

No. 635,465.

Patented Oct. 24, 1899.

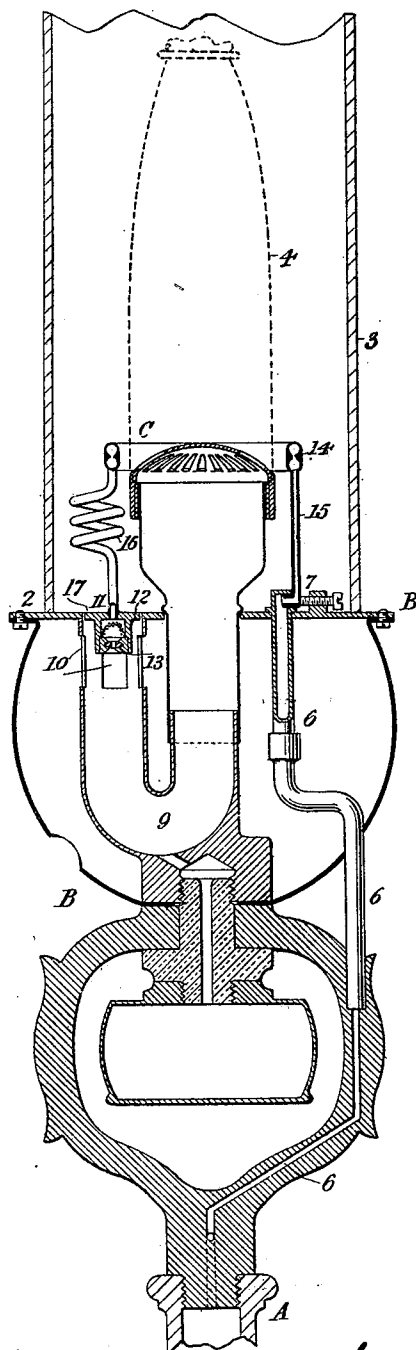
C. C. BRUCKNER.
HYDROCARBON VAPORIZER AND BURNER.

(Application filed Dec. 27, 1898.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1



WITNESSES:

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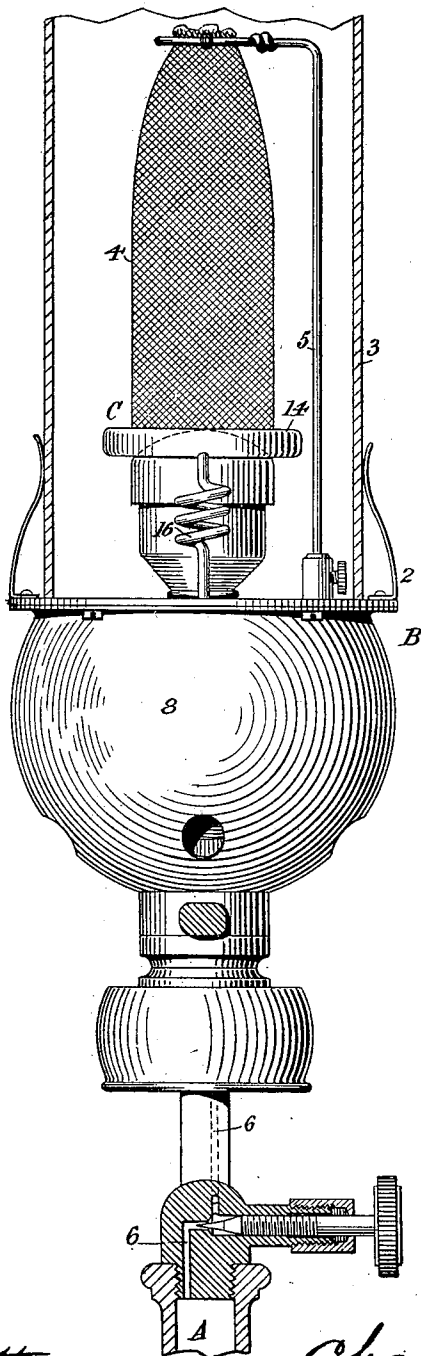
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(No Model.)

2 Sheets—Sheet 2.

Fig. 2



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UNITED STATES PATENT OFFICE.

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HYDROCARBON VAPORIZER AND BURNER.

SPECIFICATION forming part of Letters Patent No. 635,465, dated October 24, 1899.

Application filed December 27, 1898. Serial No. 700,472. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. BRUCKNER, of New York, county of New York, State of New York, have invented a new and useful Improvement in Hydrocarbon Vaporizers and Burners, of which the following is a specification.

My invention relates to improvements in hydrocarbon vaporizers and burners, particularly of the type employing a Bunsen burner and an incandescent mantle or hood, such as the Welsbach, to increase the illuminating power of the flame.

