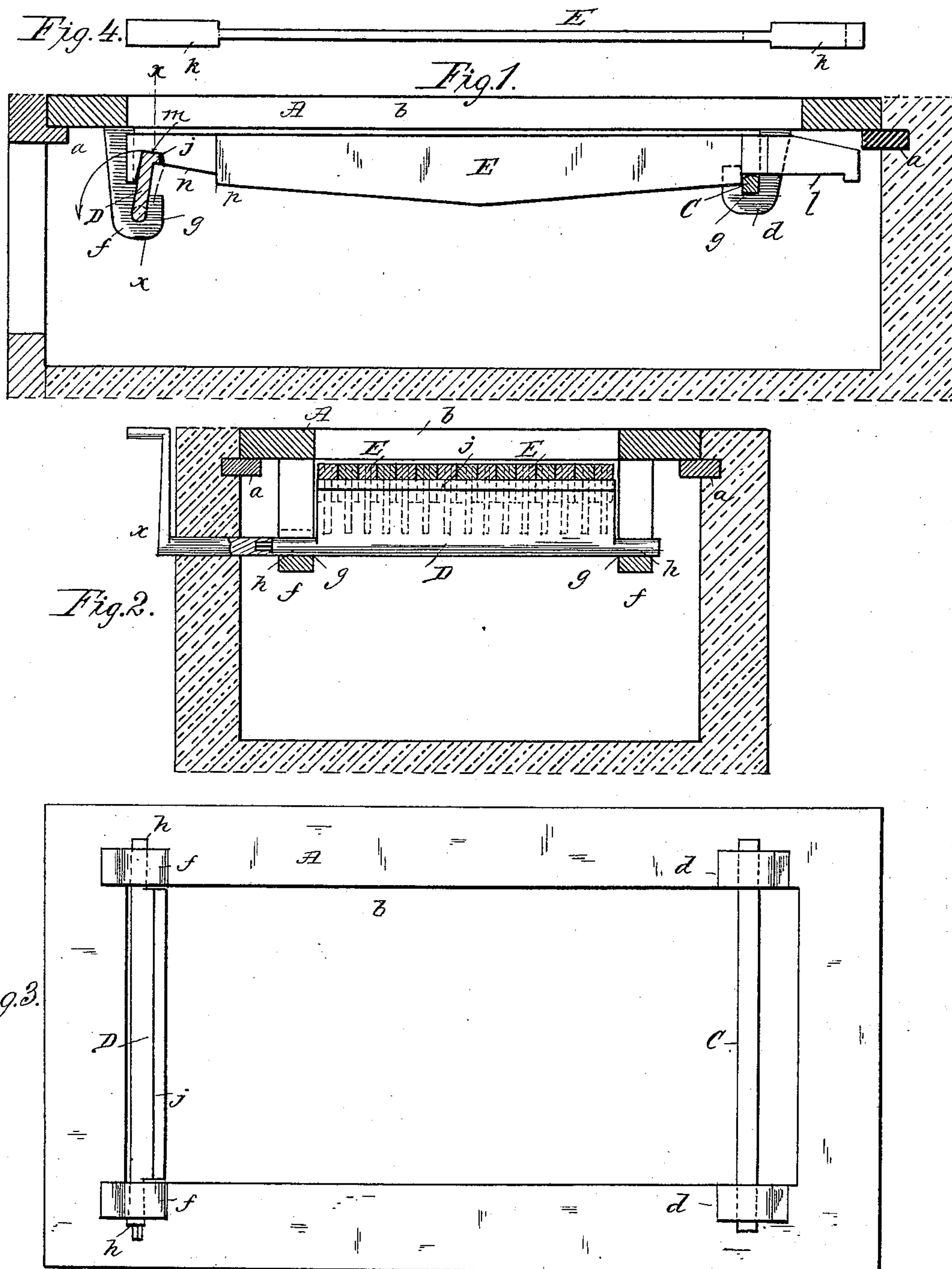


(No Model.)

E. N. GATES.
FURNACE GRATE.

No. 407,344.

Patented July 23, 1889.



Witnesses

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UNITED STATES PATENT OFFICE.

EUGENE N. GATES, OF FITCHBURG, MASSACHUSETTS.

FURNACE-GRATE.

SPECIFICATION forming part of Letters Patent No. 407,344, dated July 23, 1889.

Application filed October 29, 1888. Serial No. 289,445. (No model.)

To all whom it may concern:

Be it known that I, EUGENE N. GATES, a citizen of the United States, residing at Fitchburg, in the county of Worcester and State of Massachusetts, have invented new and useful Improvements in Furnace-Grates, of which the following is a specification.

