

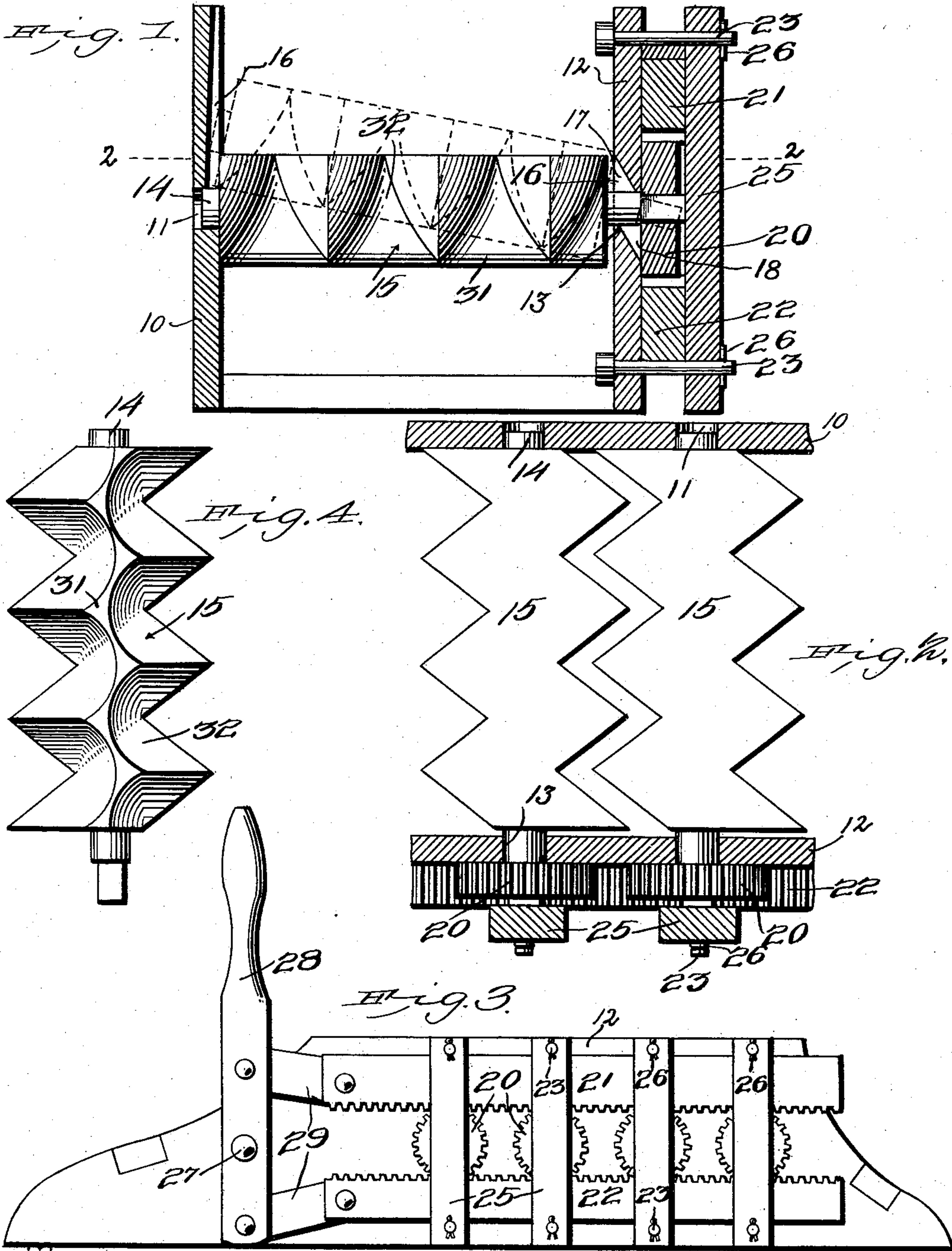
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PATENTED AUG. 4, 1903.

F. TORRY.
DUMPING GRATE.

APPLICATION FILED JULY 2, 1902.

NO MODEL.



Witnesses

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UNITED STATES PATENT OFFICE.

FAY TORRY, OF ERIE, PENNSYLVANIA.

