No. 816,528. PATENTED MAR. 27, 1906.

A. BOYCE.

HOT AIR FURNACE.

APPLICATION FILED APR 16, 1904.

Fig. 1

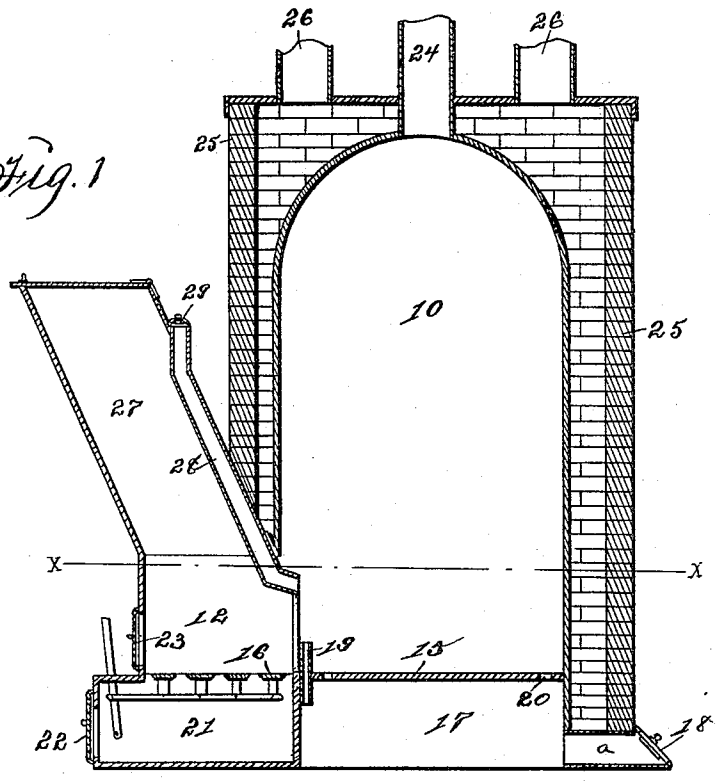
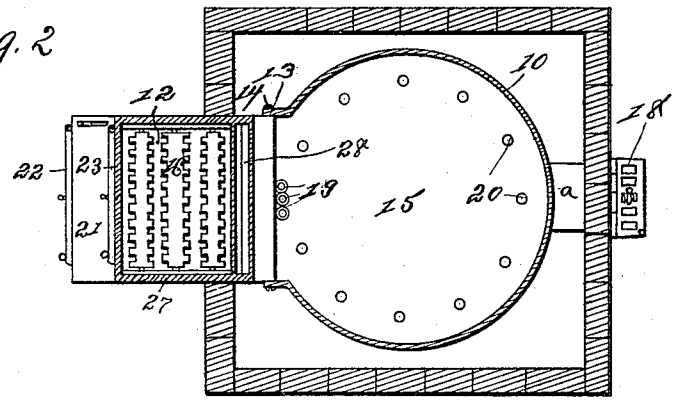


Fig. 2



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UNITED STATES PATENT OFFICE.

ARTHUR BOYCE, OF DES MOINES, IOWA.

HOT-AIR FURNACE.

No. 816,528. Specification of Letters Patent. Patented March 27, 1906.

Application filed April 16, 1904. Serial No. 203,527.

To all whom it may concern:

Be it known that I, ARTHUR BOYCE, a citizen of the United States, residing at Des Moines, in the county of Polk and State of Iowa, have invented a new and useful Hot-Air Furnace, of which the following is a specification.

My object is to promote combustion in a furnace and to prevent the annoyances and waste of fuel incident to the production of soot and black smoke.

A further object is to economize in the construction and combination of a fire-pot, a fuel-magazine, and combustion-chamber and to facilitate the operation and to reduce the manual labor required to attend the feeding of fuel to the fire on the grate.

My invention consists in the specific construction, arrangement, and combination of parts, as hereinafter set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a vertical central sectional view that shows the forms and relative positions of all the parts. Fig. 2 is a transverse sectional view looking downward from the line *x x* in Fig. 1.

The numeral 10 designates the combustion-chamber that is preferably made of sheet-steel and cylindrical and may vary in size, as desired. It is connected at its front and bottom portion with a fire-pot 12 by means of flanges 13 and screws 14, as shown in Fig. 2, or in any suitable way. It has a diaphragm 15, fitted and fixed in its lower portion on a level with the grate 16 in the fire-pot to produce an air-chamber 17 in its bottom. A passage-way *a* for air extends rearward and outward from said chamber and is provided with a register 18 for regulating the admission of air to the chamber.

