E. DOR-DELATTRE.

MEANS FOR HANDLING SMELTING FURNACE RESIDUES.

APPLICATION FILED MAR. 18, 1911.

1,031,918.

Patented July 9, 1912.

4 SHEETS—SHEET 1.

Fig. 1

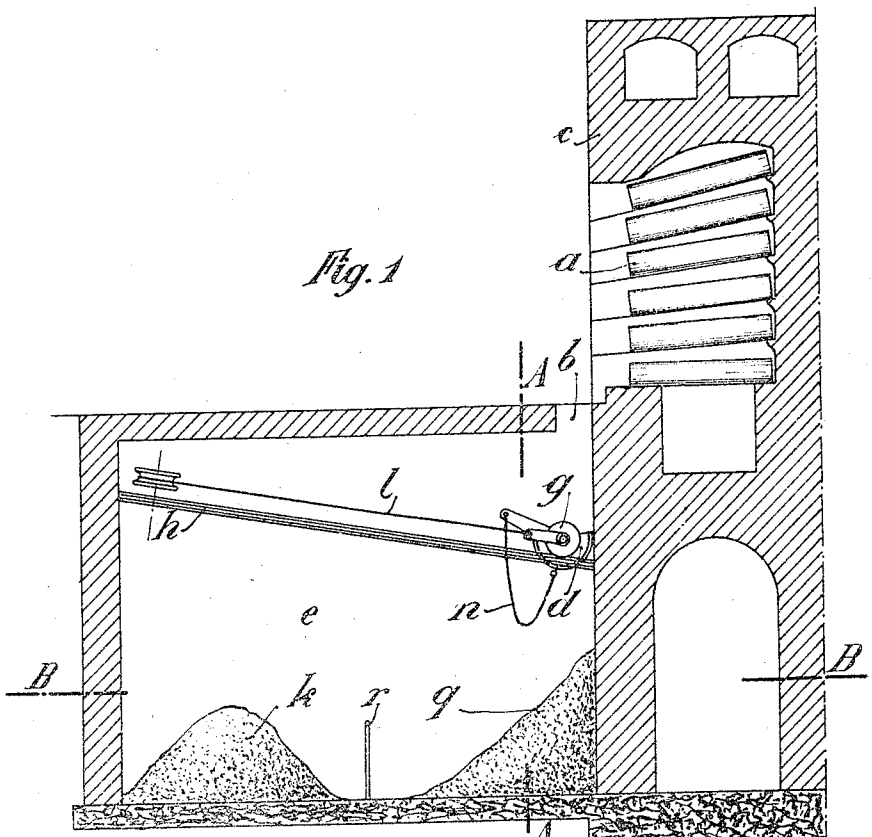
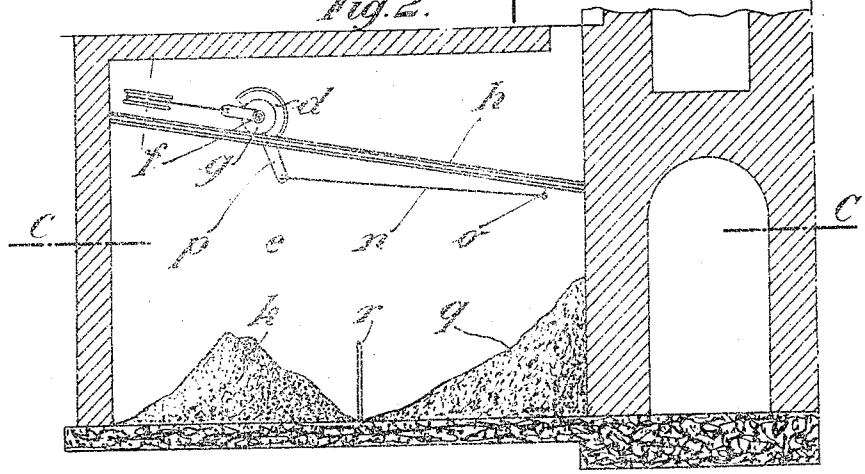


Fig. 2.



