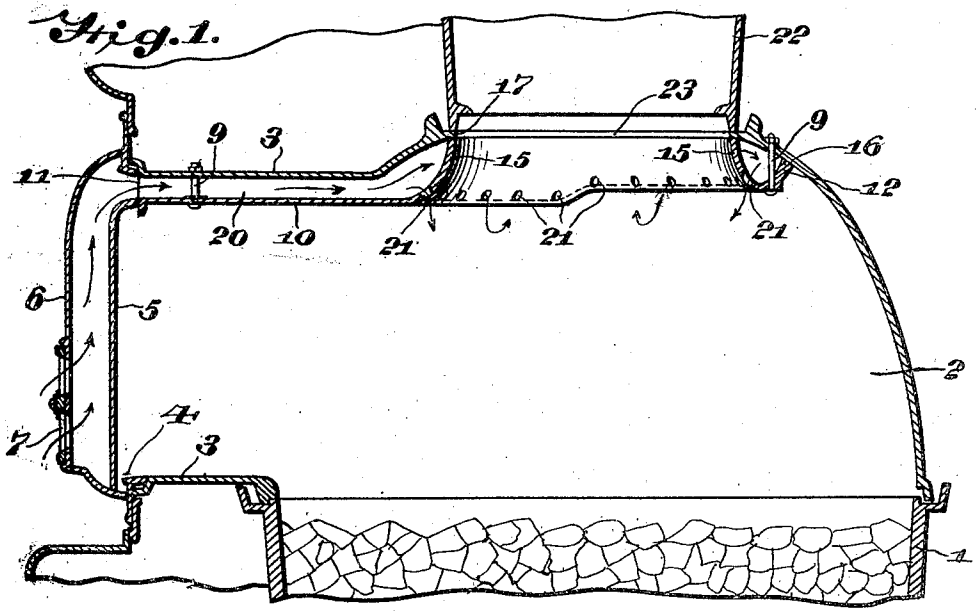
Jan. 20, 1925. 1,523,508

G. F. BIBB

CARBON CONSUMING DEVICE

Filed May 4, 1922

Fig. 1.



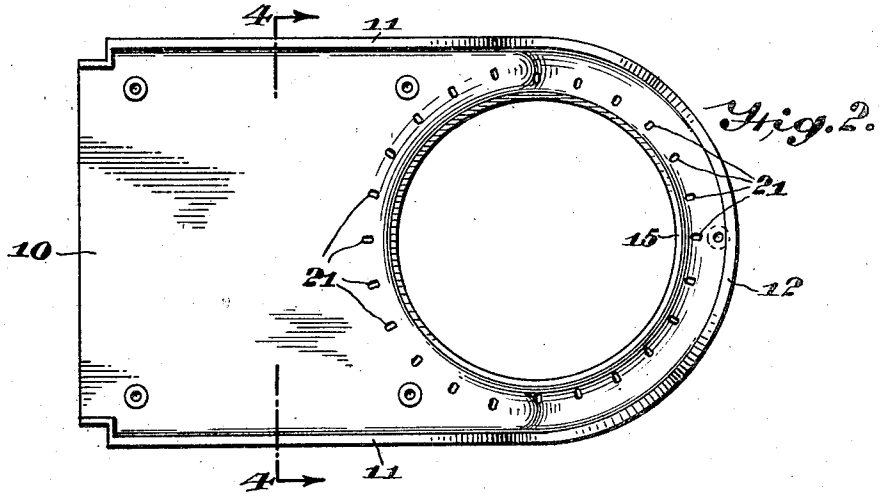




Fig. 2.

Fig. 3.

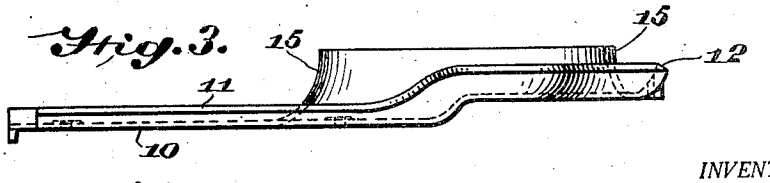
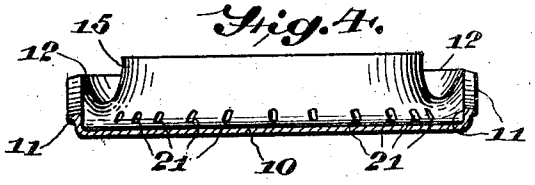



Fig. 4.




