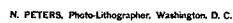


Blast Furnace.

Patented Feb. 3, 1857.



UNITED STATES PATENT OFFICE.

H. WEISSENBORN, OF NEW YORK, N. Y.

IMPROVEMENT IN BLAST-FURNACES.

Specification forming part of Letters Patent No. 16,560, dated February 3, 1857.

To all whom it may concern:

Be it known that I, HENRY WEISSENBORN, of the city, county, and State of New York, have invented a new and useful Improvement in Blast-Furnaces for the Manufacture of Iron; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a central vertical section of the upper part of a blast-furnace having my improvements applied. Fig. 2 is a horizontal section in the line *xx* of Fig. 1.

Similar letters of reference indicate corresponding parts in both figures.

This invention consists in a certain novel arrangement of a feeder and a gas-chamber for the purpose of enabling the waste gas escaping from the furnace to be conveyed down to the level of the lower part of the furnace, there to be used to heat the blast to generate steam or for any other purpose.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A is the upper portion of the interior of a blast-furnace constructed in the usual manner.

B is a hollow cylinder of cast-iron, which I term the "feeder," of a diameter about equal to two-thirds or three-fourths the diameter of the throat of the furnace. This cylinder may be made in one piece or in sections, and for a blast-furnace of ordinary size will be about nine or ten feet in height, and will be capable of containing nearly three charges of ore and coal. It is provided near its bottom with an external flange, *a a*, to rest upon the internal flange, *b b*, at the top of a hollow cast-iron base-piece, C, which is supported upon the top of or built into the furnace, the interior of the said base-piece being of such size as to form, as it were, an upward continuation of the interior of the furnace. The bottom of the feeders B is intended to stand on the same level as the throat of the furnace at the bottom of the base-piece C and the space D, between the feeder and the hollow base-piece.

C constitutes an open-bottomed gas-chamber standing above the throat of the furnace. This chamber is provided with two or more

branch pipes, E E, leading down to the bottom of the furnace, to convey the gas which is collected in the chamber D down to the blast-oven and steam-boiler or such other apparatus as may be desired. It is also provided with a suitable number of doors, F F, to admit air to cool it, when desired, to blow out the furnace. A floor or platform, G, is constructed near the top of the cylinder for the workmen to stand on to feed the furnace.

The operation of the apparatus is as follows: The furnace is fed from the top of the feeder A, and the charge is never allowed to get down near the bottom of the feeder; but when a new charge is put in it should reach nearly or quite to the top of the feeder, leaving a deep body of coal and ore above the entrance to the gas-chamber, the consequence of which is that the gas, as it is forced upward by the pressure of the blast from the lower part of the furnace, escapes into the chamber D, whose open bottom, standing over the furnace, is always ready to receive it, rather than pass through the dense body of material in the feeder, and is driven down the pipes E E.

It has been an object much desired, for reasons well known, to place the blast-oven and the steam-boiler, which is almost invariably employed in connection with the blast-furnace, at the bottom of the furnace; but this has been hitherto effected with only very doubtful success, owing to the difficulty of conveying down the gas to heat them. By the within-described arrangement of the feeder, the gas-chamber, and pipes, the gas is forced downward without difficulty.

In addition to the advantage secured of enabling the blast-oven, boilers, &c., to be placed at the bottom of the furnace, it has been found, in putting my invention in practice, that at the upper mouth of the feeder there is at no time a sufficient escape of gas to inconvenience the workmen employed in feeding the furnace.

What I claim as my invention, and desire to secure by Letters Patent, is—

The mechanical arrangement of feeder B, in combination with a surrounding gas-chamber, D, with an open bottom placed above the furnace-throat, whereby the gas is prevented from escaping from the throat of the feeder B with-

out being covered, and then forced into the gas-chamber by the dense body of coal and ore always contained in the feeder, and therefore delivers a regular supply of gas, which can be carried descending to any heating-furnaces placed on the bottom ground of the blast-furnace with the same advantages as if applied

on the top of it, for the purpose and in the manner as specified.

HENRY WEISSENBORN.

Witnesses:

J. W. COOMBS,

JAMES F. BUCKLEY.