W. J. ALLEN.
Furnace Grate.

No. 199,609. Patented Jan. 29, 1878.

Fig. I.

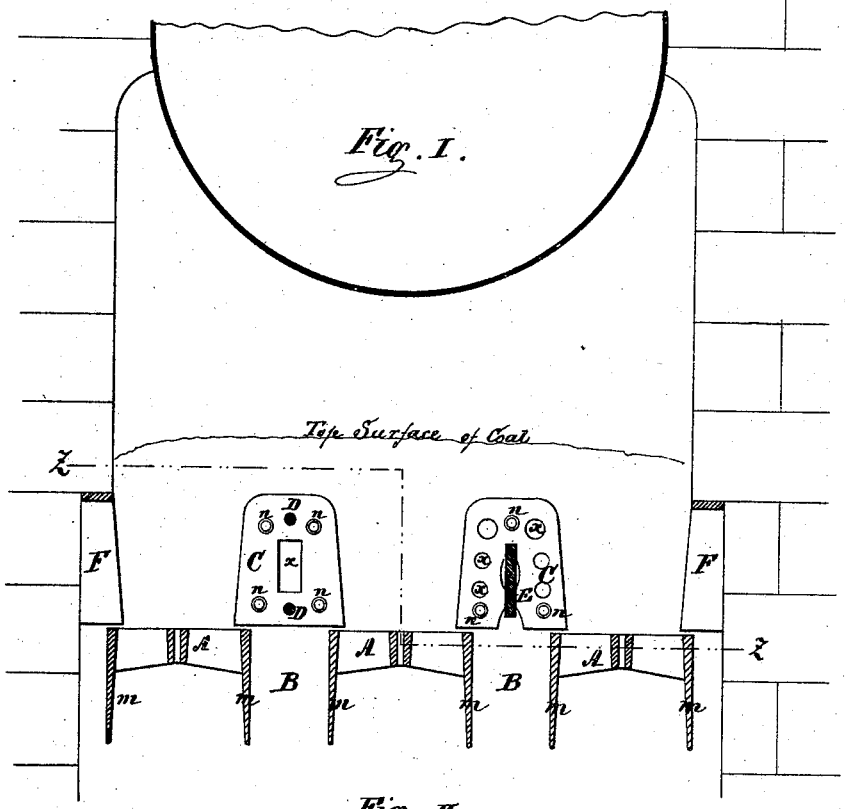
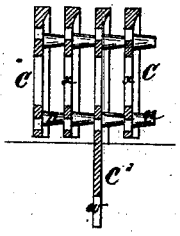


Fig. V.



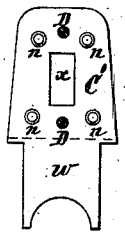


Fig. IV.

Fig. II.

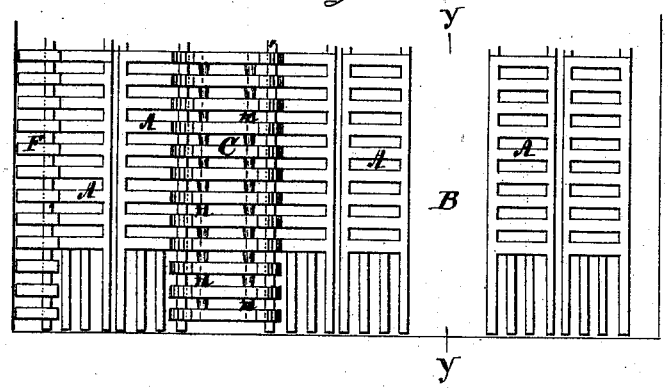
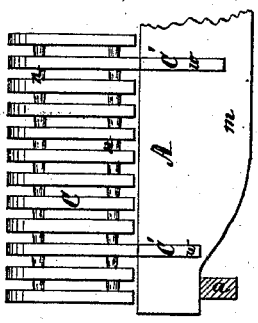


Fig. III.



Witnesses.

Earle H. Smith
William Ehret.

Inventor:

William J. Allen
per Henry E. Roeder
Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM J. ALLEN, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF HIS RIGHT TO HENRY THOMPSON, OF JERSEY CITY, N. J.

IMPROVEMENT IN FURNACE-GRATES.

Specification forming part of Letters Patent No. **199,609**, dated January 29, 1878; application filed October 25, 1877.

To all whom it may concern:

Be it known that I, WILLIAM J. ALLEN, of New York, in the State of New York, have invented a new Improvement in Grates for Steam-Boiler and other Furnaces, which improvement is fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure I represents a cross-section of a grate arranged for a steam-boiler. Fig. II is a top view and section of the same at line *z z*, Fig. I. Fig. III is a longitudinal section of part of its length at line *y y*, Fig. II.

The object of my invention is to construct a grate for steam-boilers and other furnaces to enable the burning of very fine coal, for which purpose I combine with ordinary horizontal grate-bars raised or elevated bars, so as to divide the body of the coal, and thus increase the surface for the admission of air to the coal to be burned.

My invention further consists in the construction of these raised or upper bars, to facilitate the removing of the separate parts forming the same.

A A are the horizontal straight bars, constructed in the usual manner, only made with small openings or spaces between the several divisions, to prevent the fine coal intended to be burned falling through, and are supported on usual cross-bars *a*, placed at the front and back ends of the fire-place; and if the fire-place is very long, one or more may be placed in the middle, in the usual manner. These bars A A are placed in the furnace, alternating with wide open spaces B. These spaces B are covered with a grating, C, projecting above the surface of the bars A about three inches or more. This grating is composed of a series of plates or bars, C, provided with projections *n*, to regulate the distance between them, and are fastened together by bolts D, or by being placed upon a bar, E, arranged edgewise. The lower part of these plates project some distance over the edge or strengthening rib *m* of the horizontal bars A, to protect the same by keeping the burning coals away from the same. Two or more of these bars or plates, C′, are made of such a length as to rest upon these ribs *m*, and thus support this grating, and are provided with elongations *w* (see Fig. IV) on the bottom, fitting between the ribs *m*, to guide this grating and keep the same in its proper place. These plates C are provided with holes *x*, to allow a current of air lengthwise of the grating, and are made thinner in the middle than at their edges, (see Fig. V,) to enable the ashes, after having passed the edge surfaces, to fall readily without obstruction into the ash-pit. This raised grating divides the body of coal, and gives increased current of air for the combustion of the fuel. To prevent the coal lying against the sides of the furnace, and to give the necessary air to that part of the fuel, side grates F are arranged at each side of the furnace, to allow the required quantity of air to pass on the sides.

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

In grates for furnaces, the upwardly-projecting air-supply device, made up of sections C, provided with separating-lugs *n* and bolted together, central openings B, and side walls F, with the ordinary grates, all constructed and arranged to operate substantially as described.

WILLIAM J. ALLEN.

Witnesses:
HENRY E. ROEDER,
J. B. NONES.