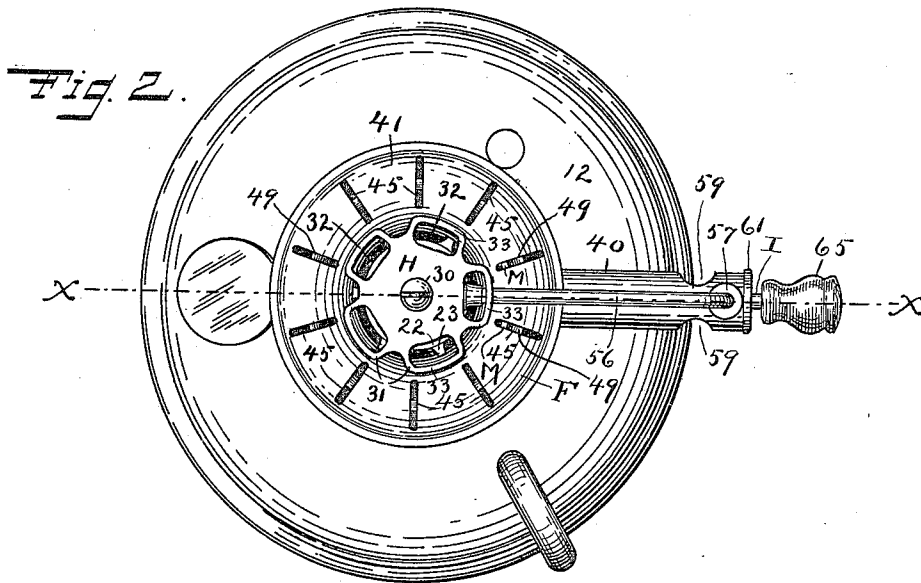
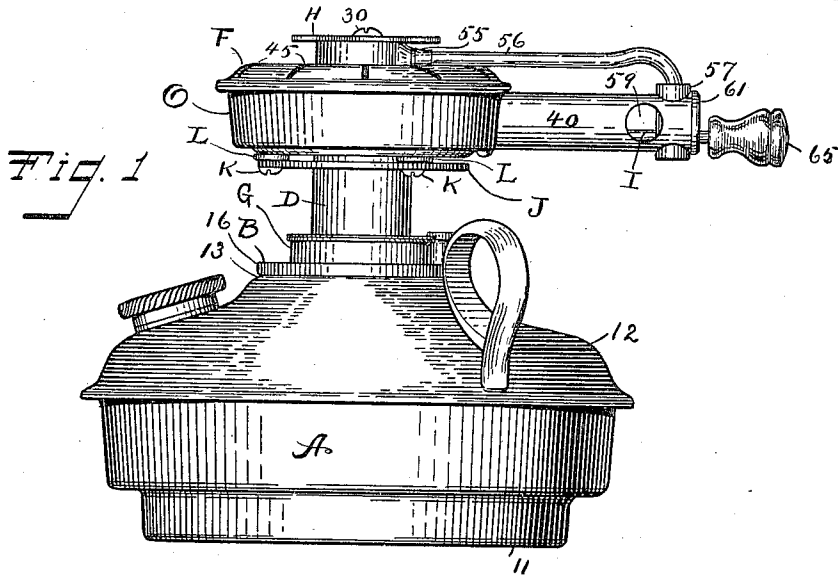


A. A. WARNER.
VAPOR LAMP.
APPLICATION FILED FEB. 1, 1910.

993,925.

Patented May 30, 1911.

3 SHEETS-SHEET 1.



Witnesses.

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3 SHEETS-SHEET 2.

