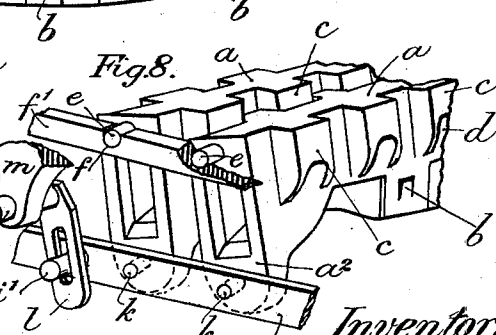
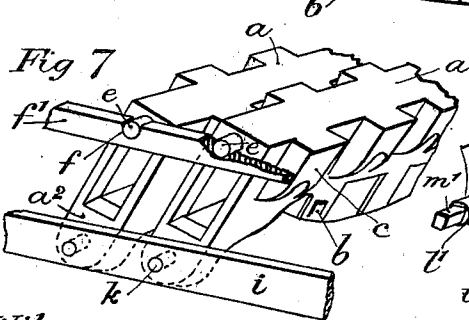
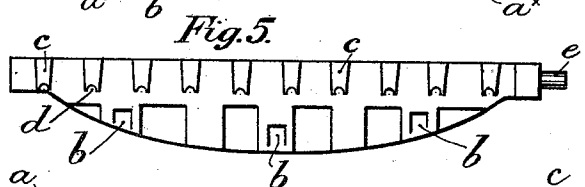
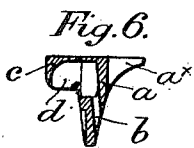
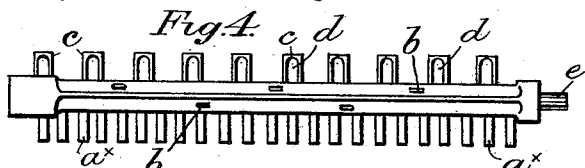
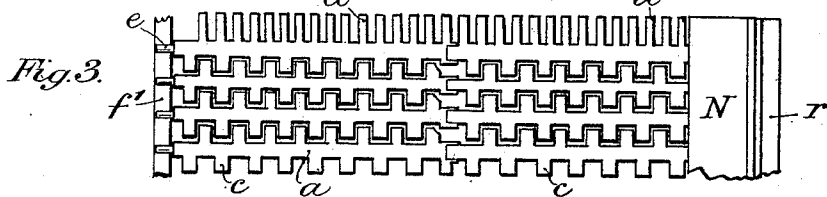
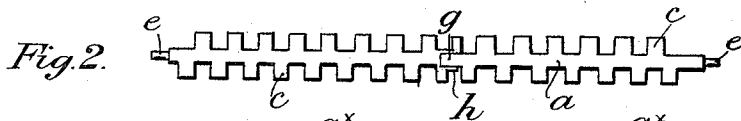
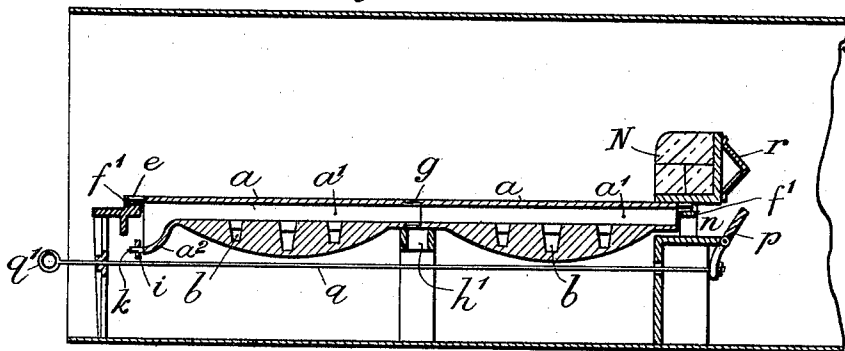


A. PILLATT.
ROCKING FIRE BAR FOR FURNACES.

(Application filed Oct. 22, 1896.)

(No Model.)

Fig. 1.



Witnesses:
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UNITED STATES PATENT OFFICE.

ANDREW PILLATT, OF NOTTINGHAM, ENGLAND.

ROCKING FIRE-BAR FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 608,712, dated August 9, 1898.

Application filed October 22, 1896. Serial No. 609,775. (No model.)

To all whom it may concern:

Be it known that I, ANDREW PILLATT, a subject of the Queen of Great Britain and Ireland, residing at Nottingham, England, have invented new and useful Improvements in Furnaces and in Rocking Fire-Bars Therefor, of which the following is a specification.

My invention relates to improvements in furnaces and in rocking fire-bars therefor, whereby any kind of solid fuel can be burned with practically complete combustion, and consequently without smoke, the furnace being at the same time durable, easily managed, and readily cleaned.

According to my invention the rocking bars are hollow and have lateral air-inlets and teeth or projections, which latter are preferably formed with openings, so as also to admit air. These bars are caused to rock by means of a lever acting on a connecting-rod with which pins on the bars directly engage. The bars project into an opening leading through the fire-bridge, and this opening is provided with a damper, above which is arranged a guard to prevent dust and cinders falling into the opening.

In the drawings, Figure 1 is a longitudinal section of a furnace constructed according to my invention provided with my improved rocking fire-bars. Fig. 2 is a plan of one of my said bars formed of two lengths. Fig. 3 is a plan of the grate-surface, showing a number of my improved fire-bars combined. Fig. 4 is an under side view, Fig. 5 a side elevation, and Fig. 6 a cross-section, showing to a larger scale the construction of the outside fire-bars. Figs. 7 and 8 are perspective views showing the manner in which the said hollow fire-bars are rocked.

a are the fire-bars, having a main passage *a'* from end to end.

b are the lateral air-inlets, which are situated in the web or rib of the bar and lead into this main passage.

c are the teeth or projections, which, as shown, are arranged to alternate on opposite sides of the bar. They are approximately of the same width as the bar, and those of one bar mesh into those of the next, as shown.

d are the openings with which the teeth are by preference provided and through which the air passes.

