Apr. 17, 1923. 1,452,336

G. R. BRADLEY

POWER DECLINKERING APPARATUS

Filed Oct. 18, 1920

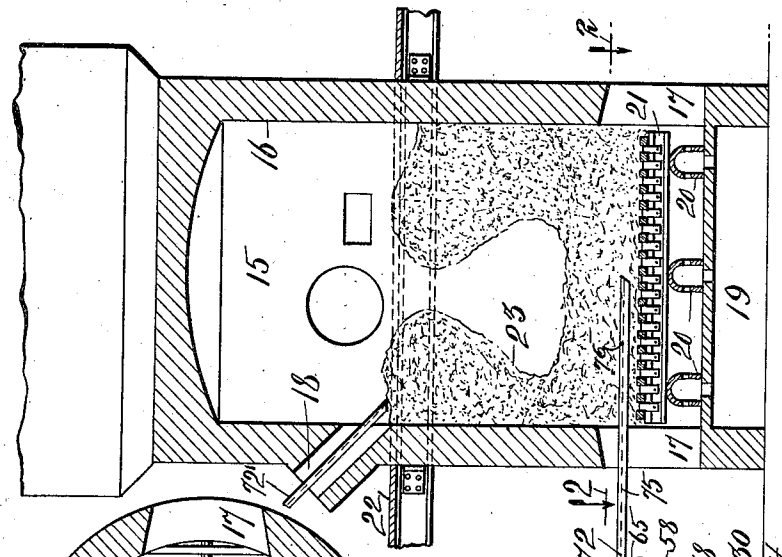


Fig. 1

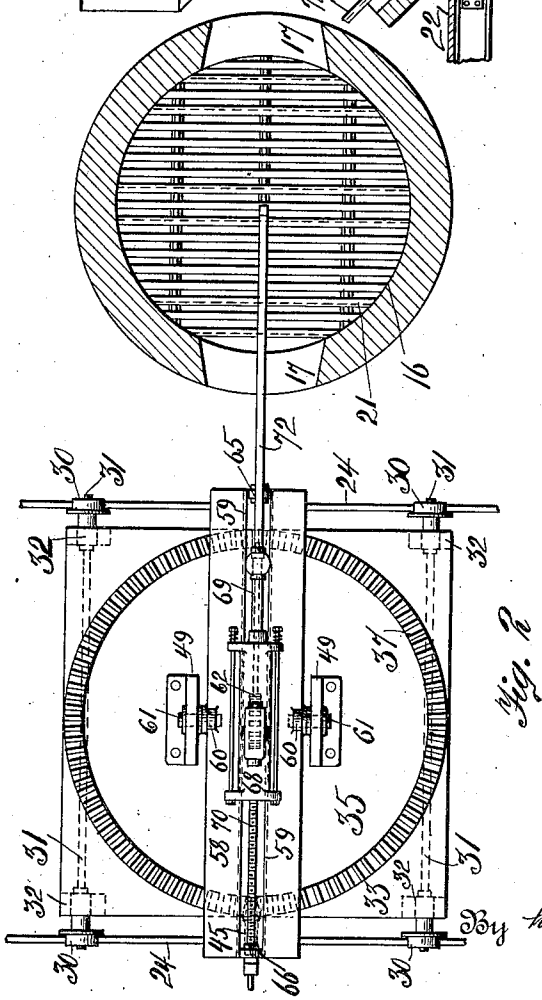


Fig. 2

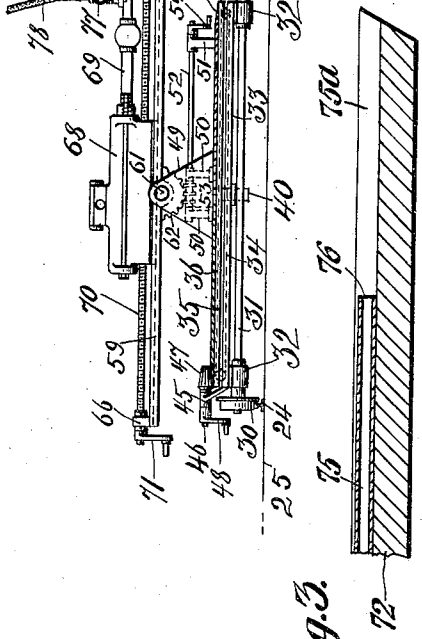


Fig. 3

Inventor
George R. Bradley
By his Attorney
A. A. de Bonneville

Patented Apr. 17, 1923. 1,452,336

UNITED STATES PATENT OFFICE.

GEORGE R. BRADLEY, OF BROOKLYN, NEW YORK.

POWER DECLINKERING APPARATUS.

Application filed October 18, 1920. Serial No. 417,317.

To all whom it may concern:

Be it known that I, GEORGE R. BRADLEY, citizen of the United States, and resident of the borough of Brooklyn, city of New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in a Power Declinkering Apparatus, of which the following is a specification.

This invention relates to mechanically power actuated declinkering means for furnaces. Its object is the production of a mechanically power driven declinkering apparatus, which is particularly adapted to the purpose of the breaking loose of clinker formations from the walls of gas generator furnaces, and to the breaking up of clinkers formed in said furnace.

The organization of the apparatus comprises in this instance power cylinder, similar to a drill cylinder, the reciprocating piston of which actuates a declinkering bar. The cylinder is slidably supported on a bed and can be moved by means of a feed screw to different positions. The bed is trunnioned on a turntable and the latter is supported on a truck. By the coaction of the appurtenances of the apparatus, it can be moved in position opposite one or more furnaces. The declinkering bar is reciprocated through the opening of a furnace either in a horizontal plane at different angles, or in a vertical plane at different angles to break or declinker the clinkers of the furnace.

Fig. 1 represents an elevation of the power declinkering apparatus with a vertical axial section of a gas generator furnace and Fig. 2 shows in part a top plan view and section of Fig. 1 on the line 2, 2. Fig. 3 shows a detail view of one end of the declinkering bar.

A gas generator furnace 15 is indicated with the cylindrical wall 16 having the door opening 17, the barring up door 18, the blast chamber 19, blast bars 20 and grate 21. An upper floor is shown at 22 and clinkers 23 are indicated in the furnace 15. Tracks 24 are shown on the lower floor 25.

