

(No Model.)

R. S. RICHARDS.
FURNACE GRATE.

No. 433,491.

Patented Aug. 5, 1890.

Fig. 1.

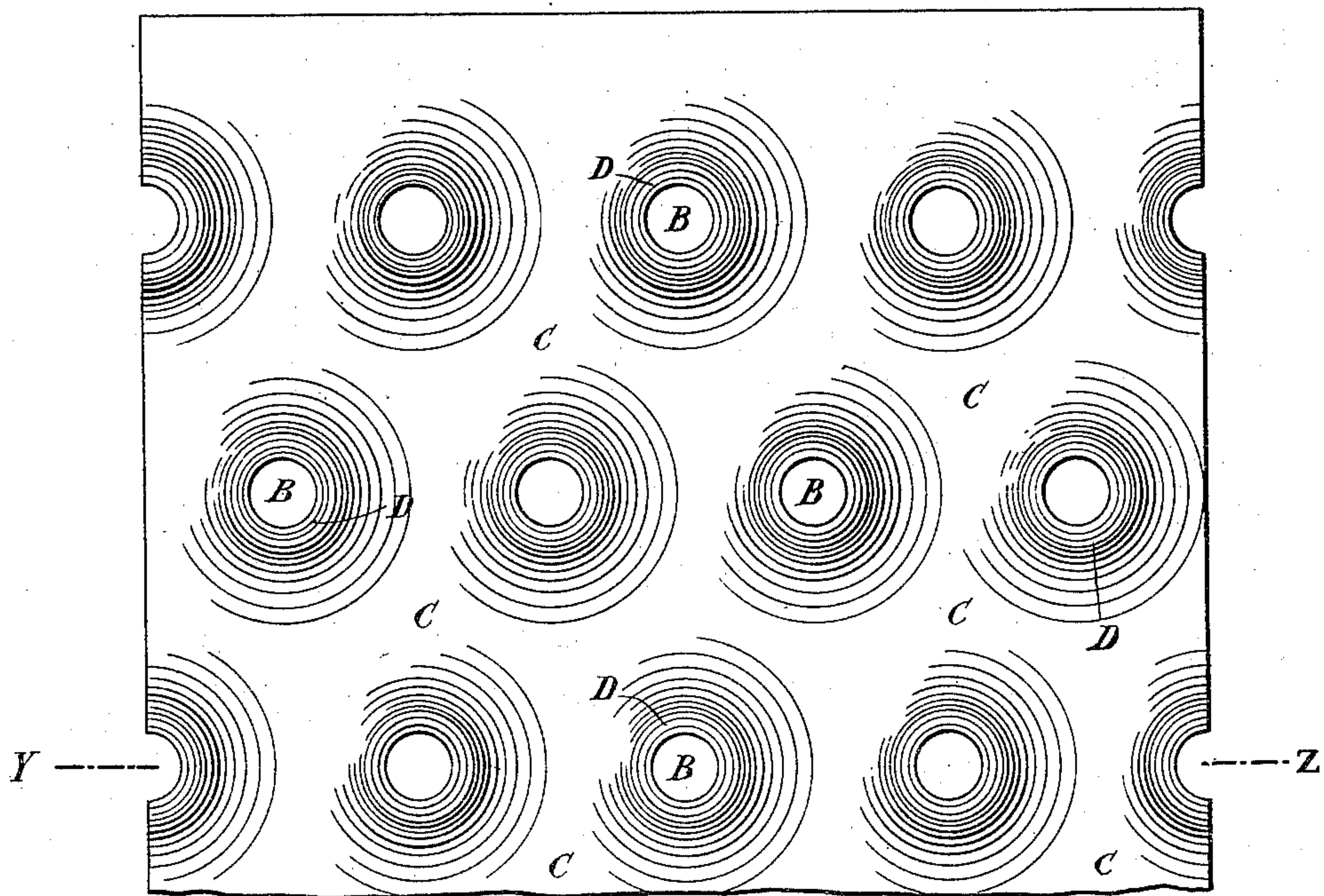
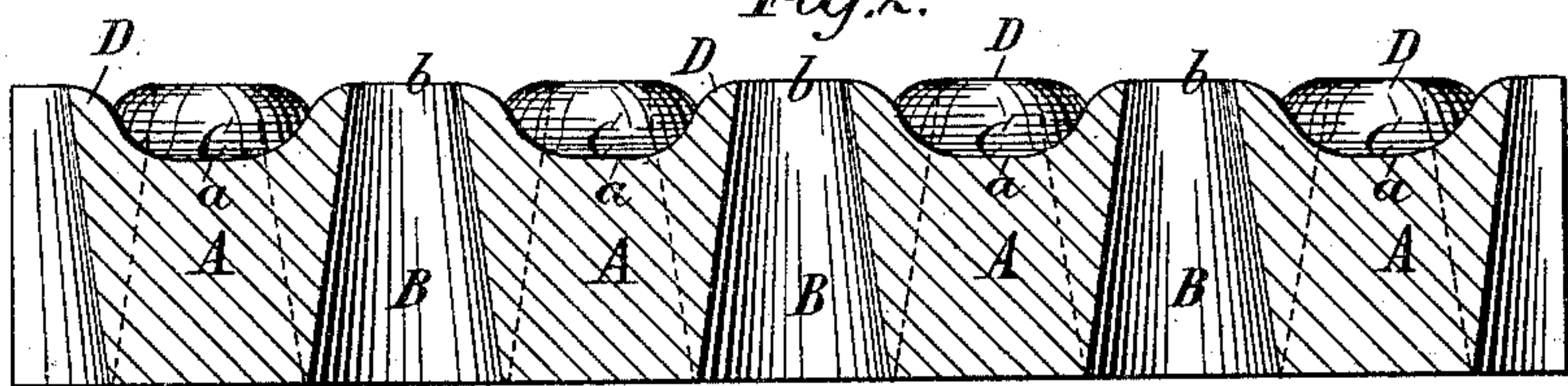


