(No Model.)

G. SCHOONJANS.

GAS HEATING APPARATUS.

No. 589,306. Patented Aug. 31, 1897.

Fig. 3.

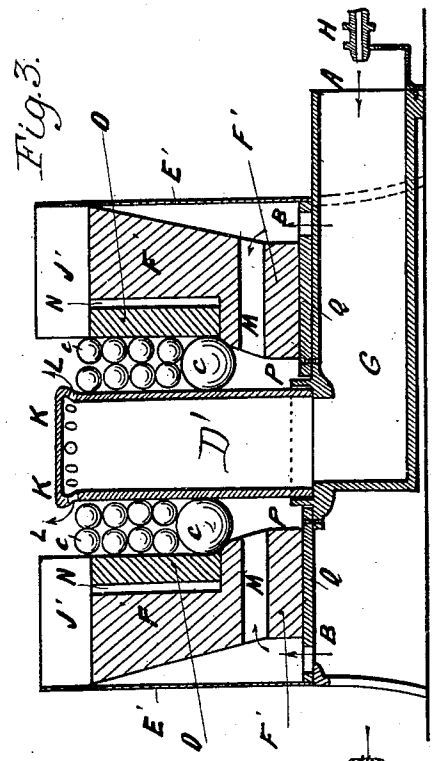


Fig. 4.

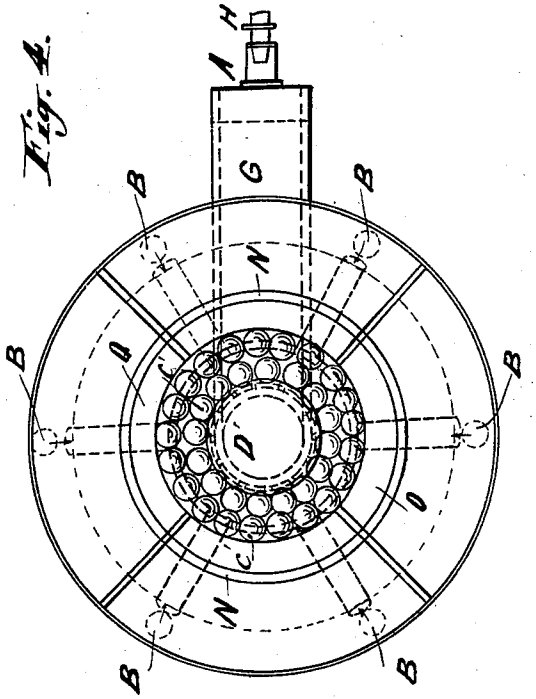


Fig. 1.

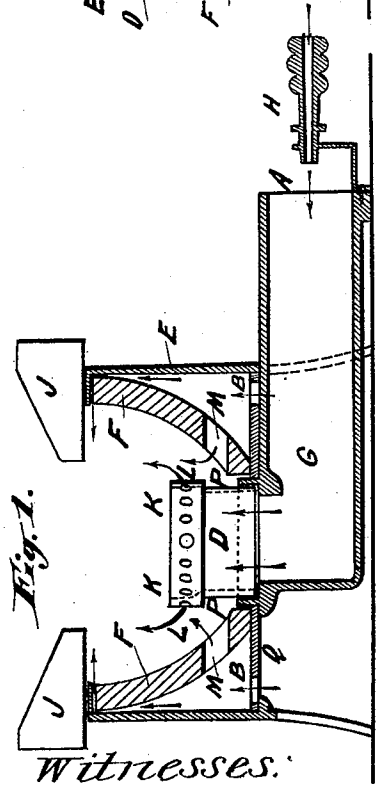
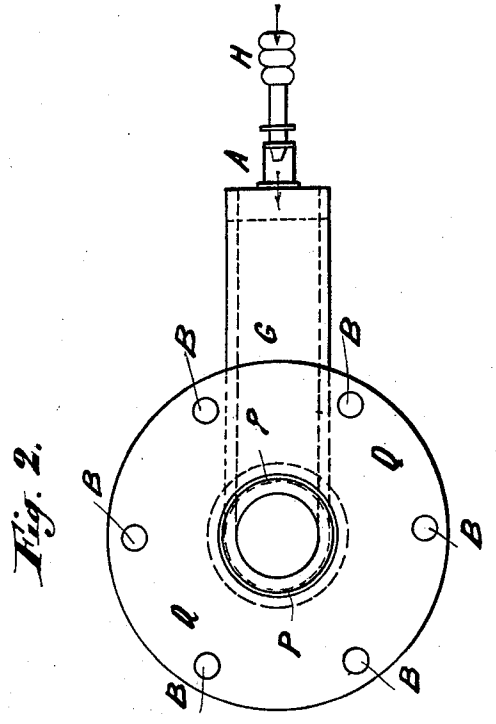


Fig. 2.



