

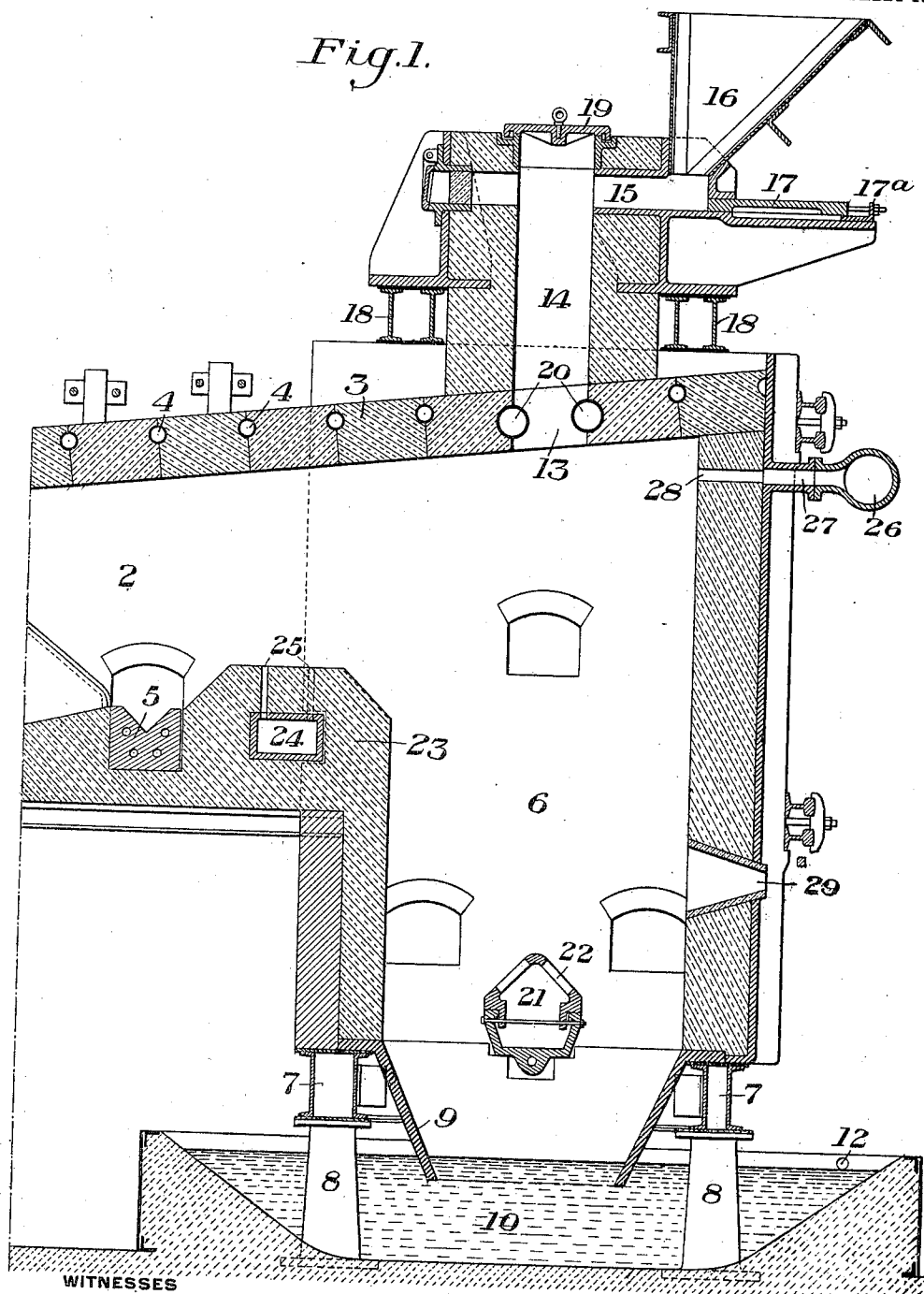
1,029,605.

