M. I. COHEN.

LAMP.

APPLICATION FILED MAY 27, 1908.

936,521.

Patented Oct. 12, 1909.

3 SHEETS—SHEET 1.

Fig 1

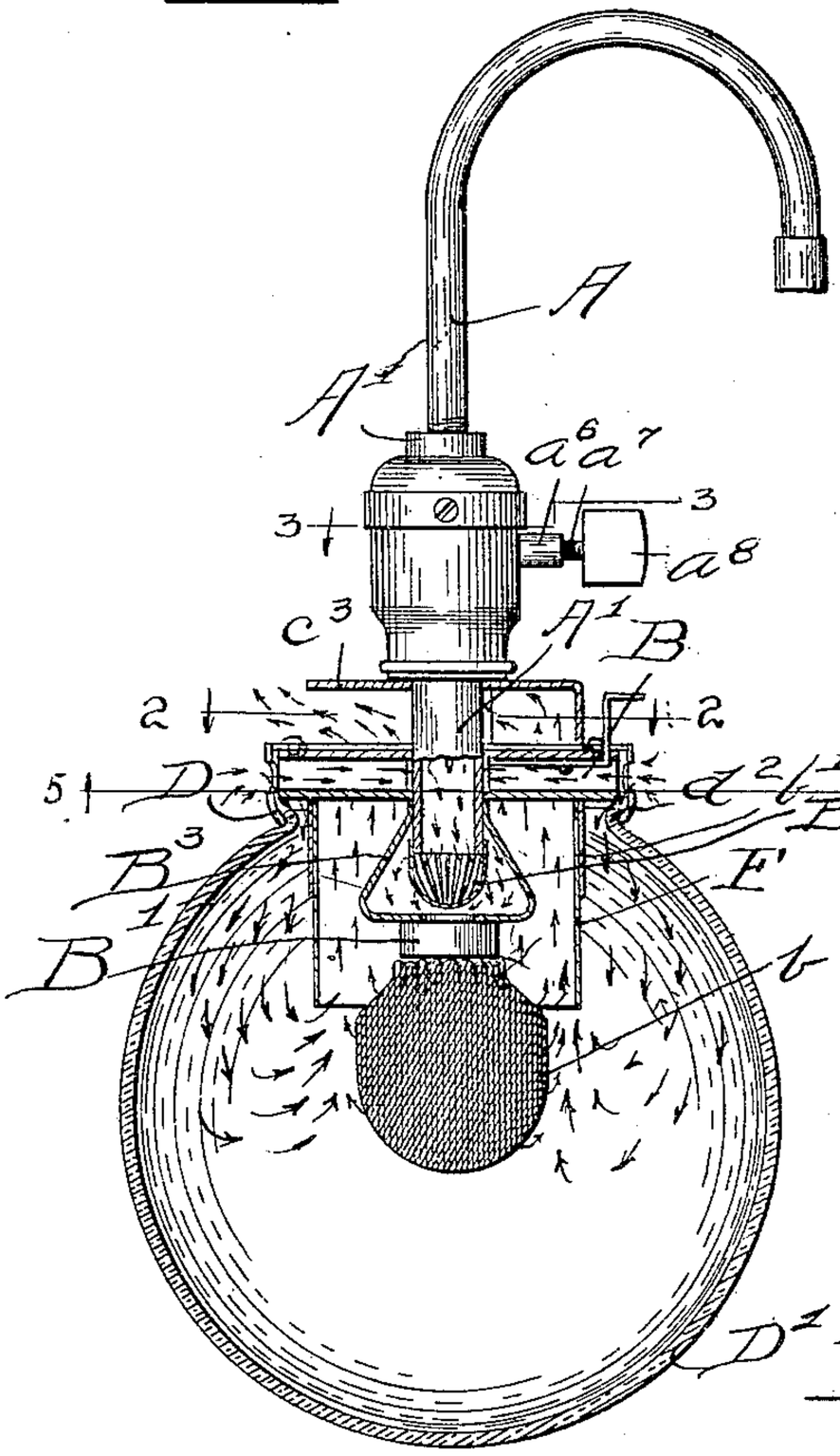


Fig 2

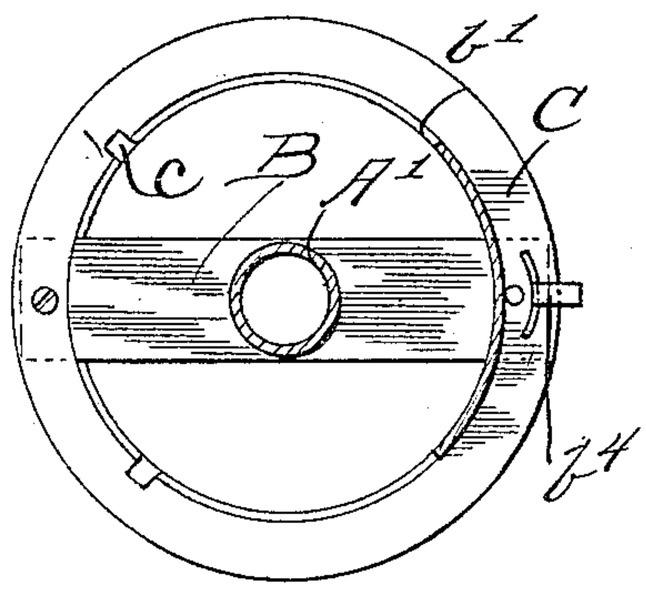


Fig 4

