

T. V. ELLIOTT.

GRATE.

APPLICATION FILED OCT. 27, 1908. RENEWED JULY 14, 1911.

1,018,352.

Patented Feb. 20, 1912.

2 SHEETS—SHEET 1.

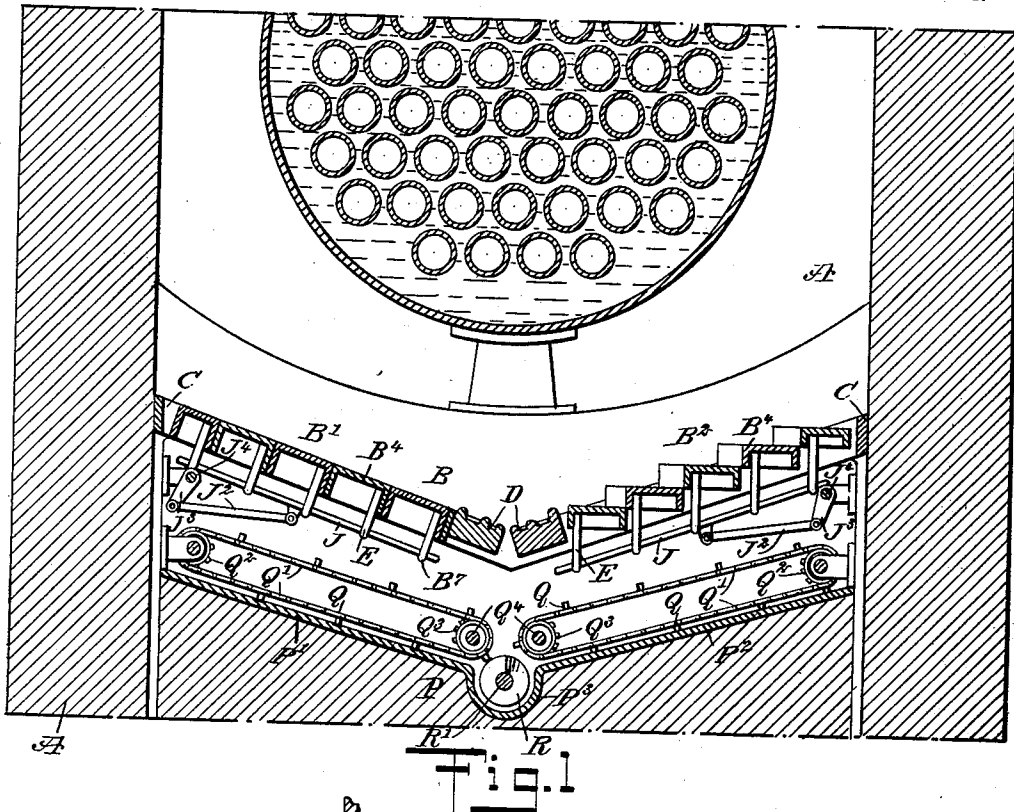


Fig. 1

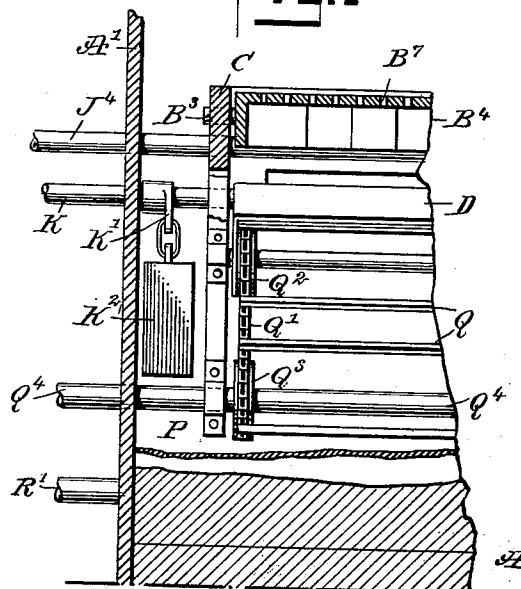


Fig. 2

WITNESSES

