

(No Model.)

C. B. TODD.

GAS BURNER.

No. 377,787.

Patented Feb. 14, 1888.

Fig. 2.

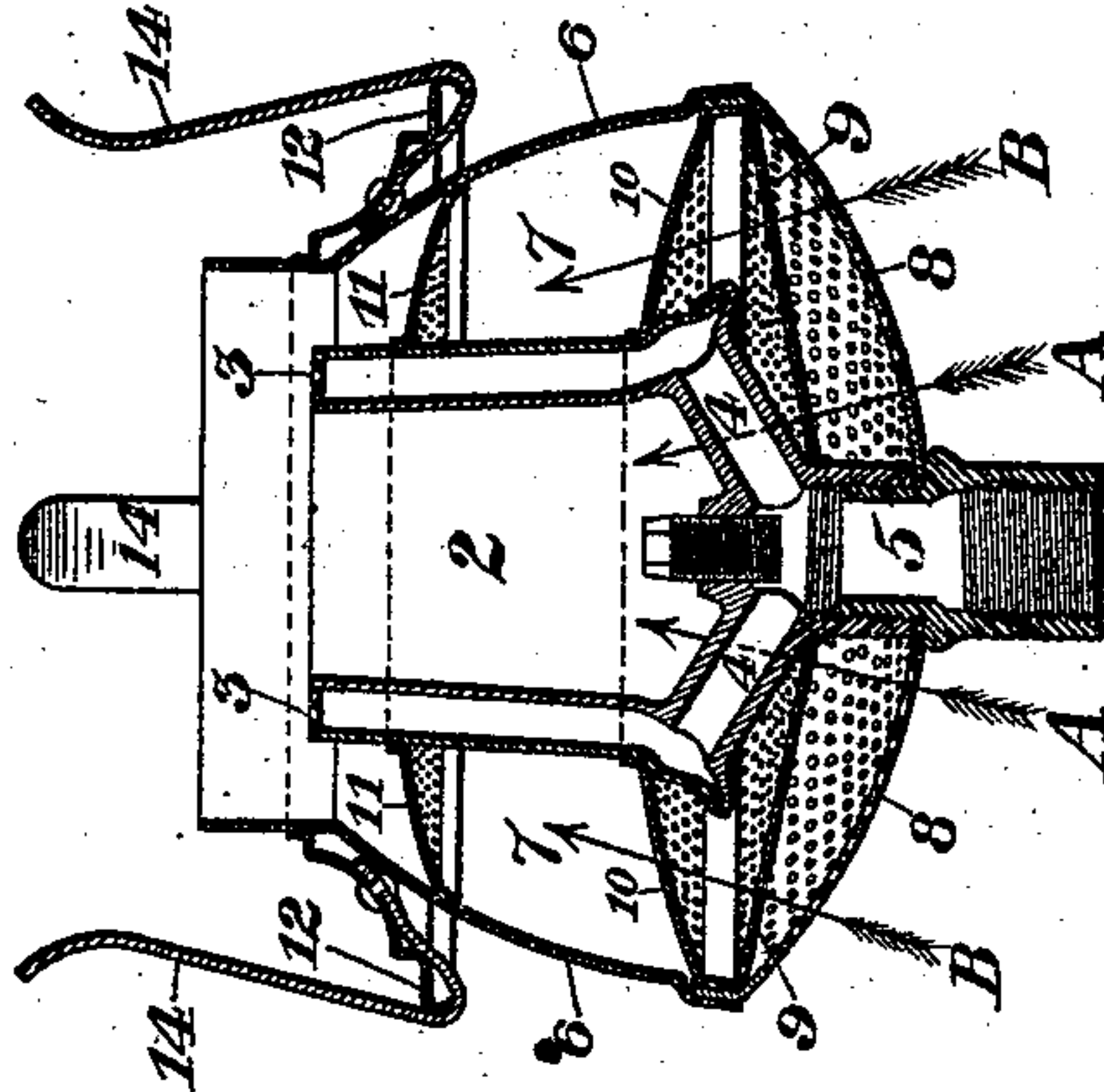
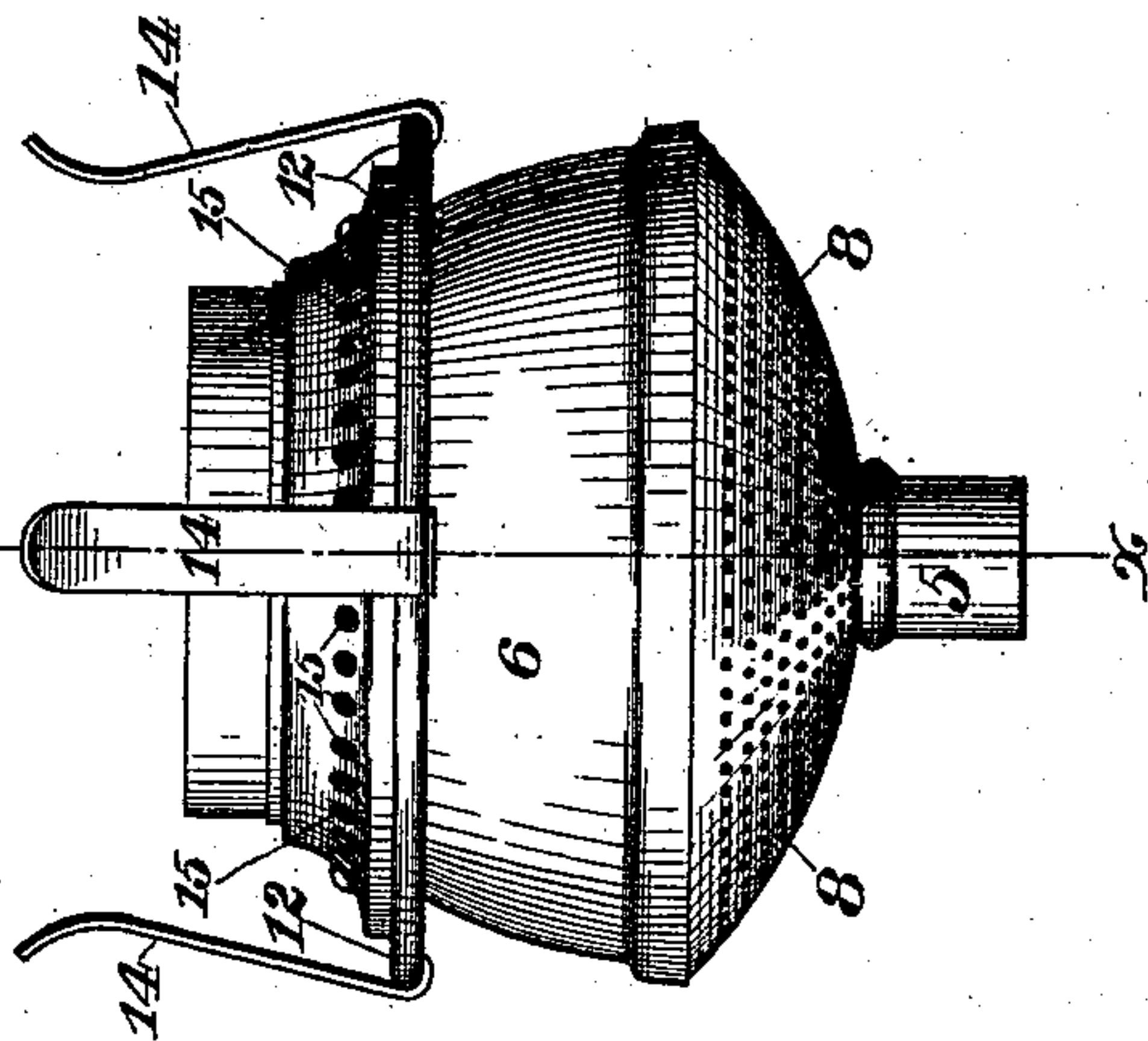