The principal objects sought to be attained by my invention are, first, means for vaporizing the first flow of oil by the momentary application of a tiny flame, such as that of an ordinary friction-match or wax taper, in order to dispense with the necessity of heating the entire burner, as with a torch, and the use of a subsidiary lighter or burner as a permanent part for the apparatus; second, to so arrange the vapor-generator by means of which the burner while in use is continuously supplied with vapor, so as to avoid obscuration of the light emitted from the flame and mantle and at the same time avoid the possibility of any part of the circulating system being subjected to excessive or destructive heat, and to position the vapor-generator as closely as possible to the mixing-chamber and burner, so as to reduce the loss of heat from the vapor in passing from the generator to the burner, and, third, an improved vapor-jet fitting which will not be clogged by adhering deposits of free carbon.

To these ends my invention consists in providing an initial vaporizer, preferably arranged in the vapor-circulating system intermediate of the main vaporizer or generator and the mixing-chamber and outside of the excessive heat-zone of the burner. It is essential that such vaporizer have an oil-conducting passage extremely constricted or narrow, so as to permit only a mere thread or film of oil to pass, that the walls of the vaporizer shall be of some good heat-conducting metal, such as copper, and that the thickness or mass of the walls shall be sufficient to retain the heat absorbed from the match-flame against the chilling influence of the oil within

and atmosphere without, so as to maintain the vaporizing action of the attachment until the burner can be lighted and the heat of its flame has established the regular automatic generating of vapor. My preferred construction for this purpose is a main generator or vaporizer tube of circular form arranged concentric with the burner and adjacent the blue or non-luminous zone of the flame. The initial vaporizer I have connected with this tube and located it below the same and intermediate of it and the mixing-chamber underneath the burner, whereby it is positioned below the excessive heat-zone of the burner and its more delicate construction thus protected from injurious heat.

The preferred form of initial vaporizer I have found to be a tube curved into helical form, thus affording a conical opening in the center to receive the match-flame and utilize the maximum amount of its heat. The opening or bore of this tube is so small that for convenience and proper definition I term the same "filamentary," and it is preferably less than one thirty-second of an inch in diameter. The walls of the tube should, on the other hand, be not less than one thirty-second of an inch in thickness in order to insure sufficient mass to retain the heat for a sufficient period, as above stated. I have found by actual use that with an initial vaporizer of the foregoing description the flame of an ordinary match applied to the interior of the coil for fifteen or twenty seconds will heat the same sufficiently to vaporize the first flow of oil, properly regulated, and continue the operation until the heat of the burner-flame has established vaporization in the main generator. One of the great defects of ordinary apparatus of this character consists in the clogging and stopping of the vapor-jet opening by deposits of free carbon. These deposits will adhere to metallic surfaces and form an obstruction. I have found, however, by careful experiments that if the jet-opening is through a non-metallic mineral having a smooth or polished surface—such, for example, as a quartz or crystal—the material, because of its smoothness and possibly also by reason of its being a poor conductor of heat, will not permit the carbon to adhere, and that

a jet-fitting of this character will operate indefinitely without clogging.

The particular construction of the various devices thus generally described will more fully appear in the following detailed description and is illustrated in the accompanying drawings, forming part of this specification, in which—

Figure 1 is a central vertical section of a lamp fitted with my improvements having an incandescent mantle and Bunsen burner, and Fig. 2 is an elevation of the same.

In detail, A represents the body or reservoir which is intended to be hermetically closed and provided with any suitable means (not shown) for applying pressure to the contained oil.

B is a burner of the Bunsen type provided with a chimney-holder 2, chimney 3, incandescent mantle 4, and mantle-supporting standard 5.

G is a tube leading from the reservoir upward and adjacent the burner and preferably connected to a coupling 7.

S is a hemispherical case arranged below the burner and through which the pipe G passes. Within this case is arranged the mixing-chamber 9, substantially U-shaped, one end connected with the burner and the other end being provided with air-inlet openings 10. This end of the mixing-chamber is also provided with a coupling 11, to which is connected the vapor-tube 12, fitted with a piece of non-metallic mineral, such as quartz or crystal 13, having a polished jet-opening. Around the burner and base of the mantle is arranged the main vaporizing-tube C, of circular form, concentric with the burner and positioned substantially in the same horizontal plane with the top of the burner. A tube 15 connects the tube C with the coupling 7, whereby it is rendered readily removable for the purpose of repair. Below the tube C and connecting it with the vapor-tube 12 is the filamentary tube 16, of substantially the dimensions above described and formed into a helical coil, to which the match-flame is intended to be applied. In some cases I may prefer to provide a coupling between this coil and the tube C in order that they may be disconnected whenever necessary.

