(No Model.)

M. DOWNER & J. MOHR.

GRATE FOR BOILER FURNACES.

No. 265,039. Patented Sept. 26, 1882.

Fig. 1.

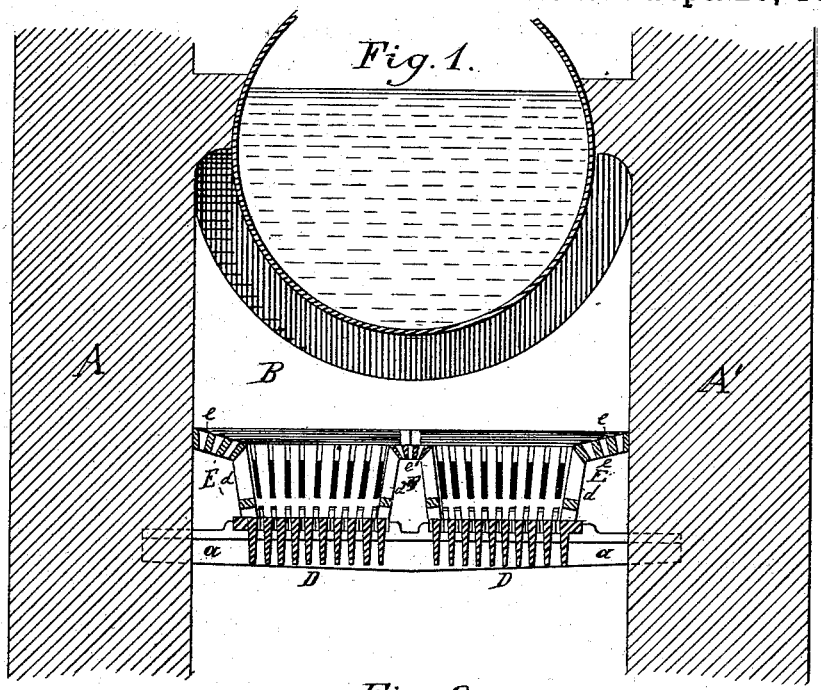
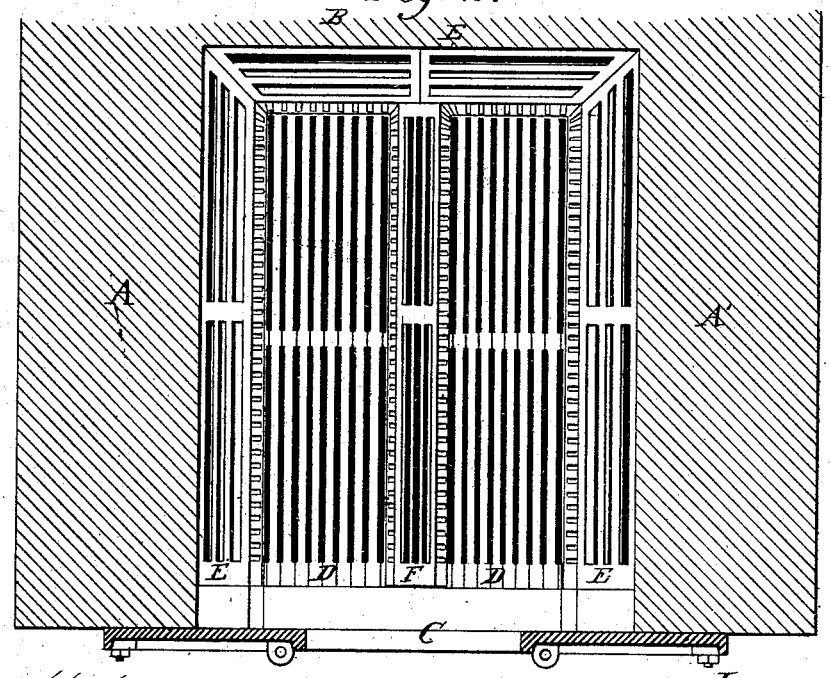


Fig. 2.



