

No. 631,200.

Patented Aug. 15, 1899.

T. J. CRANSTON.  
BURNER FOR INCANDESCENT OIL LAMPS.

(Application filed Nov. 19, 1898.)

(No Model.)

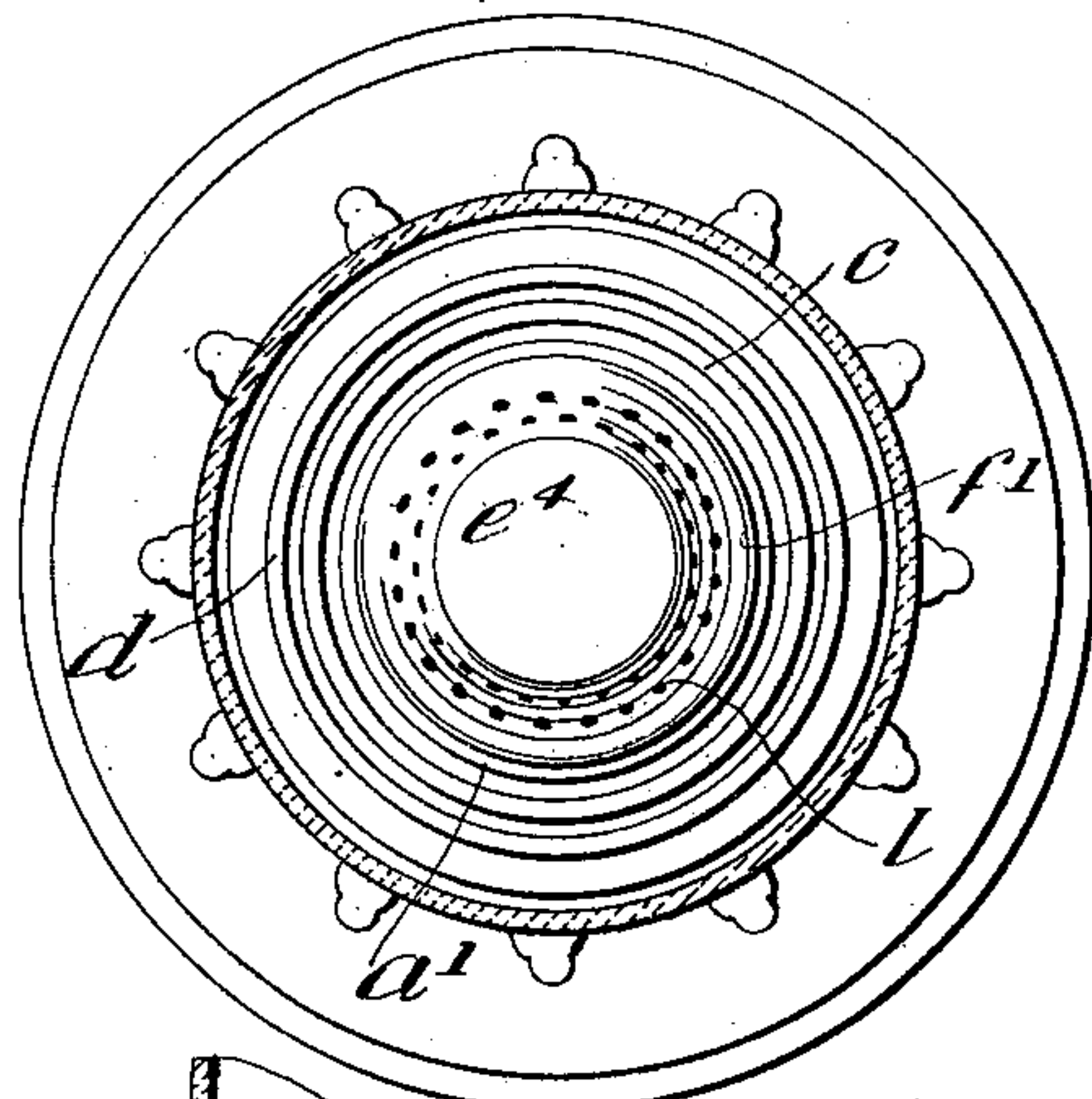


Fig. 2.

