

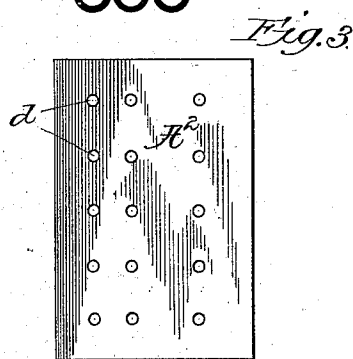
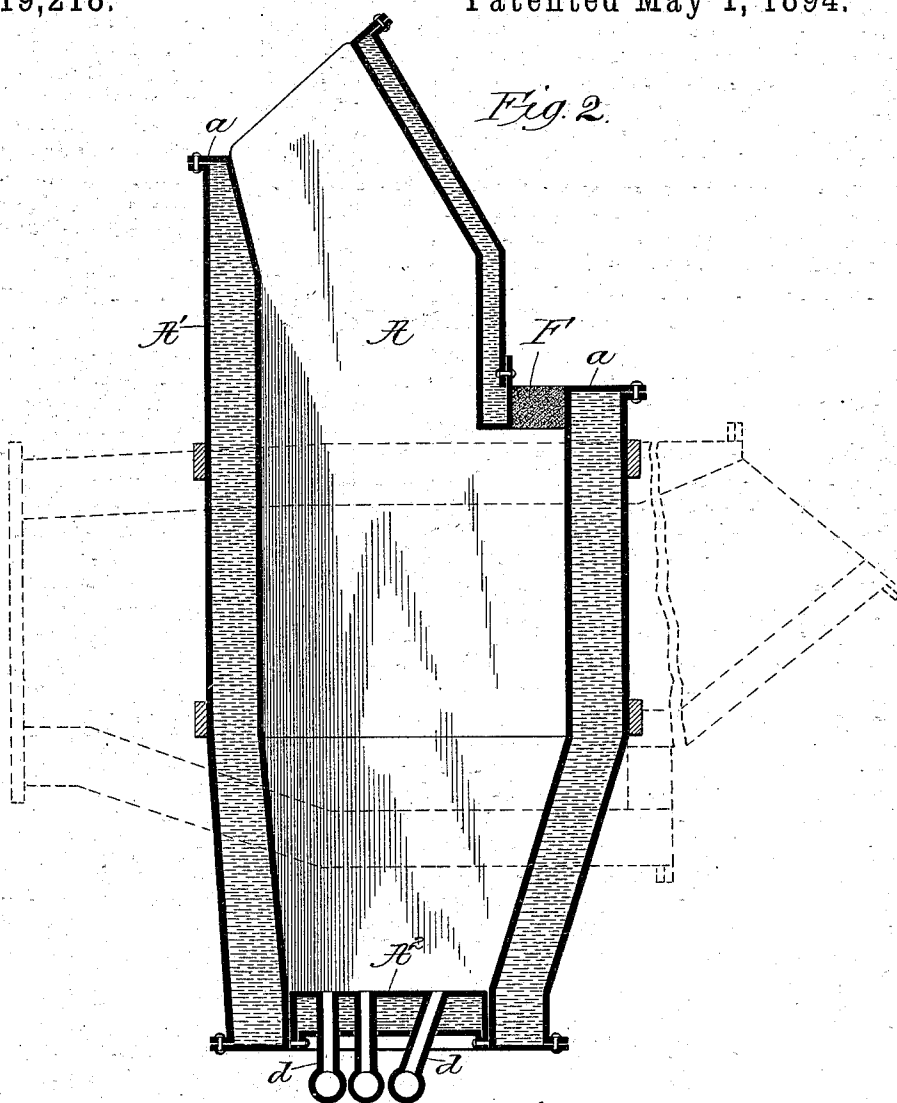
(No Model.)

2 Sheets—Sheet 2.

C. M. ALLEN.
CONVERTER FOR SMELTING ORES.

No. 519,218.

Patented May 1, 1894.



Witnesses:
Edw. Gaylord,
Lute D. Alter.

Inventor:
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UNITED STATES PATENT OFFICE.

CHARLES M. ALLEN, OF BUTTE, MONTANA.

CONVERTER FOR SMELTING ORES.

SPECIFICATION forming part of Letters Patent No. 519,218, dated May 1, 1894.

Original application filed April 18, 1893, Serial No. 470,826. Divided and this application filed December 12, 1893. Serial No. 493,467. (No model.)

