

(No Model.)

W. H. HEESON.

FURNACE GRATE.

No. 378,005.

Patented Feb. 14, 1888.

Fig. 1.

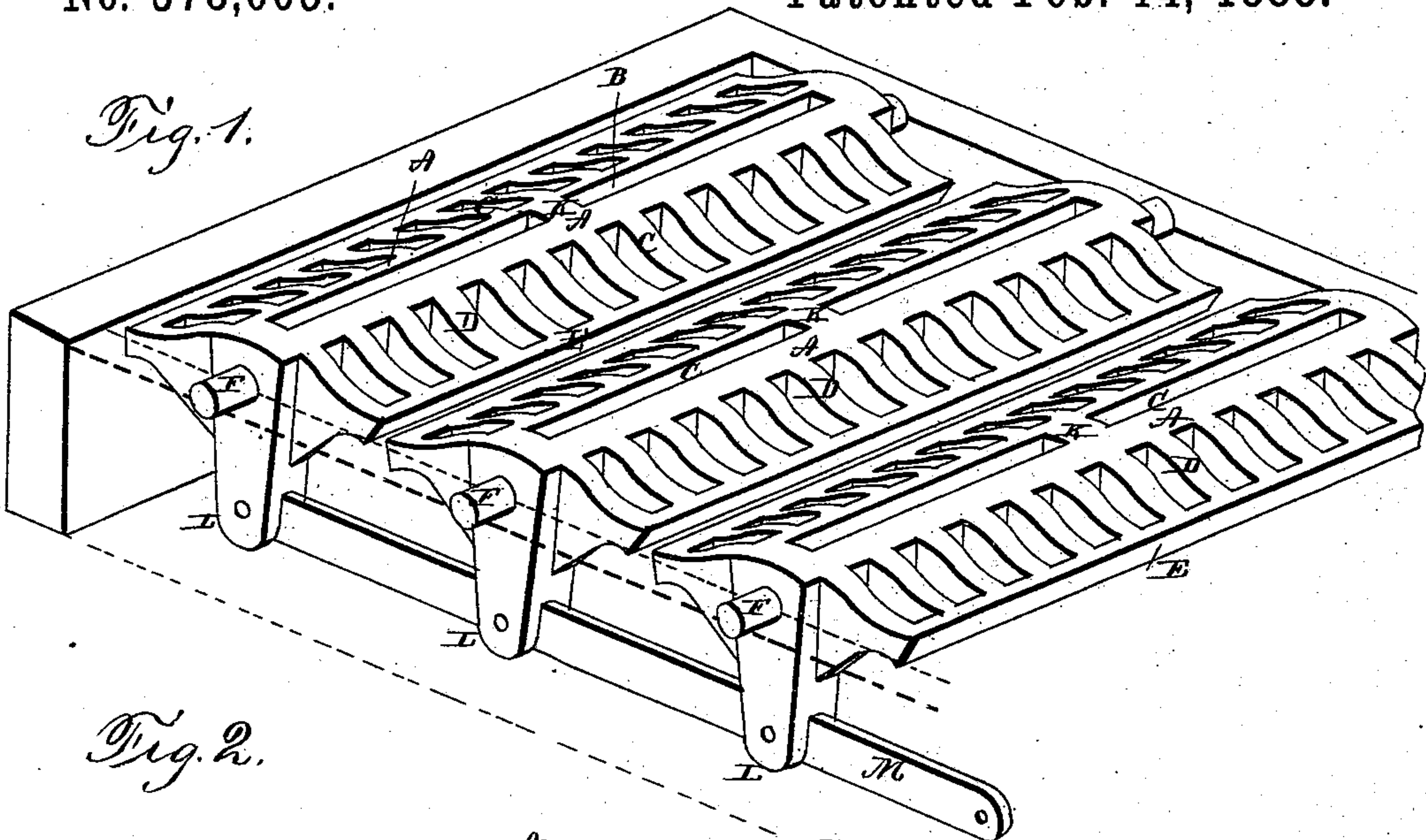


Fig. 2.