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Reed H. Foster

INVENTOR

Thaddeus V. Elliott

BY *Mumma & Co.*
ATTORNEYS

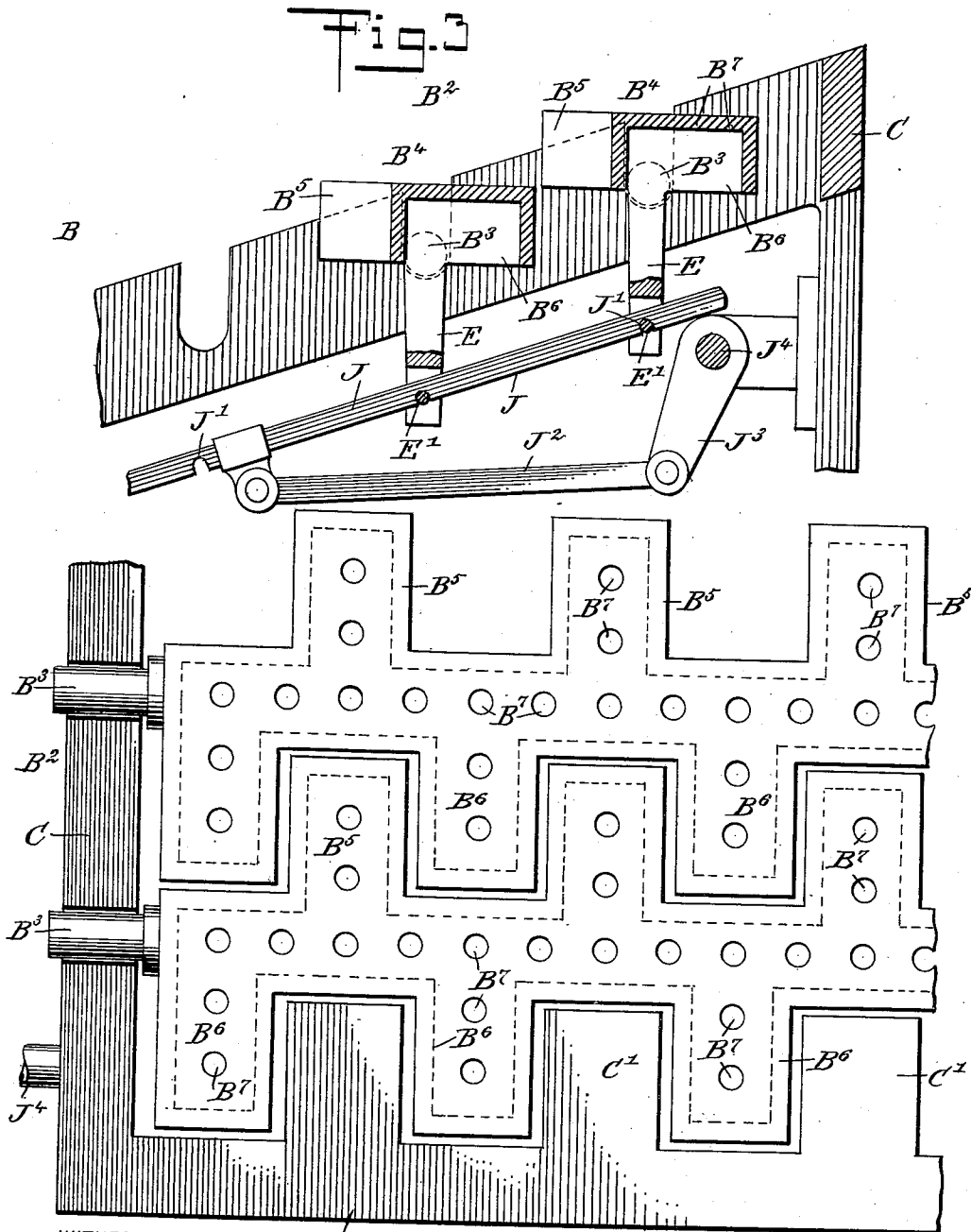
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Fig. 4

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UNITED STATES PATENT OFFICE.

