

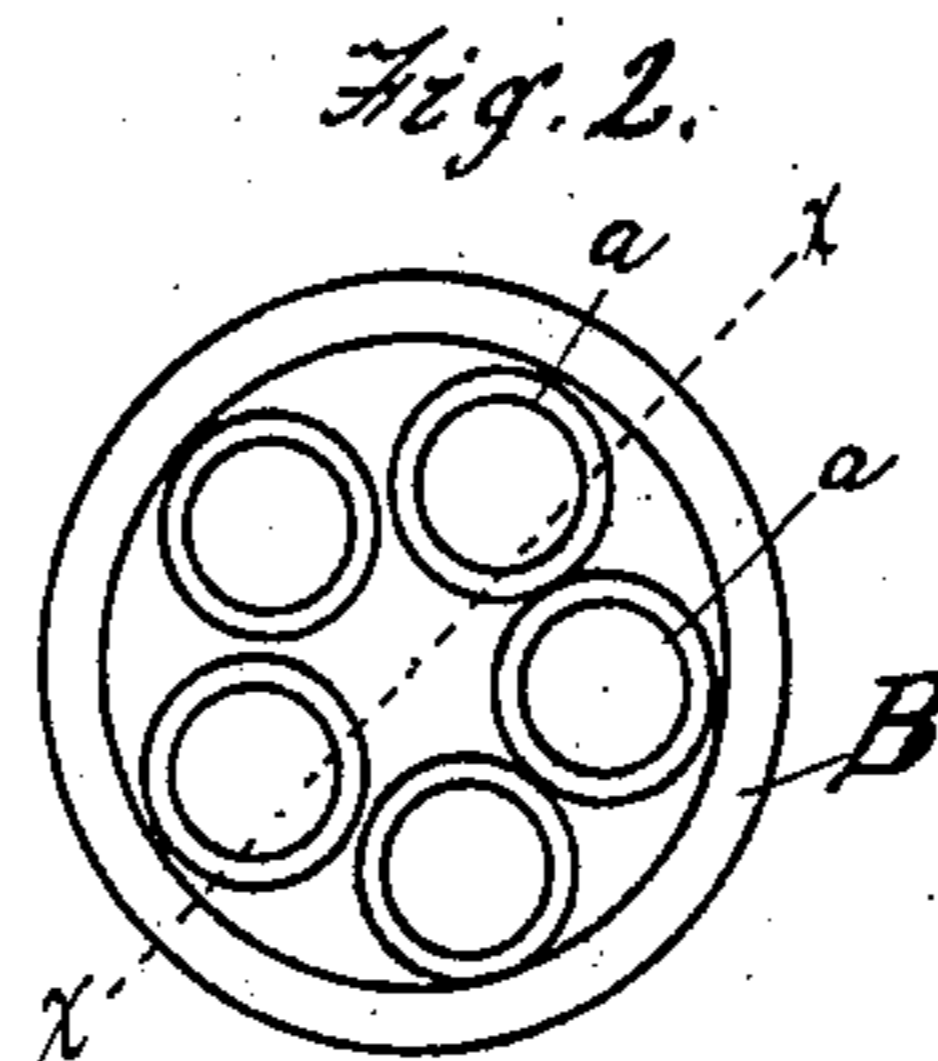
