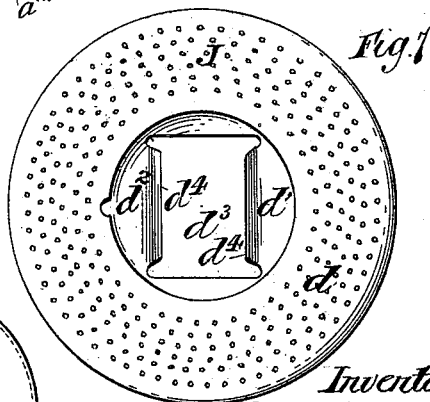
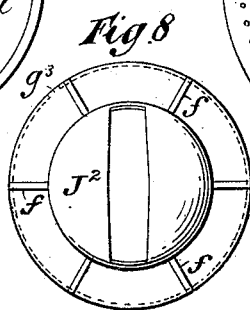
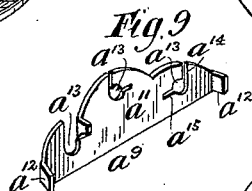
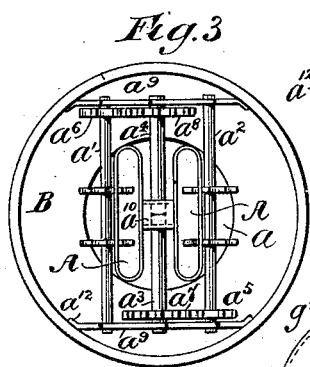
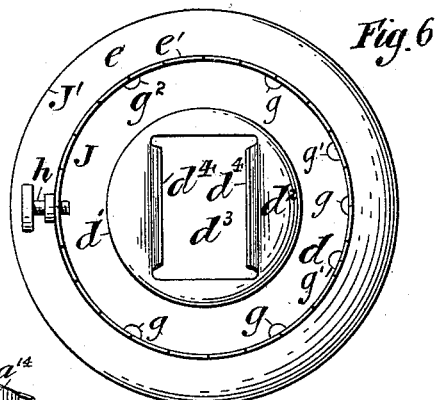
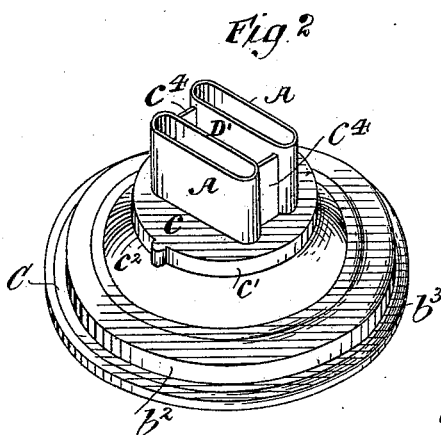
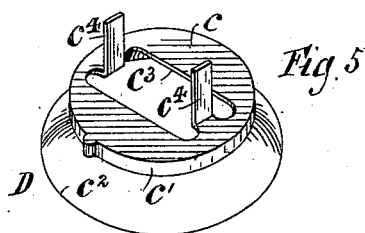
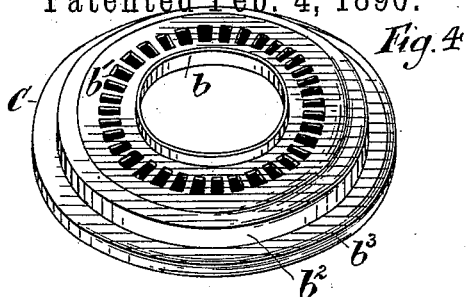
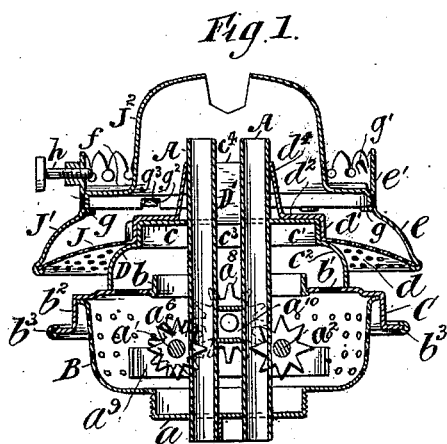


E. F. TRENT.  
LAMP BURNER.

No. 420,584.

Patented Feb. 4, 1890.