DUMPING-GRATE.

SPECIFICATION forming part of Letters Patent No. 735,623, dated August 4, 1903.

Application filed July 2, 1902. Serial No. 114,134. (No model.)

To all whom it may concern:

Be it known that I, FAY TORRY, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented a new and useful Dumping-Grate, of which the following is a specification.

My invention relates to certain improvements in furnace-grates of that class in which the grate-bars are independently mounted and connected to a common operating means by which they may be operated to break up clinkers and clear the fire of ashes or turned at an angle to their normal position to dump the fire.

One of the objects of the invention is to so construct the grate-bars and their supports that any bar may be readily removed if damaged and a new bar inserted in place without disturbing any other portion of the grate.

A further object of the invention is to improve and simplify the construction of the grate-operating mechanism with a view of rendering the shaking operation more easy and to permit the application of considerable power when it becomes necessary to break up clinkers caught between the bars of the grate.

A still further object of the invention is to so construct the operating mechanism as to partly support the grate-bars and retain them in proper position without the employment of auxiliary securing devices; and a still further object is to provide an improved form of grate-bars which will insure the breaking up or crushing of any clinkers too large to pass between the bars.

With these and other objects in view the invention consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a transverse sectional elevation of a furnace-grate constructed in accordance with my invention. Fig. 2 is a sectional plan view of the same on the line 2 2 of Fig. 1. Fig. 3 is a side elevation of the device, illustrating the construction and arrangement of the shaking

mechanism. Fig. 4 is an inverted plan view of one of the grate-bars.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

In the rear wall 10 of the furnace—the bridge-wall, if the device be applied to a boiler—are a series of openings 11, and in the front wall 12 are openings 13, forming bearings for the reception and support of the pivot-pintles 14 of the grate-bars 15. In the inner face of the rear wall 10 are vertically-arranged grooves 16, extending from the openings 11 to the top of the wall and forming passages to permit the insertion of the grate-bars. In the inner face of the front wall 12 is an inclined slot 17, extending from the inner face of the wall to a point about midway of the length of the opening 13, and on the outer face of the wall is a similar slot 18, extending rearwardly to a point somewhat beyond the center of the opening 13, the inclined faces of the two slots 17 and 18 being substantially parallel with each other, and the distance between the planes in which they are respectively situated being slightly greater than the diameter of the pivot-pintle 14 of the grate-bar. The construction is such that the front and rear walls may first be placed in position and the grate-bars afterward inserted and removed whenever necessary without disturbing the position of the grate-bar supports. When a grate-bar is to be inserted, its front pivot-pintle is inserted between the faces of the slots 17 and 18, the grate-bar being held in an angular position, as indicated by dotted lines in Fig. 1. The rear pivot-pintle enters the upper portion of the groove 16, and its rear end is gradually lowered, causing the projection of the front pintle through the opening 13 until the grate-bar finally assumes a horizontal position, after which it is moved slightly to the rear until its rear pivot-pintle is partially entered in the opening 11. In this manner a damaged grate-bar may be readily removed and a new one substituted without loss of time and without interfering with the remaining grate-bars or their supports. On the projecting end of each of the front pintles is mounted a pinion

20, the extreme end of the pintle and the pinion being angular in form, so that the pinion may be readily placed in position on an inserted bar or removed when the bar is to be
5 taken out of the grate.

21 and 22 designate, respectively, upper and lower rack-bars, the teeth of which intermesh with the teeth of all of the pinions 20. Immediately above the rack-bar 21 and below the rack-bar 22 are pins 23, projecting from the front of the wall or casing 12, said pins being arranged in pairs and disposed in the same vertical plane with the pivot-pintles of the grate-bars, as shown in Fig. 3. The
10 space between the upper and lower pins of each pair is such that the racks are held closely in engagement with the pinions, the lower racks serving to some extent as supports for the pinions and the grate-bars to
15 which they are secured.

25 designates a series of vertically-disposed bars, each having openings for the reception of the pins 23. These bars extend over the ends of the pivot-pintles and serve not only
25 to hold the pinions on the pintles, but also to retain the rear pivot-pintles within the openings 11 in the rear wall of the furnace. The bars may be secured in position by any suitable holding devices, as by keys 26, extending through suitable openings formed in the
30 pins 23, or nuts may be employed, the ends of the pins being threaded for their reception.

