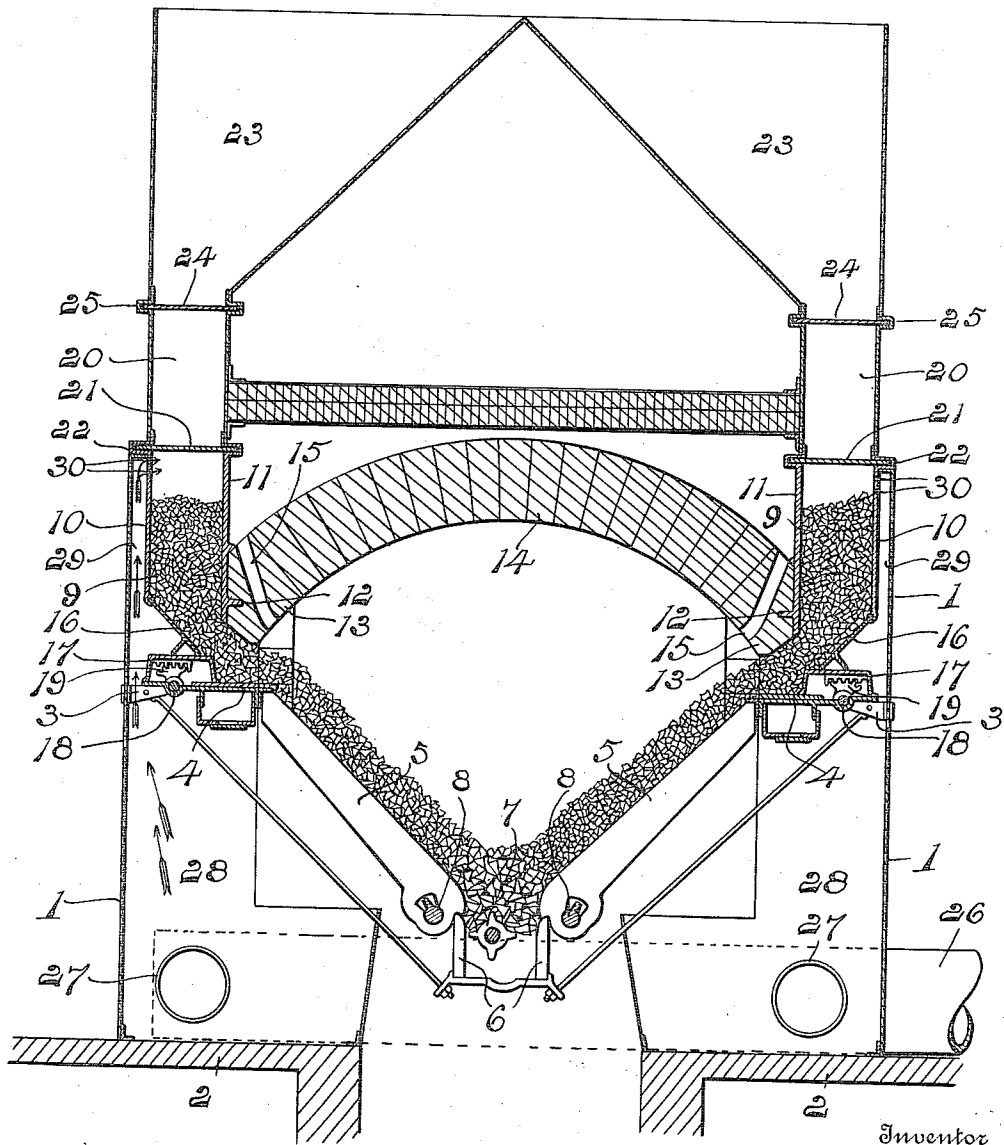


J. R. FORTUNE.
FURNACE.
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FURNACE.

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To all whom it may concern:

Be it known that I, JOHN R. FORTUNE, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Furnaces, of which the following is a specification, reference being had therein to the accompanying drawings.

10 In furnaces of the class of automatic stokers in which feed hoppers are employed to supply coal to the furnace and automatic devices are employed to feed the coal from said hoppers on to the grate bars, and
15 in furnaces of this class where a forced draft is created by means of blowing air into the fire chamber, it is found that the accelerated draft causes the fire to burn up into the lower ends of the hoppers, over-heating the
20 walls thereof and also causes gases liberated by the burning of the coal to pass out through the open upper ends of the hoppers and escape into the boiler room.

25 The object of this invention is to so construct and arrange a furnace of the above described class employing a forced draft, as to prevent the burning of the coal within the hoppers and the escape of gas therefrom.

30 A further object is to provide certain other new and useful features in the construction and arrangement of parts, all as hereinafter more fully described and particularly pointed out in the claims reference being had to the accompanying drawing in
35 which,

The figure represents a transverse vertical section through a furnace embodying the invention.

40 In the drawing 1, 1 represent the side walls of the furnace which support, at a distance above the floor 2 thereof, by means of suitable brackets 3, the coking plates 4 adjacent to which plates the upper ends of inclined grate bars 5 are supported. The
45 lower ends of these bars are supported by a grate bearer 6 within which is the usual rotatable clinker bar 7, and certain of the grate bars are moved in the usual manner by the rock shafts 8 extending through
50 openings in the lower end of said bars.

