No. 824,356. PATENTED JUNE 26, 1906.

E. HARCHARICK.

FUEL FEEDING DEVICE.

APPLICATION FILED AUG. 9, 1904.

Fig. 1.

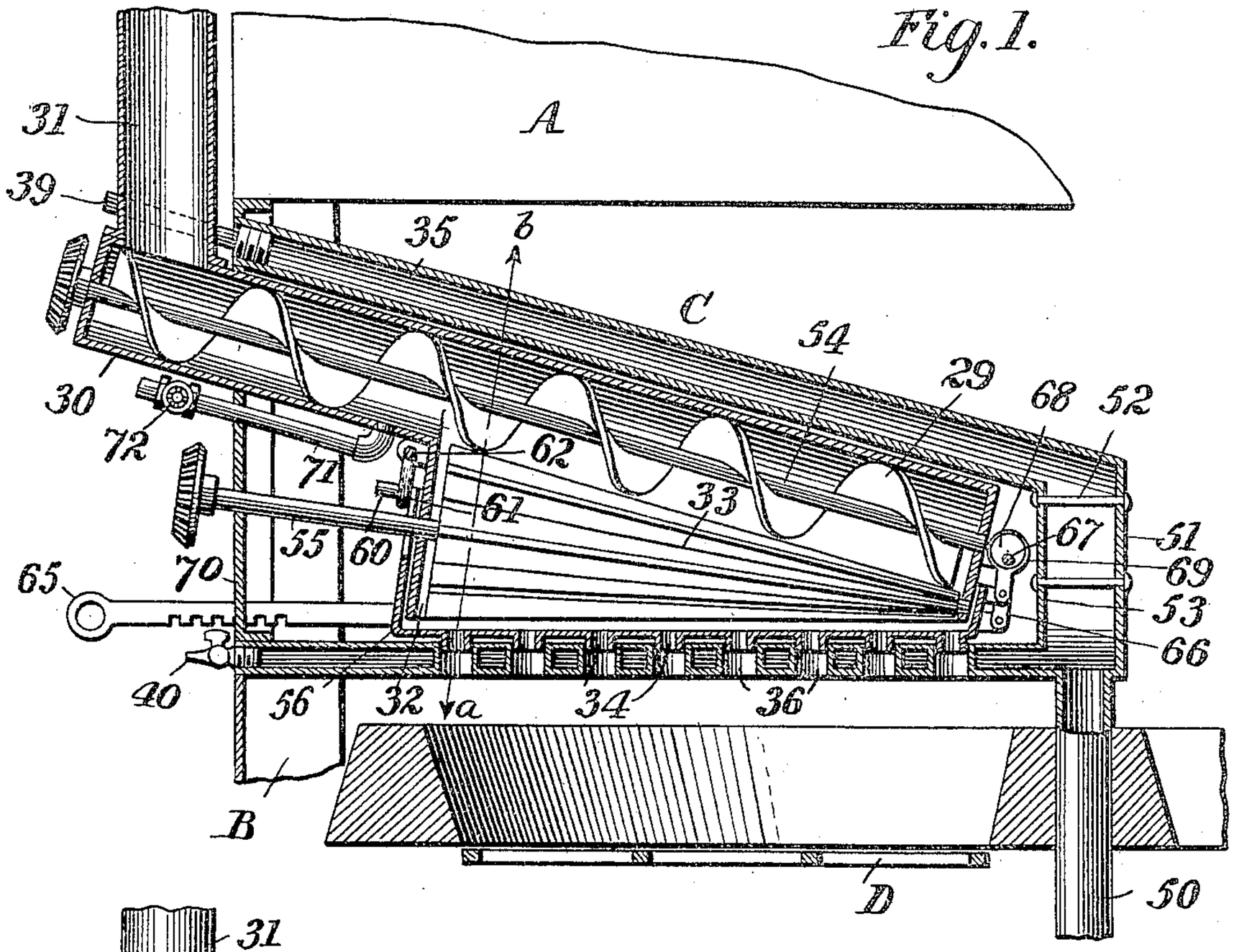



Fig. 3.

