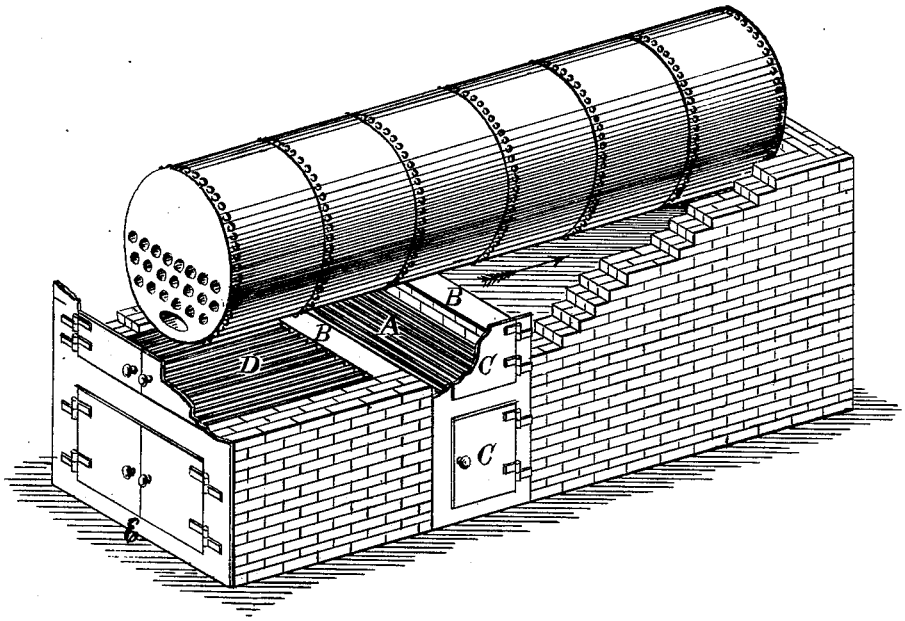
W. M. FISHER.

Smoke Preventing Furnaces.

No. 205,849. Patented July 9, 1878.



Witnesses.
W. M. Shortridge.
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UNITED STATES PATENT OFFICE.

WILLIAM M. FISHER, OF CINCINNATI, OHIO.

IMPROVEMENT IN SMOKE-PREVENTING FURNACES.

Specification forming part of Letters Patent No. **205,849**, dated July 9, 1878; application filed May 27, 1878.

To all whom it may concern:

Be it known that I, WILLIAM M. FISHER, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a certain new and useful Improvement in Smoke-Preventing Furnaces, of which the following is a full, clear, and exact description.

This invention relates to furnaces for steam-boilers where a secondary grate is used directly in rear of the ordinary primary grate for supporting a bed of incandescent coals periodically supplied from the rear end of the primary grate for the purpose of igniting the gases passing over from the primary grate in the form of smoke.

My improvement consists in arranging the secondary grate at right angles or thereabout to the primary grate, and supplying it with currents of fresh air entering at the side of the furnace in the direction of the grate-bars of such secondary grate, by reason of which construction the sheets of flame arising from such secondary grate stand across the current of gases from the primary grate, and, by retarding them, cause their more perfect combustion before they enter the flues of the boiler.

The accompanying drawing illustrates my invention, in perspective, as applied to a steam-boiler.

The steam-boiler shown is provided with the usual grate G at one end, which I call the "primary grate," onto which the fuel is fed through a door by hand, or in any other preferred manner. Immediately in the rear of this primary grate I arrange a secondary grate, A, onto which burning coals are fed from the rear end of the primary grate. The fuel on secondary grate A is continually kept in a bright incandescent state, so that the gases passing over it from the grate G will be ignited and pass in the form of flame to and through the flues of the boiler. To this end the secondary grate A receives fresh air from a separate air-chamber under it to supply the necessary oxygen, said separate air-chamber being formed by dividing the ash-pit under the grates by a partition-wall along their junction. Access to the secondary grate and to the air-chamber under it can be had through suitable doors in the side of the furnace-setting or brick-work.

The grate-bars of the secondary grate are arranged at right angles or thereabout to the grate-bars of the primary grate and to the flue back of the grates, so that the sheets of flame of the secondary grate, by running across the current of gases from the primary grate, tend to retard them sufficiently to give time for their ignition before they pass into the flues.

The partition-wall under the grates extends down to the bottom of the ash-pit, so that all air for the secondary grate enters its separate ash-pit or air-chamber from the side of the furnace in the direction of its grate-bars.

The bridge-wall B is arranged directly in rear of the secondary grate.

I do not claim, broadly, either the use of primary and secondary grates, nor, broadly, the combination with such primary and secondary grates of communicating separate ash-pits.

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination, substantially as specified, of the primary longitudinal grate, the secondary transverse grate, and the solid transverse partition at the junction of the grates dividing the ash-pit down to the bottom, so as to form a separate transverse air-chamber for supplying the transverse grate with fresh air from the side of the furnace.

WILLIAM M. FISHER.

Witnesses:

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