

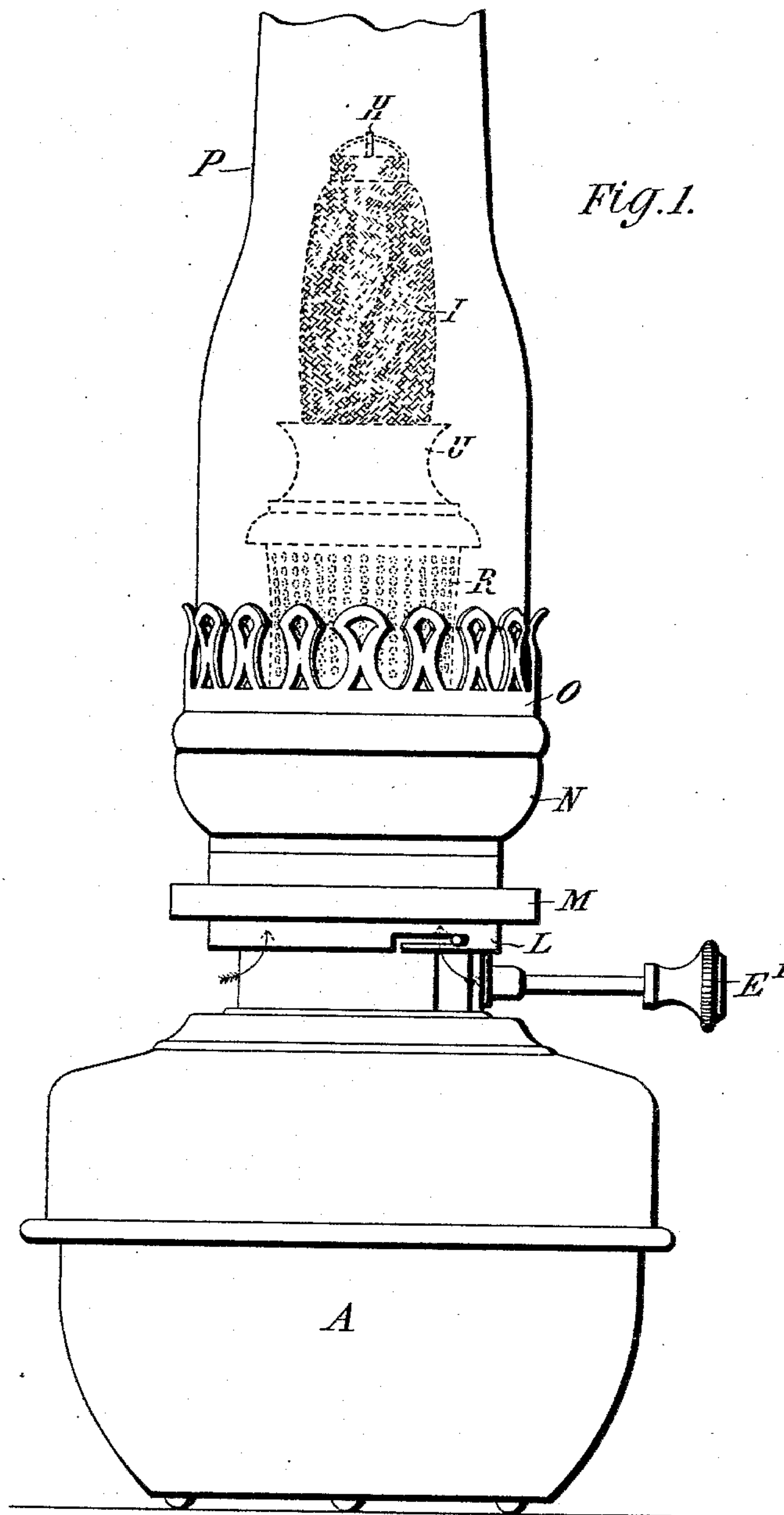
(No Model.)

2 Sheets—Sheet 1.

W. & I. DARBY & J. H. PUNCHARD.
BURNING LIQUID HYDROCARBONS FOR PRODUCING INCANDESCENT
OIL BURNERS..

No. 589,819.

Patented Sept. 14, 1897.



