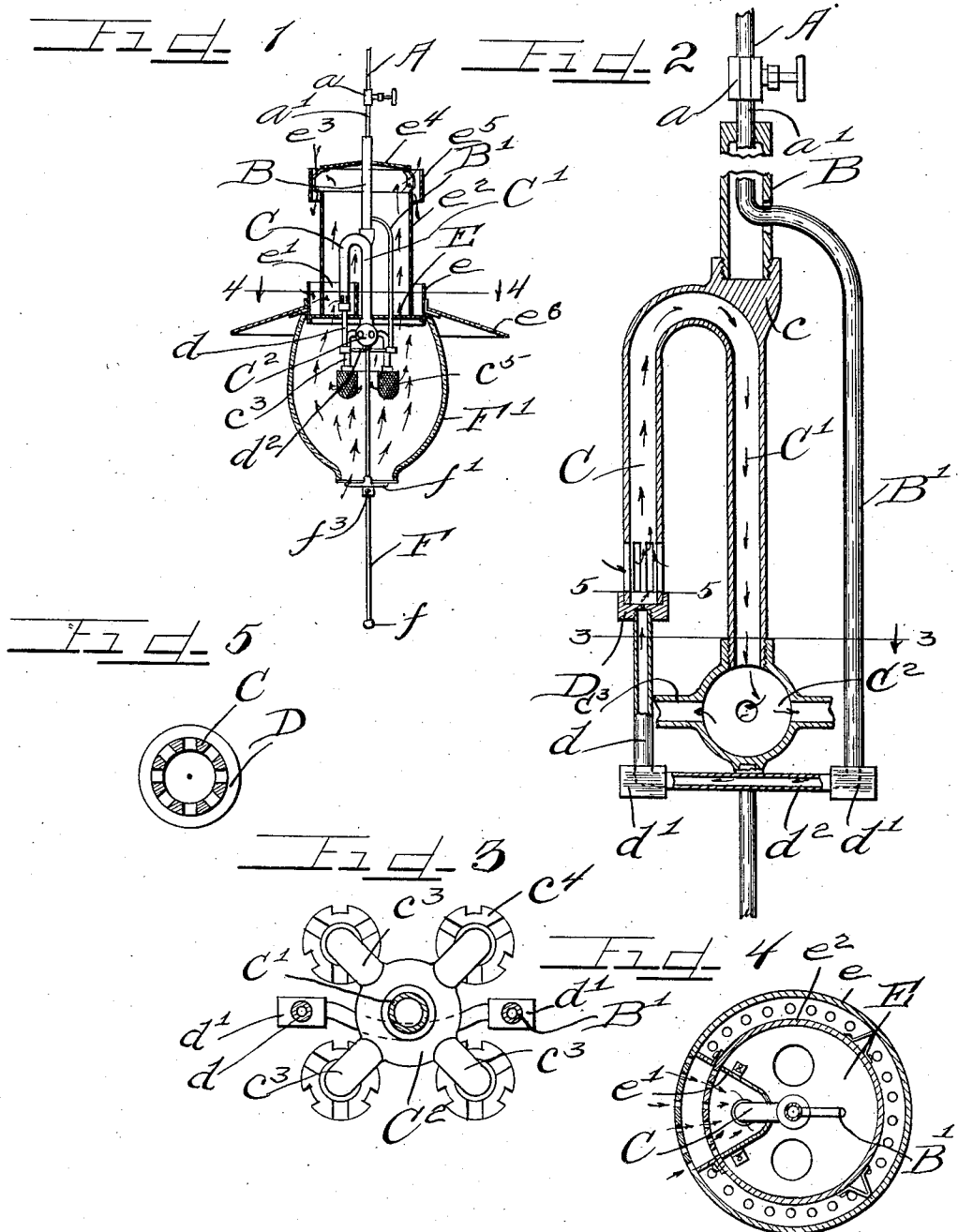


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HYDROCARBON LAMP.

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HYDROCARBON-LAMP.

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To all whom it may concern:

Be it known that I, JAY F. LAWRENCE, a citizen of the United States, and a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Hydro-carbon-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.

This invention relates to improvements in that class of lamps known as incandescent inverted lamps or in other words, for convenience, is shown embodied as a lamp adapted for the combustion of vapors, gasolene or the like. Of the numerous lamps of this kind heretofore constructed, most of the same have been found in practice to have insufficiently generated and mixed the hydro-carbon with air and in consequence, in part of this and also because of the insufficient oxygen supply from without the mantle, it is not uncommon to find that a considerable portion of the mantle is frequently blackened or covered with carbon deposits due to imperfect combustion.

The object of this invention is to provide an exceedingly cheap, simple and durable lamp of the class described in which perfect generation of the hydro-carbon vapor and satisfactory mixture with a sufficient volume of atmospheric air is assured at all times and in which the resulting mixture is subjected to a high degree of heat in its passage to the burners.

It is a further object of the invention to dispense with the use of a needle valve and to graduate the supply of hydro-carbon in part by the size of the ducts and the vent opening and in part by a valve of any type connected in the supply pipe at a point outside the lamp.

