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BLOWPIPE

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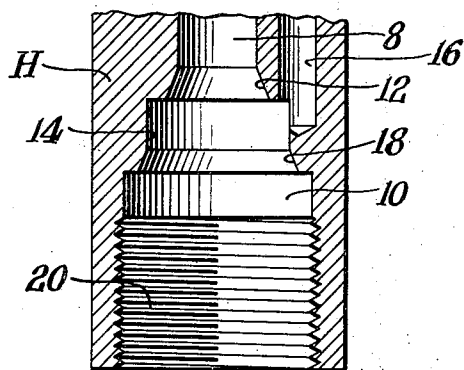


Fig. 1.

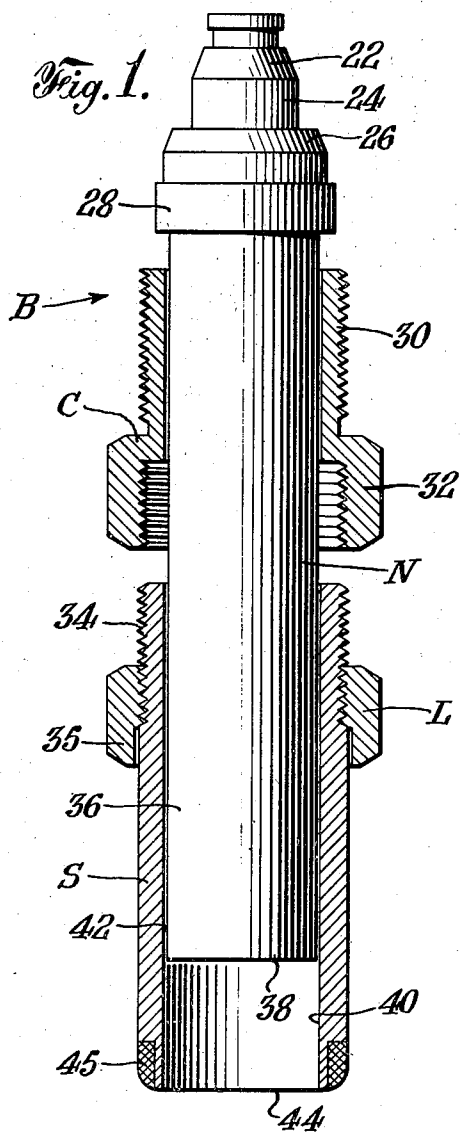
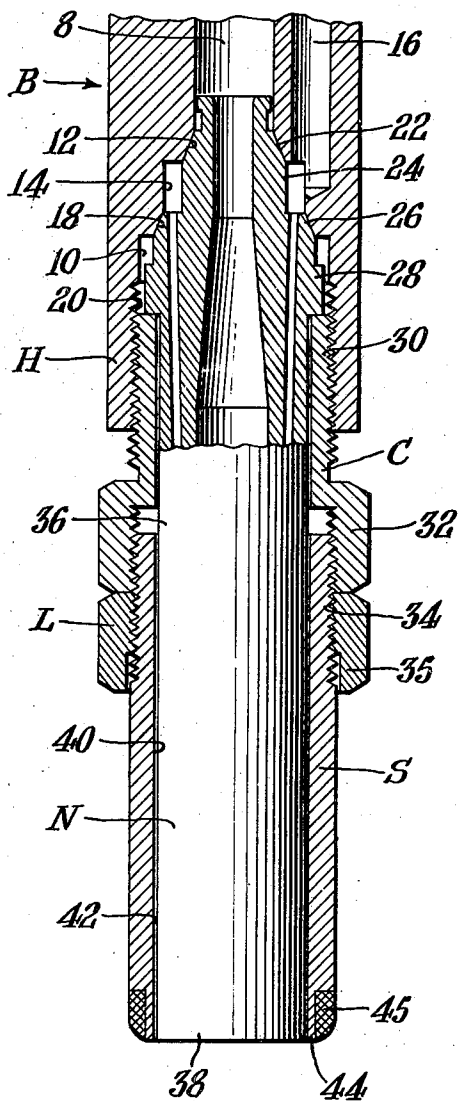


Fig. 2.



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BLOWPIPE

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4 Claims. (Cl. 158—27.4)

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This invention relates to blowpipes, and more particularly to blowpipe nozzles, the forward ends of which engage and are guided by a surface which is acted upon by a stream discharging from the nozzles.

In certain metal-working operations, e. g., when deseaming steel billets and the like, the work surface is heated to ignition temperature and an oxidizing gas stream is applied obliquely against successive portions of the so heated metal surface to remove metal from such surface. Nozzles employed for this purpose usually include an oxygen passage extending along or parallel with the axial center line of the nozzle, and a series of heating gas passages parallel with the large oxygen passage or converging toward the forward end of the nozzle, and usually, but not necessarily, spaced circumferentially about the oxygen passage.