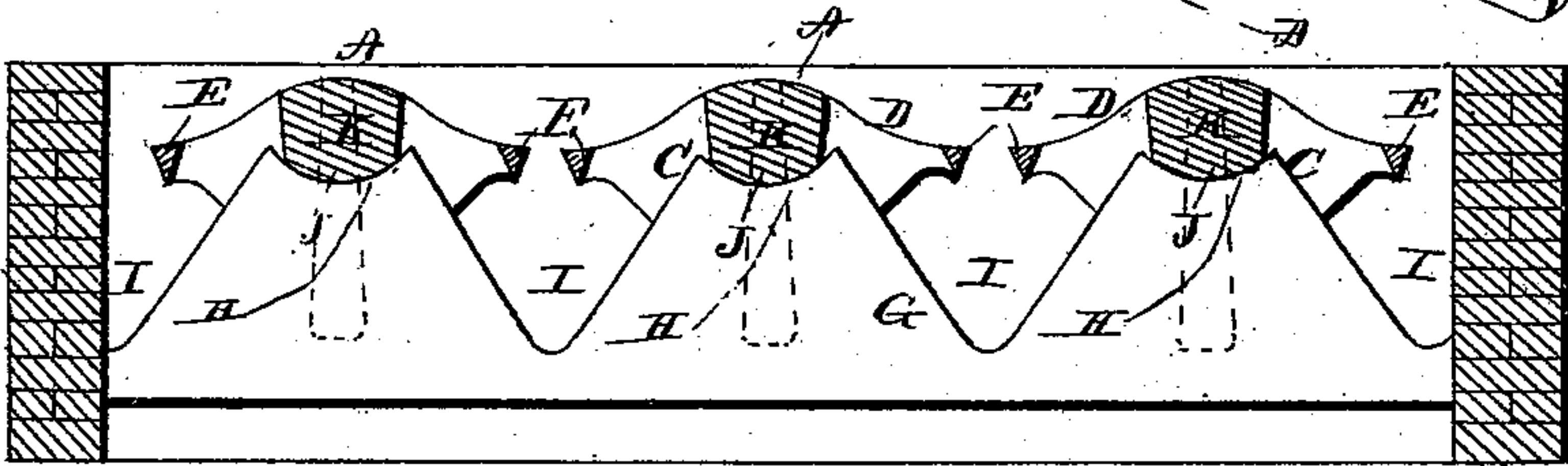


Fig. 3.

