

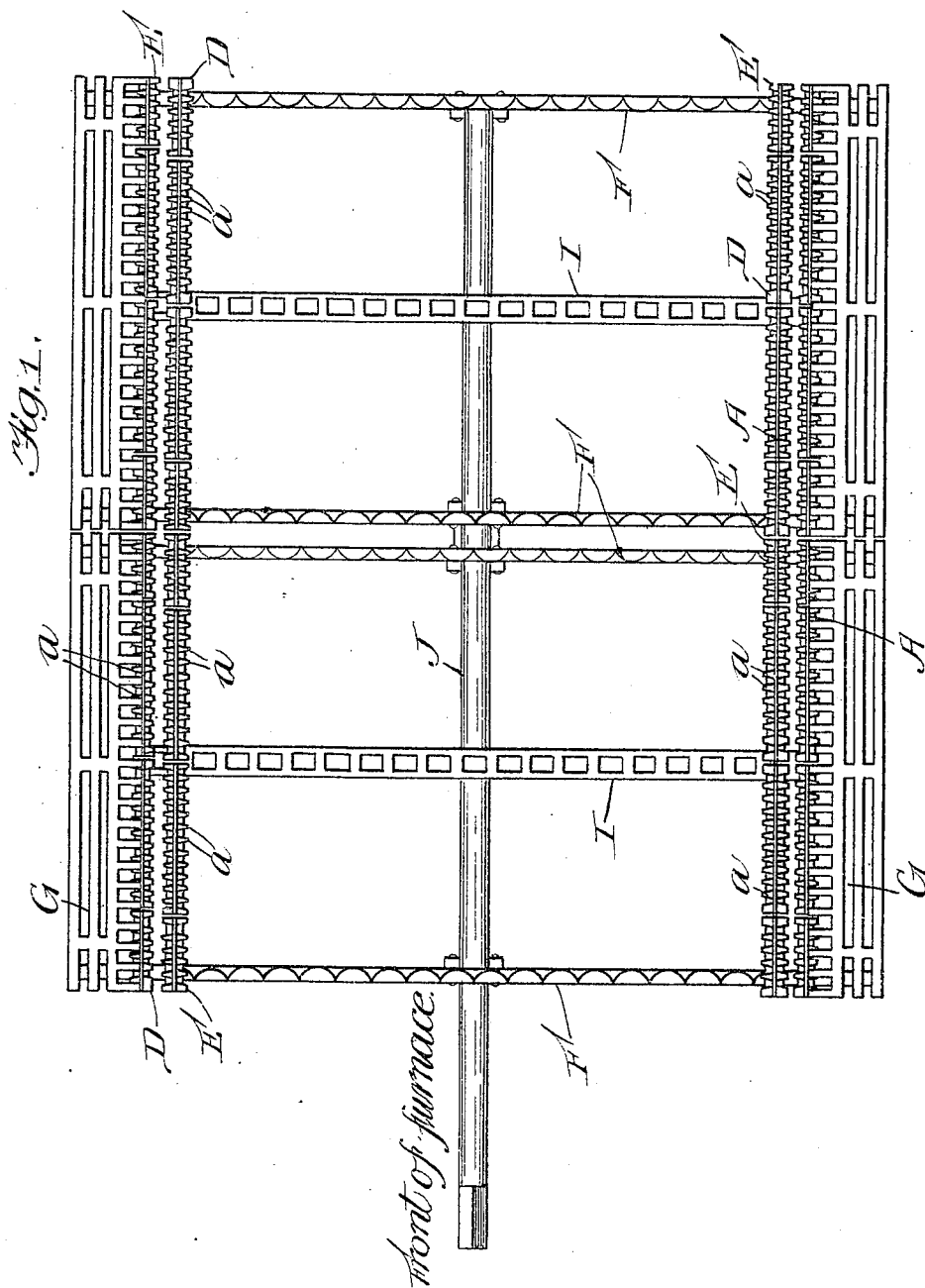
No. 838,431.

PATENTED DEC. 11, 1906.

T. E. MARTIN.
FURNACE GRATE.

APPLICATION FILED MAY 14, 1906.

2 SHEETS—SHEET 1.



Witnesses:

Robert A. Weir
J. H. Nelson

Inventor:

Thomas E. Martin.

By Buckley & Durand
Attys.

