

(No Model.)

J. A. ALLEN.
GRATE BAR.

No. 402,126.

Patented Apr. 30, 1889.

Fig. 1.

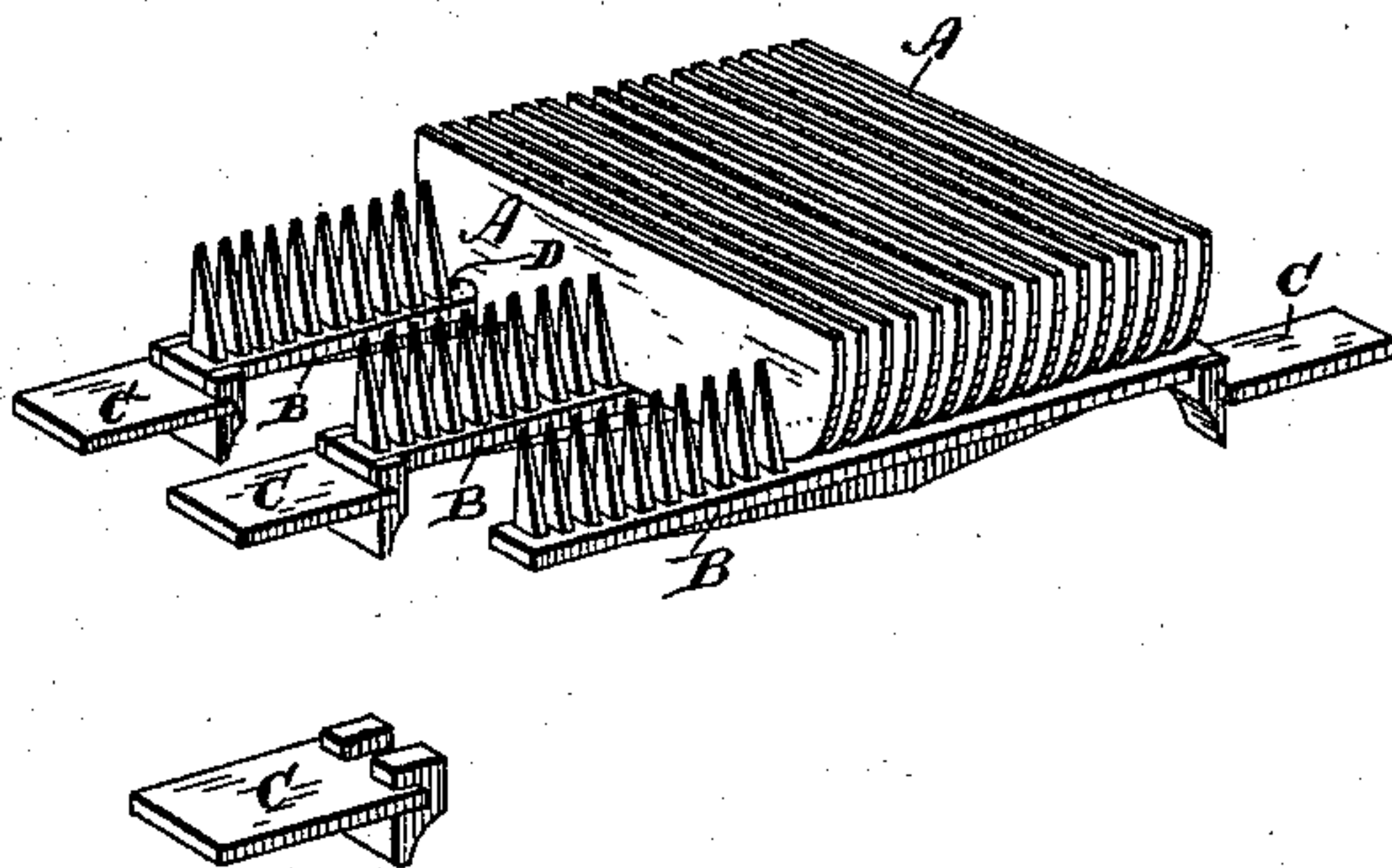


Fig. 2.

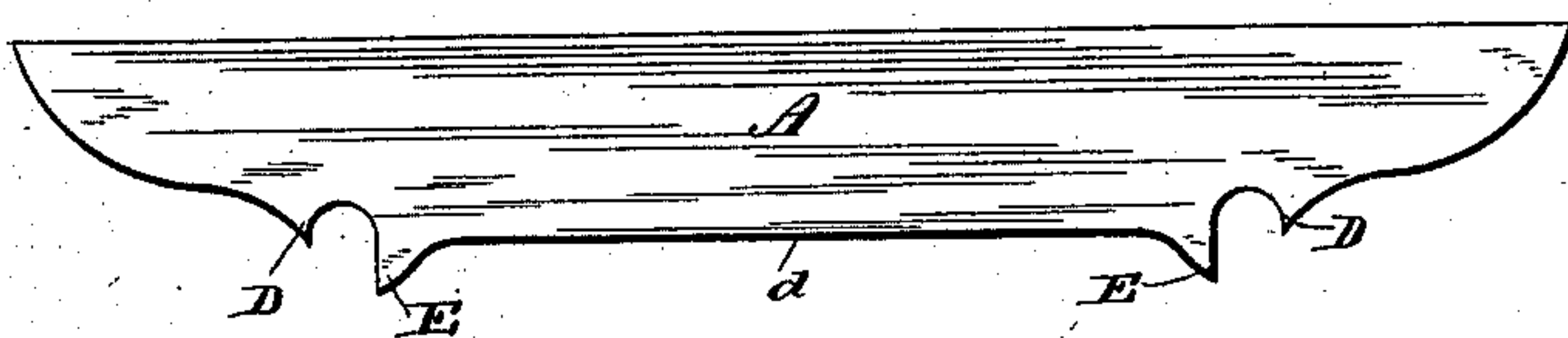


Fig. 3.



