(Model.)

G. B. SNOW & I. M. SEAMANS.

Burner for Crucible-Furnaces.

No. 227,852. Patented May 18, 1880.

Fig. 1.

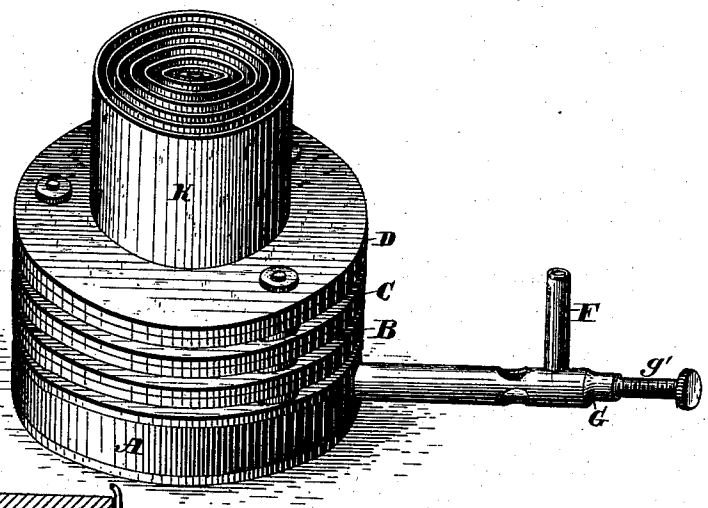
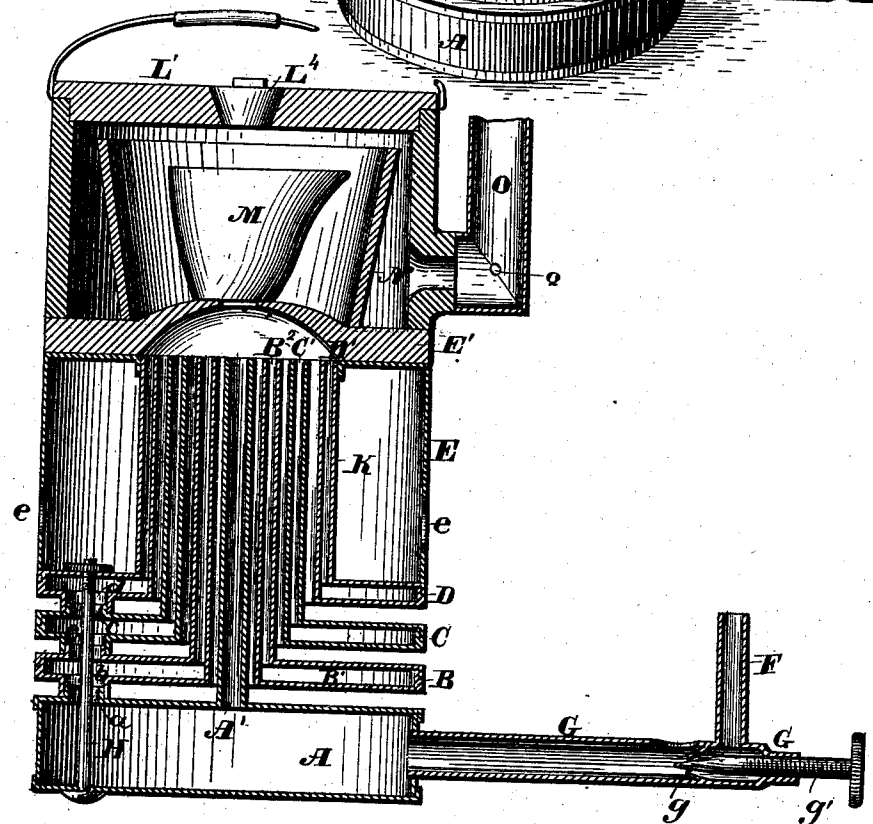


Fig. 2.



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UNITED STATES PATENT OFFICE.

GEORGE B. SNOW AND IRVING M. SEAMANS, OF BUFFALO, NEW YORK, ASSIGNORS TO BUFFALO DENTAL MANUFACTURING COMPANY, OF SAME PLACE.

BURNER FOR CRUCIBLE-FURNACES.

SPECIFICATION forming part of Letters Patent No. 227,852, dated May 18, 1880.

Application filed March 2, 1880. (Model.)

To all whom it may concern:

Be it known that we, GEORGE B. SNOW and IRVING M. SEAMANS, citizens of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Burners for Crucible-Furnaces, of which the following is a specification.

Our invention relates to furnaces for producing high temperatures by the combustion of ordinary gas, the necessary admixture of air being attained by the draft of a chimney.

The object of our invention is to provide an improved pattern of burner for such furnaces, in which the gas and air shall be intimately mixed in such proportions as to secure a quick and perfect combustion, thus producing a high temperature with an economical use of gas, the burner being at the same time so constructed as to be easily taken apart for repairs or renewal of parts.

The improvement consists in forming the burner of a series of concentric tubes connected at their bases with annular gas-compartments, that communicate with each other and with the gas-supply pipe, so arranged as to leave air-spaces alternately with the said spaces that supply the gas or mixture of gas and air, as will hereinafter more fully appear.

The improvement further consists in forming each one of the series of concentric tubes and its annular gas-compartment rim or base in separate parts, held together by bolts passing through openings in the annular rims at suitable distances apart, which openings also serve to connect their interior with each other, so that the burner may be readily disjointed by removing the bolt.

