T. WEISS.

Gas Furnace.

No. 108,862. Patented Nov. 1, 1870.

Fig. 2.

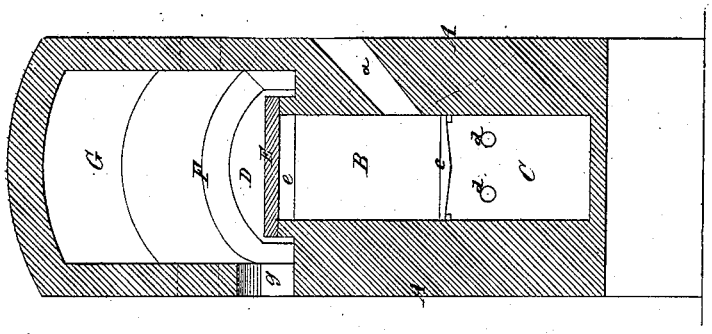
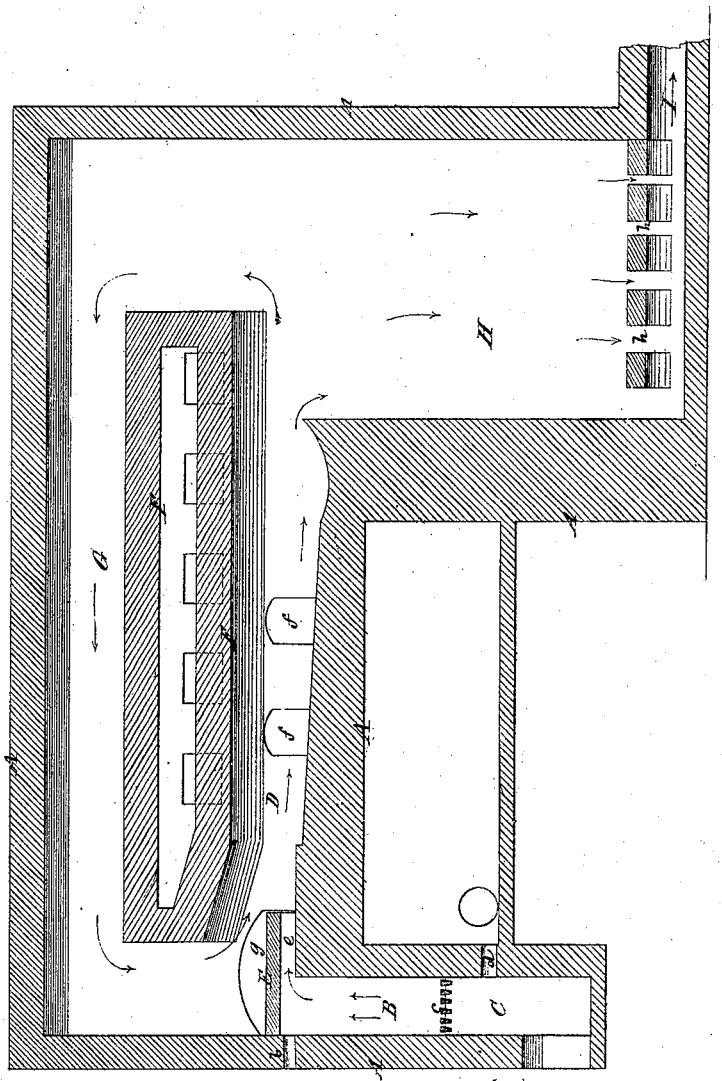


Fig. 1.



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UNITED STATES PATENT OFFICE.

THEODOR WEISS, OF DRESDEN, SAXONY.

IMPROVEMENT IN METALLURGIC AND OTHER FURNACES.

Specification forming part of Letters Patent No. **108,862**, dated November 1, 1870.

To all whom it may concern:

Be it known that I, THEODOR WEISS, of Dresden, in the Kingdom of Saxony, have invented a new and useful Improvement in Furnaces and other Fire-Places or Structures; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, and in which—

Figure 1 represents a longitudinal vertical section of a furnace constructed in accordance with my invention; and Fig. 2, a transverse section of the same, taken as indicated by the line *x x* in Fig. 1.

Similar letters of reference indicate corresponding parts in both figures.

The invention consists in a certain arrangement of an air-heating chamber from which the blast is taken, with the fire-place of the furnace, blast-apertures thereto, the passage from the fire-place, and direct and return flues within the furnace and arch of the latter, whereby a most thorough combustion is insured and the heat utilized in its escape to the chimney.

To enable others skilled in the art to make and use my invention, I will proceed to describe it with reference to the drawings, which show the application of my invention to one kind of furnace.

A is the outside brick-work of a furnace of ordinary construction.

B is the fire-place, arranged at one end of the furnace, and which is of a closed-in or air-tight character, the same having an opening, *a*, for the introduction of fuel, and a smaller upper opening, *b*, for the insertion of a blast-pipe.

C is the ash-pit, arranged below the grate *c*, and which should be closed in or made air-tight when the furnace is in operation, said ash-pit also being provided with an opening, *d*, for the insertion of another blast-pipe.

D is the main flue of the furnace, which may be of any suitable construction. It communicates with the fire-place by means of a narrow passage-way, *e*, which is formed by the top E of the fire-place B.

F is the arch to the main flue D. This arch may be made hollow, so as to allow cold air to circulate through it by means of openings formed in the sides of the arch.

f f are doors for the introduction of material to be worked in the furnace.

g is a door or opening to facilitate repair or replacement of the top E of the fire-place B. When the furnace is at work said door or opening is kept closed.

G is a flue formed above the arch F. This flue allows a portion of the products of combustion to return back to or over the top of the fire-place, and from thence to pass again along the main flue D of the furnace, mixing with new products of combustion.

H is an air-heating chamber arranged at the back end of the furnace, and in open communication at its top with the flues thereof, and at its bottom with the chimney-flue I.

h h are passages by which the communication with the chimney-flue I is established.

The action of the furnace is as follows: The products of combustion formed in the fire-place B pass through the narrow passage-way *e*, along the main flue D of the furnace, a portion of which is then returned through the flue G to be mixed again with the new gases, thereby securing a more thorough combustion of the gases. The remainder of the gases pass down through the air-heating chamber H, there to give out or concentrate most of the heat escaping from the flue D, for the purpose of heating air contained in said chamber to be used as blast, and thus utilizing the heat before its final escape to the chimney. The air, which is supplied to and forced through the heating-chamber H in any suitable manner, is introduced as hot-blast, both below the fire-grate by the opening *d*, as well as near the top of the fire-place by the opening *b*, thereby causing a most perfect combustion and producing an intense heat, and, by the arrangement shown and described, effecting the same in a most economical manner, and, by the return of the products of combustion, or a portion of them, over the fire-place, materially aiding in making the furnace a smoke-consuming one.

What is here claimed, and desired to be secured by Letters Patent, is—

The arrangement of the air-heating chamber H, the fire-place B, the blast-apertures *b d*, the passage *e*, the flues D G, and the arch F, substantially as specified.

This specification signed by me.

THEODOR WEISS.

Witnesses:

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