

W. S. FLORY.
Grates.

No. 153,062.

Patented July 14, 1874.

Fig. 1.

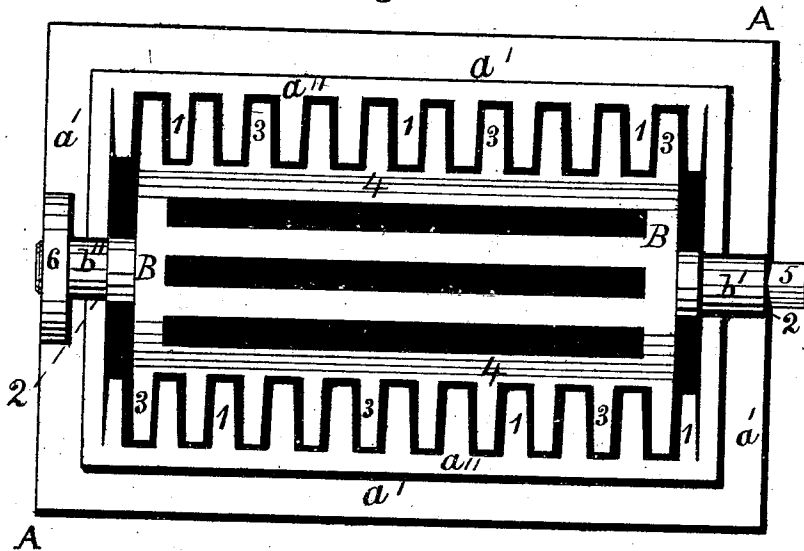
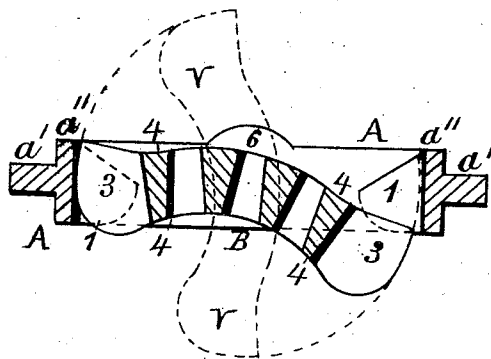


Fig. 2.



Witnesses:
Wm. H. Morrison.
Wm. Harris.

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UNITED STATES PATENT OFFICE.

WILLIAM S. FLORY, OF STROUDSBURG, PENNSYLVANIA.

IMPROVEMENT IN GRATES.

Specification forming part of Letters Patent No. **153,062**, dated July 14, 1874; application filed February 25, 1874.

To all whom it may concern:

Be it known that I, WILLIAM S. FLORY, of Stroudsburg, in the county of Monroe and State of Pennsylvania, have invented an Improved Grate for Ranges, Heaters, and Stoves, of which the following is a specification:

The object of my invention is to produce a grate for ranges, heaters, and stoves, which will be strong and not liable to warp or get out of working order in use, and at the same time afford more perfect facility for separating the ashes and cinders from the incandescent fuel in the fire-box, and for discharging the whole contents of the latter at any time, as occasion may require.

I will now proceed to describe my invention and the mode of its operation, with reference to the accompanying drawings, in which—

Figure 1 is a plan view of the upper side of the grate with its projecting flanges, whereby it rests upon suitable supports in the ash-pit, (not shown,) and supports the usual fire-bricks or fuel-box. (Not shown.) Fig. 2 is a vertical transverse section of the same, showing the extent of the vertical vibratory motions intended to be given to the movable portion of the grate in separating the ashes from the incandescent fuel of the fire-box, and also, by dotted lines, the position into which the said movable portion of the grate is intended to be brought for discharging the whole of the contents of the said fire-box, when necessary.

The stationary portion A of the grate is a rectangular horizontal frame of cast-iron, the two longer sides of which have each a series of short inwardly-projecting bars or teeth, 1 1, the tops or upper edges of each of which are sloped downward from the upper edge of the frame to their ends, and their lower or under edges rounded back to the frame from which they project, as shown in Fig. 2. The broad or deep opposite sides of each tooth are inclined or sloped toward each other as they extend downward, and consequently the spaces between the said teeth are wider at the bottoms than at the tops, respectively, and the width of the upper part of each space is about one-half greater than the width of the upper edge of any one of the teeth. The reason of this will be more fully understood when the

construction and operation of the moving part of the grate are described.

