No. 730,620. PATENTED JUNE 9, 1903.

J. A. DURFEE.

REGENERATIVE FURNACE.

APPLICATION FILED MAR. 29, 1902.

NO MODEL.

Fig. 1

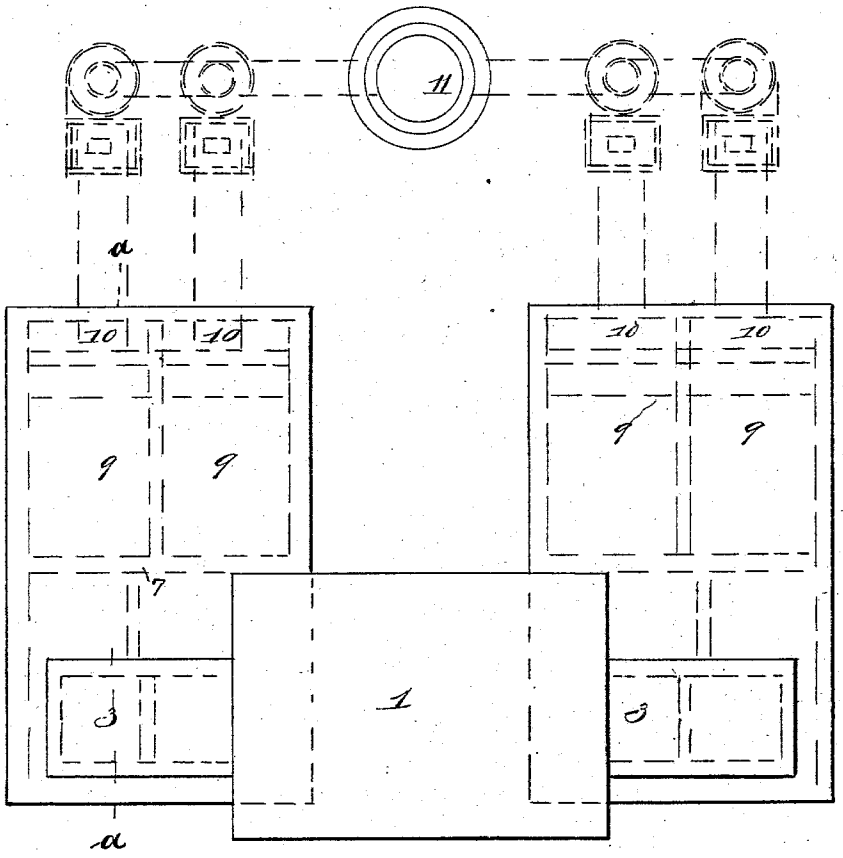
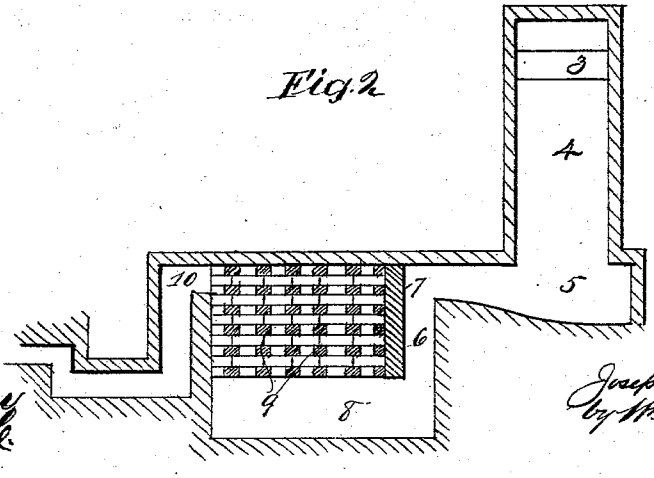


Fig. 2



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No. 730,620. Patented June 9, 1903.

UNITED STATES PATENT OFFICE.

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REGENERATIVE FURNACE.

SPECIFICATION forming part of Letters Patent No. 730,620, dated June 9, 1903.

