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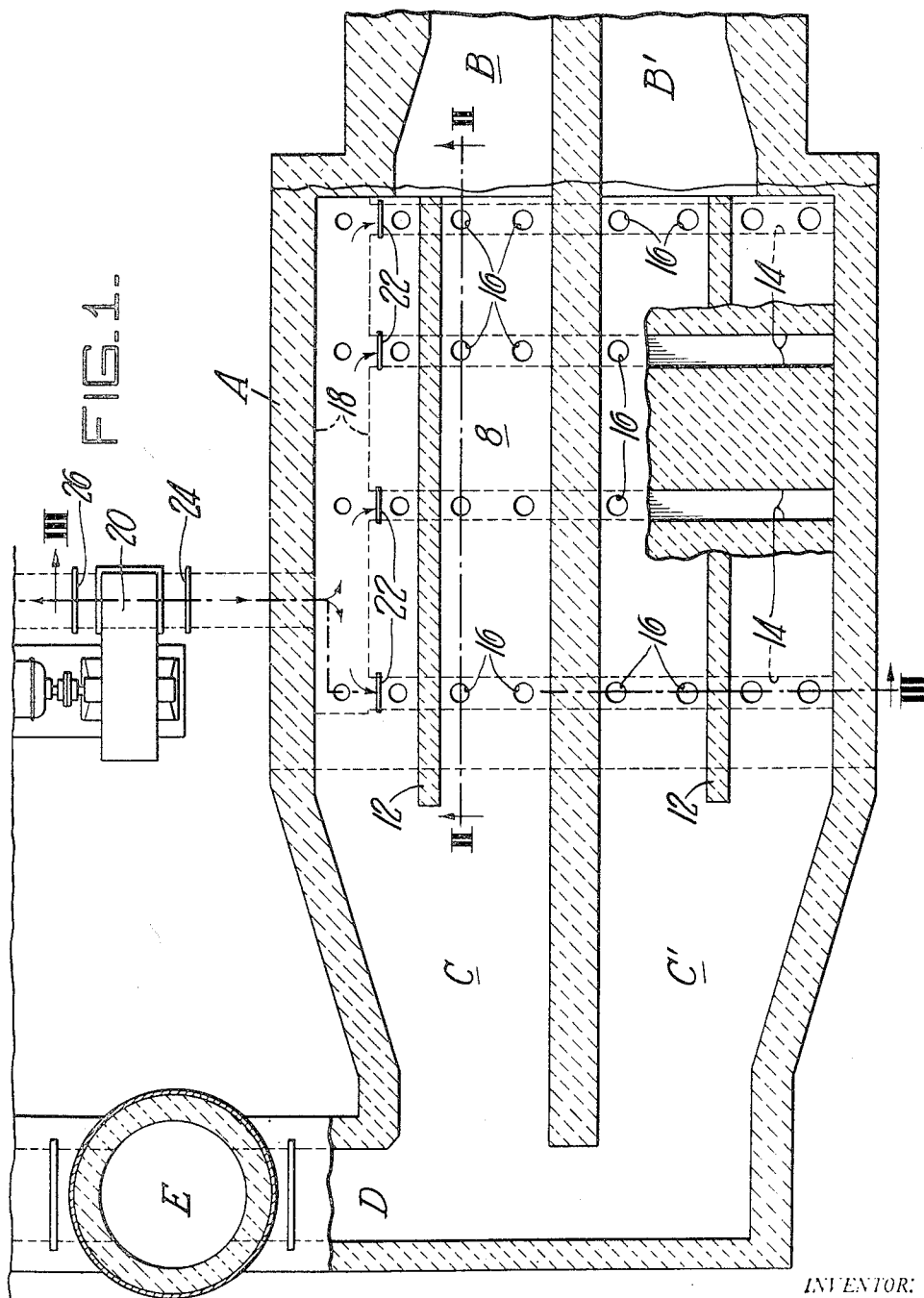
W. M. HENRY

