A. W. JOHNSON.
VAPOR-BURNERS.

No. 194,873. Patented Sept. 4, 1877.

Fig. 1

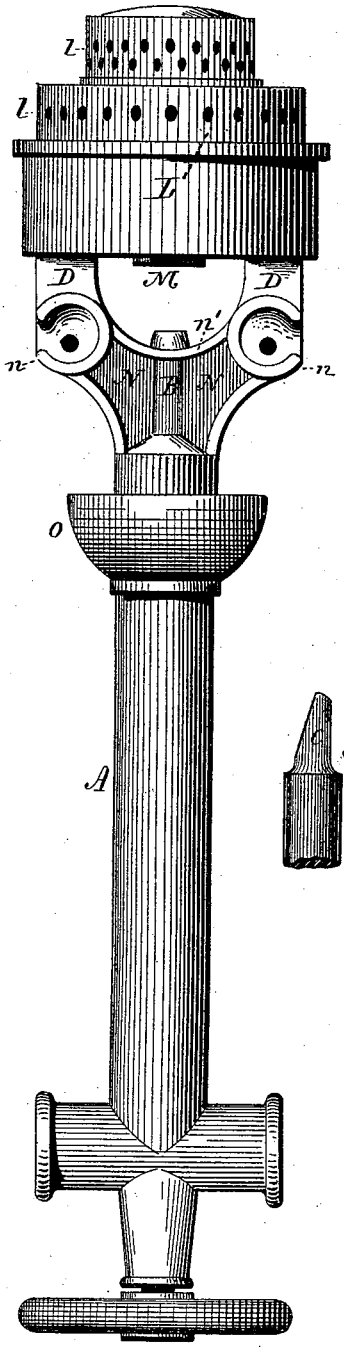


Fig. 2

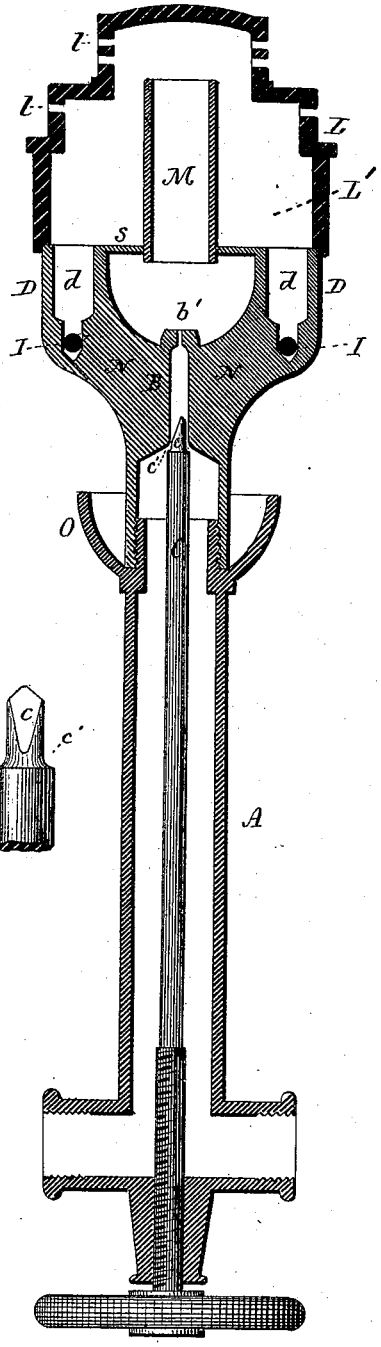
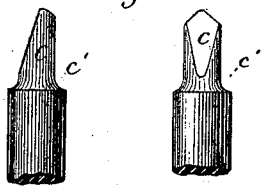


Fig. 3



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UNITED STATES PATENT OFFICE.

ALBERT W. JOHNSON, OF NEW HAVEN, CONNECTICUT.

IMPROVEMENT IN VAPOR-BURNERS.

Specification forming part of Letters Patent No. **194,873**, dated September 4, 1877; application filed July 24, 1877.

To all whom it may concern:

Be it known that I, ALBERT W. JOHNSON, of New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Vapor-Burners; and 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, making part of this specification.

This invention is in the nature of an improvement in burners for burning vaporized gasoline or other hydrocarbons; and the invention consists in a vapor-generating chamber closely surrounded by heat-transmitting webs and ribs, and provided with a valve at its lower end for regulating the inflow of liquid to be vaporized; hollow supporting-posts provided with openings for conducting a portion of the vapor to a point near the said generating-chamber, and a valve of novel construction, substantially as hereinafter described.

In the accompanying drawings, Figure 1 is a side elevation of burner with my improvements. Fig. 2 is a vertical section of the same. Fig. 3 is two views of valve.