Witnesses:

W. C. Bender

C. S. Brown

Inventor

Emile Dor-Delattre

by Foster Freeman Watson & Coit

Attys.

E. DOR-DELATTRE.

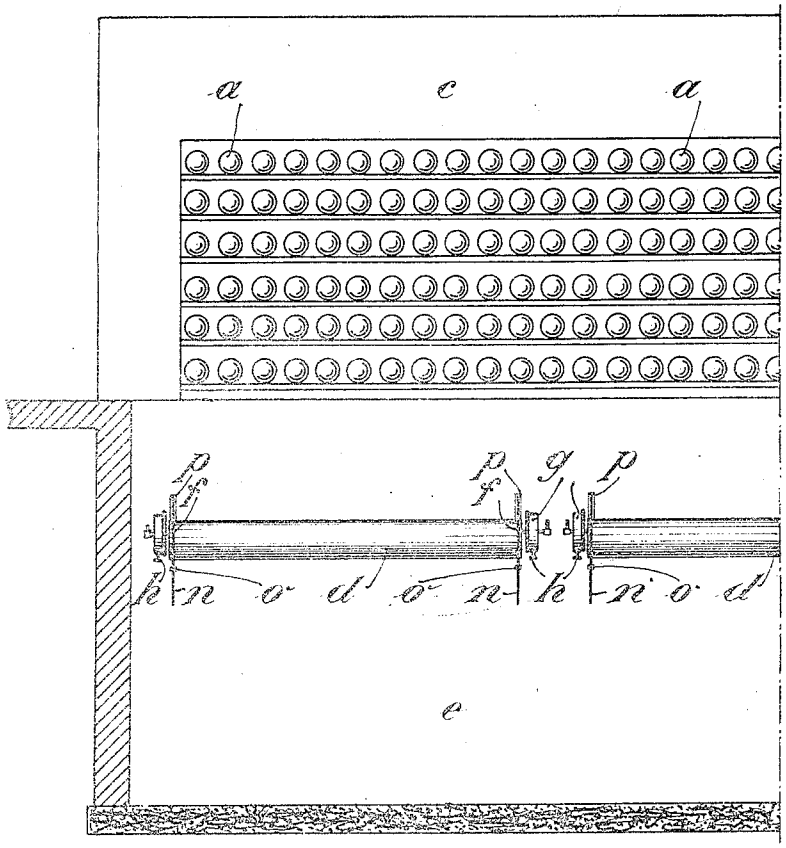
MEANS FOR HANDLING SMELTING FURNACE RESIDUES.

APPLICATION FILED MAR. 18, 1911.

1,031,918. Patented July 9, 1912.

4 SHEETS—SHEET 2.

Fig. 3.



Witnesses:
W. C. Bender,
C. D. Brown.

Inventor:
Emile Dor-Delattre
by Foster Freeman Watson & Coit
Attys

E. DOR-DELATTRE.

MEANS FOR HANDLING SMELTING FURNACE RESIDUES.

APPLICATION FILED MAR. 18, 1911.

1,031,918.

Patented July 9, 1912.

4 SHEETS—SHEET 3.

Fig. 4.

