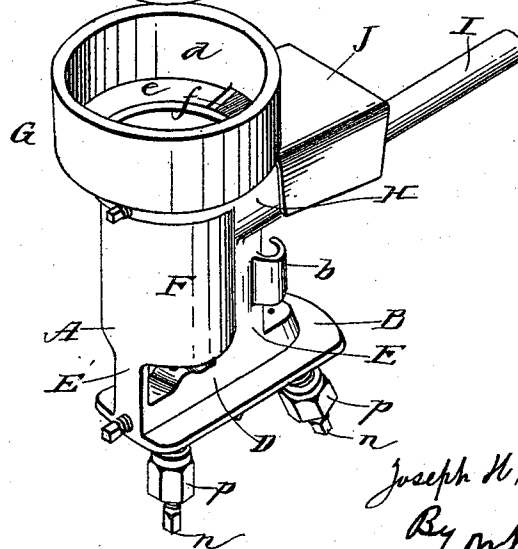
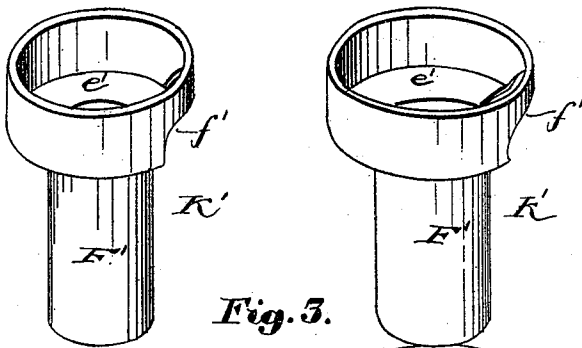
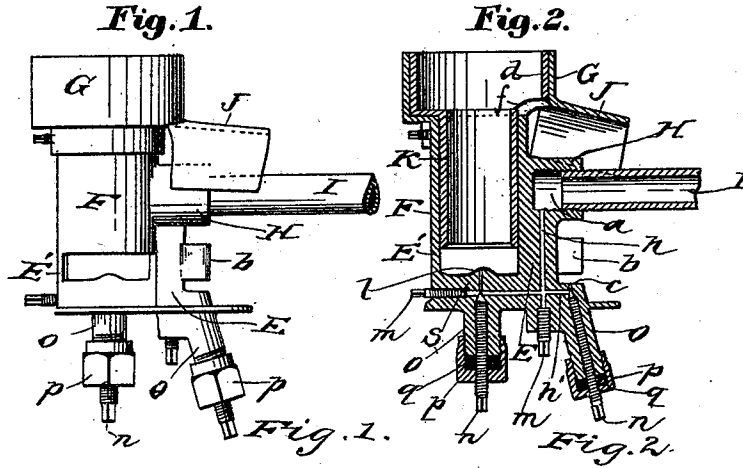


(No Model.)

J. H. MATHEWS.
HYDROCARBON VAPORIZER AND BURNER.

No. 496,523.

Patented May 2, 1893.



Witnesses

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JOSEPH H. MATHEWS, OF CANTON, OHIO.

HYDROCARBON VAPORIZER AND BURNER.

SPECIFICATION forming part of Letters Patent No. 496,523, dated May 2, 1893.

Application filed September 5, 1892. Serial No. 445,059. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH H. MATHEWS, a citizen of the United States, and a resident of Canton, county of Stark, State of Ohio, have invented a new and useful Improvement in Hydrocarbon Vaporizers and Burners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention relates to an improvement in hydro-carbon vaporizers and burners, and particularly to a class of burners adapted to burn the vapor under high pressure as in the operation of assaying and general melting of precious or other metals.

With this object in view my invention consists in providing a hydro-carbon vaporizer and burner having removable portions by which the size and character of the fire or flame may be determined to adapt the burner to the size of crucible to be used and to provide means to control and deflect the sub-jet through an aperture provided therefor into the burners, to light and relight the vapor.