The operation of the apparatus is as follows: When it is desired to light the burner, a match or taper flame is applied to the interior of the helical coil 16, and as soon as it is sufficiently heated thereby a slight flow of oil is permitted, which in passing through the coil is vaporized, and the vapor is carried downward to the mixing-chamber and thence with the intermingled air to the burner, where it is lighted. Sufficient heat is retained in the helical coil to continue this vaporizing action until the heat of the burner-flame has generated sufficient heat in the main vaporizing-tube C to establish its operation as a vaporizer. Thereafter only the tube C is at the point of maximum heat, the helical coil and connected

parts being, however, sufficiently heated by their close position to the burner to prevent undue chilling of the vapor as it passes to the burner, the helical coil being subjected to high heat only for the few seconds during which the match is applied to it. Clogging or injury to the coil by reason of excessive heat is therefore prevented and its life or period of efficient service thereby indefinitely prolonged.

By the construction above described it is apparent that the main vaporizer C is brought very close to the mixing-chamber and the minimum amount of heat is lost in the transmission of the vapor to the burner. The form and positioning of the main vaporizer C, all parts of which are subjected to substantially the same degree of heat, make it unnecessary to subject any part of it to excessive heat, and its proximity to the mixing-chamber makes it unnecessary to heat it to as high a degree as is the case where the vaporizer is positioned farther away from the air-mixing chamber. It is also to be observed that there is practically no obscuration of the light from the mantle, a feature of practical value and importance in such apparatus. By employing the quartz fitting for the vapor-tube opening, thereby securing a non-clogging orifice, frequent stopping of the flow of vapor, as is common to such apparatus, is avoided and the operation of the lamp is continuous and uninterrupted.

Various modifications of the above-described structure may be made without departing from the essential ideas of my invention which have been above set forth in general terms, it being particularly emphasized that some part of the vapor-circulating system shall be of suitable dimensions and construction to be efficiently utilized for initial vaporizing, as described.

Having thus described my invention, I claim—

1. In an apparatus of the class described, an initial vaporizer forming a part of the circulating system, consisting of a filamentary tube or conduit, substantially as and for the purposes specified.

2. In an apparatus of the class described, an initial vaporizer forming part of the circulating system, consisting of a filamentary tube, the thickness of the walls of which is substantially the same as the diameter of the bore, substantially as and for the purposes specified.

3. In an apparatus of the class described, an initial vaporizer comprising a filamentary tube, the thickness of walls of which is substantially equal to the diameter of the bore, formed into a helical coil, as and for the purposes specified.

4. A vapor-jet fitting consisting of a perforate non-metallic mineral having polished, glassy or crystalline surfaces adjacent the vapor-opening.

5. In an apparatus of the class described, in combination with a Bunsen burner an in-

candescant mantle, a mixing-chamber beneath said burner, and a source of oil-supply under pressure; a circularly-curved tube arranged concentric with said burner substantially level with its top and connected with the source of oil-supply, and an initial vaporizer having a filamentary opening or passage positioned intermediate of and connected with said tube and mixing-chamber.

6. In an apparatus of the class described, in combination with a Bunsen burner, an incandescent mantle therefor, a mixing-chamber, and a source of oil-supply under pressure; a circularly-curved vaporizing-tube connected with the source of oil-supply and arranged concentrically around said burner and substantially in the same horizontal plane with its top, and the helically-coiled tube intermediate of and connecting said main vaporizing-tube and said mixing-chamber, substantially as and for the purposes specified.

7. A vapor-jet fitting consisting of a perforate crystal.

8. In a vapor-burner, in combination with the air-mixing chamber, an inlet-jet fitting comprising a piece of quartz or crystal having a polished orifice therethrough.

9. In an apparatus of the class described, in combination with the vapor-tube and mix-

ing-chamber; a quartz or crystal fitted to the tube and having a jet-opening therethrough.

10. In an apparatus of the class described, the combination with the burner, the incandescent mantle and the mixing-chamber, of the main vaporizing-tube concentric with said burner and subject to the thermal influence of its flame and an initial vaporizer consisting of a filamentary tube with walls of a thickness approximately equal to the diameter of the bore of the tube and positioned intermediate of said main vaporizing-tube and the mixing-chamber, whereby it is exposed to less of the thermal influence of the burner-flame than said main vaporizing-tube.

11. In combination with a hydrocarbon-burner an initial vaporizer consisting of a filamentary tube or conduit.

12. In combination with a hydrocarbon-burner, an initial vaporizer consisting of a filamentary tube or conduit, the thickness of the walls of which is substantially equal to the width of the passage, or more.

Signed at New York this 15th day of December, 1898.

CHARLES C. BRUCKNER.

Witnesses:

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CHARLES HALL BOTFORD.