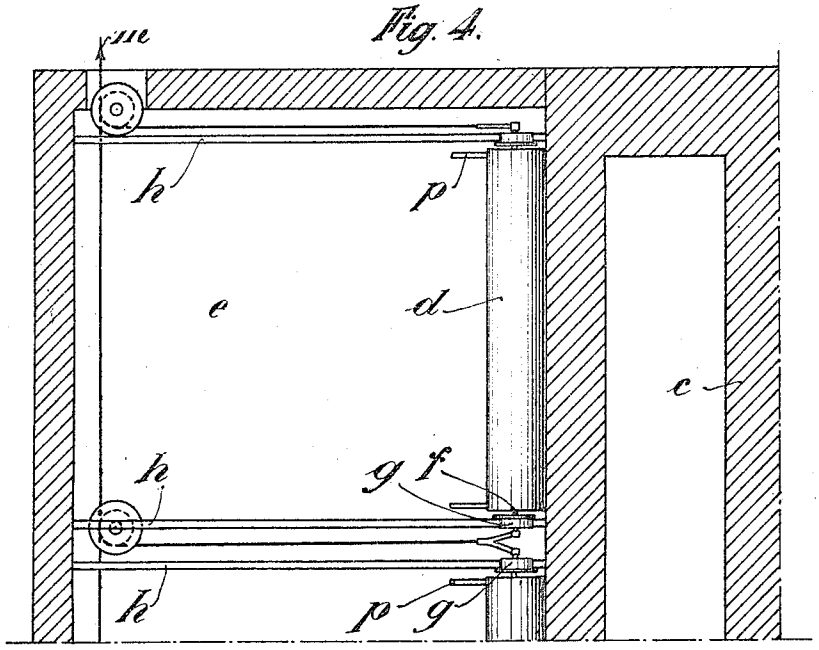
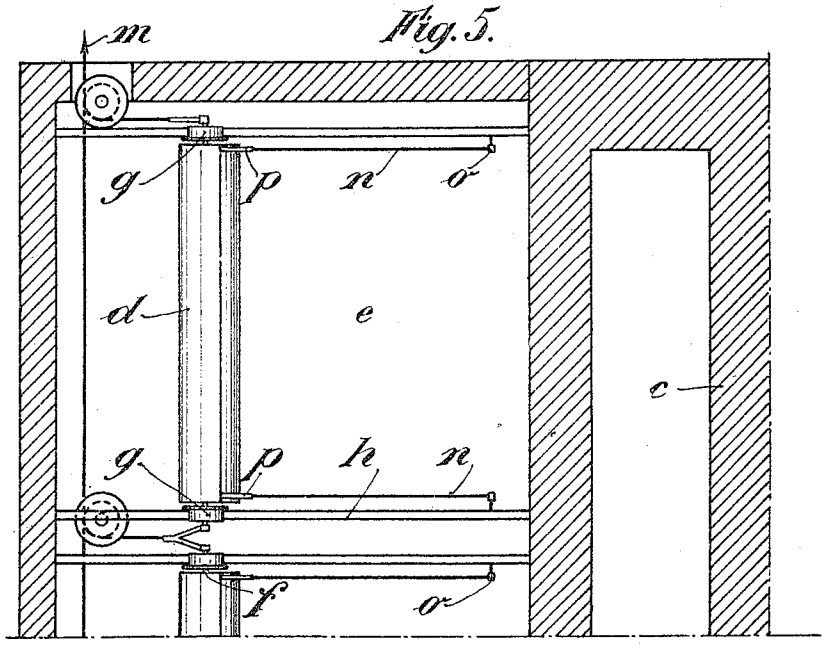


Fig. 5.



Witnesses.
W. C. Bender
C. S. Brown.

Inventor:
Emile Dor-Delattre
by Foster Freeman Watson & Coit
Attys

E. DOR-DELATTRE.

MEANS FOR HANDLING SMELTING FURNACE RESIDUES.

APPLICATION FILED MAR. 18, 1911.

1,031,918. Patented July 9, 1912.

4 SHEETS—SHEET 4.

Fig. 6.

