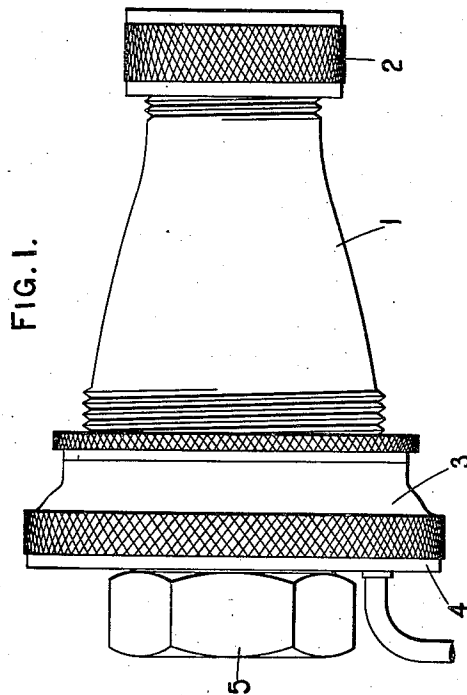
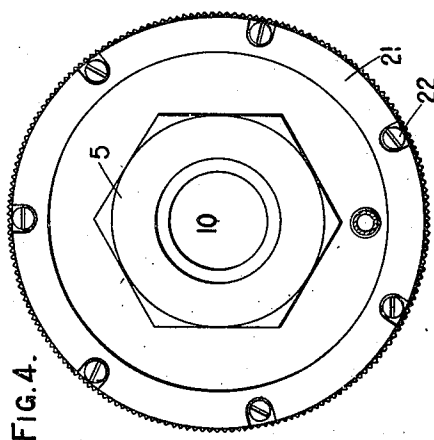


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OXYACETYLENE BLOWPIPE.
APPLICATION FILED MAY 23, 1921.

1,409,433.

Patented Mar. 14, 1922.
2 SHEETS—SHEET 1.



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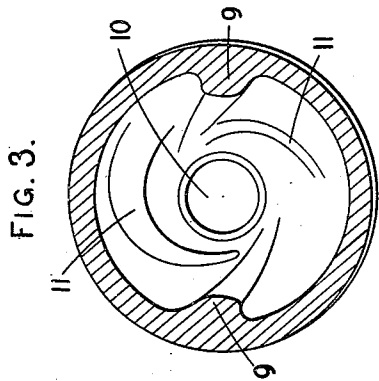
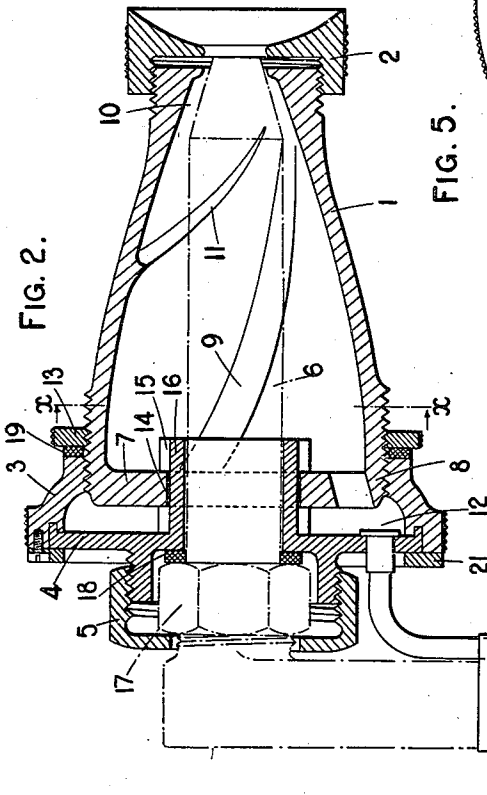
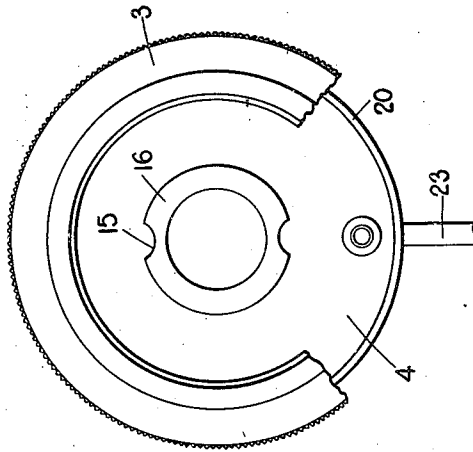


FIG. 5.



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UNITED STATES PATENT OFFICE.

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OXYACETYLENE BLOWPIPE.

1,409,433.

Specification of Letters Patent. Patented Mar. 14, 1922.

Application filed May 23, 1921. Serial No. 471,961.

