

Jan. 12, 1926.

1,569,024

L. OLIPHANT

BLOWPIPE

Filed Feb. 3, 1922

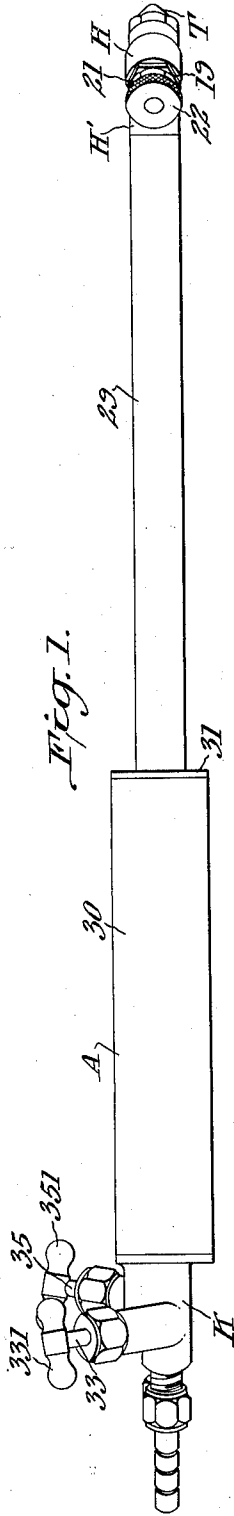


Fig. 1.

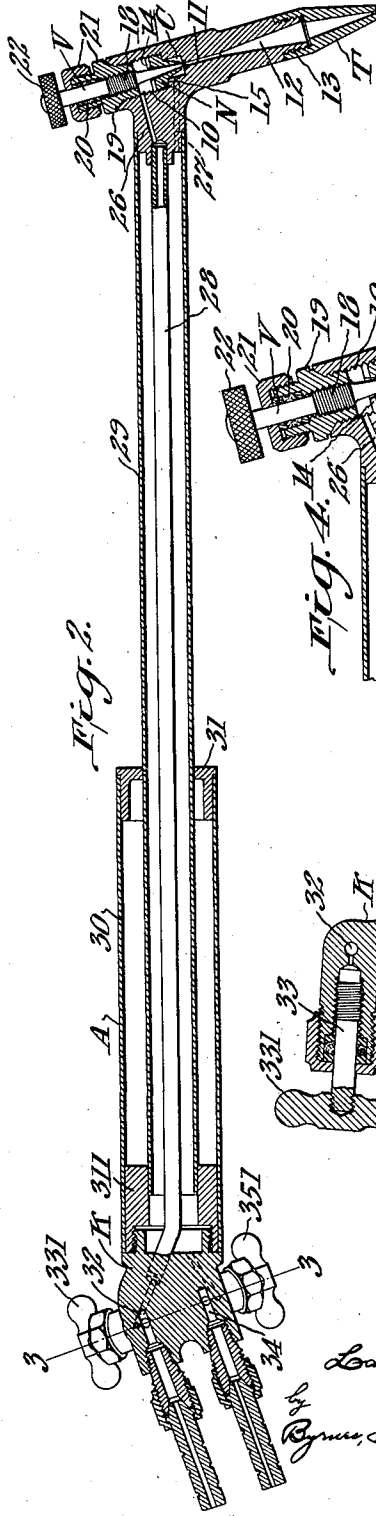


Fig. 2.

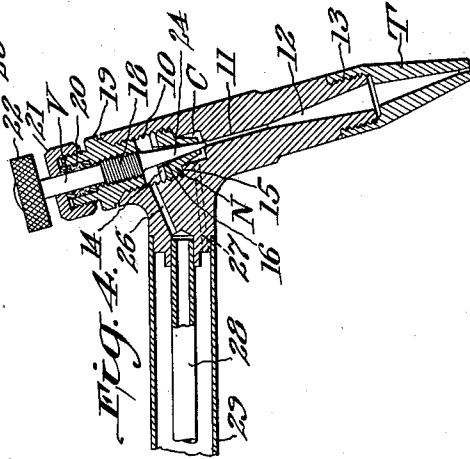


Fig. 4.

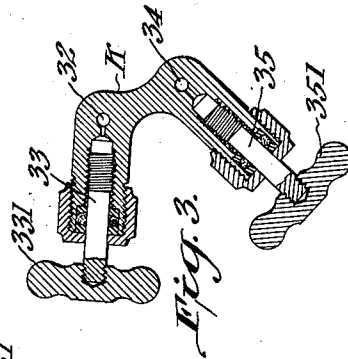


Fig. 3.

Inventor:
Lawrence Oliphant,
By *Bynes, Townsend & Richardson*,
Attorneys.

UNITED STATES PATENT OFFICE.

LAURENCE OLIPHANT, OF TRENTON, NEW JERSEY, ASSIGNOR TO OXWELD ACETYLENE COMPANY, A CORPORATION OF WEST VIRGINIA.

