

C. K. HARDING.
 INCANDESCENT BURNER.
 APPLICATION FILED APR. 14, 1911.

1,006,085.

Patented Oct. 17, 1911.

2 SHEETS—SHEET 1.

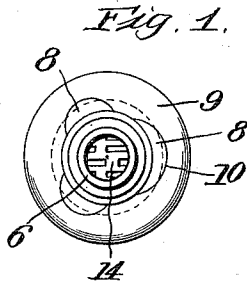


Fig. 2.

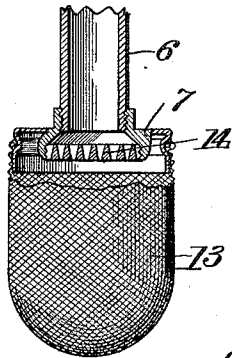


Fig. 4.

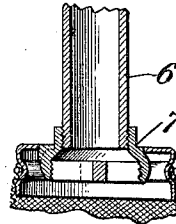
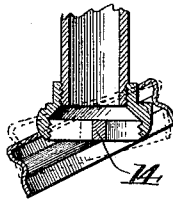


Fig. 5.

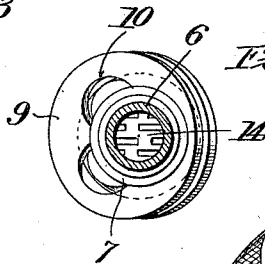


Fig. 3.

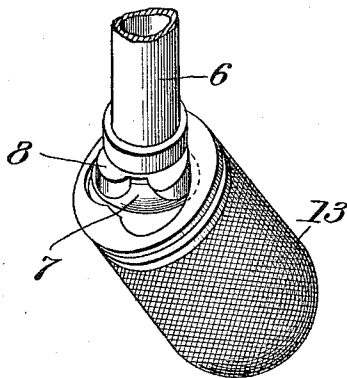


Fig. 7.

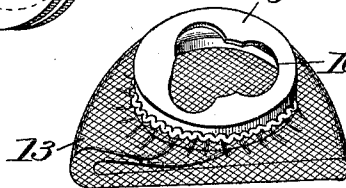
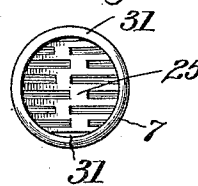


Fig. 8.



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2 SHEETS—SHEET 2.

Fig. 10

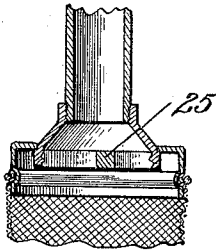


Fig. 9.

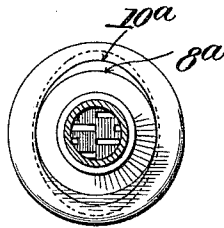


Fig. 11.

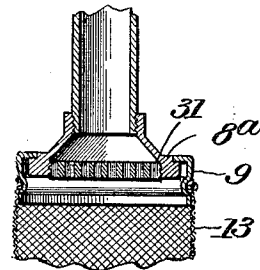


Fig. 13.

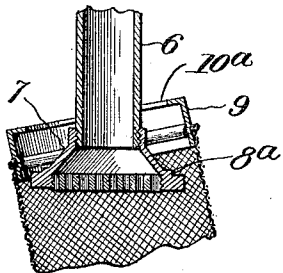


Fig. 12.

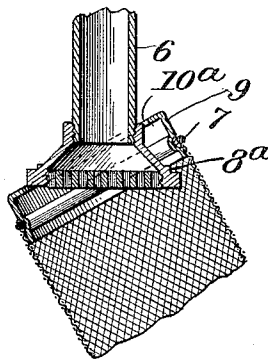


Fig. 14.

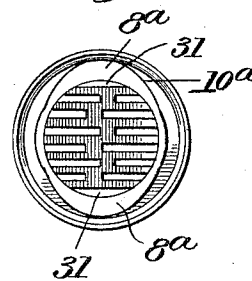


Fig. 16.

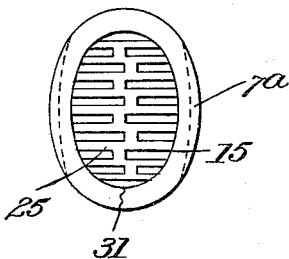
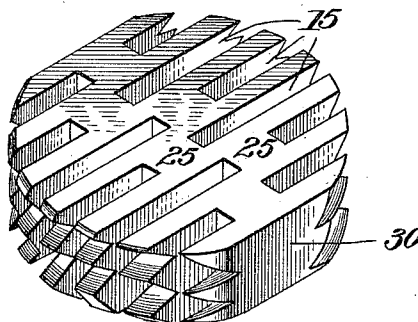


Fig. 15.