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GRATE.

1,018,352.

Specification of Letters Patent.

Patented Feb. 20, 1912.

Original application filed December 8, 1904, Serial No. 235,942. Divided and this application filed October 27, 1908, Serial No. 459,702. Renewed July 14, 1911. Serial No. 638,580.

To all whom it may concern:

Be it known that I, THADDIOUS V. ELLIOTT, a citizen of the United States, and a resident of the city of New York, Flatbush, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Grate, of which the following is a full, clear, and exact description, this being a division of the application for Letters Patent of the United States for a stoker, Serial No. 235,942, filed by me on December 8, 1904.

The object of the invention is to provide a new and improved grate, more especially designed for furnaces using pulverized coal or a like reduced material as a fuel, and arranged to provide a continuous inclined bed for the fuel to rest on, to admit air for proper combustion, and to allow rocking of the grate bars for actuating the fuel and causing the same to gradually slip down and off the lower end of the inclined bed.

The invention consists of novel features and parts and combinations of the same, which will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a cross section of the improvement as applied; Fig. 2 is a sectional side elevation of the same; Fig. 3 is an enlarged cross section of the same; and Fig. 4 is a plan view of the same.

The furnace A is provided in its fire box with a grate B made V-shape in cross section, to provide inclined sides or sections B' and B², onto which the fuel, such as coal in a divided state, is scattered by the force of revolving brushes, as more fully explained in the original application above referred to, so that further description of this part of the invention is not deemed necessary. Each of the grate sections B', B² is mounted on the frame C, having bearings for trunnions B³ formed or secured at the ends of each of the grate bars B⁴, adapted to rock so as to agitate the burning fuel on the grate bars, and to cause the same to gradually slip down the grate bars B⁴ toward the apex of the grate, the burned out material being finally removed from the apex of the grate by the use of dumping

bars D; hereinafter more fully described. Each of the grate bars B⁴ is provided on opposite sides with spaced extensions B⁵, B⁶, and adjacent grate bars are arranged so that the extensions B⁵ of one grate bar fit into the space between adjacent extensions B⁶ of the next following grate bar, as plainly indicated in Fig. 4, so that when the grate bars are in the position as shown to the left in Fig. 1 then they form a continuous inclined bed for the fuel to rest on. Each of the grate bars B⁴ and its extensions B⁵ and B⁶ are provided with an air chamber at the under side, the air chamber being open at the bottom and provided at the top with apertures or perforations B⁷, leading to the upper surface of the grate bar, so that air can pass from the said chambers by way of the perforations B⁷ to the fuel resting on the top of the grate bars, to insure combustion of the fuel on the grate bars.

As shown in Fig. 4, the frame C carrying the grate bars is provided at the upper side with extensions C' fitting into the spaces between the extensions B⁶ of the uppermost grate bar B⁴, to render the surface of the bed continuous at this point. Each of the grate bars B⁴ is provided with a depending arm E carrying a pin E', and the several pins E' of one grate section B' or B² engages the notches J' cut in a bar J, pivotally connected by a link J² with an arm J³ attached to a longitudinally-extending shaft J⁴ journaled in suitable bearings on the frame C.

As indicated in Figs. 1 and 2, the outer end of the shaft J⁴ extends through the front A' of the furnace, and the outer end of the shaft is connected with suitable mechanism, for imparting a rocking motion to the shafts J⁴, whereby the arms J³, links J², bars J, pins E' and arms E impart a rocking motion to the grate bars B⁴, to agitate the burning fuel thereon, and cause the same to gradually work downward to the dumping bars D at the apex portion of the grate sections B' and B² of the grate B.

