

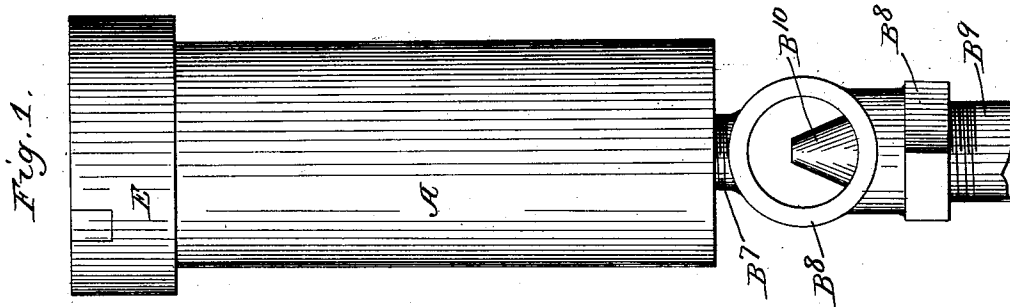
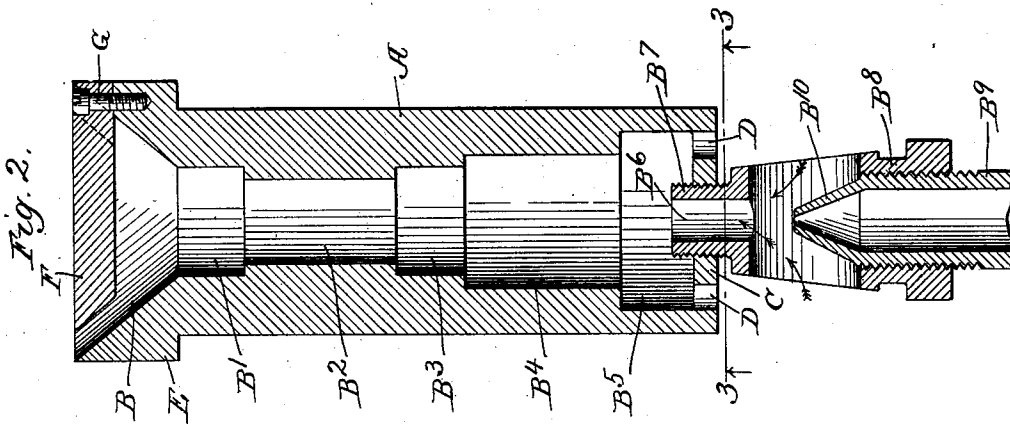
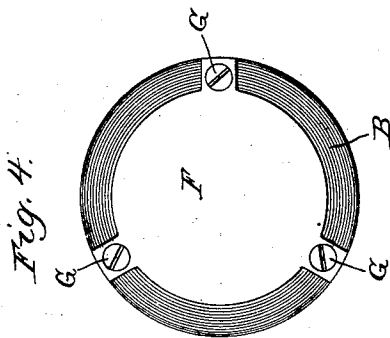
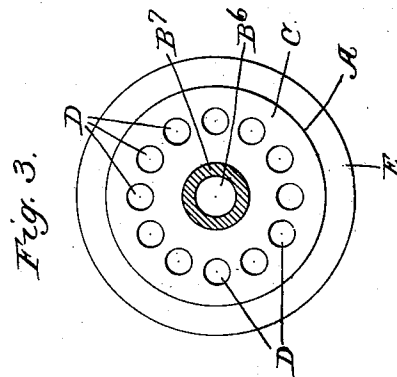
No. 703,625.

Patented July 1, 1902.

S. R. TREEN.
GAS BURNER.

(Application filed Dec. 4, 1901.)

(No Model.)



Witnesses.
Edward T. Wray.
Homer L. Kragg.

Inventor.
S. R. Treen.
by Parker Carter
Attorney's.

UNITED STATES PATENT OFFICE.

SIDNEY R. TREEN, OF CHICAGO, ILLINOIS.

GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 703,625, dated July 1, 1902.

Application filed December 4, 1901. Serial No. 84,617. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY R. TREEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Gas-Burners, of which the following is a specification.

My invention relates to fluid-burners such as are intended to be used in connection with the burning of fluid gases, particularly for heating purposes.