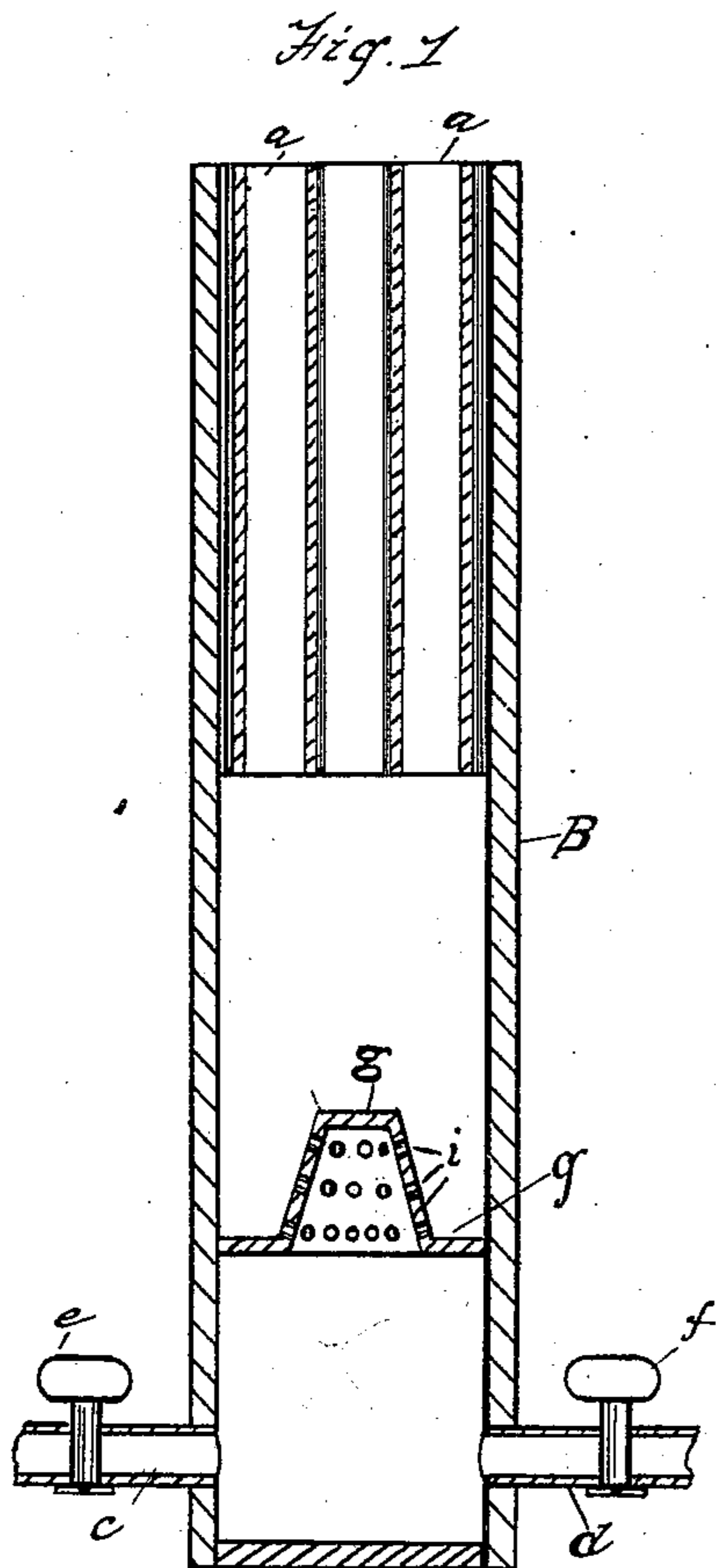
(No Model.)

