(No Model.)

W. FITZGERALD.

GRATE.

No. 343,447. Patented June 8, 1886.

Fig. 1.

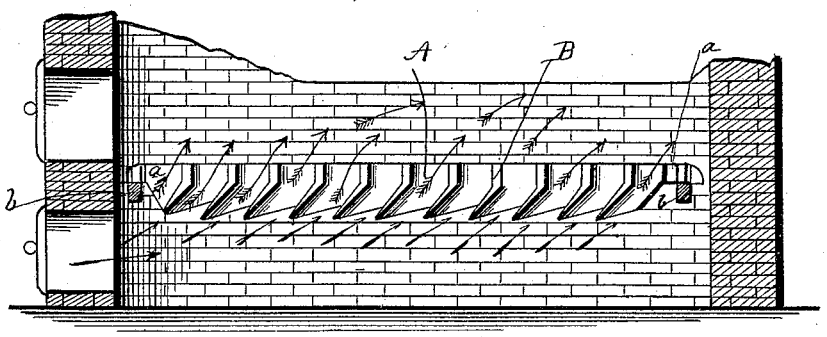


Fig. 2.

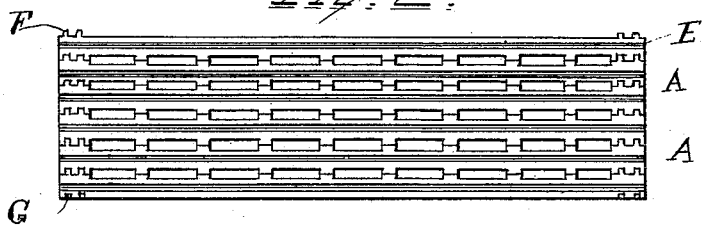
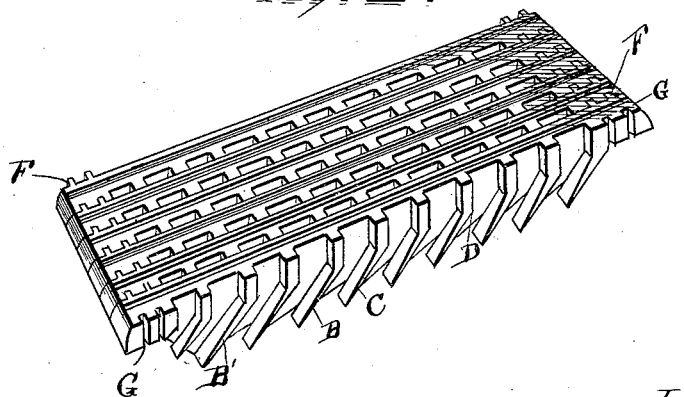


Fig. 3.



Witnesses.
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E. A. Keyes.

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UNITED STATES PATENT OFFICE.

WILLIAM FITZGERALD, OF BOSTON, MASSACHUSETTS.

GRATE.

SPECIFICATION forming part of Letters Patent No. 343,447, dated June 8, 1886.

Application filed December 21, 1885. Serial No. 186,350. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM FITZGERALD, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Grates, of which the following is a specification.

My invention relates to grates for furnaces, stoves, ranges, &c., and has for its object to provide a grate of such construction as that the draft of air to the bed of burning fuel shall be ample, and be evenly distributed thereover and at the same time be directly upward therethrough.

To this end my invention consists in a grate having the front and rear walls of its air-chambers inclined rearwardly and upwardly for a portion of the distance, and extending vertically to the top of the grate for the remaining distance, whereby the inrushing air will readily enter the lower part of said chambers and be deflected and gradually turned vertically upward through the bed of burning fuel.

My invention also consists in the construction and arrangement of parts, all hereinafter described, and particularly pointed out in the claims.

In the drawings accompanying and forming a part of this specification, Figure 1 represents a sectional side elevation of my grate in position in a furnace, the latter being also represented in section. Fig. 2 represents a top view of my grate. Fig. 3 represents a modification of the same.

Like letters represent like parts in all of the figures.

