Aug. 30, 1938. C. W. DAVIS 2,128,638

MANTLE SUPPORTING MEANS

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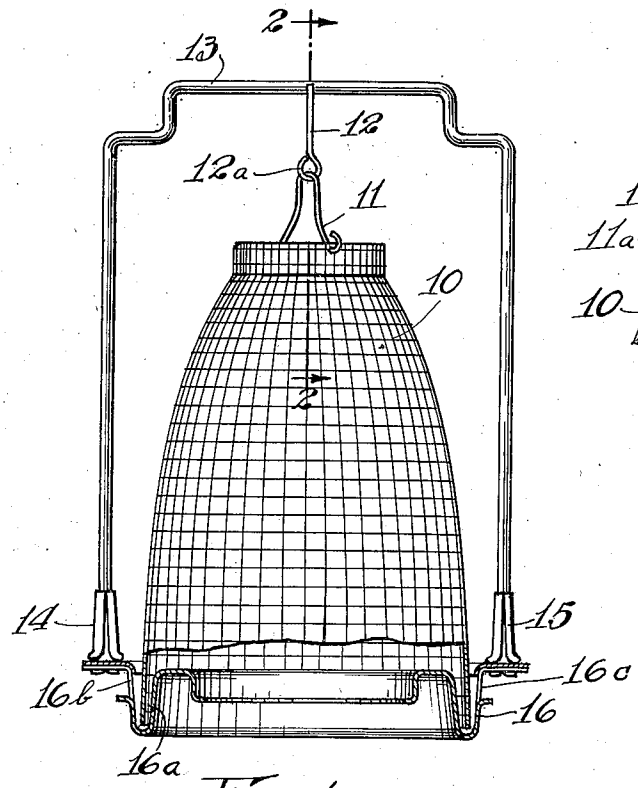

Fig. 1.

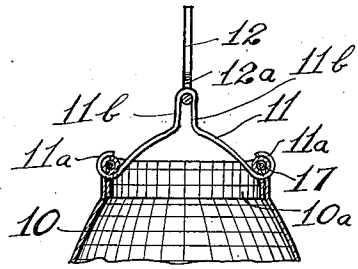

Fig. 2.

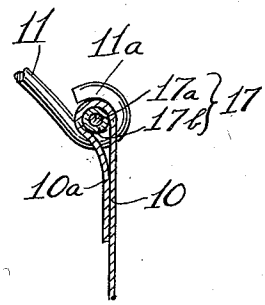

Fig. 3.

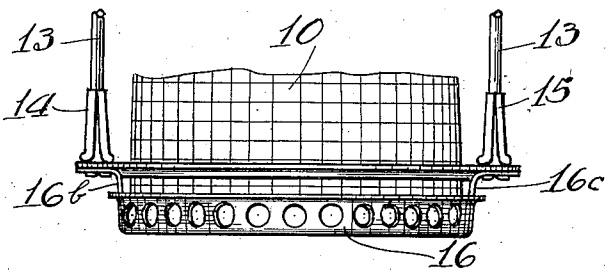

Fig. 4.

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MANTLE SUPPORTING MEANS

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7 Claims. (Cl. 67—101)

The present invention pertains to means for supporting mantles employed for illuminating purposes, to the end that the supporting means may be relatively permanent and not burn out quickly in use, without requiring the construction to consist of a prohibitive amount of expensive material.

In connection with the use of mantles for illuminating purposes, it is well known that high temperatures are produced by the burners to produce the desired incandescence of the mantles, as a result of which, particularly with kerosene and similar liquid fuel burners, where it is attempted to support the mantles by iron or steel rods or wires closely adjacent the upper ends of the mantles, the rods or wires are rapidly oxidized and disintegrated, with the result that the supporting structure is frequently of much shorter life than the mantles themselves. While it is possible to correct this difficulty by the use of heat-resisting metals or alloys, such a course is not practical on account of the high cost of such metals or alloys, if it is attempted to make the main supporting structure for the mantles, of such metals or alloys. At the same time, to be successful practically, the supporting structure must have a life substantially equal to the life of the mantles, otherwise the combined structure is not satisfactory in use.

