E. KIRCHBERG.

REGENERATIVE FURNACE.

APPLICATION FILED OCT. 6, 1908.

944,444.

Patented Dec. 28, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

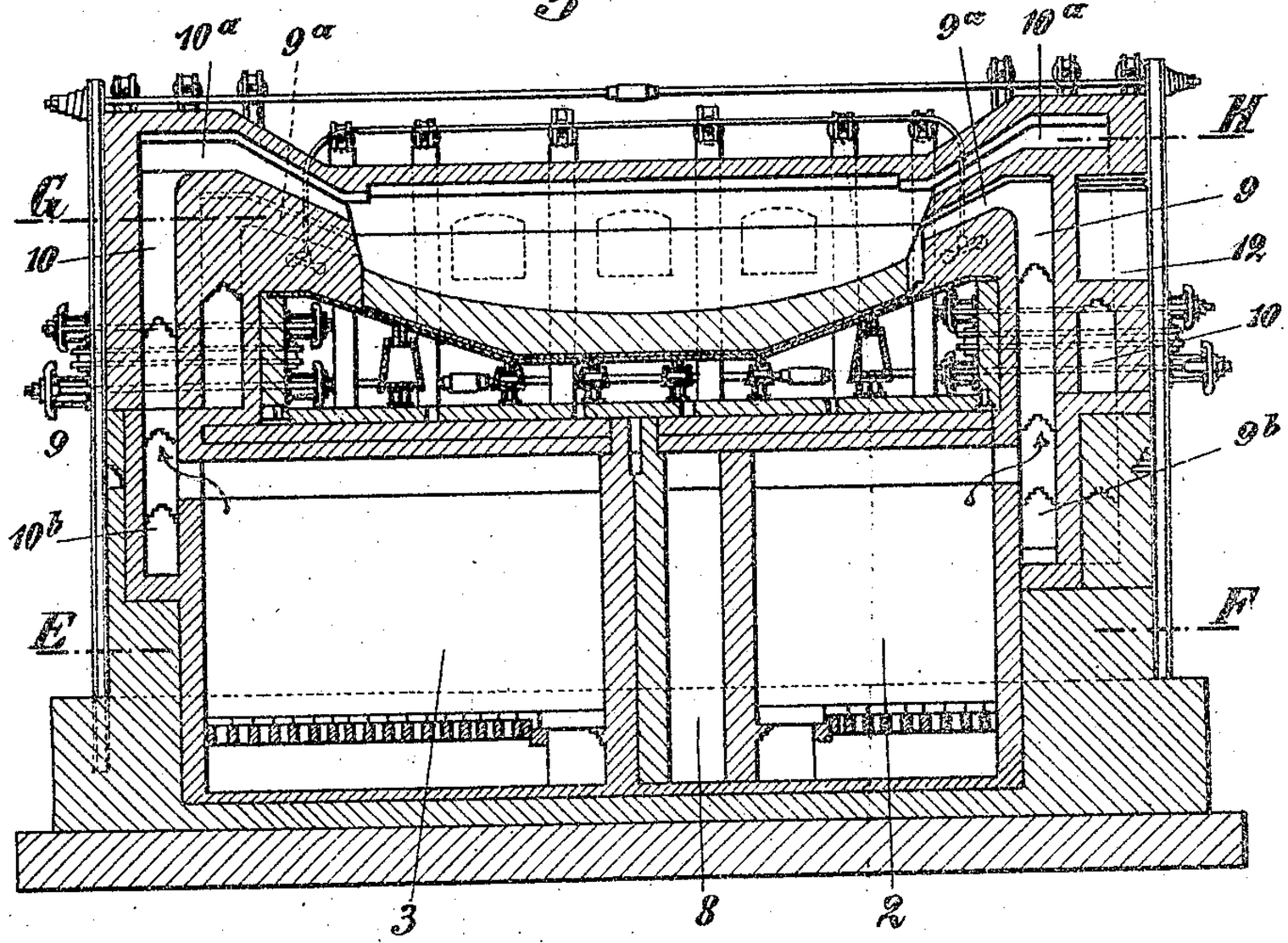
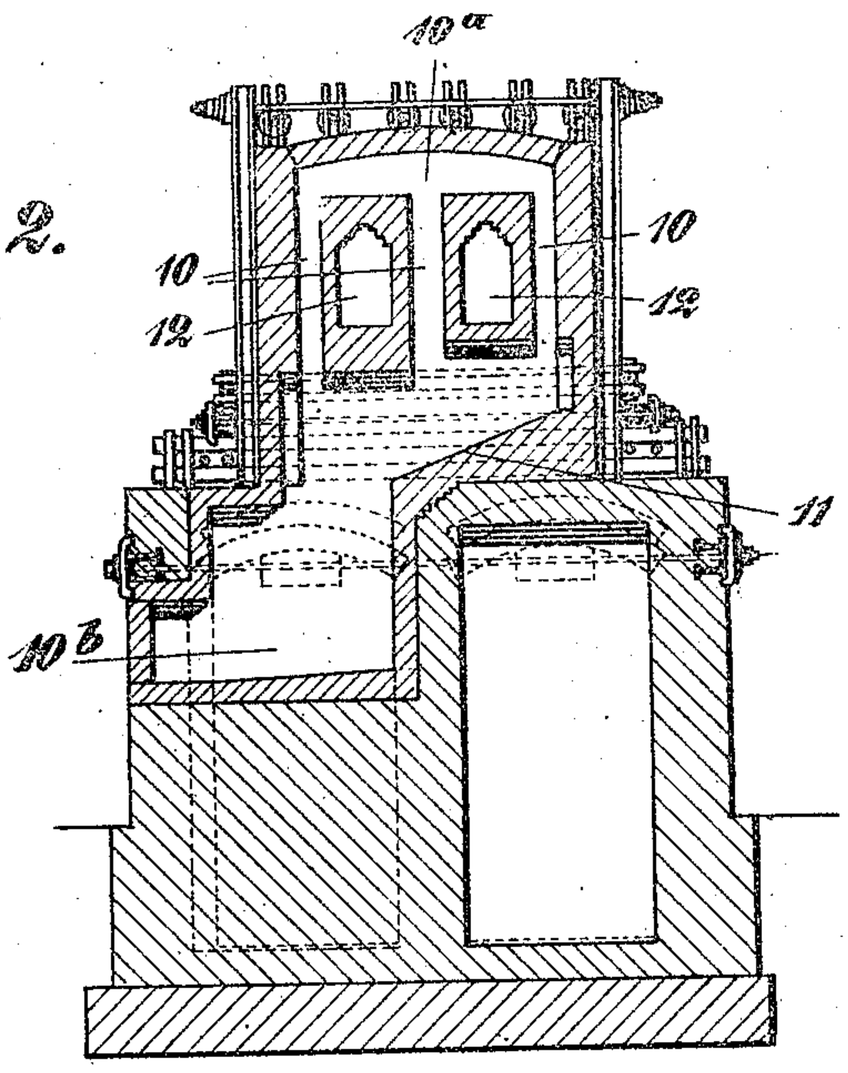