The nozzle is usually held so that its axis is oblique and makes a sharp angle with the surface of the workpiece and the nozzle is guided by and pushed along the workpiece in the direction of the issuing oxidizing gas stream, thus wearing away the front periphery and the peripheral portions behind the front face of the nozzle body and exerting a rearward thrust against the latter. Such guidance of the nozzle by contacting its end with the metal surface is especially desirable when hand-operated deseaming blowpipes are moved along the surface to be deseamed because the preheating and oxidizing jets may then be maintained in accurate positions with respect to the work surface during relative movement, irrespective of the surface contour of the work. Thus, uniform removal of metal along the surface can be accomplished.

Rapid wear and deterioration will occur at the periphery of the nozzle adjacent but behind its front face when such periphery continually engages the surface of a workpiece to guide the nozzle while held obliquely against the workpiece, especially during a deseaming or other thermochemical operation, because of the intense heat adjacent the nozzle and in contact with the work.

In accordance with prior art there has been provided a deseaming blowpipe nozzle comprising an elongated body of metal, such as copper, having oxygen and combustible gas passages extending longitudinally therethrough, said passages having their outlets in the front face of the body which has a substantially cylindrical outer surface; and a protective metal collar permanently secured in metal-to-metal contact to the body

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and extending around the same behind but adjacent the front end face thereof. The collar comprises a metal ring which is relatively thick radially and has a substantially greater outside diameter than the cylindrical surface of the body adjoining the ring which consists throughout of metal having greater wear resistance than the metal of the body, an outer circumferential portion of the ring adjacent its periphery having greater wear resistance than the portion of the ring closer to the body. The ring is permanently secured to the body by a relatively thin layer of bonding metal united to and covering both the entire inner peripheral surface of the ring and the corresponding opposed outer surface portion of the body within the ring.

Deseaming nozzles thus are provided with a wearing ring of hard metal on the front end for the nozzle to ride on and to protect the front end. Such rings have in the past been fastened to the nozzle by silver solder or by spinning or both. Should the front end become marred, trimming off is needed. This is difficult because of the hard ring. Furthermore, the ring is shortened and becomes less strong and wears out sooner. Should the ring crack in use, which frequently happens, replacement becomes a major job.

The main objects of this invention are to provide novel and improved means for overcoming disadvantages and difficulties of the prior art; a deseaming blowpipe having a nozzle protected by a sleeve which is annularly spaced from and adjustable axially with respect to the nozzle; and nozzle protective means that is inexpensive to manufacture and maintain compared to the proposals of the prior art.

According to the invention, a novel coupling is provided that bears against the shoulder of the nozzle and holds the nozzle in the blowpipe head. Such coupling also has a socket provided with an internal thread at its far end which receives a protective sleeve or tube which is threaded into the coupling until its outer end is at a desired location with respect to the outer end of the nozzle. For example, it may be adjusted farther out than the nozzle end, thereby enabling an ordinary C_2H_2 nozzle to function well on "fuel gas" such as propane. For oxy-acetylene nozzles the outer ends of the nozzle and sleeve may be located in a common transverse plane. A lock-nut on the tube bears against the socket end of the coupling and locks the assembly in

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adjusted position. A heat-insulating air gap is provided between the sleeve and the nozzle.

Should the sleeve become damaged so it cannot be used, it can be easily replaced. Should the nozzle front end require trimming, all that need be done is to screw the sleeve further into the coupling and lock it in its new position. Also, the sleeve covers the otherwise exposed lateral surface portion of the nozzle, thereby preventing bending and marring of the nozzle.

Referring to the drawings:

Fig. 1 is an exploded view mainly in section of a blowpipe exemplifying the invention; and

Fig. 2 is a view mainly in section of the assembled parts shown in Fig. 1.

The deseaming blowpipe B includes a head H and a nozzle N. The head H is provided with an oxygen inlet 8, a socket 10 having a frusto-conical female seat 12, an annular recess 14, a fuel gas inlet 16, a frusto-conical female seat 18, and a threaded portion 20. The inner end portion of the nozzle N is adapted to be inserted in the socket and is shaped to provide a frusto-conical male seat 22, an annular recess 24, a frusto-conical male seat 26, and an annular shoulder 28. When the nozzle and head are assembled, the female seats 12 and 18 fit the corresponding male seats 22 and 26, so that leakage between the oxygen and fuel gas inlets as well as to the atmosphere is prevented. The seats are hermetically sealed by a hollow nut or coupling member C having a threaded male portion 30 engaging the threaded portion 20 of the socket. The inner end of the member C bears against the shoulder 28.