This invention relates to furnace-grates, the object of which being to simplify the construction, reducing the expense of manufacture, and to insure increased efficiency therein; and the invention consists in the construction and combination of the various parts, all substantially as will hereinafter more fully appear, and be set forth in the claims.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the views, and in said drawings, Figure 1 is a longitudinal sectional elevation of a furnace-grate constructed according to this invention; and Fig. 2 is a cross-section thereof on the line $x x$, Fig. 1. Fig. 3 is a plan view of the under side of the grate-frame, also showing the bars for supporting the grate-bars thereon; and Fig. 4 is a top view of one of the grate-bars.

The grate-frame A is supported horizontally in the fire-box of the furnace on lugs a , built in or supported from the masonry or otherwise, said frame being of rectangular form and inclosing a large rectangular space b , and is provided with pendent lugs $d d$ and $f f$ at each end near the borders of said opening, said lugs being of hook shape or formed with sockets g for the reception and support of the transverse bars C and D, which sustain the grate-bars, the former being at the rear end of the grate and immovable when in place, while the latter at the front is of greater width and is provided with end trunnions h , whereby it is capable of a rolling bearing in its supporting-lugs, and normally is supported in a plane which is or nearly vertical, and its upper edge is preferably provided with a narrow laterally-extending rib j . A cranked shaft x is connected with one of the trunnions h and extended through the furnace-wall for convenience in either vibrating the grate-bars or depressing the lower front ends thereof.

E represents a grate-bar, a series of which are supported on top of the transverse bars C D, and said grate-bars are to be of any desired cross-sectional form and may be made singly or cast in gangs—that is, one casting to comprise several of such bars—and when formed singly are to be provided at their end portions with lateral enlargements k , whereby said bars may be maintained parallel and the openings between them of uniform width. The grate-bars when assembled on the supporting-bars therefore are confined against lateral movement by the lugs $d f$.

Upon the under side of each grate-bar at its rear end is a shallow horizontal depression l , by which it rests on the cross-bar C, and near the opposite end of the bar it is provided with a somewhat deeper notch m to fit more or less closely the ribbed end of the rocker-bar D, inside of which notch the surface of the grate-bar recedes obliquely, as at n , to a shoulder p , all so that when the said bar D is rocked by its upper end outwardly in the direction of the arrow and into a horizontal position the adjacent end of the grate-bar will be swung thereby and therewith, the end of the grate-bar being drawn forward and depressed, the rabbeted portion n thereof at that time lying upon the then horizontal face of the rocker-bar, and at such time a poker or scraper may be introduced through the fire-pit door over the top of the grate-bars but below the grate-frame.

It will be noticed that the rear ends of the grate-bars project under the rear end of the grate-frame, so that on the forward movement of the said bars as well as at all other times the entire length of the space within the grate-frame will be traversed by grate-bars.

What I claim as my invention is—

1. The combination, with the frame provided at each side with the downwardly-extending hook-shaped lugs $d f$ and the cross-bars C D, supported thereby, and the latter having a width greater than its thickness and having a rolling bearing in the lugs f , of the grate-bars, each provided at its one end with a notch m , engaging the edge of the bar D, and by its other end portion resting for a slide on the bar C, and means, substantially as described, for rocking said bar D,

whereby said grate-bars will be moved endwise and whereby one end of each thereof will be downwardly swung with its contact with the bar C as the center of oscillation, 5 substantially as described.

2. The combination, with the frame provided at each side with the downwardly-extending hook-shaped lugs *d f*, and the cross-bars C D, supported thereby, and the latter 10 having a width greater than its thickness and having a rolling bearing in the lugs *f* and provided with the rib *j*, of the grate-bars, each provided at its one end with the notch *m*, recess *n*, and engaging the bar D, and by its 15 other end portion resting for a slide on the bar C, and means, substantially as described, for rocking said bar D, whereby said grate-bars will be moved endwise and whereby one 20 end of each thereof will be downwardly swung with its contact with the bar C as the center of oscillation, substantially as described.

3. The combination, with the frame provided at each side with the downwardly-extending hook-shaped lugs *d f* and the cross-bars C D, supported thereby, and the latter 25 having a width greater than its thickness, and having a rolling bearing in the lugs *f*, and provided with the rib *j*, of the grate-bars, each provided with the lateral enlargements *k*, and 30 at one end with the notch *m*, recess *n*, and engaging the bar D, and by its other end portion resting for a slide on the bar C, and projecting under the rear of the frame, and means, as described, for rocking said bar D, 35 whereby said grate-bars will be moved endwise and whereby one end of each thereof will be downwardly swung, substantially as described.

EUGENE N. GATES.

Witnesses:

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