

(No Model.)

J. A. PRICE.
FURNACE GRATE.

No. 312,293.

Patented Feb. 17, 1885.

Fig. 2.

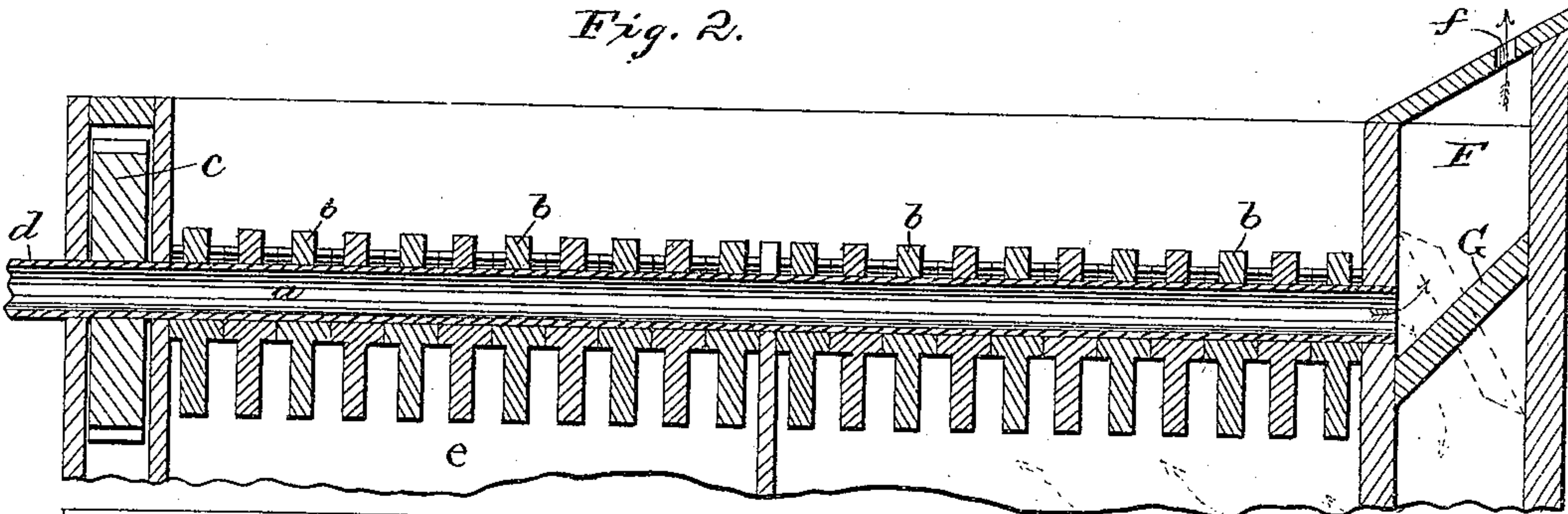


Fig. 1.

