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WICK TUBE FOR HYDROCARBON BURNERS.

APPLICATION FILED AUG. 22, 1914.

**1,229,043.** Patented June 5, 1917.

2 SHEETS—SHEET 1.

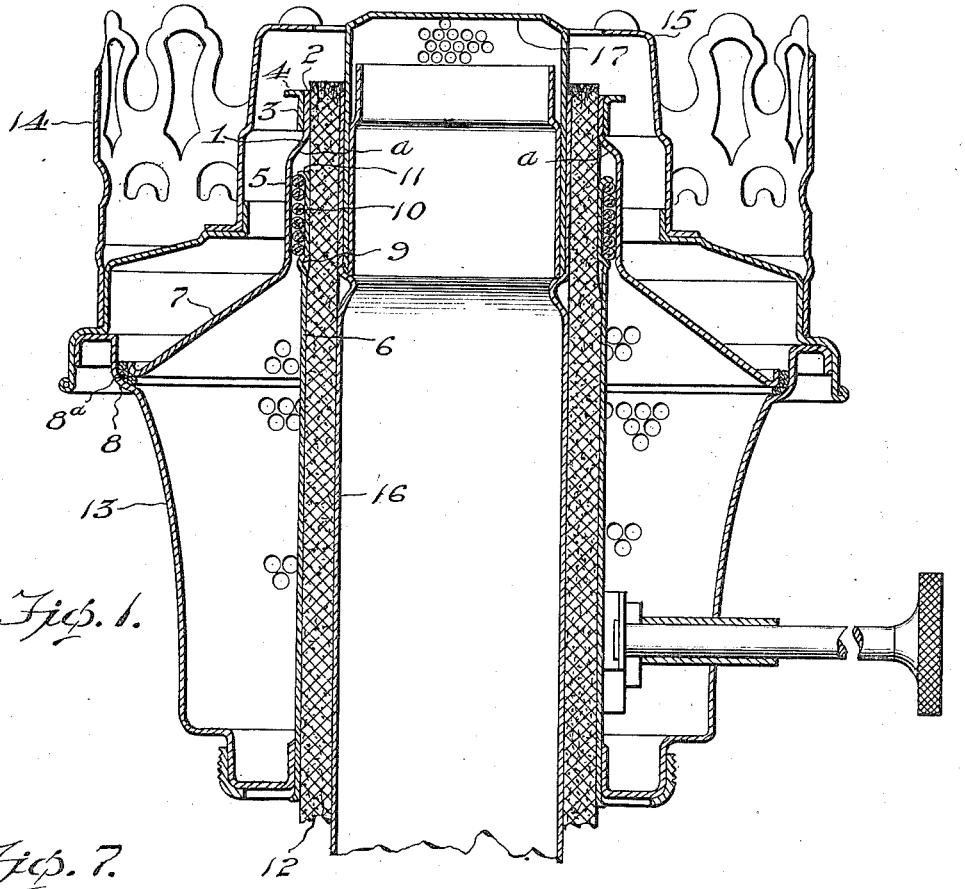



Fig. 1.

Fig. 7.

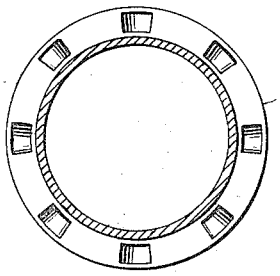
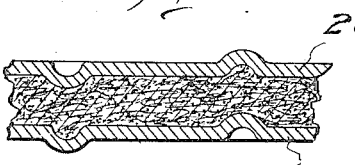



Fig. 5.



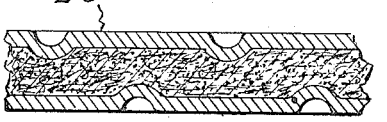




Fig. 6.

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2 SHEETS—SHEET 2.

Fig. 2.

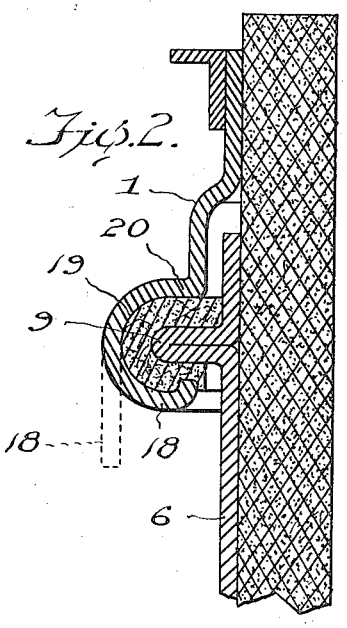



Fig. 4.

