H. H. BURRITT & G. A. OHL.

Furnace-Grates.

No. 198,967. Patented Jan. 8, 1878.

Fig. 1.

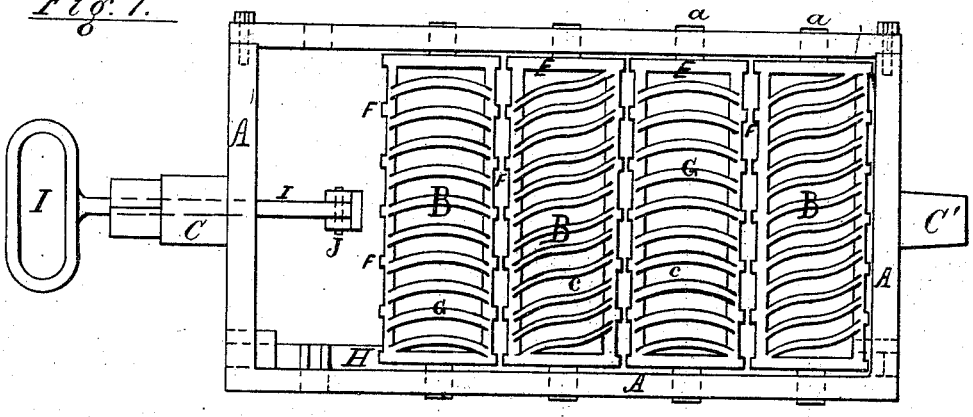


Fig. 2.

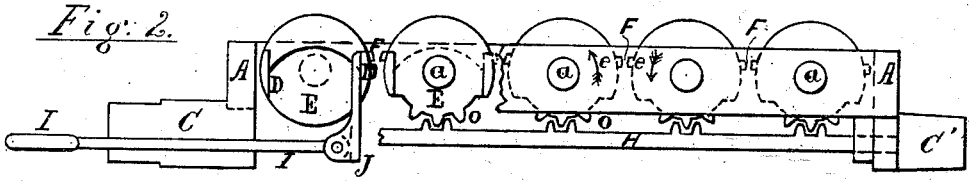


Fig. 4.

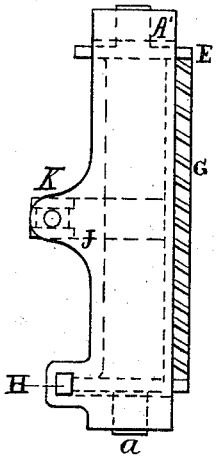
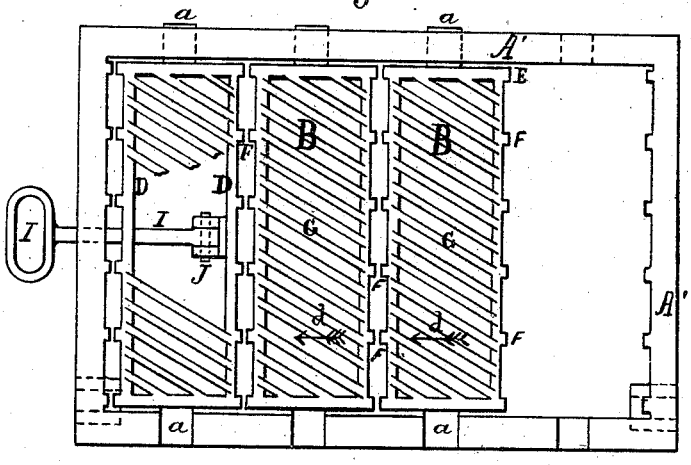


Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

HARVEY H. BURRITT AND GEORGE A. OHL, OF NEWARK, NEW JERSEY.

IMPROVEMENT IN FURNACE-GRATES.

Specification forming part of Letters Patent No. **198,967**, dated January 8, 1878; application filed August 24, 1877.

To all whom it may concern:

Be it known that we, HARVEY H. BURRITT and GEO. A. OHL, of the city of Newark, Essex county, New Jersey, have invented certain Improvements in Grates for Burning Coal; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a plan of a dumping-grate constructed according to our plan; Fig. 2, a sectional side view of the same; and Figs. 3 and 4, respectively, are a plan and end view of a stationary furnace-grate fitted with rocking grates, as described herein.

Our improvements consist in a peculiar mode of constructing rocking grates, and in operating the same, both in a stationary furnace-grate and in a dumping-grate.

In Fig. 1 we have shown a dumping-grate constructed with a frame, A A, into which are fitted a number of rocking grates, B B. The frame is fitted with pivots C C′, upon which it can be rotated in the furnace, and its contents discharged when desired.

