F. E. WRIGHT.

TIP FOR TORCHES.

APPLICATION FILED APR. 10, 1915.

1,186,962.

Patented June 13, 1916.

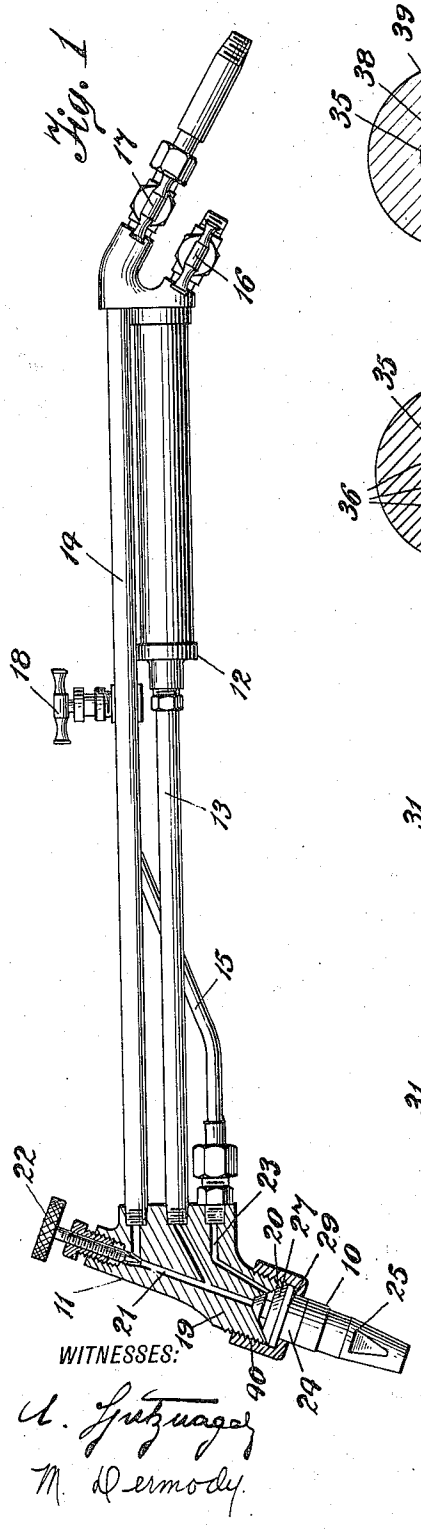


Fig. 1

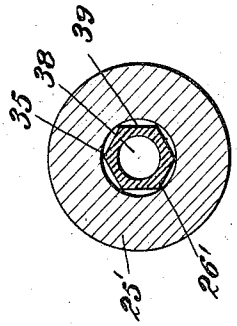


Fig. 6

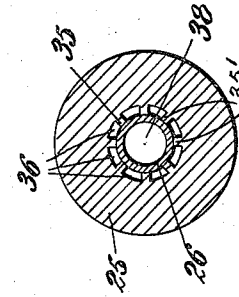


Fig. 5

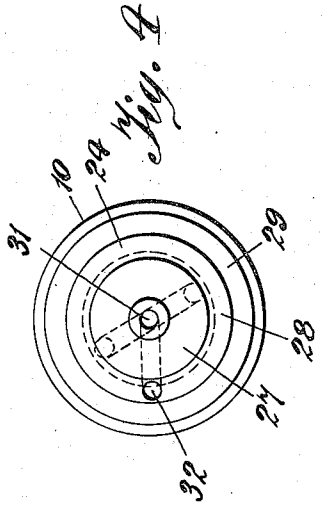


Fig. 4

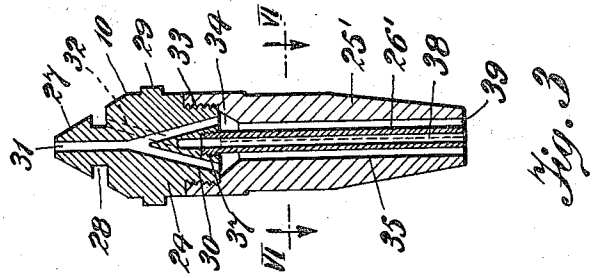


Fig. 3

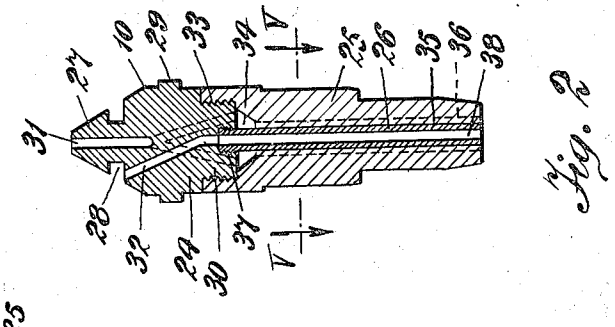


Fig. 2

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TIP FOR TORCHES.