2,543,367

METHOD OF OPERATING REGENERATORS FOR OPEN-HEARTH

Filed April 11, 1945

2 Sheets-Sheet 1



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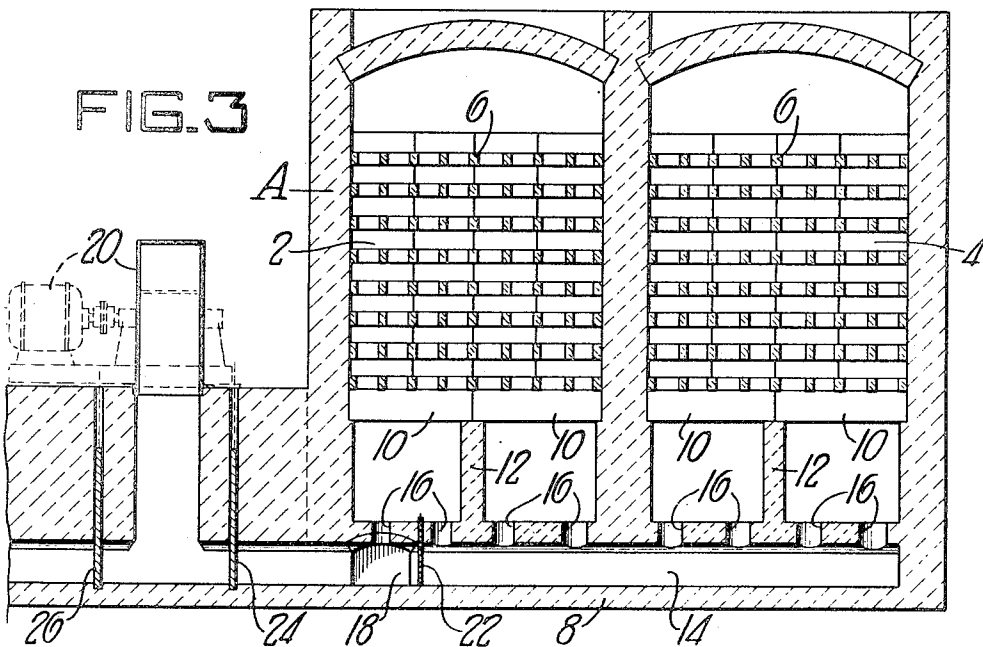
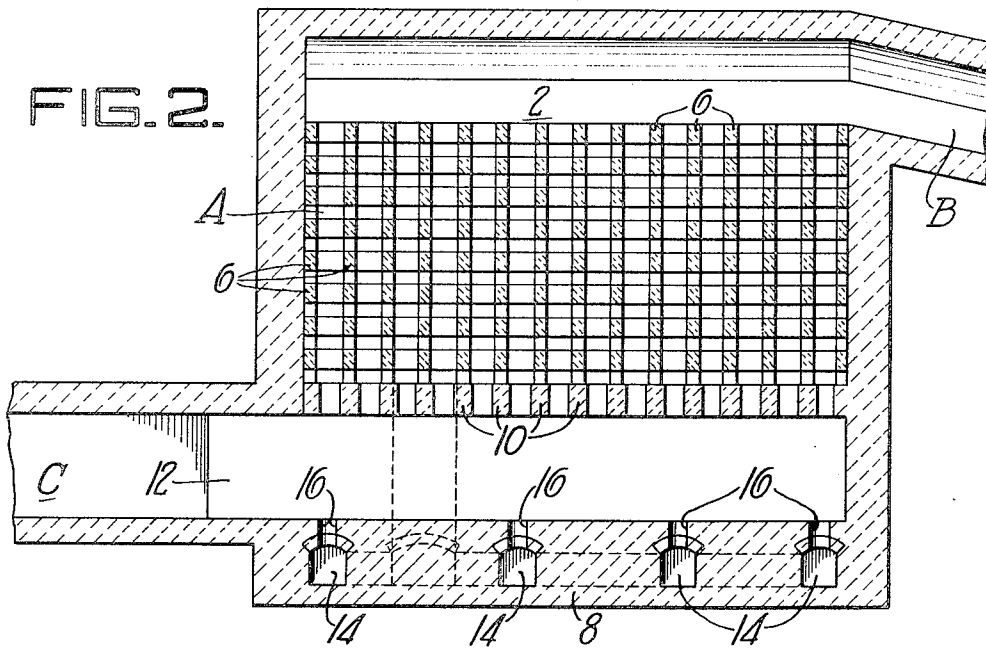
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METHOD OF OPERATING REGENERATORS FOR OPEN-HEARTH

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UNITED STATES PATENT OFFICE

2,543,367

METHOD OF OPERATING REGENERATORS FOR OPEN HEARTHES

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2 Claims. (Cl. 263—52)

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This invention relates to improvements in the distribution of air to be heated through regenerators for open-hearth furnaces and the like.

It is among the objects of the present invention to provide a method of injecting air evenly into regenerators. It is another object to prolong the life of regenerators. It is a further object to provide better combustion in open-hearth furnaces and the like.

The foregoing and further objects will be apparent from the specification and drawings, wherein:

Figure 1 is a horizontal section of an open-hearth regenerator;

Figure 2 is a vertical section on line II—II of Figure 1; and

Figure 3 is a vertical section along the lines III—III of Figure 1.

