P. F. WILLIS.

OXYACETYLENE TORCH.

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1,039,238.

Patented Sept. 24, 1912.

Fig. 1.

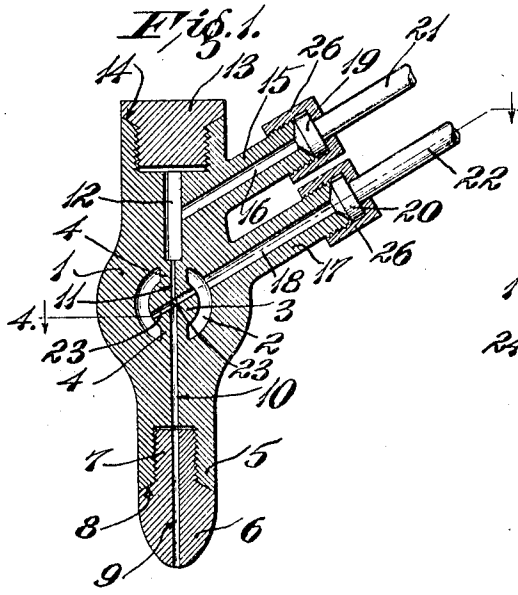


Fig. 2.

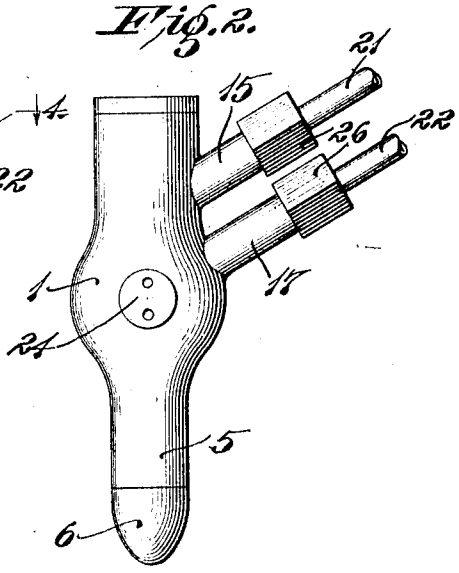


Fig. 3.

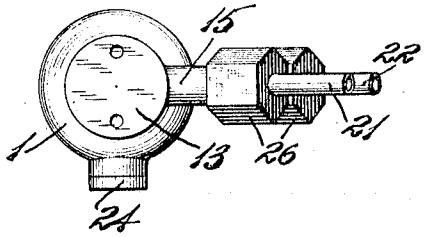


Fig. 5.

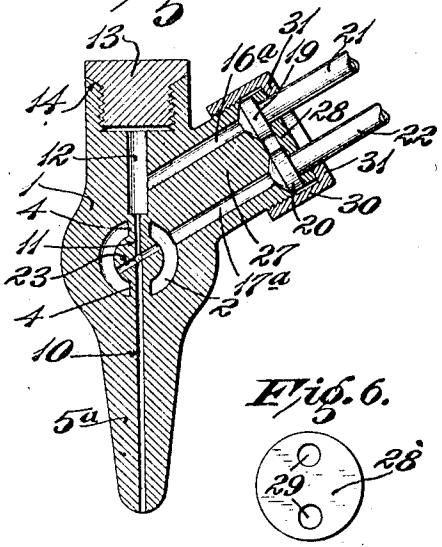


Fig. 4.

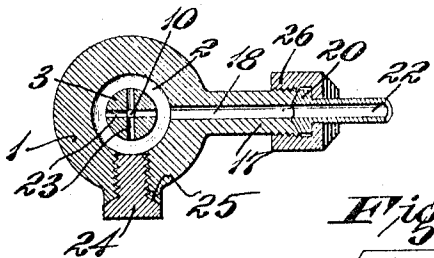
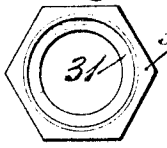


Fig. 6.

Fig. 7.



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UNITED STATES PATENT OFFICE.

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OXYACETYLENE-TORCH.

1,039,238. Specification of Letters Patent. Patented Sept. 24, 1912.

Application filed October 6, 1911. Serial No. 653,162.

To all whom it may concern:

Be it known that I, PRIOR F. WILLIS, a citizen of the United States, and a resident of the city of St. Louis and State of Missouri, have invented a new and useful Improvement in Oxyacetylene-Torches, of which the following is a specification.