To all whom it may concern:

Be it known that we, JOSEPH WASS and ROY SUMNER MACGREGOR, both subjects of the King of Great Britain and Ireland, residing at The Clyde Marine and Motor Engineering Works, Newhaven, in the county of Sussex, England, and 8 High Street, Newhaven, in the county of Sussex, England, respectively, have invented certain new and useful Improvements in and Relating to Oxyacetylene Blowpipes, (for which we have filed an application in England Mar. 22, 1920, No. 8,465,) of which the following is a specification.

The present invention relates to improvements in oxy-acetylene blow pipes for use in the autogeneous cutting of metal under water of the type furnished with means for enabling the flame to be enveloped with a mantle of compressed air for the purpose of displacing the water immediately surrounding the flame so that said flame may act freely on the metal it is desired to cut.

In the burners heretofore devised for the cutting of metal under water the compressed air has been admitted to a ring or chamber surrounding the nozzle of the burner through an aperture located in the side wall of said ring or chamber and allowed to issue from a series of apertures provided in the ring or from an annular passage formed around the nozzle, the arrangement in either case being such that the air issues in a mantle co-axial to and approximately parallel with the flame.

From experience it has been found necessary to so arrange the parts that the compressed air issues from the nozzle of the chamber surrounding the nozzle of the blow pipe with greater force at a point below said nozzle and at an angle to the axis of the flame, and it is the object of this invention to provide a blow pipe with means for enabling this result to be attained.

As in the known devices, the chamber to which compressed air is delivered, is according to this invention adapted to surround the nozzle of the blow pipe, but in the present case the chamber has a much larger area at the back end where the compressed air enters than it has at the nozzle or exit end and in addition the interior surface and the orifice of said chamber are so formed that the air is directed to the bottom of the chamber and issues from said orifice with a cyclonic or spiral effect.

The device forming the subject of this invention is used in combination with a metal blow pipe of any suitable construction, having a nozzle adapted to be supplied with oxygen and acetylene gas through independent pipes connected to the respective gas holders. Suitably connected to the blow pipe and arranged so as to completely surround the nozzle is a chamber suitably connected with a supply of air or the like under pressure, a suitable non-return valve being located between the chamber and the source of supply. The chamber is provided on its interior with a plurality of spirally arranged vanes or ribs forming by and between them a series of grooves or channels the outer ends of which terminate at or near the nozzle. The outer face of the chamber, in proximity to the nozzle, may be formed concave or cup shaped for the purpose of producing, in conjunction with the spiral grooves or channels within the chamber, a cyclonic effect as the air or the like under pressure issues from the nozzle of the chamber.

In the accompanying drawing which illustrates a form of construction of this invention:—

Figure 1 is a side elevation.

Figure 2 is a sectional elevation showing the device forming the subject of this invention, applied to an oxy-acetylene blow pipe, in the position in which it should be held when in use.

Figure 3 is a section on line $x-x$ Figure 2, looking towards the nozzle end of the attachment.

Figure 4 is an end view of the outer face of the base of the attachment.

Figure 5 is an end view of the inner face of the base with the chamber removed and part of the adjusting ring cut away.

The device comprises, according to the construction illustrated a chamber 1, an adjustable nose 2 an adjusting ring 3 and a fixed base 4 furnished with a union nut 5 by means of which the attachment is firmly secured to the nozzle 6 of the blow pipe. The parts 1 and 4 are so arranged that they may be adjusted in an axial direction with relation to each other but so that they have no independent rotary movement.

The chamber 1, is provided with a base 7 furnished with a port 8, and the interior wall is provided with a series of vanes or ribs, forming by and between them a series

of channels or grooves. There are two oppositely disposed main vanes 9 which extend from the base 7 of the chamber to the nozzle aperture 10, and two shorter vanes 11 which extend approximately from the middle of the chamber to the aperture 10, the outer face of each vane towards the nozzle end of the chamber is arranged to project towards the axis of the chamber so that it will lie in close proximity to the face of the nozzle when the chamber is attached to the blow pipe.

The vanes are so disposed that that part of the wall running from the aperture 8 to the nozzle aperture 10 is unobstructed, thereby leaving a clear passage for the compressed air as it issues through the port 8 from the chamber 12 formed between the base 4 and the base 7 of the chamber 1, and the air that finds its way into the upper part of the chamber is directed downwardly by the vanes and is caused to pass through the channels between said vanes to the aperture 10 in a spiral direction, the main volume of air at the highest pressure being caused to issue from the nozzle 10 below the nozzle 6 of the blow pipe.