Referring more particularly to the drawings, the letter A designates a regenerator for an open-hearth furnace or the like composed of two chambers 2 and 4 having checkerbrick 6 therein supported above the floor 8 by arches 10 on rider walls 12.

Hot gases from the combustion chamber of a furnace, such as an open hearth (not shown), are admitted to the chambers 2 and 4 through uptakes B and B' and are withdrawn therefrom through ports C and C', into flue D and stack E. Uptakes B and B', also function to withdraw heated air from the chambers 2 and 4 to support combustion in the furnace chamber (not shown).

In accordance with the teachings of the present invention, air to be heated in the checker chambers 2 and 4, instead of being admitted thereto through ports C and C', is evenly distributed therethrough in the following manner. Flues 14 are provided in the floor 8 from which ports 16 open into the respective chambers 2 and 4 at spaced points throughout the width thereof. The flues 14 are connected to a main flue or manifold 18 which is connected to a compressor and pumping station 20. Dampers 22 are provided in the flues 14 adjacent the manifold 18.

In order to provide an even distribution of the air throughout the chambers 2 and 4, the ports 16 are progressively enlarged toward the rearward side of the chambers, being smallest at the side nearest the manifold 18.

Dampers 24 and 25 are disposed on either side of the pumping station 20 to close it off from the manifold and flue arrangement when the regenerator is being heated by passing exhaust gases therethrough. When air is to be passed

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through the checker chambers 2 and 4, the damper 24 is opened so that compressed air from the station 20 will be passed through the manifold 18, flues 14 and ports 16, and thereby be evenly distributed throughout the chambers. The heated air flows therefrom to the combustion chamber (not shown) through uptakes B and B'. It is understood that while air is being heated by being passed through chambers 2 and 4, similar chambers (not shown) are being heated by passing exhaust gases therethrough. During this time, the damper 26 is closed to shut off the pumping station from the exhaust gases.

In this manner of distributing air through regenerators not only is a more uniform distribution achieved but also the air can be directed into or through particular portions of the checkerworks. Due to the dust precipitating from the exhaust gases the openings in the checkerwork gradually fill up. The openings closest to the uptakes B and B' are blocked off first as they become full and as use of the regenerators is continued the checkers are progressively closed off by the dust in a direction towards the ports C and C'. When regenerators are first started in service, the hottest portion thereof is that closest to the uptakes B and B' and the coldest portion is adjacent the ports C and C'. Accordingly by my improved method of operation, the flues 14 adjacent the ports C and C' are closed by means of dampers 22 when the regenerators are first put in service, the air being admitted to the hottest portion of the checkerwork through the flues 14 adjacent the uptakes B and B'. As service is continued and the openings in the checkerwork adjacent the uptakes B and B' become closed, the flues 14 beneath the clogged-up portions are progressively shut off by closing their respective dampers 22 and the remaining ducts progressively opened as the hot region of the checkerwork advances towards ports C and C'. Accordingly, maximum efficiency and uniformity in operation is achieved.

While one specific embodiment of the invention has been shown and described, it will be understood that this embodiment is merely for the purpose of illustration and description and that various other forms may be devised within the scope of the invention, as defined in the appended claims.

What is claimed is:

1. The method of operating regenerator chambers which are alternately heated by exhaust gases passed therethrough and then utilized to pre-heat gases prior to combustion which com-

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prises admitting air thereto from spaced ports opening from a plurality of flues extending across the width of such chambers and in a direction at right angles to the passage of waste gases therethrough, closing off certain of the flues adjacent the end of the chamber nearest the furnace when the chamber is first put into use and progressively opening said flues and progressively closing the flues at the opposite end of the chamber as the chamber is continued in service and the openings in the checkerbrick at said last mentioned end become clogged by dust precipitated from the heating gases.

2. The method of operating a regenerator chamber which is alternately heated by dust-containing exhaust gases passed therethrough and then utilized to pre-heat air prior to combustion which comprises, admitting the air thereto from spaced ports opening from a plurality of flues extending across the width of such chambers and in a direction at right angles to the passage of exhaust gases therethrough, closing off certain of said flues to direct the air into the most highly heated section of the chamber when

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the chamber is first put into use and progressively opening said closed flues and closing certain of the remaining open flues to direct the incoming air into the most highly heated section of said chamber as said section shifts due to portions of the chamber being clogged by dust precipitated from the exhaust gases whereby the heat exchange capacity of said chamber is maintained substantially uniform.

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Deceased.

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