

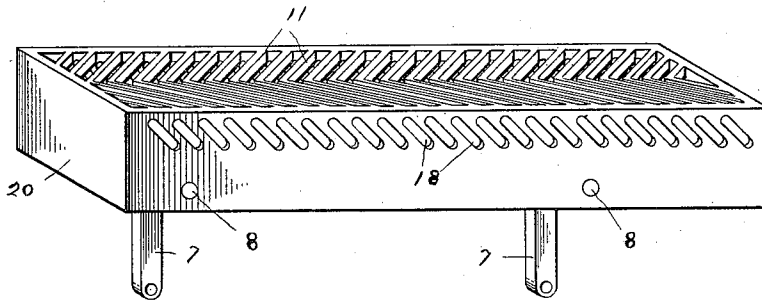
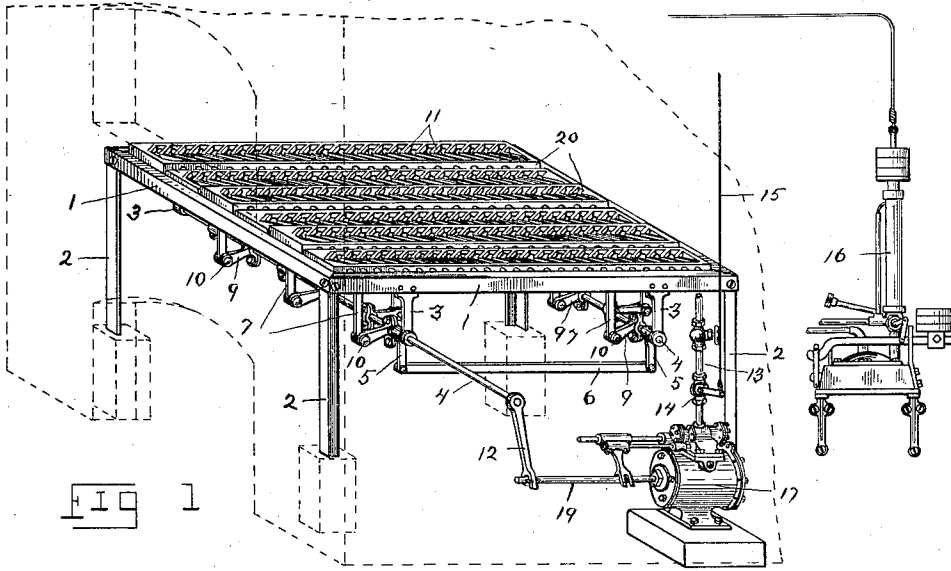
E. L. MARTIN.
SHAKER GRATE.

APPLICATION FILED JAN. 19, 1912.

Patented Feb. 11, 1913.

2 SHEETS-SHEET 1.

1,052,493.



WITNESSES

M. L. Lefevre.
B. P. Faltin

INVENTOR

Edward L. Martin,
BY

John J. Thompson
ATTORNEY

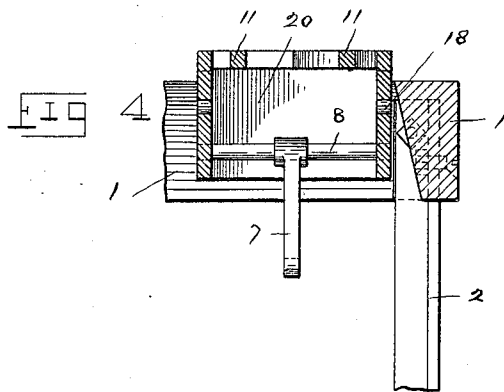
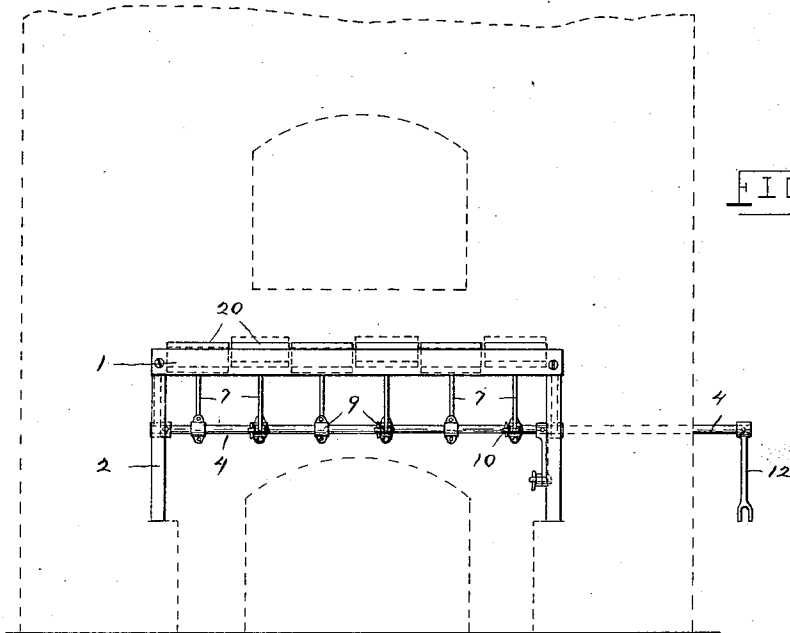
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UNITED STATES PATENT OFFICE.