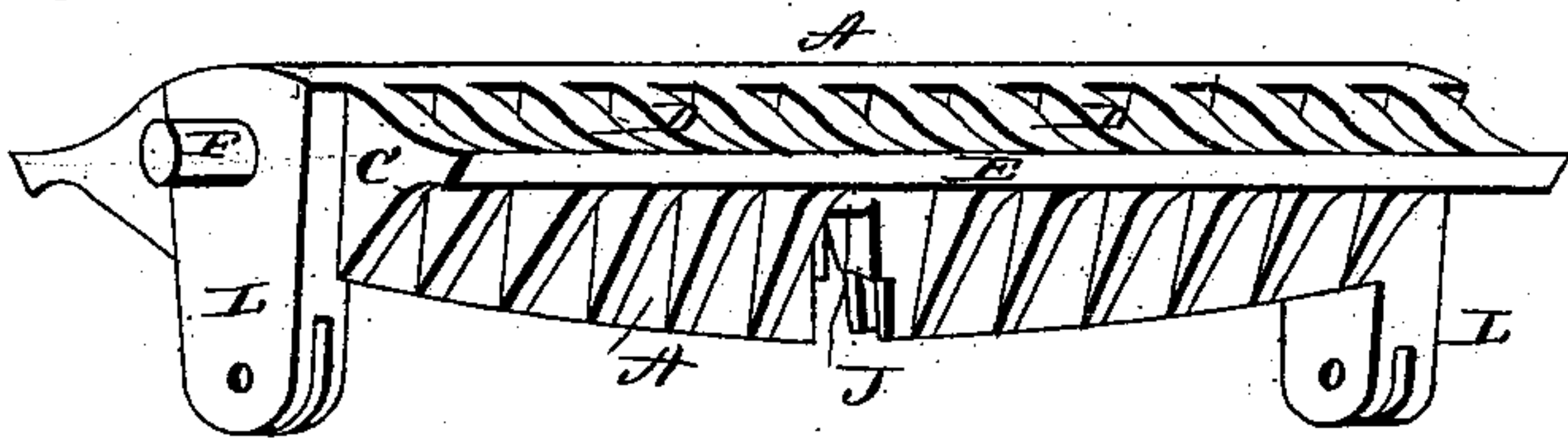
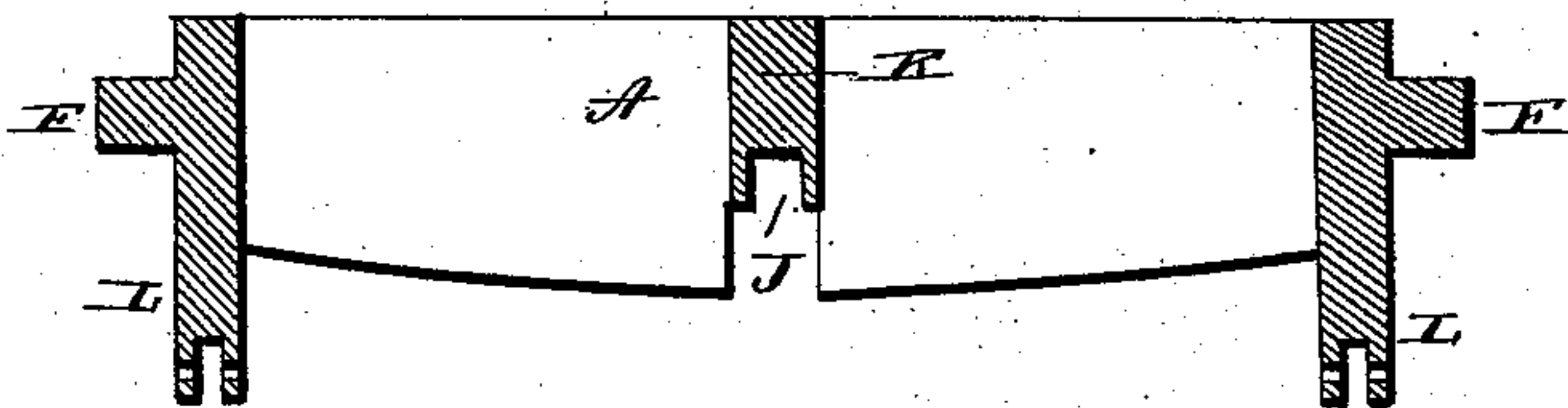


Fig. 4.



Witnesses

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FURNACE-GRATE.

SPECIFICATION forming part of Letters Patent No. 378,005, dated February 14, 1888.

Application filed July 11 1887. Serial No. 243,919. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HENRY HEESON, a citizen of the United States, and a resident of Baltimore, in the State of Maryland, have
5 invented certain new and useful Improvements in Furnace-Grates; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it apper-
10 tains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a perspective view of a portion of a furnace provided with my improved grate.
15 Fig. 2 is a transverse central vertical sectional view of the same. Fig. 3 is a perspective detail view of one of the grate-bars, and Fig. 4 is a longitudinal central sectional view of the same.

My invention relates to grates and grate-
20 bars for furnaces; and it consists in the improved construction of the same, as will be hereinafter more fully described, and pointed out in the claims.

