L. YOKSCH.

SMOKE CONSUMING FURNACE.

APPLICATION FILED APR. 9, 1906.

912,223.

Patented Feb. 9, 1909.

2 SHEETS—SHEET 1.

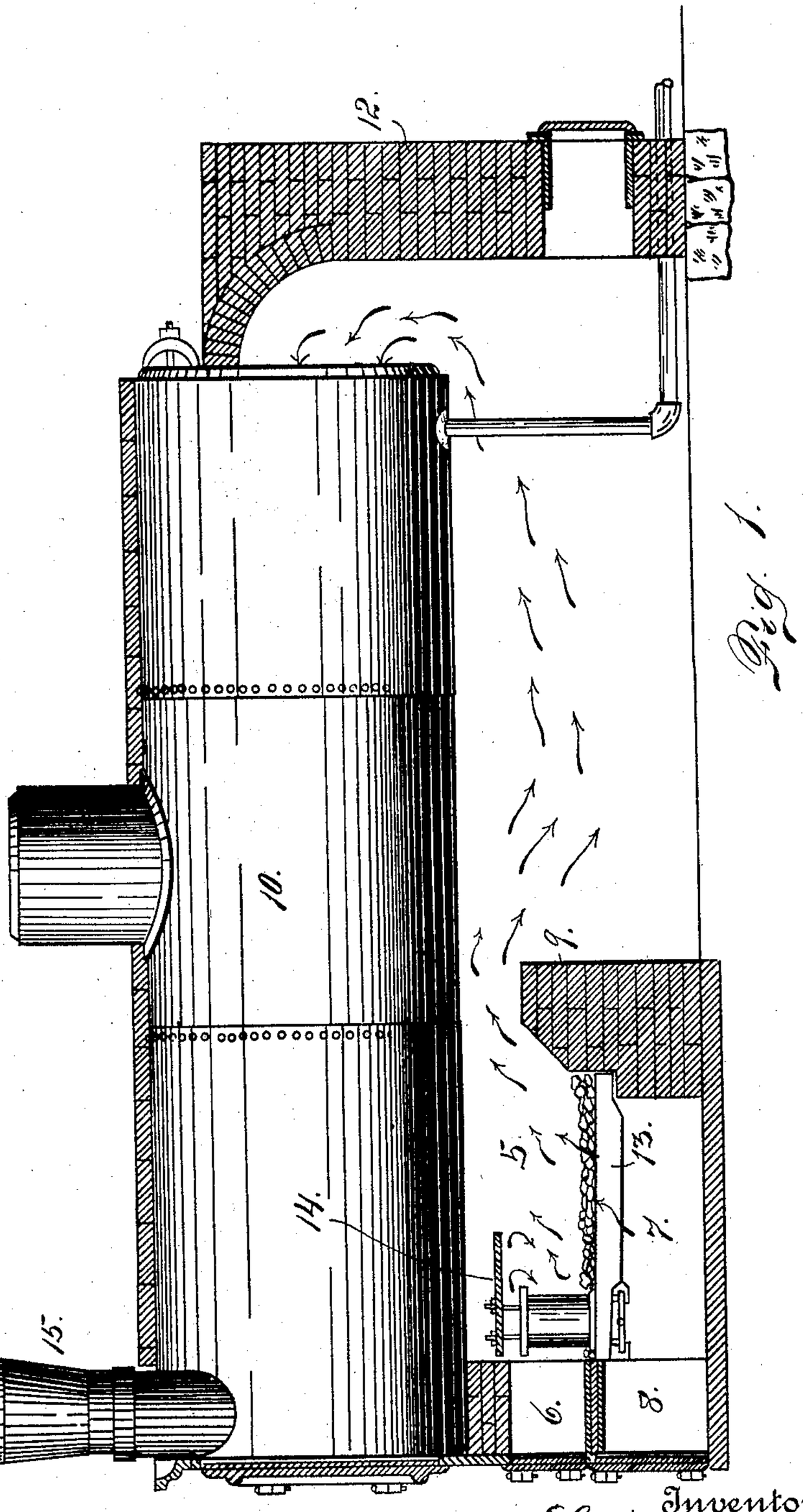

Fig. 1.

Witnesses

Dena Nelson.

Otto E. Hoddick.

Inventor

Louis Yoksch.