Fig. 2.



Witnesses:
Hermann Bormann.
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att'y.

UNITED STATES PATENT OFFICE.

RICHARD SLOANE RICHARDS, OF LONDON, ENGLAND.

FURNACE-GRATE.

SPECIFICATION forming part of Letters Patent No. 433,491, dated August 5, 1890.

Application filed May 14, 1890. Serial No. 351,803. (No model.) Patented in England March 16, 1889, No. 4,603.

To all whom it may concern:

Be it known that I, RICHARD SLOANE RICHARDS, a subject of the Queen of Great Britain, residing at London, England, have invented certain new and useful Improvements in or Relating to Furnace-Grates, (for which I have obtained a patent of Great Britain, No. 4,603, dated March 16, 1889,) of which the following is a specification.

My invention relates to the use in a furnace of a perforated plate of a particular construction in lieu of the ordinary fire-bars.

Previous to my invention it had been proposed to form a grate of a rectangular-shaped plate with deep longitudinal channels therein, and projecting tubular air-passages formed in the walls adjacent to said channels and having the surface between the projecting tubular air-passages recessed or cut away laterally; but in practice such form of grate presented many objectionable features, among which principally that of the live or highly-heated coal and clinker rapidly collecting in the longitudinal channels and transverse recesses of the grate, and thereby causing the same to warp and soon to be rendered useless.

The principal object of my invention is to provide a cheap, durable, and effective grate composed of a flat or plain plate having air-openings arranged at suitable distances apart and extending through the body thereof, and with rims or nozzles surrounding the upper surface of said openings, the grate being arranged so that clinker and ash will spread over the surface thereof, and thereby form a covering to protect said plate against the heat of the furnace, and of the same being exposed to rapid deterioration in use through constant contact of live coal with the surface of said plate, as heretofore, causing warping and many other serious or damaging effects.

My invention consists of a grate for a furnace of the character hereinafter described, specifically claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a plan of a portion of a plate constructed according to this invention, and Fig. 2 is a section of the same on the line Y Z. A is a solid portion of the plate, which is

composed of metal, fire-clay, or other suitable material.

B are the conical holes through which the air enters the furnace. The upper surface of the plate A is recessed between the holes B in the manner shown at C, so as to leave the upper ends *b* of the said holes projecting up above the level *a* of the plate proper, each hole being surrounded by a rim or nozzle D, having preferably an easy curve from the upper level *b* of the top of the hole B to the lower level *a* of the surface of the plate or bottom of the recess C, as shown more clearly in Fig. 2. By this construction of furnace-plate it is found that the clinker forms on the surface of the plate at C, thus forming a protective covering for the plate against the intense heat of the furnace, and leaving the holes B clear for the free passage of air through them.

If desired, the holes B, instead of being conical, as shown in the drawings, may be parallel throughout their length.

Although in forming these plates the usual course would no doubt be to mold or cast them complete, I wish it to be understood that, if desired, the nozzles may be made separate from the rest of the plate and secured in any convenient manner.

The rims or nozzles D, though preferably circular, may be made of any desired shape.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

The herein-described furnace-grate, composed of a flat or plain plate having the solid portions A and the apertures B extending through the body of said plate, and having rims or nozzles D applied or formed integral with the upper extremities of said apertures, all arranged as shown, and for the purposes set forth.

In testimony whereof I have hereto set my hand in the presence of two subscribing witnesses.

RICHARD SLOANE RICHARDS.

Witnesses:

ALFRED J. BOULT,
HARRY B. BRIDGE.