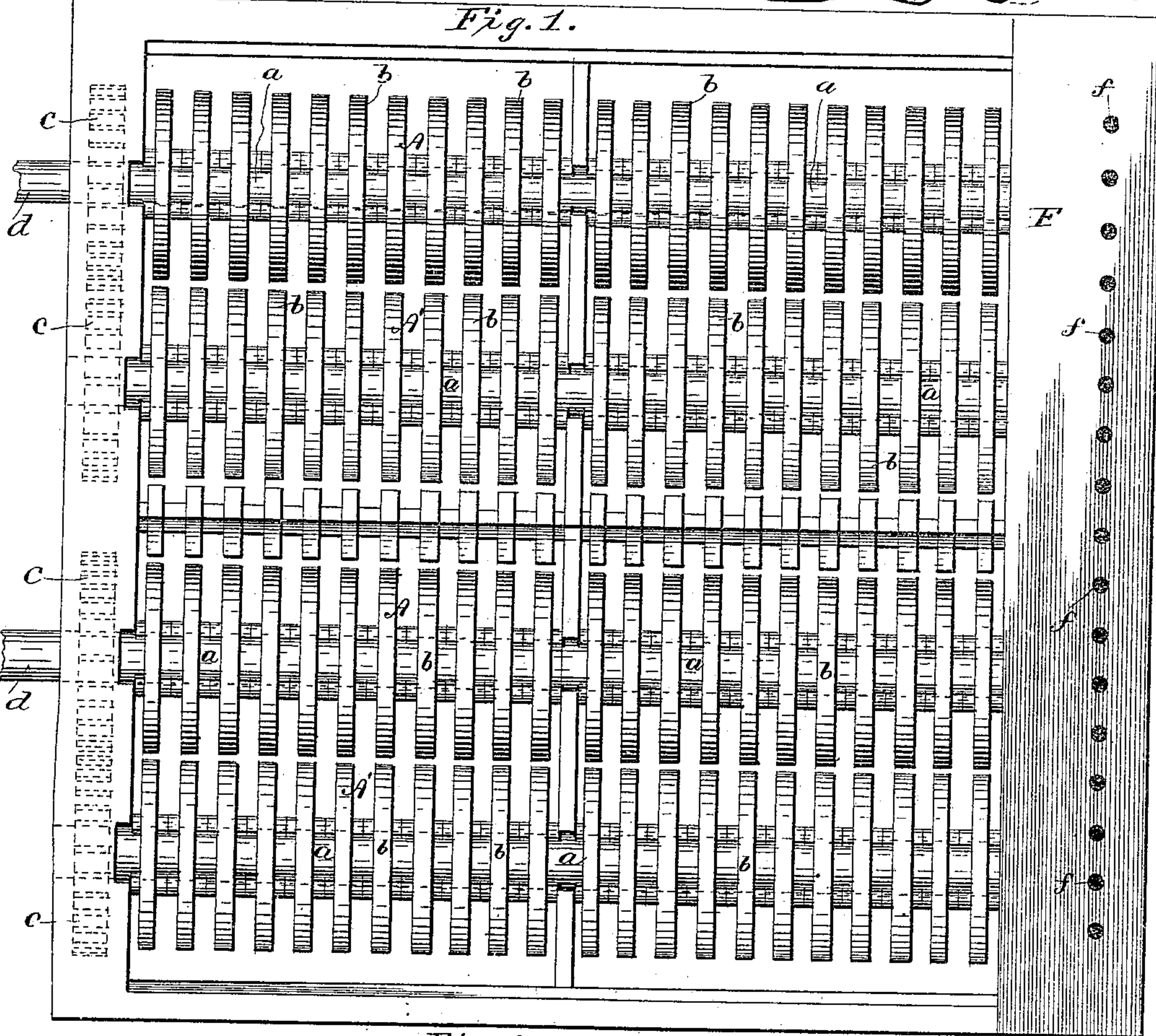


Fig. 3.

