C. K. ROGERS & W. S. McINTIRE.

Grate-Bars.

No. 227,180. **Patented May 4, 1880.**

Fig: 1.

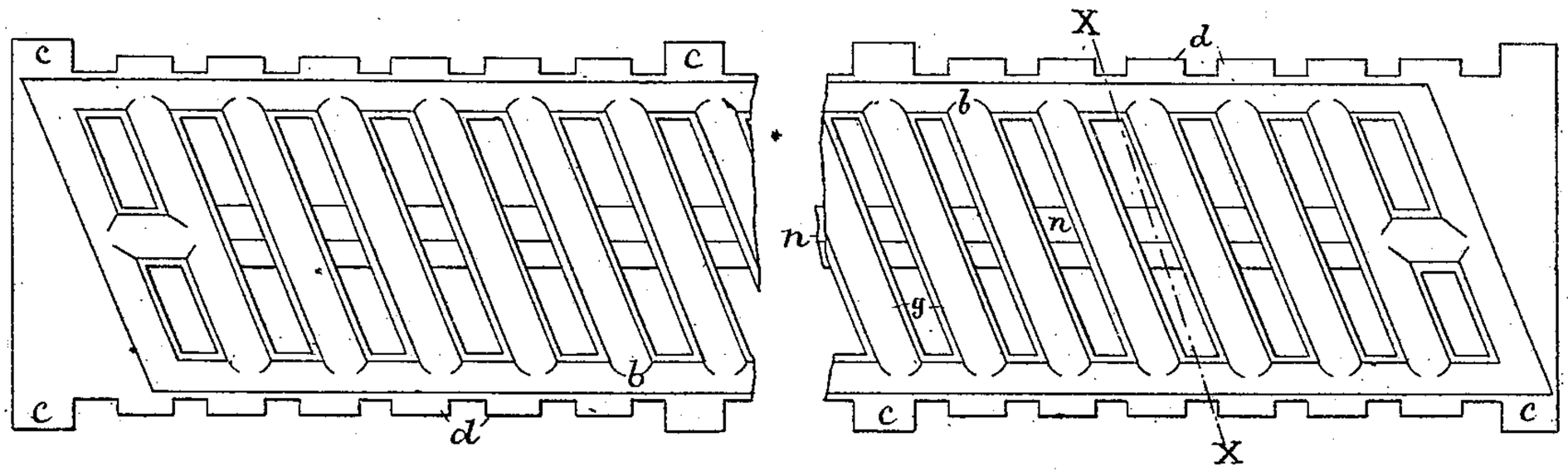


Fig: 2.

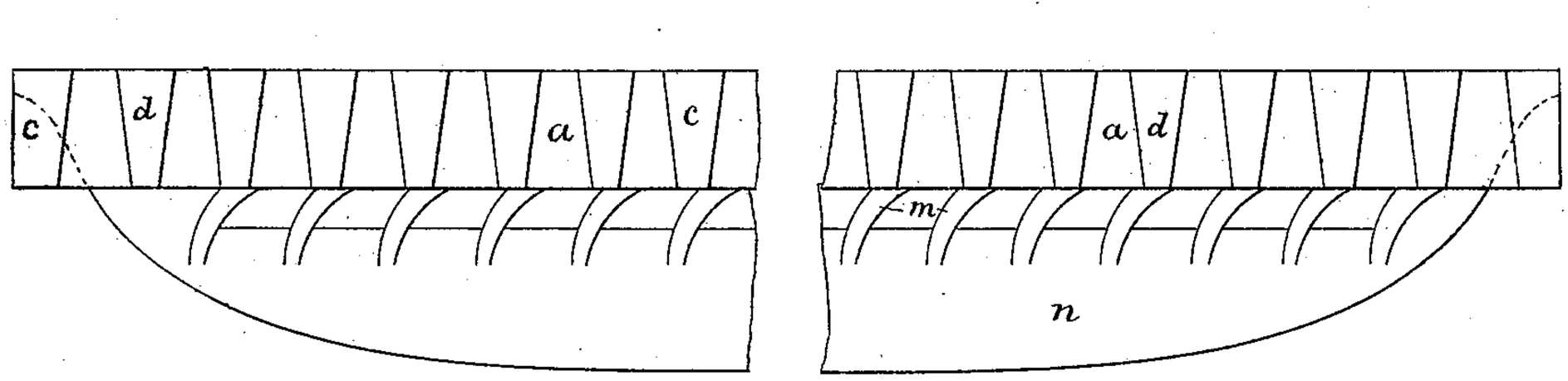
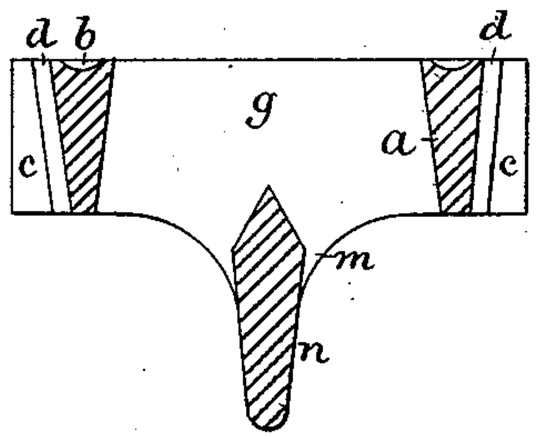