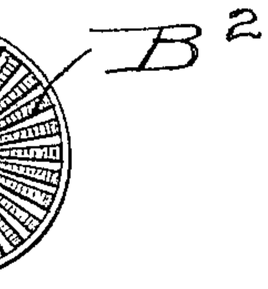


Fig 5

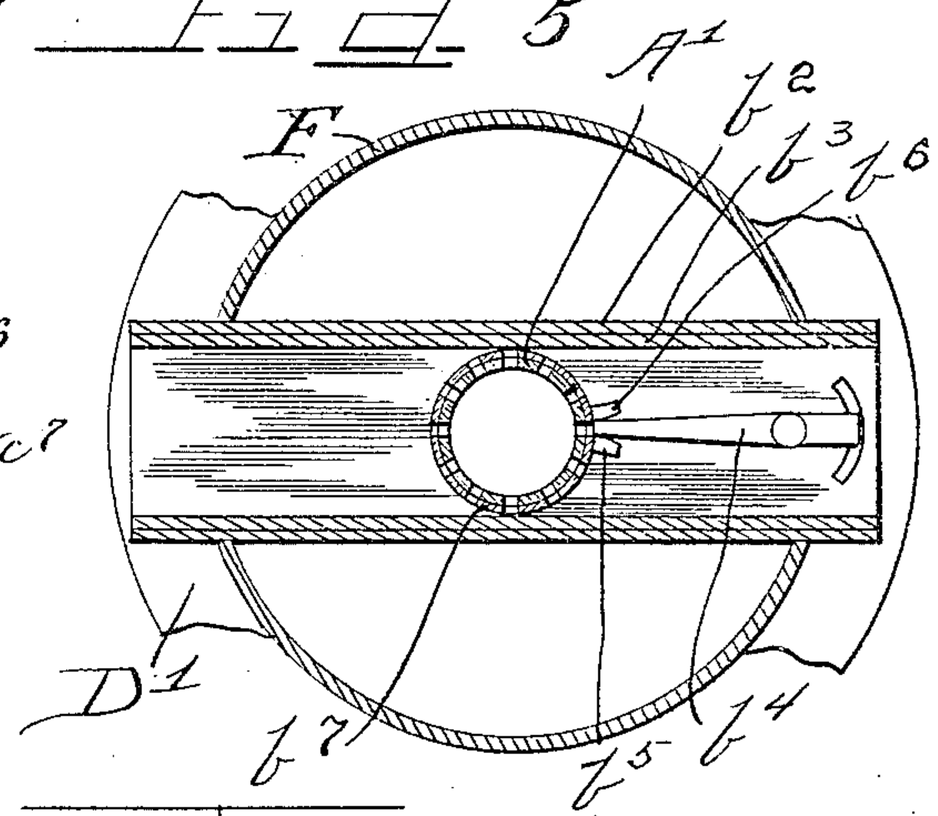
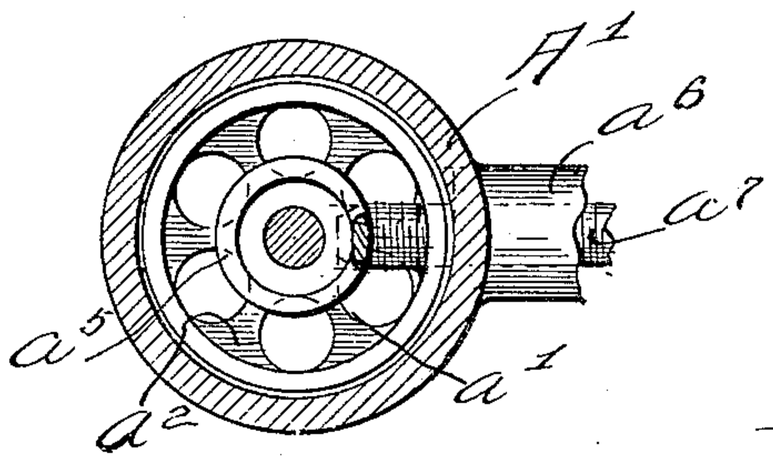


Fig 3



Witnesses

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3 SHEETS—SHEET 2.

