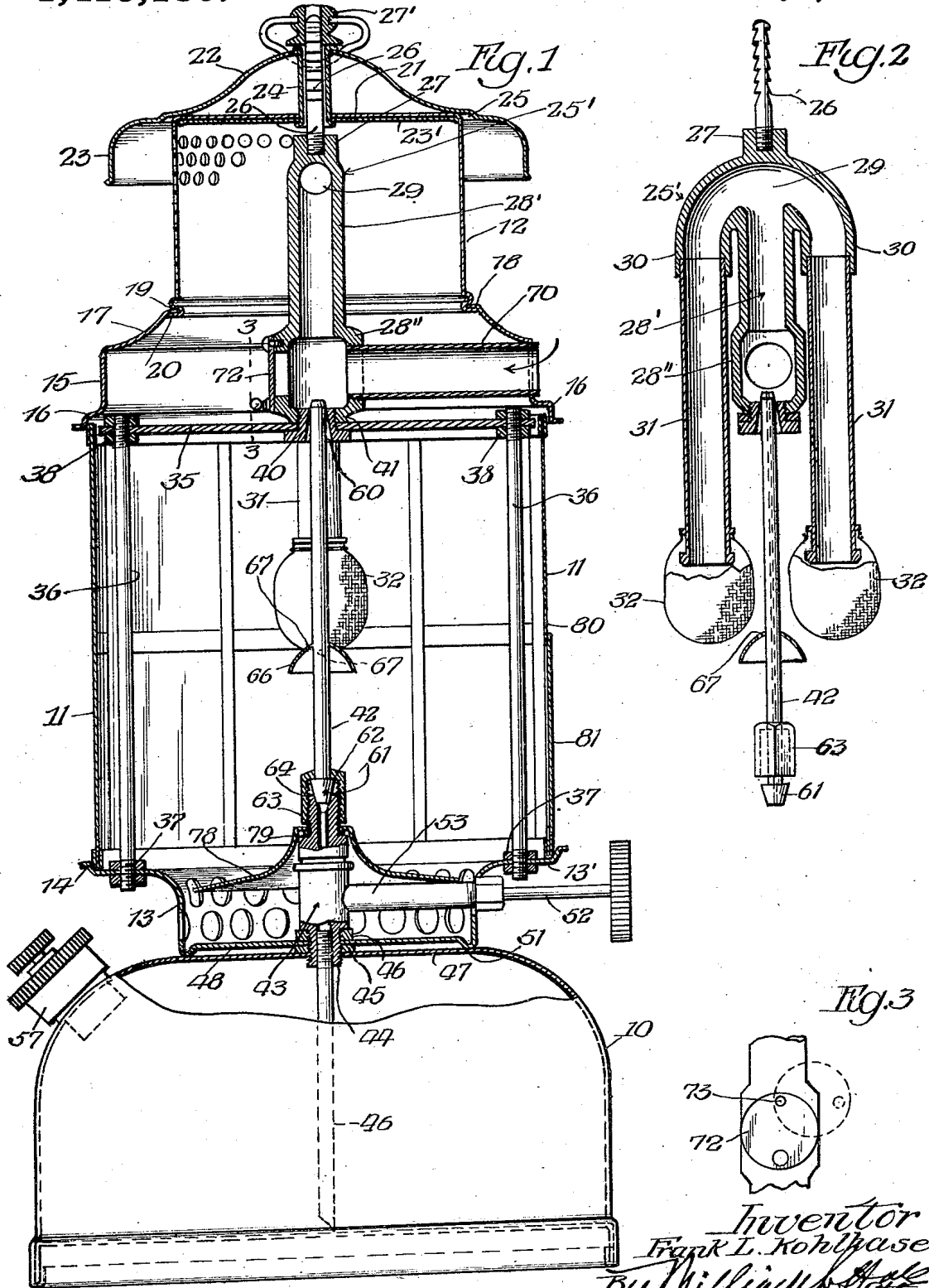


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VAPOR BURNER.
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Patented May 9, 1922.



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FRANK L. KOHLHASE, OF CHICAGO, ILLINOIS.

VAPOR BURNER.

