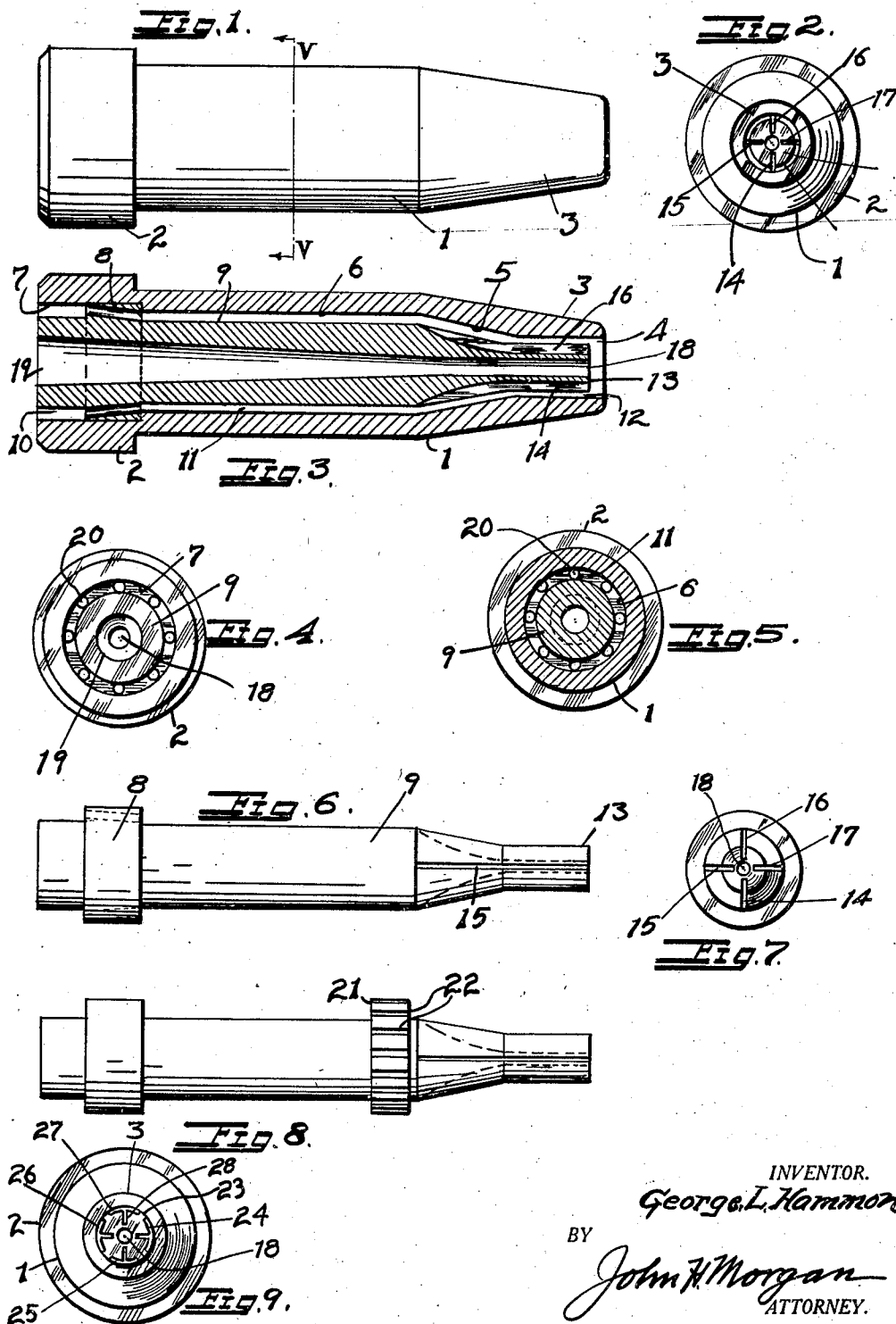


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CUTTING TIP FOR GAS TORCHES

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CUTTING TIP FOR GAS TORCHES

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This invention relates to improvements in "cutting tip for gas torches" using gas mixtures, and this tip is specially efficient for natural gas torches.

It is well known in this art that cutting tips have the very objectionable fault of getting very hot in use and transmitting the heat to the entire torch, and one of the principal objects of the present invention is to provide a tip that will be practically free from this heating fault. Another object is the provision of means for intensifying the heat in the central cutting jet by concentrating the heat from the heating flame surrounding it toward the center.

Another object is to provide a tip having a central orifice supplying the oxygen cutting jet, means to supply a film of fuel mixture surrounding the central orifice, and spaced slotted openings connecting said film and extending radially close to the central orifice.

Another object is to provide a tip that will not blow out when in use.

Other objects will appear to those skilled in this art as the description progresses.

An embodiment of the invention is shown in the accompanying drawings in which the same reference numeral is applied to the same portion throughout the several views, and of which there may be modifications:—

Figure 1 is a complete view of the tip.

Figure 2 is an end view looking from the right of Figure 1.

Figure 3 is a longitudinal sectional view of the tip.

Figure 4 is a view of the seat end of the tip showing the holes through the flange.

Figure 5 is a section taken on line 5—5 of Fig. 1.

Figure 6 is a detached view of the central member of the tip.

Figure 7 is an end view looking from the right of Fig. 6, showing the slots cut in the end.

Figure 8 is a modified form of the central member of the tip showing an additional supporting flange.

Figure 9 is a modified form of tip end

showing a support for the central member at the tip end.

The numeral 1, indicates the tip body having the head 2 for attaching the tip to the torch by means of a head nut (not shown), the tapered tip end 3, has the opening 4, which extends to the flared opening 5, which in turn joins the main bore 6 of the tip body.

