

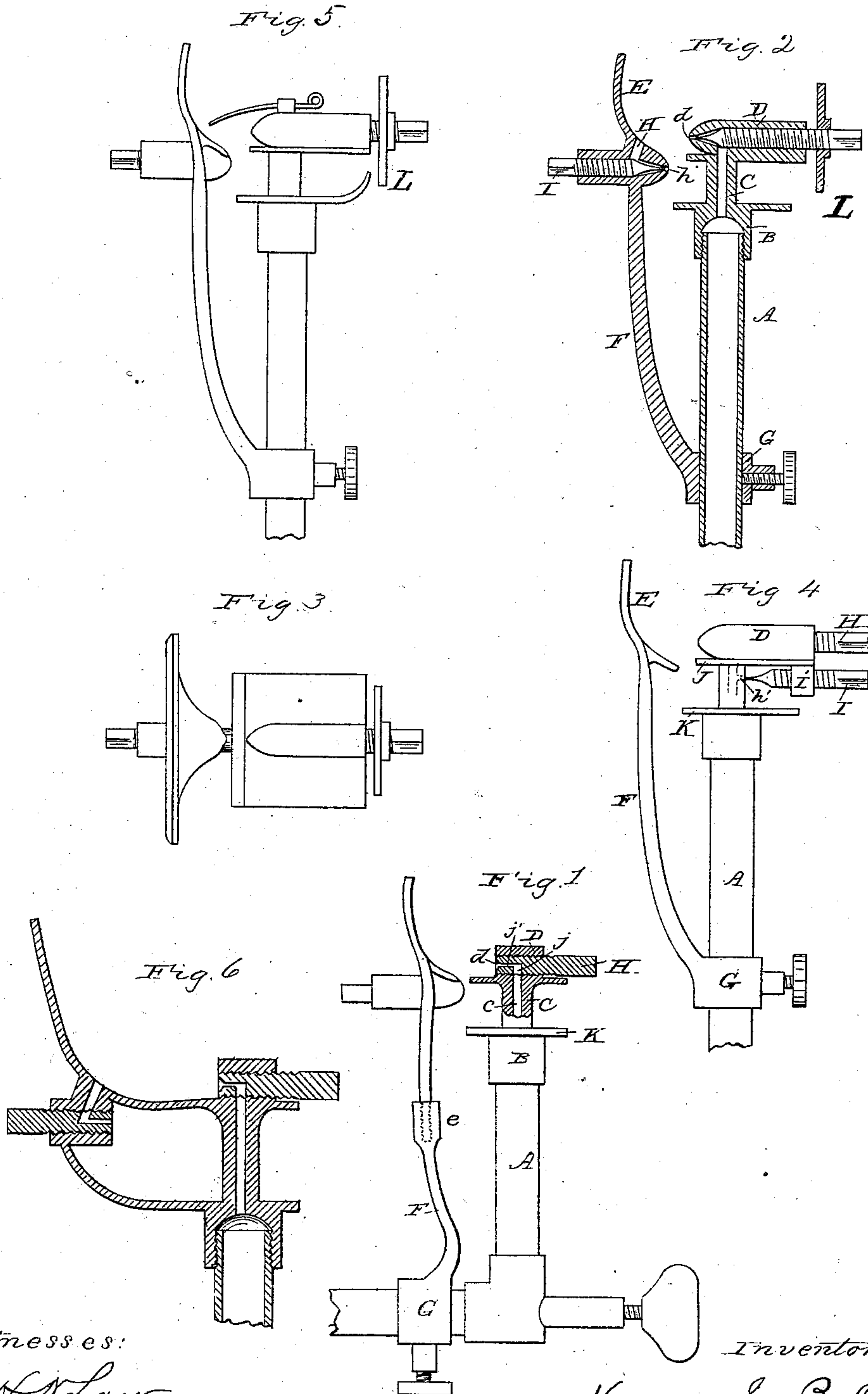
(No Model.)

H. S. BELDEN.

VAPOR BURNER.

No. 272,195.

Patented Feb. 13, 1883.



Witnesses:

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UNITED STATES PATENT OFFICE.

