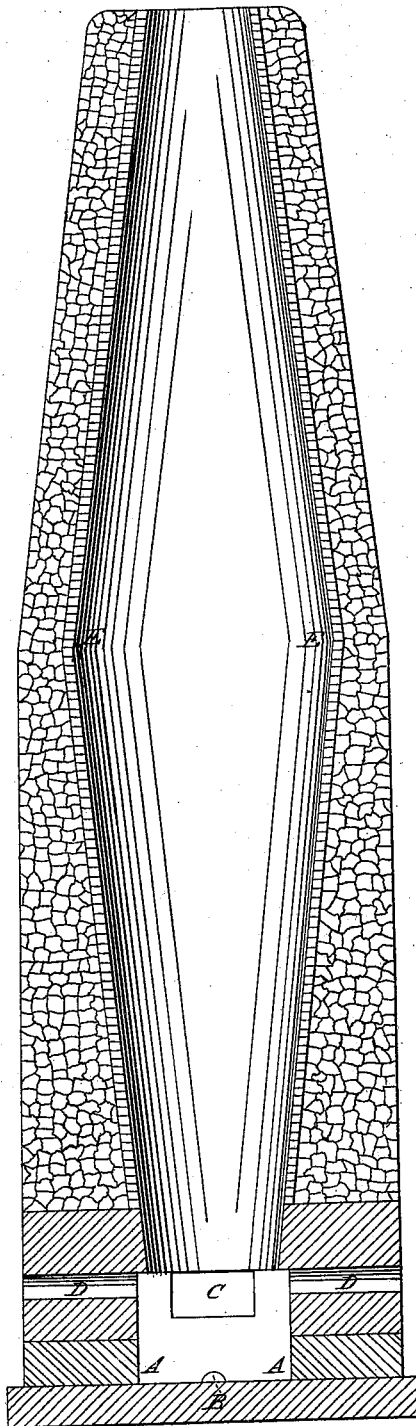


S. BROADMEADOW.

Blast Furnace.

No. 175.

Patented Apr. 5, 1837.



# UNITED STATES PATENT OFFICE.

SIMEON BROADMEADOW, OF NEW YORK, N. Y.

## IMPROVEMENT IN CONSTRUCTION OF FURNACES FOR THE SMELTING OF IRON ORE BY THE USE OF HARD OR ANTHRACITE COAL.

Specification forming part of Letters Patent No. 175, dated April 5, 1837.

### *To all whom it may concern:*

Be it known that I, SIMEON BROADMEADOW, of the city of New York, in the State of New York, have invented a new and Improved Mode of Constructing Furnaces for the Smelting of Iron Ore by the Use of Hard or Anthracite Coal as a Fuel; and I do hereby declare that the following is a full and exact description thereof.

The dimensions of the respective parts of my furnace, which I am about to give, are such as will designate one of ordinary size, my object therein being to afford a clear view of its general construction and arrangement, without intending to limit myself to the precise admeasurements set down, but rather to exhibit a general character by which any competent iron-master will be enabled to see the difference between my furnace and all those which have preceded it, and also to construct the same. The whole height of the furnace above the hearth is twenty-five feet. The form of the stack above the tympan is that of two truncated cones, the bases of which unite at the middle of the stack, whence they regularly taper to the diameter of two feet at the top and the same at the tympan. The tympan must be eighteen inches long and nine inches deep, as will be seen by the drawing deposited in the Patent Office, which is drawn upon a scale of half an inch to a foot. The hearth below the tympan, where the molten iron lies ready to be drawn off, is three feet square and two feet deep, whence the slag or dead cinders are to be thrown off as in other furnaces. I use two tuyeres, which at the inlet are each

two inches in diameter. The pressure of the blast is two pounds and a half to the square inch. Should the furnace much exceed the height designated, the weight of the anthracite and of the ore will be such as to obstruct the passage of the blast through the mass, and consequently to defeat the process; but by keeping the proportions given the pressure of the mass upon the tuyere will be moderated, and the blast will readily find its way to the top of the furnace, and a good working heat be attained. In using such a furnace I first heat it by putting in three hundred bushels of charcoal. I then charge it by putting in two hundred pounds of hard coal, then two hundred pounds of iron ore, and fifty pounds of limestone, repeating the charge as the materials sink, treating it in these particulars in the ordinary mode of managing furnaces for making iron. The ore is to be roasted and otherwise prepared in the ordinary way, and I of course vary the flux and other things according to the nature of the ore to be smelted.

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

The construction and employment of such a furnace as that herein described for smelting iron by means of anthracite or hard coal—that is to say, a furnace which is substantially the same with that described in the general structure, proportion, and arrangement of the part containing the ore to be smelted.

SIMEON BROADMEADOW.

Witnesses:

I. LABAGH, Jr.,  
G. W. GUIDER.