

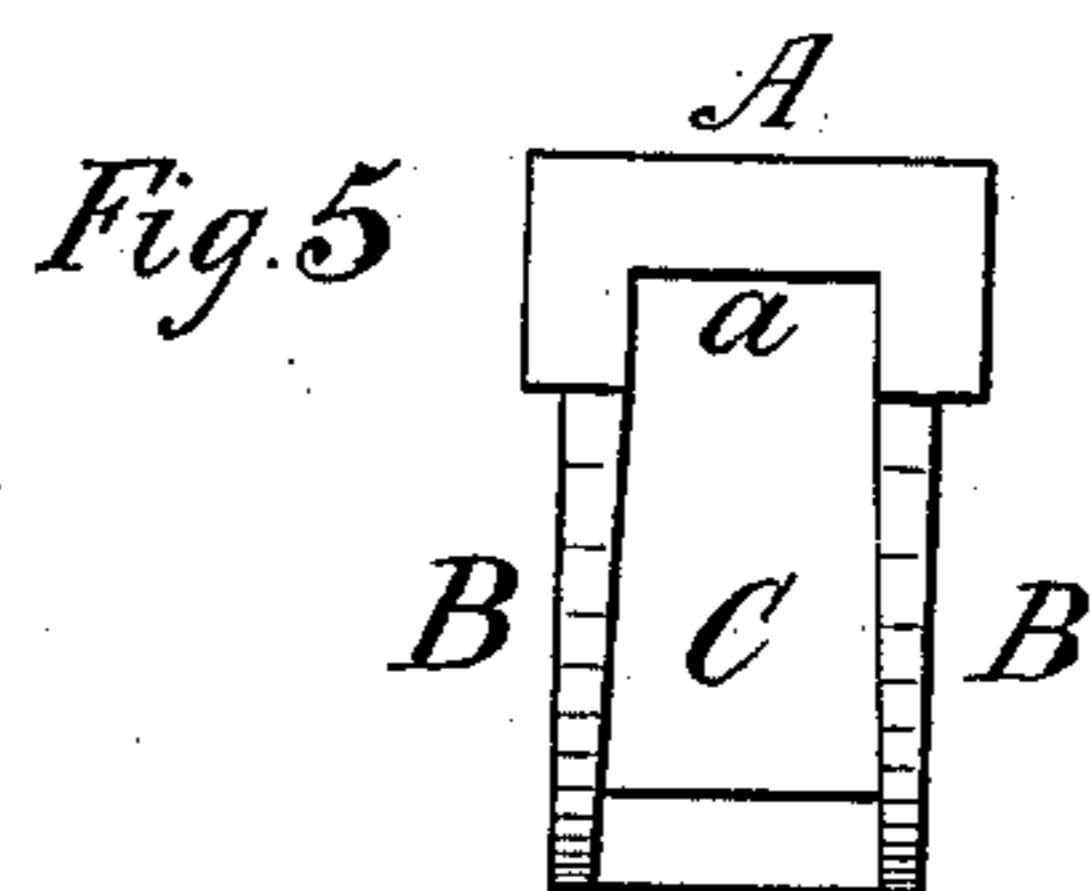
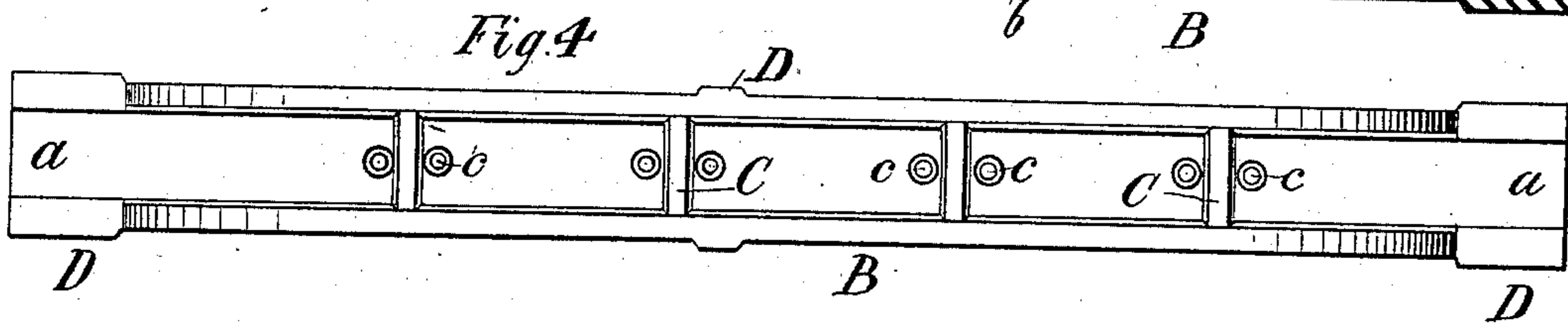
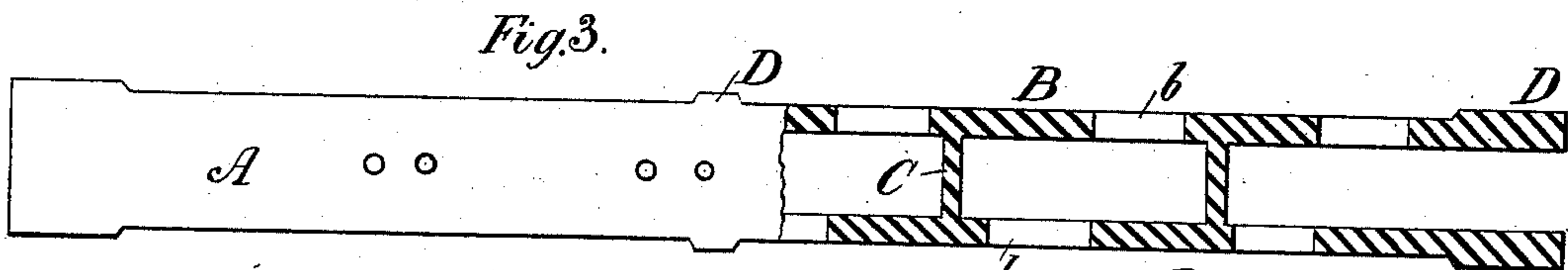
