Z. DAVIS.
Vapor-Burner.

No. 215,890. Patented May 27, 1879.

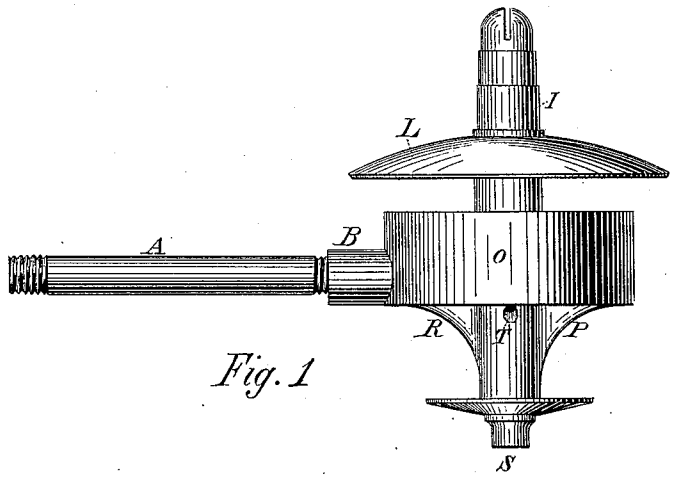


Fig. 1

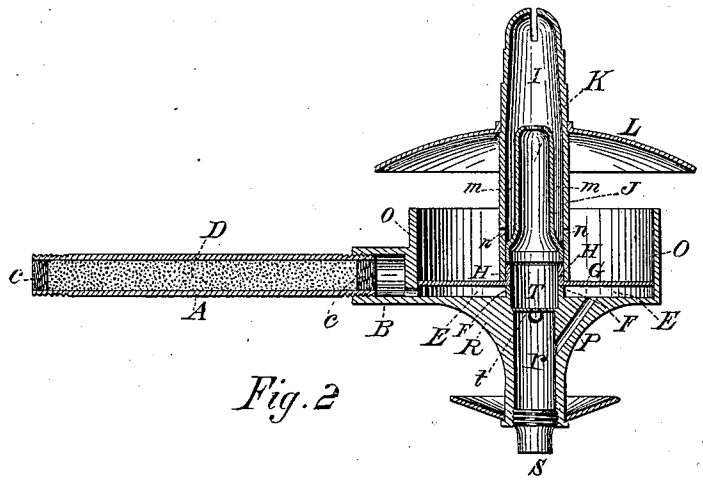


Fig. 2

A. McManley
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Witnesses.

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UNITED STATES PATENT OFFICE.

ZEBULON DAVIS, OF CANTON, OHIO.

IMPROVEMENT IN VAPOR-BURNERS.

Specification forming part of Letters Patent No. **215,890**, dated May 27, 1879; application filed September 2, 1878.

To all whom it may concern:

Be it known that I, ZEBULON DAVIS, of Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Vapor-Burners for Street-Lamps; 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates more particularly to an improvement in a vapor-burner for street-lamps numbered 182,176, for which Letters Patent were granted to me September 12, 1876; and consists in the peculiar construction and the arrangement of parts, that will be more fully described hereinafter, whereby a cheap, simple, and effective burner is produced.

Figure 1 is a perspective view of my invention. Fig. 2 is a vertical longitudinal section of the same.

A represents the conducting-tube, which is provided with suitable means for controlling the flow of the oil or gas through it to the retort-chamber. In each end of the tube A, I place a packing, C, which may be of mineral wool, wire-gauze, or similar porous refractory substance, for the purpose of holding the cut-wire filling D in place. I use finely-cut wire for this filling in preference to any other substance, because, when made of copper or brass, it is a good conductor of heat, packs closely, and by reducing the spaces or interstices permits the heat of the lamp to be readily transmitted from one particle to another, which heat, acting upon the gas-producing substance while in a finely-subdivided state, causes its vaporization in the coldest weather. A heat-conducting metallic substance is very essential for this packing, for where shot, sand, and other comparatively non-conducting substances are used, although they may divide the oil up into fine particles, they do not retain sufficient heat to convert the oil or other fluid being burned into vapor. Another essential to the perfect vaporization of the burning-fluid is, that the tube or pipe holding this packing should be so placed that the heat from the burner will pass directly into it, and thus keep the packing at as high a heat as possible.