The present invention consists essentially of a composite supporting structure, by which the parts of the structure in the highly heated zone at the upper end portion of the mantle, may be constructed of small size and weight, and thus be made of metal or alloy that is highly heat-resistant, while the main supporting bracket or structure is so substantially spaced from the highly heated zone, that it may be made of iron or steel, thus providing that the part of the supporting structure which has the largest bulk and weight, may be made of inexpensive material, without sacrificing anything in the way of effectiveness and long life, in connection with the supporting structure as a whole.

The present invention also has for its object to construct the upper end portion of illuminating mantles so that they are adapted to be used with supporting structures of the kind referred to, by providing the mantles with reinforcing rings of heat-resisting material and preferably rings consisting of heat-resisting metal or alloy wrapped with fibrous material which is also heat-resistant, which reinforcing rings are engaged by the supporting structure and give a length of life to the upper end portion of the mantle which is commensurate with the life of the mantle itself and also the life of the supporting structure.

In connection with mantles for use with kerosene and similar liquid fuel burners, it is important that the tops of the mantles shall be provided with openings of substantial size to form exits for the gases resulting from combustion within the mantles. It is also important in such uses, that mantles for use with any particular burner construction and any particular liquid fuel, shall have top openings of uniform size and shape, to secure efficient and effective results. With the practice common in the past, of forming the tops of the mantles by binding and tying them with asbestos cord before burning the mantles, such uniform top openings cannot be produced, even where the mantle tops are so tied on formers of uniform size, since during the burning of the mantles, the tops do not have stable support, and distorted and irregular top openings are produced, which are unsatisfactory in use. With the present invention, on the contrary, by using uniform formers in placing the reinforcing rings in the tops of the mantles before burning them, top openings of uniform size and shape are produced, because the tops of the mantles are positively held in proper position during their burning, to produce said uniform top openings, by the stable support of said reinforcing rings. Furthermore, this is accomplished without the use of expensive construction, and without incorporating in or attaching to the mantle tops, metal parts of such mass and inertia as to easily damage and destroy the mantles in handling and using them.

The present invention will be best understood by reference to the accompanying drawing, illustrating a preferred embodiment thereof, in which—

Fig. 1 shows in side elevation, a mantle and supporting device in accordance with the invention, the lower part of the supporting structure being shown in vertical, central, sectional view;

Fig. 2 is a vertical, sectional view to an enlarged scale of a part of the structure shown in Fig. 1, taken along the line 2—2;

Fig. 3 shows in a view similar to Fig. 2 and to a further enlarged scale, the connection of one side of the mantle reinforcing ring with one end of the supporting yoke employed, and

Fig. 4 shows in elevation, the lower part of the supporting structure illustrated in Fig. 1.

Similar numerals refer to similar parts throughout the several views.

As shown in Fig. 1, a mantle of the kind under consideration is illustrated at 10, to the upper end of which a metal yoke 11 of heat-resisting material, for example, an alloy wire of nickel and manganese, is secured at its ends, the mid-portion of the yoke 11 being engaged by a hook 12a on the lower end of a slender metallic rod or wire 12 extending downwardly from a metal bracket 13. The rod 12 is preferably of heat-resisting material, for example a nickel manganese alloy, and it is preferably rigidly secured to the metal bracket 13, for example, by electric welding, so that the hook 12a will have a fixed position relatively to the bracket 13, to facilitate holding the upper end of the mantle in proper position relatively to the burner with which the mantle is used, assuming that the bracket 13 is properly supported on the burner.

While the bracket 13 may have any form that will effectively support the mantle 10, the form illustrated in Fig. 1 consists of an inverted U-shaped structure, the end portions of which extend downwardly on opposite sides of the mantle 10 and are mounted at their lower ends in metal sockets 14 and 15 carried by the base 16 of the supporting structure, said base being in any suitable form to cooperate with the burner with which the mantle is to be used, the form illustrated consisting of a sheet metal ring having an annular trough 16a which opens upwardly to receive the lower edge of the mantle 10 to protect the same and hold it in centered relation relatively to the burner with which the mantel is used. The trough shaped member is provided with outwardly extending opposite ears 16b and 16c to support the sockets 14 and 15, which sockets are preferably pressed tightly into engagement with the lower ends of the bracket 13.

