J. W. HOSLER.

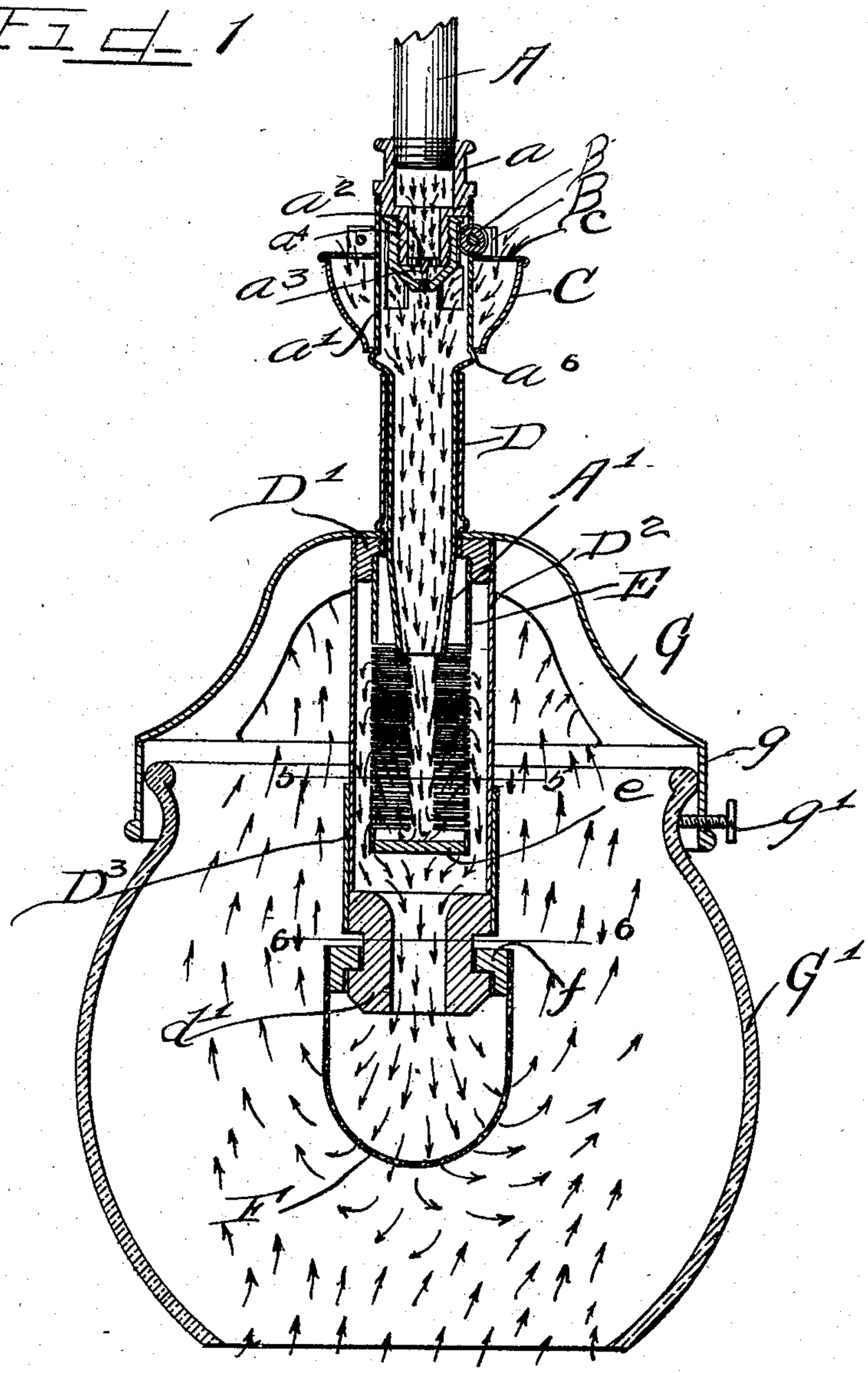
INVERTED INCANDESCENT GAS LAMP.

APPLICATION FILED JUNE 17, 1908.

923,972. **Patented June 8, 1909.**

2 SHEETS—SHEET 1.

Fig. 1



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2 SHEETS—SHEET 2.

