J. BENSON.

Vapor-Burner.

No. 165,468. Patented July 13, 1875.

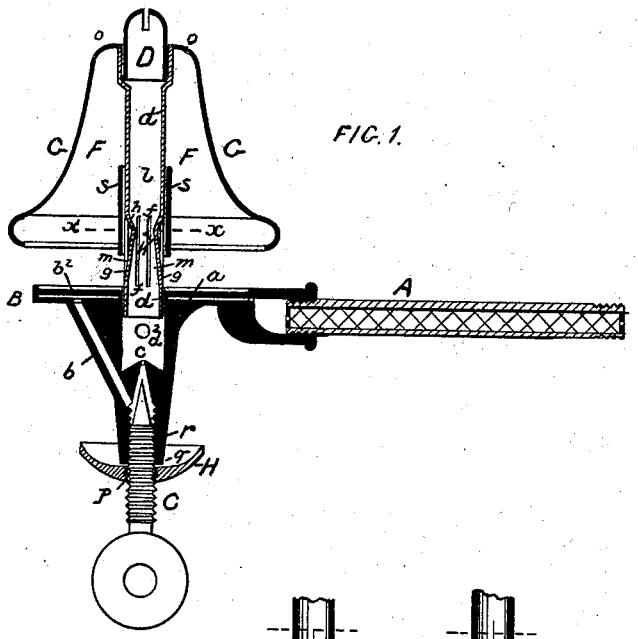

FIG. 1.

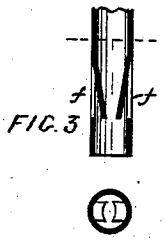

FIG. 3.

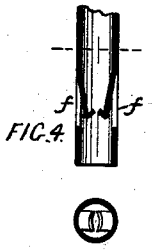

FIG. 4.

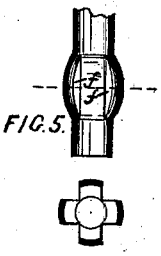

FIG. 5.

FIG. 2.

WITNESSES.

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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN VAPOR-BURNERS.

Specification forming part of Letters Patent No. **165,468**, dated July 13, 1875; application filed June 3, 1875.

To all whom it may concern:

Be it known that I, JOSEPH BENSON, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Vapor-Burners, of which the following is a specification:

This invention relates to naphtha vapor-burners, and its object is to secure the supplementary flame to heat the naphtha and make it into a gas by the direct emission of gas from the inside of the burner-tube at or near that part of the burner-tube on which the supplementary flames are to act; and, for this object, this improvement in vapor-burners consists in the combination, with an opening or openings made in and extending directly from the outside to the inside of the burner-tube, and located at or near the part of the burner-tube to be heated for generating gas from the naphtha, of a contraction, substantially such as herein described, on the inside of the burner-tube, that is situated therein with regard to the said openings so as to restrain the upward passage or flow of the gas through the burner-tube, and thereby accumulate sufficient backward pressure thereof to secure its emission at the openings against the inward pressure of the external air, and in the proper direction for the flames produced from it to impinge against the part or parts of the burner-tube to be heated.

In the accompanying plate of drawings my present improvements in vapor-burners are illustrated in connection with a vapor-burner constructed substantially, except as to the features of this invention, like the burner described in the Letters Patent issued to me dated April 13, 1875, and No. 162,016; and, in said plate—

Figure 1 is a central vertical section of the burner, and Fig. 2 a horizontal section enlarged on line *x x*, Fig. 1.

