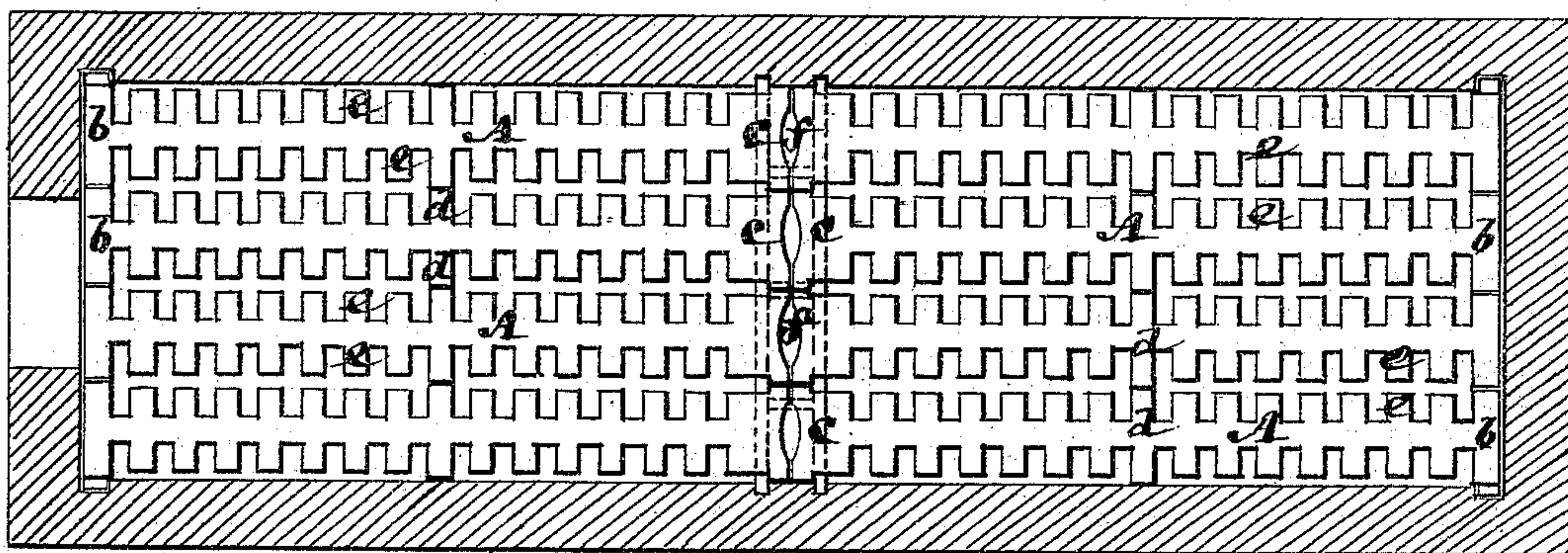


J. SANDERS.  
Grates for Steam-Boilers.

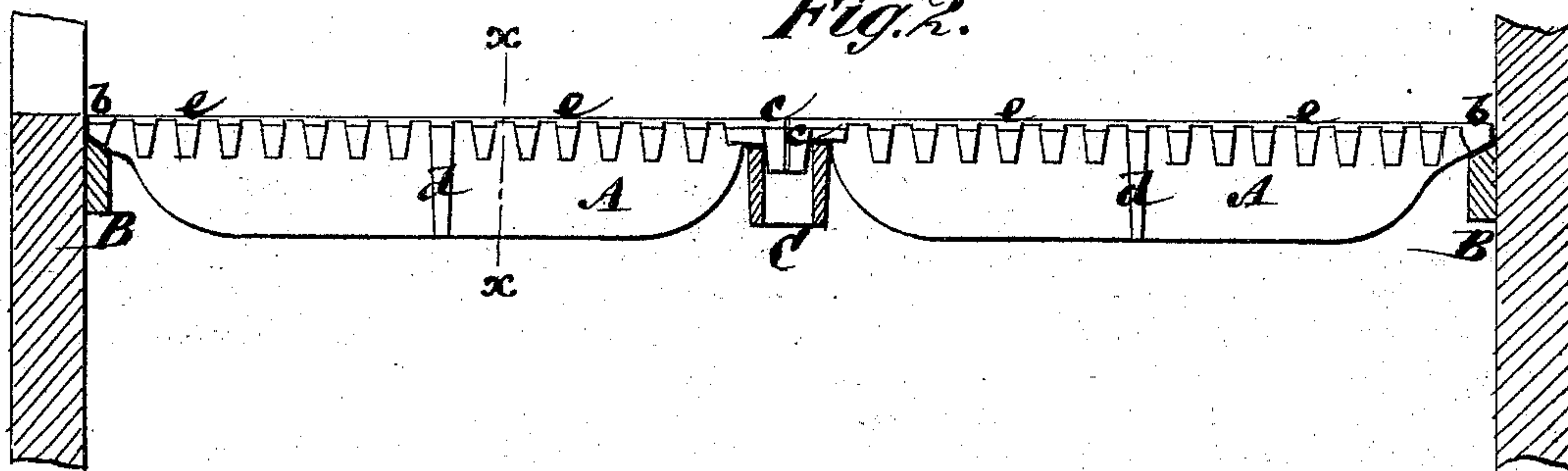
No. 152,692.

Patented June 30, 1874.

*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



*Witnesses*

*John Becket*  
*Geo. Haynes*

*James Sanders*  
*by his Attorney*  
*Brant Allen*

# UNITED STATES PATENT OFFICE.

JAMES SANDERS, OF WAPPINGER'S FALLS, NEW YORK, ASSIGNOR TO DISBROW AND HALLIWELL, OF SAME PLACE.

## IMPROVEMENT IN GRATES FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **152,692**, dated June 30, 1874; application filed May 29, 1874.

*To all whom it may concern:*

Be it known that I, JAMES SANDERS, of Wappinger's Falls, in the county of Dutchess and State of New York, have invented certain Improvements in Grates, of which the following is a specification:

This invention has for its object to improve the grate-bars employed for steam-boilers, and consists of a peculiar construction of the bars, which is hereinafter pointed out and specifically claimed, whereby a free circulation of air is afforded and the liability of choking is avoided.

In the accompanying drawing, which forms part of this specification, Figure 1 represents a plan of a grate constructed in accordance with my invention; Fig. 2, a longitudinal vertical section of the same; and Fig. 3, a transverse vertical section on the line *x x*.

A A are the fire-bars of the grate, arranged side by side, and in one, two, or more longitudinal series, the one back of the other. Said bars are formed with end portions *b c*, and preferably with intermediate portions *d d*, of a suitable width to keep the bars at a proper distance apart for the passage