

UNITED STATES PATENT OFFICE.

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PETROLEUM-BURNER.

SPECIFICATION forming part of Letters Patent No. 632,865, dated September 12, 1899.

Application filed July 29, 1898. Serial No. 687,180. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. BRUCKNER, a citizen of the United States, residing at the city of New York, in the county and State of New York, have invented an Improvement in Petroleum-Burners, of which the following is a specification.

Burners for hydrocarbon liquids have been constructed in such a manner that the liquid is allowed to flow through a generator above the flame and the escape of gas into the flame has been regulated and the liquid has passed to the heated generator as rapidly as necessary and controlled by the escape of the gas into the flame. Lamps have also been constructed in which a mantle has been exposed to the action of a non-luminous flame, so as to become incandescent, and the non-luminous flame has been fed by a mixture of air and gas, the gas being generated by heat from the flame; but the generator has usually been placed above the flame and mantle, or at the side thereof, in a position to become sufficiently heated for the conversion of the petroleum or liquid hydrocarbon into a vapor. In the present invention I make use of a filamentary tubular generator within the non-luminous flame and generally within the mantle, such filamentary tubular generator acting to furnish the heat necessary for converting the petroleum or other liquid hydrocarbon into a gaseous vapor and of a sufficiently high temperature to cause the same to burn without smoke and substantially non-luminous when mixed with air and burned at the base of the mantle.

In carrying out this invention the liquid hydrocarbon is supplied to one end of the filamentary tubular generator and the escape of gas is regulated, preferably, at the discharge end and in issuing draws in and mixes with atmospheric air and passes on to the chamber of the non-luminous burner and is burned above such chamber, and the filamentary generator is within the flame and preferably of copper or aluminium and so small that it does not interfere with the uniformity of combustion of the non-luminous flame or with the luminosity of the incandescing mantle.

In the drawings, Figure 1 is an elevation, partially in section, representing the present improvement. Fig. 2 is a sectional plan view

at the base of the burner through the mixing-chamber upon the line 2 2, and Fig. 3 represents the burner and generator without the mantle.

The petroleum or other liquid hydrocarbon is supplied from any suitable reservoir. I have represented a reservoir A for the liquid with a pipe 3, which is to extend to the bottom of the reservoir, or nearly so, and is provided with a tightly-closing valve 4, and inasmuch as the burner in this form of lamp is represented as above the reservoir the surplus air-pressure is made use of in elevating the petroleum, and I find it advantageous to make use of an air-valve and tube 5, to which a pump is applied similar to the pump made use of in inflating the tires of cycles, so that the necessary air-pressure can be obtained within the reservoir A for causing the liquid to rise in the pipe 3, and it is also advantageous to make use of a safety-valve at 6 to prevent too-great air-pressure being employed within the reservoir. Any desired distance may intervene between the burner and the reservoir.

I have shown the burner-base at B, which is hollow and advantageously provided with a finely-perforated or gauze upper end 7, through which the air and gas as they are mixed pass and burn in the form of a non-luminous Bunsen flame, and a suitable mantle is made use of, upon which the non-luminous flame acts to render it incandescent and luminous. A portion of the mantle is shown at C, and it is advantageous to suspend the mantle from a wire D, secured to the removable holder E, which may also be adapted to receive a lamp-chimney surrounding the mantle, if desired. These parts thus far described may be of any desired character and while advantageously employed in lamps of this description may be varied according to the character of the lamp and the place where the same is to be used.

The filamentary tubular generator F is preferably within the Bunsen flame. It is coiled more or less, and it is of a sufficiently small size not to interfere with the burning of the Bunsen flame or to cause any deflection or cooling of the flame or of the mantle adjacent to the generator. I find it advantageous to make this filamentary tubular generator of a

small copper or aluminium tube about one sixty-fourth of an inch in diameter, because the same is adapted to act as a generator and for the passage of the gas to the lamp without interfering with the flame, and the ends of this filamentary tubular generator are advantageously below the flame and enlarged. I have represented the enlargement 8 at the entrance end of the filamentary generator and connected to the upper end of the supply-pipe 9. The pipes 8 and 9 are sufficiently large to prevent their becoming clogged or stopped by any deposit from the liquid hydrocarbon, and they are heated by the conductivity, so that the liquid is vaporized before passing into the filamentary tubular generator, and it is advantageous to connect the pipes 8 and 9 at the coupling-block 10, the one slipping tightly into the other and being held by a screw, so that the filamentary tubular generator can be removed and another one substituted should the same become obstructed by any carbonaceous deposit or otherwise.