Fig. 2

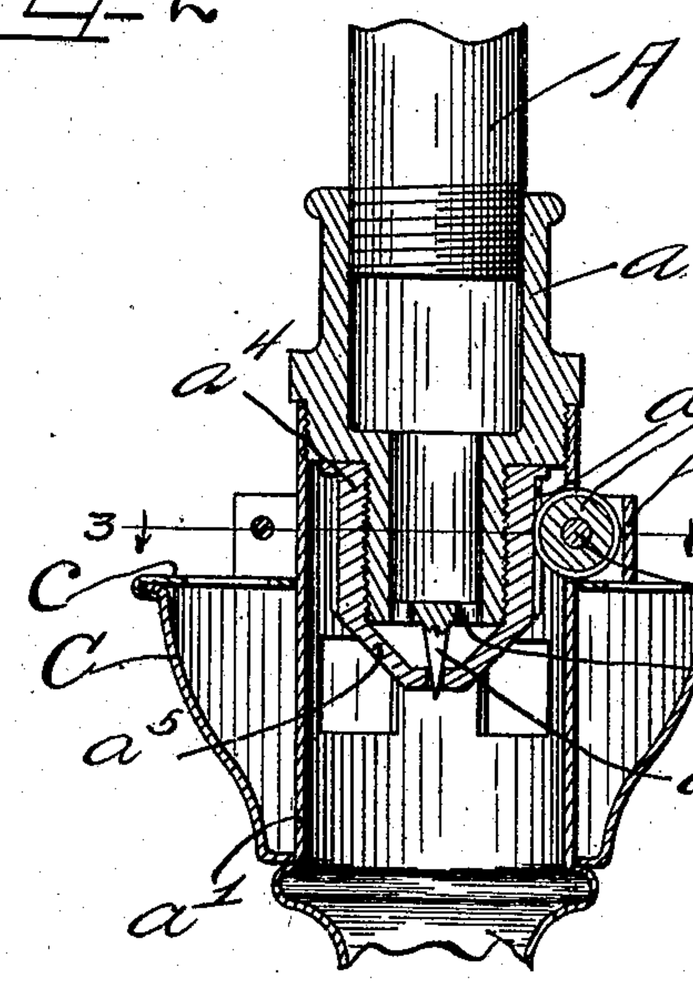


Fig. 3

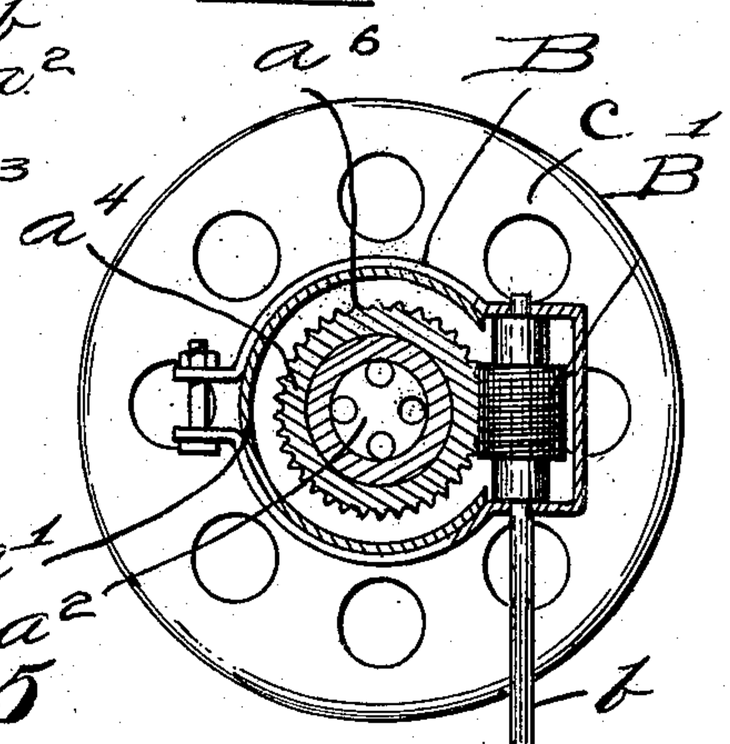


Fig. 4

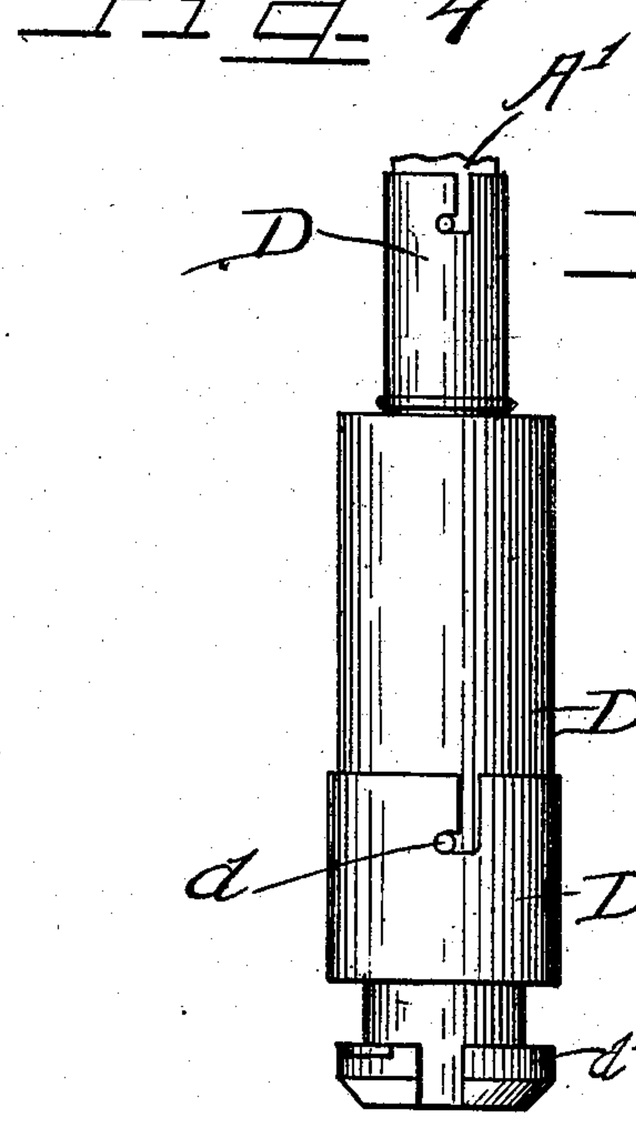


Fig. 5

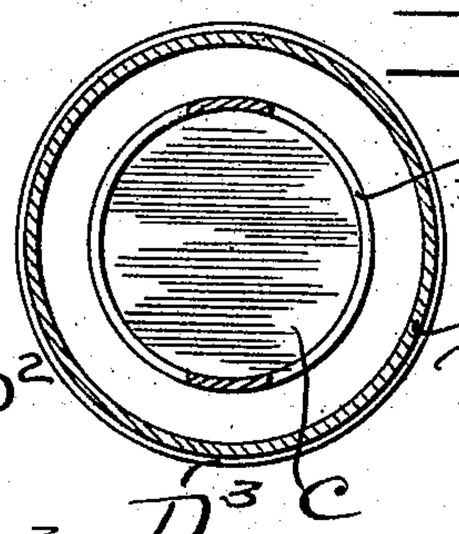
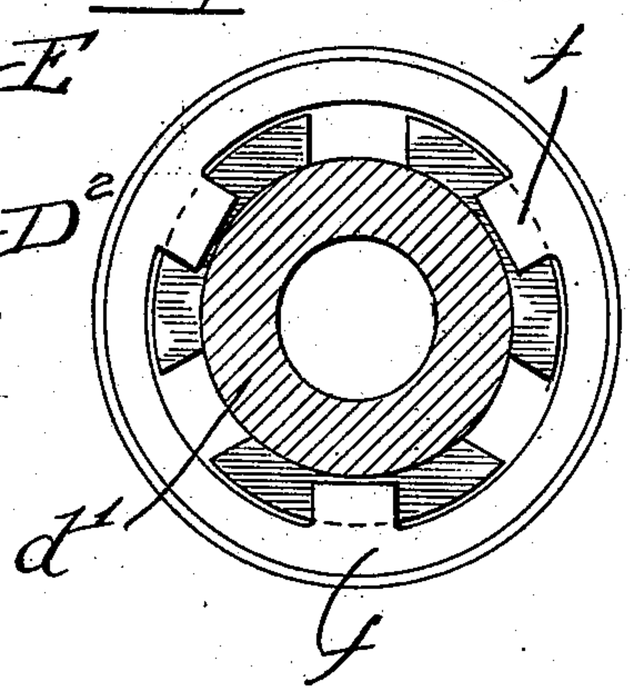


Fig. 6



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UNITED STATES PATENT OFFICE.

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INVERTED INCANDESCENT GAS-LAMP.

No. 923,972. Specification of Letters Patent. Patented June 8, 1909.

Application filed June 17, 1908. Serial No. 438,954.

