

Aug. 24, 1926.

W. W. THORPE ET AL

1,597,554

BURNER

Filed April 1, 1925

FIG. 9.

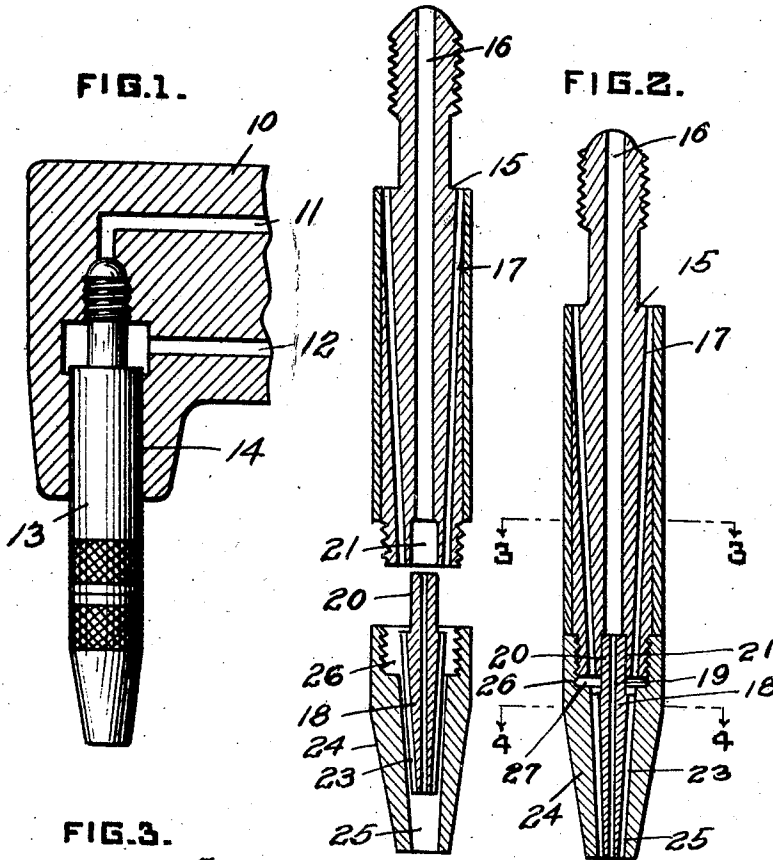


FIG. 3.

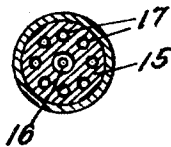


FIG. 4.

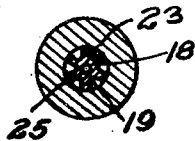


FIG. 5.

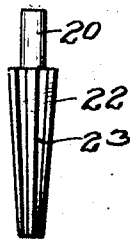


FIG. 7.

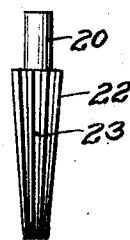


FIG. 6.

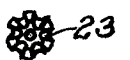


FIG. 8.



WITNESSES
J. Robert Bradley.

INVENTOR
Walter W. Thorpe
Frederick H. Hochstetler
By Green & McCallister
His Attorneys

UNITED STATES PATENT OFFICE.

WALTER W. THORPE AND FREDERICK W. HOCHSTETTER, OF PITTSBURGH, PENNSYLVANIA, ASSIGNORS TO JOSEPH C. TREES, OF PITTSBURGH, PENNSYLVANIA.

BURNER.

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This invention relates to burners and more particularly to burner nozzles of the type used in oxy-acetylene or oxy-hydrogen cutting torches.

5 An object of this invention is to provide a burner nozzle of the type set forth which is so constructed that the relative proportions of the streams of preheating and cutting gases can be easily controlled without removing the nozzle from the torch.

10 A further object of this invention is to provide an adapter for burner nozzles which is so constructed that the relative proportions of the gases delivered by the nozzle can be varied merely by substituting a different adapter, whereby the burner is made convertible so as to be adapted to the cutting, welding and riveting of metals.

15 A still further object of this invention is to provide a burner nozzle of the type set forth having a replaceable and interchangeable member for determining the relative proportions of preheating and cutting gases so that the same nozzle can be made to deliver any desired proportion of gases simply by inserting the proper, proportion-controlling member in the nozzle tip.

20 A still further object is to provide a burner nozzle of the type set forth which is so constructed that the gas transmitting passage-ways and the various ports can be easily and quickly cleaned.

25 A still further object is to provide a device of the type set forth which will constitute a practically universal burner nozzle and which will, at the same time, be cheap to manufacture, easy to operate and rugged in construction.

30 These and other objects which will be obvious to those skilled in this particular art are attained by means of this invention, one embodiment of which is shown in the accompanying drawings, in which Figure 1 is a view of one form of burner nozzle constructed in accordance with this invention and shown mounted in the end of a cutting torch which is illustrated in cross section. Fig. 2 is a longitudinal sectional view of the burner nozzle shown in Fig. 1. Figs. 3 and 4 are transverse sections on the lines 3—3 and 4—4, respectively, of Fig. 2. Fig. 5 is a view in side elevation of one of the proportion-controlling members and Fig. 6 is an end view thereof. Fig. 7 is a view in side elevation of another gas proportion-control-

ling member and Fig. 8 is an end view thereof. Fig. 9 is a sectional view of the burner shown in Fig. 2 showing the parts somewhat separated.

