

(No Model.)

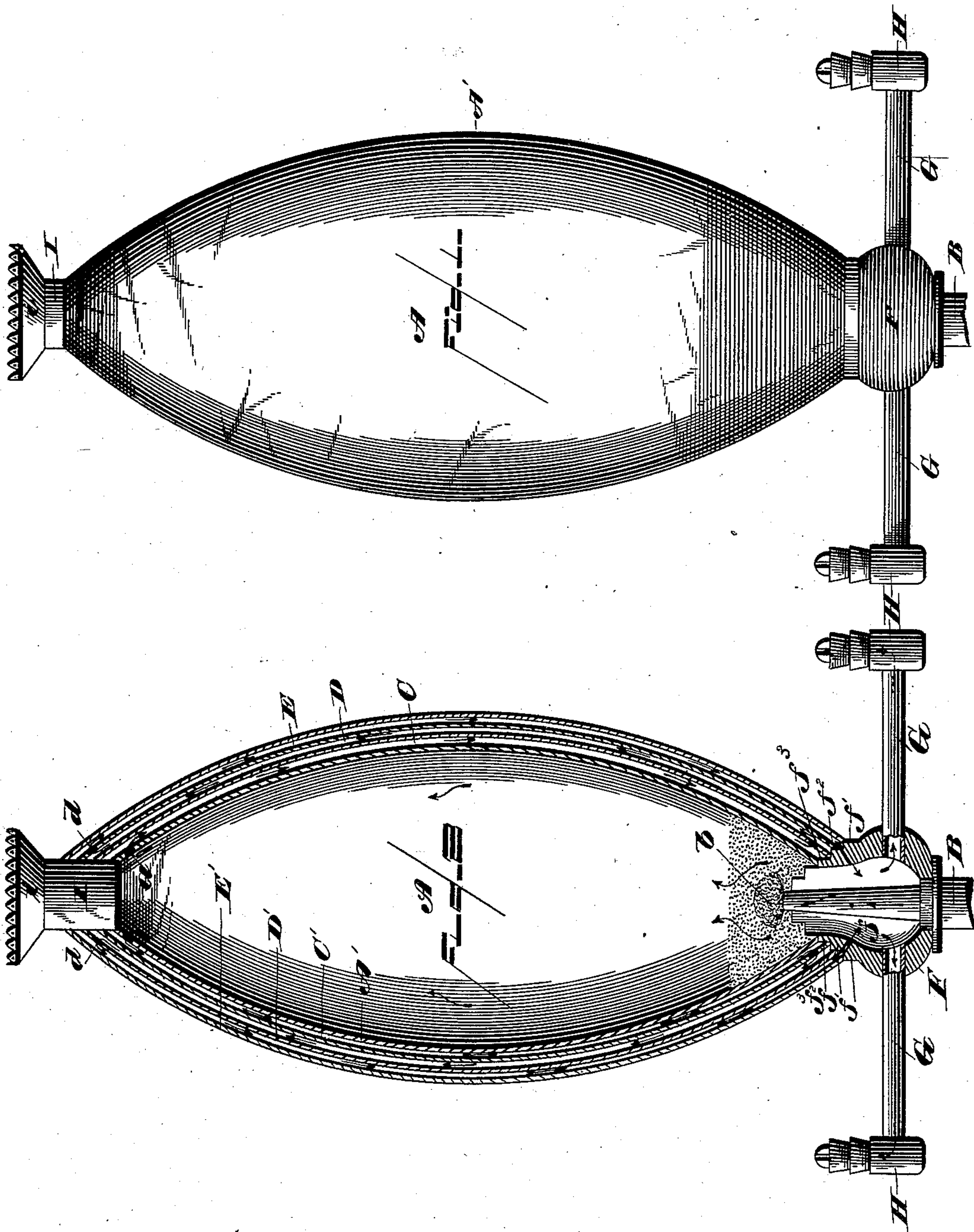
2 Sheets—Sheet 1.