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UNITED STATES PATENT OFFICE.

JAMES A. ALLEN, OF ADAMS, MASSACHUSETTS.

GRATE-BAR.

SPECIFICATION forming part of Letters Patent No. 402,126, dated April 30, 1889.

Application filed October 4, 1887. Serial No. 251,447. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. ALLEN, of Adams, in the county of Berkshire and State of Massachusetts, have invented certain new and useful Improvements in Furnace-Grates; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

My invention relates particularly to improvements in that class of furnace-grates of which the grate shown in Letters Patent No. 212,531, granted to me February 25, 1879, is a type; and it consists in a novel construction of the grate-bars, whereby they are prevented from being clogged or locked in their supporting-bars by the deposit and accumulation of ashes or cinders and are enabled to be removed and replaced at will, all as will be hereinafter fully described, and pointed out in the claims.

Referring to the accompanying drawings, Figure 1 is a perspective view of the furnace-grate constructed according to my invention; Fig. 2, a view of one of the grate-bars detached; Fig. 3, a view of one of the bearing or supporting bars detached.

The letters A A indicate the grate-bars, B B the supporting-bars, and C C castings or sockets in which the supporting-bars B are seated and by which they are held in position. The supporting-bars and their sockets C do not differ essentially from those shown in my previous patent referred to, and the grate-bars A, so far as their general form in cross-section is concerned, are also substantially like those shown in said patent. Instead, however, of making the lower faces of the grate-bars substantially flat and resting them upon the supporting-bars, and relying upon pins or lugs laterally projecting from said grate-bars to prevent the longitudinal displacement of the same, as in said former patent, I now form projections D D near the ends of the grate-bars and cause these projections to bear upon the end-supporting bars B B; and I also form longer downwardly-extending projections E E on said grate-bars for the purpose of constituting the stops which are to limit the longitudinal movement

of said bars. The points or edges of the projections D D are preferably in line with the lower face, *d*, of the middle portion of the bar, so as to give three points of support for each bar.

In the former patented construction it was found in practice that there was a liability of ashes and cinders falling down between the fingers of the supporting-bars and the grate-bar, and by excluding air from said joints becoming cooked and hardened by heat, so as to prevent altogether the removal and shifting of the grate-bars, or rendering such operation at least very difficult. In the present construction, however, the points or projections D furnish edge bearings, which rest upon the top face of the supporting-bars between the fingers, and in the raking of the grate vibrate backward and forward to a limited extent upon the supporting-bars, thus by a scraping operation keeping clean the upper faces of the supporting-bars and preventing the accumulation of any ashes or cinders thereupon. The amount of reciprocating motion which each grate-bar is permitted to have on its support is limited by the amount of space left between the downwardly-extending projections E and the proximate sides of the supporting-bars B.

It should be here remarked that the projections D offer no obstruction to the dropping of ashes and cinders through the grate, nor do they, when they strike the sides of the supporting-bars in the operation of cleaning the grate, tend to wrench and rack said supporting-bars in their sockets or seats, as did the laterally-projecting limiting-stops in the former construction of grate, which came in contact with the fingers of the supporting-bars at a point removed from the center of said bars, thereby exerting quite a leverage. The said projections E are located at the proper points to permit of the proper expansion and contraction of the grate-bars, and to allow of the aforesaid limited longitudinal movement of the latter, but not so as to permit a movement that would enable said bars to touch the back wall or door-plates in the fire-box and interfere with the maintenance of a clear air-space at both ends of the grate.

In the constructions heretofore patented the edge bearing has been placed on the support-

ing-bar and the broad bearing on the grate-bar; but the disadvantages of such construction are obvious. In the first place, the support afforded the teeth is insufficient to give
5 the necessary lateral strength, as the bars are necessarily narrow, to permit the ashes to clear, and, second, when the stops are placed inside of the supporting-bars to limit the longitudinal movement of the
10 grate-bars, they have to be very long, in order that they may come in contact with the supporting-bar at a point low enough down to prevent the twisting of the bar, rendering them weak and liable to be broken,
15 this having given rise to the practice of forming the grate-bars wide at the center with deep shoulders at the ends. With my present construction, however, it will be seen that without employing any additional stock in
20 the grate-bars, the shoulders E, which may be very short, will come in contact with the body of the supporting-bar on a line between its supports, and the said bar and teeth may be as wide as necessary and still be effectually
25 cleared from ashes by the edges D, which edges do not offer any material resistance to the movement of the grate-bars. Further, this construction permits the air to circulate freely up and around the grate-bars between
30 the teeth, preventing the burning and crys-

tallization of the teeth at the bases, and also permits any ashes to pass freely through onto the supporting-bar, from where they are removed, as before described.

Having thus described my invention, what 35 I claim as new is—

1. The combination, with the supporting-bars having the separating and spacing fingers with flat bearing-surfaces between them, of the grate-bars provided with projections 40 on the under side terminating in transverse edges for resting upon the flat bearing-surfaces between the fingers of the supporting-bars, as set forth.

2. The combination, with the supporting- 45 bars having the separating and spacing fingers with flat bearing-surfaces between them, of the grate-bars provided with projections on the under side terminating in transverse edges for resting upon the flat bearing-sur- 50 faces between the fingers of the supporting-bars, and other projections on said grate-bars for abutting against the supporting-bars to limit the longitudinal movement of the grate-bars, substantially as described.

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Witnesses:

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