Fig 6

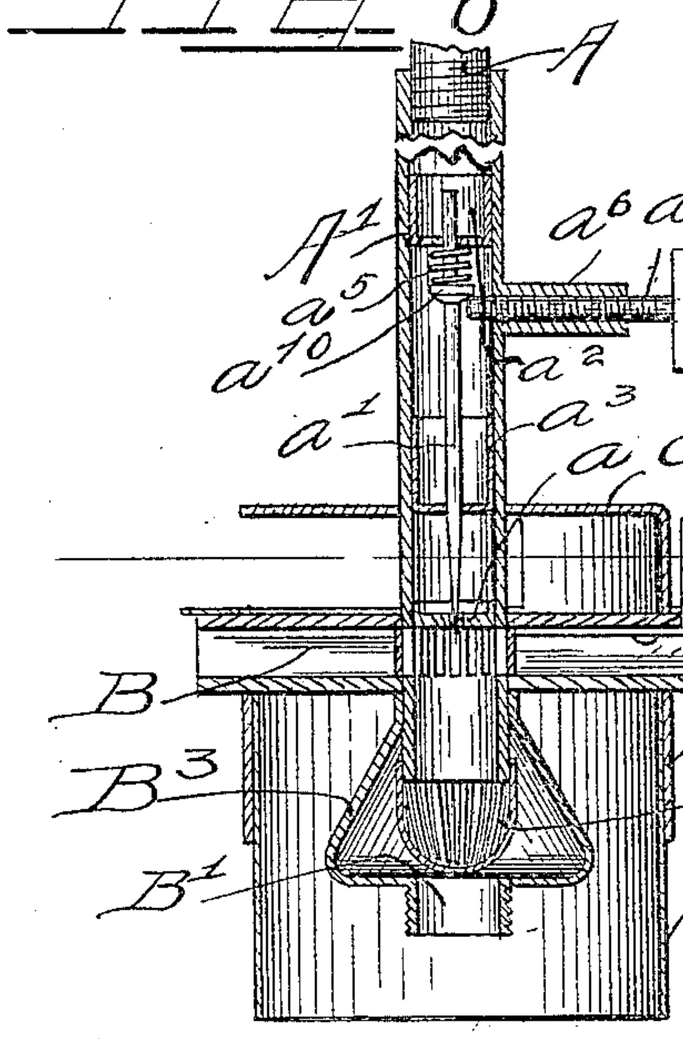


Fig 8

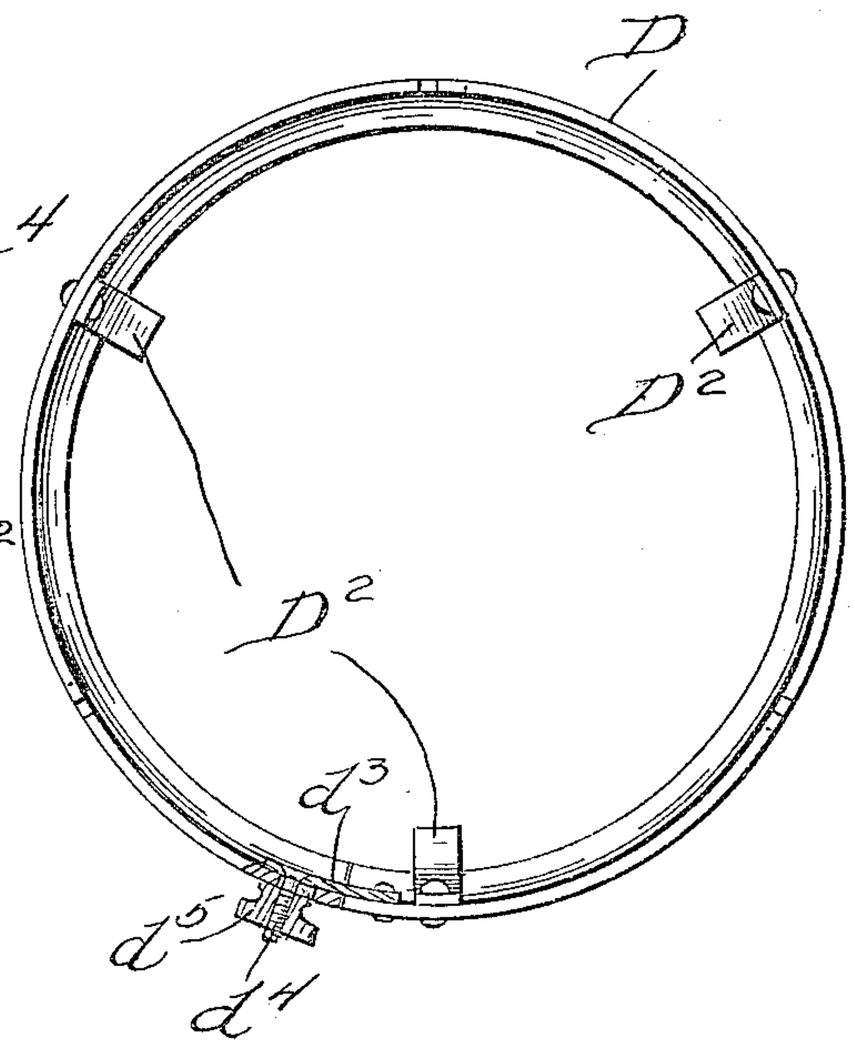


Fig 7

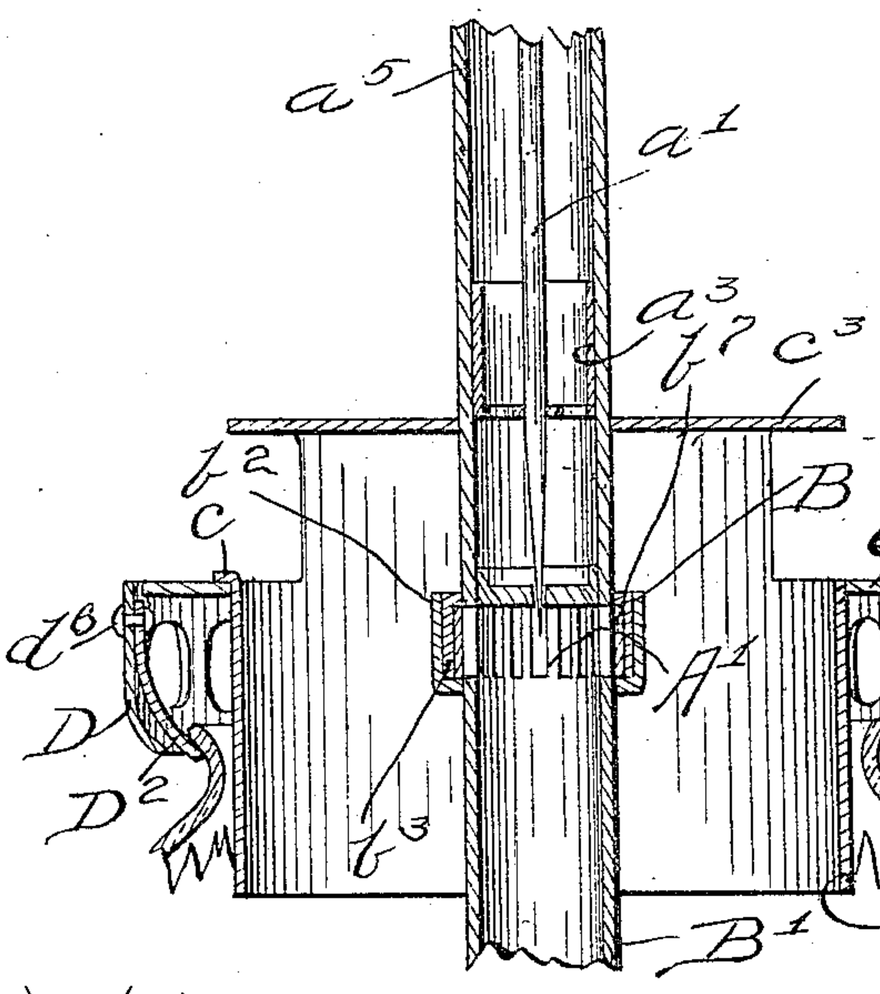
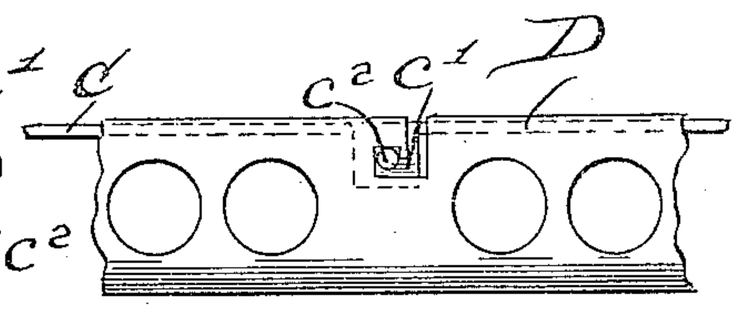


Fig 9



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APPLICATION FILED MAY 27, 1908.

936,521. Patented Oct. 12, 1909.