Fig. 1.



Witnesses

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UNITED STATES PATENT OFFICE.

CORNELIUS B. TODD, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE CAMPBELL BURNER COMPANY, (LIMITED,) OF SAME PLACE.

GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 377,787, dated February 14, 1888.

Application filed October 5, 1886. Serial No. 215,345. (No model.)

To all whom it may concern:

Be it known that I, CORNELIUS B. TODD, of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Gas-Burners; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side view of the burner. Fig. 2 is a vertical axial section thereof on the line *x x* of Fig. 1.

Like symbols of reference indicate like parts in each.

In producing this invention it is my purpose to provide a good and simply-constructed burner for natural gas, which, on account of its poverty in carbon, is not well adapted for use as an illuminant unless carbureted. The ordinary regenerator-lamps, which operate on the principle of heating the gas and the air before they are permitted to unite, cannot be employed successfully with natural gas, because of the property which this gas possesses of decomposing under the influence of heat and depositing its carbon in the form of graphite. This hard deposit soon chokes up the regenerator-flues of the lamp and renders them useless. The best conditions for burning natural gas without carbureting exist when the air for combustion is heated and limited in quantity and the gas is not substantially heated. My burner is constructed upon this principle.

In the drawings, 2 is the gas burner proper, which is an ordinary Argand burner, consisting of an annular hollow shell having a circular series of jet-holes, 3, at the top, and connected at the base by means of hollow branch pipes 4 with the gas-supply pipe 5.

