J. H. MEARNS.

GRATE.

No. 191,702. Patented June 5, 1877.

FIG. 1.

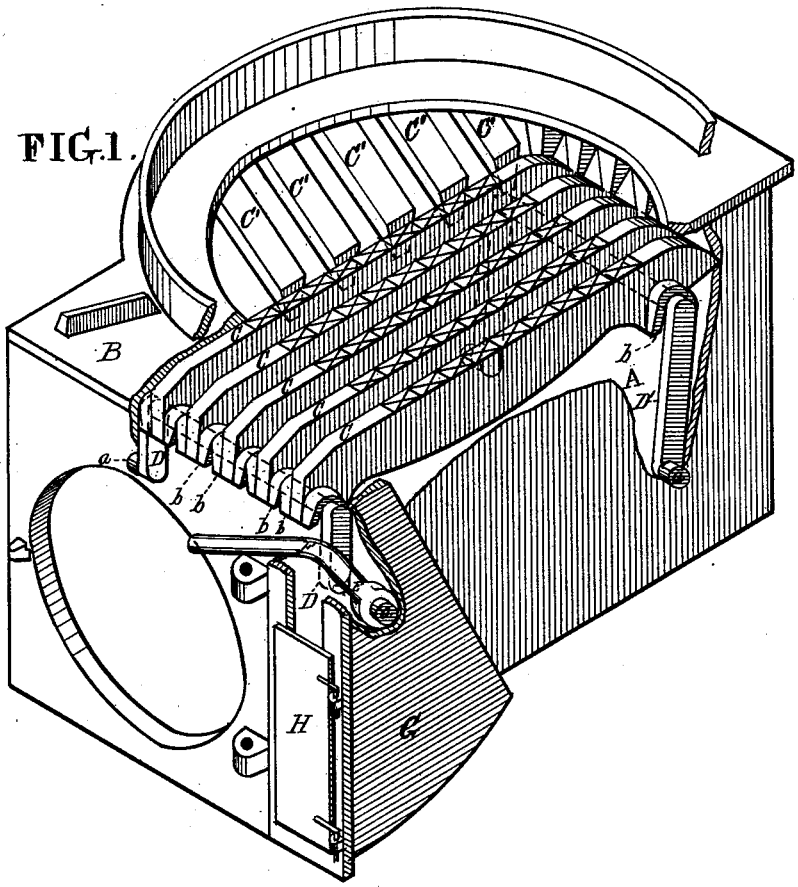
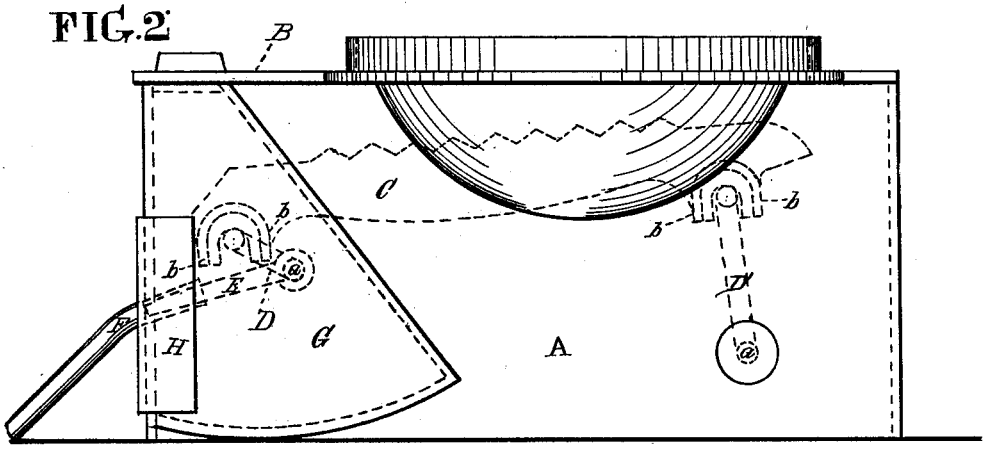


FIG. 2.



Witnesses

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JAMES H. MEARNS, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN GRATES.

Specification forming part of Letters Patent No. **191,702**, dated June 5, 1877; application filed January 19, 1877.

