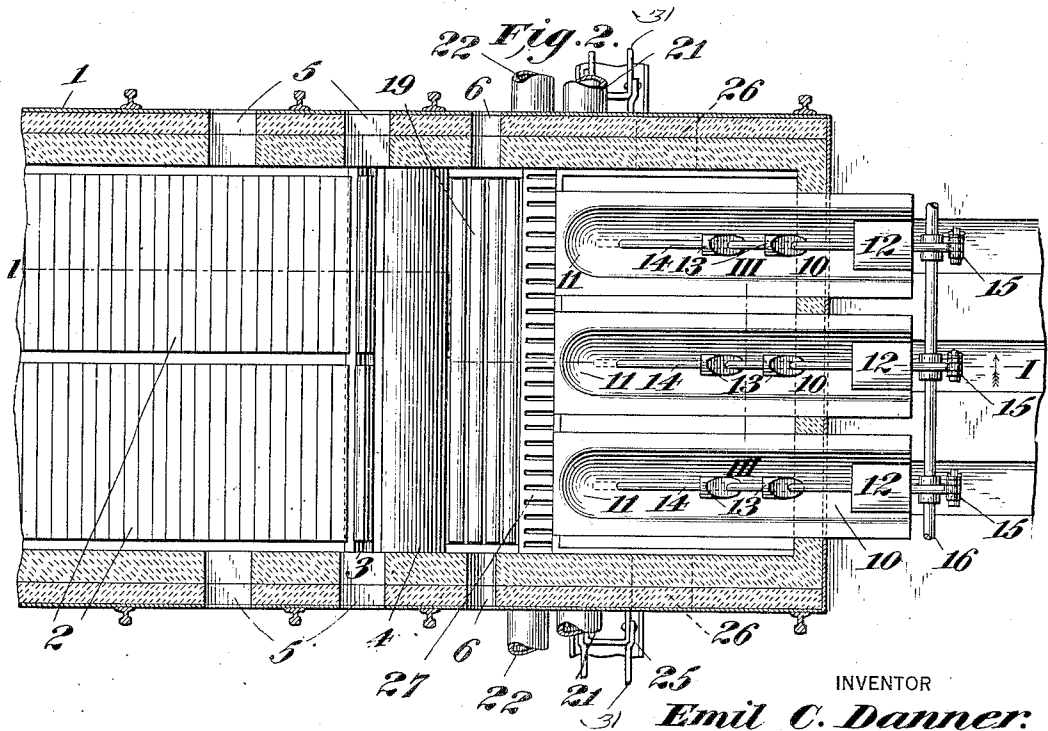
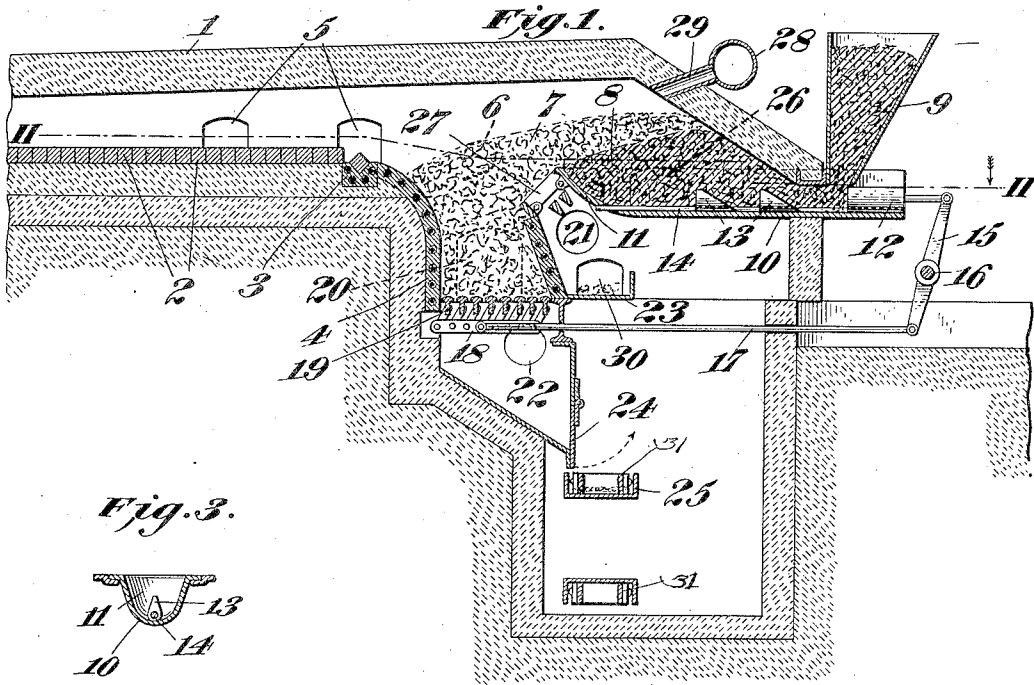


