

(No Model.)

J. S. WOOD.
VAPOR BURNER.

No. 515,984.

Patented Mar. 6, 1894.

Fig. 1.

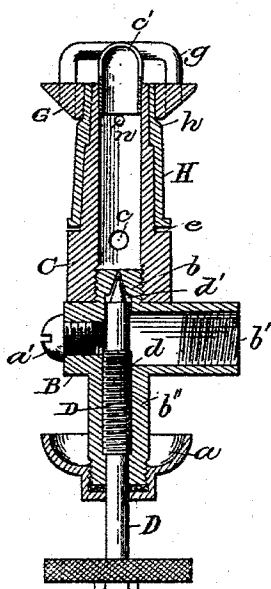


Fig. 2.



Fig. 2^a

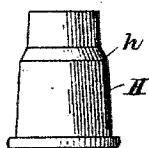


Fig. 2^b

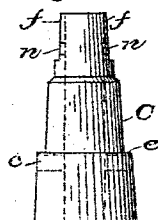


Fig. 3.

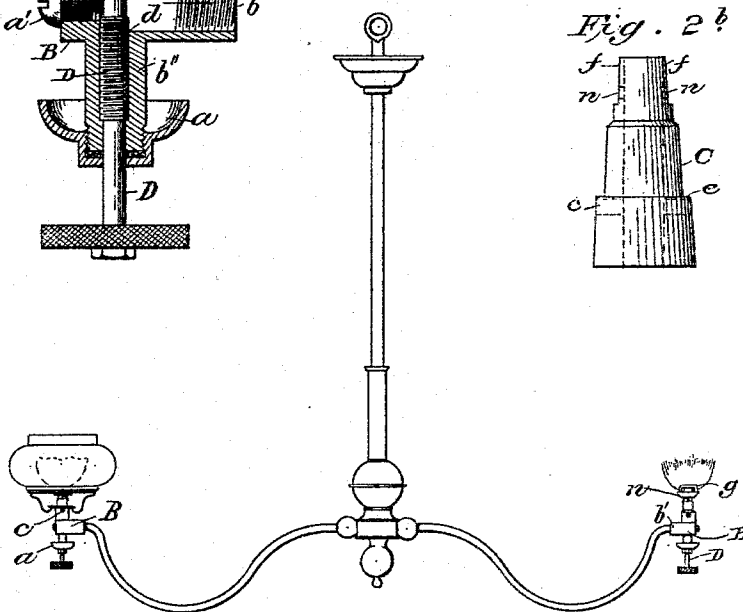
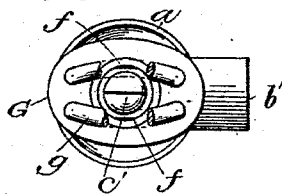


Fig. 4.



Witnesses
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VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 515,984, dated March 6, 1894.

Application filed April 20, 1893. Serial No. 471,189. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH S. WOOD, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Vapor-Burners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a vapor burner constructed and arranged for vaporizing hydrocarbon liquid and for causing a jet of such vapor, escaping through a small orifice, to draw in air and mix therewith, to produce an illuminating flame of any desired candle power.

The object of my invention is to provide for better heating the heat conducting devices of the burner by means of a special heating flame issuing from lateral orifices below the burner tip and in contact with heating wires, so as to conduct increased heat to the vaporizing chamber of the burner.

My burner is more particularly adapted for a chandelier for use in house lighting. My burner belongs to that class in which a needle valve is used for controlling the flow of a jet of vapor into the mixing chamber where it draws in a current of air and mixes therewith to form illuminating-gas which will burn with a bright flame free from smoke. My burner is constructed with a solid metallic flame-spreader, having a pair of heat conducting wires or bows arranged to stand on each side of the flat flame issuing from the burner tip, so as to conduct heat to the vaporizing part of the burner. The pillar of the burner is provided with small lateral orifices near the burner tip and there is applied to the outside of the pillar a jacket or sleeve, which extends to the top of the pillar, forming between the two a passage through which gas escapes from the lateral orifices and burns with a small blue flame outside of the burner tip, and impinges upon the heating wires which are connected to the flame spreader for increasing the heat of such parts so that a greater amount of heat may be conducted to the vaporizing chamber of the burner.

The features of construction of my burner will now be described by reference to the accompanying drawings, in which—

Figure 1 represents a vertical section of the burner device. Figs. 2, 2^a and 2^b represent, in elevation, the pillar of the burner and its attachments shown detached from the pillar. Fig. 3 represents an elevation of a chandelier provided with my improved vapor burner. Fig. 4 represents a top plan view of the burner.