1,186,962. Specification of Letters Patent. Patented June 13, 1916.

Application filed April 10, 1915. Serial No. 20,493.

To all whom it may concern:

Be it known that I, FREDERIC E. WRIGHT, a citizen of the United States, and a resident of Long Island City, county of Queens, and State of New York, have invented a certain new and useful Improvement in Tips for Torches, of which the following is a full, clear, and exact specification.

This invention relates more particularly to a class of devices adapted to be used in conjunction with apparatus for cutting metal by heat.

My invention has for its object primarily to provide a tip designed to be employed with blow pipes, burners, and like apparatus used in the art of metal working, and which is especially adaptable for use in connection with the form of torch disclosed in my Patent No. 1,060,393, issued April 29, 1913, whereby the cutting of metal may be accomplished with unusual facility by employing a combustible gaseous fuel, such as acetylene, hydrogen, coal gas, etc., and a combustion supporting gas, for instance oxygen, the feed of the combustible fuel and the supporting gas being so distributed by the use of this form of tip that an oxidization of the part of the metal being cut is caused to take place, thereby permitting the cutting process to be greatly facilitated.

The invention consists essentially of a body adapted to be removably applied to the head of a torch provided with the delivery conduits of a source of fuel supply of mixed combustible gases, and being provided with a delivery conduit of a source of supply of combustion supporting gas, the body having a number of spaced distributing passages adapted to lead from the delivery conduit of the combustible gases, these passages being relatively arranged concentrically whereby the flame when the gases are ignited will be substantially tubular in shape, and the body also having an inner distributing passage centrally of and in spaced relation to the outer passages, the inner passage being adapted to lead from the delivery conduit of the combustion supporting gas or oxygen whereby the supporting gas will flow from the tip in the center of the flame and due to the metal midway of the part contacted by the tubular shaped flame being heated in the presence of oxygen, said metal will be rendered more readily combustible and due to the combustion thereof, the cutting of the metal will be hastened.

A further object of the invention is to provide a tip of simple construction, and which may be made so as to combine unusual efficiency and durability.

A practical embodiment of the invention is represented in the accompanying drawing forming a part of this specification in which similar characters of reference indicate corresponding parts in all the views, the said invention being more fully described hereinafter, and then pointed out in the claims at the end of the description.

In the drawing, Figure 1 is a side view, partly in section, of a torch with one form of tip embodying my invention applied thereto. Fig. 2 is a section taken vertically through the tip. Fig. 3 is a section taken vertically through a slightly different form of the tip. Fig. 4 is an enlarged view looking downwardly on the tip, this end of each form of the tip being the same. Fig. 5 is an enlarged section taken on the line V—V of Fig. 2, and Fig. 6 is an enlarged section taken on the line VI—VI of Fig. 3.

The tip has a body 10 adapted to be detachably mounted on the head 11 of a torch, as 12, having pipes 13, 14, 15, the pipe 13 leading from a source of supply of combustible gaseous fuel, such as acetylene, hydrogen, coal gas, etc., the pipe 14 leading from a source of supply of low-pressure oxygen, and the pipe 15 leading from a source of supply of high-pressure oxygen. The flow of the gases through these pipes are controlled by valves of suitable types, as 16, 17, 18, one of which is interposed in each of the pipes. The head 11 of the torch has an angularly disposed exteriorly threaded nib, as 19, the free end of which is recessed, at 20, in a cup-shape, or cone-shape, and through the head leading from the center of this recess is a delivery conduit, or passage 21 the upper end of which communicates with the passage of the pipe 14 of the supply of low pressure oxygen, the delivery of this gas through the conduit 21 being regulated by manipulating a needle-valve 22 arranged in the head so as to control the opening and closing of the upper part of this conduit. Part of the conduit 21 under the needle-valve 22 communicates with the passage through the pipe 13 of the supply of acetylene, and from the passage

of the pipe 15 of the supply of high-pressure oxygen is a conduit, or passage 23 which leads into the recess 20 of the head 11 at a spaced interval from the passage 21. All of these parts of the torch are substantially similar in construction and operation to like parts of the torch disclosed in my Patent No. 1,060,393, issued April 29, 1913, and although this form of tip is illustrated and described as being especially adaptable for use in conjunction with a particular type of torch it may be used with other forms of torches, burners, blowpipes, and like apparatus susceptible of being employed for cutting metal by heat.