Placed so that its bottom—which is made flat, so as not to hold or retain sediment or oil to interfere with lighting the lamp—will be on a line with the lower side of the conducting-tube A is the retort-chamber E. This construction elevates the socket B, holding one end of the tube A, so that the greater portion of its covered end is above the top of the retort-chamber E and exposed to the flame of the subsidiary jets, and the heat therefrom conveyed directly to the cut-wire filling D. The retort-chamber E, which is cast in the body of the lamp, has a central post, F, also cast with the lamp. This post is bored out to a suitable depth, as shown, and conducts the mingled gas and air to the burner-tube, and extends from the bottom of the chamber E to a suitable distance above its lid or top G, which top is of thin sheet metal, spun gas-tight against shoulders turned upon the outside of the hollow post and against the outer edge of the chamber. By this means communication between the interior of the hollow post F and chamber E is cut off, and the end of the hollow post marked H, rising above the sheet-metal top G, serves as a hub to carry the lower end of the burner-tube I, which burner-tube can thus be easily removed for the purpose of cleaning or repairing.

The burner-tube I consists of two tubes, J K, arranged one within the other. The outside tube has a shoulder turned on it, and carries the hood L, as shown in the drawings. The inside tube is shorter and of less diameter than the outer, so that when in the position shown there is formed between them an annular space, *m m*, for the downward passage of the oxygenized gas to the points of issue *n n*, two or more of which are drilled through the outer tube at the bottom of said annular space, and has its lower end spun or swelled out to fit tightly within the outer tube, by which means a joint is formed to prevent communication at their lower ends between these tubes and the before-mentioned annular space. The upper end of the inside tube is contracted in the manner shown, and the top of the annular space enlarged, and the rising current of oxygenized gas is slightly checked and converged in such a manner as to prevent its expansion against the outer directly over the

end of the inner tube, and by the attraction of cohesion among its particles in its upward movement interfere with the downward passage of the gas necessary to feed the subsidiary jets, which is the case when the inner tube is of uniform diameter.

By this peculiar construction of the burner-tube I am enabled to overcome the common defect of weak and uncertain subsidiary jets heretofore existing in many vapor-burners, and make said jets strong and certain, and not liable to be blown out in times of storm and high winds.

In order to protect the subsidiary jets from wind-currents, confine them more closely to the burner-tube, that the mingled air and gas passing through it may be more effectually superheated, also to the top of the retort-chamber, and present more surface to gather the heat of these jets, I cast the shield O upon the lamp.

Cast upon the lower side of the retort-chamber E are the web-pieces P R. The one marked P is bored out, as shown, to communicate with the chamber E and convey the gas from it to the opening *r*, closed at its lower end by the plug S and at its upper end by the metal top, through which is drilled the main jet-orifice *t*, from which the gas escapes to the burner-tube, the air necessary to support combustion and produce a brilliant flame being entrained or drawn by the rising current of gas through the holes T T, one of which is made for this purpose on each side of the lamp.

This casting of the web-pieces solidly upon the lamp is an improvement on the arms of the lamp for which Letters Patent were issued to me, as before mentioned, as by this construction I shorten the lamp, bring the jet-orifice *t* nearer the burner-tube, and by reducing the distance the gas travels before burning prevent its exposure and condensation. The web-pieces also conduct the heat from the surfaces exposed to the subsidiary jets in a more efficient manner than the arms of the former lamp, which is an important feature, serving to maintain the gas at a higher temperature, and thus produce a better and more reliable light.

By this construction I am able to dispense with the needle of the former lamp, which needle, from its liability to leak about the screw-shank, was troublesome and expensive.

Having thus described my invention, I claim—

A vapor-burner body consisting of the socket B, shield O, and web-pieces P R, all cast in a single piece, in combination with the tubes I K, the outer one having small jet-holes made through it, hood L, and plug S, substantially as shown.

In testimony that I claim the foregoing I have hereunto set my hand this 9th day of April, A. D. 1878.

ZEBULON DAVIS.

Witnesses:

GEO. D. SAXTON,

WALLACE WEBB.