EDWARD L. MARTIN, OF LANCASTER, PENNSYLVANIA.

SHAKER-GRATE.

1,052,493.

Specification of Letters Patent.

Patented Feb. 11, 1913.

Application filed January 19, 1912. Serial No. 672,159.

To all whom it may concern:

Be it known that I, EDWARD L. MARTIN, a citizen of the United States, residing at Lancaster, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Shaker-Grates, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to a furnace grate of the shaker type, such as is employed in connection with power boilers, where the shaking of the grates is done in a mechanical and automatic manner; the mechanism employed for this purpose being actuated by live or exhaust steam from the boiler.

The objects of the invention are to provide a grate of this class that shall be cheap, durable, and efficient; consist of few parts; and be so constructed that renewals can be effected in a simple and effective manner without dismantling the entire grate.

Another object of the invention is to provide a grate in which the bars are of such construction that they admit the greatest amount of air, thus prolonging the life of the bar and aiding the combustion.

Still another object is to so construct the grate-bars that no clinkers can form nor can the operation of the grates be affected by clinkers or lumps of coal lodging between them.

With these and other objects in view, my invention consists in certain construction and combination of parts as will hereinafter be fully described and claimed in the annexed specification and illustrated in the accompanying drawings which form a part of this application and in which like figures of reference refer to corresponding parts in all of the views; but it is fully understood that while I have here described my invention as shown, that I do not confine myself to the exact design, as slight changes may be made in the construction and arrangement of the several parts without departing from the spirit of the invention.

In the drawings:—Figure 1, is a perspective view of a furnace grate embodying my invention, and its operating mechanism. Fig. 2, is an enlarged perspective view of one of the grate-bars. Fig. 3, is a front elevation of the device as shown, in Fig. 1. Fig. 4, is a cross sectional view of one of the grate-bars and the supporting frame.

Referring to the drawings the grate-bar

supporting frame 1, is mounted within the fire-box of the furnace in the usual way and upon the supporting legs 2; said frame being under cut or beveled as shown in Fig. 4, to prevent the ashes from clogging the action of the grate-bars. Secured to and projecting downward from said supporting frame 1, are the hangers or brackets 3, within which are rotatably secured the rocker-shafts 4, which are connected together by the arms 5, and connecting-rod 6.

The grate-bars are mounted within the supporting frame 1, with their sides in close proximity to each other, the outer grate-bar and the ends of all of said bars are also in close proximity to the supporting frame, thus preventing any appreciable amount of lateral movement of said bars; while they have sufficient clearance to enable them to have an easy vertical movement and allow fine ashes to pass between them.

The grate-bars are supported entirely by, and have a vertical reciprocating movement imparted to them by the links 7, which have their upper ends pivoted to the grate-bars by a pin 8, extending transversely through the bar and which is prevented from accidental withdrawal when the grate-bar is in position by the side of the adjacent bar, as when the bars pass each other during their stroke and are in extreme positions, the ends of said pins 8, are not exposed. The lower ends of the links 7, are pivoted to the outer end of a crank 9, by the pin or bolt 10; and said cranks 9, are adjustably and detachably secured to the rocker-shaft 4, in such a manner that when said shafts are turned the alternate grate-bars will move together, so that as one bar descends, the bar on either side of it will rise, thus keeping the entire grate surface in motion and preventing the formation of clinkers and sifting out the ashes.

The grate-bars are of a rectangular form, the sides being connected near the top by the bars 11; while the side walls of the grate-bars are formed with a series of perforations near the upper edge and communicating with the spaces between said bars 11; said perforations being placed in a slanting direction to present in coöperation with the perforations in the adjacent grate-bar, a shearing surface to break up any coal or clinker lodging between them, thus at all times preventing the grate from becoming locked.

For automatically and mechanically operating the grates, one of the rocker-shafts 4, is extended through the furnace wall and has secured thereon a crank 12, connected to the piston-rod of a motor 17, driven by steam conducted from the boiler by the feed pipe 13; the action of said motor 17, being controlled by a valve 14, attached by a cable 15, to a damper regulator 16; and in this manner the grate-bars have a vertical reciprocating movement imparted to them; while the furnace damper is in the required position to admit steam to the motor, or the rocker-shaft may be so connected that it can be operated by hand, if desired.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

In a furnace grate of the class described, the combination with a supporting frame, of a series of grate-bars disposed side by side

in said frame, said grate-bars having a rectangular box-like form having bed bars extending across the top thereof, spaced apart and integral with the sides of said grate-bars, the sides of said grate-bars formed with a series of openings extending in a diagonal direction part way down the sides thereof and communicating with the spaces between the bed bars, and automatic means for reciprocating said grate-bars in a vertical manner so that alternate bars ascend while the remaining bars descend, to produce a crushing action of the clinkers between the sides thereof.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD L. MARTIN.

Witnesses:

WM. J. COULTER,
JOHN J. THOMPSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."