Witnesses
J. P. Giusta.
D. H. Blakelock

Inventors
Walter Darby
John Darby &
John Henry Punchard,
by Whitman & Wilkinson,
Attorneys

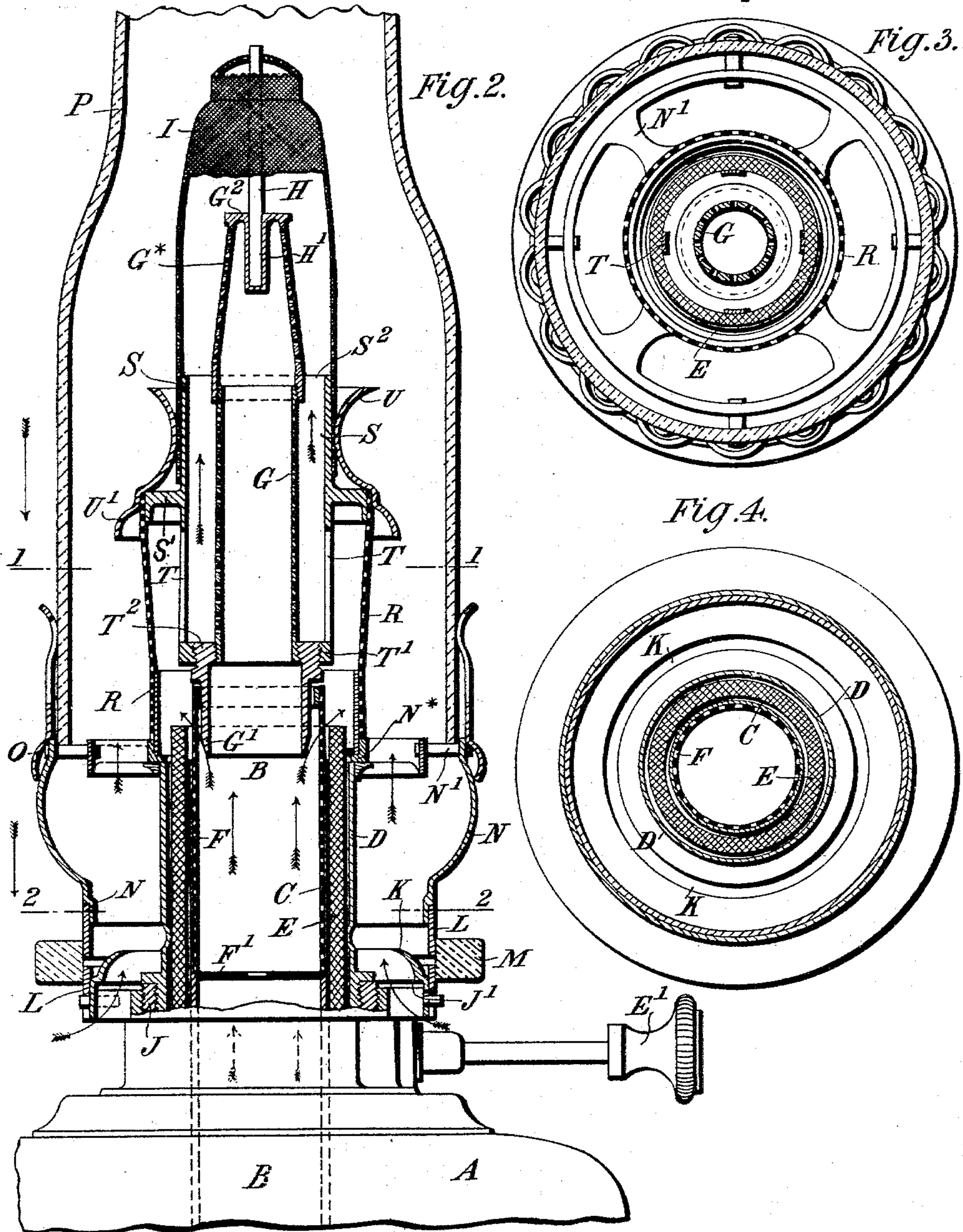
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UNITED STATES PATENT OFFICE.

WALTER DARBY, ION DARBY, AND JOHN HENRY PUNCHARD, OF LONDON,
ENGLAND.

BURNING LIQUID HYDROCARBONS FOR PRODUCING INCANDESCENT OIL-BURNERS.

SPECIFICATION forming part of Letters Patent No. 589,819, dated September 14, 1897.

Application filed November 16, 1896. Serial No. 612,360. (No model.) Patented in England September 6, 1895, No. 16,716.