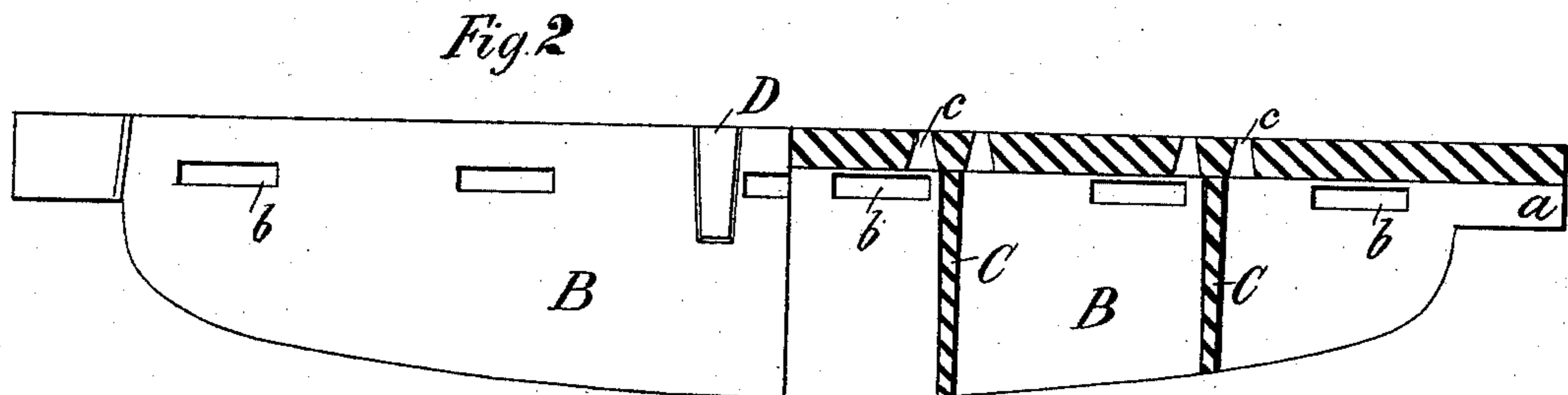
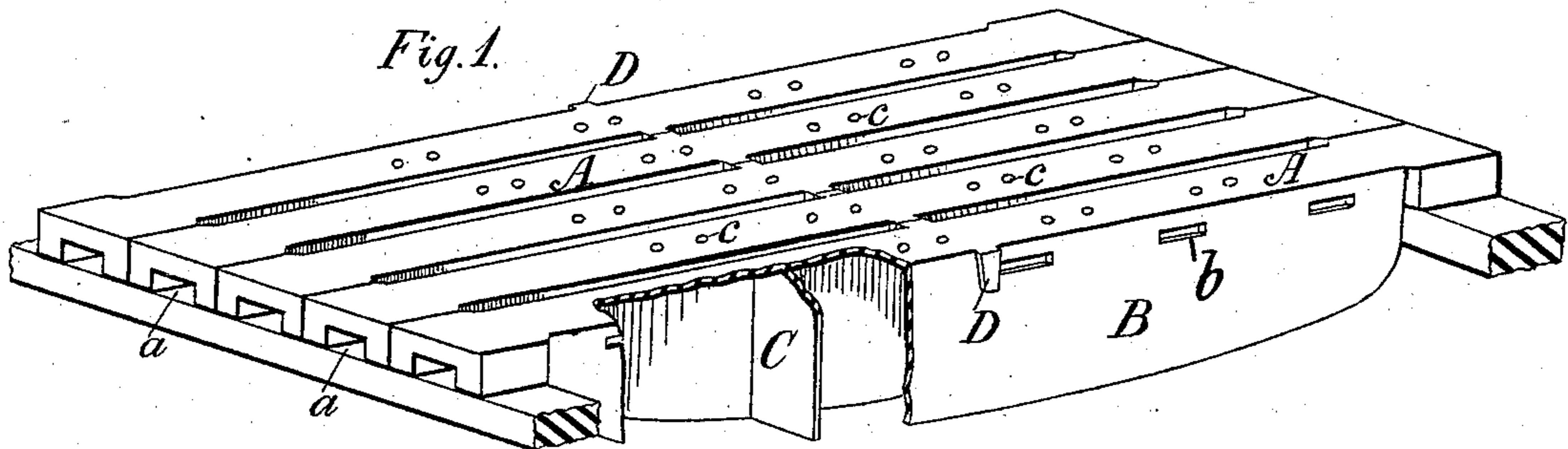
(No Model.)

