(No Model.)

J. EVANS.

SHAKING AND DUMPING FURNACE GRATE.

No. 496,194. Patented Apr. 25, 1893.

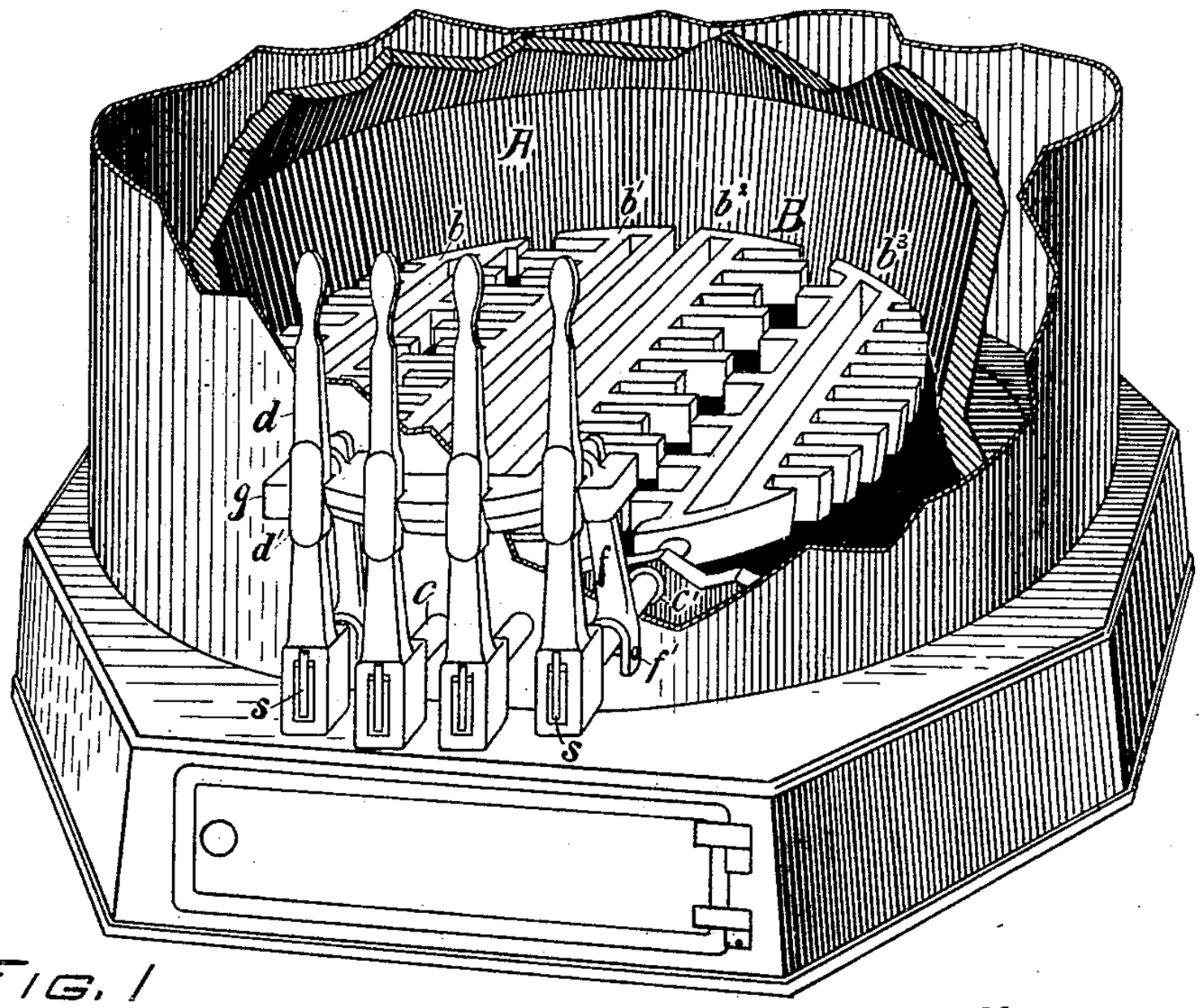

FIG. 1

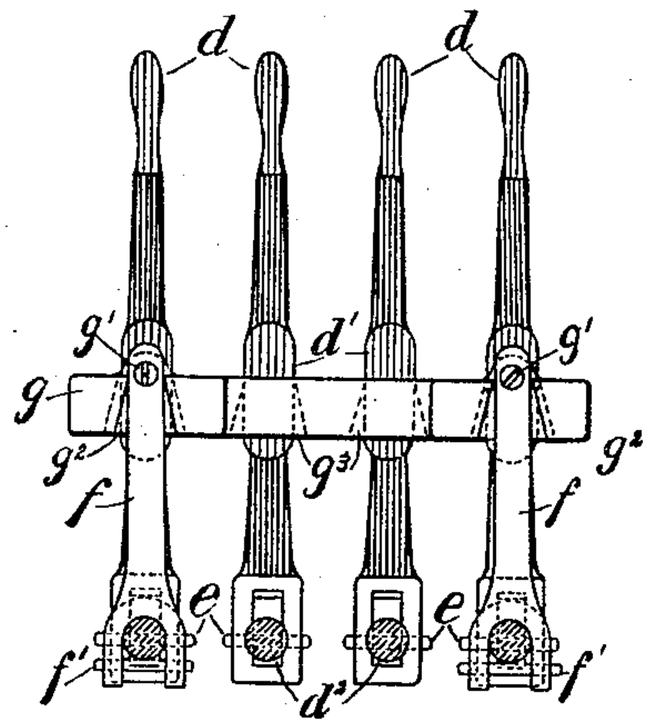

FIG. 3

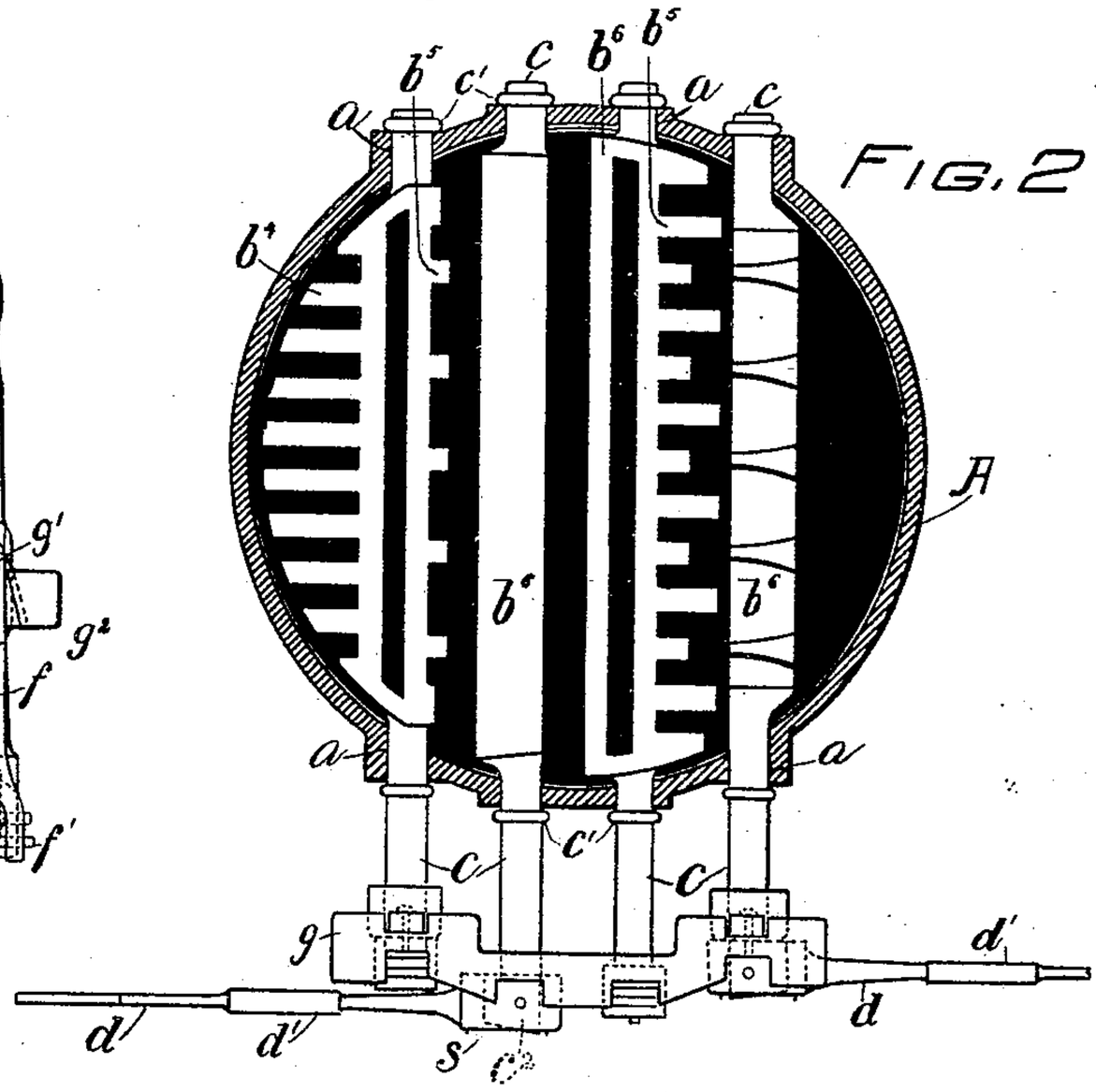

FIG. 2

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SHAKING AND DUMPING FURNACE-GRATE.

SPECIFICATION forming part of Letters Patent No. 496,194, dated April 25, 1893.

Application filed October 15, 1892. Serial No. 448,930. (No model.)

To all whom it may concern:

Be it known that I, JOHN EVANS, a citizen of the United States, residing in the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Shaking and Dumping Furnace-Grates, of which the following is a specification.

My invention relates to a combined shaking and dumping grate adapted for employment in furnaces or other analogous heating appliances.

The principal objects of my invention are first, to provide a comparatively simple, durable and efficient furnace grate; second, to provide a grate for thoroughly and effectually shaking the fire bed without waste of live coal, and of the type that may be dumped and caused to assume its normal position by means of devices actuated from the outside of the furnace; third, to provide a grate in two or more sections adapted to permit of separate and conjoint action by means of levers operated from the outside of the furnace or other heating appliance, whereby the fire bed may be thoroughly settled, raked or independently dumped without disturbing the remaining portions of the fire bed; and fourth, to provide a grate with two or more intermeshing sections, provided with devices for supporting in position levers connected with the respective sections, whereby each section may be independently operated with respect to other sections for discharging clinkers or other extraneous matter from the fire bed.