3 SHEETS—SHEET 3.

Fig. 10

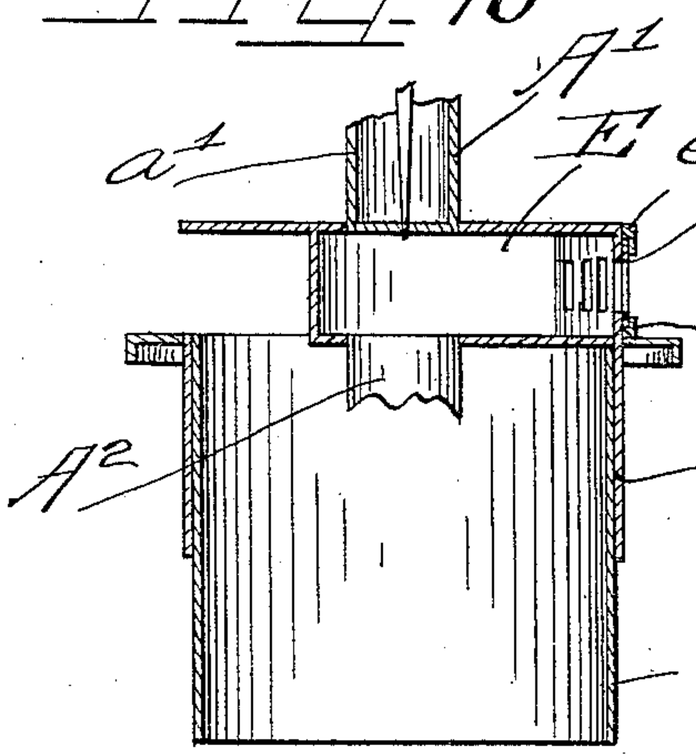


Fig. 11

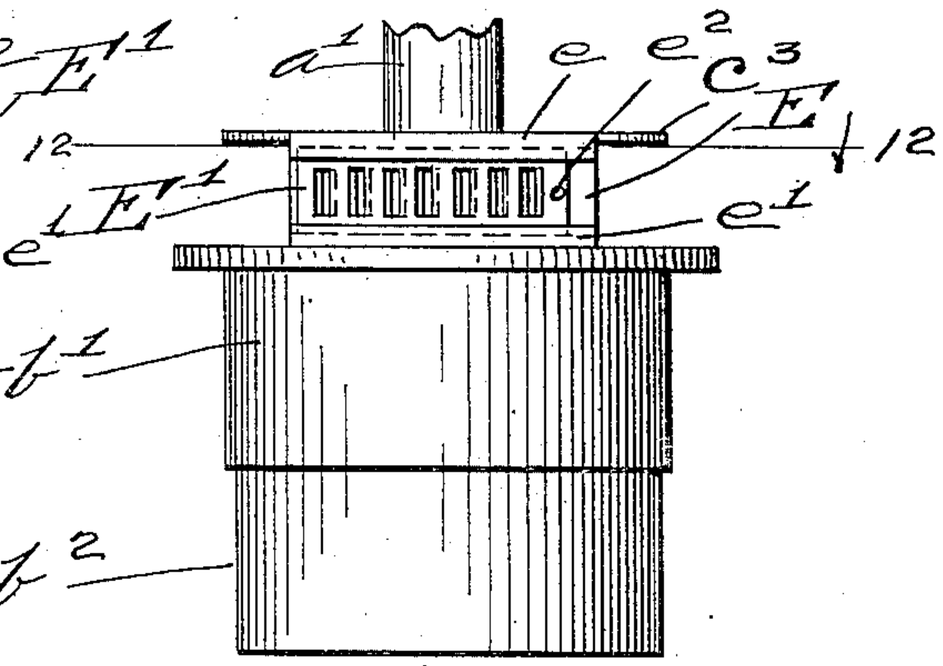
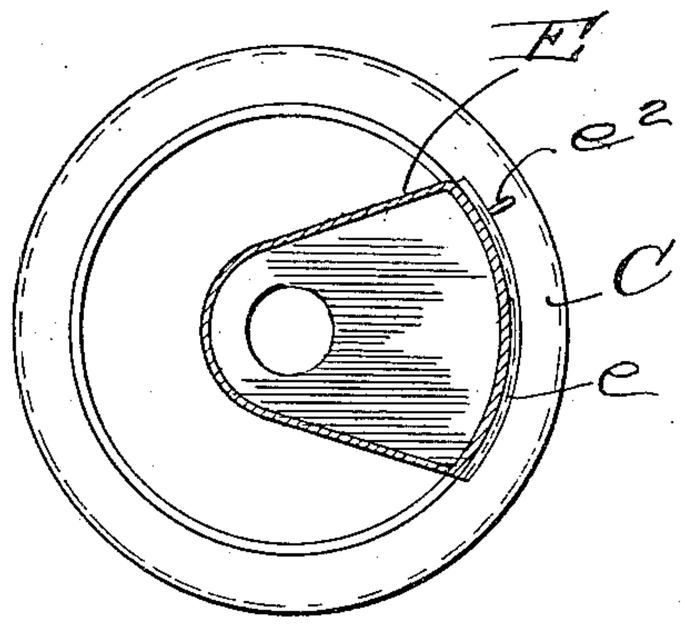


Fig. 12



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LAMP.

936,521. Specification of Letters Patent. Patented Oct. 12, 1909.

Application filed May 27, 1908. Serial No. 435,328.

To all whom it may concern:

Be it known that I, MORRIS I. COHEN, 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 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.

Heretofore though a number of inverted, incandescent hydro-carbon lamps have been devised, great difficulty has been experienced in obtaining satisfactory combustion and in consequence the mantle soon becomes carbonized or blackened for a considerable portion of its length, particularly above the middle, thus preventing the lamp operating with maximum efficiency. This, of course, arises from imperfect combustion, due usually to imperfect mixture, an insufficient quantity of air being admitted to produce complete oxidation or combusition. Furthermore, it has been a very serious difficulty with inverted lamps heretofore that the column of hot air and the products of combustion arising therefrom so heats the supporting feed tube and the regulating means as to seriously affect the regulation of the mixture after the lamp has been in operation a short time. Furthermore, in lamps of the kind, it has been a serious objection and obstacle to their introduction that only particular sizes and styles of globes could be used; in other words, only specially constructed globes could be used for the purpose and should breakage occur, considerable inconvenience has frequently resulted.

It is an object of this invention to provide an abundant inlet of atmospheric air which is delivered within the mantle by the natural draft created by the combustion and also to afford means for heating the air admitted to facilitate combustion and to prevent deposition of carbon through chilling.

It is a further object of the invention to afford regulating means whereby the proportion of the hydro-carbon vapor (if gasolene be used), or gas can be regulated with exactness to insure complete combustion and to so protect said regulating means from the heat of the lamp as to enable the same at any time to be manipulated.

It is also an object of this invention to provide means for quickly and accurately regulating the supply of air mixed with the hydro-carbon gas to insure the greatest efficiency.

It is a very important object of this invention to provide an equalizing or pressure chamber for the mixed gas and air whereby the pressure at which the combustible mixture is delivered to the burner is maintained uniform and steady even when other lights in the circuit are being turned on or off, thus eliminating all flickering of the light.