A. W. GRIFFITH.
CONTINUOUS HEATING FURNACE.
APPLICATION FILED SEPT. 22, 1909.

Patented June 18, 1912.

2 SHEETS—SHEET 1.

Fig. 1.



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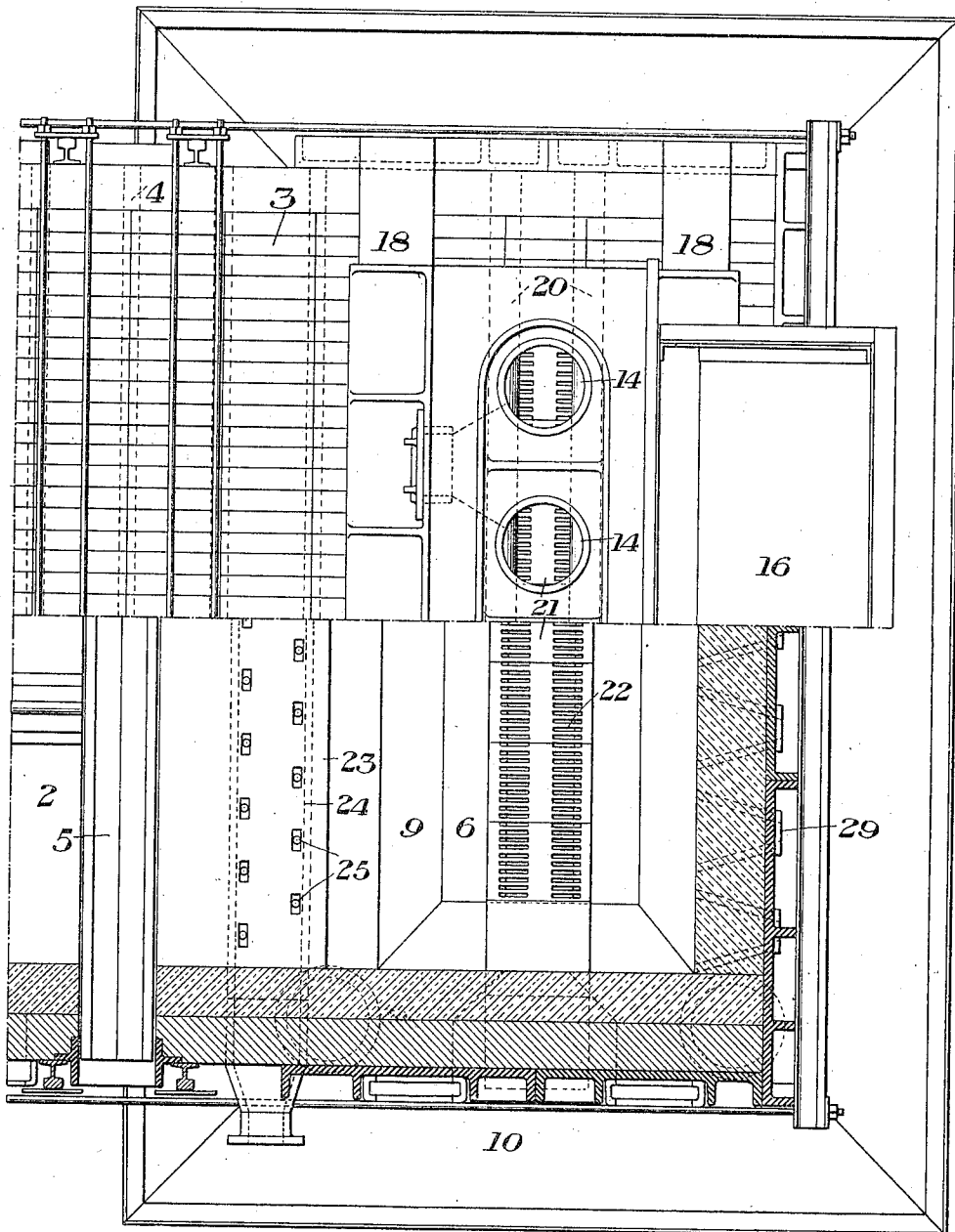


Fig. 2.