My invention consists of a sectional furnace grate provided with levers suitably connected therewith and adapted to afford a successive rocking or reciprocating movement of the grate or an independent actuation of any of the sections thereof in order to dump a portion or portions of the fire bed.

My invention further consists of a sectional intermeshing grate provided with pintles supporting a rack and levers pivotally connected with said pintles and engaging said rack.

My invention further consists of a furnace provided with an inter-meshing sectional shaking and dumping grate provided with pintles supporting a recessed rack and with levers pivotally connected with the pintles and engaging the rack, the construction being such as to permit of a rocking or reciprocating motion of the sections of the grate by means of the rack or of the independent operation of any of the sections of the grate by means of the levers thereof operated from the exterior of the furnace; and my invention further consists of the improvements hereinafter described and claimed.

The nature, scope and general characteristic features of my invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof, and in which—

Figure 1, is a perspective view of the base of a furnace with a shaking and dumping grate embodying features of my invention shown in application thereto. Fig. 2, is a top or plan view thereof, showing two of the grate bars turned over. Fig. 3, is a rear elevational view showing the recessed rack and its complemental supporting arms.

In the drawings a, are sockets or bearings carried by the fire box base A, or other suitable portion of a furnace or heating appliance.

B, is a sectional grate comprising, in the present instance, a series of four grate bars b, b', b^2 and b^3. However, the number of grate bars is immaterial and may be increased or diminished. The respective extremities of each of the grate bars is provided with a pintle or shaft c, revolubly supported in the sockets or bearings a, and with a collar c', for preventing undue endwise play of the pintles or shafts. The extremities of each of the front pintles or shafts is provided with a rectangular seat c^2, for a purpose to be presently described.

d, are handles or levers provided with square shanks d', and with slots d^2, adapted to loosely engage the seats c^2.

e, are pins, bolts or screws for connecting the handles or levers d, with the grate bars, in such manner that the former are allowed a slight range of motion toward and away from the furnace or other heating appliance.

f, are arms having their lower extremities forked and pivotally secured to certain of the pintles of the grate bars and in the present instance to the pintles of the bars b and b^3,

by means of pins f'. The upper extremities of each of these arms f, are pivotally attached to a rack g, by means of screws, pins or bolts g', and adapted to work in V-shaped recesses g^2, the side walls of which act as stops for the arms f, and thus serve to limit the range of motion of the rack.

s, are springs tending to shift the shanks d', of the handles or levers d, into engagement with the respective recesses g^3, between the teeth of the rack g, and adapted to yield in order to permit the handles or levers d, to be turned out of engagement therewith and operated separately.

