No. 676,451. Patented June 18, 1901.

C. S. STEWARD.

GAS BURNER.

(Application filed Feb. 27, 1900.)

(No Model.)

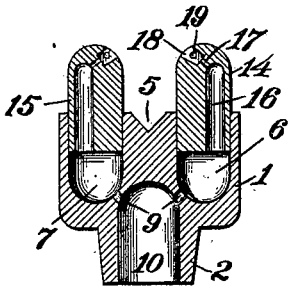

Fig. I.

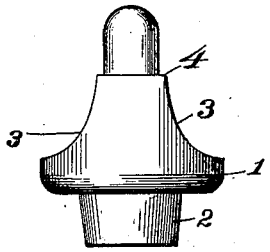

Fig. II.

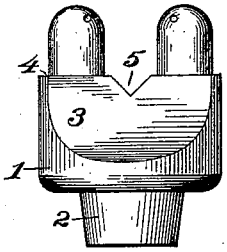

Fig. III.

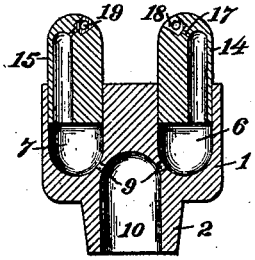

Fig. IV.

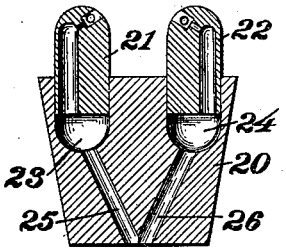

Fig. V.

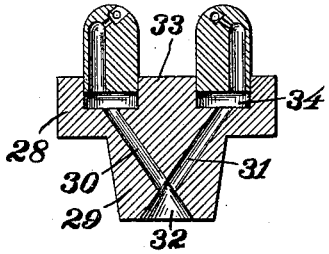

Fig. VI.

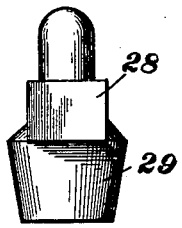

Fig. VII.

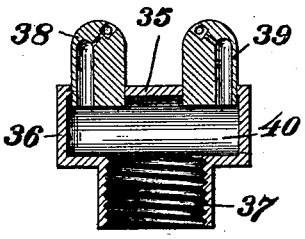

Fig. VIII.

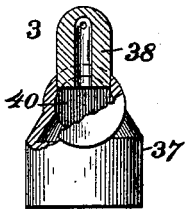

Fig. IX.

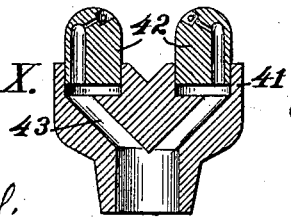

Fig. X.

Witnesses
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UNITED STATES PATENT OFFICE.

CLARENCE S. STEWARD, OF CHATTANOOGA, TENNESSEE.

GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 676,451, dated June 18, 1901.

Application filed February 27, 1900. Serial No. 6,702. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE S. STEWARD, of Chattanooga, in the county of Hamilton and State of Tennessee, have invented certain new and useful Improvements in Gas-Burners, of which the following is a complete specification, reference being had to the accompanying drawings.

My invention relates to improvements in gas-burners adapted particularly for consumption of acetylene gas or other rich gases.

One object of my invention is to produce a burner adapted to support impinging jets, in which provision is made for supplying air underneath the flame with the least possible obstruction through interposition of the body of the burner against upward air-currents.

Another object is to provide parallel adjustable tips. In this connection it may be observed that adjustable tips have been previously used in burners; but they have been either convergently or divergently disposed upon the body of the burner, with the respective gas-passages either formed at right angles with the bore of the tip or coaxially therewith. By my invention the gas passages or exits, being disposed, respectively, in lines at less than a right angle with reference to the axes of the tips, are adapted to support a flame between them at the point of impingement of the two jets and through their adjustability to fix that point properly and to the best advantage for the production of a perfect flame, whereas in burners having non-adjustable tips inaccurate construction is liable to produce defects in the burner which cannot be remedied. In burners having divergent or convergent tips, even though adjustable, the proper location of the point of impingement either cannot be secured at all or can be secured only partially and with difficulty.