Witnesses:
E. B. Bolton
Otto Munn

Inventor:
Guillaume Schoonjans
By Richards & Co.
his Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

GUILLAUME SCHOONJANS, OF BRUSSELS, BELGIUM, ASSIGNOR TO THE SOCIÉTÉ ANONYME POUR L'EXPLOITATION DES APPAREILS ECONOMIQUES Á GAZ SYSTÉME SCHOONJANS, OF SAME PLACE.

GAS HEATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 589,306, dated August 31, 1897.

Application filed April 26, 1897. Serial No. 633,947. (No model.) Patented in Belgium September 17, 1895, No. 117,449; in Germany December 14, 1895, No. 88,564; in England December 14, 1895, No. 24,012; in France March 21, 1896, No. 254,965, and in Austria April 26, 1896, No. 46/1,620.

To all whom it may concern:

Be it known that I, GUILLAUME SCHOONJANS, a Belgian subject, residing at Brussels, Belgium, have invented new and useful Improvements in Gas Heating Apparatus, (for which I have obtained patents in Belgium, No. 117,449, dated September 17, 1895; in Germany, No. 88,564, dated December 14, 1895; in Great Britain, No. 24,012, dated December 14, 1895; in France, No. 254,965, dated March 21, 1896, and in Austria, No. 46/1,620, dated April 26, 1896,) of which the following is a specification.

This gas heating apparatus is especially intended for assays and for the smelting of gold, silver, and the like and produces, by a gas-pressure of twenty millimeters and an average gas consumption of five hundred liters per hour, a heat in the furnace above it of about 1,100° centigrade.

The apparatus may also be used for other heating purposes or for the boiling of water and other substances in laboratories or in houses.

I will now describe my invention with reference to the accompanying drawings, in which—

Figure 1 shows a sectional elevation of my gas heating apparatus intended more especially for general use. Fig. 2 shows a plan view of disk Q. Fig. 3 shows a modified form of my gas heating apparatus, and Fig. 4 shows a plan view of Fig. 3.

Referring to Figs. 1 and 2, the burner-tube D has a closed top K and lateral discharge-perforations L. Said tube rests in a seat P, formed upon the tube G, into which the gas is discharged from a jet H and into which the air for the Bunsen flame is drawn through the mouth A. The burner D is surrounded by a cup-shaped shell or recuperator F, flaring upwardly and having lateral air-inlet openings M, adapted to lead a supply of air to the flame. Around the shell F a heat-retaining mantle E is placed, with a space between it and the mantle, and into this space air is let through openings B in a plate or disk Q. This air is heated prior to its contact with the gas-flame.

The mantle E is supported by legs, so that the outside air may be drawn through the openings B in the disk Q. The mantle E has an inwardly-extending flange at its upper end, and between this and the top of the shell F a small space is left for the entrance of the heated air above the burner and into the flame issuing therefrom.

An annular rim J is arranged above the shell F, upon which rests the crucible to be heated.

In Figs. 3 and 4 the parts lettered A, H, G, Q, B, P, K, L, and M are the same as those above described, these figures being for a modification differing from the form of Figs. 1 and 2 in the following particulars: In this form a cylindrical shell F′ surrounds the elongated burner-tube D′, and within this shell a ring O is placed with a dead-air space N between it and the shell, so that the heat will be retained within the shell, the air-space acting as a non-conductor. Between the ring O and the elongated burner a series of balls *c* is placed, the lower balls being larger to bridge the space about the mouth of the opening M and support the upper smaller balls *c*. These balls become heated by conduction and radiation, and they form an air-distributer by which the rising column of air is broken up and fully heated.

The heat-retaining mantle extends to the top of the shell F to the crucible-support J′.

I claim—

1. In combination, the burner-tube, the Bunsen tube G leading thereto, a shell surrounding the burner-tube and having openings M for the inlet of the air, a mantle surrounding the shell, and a disk Q having openings connecting with the space between the mantle and shell, substantially as described.

2. In combination, the burner, the Bunsen tube connecting therewith, the shell surrounding the burner and having openings M for the inlet of air, the ring O inserted within the shell with a dead-air space N between the

said parts and the balls *c* between the ring O and the burner-tube, substantially as described.

3. In combination, the burner, the Bunsen tube connecting therewith, the shell surrounding the burner and having openings M for the inlet of air, the ring O inserted within the shell with a dead-air space N between the said parts, the heat-retaining mantle about the shell, air-inlets leading to the space between said shell and mantle, and the balls *c* between the ring O and the burner-tube, substantially as described.

4. In combination, the burner, the perforated shell about the same having the upwardly-flared outer walls, the Bunsen tube leading to the burner, the perforated disk Q and the cylindrical mantle about the shell, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

GUILLAUME SCHOONJANS.

Witnesses:
H. E. E. OTIENPUTRIEN,
J. J. KIRKPATRICK.