A represents a barrel for containing the liquid to be vaporized, its lower end being T-shaped and threaded, for the purpose of connecting one of its arms to a pipe leading from an elevated reservoir, (not here shown,) while the other arm connects with a pipe leading to another burner, or may be closed by cap or plug, as may be desirable. Near the top of the barrel A, and surrounding it, is a circular flange, O, the rim of which is curved upward, forming a cup. Situated above and connecting with the barrel A is a vapor-generating chamber, B, provided at its top with a small aperture, *b'*, for the escape of vapor, and at its lower end with a valve, *c*, for admitting or stopping the flow of liquid from the barrel A. On two opposite sides of the chamber B, and attached thereto, are webs N N, terminating at their upper ends in upright posts or supports D D, bearing a circular disk, S, which forms the bottom of the gas-chamber L'. From the bottom of the gas-chamber L' are cavities *d d* extending down into the posts D D, the lower ends of these cavities being provided with apertures I I upon either side. *n n* are curved projecting ribs partly surrounding the apertures I I. *n'* is a rib connecting the ribs *n n* and the exterior of the vapor-generating chamber B. L is an inverted cup, and forms the upper part of the gas-chamber L', and is provided with holes *l l* for the escape of the vapor. M is a tube placed over the aperture *b'*, and extends from a point a little above said aperture through the disk S to a point within and near the top of the gas-chamber L', as shown.

The valve *c* is made in the form of a cylinder, slabbed or flattened (or may be grooved) from a point on its periphery near its base to its upper end, and is loosely fitted into the chamber B. At its base is a shoulder, *c'*, tapering or concaved, which comes in contact with and seats upon the metal surrounding the lower end of the chamber B when the valve is closed. This valve is operated by means of a screw and hand-wheel at the lower end of the valve-rod C. In opening this valve the passage into the chamber B is gradually enlarged by reason of the tapering or wedge shape of the valve.

The operation of this burner is as follows: The valve *c* is opened to allow a small quantity of gasoline or hydrocarbon to flow into the cup O, and then closed, and the liquid in the cup ignited. The flame thus produced heats the generating-chamber B. The valve is then again opened, and the gasoline or hydrocarbon flows from the barrel A into the heated chamber B, is instantly converted into vapor, and flows out through the aperture *b'*, and enters the gas-chamber L' through the tube M, taking up an amount of oxygen from the atmosphere in its passage between the aperture *b'* and tube M, with which it becomes intimately mixed in the gas-chamber L'. This mixture of vapor and oxygen then issues in the several small holes *l l* from the upper part of the gas-chamber, and, being ignited, burns with intense heat. A portion also of the mixed vapor and oxygen passes down through the cavities *d d* in the posts D D and out at the apertures I I, and, these jets being ignited, the heat from them is transmitted through the ribs *n n* and *n'* and the webs N N to the generating-chamber B, keeping it sufficiently hot to continue to vaporize the inflowing liquid.

From the foregoing description it is obvious that, whatever the pressure of liquid in the supply-pipe, it can be easily regulated and controlled by the valve *c* (which may be made extremely sensitive by elongating the flattened portion of the cylinder) at the lower end of the vapor-generating chamber, by reason of which, and the free open passage-way for the escape of vapor at the upper end of said chamber, a steady and even flow of vapor is insured, not uniformly attainable in burners where the escape-passage for the vapor is regulated by a valve. The vapor-generating chamber being very narrow and long, and the heat being transmitted directly to it, it is impossible for the liquid at the ordinary pressure at which it is used to pass into said generating-chamber fast enough to reach the vapor-escape aperture at its top before being thoroughly converted into vapor, even if the valve below should be left wide open; hence all danger of the inflammable liquid escaping into the flame above is obviated, even in the hands of the most inexperienced operator.

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

1. The vapor-generating chamber B, situated between the valve *c* and the gas-chamber L′, in combination with the hollow supporting-posts D D, substantially as described, and for the purpose set forth.

2. The hollow supporting-posts D D, provided with openings I I, substantially as and for the purpose described.

3. The openings I I, arranged as conductors for discharging the vapor in its passage from the gas-chamber L′ through the hollow supporting-posts D D to the point of ignition, substantially as shown and described, and for the purpose set forth.

4. The combination of the heat-transmitting webs N N and ribs *n n* and *n′* with the openings I I and vapor-generating chamber B, substantially as described and set forth.

5. The combination of the vapor-generating chamber B, the hollow posts D D, the heat-transmitting webs N N, and ribs *n n* and *n′*, openings I I, valve *c*, tube M, and gas-chamber L′, substantially as and for the purpose described.

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