The declinkering apparatus comprises a truck with the wheels 30 fastened to the axles 31, and the latter are journaled in the journal boxes 32. The wheels 30 are supported on the tracks 24. A platform 33 with the ball race 34, is fastened to and supported on the journal boxes 32. A turntable 35 with the ball race 36 on its lower face and the bevel teeth 37 on its upper face is located over the platform 33. Ball bearings 38 are located in the said ball races and support the turntable 35. A king bolt 40 extends from the turntable 35 and rotatively connects it, with the platform 33 in the usual manner. A journal bracket 45 extends from the platform 33 and has journaled therein the spindle 46, which at one end has connected thereto the bevel pinion 47 which meshes with the bevel teeth 37. An operating handle 48 is fastened to the other end of the spindle 46. A pair of journal brackets 49 are bolted to the turntable 35. Journal stanchions 50 and 51 extend up from the turntable 35 and have journaled therein the spindle 52. A worm 53 is fastened to the spindle 52, between the journal stanchions 50, and an operating handle 54 is fastened to the spindle 52 adjacent to the journal stanchion 51. A bed plate 58 having the dovetail guides 59 has formed therewith the brackets 60, which have fastened therein the trunnions 61. The latter are supported in the journal brackets 49. A worm sector 62 extends from the lower face of the bed plate 58 and meshes with the worm 53. Journal brackets 65 and 66 extend up from the bed plate 58. A fluid actuated power cylinder 68, preferably similar to a drill cylinder, with the reciprocating piston 69 is slidably supported on the bed plate 58 and its casing engages the dovetail guides 59. A feed screw 70 has its ends journaled in the journal brackets 65 and 66 and is in threaded engagement with the casing of the cylinder 68. An operating handle 71 is fastened to one end of the feed screw 70. A declinkering bar 72, preferably similar to a drill rod, is detachably connected to the piston 69 of the cylinder 68. A pipe 75 is fastened in a groove 75^a in the declinkering bar 72. One end 76 of the pipe 75 extends to near the tip end of the bar 72, while at the other end is connected a valve 77 and the flexible tubing 78.