The body 10 of the tip is preferably composed of a supporting member, or head 24, an outer tubular member, or shell 25, and an inner tubular member, or pipe 26 as shown in Figs. 2 and 5, said parts being denoted by 25′ and 26′ in Figs. 3 and 6. The supporting member 24 is formed with a substantially cup-shaped, or cone shaped end, as 27, which corresponds to the shape of the cone-shaped recess 20 of the head 11 of the torch so as to be removably seated therein. Approximately midway of the periphery of the cone-shaped end 27 is a concentric groove 28 which is adapted to be registered with the conduit 23 of the head of the torch, and on the periphery of the supporting member 24 adjacent to its cone-shaped end is a projecting annular flange 29. The end of the supporting member 24 opposite to its cone-shaped end is reduced in diameter, as at 30, and this reduced end is exteriorly threaded. Extending lengthwise through the supporting member 24 is part of a distributing passage 31 which is preferably substantially the shape of an inverted Y to provide, as shown, a straight upwardly disposed portion and two downwardly diverging branches, the upper portion of the passage 31 being adapted to be registered with the conduit 21 of the head of the torch, while the branches of this passage terminate in spaced relation at the free end of the exteriorly threaded reduced end 30 of the supporting member. Also through the supporting member 24 is another distributing passage 32 which is disposed to lead from the concentric groove 28 so as to terminate in the center of the reduced end 30 of this member and between the diverging branches of its Y-shaped passage 31.

The tubular members 25 and 25′ of the body of the tip have an interiorly threaded recessed end 33 into which is screwed the exteriorly threaded reduced end 30 of the supporting member 24, and also in this end of the tubular member is a communicating countersunken recess 34 having tapered walls. The tubular members 25 and 25′ may be of any desired length and shape, though the exterior formation of each preferably tapers toward the end thereof which is opposite to its recessed end, and lengthwise through the center of each member is a circular distributing passage 35 of a suitable diameter, as shown in Figs. 3 and 6, or this passage may be formed with a number of inwardly projecting spaced longitudinal ribs 35′, providing spaced grooves, as 36, extending lengthwise in the wall thereof, as illustrated in Figs. 2 and 5, so as to communicate with the passage 35. One end of the passage 35 is in register with the countersunken recess 34 of the recessed end 33 of this tubular member, and the passage leads to the free end of the member, thus when the low-pressure oxygen and the acetylene are delivered to the tip through the conduit 21 of the head of the torch, the mixed combustible gases will be received into the Y-shaped passage 31 of the supporting member 24 for transmission therethrough to the countersunken recess 34, and then delivered through the passage 35 of the tubular member 25 so as to be ignited at the free end of this tubular member.

The tubular members 26 and 26′ of the body of the tip each have an exteriorly threaded end 37 which is screwed into a threaded recess centrally of the end of the reduced end 30 of the supporting member 24 so that the passage 38 of this tubular member will be in register with the passage 32 of the supporting member. The tubular member 26 is disposed in the passage 35 of the tubular member 25, the former tubular member being of a length whereby its other end terminates at the free end of the latter mentioned tubular member. When the tubular member 26 is used in conjunction with the form of the tubular member 25, shown in Figs. 2 and 5, which is provided with the spaced grooves 36 in the wall of its delivery passage 35 the outer periphery of the member 26 is made circular in shape so as to snugly fit the wall proper of the passage 35 of the member 25. The mixed combustible gases when received in the recess 34 of the body will thereby be caused to flow through the spaced grooves 36, and when the tubular member 26′ is used in conjunction with the form of tubular member 25′, shown in Figs. 3 and 6, in which the spaced grooves are dispensed with the outer periphery of the member 26′ is made hexagonal, as at 39, or of any other polygonal shape. The extreme outer diameter of the polygonal shaped tubular member is then formed so that the junctures of its faces will contact with the circular wall of the passage 35 of the tubular member 25, and in this manner the faces of the polygonal shaped member will be spaced from the tubular member 25′. In either of these forms of the tip the delivery passage 35 is thereby composed of a number of concen-

trically arranged spaced passages, and the passage 38 of the tubular member 26′ is in register with the passage 32 of the supporting member 24.