of air up between them, and are furthermore provided with lateral projections or wings *e e*, which, while serving to support the fuel, allow of the passage of air up in between them to promote combustion; and the more effectually to secure this latter result, said wings extend only for a portion of the depth of each bar, and are beveled or taper off where they join the body

of the bar, thus giving a large or free air-space in between the bars to promote combustion.

B, B, and C are cross-bearers on which the bars are supported. The bearers B B are made sloping or beveling downward in an inward direction on their upper edges, and the end portions *b* of the bars made similarly sloping on their under surfaces where they rest on said bars, whereby increased facility is afforded for contraction and expansion of the bars and clearance of cinder choking said ends of the bars. The other ends of the bars *c* are of hook form, to give the bars a lock or hold on the intermediate bar C, which is made double or hollow for the purpose, and said ends or portions of the bars constructed to form an upper cavity, *f*, for the further passage of cinder, and free admission of air to the fire.

What I claim is—

The combination, with the bars A, having hooked ends *c* for engaging with the intermediate bar C, of the portions *d* for holding the bars at a suitable distance apart, the wings *e* extending only for a portion of the depth of the bars for the free passage of air, and the cavities *f* in the ends of the bars for the admission of air and passage of cinders, substantially as herein shown and described.

JAMES SANDERS.

Witnesses:

W. HENRY REESE,  
JOSEPH FAULKNER.