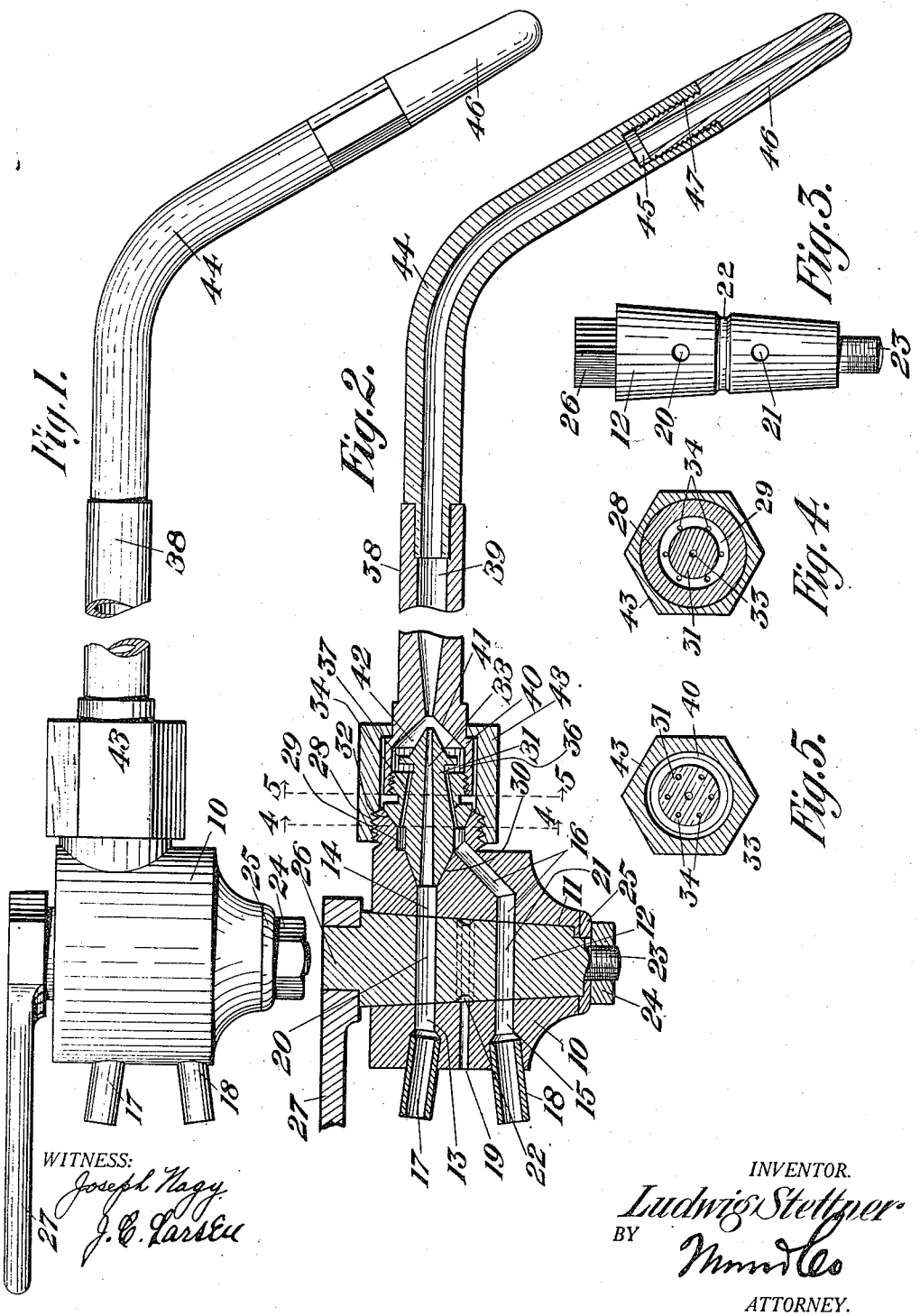
L. STETTNER.

TORCH.

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TORCH.

1,216,875. Specification of Letters Patent. Patented Feb. 20, 1917.

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To all whom it may concern:

Be it known that I, LUDWIG STETTNER, a citizen of the United States, and a resident of Oakland, in the county of Alameda and State of California, have invented certain new and useful Improvements in Torches, of which the following is a specification.

My invention relates to improvements in oxygen-acetylene torches, for welding or the like.

