

No. 647,972.

Patented Apr. 24, 1900.

E. A. KLAUSS.
HOT AIR HEATER.

(Application filed Dec. 19, 1899.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1

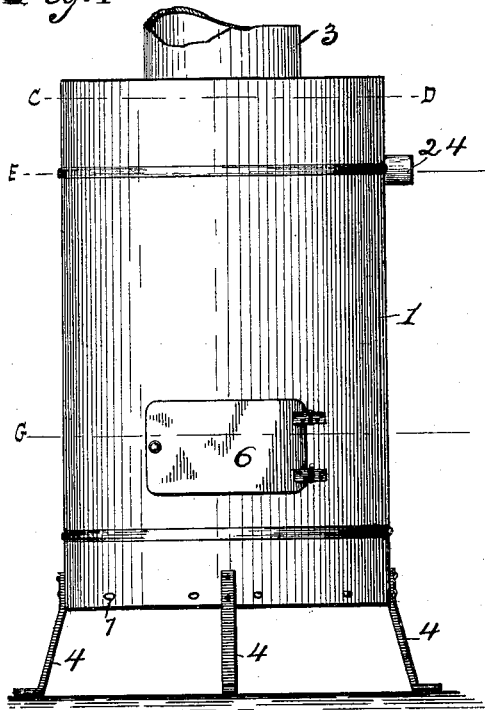


Fig. 3

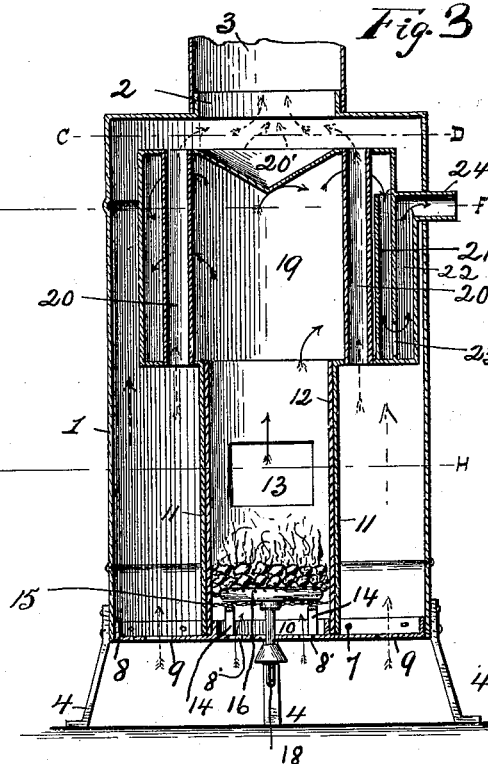


Fig. 2

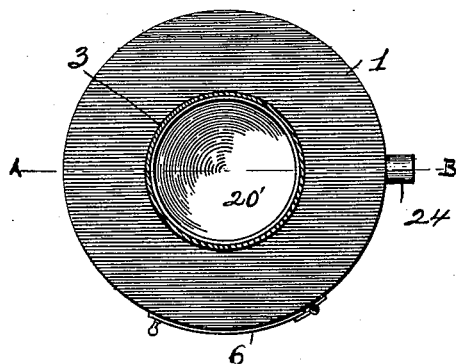
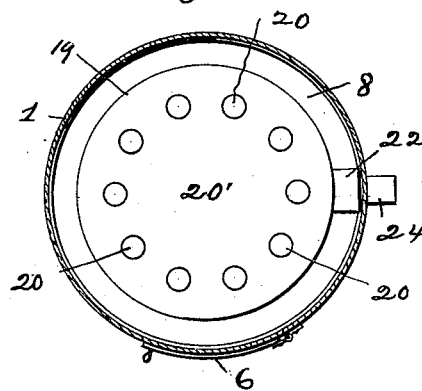