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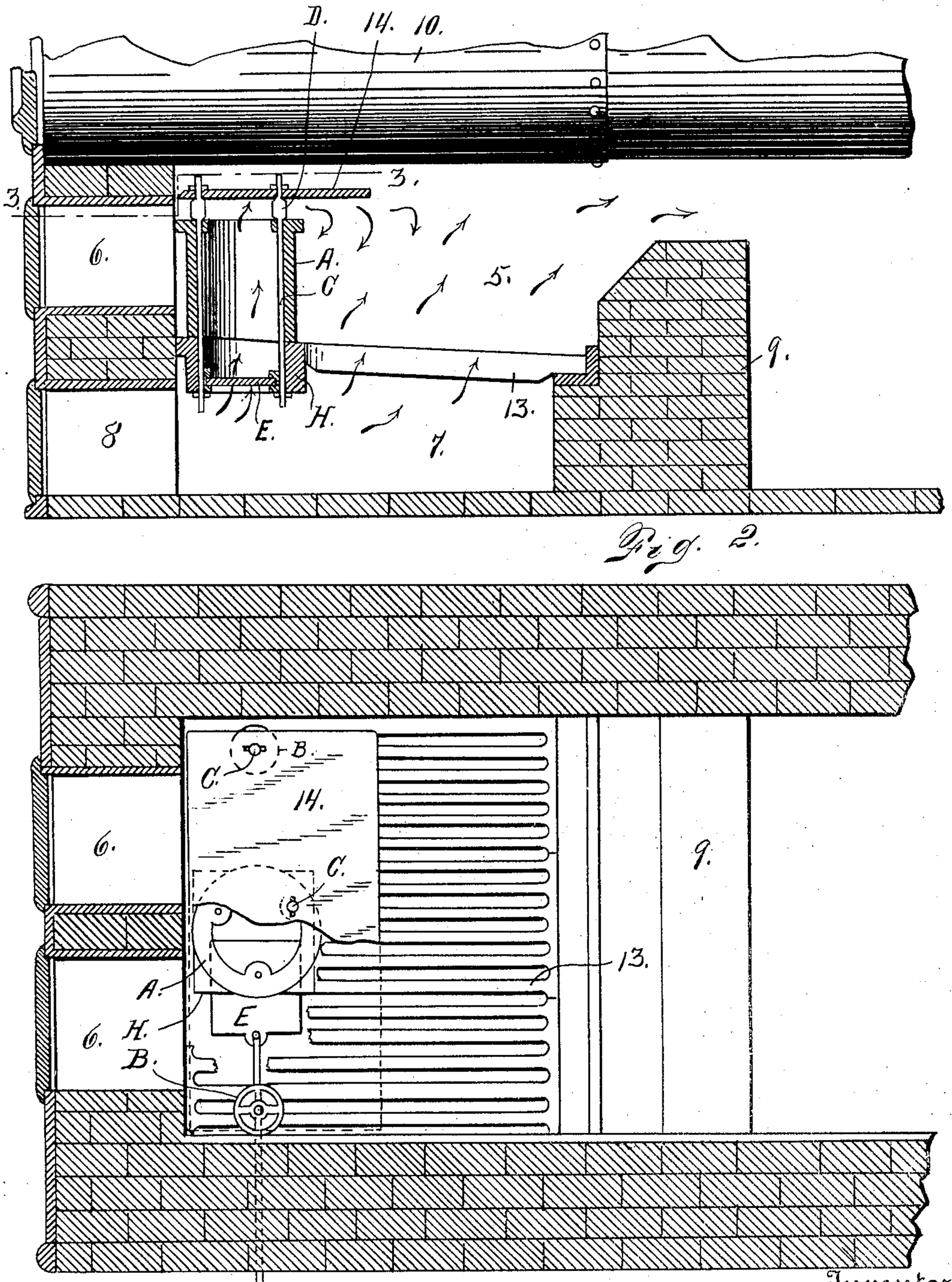

Fig. 2.

Fig. 3.

Witnesses

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UNITED STATES PATENT OFFICE.

LOUIS YOKSCH, OF DENVER, COLORADO.

SMOKE-CONSUMING FURNACE.

No. 912,223. Specification of Letters Patent. Patented Feb. 9, 1909.

Application filed April 9, 1906. Serial No. 310,614.

To all whom it may concern:

Be it known that I, LOUIS YOKSCH, a citizen of the United States, residing at the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Smoke-Consuming Furnaces; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in smoke consuming boiler furnaces, my object being to obtain complete combustion and thereby do away with the loss of carbon or unconsumed fuel, resulting in the smoke which issues from the stacks of ordinary boiler furnaces.