2 Sheets—Sheet 1.

J. F. BARKER.
GAS BURNING DEVICE.

No. 407,323.

Patented July 23, 1889.



WITNESSES:

George L. Hussey
E B Maynard

John F. Barker INVENTOR

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(No Model.)

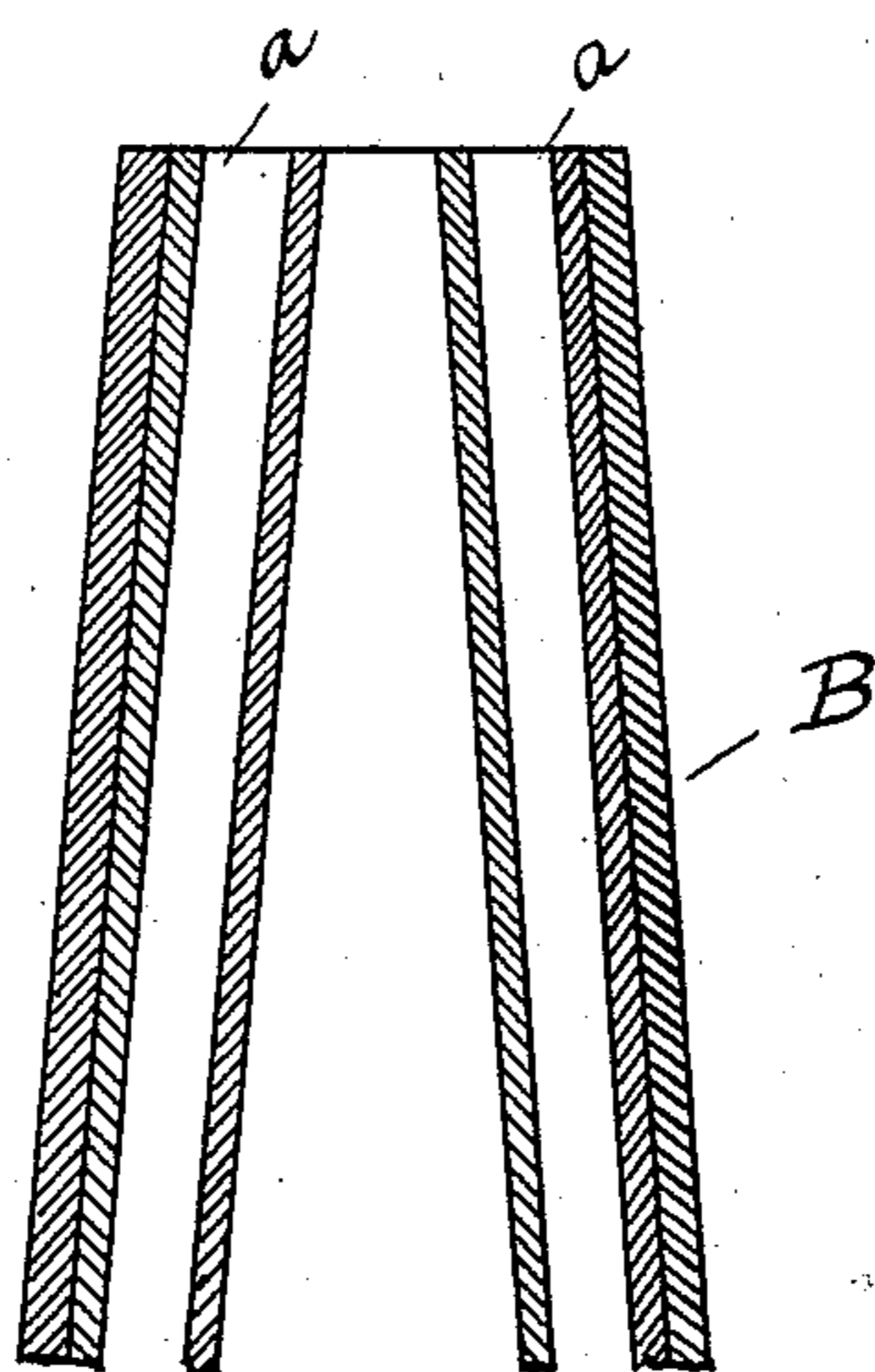
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Fig 3



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN F. BARKER, OF SPRINGFIELD, MASSACHUSETTS.

GAS-BURNING DEVICE.

SPECIFICATION forming part of Letters Patent No. 407,323, dated July 23, 1889.

Application filed August 13, 1886. Serial No. 210,838. (No model.)

To all whom it may concern:

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

My invention relates especially to a class of gas-burners where, for heating and mechanical purposes, ordinary illuminating-gas is combined with atmospheric air. As is well known in the use of these gases for thermal effect, it is necessary at times for the purpose of intensifying the heat to largely increase the emission of gas or gas and air combined. To accomplish this the gases must be forced out with great velocity. Again, it is often desirable to reduce combustion, and for that purpose to reduce the flow of gas to the minimum limit.

In devices heretofore employed when these gases are ejected at high velocity, the flame is liable to be blown away from the mouth of the burner, and, on the other hand, when only a light flow of gas is permitted, the flame is liable to follow back into the delivery-pipe and become extinguished. The latter difficulty may be partially remedied by the employment of a wire screen over the mouth of the burner; but a screen, or even a perforated cap, has a tendency to "scatter" the jets produced thereby, or cause them to diverge contrary to what is usually desired—namely, concentration of heat at a particular point or within a limited area.