A plurality of open-ended tubes 19 are fixed in the diaphragm 15, as shown in Fig. 1, to convey air from the chamber 17, as required to feed to and mingle with the products of combustion as they pass rearward from the open rear end of the fire-pot into the combustion-chamber. The diaphragm is also provided with a plurality of air-holes 20, as shown in Fig. 2, and as required to distribute air from the air-chamber to aid in producing an upward draft in the furnace to the combustion-chamber.

An ash-chamber 21 under the grate is provided with a door 22 for regulating the admission of air to fuel on the grate. The fire-pot 12 is also provided with a door 23 for gaining access thereto, as required for stirring the fire and cleaning the grate.

A flue 24 at the top of the combustion-chamber is designed to be connected with a chimney. A jacket or wall 25 incloses the combustion-chamber to produce a hot-air chamber, and pipes 26 are connected with its top for conveying hot air to different rooms in a building.

A fuel-magazine 27 is fixed on top of the fire-pot 12 to extend upward and incline forward for retaining and feeding fuel to the fire-pot. By inclining it in place of having it perpendicular the fuel will be in a measure held up and prevented from being fed to the fire too rapidly. An air-conductor 28 is fixed to the rear side of the magazine to convey and discharge air into the combustion-chamber simultaneously with the passage of products of combustion as they pass from the fire-pot into the combustion-chamber. The top of the air-conductor is provided with a cover and register 29 to regulate the passage of air therethrough, as required to regulate the fire on the grate.

Having thus set forth the purpose of my invention and its construction and the operation thereof, its practical utility will be obvious to persons familiar with the art to which it pertains, and

What I claim as new, and desire to secure by Letters Patent, is—

1. In a furnace, the combination of a combustion-chamber, an air-chamber located under said combustion-chamber and in open communication therewith at a plurality of points, a fire-pot located alongside of said combustion-chamber and in open communication therewith, a plurality of tubes each of said tubes at its lower end being in open communication with said air-chamber and having its upper end extended upward into and terminated within the path of the products of combustion as they pass from the fire-pot into the combustion-chamber and adapted to feed air into the midst of said products of combustion and means for controlling the supply of air to said air-chamber.

2. In a furnace, a combustion-chamber, an air-chamber under the combustion-chamber provided with air-holes in its top to aid in producing an upward draft in the furnace, means for regulating the passage of air into the air-chamber, a fire-pot communicating with the front and lower portion of the com-

bustion-chamber and means to feed air to the products of combustion as they pass from the fire-pot into the combustion-chamber.

3. In a furnace, a combustion-chamber, an air-chamber under the combustion-chamber closed at its front end and provided with air-holes in its top to feed air into the combustion-chamber at different points to produce an upward draft in the furnace, means for regulating the passage of air into the air-chamber, a fire-pot in front of the air-chamber in a plane above the air-chamber, a plurality of open-ended tubes fixed in the air-chamber immediately in rear of the fire-pot to feed air upward into the products of combustion as they pass from the fire-pot into the combustion-chamber.

4. In a furnace, a combustion-chamber, an air-chamber under the combustion-chamber closed at its front end and provided with means to admit air at its rear end, a plurality of open-ended tubes fixed in the top of the air-chamber, a fire-pot communicating with the lower end and front of the combustion-chamber and a fuel-magazine on top of the fire-pot extending upward and inclining forward and an air-conductor on the back of the magazine communicating with the combustion-chamber to mingle air with the products of combustion as they pass from the fire-pot into the combustion-chamber.

5. A hot-air furnace comprising a double-walled combustion-chamber, an air-chamber under the combustion-chamber closed at its front end and provided with an air-register at its rear end and air-holes in its top, a plurality of open-ended tubes fixed in the top and front of the air-chamber, a fire-pot communicating with the lower end and front of the combustion-chamber, a fuel-magazine on top of the fire-pot extending upward and inclining forward, an air-conductor on the back of the magazine communicating with the combustion-chamber to mingle air with the products of combustion as they pass into the combustion-chamber, a grate in the bottom of the fire-pot and an ash-chamber under the grate, arranged and combined as shown and described to operate in the manner set forth for the purposes stated.

ARTHUR BOYCE.

Witnesses:
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