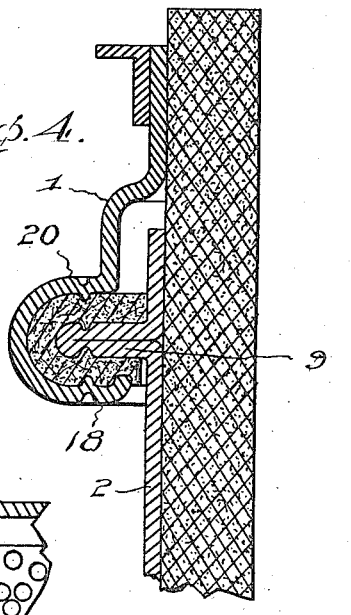
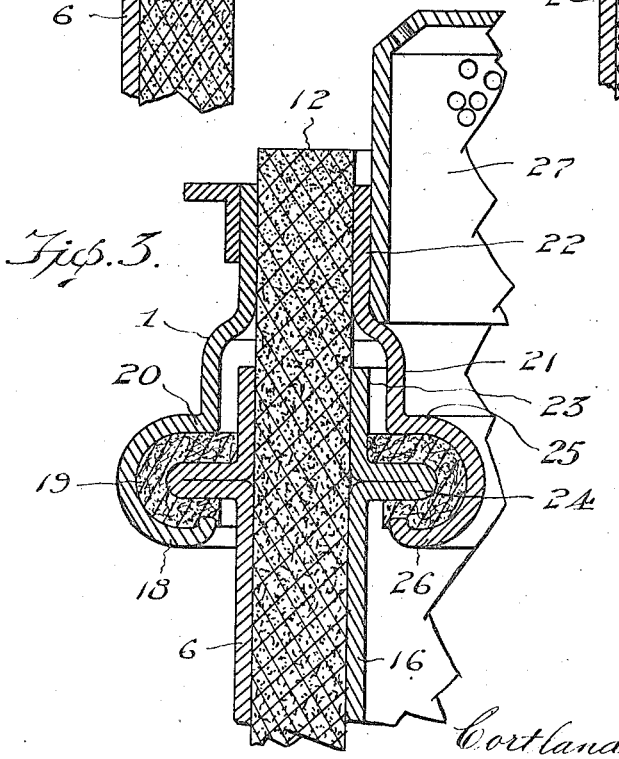



Fig. 3.

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# UNITED STATES PATENT OFFICE.

CORTLAND W. DAVIS AND VICTOR S. JOHNSON, OF CHICAGO, ILLINOIS, ASSIGNORS TO THE MANTLE LAMP COMPANY OF AMERICA, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

## WICK-TUBE FOR HYDROCARBON-BURNERS.

1,229,043. Specification of Letters Patent. Patented June 5, 1917.

Application filed August 22, 1914. Serial No. 858,070.

*To all whom it may concern:*

Be it known that we, CORTLAND W. DAVIS and VICTOR S. JOHNSON, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Wick-Tubes for Hydrocarbon-Burners; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention is an improvement in wick tubes, used in hydro-carbon burners of the wick type, and is especially adapted for the blue flame type of burners used for the production of heat or light.

In burners of this classification, it has been recognized that a large amount of heat is transmitted from the flame to the various parts of the burner, and more especially to the wick tubes. It is a known fact that the heating up of the wick tubes surrounding the wick increases the volume of fuel given off from the wick to the flame. The increased flame, in turn, effects additional heating of the wick tubes. This action is cyclic and known in the art as "creeping up."

In burners of the blue flame type to be used with a mantle, it is not infrequent that, when the burner parts become excessively heated, vapor is formed between the wick and the tubes surrounding the same, and a pressure is generated. If the tubes are not air tight the vapor will leak out below the burning level, the flame may flash back and burn around the point of leakage, causing further excessive heating and often annealing the metal or ruining the burner.

It is an aim of this invention to overcome the defects in burners of this type by maintaining various parts of the burner, and especially the lower part of the wick tubes, in a cool condition, by restricting the heat from the flame creeping down the structure of the burner.

It is a further object of the invention to so construct a wick tube that an insulated section thereof may be so positioned with relation to its adjacent section, that leakage will not be permitted between the tube sections, thereby producing a substantially continuous-closed-tube of insulated parts.

A further purpose of the invention is to produce a burner which, when the flame is set at a desired volume, will reduce to a minimum the "creeping up" of the flame.

Different means for accomplishing the results desired are obtained by the burner constructions illustrated and described, as practical forms of the invention.

In the accompanying drawings:

Figure 1 is a vertical sectional view of an embodiment disclosing an outer wick tube formed in a plurality of sections.

