

No. 703,309.

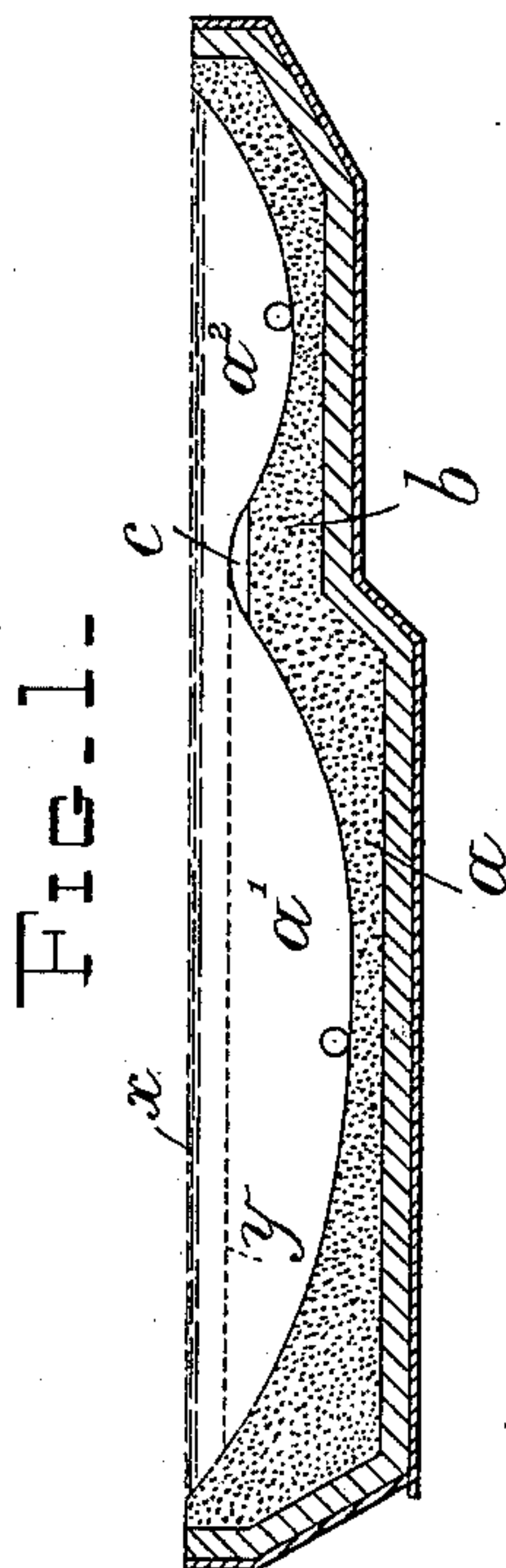
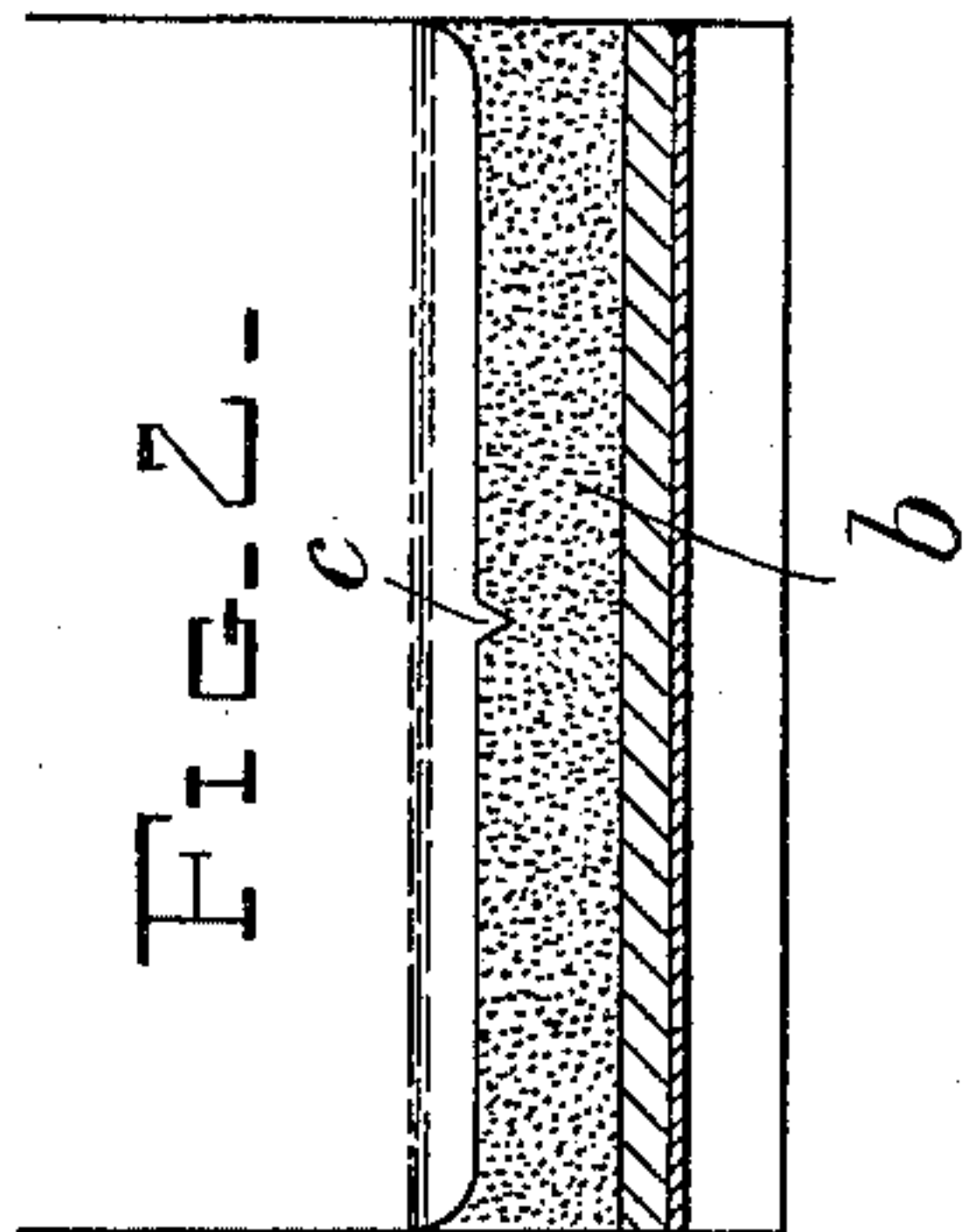
Patented June 24, 1902.

