

J. S. HULL.
BLOWPIPE.

No. 39,398.

Patented Aug. 4, 1863..

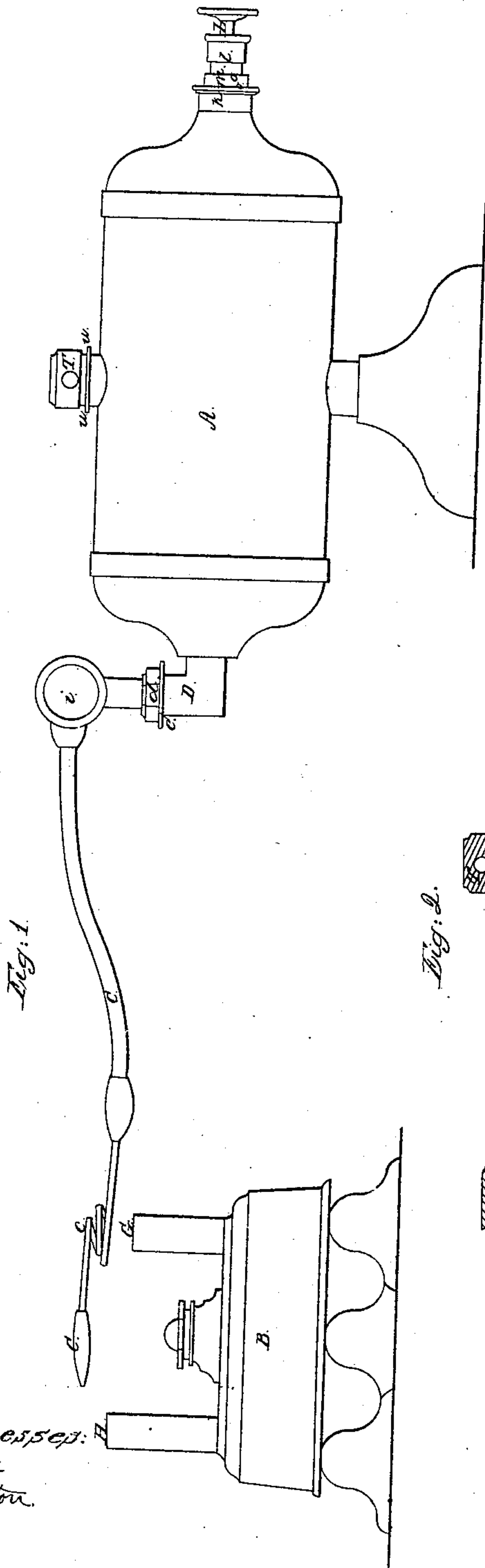


Fig. 1.