J. A. DEARBORN.

GAS BURNER.

No. 362,497.

Patented May 10, 1887.



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(No Model.)

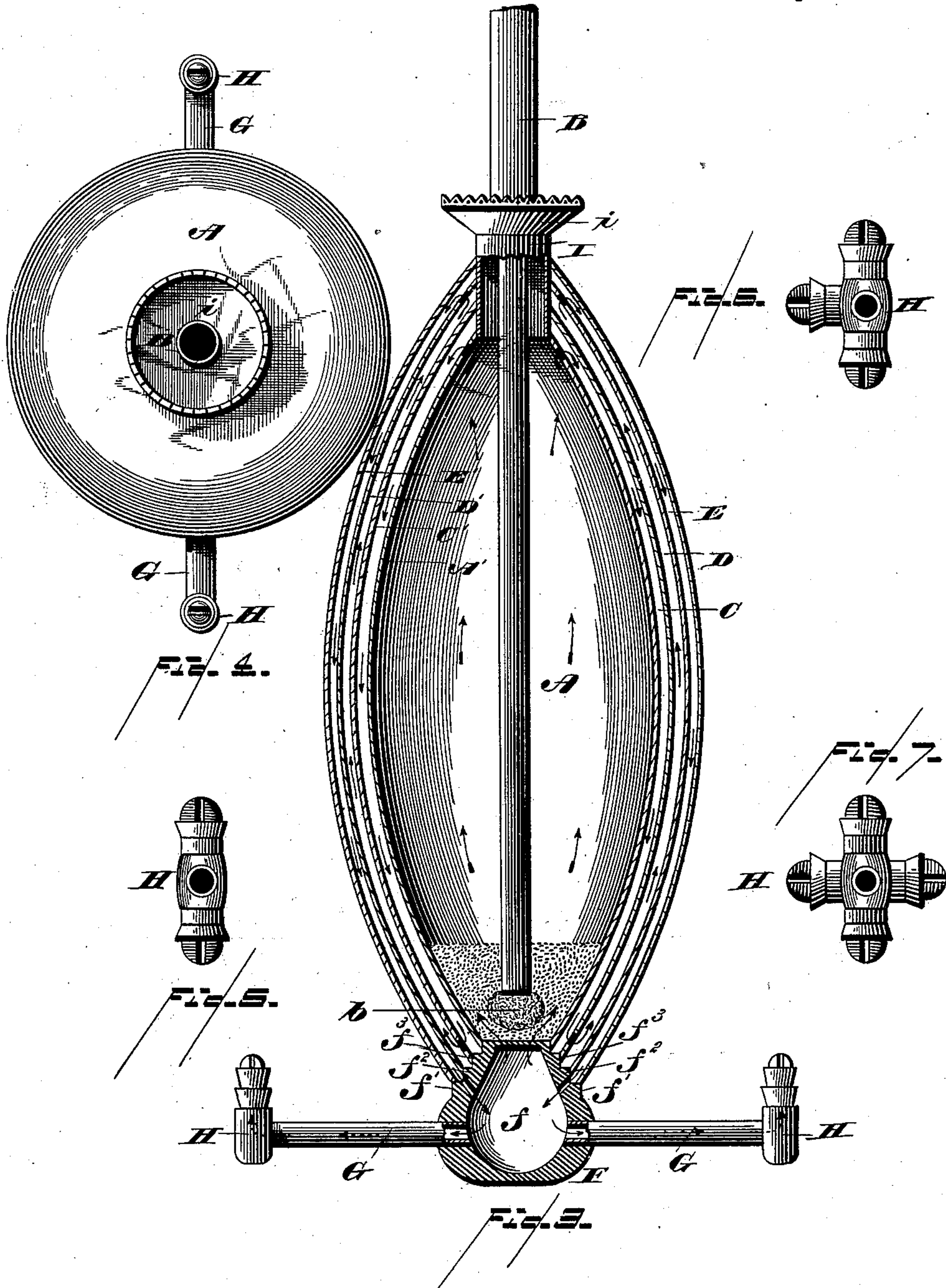
2 Sheets—Sheet 2.

