(No Model.)

D. M. MONROE.

GAS BLOW PIPE.

No. 418,807. Patented Jan. 7, 1890.

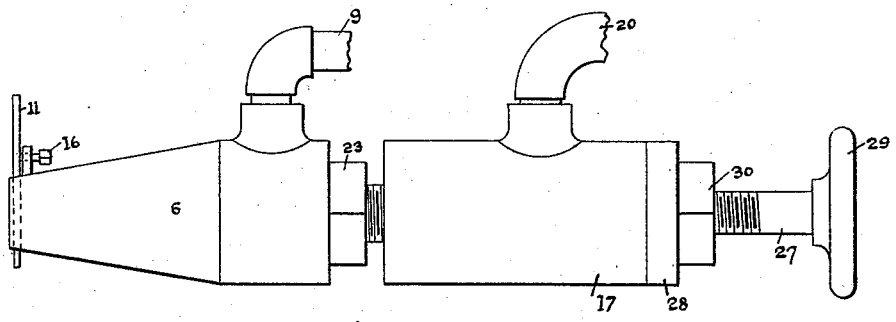

FIG. I.

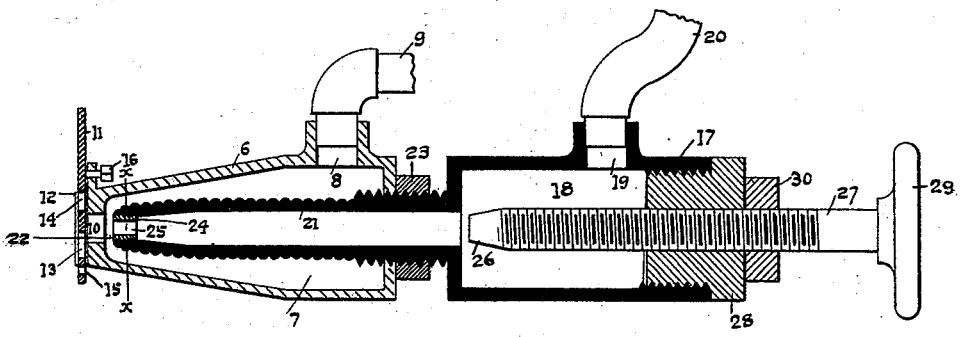

FIG. II.

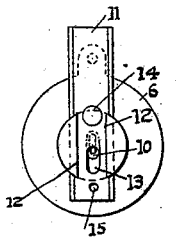

FIG. III.

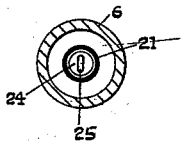

FIG. IV.

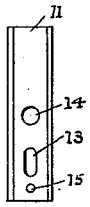

FIG. V.

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UNITED STATES PATENT OFFICE.

DAVID M. MONROE, OF BALTIMORE, MARYLAND, ASSIGNOR TO ROBERT TYNES SMITH, OF SAME PLACE.

GAS BLOW-PIPE.

SPECIFICATION forming part of Letters Patent No. 418,807, dated January 7, 1890.

Application filed October 19, 1889. Serial No. 327,531. (No model.)

To all whom it may concern:

Be it known that I, DAVID M. MONROE, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Gas-Burners; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in that class of gas-burners wherefrom an intense heat is produced by a large volume of oxygen supplied to the flame thereof; and I have for my object to provide such means of controlling both the supply of combustible gas and the oxygen supplied thereto that the heat intensity of the flame may thereby be readily increased or diminished, and whereby the size and form of the flame may with facility be changed to suit the requirements of the work upon which the heat is to be concentrated, all of which I accomplish by the devices hereinafter fully described and claimed, reference being had to the accompanying drawings, in which—

Figure I shows a side elevation of the device. Fig. II shows a sectional view of the device shown in Fig. I. Fig. III shows a view looking on the end of the device from the left. Fig. IV shows a cross-section through the device indicated by the line *x x* in Fig. II. Fig. V shows a detail view of the controlling-plate.

The same numbers refer to the same or similar parts throughout the several views.

The number 6 denotes the casing wherein is formed the gas-mixing chamber 7, that receives its supply of combustible gas through the port 8 from the gas-pipe 9, which is screwed in the port 8 and which serves to hold the burner in position. The casing 6 is made of the tapered form shown, and in the smaller end thereof is provided the discharge-orifice 10, which is made of the oblong form shown in Fig. III, whereby when the gas from the chamber 7 escapes unobstructed through the said orifice and is ignited the flame thereof will assume a thin fan-like form, and thus concentrate its heat in a straight line, the breadth and thickness of which is established by the length and width of the said orifice 10. In order that this feature of the breadth and form of the flame may be controlled, there is provided the plate 11, that moves in suitable dovetailed guides 12 therefor, which are extended from the small end of the body 6, whereby the said plate 11 will be held in close contact with the outer surface of this end of the casing 6 and free to slide over the orifice 10 therein. In this plate 11 is formed the oblong opening 13, Fig. V, that is of size and form to correspond with the orifice 10, whereby when the plate 11 is in such position that its oblong opening 13 is squarely over the said oblong orifice 10 the full length of the discharge-orifice 10 will be presented for the escape of the gas from the chamber 7, and the flame therefrom will be in its broadest and most flattened form, which may be contracted at will by the sliding movement of the plate 11, so that the oblong opening 13 therein will be only partly over the discharge-orifice 10, a sufficient movement of the said plate 11 closing the discharge-orifice 10 to such extent that but a small circular opening will be presented for the escape of the gas from the chamber 7, as shown in Fig. III, and the burning gas therefrom will produce a long needle-pointed flame, the heat of which is concentrated to a point. Additional holes 14 and 15, of circular form and varying sizes, are provided in the plate 11, which may be brought by the sliding movement of the plate over the orifice 10, and thereby permit such variation in the size of the needle-pointed flame as may be required for the work and not permitted by the oblong opening 13 in the plate 11. A set-screw 16, that is threaded into a suitable lug on the casing 6, serves to lock the plate 11 in any desired position.