If it is desired to vary the volume and the pressure of the air issuing from the nozzle 10, the lock nut 13 is slackened and the adjusting ring 3 is turned so as to cause the chamber 1 to move axially towards or away from the fixed base depending on whether it is desired to reduce the volume and consequently increase the pressure, or, to increase the volume and decrease the pressure. Rotary movement of the chamber 1 is prevented by the projections 14 on the base of the part 1 engaging with the grooves 15 formed in the central boss 16 on the fixed base 4. When the desired change has been effected, the lock nut is tightened up.

If it is desired to increase or decrease the distance between the face of the plate being operated on and the end of the nozzle 6 the part 2 is moved axially by a rotative movement on the part 1.

When the device is to be used with a blow pipe of the type illustrated in dotted lines in Figure 2, the nozzle 6 of said blow pipe is first removed by unscrewing the union nut 17, the union nut 5 is then slipped on and the union nut 17 and nozzle replaced. A washer 18 is slipped over the nozzle 6 and the base 4 carrying the adjusting ring 3 is secured in position by the union nut 5 an air tight joint being thereby secured between the nozzle 6 and base 4. The chamber 1 is then placed in position on the boss 16 and the adjusting ring 3 is turned to engage the screw thread at the base of the chamber 1 which is adjusted to the desired position and locked therein, a washer 19 being preferably interposed between the adjusting ring 3 and lock nut 13 to secure an

air tight joint between the chamber 1 and ring 3.

The adjusting ring 3 is provided with an annular recess adapted to receive an annular projection 20 formed on the base 4 and the two parts are held together by a flat annular ring 21 secured to the adjusting ring 3 by a number of screws 22 or in any other desired manner.

The compressed air is supplied to the chamber 12 through a pipe 23 which may be secured to the handle 24 of the blow pipe in any desired manner.

For the purpose of preventing the edge of the part 2 being placed flat against a plate or other surface said part may as shown by dotted lines in Fig. 2 if desired be castellated, that is, formed with a series of recesses or cut away portions so as to produce a series of projections around the outer edge, or if desired an additional part may be attached to said part in any desired manner.

While the main controls for regulating the supply of acetylene and oxygen are preferably disposed near to the supply, that is, above water, the blow pipe is preferably provided with additional controls so that the operator may regulate the flame and also the supply of compressed air as desired.

What we claim is:—

1. A device for use in combination with an oxy-acetylene blow pipe comprising a chamber adapted to surround the nozzle of said blow pipe and terminating in a nozzle concentrically arranged in relation to the nozzle of the blow pipe, a port in said chamber for the introduction of compressed air and means comprising a series of vanes located on the inner wall of said chamber for directing the flow of the compressed air and causing the main volume of air at the highest pressure to issue at the nozzle of said chamber at a point below the nozzle of the blow pipe.

2. A device for use in combination with an oxy-acetylene blow pipe comprising a chamber adapted to surround the nozzle of said blow pipe and terminating in a nozzle concentrically arranged in relation to the nozzle of the blow pipe, a port located at the lowest point in the base of said chamber for the introduction of compressed air and means comprising a series of vanes located on the inner wall of said chamber for directing the flow of the compressed air and causing the main volume of air at the highest pressure to issue at the nozzle of said chamber at a point below the nozzle of the blow pipe.

3. A device for use in combination with an oxy-acetylene blow pipe comprising a chamber adapted to surround the nozzle of said blow pipe, and terminating in a nozzle concentrically arranged in relation to

the nozzle of the blow pipe, a port in said chamber for the introduction of compressed air and means comprising a series of vanes located on the inner wall of said chamber for directing the flow of the compressed air and causing the main volume of air at the highest pressure to issue at the nozzle of said chamber at a point immediately below the nozzle of the blow pipe.

4. A device for use in combination with an oxy-acetylene blow pipe comprising a chamber adapted to surround the nozzle of said blow pipe and terminating at one end in a nozzle concentrically arranged in relation to the nozzle of the blow pipe, and at the other with a base having a concentrically disposed aperture, means fixed to said blow pipe for supporting said chamber comprising a base plate having a concentrically arranged boss, means for preventing independent rotative movement of said chamber independently of said chamber means interposed between the chamber and said fixed means by which said chamber may be adjusted axially relatively to said fixed means and said nozzle, means for maintaining an air tight joint between said parts, means for locking said parts rigidly together, a pipe secured at one end to said fixed part and at its other to the compressed air supply, a port in said chamber for the introduction of compressed air to said chamber, means located on the inner wall of said chamber for directing the flow of compressed air and causing the main volume of air at the highest pressure to issue at the nozzle of said chamber at a point immediately below the nozzle of the blow pipe and means adjustably mounted on the outer end of said chamber by which the distance between the part being operated on and the outer end of the nozzle may be varied.