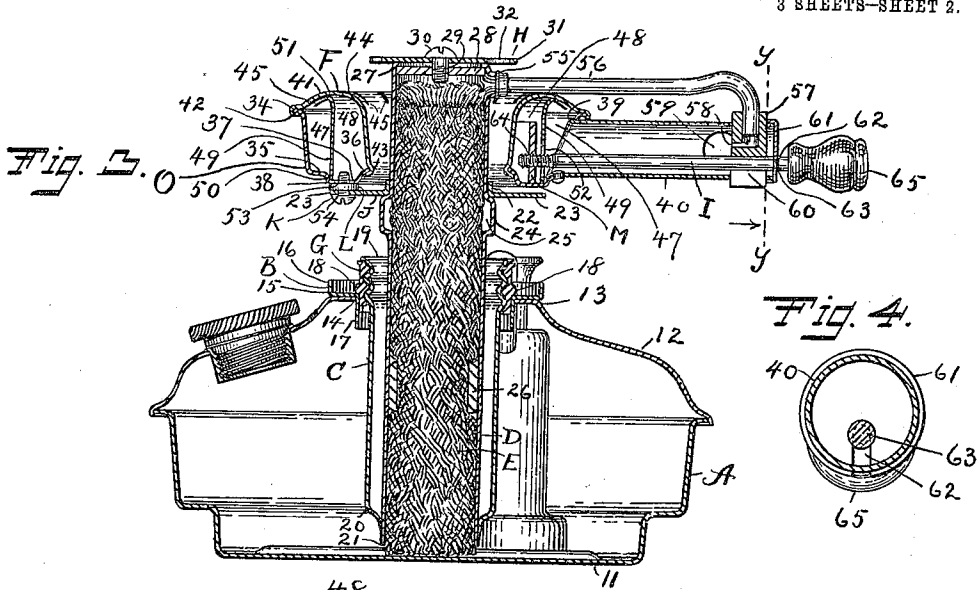


Fig. 4.

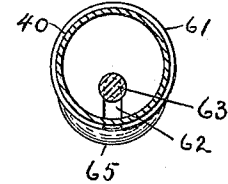


Fig. 5.

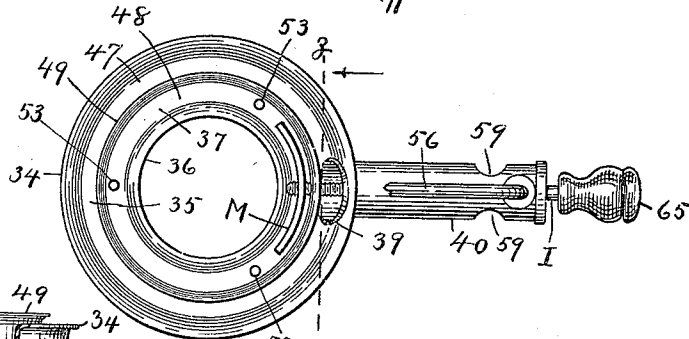


Fig. 6.

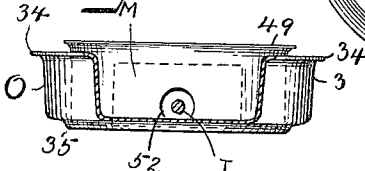


Fig. 7.

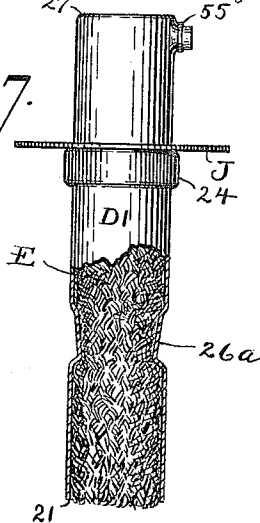
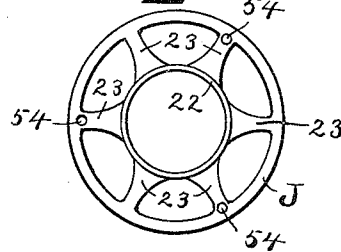


Fig. 8.



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3 SHEETS—SHEET 3.

Fig. 9.

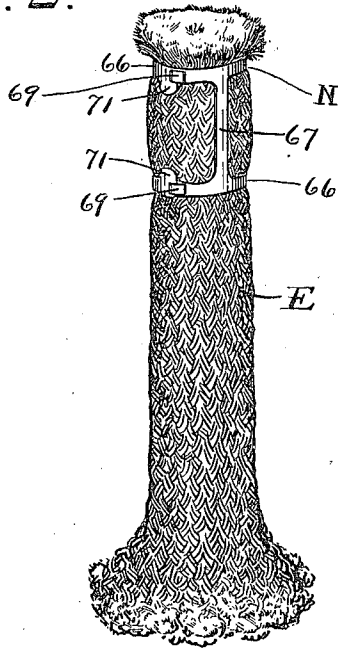


Fig. 10.

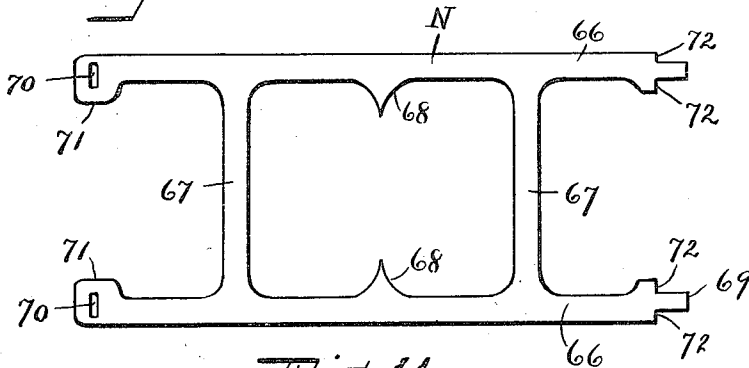
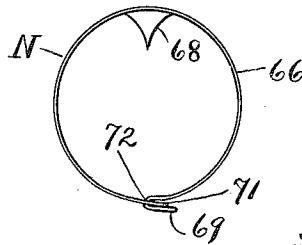


Fig. 11.



