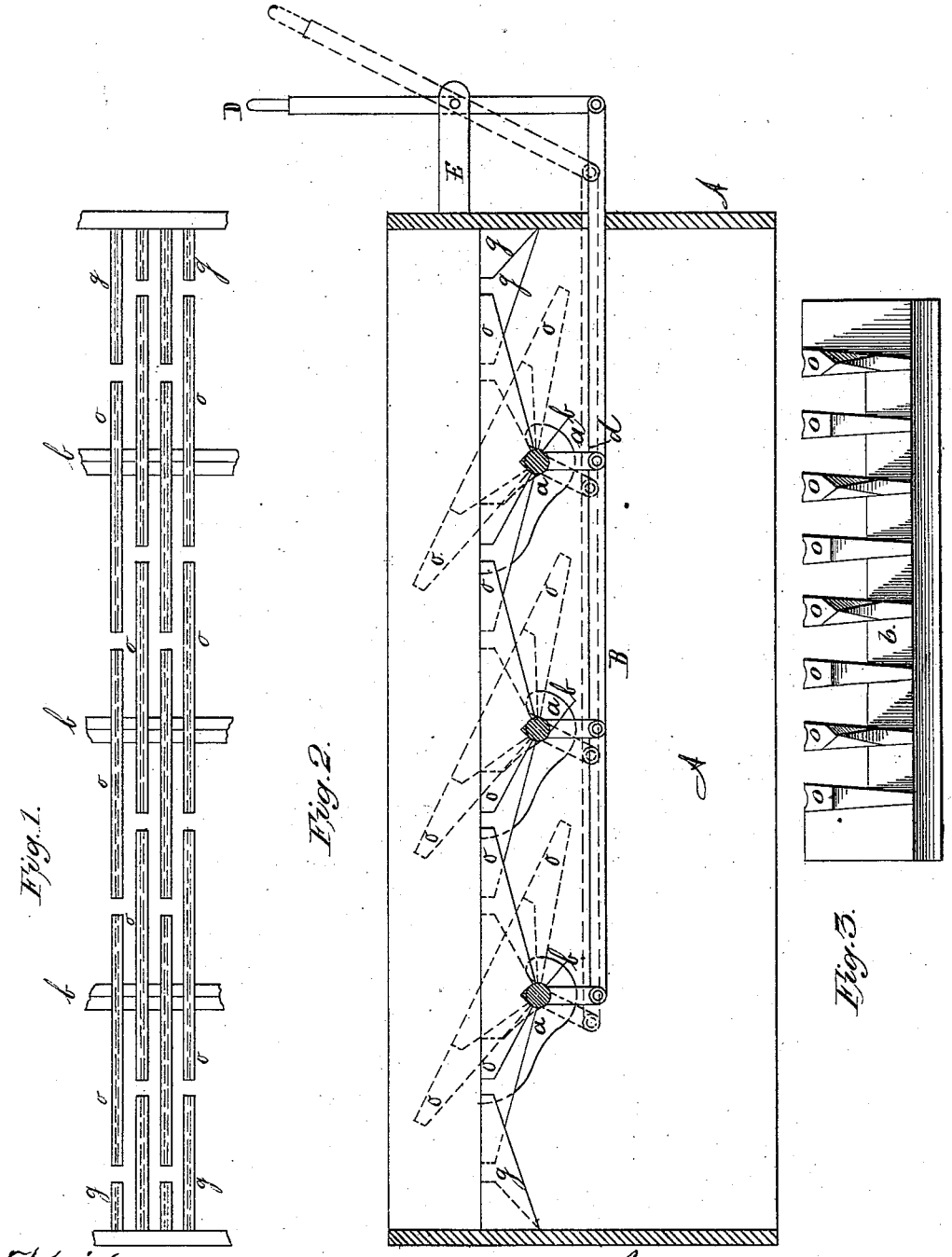
R. J. HANCOCK.

BOILER-FURNACE GRATE-BARS.

