

A. PONSARD.

Furnace for making Iron and Steel.

No. 83,542.

Patented Oct. 27, 1868.

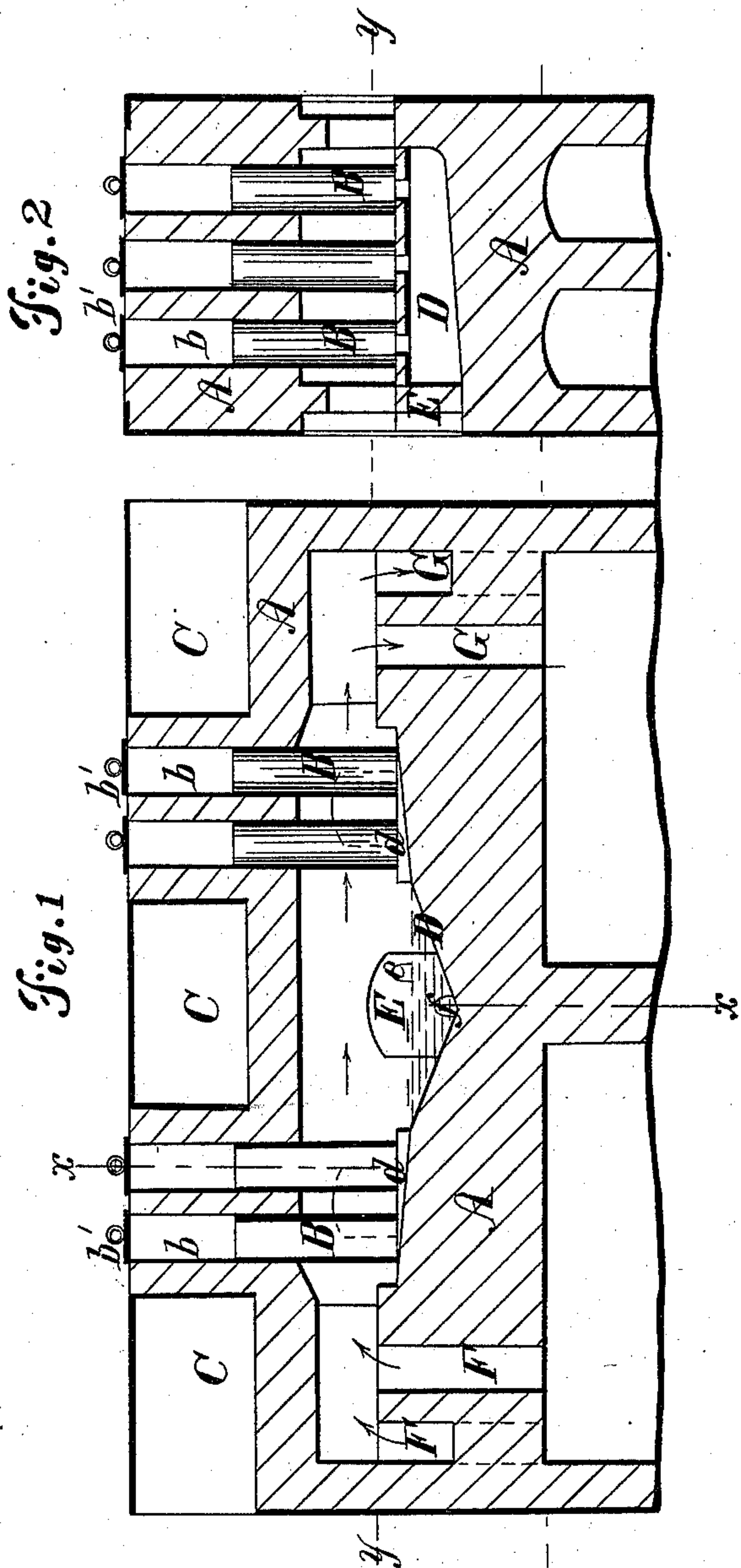
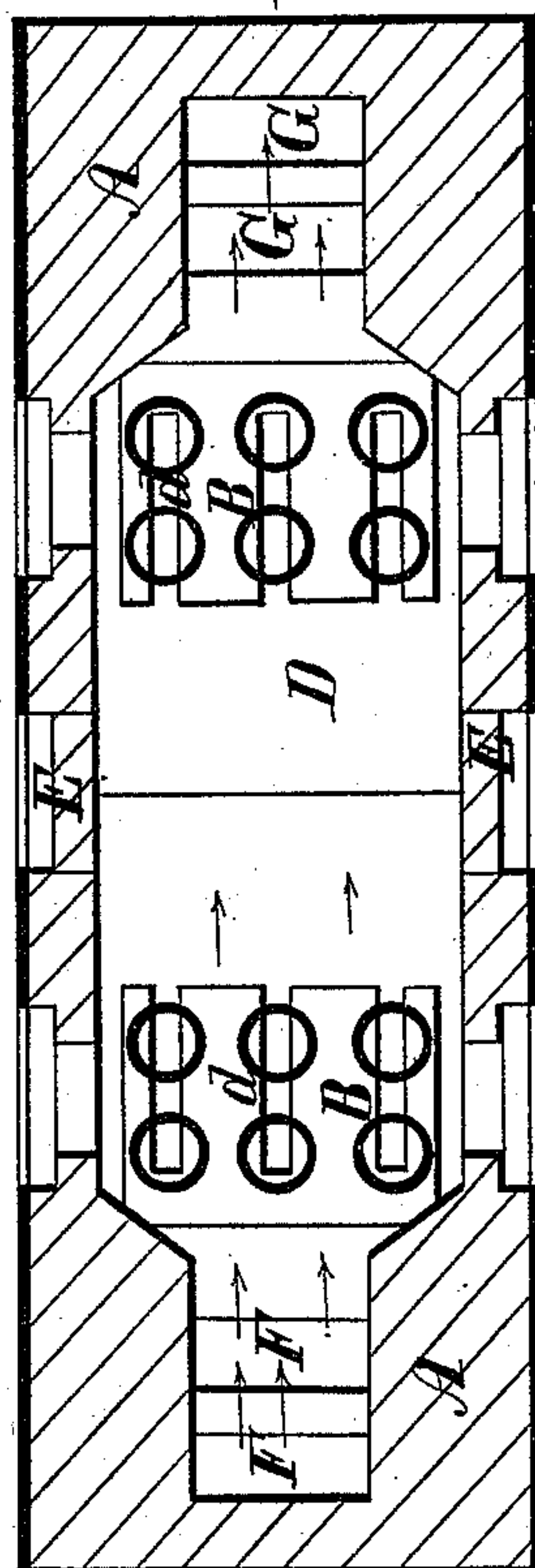


