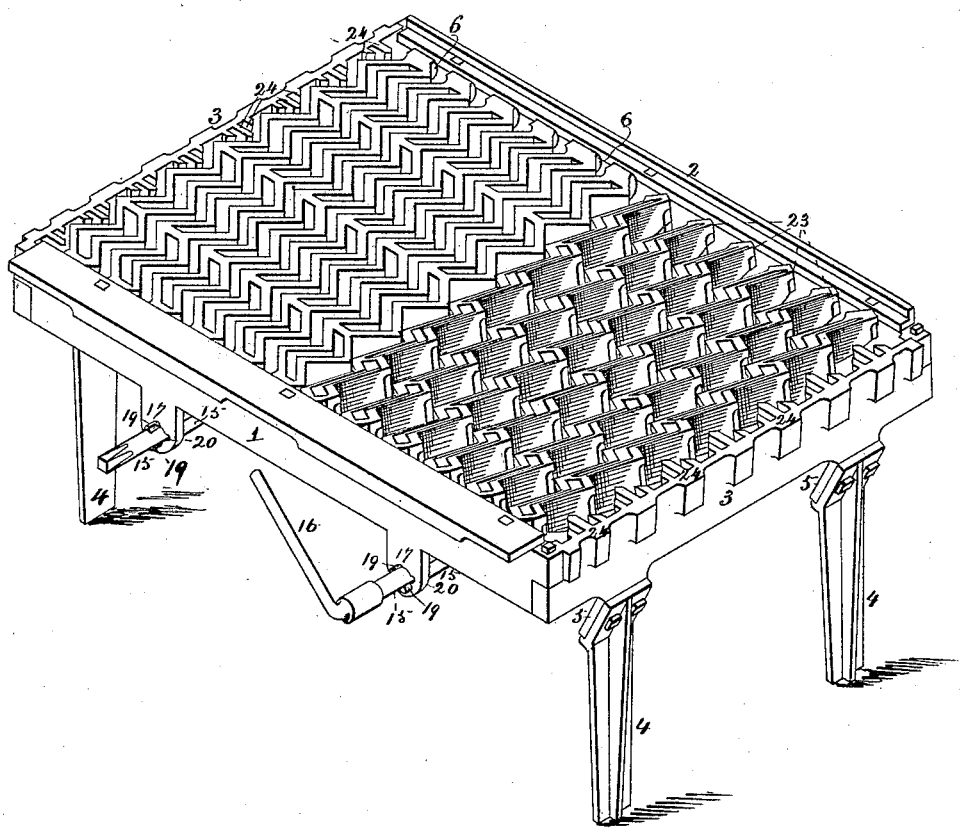
(No Model.) 2 Sheets—Sheet 1.

E. BOILEAU.

GRATE FOR FURNACES.

No. 418,491. Patented Dec. 31, 1889.

Fig. 1.



Attest;
E. Arthur.
Edward D. Knight.

Inventor;
Etienne Boileau
By Knight Bro.s
Attys

(No Model.) 2 Sheets—Sheet 2.

E. BOILEAU.

GRATE FOR FURNACES.