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UNITED STATES PATENT OFFICE.

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VAPOR-LAMP.

993,925.

Specification of Letters Patent.

Patented May 30, 1911.

Application filed February 1, 1910. Serial No. 541,349.

To all whom it may concern:

Be it known that I, ALONZO A. WARNER, a citizen of the United States, residing at New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Vapor-Lamps, of which the following is a specification.

My invention relates to improvements in vapor lamps, and the objects of my improvements are simplicity and economy in construction, and convenience, efficiency and safety in use.

In the accompanying drawings:—Figure 1 is a side elevation of my improved vapor lamp. Fig. 2 is a plan view of the same. Fig. 3 is a sectional view of the same on the line *x x* of Fig. 2. Fig. 4 is an enlarged sectional view on the line *y y* of Fig. 3. Fig. 5 is a plan view of my burner, the cap omitted, on the same scale as Fig. 1. Fig. 6 is a sectional view of the same on the line *z z* of Fig. 5. Fig. 7 is a view part in section and part in side elevation of a modification of the wick tube. Fig. 8 is a plan view of my burner support. Fig. 9 is a perspective view of my wick and sizing band. Fig. 10 is a side elevation of the blank for my sizing band, on an enlarged scale. Fig. 11 is a plan view of the sizing band with the clamping members engaged.

A is the font of a vapor lamp adapted to contain liquid fuel and as shown is annular in formation and has a flat bottom 11 and a generally bell shaped top 12 provided with a centrally disposed and annular flat top or platform 13 having a circular opening 14 and adapted as a means of support either directly or indirectly for a priming dish or vessel B, a protecting tube C, wick tube D, wick E and burner F, all of which will be described. The said priming vessel comprises an annular dish shaped vessel having an annular flat bottom 15 fitting the said annular platform 13 provided with an upwardly extending flange 16 at the outer edge constituting the outer wall and at the inner edge extends downwardly so as to form a downwardly extending neck 17, fitting and adapted to be received in the said circular opening 14. Fitting internally in the said neck 17 is the cylindrical lower end of a connecting collar G which extends upwardly through and appreciably above the said priming vessel B and the exterior

forming the inner wall for the said priming vessel and is provided exteriorly with a circular rib 18 adapted to bear against the junction of the said annular bottom 15 and neck 17. Interiorly the said collar G is provided with a screw thread adapted to receive the external thread on the upper part of the generally cylindrical protecting tube C. The said protecting tube C is generally cylindrical and screw threaded at the top 19 as described and when screwed into the said collar G extends downward into the interior of the body of the same and nearly to the bottom 11, and adjacent the said bottom the lower end 20 flares appreciably inward and supports by the extreme bottom edge 21 the said wick tube D, which extends upwardly therefrom and in axial alinement with the said protecting tube C. The said wick tube D is generally cylindrical in shape and extends above the said protecting tube C suitably for supporting the said burner F, which latter is annular in formation and surrounds the upper portion or head of the said wick tube. The direct means of support for the said burner F consists of a burner support J comprising a collar 22 fitting the said wick tube D and provided at its lower edge with the outwardly extending arms 23, the junction of which rests on an enlargement 24 in the said wick tube D and which enlargement forms interiorly between the said enlargement and the wick E an alcohol space 25. At a point generally within the body of the font A the said wick tube may be of reduced diameter as at 26^a so as to compress and form a choker for a wick that is generally a fit for the general interior of the wick tube D¹ or a cylindrical wick tube D may be used with a ring 26 mounted on the wick E as a choker.

The top end 27 of the wick tube D extends appreciably above the said annular burner F and is closed generally flush with the top end with an interior plug 28 provided with a central screw threaded hole 29. Just below the top the said wick tube D is provided with a laterally extending boss 55 suitable for receiving a vapor tube 56. A screw 30, received in said screw-threaded hole 29 holds in place across the top end 27, a quick heat conductor plate H of disk-like form, the edge of which plate or disk extends outside of and overhangs

the wick tube D. The marginal portion of the said plate is in the form of loops 31, formed therein by punching elongated oval holes 32, and cut-away portions at the edge between the said loops which, as shown, are five in number. As thus formed the plate H has an outer wall or margin 33 of slender proportions which margin extends circumferentially of the plate to be exposed to the flame from the burner, which flame may pass the said margin outside the periphery of the plate and also pass through the loop holes inside of the said margin.