J. ELLIOTT.

GRATE BAR.

No. 290,872.

Patented Dec. 25, 1883.



Witnesses

*W. R. M. Howell.*

*R. S. Cooper.*

Inventor.

*James Elliott.*

Per

*W. R. M. Howell.*

Attys.

# UNITED STATES PATENT OFFICE.

JAMES ELLIOTT, OF MONTREAL, QUEBEC, CANADA.

## GRATE-BAR.

SPECIFICATION forming part of Letters Patent No. 290,872, dated December 25, 1883.

Application filed July 28, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES ELLIOTT, of the city of Montreal, in the District of Montreal, Province of Quebec, and Dominion of Canada, have invented certain new and useful Improvements in Grate-Bars; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to improvements in that class of grate-bars which are principally used in furnaces of steam-boilers, and where it is desirable to provide for the passage or circulation of air between the bars and throughout the grate-surface.

It has for its object to preserve the bar from being destroyed by burning for a much longer period than is effected by the present styles, with a less weight of metal in the bar than heretofore, and at the same time lessen the amount of labor necessary in raking the fire by preventing the accumulation of clinkers in such large quantities as at present. The invention also insures the perfect and complete consumption of the fuel, and a consequent increase of steam-producing power, without waste of consumable substances, and with far less ashes than are left by the systems now in use. To this end I provide a grate-bar which is smooth on its upper side and thoroughly ventilated throughout its entire length by having perforations or exits for the air at both sides and top of the bar, which is made hollow and open on its under side, and also with hollow or channeled ends, so that the cold air coming into the ash-pit shall strike up inside the bar and keep the same equally cool from end to end, and preventing burning of the same in uneven patches, as at present. Again, this air, becoming heated in the interior of the bar, passes through the exits up through the fire, and thus prevents the accumulation of large clinkers and increases the combustion of the fuel, as will be readily understood.

For more complete comprehension of my improvements, reference must be had to the accompanying drawings, where letters similar to those used in the following detailed description indicate like parts, and in which—

Figure 1 is a perspective view of a number

of my bars arranged as a grate, one being partly broken away. Fig. 2 is a part elevation and part section of a bar constructed according to my invention. Fig. 3 is a top view, partly in section; Fig. 4, a bottom view, and Fig. 5 an end view of Fig. 1.

Letter A represents the top or body of the bar, having its ends channeled, as at *a a*; and B B, the sides or webs of the same, preferably of the configuration shown, C C being any desired number of partitions or webs cast in one with the top A and side webs, B B, and arranged at right angles to the latter and between same. In each of the side webs, B B, are any suitable number of exits or perforations *b b*, arranged so that those on one side will not be directly opposite those on the other, two of these exits being preferably located in the spaces between each of the partitions or webs C C. Through the top side or body of the bar I also make perforations *c c*, which are preferably conical, as shown, and these perforations are located one on each side of each of the partitions or webs C C, at their junction with the top A of the bar. Any suitable number of lugs or projections, D D, are also cast on either side of the bar, at each end and in the middle, to keep the bars the required distance apart.

The invention will be readily understood from the above description and from the drawings; but I may explain that the cold air from the ash-pit enters between the webs B B and partitions C C of the bar and becomes heated therein. It then passes through the different exits *b b* up between the bars, and also through the perforations *c c* in the top of the bar, and, forcing its way up through the fuel on the grate, produces the improved results above alluded to.

The channeled ends *a a* will allow ashes to pass freely from the end plates down into the ash-pit, thus preventing the accumulation of same at these points, and the consequent burning of the ends of the bar from the ashes becoming red-hot. These channeled ends also assist in ventilating the bar, as will be easily seen.

What I claim, and desire to secure by Letters Patent, is as follows:

1. A grate-bar formed of the body A, side webs, B B, and partitions C C, said body and webs being perforated, substantially as and for the purpose specified.

JAMES ELLIOTT.

5 2. A grate-bar composed of body A, having vertical perforations *c c* and channeled ends *a a*, with side webs, B B, provided with exits

Witnesses:

R. A. KELLOND,  
R. S. COOPER.