F. L. SANITER & J. L. SMITH.
OPEN HEARTH STEEL FURNACE.

(Application filed Nov. 4, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses.
Stephen H. Hirst
Fred W. Engler

Inventors.
Francis L. Saniter
and John L. Smith
By Wilkinson & Fisher
Attorneys.

No. 703,309.

Patented June 24, 1902.

F. L. SANITER & J. L. SMITH.
OPEN HEARTH STEEL FURNACE.

(Application filed Nov. 4, 1901.)

(No Model.)

2 Sheets—Sheet 2.

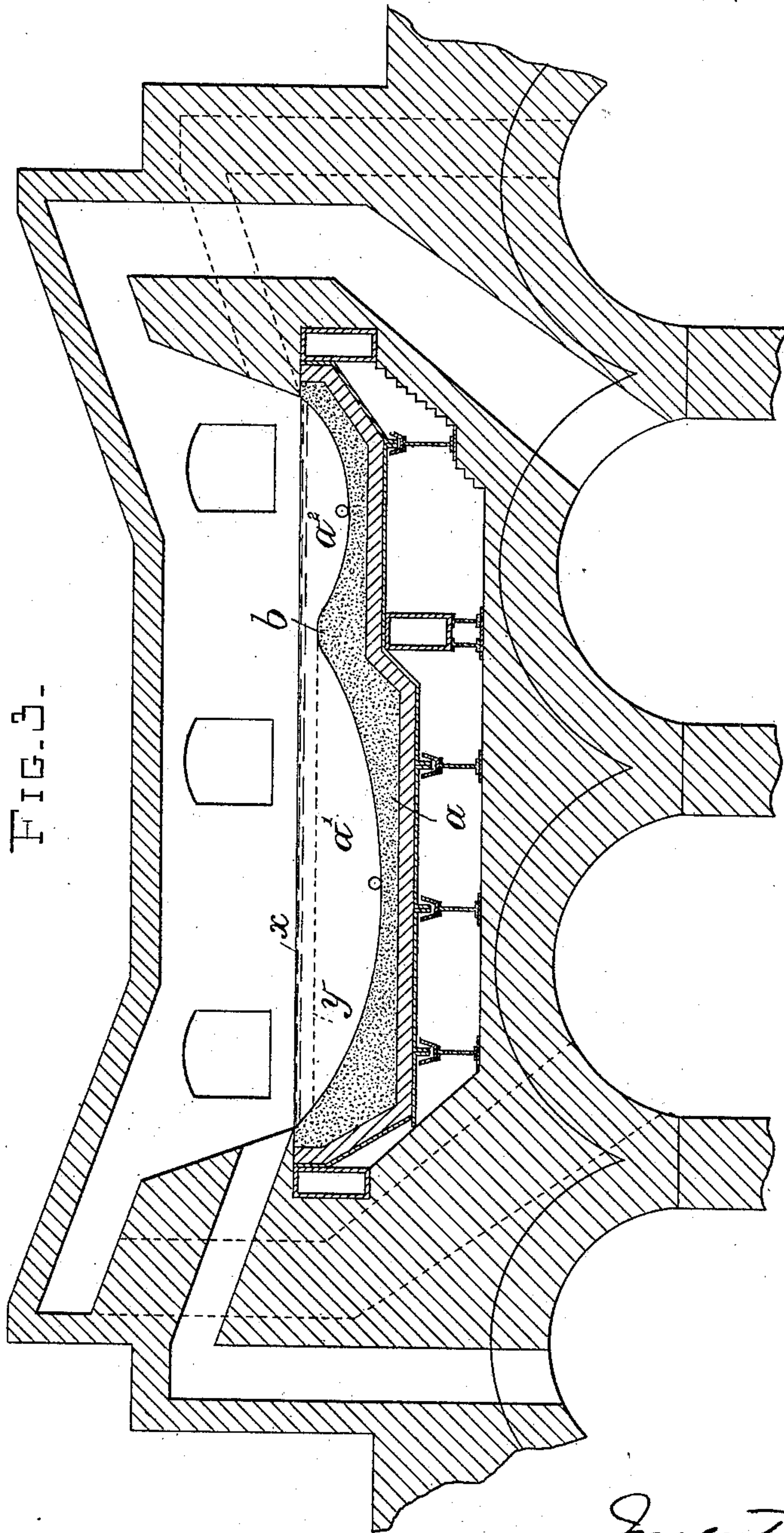


FIG. 3.

Witnesses
Stephen Hirst
Fred W. Engler

Inventors
Francis L. Saniter
and John L. Smith
by Wilkinson & Fisher
Attorneys.

UNITED STATES PATENT OFFICE.

FRANCIS LOUIS SANITER, OF SEATON-CAREW, AND JOHN LAW SMITH,
OF EAGLESCLIFFE, ENGLAND.

OPEN-HEARTH STEEL-FURNACE.

SPECIFICATION forming part of Letters Patent No. 703,309, dated June 24, 1902.

Application filed November 4, 1901. Serial No. 81,144. (No model.)

To all whom it may concern:

Be it known that we, FRANCIS LOUIS SANITER, residing at Seaton-Carew, and JOHN LAW SMITH, residing at Eaglescliffe, in the county of Durham, England, subjects of the King of Great Britain and Ireland, have invented certain new and useful Improvements in Open-Hearth Steel-Furnaces; and we 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.

This invention relates to open-hearth steel-furnaces when divided into two or more compartments separated by dams and above which the said compartments merge into one large chamber which is common to all, whereby the molten metal poured into one compartment from time to time can be made to overflow into the other compartment to be separately tapped therefrom. An open-hearth furnace characterized by these features is made the subject of special attention in our application for Letters Patent, filed February 11, 1901, Serial No. 46,901, where they will be found more fully described and claimed.

The object of our invention is to control or regulate the outlet of the slag, which is liable to be urged forward by the metal when nearing the bank-level during tapping by the means hereinafter described, which facilitate the flow of the metal over the dam from one compartment to another.

Having thus described the nature and utility of our invention, in order that the same may be clearly understood and readily carried into effect we will now proceed to a further description of the same, with reference to the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view of the bed of an open-hearth steel-furnace embodying our improvement, corresponding to which Fig. 2 is a transverse sectional view; and Fig. 3 represents in sectional view an open-hearth furnace described in our prior application referred to above, and therefore need not be further explained herein.