WITNESSES

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UNITED STATES PATENT OFFICE.

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CONTINUOUS HEATING-FURNACE.

1,029,605.

Specification of Letters Patent.

Patented June 18, 1912.

Application filed September 22, 1909. Serial No. 519,066.

To all whom it may concern:

Be it known that I, ASA W. GRIFFITH, of Youngstown, in the county of Mahoning and State of Ohio, have invented certain new and useful Improvements in Continuous Heating-Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal sectional side elevation showing a heating furnace having a combustion chamber constructed and arranged in accordance with my invention. Fig. 2 is a plan view of the same, partly in section, to show the arrangement of the twyer or wind box located in the bottom portion of the combustion chamber.

My invention relates to the construction of coal fired heating furnaces and more particularly relates to the construction of the combustion chamber of such furnaces.

The object of the invention is to provide a furnace having improved means by which the fuel is uniformly distributed in the combustion chamber and by which ashes and clinkers are removed from the combustion chamber.

A further object of the invention is to provide means by which the roof of the furnace is protected and unburned gases escaping from the fuel bed are burned.

A further object of the invention is to provide an improved construction of the ash hopper by which loss of unburned coal is prevented.

A still further object of my invention is to provide an improved twyer or wind box construction by which fusing of clinkers to the furnace wall is prevented and overcome.

In the drawings 2 represents the discharge end of a coal fired horizontal heating furnace having a roof 3 which is suspended upon water cooled pipes 4, which engage with the opposite ends of the bricks forming the roof. The bottom of the furnace opposite the charging door is provided with a water cooled sole plate 5 on which the blanks heated in the furnace are moved through the discharge door of the furnace.

At one end of the furnace 2 is a rectangular combustion chamber 6 which as shown extends entirely across the width of the furnace, the combustion chamber being built into and forming part of the furnace structure. The lower end of the combustion

chamber 6 is carried upon a suitable frame work 7 which in turn is supported upon posts or columns 8, so as to give access to the interior of the bottom portion of the chamber 6 from all sides. The lower end of the chamber 6 terminates in a downwardly and inwardly sloping ash hopper 9, the sloping sides preventing passage of unburned fuel into the water sealed ash pit 10. The lower end of the ash hopper 9 extends downwardly below the level of the water overflow outlet 12 in the ash pit 10, so as to form a water seal when the furnace is in operation.

Located in the roof above the central portion of the combustion chamber 6 is a rectangular opening 13 which communicates with the charging chute 14 through which fuel is charged into the combustion chamber of the furnace. At one side of and near the upper end of the chute 14 is a transverse opening 15 through one side wall which communicates with the lower smaller end of the fuel hopper 16. The transversely extending opening 15 is provided with a longitudinal movable charging plate 17 which is adjustably secured to an actuating device 17^a, the actuating device being connected to any suitable driving motor.

The fuel charging mechanism is supported upon beams 18 which are carried on suitable supports located at opposite ends of the combustion chamber.

The top of the upper end of the opening 14 is provided with a series of covers 19 which are removably secured in place so as to give access to the interior of the combustion chamber through the opening 14 whenever found necessary or desirable.

The ends of the roof bricks of the furnace defining the width of the opening 13 are carried on water cooled pipes 20; which serve to lengthen the life of the roof at this point by reason of the cooling effect of the water.

Located above the ash pit 10 in the lower end of the combustion chamber 6 is a twyer box or wind box 21, the sloping top surfaces of which are provided with a series of rectangular openings 22 through which air under pressure is delivered to the fuel bed in the combustion chamber and located in the bridge wall 23 of the furnace is a rectangular wind box 24 having openings leading therefrom at suitable intervals in the top surface of the bridge wall 23. The

wind boxes 21 and 24 are connected to a supply of air under pressure, the air preferably being preheated.

