P. G. FAHERTY.

REVERSING FURNACE.

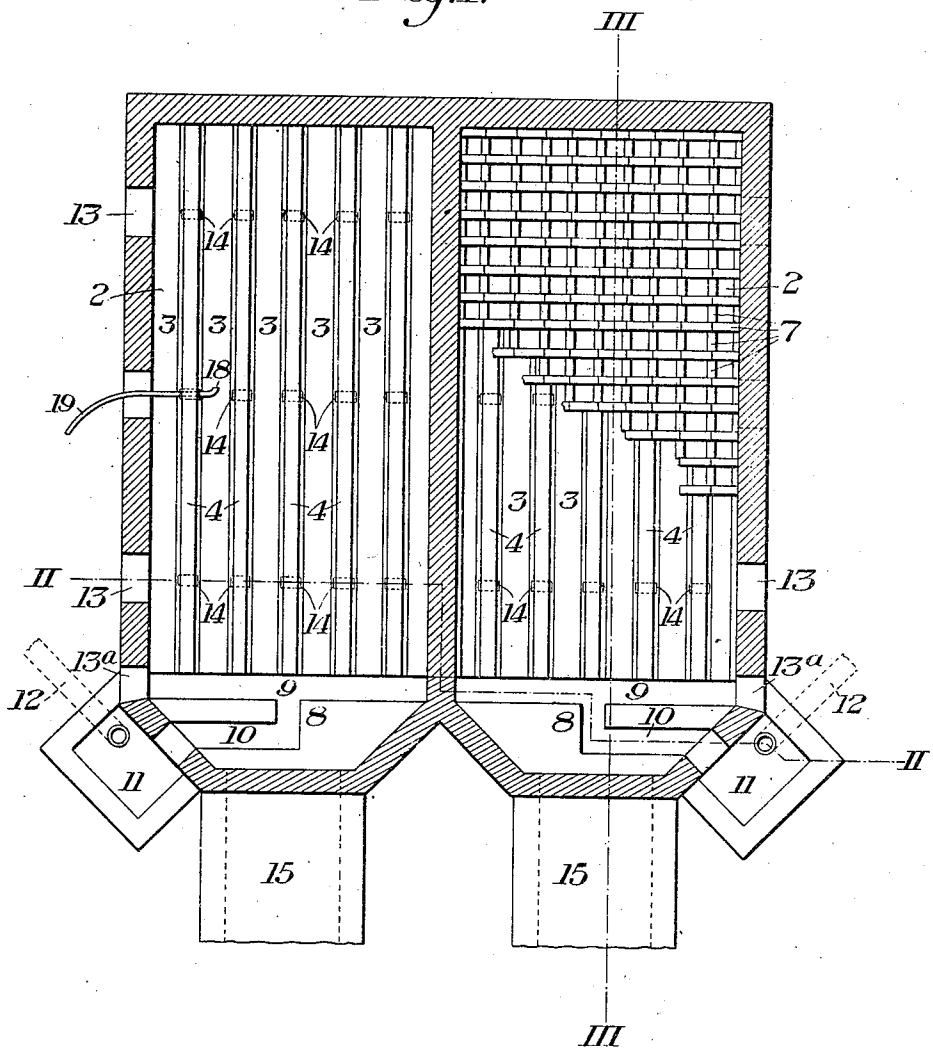
APPLICATION FILED MAR. 31, 1913.

1,069,402.

Patented Aug. 5, 1913.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES.

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2 SHEETS—SHEET 2.

Fig. 2.