E. C. DANNER.  
HEATING FURNACE.  
APPLICATION FILED SEPT. 18, 1919.

1,375,679.

Patented Apr. 26, 1921.



INVENTOR

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# UNITED STATES PATENT OFFICE.

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## HEATING-FURNACE.

1,375,679.

Specification of Letters Patent.

Patented Apr. 26, 1921.

Application filed September 18, 1919. Serial No. 324,659.

*To all whom it may concern:*

Be it known that I, EMIL C. DANNER, a citizen of the United States, residing in the borough of Westmont, in the county of Cambria and State of Pennsylvania, (whose post-office address is Johnstown, Pennsylvania,) have invented certain new and useful Improvements in Heating-Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in coal-fired heating furnaces and more particularly to the means for supplying air to, and the method of removing ashes from such furnaces.

The object of my invention is to provide a stoker-fired coal heating furnace having improved means for supplying air to the fuel whereby more complete combustion is brought about and to provide means whereby large clinkers may be removed through side doors, thus eliminating any shut-downs, such as now exist caused by cleaning the fires through the front doors in common use.

In general my furnace consists of a fuel feeding mechanism, which distributes the fuel uniformly in the combustion chamber, a stationary grate and a rocking grate for removing ashes. Air is supplied to the under sides of the grates by means of blast pipes connected with a supply of air under pressure, and side cleaning doors are provided for the removal of clinkers.

Having thus given a general description of my invention, I will now, in order to make the matter more clear, refer to the annexed sheet of drawings, which forms part of this specification, and in which like characters refer to like parts:

Figure 1 is a vertical longitudinal sectional elevation through the stoking end of a heating furnace embodying my invention, taken on the line I—I of Fig. 2; Fig. 2 is a horizontal section taken on the line II—II of Fig. 1; and Fig. 3 is a transverse sectional elevation through one of the furnace retorts taken on the line III—III of Fig. 2.

Referring now to the characters of reference on the drawings:—1 indicates the furnace in general, 2 are billets to be heated which are forced along by any suitable means and dropped one at a time into the water-cooled, notched discharge plate 3,

from which they are removed through the side door openings 5 in the furnace wall. 4 are the water-cooled walls of the fire-box, 6 are poke holes in the side walls of the furnace, the incandescent coal is 7, and the green coal is 8. This green coal 8 is fed by a hopper 9, to the trough-shaped retorts 10, from which it is forced to the upwardly inclined ends 11 of the retorts 10 and thence into the combustion chamber by means of charging plungers 12, and the pusher blocks 13, each of which is fastened to a pusher rod 14. Each charging plunger 12 is connected to one end of a rocker arm 15 which is fastened to a rocker shaft 16 as shown, said rocker shaft being oscillated by any suitable means not shown on the drawing. The opposite end of one or more of the rocker arms 15 is connected by a rod 17 to the bar 18, of the rocking grate 19, whereby the bars of the grate 19 may be caused to rock at the same time that the charging plunger 12 is caused to reciprocate, thereby allowing the ashes to fall through the grate, thus making room for the fresh green coal which is forced into the combustion chamber from the retorts 10. 20 are cleaning doors in the side walls of the furnace whereby any large clinkers can be removed from the grate, thus eliminating any shut-downs such as occur at present when cleaning fires through the usual front doors. 27 is an auxiliary stationary grate located near the upper part of the fire-box through which an additional quantity of air is supplied to the incandescent bed of coal thereby facilitating more complete combustion. Air is supplied to the under sides of the grates by the blast pipes 21 and 22, and also to the top of the fuel bed by means of the blast pipe 28, which has a plurality of nozzles 29. 23 is a pan to catch the coal which may fall through the stationary grate 27, before it is coked or fused into larger sizes; cleaning doors 30 being provided in the side walls of the furnace for removing said coal from time to time. A hinged ash door 24 may be opened to permit ashes which fall through the grate 19 to be deposited on an ash conveyer 25, provided with flights 31, which may convey and deposit them where desired. Cleaning doors 26 are provided in the side walls of the furnace as shown, to give ready access to the retorts 10, and the front part of the combustion chamber.