The burner F comprises a lower or base member O having at the top an outwardly extending edge 34 and is dished downwardly forming side walls which may be conical or inwardly tapering as shown and has a generally flat bottom 35 and a circular inner edge 36. Outwardly from the said inner edge 36 the bottom 35 is dropped so as to form an annular channel having a flat bottom 37 of appreciable width and which by its outer periphery forms with the bottom 35 a shoulder 38. The side wall of the said base member O is pierced laterally on one side by an opening 39 suitable for receiving and supporting a horizontally disposed mixing chamber tube 40. The said flat bottom 37 is provided with suitable screw threaded holes 53 adapted to register with the clearance holes 54 in the said arms 23 of the burner support J, which holes are adapted to receive screws K suitable for securing the said base member O to the said arms 23. Spacing washers L are provided between the said arms 23 and the flat bottom 37.

The upper or cap member 41 of the burner comprises an annular member having an upper and outer edge 42 and an inner and lower edge 43 adapted to be turned over and thereby united to the said top edge 34 and bottom edge 36 of the said base member and between said edges incloses with the said base member O a duplex vapor chamber. The upper wall 44 of the said cap member 41, is convex and is provided with suitable flame openings 45 in the form of radial slits. The said duplex vapor chamber is partitioned off into an outer chamber 47 and an inner chamber 48 by a generally vertical partition 49. The said partition 49 comprises a generally cylindrical ring of diameter such that the bottom edge 50 fits against the said shoulder 38 and has the top edge 51 flared outwardly slightly and fitting against the said convex top 44 so as to divide the said radial flame openings 45 essentially in the middle and forming outer and inner flame openings, and is provided opposite the said mixing chamber tube opening 39 with an opening 52 adapted for a vapor passageway and to admit the rod I of the shut off mechanism to

be described. The said mixing tube 40 comprises a horizontally extending tube of appreciable dimensions and is provided at the outer end with a jet plug 57, which is a cylindrical plug passing through the top and bottom walls, is closed at the bottom, and has a central upwardly directed bore suitable for receiving the downwardly directed outer end of the said vapor tube 56 and has an inwardly directed vapor opening 58, and below said vapor opening is pierced horizontally by an opening 60 suitable for admitting and for a bearing for the said operating rod I. Adjacent the said vapor opening 58 on each side the said mixing tube 40 is provided with air inlet openings 59. The said mixing tube 40 is capped at the outer end with a cap 61 and which is provided with a slot 62 which is a fit for a reduced portion 63 of the said rod I. The walls of the said slot 62 in abutment with shoulders on each side of the said reduced portion 63, serve as thrust bearings for the said rod I and thereby serve to maintain the longitudinal position of the said rod I.

The controlling mechanism comprises a valve M adapted to close the said vapor passageway 52 in the said partition 49 and is operated by means of the said operating rod I. The said valve M comprises an arc shaped member of sheet metal shaped to fit the interior of the cylindrical wall of the said partition 49 adjacent the said passageway 52 and is adapted to ride back and forth on the said flat bottom 37 and is provided with a screw threaded hole 64 adapted to receive the screw threaded inner end of the said operating rod I.

The outer end of the operating rod I is provided with a handle 65. By turning the said handle 65 the said valve M may be brought into abutment with the said partition 49 and thereby shut off the admission of vapor to the said inner vapor chamber 48 or may be pushed away so as to admit combined vapor and air from the mixing tube 40 to the said chamber. The said vapor tube 56 as described connects the upper end of the wick tube D with the said jet plug 57 and accordingly serves to conduct vapor from the vapor space formed in the interior of the top of the said wick tube D, adjacent the upper end of the wick E to the vapor opening or nozzle opening 58 and therefrom to the interior of the said mixing tube 40. Accordingly, the said vapor tube 56 constitutes the fuel supply conduit for supplying vaporized fuel from the generator chamber to the burner proper when the lamp is in use, and when not in use serves as a vent leading from outside to the wick tube D to allow the wick to freely absorb the alcohol from the font A.

