No. 646,254. Patented Mar. 27, 1900.

J. F. BARKER.

GAS BURNER.

(Application filed June 30, 1899.)

(No Model.)

Fig. 9

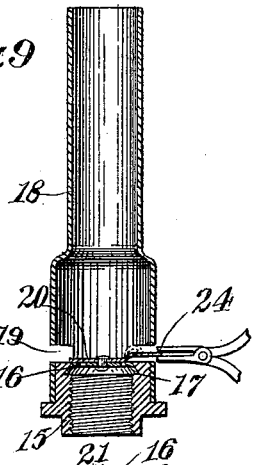


Fig. 10

Fig. 1

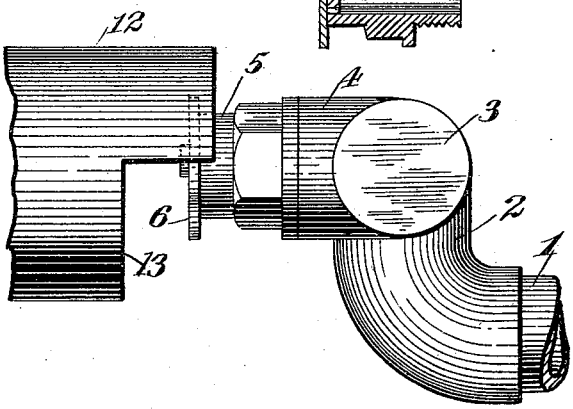


Fig. 2

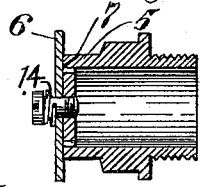


Fig. 3

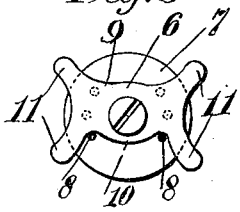


Fig. 4

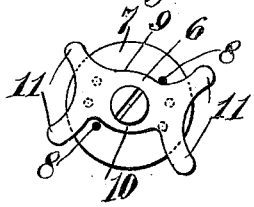


Fig. 5

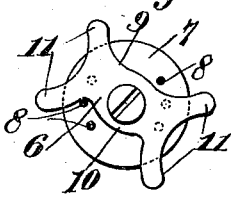


Fig. 6

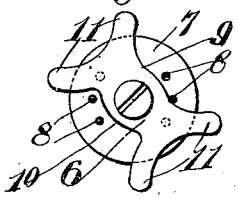


Fig. 7

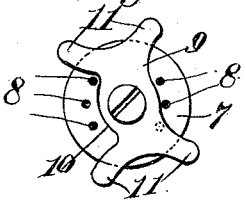


Fig. 8

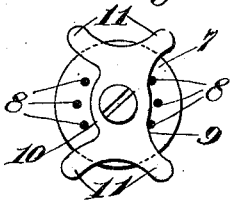


Fig. 11.

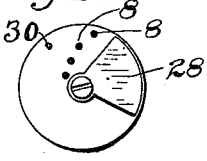
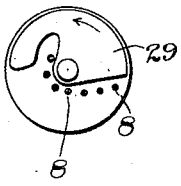


Fig. 12.



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UNITED STATES PATENT OFFICE.

JOHN F. BARKER, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR TO THE GILBERT & BARKER MANUFACTURING COMPANY, OF MASSACHUSETTS.

GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 646,254, dated March 27, 1900.

Application filed June 30, 1899. Serial No. 722,384. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. BARKER, a citizen of the United States, residing at the city of Springfield, in the county of Hampden, State of Massachusetts, have invented certain new and useful Improvements in Gas-Burners, of which the following is a specification.

This invention relates to improvements in gas-burners.

The invention particularly pertains to improvements in gas-regulating devices, and while it is adapted to and highly useful in connection with gas-heating apparatus it is also very advantageous in connection with incandescent gas-lighting, and therefore I show it in the drawings which accompany this specification constructed both for heating and for lighting.

The burner is of the Bunsen type and of the class wherein the gas-supply can be regulated according to the varying conditions of pressure, quality of gas, and other circumstances attending the use of gas in various localities for heating or lighting, and it is so designed that under all conditions of the gas regulation the maximum quantity of air to effect perfect combustion shall be drawn in by the gas and efficient mixing of the gas and air obtained.

Referring to the accompanying drawings to aid the description, Figure 1 is an elevation of the burner as applied to apparatus for heating water, and Fig. 2 is a section of the gas-regulating device. Figs. 3 and 4 are views of the gas-regulating valve in two positions of maximum closure. Figs. 5, 6, and 7 are views of the same in three several partly-open positions, and Fig. 8 is a view thereof in the fully-opened position. Fig. 9 is a vertical section, and Fig. 10 a plan, of the burner as adapted to incandescent gas-lighting. Fig. 11 is a plan of one modification, and Fig. 12 a plan of another modification, of the device with but a single series of holes.