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To all whom it may concern:

Be it known that I, FRANK L. KOHLHASE, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Vapor Burners; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in vapor burners, and refers more particularly to that type of burner that is designed to use a liquid fuel which, upon vaporization and mixture with air, produces a fuel that can be burned in a burner having a mantle to provide a high power light, such, for instance, as a lantern, a table lamp, and the like.

Among the objects of the invention is to provide an exceedingly simple, relatively light, burner structure which can be rigidly supported at the top of the illuminating chamber, in connection with a vaporizing tube which receives liquid fuel from a fuel source and delivers vapor derived therefrom by heat to the mixing tube of the burner, together with means whereby the vaporizing tube can be heated by a match in a simple way to start the burner.

Another object of the invention is to provide a novel form of burner of this type, in which a small light gauge vaporizer tube disposed substantially in the axis of the lamp and used to conduct the liquid from the font and deliver the vapor directly to the burner, may be so arranged that the heat of an ordinary match applied directly to this tube is sufficient to vaporize the liquid fuel.

Another object of the invention is to so support a burner structure, having novel means of a character to effectively apply the flame of a match to the vaporizing tube to quickly vaporize the fuel and deliver it to the mixing tube of the burner in such a way that the burner support and vaporizing tube cast a minimum shadow.

A further object of the invention is to provide a novel fuel conducting and vaporizer delivery tube.

A further object of the invention is to provide a novel means to connect, and to provide a liquid tight joint between, the lower end

of the fuel conducting and vaporizer tube 55 and the nipple which rises from and communicates with the interior of the font.

A further object of the invention is to provide an improved construction at the discharge end of the vaporizing tube which is arranged to facilitate access to the minute nozzle of the tube for the purpose of cleaning the nozzle. 60

Another object of the invention is to provide a novel supporting means, arranged at the top of the burner, for supporting the upper lamp or globe supporting means constructed also in a way to carry the weight of the lantern therefrom. 65

A further object of the invention is to provide a globe or chimney support to receive the bottom of the globe and novel means of fastening it to the font. 70

A further object of the invention is to provide, in connection with the means for affording access to the vaporizer tube for the purpose of cleaning the same, novel means for admitting air to the mixing tube. 75

Other objects of the invention are to improve and simplify vapor burners of the type referred to, and the invention consists in the combination and arrangement of the parts shown in the drawings and described in the specification, and is pointed out in the appended claims. 80

In the drawings;

Figure 1 is an axial view, partly in section, of a lantern embodying my invention.

Figure 2 is an axial section of the burner, detached, in a plane at right angles to the plane shown in Figure 1. 85

Figure 3 is a detail view as seen from the line 3—3 on Figure 1.

The invention is herein shown as adapted to an ordinary lantern having a font 10, a chimney or globe 11, and an upper perforated collar 12, outwardly through which the heated gases from the lamp pass. Between the font 10 and the globe 11 is a single piece globe support, embracing a cylindric perforated collar portion 13 and an outwardly and upwardly directed flange having an outer annular extension affording a horizontal portion 13' concentric with the lamp axis on which the lower end of the chimney or globe is supported. The globe is held laterally in place by an upturned flange 14. The said globe holder and collar 13 are made of one 105

piece of sheet metal and are clamped on the top of the font by means hereinafter described.

The upper end of the chimney or globe is supported by a ring-like member or collar 15 that is provided with a down-turned flange 16 to receive and hold the globe centrally with respect to the axis of the lamp. Said ring support 15 is tapered inwardly and upwardly at its upper end at 17 and is provided with an inturned flange 18, upon which the perforated collar 12 is supported by means of a downwardly facing shoulder 19, which is formed with a reverse curve of the metal of the collar, the lower terminal of the curve 20 being turned outwardly beneath the upper flange 18 of the conical end of the ring structure to bind it and the collar firmly together. The said collar 12 is turned in at its top to form an inner annular flange 21.

The collar 12 supports a canopy 22 which is enlarged to form a downturned flange 23 that extends a distance radially beyond the upper end of said collar. The said canopy 22 is fixed to the top of the collar 12 by means made as follows:

Located within said collar and underlapping at its margin the upper flange of the collar is a centrally apertured plate 23'. The canopy and flange 21 is likewise centrally apertured and it and the plate 23' are fixed together by means of a hollow bushing 24 that is upset at its upper and lower ends, one over and the other beneath, respectively, said canopy and plate 23', thereby rigidly fixing the canopy to the apertured collar through the plate 23' and the flange 21. The said canopy is formed with a horizontal annular surface 25 that seats against the inturned upper flange of the collar 12, and thereby assists in centralizing the parts. The construction described provides simple means to form the different parts and to fix them rigidly together.