Witnesses  
M. J. Roach  
Geo. Wadman

Inventor  
Eugene F. Trent  
By his attorneys  
Gifford & Brown

(No Model.)

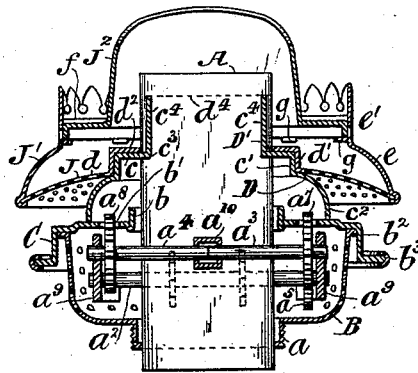
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Fig. 10.



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# UNITED STATES PATENT OFFICE.

EUGENE F. TRENT, OF JERSEY CITY, NEW JERSEY.

## LAMP-BURNER.

SPECIFICATION forming part of Letters Patent No. 420,584, dated February 4, 1890.

Application filed January 5, 1888. Serial No. 259,853. (No model.)

### *To all whom it may concern:*

Be it known that I, EUGENE F. TRENT, of Jersey City, in the county of Hudson and State of New Jersey, have invented a certain new and useful Improvement in Lamp-Burners, of which the following is a specification.

The burner is organized for what is known as a "duplex" burner, and is especially adapted to the burning of heavy hydrocarbon oils.

I will describe in detail a lamp-burner embodying my improvement, and then point out the novel features in claims.

In the accompanying drawings, Figure 1 is a vertical section of a lamp-burner embodying my improvement. Fig. 2 is a perspective view of a portion of the burner, the cone and another part being removed. Fig. 3 is a plan or top view of the base portion of the burner, showing certain wick-raising mechanism. Fig. 4 is a detached view in perspective of means for operating the wick-raising mechanism. Fig. 5 is a detached view in perspective of a piece forming the top of an air-chamber in the burner and constituting also a deflector. Fig. 6 is a plan or top view of an air-distributor, chimney-gallery, and cone-support employed in the burner. Fig. 7 is a bottom view of the same. Fig. 8 is a plan or top view of the cone. Fig. 9 is a detail showing certain bearings for shafts employed in the wick-raising mechanism.

Similar letters of reference designate corresponding parts in all the figures.

A designates the wick-tubes. They are flat and arranged side by side a short distance apart, as is usual. They extend through suitable apertures in the base *a* of the burner, and, as shown, a short distance below the same. They are secured in the base-piece by solder or otherwise. The base-piece is screw-threaded, as usual, to facilitate its attachment to the collar of a lamp-fount. The wick-raising mechanism comprises four shafts *a'* *a<sup>2</sup>* *a<sup>3</sup>* *a<sup>4</sup>*. The shafts *a'* *a<sup>2</sup>* are arranged in the same plane and extend parallel with each other and outside the wick-tube. Each of these shafts is provided with two star-wheels, which latter extend through suitable slots in the wick-tubes. The shafts *a'* *a<sup>2</sup>* rotate in unison and in opposite directions. They bear near one of their ends gear-wheels *a<sup>5</sup>* *a<sup>6</sup>*.

The gear-wheel *a<sup>5</sup>* meshes with a gear-wheel *a<sup>7</sup>* on the shaft *a<sup>3</sup>*, and the gear-wheel *a<sup>6</sup>* meshes with a gear-wheel *a<sup>8</sup>* on the shaft *a<sup>4</sup>*.

