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Complete Specification Left, 30th June, 1902—Accepted, 1st Nov., 1902

PROVISIONAL SPECIFICATION.

Improvements in or relating to Spirit Lamps for use with Incandescence Mantles and the like.

We, FRANZ CHRISTEN, of 11, Hausvoigteiplatz, Berlin, Germany, Merchant, and FELIX HEINRICH ASCHNER, of 222, Prenzlauer Allée, Berlin aforesaid, Engineer, do hereby declare the nature of this invention to be as follows:—

Spirit lamps designed for use with incandescence mantles and the like (hereinafter referred to as mantles), as heretofore constructed, have proved unsatisfactory, as the burners have, after a comparatively short time, become extremely hot. This defect is due to the too close proximity of the flame to the wick tube and other parts of the burner the cooling of which is extremely difficult, or to an excessive radiation of heat from the vaporizer with which a spirit lamp of the type referred to is usually fitted.

This invention has for object to obviate the defects of incandescence spirit lamps as heretofore constructed, by protecting the parts of the burner, and especially the wick tube, from direct contact with the flame; and at the same time to reduce considerably or prevent completely the radiation of heat from the vaporizer or from the flame spreader by removing these parts to a greater distance from the upper edge of the wick tube. For this purpose a lamp according to this invention is so constructed that during the burning thereof the wick projects considerably beyond the upper edge of the wick tube whilst at the same time a current of air flows along a narrow annular passage on the exterior of and surrounding the wick, so that the flame is sufficiently supplied with oxygen, and is at the same time prevented from burning down to the upper edge of the wick tube. The vaporizer usually arranged in the vicinity of the upper edge of the wick tube is dispensed with; and since the flame is maintained at a considerable distance from the upper edge of the wick tube, the overheating of the wick tube is effectually prevented. The burner is, as heretofore, constructed with an annular wall; but this wall is arranged to form the narrow passage above the burner tube and surrounding the wick, already referred to. In order to cool the wick tube efficiently it is advisable to conduct all the air supplied to the exterior of the flame through the annular passage. The flame is thus caused to exert greater force from the interior upon the incandescence mantle, and consequently to heat the same more effctually than when only a portion of the outer air is led upwards through the annular passage and the remainder is conducted outside the mantle.

It is not necessary to arrange a vaporizer above the upper edge of the wick tube; a flame spreader may, however, especially in the case of large burners, advantageously be arranged above the upper edge of the annular wall surrounding the wick, so as to serve only for spreading out the flame and not for vaporizing the combustible. In large burners it is advisable, for the purpose of effectually cooling the wick tube, to force the air that flows through the wick tube, more strongly towards the inner periphery of the wick tube by means of a shaft arranged in the interior of the wick tube. If this shaft is formed as a tube open at the

[*Price* 8*d*.]

top and provided with air inlet openings the flame will be forced against the mantle through the expansion of the colder air flowing through this tube as it issues from the upper edge thereof, and consequently the action is similar to that obtained by conducting all the outer air through the annular passage surrounding the wick tube in the beforementioned manner. Very perfect results are obtained by the combination of the tubular shaft open at the top and arranged in the interior of the wick tube, with the annular passage between the wick tube and the annular wall, through which the entire supply of air to the exterior of the flame is conducted.

Dated this 1st day of October 1901

F. WISE HOWORTH,
46, Lincoln's Inn Fields, London, W.C.
Agent for the Applicants.

COMPLETE SPECIFICATION.

Improvements in or relating to Spirit Lamps for use with Incandescence Mantles and the like.

We, FRANZ CHRISTEN, of 11, Hanovoigteiplatz, Berlin, Germany, Merchant, and FELIX HEINRICH ASCHNER, of 222, Prenzlauer Allée, Berlin aforesaid, Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed to be particularly described and ascertained in and by the following statement:—

Spirit lamps designed for use with incandescence mantles and the like (hereinafter referred to as mantles), as heretofore constructed, have proved unsatisfactory, as the burners have, after a comparatively short time, become extremely hot. This defect is due to the too close proximity of the flame to the wick tube and other parts of the burner the cooling of which is extremely difficult, or to an excessive radiation of heat from the vaporizer with which a spirit lamp of the type referred to is usually fitted.