In order to facilitate the operation of disengaging the levers or handles d, appertaining to the intermediate grate bars, that is the grate bars b' and b^2, the pitch line of the rack may be disposed on the arc of a circle and the pintles of the intermediate grate bars may be extended beyond the pintles of the grate bars b and b^3, so that said levers may swing clear of the levers appertaining to the grate bars b and b^3, as shown in Fig. 2. The recesses between the teeth of the rack g, are V-shaped in order to afford the levers or handles d, a slight range of movement therein to permit of the simultaneous operation of all the grate bars of grate B. When a single grate bar is turned it is important that a surface substantially in alignment with the other portions of grate B, should be presented for supporting the coal. This result may be accomplished by providing each grate bar upon one side of its axis with coal supporting fingers b^4, and upon the other side of its axis with lugs b^5, adapted to inter-mesh with the fingers b^4, or with bars b^6, so that when a grate bar is turned the lugs b^5, or bars b^6, lie in substantially the same plane as the other portions of the grate B, and thus serve as supports of the coal.

The mode of operation of the hereinabove described grate is as follows: The handles or levers d, may be permitted to engage with the recesses g^3, of the rack g, as shown in Fig. 1, and all of the grate bars may be simultaneously rocked back and forth by the simple operation of vibrating one of the handles or levers d. Under these circumstances the fire is thoroughly shaken and cleaned. Whenever it becomes requisite or necessary to rock or otherwise operate one or more of the grate bars separately the corresponding handles or levers may be disengaged from the rack g, as shown in Fig. 2, and vibrated manually with the result that a portion of the fire is shaken or dumped without disturbing the remaining portions thereof. All of the fire may be dumped or permitted to fall through the grate bars by detaching all of the handles or levers d, from the rack g, and turning them outward so that all the grate bars are turned edgewise and thus afford spaces between them for the passage of the coal, ashes, &c., into the ash pit.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A sectional shaking and dumping grate provided with pintles or shafts, a rack mounted on and supported by certain of said pintles or shafts and levers connected with said pintles or shafts and engaging said rack, substantially as and for the purposes set forth.

2. A sectional shaking and dumping grate adapted to a furnace and having certain pintles or shafts projecting therefrom and supporting a recessed rack, levers pivotally connected with said pintles or shafts and engaging said rack, substantially as and for the purposes set forth.

3. An inter-meshing sectional shaking and dumping grate journaled to a furnace and having pintles supporting and operating a rack and levers suitably connected with said sections and engaging with said rack, the construction being such that independent sections of the grate may be actuated to dump portions of the fire bed, substantially as and for the purposes set forth.

4. An inter-meshing sectional shaking and dumping grate afforded a rocking or reciprocating movement by means of a rack supported on front pintles of the sections of the grate and levers pivotally connected with said pintles, the construction being such that the respective sections may be independently operated by said levers to dump portions of the fire bed, without disturbing the remaining portions thereof, substantially as and for the purposes set forth.

5. A sectional shaking and dumping grate provided with pintles supporting a pivotal recessed rack and independent levers engaging therewith, the construction being such that the sections may be rocked or reciprocated and independently operated by the levers to dump parts or the entire fire bed as required, substantially as set forth.

6. In combination, a furnace provided with a shaking and dumping inter-meshing sectional grate having pintles supporting a recessed rack and levers connected with said pintles and engaging with said rack, substantially as and for the purposes set forth.

7. A shaking and dumping grate comprising a series of grate bars, a movable rack, and a series of levers or handles connected with the grate bars and adapted to engage and disengage said rack, substantially as and for the purposes set forth.

In witness whereof I have hereunto set my signature in the presence of two subscribing witnesses.

JOHN EVANS.

Witnesses:
THOMAS M. SMITH,
RICHARD C. MAXWELL.