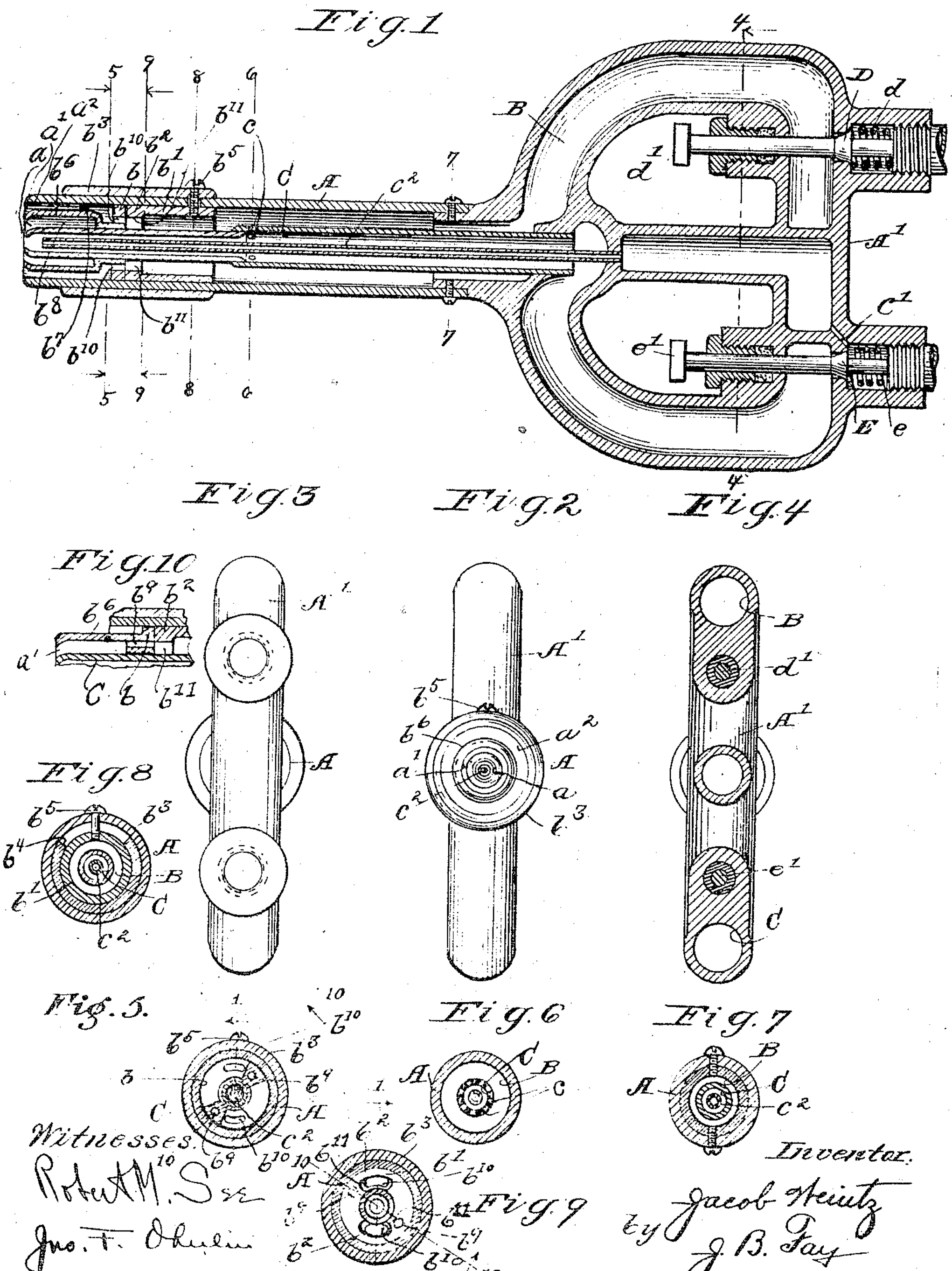
J. WEINTZ.

BLOW TORCH.

APPLICATION FILED JULY 9, 1910.

1,006,034. Patented Oct. 17, 1911.



Witnesses.

Robert M. Sse

Jno. T. Ohulin

Inventor.

Jacob Weintz

by J. B. Fay

Attorney.

UNITED STATES PATENT OFFICE.

JACOB WEINTZ, OF CLEVELAND, OHIO.

BLOW-TORCH.

1,006,034. Specification of Letters Patent. Patented Oct. 17, 1911.

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To all whom it may concern:

Be it known that I, JACOB WEINTZ, a citizen of the United States, and a resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Blow-Torches, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The present invention has relation to a blow torch and has for its general objects the provision of a torch which may be conveniently handled and in which the flow of gas and air may be easily and closely controlled.