Fig. 2 is a partial vertical sectional view of another embodiment of the burner with the outer wick tube in a plurality of sections and producing a different manufacturing and repair proposition, the upper section being supported from the lower section.

Fig. 3 is a partial detail view of the inner and outer wick tube construction.

Fig. 4 is an enlarged partial detail view of the insulating material retained between the tube sections, of Fig. 2.

Fig. 5 is a detail view of a means to retain the insulating material in position.

Fig. 6 is a similar detail view with the staggered retaining means.

Fig. 7 is a plan view of the flange to retain the insulator.

It is to be understood that the invention is susceptible for use in connection with burners for lamps and stoves as well as incandescent mantle lamps, although the invention is designed particularly for burners of the blue flame type.

The wick tube of the burner is produced in a plurality of sections. These sections may be retained in a substantially continuous structure to guide a wick, but are so positioned that they will restrict the transmission of heat from one section to another. In maintaining the tube sections out of contact with each other, suitable insulating means may be employed to prevent heat from the flame creeping down the tube structure to the fuel supply and causing an over-production of combustible vapor.

In the structure disclosed in the drawings the burner comprises a plurality of sections. The section nearest the flame, which we have termed the flame section 1 of the outer wick tube, may have an upper wick engaging part provided with an outwardly extended baffle, shown in Fig. 1 as an annular sleeve 3 with an angularly positioned

flange 4. This upper section 1 may be formed with a part of greater diameter 5, which is designed to envelop a part of another section of the outer wick tube, shown as the fuel section 6. This part 5 is thereafter flared outwardly, as at 7, and perforated to produce an air screen or distributer. This distributer portion 7 is adapted to be supported from a seat 8 on the burner base to maintain the upper portion 1 in proper relation to the lower, or fuel, section 6 of the wick tube.

The lower section, or fuel, section 6, may be provided with a suitable stop device, shown in Fig. 1, as an annular rib 9 which is positioned near the base of the portion 5 of upper tube section 1. It will be noted that the portion 2 is of substantially the same diameter as the fuel section 6, and these sections 2, 6, coöperate to support and guide the outside of the wick. The upper end of section 6 is shown terminating at a point substantially coincident with the contracted wall *a* of the flame section 1, it being understood that the wick tube sections are maintained out of contact with each other. This may be accomplished by the employment of insulating means such, for example, as asbestos, magnesium, or any other suitable material, indicated at 10. In the structure of Fig. 1 the insulating material may be in the form of rings held between the rib 9 and the outwardly flared end 11 of the tube section 6, although it is obvious that other retaining means may be employed. However, it will be observed that neither air nor fuel is permitted to pass the insulating material 10 between the parts 1 and 6. The wick is shown at 12.

The oblique flange 7, of the upper section 1, which acts as an air distributer, may be separated from the base 13 by insulating material, indicated at $8^a$ in Fig. 1, if desired.

It is to be observed that the burner is provided with the usual base 13, the gallery 14, a cone cap 15, and an inner wick tube 16 of any desired construction. The flame spreader 17, in this construction, is shown supported by the inner wick tube 16.

In the construction illustrated in Fig. 2, the outer wick tube is shown composed of two members, 1 and 6, such as illustrated in Fig. 1, the structure being somewhat similar to that in Fig. 1 except that the distributer or screen 7 is not connected with the flame section 1 of the wick tube. In this construction, however, the section 1 is shown provided with an extended lower portion which is adapted to be crimped in, after the assembling of the parts, to produce a reentrant flange 18. It is to be understood that before assembling the wick tube sections to form a continuous structure for the outer wick tube, the section 6, which may have an annular rib 9, such as illustrated in Fig. 1, is properly supported from the burner base 13. The base 13 is provided with a series of perforations or apertures to leave very narrow bridges of metal, thereby enabling the heat, conducted from the gallery of the burner to the base, to be eliminated by radiation, and thereby effectively dissipating heat prior to its reaching the outer wick tube 6. The portion 18 of section 1 is preferably formed as a continuation of section 1 and is extended in a plane substantially parallel with the section 6.

When the portion 1 is passed over the upper end of section 6, the lower portion 18 may thereafter be bent upwardly to the position shown in Figs. 2 and 4, forming a channel 19. It is preferable to separate section 1 from section 6 by suitable insulating material so that the metal of these tube sections will not contact with each other. This insulating material may be in the form of asbestos rings, and be clamped between the shoulder 20 and flange 18 of tube section 1, around the stop 9 of tube section 6. The stop 9 may be of any preferred form or construction, but to facilitate manufacture, it is shown as an annular rib. The structure illustrated in Figs. 2 and 4 may be preferred, as a manufacturing construction, over that illustrated in Fig. 1, but the purpose of the invention is the same *i. e.*, insulating a portion of a wick guiding element, which is adjacent the flame, from another portion of the wick guiding element which is removed from the flame to maintain the latter element in a cool condition.

