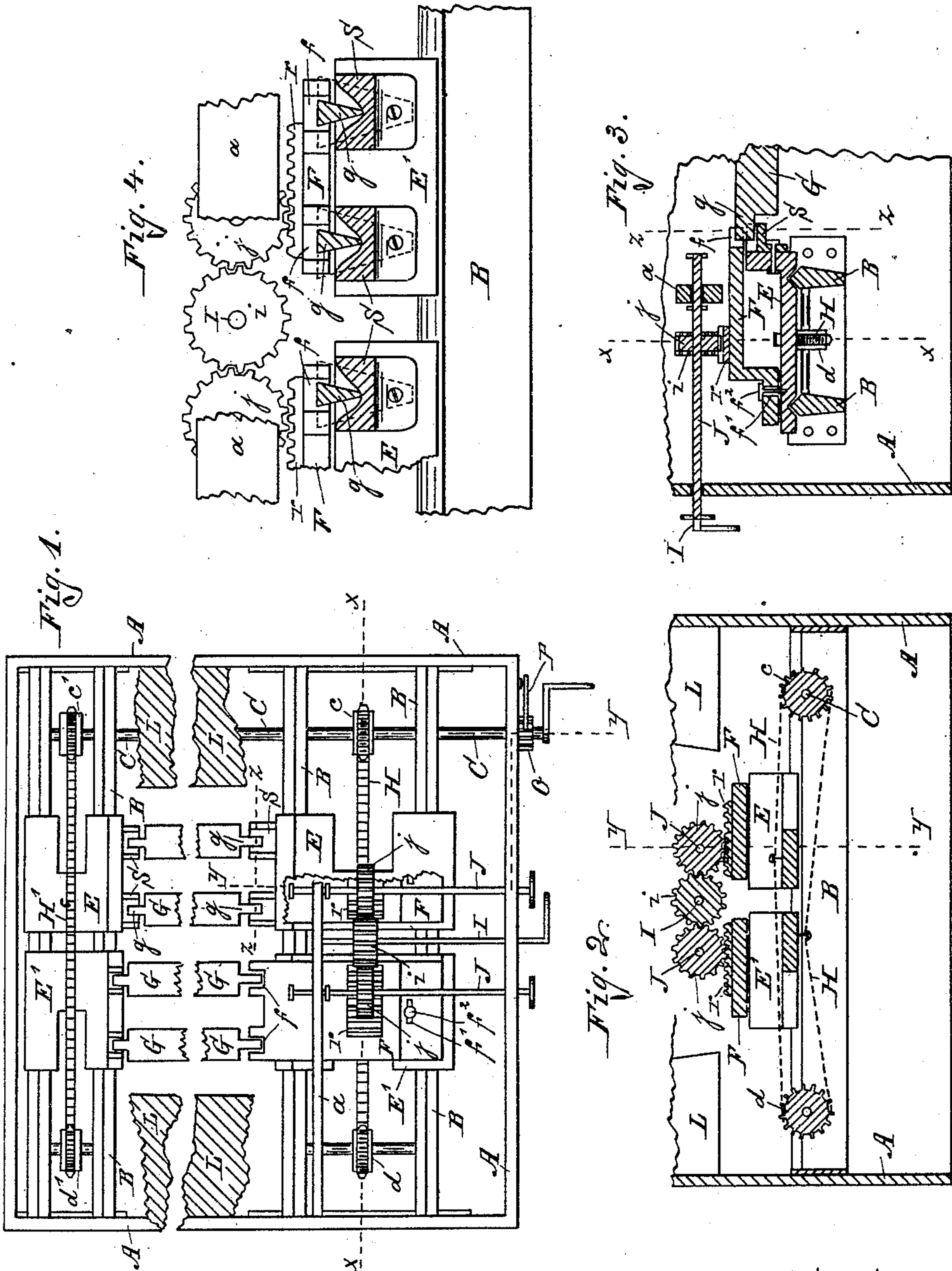


(No Model.)

J. VOEGTLE.  
FURNACE GRATE.

No. 354,523.

Patented Dec. 14, 1886.



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# UNITED STATES PATENT OFFICE.

JACOB VOEGTLE, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO OSCAR VOEGTLE, OF SAME PLACE.

## FURNACE-GRATE.

SPECIFICATION forming part of Letters Patent No. 354,523, dated December 14, 1886.