In the accompanying drawings, Figure I is a vertical central section through its tips of a preferred form of my burner. Fig. II is a side elevation thereof. Fig. III is a view similar to Fig. II, but taken at right angles thereto. Fig. IV is a view similar to Fig. I, showing a modified form of burner in which the cleft or cavity in the crown of the burner as shown in Fig. I is omitted. Fig. V is a view similar to Fig. I, showing a form of burner in which the form of the body part is modified. Fig. VI is a similar view showing a still further modification. Fig. VII is an end view of the modified form of burner shown in Fig. VI. Fig. VIII is a view corresponding to Fig. I of a further modification. Fig. IX is an end view, partially in section, of the subject-matter of Fig. VIII; and Fig. X illustrates in section a burner having a body with a modified form of bore.

Referring to the numerals on Figs. I, II, III, and IV, 1 indicates a body part of suitable shape and dimensions, preferably of general cylindrical form. It is provided at one end with a neck 2 and is narrowed by walls 3, which, being upwardly convergent, are preferably curved and reëntrant. The top of the burner, defined between the upper ends of the walls 3, is flat, as indicated at 4, being provided with a middle cavity or cleft 5 or not, as preferred, the omission of the cavity being indicated in Fig. IV. Through the top 4 and into the body part thereof are bored parallel chambers 6 and 7. Their lower ends are preferably rounded, as illustrated, and between them, as through apertures 9, communication is respectively established with a central bore 10, formed in the neck 2 and body part 1 of the burner. It may be here noted that unless otherwise specified the term "bored" is employed to denote a preferred mode of forming a bore in steatite and that that term is intended to be employed only for illustration and not by way of limitation. The apertures 9 between the chambers 6 and 7 and the central bore 10 of the burner are preferably, by comparison with the chambers and bore, of narrow diameter, being only of a size to afford sufficient supply of gas to the chambers, which preferably constitute gas-reservoirs within the body of the burner. The upper ends of the chambers 6 and 7, respectively, are closed by tips 14 and 15, each of which is provided near its outer periphery with a longitudinal bore 16, from which leads a duct 17, that discharges through an enlarged recess 18, the interior of which is supplied with air, as by air-holes 19, common in this type of burner. From the foregoing description it will be perceived that the tips 14 and 15 are, like the chambers 6 and 7, into which they fit, parallel and that the gas-passages leading from their respective bores 16,

represented by the ducts 17 and recesses 18, proceed along lines between the axis of the bore 16 and a line at right angles thereto—that is to say, at an angle less than a right angle. By locating the bores 16 near the side walls of their respective tips sufficient thickness of wall in the tip is provided for the accommodation of the ducts 17 and recesses 18. The tips 14 and 15 are vertically and revolubly adjustable within their respective chambers. In practice by slight manipulation and test they may be nicely adjusted, so that jets proceeding from their respective recesses 18 may be caused to impinge against each other at a point suitably elevated above the top 4 of the burner and equidistantly between the tips. When the adjustment is made, it can be secured by the application of a suitable cement or, if preferred, by means of screw-threads upon the respective parts.

As was above specified, the chambers 6 and 7 constitute gas-reservoirs within the body of the burner. They are kept constantly filled with gas supplied from the bore 10, and as this gas is drawn off only through the minute ducts 17 of the tips it is in use heated and kept heated while the burner is supporting a flame.