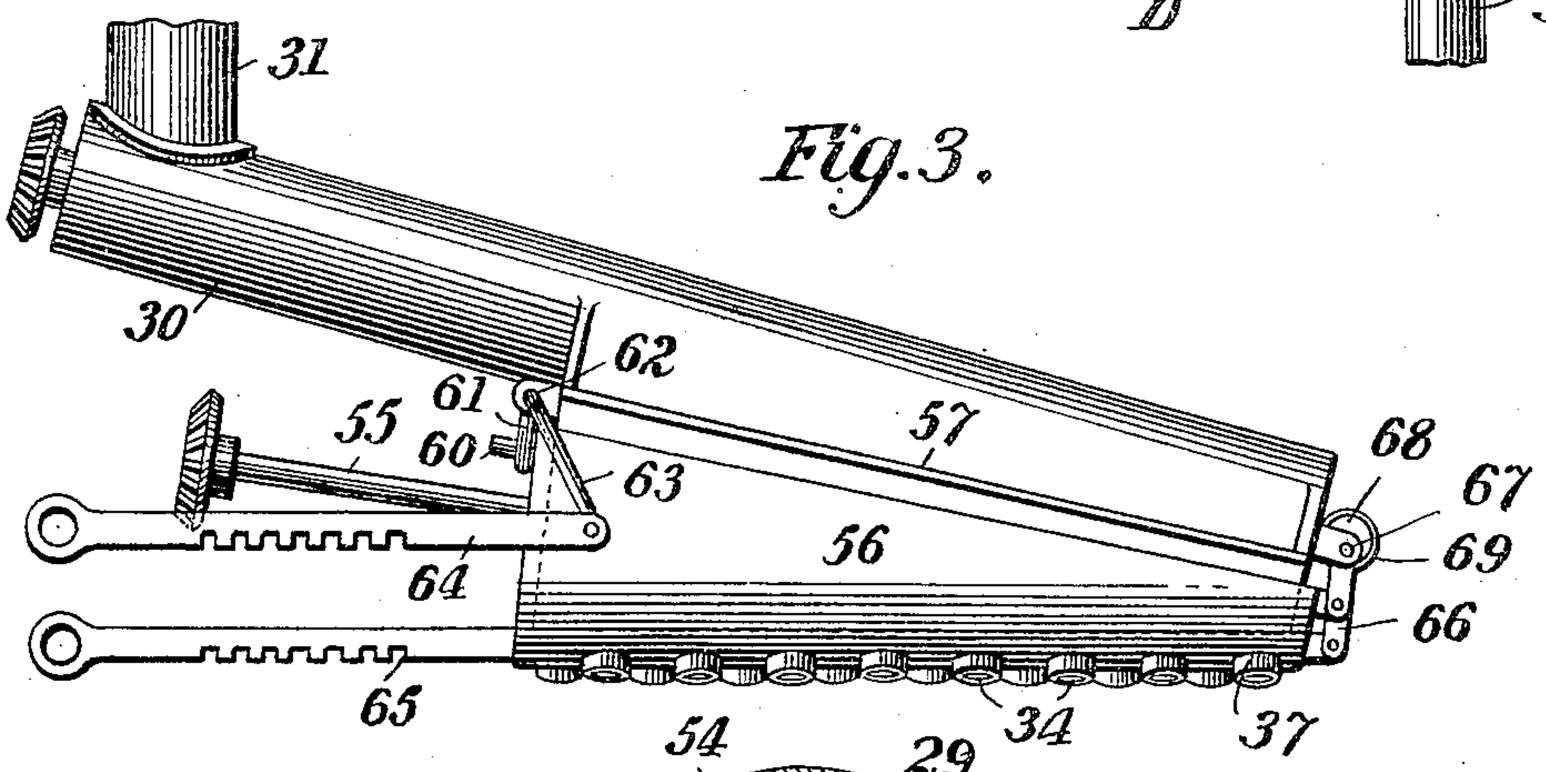
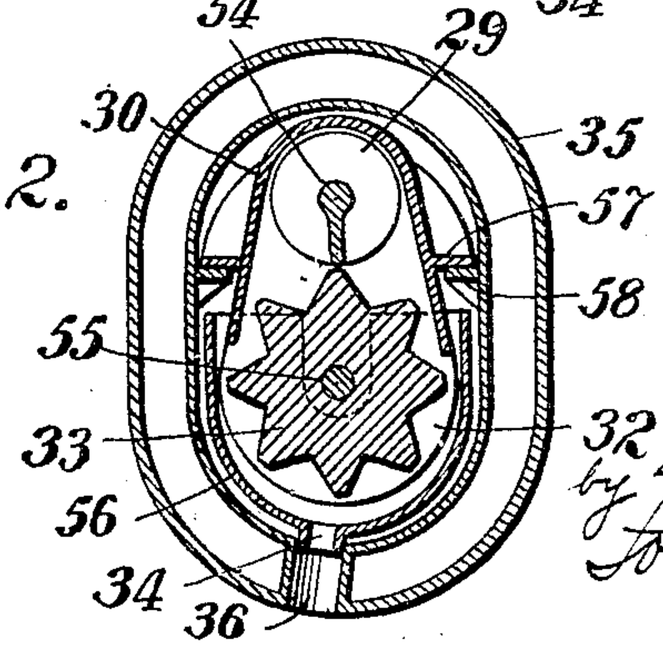



Fig. 2.