The said canopy, the collar, and ring-like globe support are removably connected to the upper end of a burner structure, designated as a whole by 25' through the medium of a threaded stem 26 that extends through the bushing 24 and is threaded at its lower end axially into an upstanding lug 27 of the burner structure. A nut 27' is threaded to the upper end of the stem, to which is attached a swinging eye piece and the lower face of the nut 27' bears against the upper turned-over edge of the bushing 24. When the bushing 24 is released from the upstanding stem 26, the connected canopy, collar and globe supporting ring may be removed upwardly away from the globe, so as to expose the burner structure, which will now be more fully described. The thread of the screw stem is cut away or interrupted on opposite sides of the stem 26, so that a half turn of the nut 27', likewise threaded, will

release it to slide freely endwise of said stem to quickly release the parts secured by the screw stem and nut.

The burner structure in its essential details comprises, when adapted to a lantern, a central upstanding mixing tube 28' which communicates with and constitutes a part of the mixing chamber 29, and said mixing chamber is provided with diametrically disposed parallel downturned portions or nipples 30, into which are screwed the upper ends of burner tubes 31, the lower ends of which carry the usual refractory mantles 32. The burner is herein shown as of the twin type but may, so far as the broader phases of the invention are concerned, take the form, with simple changes, of a single burner employing a single burner tube and mantle.

In the said burner herein shown, and as preferably constructed, the transverse and vertical mixing passages 29, 28', respectively, may be formed as an integral casting to constitute, together with a collar 28'' the mixing chamber of the burner, said collar 28'' having a horizontal axis and made integral with the lower end of the mixing tube 28'. The burner tubes 31 can be made separate from the integral casting and threaded into the ends of the horizontal or transverse mixing passage 29.

The burner is supported from the lower globe holder through the medium of a cross bar 35 that extends diametrically across the upper part of the lantern and is supported at its ends on the upper ends of two or more posts or standards 36 which rise from and are secured to the rim of the lower globe holder by the clamping nuts 37 or in any other suitable manner like clamping nuts being employed at the upper ends of the posts 36 to fix the posts to the cross bar 35. The means for fastening the burner structure to the supporting bar 35 comprises a headed vertical bushing 40 which extends upwardly through a central opening in the supporting cross bar 35 and is threaded into a boss or enlargement of the collar 28'', the bushing being formed on its lower end with a polygonal head by which it may be turned into and out of place. With this construction it will be noted that the cast parts of the burner structure are very rigidly connected to the supporting structure beneath and it will also be observed that the connections which extend from the top to the bottom of the lantern (the posts 36) can be made small, so that they will cast little or no shadow.

A small vaporizing tube 42, of thin gauge, extends upwardly from a valve nipple 43 that is in the center of the top wall of the font 10 and is secured thereto by its screw threaded lower end 44 which is threaded into a nut 45 which may be fixed in any

suitable manner to the top wall of the font. A feed pipe 46 extends from said nipple to the bottom of the font and is preferably bevel cut so that it can reach to the bottom of the font without likelihood of the pipe being clogged. The threaded portion 44 of the nipple also extends through an aligned opening in the bottom plate of the globe holder 13 and said top font wall and the bottom wall 48 of the globe holder can be clamped together between nuts on the lower threaded end of the nipple 43, one fixed to the top wall of the font and the other 46 threaded to the nipple or made part thereof. The globe holder may have a concentric rim 51 to seat on the font to aid in stabilizing and strengthening the parts. The turning of the font and, therefore, the nut 45 fixed thereto tightens and relieves the clamping action of the nuts, so that the nuts on the threaded lower end of the nipple constitutes a simple means of yieldingly pressing the parts together and holding them in relatively fixed relation and the nipple to the font.

The interior of the nipple 43 is provided with any suitable valve passage and seat that cooperates with a needle valve carried on a stem 52 which is mounted to rotate in a right angle extension 53 of the nipple, these parts being of any known construction.