To all whom it may concern:

Be it known that I, JOHN W. HOSLER, a citizen of the United States, and a resident of the city of Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Inverted Incandescent Gas-Lamps; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

One very serious difficulty heretofore not satisfactorily overcome in the construction of inverted and many other incandescent gas lamps has been the flickering due to the slight but constant variations in the pressure, which soon produces extreme weariness of the eye. This, in such lamps as employ gasolene or a similar hydro-carbon is due to slight variations in the rate of generating. In others—where city gas is used, similar conditions are caused no doubt, by variations in pressure, caused by variations in consumption from the main. Appreciable variations in the flame, however, are constantly noticeable and these have heretofore been present to a greater or less extent in all lamps of this class. Furthermore, and particularly in inverted lamps it has heretofore proven quite difficult to afford a uniform and perfect combustion. This is clearly evidenced from the fact that in most of such lamps a very considerable portion of the mantle is often blackened and loaded with carbon deposits, thus destroying to a considerable extent the efficiency of the lamp. This, no doubt, in part is occasioned by imperfect mixture of the burning fluid and in part by inadequacy of the air supply about the mantle. In any event, the lamp must of necessity prove inefficient to the extent that the mantle is carbonized or blackened.

It is an object of this invention to afford first, an incandescent lamp of the inverted type in which the ingredients may be correctly proportioned and thoroughly mixed before admission to the burner.

It is a further object of the invention to afford a mixing chamber in connection with a lamp of the class described in which the hydro-carbon fluid associated with a proper quantity of air, is directed in a jet or stream thereinto and thence sprayed into a pressure chamber, from which the lamp is supplied with its fuel, thus affording not only a perfect mixture, but as well preliminary heating of the mixture, and a gas retaining receptacle in which the hydro-carbon vapor mixed with air is held at such pressure as to compensate for the variations in the pressure in the system.

It is a further object of the invention to supply an adequate and abundant supply of air both within and without the mantle to afford perfect combustion and freedom from carbonization.

It is a further object of the invention to afford a suitable burner and support therefor on which the mantle may be quickly and detachably engaged.

It is also an object of the invention to afford a screen of suitable metal adapted to be heated by the combustion but of such construction and fineness of aperture as to preclude back-firing.

It is also an object of the invention to afford an exceedingly simple and accurate adjusting means for the needle valve.

Finally it is an object of the invention to afford a lamp of the class described of cheap and durable construction and in which the parts may be easily and quickly separated to permit of cleaning or repairs.

The invention consists in the matters hereinafter described and more fully pointed out and defined in the appended claims.

In the drawings: Figure 1 is a central vertical section of a lamp embodying my invention. Fig. 2 is an enlarged central vertical section of the regulating valves. Fig. 3 is a section taken on line 3—3 of Fig. 2. Fig. 4 is a side elevation of the burner and parts on which the same is connected and supported, but showing the globe and hood removed and the supply nozzle broken. Fig. 5 is an enlarged section on line 5—5 of Fig. 1, with parts omitted. Fig. 6 is an enlarged section taken on line 6—6 of Fig. 1.

As shown in the drawings: A, indicates the supply pipe either connected with a source of hydro-carbon vapor as, for instance, gasolene, or connected with service pipes of a gas system. Threaded on said pipe is the needle valve, which consists of a sleeve *a*, in which the service pipe A, is connected, and which is also threaded toward its lower end on the outer side to afford connection with the upper and large end of the nozzle *a'*, and through which are provided apertures

