

(No Model.)

G. E. FRANK.
SHAKING GRATE.

No. 601,374.

Patented Mar. 29, 1898.

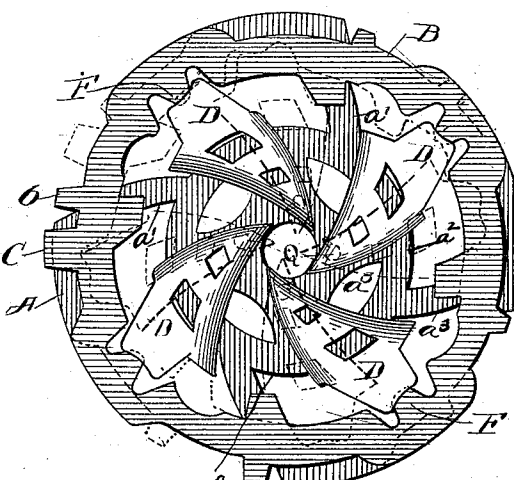
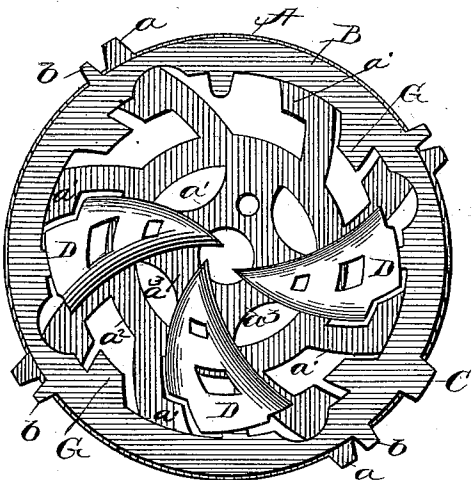
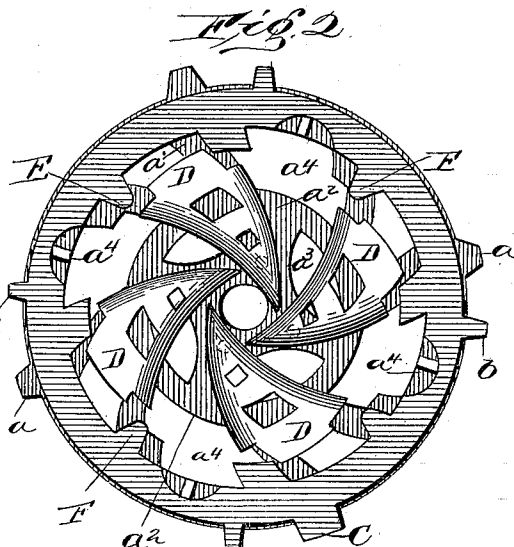
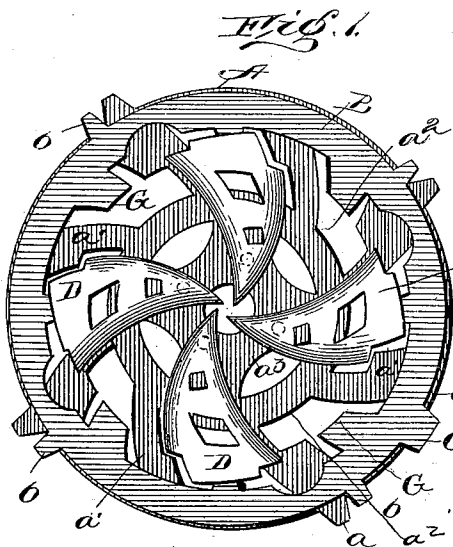


Fig. 5.

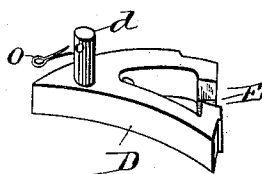
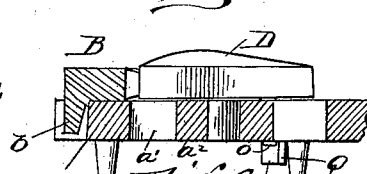


Fig. 6.