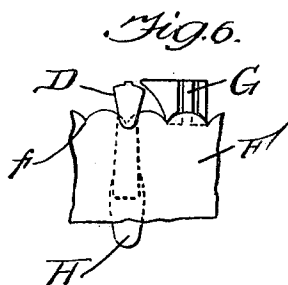
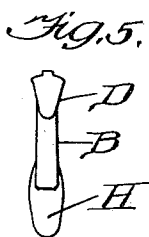
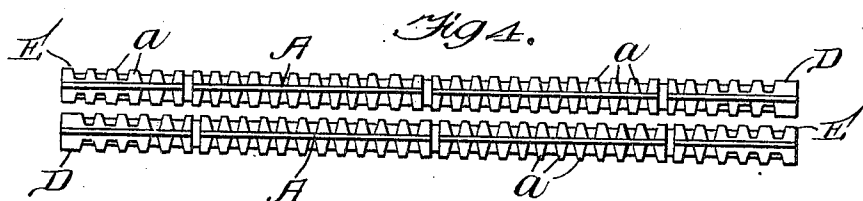
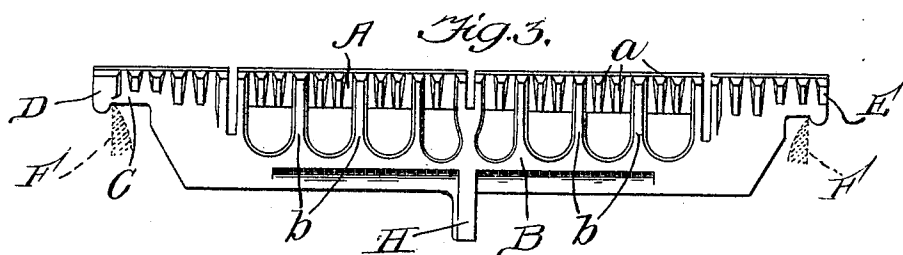
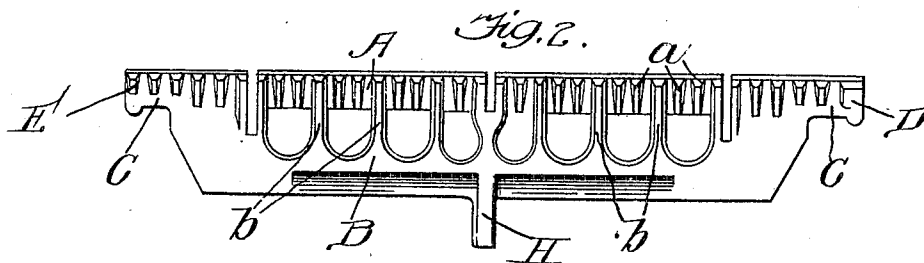
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UNITED STATES PATENT OFFICE.

THOMAS E. MARTIN, OF BUFFALO, NEW YORK.

FURNACE-GRATE.

No. 838,431.

Specification of Letters Patent.

Patented Dec. 11, 1906.

Original application filed May 6, 1905, Serial No. 259,157. Divided and this application filed May 14, 1906. Serial No. 316,612.

To all whom it may concern:

Be it known that I, THOMAS E. MARTIN, a citizen of the United States of America, and a resident of Buffalo, Erie county, New York, have invented a certain new and useful Improvement in Furnace-Grates, of which the following is a specification.

My invention relates to furnace-grates in which the grate-bars are adapted for suitable rearrangement for the purpose of either staggering or alining the teeth thereof.

This application is a division of my prior application, Serial No. 259,157, filed by me in the United States Patent Office on the 6th day of May, 1905.

In the said prior copending application I have claimed my invention broadly, while in the present application I have elected to prosecute specific claims for the furnace in which the grate-bars can be reversed or turned end for end for the purpose of either staggering or alining the teeth thereof.

The object of my invention is to provide an improved construction and arrangement whereby the size of the openings in the grate can be changed or varied with respect to different kinds of fuel.

To the foregoing and other useful ends my invention consists in the matters hereinafter set forth and claimed.

In the accompanying drawings, Figure 1 is a plan of a furnace-grate embodying the principles of my invention, it being understood that only a portion of the total number of grate-bars is shown and that the bars at the right-hand side of the grate are so arranged that the teeth of one bar are opposite the teeth of adjacent bars, while the bars at the left-hand side of the grate are so arranged that the teeth of one bar are opposite the spaces between the teeth of adjacent bars. Fig. 2 shows one side of the grate-bar. Fig. 3 shows the other side of said grate-bar. Fig. 4 is a plan of two of my improved grate-bars mounted side by side and so arranged that the teeth of one bar are opposite the spaces between the teeth of the other bar. Fig. 5 is an end view of one of my improved grate-bars. Fig. 6 is a detail side elevation of a portion of one of the bearing-bars, showing a rocking grate-bar and a stationary outer bar mounted thereon.

As thus illustrated, each grate-bar has an upper web A, provided with laterally-projecting teeth *a*. A relatively heavy portion B is connected with the said web by means

of uprights *b*. The opposite ends of the bar are preferably provided with knife-edge bearing portions C. The said teeth of the bar are so arranged that should the bar be reversed or turned end for end the teeth at one side of the same will then occupy the positions previously occupied by the spaces between the teeth on the other side of the bar. Also the teeth on one side of the bar are preferably opposite the teeth on the other side of the bar, and with this arrangement a reversal or turning of the bar end for end will bring all of the teeth thereof into the positions previously occupied by the spaces between the teeth. Furthermore, in order to facilitate the arranging of the bars one end of each bar is provided with a relatively thick tooth D, and the other end of each bar is provided with a relatively thin tooth E. It will be understood, of course, that the intermediate teeth *a* are evenly spaced between the said relatively thick and thin teeth. Thus by placing all of the bars with their thick tooth ends toward the front of the grate it is obvious that the teeth of one bar will be brought opposite the teeth of adjacent bars. (See the grate-bars at the right-hand side of grate in Fig. 1.) Suppose then that the character of the fuel should require smaller openings in the grate. In such event the alternate bars can be reversed or turned end for end, and by so doing the teeth of each bar will be brought opposite the spaces between the teeth of adjacent bars. (See Fig. 4 and the bars at the left of the grate in Fig. 1.) After this should the alternate bars again be reversed or turned end for end the teeth thereof will then be brought into alinement. In this way the bars can be rearranged for the purpose of either staggering or alining the teeth, and for the purpose of thereby changing or varying the size of the grate-openings with respect to different kinds of fuel.