Although I have shown and described my

invention in considerable detail, I do not wish to be limited to the exact and specific details thereof, as shown and described, but may use such modifications in, substitutions for or equivalents thereof, as are embraced within the scope of my invention, or as pointed out in the claims.

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

1. A furnace comprising a combustion chamber, a heating chamber leading therefrom, a water-cooled fire-box below the rear of said combustion chamber, a stationary grate at the top of the front wall of said fire-box, a rocking grate at the bottom of said fire-box, means for supplying air to the under sides of said grates, and means for feeding coal upwardly into said combustion chamber and thence across said stationary grate into the fire-box.

2. A furnace comprising a combustion chamber, a heating chamber leading therefrom, means for supplying air to the upper part of the combustion chamber, a water-cooled fire-box below the rear of said combustion chamber, a stationary grate at the top of the front wall of the fire-box, a rocking grate at the bottom of said fire-box, means for supplying air to the under-sides of said grates, means for feeding coal upwardly into said combustion chamber and thence across said stationary grate into the fire-box, and means for collecting any coal falling through the stationary grate.

3. A furnace comprising a combustion chamber, a heating chamber leading therefrom, a water-cooled fire-box below the rear of said combustion chamber, an inclined stationary grate at the top of the front wall of said fire-box, a rocking grate at the bottom of said fire-box, means for supplying air to the under-sides of said grates, means for feeding fuel upwardly into said combustion chamber and thence across said stationary grate into the fire-box, and means for collecting and removing the ashes falling through the rocking grate.

4. In a furnace of the character described, a heating chamber, a combustion chamber connected with and adapted to supply heat to the heating chamber, a fire-box below

the rear of said combustion chamber, a stationary grate extending downwardly from near the central portion of the bottom of the combustion chamber to the top of the front wall of the fire-box, a rocking grate at the bottom of the fire-box, means for supplying air to the under-sides of said grates, means for feeding coal upwardly into said combustion chamber and thence across said stationary grate into the fire-box, means for collecting and removing the ashes falling through the rocking grate, and cleaning doors in the side walls of the furnace adapted to permit removal of clinkers from above the rocking grate.

5. In a furnace of the character described, a heating chamber, a combustion chamber connected with and adapted to supply heat to the heating chamber, a fire-box below the rear of said combustion chamber, an inclined stationary grate at the top of the front wall of the fire-box, a rocking grate at the bottom of the fire-box, means for oscillating said rocking grate, a reciprocating charging plunger and connections adapted to feed coal upwardly into said combustion chamber and thence across said stationary grate into the fire-box, and means for supplying air to the under-sides of said grates.

6. A furnace comprising a combustion chamber, a heating chamber leading therefrom, a water-cooled fire-box below the rear portion of said combustion chamber, an inclined stationary grate extending from about the middle portion of the bottom of said combustion chamber to the top of the front wall of the fire-box, a rocking grate at the bottom of said fire-box, means for supplying air to the under-sides of said grates, a plurality of retorts in the combustion chamber, a reciprocating charging plunger mounted in each retort and adapted to feed coal upwardly into the combustion chamber and thence across the stationary grate into the fire-box, means for removing coal falling through the stationary grate, and means for collecting and removing ashes falling through the rocking grate.

In witness whereof I hereunto affix my signature.

EMIL C. DANNER.