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# UNITED STATES PATENT OFFICE.

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## FUEL-FEEDING DEVICE.

No. 824,356. Specification of Letters Patent. Patented June 26, 1906.

Application filed August 9, 1904. Serial No. 220,113.

*To all whom it may concern:*

Be it known that I, EMRO HARCHARICK, a citizen of the United States, residing at Wilkes-Barre, in the county of Luzerne, State of Pennsylvania, have invented certain new and useful Improvements in Fuel-Feeding Devices, of which the following is a specification.

This invention relates to fuel-feeding devices or stokers, and has for its object the provision of improvements in this class of apparatus, as will be hereinafter set forth.

In the accompanying drawings, Figure 1 is a vertical section showing an embodiment of the improved fuel-feeding device in position for use. Fig. 2 is a section on the line *a b* of Fig. 1, and Fig. 3 is a side elevation of the improved stoker.

Referring to the drawings, the boiler A is suitably supported on a foundation B. Beneath the boiler is arranged the stoker C, extending over a grate D. The furnace of which the grate and stoker form a part will of course be provided with suitable ash-chambers and air-draft where necessary and connections whereby proper circulation of water and air may be effected. Only those portions of the last-mentioned devices are shown, however, which are necessary to an understanding of the present invention.

The grate D is rotatable by any suitable means. The stoker C extends radially over the grate and comprises a conveyer which may be a screw 29, fitting within a tube or casing 30, which communicates upon the outside of the furnace with a fuel-supply chute 31 and within the furnace with a chamber 32, in which is rotatably mounted a feeder, preferably a fluted cone 33, for feeding the fuel, the chamber 32 having openings 34 for the passage of said fuel. The shafts of the screw and cone are driven by any suitable means. (Not shown.)

The stoker is surrounded by a water-jacket 35, through which extend passages 36 for the passage of the fuel. Preferably tubes 37 are secured to the wall of the chamber 32, surrounding the holes therein and extending into the holes in the water-jacket to properly lead the fuel. The jacket may be fed by a water-pipe 50, which may conveniently extend upwardly from the center of the grate, as shown. The water-jacket affords protection from the heat of the furnace to the working parts of the stoker, and the hot water may be employed for feeding the boiler, as through a pipe 39, connected to a hot-well, injector, or other boiler-feed source. A blow-off cock 40 near the bottom of the water-jacket should be provided. For securing greater structural strength and to prevent the blowing out of the end 51 of the water-jacket by the pressure in it, as by the generation of steam, rivets 52 are provided, which secure together the outside end 51 and the inside end 53 of the jacket.

The shaft 54 of the screw 29 is journaled in the ends of the screw-casing 30. The shaft 55 of the cone 33 is journaled in projections from the casing 30, which project into the chamber 32, which is inclosed by the casing 56. The casing 56 is supported from the casing 30, which in turn is supported by means of lugs 57, extending longitudinally thereof and engaging with brackets 58, fixed to the interior of the water-jacket and extending longitudinally of the stoker. The casing 56 is adjustably connected with the casing 30, as hereinafter described, so that the tubes 37 may be withdrawn from the passages 36 when desired. It will be obvious that the stoker parts are connected together to form a unit which is not in any way secured to the jacket or other portion of the furnace, but may be slid out longitudinally whenever required without disturbing the remainder of the structure. The space between the cone 33 and casing 56 may be varied in size by adjusting said casing, and thereby the amount of fuel adjacent each opening 34 can be controlled. The casing 56 is preferably adjustable at both ends, and in the embodiment of the invention illustrated it is supported at its outer end by a projection 60, which rests upon a crank 61, pivoted to the casing 30 at 62 and rotatable by means of an arm 63, fixed to the crank 61 and pivoted to the slide 64, which extends outwardly through the front face of the furnace. It will be seen that by pushing the slide 64 inwardly the crank will be moved to such position as to permit the projection, and with it the outer end of the casing 56, to fall, thereby increasing the clearance between the casing and the cone and increasing the feed of fuel near the outer edge of the grate. Movement of the slide in the opposite direction will cause the crank to raise the outer end of the casing 56, and thereby decrease the fuel-feed at that end.

The inner end of the casing is adjustable by means of a slide 65, which operates by its reciprocation to raise and lower the inner end

of the casing through the crank 66, to which it is pivoted and which is in turn fixed to a shaft 67. To the shaft 67 is fixed a cam 68, which is inclosed by a strap 69, pivoted to the casing 56. The slides 64 and 65 may be provided with notches, as shown, which engage with a front plate 70 of the furnace to fix them in adjusted positions. The plate 70 is removable, so that the withdrawal of the stoker, as before described, may be effected.