5. A device for use in combination with an oxy-acetylene blow pipe comprising a chamber adapted to surround the nozzle of said blow pipe and terminating in a nozzle concentrically arranged in relation to the nozzle of the blow pipe, means by which said chamber may be adjusted axially relatively to said nozzle, means for maintaining an air tight joint between said parts, a port in said chamber for the introduction of compressed air to said chamber, means located within said chamber for directing the flow of compressed air and causing the main volume of air at the highest pressure to issue at the nozzle of said chamber at a point immediately below the nozzle of the blow pipe, and means adjustably mounted on the outer end of said chamber by which the distance between the part being operated on and the outer end of the nozzle may be varied.

6. A device for use in combination with an oxy-acetylene blow pipe comprising a

chamber adapted to surround the nozzle of said blow pipe and terminating in a nozzle concentrically arranged in relation to the nozzle of the blow pipe, means fixed to said blow pipe for supporting said chamber, means by which said chamber may be adjusted axially relatively to said fixed means and said nozzle, means for supplying compressed air to said chamber and means located on the inner wall of said chamber for directing the flow of compressed air and causing the main volume of air at the highest pressure to issue from the nozzle of the chamber at a point immediately below the nozzle of the blow pipe.

7. A device for use in combination with an oxy-acetylene blow pipe comprising a chamber adapted to surround the nozzle of said blow pipe and terminating in a nozzle concentrically arranged in relation to the nozzle of the blow pipe, means fixed to said blow pipe for supporting said chamber, means interposed between the chamber and said fixed means by which said chamber may be adjusted axially relatively to said fixed means and said nozzle, means for supplying compressed air to said chamber and a series of vanes located on the inner wall of said chamber so arranged as to direct the flow of the compressed air as to cause the main volume of air at the highest pressure to issue from the nozzle of the chamber at a point immediately below the nozzle of the blow pipe.

8. A device for use in combination with an oxy-acetylene blow pipe comprising a chamber concentrically arranged with relation to and adapted to surround the nozzle of said blow pipe, means fixed to said blow pipe for supporting said chamber, means for maintaining an air tight joint between said nozzle and fixed part, means interposed between the chamber and said fixed means by which said chamber may be adjusted axially relatively to said fixed means and said nozzle, means for maintaining an air tight joint between said parts, means for supplying compressed air to said chamber and a series of spirally arranged vanes secured within said chamber for directing the flow of compressed air and causing the main volume of air at the highest pressure to issue from the nozzle of the chamber at a point immediately below the nozzle of the blow pipe.

9. A device for use in combination with an oxy-acetylene blow pipe comprising a chamber concentrically arranged with relation to and adapted to surround the nozzle of said blow pipe, means fixed to said blow pipe for supporting said chamber, means interposed between the chamber and said fixed means by which said chamber may be adjusted axially relatively to said fixed means and said nozzle, means for maintain-

ing an air tight joint between said parts, a port in said chamber for the introduction of compressed air to said chamber, a plurality of spirally arranged vanes located on the inner wall of said chamber forming by and between them a series of channels in which the main volume of compressed air at the highest pressure is caused to issue from the nozzle of the chamber at a point immediately below the point of the nozzle of the blow pipe, means adjustably mounted on the outer end of said chamber by which the distance between the part being operated on and the outer end of the nozzle may be varied.

10. A device for use in combination with an oxy-acetylene blow pipe comprising a chamber concentrically arranged with relation to and adapted to surround the nozzle of said blow pipe, means fixed to said blow pipe for supporting said chamber, means for maintaining an air tight joint between said nozzle and fixed part, means interposed between the chamber and said fixed means by which said chamber may be adjusted axially relatively to said fixed means and said nozzle, means for maintaining an air tight joint between said parts, means for supplying compressed air to said chamber and means located on the inner wall of said chamber for directing the flow of compressed air and causing the main volume of air at the highest pressure to issue from the nozzle of the chamber at a point immediately below the

nozzle of the blow pipe, means adjustably mounted on the outer end of said chamber by which the distance between the part being operated on and the outer end of the nozzle may be varied.

11. A device for use in combination with an oxy-acetylene blow pipe comprising a chamber adapted to surround the nozzle of a blow pipe and terminating in a nozzle concentrically arranged in relation to the nozzle of the blow pipe, means fixed to said blow pipe for supporting said chamber, means interposed between the chamber and said fixed means by which said chamber may be adjusted axially relatively to said fixed means and said nozzle, means for maintaining an air tight joint between said parts, a port in said chamber for the introduction of compressed air to said chamber, means located within said chamber for directing the flow of compressed air and causing the main volume of air at the highest pressure to issue from the nozzle of the chamber at a point immediately below the nozzle of the blow pipe, means adjustably mounted on the outer end of said chamber by which the distance between the part being operated on and the outer end of the nozzle may be varied, and means for preventing said adjustable part from being placed in close contact with the part being operated on.

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