The vaporizing tube enters loosely at its upper end a conical, downwardly directed opening 60 in the hollow bushing 40. The upper end of the tube extends a distance above the floor of the collar 28'' of the burner structure, and the tube is adapted to be detached at its lower end from the nipple 43, so that when so detached the vaporizing tube may be allowed to slip upwardly into the burner collar and then be tilted at its lower end away from the axis of the nipple, due to the conical opening 60, whereupon the vaporizer tube may be pulled away from the bushing, thereby allowing the vaporizing tube to be removed from the lantern. Such removal of the vaporizing tube is effected in a plane at a right angle to a plane passed through the burner tubes and mantles.

In order to fasten the lower end of the vapor tube to the nipple to provide a liquid tight joint, the lower end of the vaporizing tube is formed with an enlargement 61 having a downwardly facing conical seat that enters a like upwardly opening seat in the nipple and with an upwardly facing shoulder 62. The parts are removably attached together by a coupling nut 63 having an apertured top through which the vaporizing tube extends and forming a downwardly facing seat to engage the upwardly facing shoulder 62 on the conical enlargement 61, so arranged that when the nut is screwed down on the threaded por-

tion 64 of the nipple, the conical seats are pressed together to avoid leakage of fluid between the internally coned threaded end of the nipple and the conical lower end of the vaporizing tube; and the seating movement of the coupling nut is arrested when the conical parts are wedged together.

Said vaporizing tube lies between the burner tubes and their mantles, so that after the burner operation has been once established, pressure applied to the fuel in a known manner, the fuel is, by the heat of the adjacent burner tube, and their mantles, maintained hot enough to vaporize the liquid fuel during the continuous operations of the burner. In order that the burner may be started with the small amount of heat that can be furnished by an ordinary match, the said tube is provided with a flame arrester and concentrator 66 which preferably surrounds said tube, and, as herein shown, is of generally hollow concavo-convex form, with the open concave side facing downwardly and with the upper side rigidly attached to the tube 42 in heat conducting relation to the tube. The said element 66 is made of relatively thin metal, and maintains good heating conducting relation to the tube, so that it not only arrests the flame and concentrates it on the thin tube, but actively heats the tube by thermally conducting heat, derived from the match flame, to the tube. The function of the flame arrester element 66 is to arrest the flame of a match and to throw the flame inwardly against the outer wall of that part of the tube which is surrounded by the arrester 66, so as to localize the heat of the match flame against this part of the thin gauge tube in a way that will rapidly heat the tube to permit rapid vaporization of the liquid fluid, the vapor passing into the collar 28'' of the burner structure. If desired, there may be one or more small openings 67 at the top of the conical flame arrester and very near the tube 42 and of such size and direction as to establish a slight upward circulation of the match flame, which circulation will tend to draw all of the flame into the arrester and around the tube in the event the volume of the match flame, or a tending to deflect it by wind pressure, should be such as to tend to cause some of the flame to escape past the lower edges and be lost for useful function.

Said arrester, in addition to its function of confining the match flame about and against the tube within the operative confines of the flame arrester has the further function of carrying by conduction the temperature imparted to the metal of the arrester to the metal of that part of the tube to which it is connected. It has been found in practice, with the construction described, that by the use of a single match the fluid

fuel can be vaporized in a period of less than one half minute to start the burner in operation, and after the vaporization of the liquid fuel has begun, the heat generated at the mantles and in the burner tubes maintains the temperature of the liquid fuel in the vaporizing tube such as to produce a uniform and sufficient generation of the liquid fuel into a gas to properly carry on the operation of the burner.

Air is admitted to the mixing chamber of the burner structure through a horizontal tube 70 that is threaded into a lateral opening in the collar portion 28'' of the burner structure, said inlet being threaded into said opening and extending outwardly to the apron portion or ring 15 of the lantern top and through an opening therein. A tube of large volume can be thus arranged in connection with the burner and can be so located as to not be unsightly, not to take up otherwise valuable space in the burner, nor in any way does said tube effect the casting of a shadow from the burner flame.