No. 192,331. Patented June 26, 1877.



Witnesses.
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UNITED STATES PATENT OFFICE.

ROBERT J. HANCOCK, OF SPRINGFIELD, MASSACHUSETTS.

IMPROVEMENT IN BOILER-FURNACE GRATE-BARS.

Specification forming part of Letters Patent No. **192,331**, dated June 26, 1877; application filed April 10, 1877.

To all whom it may concern:

Be it known that I, ROBERT J. HANCOCK, of Springfield, county of Hampden and State of Massachusetts, have invented new and useful Improvements in Boiler-Furnace Grate-Bars, which improvements are fully set forth in the annexed specification and accompanying drawing, which consists of two figures—

Figure 1 being a side elevation of a furnace with my improved grates, and Fig. 3 a view in cross-section of the grates in Fig. 1.

A represents the walls surrounding the grates. *a a a* are flat bar-shaped cast-iron supports attached to the sides of the walls under the grates, and having cast in them proper slots extending from the top edge downward to receive the bearing ends of the rock-shafts. *b b b* are the rock-shafts above mentioned. *d d d* are downwardly-projecting arms on said rock-shafts. B is a connecting-rod, to which, by screw-bolts or other means, the arms *d* are hinged. D is a lever to which the end of connecting-rod B is hinged, and E is its fulcrum. *o o o* are the grate-bars, and *g g* are fixed end sections of bars which are cast solid upon a rectangular bar, and stand at right angles to the face thereof, said end-section bars being alternately long and short, to conform to the position of the bars upon the rock-shafts, with which they interlock.

The object of my invention is to provide for boiler-furnaces a sectional grate, in which the motions given to the grate shall operate to more perfectly lift up and open the bed of coals lying thereon, so as to produce a more perfect combustion by the freer admission of air among them than can be obtained by other sectional grates, wherein the motion is more oscillatory than lifting.

In the use of these latter, the action of the grates against the under side of the bed of coals is mainly abrasive, and that is not sufficient to open up the fire and aid the combustion of the fuel. Also, by the use of my improved grates, constructed with the bars *o o o* mounted upon the rock-shafts to one side of their axis of motion, I am able to more effectually work the bars against the resistance of any cinders that may fall between the ends of the bars, and crush and grind them so they will fall into the ash-pit. Furthermore, the construction of my grates permits of conveniently tipping the sections to a sufficient degree to cause all the coals and cinders lying on them to be dumped into the ash-pit, save those on the end sections, which are easily removed otherwise. Also, the meeting or interlocking portions of the bars are tapered upward from their junction with the rock-shafts, so as not to require to be tipped so much to free themselves from any cinders that may catch between the ends of the bars as they are being shaken.

By this latter provision more power is available to crush the cinders through the use of the lever D, connecting-rod B, and arms *d*, than could otherwise be obtained.

I also make the under side of the interlocking ends of the bars V-shaped, so that they may more readily cut and clear themselves from any cinders that may catch between them.

The form of the supports *a a a* on the walls of the furnace permits of easily replacing burned-out grate-bars with new sections.

The construction of my grates is so simple, and their operation so easily understood from the drawing, that any lengthened description of that seems hardly necessary.

The dotted lines on the drawing show the positions of the lever D, connecting-rod B, arms *d*, and grate-bars, when operated upon for dumping, and much or little motion can be given to the grates by the lever, as circumstances may require.

In making my sectional grates, the grates *o*, rock-shaft *b*, and arm *d* are cast in one piece, and only require to have a bolt-hole drilled where the arm is connected to the connecting-rod.

Having thus described my invention, what I claim is—

The grate-bars *o o o*, mounted upon the rock-shafts *b b b* to one side of their axis of motion, the under edge of said grate-bars, from near the rock-shaft to the ends of them, being made with a sharp upward pitch, and the bottom edges thereof V-shaped, substantially as and for the purpose set forth.

ROBERT J. HANCOCK.

Witnesses:
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