In the drawings, A represents the naphtha feed-tube of a naphtha-burner, which tube is to be packed as ordinarily. The feed-tube A enters and opens into the chamber *a* of a flat disk, B; *b*, an inclined vertical passage leading from chamber *a* of disk B to the vertical central passage *c* below disk B, which vertical passage *c* opens to the burner-tube *d*, and is provided with a pointed screw-regulator, C, and an air-hole, d^2, all as ordinarily in naphtha-burners; D, the burner-tip at upper end of burner-tube *d*; *f f f*, &c., slit-openings in burner-tube *d*. These slits *f* commence just above the upper plate of chambered disk B, and they extend from such point in vertical and parallel lines upwardly along and for a portion of the length of the burner-tube *d*, and are separated from each other by the intermediate and remaining parts *g g*, &c., of the said tube *d*. Every other one of these intermediate parts *g g* separating slit-openings *f* of burner-tube is similarly bent inwardly, as at *h*, Fig. 1, which proportionately contracts the central passage *l* leading through the burner-tube *d* to the burner. The gas passing through burner-tube, more or less, escapes at the slit openings *f f*, and there being ignited makes a supplementary flame or flames, by which to heat the naphtha and generate it into a gas to be consumed at the burner-tip when the burner is lighted; and, in the present construction of parts, these supplementary flame or flames from said slit-openings *f f* act against the upper plate b^2 of the chambered disk B. The escape of gas at the slit-openings *f f* of burner-tube *b*, as above stated, is secured from the back pressure produced in the gas as it passes upwardly through the burner-tube *b*, because of the inside contraction, herein described, of central passage *l* through said tube, which acts to restrain the flow of the gas to the burner-tip, and thereby enables it to accumulate and maintain a back pressure sufficient to overcome, and consequently to secure the escape of the gas against, the pressure inwardly of the external air at said slit-openings *f f*, &c., and this result is secured without any substantial or practical interference with the supply of gas at the burner-tip. By the downward and outward incline of the lower portion *m* of the inwardly-bent walls *g*, the gas in its escape at the slit-openings *f f*, &c., as above described, is directed toward the upper plate b^2 of the chambered disk, and thus made, when ignited, to impinge the better against the chambered disk for heating it, and the naphtha passing through its chamber from the feed-tube A. Figs. 3, 4, and 5 of the drawings represent modifications more particularly in the form of

the inside contraction of the burner-tube passage, and their contractions are obvious without particular description, and, while they each and all act to produce the escape of gas at the openings *f f* leading thereto, in substantially the same manner as the construction herein particularly described, and shown in Figs. 1 and 2 of the drawings, they are not as efficient, practical, and perfect; F, a chamber surrounding burner-tube *d*. This chamber is closed at its upper end, except as to the small vent-holes *o o* for air to escape, but it is open at its lower end to the entrance of the supplementary flame or flames from the slit-openings *f* in burner-tube, and these flames within the chamber F are confined and held about the burner-tube for an increased heating of the gas passing to the burner-tip by the surrounding outer wall G, making the chamber F, which wall is of a bell shape. (See Fig. 1.) H, the ordinary cup-shaped dish to receive naphtha, or other suitable fluid, by which to start the generation of gas from the naphtha fed by the naphtha feed-tube when the burner is to be lighted.

Although I have herein described my improved construction of burner-tube for producing the supplementary flame or flames in connection with a chambered disk, B, for generating gas from the naphtha, it is obvious that the operation of such construction is not dependent upon any particular construction of the burner for the impingement of the supplementary flames, it being of course necessary in all cases, for the most efficient and perfect results, that the formation of the inside contraction of the burner-tube should be such as to properly direct the escape of the gas for a direct impingement of its flame against the surface to be heated by it. And, furthermore, it may be well to here observe that the shape of the openings *f f* may be varied, but the form described is found in operation to be most efficient and perfect. To regulate the escape of the gas at the supplementary-flame openings *f f*, I provide the outside of the burner-tube *d* with a sleeve or collar, *s*, and arrange it thereon, so that it may be slid up or down to expose or cover, as the case may be, more or less of the said flame-openings *f f* to the escape of gas according as may be found necessary.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The burner-tube *d*, provided with the openings *f*, in combination with an inside contraction of the passage *l* through said tube, substantially as and for the purpose described.

2. The burner-tube *d*, constructed with the openings *f* and inside contraction, as described, in combination with the chamber F surrounding the burner-tube, substantially as described, for the purpose specified.

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Witnesses:

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