6 is a hollow shell set around the outside of the burner 2 and separated therefrom, so as to leave an intervening annular space, 7, surrounding the burner. This chamber is closed at the base by a plate, 8, which extends from side to side of the shell 6, and has a central perforation, through which the gas-pipe 5 passes. The plate 8 is perforated with small holes, and is preferably cup-shaped, as shown in Figs. 1 and 2.

9 is a second perforated plate, which extends across the chamber 7 above the plate 8, but below the base of the burner 2, and 10 and 11 are additional perforated plates arranged within the chamber 7 above the base of the burner and around it, the plate 11 being preferably very near the top of the burner.

12 is a flange or gallery projecting from the side of the shell 6 and provided with vertical spring-arms 14. A common glass chimney fits within the arms 14 and rests upon the flange 12. Air is admitted within the chimney around the shell 6 through holes 15.

The operation is as follows: When the gas is turned onto the pipe 5, it escapes in an annular jet through the holes 3. The flame is fed by two currents of air, one of which follows the course of the arrows A in Fig. 2, traversing the plates 8 and 9, and passing through the interior of the Argand-burner shell 2, while the other follows the course indicated by the arrows B, passing through the plates 8 and 9, and around the burner 2 within the chamber 7, through the plates 10 and 11. All of these plates are somewhat heated by the burning jets, the heat being conducted to them through the external shell, 6, and they therefore retard the passage of the air and heat it before it reaches the gas. The only air-current not traversing the plates is that which goes through the holes 15, and the purpose of this is not so much to support combustion as to afford an annular current of air outside the flame and next to the chimney, to protect the latter from direct contact with the flame. When the shell 6 is extended above the top of the burner 2, as shown in Fig. 2, the air-current from the holes 15 does not reach the gas-jets, and the only air used in combustion is that which is drawn through the plates. I find that this extension of the shell materially improves the operation of the burner.

I have shown four perforated plates for the passage of the air to the burner. If desired, more or less of these (more than two) may be employed, my invention consisting in the use of the chamber 7, through which the air must pass to the burner, with perforated plates interposed in the chamber for the purpose of

retarding and heating the air without substantially heating the gas.

The distinguishing feature of my improved burner is the fact that it is arranged to heat the air used in combustion without substantially heating the gas. The air passing through the several perforated plates is broken up and retarded, and is subjected to a large area of heating-surface, the heat being derived principally by conduction from the shell 6, while the gas-burner, being an isolated structure, without any special appliances for the conduction of heat, and having a small heating-surface, imparts but little heat to the flowing gas. Other burners resembling my burner in having perforated plates for passage of air have been employed; but all these have been arranged to heat both the air and gas, and other burners have been constructed to heat the gas alone; but I know of none constructed before the date of my invention so as to heat the air and not the gas. The special advantage of my system is that I prevent clogging of the burner with solidified crystals of carbon and attain a remarkably fine light from a small quantity of gas.

I have applied my invention to practical use and have found it to be of great utility. With an ordinary Argand burner unprovided with the air-heating plates I obtained from natural gas a light equal to six and a half candle-power, and with the heating-plates I obtained from the same supply of gas a light equal to fourteen candle-power.

I claim--

1. The combination of the gas-burner 2, a surrounding casing, 6, and perforated air-heating plates in the chamber inclosed by the cas-

ing 6, extending across the same, said gas-burner being arranged in the middle of said chamber and being isolated from heat-conducting surfaces, substantially as and for the purposes described. 40

2. The combination of the gas-burner 2, a casing, 6, surrounding the burner, and perforated plates in the chamber inclosed by the casing 6, extending across the same below the base of the burner 2, said gas-burner being arranged in the middle of said chamber and isolated from heat-conducting surfaces, substantially as and for the purposes described. 50

3. The combination of the gas-burner 2, a casing, 6, surrounding the burner, and perforated plates in the chamber inclosed by the casing 6, extending across the same below the base of the burner 2, said gas-burner being arranged in the middle of said chamber and isolated from heat-conducting surfaces, and perforated plates arranged in said chamber above the base of the burner, substantially as and for the purposes described. 60

4. The combination of the gas-burner 2, a surrounding casing, 6, perforated air-heating plates in the chamber inclosed by the casing 6, extending across the same, said gas-burner being arranged in the middle of said chamber and being isolated from heat-conducting surfaces, and a chimney-gallery, 12, provided with perforations, substantially as and for the purposes described. 70

In testimony whereof I have hereunto set my hand this 23d day of September, A. D. 1886.

CORNELIUS B. TODD.

Witnesses:

W. B. CORWIN,

THOMAS W. BAKEWELL.