To all whom it may concern:

Be it known that we, WALTER DARBY, ION DARBY, and JOHN HENRY PUNCHARD, manufacturers, subjects of the Queen of Great Britain, residing at Weston Works, Weston Street, and 249 Pentonville Road, London, England, have invented certain new and useful Improvements in or Relating to Burning Liquid Hydrocarbons in Conjunction with an Incandescent Hood or Mantle to Produce an Incandescent Oil-Burner, (for which we have received Letters Patent in Great Britain, No. 16,716, dated September 6, 1895,) of which the following is a specification.

This invention is designed with the object of utilizing incandescent mantles, hoods, or the like (such as the now well-known "Welsbach" incandescent mantle or the like) for the purpose of burning liquid hydrocarbons as the source of heat in connection therewith in place of gas as heretofore; and the present invention consists of an apparatus for converting the liquid hydrocarbons at the moment of burning in an oil-lamp into such a state or condition as to render the same suitable for burning in conjunction with an incandescent mantle, and thus producing an incandescent oil-burner.

In arriving at the present invention we have found that it is very essential to vaporize the liquid hydrocarbons and mix a large proportion of air therewith before the full combustion takes place in the hood or mantle, and for the sake of example we will describe our present invention more particularly with reference to a hood or mantle of the now well-known "Welsbach" system, though of course we do not wish to limit ourselves to any particular character of hood or mantle, provided same is suitable for our purposes—i. e., adapted to be rendered incandescent by an oil-flame. The "body" and "basket" may be of any suitable character—for instance, as in existing oil-burners—a central air-shaft or air-tube being arranged as usual, either with this central air-supply coming from the basket or body or right through from the bottom of the oil-reservoir.

Referring to the drawings hereunto annexed, in which our present invention is illustrated, Figure 1 is a side view of an incan-

descent oil-lamp according to our present invention. Fig. 2 is a central vertical section on a rather larger scale. Fig. 3 is a cross-section on line 1 1, Fig. 2. Fig. 4 is a cross-section on line 2 2, Fig. 2.

Similar letters of reference indicate corresponding parts throughout.

A is oil-reservoir.

B is central vertical air-supply passage through said reservoir.

C is inner wick-tube, and D is exterior wick-tube, between which circular tubes C and D the circular wick E is raised and lowered in any suitable manner, such as by the wick-raiser E'.

F represents a perforated cylinder which extends above the top of the wick-tubes and is open at its upper end and closed almost entirely at its lower end by means of a plate F', having a single opening therethrough, as shown in Fig. 2.

For facility of construction, and particularly to enable the upper part of the apparatus to be raised (mantle and all) to allow the wick E to be lighted, we only continue said reticulated cylinder F a little way above the wick-tubes C and D, and then a separate reticulated cylinder G, (advantageously a little less in diameter than the cylinder F,) having a conical lower end piece G' thereon, is inserted and fits closely within said cylinder F, so that the passage B is continued through the cylinder F into the cylinder G, and thence to the perforated top G^x, which is advantageously plugged or stopped at G² and has a step or bearing H' therein to carry the fork or support H, which latter in turn carries the incandescent mantle or hood I. Thus the mantle I is supported over and envelops the perforated top or "rose" G^x, to which latter a direct supply of air is furnished from the passage B.

On the outside of the exterior wick-tube D the ring J is screwed, and this ring J, by means of the arms J', extending therefrom, carries the ring or mount K in such manner as to leave a clear annular space for the admission of air (vertically) between said mount K and the wick-tube D.

L is a cylindrical ring which is slid over the mount K and secured thereto by a bayo-

net-joint (see Fig. 1) or in any other suitable manner, and advantageously has a ring M, of non-conducting or other suitable material, inserted therein by which to grasp said ring L by the hand.

N is the outermost casing or inclosing wall, adapted to fit down closely within the ring L, and this casing or body N at the upper part thereof supports the gallery O for the chimney P, and also, by means of the inwardly-extending arms N', carries the ring or support N^x, upon which the aforesaid perforated cylinder R rests and is supported. This outer reticulated cylinder R is adapted to receive therein the flat ring or flange S' on the short cylinder S, between which latter and the inner perforated cylinder G a clear annular space is left for the vapor formed between the perforated cylinders R and G to pass, thence up to the outlet S² to the interior of the hood or mantle I. This ring or flange S' is connected by four or other suitable number of connecting arms or supports T to the ring T', screwed onto the flange T², formed to receive same on the conical lower part G' of the inner perforated cylinder G. Thus it will be seen that by raising (for instance on a spiral thread of quick pitch) the body or casing N, thereby the outer cylinder R will be raised, and with it the short cylinder S and its connections T, the inner perforated cylinder G, with its fork H and the mantle I, as well as the gallery O and chimney P, so that access can thus be obtained to the wick E to light same.