The body of the vaporizing device in my burner preferably consists of a metallic casting B, constructed with a horizontal inlet tube, *b'*, an upwardly extending boss, *b*, containing the jet opening and a downwardly extending boss *b''*, which is screw-threaded at its lower end and has applied to it the alcohol-cup, *a*. The upper and lower bosses, *b*, and *b''*, have a vertical central passage, *d*, which at its lower end is screw-threaded and at its upper end is tapered to form a valve seat and jet orifice, *d'*. The needle-valve rod, D, is screw-threaded for working in the screw-threaded passage, *d*, and its upper end is tapered or pointed in the usual form of a needle valve and fits in the conical seat and jet opening, *d'*, for controlling the flow of vapor to the mixing chamber and burner. The inlet tube, *b'*, is screw-threaded for attaching it to a bracket or other supply pipe, and the boss, *b*, is externally screw-threaded for attachment of the pillar C. An opening in the body of the vaporizer opposite the inlet tube, *b'*, is provided with a closing-screw, *a'*.

The burner pillar, C, is internally screw-threaded at its lower end for attaching it to the boss *b*, and externally is provided with a circular shoulder *e*, which acts as a stop for the gas jacket H. The pillar is also provided with lateral air ports, *c*, so placed as to be just at the top of the boss, *b*, and adjacent to the jet opening, *d'*, so that the escaping jet of hydrocarbon vapor will draw in the necessary quantity of air to mix therewith in the mixing chamber of the pillar to form illuminating-gas.

The pillar, C, at or near its upper end, has its sides filed away or flattened as shown at *f*, so as to form narrow passages, and through such flattened portions are formed vapor orifices, *n*, for the escape of a small stream of

vapor to burn outside of the jet for separately heating the heat conducting wires and spreader.

A detachable gas jacket, H, having an annular shoulder, *h*, is slipped over the pillar, C, and rests at its lower ends upon the shoulders, *e*. This jacket, H, forms with the pillar a small annular auxiliary burner passage through which gas flows from the openings, *n*, for burning with a small flame around the burner tip, and it also receives and conducts heat to the vaporizing part of the burner.

The detachable flame spreader, G, is made of elliptical form in plan view and with a central opening for fitting over the jacket H and resting upon its shoulders *h*. Heating wires, *g*, are secured at their ends in the top of spreader G, and upon each side of the burner tip *c'*, so as to be nearly parallel to its slot. The slot of the burner tip, extends down to very near the upper face of the spreader G, so that the flame will be properly spread into a broad flat shape. The flame spreader G, is preferably made separate and detachable from the jacket H, as shown, but may be made integral therewith. The heating wires, *g*, are slightly curved outward around the tip, *c'*, so as to be directly in the line of the small annular auxiliary burner passage between the pillar C and jacket H, and thus be effectively heated by the small flame from such annular passage. By means of the vapor opening, *n*, jacket H, flame spreader G and wires *g'*, the burner and its vaporizing chamber are effectively heated for better generating vapor from liquid hydrocarbon which is supplied thereto.

In practice a suitable hydrocarbon liquid of light gravity is supplied to the vapor burner from an elevated reservoir.

In starting the operation, a small quantity of alcohol is first burned in the cup, *a*, for the purpose of heating up the body of the vaporizer and burner,—then, when the device is sufficiently hot to vaporize oil, the valve of the supply pipe is opened and a small stream of hydrocarbon liquid admitted to the burner device. The needle-valve is now opened, permitting the vapor to escape in a jet through the orifice *d'*, and such jet draws in a suitable proportion of air through the ports *c*, and the two are thoroughly mixed in the mixing chamber above. The resulting gaseous mixture escapes through the slot *c'*, of the

burner tip, where it is ignited producing a large brilliant light, the same being spread by the spreading device G. At the same time a part of the gaseous mixture escapes through the lateral openings, *n*, and is ignited at the top of the annular auxiliary burner passage between the jacket H and the burner pillar C, resulting in highly heating the heat conducting wires, *g*, spreader G and jacket H, the heat of which is conducted to the body B of the vaporizer, thereby effectively vaporizing the hydrocarbon liquid, as it flows through the inlet pipe *b'*. The flame lies upon the face of the spreader G, and is thereby prevented from flickering so that a steady light is produced.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a vapor burner, the combination with the body having a jet orifice and needle valve, of a pillar, provided at its upper end with lateral openings and a burner tip, a jacket or sleeve surrounding said pillar and forming an annular auxiliary burner passage around the burner tip, and heating wires above said passage, substantially as described.

2. In a vapor burner, the combination with the body, having a jet orifice and needle valve, of a pillar, provided at its upper end with lateral openings and a burner tip, and a flame spreader having a pair of heating wires, said lateral openings in the pillar connecting by passages to the top of the flame spreader below said heating wires, whereby the wires and spreader may be heated by a small auxiliary flame, substantially as described.

3. In a vapor burner, the combination with the body provided with a jet orifice and needle valve, of a pillar provided at its upper end with lateral openings and a burner tip, a jacket or sleeve surrounding said pillar and openings, to form an annular auxiliary burner passage around said tip, and a flame spreader provided with heating wires, the body, pillar, sleeve, and flame spreader, being all detachably joined together, substantially as described.

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

JOSEPH S. WOOD.

Witnesses:

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SAML. B. COUGHLIN.