The bearing-bars F are provided with bearings *f*, adapted to receive the knife-edge bearing portions C of the grate-bars. With this arrangement the grate-bars are suitably spaced apart and so arranged that each bar is adapted to rock its teeth opposite either the teeth or the spaces between the same of adjacent bars.

The outside or stationary bars G are adapted to rest upon the said bearing-bars and are also adapted to slightly overhang the outermost rocking grate-bars, as shown more clearly in Fig. 6.

With respect to the character of the grate-bars it will be seen that the web A of each grate-bar has an upper edge adapted to form the crest of the bar, the teeth of the bar stopping short of the said upper edge of the web. Also the said teeth are preferably rounded or sloped on their upper surfaces, so that the grate-bars may rock without causing the teeth to raise and lower the fuel supported thereon. In addition each grate-bar may have its upper portion divided into sections, as shown more clearly in Figs. 2 and 3, in order to preclude or greatly reduce the tendency toward warping when the bar is subjected to high temperature. It will be understood, however, that for the broader purposes of my invention I do not limit myself to the exact character or formation of bars shown or described, nor do I limit myself to rocking grate-bars.

Each grate-bar can be provided with a centrally-arranged stem H, adapted to engage a slotted opening in one of the shaker-bars I. It will be seen that these shaker-bars extend across the furnace and are adapted to be operated by the shaft or shaker-rod J. With this arrangement the bars can be rocked in order to shake the grate, and at the same time each bar is of such character that it can be reversed or turned end for end in its bearings.

What I claim as my invention is—

1. A grate comprising in combination bearing-bars, and a plurality of grate-bars supported in the bearings of said bearing-bars, said grate-bars adapted to be reversed end for end in said bearings and provided with teeth extending laterally from the sides thereof, said teeth being so arranged that when each bar is reversed those on one side of the bar will occupy the positions which were occupied by the spaces on the opposite sides before reversal.

2. In a furnace-grate, the combination of bearing-bars, grate-bars mounted in the bearings of said bearing-bars, each grate-bar having an upper web provided with laterally-projecting teeth, each grate-bar adapted to be reversed or turned end for end in said bearings, and the teeth of each bar being so disposed thereon that the reversal of a bar will cause its teeth to then occupy the positions previously occupied by the spaces between the same.

3. In a furnace-grate, the combination of bearing-bars, reversible rocking grate-bars mounted in the bearings of said bearing-bars, each grate-bar provided with a centrally-located stem, and shaker-bars engaging said stems, each grate-bar provided with later-

ally-projecting teeth so disposed thereon that a reversal of any bar will cause the teeth thereof to then occupy the positions previously occupied by the spaces between the same.

4. In a furnace-grate, the combination of bearing-bars, and reversible grate-bars mounted upon said bearing-bars, each grate-bar provided with thick teeth at one end and thin teeth at the other end, together with evenly-spaced laterally-projecting teeth between said relatively thick and thin teeth, each grate-bar adapted to be reversed or turned end for end to bring the teeth thereon into the positions previously occupied by the spaces between the same.

5. In a grate, the combination of bearing members, and reversible grate-bars mounted on said members, each grate-bar provided with an upper web having laterally-projecting teeth thereon, said teeth and the spaces between the same being equal or substantially the same in width, and said teeth being so disposed that when a grate-bar is reversed or turned end for end the teeth thereof will then occupy the positions previously occupied by the spaces between the same.

6. In a furnace-grate, the combination of reversible rocking grate-bars suitably spaced apart, each bar provided with laterally-projecting teeth so arranged thereon that when a bar is reversed or turned end for end the teeth on one side thereof will then occupy the positions previously occupied by the spaces between the teeth on the other side of the bar.

7. In a furnace-grate, the combination of a plurality of rocking reversible grate-bars suitably spaced apart and means for rocking the bars, each bar being provided with laterally-projecting teeth so arranged that by reversing the bar its teeth will be brought opposite either the teeth or the spaces between the teeth on adjacent bars.

8. In a furnace-grate, the combination of a plurality of reversible rocking grate-bars suitably spaced apart, each bar being provided with a depending leg midway its length and also with laterally-projecting teeth so arranged that by reversing the bar its teeth will be brought opposite either the teeth or the spaces between the teeth on adjacent bars, and means engaging the depending legs for rocking the bars.

Signed by me at Buffalo, New York, this 10th day of May, 1906.

THOMAS E. MARTIN.

Witnesses:

GEO. R. RIX,
AUG. C. GLASSER.