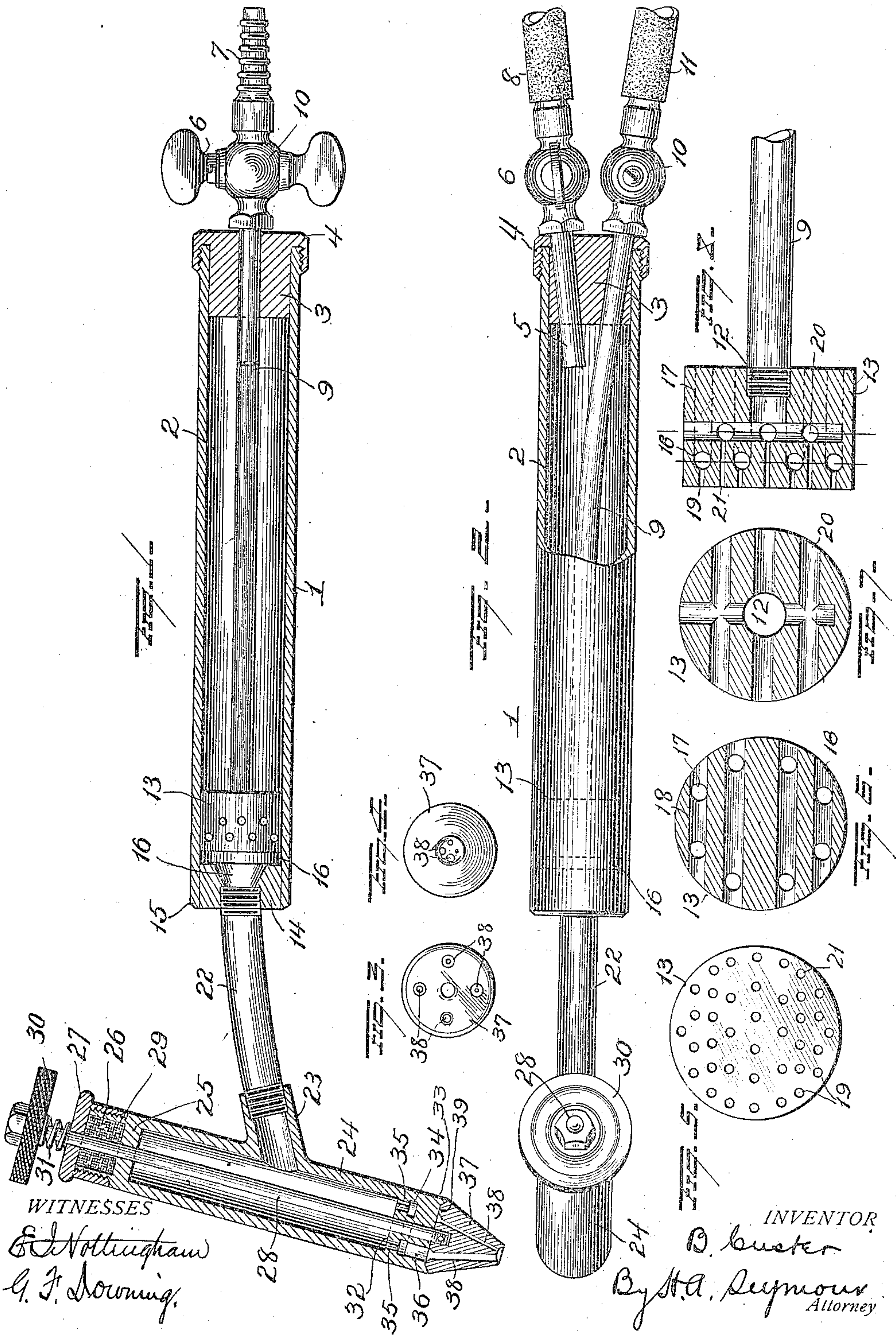


WELDING TORCH.

APPLICATION FILED MAR. 28, 1914. RENEWED MAR. 22, 1915.

1,154,974.

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# UNITED STATES PATENT OFFICE.

BURR CUSTER, OF MARION, INDIANA.

WELDING-TORCH.

1,154,974.

Specification of Letters Patent.

Patented Sept. 28, 1915.

Application filed March 28, 1914, Serial No. 828,012. Renewed March 22, 1915. Serial No. 16,268.

*To all whom it may concern:*

Be it known that I, BURR CUSTER, a citizen of the United States, and resident of Marion, in the county of Grant and State of Indiana, have invented certain new and useful Improvements in Welding-Torches; 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 improvements in welding torches,—the object of the invention being to provide a device of this character in which the gas and oxygen shall be thoroughly diffused and mixed before reaching the jet or flame orifice, and in which the size or extent of the flame may be readily and accurately controlled.

With this object in view the invention consists in certain novel feature of construction and combinations of parts as hereinafter described and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view, partly in section, illustrating an embodiment of my invention. Fig. 2 is a view at right angles to Fig. 1. Figs. 3 and 4 are top and bottom plan views of the nozzle 37; Fig. 5 is an enlarged end view of the block 13; Figs. 6 and 7 are enlarged transverse sectional views of the block 13, and Fig. 8 is an enlarged longitudinal sectional view of said block.