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GAS BURNER.

No. 362,497.

Patented May 10, 1887.



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UNITED STATES PATENT OFFICE.

JOHN ADAMS DEARBORN, OF LIBERTY, MISSOURI.

GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 362,497, dated May 10, 1887.

Application filed November 1, 1886. Serial No. 217,710. (No model.)

To all whom it may concern:

Be it known that I, JOHN ADAMS DEARBORN, a citizen of the United States, residing at Liberty, in the county of Clay and State of Missouri, have invented a new and useful Improvement in Gas-Burners, of which the following is a specification.

My invention relates to improvements in gas-burners; and it consists of the peculiar combination of devices and novel construction and arrangement of the various parts, substantially as hereinafter fully described, and particularly pointed out in the claims.

The primary object of my invention is to provide an improved device for burning coal and other gas, which shall effect a very material saving in the quantity of the gas consumed, and give a better light, of increased power and brilliancy, than has been attained with burners of ordinary construction at present in use, thereby effecting a saving in the cost of the gas consumed by the owner.

I propose to provide an improved burner or device of simple and cheap construction, which shall first purify and cleanse the gas of the greater part of its impurities as it is delivered thereto from the main or pipe-line, and subsequently rarefy and expand the gas to increase the quantity and brilliancy thereof before its delivery to the tip for consumption, the heat of the flame from the tip being utilized to heat the parts of the device in which the gas is rarefied, so that no additional expense or cost is imposed upon the consumer, all as more fully presently described.

In the accompanying drawings, which illustrate a gas-burner embodying my invention, Figure 1 is a side elevation showing it adapted for use as a street-lamp. Fig. 2 is a vertical central sectional view of the same. Fig. 3 is a vertical central sectional view of another form of my invention, showing the same in the form I prefer for suspending it from halls, the ceilings of rooms, &c. Fig. 4 is a top plan view. Figs. 5, 6, and 7 are detail views of different forms of tips to be used with my improved burner.

Referring to the drawings, in which like letters of reference denote corresponding parts in all the figures, A designates the central purifying-chamber of my improved gas-burn-

ing device, which is filled with a suitable compound for absorbing the impurities in the gas from the main or pipe-line. A pipe or tube, B, enters this purifying-chamber from either the upper or lower end thereof to conduct the gas from the main or pipe-line into the said chamber of the burner, and the inner terminal end of this supply-pipe is covered and protected by a shield, *b*, of wire-gauze or other suitable material, which will permit of the free and unobstructed entrance of the gas into the purifying-chamber, and effectually exclude any particles of the compound in the chamber from entering the supply-pipe.

A heating-chamber, C, surrounds the purifying-chamber and receives the gas therefrom after it has passed through the purifying compound in the central chamber, A, and this chamber C is in turn surrounded by another chamber, D, of like construction, and finally a third chamber, E, is arranged around the second or intermediate chamber, D. The gas is compelled to traverse first through the compound in the purifying-chamber A, from whence it is discharged into the inner heating-chamber, C, through suitable exit-openings, *a*, in the upper end. Then it passes down through the inner chamber and into the intermediate chamber, D, through openings *c* in the lower end, then up through the intermediate chamber and suitable openings, *d*, at the upper end thereof into the outer chamber, E, and finally into a central bulb, F, at the base of the purifying and heating chambers, from whence it flows through radial tubes or arms G to the tips H, where it is consumed. By thus purifying the gas of all impurities therein in the central chamber, A, and subjecting it to heat during the tortuous course through the heating-chambers, the gas is very materially rarefied and expanded before it is delivered into the bulb for delivery to the tips, so that a better light, of increased power and brilliancy, is produced.