As shown in Fig. 2, the mid-portion of the yoke 11 extends upwardly with substantially parallel portions 11b below the hook 12a, bent slightly towards each other around the hook, to insure that the hook shall be maintained in engagement with the central portion of the yoke, and thus prevent lateral displacement of the mantel 10 relatively to the rod 12. As shown in Fig. 2, the upper end portion of the mantle 10 is provided with a reinforcing ring 17 around which the upper end portion of the mantle fabric is folded and extends downwardly inside of the body portion of the mantle, as illustrated at 10a. The yoke 11 is secured to the mantle 10 by extending its ends through opposite sides of the mantle under the ring 17, and tightly wrapping the yoke ends around said ring as illustrated in Fig. 2 at 11a, 11a. The relation of the reinforcing ring 17 to the fabric of the mantle and to one end of the yoke 11 is more clearly shown in Fig. 3, where the ring 17 is shown as consisting of a core 17a comprising a metal wire of small diameter and of heat-resisting material, for example, nickel manganese alloy, around which wire fibrous material 17b which is heat-resistant, is wrapped to give substance to the reinforcing ring and protect the metallic core 17a, a suitable fibrous material for the purpose being asbestos. In the manufacture of the mantle and before it is burned, the upper edge portion of the impregnated fabric is folded over the ring 17 and inside of the body portion of the mantle and pressed against said body portion, to facilitate which, suitable former tools may be employed; the yoke 11 is then applied to the mantle by inserting its ends through the mantle under the ring 17 and then bending said ends until they clamp the ring 17 as indicated at 11a in Fig. 3, after which the mantles are burned, leaving the salts of the impregnating materials in the form of oxides, to effect the incandescence incident to the use of the mantles for illuminating purposes. After the mantles are fired, the material of the mantles is relatively rigid, and as a result the reinforcing rings are securely held in place without additional means, and definitely produce top openings in the mantles, of desired size and shape.

From the construction described, it will appear that besides effecting secure engagement with the mantle, the yoke 11 may be extended at its mid-portion, upwardly from the mantle, to any height that may be desired and that practical conditions may require, and that by tightly closing the hook 12a after the yoke 11 has been placed thereon, the parts are interlocked and cannot be displaced in any direction, since the rod 12 is rigidly secured to the bracket 13. It will also be observed that the rod 12 may have any desired length that practical conditions may require. On account of the weight of the mantle being small, the yoke 11 may be made of wire of small diameter and thus, although the wire may be relatively expensive, the small weight required for each mantle, does not make the construction prohibitive from the cost standpoint. Furthermore, the nickel manganese alloy is found to be so highly heat-resistant, that it will afford a length of life that is entirely satisfactory for the purposes described. Similarly, the rod 12 may be of small diameter, since its entire function is to support the weight of the mantle and hold the same in centered relation relatively to the burner with which the mantle is used. Here again, the weight involved in the rod 12 for each mantle, is small, so that the use of relatively expensive alloy that is highly heat-resistant, is not prohibitive, the small diameter of the rod 12 requiring but a small weight of the alloy for each mantle. The yoke 11 and the rod 12 may readily be given sufficient length so that there is a substantial separation between the mid-portion of the bracket 13 and the zone of high heat at the upper end of the mantle 10, as a result of which the heat from the mantle is so much dispersed by the time it reaches the bracket 13, that said bracket is not heated to nearly the same degree that the yoke 11 and rod 12 are heated. This permits making the bracket 13 of iron or steel wire that is inexpensive and of relatively large diameter to afford stability to the supporting structure, without increasing the cost of the structure prohibitively, and the entire supporting structure is thus given a length of life that is commensurate with the length of life of the mantle itself.

From the above it will appear that by my invention I produce a mantle top construction that is simple, effective and inexpensive, and that the top openings in the mantles may thereby be made of uniform size and form; also that the mounting construction for the mantles is of much greater permanence than possible without the use of heat-resistant parts.

While I have shown my invention in the particular embodiment above described, I do not limit myself thereto in carrying out my invention, as I may employ equivalents known to the art without departing from the scope of the appended claims.