By reason of the arrangement of the air tubes 70, wherein it can be set into the rather narrow collar 28'', it becomes possible to provide the side of the collar 28'' opposite to the air tube 70 with an opening that is normally closed by a swinging door 72. When the top structure is removed, which can be effected by relieving the nut 27' and pulling the bushing 24 over the threaded stem 26, said door 72 may be swung on its hinges, as indicated by the dotted lines in Figure 3, and convenient access may be had to the fine opening in the nozzle of the vaporizing tube, so as to clear said nozzle. It will be observed by inspection of Figure 1 that the opening of the collar 28'' is located closely to the nozzle of the vaporizing tube and dislodgement of carbon from the nozzle may be effected by an L-shaped rod having a fine prodding point at one end of its shank, and that a substantial length of this sharp prodding operative portion of the instrument or tool is made possible.

In order to prevent the heat of the fuel which tends to be cast downwardly by the combustion within the mantles from unduly heating the flattened portion of the lower globe support and the top of the font, there is provided a shield 78 which comprises a plate having formed at its top a downturned inner tubular threaded stem 79 which threads over the upper screw threaded portion of the nipple. The shield curves downwardly and outwardly from its attachment to the nipple in an outward direction to practically fill the lower globe supporting collar above the valve stem guide 53 therein. The presence of this shield has the further effect of maintaining the shield cooled by air which enters the collar through its lower

perforations. This cooling effect has also the function of neutralizing the upper heat thrown down on the shield. The result is that the valved portion of the nipple and the upper part of the font are maintained reasonably and permissibly cool.

In the construction described, it will be noted that the posts or rods 36 support the burner structure in a very stable and unobtrusive manner, having the effect to cast a minimum shadow from the light rays, and when used in connection with the type of globe shown, said supporting standards or posts are scarcely visible. It will furthermore be observed that by the use of the single element at the center of the lamp, to wit the vaporizing tube and its flame arrester, the lantern presents a very attractive appearance with exceedingly simple light obstructing elements to cast a shadow. It will further be observed that with the construction shown, said vaporizing tube is not called upon to support any part of the superstructure, and can be made of thin gauge metal and be maintained free from heat conducting relation to the burner structure.

It will be furthermore noted that the cone shape of the arrester produces an important effect, aside from its arresting function in that it serves to concentrate the flame against the vaporizing tube and thereby concentrates the effect of the temperature of the flame in a restricted zone of the vaporizer pipe. Thereby the concentrating effect is employed to its maximum power in a small zone so as to quickly heat the metal of the tube and the liquid fuel within to start the burner in operation.

The flame arrester may be reached through an opening in the metal part 80 of the globe, which opening can be closed either by a swinging or sliding door 81. In some forms of structure a wide segment of the globe, from top to bottom thereof, may constitute a portion of the globe, the metal portion constituting a reflector to throw the rays outwardly.

I claim as my invention:

1. In a match lighter vapor burner, a burner structure, and a thin gauge vaporizer tube adapted to extend from a fuel supply source to said burner structure and provided between its ends with a heat conducting flame arrester which surrounds and is in contact with said tube.

2. In a match lighter vapor burner, a burner structure, and a thin gauge vaporizer tube adapted to extend from a fuel supply source to said burner structure and provided between its ends at a straight portion of said tube with an exterior thin gauge flame arrester supported in heat conducting relation thereto and disposed in a plane transverse to the axis of the tube.

3. In a match lighter vapor burner, a

burner structure, and a vaporizer tube adapted to extend from a fuel supply source to said burner structure and provided between its ends with a surrounding, thin gauge, flaring, heat conducting, concentrating flame arrester in contact at its smaller end with the tube and supported thereon.

4. In a match lighter vapor burner, a burner structure having means to admit air thereto, a thin gauge vaporizer tube adapted to extend from a fuel supply source to the burner structure to supply vapor thereto, and provided between its ends with a surrounding, thin gauge, heat conducting, downwardly opening, cone-like, match flame arrester supported at its smaller end in contact with and by the wall of said tube.

5. A match lighter vapor burner, comprising a burner structure, a liquid fuel font, a thin gauge vaporizer tube extending from said font to the burner and provided between its ends, below the burner structure, with a thin gauge, downwardly opening, cone-like flame arrester concentric to and attached at its small end to the tube.

