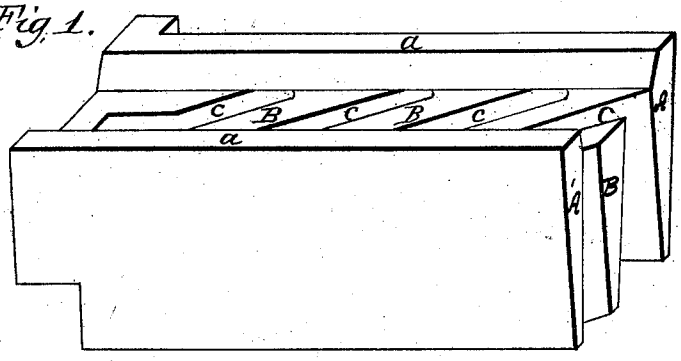
W. C. Cambridge,

Furnace-Grate Bar.

No. 83,689 Patented Nov. 3, 1868.

Fig. 1.



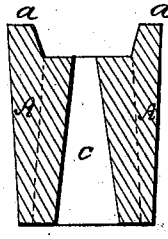


Fig. 2.

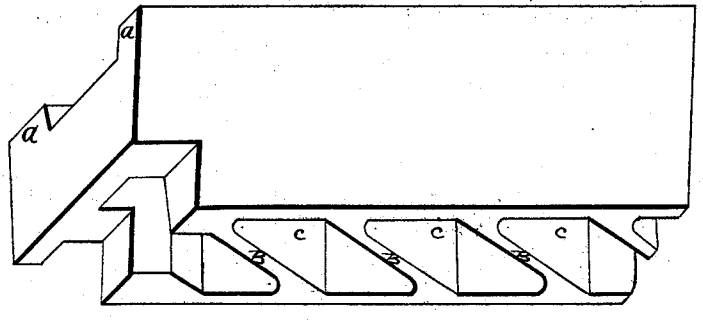


Fig. 3.

Witnesses.

Geo. Lawrence.

Robert W. Prosser.

Inventor.

William C. Cambridge

by J. Fraser & Co. attys.

United States Patent Office.

WILLIAM COLBORNE CAMBRIDGE, OF BRISTOL, GREAT BRITAIN, ASSIGNOR TO HIMSELF AND J. T. GRIFFIN, OF NEW YORK CITY.

Letters Patent No. 83,689, *dated November* 3, 1868.

IMPROVEMENT IN GRATE-BARS FOR FURNACES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, WILLIAM COLBORNE CAMBRIDGE, of Bristol, in the Kingdom of Great Britain, engineer, have invented a new and useful Improvement in Furnace-Grate Bars; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing, in which—

Figure 1 is a perspective view of the top of a portion of one of my improved bars;

Figure 2 is a transverse section; and

Figure 3, a perspective view of the under side of the same.

Like letters designate corresponding parts in all of the figures.

The nature of my invention consists in constructing grate-bars with vertical lateral ribs, in combination with a depressed central web, pierced with obliquely-transverse openings or air-passages, as hereinafter set forth.

As represented in the drawings, A A constitute the vertical ribs or supporting-portions of each bar, and B B, the central web uniting them, which is pierced by the cells or openings *c c*.

The ribs standing above the surface of the web, at *a a*, keep the fuel, to a great extent, from resting on the latter, thereby leaving a space for the circulation of air above the surface of the ribs B, which not only keeps the metal from becoming overheated, but, by diffusing air more generally through the fuel, produces more perfect combustion.

Ordinarily the grate or fire-bar presents so large a surface to the fuel which it supports, as to materially intercept the entrance of air, rendering the combustion slow and imperfect at the points in contact with the bar. This defect results from the considerable size required to insure the requisite strength under the weight of the fuel when the metal is weakened by the heat of the fire.

My improved construction obviates this, by making the bar very strong vertically, in consequence of the great depth of the ribs A, and by avoiding the overheating of the metal, by the large amount of surface exposed to the cold air, and the very small surface which is in direct contact with the fuel, it being only the top, *a*, of the ribs, and from this construction also result the advantages of admitting air to the fuel, through nearly the whole of the space occupied by the bar, and of preventing the fuel or cinders from compacting upon the top of the bar, while the bars are both light and strong, and possess increased durability.

I do not confine myself to any particular size or proportion of the ribs or openings, only that they are formed between ribs raised vertically at each side of the bar, the said openings tapering upwards, leaving, at the top, portions of metal between such openings, of greater thickness than at the bottom of each of said bars, and these openings may extend obliquely across from one side of the bar to the other, or they may be turned off at an angle, as shown. The length and strength of the said bars may be varied according to circumstances.

The ribs standing above the web at the sides, may be of any height and thickness that may be needful, and very suitable dimensions are half an inch rise above the surface of the web, and a thickness of half an inch on the level of the top of the web, bevelled off to the top of the rib, to facilitate lifting and moulding. These sides keep the fuel more hollow or loose, and cause the air to act more evenly and effectually through the fire, thus producing more heat with less fuel.

What I claim as my invention, and desire to secure by Letters Patent, is—

A fire-bar, constructed with vertical side ribs A A, having raised ledges *a a*, in combination with the depressed web B and oblique opening *c*, substantially as and for the purposes set forth.

In witness whereof, I have hereunto signed my name, in the presence of two subscribing witnesses.

WILLIAM COLBORNE CAMBRIDGE.

Witnesses:

S. C. EASTMAN,

JOHN G. DODDS.