60 The particular embodiment of this invention which has been chosen for the purposes of illustration includes a body member having a central bore or passage-way extending throughout the length thereof for transmitting a cutting gas such as pure oxygen. 65 This central passage-way is surrounded by other passages for transmitting the preheating gas which is ordinarily an oxy-acetylene or an oxy-hydrogen mixture. One of a series of interchangeable members which are adapted to control the relative proportion of preheating and cutting gases delivered by the nozzle, is removably mounted in one end of the central passage-way and itself has a central bore or passage-way which forms a continuation of the central opening in the body member. The interchangeable member is preferably provided with a cone-shaped surface throughout the major portion of its length and this surface has a plurality of longitudinally extending grooves. A nozzle tip is threaded on the body member and has an inner tapered bore which engages the cone-surface of the interchangeable member for securing the latter in assembled position. 75 The tapered bore of the nozzle tip cooperates with the open grooves of the proportion-controlling member so that they form passageways which, in effect, constitute continuations of the passage-ways in the body member for transmitting the preheating gas mixture. In order to vary the proportions of cutting and preheating gases which are delivered by the burner nozzle it is only necessary to unthread the nozzle tip and replace the proportion-controlling member with another member whose external grooves or whose central passage-way is of a different size so as to permit a different rate of flow of either or both streams of gases. 85 90 95 100

The particular embodiment of this invention which is illustrated in the drawings is shown in Fig. 1 as applied to an ordinary torch 10 having the usual passage-way 11 for the cutting gas and a second passage-way 12 for the preheating gases. The burner nozzle 13 is mounted within a bore 14 with which the gas conveying passage-ways communicate. The nozzle includes a body member 15 having a central bore or passage-

way 16 throughout its length which is adapted to communicate with the passage-way 11 of the torch for the transmission of the cutting gas. The preheating gases pass through one or more passages 17 formed in the body member around the central passage 16 and when the nozzle is positioned in the torch 10 the passages 17 form continuations of the passage 11 for transmitting the preheating gases, all as is well known in this particular art.

Any predetermined proportion of preheating and cutting gases can be delivered by the nozzle by providing a suitable, interchangeable, proportion controlling member 18 which is provided with a central bore 19 throughout its entire length and which has a cylindrical shank 20 at one end thereof adapted to seat within a counterbore 21 formed in the body member at the outer end of the central passage-way 16. The major portion 22 of this replaceable member is tapered or cone-shaped and has grooves 23 extending longitudinally along the surface thereof.

A nozzle tip 24 has a tapered bore 25 adapted to engage the cone-shaped surface of the proportion controlling member to secure the latter in position. The tip is provided with a threaded counterbore 26 by means of which it is secured to the body member.

The length of the counterbore 26 and the length of the cylindrical shank 20 of each interchangeable proportion-controlling member 18 is such that when the members are assembled for use a chamber 27 is formed between the bottom of the counterbore 26 and the adjacent end of the body member, and between the end of the body member and the adjacent ends of the grooves 23. The provision of such a chamber eliminates any necessity for aligning each groove 23 with a channel 17 and enables the easy assembling of the various elements.

Any number of interchangeable adapter members having various sized grooves 23 and central bores 19 can be provided and the proportion of preheating and cutting gases delivered by the burner nozzle will depend upon the particular proportion controlling member 18 which is in use at the time. In order to change the proportions of gases it is merely necessary to unthread the nozzle tip 24 and substitute the proper sized adapter proportion-controlling member 18. Two such members are illustrated in Figs. 5 to 8.

The present invention provides a burner

nozzle which is adapted to be used with any gas or combination of gases, the proportions of which can be easily and quickly changed or controlled so as to adapt the burner to the cutting, welding or riveting of metals.

While we have described a specific embodiment of this invention it will be obvious that various changes, additions, omissions, and substitutions can be made therein without departing from the spirit of this invention as defined in the appended claims.

What we claim and desire to secure by Letters Patent is:

1. The combination in a torch burner having a body member provided with gas passages, of a burner body threaded into said body member and provided with a centrally disposed gas passage and a series of gas passages arranged around said gas passage, a proportioning member extending axially into said burner member and provided with a central gas passage and exterior grooves forming gas passages and a removable end cap threaded onto said burner body and provided with a conical bore co-operating with the exterior surfaces of said proportioning member.

2. The combination in a torch burner having a body member provided with gas passages, of a cylindrical burner body threaded into said body member and having a centrally disposed gas passage and a series of gas passages arranged around said central passage and converging toward the outer end of said burner body, a proportioning member extending axially into said burner member and being readily removable therefrom and a removable end cap threaded onto said burner body and provided with a conical bore co-operating with said proportioning member.

3. The combination in a torch burner having a body member provided with gas passages, of a burner body having a cylindrical portion provided with gas passages extending longitudinally therethrough and a reduced portion threaded into said body member, a proportioning member extending into said burner body and provided with a central gas passage and exterior longitudinal grooves and a removable end cap threaded onto said burner body and surrounding said proportioning member.

In testimony whereof, we have hereunto set our names this 9th day of March, 1925.

FREDERICK W. HOCHSTETTER.
WALTER W. THORPE.