An important object of the invention is to provide apparatus of the above mentioned character, having means for effecting an intimate and thorough mixture of the oxygen and acetylene gas, in desired proportions, such means also serving to prevent back-firing of the mixture.

A further object of the invention is to provide apparatus of the above mentioned character, which is simple in construction, inexpensive to manufacture, convenient in use, strong and durable.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a side elevation of apparatus embodying the invention;

Fig. 2 is a central vertical longitudinal sectional view through the apparatus;

Fig. 3 is a side elevation of a valve removed;

Fig. 4 is a transverse sectional view taken on line 4—4 of Fig. 2, and,

Fig. 5 is a similar view taken on line 5—5 of Fig. 2.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 10 designates a housing provided with a main preferably conical opening 11, for the reception of a conical pivoted valve 12. The housing 10 is provided with an upper pair of alined oxygen ports 13 and 14 and with a lower pair of alined acetylene gas ports 15 and 16, as shown. An oxygen supply pipe 17 leads into a port 13, while an acetylene gas supply pipe 18 leads into the port 15, as shown. The housing 10 is also provided with an escape port 19, communicating with the atmosphere, for a purpose to be described. The pivoted valve 12 is provided with an upper transverse oxygen port 20, adapted for movement into and out of registration with the ports 13 and 14. This valve is also provided with a transverse acetylene port 21, adapted for movement into and out of registration with the ports 15 and 16, as shown. The valve 12 is provided between these oxygen and acetylene ports with an annular escape groove 22, in registration with the escape port 19. The function of this groove and escape port is to provide means whereby the oxygen or the acetylene gas, or both, may escape to the atmosphere, prior to passing to the mixing chamber to be described, should the valve 12 work loose and allow of the escape of the gases. At its lower end, the valve 12 is provided with a reduced screw-threaded extension 23, carrying a nut 24, and a washer 25 is preferably arranged between the nut and the lower end of the housing, as shown. The valve 12 is provided at its upper end with a reduced shank 26, upon which is rigidly mounted a handle 27, by means of which the valve 12 may be turned.

The housing 10 is provided with an exteriorly screw-threaded tubular boss 28, having an interior annular acetylene gas receiving chamber 29, in communication with a tapered opening 30, leading to the port 14, as shown. The numeral 31 designates a mixing nozzle, having a beveled flange 32, adapted to contact with the beveled end of the boss 28. The inner end of this nozzle is tapered and fits within the opening 30, so that the longitudinally extending tapered oxygen port 33 of the nozzle is in communication with the port 14, while the acetylene gas chamber 29 has no communication with this port, as is obvious. The chamber 29, however, has communication with the port 16, to receive acetylene gas therefrom. The nozzle 31 is provided with forwardly converging acetylene gas ports 34, the rear ends of which communicate with the chamber 29, and the forward ends of which discharge into an annular space 36, as shown. The nozzle 31 has its forward end apertured as shown, and is provided with an annular deflector flange or baffle 37, as shown.

The numeral 38 designates an expansion tube, having an apertured bore 39, increasing in diameter forwardly. This tube is provided with an enlarged tubular head 40, the opening of which has a tapered or coni-

cal end portion 41, in communication with the bore 39. This enlarged head has screw-threaded engagement with the nozzle and co-operates therewith for forming a tapered or conical mixing chamber 42, as shown. The enlarged head 40 is arranged within and engaged by a coupling 43, having screw-threaded engagement with the boss 28, as shown.

Connected with the tube 38 is a pipe or conduit 44, the free end of which is counter-bored and internally screw-threaded, providing an enlarged chamber 45. The numeral 46 designates a burner tip of any well known or preferred construction having a screw-threaded shank 47, adapted for engagement within the opening of the tube 44. As shown in Fig. 2, the inner end of the shank 47 is spaced a substantial distance from the shoulder of the chamber 45, which functions to retain the oxygen and acetylene gas thoroughly mixed, as it passes to the burner and this chamber 45 may be made longer by decreasing the length of the shank 47.

In operation, the valve 12 is turned to bring the port 20 into registration with the ports 13 and 14; and the port 21 into registration with the ports 15 and 16; whereby the acetylene gas is supplied into the conical mixing chamber 42, through the circular group of ports 34, while the oxygen is passed into the chamber within the streams of acetylene gas, through the port 33. The oxygen and acetylene gas become intimately mixed in this chamber 42, and the mixture passes into the expansion tube 38, and is more intimately mixed therein. The mixture passes through the tube 44 and through the chamber 45 and into the burner tip 46, to be ignited at the free end of the burner. The arrangement of the mixing nozzle and associated elements is such that back-firing of the mixture is effectively prevented.