for the admission of air, as shown in Figs. 1 and 2. Within the upper end of the nozzle pipe a', said fitting or casing a, is reduced in diameter and externally threaded and provided across its end with a head a^2, which is apertured to permit the passage of gas or vapor therethrough and centrally engaged on said head a^2, is the needle a^3, of the needle valve. Threaded on said reduced portion of the casing is a cap a^4, provided with a downwardly tapered closed end a^5, which is provided with a central aperture therethrough, as shown in Fig. 2, to receive the needle a^3. Said cap, as shown, is of a length that when threaded upwardly on the reduced portion of the fitting or casing a, for the needle to entirely close the aperture therethrough and when threaded downwardly, to permit said cap to descend below the needle sufficiently to open the passage to the extent desired. Said cap a^4, is provided on its outer side with longitudinal ribs, which may be likened to gear teeth a^6, and journaled in a suitable clip B, engaged around the supply nozzle a', and projecting through a suitable aperture in the side of said supply nozzle, is a worm B', which engages the longitudinal teeth on said cap, as shown in Fig. 3, to rotate the cap either downwardly or upwardly. As shown, said worm B', is provided with an outwardly directed stem b, provided with a hand wheel b', to permit the ready rotation thereof. Fitted around the nozzle and serving in part as a guard to deflect the heat from the lamp from said valve and the air inlet apertures, is a conical, downwardly tapering deflector C, the lower end of which fits against a bead a^6, on the supply nozzle and the upper end of which flares outwardly from the supply nozzle and is closed at the top by means of a cover c, which extends inwardly to the walls of the supply nozzle a', and is provided with apertures to permit of inlet of air, the outwardly flaring sides of said deflector obviously serving to direct the hot products of combustion rising from the lamp from said inlet apertures. Said nozzle a', extends downwardly for a suitable length and near its lower end A', is tapered or constructed to deliver the fuel mixture or illuminant in a pencil-like jet therefrom. The lamp proper is supported on said nozzle. For this purpose, as shown, a sleeve D, of a diameter to receive the nozzle therethrough, as shown in Figs. 1 and 4, is provided at its upper end with a lamp socket notch, as shown in Fig. 4, adapted to engage a pin on the nozzle and at its lower end, which terminates above the taper on the nozzle, is threaded to engage thereto the nut D', which is also externally threaded to afford threaded engagement with the upper end of the casing or sleeve D^2, and is provided on its under side with a somewhat larger bore also threaded to afford threaded engagement with the upper end of the mixing and spraying chamber or cage E. Said casing D^2, is of a length and diameter to afford a relatively large chamber for the reception of the illuminant mixture, and at the lower end of said sleeve is engaged a sleeve D^3, which is also engaged on the casing D^2, by means of a lamp socket slot, as shown in Fig. 4, and adapted to engage a pin d, set in opposite sides of the wall of said casing.

Supported on the lower end of the burner sleeve D^3, is the burner or jet d', which may be constructed of any suitable material, preferably of material of an extremely refractory nature and not subject to undue expansion. Said jet or burner is provided with a bore of suitable size therethrough to admit the discharge of the combustible mixture and is turned or shaped to afford a peripheral channel or groove about the same intermediate its ends and the lower flange thus afforded is radially notched, as shown in Fig. 6, to permit of insertion of the ring f, thereon, on which the mantle F, is supported, said mantle ring being provided with inwardly directed projections f', which engage on the flange of the burner to support the mantle.

The mixing and spraying chamber E, comprises conveniently a sleeve or tube which, from a point somewhat above the inner tapered end A', of the nozzle, is sawed or slitted inwardly to afford a plurality of closely arranged and very fine slits, the webs between which are substantially horizontal and may or may not be all arranged on opposite sides of the shell or sleeve. Engaged in the lower end of said mixing chamber and affording a tight bottom therefor is a plate e, against which the jet directed inwardly by the tapered end A', of the nozzle, impinges and thus sprays as indicated by the arrow in Fig. 1.

Engaged over the nut D', is a hood G, provided with apertures therethrough, which permit of ready escape of the products of combustion and as shown, provided with a peripheral depending flange g, affording a globe ring and provided with set screws d', adapted to engage beneath the peripheral bead or flange on a globe G'.

The operation is as follows: The hydrocarbon gas or fluid is admitted through the supply pipe A, and needle valve into the nozzle, for this purpose the needle valve being adjusted to afford the desired rate of inflow, and of course, being readily adjusted to vary the rate by threading the cap a^4 upwardly or downwardly on the externally threaded, tubular stem on which the needle a^3, is supported. The jet from said hydrocarbon fluid is delivered centrally down said nozzle and draws inwardly an amount of air through the apertures in the cover c, of the deflector C, sufficient to support the com-

bustion and any regulating means may be provided to retract or limit said apertures to graduate the air supply. From the nozzle, the air and illuminant fluid are directed with suitable force against the bottom plate *e*, of the mixing and spraying chamber and impinged against the same, owing to the construction of the nozzle, and directed upwardly and outwardly through the substantially horizontal slots in said chamber, as indicated by arrows in Fig. 1, and thus passes downwardly between the cage and the walls of the chamber or reservoir D^2, and through the jet or burner into the mantle, where combustion occurs. At the same time a considerable quantity of air is admitted into the globe G′, around the lamp ring and through the hood G, and this passing downwardly around the mantle affords an external source of oxygen to support fervent combustion sufficient to raise the mantle to incandescence throughout its entire extent. Back firing can never occur because of the slotted cage serving as a screen.

