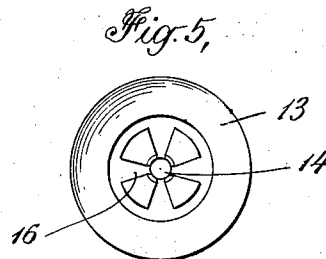
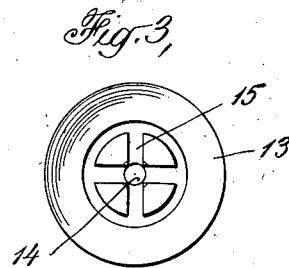
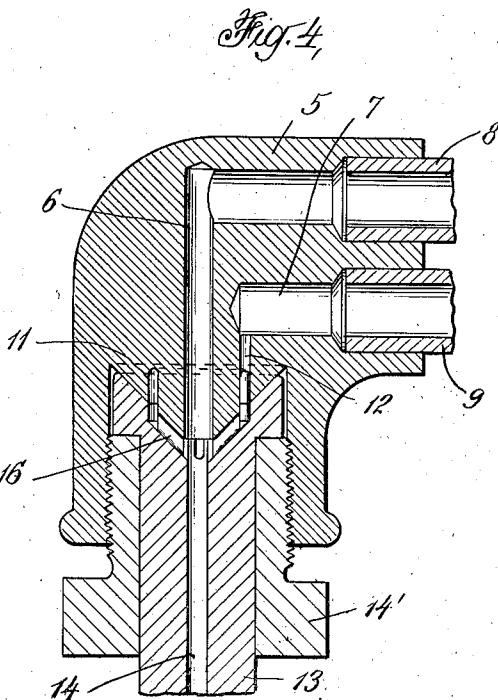
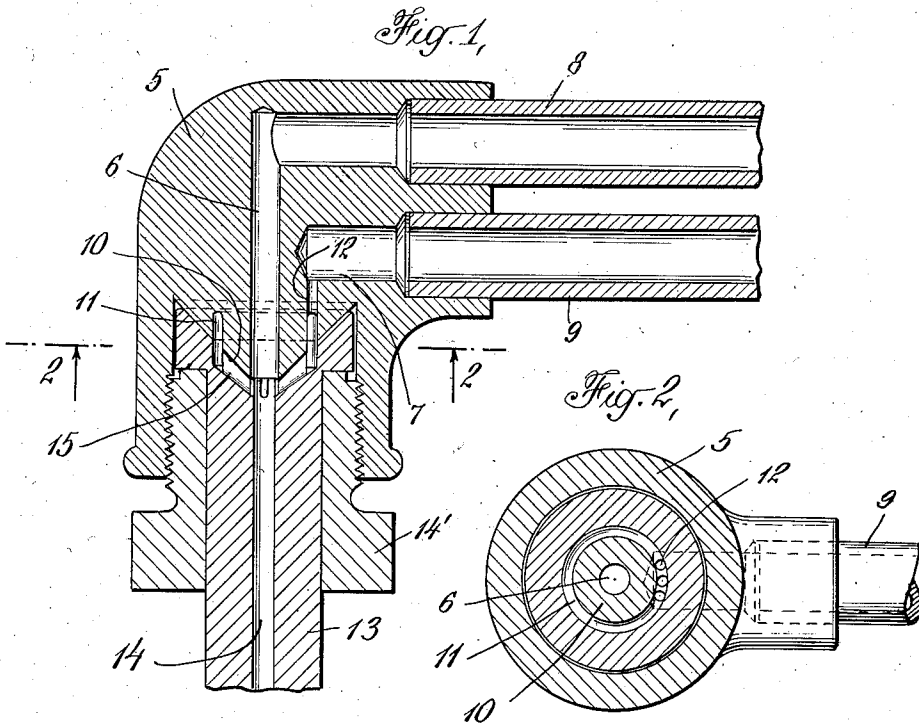


G. L. WALKER,
BLOWPIPE.
APPLICATION FILED MAY 1, 1919.

1,387,434.

Patented Aug. 9, 1921.



INVENTOR
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BY
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UNITED STATES PATENT OFFICE.

GEORGE L. WALKER, OF NEW YORK, N. Y., ASSIGNOR TO AIR REDUCTION COMPANY,
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BLOWPIPE.

1,387,434.

Specification of Letters Patent.

Patented Aug. 9, 1921.

Application filed May 1, 1919. Serial No. 294,004.

To all whom it may concern:

Be it known that I, GEORGE L. WALKER, a citizen of the United States, residing at New York city, in the county of New York, State of New York, have invented certain new and useful Improvements in Blowpipes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to blowpipes burning mixtures of combustible and oxidizing gases such as acetylene and oxygen and employed in heating, welding and cutting operations.

My invention particularly relates to the blowpipes described in the patents to George H. Zouck, Nos. 1,310,100 and 1,310,101, although the principles herein described may be employed in blowpipes differing in details of construction from those described. The invention is in fact of general application in blowpipes having grooves in one of two coöperating surfaces whereby one of the gases is conveyed to and mixed with the other to provide a combustible mixture which is discharged and burned to produce high temperature flames.

The object of my invention is to improve the operation of blowpipes by insuring a proper mixture of the gaseous constituents and particularly to prevent "flashback" or backward propagation of the flame in the discharge passage of the tip.