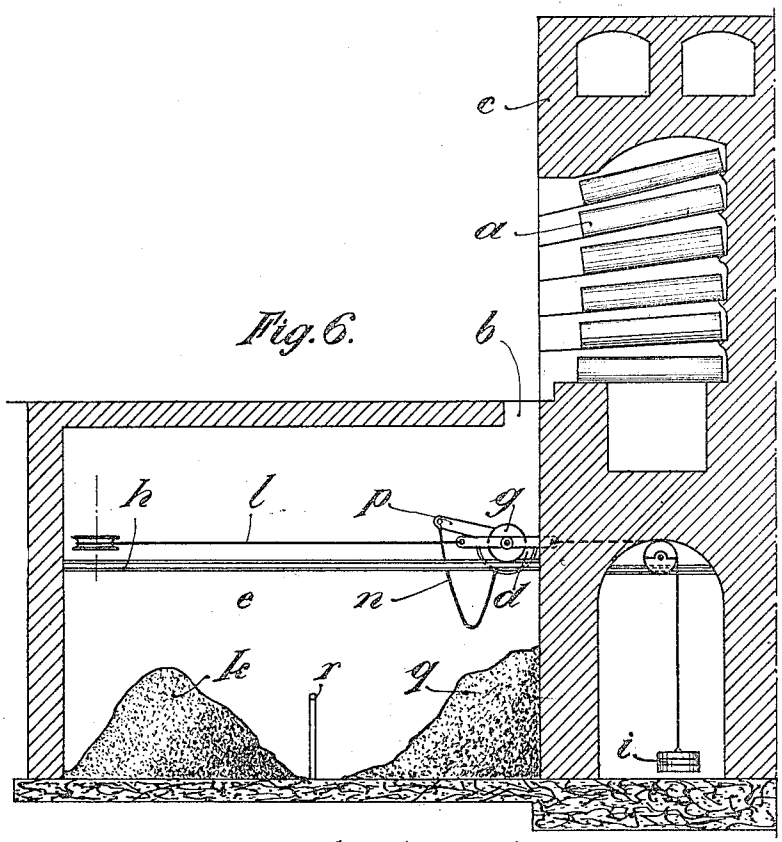
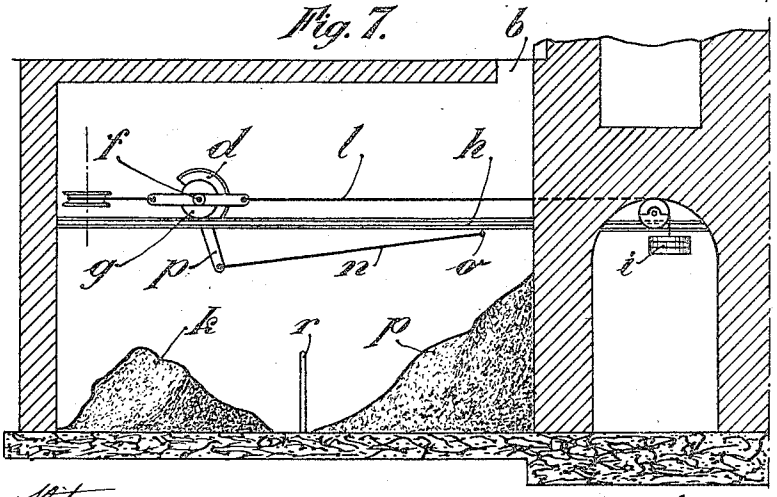


Fig. 7.



Witnesses:

W. C. Bender

C. A. Brown

Inventor:

Emile Dor-Delattre

by Foster Freeman Watson & Coit

Attys.

UNITED STATES PATENT OFFICE.

EMILE DOR-DELATTRE, OF LIEGE, BELGIUM.

MEANS FOR HANDLING SMELTING-FURNACE RESIDUES.

1,031,918. Specification of Letters Patent. Patented July 9, 1912.

Application filed March 18, 1911. Serial No. 615,306.

To all whom it may concern:

Be it known that I, EMILE DOR-DELATTRE, subject of the King of Belgium, residing at Liege, Belgium, have invented certain new and useful Improvements in Means for Handling Smelting-Furnace Residues; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

In the manufacture of zinc it usually happens that those portions of the mixture of ore and coal which are found at the front ends of the retorts are very imperfectly reduced. When the retorts are cleared out these non-reduced portions can be collected separately from the others, but it is then necessary to spread them on the working floor, which causes very serious inconveniences by reason of the enormous quantities of fumes and dust which are evolved, and by reason of their great heat. It is thus found necessary to allow them to fall into the pit, where these non-reduced parts mix with the waste or useless parts; it is therefore practically impossible to use them over again, which results in a very considerable loss.

The object of the present invention is to mechanically separate these residues of manufacture into two distinct parts, so that one can recover, easily and without expense, those parts which are of value.

The accompanying drawings represent an arrangement for attaining this result.

