

J. W. HATCH.
FURNACE.

No. 423,926.

Patented Mar. 25, 1890.

Fig. 1.

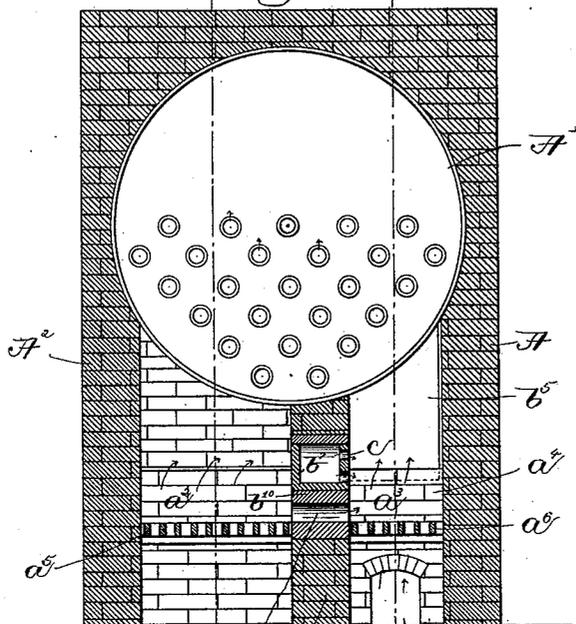
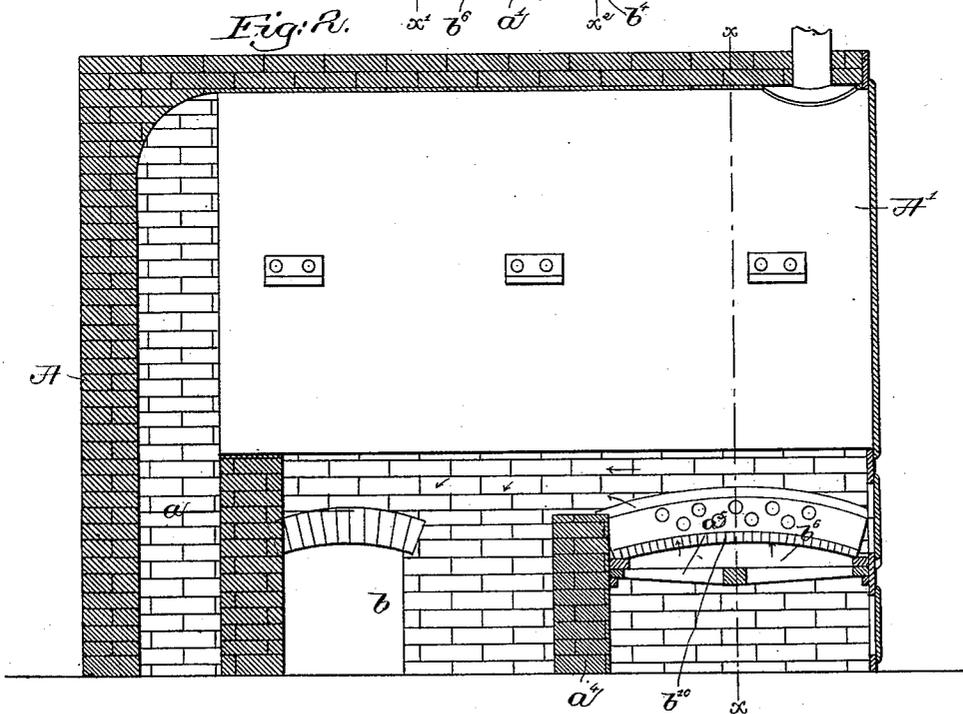


Fig. 2.