The wick E is provided at the upper end

with a sizing band N, formed of skeleton construction of sheet metal, and which comprises essentially two similar parallel bands 66, respectively an upper band and a lower band, spaced an appreciable distance apart, tied together by a pair of cross bars 67 and provided with suitable inwardly directed and integral spurs 68. The said bands are applied to the wick by being rolled around the same and are secured by their ends by means of fingers 69 at one end engaging with eyes 70 in ears 71 at the other ends. Shoulders 72 at the inner ends of the said fingers 69 engage with the walls of the said eyes 70 so as to limit positively the circumferential dimensions of the wick by means of the said sizing band. The use of the said sizing band as described insures the formation of vapor spaces adjacent the same, and also insures the conduction of heat essentially uniformly to the circumference of the wick. The said shoulders 72 as described are of particular importance in insuring similar results in all the individual members of a lot produced at one time, regardless as to the number.

In starting my lamp, fuel in the priming vessel B is ignited and the heat therefrom heats the burner and the upper part of the wick tube D, thereby vaporizing fuel supplied by the wick E from the font A, a vapor pressure being produced due to the choking effect of the choker 26 provided in the wick tube. The annular insulating space between the wick tube D and the protecting tube C protects the body of the fuel in the font A from undue heating. Accordingly as described there is produced a positive vapor pressure in the upper part of the wick tube D. Vapor will accordingly be forced through the vapor tube 56 and opening 58 to the mixing tube 40, which vapor mixed with air drawn in through the said openings 59 will be delivered to the exterior vapor chamber 47 of the burner and also to the interior vapor chamber 48, the opening or passageway 52 being uncovered by turning handle 65 to push the valve M away from the same, the mixture escaping through the flame openings 45 and igniting. The peripheral walls or arms 33 being slender become quickly heated by the flame produced by the vapor from the said inner vapor chamber 48, and conduct heat to the top of the wick tube D, which heat produces the generation necessary for the maintenance of the flame after the priming fuel has been consumed.

Closing the valve M against the passageway 52 by turning the handle 65 cuts off the supply of fuel to the inner vapor chamber 48 and accordingly interrupts the direct exposure of the quick conductor plate H to the flame, which plate accordingly cools relatively and fails to deliver heat suf-

ficient for vapor generation to the vapor generating space at the top of the wick tube D, so that vapor generation will cease and in consequence combustion will cease altogether and the flame will die out from lack of fuel, without interruption of connection from the generating space to the outer vapor chamber.

The holes or perforations 32 in the quick heat conductor plate H admit flame during normal conditions of operation so that the bars or spurs 33 are virtually surrounded by flame and are quickly responsive to the action of heat and also heated to a high degree and when the flame to which they are exposed is interrupted they are quickly cooled below the temperature necessary for proper vapor generation.

I claim as my invention:—

1. A vapor lamp comprising a generating chamber, an annular burner of a larger diameter than the said chamber and connected therewith, the said burner having a series of flame openings surrounding the said chamber below the upper end thereof, the said burner, inside of the flame openings, being larger diametrically than the said chamber, and a quick heat conductor comprising a central body portion in contact with one end of the said chamber and an outer portion of slender proportions extended laterally from the said chamber over the space between the said chamber and the said flame openings, whereby the said outer portion is quickly responsive to the action of heat when exposed to the flame from the inner portions of the said flame openings.

2. In a vapor lamp, a generating chamber, a burner connected with the said chamber, and a quick heat conductor in the form of a disk-like plate mounted on the said chamber and having loop holes formed through it near the edge thereof, with a margin of slender proportions extended circumferentially of the said plate over the burner to be exposed to the flame therefrom which may pass the said margin outside the periphery of the said plate and also pass through the loop holes inside of the said margin.

3. In a vapor lamp, a burner provided with a duplex vapor chamber comprising a hollow ring and a partition dividing said ring into an inner and an outer vapor space, a port interconnecting said spaces and a valve adapted to close said port.

4. In a vapor lamp having a wick tube provided with a closed upper end and a wick in said tube, a sizing band on said wick comprising a strap of sheet metal having a connecting eye and a finger adapted to engage therewith, shoulders on said finger and a spur on said strap adapted to penetrate said wick.

5. In a vapor lamp a wick tube and a

wick generally fitting said tube, a sizing band on said wick comprising a strap of sheet metal having a connecting eye and a finger to engage therewith said finger provided with shoulders.

6. In a vapor lamp, an annular vapor chamber provided with a series of flame openings, and a partition dividing the said chamber into outer and inner vapor spaces, the said openings being partly on each side of the said partition.

7. In a vapor lamp, a burner provided with a duplex vapor space comprising an

inner and an outer vapor space and each provided with flame openings, means for connecting said spaces with one another, a generating chamber, means for connecting said spaces with said chamber and means for disconnecting said inner space from the said chamber and leaving said outer space connected therewith.

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