Fig. 4



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Fig. 5

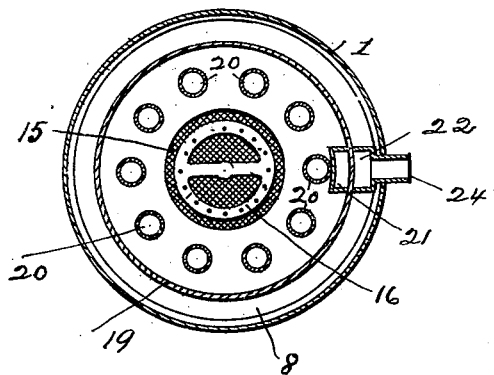


Fig. 6

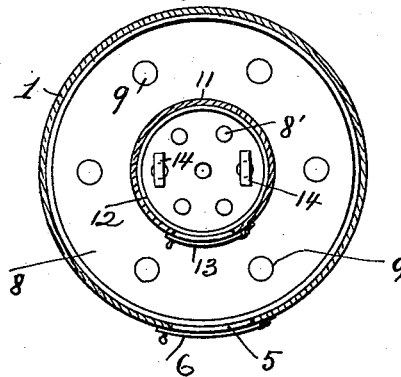


Fig. 7

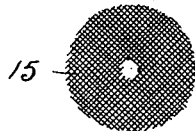


Fig. 8

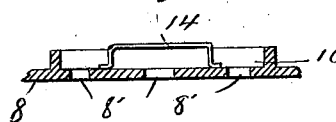


Fig. 9

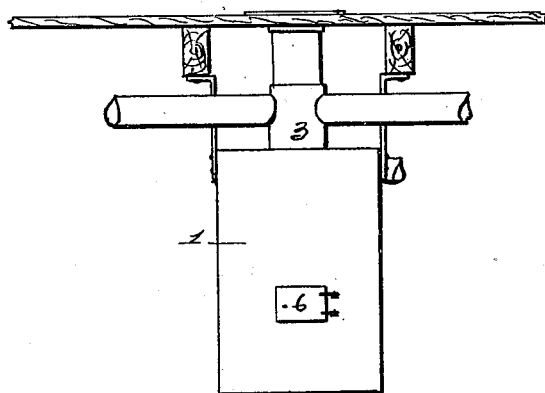
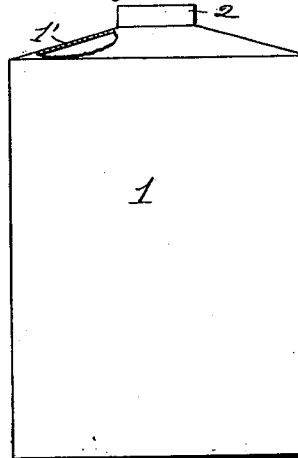


Fig. 10



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UNITED STATES PATENT OFFICE.

EDWARD A. KLAUSS, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO CHARLES W. SCARBOROUGH, OF SAME PLACE.

HOT-AIR HEATER.

SPECIFICATION forming part of Letters Patent No. 647,972, dated April 24, 1900.

Application filed December 19, 1899. Serial No. 740,860. (No model.)

To all whom it may concern:

Be it known that I, EDWARD A. KLAUSS, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Hot-Air Heaters; 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 figures of reference marked thereon, which form a part of this specification.

This invention relates to certain new and useful improvements in heaters for dwelling-houses.

The class of heaters to which my invention belongs is of the hot - air class employing natural or artificial gas as a fuel.

The object of my invention is to provide a heater of the above-described class which can not only be constructed at a nominal cost, but will be economical in the use of fuel.

With the above object in view I have from repeated experiments produced a heater of the novel construction, combination, and arrangements of parts, as will be hereinafter more fully described in detail.

In describing the invention in detail reference is had to the accompanying drawings, which form a part of this specification, and wherein like detail parts are designated by like numerals in the several views.

In said views, Figure 1 is a vertical front elevation of my improved heater. Fig. 2 is a plan of the same. Fig. 3 is a vertical sectional view of the heater on the line A B of Fig. 2. Fig. 4 is a horizontal sectional view of the heater, taken on the line C D of Figs. 1 and 2. Fig. 5 is a horizontal sectional view of the heater, taken on the line E F of Figs. 1 and 2. Fig. 6 is a horizontal sectional view taken on the line G H of Figs. 1 and 2. Fig. 7 is a plan view of the wire screen employed in the heater to support the burner and artificial fuel. Fig. 8 is a sectional side elevation of a portion of the base-plate. Fig. 9 is a vertical side view of the heater suspended to the floor-rafters instead of setting the same upon legs. Fig. 10 is an enlarged side view of the heater-casing, having a variation in the top in the form of a cone.