Above the coking plates 4 are suitable magazines 9, the outer walls 10 of which are spaced from the side walls 1 of the furnace and the inner walls of which hoppers are
55 formed by arch plates 11. These arch plates are each formed near their lower ends with

a laterally extending rib 12 to engage grooves in the fire brick 13 forming the edges of an arch 14 which springs across the space between the arch plates over the fire chamber. The brick 13 are preferably
60 formed with air passages 15 extending therethrough and communicating with the space above the arch, the lower ends of the passages opening through the inner face
65 of the arch adjacent to the coking plates.

The throat or lower end of each magazine is formed in the usual manner by an inclined plate 16 beneath which a stoker box 17 slides upon the coking plate, said box being actuated in the usual manner by means of a
70 rock shaft 18 provided with a series of gear segments 19 engaging teeth on the box.

Above the magazines 9 are magazines 20 separated from the magazines 9 by suitable
75 slides 21 movable in grooves 22 formed in the walls of the magazines and above the magazine 20 are suitable hoppers 23 separated from the magazines 20 by means of
80 slides 24 movable in suitable grooves 25 formed in the sides of the magazines.

A suitable pipe 26 through which air is forced under pressure is provided with discharge openings 27 opening into chambers
85 28 in the lower part of the furnace below the grate bars 5 to force air into the furnace and accelerate the draft. The air is free to pass through the grate bars into the fire chamber and from said chamber into the lower ends of the magazines. Passages 29
90 communicating with the upper ends of said chambers 28 are formed for the air by spacing the outer edges of the coking plates 4 from the walls 1 of the furnace, by means
95 of the brackets 3. These passages or conduits 29 extend upward between the walls 1 and the outer walls 10 of the magazines 9, and suitable openings 30 are provided in the walls 10 of the magazines near the slides 21
100 to permit air under pressure to enter the upper ends of said magazines 9. The air entering the upper ends of said magazines neutralizes the pressure of the air entering the lower ends of the magazines from the fire chamber and thus the tendency of the
105 draft to cause the fire to burn up into the magazine is overcome.

Coal is fed to the magazines 9 by first opening the slides 24 thus admitting coal from the hoppers 23 to the magazines 20.
110 Said slides are then closed and the slides 21 opened to allow the coal contained in the

magazines 20 to fall into the magazines 9. The upper ends of the magazines are thus always closed so that a constant air pressure is maintained within the upper ends of the
 5 magazines through the air passages 29 and the escape of gas through the hoppers is effectually prevented by said closures and also by the air entering the upper ends of
 10 said magazines which causes a down draft therein effectually excluding gas therefrom.

By spacing the coking plates from the walls 1 of the furnace, any ash, fine coal or other residue which may work through between the plates 16 and the stoker boxes 17
 15 and fall behind said boxes, will be pushed from the outer edges of the coking plate and fall through the opening to the furnace floor below, and thus clogging of the stoker boxes by an accumulation between the same
 20 and the furnace walls is prevented.

Having thus fully described my invention what I claim is:—

1. In a furnace, the combination of a fire chamber having a fuel support therein,
 25 means for automatically feeding fuel into said chamber, an air chamber communicating with the fire chamber through the fuel support and having a wall forming one side of the chamber, means for supplying air under
 30 pressure to said air chamber, a magazine above said feeding means having an open lower end from which the fuel is fed into the fire chamber by said feeding means, and means for supporting and spacing one
 35 side of said magazine from said wall to form an air passage communicating through the side of the magazine near its upper end with the interior thereof.

2. In a furnace the combination of a series
 40 of grate bars, a fire chamber above the bars, and an air chamber below the bars communicating with the fire chamber through said grate bars and having a furnace wall forming
 45 one side thereof, means for supplying air under pressure to the air chamber, means for automatically feeding fuel to the grate bars, a magazine for holding a supply of
 50 fuel located above the feeding means and provided with an open lower end and openings in its side wall near the upper end thereof, said side wall being spaced from said wall forming the side of said air chamber to form an air passage communicating at its

lower end with the air chamber and at its upper end with the interior of the maga- 55
 zine through said openings in the wall of the magazine, and brackets on the furnace wall for supporting the feeding means with a space between said means and wall.

3. In a furnace the combination of in- 60
 clined grate bars, a horizontally extending coking plate at the upper ends of said bars, stoker boxes reciprocable upon said plate, means for actuating said boxes, a magazine
 65 above the coking plate having an open lower end from which fuel is fed to the upper ends of the grate bars by the movement of said stoker boxes, means for closing the upper
 70 end of said magazine and a wall spaced from the vertical side wall of the magazine and from one edge of the coking plate to form an air passage opening into the space below
 the grate bars and communicating at its upper end with the interior of the magazine, and means for supplying air under pressure 75
 to the space below the grate bars.

4. In a furnace the combination of side walls, magazines having outer walls spaced from said side walls to form air passages be- 80
 tween, said outer walls of said magazines being formed with openings to admit air from said air passages into the upper ends of the magazines, an arch extending across
 85 between the inner walls of the magazines, coking plates below the lower open ends of the magazines, brackets on said side walls for supporting the outer edges of the coking plates and spacing said edges from said
 90 walls, stoker boxes reciprocable upon said plates to feed fuel from the lower open ends of the magazines, inclined grate bars with their upper ends adjacent to the inner edges
 95 of the coking plates, means for supplying air under pressure to the space below the grate bars and to said air passages, means for supplying fuel to the upper ends of the magazines, and means for closing the upper ends of the magazines adapted to be opened to admit fuel thereto.

In testimony whereof I affix my signature 100
 in presence of two witnesses.

JOHN R. FORTUNE.

Witnesses:

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 OTTO F. BARTHEL.