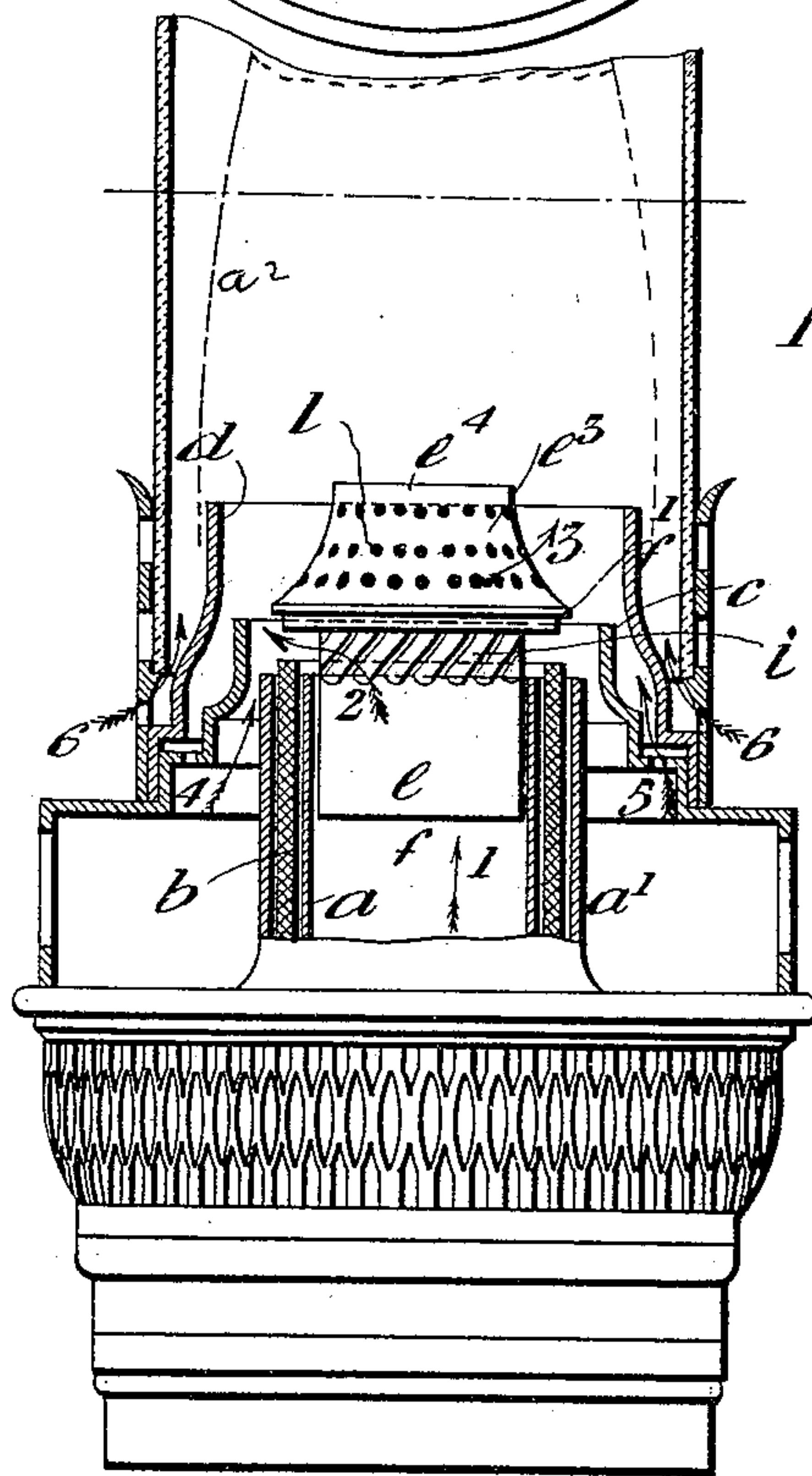


Fig. 1.

Witnesses  
J. B. Keefe  
Bruce S. Elliott

Inventor  
Thomas J. Cranston  
By James L. Norris



# UNITED STATES PATENT OFFICE.

THOMAS JAMES CRANSTON, OF FOWNHOPE, ENGLAND, ASSIGNOR TO THE  
ERA INCANDESCENT OIL LAMP COMPANY, LIMITED, OF LONDON,  
ENGLAND.

## BURNER FOR INCANDESCENT OIL-LAMPS.

SPECIFICATION forming part of Letters Patent No. 631,200, dated August 15, 1899.

Application filed November 19, 1898. Serial No. 696,903. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS JAMES CRANSTON, a citizen of England, residing at Ringfield, Fownhope, county of Hereford, England,  
5 have invented a certain new and useful Improved Burner for Incandescent Oil-Lamps, (for which a patent has been applied for in Great Britain, dated August 18, 1898, No. 17,830,) of which the following is a specification.  
10 tion.

This invention relates to an improved construction of burners for incandescent oil-lamps, which I will describe with reference to the accompanying drawings, in which—

15 Figure 1 shows a vertical section of the burner, and Fig. 2 shows a plan.

The burner is mainly similar in construction to one described in an application bearing even date herewith—that is to say, it consists of a wick tube  $a$   $a'$  for the wick  $b$ , having a central air-supply space  $f$  for air-currents 1 and provided with an inner air-tube  $e$ , the wick-tube being surrounded by two caps  $c$   $d$  and provided with a number of separate air-inlets.  
25 arate air-inlets.