Witnesses:
J. M. Fowler Jr.
Thomas Durant

Inventor:
George E. Frank,
by Church & Church
his Attorneys

UNITED STATES PATENT OFFICE.

GEORGE E. FRANK, OF DUNMORE, PENNSYLVANIA.

SHAKING-GRATE.

SPECIFICATION forming part of Letters Patent No. 601,374, dated March 29, 1898.

Application filed May 18, 1897. Serial No. 637,059. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. FRANK, of Dunmore, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Shaking-Grates; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

Difficulty has been experienced in securing a flat grate for stoves, furnaces, and the like which may be so manipulated as to effectually clear the entire under surface of the fire from ashes, clinkers, and the like, and especially in that class of grates wherein the motion is concentric around a center coincident with the center of the fire-pot. My present invention relates to this class of grates; and it has for its objects to overcome the defects pointed out and to provide a grate which will operate easily and smoothly, effectually cutting off and removing the clinkers and allowing of a free escape of the ashes and clinkers from every part of the grate-surface, the center as well as the outer portion.

The invention further consists in certain novel details of construction and combinations and arrangements of parts, all as will be now particularly described, and pointed out in the appended claims.

Referring to the accompanying drawings, Figure 1 is a top plan view of a grate embodying my present improvements. Fig. 2 is a similar view with the sections moved to the opposite extreme of their movement. Fig. 3 is a similar view with one of the pivotal sections removed. Fig. 4 is a top plan view showing a slightly-modified arrangement of the grate-section, said view showing in full lines the sections in one position and in dotted lines in the other position, said positions being at opposite extremes of the movement made in shaking the grate. Fig. 5 is a bottom perspective view of one of the pivoted sections. Fig. 6 is a detail section on the line *x x*, Fig. 3.

Like letters of reference in the several figures indicate the same parts.

The letter A indicates the bottom section

of the grate, being provided with lateral lugs or projections *a*, whereby it is supported and positioned in the fire-pot, and having a series of inwardly-curved ribs *a'*, terminating in a concentric inner circle *a²*, having a centrally-perforated and open-work section *a³*. On the upper surface of this bottom section there are provided a series of lugs or wearing-surfaces *a⁴*, upon which the upper section or operating-ring B rides. This section or ring B rests loosely upon the lower section and is held in place by downwardly-extending lugs *b*, embracing the periphery of the lower section, and it is adapted to be oscillated back and forth by a horizontal handle or projecting portion C, extending out through the side or front of the stove in the ordinary manner. Also mounted upon the lower section A are a series of independent sections D, each independently pivoted in the lower section by means of a downwardly-extending pintle *d*, passing through bearings or apertures in the lower section at a point somewhat removed from the center and each having in its outer portion recesses or notches E for the reception of corresponding teeth or projections F on the ring B. Each of the sections D is substantially triangular-shaped in top plan view, and their upper surfaces are crowning or curved to prevent the lodgment thereon of ashes or other accumulations. The conformation of the sections D is such that they occupy a large proportion of the space of the grate and in effect support the weight of the fire and ashes in the fire-pot. Their pivotal movements on their independent centers cause them to oscillate back and forth at both ends, thereby agitating the fire at the center as well as at the periphery of the fire-pot, and, furthermore, when moved to one position they uncover the spaces in the lower section, including the central opening, where with the ordinary grates the main accumulation of clinkers occurs. By opening the center aperture in the grate such clinker is in the present instance allowed to drop down between the pivotal sections, and when said sections are turned back to the opposite position the clinker is broken up and with the next movement allowed to drop through the center aperture into the ash-pit.

