

R. LANGHANS.
INCANDESCENT MANTLE.
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990,753.

Patented Apr. 25, 1911.

Fig. 1.

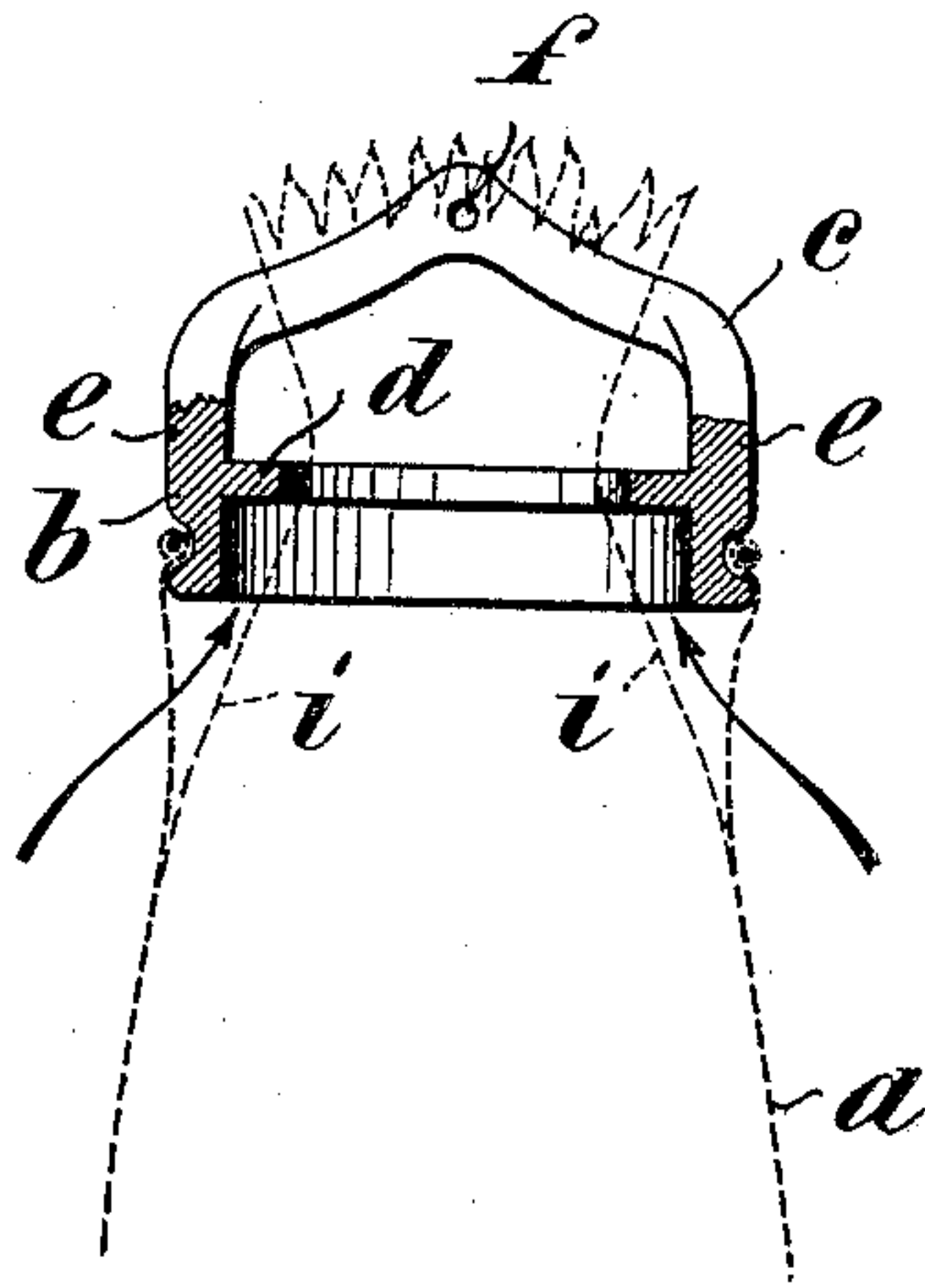
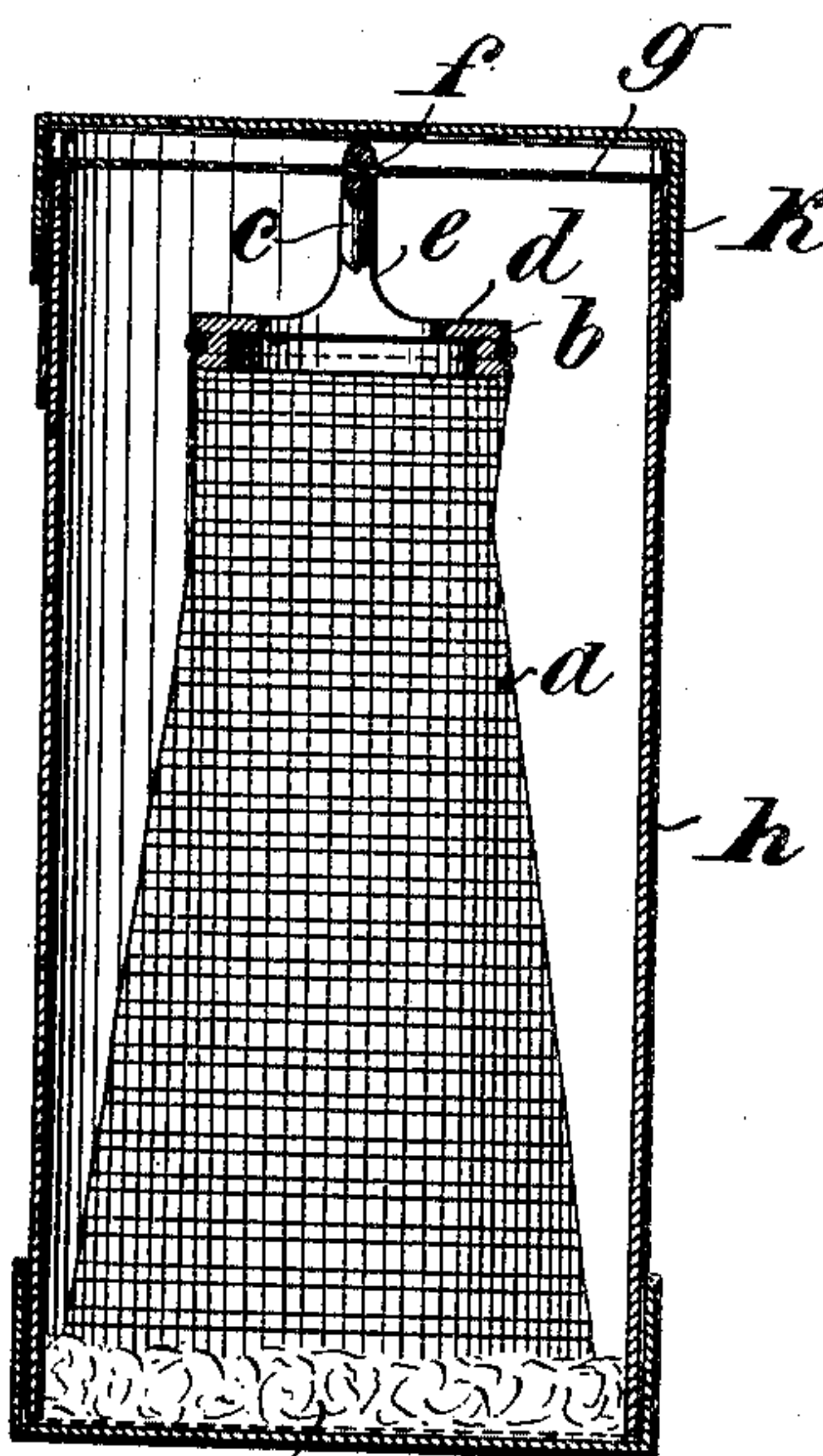