At the upper outer end of the combustion chamber 6 is a pipe 26 having a series of branches 27 which communicate with openings 28 extending through the end wall of the furnace at a point slightly below the inner surface of the roof. The pipe 26 connects with a source of preheated air to supply air to the furnace immediately below the roof so as to complete the combustion of unburned gases in the top of the furnace and also serves to protect the roof and prevent its becoming excessively heated.

Suitable plug holes 29 are provided in the combustion chamber for cutting or slicing the fire and breaking up clinkers during the firing operations.

In the operation of furnaces built in accordance with my improved construction, the coal is fed from the hopper 16 into the chute 14 by means of the pushers 17. The coal or other fuel then drops vertically into the central portion of the chamber where it becomes evenly distributed over the surface of the combustion chamber. The coal being burned is supported on the ashes which rest in the ash pit 10. As the ashes and clinkers collect in the furnace, they are raked out through the ash pit from all sides of the combustion chamber, in this way causing an even descent of the column of burning fuel in the combustion chamber. Air under pressure is supplied to the under side of the bed of burning fuel from the twyer box 21, extending across the width of the furnace through the air holes 22. Air is also provided, preferably in a preheated condition, to the under side of the gases passing into the furnace 2 from the wind box 24 through the openings 25 in the bridge wall 23. Preheated air is also led into the upper portion of the furnace through the openings 28 and by passing along the underside of the furnace roof in a thin sheet, efficiently protects the furnace roof from excessive heat and also causes the combustion of any unburned gases escaping upwardly from the combustion chamber, and in this way greatly increases the life and efficiency of the furnace.

The advantages of my invention will be apparent to those skilled in the art. The apparatus is simple and easily kept in repair. The life of such furnaces is very greatly lengthened while the heating capacity of the furnace is largely increased.

Modifications in the construction and arrangement of the parts may be made without departing from the spirit and scope of my invention as defined in the claims.

I claim:

1. A heating furnace including an upright

combustion chamber, a substantially horizontal heating chamber leading from the upper portion of the combustion chamber throughout the width thereof, and a wind box in the lower portion of the combustion chamber substantially midway between the front and back thereof and below the heating chamber and extending the full width of the combustion chamber, said wind box having upwardly converging front and rear perforate sides, the roof of the combustion chamber having a charging opening there- through extending the full width of said chamber and located in alinement with the wind box, substantially as described.

2. A heating furnace including an upright combustion chamber, a substantially horizontal heating chamber leading from the upper portion of the combustion chamber throughout the width thereof, a wind box in the lower portion of the combustion chamber substantially midway between the front and back thereof and below the heating chamber and extending the full width of the combustion chamber, said wind box having upwardly converging front and rear perforate sides, the roof of the combustion chamber having a charging opening therethrough extending the full width of said chamber and located in alinement with the wind box, and means for maintaining a sheet of air against the under side of the roof of the furnace, substantially as described.

3. A heating furnace including an upright combustion chamber, a substantially horizontal heating chamber leading from the upper portion of the combustion chamber throughout the width thereof, a wind box in the lower portion of the combustion chamber substantially midway between the front and back thereof and below the heating chamber and extending the full width of the combustion chamber, said wind box having upwardly converging front and rear perforate sides, the roof of the combustion chamber having a charging opening therethrough extending the full width of said chamber and located in alinement with the wind box, a charging chute communicating with the charging opening throughout the length thereof, a feed hopper at one side of the chute, there being a passage leading from the hopper through one side of the chute throughout the horizontal length thereof, and a mechanical charger working in the passage, substantially as described.

In testimony whereof, I have hereunto set my hand.

ASA W. GRIFFITH.

Witnesses:

JOHN HULST,
A. C. COOK.