In order to control the quantity of gas escaping through the discharge-orifice 10, and thus in any position of the plate 11 regulate the size and intensity of the flame, and at the same time cause a blast of air to be discharged through the orifice 10 and thereby draw the gas from the chamber 7, there is provided the casing 17, that has formed therein the air-

chamber 18, which receives its supply of air under pressure through the port 19 and flexible tube 20 connected thereto, there being extended from the casing 17 the cylindrical tubular extension 21, which is threaded into the larger end of the casing 6 in such manner that by turning the casing 17 in one direction or the other the valve end 22 of this extension 21 will be brought nearer to or removed from the orifice 10, and thus restrict at pleasure the flow of gas through the said orifice 10 from the chamber 7. A lock-nut 23 serves to lock the two casings 6 and 17 in such position as will maintain the desired opening between the valve end 22 of the extension 21 and the discharge-orifice 10.

To convey the air-pressure from the chamber 18 and cause the blast therefrom to be discharged through the orifice 10, and thus draw with it the gas from the chamber 7, the cylindrical extension 21 is made of tubular form, the end thereof being provided with a plug 24, that has therein the oblong opening 25, which is of similar form to the discharge-orifice 10, and is placed centrally in position therewith, whereby the air escaping through this opening 25 will be concentrated in such form as to expend its force through the said orifice 10.

It is found in practice that a certain quantity of the air discharged from the opening 25 in the extension 21 will not immediately be driven through the discharge-orifice 10, but some part will find its way back into the chamber 7 and therein become mixed with the combustible gas that is supplied thereto through the port 8. As this mixture of the air and gas in the chamber 7 is a desirable feature, in order to facilitate the mixing of these fluids therein the exterior surface of the extension 21 is made of a corrugated or ring form, (shown in Fig. 2,) whereby the currents of gases that are moving in the chamber 7 will be broken up and a more thorough mixing of the air and gas result in this chamber, which mixture, when forced through the discharge-orifice 10, will meet with the air-blast therethrough from the opening 25 in the extension 21, and thus to any extent may the flame of the burning gas be oxygenated and the thin flat form of the flame preserved when this character of flame is required.

In order to control the flow of air under pressure through the tubular extension 21 there is provided the valve 26, the spindle 27 of which extends through and is threaded in the cap 28 of the air-chamber 18 and may be locked in position by nut 30. By turning the milled head 29 of valve 26 the amount of air escaping through the opening 25 in the tubular extension 21 will be controlled by the valve 26 being brought nearer to or removed from the inner open end of said extension 21.

From the description just given of the construction and operation of the device it will be seen that a complete mixture of the air and gas is obtained, and that a perfect control of the flame therefrom may be maintained in both form and intensity. In certain character of work—such as soldering can-seams by a flame—it is necessary that a thin flat flame of intense heat be employed, so concentrated that the heat therefrom will strike immediately on the seam to be soldered and all dissipation of heat that would be injurious to the can avoided. To maintain this thin form of the flame and concentrate the heat in a straight line, the discharge-orifice 10 is made of the oblong form described, and that this form of the flame may be oxygenated without any dissipation of heat the opening 25 in the tubular extension 21 is made of like elongated form, and thus the blast therefrom will conform in shape to the flame from the orifice 10 and the thin flat form of the flame be preserved.

In lieu of changing the form of the flame by the use of the plate 11, as herein described, there might be substituted a number of plugs, each of which is provided with the required openings 13, 14, and 15—these plugs, one or the other, being placed in the orifice 10, as occasion requires. This use of the plugs, however, would not admit of the ready adjustment and variation of the length of the flame, as is permitted by the use of the plate 11 and its operation as described.

Having described my invention and the manner of operating, what I claim, and desire to secure by United States Letters Patent, is—

1. A gas-burner consisting of a gas-chamber 7, provided with a discharge-orifice 10, and an air-chamber 18, provided with the tubular extension 21, the said tubular extension 21 having its exterior surface of a corrugated form and placed centrally in the interior of the said chamber 7 and free to be moved inward and outward therein, for the purpose set forth.

2. In a gas-burner, the combination of a gas-chamber 7, provided in one end thereof with an oblong orifice 10, an air-chamber 18, provided with a tubular extension 21, the said tubular extension being placed centrally in the said gas-chamber 7 and free to be moved inward and outward therein, an oblong opening 25, provided in the end of said tubular extension, whereby the air-blast therefrom will conform in shape to the said discharge-orifice 10 in the gas-chamber, and a valve for controlling the flow of air through the said tubular extension, for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

DAVID M. MONROE.

Witnesses:
JNO. T. MADDOX,
WM. L. BAILIE.