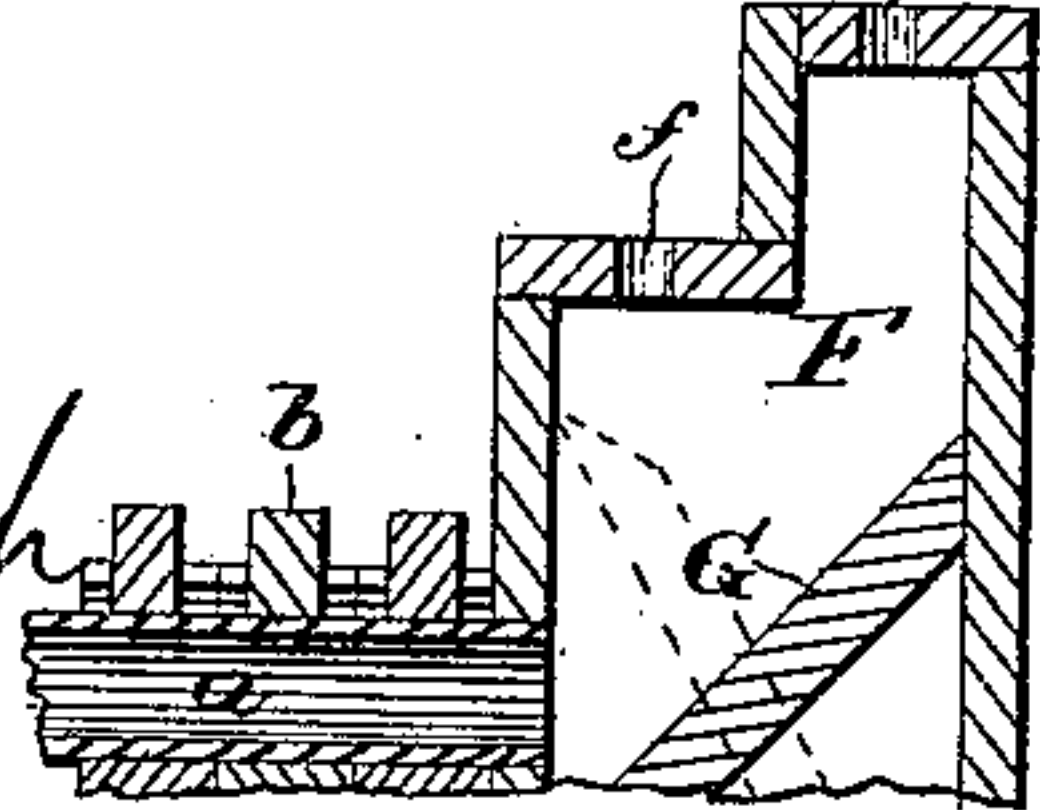
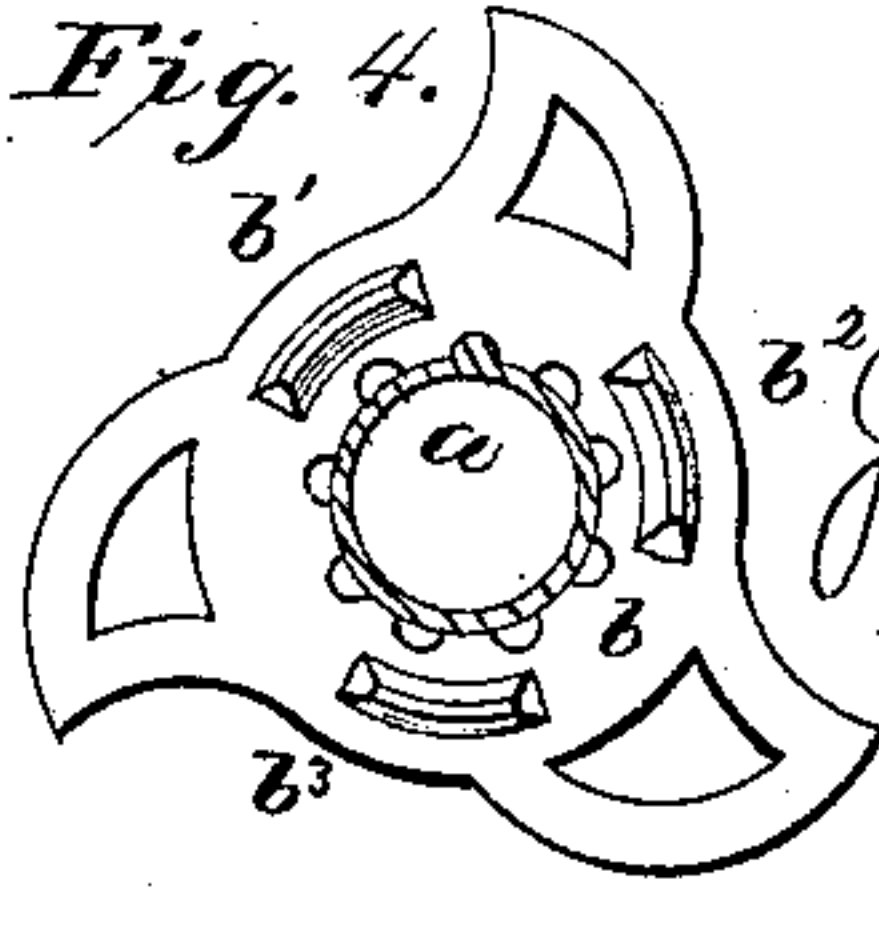


Fig. 4.



WITNESSES

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FURNACE-GRATE.