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

RUDOLF LANGHANS, OF BERLIN, GERMANY.

INCANDESCENT MANTLE.

990,753.

Specification of Letters Patent.

Patented Apr. 25, 1911.

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To all whom it may concern:

Be it known that I, RUDOLF LANGHANS, of Berlin, a subject of the Emperor of Austria-Hungary, and whose post-office address is 9/9^a Schönhauser Allee, Berlin, Kingdom of Prussia, German Empire, have invented a new and useful Incandescent Mantle, of which the following is a specification.

10 This invention relates to that class of incandescent mantles for burners which are fed with liquid fuel such as alcohol, petroleum, kerosene and other liquid hydrocarbons, in which the apical portion or head
15 of the mantle is provided with a large head-opening supported by a body of annular shape or "supporting annulus" constructed with a refractory material such as magnesia, other refractory earths, ceramic compositions and the like. As is well known
20 the said large head-opening is provided for allowing the products of combustion to readily escape without hindrance from within the space encompassed by the mantle and,
25 moreover, to enable the flame, when rising or growing spontaneously, as very frequently occurs with petroleum and the like burners, to freely protrude beyond the head-opening for the purpose of preventing the
30 mantle from being sooted. And in order to enable this mantle to be suspended above the burner from the bifurcated top end of a vertical pin arranged in the vertical axial line of the burner or from the hooked end
35 of a laterally arranged arm extending from the outside into said line, the supporting-annulus is combined with a suspension-loop likewise made from a refractory earthy material and rigidly connected to the annulus.
40 Now experience has proved the said suspension-loop to be very apt to interfere with the above defined functions of the head-opening by exerting a stemming or repulsing action upon the combustion gases and
45 the head of the rising flame, such action being principally due to the lowermost portions of the legs of the loop projecting more or less into the path of said gases, whereas the apical portion of the loop has no appreciable influence. This action of the loop
50 has the effect of obstructing more or less the free passage of the combustion products and the flame at the inner circumference of the supporting-annulus, whereby sooting of
55 the mantle is provoked as soon as the grow-

ing flame is about to reach the head opening thereof. Moreover, the supporting annulus, especially when combined with a suspension loop as described has the effect that the mantle is weighted heavily at its extreme top. 60 Now, when the mantle is suspended by means of the usual thread in the tube or box into which it is packed for transport the unavoidable jolting during transport acts to swing the mantle with its weighted head 65 against the sides of the box, and the mantle will very readily follow this impulsion considering the pronounced conical shape usually given to incandescent mantles for petroleum and the like burners. Owing to 70 this swinging the head portion of the mantle gradually compresses the packing of wadding or forces it aside and finally strikes against the sides of the box whereby the mantle becomes damaged in shape and 75 structure in most cases to such an extent as to be rendered unfit for use.

My present invention has for its object to provide means whereby the defects above specified, are done away with or reduced to 80 a minimum.

In accordance with my present invention the supporting annulus is so constructed that it becomes enabled to exert an injector-like action when the growing flame is about to 85 rise into the head opening and subsequently grows into and through the supporting annulus, whereby the outer air is drawn through the meshes of the upper portion of the mantle into the head of the mantle and 90 the annulus with the effect of constricting the flame below and within the annulus, so that the flame is kept away from the inner wall of the annulus and the lower portions of the legs of the suspension loop. This injector-like action of the supporting annulus is obtained by constricting the exit opening of the same, for instance by providing the annulus at or near its upper aperture with an inwardly projecting flange. The moment 100 the head of the flame reaches and rises through the head opening of the mantle, a vacuum is created in the angle between the underside of the flange of the annulus and the inner side of the latter. At once the 105 outer air rushes through the meshes of the portion of the mantle adjacent to the annulus into the head of the mantle and the annulus with such energy that the head of the flame will have already become constricted 110

by the time it has reached the plane of the flange and then the constriction of the flame is further so intensified that the latter will be kept permanently at a sufficient distance
 5 away from the annulus and the lower portions of the legs of the suspension-loop. The said flange may be horizontal or it may be made inclined upwardly or downwardly. It may be formed into one piece with the supporting annulus or it may be made separate therefrom. The flange may be made of
 10 magnesia, other refractory earths or ceramic compositions, or it may be made of a suitable metal.

