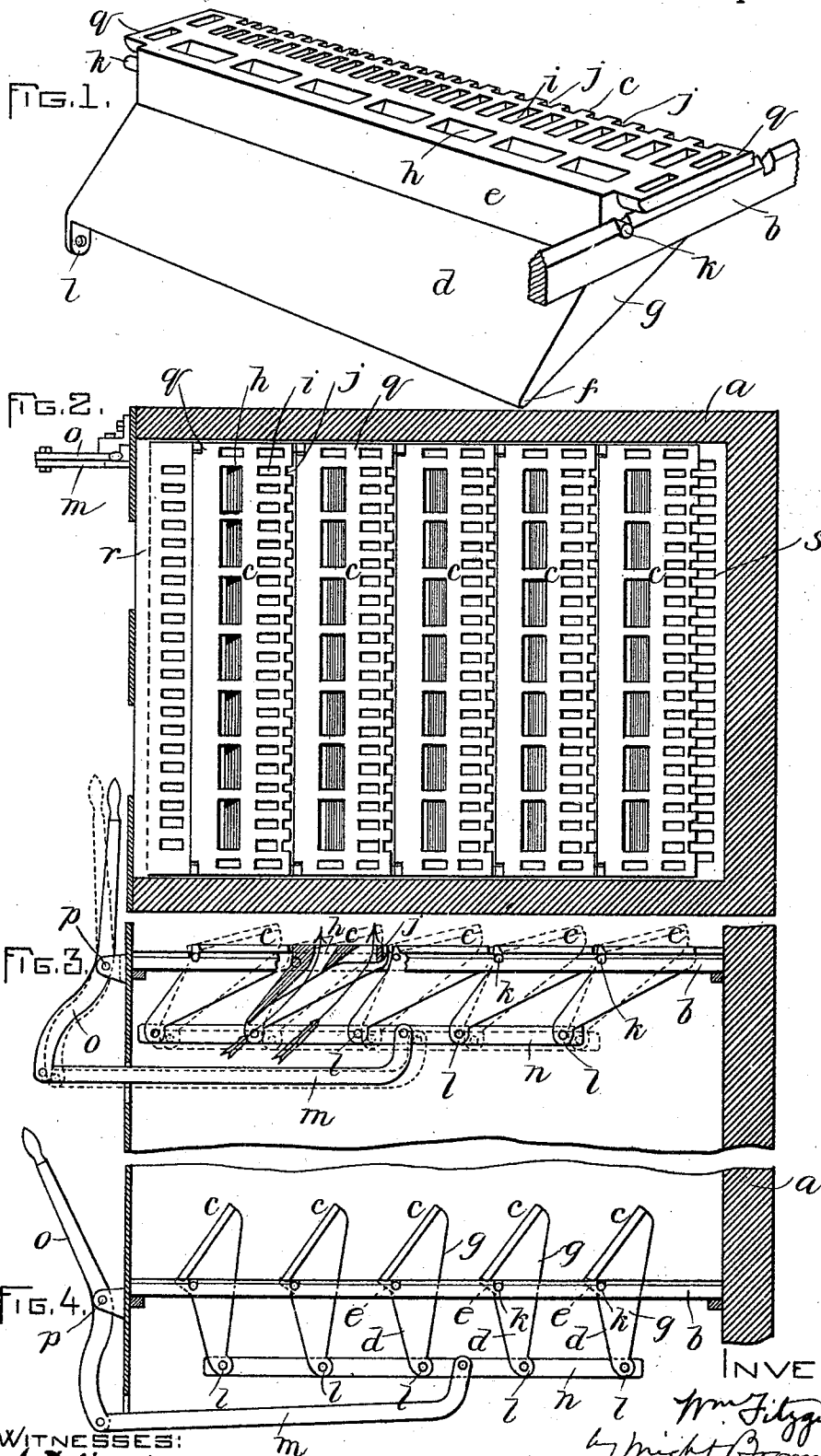


(No Model.)

W. FITZGERALD.
SHAKING AND DUMPING GRATE.

No. 518,779.

Patented Apr. 24, 1894.



WITNESSES:

A. B. Harrison

W. F. J. Leod.

INVENTOR:

Wm. Fitzgerald
by Night Brown Crossley
Atty.

UNITED STATES PATENT OFFICE.

WILLIAM FITZGERALD, OF EVERETT, MASSACHUSETTS, ASSIGNOR OF THREE-FOURTHS TO WILLIAM E. FITZGERALD, JOHN J. FITZGERALD, AND HELEN M. FITZGERALD, OF SAME PLACE.

SHAKING AND DUMPING GRATE.

SPECIFICATION forming part of Letters Patent No. 518,779, dated April 24, 1894.

Application filed June 24, 1893. Serial No. 478,719. (No model.)

To all whom it may concern:

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

This invention has relation to grates for fire pots and places generally, and particularly to grates for furnaces employed in the generation of steam.

It is the object of the invention to provide such improvements in shaking and dumping grates as will enhance their efficiency as such, and which will, at the same time secure such a draft to the fire as will tend to the consumption of all gases generated in the process of combustion.

To these ends my invention consists broadly of a pivoted grate-bar provided with a forward wall or face which is inclined upward at its lower part and made vertical in its upper part, and a rearward wall or face starting with the lower edge of the front wall and inclining rearwardly, with substantially vertical flues formed through the bar, so that when several bars are arranged side by side the draft of air entering the ash pit will be readily caught, and deflected by the walls of the bars vertically upward through the fire, instead of outward over the bridge wall, as is the case in the use of grate bars as now commonly constructed.