Fig. 2.

C-D.

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2 SHEETS—SHEET 2.

Fig. 3.

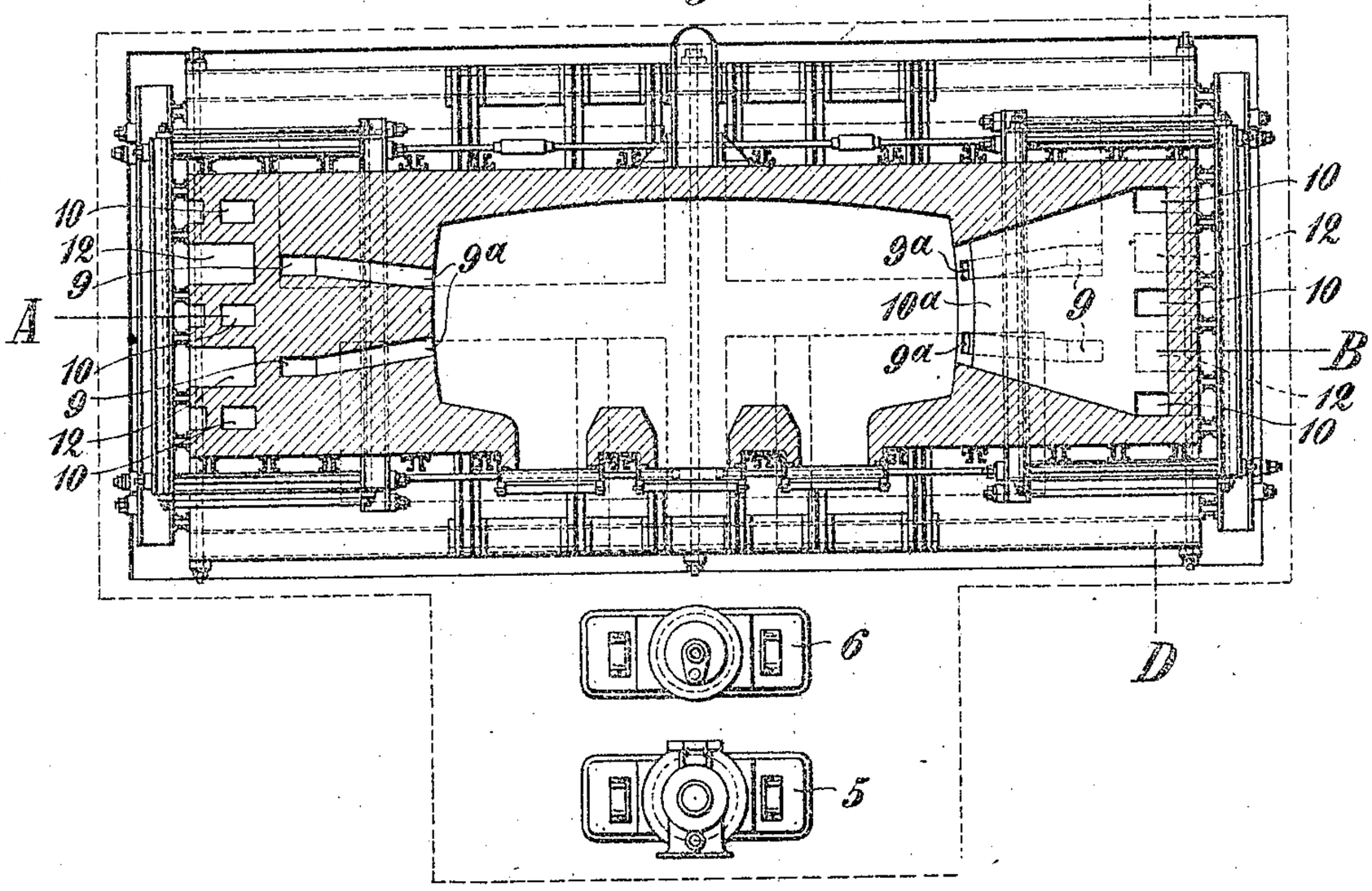
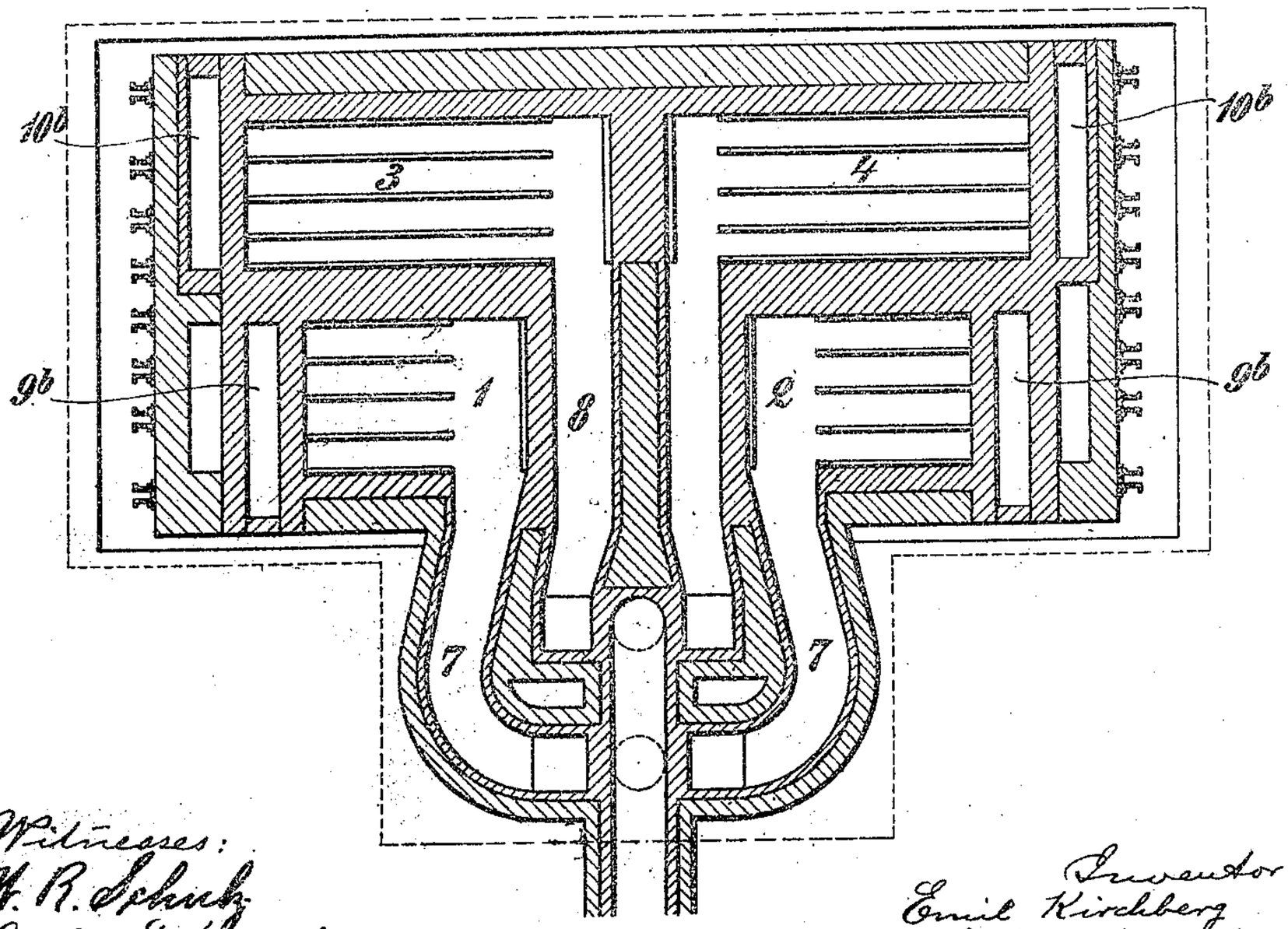