I will now proceed to describe the peculiar construction and arrangement of the various parts of my invention.

The central bulb, F, is made substantially spherical or round in form and hollow to provide a chamber, *f*, and the upper end of the bulb is contracted to form a series of shoul-

ders, f' , f^2 , and f^3 , preferably three in number. The shoulders are arranged one above the other and out of line with one another, the lower shoulder or ledge, f' , being arranged to one side of the second shoulder, f^2 , and the upper shoulder, f^3 , being inclosed within the said shoulder f^2 , as clearly shown. As the bulb is made substantially spherical in form, the shoulders take the shape of rings in plan, and they are of different diameters and arranged concentric with one another, as will be very readily understood.

The inner central purifying-chamber, A, of the burner is formed by or composed of a shell, A', which is in the form of two cones, with their bases placed and joined together, as shown. The lower edge of the shell A' of the said central chamber is rigidly secured or affixed in any suitable manner to the upper contracted end of the bulb F, and the upper edge of the shell or walls of the said chamber is affixed to a central crown-piece, I, which is in the form of a tube, and has its upper end closed by a partition, i , that is rigidly affixed or secured thereto. The walls or shells of the surrounding heating-chambers C D E are arranged exteriorly to the shell or wall A' of the central chamber, A, and concentric therewith, to provide or form a series of chambers of substantially uniform width, through which the gas is free to pass or circulate. The lower edge of the shell C' of the chamber C is affixed to the shoulder f^3 , the edge of the shell D' of the chamber D being connected to the shoulder f^3 , and the corresponding edge of the shell E' of the chamber E is affixed to the shoulder f' of the bulb, the upper edges of all of the said shells being securely connected to the central crown-piece, I, of the device. The joints between the several shells of the chambers, the bulb, and the crown-piece are hermetically sealed to effectually prevent the waste and escape of the gas from the device, and the parts are securely connected together to provide a firm and rigid structure which will withstand the pressure of the gas therein, and all ordinary wear or use to which the device is subjected.

The radial tubes or arms G enter the central bulb, F, at diametrically-opposite points, and communicate with the chamber f thereof to conduct the gas from the said chamber to the tips. Two, four, or more of these radial arms are provided, according to the quantity of gas to be consumed, and the outer ends of these pipes G are provided with one or more tips, as may be desired. These arms are of such a length and the chambers of such a diameter that the tips H at the outer ends of the pipes are arranged in close proximity to the said chambers, so that the heat of the flame from the tips will serve to heat the walls or shells of the chamber, as is necessary for the rarefaction of the gas as it passes through the heating-chambers on its way to the bulb and tips. The tips may be one or more in number at the outer end of the pipes G, as shown.

In Fig. 5 I have illustrated a double burner which comprises two tips, which are arranged in line with each other and on substantially the same horizontal plane, while Fig. 6 shows three tips, one of which is arranged at right angles to the other two tips, that are arranged in line with each other, as in Fig. 5.

In Fig. 7 of the drawings I have shown a burner of four tips, which are arranged at right angles to each other in substantially the same horizontal plane, and the said tips meet at a common center and receive their supply of gas from a single pipe.

In Figs. 1 and 2 of the drawings I have illustrated my invention adapted for illuminating streets and other thoroughfares. The supply-pipe B to the central purifying-chamber passes upwardly through the bulb F at the base of the chambers, and the upper terminal end of the said pipe is covered and protected by the shield b , which is rigidly affixed thereto, or to the shell A' of the central chamber.

In Fig. 3 of the drawings the device is shown as a suspension-burner, and in this instance the supply-pipe B passes through the central crown-piece, I, and extends entirely through the central purifying-chamber, A. The lower end of the said pipe B terminates a short distance above the lower end of the central chamber, A, and the shield b is rigidly affixed thereto. In this form of my invention the supply-pipe is rigidly affixed to the crown-piece I, to suspend the entire apparatus from the ceilings of halls, rooms, and apartments; but in Figs. 1 and 2 the pipe is rigidly affixed to the bulb at the base to support the apparatus in an upright position.

