No. 820,783. PATENTED MAY 15, 1906.

E. HARCHARICK.

GRATE AND FUEL FEEDER.

APPLICATION FILED APR. 1, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

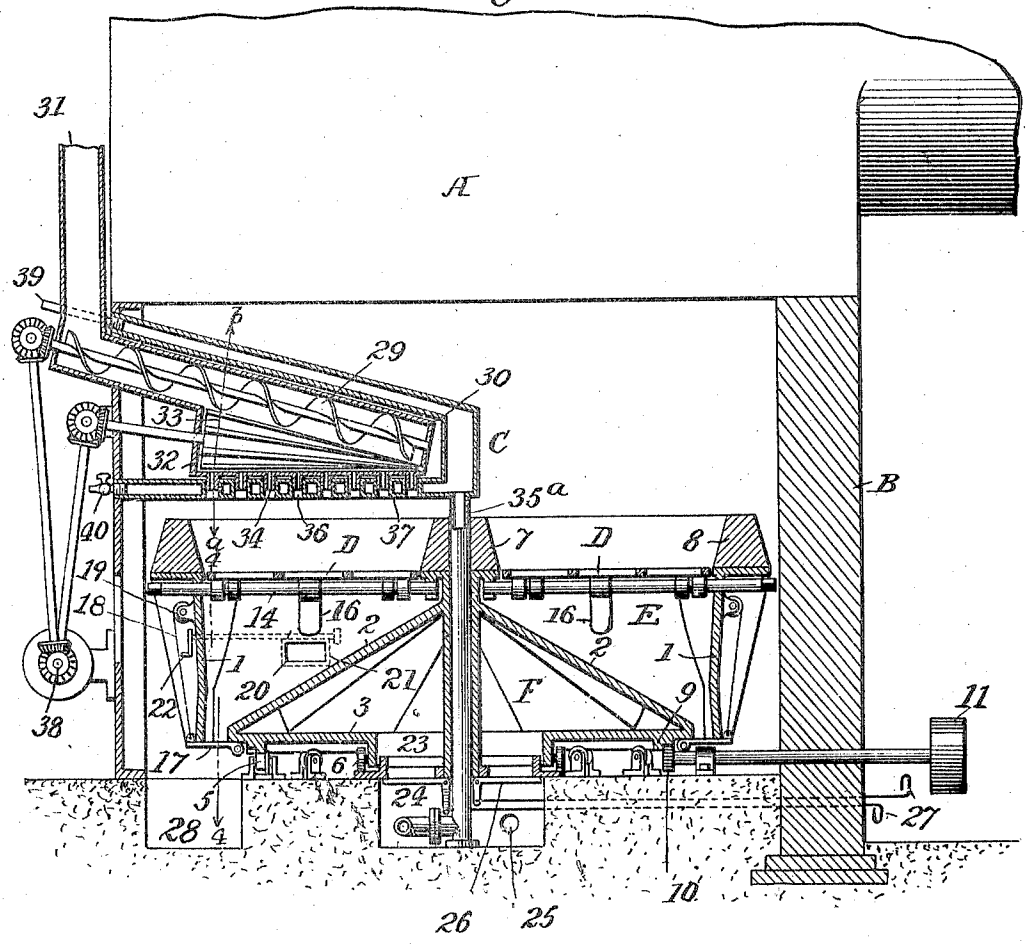
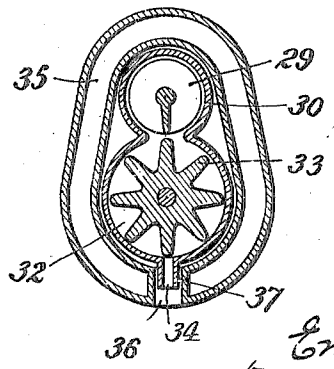


Fig. 2.



Witnesses
Hon. Fillmore, Jr.
Thos. Howe

Inventor
Emro Harcharick,
by Foster Freeman & Watson
Attorneys

No. 820,783. PATENTED MAY 15, 1906.

E. HARCHARICK.

GRATE AND FUEL FEEDER.

APPLICATION FILED APR. 1, 1904.

2 SHEETS—SHEET 2.

Fig. 3.