15 With the improved supporting annulus I prefer to combine a suspension loop having steeply rising legs, preferably vertical legs, whereby a larger portion of the legs is permanently kept out of contact with the flame
 20 growing or rising through the supporting annulus. Moreover, the vertical arrangement of the legs of the suspension loop in combination with the described injector-like action of my improved supporting annulus has the effect that the distance between the apex of
 25 the loop and the plane of the exit-opening of the supporting annulus can be largely diminished. For instance the vertical portion of the legs may be equal to one fourth of the inner diameter of the annulus, and the apex
 30 of the loop will be arranged at a distance from said plane equal to about four tenths of the diameter of the annulus. This reduced height of the loop has proved to be very advantageous for suspending the
 35 unburned mantle in the incinerating and shaping steps of its production, as also for suspending the burned mantle both in the box for transport and in the lamp.

40 In order to prevent the head of the mantle from striking against the sides of its containing box during transport, I provide the suspension loop with means for threading through the usual suspension thread. These
 45 means consist preferably in a hole provided for in the apex of the loop, or in two holes arranged on the same level on opposite sides of the apex of the loop, the diameter of the hole or holes being such that the suspension
 50 thread can be passed through with a slight friction. The thread having been threaded through these holes, and the mantle having been placed in the box, the thread is drawn tight in the ordinary manner over the edge
 55 of the box, and is there held firmly when the cover of the box is put on, or by any other suitable means provided on the outside of the box. In this manner a connection is established between the suspension thread
 60 and the mantle top which allows the latter a certain amount of freedom for swinging movement, while preventing any great tendency of the mantle to tip. Thus the supporting ring is secured from coming into
 65 dangerous proximity to the sides of the box,

as frequently happens when the thread is passed under the loop in the usual way so that the loop rides on the thread.

On the annexed sheet of drawings I have illustrated the preferred form of practicing
 70 my present invention.

Figure 1 is a vertical section of the upper portion of an incandescent mantle provided with the improvement specified, and Fig. 2 is an elevation partly in section, of a similar
 75 mantle suspended in its box for transport, the upper packing of wadding being omitted.

In both figures *a* is the incandescent mantle and *b* the supporting annulus having the suspension-loop *c* formed therewith in one
 80 piece. The upper opening of the annulus *b* is constricted by being provided with an internal horizontal flange *d*, and the suspension-loop *c* is provided with vertical legs *e* and its apex is perforated with a hole *f*
 85 made with such a diameter that the thread *g* (Fig. 2) for suspending the mantle in its box *h* for transport can be threaded through with a slight degree of friction. In Fig. 1 the dotted lines *i* show the constricted form impressed upon the flame by
 90 the injector-like action of the flange *d* when the flame in spontaneously rising grows into and through the supporting annulus, whereby, as specified, the flame is efficiently kept
 95 out of contact with the inside of the annulus *a*, its flange *d* and the vertical legs *e* of the suspension loop; the arrows shown in Fig. 1 being intended to illustrate the inrush of outer air through the head portion
 100 of the mantle into the supporting annulus.

For transport the usual thread *g* is threaded through the hole *f* of the suspension loop *c*, when the mantle is let down into the box *h*, the thread *g* engaged into
 105 vertical incisions or very narrow slits provided in the edge-portion of the box at diametrically opposite points thereof, as shown in Fig. 2, or the thread *g* may be simply stretched over the edge of the box at
 110 diametrically opposite points and clamped upon said edge by means of the lid *k* in closing the box as usual.

l indicates the usual lower packing of wadding, the upper packing of wadding being
 115 omitted for clearness sake.

It is preferred to provide the underside of the apex of the loop with a slight depression to be penetrated by the suspension-fork or hook.
 120

What I claim as my invention, and desire to secure by Letters Patent of the United States, is:—

1. The combination of an incandescent mantle, the head-opening thereof, a refractory supporting annulus fixed to the edge of said opening and being provided at its outlet-opening with an inwardly projecting flange, a refractory suspension-loop rigidly connected to the supporting annulus, and
 125 130

means connected with said loop for suspending the mantle in the box for transport, substantially as and for the purpose specified.

a hole in the apex of the loop for threading through the thread for supporting the mantle in the box for transport, substantially as and for the purpose specified.

15

5 2. The combination of an incandescent mantle, the head-opening thereof, a refractory supporting annulus fixed to the edge of said opening and being provided at its outlet with an inwardly projecting flange,
10 a refractory suspension-loop having vertical legs rigidly connected to said annulus, and

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

RUDOLF LANGHANS.

Witnesses:

WOLDEMAR HAUPT,
HENRY HASPER.

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