This invention has for object to obviate the defects of incandescence spirit lamps as heretofore constructed, by protecting the parts of the burner, and especially the wick tube, from direct contact with the flame; and at the same time to reduce considerably or prevent completely the radiation of heat from the vaporizer or from the flame spreader by removing these parts to a greater distance from the upper edge of the wick tube. For this purpose a lamp according to this invention is so constructed that during the burning thereof the wick projects considerably beyond the upper edge of the wick tube whilst at the same time a current of air flows along a narrow annular passage on the exterior of and surrounding the wick, so that the flame is sufficiently supplied with oxygen, and is at the same time prevented from burning down to the upper edge of the wick tube. The vaporizer usually arranged in the vicinity of the upper edge of the wick tube is dispensed with; and since the flame is maintained at a considerable distance from the upper edge of the wick tube, the overheating of the wick tube is effectually prevented. The burner is, as heretofore, constructed with an annular wall; but this wall is arranged to form the narrow passage above the burner tube and surrounding the wick already referred to. In order to cool the wick tube efficiently it is advisable to conduct all the air supplied to the exterior of the flame through the annular passage. The flame is thus caused to exert greater force from the interior upon the incandescence mantle, and consequently to heat the same more effectually than when only a portion of the outer air is led upwards through the annular passage and the remainder is conducted outside the mantle.

It is not necessary to arrange a vaporizer above the upper edge of the wick tube; a flame spreader may, however, especially in the case of large burners, advantageously be arranged above the upper edge of the annular wall surrounding the wick so as to serve only for spreading out the flame and not for vaporizing the combustible. In large burners it is advisable, for the purpose of effectually cooling the wick tube, to force the air that flows through the wick tube, more strongly towards the inner periphery of the wick tube by means of a shaft arranged in the interior of the wick tube. If this shaft is formed as a tube open at the top and provided with air inlet openings the flame will be forced against the mantle through the expansion of the colder air flowing through this tube as it issues from the upper edge thereof, and consequently the action is similar to that obtained by conducting all the outer air through the annular passage surrounding the wick tube in the before mentioned manner. Very perfect results are obtained by the combination of the tubular shaft open at the top and arranged in the interior of the wick tube, with the annular passage between the wick tube and the annular wall, through which the entire supply of air to the exterior of the flame is conducted.

The accompanying drawing shows in central vertical section the burner of an incandescence spirit lamp in accordance with this invention.

The wick tube *a* of the burner, which, as usual, is arranged within a basket *b* and adapted to serve as a guide for the wick *c*, has around its upper end an annular wall *d* which projects above its upper edge. There is thus formed around the upper portion of the wick an annular passage *h* through which is conducted all the air supplied to the exterior of the flame. The annular wall *h* is furnished with a horizontal cover *i* which forms the upper part of the basket, and carries the gallery, chimney, and the mantle-support *n*; this base *i* in the example, has no perforations in it for the supply of air to the flame. In the interior of the wick tube is a hollow shaft or tube *k* which is open at the top and is provided with air inlets *l*. When the lamp is to be lighted, the incandescence mantle *m* is removed, preferably by taking off the upper part of the basket *b*; a light is then applied to the wick, the upper part of the basket is replaced, and the wick is so adjusted as effectually to heat the incandescence mantle. The proportions of the various parts of the burner are preferably such as to give a good heating flame when the upper edge of the wick is almost level with the upper edge of the annular wall *d*; the lower edge of the flame is then only a short distance below the upper edge of the wick, and a considerable distance intervenes between it and the upper edge of the wick tube, so that the latter is kept cool. Notwithstanding the cooling effect of the current of air passing between the annular wall *d* and the outside of the wick, the annular wall may be to some extent heated by the flame. In consequence however of the large cooling surface provided by the basket *b* and its small capacity for heat, due to the thinness of the sheet metal employed in its construction, but little heat is conducted downwards towards the reservoir, which consequently remains cool. The supply of air to the exterior of the flame exclusively through the annular passage *h* has, besides the advantage already referred to (*viz.* that the burner is thereby kept cool), the further advantage that, the flame is not then compressed or driven inwardly, as would be the case even if air were supplied to the exterior thereof from between the chimney and the incandescent mantle. The flame consequently acts more energetically from the interior upon the mantle, and in lamps of moderate size, enables a flame spreader to be dispensed with.

The air supplied to the interior of the flame through the openings *l* in the shaft *k*, even after its arrival at the upper mouth of the shaft *k*, is still at a comparatively low temperature; but upon its exit from the shaft *k* into proximity to the flame, it rapidly expands; and pressing the flame outwardly against the mantle causes the lower portion thereof to be more effectually heated. The shaft *k* may, especially in smaller burners be dispensed with, as may also the imperforate cover *i*.

Improvements in or relating to Spirit Lamps for use with Incandescence Mantles.

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

1. In a burner for a spirit-lamp for incandescence-lighting, the combination of a wick tube having an air inlet and an annular wall which projects above the upper edge of the wick tube and forms with the wick tube and the wick an annular passage so that air will be supplied to the outer side of the wick and lift the flame off the upper edge of the wick tube and the use of a vaporizer will be dispensed with.