SPECIFICATION forming part of Letters Patent No. 312,293, dated February 17, 1885.

Application filed July 12, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. PRICE, of Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Furnace-Grates; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

This invention relates particularly to that class of grates in which the fire-supporting arms or bars are mounted upon shafts made tubular for the circulation of air through them, as shown in the patent to Price and Wright, dated February 12, 1884, No. 293,274; and it has for its object, first, to utilize the air passed through and heated by the tubular shafts of the grate, by conducting it through a suitable bridge-wall and discharging it into the body of wholly or partially unconsumed gases and other products passing off from the fire-bed of the furnace, so as to cause the burning of such gases and products by supplying additional oxygen thereto, all as will be farther on described. It has farther for its object to provide means whereby the air circulated through the shafts of the grate may be diverted into the ash-pit, and thence up through the fire when it is not desired to pass it up through and out of the bridge-wall, thus providing for a free circulation through the grate-shafts under all circumstances, and preventing the warping and cracking of the latter by the heat of the fire, as will be hereinafter fully explained.

Referring to the accompanying drawings, Figure 1 represents a plan view of a furnace and grate embodying my invention; Fig. 2, a longitudinal section of the same, taken on the line *x x*, Fig. 1. Fig. 3 is a detail view of a modified form of bridge-wall; Fig. 4, a sectional view taken on the line *y y*, Fig. 1, showing a cross-section of one of the tubular shafts and one of the fire-supporting arms or sections mounted thereon.

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

The letters *A A'* indicate the several sections of which the grate is composed, each section consisting of a tubular shaft, *a*, armed

with a series of fire-supporting arms or collars, *b*, such as shown in Fig. 4. Suitable gears, *c c*, connect the sections in pairs, and the shaft of one of the sections of each pair is prolonged through the casing, as shown at *d*, and is preferably formed to receive the handle by which the pair of sections is rotated. The form of the arms or collars *b* is such that they present three separate supporting-surfaces to the fire—viz., *b'* *b''* *b'''*—as seen in Fig. 4, and each time one surface is turned down a portion of the lower part of the contents of the fire-chamber is cut out and dumped into the ash-pit *e* below, a new supporting-surface being immediately presented to the fire similar to the one turned down.

F indicates a hollow bridge-wall extending from side to side of the furnace, and located at the rear of the fire-chamber, as shown in Figs. 1 and 2. This bridge-wall may be made slanting on top, as shown in Fig. 2, or of the form shown in Fig. 3, or of any other suitable form. Whatever be its form, it is provided with one or more series of perforations, *f f*, at the top, as shown. Within the bridge-wall is preferably arranged a valve, *G*, controlled from without by a stem, *g*. When this valve is turned into the position shown in full lines, Fig. 2, the air passing in through the tubular shafts *a* is discharged into the hollow bridge-wall, and passes thence in a highly-heated condition, due to its contact with the shafts and with the bridge-wall, out through the perforations *f* at a point where it commingles with the unconsumed gaseous and other products passing off of the fire, causing the latter to be entirely consumed, thus greatly economizing fuel and reducing the amount of smoke to a minimum. The heating of the air before discharging it from the bridge-wall decreases little if any its oxygenating effect, and it is advantageous in that the delivery of it in that condition does not tend to materially lower the temperature of the gases desired to be consumed. Through the heating of the air by the tubular shafts the latter are to such an extent cooled as to prevent their being warped or cracked by the heat of the fire, or in any way affected so as to interfere with their free rotation in their bearings. When the valve is turned into the position indicated by the

dotted lines, Fig. 2, the heated air, being unable to ascend, is caused to pass down into the ash-pit and up through the grate into the fire, as indicated by the dotted arrows. The circulation of the air through the shafts being thus preserved, no damage results to the latter, as would be the case were the circulation entirely cut off.

Having thus described my invention, what I claim as new is—

The combination of the hollow shafts of the grate-sections, the hollow perforated bridge-

wall, and the valve in the bridge-wall for directing the air entering through the hollow shafts either directly out at the top of the bridge-wall, to mingle with the products of combustion from the fire, or down into the ash-pit and upward between the grate-bars, substantially as described.

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Witnesses:

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