(No Model.)

J. BURRELL.

GRATE BAR FOR FURNACES.

No. 317,439 Patented May 5, 1885.

Fig. 1

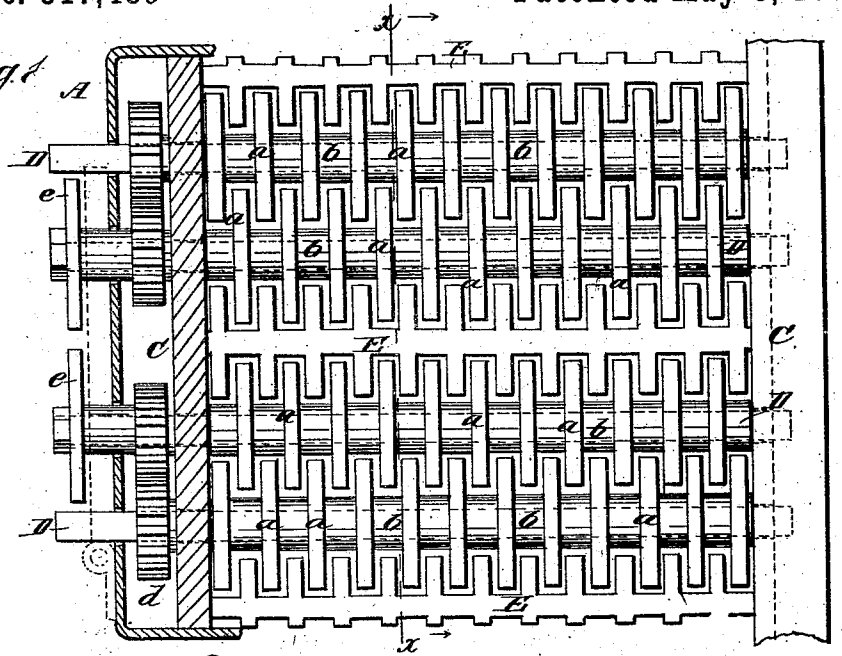


Fig. 2

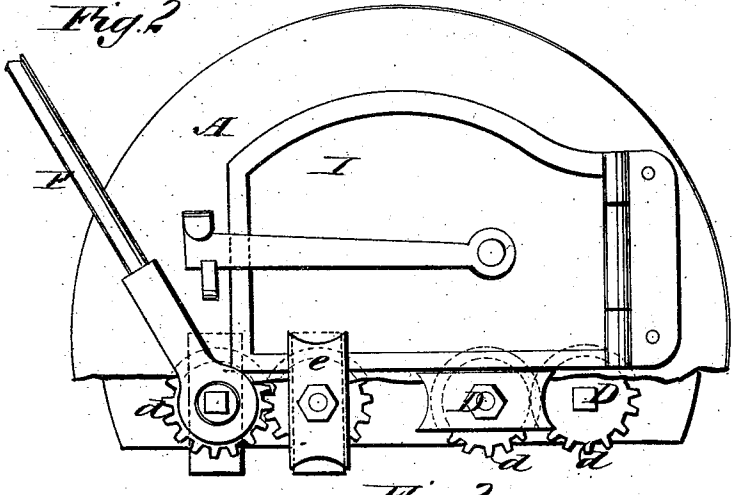
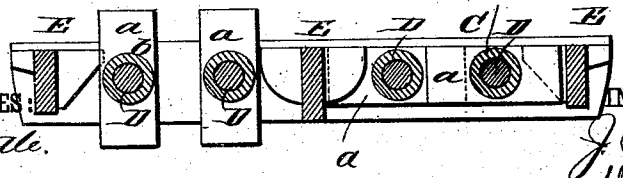


Fig. 3



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JAMES BURRELL, OF BRISTOL, COUNTY OF SOMERSET, ENGLAND.

GRATE-BAR FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 317,439, dated May 5, 1885.

Application filed September 29, 1884. (No model.)

To all whom it may concern:

Be it known that I, JAMES BURRELL, of Bristol, in the county of Somerset, England, have invented a new and useful Improvement in Grate-Bars for Furnaces, of which the following is a full, clear, and exact description.

The object of my invention is to provide for the easy removal of ashes, clinker, slate, and other incombustible matters from the fire-chambers in or under boilers, forges, and furnaces, so as to insure an absolutely-clean fire-surface, and consequently complete combustion.

The invention consists in a series of rotating shafts provided with plates or bars, and fitted to work between fixed bars, as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view, partly sectional, of a grate embodying my invention. Fig. 2 is a front elevation of the fire-box, showing the fire-door and the ends of the grate-bars. Fig. 3 is a transverse section on the line *x x*, Fig. 1.

A represents the front of the fire-box, provided with a door, B, as usual.

C C are the front and back bearers or girders supporting the grate-bars.

In the bearers C C are supported shafts D, that may be of either round or angular form, and on these shafts are fixed the plates or bars *a*, that may be of either oblong or triangular form.

Between the plates or bars *a* are bosses or collars, *b*, to retain the bars the proper distance apart. In some cases the cross-bars *a* and the shafts may be cast together in one piece.

Between the shafts D are the fixed bars E, which are formed with side projecting arms or bars that intermesh with the bars *a* upon the shafts. The plates and cross-bars together form the grate-surface, and it is to be understood that there may be any number of shafts as required. The ends of the shafts D project at the front of the fire-box, and are geared together in pairs by gear-wheels *d d*. One shaft of each pair is formed for receiving a handle, F, so that the handle can be used for turning the shafts. Upon the end of the other shaft of each pair is an oblong plate, *e*, which extends in the direction corresponding to the bars *a*, so that when the grate bars are in any other position except level the plates *e* will project in front of the fire-door B, and thus prevent the opening of the door until the grate-bars are brought to the level, the plates thus serving as an indicator or guide to prevent the grate-bars from being left out of level.

By turning the shafts D, and thus reversing the position of the grate-bars, the ashes, clinker, and other incombustible matters are carried or allowed to drop through to the ash-pan, and in that manner the fire can be kept clear at all times and perfect combustion insured.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A furnace-grate consisting of the rotating shafts D, provided with cross-bars *a*, and the intermediate fixed bars, E, combined substantially as described.

2. In a grate, the combination of the plates *e* with the rotating shafts D and fire-door B, substantially as and for the purpose specified.

JAMES BURRELL.

Witnesses:
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