My invention is illustrated in one form in the accompanying drawings, wherein—

Figure 1 is a side elevation of the burner. Fig. 2 is a longitudinal section. Fig. 3 is a section on line 3 3, Fig. 2; and Fig. 4 is a view looking down on the burner from the top.

Like parts are indicated by the same letter in all the figures.

A is the body portion, which may be composed of one or more parts attached together or may consist of one integral mass. It is preferably in general form cylindrical.

B is a discharge end, preferably enlarged and outwardly flaring, as shown.

B' is a combustion-chamber immediately back of such discharge end and which in a general way is the point at which the combustion begins.

B² is the passage, which I call the "contraction" and which serves to make a separation between the combustion-chamber and the mixing-chambers.

B³ and B⁴ are the mixing-chambers, and B⁵ is the introduction-chamber. As hereinafter explained, the several gases are introduced into the introduction-chamber B⁵ and then pass to the mixing-chambers B⁴ and B³. At the lower and middle portion of the introduction-chamber is the inlet B⁶, in this case being the inner opening of a pipe B⁷, which is screw-threaded onto the bottom of the introduction-chamber. This, however, is only a matter of convenience in construction. This pipe is formed in this case integral with the support B⁸, which is open at both sides, so as to admit air within it, whence the air passes up through the pipe B⁷. The lower portion of the support B⁸ is preferably screw-threaded upon the pipe B⁹, which is itself provided with an upwardly-extending discharge-tip B¹⁰. This tip preferably discharges in the middle of the

open space formed in the support B⁸ and below and a short distance from the inlet B⁶. The bottom of the introduction-chamber B⁵ is indicated at C and consists of a diaphragm which may or may not be integral with the cylindrical portion of the burner. This diaphragm receives the screw-threaded pipe B⁷ and is also provided with a series of secondary inlets D D. These secondary inlets are arranged in the form of a circle about the bottom and at a considerable distance from the central inlet. The head of the cylinder about the discharge end may be enlarged, if necessary, as indicated at E. A spreader-plate F may be placed in the discharge end of the burner, the same being secured in position by the screw-bolts G G. As previously suggested, these several parts may be greatly changed without departing from the spirit of my invention, and some of them may be omitted while employing others.

The use and operation of my invention are as follows: The gas is first turned on through the pipe B⁹ and tip B¹⁰, the pipe being properly controlled by a valve. (Not here shown.) This gas, being discharged under a certain amount of pressure, rushes up through the pipe B⁶, carrying with it a quantity of air, which travels as indicated by the small arrows. If now the apertures D D were not employed or if there were no secondary inlets, a certain amount of air would be carried in, and if the gas should be lighted at the discharge end combustion would take place, and the device would operate as a gas-burner for heating or other such purposes. I have found, however, that in the attempt thus to introduce air with the gas at a single opening or at the opening or openings through which the gas itself is admitted the results are decidedly unsatisfactory. It is extremely difficult to secure in this manner the introduction of a sufficiently large amount of air in proportion to the amount of gas used to get the desired result in an economic manner. One of the steps in my invention is therefore to employ the contraction B² or the reduced passageway between the gas-supply and the point where it is burned. The diameter of this contraction must be varied in accordance with the other conditions which prevail and in any particular burner is only to be learned by ex-

periment or careful investigation. The result of this passage is to confine the combustion-chamber to a point beyond the contraction, and to increase the supply of air at that point I supply the other or secondary inlets, in this case arranged in a circle about the primary inlet. As the gas burns in the chamber B' and beyond it room is made for more air, and a very large quantity of air can thus be drawn up and consumed without increasing the consumption of gas. The result is to give a high and perfect combustion at that point, with an extraordinarily large amount of air or oxygen in proportion to the amount of gas used.

The form and shape of the several chambers may be considerably varied, although the particular form, shape, and proportions here shown I have found to be very effective by actual experiment. It is necessary with each

change in the device to institute a series of changes in the other proportions in order to get the best results.

I claim—

In a gas-burner, the combination of a gas-discharge tip placed in an open space, with a short inlet-pipe in front of the tip and a short distance therefrom, a series of large but gradually-contracting mixing-chambers at the end of the short inlet-pipe, a series of secondary air-inlets immediately around the short inlet-pipe and opening into the first and largest of said mixing-chambers, a contracted passage beyond the mixing-chambers, and an enlarged discharge end.

SIDNEY R. TREEN.

Witnesses:

HOMER L. KRAFT,
FANNY B. FAY.