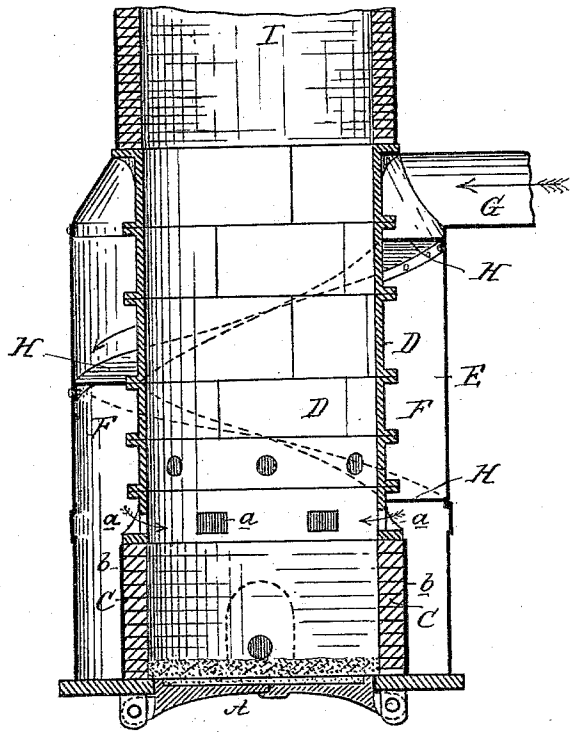
(No Model.)

V. COLLIAU.

FURNACE.

No. 295,355. Patented Mar. 18, 1884.



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UNITED STATES PATENT OFFICE.

VICTOR COLLIAU, OF DETROIT, MICHIGAN.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 295,355, dated March 18, 1884.

Application filed October 16, 1883. (No model.)

To all whom it may concern:

Be it known that I, VICTOR COLLIAU, of Detroit, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Furnaces; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, which forms a part of this specification.

This invention relates to certain new and useful improvements in the construction of furnaces, more especially designed for the reduction of ores; and it consists in the peculiar construction, arrangement, and combination of parts, as hereinafter more fully described and claimed.

In the accompanying drawing, which forms a part of this specification, and in which is shown in vertical section a furnace for reducing ores, A represents the bottom of any of the known or desired constructions adapted for the purpose designed.

C is a lower section built of suitable bricks to the height of the lower tuyeres, *a*, and it is surrounded by a metallic shell, *b*.

D is the section above the section C, and it is composed of metallic plates extending to the top of the furnace proper.

E is a metallic shell surrounding the whole, forming an inclosing annular air-chamber, F, which is provided with an inlet, G, which is connected with a blower or fan (not shown) of any desired construction, by means of which cold air is driven into the annular chamber. To compel a circulation of this air around the section D in order to take the caloric from it, thereby highly heating such air, preparatory to its use for a hot blast, and to prevent the passage of such air directly from the inlet to the outlets through the tuyeres into the furnace. I provide a diaphragm, H, the width of which equals the distance between the wall of the section D, and the outer shell. One end of this diaphragm is secured just below the inlet G, and it extends spirally and downwardly, making at least one entire turn around the section D, and terminating at a point just above the tuyere immediately below the said inlet. This circulation forced by the blower and compelled to take its course around the section D cools the latter, while the air becomes so highly heated that on arriving at the tuyere through which it seeks an outlet it is of the proper temperature to furnish the necessary hot blast requisite to the successful and economical reduction of the ores under treatment.

Above the section D the mouth I of the furnace may be constructed in any desired convenient manner, while the section below the tuyeres is protected by fire-brick.

I am aware that it is not new to use air to cool the lining of a furnace, and do not claim, broadly, such constructions.

I am also aware that it has been proposed to arrange a spiral partition around the top of a furnace in order to force the air to circulate around the lining of the same, from whence the air is carried to the tuyeres through isolated pipes, and do not claim such construction, for by such the air which is slightly heated in passing through the spiral chamber is cooled in its passage to the tuyeres, and that is just what it is my object to avoid. I therefore deem it important that the diaphragm H extend the full length of the section D—that is, to a point just above the tuyeres—for by this arrangement the air is kept in contact with the lining of the furnace, and is gradually heated from the time it enters at G till it enters the furnace through the tuyeres, when it is of such a high temperature as to be used as a hot blast, thus performing the double function of cooling the furnace and avoiding the necessity of a separate stove or furnace for supplying a hot blast.

What I claim as my invention is—

A blast-furnace having an outer metallic lining, E, an inner metallic casing, D, above the tuyeres, the section C below the tuyeres being of fire-brick, as described, to prevent damage to the portion of the furnace where there is no circulation of air, an air-inlet, G, into which air passes under pressure, and a spiral diaphragm between the casings extending from said air-inlet to the tuyeres for compelling the air to circulate around the section above the tuyeres and gradually descend to the same, whereby the air is gradually heated before entering the tuyeres, substantially as described.

VICTOR COLLIAU.

Witnesses:
H. S. SPRAGUE,
E. SCULLY.