To all whom it may concern:

Be it known that I, CHARLES M. ALLEN, a citizen of the United States, residing at Butte city, Montana, have invented certain new and useful Improvements in Converters for Smelting Ores, of which the following is a specification, being a division of an application filed by me April 18, 1893, Serial No. 470,826.

In the drawings, Figure 1 is a side elevation of my improved converter; Fig. 2 a vertical section taken on line 2 of Fig. 4; Fig. 3 a plan view of the bottom of the converter detached; and Fig. 4 a vertical section taken on line 4 of Fig. 1.

In constructing my improved converter, I make a converter provided with a smelting or converting chamber, A, having side water jackets, A', and a bottom jacket, A². These water jackets are made of sheets of metal with a space between them for the circulation of water. The edges, *a*, of the inner sheets are turned or bent outward and fastened to the edges of the outer sheets by rivets, or in any other convenient way. In this way, I avoid all seams, rivet holes, or other openings through the inner sheet of the water jackets, so that all liability of leakage into the converter, which may occasion accidents, is avoided. The bottom water jacket is intended to fit in and to be inclosed by the lower ends of the side jackets, as shown in the drawings. The upper end of the converter, as will be understood, is intended to open into a dust chamber, and has proper communication or connection with a smoke stack, as is now the usual construction.

In order to support the converter in a vertical position during its operation, I provide supports or standards, B, which are provided with journals or bearings, *b*, at their upper ends.

I provide the converter with hollow trunnions, C, adapted to rest and be supported in the journals of the supports or standards on which the converter is mounted. Through one of the hollow trunnions I introduce a blast pipe, D, so that a blast or current of air can be forced in through the trunnion and through a continuation of the blast pipe,

D', which communicates at its upper end with the hollow trunnion, and leads at its lower end to the tuyeres, *d*, which preferably enter the converter through the bottom water jacket more at one side of the bottom than the other, as shown in Fig. 2. I carry a water pipe, E, leading from a proper source of supply through the other hollow trunnion and down to or near the bottom of the side water jacket, which pipe may be divided into branches, one leading into the side water jacket and the other into the bottom water jacket, so as to supply the requisite quantity of water to each. Pipes, E', lead from the water jackets out through the hollow trunnion, to permit the water to flow through the water jacket and be carried off, so that a fresh supply will constantly be introduced into the water jackets.

I make a section of the converter, F, which will be above the surface of the molten material when the converter is in its initial working position, of brick work or other frangible material, so that it can be punctured to form a tap to draw off from time to time the desired quantity of molten material.

As will be apparent from the description up to this point, the converter is intended to be tipped or turned over, as represented by dotted lines in Fig. 2, when it is desired to draw off a quantity of molten material. The section, F, in which the tap is intended to be made, will be below the surface of the molten material when the converter is tipped over to draw off a portion of the charge. At such times also the tuyeres, *d*, which, as above stated, are arranged toward one side of the bottom of the converter, will open into the converter above the surface of the molten material, so that the blast will not be driven through nor agitate the material when the converter is tipped to draw off the material. It will thus be permitted to settle and assume the condition desired before drawing off.

In order to tip the converter, I arrange a gear wheel, G, on one of the trunnions, and a rack, G', with its teeth intermeshing with the gear wheel, and to move this rack up and down whenever it is desired to tip the con-

verter, I employ a hydraulic cylinder, H, the piston in which connects with the rack, so that when water is admitted behind the piston it will move the rack up, turn the gear wheel, G, and tip the converter.

5 It will thus be seen that by changing the position of the converter with its converting chamber the molten material in it occupies one place while the converting chamber is in
10 its initial or working position, and another place when it is in its discharging position. In a word, it changes its position relatively to the converting chamber to permit the discharge and prevent the blast of air from agitating the molten material.

15 I claim—

1. A tipping, tapping converter having a smelting chamber for the reception of molten materials, tuyeres for the admission of an air
20 blast, a section of brick work arranged above any molten material in such chamber when in its initial working position and below the surface of any such material when the con-

verter is tipped, and means for tipping the converter, substantially as described.

2. A tipping, tapping converter having water jackets entirely surrounding its smelting chamber, hollow trunnions for supporting such converters, tuyeres for the admission of an air blast in the bottom of such converter, blast pipe connecting such tuyeres and leading in through the hollow trunnion, water supply and discharge pipes connected with such water chambers and leading in through the trunnion, and a section of such converter wall formed of brick work arranged at a point above any molten material in such chamber when the converter is in its initial working position and below such material when the converter is tipped, and means for tipping
4 the converter, substantially as described.

CHARLES M. ALLEN.

Witnesses:

W. C. THOMAS,
FRANK KNOWLES.