The discharge end of the filamentary tubular generator F passes into the mixing-chamber G, which is advantageously in the form of a cylindrical segment or tubular ring around the burner-base B, the end of the filamentary tubular generator being sufficiently enlarged to be held by the screw 11 where it passes through the wall of the mixing-chamber, and there is a needle-valve 12 at the discharge end of the filamentary tubular generator, by which the quantity of gas or vapor issuing into the mixing-chamber can be regulated, and there is an opening at 13 at the end of the mixing-chamber G for air to be drawn in by the action of the issuing jet of vapor, and as these travel together around through the segmental mixing-chamber they become very intimately associated and uniformly diffused, so that the air and gas in a mixed condition passing into the burner-base at 14 are well adapted to a perfect combustion at the upper end of such burner-base, the flame being substantially non-luminous and adapted to heating the mantle.

I have represented the filamentary tubular generator as bent in the form of a loop and adapted to the Bunsen flame passing up and all around the tubular generator, so as to highly heat the same, and this filamentary tubular generator is not sufficiently close to the mantle to injure the same by contact or to lessen the heat and luminosity of such mantle, and the vapors become so intensely heated that the mixture of air and gas is rendered very intimate, and the combustion of the same at the flame is promoted.

When lighting this lamp, the chimney and mantle can be lifted off and the flame of a match, taper, or other burning material can be applied to the filamentary tubular generator, and this quickly becomes hot enough to generate the vapor required in starting the Bunsen flame, so that the use of alcohol or other liquid in heating up the generator is

rendered unnecessary, and it is well known that liquids of this character are liable to be spilled either on the lamp or on the furniture, or both, and that fires often arise from careless handling of such liquids.

Besides the foregoing it is to be borne in mind that the filamentary tubular generator exposed to the direct action of the flame speedily becomes sufficiently hot to act upon the vapor and adapt it to mix intimately with the air in supplying the Bunsen burner and that as soon as the flame is extinguished the filamentary tubular generator cools so rapidly that there is no risk of vapors or gases forming after the supply of liquid has been cut off or the flame extinguished.

I claim as my invention—

1. The combination with the hollow burner-base for a Bunsen flame and an incandescing mantle and a mixing-chamber, of a filamentary tubular generator passing up to the flame and descending to the mixing-chamber and having the end tubular portions of larger exterior diameter, and a clamp for removably securing one end to the supply-pipe for the liquid hydrocarbon and means for securing the other end at an opening into the mixing-chamber, and a valve passing through the mixing-chamber and acting at the jet-opening in the end of such filamentary generator, substantially as set forth.

2. In a lamp having an incandescing mantle and a hollow burner-base below the mantle, of a mixing-chamber passing around the burner-base, a supply-pipe for liquid hydrocarbon and a filamentary tubular generator extending from the supply-pipe up into the flame and descending to the end of the mixing-chamber, a valve for regulating the discharge of the vapors from the filamentary generator into the mixing-chamber, there being an opening for the admission of atmosphere at the end of the mixing-chamber adjacent to the end of the tubular generator and an opening from the inner end of the mixing-chamber into the hollow burner-base, substantially as set forth.

3. The combination in a lamp for petroleum or similar hydrocarbon, of a hollow burner-base and an incandescing mantle, a pipe for supplying liquid hydrocarbon and a mixing-chamber passing around the base of the burner and to which the end of the supply-pipe is connected, a filamentary generator passing up into the flame and descending, an enlarged valve-shaped connection at one end and means for clamping the same at the end of the supply-pipe, the other end of the filamentary generator being of larger external diameter and passing into the mixing-chamber, a valve acting at such end, there being an adjacent opening into the mixing-chamber for the supply of air and an opening from the mixing-chamber into the burner-base, substantially as set forth.

4. The combination in an incandescing lamp with the burner-base, of a mixing-cham-

ber passing around the burner-base and hav-
ing an opening into the same and an opening
for the supply of air into the mixing-cham-
ber, a filamentary tubular generator passing
5 up into the flame and descending and having
one end removably connected to the supply-
pipe and the other end movably connected to
the mixing-chamber and means for regulat-

ing the supply of the fluid hydrocarbon, sub-
stantially as set forth.

Signed by me this 27th day of July, A. D. 1898.

CHARLES C. BRUCKNER.

Witnesses:

HAROLD SERRELL,
S. T. HAVILAND.