In Fig. 2, at B B, are shown two of the rocking grates in section, by which it will be seen that they consist of side bars D D, connected at the ends by trunnion-plates E, and carrying a series of arched ribs, G, which sustain the coal. The side bars D are also furnished with spurs F, projecting toward the adjoining grates, and serving to break and grind the clinkers lodged between the grates when the same are simultaneously rocked. The trunnions are marked *a*.

The rocking mechanism may consist of a bar, H, furnished with teeth meshing into cogs O, formed on the trunnion-plates E, and actuated by the power applied to bar H or to one rocking grate of the set.

In Fig. 2 is shown a handle, I, (which may be passed either through or below the pivot C,) attached to an arm or projection, J, on one or more of the rocking grates. By reciprocating this handle I, the grate to which it is connected has a rocking motion imparted to it, and the other grates, B B, are rocked simultaneously through the agency of the bar H.

The arrangement of the rocking grates and mode of operating the same, when fitted into a stationary grate, is shown in Figs. 3 and 4, and is precisely similar to that just described, except that the handle I is supported by a suitable guide, K, there being no pivot C required on the stationary frame A′.

In rocking grates hitherto made, the bearings or ribs supporting the fuel have only been capable of loosening the clinkers that formed upon their surface; and the object of our improvement is to construct a grate that will break and grind up the clinkers, as well as to dislodge them from the convex surface of the grate.

To effect this object we arrange the ribs G, which form the principal surface of the grate, at an angle or curve with the side bars D, so that the clinkers lying upon the grate (and necessarily penetrating the spaces *c* between the ribs G) will be forced lengthwise of the grate as it is rocked upon its trunnions, and, being forced by the rocking motion into contact with the coal on the adjoining grate at the same time, it will be effectually broken up and ultimately fall into the spurs F, which will reduce it still further, and discharge it below the grate.

In Fig. 3 are shown three grates, in which the ribs are simply inclined to the side bars of the grate D D, while the tops are arched, as shown in Fig. 2.

It will be evident that when the grates are rocked, the adjoining spurs, as at *e e*, Fig. 2, will be moved in opposite directions, as indicated by the arrows *d d*.

At *d d*, in Fig. 3, the arrows also show that the clinkers would be pushed in opposite directions, thus exposing them to a variety of forces, which insure their speedy reduction.

In Fig. 1 the ribs G are shown, both spirally and curved, in a top view, either of which arrangements is greatly preferable to the usual transverse arrangement of the rocking surfaces, as tending to push clinkers along on the grate and break them into fragments, as well as to dislodge them.

It will be noticed that the spurs F are not mere guards or lugs to regulate the space between adjoining grates, that being fully determined by the position of the trunnions *a a*

in the frame A A, but are provided at frequent intervals, to catch and break up the loosened fragments of clinkers.

It will also be seen that the rocking grate shown in Fig. 1 can be readily substituted for any dumping-grate now in use in ranges and cooking-stoves, the external frame A and pivots C C′ being carefully made to correspond with the present pattern. By such a substitution of a rocking and dumping grate for the ordinary stove-grate, much greater economy can be secured in the consumption of the coal, as it can be raked by rocking the grates from time to time, and the heat thus be always obtained from a clear fire.

It is evident, also, that our rocking grates can be fitted into a frame suitable for portable furnaces and heaters now using a shaking and dumping grate, thus greatly diminishing the labor required to keep the fire clean, as the rocking grate is operated, when cleaning the fire, with one-half the labor required by a shaking-grate. In this case the frame A A may require to be of a round or curved form, and the rocking grates may be preferably operated by other means than the bar H and cogs *e*, as, by connecting the handle I to a projection, J, on each rocking grate B, or moving the bar H by a lever or other connection to the handle I, the passing of handle I through the pivot C permitting the frame A A to be rotated whenever the contents are to be dumped.

We are aware that single grate-bars have been constructed to rock, and to drop or tip down at one end to discharge their contents, and we cannot, therefore, claim such a construction; but having secured in our arrangement the ease of cleaning the fire afforded by rocking the coal-bearing grates, and facility in dumping by supporting them in a pivoted frame, and convenience in raking or rocking the same by a handle, I, passed through the pivot C of the rotating frame A A,

We claim and desire to secure by Letters Patent—

1. The frame A A, arranged to rotate on pivots C C′, and containing rocking grates B B, operated by connections to handle I passing through pivot C, the whole constituting a rocking and dumping grate for furnaces.

2. The rocking grate B, constructed with side bars D D, trunnion-plates E, trunnions *a a*, and ribs G, inclined at an angle to the side bars D, for moving clinkers longitudinally on the grate, in the manner and for the purpose described.

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