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Fig. II,

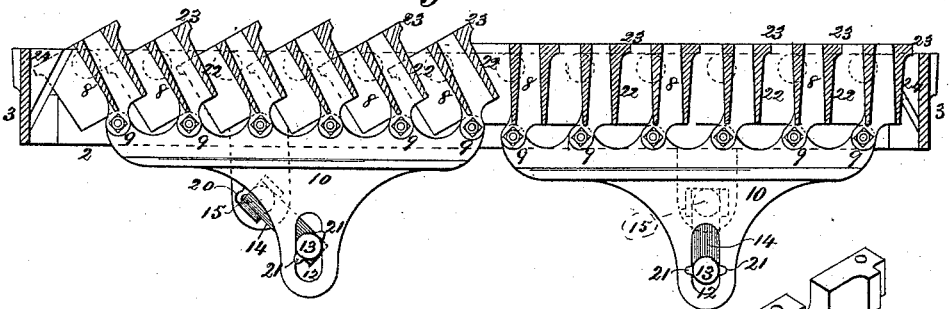


Fig. III,

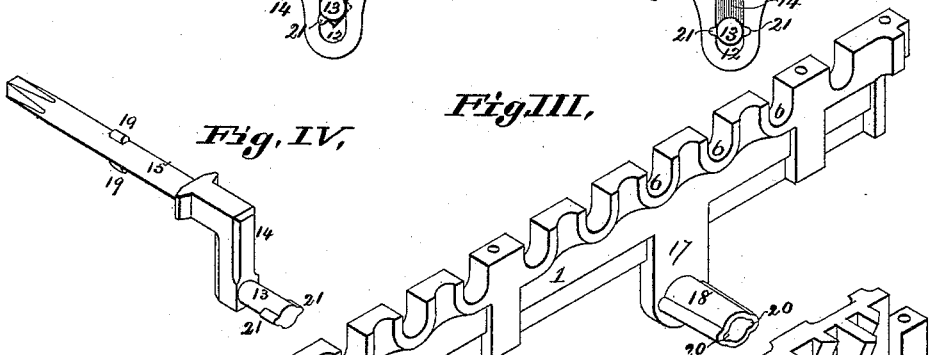


Fig. IV,

Fig. V,

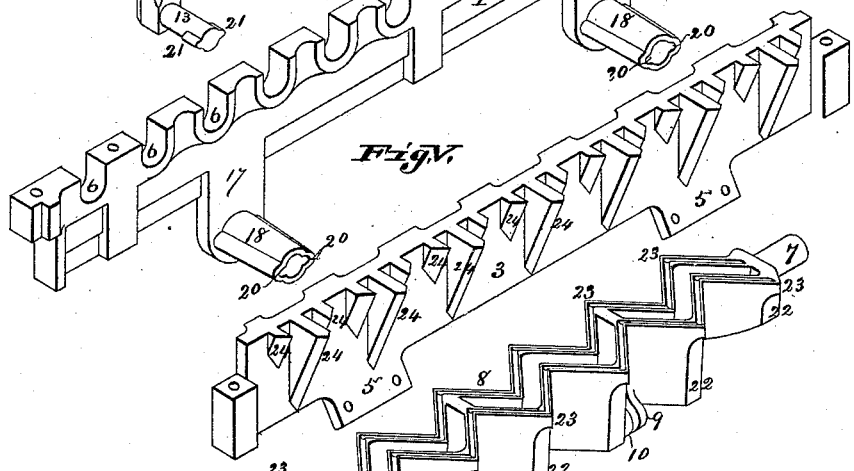


Fig. VI,

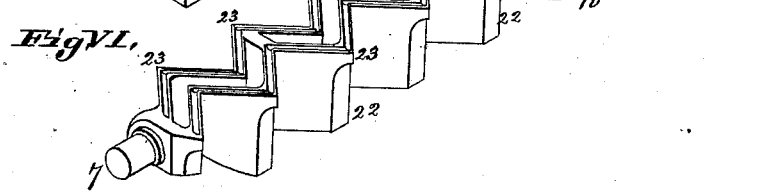
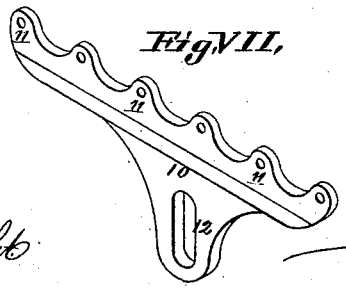


Fig. VII,



Attest,
E. Arthur
Edward L. Knight

Inventor:
Etienne Boileau.
By Knight Bros.
Attys.

UNITED STATES PATENT OFFICE.

ETIENNE BOILEAU, OF ST. LOUIS, MISSOURI, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE IMPROVED ZIG-ZAG GRATE BAR COMPANY, OF SAME PLACE.

GRATE FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 418,491, dated December 31, 1889.

Application filed June 29, 1889. Serial No. 315,973. (No model.)

