided into two chambers B and K, the former chamber B being the upper chamber and receiving the illuminating-oil and the latter being the lower chamber and receiving the fluid to be vaporized. C designates the lamp-wick, and D the burner. This burner may be of various forms; but we prefer the form shown, which includes a cylindrical jacket or casing in which the wick C is received and a central bore through each end through which the air may pass. In practice it has been found desirable, although not necessary, to have a special air-chamber E in connection with the central bore of the wick tube or jacket and through apertures in its bottom with the outer air. It has also been found advantageous to employ a surrounding casing F, the walls of which are sufficiently removed from the burner-casing to provide passages G for the air in order that the draft-air may ascend through these pas-

sages as well as through the central-bore opening. By this arrangement the draft of air passes inside of as well as outside of the flame. The oil-chamber B may communicate
 5 with the wick-casing in any suitable manner. A convenient arrangement for the purpose is that shown in the drawings, in which passages H are provided. The forced draft is arranged beneath the burner, and in practice
 10 it is found that because of such location only a fine stream of vapor or steam is required to produce the desired effect. In the drawings a convenient form for this purpose is shown which comprises a capillary tube in commu-
 15 nication at one end with the fluid to be vaporized and at the other end with the air which is to be forced upward to the burner. As before stated, the steam, gas, or other vapor used may be forced through the capillary
 20 tube in many different ways, and the scope of the present invention includes, broadly, the method of forcing the vapor by any means through the capillary tube and delivering the same at a suitable point below the burner in
 25 such manner as to set the body of air surrounding the same in motion in a direction toward the upper end of the burner, and the particular means for effecting this may be widely varied.

30 A mechanically-effective plan of operation is to partially fill the chamber K with water, have a wick extend through the tube J from a point adjacent to the flame of the lamp downward and into the fluid, and have the
 35 tube bend upon itself and then inward, and finally terminate in the air-chamber at a proper point below the burner. In the form shown the open end of the capillary tube or jet passes in through air-chamber E under
 40 the burner. It is obvious that the wick will lift up the fluid by capillary attraction, and that the flame will vaporize such fluid at the upper end of the wick, and that the pressure thereby created will crowd the fine jet or
 45 stream of vapor through the tube and create a jet of such steam or vapor at the exit, and thereby set in motion the body of air surrounding the same and in an upward direction, so as to cause such air to pass through
 50 and around the burner. The chamber E may be designated the "draft-chamber." In practice either alcohol or other fluid may be employed. In fact, while a vapor-draft is preferable, yet it is manifest that it is not neces-
 55 sary to vaporize fluid for that purpose, because any power which would produce a current underneath the burner would be within the spirit of the invention, and it is obvious that this may be mechanically operated from
 60 any suitable moving part of a wheel, and thereby effect the same end. As yet, however, the most economical and effective means is steam generated from water carried in the lamp and vaporized by the heat of the flame.

65 The illuminating-oil may be introduced in chamber B through pipe N, provided with a screw-cap, and the fluid for vaporizing pur-

poses may be introduced through a pipe M, which may also be covered by a screw-cap.

Many variations and changes in the details
 70 of construction and arrangement could be described; but it would be impossible to set forth all of the modifications which would readily suggest themselves to persons skilled in the
 75 art. Therefore this will not be attempted, it being understood that we have set forth the principles of the invention and the best mode of carrying it out which we have yet discovered and that we do not desire to be limited
 80 or restricted to the exact construction specifically described herein.

What we claim, and desire to secure by Letters Patent, is—

1. In a lamp, a tubular wick-holder adapted to receive a wick, an inclosing sleeve there-
 85 for, a draft-air passage communicating with said tubular holder and also with the space between said sleeve and holder, a gas or vapor generator arranged in proximity to said
 90 holder to be heated by the flame from the wick, and connections from said generator arranged to deliver into said air-passage, as and for the purpose set forth.

2. In a lamp, a body having two chambers, one adapted to contain an illuminating-oil,
 95 and the other a vaporizable fluid, a wick-holder adapted to receive a wick, said wick-holder communicating with the first-mentioned chamber, a draft-air passage through which air is supplied to said wick-holder, a
 100 capillary tube communicating at one end with the vaporizable-fluid chamber and at the other end delivering into said air-passage, said tube intermediate its ends arranged in proximity
 105 to the wick-holder and adapted to be heated by the flame of the wick, as and for the purpose set forth.

3. In a lamp, a body having two chambers, one adapted to contain an illuminating-oil
 110 and the other a vaporizable fluid, a wick-holder communicating with the first-mentioned chamber and having air ducts or passages extending from below to near the top thereof, a tube communicating at one end
 115 with the chamber containing the vaporizable fluid and at the other end terminating in a jet arranged beneath said holder and communicating with such ducts or passages, said tube intermediate its ends arranged in prox-
 120 imity to said holder to be heated by the flame therefrom and adapted to contain a wick extending from such point into the vaporizable fluid, as and for the purpose set forth.

4. In a lamp, an oil-chamber, a wick-holder arranged in communication with said oil-
 125 chamber, an air-receiver chamber, ducts or passages through which air is delivered therefrom to said holder, said receiver-chamber having openings in its bottom for admitting
 130 the outer air, a fine tube or jet arranged to terminate at one end within such air-chamber below said holder, a generator arranged adjacent to said holder and adapted to be heated therefrom, the other end of said tube

communicating with such generator, whereby the air contained in such receiver-chamber is set in motion in an upward direction, and a chamber adapted to contain a vaporizable fluid and arranged in communication with said generator, as and for the purpose set forth.

5. In a lamp, a body having an upper chamber adapted to contain an illuminating-oil and a lower chamber adapted to contain a vaporizable fluid, an air-chamber communicating with the outer air, a wick-holder, said air-chamber being arranged beneath said holder, a capillary tube having one end communicating with the vaporizable-fluid chamber and the other end terminating in a jet within the air-chamber, a portion intermediate its ends extending into proximity to the flame adapted to contain a wick which extends from such point of proximity to the flame downward into the vaporizable fluid, as and for the purpose set forth.

6. In a lamp, a wick-holder, an air-passage through which air is supplied to said holder, a generator arranged in proximity to and adapted to be heated by the flame of the wick in said holder, an oil-chamber with which said holder communicates, a chamber adapted to contain a vaporizable fluid, said chamber communicating with said generator, and a tube communicating at one end with said generator and at the other end with said air-passage, whereby the column of air contained in said air-passage is forced through said holder thereby creating a forced air-draft, as and for the purpose set forth.

In witness whereof we have hereunto set our hands, this 12th day of August, 1897, in the presence of the subscribing witnesses.

ELISHA GRAY.

EDWARD E. GRAY.

Witnesses:

S. E. DARBY,

H. H. HUMPHREY.