BLOWPIPE.

Application filed February 3, 1922. Serial No. 533,933.

To all whom it may concern:

Be it known that I, LAURENCE OLIPHANT, a citizen of the United States, residing at Trenton, in the county of Mercer and State of New Jersey, have invented certain new and useful Improvements in Blowpipes, of which the following is a specification.

This invention relates to blowpipes and particularly to an improved type of portable welding blowpipe for working metals.

In injector-type blowpipes as heretofore constructed, the throttling action occurs at a point behind the exit orifice of the injector nozzle and before the gas emerges from the injector, causing a slower speed of the jet for certain adjustments. An important object of the present invention is to provide a blowpipe in which the throttling of the gas always occurs at the exit orifice of the injector nozzle so as to give the maximum injector action for any adjustment of the injector valve.

Another object of the invention is to simplify the construction of the blowpipe and to render it more conveniently operable close to the work.

The above and other objects and the novel features of the invention will be apparent from the following description taken in connection with the drawings in which Fig. 1 is a top plan view of the blowpipe; Fig. 2 is a central longitudinal sectional view of the same; Fig. 3 is a detail cross-sectional view taken on the line 3—3 of Figure 2; and Fig. 4 is an enlarged sectional view of the injector nozzle and parts associated therewith.

Generally speaking, the improved blowpipe comprises a one-piece head H of brass or other suitable composition rigidly mounted on a handle A, the rear end of which comprises the valve body or casting K that carries gas controlling valves and the usual hose couplings which are connected to the gas supply devices. The blowpipe herein disclosed is particularly adapted as a welding blowpipe using two gases, such as oxygen and acetylene, the oxygen gas being desirably supplied under a pressure of several pounds and the combustible gas or acetylene being under a pressure of less than one pound, the two gases being mixed by an injector in the head H which utilizes the energy of the high pressure gas to create a suction vacuum to draw the low pressure gas

into the mixing chamber and force the mixture from the tip of the blowpipe. The passage in the nozzle of the injector is adjustable in size so that it may be used with different sizes of tips. The flow of the gases to the injector device is controlled by separate needle valves.

The one-piece head H may be substantially straight and cylindrical and is desirably provided with a rearwardly extending boss H'. The head has a passage extending axially therethrough, the upper end of said passage comprising a threaded socket portion 10 which communicates through a throat 11 with a flaring outlet portion 12 that is adapted to discharge directly into the tapering passage in the tip T, coupled to the lower end of the head, as by screw threads 13. The complete blowpipe comprises a number of tips, similar to the tip T, but of different sizes for various classes of welding. The tips of the blowpipe are desirably of copper or other composition having the necessary heat resisting property.

An injector nozzle N is adapted to be screwed into the threaded socket 10, being desirably provided with a slot 14 arranged to take the end of a screw driver whereby the nozzle may be fitted against the shoulder 15 in the socket. The nozzle N has a passage 16 therethrough that is axially in line with and adapted to discharge into the throat 11. The forward outer portion of the nozzle is tapered to provide a combustible gas chamber C in the socket portion of the head passage adjacent to the entrance of the throat 11, so that the gas discharging from the nozzle into the throat 11 will entrain gas from the chamber C. The mixture flows through throat 11 into the flaring passage 12 and the passage in the tip where a more intimate mixture is effected before the same is finally discharged from the orifice of the tip.

The throttling of the gas passing through the nozzle N is effected by means of the needle valve V, the stem of which has adjusting threads 18 cooperating with corresponding threads in the securing nut 19 that is screwed into and constitutes a closure for the outer end of the socket 10. Suitable packing 20 is held in place between the valve stem and the adjusting nut 19 by the collar 21, to prevent gas leakage, and the outer end of the stem is provided with means for turning or adjusting the same, such as the thumb

wheel 22. By removing the nut 19, the entire valve assembly may be withdrawn as a unit for inspection or repairs. The threaded portion of the socket is of uniform diameter and takes both the threaded portions of the nozzle N and the nut 19, which further simplifies the construction of the blowpipe head.

It is desirable that the gas issuing from the injector nozzle shall have the highest possible orifice velocity and to obtain this the gas passage in the injector and the needle valve working therein are designed so that the throttling of the gas always occurs at the exit orifice of the injector nozzle. The end of the needle valve that operates in the nozzle has a tapered seating surface 24 that is inclined more abruptly than the cooperating seating surface in the nozzle passage 16, so that the end of the needle valve at all times projects through the nozzle. Accordingly, in all positions of the needle valve the throttling of the gas passing through the nozzle takes place at the exit orifice of the nozzle and affords the maximum injector action that is possible for any adjustment of the valve.