Fig. 3



Inventor;

Witnesses;
A. Keller
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per Brown & Combs & Co.

United States Patent Office.

AUGUSTE PONSARD, OF PARIS, FRANCE.

Letters Patent No. 83,542, dated October 27, 1868.

IMPROVED FURNACE FOR THE MANUFACTURE OF IRON AND STEEL.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, AUGUSTE PONSARD, of Paris, Empire of France, have invented a new and useful Improvement in Furnaces for the Manufacture of Iron and Steel; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, which forms a part of this specification, and in which—

Figure 1 is a longitudinal section of my improved furnace;

Figure 2 is a vertical transverse section thereof, on the line *x x* in fig. 1; and

Figure 3 a horizontal section, taken as indicated by the line *y y*:

Similar letters of reference indicate corresponding parts throughout the several figures.

The object of my invention is to construct a smelting-furnace that will simplify the process of manufacturing iron or steel, and obviate the use of different furnaces for obtaining different products direct from the ores.

To attain this end, the invention more especially consists in providing the inside of a furnace, built similar to the reverberatory furnaces now in use, with vertical tubes, extending from the sole of the furnace through the brick-work forming the arch of the furnace, the same serving as receptacles for the ores, flux, and carbon.

The invention also consists in the peculiar construction of the sole of the furnace, whereby the fluid metal is allowed to run from the open bottom of the tubes to a basin which is situated in the middle of the sole of the furnace.

Another feature of this furnace is the entire separation of the fuel from the carbon necessary to deoxidize and carburize the ores, whereby the best quality of carbon may be used for the latter purpose, and an inferior quality for the fuel.

To enable others skilled in the art of building furnaces according to my improvement, I will proceed to describe the same with reference to the drawing.

A is the brick-work of a furnace, constructed somewhat similar to the reverberatory furnaces now in use. The inside of this furnace is provided with vertical tubes, B B, made of refractory material, and extending from the sole of the furnace, up through the roof of the same, to a certain height, and communicating with openings, *b b*, which form a continuation of the tubes, said openings being provided with covers, *b' b'*. On top of the furnace, and around the openings *b b*, shelves, C C, are formed, for containing the ores, carbon, and flux, the same affording every convenience or facility for charging the tubes B B. These tubes are so arranged in the furnace that a basin, D, formed on the sole or bed of the furnace, for the collection of the fused metal, may occupy the middle portion of the furnace, as plainly shown in figs. 1 and 3. E E are side doors, to enable the operator to work the fused metal.

e is a small aperture, through which the excess of scoria or slag is allowed to run off.

To enable the fused metal to run freely from the bottom of the tubes, that portion of the sole or bed of the furnace on which these tubes rest is inclined towards the basin, and provided with grooves, *d*, which lead directly from under the tubes.

The passages F F, situated at one end of the furnace, serve to introduce the necessary heat for the fusion of the ores, the products of combustion being carried off through the passages G G, at the opposite end of the furnace. The heat may be supplied from a special apparatus, or be generated in the furnace itself.

I will now proceed to describe the operation for making cast-iron.

The tubes B B are charged, through the openings *b b*, with successive layers of ore, carbon, and limestone, or other suitable flux, properly proportioned, when fused, to produce cast-iron. The openings *b b* are then closed by the covers *b' b'*, and the necessary heat introduced through the passages F F. Now it will be seen that the body of heat and flame passing up through F F, will be reverberated by the formation of the furnace and the presence of the tubes B B, thereby causing a quick fusion of the ores. Whenever a sufficient quantity of fluid metal has accumulated in the basin D, it may be drawn off through the loop-hole *f*, into moulds, and formed into pigs, to be used for making castings direct.

The process for making malleable or wrought-iron is as follows:

The ores may be first reduced to a metallic state by calcination in the usual way, or treated as for making cast-iron, by charging the tubes B B with the ores, which are previously mixed with the necessary carbon and flux. When a sufficient quantity of fused metal has accumulated at the basin, it may be formed into pigs or ingots, or into bars, &c., in the usual manner, the doors E E enabling the workman to operate on the fused metal.

The process for making steel is the same as that for making cast or malleable iron, and can be carried on in the same furnace, only varying the amount of carbon necessary to produce steel.

What I claim, and wish to secure by Letters Patent, is—

A furnace for the manufacture of iron and steel, constructed substantially as specified, and provided or fitted with tubes or ore, carbon and flux-receptacles B B, in communication at their base with the basin D of the furnace, essentially as shown and described.

In testimony whereof, I have signed my name to this specification, before two subscribing witnesses.

ATE. PONSARD.

Witnesses:

F. OLCOTT,
DUMAS.