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UNITED STATES PATENT OFFICE.

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INCANDESCENT BURNER.

1,006,085.

Specification of Letters Patent.

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Application filed April 14, 1911. Serial No. 621,064.

To all whom it may concern:

Be it known that I, CHARLES KNOX HARDING, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Incandescent Burners, of which the following is a specification.

This invention relates to burners adapted for use on inverted hydrocarbon incandescent lamps.

An object of the invention is to provide improved means for supporting a mantle and connecting the same to the burner tube.

A further object of the invention is to provide an improved gauze or disk to properly distribute the gas or vapor and to prevent back flashing or firing thereof.

The mantle support hereinafter described is so constructed that it may be readily applied to the tip of a burner tube, and when in position will close all openings around said tube, and confine the vapor to the mantle.

The invention is illustrated in the accompanying drawings in which—

Figure 1 is a top plan view of the device. Fig. 2 is a vertical section thereof. Fig. 3 is a perspective view, Fig. 4 is a section and Fig. 5 is a plan view, all illustrating the manner of applying the mantle support or ring to the burner tube. Fig. 6 is a section at a right angle to Fig. 2. Fig. 7 is a perspective view of the mantle and its support. Fig. 8 is a bottom end view of the burner tube. Figs. 9, 10 and 11 are respectively top and sectional views of a modified form of support. Figs. 12 and 13 are sectional views illustrating the manner of placing said modified support in position on the tube. Fig. 14 is a bottom view of the modification. Fig. 15 is a perspective view of the gauze or slotted disk which fits in the burner tip. Fig. 16 is a bottom view of a modified gauze and tip.

Referring specifically to the drawings, 6 indicates an ordinary burner tube which in practice is connected to the vapor supply or generating devices as usual. On the lower end of this tube is screwed a tip ring 7 which may be made in various forms within the scope of this invention. As shown in Figs. 1 and 3, especially, in one form this ring is flared as usual, and is provided on its outer side with several projections 8 which are spaced apart and which when the mantle is put in position serve to retain the mantle

ring in proper place. With this form of tip I use a ring the construction of which is clear from Figs. 6 and 7. This ring or support consists of a cupped piece of metal or other suitable material 9 having a central opening with eccentric or asymmetrical enlargements 10 which correspond in outline or shape to the shape of the projections 8, the main or central opening being of proper size to fit on the burner tip, said enlargements producing inwardly extending projections 11 which are adapted to rest on the shoulders of the part 7 between the projections 8. The depending flange of the cupped piece is grooved or corrugated around the same to facilitate the attachment of the mantle 13 which may be of the usual rag or flexible type, or of the finished or formed type, the mantle being held on the flange of the ring by any suitable means such as a band or thread which will gather the edge of the mantle and bind the same to the ring.

The burner gauze or diaphragm 14 which fits in the burner tip is of special construction. As shown especially in Figs. 8 and 15 the disk is provided with a series of parallel slots 15 which are of unequal length. These slots extend inwardly from opposite edges of the disk toward the middle, and thereby form a staggered bar 25 extending across the middle of the disk between the inner ends of the slots. There is an advantage in this, as compared to a gauze having a straight bar, for the reason that if the slots were of equal length with a straight bar between the vapor issuing from said slots would be divided by a zone which would or might produce a dark band or strip along the mantle, in line with said bar, because of insufficient supply, but by making the slots of unequal length with a staggered bar between a comparatively even flow of gas is maintained, which avoids the production of a dark zone on the mantle. The periphery of the disk thus constructed may be provided with screw threads to screw into the burner tip as shown.

A slotted disk or gauze constructed as above stated has a further advantage in practical operation, explainable as follows. Primarily it may be stated that slots in such a diaphragm are superior to other perforations or holes, for the reason that slots will permit the passage of a larger amount of vapor. With a slotted disk, however, the tendency is to spread the vapor, and conse-

quently the flame in a direction parallel to the slots, as it issues therefrom, thereby forming a broom shaped body of vapor. This tendency however is undesirable because the mantle is cylindrical, and theoretically it is desirable that the vapor column be circular in outline, instead of broom shaped or elliptical as indicated. To correct this tendency of an ordinary slotted gauze I increase the slot area as much as possible in a direction at right angles to the length of the slots. Thus, in the embodiment shown, I flatten the sides of the disk, as indicated at 30, and when this is set into the burner tip it produces two side slots 31, located at the end of the staggered cross bar, thereby permitting the escape of a certain amount of vapor through said side slots, which vapor, spreading as it issues from the slots will flow or expand in a direction at a right angle to that of the main slots in the disk, and thereby deliver a substantially circular body of vapor to the mantle. It is within the scope of my invention to increase this effect, if necessary, by making the disk or gauze elliptical in form with its longer axis at a right angle to the length of the slots so that the tendency of the slots to deliver an elliptical or broom shaped mass of vapor will be corrected or counteracted by the increased length of the disk in a direction at a right angle to said slots.

