# Grisrold & Thomson,

## Furnace-Grate Bar.

No. 81,161. Patented Aug. 18, 1868.

Fig. 1

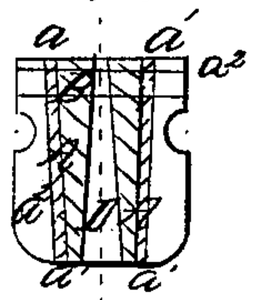



Fig. 2

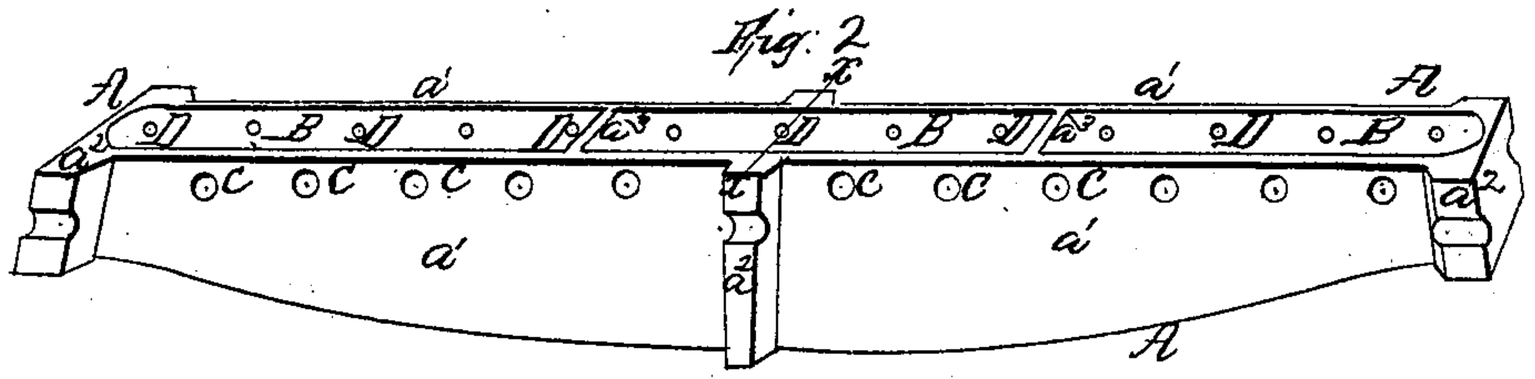
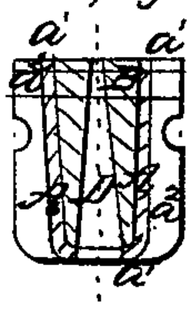



Fig. 3.

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# UNITED STATES PATENT OFFICE.

JOHN W. GRISWOLD AND EDGAR L. THOMSON, OF PHILADELPHIA, PA.

## IMPROVEMENT IN GRATE-BARS.

Specification forming part of Letters Patent No. **81,161,** dated August 18, 1868.

*To all whom it may concern:*

Be it known that we, JOHN W. GRISWOLD and EDGAR L. THOMSON, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Grate-Bars; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical cross-section of our improved grate-bar, taken through the line *x x* of Fig. 2. Fig. 2 is a perspective side view of the same. Fig. 3 is the same section as Fig. 1, showing a modified form of the bar.

Similar letters of reference indicate like parts.

Our invention has for its object to furnish an improved grate-bar, constructed in such a way as to cause a more perfect combustion of the fuel, to prevent the bar from being burned or destroyed by the heat, to prevent, in a great degree, the formation of clinkers, and which shall, at the same time, be lighter than the ordinary solid bar.

It consists in the combination of a non-conducting material with a cast-iron shell or frame, and in perforating the bar thus constructed with vertical conical holes, the whole being constructed and arranged as hereinafter more fully described.

A is the iron frame or shell of the bar, which consists of two side plates, $a^1$, connected to each other at their ends, and provided with lugs $a^2$ at their sides, in the ordinary manner. The side plates $a^1$ are also connected to each other by cross-partitions $a^3$, as shown in Fig. 2. The iron bar A may be open at both top and bottom, as shown in Fig. 1, forming a frame, or it may be closed at the bottom, as shown in Fig. 3, forming a shell. The space or cavity between the side plates $a^1$ is filled with some non-conducting material B, such as fire-clay, plumbago, gypsum, &c., as shown in Figs. 1, 2, and 3.

C are holes formed horizontally through the bar A and filling B, near the upper edge of the bar, as shown in Fig. 2, to form air spaces or passages.

D are conical holes extending vertically through the bar, and terminating in small holes in the upper edge of the bar, forming air-passages, which tend to keep the bar cool, and at the same time heat the air before it comes in contact with the fuel, thus promoting the more perfect combustion of the fuel, and preventing, in a very great degree, the formation of clinkers.

In the construction of our grate-bar we use the non-conducting material as a fixed core, around which the iron is cast, so that when the bar leaves the sand it is finished and ready for use. The core is not removable.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

Perforating the bar A B, constructed as described, with vertical conical holes D, substantially as herein shown and described, and for the purpose set forth.

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