Application filed March 29, 1902. Serial No. 100,527. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH A. DURFEE, a citizen of the United States, and a resident of Chardon, county of Geauga, State of Ohio, have invented certain new and useful Improvements in Regenerative Furnaces, of which I hereby declare the following to be a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

The objects of my invention may be described to be as follows: Primarily the objects are to provide means for prolonging the life of the checker-work in regenerative furnaces by preventing the deposit thereon, as far as possible, of refuse matter suspended in the gases passing through them or of the products of combustion, which might prove deleterious to them. Heretofore the gases and products of combustion have been passed from above downwardly through the checker-work or have passed directly into the checker-work without any provision for the previous deposit of injurious matter therein, which is thus carried directly through the brickwork. To avoid this possibility, and also to afford room for the gases to expand and thereby to be more evenly distributed, and also to provide an opportunity for the discharge of refuse matter from the gas before entering the brickwork, I employ the downwardly-extending passages from the furnace and slag-pockets at the lower extremity thereof to catch the refuse, and also place one slag-pocket below the level of the checker-brick and form an upwardly-extending passage therefrom to the checker-work, as hereinafter described, shown in the accompanying drawings, and specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of a regenerative furnace of the type to which this invention applies. Fig. 2 is a longitudinal vertical section through the checker-work on one side of the furnace on line *a a*, Fig. 1, the two sides being shown in the drawings as duplicates and placed at a lower level than the furnace.

This furnace is shown as placed transversely across the lines of the passages and checker-work leading to the smoke-stacks.

In the drawings, 1 is the furnace; 2, the bed therefor; 3, a passage leading from either end for products of combustion or heated air as the furnace may be reversed in use.

4 represents downwardly-leading passages terminating immediately below in the slag-pocket 5. From this pocket at the opposite end leads downwardly the continuation of the passage 6, which is separated from the checker-brick by means of the partition 7, which thus forces the gases to enter the checker-brick from below.

8 is a second slag-pocket placed underneath the checker-brick 9. This slag-pocket is designed to afford the gases space for expansion, so that they will be evenly distributed through the checker-work and heat all portions thereof alike. The expansion and further dissemination of the gases also gives opportunity for all extraneous matters to be deposited which would be likely to have an injurious effect or might accumulate thereon and retard the circulation of the gas therethrough and which the first slag-pocket through which the gases passed might not have retained. To insure the complete circulation of the gases through the checker-brick from bottom to top, I provide an outlet therefrom at the top of the checker-brick at one side, as at 10. From this point the gases pass to the chimneys 11 in any suitable manner. The passage 10 is shown as again turning downwardly before arriving at the chimney; but this feature is not essential to the operation of the device.

This invention can be used successfully in any system of regenerative furnace when the regenerators are located underneath the level of the furnace, either when they are directly underneath or at a lower level, but not directly underneath the furnace, the essential features being the upward draft through the checker-work and the slag-pockets over which the gases pass before entering the checker-work.

These furnaces can be used for producer-gas, natural gas, or fuel and are shown with double regenerative chambers.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a furnace, of regenerators located upon a lower level, a descending passage leading from each side of

said furnace to a slag-pocket, a descending passage from said slag-pocket to a slag-pocket located underneath the regenerator, and a passage leading from the top of the regenerator, substantially as described.

2. The combination with a regenerative furnace, and checker-brick regenerators therefor located below the level of the furnace, of means for clarifying the gases from the furnace from the products of combustion and deleterious matter in their passage to the checker-brick, consisting of a passage extending downwardly underneath said checker-brick from each end of the furnace, a slag-pocket underneath each of said passages, a slag-pocket underneath each regenerator placed at a lower level than the first-named pocket, and a passage leading from each first-named pocket to the lower pocket substantially as described.

3. In combination with a furnace, regenerators located upon a lower level, passages descending from each end of the furnace, slag-pockets underneath the lower extremities of said passages, a vertical passage leading downwardly from each slag-pocket, a slag-pocket at the lower extremity of each of said vertical passages extending underneath each regenerator, and a passage leading downwardly from the upper extremity of each regenerator, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH A. DURFEE.

Witnesses:
GEO. O. WILLET,
R. M. BROWNE.