It will appear by reference to Fig. II that the tips 14 and 15 are but little narrower than the top 4 of the body part of the burner. This narrowness of the top 4 is obtained through the gradual upward sweep of the curved walls 3. Consequently when the burner is in use there is maintained underneath the flame a volume of fresh air which finds free access to the flame from beneath and affords that free supply of oxygen to the flame which is essential to the promotion of proper combustion at the point of impact between the jets discharged from the tips 14 and 15. Hitherto in burners of this type provision has been made for an air-space underneath the flame by the construction of a cavity underneath the place of location of the flame. By my invention, however, the necessity for the cavity is largely eliminated, and the cavity 5 may be employed, as illustrated in the first three figures, or dispensed with, as shown in Fig. IV.

Fig. V illustrates merely a modified form of body part. It is indicated by the reference-numeral 20 and shown as provided with tips 21 and 22, communicating, respectively, through chambers 23 and 24 with gasways 25 and 26, that meet in the bottom of the body part 20. Correspondence of the names of the various elements indicates identity of function unless otherwise specified, and further description with reference to Fig. V appears to be unnecessary, except the statement that the various modifications illustrated are intended to indicate the extent to which the form of my burner may be varied without departing from the scope which I consider to properly belong to my invention. These modifications serve to show how a part of the structural features exhibited in the preferred form of embodiment of my invention as illustrated in Figs. I to IV may be dispensed with and at the same time retain certain features which I regard as essential.

In Figs. VI and VII is illustrated a slight structural departure from the subject-matter of Fig. V. The burner shown in Figs. VI and VII is provided with an oblong rectangular body part 28, which is provided with a neck 29. The gasways 30 and 31 converge in consequence within the neck 29 and merge into a common bore 32 in the neck. The other features are precisely the same as those shown in Fig. V, except that the bottoms of the chambers 33 and 34 are plain instead of curved.

The burners above described are severally provided with necks adapted to be inserted into a pillar, the taper of the body part 20 in Fig. V constituting in itself a neck for that purpose. These burners are also preferably made of steatite, though other material may be used, if preferred.

In Figs. VIII and IX, I illustrate a body part 35, which may consist of a metallic pipe closed, as indicated at 36, at its opposite ends and provided with an internally-threaded nipple 37, by which it may be screwed to a gas-pipe. The tips 38 and 39 are substantially of the same form and function as those previously described; but they are fitted into the wall of the body part 35 and communicate with a common chamber or reservoir 40.

In Fig. X a cylindrical form of body part 41 is illustrated instead of one having cut-away walls 3, and the bores of the tips (indicated at 42) are shown as communicating with an inversely-conical bore 43.

What I claim is—

1. A gas-burner comprising a body part of substantially cylindrical shape narrowed upon opposite sides by upwardly-convergent walls which define between them a narrow top extending from one side to the other of the body part, tips projecting approximately from the ends of said top, respectively, and passages for the discharge of gas, leading through the body part and tips, respectively, and adapted to discharge from the tips impinging jets.

2. A gas-burner comprising the combination of a body part provided upon opposite sides with upwardly-convergent, reëntrant walls, and a narrow top above the walls extending substantially from one side to the other of the body part, with tips projecting approximately from the opposite ends of the top, respectively, and adapted to discharge impinging jets, and passages for the discharge of gas leading through the body part and the tips.

3. In a gas-burner the combination with a body part provided with a bore, of a pair of parallel straight gas-discharge tips communicating with the bore, and oppositely-discharging gas-passages in the respective tips communicating with the bores thereof, re-

spectively, at an angle less than a right angle, substantially as set forth.

4. In a gas-burner the combination of a body part provided with a plurality of tips, each of which is provided near its outer periphery with a longitudinal bore, ducts leading from the respective bores in the tips through the thick wall of the respective tips, recesses into which the ducts lead respectively, and air-holes for supplying the recesses with air, substantially as set forth.

In testimony of all which I have hereunto subscribed my name.

CLARENCE S. STEWARD.

Witnesses:
B. F. KERR,
OLIVER P. STEWART.