It is also an object of the invention to construct a lamp of the class described with a few parts and those of inexpensive construction and of such a simple construction as to enable the same to be readily assembled by one not previously skilled.

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 and provided with a plurality of

downturned or inverted burners. Fig. 2 is an enlarged central, vertical section of the generating and supply pipes and with the burners, globes and canopy omitted. Fig. 3 is a section taken on line 3—3 of Fig. 2 showing the burners attached. Fig. 4 is a section taken on line 4—4 of Fig. 1. Fig. 5 is a section taken on line 5—5 of Fig. 2.

As shown in the drawings: A, indicates the pipe, stem or tubular rod, whereby the lamp is connected with the fluid conducting main, whether of gas or gasolene. Connected on the end thereof is a valve *a*, which may be a needle valve or any other type of valve capable of closing off the flow of the hydro-carbon fluid. Connected to said stem A, by means of the valve is a pipe *a'*, which, as shown, extends downwardly into and laterally through a pipe connection B, which affords the connection between the lamp and the supporting stem. Threaded on the lower end of said pipe connection B, is a mixing tube, which, as shown, is constructed of cast metal to afford an upwardly directed, internally threaded boss *c*, and downwardly directed, parallel ends C—C', which are tubular and connected at their upper ends to afford an arch-shaped passage. Said pipe end C', is externally threaded at its extremity and threaded thereon is a globular or ball shaped metallic regenerator chamber C², provided with lateral and downwardly directed tubular arms *c*³, as shown four in number, and communicating therewith and provided at their lower ends with mantle supporting tips *c*⁴, of any desired or suitable kind, on which the incandescent mantles *c*⁵, may be removably secured. The other or shorter arm C, of said pipe is provided with longitudinal, peripherally arranged slots to afford air inlet apertures and secured on the end thereof in any suitable manner is a cap D, having a very small aperture opening centrally therethrough and positioned to direct the spray therefrom centrally and upwardly in the pipe end C. Threaded in said cap D, is a tube *d*, at its lower end threaded into a connecting block *d'*. A corresponding tubular connecting block *d'*, is provided on the lower end of a supply pipe or tube B', which is connected through the pipe connection B, and connecting said blocks *d'*, is a generating pipe or tube *d*², which, as shown extends between the regenerating chamber C² and the burners and is bent laterally at one side of the center

of the regenerating chamber, thus affording a circuit for the hydro-carbon fluid from the supply pipe A, pipe a' , supply pipe B', and connecting block d' , pipes d^2 and d , and mixing tubes C—C', and discharging into the regenerating chamber, and thence into the burners. Secured on the mixing tubes C—C', is a top plate E, centrally through which the end of pipe C', extends, and said plate is circular in form and provided with a peripheral upstanding flange e . Said plate E, is perforated to permit the escape of the gases of combustion and as shown, the flange e , on the side adjacent the air inlet apertures into the mixing tube is provided with closely arranged perforations for a portion of its length and connected on the inner side of the same and on the plate E, is an upstanding plate of metal e' , which extends radially inwardly and between the ends of the mixing tube and outwardly to the rim or flange e again, affording between the ends thereof a chamber through which air is admitted to the air inlet apertures in said mixing tube. As shown, a cylindric sheet metal guard e^2 , of less diameter than the flange e , is secured on and concentric with the plate E, and extends upwardly to a point above the mixing tube, and said plate E is provided between the flange e , and said cylindric shell e^2 , with closely arranged perforations except in the air inlet box or chamber to permit the escape of the products of combustion therethrough. Secured around the top of said shell e^2 , by means of suitable straps e^3 , riveted or otherwise secured thereto in a manner not to be injuriously affected by the heat, is an upper deflecting plate e^4 , through which the pipe connection B, extends, and which is of approximately the same diameter as said shell e^2 , and secured on said straps e^3 , and of greater diameter than said shell e^2 —or deflector e^4 , is a peripheral deflecting band e^5 , between which and the shell and said deflector plate the products of combustion may escape upwardly, and an inward current of air is provided between the bottom of said band e^5 , and the top of the shell. Said shell is also provided with apertures in its side wall and near its bottom in the air inlet box or chamber to permit free inflow of outer air to the air intake. Secured on the outer side of the flange e , in any suitable manner is a shade or reflector e^6 , which, of course, may be shaped in any suitable manner to direct the light from the burners as desired, but is usually concave on the under side. Threaded in the bottom of the regenerating chamber C² is a rod F, provided at its lower end with an enlarged head f , which may be milled or otherwise constructed to afford a convenient grip for the hand, and adjustably secured on said rod by a set screw f^3 or other suitable means is a perforated plate

f' , adapted to support the glass globe F', which at its upper end is open and of sufficient diameter to receive the lower edge of the flange e , therein, and at its lower end is also open and adapted to fit upon the globe supporting plate f' . Said globe supporting plate is, of course, perforated to permit the inflow of air to the burners.