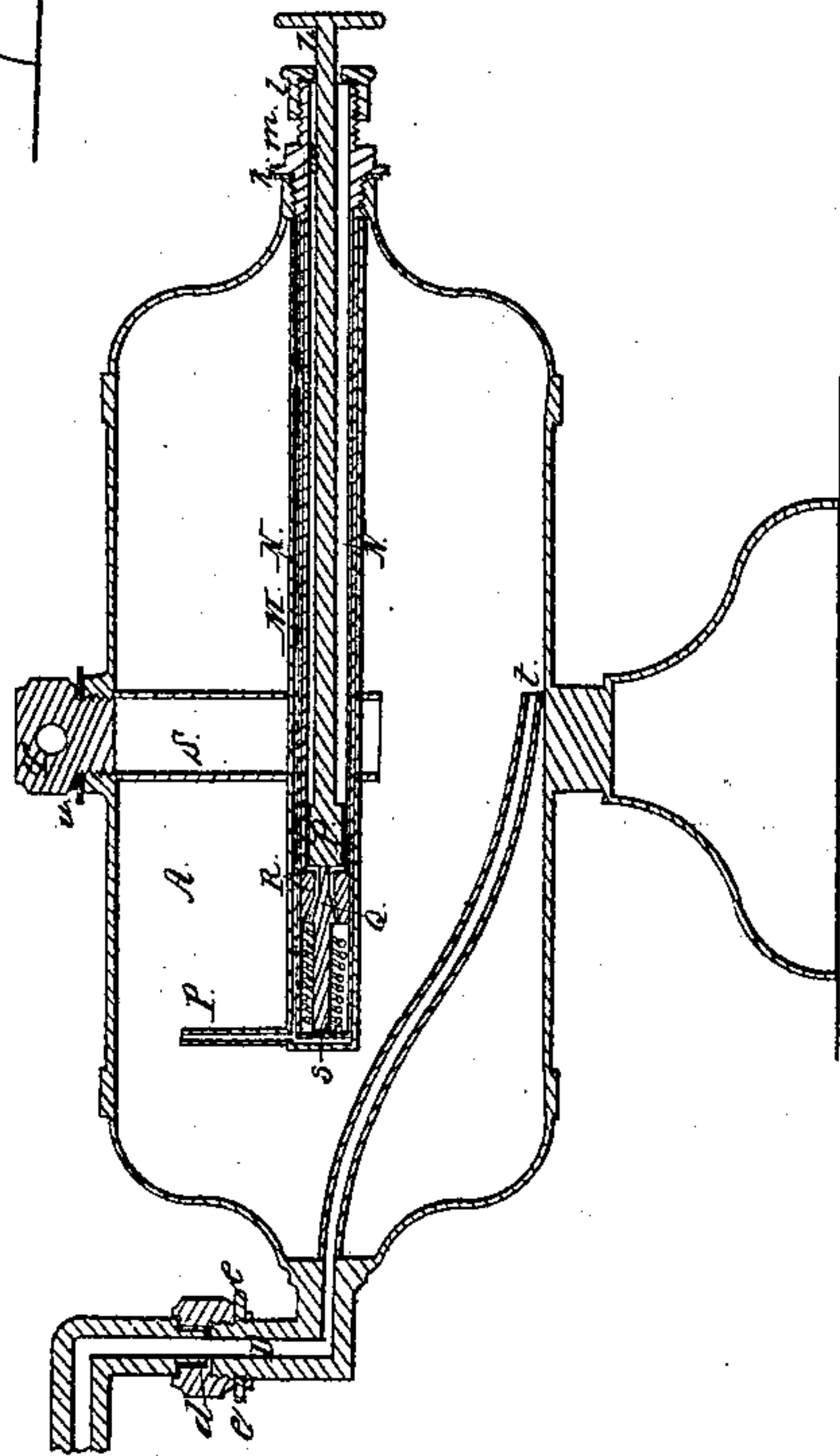


Fig. 2.

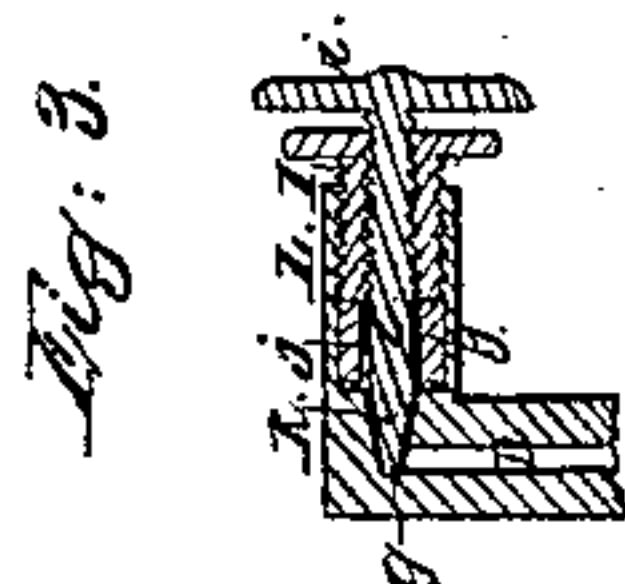


Fig. 3.

Witnesses:
James Brown
H. J. Denton.

Inventor:
John S. Hull,
By his atty,
J. S. Brown

UNITED STATES PATENT OFFICE.

JOHN S. HULL, OF CINCINNATI, OHIO.

IMPROVEMENT IN BLOW-PIPES.

Specification forming part of Letters Patent No. 39,398, dated August 4, 1863.

To all whom it may concern:

Be it known that I, JOHN S. HULL, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and Improved Blow-Pipe; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Figure 1 is a side elevation of the improved blow-pipe complete; Fig. 2, a longitudinal vertical section of the condensing or pressure reservoir; Fig. 3, a vertical section showing the construction of the cut-off or jet regulator.

Like letters designate corresponding parts in all of the figures.

Alcoholic blow-pipes as heretofore constructed have a close boiler, in which the alcohol is boiled and vaporized, and from which the vapor is forced through the jet-pipe by the pressure of that remaining within the boiler. The disadvantages of this arrangement arise from the necessity of heating all the reserve alcohol before the blow-pipe can commence to operate, and of the employment of a separate lamp or heater therefor, and from the liability of explosions, unless the expense of a sure safety-valve is incurred.