The preparation of molds for casting involves the drying or baking of the surface of the sand which forms the mold, so that no steam will be formed when the molten metal comes into contact with the mold. The torch, which the present invention provides, is especially adapted for use in drying the surfaces of molds, but it, of course, may be adapted to many other uses.

To the accomplishment of these and related ends said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawing and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may be used.

In said annexed drawing:—Figure 1 is a central vertical section of a torch embodying my invention; Fig. 2 is an end elevation looking from the left in Fig. 1; Fig. 3 is an end elevation looking from the right in Fig. 1; Fig. 4 is a vertical section on the line 4—4 in Fig. 1; Fig. 5 is a section on the line 5—5 in Fig. 1; Fig. 6 is a section on the line 6—6 in Fig. 1; Fig. 7 is a section on the line 7—7 in Fig. 1; Fig. 8 is a section on the line 8—8 in Fig. 1; Fig. 9 is a section on the line 9—9 in Fig. 1; and Fig. 10 is a detail sectional view on the plane of the section line 10—10 of Figs. 5 and 9.

The torch comprises a body composed of the cylindrical portion A and the handle portion A'. An air passage B extends through the body and a gas passage C also extends through the body, and in the cylindrical portion A of the body the gas passage C is within, and concentric with, the air passage B, the two passages having a common orifice *a*. On a plane removed from the orifice *a* the wall which separates the air passage B and the gas passage C is perforated by a circle of communicating openings *c*.

Inserted in the outer end of the cylindrical body portion A, in the annular space between such body portion proper and the walls of gas passage C, is a tubular member b^6 sub-dividing such annular passage at its outer end into two concentric chambers b^7 and b^8. Communication between the main air passage and these two terminal chambers, into which it is sub-divided, is controlled by two sets of ports in a transverse wall *b* formed integral with the inner end of tubular member b^6, and a rotatable tubular member *b'* disposed within the air passage B and provided with an apertured flange b^2, which bears against such wall. Of the apertures or ports in the wall, one set b^9 is considerably smaller than the other, and communicates with the concentric chamber b^8 nearest the center of axis of the device, while the other larger apertures b^{10} communicate with the outer concentric chamber. The apertures b^{11} in the rotatable valve member are of such a size and disposition as to be capable, in different axial positions of said member, to close both such sets of apertures b^9 and b^{10} in the wall *b*, or to open either or both as desired, (see Figs. 5 and 9). In order to position such member *b'* to cause the apertures therein thus variously to register with those in the wall *b* a rotatable sleeve b^3 is mounted exteriorly on the cylindrical portion A of the body and through a slot b^4, in the wall of the body a screw b^5 rigidly connects the sleeve b^3 and the member *b'*. By rotation of said sleeve b^3, which is designed to be manually effected, a corresponding rotation of the inner valve member *b'*, as it may be termed, will obviously be obtained. Said sleeve, or the valve member, will of course be fitted to the body portion A tightly enough to cause said valve member to remain wherever it may be thus placed by the operator's hand.

From the foregoing description, it will be seen that the body portion in question has in effect three discharge orifices, not including the pilot tube. Of such orifices, the central one *a* constitutes the outer discharge

end of the gas supply passage C, while the two remaining orifices a' and a^2 are the outer ends of the concentric chambers b^8 and b^7 into which the terminal portion of the air passage A is sub-divided by member b^6.

The air passage B is primarily controlled by a valve D which is held to its seat by a spring d and is openable by pressure upon the valve stem d'. A similar valve E controls the gas passage, and it is held to its seat by a spring e and is openable by pressure upon its valve stem e'. The valve stems d' and e' are so disposed that when the operator grasps the handle portion of the torch these valve stems will lie under his fingers so that by mere closure of his hand the valves may be operated. A leak-port e^3 leads past the gas valve E, and a tube e^4 extends from the leak-port to a point adjacent the orifice a, the tube e^4 being disposed centrally within the gas passage C.