6. A thin gauge vaporizer tube for vapor burners comprising a straight, thin wall tube having at one end a restricted outlet nozzle, and at its other end the packing member of a liquid tight joint, and provided between its end with a downwardly and outwardly, flaring, heat conducting, thin gauge, concentrating, flame arrester attached at its upper end by a heat conducting joint to the tube wall.

7. A vapor lamp comprising a font, a burner thereabove provided with a depending burner tube adapted at its lower end to support a mantle, and a vaporizer tube extending from the font and entering the mixing chamber of the burner, said tube being of thin gauge material, and having between its ends below the mixing chamber of the burner a thin gauge, downwardly opening flame arrester in heat conducting contact with and supported on the tube wall in its straight portion for directing the flame of a match held beneath the same inwardly against the exterior wall of the tube and against the under face of said arrester.

8. A vapor lamp comprising a font, a burner structure above the font embracing a mixing chamber and a burner tube, an air pipe connected to and delivering air to said mixing chamber, means to supply vaporized liquid fuel to said mixing chamber, a chimney support axially mounted on said font, posts fixed to said chimney support at the outer margins thereof, and a cross member extending across and supported at its ends on said posts, said posts and cross member constituting the sole support for said burner structure.

9. In a vapor lamp, the combination with a font, a support fixed axially thereto, dia-

metrically opposed posts fixed to said support at its margin, a cross member fixed to the upper ends of said posts, a burner structure having a mixing chamber supported above and solely on said cross bar, an air pipe connecting to said mixing chamber, and means for supplying a vaporized liquid fuel to said mixing chamber, comprising a thin gauge, non-supporting vaporizing tube connected to said font and arranged axially of the lamp structure and loosely connected to said mixing chamber, and provided between its ends with match starting means to vaporize the liquid fuel in said tube.

10. In a vapor lamp, the combination with a font, a chimney support fixed axially thereto, diametrically opposed posts fixed to said support, a cross bar fixed to the upper ends of said posts, a burner structure having a mixing chamber supported on said cross bar, an air pipe connected to said mixing chamber, a liquid fuel conducting, thin gauge tube extending from the font to said mixing chamber and arranged axially of the structure, and a cone-like member surrounding said tube and fixed thereto in heat conducting relation at its smaller end and open downwardly at its larger end.

11. A vapor lamp comprising a font, a globe support fixed centrally on the font, an upper globe holder, posts extending upwardly from and fixed directly to the lower globe support, a cross connection between and supported on said posts, a burner structure supported solely by said cross connection, a non-supporting thin gauge vaporizer tube extending between said font and the burner structure and loosely connected to the mixing chamber of the burner structure and a thin gauge, heat conducting, downwardly opening, match flame arrester and concentrator surrounding and supported on said tube below said burner structure.

12. A vapor lamp comprising a font, an annular globe support fixed centrally on the font, an upper globe holder, posts extending upwardly from the margin of the lower globe support, a cross bar extending between and supported on said posts, a burner structure having a mixing chamber above and supported on said cross bar, whereby said cross bar constitutes the sole support for the burner, and means to supply air and vaporized fuel to said mixing chamber, said vaporized fuel supply means embracing a central, non supporting, thin gauge vaporizer tube extending from the font to the mixing chamber of the burner, and a flame arrester surrounding the vaporizer tube and formed to arrest and concentrate the flame of a match inwardly against said tube.

13. A vapor lamp comprising a font, a globe support on the font, and having a rim portion to support the globe, an upper globe

holder, posts extending upwardly from said rim portion, a cross bar extending across the globe and supported on the upper ends of said posts, a burner structure supported on
 5 said bar embracing a lower inlet chamber and an upstanding mixing tube with a burner tube depending therefrom, a vaporizer tube connecting with the font and with the air chamber of the burner, and along a
 10 portion of which the burner tube lies, and a flame arrester fixed to and surrounding the vaporizing tube between the ends of the latter.

14. A vapor lamp comprising a font, a
 15 globe support thereon, an upper globe holder, a cross bar extending across the globe and having means to support it on the globe support, a burner structure supported on said bar and attached thereto by a hollow bushing
 20 that communicates with the burner mixing chamber, and a vaporizing tube connected with the font and entering said bushing.