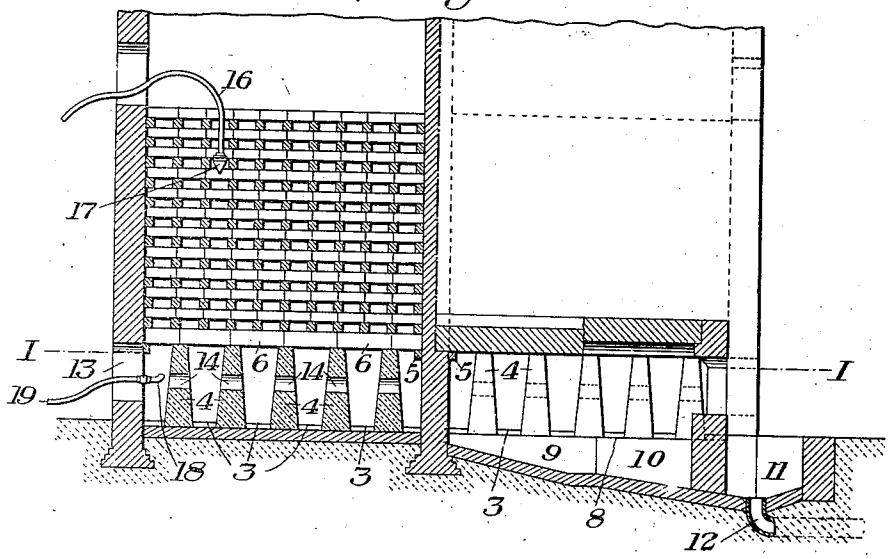
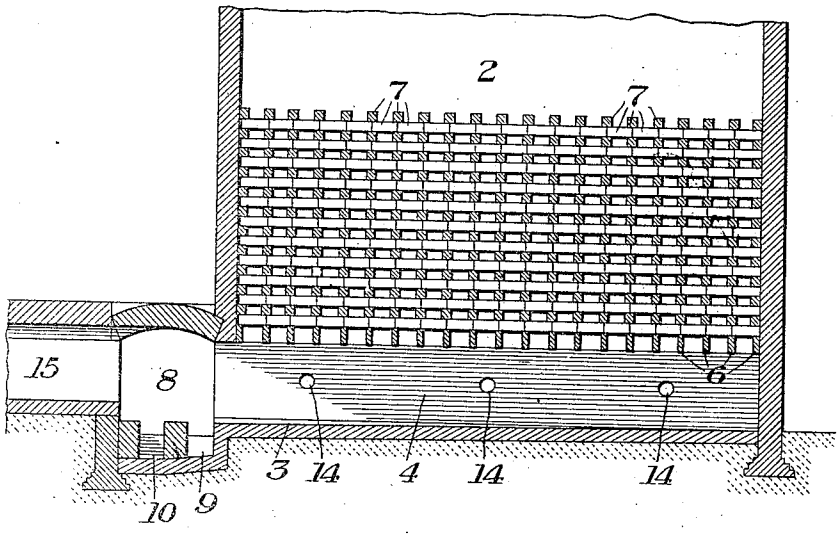


Fig. 3.



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REVERSING-FURNACE.

1,069,402. Specification of Letters Patent. Patented Aug. 5, 1913.

Application filed March 31, 1913. Serial No. 757,759.

To all whom it may concern:

Be it known that I, PATRICK G. FAHERTY, a citizen of the United States, and a resident of Munhall, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Reversing-Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional plan view of a portion of a reversing furnace, showing one form of my improved checker work chambers for open-hearth furnaces, taken on the line I—I of Fig. 2. Fig. 2 is a partial sectional view on the line II—II of Fig. 1; and Fig. 3 is also a partial sectional view on the line III—III of Fig. 1.

This invention relates to an improvement in reversing furnaces, and is particularly adapted for regenerative open-hearth furnaces.

The object of my invention is to provide a cheap and efficient structure of this character, in which the checker work can readily be cleaned and the material removed from the checker work chambers without tearing down any portion of the structure.

It is well known to those familiar with the art that the life of a furnace of this character is dependent upon the life of the checker work, and as soon as the checker work becomes clogged or filled up the furnace must be practically rebuilt, which is not only expensive, but also takes considerable time to reconstruct, and after it has been reconstructed, the furnace must be fired for a long time to season it before it can be used for melting metal.

In order to provide means for readily removing the deposits from the checker work, I provide the bottom of the checker work chambers with a plurality of parallel gutters into which the deposits on the tops of the checker work tiles will fall when removed therefrom. These gutters slope toward a suitable outlet or outlets, through which the deposits collected in the gutters are washed out by water admitted to the gutters. By the use of a structure of this character, I am enabled to overcome all of the former objections, without keeping the furnace out of commission for any length of time, and without materially cooling off the furnace during the cleaning operation.

The precise nature of my invention will be best understood by reference to the accompanying drawings, which will now be described, it being premised, however, that various changes may be made in the details of construction of the checker work chambers without departing from the spirit and scope of my invention, as defined in the appended claims.

Referring to the accompanaying drawings, the numeral 2 designates regenerative chambers of an open hearth furnace, the lower portion of each of these chambers being provided with a plurality of gutters 3, formed between longitudinally extending piers or walls 4. Supported on the tops of these walls 4 and projections 5 extending inwardly from the walls of the chambers are tiles 6, and 7 are checker work tiles of the usual shape and size supported on the tiles 6.

Longitudinally disposed in front of each of the chambers 2 is a catch basin 8, each of which is provided with a sloping gutter 9, adjacent to the front end of each of the gutters 3 in their respective chambers. These gutters 3 slope from the rear of the furnace toward the catch basins 8.