The depth of the rectangular frame A for an ordinary-sized stove or range grate should be about one and a quarter inch, and its thickness about a quarter or three-eighths of an inch. The flange *a'* may be about a fourth of an inch thick, and projects horizontally from the outer sides of the frame to the extent of about two inches, as shown in the drawings, so as to rest upon any suitable support in the usual ash-box, (not shown,) and also support the fire-brick or iron fuel-box, (not shown,) the said flange being about a quarter of an inch below the upper edge *a''* of the grate-frame, so as to leave a shoulder thereat, against which the inner side of the said fire-brick or iron fire-box may bear, and thus be kept from slipping out of its proper place. The two opposite ends of the frame A are each cast with a depression, 2, across the middle of the upper side, for the reception of the journals of the moving portion of the grate. The moving portion of the grate consists of a longitudinally-slotted piece, B, having cylindrical journals *b' b''* projecting outward from its respective ends, and a series of short teeth, 3, projecting horizontally from the outer side of each of the two outside bars, 4 4. The depth of the bars 4 4, and also of those between them, is about equal to that of the frame A, and tapered from their respective top surfaces downward, in the usual manner for grate-bars, to prevent pieces of coal or cinder from wedging in the slots between them. Each of the teeth 3 3 of the two series is of the same thickness, taper, depth, and length of the teeth 1 1 of the frame A, excepting that the under curve of the ends of the teeth 3 3 are each concentric with the center line of the two journals *b' b''*, the object of which is to prevent any pieces of coal or cinder in the fuel-box (not shown) from getting between their respective ends and the spaces in which they are intended to be moved in shaking out the ashes. The central or slotted portion of the upper side of B is convex transversely; but the projecting teeth 3 3 are each in the same horizontal plane, on their upper surfaces, as the upper surfaces of the two bars 4 4, from which they project. The outer journal, *b'*, is

squared at its outer end, 5, to receive over it the usual shaking-lever, and the rear journal, *b''*, is partly covered by a cap, 6, which is cast with the frame A.

It will be seen that the whole grate is cast in two distinct and separate pieces, A and B, and that the part A is intended to be fixed and stationary under the fuel-box and over the ash-pit, (not shown,) while the part B is intended to turn, right and left, upon its journals *b' b''* in the depressions 2 2 of the frame A.

In operating this grate for the purpose of separating the ashes from the incandescent fuel in the fuel-box, the middle portion B is to be vibrated rapidly, and to no greater extent than will bring the outer or extreme ends of the top surfaces of the teeth 3 of either of its series, alternately, to the upper surfaces *a''* of the sides of the frame A, and consequently the opposite series of teeth of the said part B will not pass their extreme ends below the bottom edges of the series of teeth 1 1 of the fixed frame A, (see Fig. 2,) and the curves of the ends of the teeth 3 being concentric with the central line of motion of the part B, nothing but the ashes, or very small fragments of coal or cinder, can pass through the spaces between the respective series of teeth, so as to choke the spaces and prevent the requisite vibratory motions of the part B in separating the ashes from the incandescent fuel in the fuel-box.

When the part B is at rest in its normal horizontal position, as shown in Fig. 1, the

upper surfaces of the series of teeth 1 1 (being sloped downward, as shown in Fig. 2) afford a better draft through the spaces between the teeth of A and B, and produce a shearing action upon the cinders, which rapidly cuts and crushes them when the part B is vibrated forcibly for the purpose.

In order, at any time required, to discharge the whole contents of the fuel-box, the operator has only to turn the portion B into the position indicated by the dotted lines *v v* in Fig. 2.

It will be seen that the form and construction of this grate give it great strength and durability; that it is not liable to get easily out of working order in use; and that it affords most perfect facilities for separating the ashes and cinders from the incandescent fuel, and for discharging the whole contents of the fuel-box, when desired.

I claim as my invention—

In combination with the moving portion B, the outside teeth 1 1 on the stationary frame *a''*, each of said teeth being sloped downward from the upper surface of said frame to the free end of the tooth, as described, and shown in Fig. 2, the said parts operating together in the manner and for the purposes set forth and specified.

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Witnesses:

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