INVENTOR.

George F. Bibb

BY Cyrus N. Anderson

ATTORNEY.

Patented Jan. 20, 1925. 1,523,508

# UNITED STATES PATENT OFFICE.

GEORGE F. BIBB, OF TROY, NEW YORK, ASSIGNOR TO LEHIGH STOVE AND MANUFACTURING COMPANY, OF LEHIGHTON, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

## CARBON-CONSUMING DEVICE.

Application filed May 4, 1922. Serial No. 558,508.

*To all whom it may concern:*

Be it known that I, GEORGE F. BIBB, a citizen of the United States, and a resident of Troy, in the county of Rensselaer and State of New York, have invented an Improvement in Carbon-Consuming Devices, of which the following is a specification.

Broadly speaking my invention relates to solid fuel burning stoves or furnaces, such for instance as the type now known as "pipeless" furnaces.

The general object of the invention is to provide means for effecting the complete combustion of the carbon of the fuel to thereby not only obtain from the fuel a maximum amount of heat capable of being produced by the burning thereof but also prevent the discharge of smoke from the furnace. This is a very important desideratum particularly with respect to heating furnaces.

A further object is to provide novel means for receiving air through a channel leading from the exterior of a stove or furnace which air is heated by the heat from the combustion chamber and is thereafter delivered in a stream or streams in radial directions toward the vertical axis of the stove or furnace into the stove or furnace chamber wherein the oxygen of the air combines with the finely divided carbon which may be ascending with the gases to effect ignition and complete combustion of the same.

A further general object of the invention is to provide means of the character indicated which is simple in construction, easily applied to furnace structures, and hence may be economically constructed and installed.

Without undertaking to state other and further objects of the invention I shall now proceed to a description of the same and in doing so will make reference to the accompanying drawing in which I have illustrated one form of a convenient embodiment of my invention as applied to a furnace structure. However, it will be understood that changes in the details of construction may be made within the scope of the claims hereunto appended without departing from the said invention.

In the drawing:

Fig. 1 is a central vertical sectional view taken in a plane extending from front to rear of the furnace structure showing the central and upper portions of such structure, the latter being provided with the device embodying my invention;

Fig. 2 is a top plan view of the device embodying my invention;

Fig. 3 is an edge elevation thereof; and

Fig. 4 is a transverse sectional view taken on the line 4—4 of Fig. 2.

Referring to the drawing: 1 designates the upper portion of the fire box or chamber of a furnace of a type generally known as "pipeless," and 2 the combustion chamber thereof. The forward side of the said chamber is provided with a forwardly extending portion 3 the forward end of which is open, as indicated in Fig. 1 and is adapted to be closed by means of a door comprising inner and outer walls 5 and 6 spaced from each other as shown in Fig. 1. A valve controlled air inlet opening is indicated at 7. By adjusting the valve plate associated with this opening the amount of air permitted to enter the space between the plates 5 and 6 may be controlled.

Secured by means of bolts 9 to the under side of the top portion of the wall of the combustion chamber 2 and to the top portion of the extension 3 at the front side thereof is a device comprising a front relatively flat portion 10 the opposite edges of which are provided with upwardly extended beaded flanges 11 which merge into the semi-circular flange 12 at the inner end of the said device. Concentrically of the flange 12 is another circular upwardly extending flange-like portion 15 which extends to a greater height than the flange 12. These two flanges merge into each other as indicated in the drawing. The flange 12 contacts with the inner surface of the wall of the chamber 2 a short distance below the top thereof, as is indicated at 16 in Fig. 1. The upper end or edge of the wall of the said combustion chamber is extended inwardly, as shown at 17 in Fig. 1, and the upper edge of the flange 15 contacts with the inwardly extended edge portion of the walls of the said combustion chamber 2.