The invention will now be described in detail reference being made to the accompanying drawing in which is illustrated an embodiment thereof.

In this drawing, Figure 1 is a section taken through a boiler furnace equipped with my improvements, the boiler and my improvements being shown in elevation. Fig. 2 is a fragmentary enlarged view of the construction shown in Fig. 1. In this view a furnace is shown in central vertical section. Fig. 3 is a horizontal section taken on the line 3—3 Fig. 2, a portion of the baffle plate being broken away.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate the fire box; 6 the fuel supply opening; 7 the ash pit; 8 the opening leading to the ash pit; 9 the bridge wall; 10 the boiler and 12 the rear wall of the furnace. Between the ash pit and the fire box the usual grate bars 13 are placed.

In the upper forward portion of the fire box is located a baffle plate 14 occupying a position a short distance below the bottom of the boiler. This baffle plate may be supported in any suitable manner. Mounted upon the forward extremity of the grate below the baffle plate, is a number of vertically disposed ducts. In the drawing a large central duct A is shown while smaller ducts B are located on opposite sides of the large central duct. These ducts are open at both extremities. Air from the ash pit passes up through the ducts and is delivered to the fire box below the baffle plate 14 whereby the air is carried rearwardly and supplies the fire box with the necessary oxygen for combustion. The object of delivering air through these ducts, is that it may be thoroughly heated before it is brought into contact with the combustible gases.

Experience has proven that a supply of cold air to a fire box not only has a cooling effect upon the fire, but the oxygen of the cold air does not readily unite with the fuel elements to produce combustion. However, by having the air heated when it comes in contact with the fuel elements in the upper part of the fire box, combustion takes place immediately. In this manner I am able to obtain practically perfect combustion thus doing away with the smoke.

In my improved construction of furnace the fuel supply is passed through the opening 6 to the grate in the usual manner. The air necessary for combustion enters the ash pit through the opening 8 in front and passes thence upwardly through the grate and also upwardly through the ducts A and B. The air passing through the grate unites with the fuel producing partial combustion and generating a large portion of unconsumed gases. The air which passes up through the ducts A and B being thoroughly heated, is delivered to the upper part of the fire box and caused to mingle with the gases which being lighter naturally rise, producing immediate combustion. The heat resulting in this combustion within the fire box, passes rearwardly over the bridge wall underneath the boiler and thence to the rear wall 12 where it enters the fire tubes of the boiler and passes forwardly and thence to the stack 15 through which the products of combustion escape.

The baffle plate 14 is supported by a number of rods C which pass upwardly through the ducts, the said rods being connected with the walls of the ducts in such a manner as to hold the rods securely in place. The upper extremities of the rods are separated from the baffle plate by spacing sleeves D through which the rods C of the larger duct pass. These spacing sleeves D are interposed between the top of the wall of the duct and the said baffle plate, thus maintaining the latter at a uniform distance from the top of the duct, allowing a free escape for the air from the ducts into the fire box. The ducts A and

B may be supported upon the grate in any suitable manner. As shown in the drawing (see Fig. 2) the central duct A is supported upon a plate H formed integral with the grate or a portion thereof, the said plate having an opening registering with the opening of the duct A. In the bottom of the plate H are formed ways or grooves in which a damper or valve E is slidably mounted. This damper or valve is controlled by a stem F which is connected therewith at its inner extremity while its outer extremity is exposed at the side of the furnace (see Fig. 3) whereby the damper may be manipulated from the outside thus making it practicable to control the volume of air which passes through the duct A, at will.

Having thus described my invention what I claim is:

In a smoke consuming furnace, the combination with a fire box, of a grate, an ash pit, a plate located in the forward portion of the fire box and formed integral with the grate, an air duct mounted on the said plate, the said plate being provided with an opening affording means of communication between the ash pit and the duct, rods fastened to the plate and passing through the duct, a baffle plate supported above the duct by said rods and projecting over the grate, the said rods being provided with suitable means located between the duct and the baffle plate to hold the said plate in spaced position relative to the top of the duct so as to allow the air to escape from the duct into the fire box, and a damper slidably mounted in the first mentioned plate for the purpose of controlling the admission of air through the opening formed in the said plate, substantially as described.

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

LOUIS YOKSCH.

Witnesses:

DENA NELSON,

OTTO E. HODDICK.