It is essential that fuel should be fed to every portion of the grate from the center to the outside, and for this reason the holes through which the fuel is fed from the stoker are staggered, as shown.

It will be obvious from the location of the stoker that if it were not filled with coal gases would enter the fuel-feeding holes and might by their own heat or that generated by coal, which might be ignited within the stoker-casing, cause the stoker to be damaged. This might readily occur if for any reason the supply of fuel suddenly ran out or the power should be disconnected from the stoker, unless some means were employed to prevent it. This may be prevented by creating a fluid-pressure within the stoker, as by conecting the interior of the stoker-casing, by means of a pipe 71, with a source of steam or compressed air. The supply of this fluid to the stoker may be controlled by any suitable means, as a valve 72. The entrance of furnace-fumes into the stoker may thus be prevented at all times.

While I have illustrated my invention in what I consider its best application, it is to be understood that it may have other embodiments without departing from its spirit. I do not, therefore, desire to be limited to the precise construction shown.

Certain features of the construction hereinbefore described are disclosed in an application filed April 1, 1904, Serial No. 201,121.

What I claim is—

1. In a furnace, the combination with a rotatable grate, of a conveyer adapted to move fuel radially of said grate, and a rotatable cone arranged to carry fuel between said conveyer and grate, substantially as described.

2. In a furnace, the combination with a rotatable grate, of a conveyer adapted to move fuel radially of said grate, a fluted feeder arranged to carry fuel between the conveyer and grate, and a water-jacket surrounding said conveyer and feeder, substantially as described.

3. In a furnace, the combination with a rotatable grate, of a conveyer adapted to move fuel radially of the grate, a rotatable cone arranged between and adapted to deliver fuel from the conveyer to the grate, and a water-jacket extending about said conveyer and cone, substantially as described.

4. In a furnace, the combination with a rotatable grate, of a conveyer adapted to move fuel radially of the grate, and a fluted cone mounted to rotate between the conveyer and grate and to carry fuel from the conveyer to the grate, substantially as described.

5. The combination with a grate, of a stoker extending thereover and a water-jacket surrounding said stoker having openings through which fuel is fed to the grate, substantially as described.

6. In a furnace, the combination with a grate, of a conveyer adapted to move fuel toward the center of the grate, a water-jacket arranged above the grate into which said conveyer extends, said jacket having a plurality of passages through which fuel may pass to the grate, and a feeder arranged between and adapted to carry fuel from the conveyer to said passages in the water-jacket, substantially as described.

7. In a furnace, the combination with a rotatable grate, of a water-jacket extending radially of said grate and open at its outer end, said jacket having formed in its lower wall passages through which fuel may pass to the grate, and a stoker adapted to be removably inserted in said jacket through the outer end thereof and comprising means for conducting fuel from outside of said jacket to the fuel-passages in the lower side thereof, substantially as described.

8. In a furnace, the combination with a rotatable grate, of a casing supported above the grate, a water-jacket inclosing the inner end of said casing and provided with passages through which fuel can pass to the grate, means for conveying fuel through said casing to said passages, and means arranged at the axis of the grate for supplying water to the water-jacket, substantially as described.

9. In a furnace, the combination with a grate, of a water-jacket arranged above said grate, and having formed in its lower side passages for conducting fuel to the grate, a casing adapted to be removably supported within said water-jacket, and having passages communicating with the fuel-passages in said jacket, and means within said casing for conveying fuel from the outer end thereof to said fuel-passages, substantially as described.

10. The combination with a stoker having its parts so joined as to form a unit, of a water-jacket inclosing the stoker, said stoker as a unit being detachably supported within said water-jacket, substantially as described.

11. The combination with a water-jacket having longitudinally-extending brackets on its interior, of a stoker inclosed by said water-jacket and having longitudinally-extending projections resting upon said brackets.

12. In a furnace, the combination with a grate, of a conveyer adapted to positively

move fuel toward the center of said grate, a feeder mounted to rotate between and convey fuel from said conveyer to the grate, an apertured plate between the feeder and grate, and means for varying the distance between the feeder and the apertured plate, substantially as described.

13. In a furnace, the combination with a grate, of a conveyer adapted to move fuel toward the center of the grate, a feeder mounted to rotate between and carry fuel from the conveyer to the grate, an apertured plate between the feeder and grate, and means for independently adjusting either end of the apertured plate relative to the feeder, substantially as described.

14. In a furnace, the combination with a grate, of a conveyer adapted to move fuel toward the center of the grate, a feeder mounted to rotate between and carry fuel from the conveyer to the grate, an apertured plate adjustably supported between the grate and feeder, and means extending beyond one end of the feeder for independently adjusting either end of said plate relatively to the feeder, substantially as described.

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

EMRO HARCHARICK.

Witnesses:
W. L. RAEDER,
M. C. BARRETT.