This contactual relation is clearly shown in Fig. 1 of the drawing. It will be observed that the flanges 12 and 15 co-operate with opposing adjacent portions of the upper end part of the combustion chamber wall to form a substantially semi-circular channel, into which air is delivered through the channel 20 formed between the portion 10 of the device and the upper portion of the forward extension 3 previously referred to. The space between the plates 5 and 6 of the door which closes the forward end of the extension 3 through which fuel is delivered to the fire-box constitutes a channel the upper end of which is in communication with the channel 20 and the latter merges into and communicates with the semi-circular channel previously referred to. The device becomes heated by the fire within the fire-box and combustion chamber so that air flows through the opening 7 and thence through the channel 20 and into the semi-circular channel formed by the flanges 12 and 15 in co-operation with a part of the upper end portion of the wall of the combustion chamber 2, and after having been thus pre-heated is discharged through openings 21 at or adjacent the lower edge portion of the circular flange 15. Streams of air which are discharged through the said openings are directed slightly downwardly and radially toward the central vertical axis of the furnace or stove structure.

The introduction of the pre-heated air in this manner into the top portion of the combustion chamber effects a complete combustion of the carbon, thereby not only increasing greatly the efficiency of the burning operation of the stove but also avoiding the emission of unconsumed carbon from the combustion chamber. By the employment of a device embodying the principle of my invention a substantial economy in coal consumption is effected.

The radiator 22, of any desired known construction, is supported at its lower end upon the inwardly extending edge portion 17 surrounding the relatively large opening 23 in the top of the combustion chamber 2.

Although in the preferred arrangement as illustrated the device is shown as discharging the pre-heated air into the upper part of the combustion chamber, it will be understood that my invention is not limited to the particular arrangement shown. The arrangement may be such that the pre-heated air may be delivered to the region of the stove or furnace chamber above the combustion chamber. The essential thing is that it shall be delivered into a region above the fuel where the heat is sufficiently great to cause combination of the oxygen of the pre-heated air with the finely divided particles of carbon which may be ascending with the gases to ignite and cause complete combustion of the same.

A stove of the character indicated is provided with the usual draft openings for supplying air to the fire-box but as these constitute no part of my invention they are not disclosed in the drawing. For the same reason I have shown only a portion of the radiator. My invention is directed and limited to the carbon consuming device described, which, as already indicated, is a device adapted to and employed for the purpose of effecting complete combustion of the carbon of the fuel and thereby preventing the emission or discharge of black smoke from the furnace or stove.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a solid fuel burning stove or furnace, the combination of a combustion chamber, an air pre-heating device situated within the upper part of said chamber, means for securing said device to the upper part of the walls of said chamber, and the said device comprising a forwardly extending flat portion having flanges at its opposite edges which co-operate with the upper part of a portion which extends forwardly from the said combustion chamber to form a channel, and the inner end portion of said device comprising upwardly extending flange portions surrounding an opening in alinement with an opening at the upper end of the combustion chamber, and one of the said last mentioned flanges being provided at or adjacent its lower edge with a series of openings through which pre-heated air is discharged radially into the said combustion chamber.

2. A solid fuel burning stove or furnace, comprising a combustion chamber, a device situated in the upper end portion of said chamber, means for securing said device to the upper end portions of the wall of said chamber, the said device comprising a forwardly extending portion having flanges at its opposite edges and terminating at its rear end portion in an inwardly and upwardly extending circular flange-like portion surrounding an opening which is in alinement with an opening leading from the top of the combustion chamber and also having an exterior concentrically upwardly and outwardly extending semi-circular flange-like portion, the upper edges of the said flanges being in contact with the under side of adjacent portions of the combustion chamber wall to form a chamber in which air is adapted to be pre-heated, and the said device being provided with a circular series of openings at or near the lower edge of the said inwardly and upwardly extending circular flange through which pre-heated air is discharged radially into the said com-

bustion chamber, and a door for closing an opening into the said combustion chamber through which fuel is introduced, the said door comprising a plurality of spaced plates forming a channel the upper end portion of which is in communication with the channel formed by the said device in co-operation with the upper part of the wall of the said combustion chamber, substantially as discribed.

In testimony that I claim the foregoing as my invention I have hereunto signed my name this 14 day of April A. D., 1922.

GEORGE F. BIBB.