The leading features of my invention consist in applying simple atmospheric pressure to the supply-fountain, so as to force the liquid alcohol itself instead of its vapor through the jet-pipe, and in vaporizing it in small, continuous quantities in the jet-pipe itself near its extremity; whereby all the disadvantages above enumerated are obviated, and real advantages are also attained, substantially as hereinafter set forth.

I employ an air-tight reservoir, A, of any suitable shape and material, to hold the alcohol (or other equivalent liquid for the purpose) for supplying the jet; but it is necessary that this reservoir should be only partially filled with the alcohol—say one-half or two-thirds—so that sufficient space shall be left for the introduction and condensation of the pressure air therein; and in order that the requisite air-space may always be reserved, I introduce a filling-tube, S, Fig. 2, reaching down into the reservoir far enough to secure the required air-space above the level of its lower end, since the alcohol will scarcely rise above that line. The filling-cap or stopper T should, of course, be packed, as at *n*, or other-

wise be made to fit air-tight. To this reservoir is attached an air-pump or condenser, which is conveniently and efficiently constructed as follows:

In the reservoir is secured a close tube or pump-barrel, M, of the required length, and having a separate chamber, *s*, in its inner end, or another tube, N, inside of the same, as shown in Fig. 2. These tubes are fastened air-tight in the reservoir by a screw-joint, *n*, cap *m*, and packing *k*, or their equivalent. From the inner end a tube or nozzle, if necessary, ascends above the surface of the alcohol. In the inner end of the tube or barrel N is located a valve, Q, of conical or other suitable form, closing outward into its seat R by a spring, *r*, and by the pressure of the air within the reservoir, and opening inward by the pressure of the air in the barrel when condensed by the forcing forward of the piston.

The piston P is best and surest in action when made solid and in order that a valve may be dispensed with, it is drawn backward at each stop to the mouth of the barrel, or behind orifices *o*, so that air can enter in front of it when in that position. A cap, *l*, serves to prevent the piston's being drawn entirely out of the barrel.

The alcohol is led from the reservoir A first through a tube, *t*, Fig. 2, which reaches from near the bottom, so as to receive the liquid till nearly drained from the reservoir, and conducts it into an intermediate connecting-port, D. This port is provided with a pivot-joint, *d*, tightened with a screw, *f*, and packing *e*, so that the jet-pipe C may be turned horizontally in any desired direction.

In the upper end of the port D is situated a stop-cock for cutting off and regulating the flow of alcohol through the jet-pipe. I construct it substantially as represented in Fig. 3.

The passage between the port D and the opening *h* to the jet-pipe is conical, and stopped by screwing the accurately-fitting conical end *g* of the cock *i* into it. The nut I, in which the cock *i* turns, is also a tightening-cap, which screws into the supporting-socket or barrel L, and compresses a packing-block, *j*, (made of india-rubber, leather, cork, or other suitable elastic material,) and not only tightly packs it against the bottom and sides of the cavity, but around the cylindrical body of the

cock *i* itself. The flow of liquid is regulated by turning the cock *i*, and the packing is tightened by turning the milled head of the nut I.

The jet-pipe C is made as usual, except that provision is made for heating it near its extremity, to vaporize the liquid alcohol as it passes through. For this purpose the blow-pipe lamp B has not only the ordinary flame-burner, H, but a heating-burner, G, arranged so as to throw its flame against the jet-pipe. In order to render the vaporization more rapid and effectual, I usually make a coil or turn, *c*, in the jet-pipe, over the burner G, so as to present a greater length and surface to its heat.

Thus, by simply operating the pump in the reservoir occasionally, so as to condense the air therein, and lighting the lamp B at the two burners G H, the blow-pipe is ready for operation at once, and continues in operation as long as desired without heating the alcohol in the reservoir. It is perfectly controllable, and works exceedingly well, being capable of adjustment with great nicety. All the advantages designed by it as set forth above are ob-

viously attained, and all the disadvantages of common blow-pipes are obviated.

Besides the ordinary uses of blow-pipes, this apparatus may be conveniently employed for cooking and heating water on a small scale, and for other similar uses, with great advantage.

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

The application of atmospheric pressure by simple pumping to the alcohol in the reservoir, forcing the same in a liquid state through the jet-pipe, and vaporizing it therein just before it issues therefrom, substantially as and for the purposes herein specified.

In witness that the above is a complete and exact description of my improved blow-pipe, so as to enable those skilled in the art to make and use the same, I hereunto set my hand this 10th day of December, 1862.

JOHN S. HULL.

Witnesses:

J. S. BROWN,
ZENAS CLEMENT.