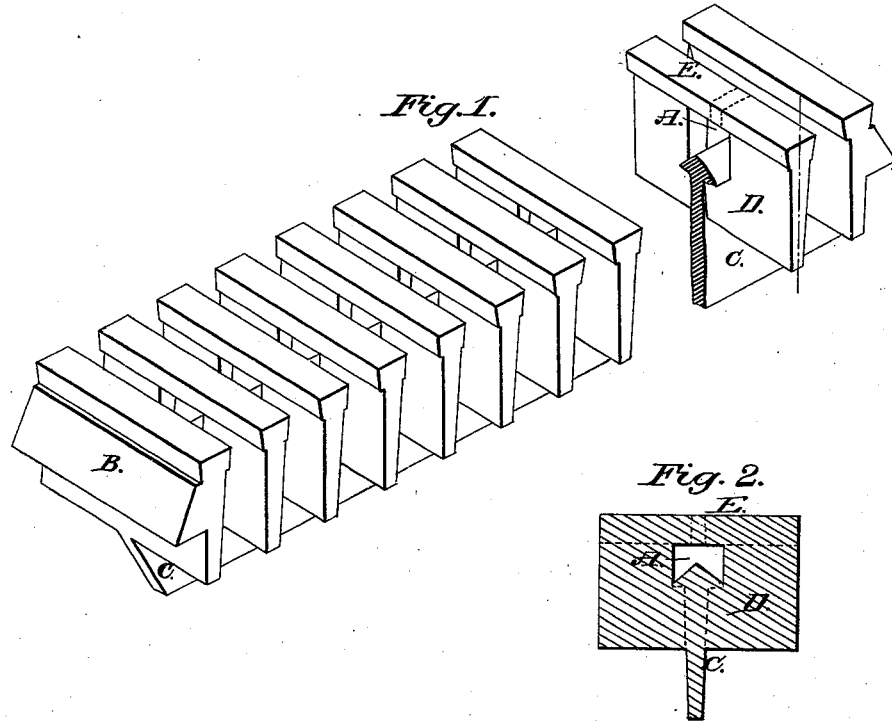


A. W. CRAM.
Grate-Bar.

No. 161,758.

Patented April 6, 1875.



Witnesses:

Milton Chase
S. C. Morse,

Inventor:

Alouzo W. Cram

UNITED STATES PATENT OFFICE.

ALONZO W. CRAM, OF HAVERHILL, MASSACHUSETTS.

IMPROVEMENT IN GRATE-BARS.

Specification forming part of Letters Patent No. **161,758**, dated April 6, 1875; application filed January 20, 1875.

To all whom it may concern:

Be it known that I, ALONZO W. CRAM, of Haverhill, in the county of Essex and State of Massachusetts, have invented certain Improvements in Grate-Bars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing and the letters of reference marked thereon, making part of this specification, in which—

Figure 1 is a perspective view of a grate-bar, partly in section. Fig. 2 is a vertical cross-section of the same.

The object of my invention is to provide for the uneven expansion and contraction, and to prevent the warping and twisting, in grate-bars; and consists in making the grate-bars of a longitudinal central web or main bar, provided with short transverse side bars, with an open space or hole left through them, so as to leave the face of the central web free for the circulation of air its entire length, by which the radiation of the heat is broken or prevented in descending, and the heat is more regularly distributed.

The construction and operation of my invention are as follows: C is the longitudinal central web or main bar, provided with the short transverse side bars D, extending each side of the web C, and upon them the fuel is placed. Through the side bars D an opening or space, A, is made, immediately over the central web C, to allow a free circulation of

air over the upper surface of said web, its entire length, by which the radiation of the heat from above is prevented, or checked in its descent, and the grate-bars will not warp or bulge, as the uneven expansion and contraction are obviated. The upper face of the web C is beveled off to prevent the accumulation of ashes, &c., and an inclined piece, B, at each end serves as the bearing on the usual bearing-bars, and by its inclined end it prevents the ashes or coal from blocking in at the ends of the bars when cool, and allows for a free expansion thereof.

In some cases, when the side or cross-bars D are very long, a short space, E, may be left to allow them to expand, thereby avoiding any lateral strain on the web C, as the cross-bars are exposed to the greatest heat, and will therefore expand more than any other portion of the grate-bar.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The cross-bars D, provided with the opening A, in combination with the main supporting-bar C.

2. The cross-bar D, provided with the space E and opening A, in combination with the main supporting-bar C.

ALONZO W. CRAM.

Witnesses:

MILTON CHASE,
S. E. MORSE.