The member C is provided with an internally threaded socket 32 for receiving the threaded inner end portion 34 of a protective sleeve S. The sleeve S is secured in adjusted position in the socket 32 on the coupling member C by a lock-nut L. The outer surfaces of the socket 32 and lock-nut L are non-circular or hexagonal for cooperation with a wrench (not shown). The lock-nut is also provided with a protecting flange or skirt 35 surrounding the sleeve S in spaced relation.

The nozzle N comprises an elongated body composed of ductile metal, such as copper having an outer annular surface portion 36 of constant diameter, in the illustrated example, extending longitudinally from the shoulder 28 to the outer end face 38 of the nozzle. The corresponding internal annular surface 40 of the sleeve S is concentric with and radially spaced from the nozzle, thereby providing an annular heat-insulating substantially dead air gap 42 between the sleeve and the nozzle. Thus, the nozzle N and the sleeve S are separated throughout the length of the sleeve by such air gap. In cases where the shape of the outer surface of the nozzle is not of constant diameter, the protective sleeve is shaped so that its inner surface corresponds to the outer surface of the nozzle, so as to provide insulating space therebetween.

The parts of Fig. 1 are assembled as shown in Fig. 2 with the outer end 44 of the sleeve S flush with the end face 38 of the nozzle N. When the length of the nozzle N is reduced by dressing-back or when the nozzle is replaced by one of different length, the axial position of the sleeve S may be readily adjusted as desired. Also, when one side of the sleeve wears, the sleeve may be circumferentially adjusted as desired.

The sleeve may be composed of any desired metal such as copper or stainless steel or nitrided steel. A hard metal facing 45 composed of

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"Stellite" alloy, for example, may be applied to the front end of the sleeve, when the latter is composed of softer metal such as steel or iron; but when the sleeve itself is composed of hard metal such facing may be eliminated. In any case the invention is less costly than proposals of the prior art, and the annular air space between the nozzle and the sleeve, being sealed at its inner end, provides an excellent insulator which protects the nozzle from excessive heating.

What is claimed is:

1. In combination, a blowpipe head having a socket, a blowpipe nozzle having an end portion seated in such socket, a hollow coupling member removably connected to said head and securing said nozzle in place in such socket, and a nozzle protective sleeve adjustably connected to said hollow coupling member, said sleeve surrounding the adjacent outside surface portion of said nozzle in uniformly spaced relation throughout the length of the sleeve and extending axially at least to the outer end of the nozzle, said hollow coupling member cooperating with said nozzle and said sleeve to seal the inner end of the sleeve, the space between the sleeve and nozzle containing substantially dead air which thermally insulates the nozzle from the sleeve.

2. The combination with a blowpipe head having a socket, a nozzle having an end portion mounted in such socket, of a hollow nut threadedly securing said nozzle and head together, said hollow nut having a socket, a nozzle protective tube having one end adjustably threaded to the socket portion of said hollow nut, and a lock-nut securing said tube in adjusted position to said hollow nut, said hollow nut and lock-nut cooperating with said nozzle to effectively seal the inner end of the sleeve.

3. A deseaming blowpipe comprising a head having a socket provided with at least one annular seat and a threaded portion, a nozzle having an annular seat fitting the corresponding seat in the socket, said nozzle also having an annular shoulder, a hollow coupling member engaging said threaded portion of the socket and said shoulder, said member having a socket, a nozzle protective sleeve adjustably threaded to the socket portion of said hollow coupling member and a lock-nut threaded to said sleeve and engaging said member, said lock-nut having a sleeve thread-protecting skirt surrounding the sleeve in spaced concentric relation, and said hollow coupling member supporting said sleeve in radially spaced concentric relation with respect to said nozzle.

4. A nozzle protective sleeve combination for attachment to a blowpipe having a head provided with a socket in which is secured one end of a blowpipe nozzle having an annular outside surface of substantially constant diameter, said combination consisting of a hollow coupling member adapted to threadedly engage such socket and secure the nozzle in place with respect to the blowpipe head, said hollow coupling member having a socket portion which is threaded, a nozzle protective sleeve having an annular internal surface of substantially constant diameter, said sleeve also having a threaded end portion engaging the threaded socket portion of the hollow coupling member, so that the sleeve can be adjusted axially as well as rotationally with respect to the coupling member, and a lock-nut threaded to such threaded end portion of the sleeve and adapted to engage the end of the socket portion of the hol-

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low coupling member to secure the sleeve in adjusted position with respect to the coupling member.

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