A. Ott,

Smelting Scrap Iron.

No. 107,712. Patented Sept. 27, 1870.

Fig. 1

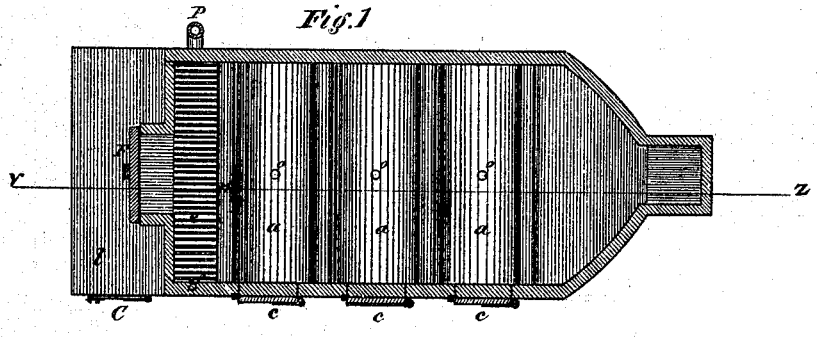
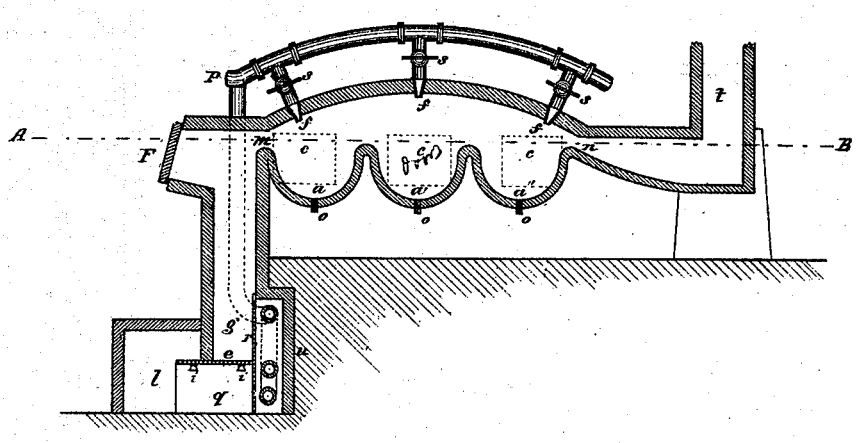


Fig. 2.



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ADOLPH OTT, OF NEW YORK, N. Y.

IMPROVEMENT IN FURNACES FOR SMELTING SCRAP-IRON.

Specification forming part of Letters Patent No. **107,712**, dated September 27, 1870.

I, ADOLPH OTT, of New York, in the county of New York and State of New York, have invented certain Improvements in Furnaces for Smelting Scrap-Iron, of which the following is a specification:

My invention relates to the combination of a generator-furnace with a reverberatory furnace having one or several hearths or sumps, in which the iron to be melted is placed; also, with a system of blast or nose pipes, which are connected with a hot-blast pipe, and terminate within the elliptical vault opposite of the several tapping-holes.

The object of this invention is to secure a great and steady heat, a flame of a constant chemical composition, and the possibility to reduce or to oxidize at will.

Figure 1 is a horizontal transverse section of my furnace after the line A B. Fig. 2 is a vertical transverse section of the same after the line *y z*.

a a' a'' are the hearths or sumps, which should be constructed of fire-proof stones or brick. *c c c* are working or charging doors, which are lined on the inside with a fire-proof material. *l* is a chamber for introducing air. *g* is the generator-furnace. *e* are fire-bars, resting on the cast-iron beams *i i*. *q* is the ash-hole. C is the ash-hole door. F is a door for feeding the generator-furnace. It is made of heavy iron plates, so that it may shut well.

P is a variously-bent iron pipe, leading from a ventilator, and serving to burn the carbureted gases produced in the generator-furnace. It passes horizontally, being bent twice, between the perforated iron plate *r r* and the furnace-wall *n u*, where the blast is heated by radiation or contact of the ashes, the fuel, and the walls of the generator-furnace. This pipe leaves the furnace at about the height of the air-chamber *l*, and turns from there first vertically upward along the furnace. Having reached a height of about half a foot above the aforementioned furnace, it turns in a horizontal direction within a distance of half its width, in order to pass parallel with the vault in the direction of its length, as represented in Fig. 2.

s s s are stop-cocks. *f f f* are nozzles or blast-pipes. They are constructed of sheet-iron, and extend themselves in the form of a slit. The aperture or mouth of such a nozzle is to consist of two heavy sheet-iron plates, which are connected with screw-bolts with the pipes leading from P. *m* is the fire-bridge. *n* is the flue. *t* is the stack. *o o* are tapping-holes to run off the melted iron.

The operation of the furnace described is easily understood. After the sumps have been charged with the scraps, which should be formed in packets, the furnace is charged with fuel. When the same is in full glow the ventilator is set in motion and blast turned on.

Through an opening in the working-doors the melted parts are brought in contact with the unmelted pieces by means of a crow-bar. If the iron has obtained the proper degree of fluidity, it is run off into a mold or into an iron box lined inside with clay.

In stirring the fluid mass just before tapping it gets more homogeneous. The furnace is charged anew while glowing.

Instead of charging the furnace with scrap-iron alone, I may mix it with gray or any other kind of pig-iron.

In turning on more blast than ordinarily, which blast will burn the carbon of the iron to carbonic oxide and carbonic acid, and separate the sulphur, phosphorus, and earthy metals, I am thus enabled to obtain a pure, fine-grained white cast-iron.

In order that the scrap-iron may weld if employed by itself, it is of advantage to throw sand upon it. A concentrated solution of liquid glass has also been found serviceable for this purpose.

As regards the fuel, it should be as dry as possible; but I may use an inferior fuel, as peat, lignite, bituminous and earthy coal. The blast should effect a pressure of one or two lines in the mercury-gage.

Claims.

I claim as my invention—

1. The combination of a generator-furnace, *g*, with a reverberatory furnace having the hearths or sumps *a a' a''*, substantially as and for the purpose hereinbefore set forth.

2. The combination of the nozzles or blast-pipes *f f f* with the reverberatory furnace, substantially as and for the purpose hereinbefore set forth.

ADOLPH OTT.

Witnesses:
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