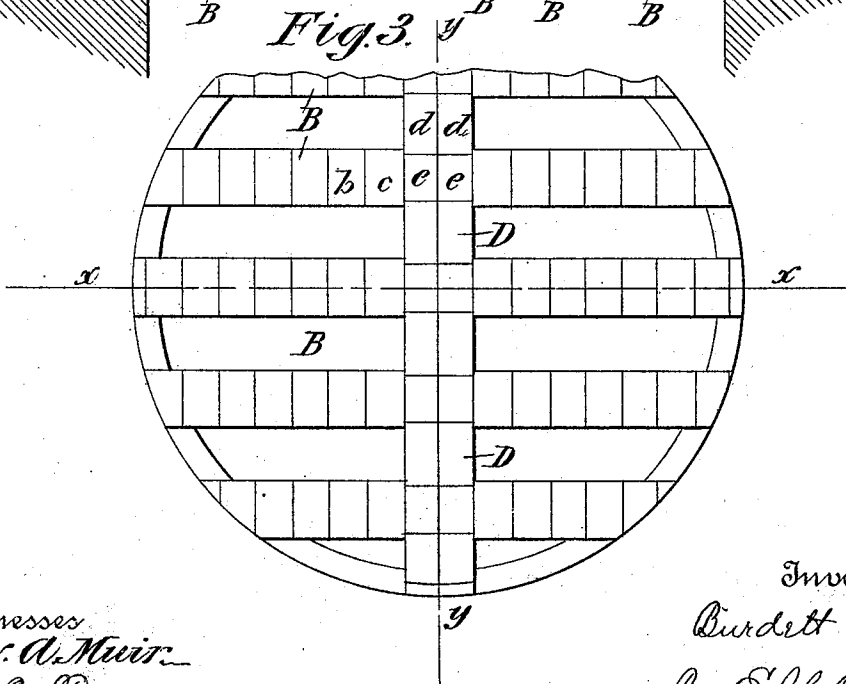
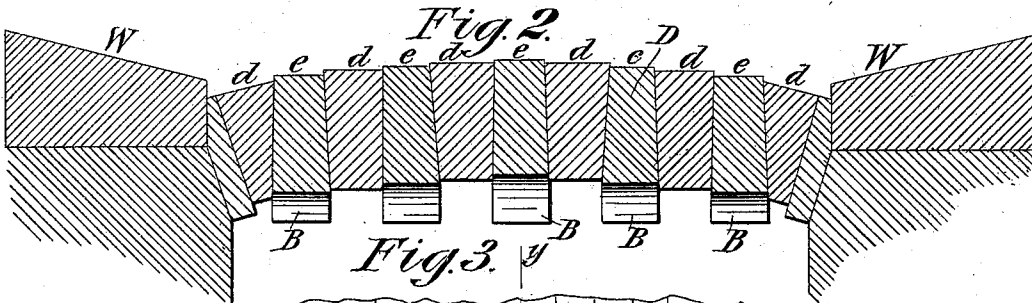
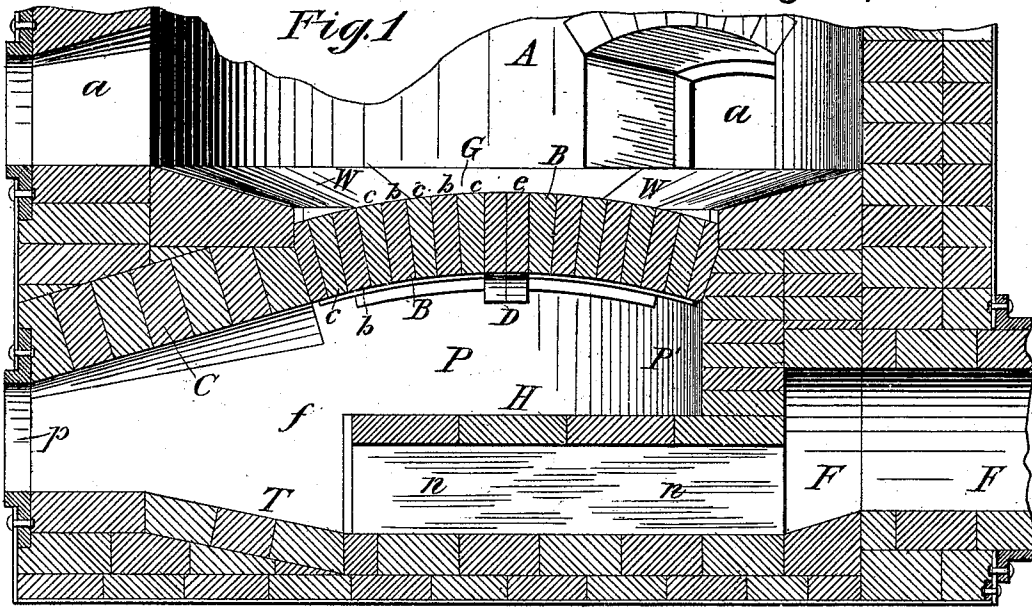


(No Model.)

B. LOOMIS.
FURNACE GRATE.

No. 503,211.