This invention relates to burner torches and more particularly to oxy-acetylene welding torches.

It has for its principal objects to avoid leakage and secure a positive and uniform mixture of acetylene gas and oxygen, to minimize the number of parts and fittings, and to attain certain other advantages hereinafter more fully appearing.

In the operation of oxy-acetylene torches it is essential that a thorough and positive mixture of the oxygen and acetylene gas be obtained continuously in a uniform proportion, but in many of the devices now in general use, owing to the multiplicity of interfitting screw-threaded parts, the mixture varies, due to leaking joints caused by an unequal expansion of the parts when the nozzle or head becomes heated.

My invention, therefore, consists primarily in a nozzle or head in which the mixing chambers and passageways are contained in an integral structure, rather than in a number of coöperating assembled members.

The invention further consists in the parts and in the arrangements and combinations of parts hereinafter described and claimed.

In the accompanying drawing which forms part of this specification and wherein like symbols refer to like parts wherever they occur,—Figure 1 is a section through a nozzle head made in accordance with my invention; Fig. 2 is a side elevation; Fig. 3 is a top plan view; Fig. 4 is a horizontal section on the line 4—4 of Fig. 1; Fig. 5 is a vertical section showing a modification of the nozzle head; Fig. 6 is a face view of the perforated disk for securing the supply pipes to the nozzle head shown in Fig. 5; and Fig. 7 is a view of the securing nut which coöperates with the perforated disk.

Referring now more particularly to Figs. 1 to 4, inclusive, the nozzle head 1 comprises a casting or integral member which is cored to provide a spherical chamber 2 in the middle of which is a spheroid 3, the latter being connected to the body of the head by diametrically opposite necks 4, so that said chamber 2 may also be defined as annular or circular. The middle portion of the nozzle head which contains the chamber 2, is enlarged and globular while the nozzle portion 5 is reduced or tapered. In the end of the nozzle portion 5 is secured a nozzle tip 6 of a metal or material that will withstand the intense heat and not fuse with metal being welded. This tip 6 has a screw-threaded shank portion 7 which is fitted tight into a screw-threaded bore in the nozzle portion 5, and a tapered shoulder 8 which fits in a counterpart seat in the end of the nozzle portion. Both the shoulder 8 and seat are ground so as to secure a tight joint. The tip 6 is provided with a drill hole 9 which is alined axially with a drill hole 10 in the body portion of the nozzle head. The upper portion 11 of the drill hole 10 which lies just above the center of the spheroid 3 and extends through the upper connecting neck 4, is of considerably smaller diameter than the lower portion, while the portion 12 above the portion 11 is considerably larger. The larger bore 12 is provided as a receiving chamber and also to facilitate drilling the small bore 11. The bore 10 may be conveniently drilled through the bore in which the tip 6 is fitted. The upper end portion of the nozzle head is bored to a still larger diameter and screw-threaded to receive a screw-plug 13. This screw-plug is provided with a beveled shoulder 14 which is ground to make a tight joint with a counterpart seat provided in the end of the nozzle head. Extending laterally from the nozzle head at an angle, as shown, or at any other desirable angle, depending upon the manner in which the torch is to be handled, is a cylindrical lug or extension 15 which is provided with an axial bore 16 communicating at its inner end with the bore 12. A second extension 17 is provided with a bore 18 which communicates at its inner end with the spherical chamber 2. Each of these extensions 15, 17, is provided with a seat in its end to receive a counterpart end face of enlargements or collars 19 and 20 on the ends of supply pipes 21 and 22, respectively. The pipe 21 is the oxygen pipe and the pipe 22 is the acetylene gas pipe, each being, in practice, connected at their outer ends to flexible tubing (not shown), which in turn communicates with the respective sources of supply. The spheroid 3 in the middle of the spherical cham-

