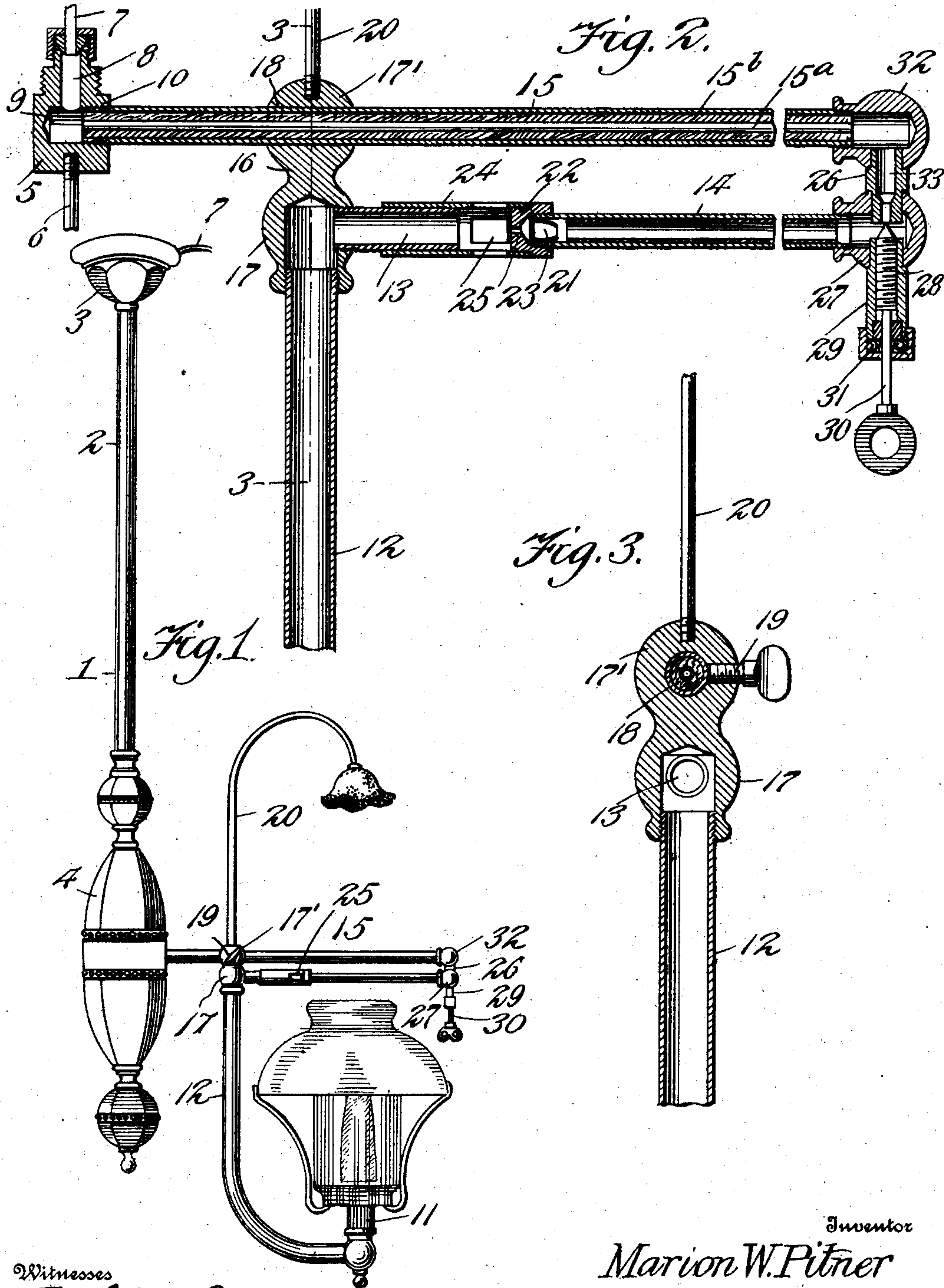


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HYDROCARBON LAMP.  
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# UNITED STATES PATENT OFFICE.

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## HYDROCARBON-LAMP.

No. 906,922.

Specification of Letters Patent.

Patented Dec. 15, 1908.

Application filed June 11, 1907. Serial No. 378,405.

*To all whom it may concern:*

Be it known that I, MARION W. PITNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Hydrocarbon-Lamps, of which the following is a specification.

This invention relates to improvements in hydrocarbon lamps of that type in which the gasolene or other hydrocarbon passes through a generator or vaporizer arranged within the heating zone of the burner, by which the gasolene is converted into vapor which is admixed with air to form a combustible gas which passes to the burner and is there ignited.

One object of the present invention is to provide a construction of double generator, constituting a generator proper in which the hydrocarbon is converted into vapor and a primary heater through which the hydrocarbon flows from the supply pipe to the generator and which is located with the latter in the heating zone of the burner, whereby the hydrocarbon is first preliminarily heated so that when it passes into the generator it will be easily and quickly vaporized.

