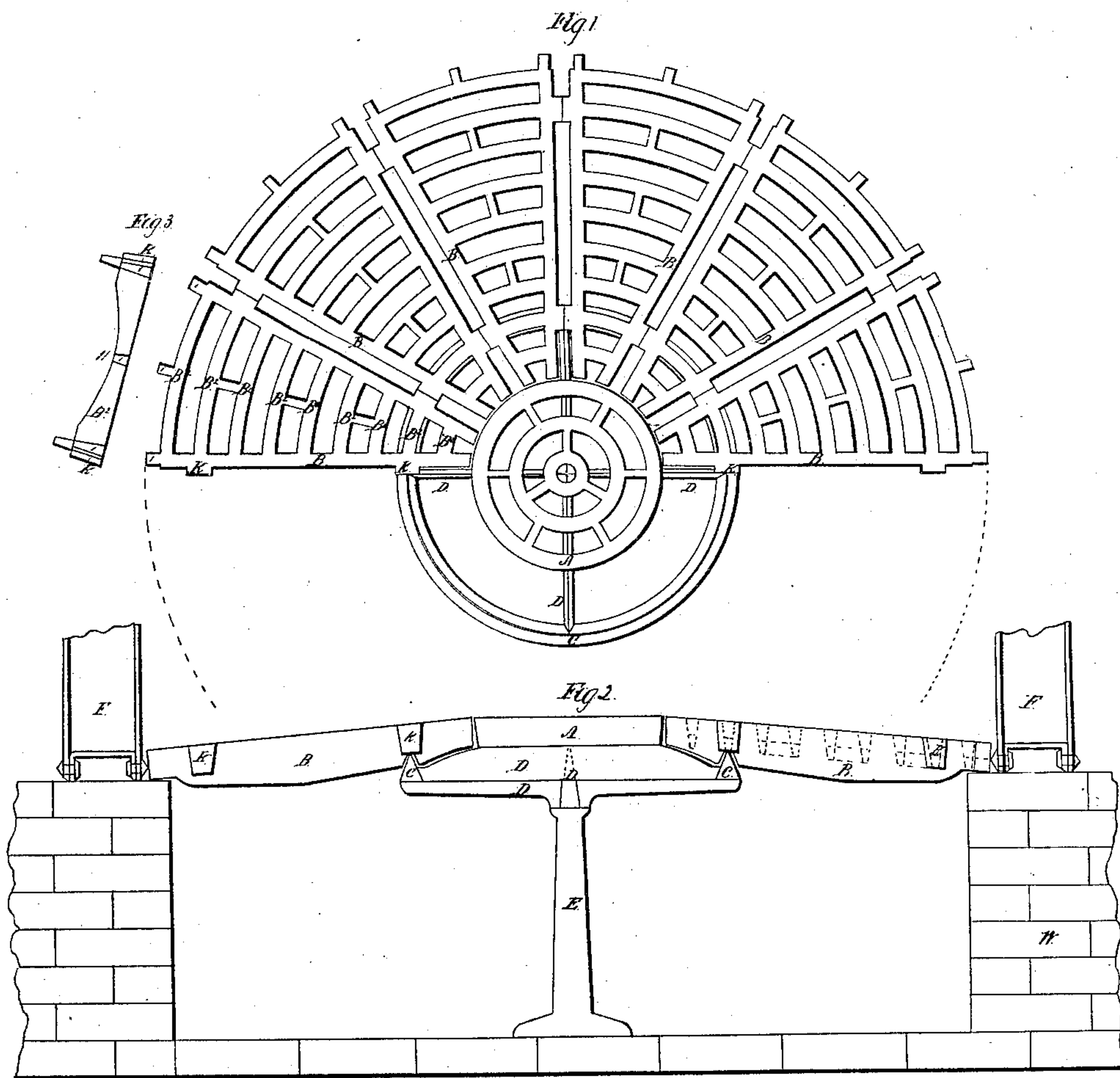


G. L. Smith.

Grate.

N^o 69,134.