It is also an object of this invention to provide means for mixing the air and gas prior to delivery into the equalizing chamber and for spraying the mixture against the heated walls of said chamber insuring further mixing and heating to a degree to insure perfect combustion, positively obviating offensive odors and preventing carbonizing or blackening of the mantle.

Finally it is an important object of the invention to afford adjustable means for supporting a globe of any of several sizes, thus enabling the lamp to be used with the usual globes for inverted gas lamps or permitting the electric light globes to be used, as preferred, and to so support said globes as to prevent breakage resulting from the expansion thereof.

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 device embodying my invention. Fig. 2 is an enlarged section taken on line 2—2 of Fig. 1. Fig. 3 is an enlarged section taken on line 3—3 of Fig. 1, with parts omitted. Fig. 4 is an enlarged view of the mixing or spraying head. Fig. 5 is an enlarged fragmentary sectional detail taken on line 5—5 of Fig. 1. Fig. 6 is an enlarged vertical section of the regulating valve and pressure equalizing chamber. Fig. 7 is a fragmentary view including the globe supporting ring and taken at a right angle with the section shown in Fig. 6. Fig. 8 is a top plan view of the globe supporting ring. Fig. 9 is a fragmentary side elevation of the globe supporting ring illustrating the method of supporting the same. Fig. 10 is a sectional view of a modified form of a regulating or controlling valve for admitting the air. Fig. 11 is a side elevation thereof.

Fig. 12 is a section taken on line 12—12 of Fig. 11.

As shown in the drawings: A, indicates the goose neck pipe adapted for connection with the gas jet or other pipe from which the supply of gas or hydro-carbon vapor is received. Threaded on the lower end of said pipe is a larger pipe A′, which, as shown, is closed at a distance from its lower end by means of a head a, provided with a central, circular aperture to receive the needle a', affording a needle valve. Rigidly secured in said pipe A′, as shown, are a succession of cups a^2—a^3, each having a perforated bottom and each provided with a central aperture of a size to receive the needle a', loosely therein, and as shown, a spring a^5, is engaged below the upper cup and also is engaged on a downwardly directed conical collar a^{10}, secured on the upper end of said needle and serves normally to press said needle downwardly to close the valve and means are provided for adjusting said valve comprising, as shown, an internally threaded sleeve a^6, extending at right angles with said pipe A′, and opening thereinto and threaded therein is a stem a^7, provided with an enlarged head a^8, whereby the same may be rotated. The inner end of said stem is tapered slightly and engages on the downwardly directed conical face of the washer so that threading of said stem inwardly serves to lift the needle and threading the stem outwardly permits said needle to fall under tension of the spring to adjust the degree of opening of the valve. Secured near the lower end of said pipe A′, is a flattened, transverse tube B, constructed conveniently of two U shaped sections b^2—b^3, one fitting within the other. The ends of said tube are open and equally distant from said pipe, and through which the air to support combustion is admitted. The pipe A, is apertured to communicate with the tube to deliver air to mix with the gas and a rotatable valve ring b^7, is provided which is apertured to register with the apertures in the pipe. Said valve ring is rotated by means of a lever b^4, which is pivoted to the tube or other convenient point with its inner end engaging between two lugs b^5—b^6, and the outer end of said adjusting lever is directed at a right angle through a slot in the tube in position for manual engagement. Supported at the under side of said flattened tube B, on the end of the pipe A′, is a concave radially slotted mixing cage or spraying head B^2, which discharges the mixture into and against the heated walls of an equalizing or pressure chamber or casing B^3, carried on the pipe A′, and which discharges through a pipe or tube B′, at the lower end of which is provided any suitable burner tip and about which is secured an incandescent mantle b, as shown in Fig. 1. Secured on the under side of said tube B, and depending at right angles therefrom, concentric with the tube B′, is a sleeve b', within which may be fitted and supported a sleeve F, of mica or other suitable transparent material which, while directing the current of hot air and the products of combustion upwardly on each side of the tube B, at the same time presents little obstruction to the light. Secured on the top of the tube B, by means of screws or otherwise, is an annular plate C, which conveniently is flush with the top of the sleeve b'. Said sleeve is provided with flanges c, (see Figs. 2 and 7) to engage said annular plate C, and the plate is provided with downwardly bent flanges c', each provided with an outwardly directed pin c^2, to receive and support the globe supporting ring. As shown, said sleeve b', on the side thereof beneath the key or head a^8, for actuating the adjusting stem, extends upwardly for some distance above the air tube B, and integrally connected therewith is a deflecting plate c^3, which is provided with an aperture through which the tube A′, extends and which serves to direct the heat from the combustion from the adjusting stem key.