Further objects and advantages of the invention will be apparent as it is better understood, by reference to the following specification, when read in connection with the accompanying drawing illustrating the preferred embodiments of the invention, in which,

Figure 1 is a longitudinal section through a blowpipe head and portion of a tip;

Fig. 2 is a section on the line 2—2 of Fig. 1;

Fig. 3 is a rear end elevation of the tip illustrated in Fig. 1;

Fig. 4 is a longitudinal section through a tip illustrating a slightly different form of the invention; and

Fig. 5 is a rear end elevation of the tip as shown in Fig. 4.

It has been discovered, as explained in the patent to George L. Walker, No. 1,310,099,

that the best results are obtained in the operation of blowpipes, when the pressures of the two gases supplied thereto are substantially equal or the pressure of the acetylene slightly exceeds that of the oxygen. In the operation of blowpipes as usually constructed any obstruction of the discharge passage results in an enrichment of the mixture in oxygen and corresponding increase in the rate of flame propagation therein. Usually a "flashback" results from this abnormal condition. In the operation of blowpipes as herein contemplated, this objectionable result is avoided. The pressures of the entering gases being substantially equal, any obstruction in the discharge passage results in a decreased flow of both gases, while the mixture remains normal, or, if the pressure of the acetylene exceeds slightly that of the oxygen, the mixture is enriched in acetylene with corresponding decrease of the rate of flame propagation in the mixture.

I have discovered that the operation of blowpipes in the manner described is materially improved when the combustible gas is conveyed through passages of uniformly diminishing cross sectional area and is mixed with the oxidizing gas immediately upon delivery from such passages. By conveying the combustible gas in this manner the maintenance of the desired velocity is assured, no opportunity being afforded for gas to expand until it flows into the discharge passage of the tip. As a result of the operation as described, I find that the character of the mixture produced is improved, and that regulation of the flame and the prevention of rearward propagation thereof are readily accomplished. The operation of the blowpipe, particularly by relatively unskilled operators, is made comparatively simple.

In Figs. 1 to 3, in which a portion of a head and tip of a blowpipe are illustrated on an enlarged scale to more clearly distinguish the invention, 5 indicates the head having passages 6 and 7 for oxidizing and combustible gases which are delivered thereto through pipes 8 and 9 from a suitable source. The passage 6 terminates at the apex of a conical seat 10 in which an annular channel 11 is formed. Ducts 12 connect the channel 11 to the passage 7.

A tip 13 having a discharge passage 14

is held in assembled relation with the head 5 by a nut 14'. The tip 13 is provided at its inner end with a conical recess, the surface of which conforms to said seat and forms therewith a gas tight joint surrounding the channel 11 and effectually preventing escape of gases from the head. One or more grooves 15 are milled, pressed or otherwise formed in the recessed surface and serve to convey the combustible gas from the channel 11 to the mouth of the discharge passage 14, where it mixes with the oxidizing gas from the passage 6.

In Figs. 1 and 3 it will be noted that the grooves 15 are relatively narrow and deep, being of equal width throughout, but of decreasing depth from the channel 11 to the discharge passage 14. When the tip is assembled with the head the grooves 15 form passages of uniformly diminishing cross sectional area as hereinbefore explained. The combustible gas issues therefore from these passages, and is delivered to the oxidizing gas, at maximum velocity with the resulting improvement of the mixture and other advantages.

In Figs. 4 and 5 of the drawing I have illustrated a slightly different form of my invention in which the grooves 16 are comparatively shallow. These grooves are of uniform depth throughout and of diminishing width from the channel 11 to the discharge passage 14. The same advantages are observed as with the previously described construction.

It is to be understood that in the accompanying drawing I have illustrated the principal modes of applying the invention, and that changes may be made therein by varying both width and depth of the grooves or depressions to provide a tapered passage for the gas. The depth and width of the grooves may be varied and are in fact carefully proportioned to provide proper mixtures in tips intended to produce flames of given dimensions. The invention is applicable, moreover, to blowpipes in which the combustible gas is conveyed to the oxidizing gas through grooves arranged otherwise than in the particular manner described, the peculiar results accomplished being attributable to the

uniformly diminishing cross sectional area of the passages.

I claim:

1. In a blowpipe, the combination with a head having oxidizing and combustible gas passages, of a tip adapted to be assembled therewith and provided with a discharge passage, said tip and head having cooperating surfaces adapted to form a gas tight joint, and a groove in one of said surfaces forming with the cooperating surface a passage of uniformly diminishing cross sectional area arranged to deliver combustible gas to said discharge passage.

2. In a blowpipe, the combination with a head having oxidizing and combustible gas passages, of a tip adapted to be assembled therewith and provided with a discharge passage, said head having a conical seat and said tip having a corresponding surface provided with a groove forming with the cooperating surface a passage of uniformly diminishing cross sectional area arranged to deliver combustible gas to said discharge passage.

3. In a blowpipe, the combination with a head having oxidizing and combustible gas passages, of a tip adapted to be assembled therewith and provided with a discharge passage, said head having a projecting conical seat and said tip having a corresponding recessed surface provided with a groove of uniform width and diminishing depth to provide a passage of diminishing cross sectional area arranged to deliver combustible gas to said discharge passage.

4. In a blowpipe, the combination with a head having oxidizing and combustible gas passages, and a seat in which said passages terminate, of a tip having a discharge passage and a surface cooperating with said seat to form a gas tight joint surrounding the ends of the passages in said head, said surface having a plurality of grooves forming with the seat a passage of uniformly diminishing cross sectional area adapted to convey gas from one of the passages in said head to said discharge passage.

In testimony whereof I affix my signature.

GEORGE L. WALKER.