1 represents a cylinder which constitutes the tubular handle portion of the implement and forms a chamber 2. A plug 3 is located in one end of the cylinder 1 and this end is closed by a cap 4. A pipe 5 passes through the cap 4 and plug 3 and at its inner end discharges into the chamber 2 of the cylinder,—the outer end of said pipe being provided with a valve 6 and the casing of this valve is provided with a shank 7 to receive a rubber hose 8 by which acetylene or other gas is conveyed to the chamber 2 of the cylinder. A pipe 9 also passes through the plug 3 and cap 4 and this pipe is provided with a valve 10, the casing of which is constructed with a shank for the reception of a hose 11 by means of which oxygen is conveyed to the implement. The pipe 9 extends through the chamber 2 of the cylinder 1 and at its forward end communicates with a chamber 12 located in a block 13 disposed within the cylin-

der 1 near its forward end. A plug 14 is located in the forward end of the cylinder and may be retained in place by a cap 15. The plug 14 is made with a conical recess which, with the space between the plugs 13 and 14 forms a chamber 16. The plug 13 is provided with a plurality of longitudinal ducts 17 and communicating transverse ducts 18, the former communicating with the chamber 2 of the cylinder and the transverse ducts communicate with small jet orifices 19 which discharge into the chamber 16. The plug 13 is also provided with a plurality of communicating ducts 20 which also communicate with the pipe 9 through the medium of the chamber 12 and with said ducts 20, small jet orifices 21 communicate and discharge into the chamber 16. By the provision of the communicating ducts 17—18 in the block 13, the gas will be thoroughly diffused and the oxygen will be also diffused by its passage through the ducts 20 and both the gas and the oxygen, entering the chamber 16 through numerous small jet orifices 21 will become thoroughly mixed in said chamber 16. The mixed gas and oxygen will leave the chamber 16 through a pipe 22 (which is preferably curved) and the forward end of this pipe communicates with a nipple 23 on the tubular head 24 of the implement.

The nipple 23 is so disposed with relation to the head 24 and the pipe 22 that said head will be in a diagonal position when the tubular handle portion or cylinder 1 is in a horizontal position.

The upper end of the tubular head 24 is closed, as at 25, and provided with a threaded flange 26 to receive a cap 27. A rod 28 passes through the cap 27 and the end 25 of the head and the space between said end 25 and cap 27 forms a compartment in which packing 29 for said rod is located. The upper end of the rod is provided with a hand wheel 30 and between said hand wheel and the cap 27, a spring 31 is located. Near the lower end of the tubular head 24, a disk or partition 32 is located and the space between said disk or partition and the end 33 of the head 24, forms a chamber 34 which communicates with the interior of the tubular head by means of a plurality of small ducts 35. The lower end 33 of the head 24 is provided with a duct 36 for a purpose presently explained.

The rod 28 passes through the partition



32 and also through the end 33 of the head 24 and enters a conical nozzle 37 to which it is secured. This nozzle is provided with a plurality of ducts 38 which differ from each other in size and therefore in capacity and the lower end of each of said ducts discharges at the apex of the conical nozzle.

With the parts in the position shown in Fig. 1, the mixed gas and oxygen from the chamber 16 will pass through the pipe 22 and enter the tubular head 24, from which said mixture will pass through the small ducts 35 and through the chamber 34 to the largest of the jet ducts 38 and will be burned at the apex of the conical nozzle, affording the largest flame of which the device is capable. By rotating the conical nozzle 37 (on its bearing 39 at the lower end of the head 24) by means of the rod 28, one of the smaller jet ducts 38 may be brought into communication with the outlet duct 36 and thus a smaller flame, according to the needs at hand, may be provided.

Having fully described my invention what I claim as new and desire to secure by Letters-Patent is:

1. In a welding torch, the combination with a tubular handle portion provided therein with gas and oxygen diffusing means and a mixing chamber, of a head communicating with said mixing chamber, a revoluble jet cone attached to the lower end of said head and provided with a plurality of jet ducts differing in size, and means for turning said cone to bring any of said jet ducts into communication with said head.

2. In a welding torch, the combination with a tubular handle portion, means for discharging gas thereinto, a diffusing device within said tubular handle and communicating with the interior thereof, a pipe for oxygen communicating with said diffusing device, and a mixing chamber communicating with said diffusing device, of a tubular head, a pipe connecting said tubular head with the mixing chamber of the tubular handle, an adjustable jet cone attached to the lower end of said tubular head and having a plurality of jet ducts differing in size, and means for adjusting said cone to bring any

one of said jet ducts into communication with the interior of the head.

3. In a welding torch, the combination with a tubular head and means for discharging mixed gas and oxygen thereinto, said head having a single duct at one end, of a revoluble jet cone attached to said head and provided with a plurality of jet ducts differing in size, and means for turning said cone to bring any one of said jet ducts into communication with the duct in the end of the head.

4. In a welding torch, the combination with a tubular head and means for discharging mixed gas and oxygen thereinto, said head having a single outlet duct at its lower end, of a partition near the lower end of said head, said partition having a plurality of small ducts, a rod passing through said head and provided at its upper end with operating means, and a jet cone secured to said rod and having a bearing on the end of said head, said jet cone having a plurality of jet ducts different in capacity.

5. In a welding torch, the combination of a tubular handle portion provided with a mixing chamber, a diffusing device in said handle adjacent to the mixing chamber and comprising a block having two sets of transverse ducts, said block also having longitudinal ducts connecting one set of transverse ducts with the interior of the handle and said block having another set of longitudinal ducts connecting the same transverse ducts with the mixing chamber, means for discharging gas into said handle, a pipe for conveying oxygen to the other set of transverse ducts in the block, and said block having longitudinal ducts connecting the last-mentioned transverse ducts with the mixing chamber, and a torch head connected with the mixing chamber.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

BURR CUSTER.

Witnesses:

GEO. L. CLUPPER,  
J. L. BOLEN.