To operate the declinkering apparatus it is brought adjacent to the furnace 15, so that the declinkering bar 72 is enabled to reciprocate through one of the door openings 17 to declinker the clinkers 27 in the furnace, which are adjacent to the grate 21. By means of the operating handle 54 the worm 53 is rotated, which through the intervention of the worm sector 62 locates the bed

plate 58 and consequently the bar 72 in a horizontal or tilted position. The cylinder 68 is supplied with its driving fluid in the usual way to reciprocate its piston 69 which carries the bar 72. By means of the construction of the cylinder 68, in the form of a drill cylinder, the bar 72 can be reciprocated at great speed, to pound the clinker in the furnace 15 with many blows in a short interval of time and thereby easily break and crush the same. The operating handle 71 is turned to advance or withdraw the declinkering bar in the usual manner. By means of the operating handle 48 and the coaction of the bevel pinion 47 and the bevel teeth 37, the turntable 35 is turned and thereby the bar 72 is located or swung to various angular positions in a horizontal plane.

By means of the flexible tubing 78 and the pipe 75, a cooling fluid like water is discharged from the open end 76 of the pipe adjacent to the tip end of the declinkering bar 72. By this means the tip end of the bar 72 is prevented being burnt by the clinkers in the furnace.

A stream of water is discharged from the pipe 75 against the hot clinker in the furnace 15. The clinker is thereby chilled by the cooling effect of the water, which together with the impact of the declinkering bar 72, breaks the clinker into small pieces that can be easily removed from the furnace.

A declinkering apparatus similar to that described is used on the upper floor 22 and its declinkering bar 72′ is reciprocated through the barring up door 18 to break up and loosen the clinkers at their upper level.

The exemplification of the invention described in this specification is indicative and not limitative thereof, as various modifications of the invention may be made without departing from the spirit of the claims.

Having described my invention what I desire to secure by Letters Patent and claim is:—

1. In a declinkering apparatus the combination of a movable truck, a turntable for the truck, a bed plate trunnioned over the turntable, a drill cylinder slidably supported on the bed plate, a declinkering bar actuated by the drill cylinder, means to locate the drill cylinder with its bar in different angular positions and means to feed the bar into the material operated upon and to withdraw it therefrom.

2. In a declinkering apparatus the combination of a movable truck, a turntable in the truck, a bed plate trunnioned over the turntable, a worm sector extending from the bed plate, a worm journaled on the turntable and meshing with said sector, a drill cylinder slidably supported on the bed plate, a feed screw journaled on the bed plate engaging the drill cylinder, a declinkering bar actuated by the drill cylinder and means to discharge a stream of water adjacent to the tip end of the bar.

3. In a declinkering apparatus the combination of a movable truck, a turntable in the truck, means to turn the turntable, a bed plate trunnioned over the turntable, means to tilt the bed plate, a drill cylinder slidably supported on the bed plate, a feed screw journaled in the bed plate and engaging the drill cylinder, a declinkering bar reciprocated by the drill cylinder, a pipe carried on the bar with an outlet adjacent to its tip end and means to feed a cooling fluid to said pipe to cool the bar, and to be discharged adjacent to the tip end thereof.

Signed at the borough of Brooklyn, city of New York, in the county of Kings and State of New York this 6th day of October A. D. 1920.

GEORGE R. BRADLEY.