HENRY S. BELDEN, OF CANTON, OHIO.

VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 272,195, dated February 13, 1883.

Application filed April 14, 1882. (No model.)

To all whom it may concern:

Be it known that I, HENRY S. BELDEN, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Vapor-Burners, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in vapor-burners of the class known as "plate-burners"—that is to say, burners having plates arranged with a portion across the path of the illuminating-jet, to receive the impact of the jet and spread it to form the illuminating-flame.

I have shown in the drawings several burners of different forms embodying my invention.

Figure 1 is a view, partly in elevation, partly in section, of such a burner. Fig. 2 is a vertical section of a somewhat modified form. Fig. 3 is a top plan view of that in Fig. 2. Figs. 4, 5, and 6 show other modified forms.

In the drawings, A represents a supply-pipe, which may be connected to a reservoir by any suitable means. The burner is attached to the supply-pipe by means of a socket, B, the burner consisting, essentially, of a pipe or passage, C, and a portion, D, having a jet-orifice. These parts, together with the socket B, are preferably formed in one piece of metal.

Opposite to the jet-orifice *d* the spreading-plate E is arranged. It is supported independently of the burner by means of a downwardly-extending arm, F, which is attached to a supply-pipe considerably below the heated portion of the metallic parts. I prefer a construction similar to that shown in the drawings—that is to say, having a supporting and adjusting collar, G, at the lower end, surrounding the supply-pipe, which may be fastened against it by a set-screw or other equivalent means. The arm (or arms) F, by which the spreading-plate is connected to the supporting part, is made thin and of flexible material, so that it may be shaped or bent as may be required to have the parts properly arranged relatively to the burner with which it may be combined. In Fig. 1 the collar is secured to a pipe below and at an angle to the feed-pipe A, so that the collar can be rocked and the plate can be swung to admit an adjustment

across the path of the jet. The arm is made in two parts, united by a screw-thread at *e*, which permits the plate to be adjusted at different angles relatively to the path of the jet. If the latter adjustment is the only one required, it can be accomplished by attaching the collar to the feed-pipe A directly, as shown in Figs. 2, 4, and 5.

I am aware that use has heretofore been made in a vapor-burner of a screw-threaded collar secured to the burner-tube, at the end, around the retort, by means of a screw-thread formed on said tube, for supporting the plate, and I do not claim such devices as my invention; but it will be seen that the means which I have provided for connecting the plate and its stem to the pipe are of such nature that adjustments are possible without the necessity of rotating the support. In the constructions heretofore employed having a screw-threaded connection between the plate and the burner it was necessary to rotate the plate more or less in order to get a vertical adjustment.

It is well known that nicety of adjustment is a matter of great advantage in devices of this character, and with a construction of the nature of mine I can adjust vertically the spreading-plate without affecting its lateral relations, as it is merely necessary to move it rectilinearly up or down on the supply-pipe. A similar advantage is incident to the construction in which the collar and set-screw are applied to the horizontal pipe, as in that case an adjustment can be effected as to the distance between the plate and the burner without moving the plate laterally. Moreover, a great advantage which I have attained by securing the plate and its support to the other parts at a distance comparatively from the escape-orifice is, that I can employ a jet-regulating screw and give it a strong mounting, whereas in the construction heretofore used having screw-threaded collars applied directly to the ends of the burners, such regulating devices could not be used. As this method of support prevents entirely the transmission of heat by conduction from the spreading-plate to the vaporizing-chamber, I have devised a mechanism for providing a heating-flame other than the illuminating-flame.

In another application I have fully set forth

in detail several methods of constructing burners for providing a supplemental or heating flame of this character.

H represents a passage formed in the spreading-plate, and situated so as to intercept a portion of the jet of vapor that escapes from the orifice *d*, and conduct it downward and backward through an orifice, *h*, to a point where it can be ignited to produce a heating-flame in proximity to the vaporizing-flame.