Application filed February 13, 1886. Serial No. 191,783. (No model.)

*To all whom it may concern:*

Be it known that I, JACOB VOEGTLE, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Furnace-Grates, of which the following is a specification.

My invention relates to improvements in grates such as are used to support the fuel in stoves, ranges, furnaces, and the like; and the objects of my improvements are, first, to supply a grate which is centrally opened and separated by the operation of an outside crank, the sections forming the grate sliding laterally under the lining of the fire-chamber, and thus insuring a central dump of the ashes and cinders; second, to provide an efficient and easily-manipulated mechanism for shaking the grate; and, third, to facilitate the removal and replacement of broken or damaged grate-bars. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a top view of the grate and its operating mechanism; Fig. 2, a vertical cross-section through the same on line *x x* on Figs. 1 and 3; Fig. 3, a vertical longitudinal section on lines *y y* on Figs. 1 and 2; Fig. 4, a vertical cross-section to a larger scale on lines *z z* on Figs. 1 and 3.

Similar letters refer to similar parts throughout the several views.

A is the frame which supports the furnace and the grate and its operating mechanism, and at the same time forms the casing of the ash-pit underneath the grate.

G G G are the bars forming the grate. These bars may be made in any number and shape desired, excepting that the ends *g g* are to be formed in such a manner that the line of contact between the bars and their supports S S is on or nearly on a line with the central axis of the bars, or, in other words, that the bars G G will pivotally rock on their ends *g g*. The bars rest loosely with their wedge-shaped ends *g g* on the bearings or forked shoulders S S. These shoulders S S are screwed or bolted to the sides of the sliding frames or carriages E and E', that face toward the fire chamber.

If it becomes desirable to remove or replace one of the grate-bars, all that is necessary to

do is to unscrew or remove the supporting-shoulder S at one end of the bar. The bar will then drop down, and a new one can easily be raised into its place and secured by replacing the supporting-shoulder.

To accomplish the easy replacement of the grate-bars, only one end of each bar is required to rest on such a shoulder, S, secured to the side of one sliding frame, while the other end may lie in a notch or recess directly on top of the other sliding frame, as shown on one-half of Fig. 1.

The frames or carriages E E and E' E' are supported by and slide laterally on the rails B B, that extend in pairs across from one side of the casing A to the other, thus stiffening the casing and forming tracks for the fore and rear carriages, E E' E'. These carriages and the sections of the grate that are supported by the same are moved from and to underneath of the center of the fire-chamber by the following mechanism:

At one side of the grate a shaft, C, extends longitudinally through the entire depth of the casing A, being supported by the walls of said casing and by the rails B B. Firmly fixed upon this shaft C, in the center of each pair of the rails B B, are the sprocket or chain wheels *c* and *c'*, that operate the endless chains H and H'. These chains H and H' pass over sprocket-wheels *d* and *d'*, corresponding to the wheels *c* and *c'*, and journaled at the other side of the grate between the rails B B. The chains H and H' are fastened to the upper side of the carriages E E and to the lower side of the carriages E' E', as shown in Fig. 2, so that by turning the crank N on the outside of the shaft C both carriages E and E' are moved in opposite directions, thus enabling me to centrally open the grate by sliding the grate-sections sidewise under the furnace-linings L L.

The device for shaking the grate-bars is constructed in the following manner: To the top of the fore carriages, E and E', are held the shaking-frames F F by means of the bolts *f<sup>2</sup> f<sup>2</sup>*, that pass through the vertical cross-slots *f' f'* in the frames F F, and are firmly secured to the supporting-frames E and E', the slots *f' f'* allowing a limited lateral movement of the frames F F in relation to the frames E and E'. The shaking-frames F F are shaped and con-