The operation is as follows: The hydro-carbon fluid from the supply pipe A, passes downwardly through the valve a , by gravity or by fluid pressure and into the supply pipe B', and thence through the generating pipe d^2 , where, if the burner is in operation, it is subjected to intense heat and where, if not in operation, generation may be produced by applying any suitable source of heat thereto to vaporize the hydro-carbon (if in liquid form) sufficiently to start the operation of the burner. The hydro-carbon vapor passes upwardly through the small jet aperture in the cap D with suitable force and is thrown in a central spray or jet upwardly in the mixing tube, the upward flow thereof producing an inward flow of air through the apertured flange e , the shell e^2 , and the apertures in the air inlet end C, of the mixing tube. The mixture thus produced passes inwardly along the tube and downwardly into the regenerating chamber C², but is exposed directly to the heat of the burner or the source of heat used for preliminary generation and thence forced to the burners, which, having once been ignited, continue the generation, the hydro-carbon fluid being then subjected to the heat of the burners to a greater or less extent for its entire travel through the supply pipe B', generating pipe d^2 , pipe d , and the mixing tubes C—C', and the mixture in a more or less heated condition is delivered into the regenerating chamber C², which is exposed directly to the heat of all the burners below the same, and is, of course, at a high temperature. Said regenerating chamber is of sufficient size conveniently to afford somewhat of a reserve supply of the mixture to prevent flickering or fluctuation at the burners due to any variation in the flow of the hydro-carbon. Owing to the fact that all parts of the fluid circuit are exposed to the heat of the burners, all the hydro-carbon fluid is entirely vaporized before it reaches the burners and the flow of fuel may be regulated after ignition of the burners by the regulation of the valve a , which may be of any suitable kind. The hot products of combustion pass upwardly through the apertures in the plate E, and escape from between the flange and the shell E^2 , and through the hood afforded by the deflector e^4 , and band e^5 , surrounding the top of the shell. The atmospheric air flows constantly into the air chamber or box in the top of said lamp through the perforations in the

flange e , and shell e^2 , and is also drawn downwardly over the top of said flange and into said shell and thence into the mixing tube through the perforations in the air inlet end thereof. The globe may be dropped at any time by either unthreading the rod F from the regenerating chamber and removing said rod and globe together, or by releasing the set screw f^3 , whereby the globe supporting plate is supported on the rod, thus permitting the globe and plate to descend to, and be supported upon the knob or head on the lower end of the rod. This permits of ready access to the burner—for the purpose of preliminary generation—for the renewal of mantles or for any other purpose including the cleaning of the lamp.

Very many details of the construction may be varied without departing from the principles of this invention. I therefore do not purpose limiting this application for patent otherwise than necessitated by the prior art.

I claim as my invention:

1. A lamp embracing a supply pipe, a generating pipe communicating therewith, a U shaped mixing tube having air inlet apertures at one end, an apertured plate through which one end of the U shaped tube and the lower end of the supply pipe extend, a shell inclosing the U shaped tube and supply pipe above the plate, a regenerating chamber supported on the end of the mixing tube below the plate, burners communicating with the regenerating chamber and which is at all times exposed directly to the heat of the burners, and a wire pipe connecting the generating pipe and mixing tube having a small central jet aperture through which the generated hydro-carbon vapor is sprayed into the mixing tube at the air inlet apertures.

2. A lamp comprising a wire supply pipe, a generator connected thereto a mixing tube connected to the generator and having air inlet apertures at one end, a regenerating chamber supported on the other end of the mixing tube, burners communicating with the regenerating chamber, a partition between the mixing tube and the regenerating chamber having apertures to admit the products of combustion therethrough, and a shell supported by the partition inclosing the mixing tube and part of the wire supply pipe.

3. In a device of the class described a

supply pipe, a mixing tube, a regenerating chamber communicating with the tube, a generating pipe below the regenerating chamber communicating with the mixing tube and also connected to the supply pipe, burners communicating with the regenerating chamber and depending below the generating pipe, an apertured partition separating the mixing tube and burners and means inclosing the mixing tube through which the heated gases from the burners pass.

4. In a device of the class described a supply pipe, a mixing tube, a regenerating chamber communicating with the tube, a generating pipe below the regenerating chamber communicating with the mixing tube and also connected to the supply pipe, burners communicating with the regenerating chamber and depending below the generating pipe, a shell inclosing the mixing tube and a globe inclosing the burners, generating pipe and regenerating chamber.

5. In a device of the class described a supply pipe, a mixing tube, a regenerating chamber communicating with the tube, a generating pipe below the regenerating chamber communicating with the mixing tube and also connected to the supply pipe, burners communicating with the regenerating chamber and depending below the generating pipe, said tube having air inlet apertures adjacent one end, and a shield around said end of the tube to prevent the products of combustion entering the air inlet apertures.

6. In a device of the class described a supply pipe, a mixing tube supported below the same having its ends directed downwardly, a chamber supported on one of said downwardly directed ends adapted to contain a reserve supply of fluid, generating means connected with the other end of the tube and to the supply pipe, burners inverted below the generating means adapted to continuously heat said generating means and a globe inclosing the burners, chamber and generating means.

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

JAY F. LAWRENCE.

Witnesses:

K. E. HANNAH,
LAWRENCE REIBSTEIN.