My invention also consists of improvements of greater or less importance incidental to the foregoing, all of which I will now proceed to describe and claim.

Reference is to be had to the annexed drawings and to the letters marked thereon forming a part of this specification, the same letters designating the same parts or features, as the case may be, wherever they occur.

Of the drawings—Figure 1 is a perspective view of one of my improved grate bars, showing also a part of the means for supporting the same in position. Fig. 2 is a plan view of a furnace fire pot equipped with my improved grate bars, the walls being represented in section. Fig. 3 is a vertical sectional view of Fig. 2, showing also one of the grate

bars in section, and illustrating the manner of shaking the grate, as also the course of the air through the flues of the grate bars into the fire. Fig. 4 is a view somewhat similar to Fig. 3, illustrating the manner of operating the grate bars to dump the fire.

In the drawings—*a* designates the walls of the ash pit and fire pot.

b are bars at the sides of the walls upon which my improved grate bars *c* are hung or pivoted and by which they are supported. The said improved grate bars embrace in their construction, a forward or front wall which has its lower part inclined rearwardly and upward as at *d*, the upper part of said front wall being vertical as at *e*. The rear wall of the bar begins at the lower front edge of the front wall as at *f*, and is inclined rearwardly and upwardly as at *g*. The bar to the rear of the vertical front wall *e* is provided with numerous flues *h i j* which may be of any desired form and size, that herein shown being simply for the purpose of illustrating as to one way in which the flues may be formed, though at the same time the said illustrated forms of flues have been found by experience to be very efficient for the purpose for which they are provided.

In the provision of a fire pot of a furnace with my improved bars, the latter will be hung upon the bars *b* by means of their trunnions *k*, beyond the ends of flanges *q*, at each side, so that by placing the bars side by side as represented in Figs. 2 and 3 the walls thereof may direct the draft of air entering the fire pot first rearwardly and upwardly, and then directly upward through the flues as indicated by arrows in Fig. 3. This inclination of the walls and the beginning of the rearward wall of each bar at the lower front edge of the front wall assists materially in catching the draft of air entering the fire pot so that it may be drawn in great volume through the fire, which would not be the case if the walls were made vertical, and if the said walls were inclined rearwardly throughout their entire extent there would be a tendency in the draft of air passing through the flues of passing rearwardly over the bridge wall of the furnace carrying gases therethrough

without burning or consuming the same, as is the case when they are carried directly upward. The bars are provided at a convenient point in their lower part with apertured ears *l* by means of which they may be pivoted upon a longitudinal bar *n* as shown in Figs. 3 and 4, to which bar *n* may be pivoted one end of a pitman *m* the other end of which is pivoted to a lever *o* fulcrumed as at *p* so that by moving said lever slightly, the bars *c* may be rocked upon their trunnions *k* as indicated by the full and dotted lines in Fig. 3, and the material on the grate shaken as when it may be necessary to discharge the ashes from the burning fuel.

In case it is desired to dump the contents on the grate into the ash pit, the lever *o* will be moved to a greater extent as represented in Fig. 4, so as to bring the fuel bearing surface of the bars to a sharply inclined or vertical position, and so dump the material thereon. Each bar is provided at its ends with flue-provided flanges *q* which rest when the bars are in position for burning fuel thereon, upon the upper edge of the supporting bars *b* which upper edge is made sharp with inclined sides so that ashes or coal or clinkers will not be liable to lodge thereon, and so prevent the bars from coming down into position to bring their upper surfaces substantially horizontal.

The fire pot may be provided both at its front and rear with flue-provided dead plates *r s* which may be so formed with reference to the grate bars as to permit of the operation of the latter, and prevent too great space being formed between the same and their adjacent grate bars.

It will be observed that the rear wall of the grate bar need not begin at the lower edge of the front wall, but may commence a short distance back therefrom without materially affecting the function of said walls, and it is further to be observed that the upper edges of the supporting bars need not be actually sharp, but they may be rounded or otherwise formed so that ashes, cinders and coal may not lodge thereon, and yet perform fully the offices for which they are designed.

It is to be noted that my improved grate bar is applicable to both stationary and portable furnaces, and that the means for shaking and dumping the same may be varied from that herein shown without departing from the nature or spirit of the invention.

Having thus explained the nature of the invention and described a way of constructing and using the same, though without attempting to set forth all of the forms in which it may be made or all of the modes of its use, it is declared that what is claimed is—

1. A grate bar for furnaces adapted to be pivoted at its ends, having a front wall inclined rearwardly and upwardly at its lower part and having its upper part vertical, and a rearward wall beginning substantially at the lower edge of its front wall and running rearwardly and upwardly, and vertically extending flues formed through the bar to the rear of the vertical part of the front wall, as set forth.

2. A grate bar for furnaces provided at its ends with flue-provided flanges and pivots or trunnions beyond the ends of said flanges and supporting bars upon which said grate bar is pivoted, and upon which said flanges bear said supporting bars having substantially sharp upper edges and inclined sides, as set forth.

3. A grate for furnaces, &c., consisting of a series of bars arranged side by side and pivoted at their ends, each bar having a front wall inclined rearwardly and upwardly at its lower part and having its upper part vertical, and a rearward wall beginning substantially at the lower edge of its front wall and running rearwardly and upwardly, and vertically extending flues formed through the part to the rear of the vertical part of the front wall, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 13th day of June, A. D. 1893.

WM. FITZGERALD.

Witnesses:

ARTHUR W. CROSSLEY,
A. D. HARRISON.