The globe supporting ring D, comprises a strip of metal rolled or otherwise formed for its lower edge to curve inwardly adapted to support the globe D′, by engaging beneath the outwardly directed flange d^2. The strip forming the said ring, as shown, is brought together at its ends and a connecting piece d^3, is secured at one end on the inner side of one extremity of said strip and at the other end is apertured to receive a bolt d^4, which is inserted through said connecting strip d^3, and also through an aperture in the other end of the ring strip and a thumb nut d^5, engaged on said bolt rigidly engages said ends together but readily permits the ring to be opened to insert the same over the flanged edge of the globe. As shown also, said ring is provided on opposite sides with a vertical slot communicating with horizontal slots in the ring, affording a bayonet joint adapted to receive the pin c^2, on the attaching plate C, to secure said ring to the lamp. To enable globes of smaller sizes to be used, springs D^2, are pivotally engaged at their upper ends by means of rivets d^6, near the top of the ring, and are of a length and shape when swung downwardly, as shown in Figs. 7 and 8, to project within the curved edge of the ring D. A plurality of said spring supports D^2, are provided about the ring and engaging the flange on the globe permit a materially smaller size to be used than would otherwise be possible. Owing to this construction any of a variety of sizes of globes may be employed with equal utility.

The construction illustrated in Figs. 10 to 12 inclusive is exactly the same as that heretofore described except the regulating valve

and air admission arrangement. A somewhat sector shaped chamber or casing E, is provided into the opposite sides of which the inlet pipe A′, for the gas opens and the outlet pipe A^2 for the mixture. Said casing, as shown, is integral with the sleeve b', and is provided with apertures for the admission of air and integral with the casing are the deflecting walls c^3, as before described. Guides e—e', are provided beneath which an apertured plate E′, is adjusted by means of a pin e^2, for regulating the amount of air admitted.

The operation is as follows: When the goose neck A, is connected with a suitable source of gas or hydro-carbon vapor supply, should gasolene or alcohol be used, the down-flowing fluid through said goose neck and tube A′, is regulated by means of the needle valve before described, inward threading of the regulating stem serving to lift the needle to afford a more free delivery and regulating the needle for permitting the discharge of the gas into the air chamber or aperture. The gas or hydro-carbon vapor mixes with the inflowing air in the tube B′, and is thoroughly mixed by the mixing cage or spray head and is then sprayed into the equalizing chamber against the heated walls thereof, where it is further mixed and affords perfect combustion and the mixture passes downwardly into the mantle and is consumed. The hot products of combustion pass upwardly through the mantle b, and sleeve b', heating the air inlet pipe to a greater or less extent so that the air delivered into the lamp when encountering the hydro-carbon is above the normal temperature of the room, and this in itself facilitates mixture, and the equalizing casing being heated raises the temperature of the combustible mixture to just the right temperature for perfect combustion. The rising column of the hot products of combustion is deflected by means of a plate or deflector c^3, from the adjusting stem, and in consequence the flow of the combustible fluid may be regulated at any time manually. Of course, the combustion within the globe tends to produce a partial vacuum, affording a strong inward draft through the air pipe, and the apertures in the globe supporting ring also serve to admit a sufficient amount of air between the globe D′, and sleeve b', to prevent the globe becoming unduly heated. The air admitted through the ring also passes around the outside of the mantle which unites with any unconsumed hydro-carbon, if there should be any from any cause, whereby maximum efficiency is assured. Such inflow, however, should not be sufficient to more than serve said purpose of cooling the globe and to afford a supply of air sufficient to consume any of the hydro-carbon that might otherwise escape through the mantle. In this way perfect combustion is assured both within and without the mantle and maximum light efficiency is assured.

The spray or mixing head is very important and may be constructed of wire gauze, if preferred. The pressure equalizing chamber is also extremely important for by its use all flickering, so objectionable in gas lamps, is entirely eliminated. This is due to the fact that owing to the size of the chamber a large quantity of heated gas is contained therein under considerable pressure so that when a light or other device is supplied from the same circuit, the temporary diminution of pressure does not affect the steady supply of pressure from the equalizing chamber owing to the volume and pressure of the mixture therein. Of course, many details of the construction may be varied, as for instance, more than one burner may be provided within each globe, in which event, of course, the air tubes would necessarily be mutiplied or other suitable provision made to insure a sufficient supply of air to support the combustion.

While I have shown the air tube as flattened to present considerable surface to the heat of the rising column of the products of combustion, this is not essential though convenient and tends to more rapidly raise the temperature of the air admitted to the burner and thus tends to prevent carbon deposits on any part of the mantle, because of imperfect combustion due in part to chilling of the mixture or the mantle.

Inasmuch as I have attempted to illustrate but one of numerous forms of embodiment of my invention, I do not purpose limiting this application for patent otherwise than necessitated by the prior art, as I am aware that many variations of detail are possible without departing from the principles of this invention.

I claim as my invention:

1. An inverted gas lamp embracing a globe, an incandescent mantle in the globe, a fluid supply pipe leading downwardly into said globe and on which the mantle is supported, an air pipe comprising a flattened tube open at its ends communicating with said fluid supply pipe above the mantle, a valve closure in the tube controlling the air admitted to the supply pipe, a lever pivoted to the tube at one end engaging the valve closure for rotating the same, a needle valve through which the fluid supply pipe communicates with the air pipe, means for adjusting said needle valve and a deflector to direct the heated products of combustion from said adjusting means.