Inasmuch as the entire lamp may be removed instantly from the nozzle by means of the lamp socket arrangement whereby the lamp supported by the tube D, is engaged on the nozzle, and inasmuch as the burner or jet may be quickly removed from the reservoir casing in the same manner, and also owing to the threaded connection of the various parts, it is obvious that the lamp and all parts thereof may be quickly disassembled to admit of repairs or cleaning the same, and may as readily be connected up again after the cleaning has been effected.

Obviously many details of the construction may be varied, as it is clearly possible to utilize a screen for the walls of the mixing and spraying chamber, said screen serving as well as the slotted construction illustrated to thoroughly break up and vaporize any vesicles of the hydro-carbon fluid not volatilized and as well to thoroughtly mix the same with the air to reduce the same practically to the condition of a fixed illuminant gas.

Inasmuch as a reserve quantity of the hydro-carbon mixture is contained within the casing D^2, and this, owing to the fervent heat of the burner is maintained under considerable pressure at all times owing to the expansion thereof, it follows that a sufficient quantity of such illuminant is at all times supplied to the burner to support maximum combustion and that slight variations in the system pressure cannot, in consequence, cause the lamp to flicker or to burn unsteadily.

While I have described but one construction embodying my invention, it will be evident that numerous variations and changes may be effected, and I therefore do not purpose limiting this application for patent otherwise than necessitated by the prior art.

I claim as my invention:

1. In a lamp of the class described the combination with a burner and an enlarged chamber to maintain a constant supply of an illuminant for the burner at uniform pressure, of a mixing and spraying chamber therein having a closed bottom having apertured sides, and a tapered nozzle extending axially into said chamber and beyond some of the apertures therein, the taper of said nozzle being such as to constrict the flow therethrough in a jet onto said bottom.

2. In a lamp of the class described the combination with the burner of an enlarged chamber with which the same is directly connected to maintain uniform pressure of the illuminant for the burner, a mixing and spraying chamber within the same, embracing a closed flat bottom and apertured sides, a tapered nozzle extending down into said inner chamber and below some of the apertures therein, the taper of said nozzle being such as to constrict the flow therethrough in a jet onto said flat bottom and regulable means admitting the illuminant mixture into the nozzle.

3. In a lamp of the class described the combination with a burner of a cylindric casing on which the burner is detachably supported, said casing affording an enlarged chamber to maintain a supply of an illuminant for the burner at constant pressure, a mixing and spraying chamber disposed axially within said enlarged chamber and having a closed flat bottom and apertured sides, a tapered nozzle extending axially into said spraying chamber and below some of the apertures therein, and directing the illuminant centrally onto said flat bottom.

4. In a device of the class described a mixing and spraying chamber comprising a cylindric shell having its side walls horizontally slotted, a flat bottom therein and a tapered nozzle extending into said chamber beyond some of the slots and directing its jet centrally on said flat bottom and a regulating inlet valve for the illuminant opening into the nozzle.

5. In a device of the class described the combination with a tapered inlet nozzle for the illuminant of a mixing and spraying shell having narrow, horizontal slots in its side walls and a flat bottom and into which said tapered nozzle extends to a point below some of the slots and directing its jet centrally on the flat bottom, a pressure chamber inclosing the spraying chamber and opening to a burner, a regulating inlet valve for the nozzle, a removable burner secured to the pressure chamber, said burner having flanges providing an annular external groove and slots opening through the lower flange, a

ring having lugs adapted to extend through the grooves in said flange and to rest on the flange to support the ring and a mantle secured to the ring.

6. In a lamp of the class described the combination with a supply pipe of a nozzle threaded thereon and tapering downwardly, a regulating needle valve affording the connection between the nozzle and supply pipe, said nozzle having air inlet openings therein below the valve, a burner supported on said nozzle by means permitting quick detachment therefrom and embracing an apertured mixing and spraying cage having an unperforated bottom and into which said tapered nozzle extends to a point below the first perforations, directing its jet centrally upon said bottom, an enlarged pressure chamber inclosing said mixing and spraying cage and opening downwardly, a burner jet and mantle detachably supported thereon and communicating therein, and an apertured deflector supported above the burner and a globe supporting ring supported thereon.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

JOHN W. HOSLER.

Witnesses:
C. W. Hills,
K. E. Hannah.