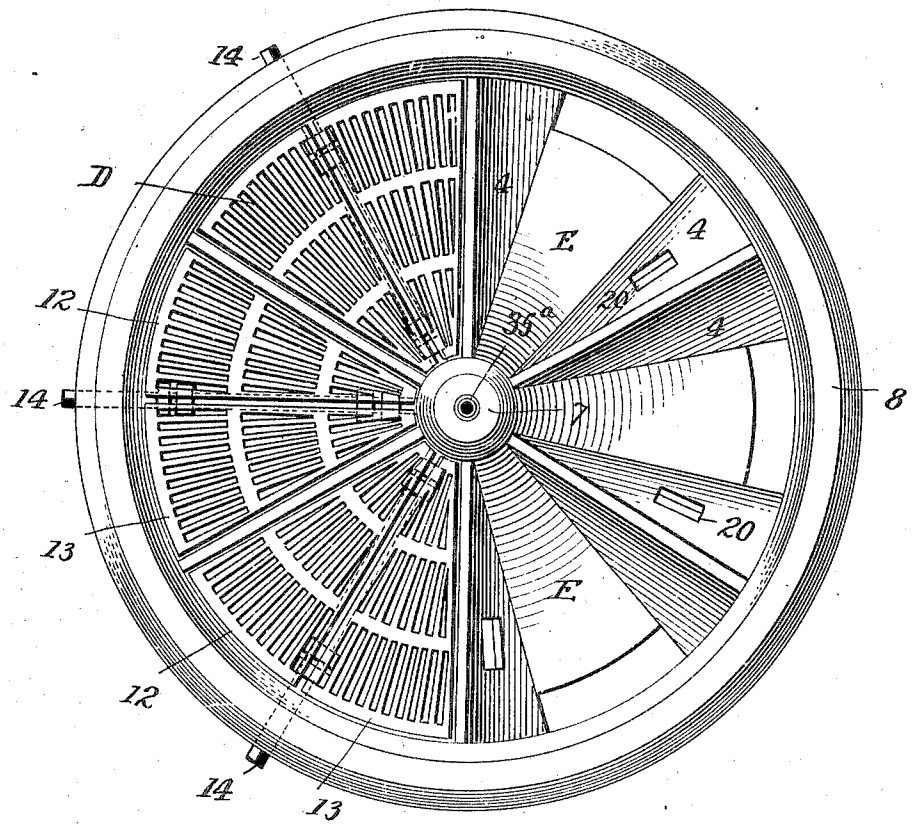
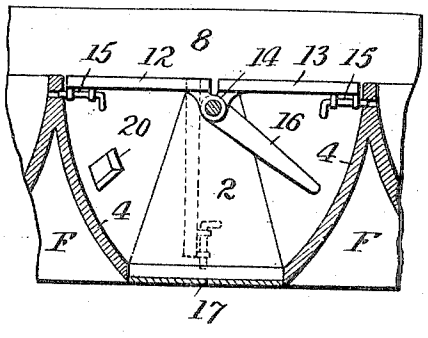


Fig. 4



Witnesses
A. M. Gillman, Jr.
Thos. Howe

Inventor
by Emro Harcharick
Foster Freeman & Watson
Attorneys

UNITED STATES PATENT OFFICE.

EMRO HARCHARICK, OF WILKES-BARRE, PENNSYLVANIA.

GRATE AND FUEL FEEDER.

No. 820,783. Specification of Letters Patent. Patented May 15, 1906.

Application filed April 1, 1904. Serial No. 201,121.

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 Grate and Fuel Feeders, of which the following is a specification.

This invention relates to furnaces and stokers, and has for its object the provision of apparatus which is especially adapted for burning the small sizes of coal.

In the accompanying drawings, Figure 1 is a vertical section of a furnace and stoker arranged beneath a boiler and embodying my invention. Fig. 2 is a transverse section of the stoker on the line *a b* of Fig. 1. Fig. 3 is a plan view of the grate, certain of the sections being removed to show the ash-chambers; and Fig. 4 is a sectional view on the line 4 4 of Fig. 1.

The boiler A is suitably supported on a foundation B, and beneath the boiler is arranged the furnace comprising the stoker C, the grate D, the ash-chambers E, the air-chamber F, and connections whereby the proper circulation of water and air is effected.

The walls 1, 2, and 3 of the air and ash chambers are suitably connected to form a frame, which is rotatably supported by wheels 5 and 6 and supports the grate and refractory walls 7 and 8 about the interior and exterior edges of the grate. Rotation of the frame, and with it the grate, may be accomplished by means of a circular rack 9, connected to the frame, which engages with a pinion 10, connected to a driving-pulley 11.

The grate is divided into radial sections, each comprising two parts 12 and 13, hinged to a radially-extending bar 14, rotatably mounted in the frame. The parts 12 and 13 are normally held in horizontal position by suitable means, as sliding bolts 15, secured to the grate portions and adapted to enter sockets in the side walls of the ash-chamber. Upon the release of bolts 15 the parts will swing into a vertical position, as indicated by the dotted lines in Fig. 4, and their contents be emptied into an ash-chamber E. The parts may be returned to the horizontal position by means of an arm 16, fixed to the bar 14, which may be moved against the bottom of either part by turning the bar 14 by means of a wrench applied to its outer end or in any other suitable manner. After having been thus returned the parts may be secured by refastening the bolts 15.