constructed in such a manner as to allow the chain H to pass between the frames F F and the top of the frames E and E'. The frames F are superposed upon the carriages E and E', and have notches *f f*, which correspond with the shoulders or bearings S S, that support the wedge-shaped ends *g g* of the grate-bars G G. The grate-bars are wide enough so that while resting in the bearings S they extend up into the notches in the frames F. To the top of the frames F are secured the rack-rails *r r*. A central crank-shaft, I, provided with a cog-wheel, *i*, operates the cog-wheels *j j*, situated at each side of the wheel *i*. These cog-wheels *j j* engage into the rack-rails *r r*, so that by rocking the shaft I the frames F F are laterally shaken, which movement is transferred to the grate-bars G G. The cog-wheels *i j j* are held in their proper relative places to each other by their shafts I J J, that are supported by the frame A, the shafts J J being loosely mounted in their bearings, so that they can be drawn out and the wheels *j j* can be disengaged with the central wheel, *i*, which always keeps its position. This construction enables me to shake either the whole grate or its right or left section at a time, and also allows the bringing together or moving apart of the carriages E F and E' F, for by having, for instance, only the left cog-wheel *j* engaged with the central wheel, *i*, the operation of the shaft I shakes only the left section of the grate, and to move the grate-sections apart or together one of the cog-wheels *j* must be disengaged with the central wheel, *i*. To prevent the shaking of the frames F and the grate-bars G from affecting the frames E E'—that is, from causing the grate-sections to slide apart—I secure on the outside of the casing A, to the shaft C, a ratchet-wheel, O, into which engages the click P. Thus when the grate-sections are in position under the fire-chamber the shaking of the grate-bars will not open the grate, the locking device O P preventing a backward motion of the shaft C. Instead of the ratchet-wheel and click, any other suitable locking device can be used. Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a grate for furnaces or the like, the combination of the frame or casing A, the cross-rails B B, the carriages or frames E E', supported on said rails B B, the grate-bars G G, supported by the carriages E E', the revolving shaft C, the chain-wheels *c* and *c'*, firmly fixed upon the shaft C, the supporting-wheels *d* and *d'*, and the chains H and H', all substantially arranged as described, and for the purpose of centrally opening and closing the grate.

2. A grate for furnaces or the like, having the casing or frame A, the cross-rails B B, the frames or carriages E E', supported on said rails B B, the removable forked shoulders or bearings S S, secured to the frames E E', as described, the grate-bars G G, having the wedge-shaped ends *g g*, and resting with these

ends in the removable bearings S S, all constructed as described, and for the purpose specified.

3. In a grate for furnaces or the like, the combination, with the frame or casing A, the furnace-lining L, and the grate-bars G G, of the cross-tracks B B, the frames or carriages E and E', supported and laterally sliding on the rails B B, the removable shoulders or bearings S S, secured to the frames E and E', and supporting the grate-bars G G, in the manner described, the shaft C, the chain-wheels *c c' d d'*, and the chains H and H', arranged for the purpose of closing the grate or removing the grate-sections under the fire-lining L, and a device for locking the grate-sections, substantially as described and specified.

4. In a grate for furnaces or the like, the combination, with the frame or casing A, the cross-bars B B, the frames or carriages E E', the shoulders or bearings S S, and the grate-bars G G, all constructed as described, of the shaking-frames F F, superposed upon the carriages E E' and held to the same by means of the bolts *f<sup>2</sup> f<sup>2</sup>* and the slots *f' f'*, the notches *f f* in the frames F F engaging with the wedge-shaped ends *g g* of the grate-bars G G, and the crank-shaft I, the cog-wheel *i*, the shafts J J, the cog-wheels *j j*, and the rack-rails *r r*, forming means to shake the grate-bars G G, all constructed as described and specified.

5. In a grate for furnaces or the like, the combination, with the casing A, the cross-tracks B B, the frames or carriages E E', supported on said tracks B B, the grate-bars G G, supported on the carriages E E', the shaft C, chain-wheels *c c'* and *d d'*, and chains H and H', forming means for centrally opening and closing the grate, of the shaking-frames F F, superposed upon the carriages E E', and engaging with the ends of the grate-bars G G, as described, and the crank-shaft I, cog-wheel *i*, shafts J J, cog-wheels *j j*, and rack-rails *r r*, forming means to shake the grate-bars G G, all constructed as described and specified.

6. In a grate for furnaces or the like, the combination, with the casing A, the grate-bars G G, the frames E E', and the shoulders S S, supporting the grate-bars G G, as described, of the shaking-frames F F, connected to the frames E E' by means of the slots *f' f'* and the bolts *f<sup>2</sup> f<sup>2</sup>*, and engaging with the ends *g g* of the grate-bars G G, the rack-rails *r r* on said frames F F, the fixed shaft and cog-wheel I *i*, and the sliding shafts and cog-wheels J J *j j*, constructed as described, and for the purpose of enabling the operator to shake either the whole grate or parts of it.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JACOB VOEGTLE.

Witnesses:

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