Should the valve 12 work loose from its seat, allowing of the escape of the oxygen and acetylene gas, or both, so that they would not be properly supplied to the mixing chamber 42, such gas or gases will pass about the valve and its seat and discharge into the annular groove 22, and through port 19 to the atmosphere, thus following the course of least resistance and completely cutting off the supply of gas or gases to the mixing chamber.

One of the main novel features of my torch is the baffle 37 which has two functions, first—diverting the multiple streams of acetylene gas around the edge of the baffle to give the acetylene gas a whirling effect before it meets the oxygen and thus making an even mixture of the two gases with the same amount of each and reducing the consumption of the two gases over torches now known to me, and, second—the baffle positively prevents back-firing in the torch for the reason that the flashback cannot reach the actylene ports 34.

Another novel feature is that of the multiple ports 34 which break the acetylene into a number of distinct and relatively minute streams and direct said streams away from the edge of the baffle 37 for the reasons above stated.

Another novel feature is that of the forwardly flared bore 39 leading from the mixing chamber 42 and which produces a soft and even flame and prevents the blowing and hissing noises of torches now known to us.

Another feature is that of the chamber 45 which maintains the oxygen and acetylene in thoroughly mixed condition previous to the emission of the mixture at the burner tip.

Another feature is that of the mixing chambers being far removed from the end of the tip, the gases thus entering the mixing chambers while cool and remain cool after thorough mixing all the way to the point of combustion, whereas in torches known to me the mixing chamber is in the head directly over the flame whereby the gases are heated before they are mixed, thereby producing an oxidizing flame.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, what I claim is:—

1. In apparatus of the character described, a housing provided with oxygen and acetylene gas ports, a valve movably mounted within the housing to control the passage of the oxygen and acetylene gas through their ports, a tubular boss carried by the housing and having an opening communicating with the oxygen ports, a nozzle having one end extending into the opening and provided with a longitudinal inner oxygen port to communicate with the first-named oxygen port and forming with the tubular boss an annular acetylene gas chamber having communication with the acetylene gas port and provided with acetylene gas ports having communication with the acetylene gas chamber and arranged exteriorly of the longitudinal inner oxygen port, a mixing chamber receiving the forward end of the nozzle and in communication with the oxygen and acetylene gas ports thereof, a conduit connected with the mixing chamber, and a burner tip connected with the conduit.

2. In apparatus of the character described, a housing provided with oxygen and acetylene gas ports, a valve movably mount-

ed within the housing to control the passage of the oxygen and acetylene gas through their ports, a tubular boss carried by the housing and having an opening in communication with the oxygen port, a nozzle having one end extending into the opening and provided with an inner longitudinal oxygen port communicating with the first-named oxygen port, said nozzle forming with the tubular boss an annular acetylene gas chamber having communication with the acetylene gas port, said nozzle being provided with a plurality of acetylene gas ports surrounding the oxygen port thereof and communicating with the acetylene gas chamber, said nozzle being further provided near its forward end and forwardly of its acetylene gas ports with a deflector, a mixing chamber receiving the forward end of the nozzle and having communication with the oxygen and acetylene gas ports thereof, a conduit connected with the mixing chamber, and a burner tip connected with the conduit.

3. In apparatus of the character described, a housing provided with oxygen and acteylene gas ports, a valve movably mounted within the housing to control the passage of the oxygen and acetylene gas through their ports, a tubular boss carried by the housing and provided with an opening in communication with the oxygen port, a nozzle having one end extending into the opening, provided with an inner longitudinal oxygen port in communication with the first-named oxygen port, forming with the tubular boss an annular acetylene gas chamber having communication with the acetylene gas port, provided with a plurality of acetylene gas ports surrounding the oxygen port thereof and communicating with the annular acetylene gas chamber, and provided near its forward end and forwardly of its acetylene gas ports with a deflector, a tube having a tapered bore increasing in diameter forwardly and provided with an enlarged tubular head having a tapered end wall for its bore, the tubular head being connected with the nozzle and forming therewith a mixing chamber, a coupling receiving the tubular head and boss and serving to connect them, a conduit connected with the tube, and a burner tip carried by the conduit.

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Witnesses:
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