J. C. BOBZIEN.

Grate-Bars for Boiler-Furnaces.

No. 219,679. Patented Sept. 16, 1879.

Fig: 1.

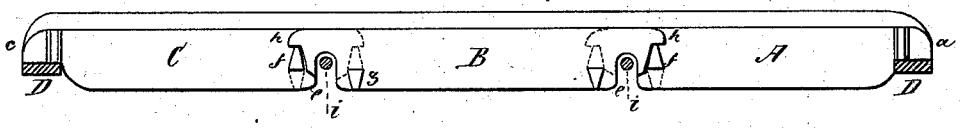


Fig: 2.

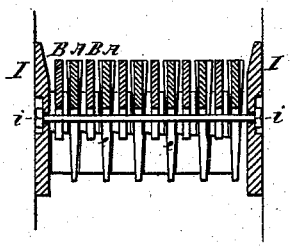


Fig: 5.

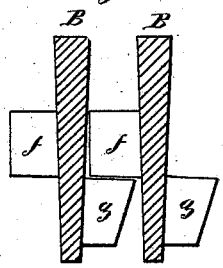


Fig: 3.

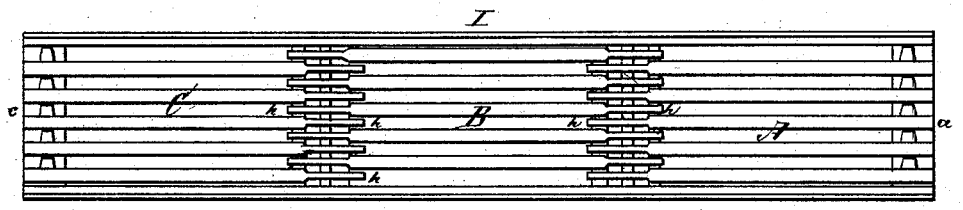
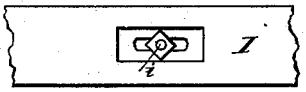


Fig: 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

JOHN C. BOBZIEN, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN GRATE-BARS FOR BOILER-FURNACES.

Specification forming part of Letters Patent No. **219,679**, dated September 16, 1879; application filed May 9, 1879.

To all whom it may concern:

Be it known that I, JOHN C. BOBZIEN, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Grate-Bars for Boiler-Furnaces; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This my invention relates to that class of grates which are composed of multitudinous short and narrow bars; and it is my object to so construct such bars that, independent of the length of the grate, the interlapping ends of the bars will interlock in a manner to be self-supporting like an arch, thereby obviating the requirement of intermediate transverse supporting-bars, allowing more freedom for expansion and contraction, providing for a more uniform admittance of atmospheric air to the fuel, and obtaining better access to the interstices between the grate-bars for poking.

My invention consists in providing the interlapping ends of the several grate-bars with projecting lugs to their sides and with overhanging lips to their extreme ends, in the manner that the end lips of two adjoining bars will hook over and bear upon the said lugs of each other bar, whereby said bars will be locked together so as to sustain themselves longitudinally on a straight line; also in additional lugs to said bars, by which each will form a step-like bearing for its transversely adjacent bar, so that said bars will be interlocked and self-supporting in every direction, and will form a level surface of great strength with multitudinous air-passages; and, finally, my invention consists in a notch in the bottom edge of the interlapping end of each bar for iron cross-rods or bolts to be placed transversely through said notches, which will hold the grate-bars longitudinally in their relative positions without furnishing a vertical support for the same, these cross-rods connecting two iron side-end plates placed against the side walls of the furnace.

In the drawings, Figure 1 represents a sectional elevation of the grate, composed longitudinally of three rows of bars. Fig. 2 represents a vertical transverse section of the grate through the interlapping ends of the bars. Fig. 3 represents a plan of the grate. Fig. 4 is an elevation of the slotted side-end bar; and Fig. 5, a cross-section through two grate-bars, showing step-like lateral interlocking lugs of the grate-bars.

A and C are the end, and D is the intermediate bar, which form the full-length grate when put together, the ends *a c* of bars A C, respectively, resting upon the boiler front and bridge-wall plates D of a furnace, and are provided with spacing-studs. *e e* are vertical notches in the center of the interlapping portions of the several bars. *f f* are wedge-shaped lugs, projecting from one side of each interlapping grate-bar end; and *g g* are similar lugs projecting from the opposite side of each grate-bar end low enough for the bottom face of lug *f* of the next adjacent bar to bear upon it. *h h* are overhanging lips, formed to the top of the extreme interlapping ends of each bar, which lips will each bear upon a lug, *f*, of the other interlapping next adjoining bar, whereby two mutually-supporting points are provided for joining longitudinally each pair of grate-bars, which, in conjunction, will sustain the said bars on a straight line with each other. These grate-bars are downwardly-tapering plain cast-iron plates of reduced thickness at their interlocking ends, and the side lugs thereto, which engage with the end lips, *h*, are made upwardly tapering for insuring a ready discharge of the ashes from the incandescent coal.

I I are two side-end bars for the grate, which project above the face of said grate, and have their upper inward edges chamfered. These bars have longitudinally-slotted recesses for receiving the heads and nuts of bolts *i*, which connect both said plates transversely, and are placed through the notches *e* under the bars A B C to prevent said bars from shifting longitudinally and from disengaging each other, without, however, assisting to support the grate from below, nor interfering with the expansion and contraction of the several bars.

Such a grate is set up by first placing the plates I and bolts *i* in position, and then by commencing from one side and laying the bars lengthwise set by set until in this manner the opposite side of the furnace is reached.

As will be noticed, each bar being held in position and from lifting out by the next ad-

jacent and interlocking bars, and each bar successively assisting to uphold and carry the others, such a grate is of great supporting strength, and yet has more air-spaces with less solid surface and a greater yielding faculty for irregular expansion and contraction than any other grate that to my best knowledge heretofore has been in existence.

The peculiar construction of this grate enables it to be made much lighter than grates of other construction, and therefore it is much cheaper to manufacture. This grate can also be easily set up in a furnace, and is very durable in use, by reason of the whole surface of the grate being subject to the draft of air. The formation of clinkers will in a great measure be prevented, and the combustion will be greatly facilitated, thereby adapting the grate for burning coal-screenings to advantage.

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

1. A grate without intermediate supporting-bars, made in sections, with the grate-bars of one section locked to those of the adjoining section, and made self-supporting, substantially as described and shown.

2. A grate without intermediate supporting bars, made in sections locked together by lugs *f* and lips *h*, whereby they are made self-supporting, substantially as described and shown.

3. A grate without intermediate supporting-bars, made in sections, the bars of one section being locked to those of the adjoining section, and made self-supporting, and the bars of each section being locked together and supporting each other laterally, substantially as described.

4. A grate without intermediate supporting-bars, made in sections locked together and supported at their ends by lugs *f* and lips *h*, and locked laterally by lugs *f g*, substantially as described and shown.

5. A grate made in self-supporting sections, constructed substantially as shown, and having notches *e* in the end of the bottom edges of the grate-bars, in combination with the slotted plates I and bolts *i*, constructed and arranged substantially as described and shown.

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