The dumping bars D are provided with shafts K, having arms K' supporting weights K², for normally holding the dumping bars D in a closed position, as shown in Fig. 1. Suitable mechanism is connected with the shaft K for periodically imparting a rocking motion to the shaft K, so as to turn the dumping bars D into a dumping

position for the burned out clinkers and the like to drop downward into an ash pit P. The shaft K is rocked back to its normal position by the action of the weight K², so that the corresponding dumping bar D moves back into a closed position after the clinkers or spent material is dumped. The dumping bars are provided with corrugations on the upper face which serve to retain the ashes until the bars are moved into a dumping position.

The ashes falling from the rocking grate bars B⁴ down into the ash pit P, reach the inclined bottoms P', P² of the said ash pit and the ashes are pushed down the said inclined bottoms by scrapers Q onto a conveyer R of spiral shape, mounted to turn in a casing P³, into which lead the lower ends of the bottoms P', P². The scrapers Q are preferably in the form of longitudinal bars secured to sprocket chains Q', passing over sprocket wheels Q², Q³, the sprocket wheels Q³ being secured on the longitudinally-extending shafts Q⁴, each of which passes with its outer end through the furnace front A' to the outside thereof, and the outer end of this shaft is connected with a suitable driving mechanism for rotating the shaft Q⁴, to impart traveling motion to the sprocket chains Q', and thereby cause the scrapers Q to scrape the ashes down the inclined bottoms P', P² into the casing P³ and onto the spiral conveyer R, which conveys the ashes out of the furnace at one end thereof; the clinkers and other spent material dumped by the dumping bars D also fall on the conveyer R to be carried along by the latter with the ashes and to be thus removed from the furnace.

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

1. A furnace provided with an inclined grate, having longitudinally extending rocking grate bars, means for imparting a continuous rocking motion to the said grate bars, a longitudinally extending dumping bar at the lower side of the grate and provided with a shaft adapted to be periodically rocked to turn the bar into a dumping position, the said dumping bar being substantially rectangular in shape and having longitudinal corrugations on its upper face, an arm on the shaft of said dumping bar, and a weight connected by a link with said arm for returning the dumping bar to its closed position.

2. A furnace provided with a fire box, a grate inclined from the side of the fire box toward the longitudinal center thereof, the said grate having rocking grate bars, an ash pit having a correspondingly inclined bottom, dumping bars extending longitudi-

nally at the lower side of the grate and adapted to be periodically rocked, the dumping bars being inclined toward each other and spaced apart, means for imparting a rocking motion to the grate bars, a conveyer at the lower side of the said bottom, longitudinal scraper bars for moving the ashes down the inclined bottom to the conveyer, and means for moving the scraper bars.

3. In a furnace, the combination with a grate formed in sections inclined downward from the sides of the furnace toward the longitudinal center thereof, the said grate having rocking grate bars, and dumping bars extending longitudinally between the lower ends of the grate sections and mounted to rock, the said dumping bars being substantially rectangular in shape and inclined toward each other and having their upper surfaces longitudinally corrugated, of an ash pit having a bottom inclined correspondingly to the grate sections, ash scrapers arranged to move over the bottom of the ash pit, and a conveyer arranged to receive the ashes.

4. A grate comprising grate bars provided with longitudinal air chambers extending from end to end of the grate bars, the said air chambers being open at the bottom and having tops provided with a series of spaced perforations, the air chamber in each grate bar having lateral extensions the tops of which are also provided with spaced perforations, the extensions being spaced apart to form recesses for the reception of the extensions of the next adjacent grate bar, and a fixed inclined frame in which the grate bars are mounted to rock, the said frame being provided at its upper side with spaced extensions fitting into the spaces between the extensions of the uppermost grate bar.

5. In a furnace, the combination with a grate formed in sections inclined downward from the sides of the furnace toward the longitudinal center thereof, the said grate having rocking grate bars, and spaced dumping bars extending longitudinally between the lower ends of the grate sections and inclined toward each other, the said dumping bars being adapted to be periodically rocked, of an ash pit having a bottom inclined correspondingly to the grate sections, and ash scrapers arranged to move over the inclined bottom of the ash pit.

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

THADDIOUS V. ELLIOTT.

Witnesses:

THEO. G. HOSTER,
JOHN P. DAVIS.