U is a loose flanged ring placed over the mantle I and resting on the top of the outer reticulated cylinder R, with its flange U' extending a little beyond the said cylinder R, so as to direct the air against and through the latter near the top thereof.

The operation is as follows: The hood or mantle I being mounted in position, as aforesaid, to light the burner, the aforesaid outer perforated cylinder R and outermost casing N, together with the glass chimney P, carried on same, are all simultaneously raised (or same may be separately raised or removed, as desired) to afford access to the wick, which can then be lighted and the parts replaced, or the wick may be lighted in any other suitable way. The following action then takes place: The flame (which just at the top of the wick-tubes C and D does not appear to burn very brightly) receives on both sides thereof an abundant supply of well-regulated and finely-divided air, which is thus thoroughly mingled with the flame or vapor formed thereby or unconsumed hydrocarbons and then passes up in the annular space formed between the perforated cylinders F, G, and R, which thus form, as it were, a perforated prolongation of the wick-tubes C and D. Finally the complete combustion of the highly-combustible mixture thus produced takes place in the mantle I, which thereby becomes incandescent. This novel construction and drawing up the flame or method of burning

at a point much above the wick-tubes, besides enabling an oil-flame to be used in an incandescent mantle, has the additional advantage that owing to the increased distance of the burner from the oil-reservoir the latter is kept very cool, as well as the other adjacent parts of the burner.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is—

1. In a burner of the character described, the combination with an inner wick-tube, of a wick mounted thereon and an outer wick-tube adapted to envelop the said wick; a reticulated cylinder inside of said wick and extending above the top thereof; a short cylinder inserted in the upper portion of said reticulated cylinder, made tapering on its outside at its lower end; a reticulated cylinder of diminished diameter fitted in the top of the said short cylinder; a perforated hood surmounting the said smaller reticulated cylinder; a mantle mounted on said hood and enveloping the same; a short cylinder engaging the lower part of said mantle, having a flange around the lower portion thereof and mounted on the aforesaid short cylinder; a reticulated tube carried on top of the said outer wick-tube and engaging at its upper extremity the aforesaid flange, substantially as described.

2. In a burner of the character described, the combination with an inner wick-tube, of a wick mounted thereon and an outer wick-tube adapted to envelop the said wick; a reticulated cylinder inside of said wick and adapted to extend above the top thereof; a short cylinder made tapering at its lower end on the outside and inserted in the upper end of the said reticulated cylinder; a reticulated cylinder of diminished diameter engaging and carried by the upper end of said short cylinder; a perforated hood surmounting the said smaller reticulated cylinder and having a bearing at the upper end thereof; a support mounted in said bearing; a mantle mounted on said support and enveloping said hood; a short cylinder engaging the lower part of the said mantle, having a flange around its lower extremity and supported by the aforesaid short cylinder; a reticulated tube mounted on the top of the said outside wick-tube, increased in diameter at its upper end and engaging thereat the aforesaid flange; an outer casing surrounding the lower portion of the said burner and having air-passages upward therethrough; a chimney and means carried by the said casing for supporting the said chimney, substantially as described.

3. In a lamp of the character described, the combination with an oil-reservoir having a vertical air-passage therethrough, of an inner wick-tube and a wick mounted thereon; an outer wick-tube adapted to envelop the said wick; a reticulated cylinder mounted within said wick and adapted to extend above the

top thereof; a short cylinder made tapering
at its lower end on its outside and inserted
in the upper end of the said reticulated cyl-
inder; a reticulated cylinder of diminished
5 diameter engaging and carried by the upper
portion of said short cylinder; a perforated
hood surmounting the said smaller reticu-
lated cylinder and having a bearing in the
upper end thereof; a support mounted in said
10 bearing; a mantle mounted on said support
and enveloping said hood; a short cylinder
engaging the lower part of said mantle, hav-
ing a flange around its lower extremity and
supported by the aforesaid short cylinder; a
15 reticulated tube mounted on top of the said
outside wick-tube, increased in diameter at

its upper end and engaging thereat the afore-
said flange, an outer casing surrounding the
lower portion of the said burner and having
air-passages upward therethrough, a chim- 20
ney and means carried by said casing for sup-
porting the said chimney and means for si-
multaneously raising the reticulated tube,
the outer casing and the chimney for lighting
the said lamp, substantially as described.

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