Referring to the accompanying drawings, in
25 which the same letters of reference indicate corresponding parts in each of the figures, A A indicate the two parallel longitudinal pieces forming the central portion of the grate-bar, and having an air-space, B, between them.
30 Upon the outer face of each of these parts or pieces A A are secured the inner ends of the laterally-extending ribs C C, which form webs and which are preferably made to alternate with each other, and also have their upper
35 edges, D, cut off slantingly from the middle pieces, A A, which thus causes the bar to be slightly oval in cross-section. The outer ends of these laterally-extending ribs are connected together by means of a longitudinal rib or side
40 piece, E, one-upon each side of the grate and cast integral with the ribs of the bar. These side pieces are made triangular in cross-section, so that when the grate-bar is rocked in its bearings the outer edges of the pieces will
45 not swing nearer to the adjoining bar, as would be the case if the side of the bar were perpendicular. By making the air-spaces between their ribs and also between the two side pieces A A narrower at the top than at the
50 bottom they are not so liable to become choked with ashes, &c., as when the grate is rocked anything that can pass through the top por-

tion of these spaces can the more readily pass on through and out of the bottom of the grate.

Each grate-bar is provided at its ends with
55 the round trunnions F F, which fit in suitable bearings or supports in the furnace, as shown. In addition to the end trunnions, each bar is provided at its middle with a semicircular trunnion, J, which is in an axial line with the
60 end trunnions and which fits and rocks within a semicircular bearing, H, in the partition G, which is built across the furnace below the grate. The partition is further provided with
65 deeper inclined recesses I I, between the bearings H, which are substantially V-shaped in form. These deeper recesses permit of the sides of the bars being moved down without coming in contact with the partition, while the bearings at the middle of the grate pre-
70 vent the bars from warping laterally from the heat.

In making the bar with the middle partition I prefer to make that portion of it above the bearing solid, as shown at K, which will pre-
75 vent the heat from the fire on the top of the grate having such a direct effect upon the trunnion or its bearing as would be the case if the bar were not made solid at that point.

Each of the grate bars is provided at each
80 end with a downwardly-projecting lip, L, which in reality is an extension of the end of the bar, the ends of the pieces A A being secured to one side of its upper portion and the trunnion F upon the other side. By provid-
85 ing each end of the bars with these lips the bars may be placed in the furnace with either end at the front, and can be changed end for end at any time. These lips at one end of the furnace are connected together by means of a
90 transverse bar, M, which is pivotally secured to each of them, and this bar M can be operated by any of the ordinary means for such work, as a crank or lever. In this manner all of the bars can be rocked or turned in unison. 95

By forming the grate-bar oval in cross-section and having webs, as described, a trough is formed between the adjoining bars, into which the dross or slag will run as it is melted, and where it remains until the bars are rocked
100 or tilted, when it quickly falls between the bars, the beveled portions of the sides of the bars facilitating its escape by increasing the distance between the bars as they are rocked;

and by making the outside of the bars smooth, as shown, or without projections upon their outer portions, they are not so liable to get out of order as where they are made with such projections, as the "slash-bar," when it is put in to break the coal, is apt to be thrust against them and thereby either break or bend them so that they will interfere with those on the adjoining bar and prevent the bars from being rocked back and forth. Another advantage is derived by forming the arch or swell at the top of the bar, or at the point where the air-spaces open into the top of the bar, which thereby increases the superficial surface or area of the bar in such a manner that all its parts will be evenly and equably subjected to the action of the heat, no matter what the position of the bars may be relative to the furnace within which they are placed and of which they form a part.

Having thus described my invention, I claim—

1. A grate-bar having a trunnion at each end and a trunnion at its middle, said trun-

nions being in an axial line with each other, and the middle trunnion having a semicircular bearing, substantially as and for the purpose set forth. 25

2. In a furnace-grate, the combination of a number of grate-bars, each having a trunnion at its end and a trunnion at its middle, said trunnions being on an axial line with each other, and the middle trunnion having a semicircular bearing, a partition across the furnace below the grate, having a number of semicircular bearings adapted to receive the middle trunnions of the bars, and having deep V-shaped recesses between the semicircular bearings, substantially as and for the purpose set forth. 30 35 40

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

WILLIAM HENRY HEESON.

Witnesses:

HARRY G. RUTTER,
GEO. H. ROGERS.