In the drawings, A represents a grate-bar, provided with ribs, B, on both sides thereof, as shown in Fig. 2. Said ribs form the front and rear walls of the air or draft chambers of the grate, and extend obliquely upward and rearward from the bottom of said bar for a portion of the distance, as represented at C, and from this point they extend directly upward to the top of the bar, as represented at D. Each bar is stepped or notched on its under side (in side view) somewhat after the manner of the teeth of an ordinary saw, the number of such notches corresponding with the number of ribs, as clearly shown in Fig. 1. The bottom face of the side walls or partitions of said chambers are thus made to incline upwardly and rearwardly from a point beginning at the lower end of each front wall to the front face of the rear wall of each air-chamber.

The ribs B on each bar are so formed or constructed as that they will register or coincide with those on each and every other bar, so that when a number of bars are brought together air-chambers of the character hereinbefore mentioned will be formed, as will be readily understood.

The bottom face of the side walls or partitions of the chambers being inclined upward and rearwardly, as described, leaves the lower point of the ribs or walls B projecting downward, as shown, so that the inrushing air will readily be caught by the front face of the rear wall and be deflected and gradually be turned vertically upward through the bed of burning fuel.

The sides of the ribs B on one side of the bar are parallel from top to bottom with the sides of the ribs on the opposite side of the bar, so that when two or more bars are brought properly together or placed side to side, the ribs of the bars registering, as described, each bar forms a support from top to bottom to those adjacent, and the bars composing the grate are thus firmly supported in proper position, and all liability of an individual bar or any number of bars twisting or rocking laterally on their supports is avoided.

It is preferred to provide a series of supplemental chambers, *a*, at the front and rear of the grate adjacent to the bar or beam *b*, on which the ends of the grate-bars A rest, as shown only in Fig. 1. These air-chambers may be of any convenient form, their purpose being to keep the beam *b* cool.

Each bar is provided on its top with the usual groove or channel, E, to hold or retain some of the ashes of the burning fuel, and thus prevent the grate from burning out.

The arrows in these drawings show the course of the air up through the air-chambers and bed of burning fuel.

I prefer to couple or connect the bars together at their ends by means of what is commonly known as a "male and female coupling"—that is, the end of each bar is provided on one side with projections or lugs F, and on

its opposite side with slots G, the lugs or projections of one bar fitting into the slots of the adjacent bar, as clearly shown in Figs. 2 and 3.

It is obvious that my grate-bar may be varied in form without departing from the spirit of the invention. For instance, the ribs may be formed on one side of the bars only, as represented in Fig. 3, and the bars may be so formed as to adapt them to a round or other form of grates, and that they may be applied to stoves, ranges, furnaces, &c.

Practical experience has demonstrated that a grate having the air-chambers therein constructed as described distributes the draft equally and evenly over the bed of burning fuel and sends it directly upward therethrough, leaving no dead coals or fuel on the front part or other portion of the grate. Practical experience has also shown that a grate constructed in accordance with my invention is less liable to burn out than any with which I am now acquainted.

Having thus described my invention, I claim—

1. A grate-bar provided with ribs on its side designed to form the front and rear walls of the air-chambers, which ribs are inclined rearwardly and upwardly for a portion of their length, and directly upward to the top of the bar for the remaining distance of their length, as set forth.

2. A grate-bar having the side walls of the air-chambers formed therein substantially parallel with each other, and the front and rear walls inclining first rearwardly and upwardly for a portion of their length and then directly upward to the top of the grate for the remaining distance of their length, as set forth.

3. A grate having the side walls of the main air-chambers formed therein substantially parallel with each other, and the front and rear walls inclining first rearwardly and upwardly for a portion of their length and then directly upward to the top of the grate, and supplemental air-chambers *a* at the front and rear of the grate adjacent to the beam or bearing upon which it rests, as set forth.

4. A grate-bar provided with ribs on its side designed to form the front and rear walls of the air-chambers, which ribs are inclined rearwardly and upwardly for a portion of their length and directly upward to the top of the bar for the remaining distance, and having the bottom face of the bar between said ribs or wall inclined upwardly and rearwardly from a point beginning at the lower end of each front wall to the front face of the rear wall, as set forth.

5. A grate having the side walls of the air-chambers formed therein substantially parallel with each other, and the front and rear walls inclining rearwardly and upwardly for a portion of their distance through the grate and directly upward to the top of the grate for the remaining distance, and having the bottom face of the side walls or partitions of said air-chambers inclined upwardly and rearwardly from a point beginning at the lower end of each front wall to the front face of the rear wall, as set forth.

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

WILLIAM FITZGERALD.

Witnesses:
JOHN C. BAIRD,
WALTER S. REDDING.