Another form of device for producing a supplemental heating-flame is shown in Fig. 4, where an orifice at *h'* is formed in the pipe or chamber C, the orifice being controlled by a valve, I, substantially similar to the one in Figs. 2 and 5, it being mounted, however, in a hanger or downwardly-projecting ear, I'. When the plate is supported and the heat-orifice is provided in the manner shown in Figs. 2 and 5, the position of the heating-flame can be regulated very easily by shaping or bending the arm or arms F, these being made of very thin metal to permit of such shaping.

In Figs. 1 and 6, I have shown an improved form of regulating-valve for the jet-orifice. It consists of a screw having a jet-passage, *j*, which communicates with the duct *c* in the vaporizing-chamber, and with another jet-passage, *j'*, which permits the jet to escape through the end of the screw toward the spreading-plate.

The amount of vapor escaping can be regulated by turning the screw to vary the relation between the duct *c* and *j*. The jet-orifice *d* is produced by piercing the valve metal in substantially the manner that is now followed in making the stationary orifices.

With the needle-valves now commonly used to control the jet-orifice much trouble has been experienced, owing to the tendency to break the point of the needle and the difficulty of keeping the orifice and the chamber clean. However, the orifice *d* may be formed as shown in Figs. 2, 4, and 5, and closed by means of a needle-screw valve mounted in the upwardly-projecting piece of metal D. It is constructed to insure that when the orifice is closed by it, it (the orifice) shall be cleansed of all sediment or deposit that may be formed therein. The heating-flame is arranged to play between two shields or plates, J and K—the one immediately below the part D, and the other a suitable distance lower down. In Fig. 5 the lower shield or plate, K, is shown as turned up on the side opposite to the heating-jet orifice in order to deflect upwardly the flame and hot air. L is a stop-piece carried by the valve-screw and arranged to be impinged upon by the flame or hot air, and transmit heat and hot currents to the valve-bearing and the upper parts of the metal.

The screw H, which I have shown, can be instantly withdrawn at any time and thoroughly cleaned without inconvenience and without danger of breaking any of the parts.

I do not in this case claim the jet-deflector for directing the illuminating-jet as it escapes

from the needle-orifice, which I have shown, having made that the subject of claims in another application filed April 10, 1882, No. 57,801.

What I claim is—

1. The combination of the supply-pipe, the burner secured thereto, and having a vaporizing-chamber and a needle-orifice, the spreading-plate arranged across the path of the jet, and the means for supporting said plate secured to the supply-pipe below and independently of the retort portion, and arranged to be adjusted longitudinally on said pipe without rotation relatively thereto, substantially as set forth.

2. The combination of the supply-pipe, the burner attached thereto, the spreading-plate situated across the path of the jet, the devices which support the spreading-plate, and which are attached to the supply-pipe below and independently of the burner, and which are adjustable longitudinally on said pipe without being rotated relatively thereto, and means for conducting a portion of the vapor to a point other than that of the illuminating-flame to provide a heating-flame for generating vapor, substantially as set forth.

3. In a plate vapor-burner, the combination of the supply-pipe, the burner attached thereto, the spreading-plate situated across the path of the jet, the means for holding the spreading-plate secured to the supply-pipe below and independently of the burner, and arranged, substantially as set forth, to adjust the burner across the path of the jet, and also at different angles to the path of the jet.

4. In a plate vapor-burner, the combination of the supply-pipe, the burner attached thereto, the spreading-plate situated across the path of the jet, the means for holding the spreading-plate secured to the supply-pipe below and independently of the burner, and arranged, substantially as set forth, to adjust the burner across the path of the jet, and also at different angles to the path of the jet, and means for conducting a portion of the vapor to a point other than that of the illuminating-flame, to provide a heating-flame for generating vapor, substantially as set forth.

5. In a vapor-burner, the combination of a supply-pipe, a retort having a horizontal shield, a vertical vapor passage-way, a jet-orifice above said shield, a needle-valve for said orifice and above said shield, and mounted on lines transverse to the vertical vapor-passage, a spreading-plate across the path of the jet, a support for the plate attached to the burner below the shield, and means for withdrawing a portion of the vapor to provide a flame other than the illuminating-flame below the said shield, substantially as set forth.

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

HENRY S. BELDEN.

Witnesses:

H. H. BLISS,

H. H. DOUBLEDAY.