A further object of the invention is to provide a construction by which the primary heater will form a support for suspending the lamp from its hanger, and which is detachable therefrom and from the gas supply pipe leading to the lamp, so that the generator as a whole may be conveniently applied and removed at all the parts of the lamp, easily and quickly assembled and disassembled.

A still further object of the invention is to provide a generator of the type described which is adjustable to regulate the amount of air supplied to the mixing tube for admixture with the generated vapor, and in which provision is made to prevent the gasolene in the primary generator or heater from being heated beyond a determined temperature.

A still further object is to provide coupling or frame connections between the parts by which the construction of the frame of the lamp is simplified and its mechanical shape rendered pleasing and symmetrical, and provision also furnished for the arrangement of a valve between the primary heater and generator whereby the flow of hydrocarbon from one to the other may be easily and conveniently controlled.

With these and other objects in view, the invention consists of the novel features of construction, combination and arrangement of parts hereinafter fully described and claimed, reference being had to the accompanying drawing, forming a part of this specification, and in which:—

Figure 1 is a side elevation of a hydrocarbon lamp embodying my invention. Fig. 2 is a vertical longitudinal section on an enlarged scale through the generator. Fig. 3 is a vertical transverse section on line 3—3 of Fig. 2.

Referring to the drawing, the numeral 1 designates the hanger of the lamp, comprising a tube or pipe 2 adapted to be supported at its upper end from the ceiling in any preferred manner and provided with the usual ornamental canopy 3, the lower end of the hanger terminating in an ornamental lamp carrying bracket or pendant 4, suitably coupled to the lower end of the pipe. Preferably, the bracket or pendant is composed of a plurality of parts secured to the pipe 2 and a plug or coupling member 5 arranged within the pendant, from which plug depends a rod or pipe 6 supporting the lower portion of the pendant, which may be secured thereto in any preferred manner.

A hydrocarbon feed tube or pipe 7 enters the upper end of the pipe 2 and extends downwardly through the same and is suitably coupled, as shown in Fig. 2, to the plug 5, which is provided with a vertical feed passage 8 leading from the pipe to a chamber 9 formed in the plug and which opens through one side of the plug and is interiorly threaded, as at 10.

The lamp fixture or frame comprises a burner 11 carried by the lower end of a gas conducting pipe 12, which communicates at its upper end with a mixing tube 13 connecting at one end with the discharge end of the generator or vaporizing tube 14, which is, in turn, connected at its inlet end with the eduction end of a primary heater 15 arranged above and in parallel relation to the generator and threaded at its opposite or inlet end into the threaded portion 10 of the coupling member 9. To secure a desired restricted flow of the hydrocarbon through the primary heating tube 15, a smaller tube 15<sup>a</sup> is arranged within said tube 15 and forms a conductor through which the hydrocarbon passes from the coupling 5 to the



coupling 26, and between this tube 15<sup>a</sup> and the wall of the tube 15 is interposed a filling or lining of refractory material 15<sup>b</sup>, such as asbestos. The parts referred to are constructed and coupled in a novel manner, as hereinafter described, and the primary heating tube, as shown, conducts and preliminarily heats the hydrocarbon on its passage to the generator and also serves the function of a bracket arm to support the lamp frame proper from the pendant of the hanger.

As illustrated in detail in Figs. 2 and 3, a coupling or bracket member 16 is supported by the primary heating tube and couples the adjacent ends of the gas pipe 12 and mixing tube 13. The coupling is formed with a lower head 17 chambered to provide an elbow internally threaded to receive the upper end of the pipe 12 and discharge end of the tube 13, and is also formed with an upper head 17' provided with a passage 18 slidably receiving the heating tube 15, which is adjustably secured thereto by a set screw 19, said head being further provided with a threaded socket receiving the lower threaded end of the upwardly extending bell supporting arm 20. Clamped in position at the outlet end of the generator 14 is a screen or strainer 21, which is held in position by a threaded coupling plug 22, which also forms a diaphragm having a restricted port 23 for the discharge of the vapor from said generator. This plug, customarily termed the generator tip, forms a coupling connecting the generator with an air inlet tube 24 which slidably engages the mixing tube 13 and connects the generator therewith, said air inlet tube being provided with ports 25 for the supply of air which passes with the vapor into the tube 13 and is there commingled with the vapor to form the combustible gas supplied through the pipe 12 to the burner.