The operation of my invention will be readily understood by those skilled in the art to which it relates from the foregoing description, taken in connection with the drawings.

I have found by experiment that a purifying compound for use in the central chamber, A, of the device to cleanse the gas entering therein from the mains or pipe-lines, which is composed of granulated bone-black and granulated charcoal in the proportion of one part of bone-black to two parts of charcoal, will give good results, and effectually absorb all of the impurities in the gas as it percolates through the said compound. The purifying compound can be removed and replaced through the central crown-piece, I, of the device with ease and facility and without disturbing the other parts of the structure.

I do not desire to confine myself to the exact details of construction and form and proportion of parts herein shown and described as an embodiment of my invention, as I am aware that changes therein can be made without departing from the spirit of my invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a gas-burner, the combination of a central chamber, into which gas from a main or pipe-line is delivered, heating-chambers

surrounding the central chamber and communicating therewith to receive the contents of the same, and a burner communicating with the outer heating-chamber, substantially as described, for the purpose set forth.

2. The combination of a central purifying-chamber, into which gas from a main or pipe-line is delivered, and a series of two or more communicating heating-chambers surrounding the said central chamber, and having their shells or walls externally heated, the inner heating-chamber having communication with the purifying-chamber, substantially as described, for the purpose set forth.

3. The combination, with a gas-burner, of a central purifying-chamber, into which gas from a pipe-line or main is delivered, and two or more heating-chambers surrounding the said central chamber, the heating-chamber adjoining the central chamber being in communication therewith at one end, and the outer chambers having communication with one another at opposite ends and one of them with the burner, substantially as described, for the purpose set forth.

4. The combination of a burner, a central purifying-chamber, a supply-pipe entering the said chamber and two or more chambers surrounding the central chamber and in communication therewith, with one another, and the burner, substantially as described.

5. The combination of a series of concentric shells arranged out of contact with one another and forming a central and two or more surrounding chambers, the bulb into which the contents of one of the chambers is discharged, and the distributing-pipes provided with a burner, communicating with the chamber of the bulb, substantially as described, for the purpose set forth.

6. The combination of a bulb, the central purifying-chamber having its shell connected to the bulb, and a series of chambers surrounding the central chambers with their shells or walls affixed to the bulb, one of the said surrounding chambers communicating with the

central chamber and one emptying its contents into the bulb, and the distributing-pipe provided with a burner, substantially as described.

7. The combination, with a burner, of a bulb, a crown-piece arranged in line with the bulb, and a series of shells affixed at their ends to the crown-piece and bulb and arranged out of contact with each other to form a central and surrounding chambers, the surrounding chambers communicating with the central chamber, the burner, and with each other, substantially as described, for the purpose set forth.

8. The combination of the bulb, the central purifying-chamber, the series of surrounding chambers communicating with the bulb and central chamber and opening into one another, and the supply-pipe passing through the bulb and entering the purifying-chamber, substantially as described.

9. In a gas-burner, the combination of a bulb, a crown-piece, a series of concentric shells affixed to the crown-piece and bulb to form the central chamber and heating-chambers, as described, the heating-chambers communicating with the central chamber, the bulb, and with each other, and the distributing-pipe receiving its supply of gas from the bulb, and having the burner, substantially as described.

10. In a gas-burner, the combination of a central chamber, the externally-located chambers surrounding the central chamber and in communication therewith and with each other to form a tortuous passage for the gas, a supply-pipe having communication with the central chamber, a shield fitted over the open end of the pipe and surrounded by a purifying compound, and a burner, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JOHN ADAMS DEARBORN.

Witnesses:

JOHN M. ALLEN,
DAN. S. BRADLEY.