The shafts *a<sup>3</sup>* *a<sup>4</sup>* are intermediate of and in a more elevated plane than the shafts *a'* *a<sup>2</sup>*. The inner portions of these shafts extend between the wick-tubes and are journaled in bearings in a bearing-piece *a<sup>10</sup>*, secured to the wick-tubes. These shafts are separate, so that they may rotate in opposite directions. The ends of the shafts *a'* *a<sup>2</sup>* and the outer ends of the shafts *a<sup>3</sup>* *a<sup>4</sup>* are journaled in bearings formed in metal bearing-pieces *a<sup>9</sup>*. (Shown more clearly in Fig. 9.) These bearing-pieces may be stamped up in a die out of sheet metal. They each comprise a main portion *a<sup>11</sup>*, having ends *a<sup>12</sup>*, bent at an angle thereto. These bent end portions are soldered or otherwise secured to the inner side of an air-distributor B. Three holes *a<sup>13</sup>* are stamped in the main portion *a<sup>11</sup>* in suitable positions to receive the ends of the shafts *a'* *a<sup>2</sup>* *a<sup>3</sup>* *a<sup>4</sup>*. Cuts *a<sup>14</sup>* extend from the edge of the main portion into the holes *a<sup>13</sup>*, and other cuts *a<sup>15</sup>* extend from the holes *a<sup>13</sup>* for a distance and, as shown, at approximately right angles to the cuts *a<sup>14</sup>*. This construction enables the ready insertion of the ends of the shafts, for the portions of metal between the cuts may be bent outwardly, (I have shown one so bent,) whereupon the ends of the shafts may be inserted. If, then, the outwardly-bent portions be bent back into their original position, the ends of the shafts will be securely retained in the bearing-holes *a<sup>13</sup>*. It is to be understood in this connection that the shafts are placed in position after the bearing-pieces have been secured in the distributor B. The latter is secured to the base-piece *a* and is perforated. It may be of the usual or any desired form.

The teeth on the gear-wheels *a<sup>7</sup>* *a<sup>8</sup>* extend above the top of the distributor B.

C designates a wheel for effecting the rotation of the gear-wheels *a<sup>7</sup>* *a<sup>8</sup>*, and thus the operation of the star-wheels. The wheel C has a central circular aperture of sufficient diameter to admit of passing the wheel down about the wick-tubes. Surrounding this aperture is an upwardly-turned flange *b*, acting as a steadiment to the wheel. Outside the flange is a circumferential row of holes constituting a gear *b'*. The gear-wheels *a<sup>7</sup>* *a<sup>8</sup>*

mesh with the gear  $b'$  when the wheel C is in proper position. The latter rests upon the top of the air-distributor B and is provided with a downwardly-extending circumferential flange  $b^2$ , extending about the distributor and acting as a steadiment to the wheel. Extending outwardly from the flange  $b^2$  is a milled rim  $b^3$ . This milled rim may be grasped by hand to rotate the wheel. When the latter is rotated, the gear-wheels  $a^7$   $a^8$  are also rotated by the gear  $b'$ .

In burners of the class to which this belongs air is supplied from between the wick-tubes to the inner sides of the flames and from outside the wick-tubes to the outer sides of the flames. In my improvement all the air which is supplied to the inner sides of the flames and passes between the wick-tubes is received through the air-distributor B. In order to effect this, I form an air-chamber above the distributor B and wheel C, into which all the air entering through the distributor B will be received. The top of this air-chamber is formed by a stamped-up piece of metal D. As shown, this piece of metal has a flat top  $c$ , a cylindrical portion  $c'$  below the top, and a concavo-convex portion  $c^2$  below the portion  $c'$ . In the top is formed an aperture  $c^3$ , of such shape and size that the piece D may be passed downwardly about the wick-tubes, and the portions of metal surrounding the aperture  $c^3$  will fit snugly about the outer sides and ends of the wick-tubes. When the piece D is in position, its lower edge rests upon the wheel C outside the row of holes forming the gear  $b'$ . Extending upwardly from the top of the piece D are wings  $c^4$ . These wings may advantageously be made integral with the piece D and formed during the operation of stamping up the latter. When the piece D is in position, the wings  $c^4$  extend vertically between adjacent ends of the wick-tubes in such manner as to form the end walls of an air-flue D' between the wick-tubes. Air entering the distributor B passes upwardly through holes in the wheel C constituting the gear  $b'$  and the central aperture therein, thence into the air-chamber formed by the piece D, and thence is deflected by the piece D and passes upwardly through the flue D' to the flames. The piece D therefore constitutes a deflector as well as the top of an air-chamber. It will thus be seen that all the air entering the perforations in the distributor C passes substantially in a body to the inner sides of the flame. Of course an air-distributor may be interposed in the flue D', if desirable.