ber 2 is provided with cross passages 23 which intersect the drill holes 10 and 11. One of the cross passages 23 is drilled in axial alinement with the acetylene gas passage 18 in the extension 17 while the other cross passage may be drilled through an opening in the side of the nozzle head. This opening is originally provided to extract the core which forms the chamber 2 when the head is cast. And by screw-threading the opening and fitting a screw-plug 24 therein it may be utilized in cleaning the chamber 2 and cross passages 23 by removing the plug as required. The plug 24 is provided with a ground shoulder 25 similar to those on the nozzle tip 6 and plug 13. As the respective plugs 13 and 24 and nozzle tip 6 seldom have to be removed, it is obvious that the joints will remain tight. In practice, the passageways in the head are proportioned for a given pressure and mixture of oxygen and acetylene-gas. The heads are made so as to be detached as a whole from the supply pipes 21 and 22, instead of providing the head with interchangeable internal parts for varying the relative sizes of the passageways and mixing chamber for different work. Each head, therefore, is made for a predetermined mixture and pressure and the extensions 15 and 17 are made to a given standard so as to be interchangeably fitted to the supply pipes 21 and 22, respectively. By making the ground joints between the heads 19 and 20 and seats in the ends of the extensions 15 and 17, nuts 26 are all that are required to hold the joints tight.

In Fig. 5 the nozzle head is modified. In this construction, the separate tip 6 is dispensed with and the nozzle portion 5^a is tapered and rounded at its end. So, too, instead of providing separate extensions 15 and 17, a single lug or boss 27 is provided on the nozzle head. This boss 27 has two passageways 16^a and 18^a which communicate at their inner ends with the upper bore 12 and spherical chamber 2, respectively. In this case, a disk 28 is provided with two perforations 29 so that it may be slipped over the supply pipes 21 and 22; and a single nut 30 having an inturned annular shoulder 31 is threaded onto the boss 27 so as to clamp the disk 28 tight against the heads 19 and 20 on the ends of the respective supply pipes.

Obviously, any other suitable means for detachably connecting the nozzle heads and making them interchangeable with respect to the supply pipes may be substituted in lieu of the devices shown, and the entire torch admits of considerable modification without departing from my invention. Therefore, I do not wish to be limited to the specific construction and arrangement shown.

What I claim is:

1. In an oxy-acetylene torch a burner head comprising a body having a nozzle extension and a coupling extension or extensions, said body having intercommunicating passageways for oxygen and acetylene gas, respectively, said coupling extension or extensions having supply ducts for oxygen and acetylene gas communicating with the respective intercommunicating passageways, said nozzle extension having a passageway for mixed oxygen and acetylene gas extending therethrough and communicating with said intercommunicating passageways at their point of connection, said body and coupling and nozzle extensions being integral throughout said passageways and ducts.

2. A burner head for oxy-acetylene torches comprising a body having a nozzle extension, said body being relatively larger in diameter than the nozzle extension and having an annular chamber extending about its longitudinal axis, the portion of the body within said chamber having a transverse passageway therethrough communicating at its ends with the chamber, said body having an axial passageway communicating at one end with said transverse passageway, an oxygen supply duct communicating with said axial passageway and an acetylene-gas supply duct communicating with said annular chamber, said nozzle extension having an axial passageway therethrough extending into said body and communicating with said transverse passageway, said body and nozzle extension being integral throughout said passageways and ducts.

3. A burner head for oxy-acetylene torches comprising a body having an integral nozzle extension, said body having an annular chamber extending about its longitudinal axis, a transverse passageway extending through the portion of the body within said chamber and communicating at its ends with the chamber, said body having an axial bore adjacent to its end, the outer portion of said bore being counterbored and closed by a removable plug, an axial passageway communicating at its inner end with said transverse passageway and at its outer end with said axial bore, a lateral oxygen supply duct communicating with said axial bore, a lateral acetylene-gas supply duct communicating with said annular chamber, and a lateral opening adapted to communicate with said annular chamber and closed by a removable plug, said nozzle extension having an axial passageway therethrough extending into said body and communicating with said transverse passageway.

4. In an oxy-acetylene torch, a burner head provided with an integral nozzle portion, the burner head at the base of the

nozzle portion being enlarged and globular, said globular portion having a central annular chamber extending around the axis thereof, a longitudinal outlet passageway extending axially through the nozzle portion and into the globular portion, a transverse passageway communicating with the inner end of said outlet passageway and communicating at its opposite ends with said annular chamber, said burner head also having a restricted axial passageway in line with said outlet passageway and communicating at its end with said transverse passageway, said burner head also having an acetylene gas passageway communicating with said annular chamber and an oxygen passageway communicating with said restricted passageway.

Signed at St. Louis, Missouri, this 3rd day of October, 1911.

PRIOR F. WILLIS.

Witnesses:
G. A. PENNINGTON,
PAULINE AMBERG.