To all whom it may concern:

Be it known that I, ETIENNE BOILEAU, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Grate-Bars for Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

This is an improvement on the grate-bar described and claimed in Letters Patent No. 403,730, granted to myself and L. J. Peck May 21, 1889.

The present improvement consists partly in removing a part of the salient corners of the bars, leaving the upper part of said corners in form of a tooth to break any clinkers which may have formed and force the pieces of the same down between the bars.

Another novelty consists in the construction of the device by which rocking motion is given to the bars.

Figure I is a perspective view of the grate constructed for application to a furnace already built. Fig. II is a transverse horizontal section of the grate. Fig. III is a perspective view of the front bearing-bar. Fig. IV is a perspective view of the bell-shaft by which the grate-bars are rocked. Fig. V is a perspective view of one of the side bars. Fig. VI is a perspective view of one of the grate-bars. Fig. VII is a perspective view of the connecting-bar between the rocking lever and the grate-bar.

The front bearing-bar 1, rear bearing-bar 2, and side bars 3 are connected together at the corners and form a rectangular frame, which may be supported in the brick-work of the furnace, or may be supported on legs 4, bolted to lugs 5, upon the under sides of the side bars 3. The front and rear bearing-bars have recesses 6, forming bearings for the gudgeons 7 at the ends of the grate-bars 8. The grate-bars have lugs 9, which are hinged to the connecting-bar 10 by bolts passing through the lugs 9 and holes 11 in the connecting-bar 10. The grate-bars are shown arranged in two series connected to separate connecting-bars 10. There may be either one or more of these series in the grate.

The connecting-bar has a vertical slot 12, which receives the pin 13 upon the crank 14 of the rock-shaft 15, so that when the shaft is rocked the bars 8 connected with it are rocked upon their gudgeons.

16 is the winch, which is fitted upon the squared end of the shaft, and by which the shaft is rocked. The front bearing-bar 1 has downward projections 17, having horizontal sockets 18, in which the rock-shafts have bearing. The rock-shaft has projections 19, which pass through channels 20 in the sides of the socket when the rock-shaft is inserted in the socket, the shaft at insertion being turned one-fourth around from its normal position, so that when the projections have passed through the socket and the shaft has been put in its normal position, as seen in the shaft to the left in Fig. I, the projections are out of line with the channels and prevent the forward movement of the shaft. By similar means the pin 13 is held in the slot 12 of the plate or bar 10, the projections 21 of the pin passing freely through the slot when in the same plane, but engaging the sides of the slot when the parts are in normal position, as seen in Fig. II, and preventing the escape of the pin from the slot.

The general shape of the grate-bars 8 and their relative position are the same as described in Letters Patent No. 403,730 aforesaid; but the salient corners of the bars in this improvement have a portion removed at 22, leaving the part 23 at top projecting in a sharp angle or tooth, which, as the bars are rocked, serves to break up any clinkers which may adhere to the bars and discharge the pieces downward between the bars. The removal of the corner or angle at 22 prevents the lodging of matters between the bars, as there is more space between them below than at the point 23.

The side bars 3 have angular projections 24, which occupy the re-entering angles of the grate-bars adjacent to them. These projections narrow downwardly, so that the space between them and the grate-bars widens

downwardly, and anything entering this space from above would have no impediment in its descent.

25 is a bar closing the recesses 6 at top.

I claim as my invention—

1. The zigzag rocking bar 8, having the salient angles cut away at 22, leaving a projection or tooth 23, substantially as and for the purpose set forth.

2. The combination of the zigzag rocking bars having the salient angles cut away at the lower part, and the side bars 3, having the inclined projections 24, substantially as set forth.

3. The combination, with the rocking bars 8, of the lugs 9, the slotted bar 10, the rock-shaft 15, having a crank-arm 13 14, with projections 21, projections 19 upon the shaft, and a bearing-socket 18, with channels 20, substantially as and for the purpose set forth.

ETIENNE BOILEAU.

In presence of—

SAML. KNIGHT,

THOMAS KNIGHT.