When the tip is applied to the head of the torch its body is disposed so that the cone-shaped end 27 of the supporting member 24 will be seated in the recess 20 of the head, and to detachably fasten the tip to the head 11 of the torch, on the threaded nib 19 of the head is screwed an interiorly threaded nut 40 having an inturned annular flange disposed over the flange 29 of the supporting member 24. The passage 31 of the supporting member will then be in register with the conduit 21 of the torch, and the conduit 23 of the torch will be registered with the annular groove 28 of this supporting member. The supply of mixed combustible gases from the conduit 21 of the head of the torch will be delivered for distribution to and through the passages 31 and 35 of the tip, and the supply of high-pressure oxygen from the conduit 23 of the head of the torch will be delivered for distribution to and through the passage 38 of the member 26 or 26′. As the passage 35 of the members 25 and 25′ for distributing the mixed combustible gases is composed of a number of spaced concentrically arranged passages the flame when these gases are ignited will be substantially tubular in form, and by disposing the tubular member 26 or 26′ midway of this passage the high-pressure oxygen will be caused to be distributed from the tip centrally of the tubular flame. Moreover, by making the tubular members 26 and 26′ of a diameter whereby they contact with the wall of the passage 35 of the tubular members 25 and 25′ the tubular members 26 and 26′ will be prevented from bending when softened by the heat of the flame of the ignited combustible gases. The high-pressure oxygen when its delivery is properly regulated will thereby serve as a combustion supporting agent for the flame as well as tending to cause an oxidization to take place of the part of the metal simultaneously contacted by the flame, thus permitting the cutting process to be accomplished with great facility.

In the foregoing description, I have embodied the preferred form of my invention, but I do not wish to be understood as limiting myself thereto, as I am aware that modifications may be made therein without departing from the principle or sacrificing any of the advantages of this invention, therefore I reserve to myself the right to make such changes as fairly fall within the scope of the appended claims.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. A tip of the character described, comprising a supporting member adapted to be detachably connected to a torch, burner, or the like provided with a conduit for delivery of mixed combustible gases, a conduit for the delivery of oxygen, a cup-shaped end, said supporting body having an end formed to fit said cup-shaped end, and provided with an annular groove with which said conduit for oxygen communicates, a central passage terminating in diverging branches leading from the conduit of the combustible gases and a separate passage extending at an angle from said groove and extending centrally through the bottom portion of the supporting member to receive supply from the conduit of the oxygen, a tubular member on the supporting member and provided with spaced passages in register with the passages for the combustible gases of and the tubular member being also provided with an inner passage centrally of and in spaced relation to the outer passages, the inner passage being in register with the passage for the combustion supporting gas, as and for the purposes set forth.

2. A tip of the character described comprising a supporting member adapted to be detachably connected to a torch, burner, or the like provided with a conduit for delivery of mixed combustible gases of the torch, a conduit for delivery of a combustion supporting and oxidizing gas, and a cone-shaped recessed end, the said supporting body having a cone-shaped end fitting said recess and provided with an annular groove with which said conduit for combustion supporting and oxidizing gas communicates, a central passage terminating in diverging branches adapted to lead from the conduit of the combustible gases, and a separate passage extending at an angle from said groove at one side of the aforesaid passage and extending centrally through the bottom portion of the supporting member to receive the supply of combustion supporting and oxidizing gas from the conduit, a tubular member removably secured on the supporting member and provided with a countersunken recess and spaced concentrically arranged passages communicating therewith, said recess being in communication with the branch passages for the combustible gases of the supporting member, and a tubular member removably suspended from the supporting member and extending through the aforesaid tubular member to provide an inner passage centrally of and in spaced relation to the outer passages, the inner passage being in register with the passage for the combustion supporting and oxidizing gas of the supporting member, substantially as described and for the purpose specified.

3. A tip of the character described, comprising a tubular body adapted to be ap-

plied to a torch, burner, or the like provided with a conduit for delivery of mixed combustible gases and provided with a conduit for delivery of a combustion supporting gas, the tubular body having spaced concentrically arranged grooves in the wall of its passage substantially throughout the length thereof, and a tubular member in the passage of the body, contacting with the wall proper of the passage, the concentrically arranged grooves being adapted to lead from the conduit of the combustible gases of the torch whereby the gases will flow through the grooves to provide a tubular shaped flame when ignited, and the passage of the tubular member being adapted to lead from the conduit of the combustion supporting gas of the torch whereby the gas will flow through this member so as to be discharged from the tip in the center of the flame, for the purpose specified.

4. The combination with a torch provided with a conduit for delivery of a combustible gas and provided with a conduit for delivery of a combustion supporting gas, of a supporting member having a passage in register with the conduit of the torch for the delivery of the combustible gas, and having a separate passage in register with the conduit for the delivery of the combustion supporting gas, a tubular member detachably mounted on the supporting member, the passage of the tubular member communicating with the passage for the combustion supporting gas, and the tubular member having inwardly projecting spaced longitudinal ribs providing spaced longitudinal passages arranged around and in spaced relation to its single passage, substantially as described and for the purpose specified.

This specification signed and witnessed this ninth day of April A. D. 1915.

FREDERIC E. WRIGHT.

Witnesses:

ROBT. B. ABBOTT,

M. DERMODY.