Feb. 6, 1923.

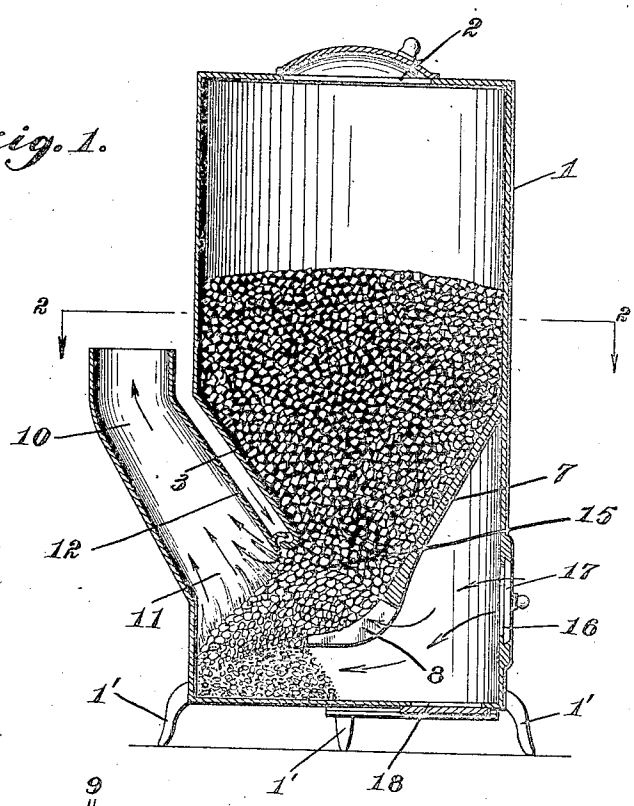
1,444,102.

W. D. BOOKER.

HEATING DEVICE.

FILED MAY 20, 1922.

Fig. 1.



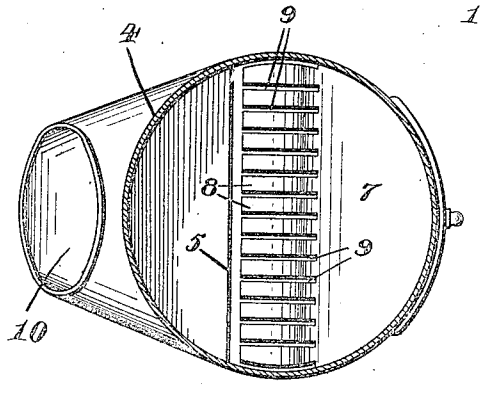
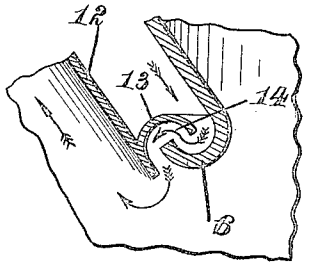


Fig. 2.

Fig. 3.



Inventor

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Patented Feb. 6, 1923. 1,444,102

UNITED STATES PATENT OFFICE.

WALTER D. BOOKER, OF WAWANESA, MANITOBA, CANADA.

HEATING DEVICE.

Application filed May 20, 1922. Serial No. 562,385.

To all whom it may concern:

Be it known that I, WALTER D. BOOKER, a subject of the King of Great Britain, residing at Wawanesa, Province of Manitoba, Canada, have invented certain new and useful Improvements in Heating Devices; and I do hereby declare that the following is 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.

This invention relates to a new and useful heating device, and has for its object the complete and efficient burning of fuel.

A further object of the invention is a combustion chamber having a chimney leading directly from the fire pot, and an air passage disposed above the lower end of the chimney, so that the draught through the chimney draws air into the fire pot for the complete combustion of the solid or gaseous hydrocarbons.

The invention is designed particularly for the burning of soft coal and a low grade of lignite. About one third of the weight of such fuels is volatile gases which are readily driven off by heat. Unless provision is made for burning them, their fuel value is lost. If they are incompletely burned, they cause the production of heavy smoke and a deposit of soot. The principle of this invention as regards the complete combustion of such fuels, consists of means for confining the burning to a relatively thin layer of fuel formed at the bottom of the fuel containing chamber, together with suitable means for supplying the required amount of air at the proper places. As the fuel burns, it drops into the ash receptacle, and is replaced by fresh fuel gravitating into the burning region because of the weight of the fuel in the containing chamber. I am aware of prior devices in the art which provide for the restriction of the burning region to the lower part of the fuel containing chamber, but the thickness of said region is approximately the same as the diameter of the fuel containing chamber, instead of relatively thinner as in this invention. The result of reducing the relative size of the burning region in this manner reduces the time required to generate sufficient heat to burn the volatile products, and increases the ease and accuracy with which the fire may be controlled.