Referring to Figs. 1 to 8, inclusive, the regulating device 5 6 is connected with the pipe 1, which supplies coal-gas, gasolene-gas, or other suitable gas for heating in any suitable manner, as by the elbow 2, header 3, and cross 4, into which the burner-tube 5 is threaded, this arrangement being very suitable where banks of burners are used, as in apparatus for heating water. Said gas-regulating device 5 6 delivers the gas into the open end of a burner-pipe 12, which is cut away at 13 both to give access to the valve 6 and to constitute an air-inductive opening. Said pipe 12 delivers the mixed air and gas to burner-tips of any desired construction. (Not here shown, as being no part of this invention.) The said gas-regulating device, consisting of the tube 5 and valve 6, is constructed as follows: The end of said tube 5 is closed by the plate 7, on which is centrally pivoted the valve 6, which is held in contact with plate 7 by the coiled spring 14. Said plate 7 is perforated by holes 8, preferably six or more in number, and said holes may be arranged in two groups and on the arcs of a circle struck from the axis of valve 6 as a center, as seen in Figs. 3 to 8, inclusive, or may be arranged in a single group, as shown in Figs. 11 and 12. The drawings show but one row of holes; but there may be several rows, preferably concentric and similarly disposed in groups. Referring to Figs. 3 to 8, segments are cut out of the valve 6 on each side, as shown, the cut-out portions constituting ports 9 10, so that when the valve is in the position of Fig. 8 all the holes 8 8 will be uncovered; but when the valve is in other positions more or fewer of said holes will be covered, and I prefer to so position said cut-away parts of the valve that even in the positions of maximum closure two holes will be uncovered, as in either Fig. 3 or Fig. 4, so that when the main gas-cock, connected with the gas-supply pipe 1 (not shown) is turned on the gas can never be accidentally shut off when adjusting the valve 6. Horns or projections 11 are left on said valve 6 to be grasped by the fingers of an attendant or engaged by any suitable tool in adjusting the valve. Referring to Figs. 11 and 12, the shape of the valve is such that as it turns it necessarily covers or uncovers an additional hole until in the open position all holes are uncovered, and in the positions of maximum closure all but one hole are closed, a stop 30 determining the closed position of the valve. With the aforesaid construction the velocity of the gas flowing through any hole or holes 8, corresponding to the pressure in pipe 1, re-

mains practically the same for all degrees of opening of said valve 6, and the gas streams draw in the maximum quantity of air at all degrees of the regulation, thereby allowing the regulation to be effected without detriment to the proper admixture of air with the gas, and this device therefore produces at the burner-tips a very perfect combustion-flame whatever may be the position of valve 6. As this perfect combustion-flame is advantageous in incandescent gas-lighting, the invention is very useful in this art also and is shown applied to an incandescent gas-burner in Figs. 9 and 10.

On the top of the nipple 15, which is threaded to connect with a gas-supply pipe, is a cap 16, which for cheapness of construction is of sheet metal, with a downwardly and outwardly flaring flange 17, which is forced into an undercut groove in said nipple 15. A valve 20 is centrally pivoted on said cap 16 with or without a spring, as 14, hereinbefore mentioned, 21 21 being a plurality of holes through the cap arranged on the arc of a circle struck from the center of rotation of the valve and in two groups, as shown. Segments are cut away from said valve at 22 23, which are of such shape and position that even when the valve is at the position of maximum closure at least one hole of each group will be open. When valve 20 is stamped out, a tongue 24 may be left at one side, if desired, of sufficient length to project a little beyond the Bunsen tube 18 when the parts are assembled. In assembling the parts this tongue 24 is bent upward sufficiently to permit the nipple and valve to be inserted in said Bunsen tube, and after said tube and nipple have been secured together said tongue is caught by a pliers or other tool and drawn out through one of the air-ports 19, as shown in Fig. 9, and the ends of said ports constitute stops to limit the throw of said valve. In use any suitable burner-head will be placed on the upper end of tube 18. Of course the tongue 24 may be omitted and the valve may be adjusted by inserting a suitable tool through an air-port.

Now, having described my improvements, I claim as my invention—

1. In a gas-burner, the combination of a gas-inlet tube having an end which is perforated with a plurality of orifices arranged in one or more groups, a valve turning on said end and adapted to uncover all said orifices when in the open position and to leave one or more of said orifices uncovered when the valve is in the position of maximum closure, substantially as described.

2. In a gas-burner, the combination of a Bunsen tube and a gas-regulating device adjacent to the air-inductive openings of said tube, and said device consisting of a gas-inlet tube equipped with an end that is perforated with a plurality of orifices arranged in groups and of a spring-pressed valve turning on said end and provided with ports in number equal to the number of said groups of orifices and of such size and arrangement that each port registers with one entire group in the open position of the valve and that said valve leaves one or more orifices uncovered when said valve is in the position of maximum closure, substantially as described.

3. The combination in a gas-burner, of a Bunsen tube, a gas-inlet tube equipped with an end that is perforated with a plurality of orifices arranged in groups, a valve turning on said end and provided with ports in number equal to the number of said groups of orifices and of such size and arrangement that each port registers with an entire group of orifices in the open position and that in the position of maximum closure said valve leaves one or more of said orifices uncovered, and a tongue on said valve adapted to be bent out through one of the air-inductive ports of said Bunsen tube for a handle, substantially as and for the purpose described.

4. In a gas-burner, the combination of a burner-tube and a gas-regulating device, and said device consisting of a gas-inlet tube equipped with an end that is perforated with a plurality of orifices arranged in groups, and of a valve turning on said end and provided with ports in number equal to the number of said groups of orifices and of such size and arrangement that each port registers with one entire group in the open position of the valve and that said valve leaves one or more orifices uncovered when said valve is in the position of maximum closure, substantially as described.

JOHN F. BARKER.

Witnesses:
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SCOTT ADAMS.