Witnesses,
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Inventor

Jesse W. Hatch,

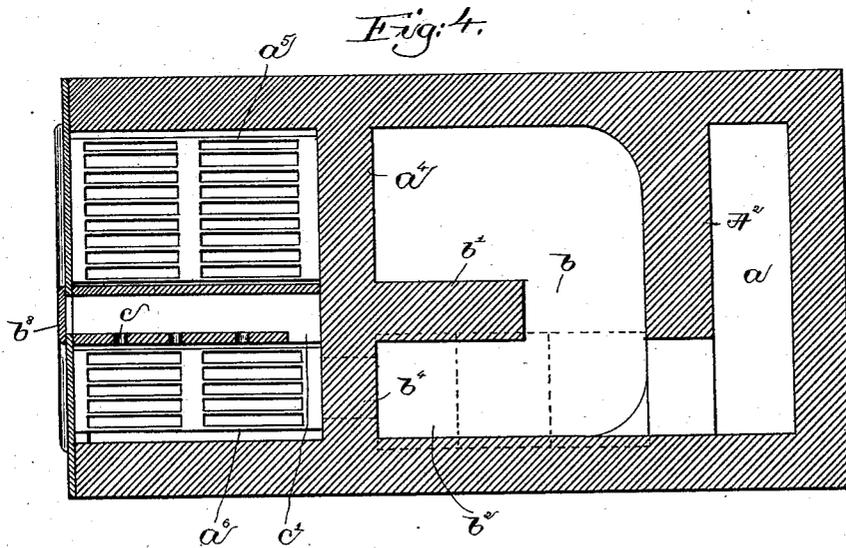
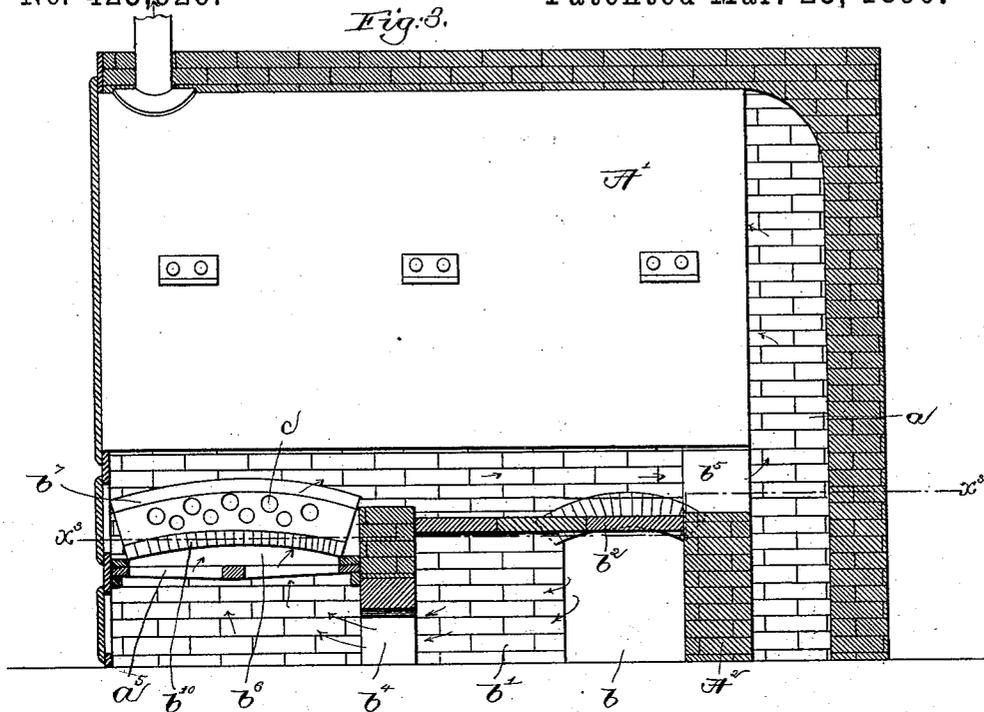
by L. S. Gregory

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UNITED STATES PATENT OFFICE.

JESSE W. HATCH, OF ROCHESTER, NEW YORK, ASSIGNOR TO CLARK'S
COKING AND SMOKELESS FURNACE COMPANY, OF SAME PLACE.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 423,926, dated March 25, 1890.

Application filed July 20, 1889. Serial No. 318,164. (No model.)

To all whom it may concern:

Be it known that I, JESSE W. HATCH, of Rochester, county of Monroe, State of New York, have invented an Improvement in Furnaces, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to furnaces of that class in which soft or bituminous coal is used as a fuel and the volatile products driven off from the coal in one chamber are caused to pass up through the grate-bars of a second chamber, where they are completely consumed.

My invention has for its object to provide a furnace of the class referred to which shall be simple in construction yet most efficient in operation.

In accordance with my invention the furnace is provided with a central wall having at its front end an archway by which communication is established between the chambers on opposite sides of the central wall, the top or arch of the said way being preferably made as a hollow metal casting, provided on one side with perforations or openings, through which air, admitted into the hollow casting at its front end, may pass into one of the said chambers, the said metal casting being supported on its under side by an arch of fire-brick.

My invention therefore consists, in a furnace, of the combination, with a transverse wall forming with the rear wall of the furnace a flue, of a longitudinal wall extended from the front of the furnace to the transverse wall to divide the furnace into a fuel and a combustion chamber, grate-bars in said chamber, a passage in the longitudinal wall at the rear of the grate-bars in the combustion-chamber to connect the fuel-chamber with the combustion-chamber below the grate-bar, and an archway or passage connecting said chambers above the grate-bars, substantially as will be described.

Other features of my invention will be pointed out in the claims at the end of this specification.

Figure 1 is a transverse section of a furnace embodying my invention, the section

being taken on line xx , Fig. 2; Fig. 2, a longitudinal section and elevation of the furnace shown in Fig. 1 on line $x'x'$, the boiler being in elevation; Fig. 3, a longitudinal section of the furnace shown in Fig. 1 on line x^2x^2 , the boiler being in elevation; and Fig. 4, a transverse section of the furnace on the irregular line x^3x^3 , Fig. 3.

The furnace A, which may be made of brick or other usual material, is provided at its rear end with a transverse wall A^2 , which supports the rear end of a boiler A' , the front end of the boiler being suitably supported by the front wall of the furnace, the transverse wall A^2 forming with the rear wall of the furnace a flue or passage a .