Figure 1 is a vertical section through a furnace and its pit, the trolley or receptacle for the residue being shown at the right hand side nearest the furnace. Fig. 2 is a similar view to Fig. 1, but shows the residue receptacle at the left hand side, away from the furnace. Fig. 3 is a longitudinal section through one of the pits on A—A (Fig. 1). Fig. 4 is a horizontal section on B—B (Fig. 1). Fig. 5 is a horizontal section on C—C (Fig. 2). Fig. 6 shows a modification, same being represented in section similar to Fig. 1. Fig. 7 is another view of this modification corresponding to Fig. 2.

The rich residues, which represent the incompletely reduced part of the charge, are first removed from the retorts *a*, which can readily be done, since they are situated in that part of the retorts which is nearest the open end. This part of the residues is allowed to fall through openings *b*, arranged longitudinally for the whole length of the furnace, into a series of trolleys or receptacles *d* situated in the pit *e* of the furnace. These receptacles *d* are mounted, by means of pivots *f*, on rollers *g*, which run on rails *h*, which are, either inclined or horizontal according to the depth of the pit *e*. When these pits are sufficiently deep (Fig. 1) the rails *h* are preferably inclined so as to form a gradient sloping down toward the furnace; the receptacles *d* then tend to take the position represented in Fig. 1. When the pits *e* are of less depth and the rails are horizontal (Figs. 6 and 7), the receptacles *d* are moved toward the furnace *c* (Fig. 6) by counterweights *i* acting on the pivots *f* of these receptacles. In this position, the receptacles *d* are situated beneath the openings *b*, so that they receive the rich residues when same are removed from the retorts. When these rich residues have been removed from the retorts *a* and the receptacles *d* are filled, these latter, are drawn along the rails *h* in order to empty their contents into the pit at *k*.

The moving of the receptacles *d* along the rails, as well as the emptying of the receptacles, can be effected in any suitable manner. The drawing represents a mechanical arrangement which may be adopted. The pivots *i* of the different receptacles *d* of each series are connected, by chains or cables *l*, to a motor or piston (preferably hydraulic) capable of exerting a pull upon the cable *m* (Fig. 4) and consequently removing the receptacles *d* from the furnace *c* (Figs. 2, 5 and 7). The emptying of the receptacles is effected automatically when they reach the required position, by chains *n;* one end of each chain *n* is fixed to a lever *p* on the receptacle, while the other end is attached to a fixed point *o*. The length of the chains is such that they become taut when the receptacles *d* arrive at the end of their travel, which has the effect of inverting the receptacles when they arrive at the point where the discharge should take place. When the rich residues have been thus collected in the heap *k*, the receptacles *d* are retained at a sufficient distance away from the furnace in order that the waste residues can fall directly into the pits *e* through the openings *b* and form the heap *q*. If necessary separators *r*, of sheet-iron or stone, can be placed in the pits *e* in order to prevent the mixing of the two different heaps *k* and *q*. It is

obvious that this mechanical separation can be effected, in the furnace pits, by means other than that described above which will have the effect, according to the position which they occupy, of depositing the products of the retorts on to the heap *k* or to the heap *q*. This method of separation and the means therefor are equally applicable to other industries than the manufacture of zinc.

I claim:

1. The combination with a smelting furnace, and a pit having an inlet to receive material withdrawn from the furnace, of means whereby useful and waste portions of material withdrawn from the furnace may be separated within the pit without exposing the furnace operatives to the heat, and gases arising from such material.

2. The combination with a smelting furnace, and a pit having an inlet to receive material withdrawn from the furnace, of means within the pit adapted to be adjusted to receive material passing through said inlet and to discharge such material within the pit at points other than those where material passing through the inlet when said means is not positioned to receive it will be deposited, whereby useful and waste portions of the material withdrawn from the furnace may be separated without exposing the operatives to the heat, and gases escaping from the material.

3. The combination with a smelting furnace, and a pit having an inlet adapted to directly receive material withdrawn from the furnace, of a receptacle supported to move in the pit to and from a position where it will receive material passing through said inlet, means separating the pit into compartments into one of which the inlet opens, and means for automatically discharging the contents of the receptacle into another of said compartments.

In testimony whereof I affix my signature in presence of two witnesses.

EMILE DOR-DELATTRE.

Witnesses:

A. NAINLOL,

ED. SEPULCHRE.