R. J. CRAM.

Shaking Grate Bar for Steam Boilers.

No. 201,752. Patented March 26, 1878.

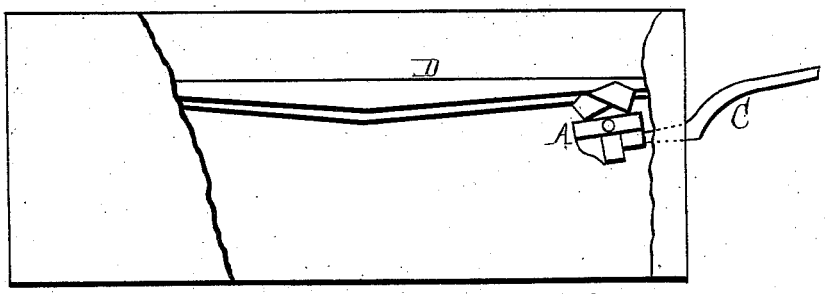

Fig. 1.

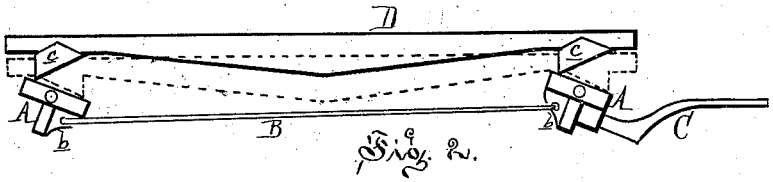

Fig. 2.

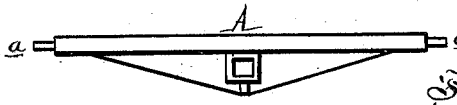

Fig. 3.

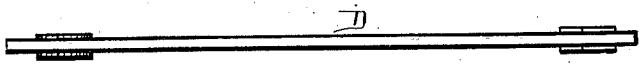

Fig. 4.

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ROYS J. CRAM, OF DETROIT, MICHIGAN.

IMPROVEMENT IN SHAKING GRATE-BARS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **201,752**, dated March 26, 1878; application filed February 7, 1878.

To all whom it may concern:

Be it known that I, ROYS J. CRAM, of Detroit, in the county of Wayne and State of Michigan, have invented an Improvement in Shaking Grate-Bars for Steam-Boilers, of which the following is a specification:

The nature of my invention relates to certain new and useful improvements in the construction of grate-bars, by means of which the fire may be thoroughly stirred when desired, and the cinder broken up and ashes shaken out; and the invention consists in the novel construction and arrangements of the various parts, as more fully hereinafter described.

Figure 1 is a vertical elevation of the side of a boiler-furnace, with the wall broken away to show the position of the various parts of my invention. Fig. 2 is a side elevation of one of the grate-bars, also showing the adjacent bar in dotted lines. Fig. 3 is a front elevation of the rocking supports of the grate-bars. Fig. 4 is a plan of the top of one of the grate-bars.

Like letters indicate like parts in each figure.

In the drawings, A represents the supports for the grate-bars, and they are suitably supported at each end upon trunnions *a*, journaled in proper bearings in or attached to the inner sides of the furnace-walls. These supports are placed one near the front and the other near the rear end of, and transversely across, the furnace, and they are provided with downwardly-projecting flanges *b*, which are connected together by the rod B, so that when a rocking motion is given to the front support by means of the removable lever C the same motion is transmitted to the rear support by means of said connecting-rod.

The grate-bars D are made, like ordinary grate-bars, slightly wedge-shaped in cross-section, being thicker on top than at bottom, in order to facilitate the discharge below of cinders and ashes.

All the bars of the grate are alike, and are constructed with lugs or projections *c*, cast under each end, of the form shown in Fig. 2. In placing these bars in position for use, every other one is reversed, or turned end for end, and rest upon the extreme lower points of their respective projections upon the upper surfaces of the transverse supports, which are sufficiently broad for that purpose. These supports being compelled to rock or rotate back and forth upon their central longitudinal axes *a*, the points of support of the two adjoining bars will be given a reciprocal vertical motion, thereby causing every other bar in the grate to rise the same distance, and at the same time causing the alternating bars to fall the same distance, thus effecting a thorough shaking and cleansing of the fire upon them.

The essential features of the supports A are, that they shall have a flat upper surface sufficiently wide to carry the points of the projections, upon which rest the adjoining grate-bars; that they shall be of sufficient strength to support the grate-bars and fuel; and that they shall be so coupled together by the connecting-rod that motion given to one will be transmitted to the other.

The advantages to be derived by the above-described arrangement are, first, simplicity of construction, durability, great convenience, general efficiency, and ease of management; second, a saving of fuel by free admission of air through all parts of the fire-surface, compelling complete combustion; third, freedom from clinkers as a natural result of a clean fire, and an even fire through the ability to keep all the parts of fire-surface free from dirt; fourth, a saving of fire plates and flues, fuel, and boiler by doing away with the necessity of opening the furnace to attend the fire, which is steadily maintained; and, fifth, ease of adaptation to any boiler-furnace, either new or old, which has a rectangular fire-box.

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination, with the alternately-reversed grate-bars D, having lugs *c*, all of the same construction, of the rocking supports A, connected together, and having broad upper surfaces, upon which the lugs *c* of the grate-bars rest without being connected thereto, the several parts being constructed, arranged, and operated substantially as described and shown.

In testimony that the above-described invention is my own I hereby subscribe my name.

ROYS J. CRAM.

In presence of—
H. E. CRAM,
M. M. PARMELEE.