At a point beyond one end of the rack-bars the front wall of the furnace is provided with
35 a pivot-stud 27, on which is mounted a handled lever 28, connected by links 29 to the two rack-bars, so that on the movement of the lever the rack-bars will be simultaneously
40 operated in opposite directions, the movement being transmitted to two points on each of the pinions 20 and enabling the operator to apply sufficient force to crush any clinkers caught between the oscillating grate-bars.

Each grate-bar 15 is of the same construction, its upper surface being flat and its opposite sides being slightly rounded and tapering to a contracted bottom 31. In each side of the grate-bar are formed angular
45 spaces 32, the spaces on one side of the grate-bar being each arranged centrally between two corresponding spaces on the opposite side of the bar, resulting in the formation of a series of angular teeth arranged in staggered order,
50 the teeth of one bar fitting into the space between the teeth of an adjacent bar, the bars being properly spaced to permit the free passage of air to support combustion. Owing to the peculiar formation of the teeth, any
55 clinkers caught between them while the bars are being operated will be broken up and fall to the ash-pit.

While the construction herein described, and illustrated in the accompanying drawings, is the preferred form of the device, it is
65 obvious that various changes in the form, pro-

portions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described my invention, what I claim is—

1. The combination in a grate, of the front and rear walls having bearing-openings, said rear wall being provided with grooves extending upwardly from its bearing-openings to permit the passage of the pintles at the rear ends of the grate-bars, and the front wall having inclined openings crossing the plane of the bearing-openings and of a diameter equal
75 to that of said bearing-openings, grate-bars having pintles fitting in the bearing-openings, and means for oscillating said grate-bars.

2. The combination of the grate-bar having end pintles, a rear wall having a bearing-opening and provided with a vertically-extending groove to permit the passage of the rear pintle, a front wall having a bearing-opening and provided on its opposite faces with inclined slots having their walls arranged in substantially
85 parallel planes and forming an inclined opening crossing the plane of the bearing-opening to permit the insertion and removal of the front pintle of the grate-bar, said inclined opening being of a diameter equal to that of
90 the bearing-opening, and means for oscillating said grate-bars.

3. The combination of the pivoted grate-bars having end pintles projecting through the front wall of a fire-box, pinions mounted
100 on said pintles, upper and lower rack-bars engaging said pinion, guiding and supporting pins for said rack-bar, said pins being arranged in pairs, one pair being in the vertical plane of each grate-bar pintle, and cross-bars
105 carried by said pins and serving to prevent lateral movement of the racks and pinions, substantially as specified.

4. The combination with a furnace having a front wall provided with bearing-openings
110 and a rear wall also provided with bearing-openings, grate-bars having end pintles adapted to said openings, pinions mounted on the front pintles, rack-bars engaging said pinions, upper and lower pins for supporting and guid-
115 ing said rack-bars, cross-bars arranged in the vertical plane of the grate-bar pintles and having openings for the reception of the pins, said bars serving to hold the rear pintles of the grate-bars in position in the bearing-openings
120 of the rear wall, and means for simultaneously moving said rack-bars in opposite directions.

5. The combination of the front and rear supporting-walls having bearing-openings and provided with slots to permit the passage
125 of the grate-bar pintles, grate-bars having front and rear pintles adapted to said bearing-openings, the front pintles having angular end portions and extending beyond the outer wall, pinions adapted to said front pintles, racks ar-
130 ranged above and below the pinions, guiding and supporting pins for said racks, cross-bars

carried by said pins and serving as guides for
the racks and acting to keep the pinions and
the grate-bars in place, a pivoted operating-le-
ver, and links pivoted to said levers at points
5 both above and below the lever fulcrumed,
said links being pivotally connected to the up-
per and lower racks, substantially as specified.

In testimony that I claim the foregoing as
my own I have hereto affixed my signature in
the presence of two witnesses.

FAY TORRY.

Witnesses:

STEPHEN TORRY,
ALFRED A. ROGERS.