Further objects and advantages of the invention will appear as the description of the embodying principles and structure is developed.

The invention is applicable wherever the combustion of coal for heating purposes is desired, but for illustration is shown as applied to a stove in the accompanying drawing, in which:

Figure 1 is a vertical section through the stove, the same being in operation;

Figure 2 is a horizontal section on the line 2—2 of Figure 1, the fuel being removed in order to show the grate; and

Figure 3 is a detail vertical section of the air passage.

The stove consists of a body 1 which may be of any desired shape, but is here shown as cylindrical in form. The body is supported on legs 1′ in the usual manner. A filling opening 2 is provided at the top. A portion of a wall of the body is bent inwardly, as at 3, along the circumferential line 4, the lower end of said inclined portion terminating in a straight line 5. At this lower end is provided an upwardly curved lip 6.

Within the body and secured thereto in any desired manner is a fuel supporting member 7 here shown as an inwardly inclined grate terminating in fingers 8 which form the grate openings 9. The disposition of the grate is such that the openings are disposed beneath the line 5 and are spaced somewhat laterally therefrom. A flue or chimney 10 is provided in the lower portion of the body and has its entrance end 11 disposed beneath the lip 6 and substantially opposite the grate openings 9. This chimney is co-extensive in width with the lip 6, and the upper wall 12 of the chimney has formed thereon a downwardly curved lip 13 disposed above the lip 6 and forming therewith an air passage 14. It is to be noted that the grate 7 cooperates with the wall 3 in forming a fire pot 15.

A draught opening 16 regulated by a door 17 is provided in the body adjacent the grate 7 and opposite the inclined wall 3. In the base of the body is a clean-out opening 18 through which the ashes may be emptied into a pan inserted between the legs on which the body is supported.

In operation the body is charged with coal through the opening 2. A fire is started in the fire pot with a piece of paper. The draught opening 17 is regulated and the air

passing through the grate openings 9 aids the combustion, the gaseous products being given off in the vicinity of the air passage 14. The tendency of the gases to rush through the chimney 10 causes an inrush of air through the passage 14, which air is received in the combustion area and furnishes sufficient oxygen for the complete burning of the volatile gases. The products of combustion and the non-combustible gaseous products escape through the flue 10. The air passage 14 which is here illustrated as a slit may be formed in the nature of openings if desired. The downwardly curved lip 13, in addition to modifying the size of the air passage, serves to shield the glare of the burning fuel. It has been found by experiment that this type of stove burns the cheapest grades of coal and gives results that are well comparable with those obtained by burning the best hard coal in ordinary stoves.

Although a specific application of the invention has been illustrated and described, it is to be understood that the nature of the invention is not limited to the specific details of construction presented, but is indicated by the scope of the appended claims.

Having thus fully described the invention, what I claim as new and desire to protect by Letters Patent is:—

1. A heating device comprising a body provided with means for supporting a layer of fuel, the wall of said body having air inlet openings therein at opposite sides of said means, and a chimney extending from the portion of the body beneath one of said openings.

2. A heating device comprising a body having an inclined grate therein, one end of which is spaced from the walls of said body, said walls having air inlet openings therein at opposite sides of the grate, and a chimney extending from the portion of the body beneath one of said openings.

3. A heating device comprising a body having an inclined grate therein, one end of which is spaced from the walls of the body, the body wall opposite the fuel supporting side of the grate being inclined downwardly towards said side, a chimney extending from the portion of the body beneath said inclined wall, the body having air inlet openings formed therein at opposite sides of the grate.

4. A heating device comprising a body having an inclined grate therein, one end of which is spaced from the walls of the body, the body wall opposite the fuel supporting side of the grate being inclined downwardly towards said side, a chimney extending from the portion of the body beneath said inclined wall, the body having air inlet openings formed therein at opposite sides of the grate, one of said openings being disposed between the inclined wall and the chimney.

5. A heating device comprising a body having an inclined grate therein, one end of which is spaced from the walls of the body, the body wall opposite the fuel supporting side of the grate being inclined downwardly towards said side, a chimney extending from the portion of the body beneath said inclined wall, the body having air inlet openings formed therein at opposite sides of the grate, one of said openings being disposed between the inclined wall and the chimney, and spaced overlapping lips within said last named opening.

In witness whereof I have hereunto set my hand.

WALTER D. BOOKER.

Witness:

C. L. ATKINSON.