The arrangement of the air-inlets and the teeth and openings will be readily seen by reference to the views of the outer bar shown in Figs. 4, 5, and 6, it being understood that there is a corresponding set of teeth and openings on each side of the intermediate bars. The projections *a^x* shown in these figures are those usually employed on the outside bars of a rocking grate.

When the bars are arranged in the furnace to form the grate, a clearance of, say, a quarter of an inch, or thereabout, according to the character of the fuel which is to be burned in the furnace, is left between the bars. At the front and rear ends of the bars are pivot-pins *e*, which rest in recesses *f* in bearer-bars *f'*, and these pivot-pins may be tubular to allow the passage of air into and out of the hollow bar.

In the furnace shown two sets of bars are fitted end to end and are socketed together, as seen at *g*, Fig. 1, being further secured by side pieces *h*. The joints are supported by a central bearer-bar *h'*, permitting them to rock freely.

i is a connecting-rod which extends along the front of the furnace, and *k* are the pins on the bars which project into holes in the said rod. These pins are secured at the lower part of the depending mouths *a²* of the bars.

l is the lever whereby the connecting-rod *i* may be reciprocated to rock the fire-bars. This lever is slotted to engage a pin *i'* on the connecting-rod, and its fulcrum *l'* is carried in a bracket *m*, arranged in any convenient position under the dead-plate and secured thereto or to the bearer-bar *f* by nuts or otherwise. It will be seen that the depending mouth serves, as it were, as a crank or rocking arm and converts the movement of the connecting-rod into rocking movements of the bars. The lever *l* is operated by a loose or removable handle which is fitted onto a square *l²* on its fulcrum when it is desired to rock the grate and removed when the rocking operation is completed. When the said lever is in its central position, the grate-surface is perfectly level and even, whereas when the lever is moved either to its extreme left or right position the bars are rocked, as indicated, respectively, in Figs. 7 and 8. By this arrangement of rocking mechanism the pawls

and ratchets and other devices which are now usually employed to rock fire-bars are dispensed with and the same result obtained without them.

5 The enlarged depending mouth a^2 at the front of the bar allows the bearer-bar f' to be made strong enough to properly support the grate without lessening the draft through the bars, and the connecting-rod i is connected
10 directly to the fire-bar instead of to a lever or the like, as is usual in rocking grates.

n is the opening in the fire-bridge N , in which the rear end of the bar is supported upon the bearer-bar f' or otherwise. This
15 opening extends through the fire-bridge in line with the bars and enables the air drawn along the bars from the teeth or projections and the lateral air-inlets to pass out behind the bridge, where it mixes with the flame and
20 gases from the fire, so insuring complete combustion.

p is the damper at the back of the bars, by which the draft from the passage a' is regulated. It extends the full width of the furnace, and is operated by a rod q , (provided
25 with a handle q'), arranged, preferably, immediately under the bars at one side of the furnace and carried in the front bearer-bar frame. (See Fig. 1.)

30 r is the guard, which is of wedge or triangular shape and is secured to the back of the bridge. It serves to prevent dust and other matters from the fire or flue falling over the bridge upon the damper p and finding their
35 way into the fire-bars.

Instead of the arrangement of pins k on the bars and connecting-rod i , above described, the pins might be formed on the connecting-rod and engage in holes in the bars.

40 The herein-described improvements are applicable to the furnaces of marine, locomotive, portable, and other boilers and permit of all clinkers and refuse material from the fire being broken up by crushing them between the teeth or projections of the bars.
45

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

50 1. In a furnace, the combination of a hollow rocking fire-bar having lateral teeth or

projections, a bridge having an opening into which said bar extends, a depending mouth to said bar serving as an air-inlet and also as a crank, and a connecting-rod acting upon the depending mouth so as to rock the bar, 55 substantially as described.

2. In a furnace, the combination of a series of hollow rocking fire-bars, an opening in the fire-bridge into which said bars extend, a damper at the rear of the opening, an operating- 60 rod for said damper arranged beneath the bars, and a dust-guard above said damper, substantially as described.

3. In a furnace, the combination of a hollow rocking fire-bar having solid or tubular 65 pivot-pins at the ends thereof, bearer-bars to receive said pins, a connecting-rod extending along the front of the furnace, a lever for working said connecting-rod, a depending mouth on the end of the fire-bar, and a pin 70 connecting the mouth with the said rod, substantially as described.

4. In a furnace, the combination of a hollow rocking fire-bar, means for supporting the same, a depending mouth on said bar provided with a pin, a connecting-rod with which 75 said pin engages, a slotted lever engaging a pin on the connecting-rod for the purpose of operating the same, a bracket carrying the fulcrum of said lever, and a square on the 80 end of said fulcrum to receive a detachable handle, substantially as described.

5. A rocking fire-bar for furnaces, having a main passage extending along it, air-inlets in the web or rib of said bar, teeth or projections at the sides thereof, and pivot-pins at 85 the ends of said bar, substantially as described.

6. In a hollow rocking fire-bar, the combination of lateral air-inlets, a depending mouth, 90 and teeth or projections with openings therein serving to admit air to the main passage of said bar, substantially as described.

In witness whereof I have hereunto signed my name in the presence of two subscribing 95 witnesses.

ANDREW PILLATT.

Witnesses:

C. W. HEARN, Junr.,

H. W. BULL.