15. A vapor lamp comprising a font, a globe support thereon, an upper globe holder,
 25 a cross bar extending across the globe and having means to support it on the globe support, a burner structure supported on said bar and attached thereto by a hollow bushing that communicates with the burner mixing
 30 chamber, and a vaporizing tube connected with the font and loosely entering said bushing, said tube being detachably connected to the font and slidable in the bushing.

16. In a vapor lamp, a cross bar extending
 35 across the upper part of the lamp structure and supported from the lower part of the lamp structure, a burner structure embracing a mixing chamber centrally supported on said bar, a threaded bushing connecting
 40 said bar to the mixing chamber of the burner, a vaporizing tube extending through said bushing, the lower end of the base of said hollow bushing being flared to permit tilting of the lower end of the vaporizing
 45 tube when the latter is otherwise unrestricted.

17. In a vapor lamp, a font, upper and lower globe holders, the lower holder embracing a cup centrally apertured and disposed
 50 closely adjacent to and supported on the top of the font and having a central raised portion, an upstanding valved nipple having a lower reduced threaded end extending through a nut above the bottom of
 55 the cup and through a nut attached to the font beneath and engaged with the raised portion of said cup.

18. In a vapor lamp, a font, upper and lower globe holders, the lower holder embracing an upwardly opening cup having a
 60 raised globe supporting rim, and centrally apertured at its bottom, an upstanding valved nipple within the rim of said cup having a lower, reduced, threaded end extending
 65 through a nut resting on the bottom

of the cup and through a nut attached to the font beneath and engaging the bottom of said cup, the lower holder having a shallow, annular portion to rest on said font, and the
 70 latter nut vertically filling the space between the font and the bottom of said lower holder.

19. A vapor lamp comprising a font, an annular globe support mounted centrally on the font, an upper globe holder, posts extending
 75 upwardly from said globe support a cross bar extending across the globe and supported on said posts, a burner structure supported solely on said cross bar embracing a mixing chamber centrally supported
 80 on said bar by a threaded hollow bushing, a vaporizing tube connected with the font and rising centrally of the lamp structure and extending into said mixing chamber and loosely through said bushing, an air inlet
 85 pipe entering said mixing chamber, a burner tube depending from the mixing chamber alongside said vaporizing tube, and a flame arrester fixed to the vaporizing tube between the ends thereof.

20. In a vapor lamp structure, the combination of a font, a threaded nipple rising therefrom, a perforated globe support supported on the font through which the nipple
 90 extends, a deflector plate within said support and fixed to said nipple, with its margin within the perforated area of said globe support, a vaporizer tube connected to
 95 said nipple and a burner to which the upper end of the vaporizer tube is connected.

21. In a vapor lamp structure, the combination of a font, a nipple rising therefrom having an upper exterior screw thread, a globe holder supported on the font through
 100 which said nipple extends, a vaporizer tube adapted for connection to a burner and having its lower end tapered and having an upwardly facing shoulder, a coupling threaded to the nipple having a shoulder to engage the shoulder of the vaporizer tube,
 110 and a downwardly flaring deflector threaded to the nipple below the lowest part of said coupling collar.

22. A top structure for a vapor lamp comprising a ring like member adapted to be
 115 fitted over the lamp globe, a perforated collar thereover interlocked to said ring like member, said collar being formed at its top with an inturned flange, a centrally apertured plate fitted upwardly against said
 120 flange, a centrally apertured springable canopy fitted over the upper end of said collar, and a hollow bushing extending through the apertures of the lower plate and canopy and upset at its ends, respectively,
 125 over said parts.

23. A top structure for a vapor lamp comprising a ring like member adapted to be
 130 fitted over the lamp globe, a perforated collar thereover interlocked to said ring like

member, said collar being formed at its top with an intumed flange, a centrally apertured plate fitted upwardly against said flange, a centrally apertured springable canopy fitted over the upper end of said collar, a hollow bushing extending through the apertures of the lower plate and canopy and upset at its ends, respectively, over said parts, a burner structure within the lamp, a stud fixed thereto and extending through said hollow bushing, and a nut threaded to said stud and bearing on the outer face of said canopy.

In witness whereof I claim the foregoing as my invention, I hereunto append my signature this 20 day of September, 1920.

FRANK L. KOHLHASE.