10 designates gutters in each catch basin 8, leading from the central portions of the gutters 9 to a drain 11 on the outside of the walls forming the chambers 8. These drains 11 are connected by means of pipes 12 with a sewer, or any suitable point to which the material removed from the checker work is to be deposited.

Extending through the longitudinal outer walls of the regenerative chambers are openings 13, which are closed by means of brick or tiles when the furnace is in operation, and 14 are openings through the walls 4 in alinement with the openings 13.

13ª are clean-out openings extending through the walls of the chambers into the catch basins 8. These openings 13ª, as well as the openings leading from the gutters 10 to the catch basins 11, are closed by means of brick work or tile when the furnace is in operation.

15 are flues leading from the chambers above the catch basins 8 to the reversing valves of the furnace, and through which flues the products of combustion pass when one set of regenerators is used for heating up the air to form combustion in the fur-

nace, and through which the incoming air is admitted to the adjacent checker work when the furnace is reversed.

When it is desired to clean out the checker work, a nozzle, such as indicated at 17, which is connected to a suitable source of air supply by means of a tube 16, is dropped down between the tiles of the checker work. This nozzle is arranged to direct radially disposed blasts of air in a horizontal direction over the tops of the bricks to blow off the deposits collected thereon, which deposits fall into the gutters 3 between the walls 4. After the deposits have been blown from the bricks or tiles, a nozzle such as indicated at 18, or a plurality of such nozzles, is inserted through the openings 13 through the walls of the checker work chambers, and also through the openings 14 to wash the deposits collected from the bottom of the gutters into the catch basins, by means of water passing through the tube 19, which is supplied from any suitable source. If desired, I may use a plurality of such nozzles or the cleaning operation can be performed by means of a single nozzle. When using a single nozzle, the nozzle is first inserted through an opening 13 adjacent to the catch basins to wash the material between said opening and the catch basin into the catch basins. I can then wash the material in the second gutter between the opening 14 adjacent to the catch basin by inserting it through said opening, and by repeating the operation the material in all of the gutters adjacent to the catch basins is flushed out. I will then insert the nozzle through the second opening 13, and wash out the material between said opening and the first opening 13 into the catch basins. This operation is repeated until all of the deposit within the gutters is flushed into the catch basin, and after the checker work chamber has been thoroughly cleansed, the various openings are sealed and the furnace is again ready for use.

By constructing a furnace as above described I am enabled to readily remove the deposits from the tops of the checker work, and then wash the deposits into the sewer or any suitable point. As the walls 14 are comparatively thick and as a very short space of time is required for washing out the gutters, the washing can be accomplished without materially reducing the temperature of the walls 14, and the heat within the walls will soon dry off the outer surfaces of the walls after the flushing has been completed and raise the temperature of the outer surfaces of the walls to the temperature of the interior of the walls.

The advantages of my invention result from the provision of a furnace having a plurality of sloping gutters below the checker work, which open into suitable catch basins having outlets through which the deposits are washed. Further from the provision of a furnace in which access can readily be had to the gutters with the flushing device for flushing the material into the catch basin.

I claim:

1. A regenerative furnace having checker work, a plurality of gutters extending below the checker work, there being outlets from said gutters, and means for admitting water at a plurality of points to each of said gutters for washing out deposits collected therein; substantially as described.

2. A regenerative furnace having checker work, a plurality of gutters having sloping bottoms extending below the checker work, there being outlets leading from said gutters, means for removing the deposits from the tops of the checker work, and means for flushing the deposits from said gutters to the outlets; substantially as described.

3. A regenerative furnace having a plurality of regenerative chambers, longitudinally extending walls in the bottoms of said chambers, checker work supported on said walls, there being a plurality of sloping gutters formed between said walls, there also being outlet openings leading from said gutters, and means for admitting water at a plurality of points to each of said gutters for washing out the deposits collected therein through said outlets; substantially as described.

4. A furnace having a plurality of regenerative chambers, thick heat-retaining walls in the bottoms of said chambers, checker work supported on said walls, said walls forming deposit-receiving gutters, a catch basin in connection with the ends of said gutters, there being an outlet leading from said basin, means for directing blasts of air over the bricks on the checker work to blow the deposits on the tops of the tiles into the gutters, and means for admitting water to said gutters to wash out the deposits; substantially as described.

In testimony whereof, I have hereunto set my hand.

PATRICK G. FAHERTY.

Witnesses:
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H. M. CORWIN.