C. WHITTIER.

FURNACE GRATE.

No. 52,236. Patented Jan. 23, 1866.

Fig: 1

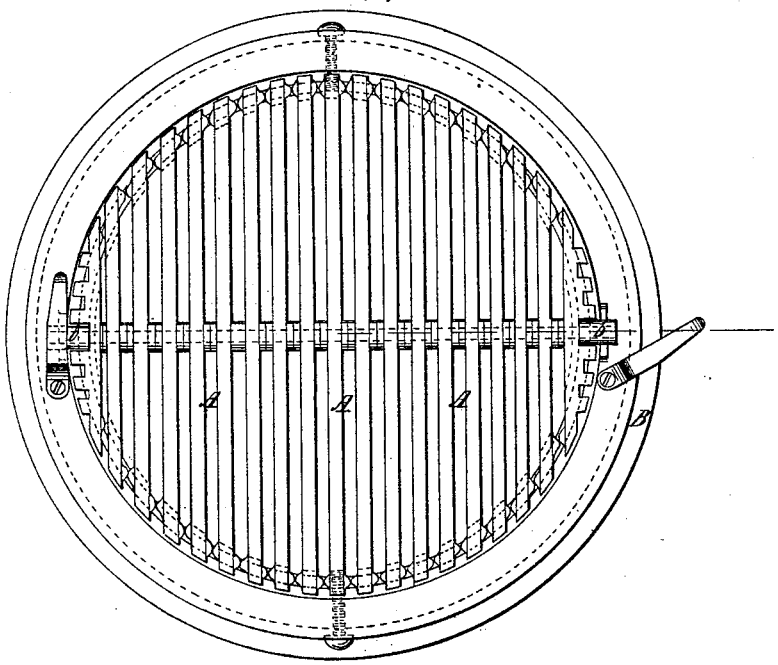
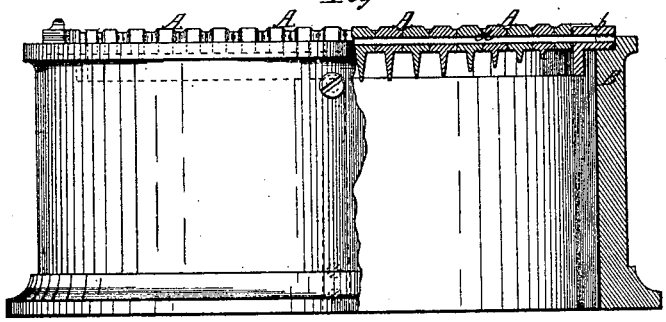


Fig: 2.



Witnesses.

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THE NORRIS PETERS CO. PHOTO-LITHO. WASHINGTON D. C.

UNITED STATES PATENT OFFICE.

CHARLES WHITTIER, OF ROXBURY, MASSACHUSETTS.

IMPROVEMENT IN FURNACE-GRATES.

Specification forming part of Letters Patent No. **52,236**, dated January 23, 1866.

To all whom it may concern:

Be it known that I, CHARLES WHITTIER, of Roxbury, in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in Furnace-Grates; and I 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 represents a plan or top view of this invention; Fig. 2, a sectional side elevation of the same.

Similar letters of reference indicate like parts.

A represents a series of thin cast-iron grate-bars, the ends of which are supported by the frame or hoop B. This frame or hoop is also made of cast-iron, or it may be made of any other suitable material, and the grate-bars are retained in their proper relative positions by a light iron rod, *a*, which runs through the center of the trunnions *b* of the grate-frame. This rod may be made to pass through holes in the grate-bars, or each grate-bar may be provided with a notch or recess, through which the rod passes. By thus supporting the grate-bars in the center while their ends are free the expansion takes place from the center outward, and the bars are not liable to warp or crack. They may be made with safety less than one-half the weight of the ordinary grate-bars, and they are much more durable. By making them thin and light they do not expand unequally, as the heat is diffused equally over the bar. A grate made upon this plan can be dumped instantly, if required, which is a great advantage, especially on steam fire-engines.

Being extremely light and open, my grate gives a great amount of air-space, and it can be used with advantage on locomotive, portable, and stationary boilers. The hoop or frame to support a grate for a thirty-inch furnace is made from one and a half by half inch flat iron, the trunnions one inch diameter, and the retaining-rod three-eighths of an inch. The whole weight of such a grate is sixty pounds cast-iron.

I claim as new and desire to secure by Letters Patent—

Hanging a series of grate-bars loosely on one or more rods passing transversely through or under them, substantially as described, whereby the grate-bars are allowed a free expansion from the center.

CHARLES WHITTIER.

Witnesses:
M. M. LIVINGSTON,
C. L. TOPLIFF.