2. An inverted gas lamp embracing a globe, an incandescent mantle in the globe, a fluid supply pipe leading downwardly into said globe and the mantle and on which the mantle is supported, a transverse open ended

air pipe connected with said fluid supply pipe above the mantle, a valve for controlling the admission of air from the air pipe into the fluid supply pipe, a needle valve through which the fluid supply pipe communicates with the air pipe, means acting by lateral pressure to adjust the needle of said needle valve and a deflector to direct the heated products of combustion from said regulating means.

3. An inverted gas lamp, a fluid supply pipe directed to discharge downwardly, a mantle supported thereon to inclose the end thereof, a transverse air pipe connected at its middle with the supply pipe, a valve regulating the mixture and flow, a globe inclosing the mantle and supported on the air pipe and a deflector protecting the regulating means for the valve from the heat.

4. An inverted gas lamp embracing a globe, an incandescent mantle in the globe, a fluid supply pipe leading downwardly into said mantle and said globe and on which the mantle is supported, a transverse open ended flattened air pipe connected near its middle in said fluid supply pipe, a needle valve in said fluid supply pipe above the air pipe, means for adjusting said needle valve, a deflector to direct the heated products of combustion from said regulating means and an annular clamping member supported on the air pipe for supporting the globe.

5. In an inverted incandescent gas lamp a gas supply pipe, a needle valve therein for regulating the delivery therethrough, a transverse horizontally flattened air pipe connected with and communicating near its middle with the gas pipe, a globe supported on said air pipe, an open ended sleeve also supported on the air pipe concentric with the mantle and projecting into the globe, a mantle supported on the fuel supply pipe at the lower end of said sleeve and a transparent sleeve projecting from the first named sleeve down past the top of the mantle.

6. In an inverted incandescent gas lamp a gas supply pipe, a needle valve therein for regulating the delivery therethrough, a transverse flattened air pipe communicating at its middle with the gas pipe, an adjustable globe supporting ring supported on the air pipe, a globe supported on said ring, an open ended sleeve also supported on the air pipe and projecting into the globe, concentric therewith, a mantle supported on the fuel pipe and a transparent sleeve in said first named sleeve and projecting below the top of the mantle.

7. In an inverted incandescent gas lamp a gas supply pipe, a needle valve therein for regulating the delivery therethrough, a transverse, flattened air pipe communicating with the gas pipe, a globe, an open ended sleeve also supported on the air pipe and projecting into the globe, a mantle supported on the gas supply pipe below said sleeve, an adjustable ring supported on the air pipe for supporting said globe and adjustable to support globes of different sizes.

8. In a lamp of the class described a supply pipe, regulable means for supplying air to mix with the gas from the supply pipe, a mantle, a spraying and mixing head for mixing the air and gas before delivery into the mantle, a sleeve around the lower end of the supply pipe, and a deflector integral with said sleeve and extending over the top thereof.

9. In a gas lamp an apertured supply pipe, a valve controlling the admission of gas, an air supply chamber or casing, a sleeve in the casing around the supply pipe having apertures to register with the apertures in said supply pipe for controlling the admission of air, a lever pivoted to the casing for rotating said sleeve, a pressure or equalizing chamber and a burner adapted to receive the combustible mixture therefrom.

10. In a gas lamp a supply pipe, a controlling valve therein, means for supplying air, a controlling valve therefor, a pressure chamber for receiving the combustible fluid, a spraying and mixing cage for mixing the gas and air before delivery into the chamber, a sleeve around the mixing chamber and a deflector integral with the sleeve and directed across the top of the sleeve.

11. In a device of the class described a gas supply pipe provided with slots, an air supply chamber around the slots, a slotted closure rotatable on the gas pipe for regulating the supply of air through said slots, pivoted means for rotating said closure, a mixing head adapted to mix the air and gas, a pressure equalizing chamber adapted to receive the mixture and a burner supplied from said equalizing chamber.

12. In a device of the class described a gas supply pipe, an air supply chamber, means for regulating the supply of air, means for regulating the supply of gas, independent actuating members for the air and the gas regulating means both extending on the same side of the device, a mixing head adapted to mix the air and gas, a pressure equalizing chamber adapted to receive the mixture, a burner supplied from said equalizing chamber, a transparent sleeve around the equalizing chamber and burner through which the products of combustion escape heating the equalizing chamber and air supply chamber and a deflector above the air supply chamber closed on the side adjacent the actuating members and open on the opposite side to permit the hot gases to escape.

13. In a device of the class described a gas supply pipe, an air supply chamber, means for regulating the supply of air, a mixing head adapted to mix the air and gas,

a pressure equalizing chamber adapted to receive the mixture, a burner supplied from said equalizing chamber, a transparent sleeve around the equalizing chamber and burner through which the products of combustion escape heating the equalizing chamber and air supply chamber and a globe surrounding the sleeve admitting air between the same to cool the globe and to supply air around the outside of the burner.

14. In a device of the class described a supply pipe, a regulating valve for controlling the supply therefrom, an air supply casing, an equalizing casing adapted to receive the air and gas from the supply pipe and air casing, means for mixing the air and gas before delivery into the equalizing casing, a burner, a mantle therearound, a transparent sleeve, a globe inclosing the sleeve and mantle and admitting the atmospheric air to flow around the outside of the mantle and through the sleeve.

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

MORRIS I. COHEN.

Witnesses:
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J. W. ANGELL.