I am aware that heretofore burners have been employed consisting of two or more pipes concentrically arranged, the inner pipe conveying atmospheric air, and the outer pipe, through the annular space intervening between it and the inclosed pipe, conveying gas. With the latter class of burners the point of union of gas and air is at the point of combustion, and they are defective in this, that the gases do not become sufficiently diffused for complete combustion, which imperfection is liable to produce oxidation of any metal exposed to it in state of incandescence.

In view of the above I have constructed my present device, which substantially consists

in the combination, with the delivery-pipe, of a perforated partition to effect the more perfect commingling of the gas and air, and in the employment of a novel burner consisting of a number of tubes inclosed within the delivery-pipe, having their ends flush with the end of the pipe and arranged to permit the flow of the combined gases through the tubes and interstices between them, all of which is shown in the accompanying drawings, in which—

Figure 1 is a vertical section; Fig. 2, a plan view showing the head of burner. Fig. 3 is a section of modified form of burner.

In Fig. 1 B is the delivery-pipe, provided with apertures *c* and *d*, for the introduction of gas and air, both being introduced under pressure. The flow of each is regulated by the stop-cocks *e* and *f* in the usual manner. Within said pipe B, and between the entrance of the gas and air pipes and burner is securely fixed the perforated partition *g*. This portion is preferably hat-shaped in form, having the perforations *i* on the side of the crown *s*, as shown. At the ends of the pipe B, and within the same, are arranged tubes *a a a a*, Figs. 1 and 2, secured in place by friction or otherwise. Through these tubes, as well as through the interstices between them, the gases freely pass.

The tubes are preferably, though not necessarily, made flush with the end of the delivery-pipe, and may vary in size, though for best results they should not exceed one-fourth inch in diameter.

With my device in practical use I have found that though the gases be ejected under great pressure and at great velocity, the flame is not driven or "blown away" from the mouth of the burner. This I assume to be is because the rims of the tubes afford shelter from the blast of the gas, and permit the flame to follow back between the jets with ultimate ignition of the jets. On the other hand, when only a small flow of gas is allowed, the flame will not follow back through the apertures of the tubes into the delivery-pipe, because of the well-known principle, not here necessary to state. Owing to the parallel arrangement of the tubes, giving corresponding direction to the jets of gas emitted through them, the

volume of gas, the area of combustion, and, consequently, the heat, remain concentrated within a limited space. When desired, the tubes may be made to converge, and thus act
5 as a series of blow-pipes directed for concentration of heat, as illustrated in Fig. 3; or they may be arranged to give other forms of flame.

My invention, though useful when employed
10 in burning ordinary illuminating-gas, is especially valuable when used with gases from oils rich in the element carbon.

Having now fully described my invention, what I claim, and desire to secure by Letters
15 Patent, is—

1. In a gas-burning device, the combination, with an inclosed chamber, of one or more inlet-pipes for the introduction of gas and atmospheric air under pressure, and a burner-
20 head leading from said chamber consisting of a pipe and a group of tubes arranged side by side therein, substantially as and for the purpose set forth.

2. In a device for burning combined gases
25 or gas and atmospheric air, the combination, with the delivery-pipe, of tubes, as *a a a*, ar-

ranged within the pipe and perforated partition *g*, said pipe being provided with a chamber intervening between the partition and the tube, substantially as described. 30

3. In a gas-burning device, the combination, with an inclosed chamber, of one or more inlet-pipes for the introduction of gas and atmospheric air under pressure, and a burner-head consisting of a pipe leading from said
35 chamber, and a group of tubes arranged side by side within said pipe, with open interstices between them for the escape of gas, substantially as described.

4. In a gas-burning device, the combination, with an inclosed chamber, of one or more
40 inlet-pipes for the introduction of combined gases or gas and atmospheric air, and a pipe leading therefrom with a number of convergent tubes therein for the concentration
45 within a limited space of the heat of burning gas-jets issuing from said pipe, substantially as described.

JOHN F. BARKER.

Witnesses:

HENRY COOLEY,
H. C. BLISS.