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UNITED STATES PATENT OFFICE.

MURILLO DOWNER AND JOSEPH MOHR, OF CHICAGO, ILLINOIS.

GRATE FOR BOILER-FURNACES.

SPECIFICATION forming part of Letters Patent No. 265,039, dated September 26, 1882.

Application filed August 2, 1882. (No model.)

To all whom it may concern:

Be it known that we, MURILLO DOWNER and JOSEPH MOHR, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Grates for Boiler-Furnaces; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The object of our invention is to produce a grate for boiler and other furnaces that will admit air to the fuel not only through the interstices between the grate-bars upon which such fuel rests, but also to the sides and top of such fuel, so as to insure a more perfect combustion of the gases, and to prevent the formation of smoke; and it consists in surrounding the main grate with a vertical grate that is a sufficient distance from the side and bridge walls, and with an inclined grate that covers the spaces between the walls and the vertical grates; also, in intersecting such main grate by two parallel vertical grates that are connected on top by a longitudinal grate, all in a manner that the fuel lies in one or several shallow pockets or baskets of grates that insure free entrance of atmospheric air to such fuel from the bottom to all sides.

In the accompanying drawings, Figure 1 represents a vertical cross-section of a boiler-furnace having our improved grate, and Fig. 2 a plan view of such grate.

Corresponding letters in the several figures of the drawings designate like parts.

A and A′ denote the side walls of a boiler-furnace; B the bridge-wall, and C the boiler-front.

D is the flat grate, composed of a series of longitudinal bars that are supported at their ends upon cross-bars *a* in the usual manner. This grate D is of less dimensions than the distance between the side walls and between the bridge-wall and boiler-front, so as to leave a parallel open margin between such grate and the side and bridge walls. This margin we cover with perforated angular plates E, which are cast in sections to make close joints with each other, and to form a continuous vertical, or nearly vertical, grate, *d*, to the top of the edges of the main grate D, and on top of this vertical grate *d* to form an inclined grate, *e*, that covers the spaces between the furnace-walls and such vertical grates. The vertical grates *d* we prefer to cast with bars having vertical interstices, and the top grates, *e*, with bars having longitudinal interstices for holding the fuel from dropping into the ash-pit, and for admitting a large amount of air to the burning fuel, which air, in passing between or through the heated grates, will be heated itself before admixing with the gases, and thereby such air will be in a favorable condition for readily combining with the hydrocarbon gases generated from the coal, and will make them highly combustible.

The fuel being placed upon the main grate, and thus leaning against the vertical grates, instead of, as heretofore, against the side and bridge walls, the fire-brick linings of such furnace-walls will be saved and protected from being worn and burned out, since no incandescent fuel will be brought in contact with such walls.

Large grate-surfaces we also intersect by a longitudinal grate-box, F, that consists of two parallel rows of nearly vertical bars, *d′*, connected on top by a series of longitudinal bars, *e′*, and in some furnaces we even intend to have a similar vertical grate between the boiler-front and main grate.

The above device, as will be noticed, is very simple in its construction, and does not add much to the expense of a furnace-grate, while its arrangement is such that an ample amount of atmospheric air is admitted to the fuel from the ash-pit without any extra openings or vents in the boiler-front, side, or bridge walls for admitting air above the grate, or any devices for an artificial draft by means of a steam-blast or other agents.

What we claim is—

1. The main grate D in a boiler-furnace, in combination with the sectional perforated angular plates E, consisting of upright grates *d* and inclined top grates, *e*, the whole being constructed and arranged substantially as and for the purpose set forth.

2. In a boiler-furnace, and in combination

therewith, the main grate D, the upright grates E, surrounding said grate D, and the grate-box F, consisting of the vertical bars d' and longitudinal bars e', and intersecting said grates E, all substantially as and for the purpose set forth.

In testimony that we claim the foregoing as our invention we affix our signatures in presence of two witnesses.

MURILLO DOWNER.
JOSEPH MOHR.

Witnesses:
RICHARD G. SCHMID,
EDWARD WESTLAKE.