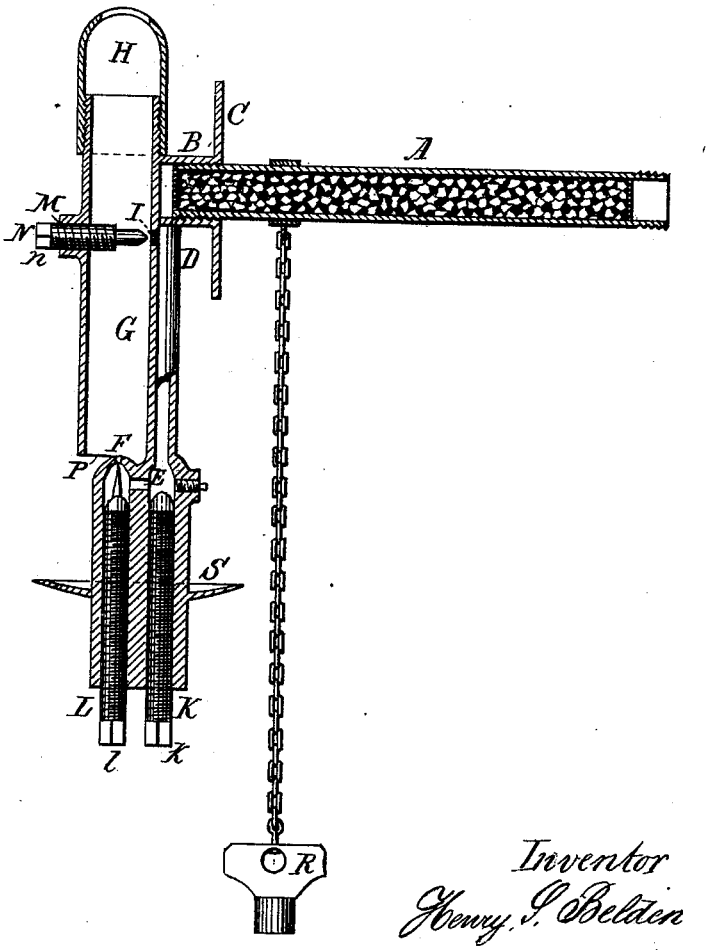
H. S. BELDEN.
Vapor-Burner.

No. 197,202. Patented Nov. 20. 1877.



Witnesses
Henry Orth
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UNITED STATES PATENT OFFICE.

HENRY S. BELDEN, OF CANTON, OHIO.

IMPROVEMENT IN VAPOR-BURNERS.

Specification forming part of Letters Patent No. **197,202**, dated November 20, 1877; application filed September 10, 1877.

To all whom it may concern:

Be it known that I, HENRY S. BELDEN, of Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Vapor-Burners; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to letters of reference marked thereon, which form a part of this specification.

The figure is a sectional view of my improved vapor-burner.

In the drawing, A represents a tube proceeding from the reservoir of oil, and conducting the oil to that part of the burner used as a retort. This pipe or tube A, for a short distance from the end to which the burner is attached, is filled with angular pieces of glass, held in proper place by wire-gauze or other suitable material.

I have ascertained by experiment that glass thus prepared is of great value for this purpose, as it is dense, hard, insoluble, not affected by heat, not decomposed or chemically affected by oil, not corrosive, easily obtained and put into use. It does not clog with sediment, but allows a regular flow of oil, though it retards said flow sufficiently to insure thorough vaporization.

The tube A, at the delivery end, is attached to a short tube, B, extending from the side of the burner, said tube B having at its outer end an annular flange, C, for forming a retort, as will be fully set forth.

Tube B communicates with a vertical tube, D, which, at its lower end, is connected with a horizontal tube, E, which leads to the orifice F, where the gas escapes into the mixing-chamber G. From the chamber G some of the gas passes to the burner-tip H for illuminating, and some through an aperture or orifice, I, directly beneath the retort-tube B, and contiguous to the vapor-feeding tube D, for heating purposes.

The flow of gas into the chamber G is controlled by the stop-screw K, which acts as a valve in the lower end of tube D. This valve-screw K enables me, when it is desired to extinguish the burner, to completely cut off the flow of oil from the reservoir, and to dispense with the extra stop-cock ordinarily employed in connection with the reservoir or conduit-tube. The amount of gas for burning is controlled by the screw L.

It will be seen that the seat for the oil-valve K is formed in one and the same piece with the burner-valve L. By so constructing the burner as to contain this oil-valve K and receive its stop-cock, I can drill, or otherwise form, the necessary seat and aperture while the seat and aperture for the stop-cock L are being formed; and by making said oil stop-cock a part of, and in the same piece with, the burner, I have reduced the cost of manufacture a large percentage.

M is a screw-threaded aperture through the burner-tube opposite to the orifice I. N is a screw, placed horizontally across the mixing-chamber G, working in the threaded aperture M, so as to open or close the orifice I.

It will be seen that if, for any reason, a change in the quantity of the heat playing upon the retort is required, by my simple construction such change can be effected without affecting the flow of illuminating-gas.

The heating-jet which escapes from orifice I bears directly and mainly upon the retort-tube B and the disk, flange, or shield C. This shield C serves to reflect the heat against the tube D and the rest of the burner. It also prevents the heat from passing too far back along the tube A; and should the heating-jet be accidentally extinguished, it (the shield) will deflect the escaping gas to the illuminating-flame for reignition. The illuminating-flame is lighted at the tip H at the top of the burner-tube.

The lower end of the burner tube or chamber G is cut away, as shown at P, so as to permit the gas escaping from orifice F to draw in, by its violent upward motion, a sufficient amount of air to make the gas perfectly combustible. The violence of this upward current is broken by striking against the screw *n*, which not only more thoroughly mixes the air and gas, but also prevents the "blowing" of gas at H.

The difficulty and inconvenience experienced in working the screws of a vapor-burner, when heated or soiled, by means of handles attached to such screws, has led me to invent and adopt a key, R, entirely separate from the burner, wherewith to manipulate said screws. As this

key is always cold and clean, the handling of the screws is, under all circumstances, easy and convenient. For the reception of the key R the outer ends of screws K, L, and N are preferably squared, as shown at *k*, *l*, and *n*.

S is a flange at or near the lower end of the burner, which serves to catch any oil that may chance to escape when the screws are open, and also prevents an uneven air-supply by upward varying currents.

The operation of my improved burner is exceedingly simple, and will be readily understood from the drawing and the foregoing description.

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

1. In a vapor-burner, a heating-orifice and an illuminating-orifice, arranged as described, so that the gas-jets can be regulated independently of each other, and can be supplied from a mixing-chamber, substantially as set forth.

2. In a vapor-burner, a retort composed of a horizontal tube, B, having an annular flange, C, in combination with a vertical gas-feed tube, D, substantially as set forth.

3. In combination with the horizontal tube B and vertical gas-tube D, the orifice I, contiguous to said tubes B D, and the screw-valve N, passing horizontally through the mixing-chamber, substantially as set forth.

4. The retort-tube B, formed with a flange, C, and vertical feed-tube D, in combination with a mixing-chamber, G, having a horizontal orifice, I, adapted to supply a flame against all of said parts.

5. A vapor-burner provided with the vertical mixing-chamber G and the vertical feed-tube D, connected at their lower ends by the throat E, in combination with the vertical screw-plugs K L, which serve to regulate the flow of oil and the flow of gas into chamber G, substantially as set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

HENRY SEYMOUR BELDEN.

Witnesses:
A. THIERRY,
H. L. KUHNS.