The boss H' has an oxygen passage 26 and a combustible gas or acetylene passage 27 which, respectively, communicate with the socket 10 behind the injector nozzle and with the chamber C. Gas is supplied to the passages 26 and 27, respectively, by concentrically arranged pipes 28 and 29 which are soldered or otherwise rigidly secured to the boss H' and extend through the handle shell 30 to the rear casting or valve body K, the pipe 29 being soldered to the collars 31 and 311 which carry the handle 30. The oxygen pipe 28 communicates with a passage 32 in the valve body K that is controlled by a suitable valve 33 and the acetylene pipe 29 communicates with a passage 34 that is controlled by a valve 35. The valves fit into internally threaded bosses on the body K and may be provided with suitable operating handles 331, 351. Heretofore, the lower valve 35 has been disposed so as to project perpendicularly downwardly from the valve body K and, when the blowpipe is in use, interferes with operations close to the work. In the improved blowpipe herein disclosed the valve 35 and the handle 351 thereof project laterally from a perpendicular plane through the blowpipe and are disposed above the horizontal plane that includes the lowest parts at the opposite ends of the blowpipe, whereby the handle does not interfere with the operation of the blowpipe close to the work.

The manipulation of the blowpipe will be readily understood from the drawings and the foregoing description. Briefly, after the valves 33 and 35 have been adjusted to admit the desired flow of oxygen and acetylene,

further adjustment of the valve V adjusts the oxygen jet issuing from the injector nozzle in accordance with the size of welding tip T that is employed. The acetylene or combustible gas carried into the mixing passages by entrainment is indirectly varied by adjusting the needle valve V.

While the improved blowpipe is shown and described in detail, it will be understood that various changes may be made therein without departing from the spirit of the invention.

I claim:

1. In a blowpipe, the combination of a head having a gas passage comprising a socket and a throat, an injector nozzle in said socket having a tapering passage therethrough arranged to discharge into said throat and providing a chamber adjacent the entrance of said throat, said head having a combustible gas duct opening into said chamber and an oxygen duct opening into said socket behind said nozzle, a tapering needle valve disposed in said nozzle passage and having its seating surface more abruptly inclined than the cooperating seat in said nozzle passage, and a nut having threads coupling it to said head and to said valve.

2. In a blowpipe, the combination of a one-piece head having a gas passage comprising a socket and a throat, an injector nozzle having threads securing it in said socket and having a tapering oxygen passage therethrough with its exit orifice spaced from but arranged to discharge into said throat, said nozzle providing a combustible gas chamber adjacent the entrance of said throat, a tapering needle valve having its seating surface more abruptly inclined than the cooperating seat in said nozzle passage and projecting through said nozzle passage at all times whereby the throttling of the gas always occurs at the exit orifice of said nozzle and a nut having threads coupling it to said head and to said valve and constituting a closure for said socket.

3. In a blowpipe, the combination of a head having means at one end for securing a tip thereto, a threaded socket at its other end terminating at an interior shoulder in said head, a chamber in front of said shoulder, and a gas passage leading from said chamber to said tip; an injector nozzle having threads cooperating with the threads of said socket and also having a screw driver slot at its rear end whereby said nozzle may be removably secured in said socket, said nozzle projecting into said chamber and adapted to discharge into said gas passage; said head having passages for leading gases to said socket behind said injector and to said chamber; a valve controlling the flow of gas through said nozzle; and a nut having threads removably coupling it to said head and other threads adjustably support-

ing said valve, said nut constituting a closure for said socket and adapted to remove said valve therewith from said head.

4. In a blow pipe, the combination of a head having means at one end for securing a tip thereto, an internally threaded socket at the other end of said head terminating at an interior shoulder in said head, a chamber in front of said shoulder, and a gas passage leading from said chamber to said tip; an injector nozzle having threads cooperating with the threads of said socket behind said shoulder and also having a screw driver slot at its rear end whereby said nozzle may be removably secured in said socket against said shoulder, said nozzle projecting into said chamber and adapted to discharge into said gas passage; said head having a boss on its rear side provided with ducts for leading oxygen and combustible gas respectively to said socket behind said injector nozzle and to said chamber; a needle valve controlling the flow of gas through said nozzle; and a nut having threads removably coupling it to said head and other threads adjustably supporting said valve,

said nut constituting a closure for said socket and adapted to remove said valve therewith from said head to render said nozzle easily accessible for inspection or removal.

5. In a blowpipe, the combination of a head having a socket therein provided with a threaded portion of uniform diameter and a gas passage leading from said socket through said head, a threaded injector nozzle fitting the thread of said socket, arranged to discharge into said gas passage and providing a chamber adjacent the entrance of said passage, said head having gas ducts opening into said chamber and into said socket behind said nozzle, a valve controlling the flow of gas through said nozzle, and a nut having a thread fitting said socket thread to couple it to said head and a central threaded portion cooperating with said valve, said nut constituting a closure for said socket and adapted to remove said valve therewith from said head.

In testimony whereof, I affix my signature.

LAURENCE OLIPHANT.