The furnace A is provided with a longitudinal wall a' , extended from the front wall of the furnace to the transverse wall A^2 , the said longitudinal wall constituting a middle support for the boiler A' and forming with the walls of the furnace two chambers a^2a^3 , provided with a bridge-wall a^4 , and having at their front ends grate-bars a^5a^6 , respectively. The chamber a^2 at the rear of the bridge-wall a^4 communicates by a passage b with a chamber b' , forming part of the chamber a^3 , but divided therefrom by a roof, preferably made of slabs or tiles b^2 , (see Figs. 3 and 4,) the chamber b' communicating with the main chamber a^3 below the grate-bars a^6 by means of a passage b^4 in the bridge-wall. The chamber a^3 above the roof b^2 communicates with the rear flue a by a passage b^5 in the transverse wall A^2 . The longitudinal wall a' at its front end is provided with an archway b^6 , having its top preferably made as a hollow metal casting b^7 , supported upon an arch b^{10} of fire-brick, by which the metal casting is prevented from being burned out, the said casting communicating at its front end with the atmosphere, it being provided with a suitable damper or door b^8 to control the admission of air into it. The side of the hollow casting b^7 adjacent to the chamber a^3 is provided with perforations c , and at the rear end of the hollow casting the perforated side forms with the bridge-wall a passage c' , through which the heated air may pass into the chamber a^3 .

In operation the chamber a^2 contains the

fuel to be burned, and the chamber a^3 will preferably contain a layer of ashes or cinders laid upon its grate-bars a^6 to retard the passage of the volatile products driven off from the fuel in the chamber a^2 . The bituminous or other coal placed upon the grate-bars a^5 in the chamber a^2 is ignited therein, and the volatile products pass from said chamber through the passage b in the central wall into the chamber b' , thence through the passage b^4 in the bridge-wall a^4 , and up through the grate-bars a^6 in the chamber a^3 , which, for sake of argument, may be called the "combustion-chamber," as a complete combustion of the volatile products takes place in the said chamber above the grate-bars, the said volatile products being commingled with the heated air issuing from the perforations c in the hollow casting and from the passage c' , the products of combustion passing from the combustion-chamber a^3 through the passage b^5 in the transverse wall A into the flue a , and thence through the boiler to the chimney. The flame caused by the ignition of the coal in the chamber a^2 may pass through the archway b^6 in the central wall into the chamber a^3 to assist the combustion.

In practice the longitudinal wall a' will preferably be located in the furnace on one side of the center line, it being shown as located so as to divide the furnace into thirds, so that substantially two-thirds of the grate area of the furnace may be used as a fuel-chamber and but one-third as a combustion-chamber.

I prefer to make the top of the archway b^6 as a hollow iron casting, supported on its under side by an arch b^{10} of fire-brick or other refractory material, and provided with perforations, through which air admitted into the hollow casting may pass into the combustion-chamber a^3 , as by this means the casting is prevented from being burned out.

I claim—

1. In a furnace, the combination, with a transverse wall forming with the rear wall of the furnace a flue a , of a longitudinal wall a' , extended from the front of the furnace to the transverse wall to divide the furnace into a fuel-chamber, and a combustion-chamber, grate-bars in said chambers, a passage b in the wall a' at the rear of the grate-bars in the combustion-chamber to connect the fuel-chamber with the combustion-chamber below

the grate-bar, and an archway or passage connecting said chambers above the grate-bars, substantially as described.

2. In a furnace, the combination, with a transverse wall forming with the rear wall of the furnace a flue a , of a longitudinal wall a' , to divide the furnace into a fuel-chamber and a combustion-chamber, grate-bars in said chambers, a passage connecting the fuel-chamber with the combustion-chamber below the grate-bar, and an archway or passage connecting said chambers above the grate-bars, and a hollow metallic arch or top for said passage or archway, provided with perforations c and communicating with the atmosphere, substantially as described.

3. In a furnace, the combination, with the transverse wall forming with the rear wall of the furnace a flue a , of a longitudinal wall a' , to divide the furnace into two chambers, a passage or archway in said wall at its front end to connect the said chambers, a bridge-wall at the rear of said passage, a top or roof in one chamber at the rear of the said bridge-wall to form a chamber b' , a passage in the bridge-wall to connect said chamber with the combustion-chamber below the grate-bars, and a passage in the longitudinal wall at the rear of the bridge-wall to connect the fuel-chamber with the chamber b' , substantially as described.

4. In a furnace, the combination, with a transverse wall forming with the rear wall of the furnace a flue a , of a longitudinal wall a' , to divide the furnace into a fuel-chamber and a combustion-chamber, grate-bars in said chambers, a passage connecting the fuel-chamber with the combustion-chamber below the grate-bar, and an archway or passage connecting said chambers above the grate-bars, and a hollow metallic arch or top for said passage or archway, provided with perforations c and communicating with the atmosphere, and an arch b^6 , of refractory material, on the under side of said casting, substantially as described.

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

JESSE W. HATCH.

Witnesses:

EDWARD WEBSTER,
ROY C. WEBSTER.