Figure 1 of the accompanying drawings is a side elevation or a hydro-carbon vaporizer and burner, illustrating my invention; Fig. 2 a vertical section, and Fig. 3 a perspective showing the vaporizer and burner and two reducers, which are removed from the burner.

Similar letters of reference indicate corresponding parts in all of the figures of the drawings.

A represents the frame or body of the burner which may be made of any suitable material preferably of brass, said body having a supporting base B, having thereon a rib D, and vertical portions E E' that serve to support the mixing chamber F, and open burner G.

At the side of the vertical portion E' is provided an outwardly projected sleeve or coupler H, in which is formed the vaporizing chamber *a*, the supply pipe I secured to the outer end portion below which and integral with the vertical portion E', are provided inwardly curved wings *b* by which the flame of the sub-jet *c* is deflected or impinged to or upon the vaporizing chamber *a*.

The burner G is of the form shown having an enlarged cylinder portion *d* connected to

the mixing chamber by the off set or shoulder *e* through which is provided an aperture *f* as shown. On the outside of the burner over and above the aperture *f* and integral with the burner is provided an outwardly projected wing portion J, the end portions of which are bent down to form a hood over the vaporizer *a* and the supply pipe I. This wing or hood portion J serves the double purpose of impinging the flame of the sub-jet about the vaporizer chamber, and deflecting the upper portion of the flame of the sub-jet through the aperture *f* into the burner, the object of which is to light or relight the vapor if the flame goes out, because of high pressure of vapor, or imperfect atomization of the hydro-carbon. This is a matter of the utmost importance, as it assures a continuous operation of the burner, without the constant presence of the operator, and further the burner in the furnace under the crucible, is not always accessible.

In operation the vapor passes from the chamber *a* down the tube *h* to the tube *h'* through which it flows to the jet *l* and sub-jet *c*, and from the jet *l* into the mixing chamber F, thence to the burner G.

m are plugs which close the unused end portions of the tube *k*.

Owing to the great pressure under which the burner is used, it has been found necessary to provide a packing about the pin valves *n*. To accomplish this a thread is cut about the ends of the downwardly projected stem *o* on which is fitted a cap gland *p* by which the packing *q* is compacted about the stem of the pin valves *u*.

To reduce the size and capacity of the burner, reducers as K K', are provided having a mixing chamber F and burner G' and aperture *f'*. These reducers are adapted to rest in the mixing chamber F, and burner G, the apertures *f f'* coinciding as shown in Fig. 2.

Having thus fully described the nature and object of my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination in a hydro-carbon atomizer and burner of the vaporizer, and tubes to convey the vapor to the sub-jet and mixing chamber, the deflecting hood by which the sub-

jet is impinged on the vaporizer, pin valves and packing boxes or glands, the mixing chamber F having at its upper end portion an outwardly projected flange or shoulder *e*,
5 the vertical cylinder portion *d*, the deflecting hood J, and aperture *f* through which the sub-jet may pass into the burner, substantially as described and for the purpose set forth.

2. The combination of the atomizer, jet *l*
10 and sub-jet *c*, of the mixing chamber and burner, the deflector J and aperture *f* by which the flame of the sub-jet may pass into the burner, substantially as described and for the purpose set forth.

15 3. The combination with the burner G, of one or more reducers as K and K', having apertures *f* to coincide with a similar aperture in the burner G, through which the flame of the sub-jet may pass to the inside of the burner,

substantially as described and for the purpose set forth. 20

4. In a hydro-carbon burner the combination of the supply pipe and vaporizer, of the mixing chamber having at its upper end portion a burner formed by the projected shoulder *e* and vertical cylinder *d*, of the outwardly
25 and downwardly projected hood J, and aperture *f* by which the sub-jet flame is held about the vaporizer and deflected into the burner, substantially as described and for the purpose set forth. 30

In testimony whereof I have hereunto set my hand this 27th day of August, A. D. 1892.

JOSEPH H. MATHEWS.

Witnesses:

W. K. MILLER,
CHAS. R. MILLER.