To all whom it may concern:

Be it known that I, JAMES H. MEARNS, of the city and county of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in Grates for Burning Fuel; which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is an isometrical view of my improved grate, in connection with the ash-pit of a furnace, the near side being broken away to show the grate-bars and cranks. Fig. 2 is a side elevation of the same, with the door H in its open position, and the free end of the slip-lever F resting on the floor to show the half-dumped position of the grate.

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

My invention relates to the following particulars:

The middle portion of the grate consists of a series of bars which have hooked ends which rest on a pair of cranks, one at the front of the fire-place, and the other at the rear side thereof, for shaking and dumping the bars. But, if desired, the bars may be connected to form the middle portion of the grate in a single piece. A short lever is connected with the front cranks for dumping the grate, and a slip-lever is connected with the short lever for shaking the grate, and also for supporting it in its proper position for removing the clinkers. One or both cranks have their pivotal connections so arranged that when the grate-bars are in their elevated position, as seen in Fig. 1, their crank-bearings are somewhat in the rear of the perpendicular lines of the crank-pivots, with the free end of the lever E bearing against the inner face of the rear side of the box G, whereby the superincumbent weight upon the pivots retains said bars in that position. There is a box at one side of the ash-pit, which incloses the lever to prevent the dirt from the ash-pit getting into the air-chamber. The box is provided with a door to prevent the dirt getting into it and obstructing the working of the lever. The door is of suitable height to act as a stop for the lever when the grate is being raked.

A is the ash-pit, and B the base-plate of the furnace which rests upon it. C C C C C are bars, which form the middle portion of the grate. D D′ are cranks, the journals or pivots *a* of which have their bearings in the side plates of the ash-pit. The grate-bars C have hooked ends formed by means of the jaws *b b*, which straddle the middle and straight part of the cranks. As the rear crank D′ is moved by the longitudinal movement of the grate-bars C, imparted by the movement of the front crank D in the dumping and half dumping of the bars, the bearings of the latter should not be brought far in front of the perpendicular plane of the crank-pivots; otherwise the crank will not have a free backward movement when the bars are returning to their horizontal position. (Seen in Fig. 1.) To avoid this difficulty, I make the arms of this crank much longer than those of the front crank D; and hence, as seen in Fig. 2, the forward movement of said bars does not bring the arms of the crank much in front of a perpendicular position. I accomplish another object by increasing the length of the arms of this crank, namely: The rear ends of the bars C are retained nearly at their greatest height, while their front ends, by the lowering of the front crank, are half dumped, by the movement of the lever F, into the position seen in Fig. 2. To complete the grate-surface there are short bars C′ at each side of the middle portion, and at right angles thereto. Their outer ends are connected with the base-plate B. They are in an inclined position, so as to incline the coal to the middle of the grate. On one end of the front crank is a lever, E, and connected therewith is a slip-lever, F. The latter is used for shaking the grate and for bringing it down to a half-dumped position, but is too long for dumping the grate, and consequently has to be slipped off the lever E, which is used alone for that purpose. G is a box at one side of the ash-pit. It is open in front to admit of the working of the levers E and F. The box is to intercept the dirt from the ash-pit and cellar, to prevent its getting into the air-chamber. The front of the box is provided with the door H, to prevent dirt getting into it from the front of the furnace, and thereby obstructing the working of the levers E F. The door H is of suitable height for its upper end to act as a stop during the shaking of the grate, to relieve it of the ashes. And

the lever F is of such length that when the grate is brought down to its half-dumped position, as seen in Fig. 2, for the removal of the clinkers from the fire, its free end shall rest on the floor, and thereby sustain the weight of the grate.

I claim as my invention—

1. The combination of the crank D with the front ends of the grate-bars C, having hooks for holding them in connection with the cranks during the shaking and dumping of the grate, substantially as set forth.

2. The combination of the slip-lever F with the lever E and front crank for supporting the grate in its half-dumped position, substantially as set forth.

3. The box G, for preventing the passage of dust from the ash-pit or cellar into the air-chamber, substantially as set forth.

4. The door H, for closing the lower part of the box G to prevent dirt getting therein, and obstructing the working of the lever F, substantially as set forth.

5. The combination of the lever F with the door H, the upper part of the door serving as a stop for the lever when the grate is being raked, substantially as set forth.

6. The combination of the lever E with the front crank and the back plate of the box G, substantially as and for the purpose set forth.

7. The combination of the crank D′ with the crank D, and grate-bars C, the arms of the crank D′ being longer than those of the crank D, substantially as and for the purpose set forth.

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Witnesses:

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