The pivotal sections are preferably themselves perforated or made with vertical apertures, as shown, for the passage of ashes and to afford an additional support for the fire or material in the fire-pot. The external ring is also preferably provided with inwardly-extending lugs or projections G, each adapted when moved in one position to cover an aperture in the bottom or fixed section and when moved to the opposite position to uncover such aperture.

Obviously the pivotal sections may be moved in both directions by the lugs entering the openings or recesses in their outer ends, as shown in Fig. 4; but in the preferred construction (shown in Figs. 1, 2, and 3) the lugs pass out of said recesses and the continued movement of the ring brings the projection G into contact with the pivotal sections and insures their full forward excursion, the reverse movement of the ring causing the teeth or lugs to again enter the recesses and return the pivotal sections to their initial positions.

The recesses in the pivotal sections before referred to in the preferred construction do not extend out to the top of the sections, but are "undercut" recesses, so to speak, whereby the entry of ashes and accumulations which might clog the action of the grate is prevented.

A further advantage in providing undercut recesses in the pivotal sections lies in the fact that the shaking-ring is thereby held against vertical displacement when in motion, and it will be particularly observed that the peculiar tapering and curved conformation of the pivotal sections in top plan view secures an agitation of practically the entire lower surface of the fire with an extremely short movement of the shaking-ring, and, furthermore, with such an arrangement there is little or no danger of the grate becoming clogged by the accumulation of clinkers between the sections, such clinkers being crushed and cut by the pivotal action of the sections when moved in one direction, and when moved in the opposite direction the clinkers are brought over one of the openings in the lower section and allowed to drop through into the ash-pit.

The independent pivotal sections, it is obvious, may be held against displacement by cotters, such as O, passed transversely through the lower ends of their pintles, or, if desired, such pintles may be provided with lateral projections Q at their lower ends, adapted to pass through an irregular or keyhole slot in the fixed section when turned in one position and to prevent the withdrawal or upward movement of the pivotal sections when in any other position, this latter construction being shown in dotted lines, Fig. 4, and in the sectional view, Fig. 6.

Having thus described my invention, what I claim as new is—

1. In a shaking-grate, the combination with the bottom section having peripheral and central apertures therein for the passage of ashes and a ring above the periphery of the said bottom section, of independent substantially triangular sections pivotally mounted on the bottom section to swing horizontally, said independent sections lying within and in the same horizontal plane with the top ring, and cooperating projections and recesses on the inner periphery of the ring and outer edge of the independent pivotal sections respectively; substantially as described.

2. In a shaking-grate, the combination with the bottom or fixed section having peripheral and central apertures for the escape of ashes and clinkers and a shaking-ring supported on said bottom or fixed section and having inwardly-extending lugs or projections, of a series of independent sections pivotally mounted on the bottom or fixed section intermediate their ends and having recesses cooperating with the inwardly-projecting lugs on the shaking-ring whereby when said ring is turned to one position said pivotal sections are caused to bridge the central aperture in the bottom section and when moved to the opposite position to open said central aperture; substantially as described.

3. In a grate, the combination with the bottom section and shaking-ring substantially as described, of a series of horizontally-movable independent sections pivotally mounted on the bottom section and operated by the shaking-ring, each of said pivoted sections having a crowning or curved top surface; substantially as described.

4. In a shaking-grate the combination with the fixed or bottom section and shaking-ring, substantially as described, of a series of independent pivotal sections entirely supported on the fixed section within the inner circumference of the shaking-ring, each having vertical apertures therein and each having a downwardly-extending pintle passing through the fixed or bottom section and cooperating recesses and lugs on the ring and pivotal sections, respectively; substantially as described.

5. In a shaking-grate, the combination with the bottom or fixed section and shaking-ring mounted thereon and having inwardly-extending lugs or teeth, of independent sections pivotally mounted on the bottom or fixed section within the shaking-ring and having undercut recesses for the reception of the lugs or teeth on said ring; substantially as described.

GEORGE E. FRANK.

Witnesses:

JOHN T. EVANS,
CHAS. E. VEGIARD.