In Figs. 4, 5 and 6 the shoulder 20 is shown provided with means to engage the insulating material and prevent movement of the section 1 with relation to the section 6 of the wick tube. If desired, the stop device 9 may also have some retaining means connected with the same. One form of retaining means may be the provision of a knurled or roughened surface of the parts 9 and 20, such knurling being effected by punching up the metal in reverse or staggered relation to each other, or opposite to each other. If desired, the reëntrant flange 18 may also be crimped around the insulating material at the same time the crimping operation is performed on the shoulder 20. It should be noted that the flange 18 is maintained out of contact with the structure of the tube 6.

The upper section 1, in Figs. 2 and 4, is supported from the lower section 6 and out of contact with any other metallic portion of the burner, and is separated from the fuel section 6 by any preferred means which will be a non-conductor of heat.

In Fig. 3, the inner and outer wick tubes are shown provided with a flame engaging

portion which is insulated from the main section or fuel contact section of the tubes. In this figure, the inner tube 16 is shown provided with an upper or flame engaging section 21 having a portion 22 of substantially the same diameter as the main part 16 of the inner wick tube, but separated therefrom. The portion 22 serves to guide the wick after the wick has passed beyond the end 23 of the lower portion of the inner wick tube. The inner wick tube 16 may be provided with a suitable stop device 24, as illustrated, for the outer wick tube, and may also be provided with any suitable means, such as the shoulder 25 and binding flange 26, to retain the insulating material in contact with the stop 24 and to support the auxiliary or flame engaging section of the inner tube out of contact with the lower or fuel engaging section of said tube. In this construction, the flame spreader 27 may be supported in any suitable manner from the upper end 22 of the auxiliary or flame contacting section of the inner wick tube.

It is obvious that minor changes in construction and parts may be made in the inner and outer wick tubes, or in baffle rings to be supported therefrom, but the right is reserved to make such changes and alterations in the structure of the wick engaging portions and flame engaging portions of a wick tube, as will insulate such portions from each other, as contemplated by the appended claims.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. In a device of the class described, a wick tube comprising a flame section and a fuel section, a non-heat conductor interposed between said sections, and a reëntrant flange on said flame section to engage said non-heat conductor.

2. In a device of the class described, a wick tube comprising a flame section and a fuel section, said flame section being supported by the fuel section and maintained out of contact therewith by insulating material.

3. A burner comprising an inner wick tube and an outer wick tube, each of said wick tubes having a plurality of sections, and a non-heat conductor interposed between said sections.

4. A burner having a plurality of wick tube members, one wick tube member extending from the base of the burner nearly to the upper end of the wick of said burner and provided with a rib, another burner member having a wick tube section, and a plurality of rings of insulating material interposed between the wick tube members of the burner to maintain the members of the burner out of metallic contact.

5. A burner comprising an inner wick tube and an outer wick tube, each of said wick tubes having a plurality of sections, one section of each tube nearest the flame being supported from its adjacent section and out of contact therewith by insulating material.

6. In a burner, a wick tube comprising a fuel section having a stop, a flame section separated from the fuel section, and insulating material interposed between the flame section and the fuel section and engaging said stop, said flame section being provided with a shoulder which is adapted to engage the insulating material adjacent the stop.

7. In a burner, a wick tube comprising a fuel section having a stop, a flame section separated from the fuel section, and insulating material interposed between the flame section and the fuel section and engaging said stop, said flame section being provided with a shoulder which is adapted to be formed around the stop of the fuel section to retain said insulating material in position and to mount the flame section from the fuel section.

8. In a burner, a wick tube comprising a fuel section having an annular stop, a flame section separated from the fuel section and provided with an annular flange adapted to be formed over said stop, and insulating material to retain said flame section out of contact with said fuel section, said flange being provided with means to clamp said insulating material between the flange and the stop.

9. In a burner, a wick tube comprising a fuel section having an annular stop, a flame section separated from the fuel section and provided with an annular flange adapted to be formed around said stop, and insulating material to retain said flame section out of contact with said fuel section, said flange being provided with projections to engage said insulating material to clamp said material in position and prevent rotative movement of the flame section with relation to the fuel section.

In testimony whereof, we affix our signatures, in presence of two witnesses.

CORTLAND W. DAVIS.
VICTOR S. JOHNSON.

Witnesses:
A. L. ALLEXON,
FREDK. SHEPPY.