In applying the mantle ring or support to the burner tip it is first placed thereon in inclined or tilted position as shown in Figs. 3, 4 and 5, one of the enlargements 10 of the central opening receiving the upper part of the tip, above the shoulder thereof, with the ring in such position that the projections 8 will pass through the other enlargements when the mantle is tilted back to vertical position, the action being indicated in dotted lines in Fig. 4, and then the projections 11 are slipped into the spaces between the projections 8 on the burner tip, and the projections 11 on the ring will rest on the shoulder of the tip and thus support the mantle in vertical position, the projections 8 fitting in the recesses 10, as shown in Fig. 1, thereby holding the mantle in proper position and preventing accidental dislodgment. Also, when the ring is so applied, it will close all openings around the burner tip, and so the vapor supplied through the tube will be confined within the mantle. This is important since it prevents the escape of combustible vapor upwardly between the mantle ring and burner tip, which results in a waste of gas and is a defect of such existing mantle rings as are spaced from the burner tip and have simply fingers or projections to support the same thereon.

In Figs. 9 to 14 a modification is illustrated consisting in this, that instead of having three eccentric recesses or enlarge-

ments as described, the opening in the ring is elliptical and the shoulder on the exterior of the burner tip is shaped to correspond, the recess being indicated at 10^a and the shoulder at 8^a, and the mantle supporting ring is placed in position by entering the burner tip through said opening with the ring at an angle so that it will pass the tip, and then tilting the mantle back to vertical position and seating the ring on the tip with the shoulder fitting in proper position in the elliptical opening.

Obviously the shape of the opening in the mantle supporting ring may be varied in many ways, with the same result as above indicated.

In Fig. 16 I show an embodiment in which the disk or gauze is elliptical in form, as above suggested, and to receive this gauze the tip 7^a is made elliptical in form. This precludes the use of screw threads, but the gauze can be fitted tightly in the tip and held by friction or otherwise, and the carrier will have an elliptical hole corresponding in shape to the elliptical tip on which it fits. This form of gauze if properly proportioned will give a perfect circular flow of vapor or flame into the mantle.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. The combination with a burner tube having a tip at the lower end thereof provided with outwardly extending projections so that it is non-circular in outline, of a ring to which a mantle may be attached, said ring having a central opening with enlargements, and of sufficient size to permit the tip to pass through the opening by tilting the ring, the outline of the enlargements corresponding to the outline of the projections, so that the projections will fit in said enlargements when the ring is turned to proper position.

2. The combination with a burner tube having an enlarged tip at the lower end thereof with a shoulder provided with projections above the lower rim of the tip, of a ring to which a mantle may be attached, said ring having a central opening with enlargements of sufficient size to permit the tip to pass through the opening by tilting the ring, the size and outline of the enlargements corresponding to that of the projections, so that the projections fit in said enlargements when the ring is turned to proper position to rest on the shoulder of the tip.

3. The combination with a burner tube having a flaring tip at the lower end with elliptiform projections on the outside thereof, of a ring to which a mantle may be attached, said ring having an elliptiform opening therein, through which opening the tip will pass when the ring is tilted and turned to a certain position, the opening be-

ing of the same outline as said projections so that the latter will fit in and fill the opening when the ring is finally seated on the tip.

4. A diaphragm disk for gas burners, adapted to fit in the tip of a burner tube, said disk having slots of unequal lengths extending from opposite edges thereof toward the middle, with a staggered bar extending across the middle of said disk between the inner ends of the slots.

5. A diaphragm disk for gas burners, adapted to fit in the tip of a burner tube, said disk having slots extending from opposite edges thereof toward the middle, with

a bar extending across the disk between the inner ends of the slots, and also having flattened portions at the ends of said bar, forming slots between the disk and the tip.

6. In a burner, the combination of an elliptiform tip, and a slotted elliptiform disk therein, the slots being at an angle to the longer axis of the disk.

In testimony whereof, I affix my signature in presence of two witnesses.

CHARLES KNOX HARDING.

Witnesses:

GEO. E. TEW,
C. W. FOWLER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."