A counterbore 7, is adapted to receive the flange 8, on the central member 9, and provides a support therefor in the counterbore.

The flange is spaced from the end to leave an annular recess 10.

The central member has practically the same contour as the bore of the tip body but is small enough to leave the annular opening 11 extending from the flange to the end of tip, but the annular opening 12 around the end 13, is much reduced in size, so that the fuel mixture propelled therefrom forms a very thin film surrounding the central member end 13.

Slots 14, 15, 16 and 17 are cut radially in the central member, and extend to a point very close to the orifice 18 which tapers back to the larger opening 19, in the seat end of the tip. There may be any desired number of these slots, in the present instance four are shown, and have been found to be very efficient in practice. A plurality of holes 20 are drilled through the flange 8, to communicate with the annular opening 11.

In the modified form of the central member an additional flange 21 is provided so that two supports are provided for the member. Slots 22 are provided to allow passage for the mixture.

The form of tip end shown in Figure 9 has the lugs 23 between the curved slots 24, 25, 26 and 27 and forms a rigid support for the tip end. The radial slots 28 are the same as the above described slots 14 to 17 inclusive, and extend from the spaced concentric slots toward the central opening.

In operation the seat of the tip is connected to a cutting torch in the well known way, and the proper fuel mixture is blown through the tip, the oxygen jet passing out the orifice 18 and the fuel mixture passing out of the annular opening 12 and the radial

slots 14 to 17 inclusive joining the annular opening.

The action of this film, or heating flame surrounding the central oxygen jet is to confine and concentrate the heat toward the central oxygen jet and toward the end of the tip where the effective heat is required. The unbroken film of fuel gases blowing outward draws an unbroken layer of air over the outside surface of the tip body and thus prevents the heat radiating back into, and heating the tip, and torch, as does the type of tip now in use.

When natural gas is used in a torch having this improved tip the cutting flame is prevented from blowing out by the action of the film of fuel mixture surrounding the cutting oxygen orifice.

From the foregoing description taken with the drawings it will be apparent that a great advance has been made in this art by the present invention.

Having thus described my invention what I desire to secure by Letters Patent of the United States is as follows, but modifications may be had in carrying out the invention as shown in the drawings and in the particularly described form thereof within the purview of the annexed claims.

I claim:

1. In a cutting tip, means to produce a tubular heating flame having spaced flat flames radiating from the inner wall of said heating flame toward the center thereof, and a jet of oxygen central of said tubular flame.

2. A cutting tip of the class described comprising a tip body, a central opening through said body, a concentric opening spaced from the central opening, and slot openings extending from the concentric opening to within a short distance of said central opening at the end thereof.

3. A tip for cutting torches of the class described comprising a body having a seat member and a tip end member, a central opening through said body, a concentric opening spaced from said central opening, slots adjacent to the tip end of said body extending from said concentric opening toward the central opening, means to connect the central opening to a source of cutting gas and means to connect the concentric opening to a source of fuel mixture.

4. A tip for cutting torches of the class described comprising a tip body having a seat, and a tip end, an opening through said body, a central member of smaller diameter than the opening in said body whereby an annular opening is formed around said central member in said opening, a support for said central member, openings in said support communicating with said annular opening, radial slots in the tip end of said central member, a central opening through said central member, means to connect the central opening

with a supply of cutting gas, and means to connect the annular opening with a supply of fuel mixture.

5. A cutting tip of the class described comprising a tip body, a central orifice from which a cutting gas is adapted to blow, an orifice concentric to said central orifice from which a film of gas mixture is adapted to flow and completely surround said cutting gas, spaced slots extending radially from said concentric orifice toward said central orifice from which ribbons of gas mixture are adapted to flow with the film of gas mixture surrounding said central cutting gas.

6. A cutting tip of the class described comprising a tip body having a seat end and a nozzle end, an opening through said body, a counterbore in the seat end, a central member for said opening having a flange adapted to fit said counterbore, and spaced from the seat end to leave an annular recess, an annular opening formed between the central member and the wall of the opening in the body, spaced slots cut in the nozzle end of the central member communicating with said annular opening, a central opening through said central member, and means to seat the tip body in a cutting torch.

7. A tip of the class described having a tip body, adapted to be attached to a cutting torch, a central cutting jet for said body, means to form a flame surrounding said cutting jet and means to form ribbons of flame radiating from the inside of said surrounding flame toward the cutting flame.

8. A tip body having a central orifice, an orifice concentric to said central orifice, and spaced therefrom, spaced slots extending from the concentric orifice toward the central orifice, and very close thereto, and means to supply the central orifice with cutting gas and the concentric orifice and slots with fuel gas.

9. A cutting tip of the class described comprising a hollow body having a reduced tip end opening, a central member having the contour of the hollow portion of said body but of smaller diameter, means to support the central member to form an annular opening, radial slots in the end of said central member extending a space back from the end, and toward the center, and a central opening through the central member.

10. A cutting tip of the class described comprising a tip body, a central opening through said body, an opening concentric to the central opening, spaced concentric openings on the tip end of the body communicating with said concentric opening, radial slots extending from said spaced openings toward the central opening, and means to connect said tip to a cutting torch.

11. A tip for gas cutting torches comprising a tip body having a seat, and a tip end, a central opening through said tip, an opening concentric to said central opening reduced

to a fine concentric orifice at the tip end, a plurality of fine spaced slits extending from the concentric orifice toward, and close to the central opening, and means to seat said tip body in a cutting torch.

12. A cutting tip of the class described comprising a tip body having a seat, and a tip end, a central opening through said tip, a plurality of open segments concentric with the central opening and a fine slit for each segmental opening extending toward, and close to the central opening.

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