The outlet or discharge end of the primary heating tube 15 is connected with the inlet end of the generator by a coupling member 26 having a lower head or ball shaped portion 27 threaded to receive the threaded inlet end of the generator tube and provided with a feed passage controlled by a needle valve 28, whereby the passage of the heated hydrocarbon to the generator may be regulated. The valve is screw threaded to work within a nipple 29 depending from the portion 27 and is provided with an operating stem 30 extending downwardly from the nipple through a cap 31 closing the lower end of the nipple, suitable packing being confined in position by the cap to prevent leakage of hydrocarbon past the valve. The upper portion of the coupling 26 comprises a head 32 similar in form to the head 27 and which is in communication with the latter through a feed passage 33 directly controlled by the point of the valve 28, said head 32

being internally threaded to receive the threaded eduction end of the primary heater 15, by which a rigid connection between the outlet end of the primary heater and the inlet end of the generator is provided.

In operation, it will be understood that when the valve 28 is open the hydrocarbon will flow through the primary heating tube 15 and coupling 26 into the generator 14, in which latter, it will be converted into vapor, which will pass through the restricted orifice 23 in the tip into the mixing tube and there be commingled with air admitted through the ports 25, forming the combustible gas which flows through the pipe 12 to the burner. The generator and primary heater are located above the burner and within the heating zone of the same, the generator, by reason of its position, being subjected to the intense heat required to vaporize the hydrocarbon. The heating tube 15 is located above the generator and at a sufficiently great distance from the burner flame to heat it to a less extent, as its purpose is not to convert the hydrocarbon into vapor, but to simply heat the same to such a degree below vaporization as to adapt it to be easily and quickly converted into vapor in the generator.

It is a well known fact that the gasolene and hydrocarbon oils on the market vary in density, and that it requires a higher degree of heat to perfectly vaporize low grade gasolene than high grade gasolene. Gasolene frequently becomes mixed with other oils, rendering it difficult to vaporize it in the ordinary generator, and the object of preliminarily heating it in the tube 15 is therefore to raise its temperature so that it will be more easily vaporized in the generator. The gasolene, however, should not be vaporized in the tube 15 or before it passes the valve 28, as it should pass through the connection 27 in a hot fluid state, otherwise the valve would be corroded by the impurities thrown off and the sediment deposited would clog the passage 33 and stick to the valve seat, thus rendering the valve defective in action. As the heating tube 15 is subjected to comparatively intense heat, provision should therefore be made to limit the amount of heat transmitted thereby to the gasolene flowing therethrough. To this end, the primary heater 15 is arranged directly over the generator and the mixer and is partially shielded by the same from the direct intense heat of the flame, whereby the gasolene flowing through the tube 15 is prevented from being heated to such a degree as to cause its generation to vapor.

It will be seen from the construction described that upon loosening the set screw 19, the parts 12, 16 and 20 forming the lamp frame proper may be adjusted on the tube 15, and that in this operation the mixing



tube 13, carried by the coupling 16, will be adjusted in the air tube 24 to regulate the size of the ports 25 and consequently the amount of air admitted thereto. The construction described also facilitates assemblage and disassemblage of the parts and access to the valve and generator for cleaning, as, upon, loosening the set screw 19, the coupling 16 may be slipped back on the tube 15, carrying with it the mixing tube 13 which will thereby be moved out of connection with the air tube 24, allowing the tip 22 to be cleaned or the generator 14 to be unscrewed for the same purpose. This backward movement of the coupling 16 and parts attached thereto also allows the coupling 26 to be turned for the purpose of detaching it and the generator from the tube 15 when occasion requires. It will thus be seen that the construction described, not only increases the efficiency of the generator mechanism, but adds increased convenience in the operations of assembling and disassembling the parts and adjusting them to regulate the action of the mixer. The construction furthermore provides a lamp frame which is compact in form and ornamental and pleasing in appearance.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a hydrocarbon lamp, a hanger, a primary heater extending horizontally from the hanger, a lamp fixture adjustably supported by the primary heater, a generator arranged below and in parallel relation to the primary heater and in communication at its inlet end with the outlet end of said primary heater, and a telescopic mixing connection between the outlet end of the generator and the lamp fixture, said connection being adjustable by the adjustment of the lamp fixture to regulate the mixing action, and said generator and mixing connection forming a shield extending continuously below the effective portion of the primary heater to protect the same from the heat of the lamp.

2. In a hydrocarbon lamp, a hanger, a primary heating tube extending horizontally from the hanger, a lamp fixture pendent from and slidably supported by the primary heater, a generator arranged below and in parallel relation to the primary heater and in communication at its inlet end with the outer end of said heater, and a mixing connection between the outlet end of the generator and the lamp fixture, said connection comprising slidably connected members, one provided with air inlets controlled by the other, whereby the adjustment of the lamp fixture on the primary heater regulates the mixing action, said generator and mixing connection extending continuously below the effective portion of the primary heater and forming a shield to protect the same from the heat of the lamp.

