

UNITED STATES PATENT OFFICE.

CHARLES J. EAMES, OF NEW YORK, N. Y.

BOTTOM FOR REDUCING-FURNACES.

SPECIFICATION forming part of Letters Patent No. 428,747, dated May 27, 1890.

Application filed January 30, 1890. Serial No. 338,683. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. EAMES, a citizen of the United States, residing at New York city, in the county and State of New York, have invented certain new and useful Improvements in Bottoms for Reducing-Furnaces; and I hereby declare the following to be a full, clear, and exact description of the same, such as will enable others to apply the invention.

My invention relates to the production of certain neutral or basic compositions for the formation of the bottoms of reducing and other metallurgic furnaces, and has for its object to obtain a smooth, durable, non-wearing bottom, on which metallurgic operations—such as the reduction of ore, desulphurization and dephosphorization of ore, &c.—can be conducted without any irregular cutting or destruction of the bottom, and without such waste of the bottom as shall modify, change, affect, or delay the metallurgic processes conducted in said furnaces.

To this end my invention, generally stated, consists in a mixture or compound for furnace-bottoms wherein dolomite or magnesian limestone and a solid carbon, the carbon acting to exclude oxygen from the lime and retard waste, are combined with one or more of the binders fire-sand, fire-clay, and fluor-spar to complete the mass and obtain a glazed surface for the bottom, all substantially as will hereinafter more fully appear.

I will now proceed to describe the preferred proportions of the elements, as well as the preferred manner of uniting and applying the same, so as to enable others skilled in the art to carry out the invention; but I distinctly disclaim limitation to said proportions, as the proportion of the elements dolomite and carbon may be greatly varied to meet known conditions and requirements of different metallurgical processes, or even different characters of ores in different reduction processes.

In carrying out my invention I preferably take seventy-five per cent., (75%), by weight, of dolomite, ten per cent., (10%), by weight, of a solid carbon, preferably one devoid of hy-

drocarbons, such as coke or graphitic carbon, seven per cent. (7%) of fire-sand, six per cent. (6%) fire-clay, and two per cent. (2%) fluor-spar.

Such of the above elements as require it—viz., the carbon, dolomite, and fluor-spar—are reduced to a granular condition by any suitable means, and all the elements are then intimately mixed and worked into a plastic mass by means of a pug or other suitable mill and the addition of a suitable liquid, preferably a weak solution of silicate of soda—say one (1) pint silicate of soda to about five (5) gallons of water; and the mixture or mass thus formed is then applied to the furnace-bottom in a layer varying from four (4) to ten (10) inches in depth, according to the size of the furnace and character of metallurgic process to be conducted in said furnace. The said mixture is applied to the cold furnace and the furnace gradually fired or heated to drive off the moisture, the heat being finally raised to vitrify or glaze the surface of the bottom.

The metallurgic processes subsequently conducted in a furnace having such a bottom will ultimately fuse the bottom for a depth of perhaps half an inch or so; but, owing to the protection afforded to the dolomite by the carbon and the virtual exclusion of oxygen from the dolomite, the waste of the bottom is exceedingly slow and so slight with each charge as to have no material effect on the charge.

The bottom hereinbefore described is exceedingly durable, and, as it retains a glazed uniform surface, facilitates the handling of the charge worked thereon.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A composition for furnace-bottoms, composed of dolomite, carbon, and binders, including fluor-spar, substantially as and for the purposes specified.

2. A composition for furnace-bottoms, composed of dolomite, carbon, and the binders fluor-spar, fire-clay, and fire-sand, substantially as and for the purposes specified.

3. A mixture for furnace-linings, composed of dolomite, carbon, fluoer-spar, fire-clay, fire-sand, and sufficient of a weak solution of silicate of soda to form a plastic mass thereof, substantially as and for the purposes specified.

In testimony whereof I affix my signature,

in presence of two witnesses, this 29th day of January, 1890.

CHARLES J. EAMES.

Witnesses:

F. W. RITTER, Jr.,

WM. A. EASTERDAY.