In the accompanying drawings, Figure 1 is a perspective view of our improved burner with the furnace removed; Fig. 2, a central vertical section through the same with the furnace and its connections in place.

The burner is formed of the sections A, B, C, D, and E. The section A is the lower one of the series, and forms a circular chamber, connected at its side or periphery with tubes F G, operating similarly to a Bunsen burner, through which the gas passes and is mixed with air before it enters the chamber A.

The tube G has a conical nozzle, *g*, opened and closed by a similarly-shaped plug or stem, *g'*, provided with a regulating-screw.

The tube F supplies the gas to the interior of the nozzle *g* and tube G, and an opening in the tube G around the nozzle *g* admits air to the interior of the tube to be mixed with the gas.

The top of the chamber A is connected to and communicates with the interior of the vertical tube A', that extends upward to the tip or igniting end of the burner. The top of the chamber A is also provided with a suitable number of openings, *a a a*, through which the bolts pass to hold the sections together, and through which the mixed air and gas may pass into the annular chambers and concentric burner-tubes of the series.

The burner-sections B C D are of similar construction. The section B, for instance, has its annular gas-chamber B' and central vertical tube, B^2, arranged around and concentric with the tube A' of the chamber A, so as to leave an air-space between them, and has a number of short tubes, *b b b*, connecting with its top and bottom plates, arranged around the rims of the chambers, one above the other, so that the uniting-bolts may pass through each of them, and allow the gas and air to pass into each of the chambers.

The top and bottom plates of the chambers B, C, and D are made separately, so that they may be separated for the easy removal of metal which may be accidentally spilled when melted. They may, however, if preferred, be permanently united at their edges.

The section C is provided with similar tube C', encircling the tube B^2, and short tubes *c c c*, fitting over or telescoping into the tubes *b b b* of the section B and over tubes *d d d* of the section D. The section D is only provided with small tubes *d d d* on the under side in order that the gas may not pass through into the air-chamber above.

The central tube, D', of the section D is similar to the others of the series.

Bolts H H H pass through all of the short tubes of the annular bases A B C D, and through the top plate of the chamber D and the bottom plate of the chamber A, and hold the sections securely together between the heads and nuts of the bolts.

The short tubes *b*, *c*, and *d* serve to hold the annular chamber A, B, C, and D at suitable distances apart to leave air-spaces, which communicate with the annular air-spaces around and between the vertical tubes A′, B², C′, and D, so that free circulation of air may pass upward around the gas-tubes and be supplied to the flame at and around the mouths of the vertical burner-tubes.

An outer shell, E, having suitable apertures, *e e*, for air to pass through it into the air-chamber K, rests upon and fits closely around the rim of the annular base D of the upper chamber, so that it may be held firmly in place. The top plate, E′, of the shell has a circular opening, through which passes the tube D′ of the section D, so that sufficient air-space is left to admit air from the chamber K to the flame ends of the burner-tubes.

The furnace L rests upon the top plate of the shell E, and may be formed of an outer cylinder, L, cover L′, and base L², which are preferably formed of fire-clay. The base L² is dome-shaped to support the crucible M, and suitably perforated to allow the flame to strike against the bottom of the crucible and pass up into the furnace.

A plumbago cylindrical shell, N, open at both ends and having its base of smaller diameter than its top, surrounds the crucible, so that the flame is kept in contact with the sides of the crucible from its base to its top. The flame is then deflected by striking against the lid L′, and, turning downward, leaves the furnace by the chimney O, communicating with the lower part of the furnace shell or cylinder L.

The chimney is provided with a suitable peep-hole, *o*, through which the flame may be observed from outside the furnace, and regulated so that it will reach to the base of the chimney and not pass up into it.

The lid L′ is provided with suitable handles L³, made of non-conducting material, and with an opening and cover, L⁴, for convenience in examining work.

A furnace and burner constructed upon the above principles will melt cast-iron in less than an hour from the time the gas is first lighted, or silver or gold in half the time, without the slightest trouble or attention. The whole burner is constructed of iron, and will be found durable, quick in operation, and fully able to stand an intense heat.

In case metal should be spilled into the burner it can be easily taken apart for its removal. The burner may be taken apart by removing the sheet-iron shell E and unscrewing the three bolts H H H, after which the parts of the burner can be easily separated.

In putting the burner together care should be taken to get the circular opening or short tubes through which the bolts pass close with each other, as they serve to conduct the gas from one section to the other.

What we claim is—

1. The multiple Argand burner formed of a series of concentric tubes provided with annular bases communicating with each other, and having a separate air-space between each base and tube of the series, in combination with an air and gas supply tube communicating with the interior of the burner bases and tubes, substantially as and for the purpose described.

2. The multiple Argand burner for crucible-furnaces, formed of a series of concentric tubes and overlying bases, furnishing air-spaces alternating with such bases, and an upper perforated shell surrounding the nest of tubes and resting upon the upper base of the series, forming an air-space around the burner-tubes, to supply additional air to the flame end of the burner, substantially as described.

3. The multiple Argand burner for crucible-furnaces, formed of the sectional shells and tubing connected with each other by short tubes that hold the shells a suitable distance apart, and secured together by bolts passing through the short connecting-tubes and the top and bottom plates of the series, substantially as and for the purpose described.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

GEORGE B. SNOW.
IRVING M. SEAMANS.

Witnesses:
WILLIAM GRAM, Jr.,
CHARLES ROTHER.