3. In a hydrocarbon lamp, the combination of a hanger, a tubular conductor extending therefrom and forming a primary heater, a generator arranged below said conductor, a coupling connecting the outlet end of the conductor with the inlet end of the generator, said coupling being provided with a feed passage and a controlling valve therefor, a lamp fixture including a gas supply pipe carrying a burner, a coupling movably mounting said fixture upon the primary heater for adjustment with relation to the generator, and a telescopic air inlet and mixing connection between the outlet end of the generator and the latter-named coupling and in communication therethrough with the gas supply pipe, said connection being controlled by the adjustment of the lamp fixture to regulate the intake of air.

4. In a hydrocarbon lamp, a hanger, a conducting tube forming a primary heater extending horizontally therefrom, a generator arranged horizontally below said primary heater, a coupling connecting the outlet end of the primary heater with the inlet end of the generator, said coupling being formed with a feed passage, a valve mounted vertically upon the lower portion of said coupling and controlling the feed passage, a second coupling slidably mounted upon the primary heater, a lamp fixture supported by the second coupling, and an air mixing connection between the outlet end of the generator and said second coupling and in communication through the latter with the lamp fixture, said connection comprising telescopic tubes respectively carried by the generator and coupling, one of said tubes being formed with lateral air inlet ports controlled by the other tube through the adjustability of the lamp fixture on the primary heater.

5. In a hydrocarbon lamp, the combination of a hanger, a primary heating tube extending horizontally therefrom, a feed conduit extending through said heating tube, a lining of asbestos between the conduit and wall of the heating tube, a lamp fixture slidably supported upon the heating tube, a generator arranged below the heating tube, a connection between the inlet end of the generator and the outlet end of the heating tube, a controlling valve in said connection between the generator and heating tube, and a telescopic air inlet and mixing connection between the outlet end of the generator tube and the lamp fixture, said inlet and mixing connection being controlled by the adjustment of the fixture to regulate the supply of air and forming with the generator a shield extending continuously below the effective portion of the primary heating tube.

6. In a hydrocarbon lamp, the combination of a hanger, a primary heating tube extending horizontally therefrom, a generator



tube arranged below the primary heating tube, a conducting coupling between the outlet end of the primary heating tube and the inlet end of the generator tube, a feed valve  
 5 controlling the flow of hydrocarbon through the coupling, a lamp fixture slidably supported for adjustment on the primary heating tube between the hanger and outlet end of the generator tube, a mixing connection  
 10 between the lamp fixture and outlet end of the generator, said connection comprising telescopic members carried by said parts, one of said members having an air inlet controlled by the other, said members being dis-  
 15 connectible by a relative outward movement of the member carried by the lamp fixture upon a determined degree of adjustment of said fixture toward the hanger to permit ready cleansing or removal of the generator  
 20 tube, and means for securing the lamp fixture in a desired adjusted position.

7. In a hydrocarbon lamp, the combination of a hanger, a conductor extending therefrom and forming a primary heater, a  
 25 generator arranged below said conductor, a coupling connecting the outlet end of the conductor with the inlet end of the generator, said coupling being provided with a feed passage, a valve controlling said pas-  
 30 sage, a bracket slidably mounted on the conductor, a gas tube carried thereby and supporting the lamp burner, means for securing the bracket in adjusted position, a mixing tube carried by the bracket and in communi-  
 35 cation with the gas tube, and an air inlet tube telescopically connecting the outlet end of the generator with the mixing tube.

8. In a hydrocarbon lamp, the combination of a hanger, a conductor extending hori-  
 40 zontally therefrom and forming a primary heater, a generator extending horizontally

below the conductor, a coupling connecting the outlet end of the conductor with the inlet end of the generator, said coupling being provided with a feed passage, a valve con- 45 trolling said passage, a bracket slidably mounted on the primary heater and provided with means for fixing it in adjusted position thereon, a gas tube carried by the bracket and supporting the lamp burner, a 50 bell supporting arm mounted upon the bracket, a mixing tube carried by the bracket and in communication with the gas tube, and an air inlet tube telescopically connecting the outlet end of the generator with the 55 mixing tube.

9. In a hydrocarbon lamp, a burner supporting fixture including a gas supply pipe leading to the burner, a hanger, a conductor extending from the hanger and forming a 60 primary heater arranged above the burner, a bracket slidably supporting the fixture upon said primary heater, a mixing tube coupled by the bracket to said gas supply pipe, a generator arranged below and in 65 parallel relation to the heater, a valved coupling connecting the outlet end of the heater with the inlet end of the generator, fastening means carried by the bracket for fixing it in adjusted position on the heater, and a 70 telescopic connection between the outlet end of the generator and the mixing tube, said connection being provided with air inlets controlled by the adjustment of the mixing tube therein. 75

In testimony whereof, I affix my signature in presence of two witnesses.

MARION W. PITNER.

Witnesses:

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