The essential feature of the present invention consists in the form of the inner air-supply tube  $e$ . This is fitted within the inner wick-tube  $a$ , and its upper end above the wick-tube is enlarged, so as to form first a flame-spreading flange  $f'$ , and above this a conical or tapering head  $e^3$ , of which the flat top  $e^4$  is imperforate, while the conical surface has perforations  $l$ . The bottom of the head is of the same diameter as the spreading-flange, while the upper end is reduced to a diameter less than that of the part below the flange  $f'$ . The part of the tube  $e$  below the spreading-flange  $f'$  is provided with helically or obliquely formed slotted holes  $i$ . The two caps  $c$   $d$  (of which the outer one  $d$  serves to support the incandescent mantle) are formed with their upper ends cylindrical instead of with an inward curvature, as heretofore. The  
30 tube is enlarged, so as to form first a flame-spreading flange  $f'$ , and above this a conical or tapering head  $e^3$ , of which the flat top  $e^4$  is imperforate, while the conical surface has perforations  $l$ . The bottom of the head is of the same diameter as the spreading-flange, while the upper end is reduced to a diameter less than that of the part below the flange  $f'$ . The part of the tube  $e$  below the spreading-flange  $f'$  is provided with helically or obliquely formed slotted holes  $i$ . The two caps  $c$   $d$  (of which the outer one  $d$  serves to support the incandescent mantle) are formed with their upper ends cylindrical instead of with an inward curvature, as heretofore. The  
45 head  $e^3$  on the air-tube  $e$  is at its base of larger internal diameter than the air-tube itself and extends thence in a concaved form to the top  $e^4$ , which is of diminished diameter. The peculiar effect of this construction is that

while the under surface  $f'$  of the head  $e^3$  acts 50 as the flame-spreader the lower row of holes in the head being brought by the enlargement of the latter much nearer to the flame and unburned portions of the vapor the issuing air-jets act with great energy thereon in 55 a slightly upward directed course, and both facilitate the production of the perfect blue flame and more effectually spread the same, bringing it against the upward-directed sides of the outer cap, which in its turn directs the 60 flame in the most advantageous manner onto the inner surface of the mantle  $a^2$  for heating this uniformly to bright incandescence. Also by making the holes  $i$  of a helical form the air and oil-vapors in passing through 65 have a circular eddying motion imparted to them, whereby a greater uniformity in the character of the flame around the wick is insured.

In addition to the air-currents 2 and 3, 70 passing through the above-described perforations of the air-tube  $e$ , air-currents 4 pass through the annular space between the wick-tube  $a'$  and the inner cap  $c$ . Also air-currents 5 pass through holes in cap  $c$  and rise 75 through the space between the two caps  $c$  and  $d$ , while other air-currents 6 pass through holes in the gallery below the glass and rise between the latter and the incandescent mantle. The action of the several above-described air-currents is to produce several different combustions. The currents 2 effect a first combustion on the inner edge of the wick, and the unburned vapors produced by the heat pass partly upward between the cap 85  $c$  and the spreading-flange  $f'$ , and partly they pass inward through the slots  $i$ , due to the eddy-currents produced immediately under the flanged deflector  $f'$ , in order to issue again, together with air, through the holes  $l$  of the 90 conical head  $e^3$ . On issuing the mixture enters into combustion, which is supported by the air-currents 4 and 5, so as to effect complete combustion. The before-mentioned unburned vapors passing up between  $c$  and  $f'$  also mix 95 and enter into combustion with the air-currents 4 and combine with the flame above the flange  $f'$ . The air-currents 6, on the other



hand, pass between the mantle and the lamp-glass for preventing the outward bulging of the former against the latter.

Having thus described the nature of this invention and the best means I know of carrying the same into practical effect, I claim—

1. In a burner for an incandescent oil-lamp, the combination with the wick-tubes  $a$   $a'$  of a central air-tube  $e$  with enlarged perforated head  $e^3$  of concave tapering form and imperforate top, the under side  $f'$  of which head constitutes the flame-spreader air-holes  $i$  below such head, an inner cap  $c$  with cylindrical upper end extending up to the flame-spreader  $f'$  and an outer cap  $d$  with cylindrical upper end extending up to near the top of the enlarged head  $e^3$ , substantially as described.

2. In a burner for an incandescent oil-lamp, the combination with the wick-tubes  $a$   $a'$  of a central air-tube  $e$  with enlarged perforated head  $e^3$  of concave tapering form and imperforate top the under side  $f'$  of which

head constitutes the flame-spreader helically-slotted air-holes  $i$  below such head, an inner cap  $c$  and an outer cap  $d$  substantially as described.

3. In a burner for an incandescent oil-lamp the combination with the wick-tubes  $a$   $a'$  of a central air-tube  $e$  with enlarged perforated head  $e^3$  of concave tapering form and imperforate top, the under side  $f'$  of which head constitutes the flame-spreader, helically-slotted air-holes  $i$  below such head, an inner cap  $c$  with air-holes 4 at its base for supply of air outside the cap, an outer cap  $d$ , and air-holes 6 in the gallery for supply of air between cap  $d$  and the chimney-glass, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

THOMAS JAMES CRANSTON.

Witnesses:

OLIVER IMRAY,

JNO. P. M. MILLARD.