An ash-chamber E is located beneath each section of the grate and is inclosed by inclined side walls 4, which may be curved, as shown, to afford clearance for the swinging grate portions 12 and 13, the outside wall 1, and the bottom 2, which slopes downwardly from the center of the frame to a point near the wall 1, at which point is located an exit for ashes, which passes over an ash-pit 28 and is normally closed by a door 17. Suitable means, as a chain 18, secured to a spring-barrel 19, may be employed for normally holding the door closed. Preferably the walls 4 extend between the grate-sections.

Beneath and between the ash-chambers is the air-chamber F, inclosed by the side walls and bottoms of the ash-chambers and the bottom 3 of the frame. This air-chamber communicates with the ash-chambers by openings 20 in the side walls, which may be closed by doors 21, operated by handles 22 or other suitable means. The air-chamber also communicates by an opening 23 with a pit 24, communicating, by means of an opening 25, with an air-blast. The forced air may be controlled by means of doors 26 in the opening 23, operated by handles 27.

The stoker C extends over the grate and comprises a radial 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 thereof. The shafts of the screw and cone are driven by any suitable means, as by gearing them to a power-shaft 38, as shown. The stoker is surrounded by a water-jacket 35, in which holes 36 are provided for the passage of the fuel. Preferably tubes 37 are secured to the wall of the chamber 32, surrounding the holes therein, and extend into the holes in the water-jacket to properly direct the fuel. The jacket may be fed by a water-pipe 35^a, which may conveniently extend up from the air-pit through 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 heated 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. In operation, as the grate revolves fuel will be distributed radially by the stoker, and the rotating of the grate will cause the fuel to be evenly distributed over its entire surface. If the substance upon the grate becomes too thick, the rotation of the grate is stopped by any suitable power-disconnecting means. The air-blast is then cut off from the particular ash-chamber by means of the door 21. The supporting-bolts are then withdrawn, when the grate parts will swing downwardly, emptying their contents into the ash-chamber. The grate parts being then returned to the horizontal position and secured in a manner as before described, fire may be raked from the adjoining grate-sections upon the one just emptied, and upon reconnecting the power it will move under the stoker and there receive a fresh supply of fuel. In a similar manner all the grate-sections may be successively dumped and resupplied with fuel.

Either ash-chamber E may be relieved of its contents whenever desired by opening the door 17 of said chamber when it is over the ash-pit. The speed of the grate and the supply of fuel are preferably so regulated that a grate-section will make a number of revolutions after it has been dumped before the fire upon it becomes too heavy.

While I have illustrated my invention in what I consider one of its best applications, it may be embodied in other constructions, and I do not, therefore, wish to be limited to that shown.

Without limiting myself to the precise construction shown and described, I claim—

1. In a furnace, the combination with a frame inclosing an ash-chamber of a grate carried by said frame, and means for revolving said frame, substantially as described.

2. In a furnace, the combination with a frame inclosing air and ash chambers, of a grate carried by said frame, and means for revolving said frame, substantially as described.

3. In a furnace, the combination with a revolving frame, of a sectional grate, supported by said frame and having in each section a plurality of independently-swinging plates, means for detachably securing said plates in operative position, and means adjacent each section of the grate for successively restoring the plates thereof to operative position after they have been dumped.

4. In a furnace, the combination with a revolving frame, of a sectional grate supported by said frame and having in each section thereof two plates adapted to swing independently about a common axis to dump the load thereon, means for detachably supporting said plates in operative position, and means movable about the axis of the plates of each grate-section to restore said plates to operative position after they have been dumped.

5. In a furnace, the combination with a revolving frame, of a sectional grate supported by said frame and having in each section thereof a plurality of independently-swinging plates, an ash-chamber rotating with the grate and divided into a series of compartments corresponding in number and arrangement to the sections of the grate, and means within each of said compartments of the ash-chamber for moving the plates of the adjacent grate-sections to operative position after they have been dumped.

6. In a furnace, the combination of a revolving sectional grate, each section including two plates adapted to move about a common axis, means for detachably holding said plates in horizontal position, and means movable in opposite directions about the axis of the plates for restoring the said plates successively to operative position after they have been dumped.

7. In a furnace, the combination of a revolving sectional grate, each section comprising a plurality of independently-swinging plates, and a rock-shaft adjacent each section of the grate and provided with means for restoring the plates of said section to operative position after they have been dumped.

8. In a furnace, the combination with a sectional grate, of a support for the grate having therein a series of ash-chambers, corresponding in number and arranged below the sections of said grate, and means for revolving said grate-support.

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

EMRO HARCHARICK.

Witnesses:
W. L. RAEDER,
ANDREW HOURIGAN.