All the air to be supplied to the outer sides of the flames enters through an air-distributor J. This air-distributor has a circular perforated portion  $d$ . This portion is shown as of concavo-convex form. Inward of the perforated portion  $d$  is an imperforate cylindrical portion  $d'$ . The diameter of the portion  $d'$  is such that the lat-

ter will fit quite closely over the cylindrical portion  $c'$  on the piece D. Above the cylindrical portion  $d'$  is a flat top portion  $d^2$ . This portion  $d^2$  is provided with a central aperture  $d^3$ , whereby the distributor may be passed downwardly about the wick-tubes. Extending upwardly from the top portion  $d^2$  are wings  $d^4$ . As shown, these wings extend upwardly at an inward angle. They are preferably formed integral with the distributor J during the process of forming the aperture  $d^3$ , being portions of metal bent up from between cuts made in forming the said aperture. The distributor J and its appurtenances may all be stamped up in one integral piece. When the distributor J is in position on the burner, portions of the wings  $d^4$  bear with considerable frictional resistance against the outer sides of the wick-tubes. By means of the cylindrical portion  $d'$ , extending about the cylindrical portion  $c'$ , and the wings  $d^4$ , bearing against the wick-tubes, the distributor D and other parts supported thereon are centered and steadied.

J<sup>1</sup> designates a cone-supporter and chimney-gallery. This supporter and gallery is in turn supported upon the distributor J. It is shown as secured near its lower edge to the outer edge of the distributor J by bending its lower edge portion about the edge of said distributor. It has an upwardly and inwardly extending concavo-convex portion  $e$ , which latter is shown as imperforate. Above the portion  $e$  extends a chimney-gallery  $e'$ . This cone-supporter and chimney-gallery may be formed in one integral piece.

J<sup>2</sup> designates a cone, which may be of the usual or any desired form and construction. It is provided with radially-extending ribs  $f$ , upon which a chimney may rest, so as to leave an air-space below the lower edge of the chimney. The cone is supported upon tongues  $g$ , formed by cutting the metal forming the chimney-gallery and bending inwardly the portions of metal between the cuts. Other similar tongues  $g'$  aid in securing the chimney. A screw  $h$  is employed to retain the chimney in position. The cone-supporter J<sup>1</sup> and cone J<sup>2</sup>, when the latter is in position on the former, form an air-chamber, into which all the air entering through the distributor J is received, and from which it is deflected by the cone against the outer sides of the flames.

This burner provides for properly distributing large quantities of air to the flames, whereby unusually heavy oils may be burned with perfect combustion, producing a very brilliant light.

In order to prevent the cone from turning when in place on the burner, I provide it with a peripheral notch  $g^3$ , adapted to receive a tongue  $g^2$  on the cone-supporter J<sup>1</sup>.

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

1. In a lamp-burner, the combination, with wick-tubes, of a perforated air-distributor

near the base of the burner, an air-chamber above said distributor; into which all the air from said distributor enters, an air-flue between the wick-tubes through which the air  
 5 from said air-chamber passes to the inner side of flames emanating from the tips of the wick-tubes, an air-distributor above said chamber having opposite unconnected elastic wings comprising upwardly-turned integral  
 10 portions having a frictional resistance against the outsides of the wick-tubes, another air-chamber above the last-named distributor, into which all the air from said distributor enters, and a cone or deflector deflecting said  
 15 air against the outer sides of the flame, substantially as specified.

2. In a lamp-burner, the combination, with wick-tubes, of an air-distributor near the base of the burner, an air-chamber above said distributor, and a removable deflector comprising the top of said air-chamber, provided with wings extending upwardly at the edges of the wick-tubes and forming the end walls of an air-flue between the wick-tubes, substantially as specified.  
 25

3. In a lamp-burner, the combination, with wick-tubes, of an air-distributor near the base of the burner, an air-chamber above said dis-

tributer, a removable deflector comprising the top of said air-chamber, provided with a cylindrical portion  $c'$ , and an air-distributor above said air-chamber provided with a cylindrical portion  $d'$ , and integral elastic wings  $d^4$ , comprising upwardly-extending unconnected portions having a frictional resistance against  
 35 the outer sides of the wick-tubes, substantially as specified.

4. The combination, with shafts  $a'$   $a^2$   $a^3$   $a^4$ , of bearing-pieces therefor provided with apertures  $a^{13}$  and cuts  $a^{14}$ , and an air-distributor  
 40 to which said bearing-pieces are secured, substantially as specified.

5. The combination, with two wick-tubes having a space between them, an air-distributor, and an air-chamber, of a metal piece  
 45 forming the top of said air-chamber, having an aperture adapted to fit against the outer sides of the wick-tubes, and integral upwardly-extending wings forming end walls of the air-flue between the wick-tubes, substantially as  
 50 specified.

EUGENE F. TRENT.

Witnesses:

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