Referring to Figs. 1 and 2, the hearth *a* is for convenience of description divided into two compartments, of which one is preferably provided with a larger and the other a

smaller compartment, and containing when charged separate pools or baths *a'* *a*² of molten metal separated up to a certain level by banking or walling up, as at *b*. Above this level the hearth forms one continuous bath, as indicated by the steel-level *x*, the lower part forming the two separate baths *a'* *a*², so designed that when the smaller bath *a*² is tapped the steel in the larger bath *a'* flows down to the level of the bank or partition-wall *b* only, as indicated by the dotted line *y*, the small bath being completely emptied, while the steel is retained in the large bath. When the molten metal is nearing this level during the process of tapping, the tendency is for the metal flowing over the dam to draw the slag over with it instead of allowing the slag to settle down on the top of the metal retained in the pool *a'* to be subsequently removed as required, and in order to control and regulate the outlet of the slag by preventing this tendency to draw it over the dam we provide one or more channels or gutters *c* in the bank as a means to allow the metal to flow freely away from the slag, while the slag settles down undisturbed on the pool retained below, which it protects and seals in the manner required, when the overflow ceases. As the molten metal will possess greater fluidity than the slag, which forms a scum or coating upon the top of the metal, the metal will flow freely through the channel or channels, leaving the slag behind, the slag being unable to pass through the narrow channels.

Having thus described the invention, we claim and desire to secure by Letters Patent—

In an open-hearth furnace for the manufacture of steel and characterized by a division of the hearth into compartments separated by dams one or more channels or gutters in the dams substantially as specified for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

FRANCIS LOUIS SANITER.
JOHN LAW SMITH.

Witnesses:

GEORGE JAMES CLARKSON,
EDWARD THOMAS ELCOAT.