Patented Sep. 24, 1867.



Witnesses.
W. W. Supper
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GEORGE L. SMITH, OF BROOKLYN, NEW YORK.

Letters Patent No. 69,134, dated September 24, 1867.

CIRCULAR GRATE 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, GEORGE L. SMITH, of Brooklyn, in the county of Kings, and State of New York, have invented a Circular Grate for Furnaces; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan view of one-half of the circular grate.

Figure 2 is a diametrical section through the grate.

Figure 3 is a view of the outer end of the grate-segments or sections.

Similar letters of reference indicate corresponding parts in the several figures.

The object of this invention is to produce a circular grate for the circular furnaces of upright boilers, in such manner that every bar and part composing the grate shall have freedom to expand and contract, thereby preventing a warping or sagging of the bars of the grate or frame thereof, and consequent rapid destruction of the grate. Another object is to provide for removing and renewing any one or more of the sections composing the grate when one or more of the sections become useless from long use; also to provide a central independent support for the sections of the grate, which is so constructed as to prevent a depression or sinking of the central portion thereof, all as will be hereinafter explained.

To enable others skilled in the art to understand my invention I will describe its construction and operation.

In the accompanying drawings I have represented a circular grate, which is elevated in the centre so that its surface inclines from the centre to the circumference, but, if desired, this grate may be made with its surface flat, so that the top surfaces of all the sections of which it is composed will all be in the same plane. The grate is composed of a number of segments, B B, surrounding a circular-grated section, A, which latter forms the central piece of the grate, as shown in figs. 1 and 2. The central piece A, and also the inner ends of the surrounding segments B, are supported upon the acute edges of double-bevelled bars C D, or what are termed V bearers. This central support is mounted upon a pedestal, E, and constructed with radial ribs united at their outer ends to the circular bearer, so as to afford a firm support for preventing the central portion of the grate from sagging, and at the same time to allow of a free upward passage of air. The central circular-grate section A is constructed of one or more concentric rings, united by intermediate radial ribs, as shown in the drawings, fig. 1. The sections B B surrounding this central section are each composed of radial side bars, united by a number of curved ribs or bars, B², which are concentric to the axis of the centre-piece A. These concentric ribs B² are arranged at regular intervals apart, and the longest ones, which are nearest the circumference of the grate, are strengthened by intermediate ribs uniting the former in pairs, as shown. The lower edges of the concentric ribs of the segments B are arched, as clearly shown in the outer end view, fig. 3, of one segment, for the twofold purpose of weakening the casting at the middle of its width, or in the middle of each one of the concentric bars or ribs, so that expansion will more readily centre at such point, and thus relieve any tendency to strain and spread the segment by intense heat. The arched bars allow of a free circulation of air over the bearer C, and also allow the ashes which would otherwise clog between the outer ends of the segments and the boiler F, to pass freely through or between said bars to the ash-pit. In the vertical cross-section, fig. 1, it will be seen that the central section A is supported upon the V-shaped bearers or arms D of the circular bearer C, and that the inner ends of the side bars of the surrounding segments B are notched over this circular bearer, so as to be held in place against endwise displacement. The outer ends of these segments are supported upon the masonry at the base of the furnace, so as to allow of any longitudinal expansion which will take place.

I am aware that it is not new in circular furnaces to employ circular grates composed of separate sections, as an instance of this kind will be found in the upright "Corlis Boiler," and I am also aware that rectangular grate surfaces have been composed of a number of rectangular sections supported upon V bearers, and these contrivances I do not claim as my invention. I have so constructed a circular grate, of independent segments or sections surrounding a central circular section, that the air-openings or spaces between the ribs of each section will always be preserved of a uniform size, and the strain and hitherto injurious results of expansion of grates are in my grate entirely prevented.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The construction of a circular grate of a series of segments or sections, B, surrounding a central section, A, substantially as described.
2. The construction of the segments B, with concentric and arched cross-bars B², substantially as described.
3. An independent central support for the section A and segments B of a circular grate, constructed substantially as described.

Witnesses:

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