Fig: 3.



Witnesses.

L. F. Connor

Jos. P. Livermore

Inventors.

Columbus K Rogers and
William S McIntire
by Crosby & Gregory Attys

UNITED STATES PATENT OFFICE.

COLUMBUS K. ROGERS AND WILLIAM S. McINTIRE, OF SALEM, MASS.

GRATE-BAR.

SPECIFICATION forming part of Letters Patent No. 227,180, dated May 4, 1880.

Application filed December 22, 1879.

To all whom it may concern:

Be it known that we, COLUMBUS K. ROGERS and WM. S. MCINTIRE, of Salem, county of Essex, State of Massachusetts, have invented an Improvement in Grate-Bars, of which the following description, in connection with the accompanying drawings, is a specification.

Our improvement relates to grate-bars, and is shown in a grate-bar having two side ribs connected by short cross-bridges, preferably running obliquely to the side ribs, said bridges being extended downward at the middle to join a strong longitudinal web, which comes in contact with the lower or downwardly-extended portion of the said bridges. The upper surface of the web is thereby located so far below the coal or other fuel upon the top of the bridges as not to serve directly as a support for the said fuel, as would be the case if the web extended, as usual, between and to the level of the top of the bridges.

Leaving the space between the bridges open, and supporting said bridges only at their lower ends, as herein described, permits a free circulation of air between the bridges and entirely about the web at all sides and over its top, so that the latter always retains its original shape and prevents the grate-bar warping or twisting, thereby increasing its durability and efficiency without adding to its cost.

Figure 1 is a top view, Fig. 2 a side view, and Fig. 3 a cross-section on the line X X, Fig. 1, of one of our improved grate-bars.

The side ribs, *a a*, preferably channeled at their upper surface, as shown at *b*, and provided with lateral projections *c*, to abut against corresponding projections of the next bar, and with shorter intermediate projections, *d*, are joined at the ends of the bar by the flat portions *e*, and at short intervals along the bar by the bridges *g*, (here shown as running diagonally across and channeled at the top.)

These bridges project downward near their middle portions, as shown at *m*, and unite with the strong longitudinal web *n*, the main body of which is below the rest of the grate-bar, and the top of which is below the upper surface of the bridges *g*.

This disposition of the parts permits the cool air of the draft to circulate around and about the web *n*, as shown by the arrows, Fig. 3, so that it is but slightly affected by the heat.

The web *n* itself and the connections thereof with the bridges *g* are sufficiently strong to prevent the upper portion of the bar, next the fire and affected thereby, from warping.

We claim—

1. A grate-bar consisting, essentially, of two lateral ribs and bridges connecting the same and a central longitudinal strengthening-web mainly below the under surface of the rest of the bar, with space for the circulation of the air around and above it, substantially as and for the purpose set forth.

2. In a grate-bar, the side ribs and bridges between them, the latter being connected with a longitudinal web the upper surface of which terminates below the upper surface of the bridges, to permit free circulation of air about the web, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

COLUMBUS K. ROGERS.
WILLIAM S. McINTIRE.

Witnesses:
HENRY E. COLLINS,
WALTER B. PERKINS.