Fig. 4.

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# UNITED STATES PATENT OFFICE.

EMIL KIRCHBERG, OF DORTMUND, GERMANY.

## REGENERATIVE FURNACE.

944,444. Specification of Letters Patent. Patented Dec. 28, 1909.

Application filed October 6, 1908. Serial No. 456,454.

*To all whom it may concern:*

Be it known that I, EMIL KIRCHBERG, engineer, a citizen of the German Empire, residing at Knappenbergerstrasse No. 112, Dortmund, in the Province of Westphalia and Kingdom of Prussia, Germany, have invented new and useful Improvements in Regenerative Furnaces, of which the following is a specification.

The invention relates to a regenerating furnace below the hearth of which are placed, as usual, two gas- and two air-chambers.

The special features of this invention are more particularly the arrangement of the gas- and air-chambers, that of the dust-chambers and that of the funnels leading to the hearth, specially for the purpose of preventing the slag from encumbering the channels and of allowing the dust-chambers to be cleaned while the furnace is in working order, also with a view to maintain the furnace in perfect condition during a longer period.

In the accompanying drawing. in which similar figures refer to similar parts throughout the several views, Figure 1 shows the furnace in longitudinal section, this section being taken on the left hand through the air-generators and on the right hand through the gas-generators. Fig. 2 shows a cross-section. Fig. 3 shows two different plan views of which that shown on the left hand demonstrates more particularly the arrangement of the air- and gas-channels, placed between hearth and generators and the arrangement of the masonry, owing to which the channels are accessible from the outside, whereas the right hand-horizontal section is illustrative of the connection of the air-generators with the hearth. The ground plan in Fig. 4 shows on the other hand more particularly the position of the regenerators and of the gas- and air-supply or eduction channels respectively.

At either side of the hearth a gas- and an air-chamber 1, 3 and 2, 4 are arranged as usually. The air-chamber is mounted on both sides behind the gas-chamber, and the distributing casings for air and gas 5 and 6 are likewise placed behind one another in front of the furnace and they are connected to the gas- and air-chambers by means of the channels 7 and 8. The channels 8 are made to pass between the gas chambers, by which means these grow shorter in relation to the air-chambers, corresponding to the width of the channels; likewise at the opposite—the exterior—sides the gas chambers are shorter than the air-chambers. Owing to this and to the arrangement of the gas- and air-channels behind each other—marked 9 and 10—it has been rendered possible that these gas- and air-channels, discharging at the sides of the hearth, can be conducted upwardly in a vertical direction whereas heretofore they had to be conveyed obliquely to the regenerators adapted in the center of the furnace. The dust-chambers 9, into which the gas channels discharge, are placed behind, relative to the dust-chambers 10 which at their top-end are connected to the air-channels, in order that there may be room enough for placing both chambers coadjacently. The dust-chambers $9^b$ with the gas-channels as well as the chambers $10^b$ are, as shown in Fig. 2, provided with slopingly ascending soles 11 and the gas-chambers 9 are partly overhanging the air-chambers. This arrangement has allowed of laying the vertical gas-channels as far as possible between the air-channels or to distribute same regularly in such a way, respectively, that the gas- and air-channels, discharging into the hearth, are arranged in alternate succession. In order to get, however, in spite of such distribution, free access not only to the air-channels, occupying their position pretty close to the outside, but also to the gas-channels, recesses 12 are arranged in the masonry of the front-walls where there are the channels 9, as shown in Fig. 1 on the right side and in Fig. 3 on the left side, allowing of their being opened from the exterior after having removed the bricks set loosely. The gas distributed correspondingly and the air enter the generator-chambers, traverse same, pass then along through the channels placed rearwardly in the upper corner into the top-part of the dust-chambers and are now taken to the hearth by means of the vertical funnels 9 and 10 and the slopingly extending channels $9^a$ and $10^a$. The slags can no where deposit nor stick close, as it occurred formerly, all funnels 9 and 10 ascending vertically; they rather get without further trouble into the dust-chambers. Owing to their being arranged beyond the gas- and air-chambers they can be readily cleaned during the operation, whereas, with other furnaces, the slag, deposited on the slopings, can only be

removed under difficulties after having entirely stopped the furnace.

I claim:

In a regenerator furnace, a hearth, an air regenerator below the hearth, a gas regenerator forward of the air regenerator, an air channel communicating with the air regenerator, a gas channel communicating with the gas regenerator, a first dust chamber communicating at its upper end with the air channel, and a second dust chamber arranged forward of the first dust chamber and communicating with the gas channel.

Signed by me at Cologne, Germany, this 23d day of September, 1908.

EMIL KIRCHBERG.

Witnesses:
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