2. A burner for a spirit-lamp for incandescence lighting according to the preceding claim in which the annular wall which projects over the upper edge of the wick tube and forms with the wick tube and the wick an annular air passage is of larger diameter throughout its length than the upper edge of the wick tube.

3. A burner for a spirit lamp for incandescence lighting according to Claim 1 in which all the air supplied to the exterior of the flame is compelled to flow through the annular passage mentioned.

4. A burner for a spirit-lamp for incandescence-lighting according to Claim 1 wherein there is provided in the wick tube a hollow central shaft or tube which is open at the top and has lateral openings for the admission of air.

5. The improved burner for a spirit-lamp for incandescence lighting, constructed, arranged, and operating as hereinbefore described with reference to and shown in the accompanying drawing.

Dated this 30th day of June 1902.

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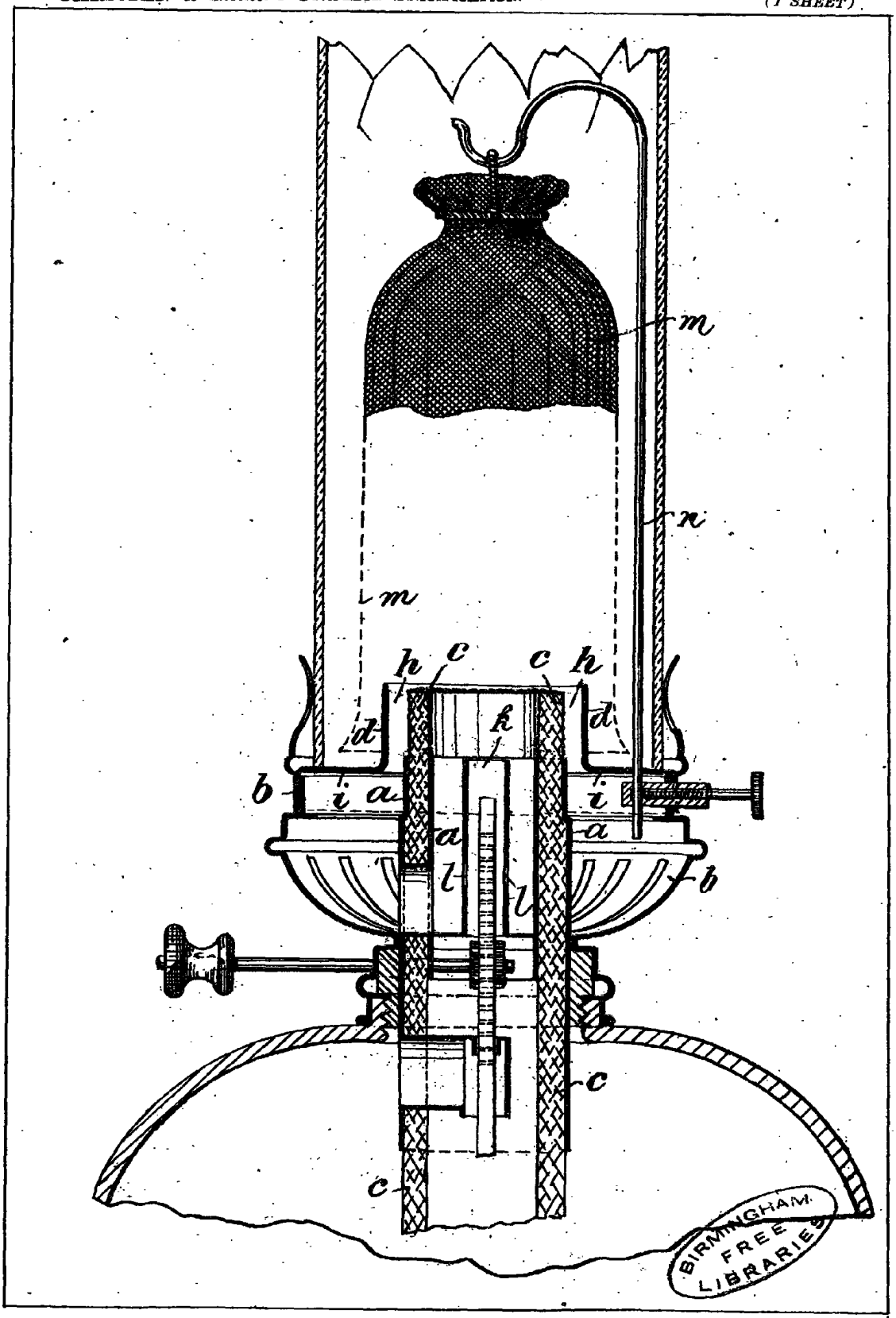
CHRISTEN & *another's* Complete Specification. *(1 SHEET)*



[This Drawing is a full-size reproduction of the Original.]

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