Patented Aug. 15, 1893.



Witnesses
Edw. A. Muir
W. L. M. Grayson

Inventor
Burdett Loomis
By *E. H. Clark*
Attorney

UNITED STATES PATENT OFFICE.

BURDETT LOOMIS, OF HARTFORD, CONNECTICUT.

FURNACE-GRATE.

SPECIFICATION forming part of Letters Patent No. 503,211, dated August 15, 1893.

Application filed November 7, 1890. Serial No. 370,693. (No model.)

To all whom it may concern:

Be it known that I, BURDETT LOOMIS, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, 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 invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improved arched fire brick grate adapted for gas producers used in generating fuel gas to heat steam boilers and for other purposes.

The object of this invention is to provide a hearth which is simple in construction and is much more durable in use than the usual iron grate, and also to provide a hearth which shall be capable of standing a high heat without danger of being melted down by the highly heated fuel gas which passes down through it and thence through a flue leading from the base of the furnace to the base of the steam boiler.

The matter constituting my invention will be described in the claims.

I will now particularly describe my improved construction of grate by reference to the accompanying drawings, in which—

Figure 1 represents a vertical section through the base of the furnace showing my arched brick grate in position, the section through the grate being on the line *x, x*, of Fig. 3. Fig. 2 represents a vertical cross section on the line *y, y*, (Fig. 3) through the main cross bar of the grate. Fig. 3 represents a top plan view of the grate detached from the furnace.

At the base of the furnace A, a part of which is here represented, I construct an annular inclined hearth W, extending inward from the outer wall of the furnace, as shown in Fig. 1, and within the central opening of such hearth I construct the arches forming the grate G. Below the hearth at the front of the furnace I construct an arch C, forming the top of the ash pit P and its opening *p* to the outer door. The rear wall *p'* of the ash pit P, is made semi-circular, as shown, and is supported upon the vertical tile *n*, set at suitable distances apart upon the floor T.

The vertical tile *n* also serves to support the floor H, of the ash pit. The rear wall *p'* closes the ash pit from direct communication at the back with escape flue F, so that the heated gases must pass from the front of the ash pit through a passage *f*, and thence below the floor H, between the vertical tile *n*, on their way to the escape flue F. The lower part of the fuel chamber is provided with openings *a*, above the hearth for giving access to clean the grate and regulate the fire, which openings, in practice, are provided externally with tight fitting doors.

The arched grate is composed preferably of fire brick and is constructed with the main cross bar D, extending diametrically through the middle of the furnace, or through the opening in the inclined hearth W, as shown in Figs. 2 and 3, and of the parallel bars B, which extend in regular order across the opening in the hearth and intersect or join with the main cross bar D, as shown in Fig. 3. The main cross bar D, is preferably arranged at right angles to a plane passing from the front to the rear of the furnace, and the bars B, are arranged so as to extend in parallel lines from the front to the rear of the furnace, so that the fire can be more readily cleaned with a bent bar or poker. The main cross bar is composed of the wide wedge shaped brick *d*, which project at their corners in between the brick of the cross bars B, and of brick *e*, which are made narrower at their upper end than the brick *b, c* composing the arched bars B, so that the bricks are bonded at the junction of the arched grate bars B, with the main cross bar D, as shown in Fig. 3, thus preventing warping and also preventing injury when the fire is cleaned. The arched grate bars B, are composed of alternate, common rectangular fire brick *b*, and of the "bull head" or wedge shaped brick *c*, as shown in Fig. 1.

The grate composed of the bars B, bonded with the brick of the main cross bar D, is very strong and durable, capable of standing a high heat and a great pressure. This grate is securely supported by the arch C, at the front of the furnace and the heavy brick work at the rear.

My improved arch brick grate is intended

for use in a down draft gas producer in which the air for supporting combustion is drawn down through the body of fuel, fresh fuel being supplied at the top, and the resulting gaseous products being drawn off down through the grate and passed through the ash pit and thence through flue F, to a steam boiler or other furnace, where they are burned. Air for burning the fuel gas may be admitted by the opening *p*, at the base of the furnace, or may be admitted into the steam boiler furnace close to the gas inlet ports.

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

1. In combination with the furnace, the parallel brick arches and the main transverse arch composed of brick constructed to interlock and form a bond with the brick of the parallel arches, substantially as described.

2. In a furnace the grate composed of parallel brick arches B and a main transverse in-

tersecting brick arch D, containing brick *e* at the intersections with the parallel arches of less diameter than the brick of such arches, and the brick *d* of arch D, interlocking with the brick *b* of arches B to form a bond, substantially as described.

3. In a furnace the grate composed of parallel brick arches B, formed of bricks *b*, *c*, and the main transverse intersecting brick arch D formed of brick *d* and of brick *e*, placed at the intersections of the arches, and which are narrower at their upper ends than the bricks *b*, *c*, of the arches B, whereby the bricks of the parallel arches and the intersecting arch are caused to interlock and form a bond, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

BURDETT LOOMIS.

Witnesses:

ELLA L. PETTIBONE,
THOMAS M. SMITH.