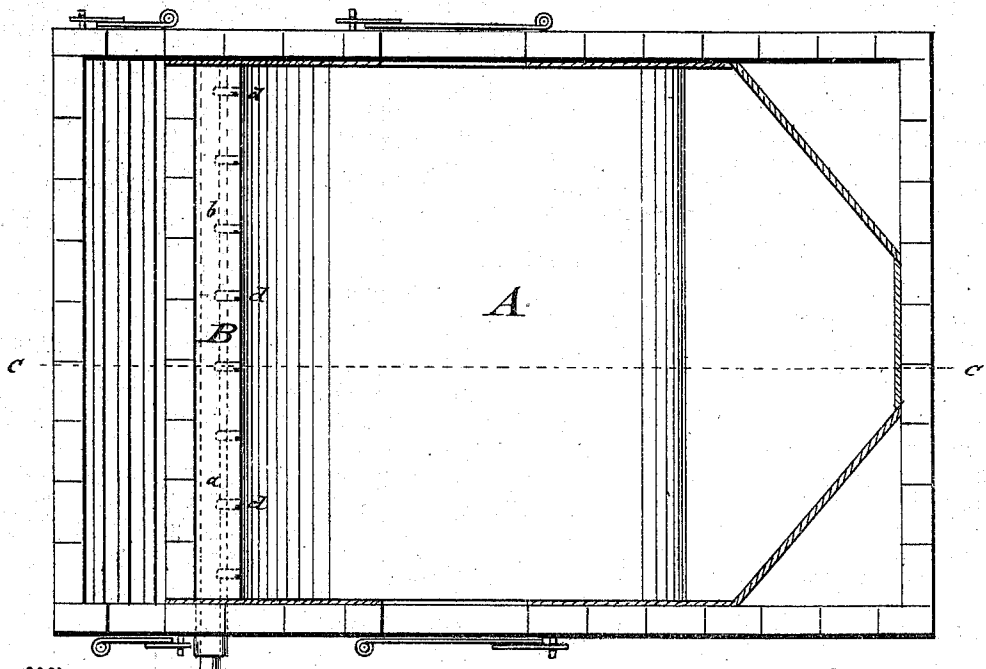
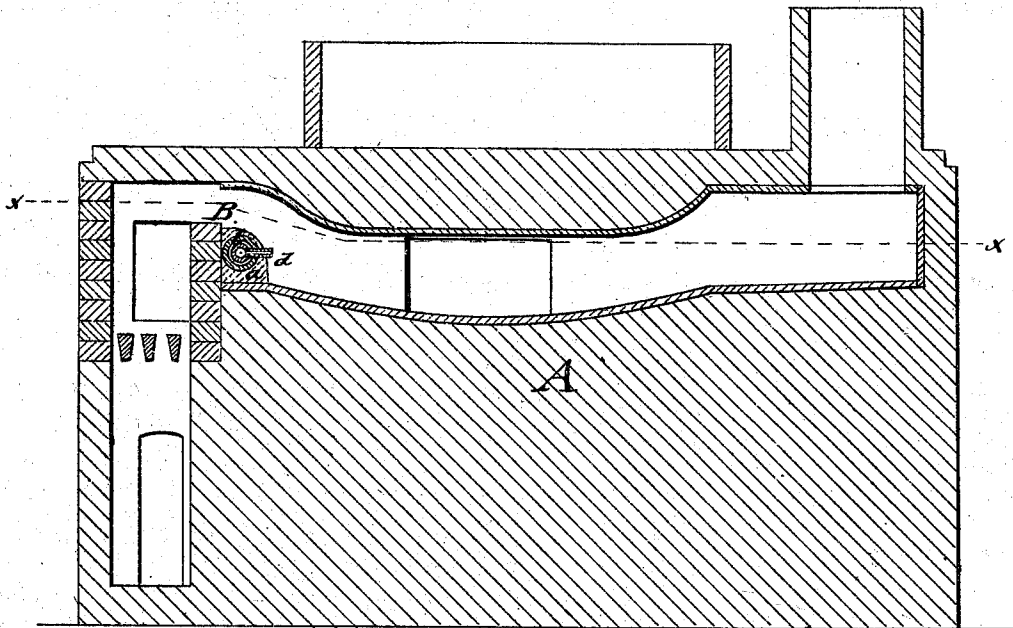


S. D. YOUNG.
Flux for Smelting Ores.

No. 142,186.

Patented August 26, 1873.



Witnesses:

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UNITED STATES PATENT OFFICE.

SAMUEL D. YOUNG, OF ELIZABETHTOWN, ILLINOIS.

IMPROVEMENT IN FLUX FOR SMELTING ORES.

Specification forming part of Letters Patent No. **142,186**, dated August 26, 1873; application filed July 5, 1873.

To all whom it may concern:

Be it known that I, SAMUEL DEAN YOUNG, of Elizabethtown, in the county of Hardin and State of Illinois, have invented a new and Improved Treatment of Fluor-Spar and Lead Ores for use in the Arts, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a vertical longitudinal section of my furnace for calcining fluor-spar and lead ores, on the line *c c*, Fig. 2, and Fig. 2 a horizontal section of the same on the line *x x*, Fig. 1.

Similar letters of reference indicate corresponding parts.

The object of my invention is to produce by a calcining process from fluor-spar an improved flux for iron ore, and, by a similar treatment of lead ores, mixed with fluor-spar, the rapid separation of the calcined spar from the lead ores. The invention consists in the improved fluor-spar flux for iron, hereinafter described and claimed.

A in the drawing represents a reverberatory furnace of the usual construction, which is provided with a fire-bridge, B, of fire-clay, through the inside of which passes an iron tube, *a*, which again surrounds a steam-pipe, *b*, connected to a steam-boiler of suitable pressure. To the steam-pipe *b* are applied, in the longitudinal direction of furnace A, the smaller steam-jets *d*, which pass through pipe *a* and holes of the fire-bridge in such a manner that only the opening from which the steam issues is exposed.

The fluor-spar or lead ore to be calcined is

placed in the furnace and roasted until a red heat is obtained. The steam is then admitted through pipe *b* and jets *d* on the charge in such quantity as to produce the thorough calcination of the same. The specific gravity of fluor-spar undergoes a considerable change, so that the separation of the same from lead ore is facilitated in a great degree.

The application of fluor-spar as a flux for iron ore is well known, but in its natural state it is detrimental to the hearths of iron furnaces. The fluor-spar, however, which is treated by the calcining process described, forms a superior flux for iron-ore without destroying the brick lining of the furnaces.

The calcined spar, when produced from the lead ore with which it is formed, is turned thereby to satisfactory use in the arts, while the calcining process at the same time, by melting the minute particles of lead, which are carried off by the old processes, increases the yield of the ore. The ore is also desulphurized, and the carrying off of particles of lead through the chimney prevented for the same reason, so that a greater percentage of lead is produced from the ore.

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

As an improved flux for iron, the calcined fluor-spar hereinbefore described.

SAMUEL DEAN YOUNG.

Witnesses:

C. W. WILKINSON,
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