In operation the torch will be connected with an air and a gas supply by any suitable pipes, although, preferably, flexible connections will be used for this purpose where the torch is to be carried from one place to another. The leak-port past the gas valve and the tube extending from it forms a pilot light at the orifice of the passages, which after once being lighted will continue to burn, because there is no means for closing the flow of gas through the port and tube. Assuming, then, the control valve in the outer portion of the air passage to be so disposed as to close both sets of apertures or ports in wall b, and further that air and gas are admitted into their respective passages by pressure of the operator's fingers to open the control valves D and E respectively, the gas will find a direct escape through its passage and orifice a, whereas the air can only escape by entering such gas passage through the series of annular apertures c in the latter's wall, and mingling with the gas. A very fine pencil-like flame is thus secured, such as is desirable, where the torch is being used in connection with the molding operation hereinbefore suggested, to reach the inner corners and recesses of the mold that is being dried. If now a more extended or broader flame is desired, this will be secured by rotating the valve member b' to open the smaller set of passages b^9 in the wall b to the escape of air therethrough by way of annular orifice a^4. The air in passing by apertures c will exercise a sufficient suction effect to draw through said apertures the necessary amount of gas to form a combustive mixture, when mingled with the gas that now escapes from the central orifice a practically free from air. Next by rotating valve member b' to open both sets of apertures in wall b a flame will issue from the torch equal in cross-section at its base to the full cross-sectional area of the nozzle, since now the third or outermost orifice a^2 is brought into use. While by cutting off the smaller set of apertures and still retaining the larger set in use, an equally broad flame is secured, but without the intensity of the one just described, since no combustive mixture is then issuing through the intermediate orifice a'.

From the foregoing description it will be seen that a wide range in the character of the flame produced and attendant heating effect of the torch follows the simple adjustment of valve b'. Whatever the adjustment in this particular, however, the flame is entirely extinguished, save for the pilot light, the moment the torch is laid aside. This adjustment furthermore may be made while the torch is in use with almost the same ease and facility that a stream of water being discharged through a nozzle may be regulated. The compactness and the simplicity of the structure in which these several advantages are combined, make a torch embodying that construction exceptionally convenient for drying the surfaces of molds, but it is readily apparent that by varying details of size or shape the torch may be equally well suited for other purposes.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any one of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. A device of the character described, comprising a body provided with concentric air and gas passages having a common orifice, and with a communicating opening between said passages, a wall in the air passage between said orifice and opening, said wall being provided with apertures, and means for controlling the apertures in said wall.

2. A device of the character described, comprising a cylindrical body formed with a slot in its wall and provided with concentric air and gas passages having a common orifice, and with a communicating opening between said passages, an apertured wall in the air passage between said orifice and opening, a tubular member within the air passage and having an apertured flange bearing against said wall, a rotatable sleeve mounted on the body, and a member rigidly connecting said tubular member and sleeve, said member extending through the slot in the wall of the body.

3. A device of the character described, comprising a body provided with air and gas passages having a common orifice, and with a communicating opening between said

passages, an apertured wall in the air passage between said orifice and opening, means dividing the air passage between said wall and orifice into a plurality of passages, and means for controlling the apertures in said wall.

4. A device of the character described, comprising a cylindrical body formed with a slot in its wall and provided with concentric air and gas passages having a common orifice, and with a communicating opening between said passages, an apertured wall in the air passage between said orifice and opening, means dividing the air passage between said wall and orifice into a plurality of concentric passages, a tubular member within the air passage and having an apertured flange bearing against said wall, a rotatable sleeve mounted on the body, and a member rigidly connecting said tubular member and sleeve, said member extending through the slot in the wall of the body.

5. A device of the character described, comprising a body provided with air and gas passages having a common orifice, and with a communicating opening between said passages, valves for controlling said passages, the body being provided with a leak-port past the gas valve, and a tube extending from said leak-port to said orifice.

6. A device of the character described, comprising a body provided with air and gas passages having a common orifice, and with a communicating opening between said passages, valves for controlling said passages, the body being provided with a leak-port past the gas valve, a tube extending from said leak-port to said orifice, and means disposed between said orifice and opening for controlling the air passage.

7. A device of the character described, comprising a body provided with air and gas passages having a common orifice, and with a communicating opening between said passages, valves for controlling said passages, the body being provided with a leak-port past the gas valve, a tube extending from said leak-port to said orifice, an apertured wall in the air passage between said orifice and opening, and means for controlling the apertures in said wall.

8. A device of the character described, comprising a body formed with a slot in its wall and provided with concentric air and gas passages having a common orifice, and with a communicating opening between said passages, valves for controlling said passages, the body being provided with a leak-port past the gas valve, a tube extending from said leak-port to said orifice, an apertured wall in the air passage between said orifice and opening, means dividing the air passage between said wall and orifice into a plurality of concentric passages, a tubular member within the air passage and having an apertured flange bearing against said wall, a rotatable sleeve mounted on the body, and a member rigidly connecting said tubular member and sleeve, said member extending through the slot in the wall of the body.

Signed by me this 5th day of July, 1910.

JACOB WEINTZ.

Attested by—

D. T. DAVIES,

JNO. F. OBERLIN.