Having thus described my invention, what I claim is:

1. In a mantle construction for blue-flame kerosene burners, the combination of an illuminating

mantle having its upper end portion folded inwardly against itself and extending a substantial distance below the fold at the upper end of the mantle, a ring in said fold and wholly contained between the two layers of said upper end portion and holding said upper end portion open for the free flow of gases therethrough, and a supporting member at the upper end of said mantle and secured to said ring.

2. Supporting means for a mantle for a wick-fed kerosene burner, which mantle is provided with an open top affording free flow of gases of combustion upwardly therethrough by the chimney draft of said burner and producing a highly heated oxidizing zone of such gases above said mantle, which supporting means includes the combination of a bracket extending above and spaced above said mantle, and a metallic wire substantially more resistant to the oxidizing effect of the gases delivered from the upper end of said mantle than is steel wire, said metallic wire being rigidly connected to said bracket and depending therefrom to support said mantle.

3. Supporting means for a mantle for a wick-fed kerosene burner, which mantle is provided with an open top affording free flow of gases of combustion upwardly therethrough by the chimney draft of said burner and producing a highly heated oxidizing zone of such gases above said mantle, which supporting means includes the combination of a bracket extending above and spaced above said mantle, and a metallic wire substantially more resistant to the oxidizing effect of the gases delivered from the upper end of said mantle than is steel wire, said metallic wire being rigidly connected to said bracket and depending therefrom to support said mantle, said metallic wire being rigid for said supporting purposes to hold the mantle in centered position and against lateral displacement on the burner.

4. Supporting means for a mantle for a wick-fed kerosene burner, which mantle is provided with an open top affording free flow of gases of combustion upwardly therethrough by the chimney draft of said burner and producing a highly heated oxidizing zone of such gases above said mantle, which supporting means includes the combination of a bracket extending above and spaced above said mantle, a metallic wire substantially more resistant to the oxidizing effect of the gases delivered from the upper end of said mantle than is steel wire, said metallic wire being rigidly connected to said bracket and depending therefrom to support said mantle, and a yoke at the upper end of said mantle, said depending wire having an eye at its lower end closed around said yoke, and said yoke comprising a wire of material like said depending wire and extending across the upper end of said mantle and having at its mid-portion an upwardly extending and substantially parallel-sided loop engaging said eye to hold the mantle in centered position and against lateral displacement on the burner.

5. Supporting means for a mantle for a wick-fed kerosene burner, which mantle is provided with an open top affording free flow of gases of combustion upwardly therethrough by the chimney draft of said burner and producing a highly heated oxidizing zone of such gases above said mantle, which supporting means includes the combination of a bracket extending above and spaced above said mantle, and a nickel-manganese wire substantially more resistant to the oxidizing effect of the gases delivered from the upper end of said mantle than is steel wire, said nickel-manganese wire being rigidly connected to said bracket and depending therefrom to support said mantle.

6. Supporting means for a mantle for a wick-fed kerosene burner, which mantle is provided with an open top affording free flow of gases of combustion upwardly therethrough by the chimney draft of said burner and producing a highly heated oxidizing zone of such gases above said mantle, which supporting means includes the combination of a bracket extending above and spaced above said mantle, and a nickel-manganese wire substantially more resistant to the oxidizing effect of the gases delivered from the upper end of said mantle than is steel wire, said nickel-manganese wire being rigidly connected to said bracket and depending therefrom to support said mantle, said nickel-manganese wire being rigid for said supporting purposes to hold the mantle in centered position and against lateral displacement on the burner.

7. Supporting means for a mantle for a wick-fed kerosene burner, which mantle is provided with an open top affording free flow of gases of combustion upwardly therethrough by the chimney draft of said burner and producing a highly heated oxidizing zone of such gases above said mantle, which supporting means includes the combination of a bracket extending above and spaced above said mantle, a nickel-manganese wire substantially more resistant to the oxidizing effect of the gases delivered from the upper end of said mantle than is steel wire, said nickel-manganese wire being rigidly connected to said bracket and depending therefrom to support said mantle, and a yoke at the upper end of said mantle, said depending wire having an eye at its lower end closed around said yoke, and said yoke comprising a wire of material like said depending wire and extending across the upper end of said mantle and having at its mid-portion an upwardly extending and substantially parallel-sided loop engaging said eye to hold the mantle in centered position and against lateral displacement on the burner.

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