A. LAWRENCE.

FURNACE-GRATE.

No. 192,073. Patented June 19, 1877.

Fig. 1

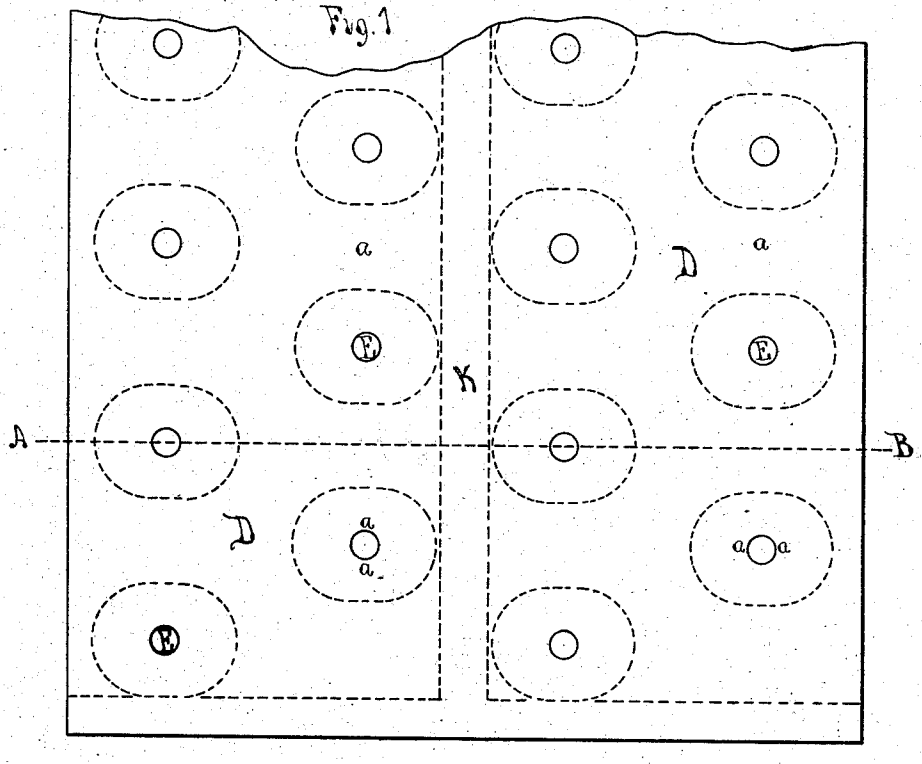
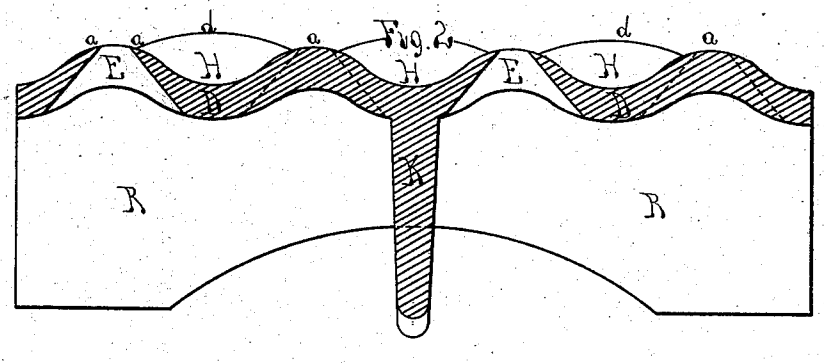


Fig. 2



Witnesses

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ALVIN LAWRENCE, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO HIMSELF AND J. KNOX FOSTER, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN FURNACE-GRATES.

Specification forming part of Letters Patent No. **192,073**, dated June 19, 1877; application filed December 11, 1875.

To all whom it may concern:

Be it known that I, ALVIN LAWRENCE, of Lowell, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Grates for Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 represents a plan or top view of a portion of one of my improved furnace-grates, and Fig. 2 a vertical cross-section on the line A B of Fig. 1.

This invention relates to furnace-grates which are used when burning dust-coal or finely-broken coal by means of a blast of air forced upward through the grate and the dust-coal thereon.

This invention has for its object the production of a furnace-grate for burning dust-coal by air-blast, and which, by its peculiar construction, shall retain upon its upper corrugated surface sufficient of the ashes of the burned coal to form a non-conductor of heat and protect the grate, the air-blast passing upward through funnel or cone shaped perforations, smallest at the upper surface of the grate, and formed and opening out through the crown or highest part of the corrugations on the upper side and between the ash-filled valleys, so that the air-blast will not disturb the ashes, and at the same time producing an ash-loading and self-protecting grate, whose upper surface is easily raked or cleared of the cinders, clinkers, or other matter without removing the ashes from the valleys between the perforations.

This invention consists of a longitudinally-corrugated furnace-grate, constructed with ash-receiving valleys between rising ridges or swells, which are perforated through their highest surfaces for the passage of air between the ash-valleys and upward through coal upon the grate, the air-blast preventing the grate-surface becoming highly heated around and near the perforations, and the ashes collecting or accumulating in the valleys prevent the grate-surface or structure between the perforations becoming heated to a high degree.

In the said drawings, D represents the longitudinally-corrugated plate, which forms the grate, and which supports the dust-coal burned upon its upper surface. This corrugated plate D has numerous funnel or cone shaped perforations, E, formed through the plate and opening out through the top of each rising swell, *a*, or highest point of each upper corrugated surface, and centrally between the ash-valleys H, which, after the dust-coal fire has been continued for a short time, become filled with ashes to about the height of the curved lines *d*, (seen in Fig. 2,) and thus protect the grate from the extreme heat of the blast-fed fire above, while the air-blast, passing through the perforations, has a tendency to keep the iron cool around them.

The upper surface of the grate is so constructed as to admit of its being easily raked or cleared of cinders, clinkers, or other spent substance from the burned dust-coal without removing the ashes, or much of the ashes, in the valleys H, between the perforations, which are intended to be from one-fourth to one-half of an inch in diameter, where they open out at the top of the swells *a*, or according to the fineness of the dust-coal to be burned on said grate, and the distance from one perforation to another across the grate will be governed by the distance between the tops of the swells *a*, and their distance apart on the longitudinal line of each swell may be about two inches; a little more or less will make no important difference.

One or more longitudinal ribs, K, depend from the under side of the grate to support the latter with rigidity, and end plates R, cast in one with the grate, provide for setting it on a wall or a bar above the ash-pit of the furnace.

I claim as my invention—

A longitudinally-corrugated furnace grate, constructed as described, with ash-receiving valleys H between rising ridges or swells *a*, which are perforated through their highest surfaces, substantially as and for the purpose described.

ALVIN LAWRENCE.

Witnesses:

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