In the drawings it will be seen that the casing 1 is provided at its top with a flanged ring 2 to engage the heat-conducting pipe 3, while at the bottom there are attached the feet or legs 4 to support the casing above the floor. This casing is made of sheet metal and is provided in its side with an opening 5, covered with a door 6. Within the base of this casing is secured, by means of screws 7, the base-plate 8, said plate being provided with a number of air-openings 8' and 9. A circular flange 10 is secured or formed upon the base-plate to engage the base of the fire-chamber. This fire-chamber 11 is constructed of sheet metal and has an interior lining 12, composed of sheet metal, but of a heavier grade, and the object of this lining is to prolong the life of the fire-chamber, as the lining may be removed when burned out and a new one inserted. An opening is formed through the fire-chamber at a point opposite the one in the casing and is provided with a hinged door 13. The object of this door-opening is so that access may be had to the interior of the fire-chamber for lighting the gas and arranging the fuel.

At the base of the fire-chamber and secured upon the base-plate are the bridges 14. These bridges form a support for the circular wire-screen plate 15. Placed on top of this screen-plate is the gas-burner 16, which is provided with a mixer 17 and coupled up to a supply-pipe 18. Artificial fuel of any suitable kind is placed in the fire-chamber upon the burner and screen, the latter serving as a support for the fuel.

A combustion-chamber 19 is formed or secured upon the top of the fire-chamber. This chamber is of greater diameter than the fire-chamber and is provided with a number of flue-pipes 20. The top of this combustion-chamber and at the center between the flues the same is made in the form of an inverted cone 20' for the purpose of directing the heat from the gas to circulate around the air-tubes. To one side of this chamber is formed the partition-wall 21, which extends down to the bottom of the chamber, but is open at the top to form a flue. Another flue 22 is constructed upon the outside of the chamber and communicates with the other inner flue 21 by an opening 23, formed in the wall of the chamber at the bottom of the flue, while at the top

of the outer flue there is a small pipe 24, connected to carry off the products of combustion.

The manner in which the air is heated in my improved heater is as follows: The supply of gas, being connected to the burner-pipe, is turned on and lighted at the burner in the fire-chamber. The air enters the fire-chamber at the base through the openings 8. This air with the heat from the gas rises into the combustion-chamber and circulates around the tubes, causing them to become heated, and that which ascends to the top of the chamber is also directed around the tubes as it strikes the inverted conical top. After circulating around the tubes it descends the flue 21 through the opening 23 and up the flue 22 to the chimney. Again, the air which is to be used for heating purposes enters at the base of the furnace through the openings 9, up through the tubes 20, and out through the top, where it is conducted by pipes to the point desired. The air which does not pass up through the tubes will pass up along the sides of the chamber and out at the top by the same route.

In Fig. 9 I have shown the heater suspended to the floor, by the metal straps 25, instead of attaching legs to the base for the heater to set upon. This is found more convenient in some cases, as the floor beneath may be easily cleaned and is not in the way.

In Fig. 10 I have shown the outer casing 1 with a conical top 1', said top being of this form for the purpose of directing the heated air to the pipe in the center.

I am aware that previous to my invention hot-air furnaces have been invented and put in use; but the details and arrangements of parts differ in various ways from my invention.

The relative arrangement of the detail parts which enter into the construction of my improved heater are of great importance to the successful production of heated air, with economy in fuel; but such detail parts may be varied to suit size and conditions without departing from the principles employed. The inner metal casing within the fire-chamber may easily be removed and a new one substituted when burned out.

Having thus fully shown and described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An improvement in hot-air heaters, comprising the combination with an outer cylindrical casing of sheet metal having a pipe connected to the top to carry off the heated air and a door in its side, of a base-plate of sheet metal removably secured within the lower end of said casing and having air-holes therein, a flange and bridges secured in the center of said base-plate, a wire screen supported upon said bridges, a burner placed on top of said screen, a vertical fire-chamber engaging said flange on base-plate and inclosing said

burner, a door in said fire-chamber placed opposite the door in said casing, a combustion-chamber formed or secured upon the top of said fire-chamber and having a diameter greater than the fire-chamber and projecting over the same, vertical flue-pipes extending up through the combustion-chamber where said chamber extends over the fire-chamber, and the flues 21 and 22 at the side of the combustion-chamber, all arranged and combined as shown and for the purpose set forth.

2. An improvement in hot-air heaters, comprising the combination with an outer cylindrical sheet-metal casing having a pipe connected to the top to carry off the heated air and a door in its side, of a base-plate of sheet metal removably secured within the base of said casing and having air-holes therein, a flange and bridges secured in the center of said base-plate, a wire screen supported upon said bridges, a burner placed on top of said screen, a vertical fire-chamber engaging said flange on the base-plate and inclosing the burner, a sheet-metal lining in said fire-chamber, a door in said fire-chamber placed opposite the door in said casing, a combustion-chamber formed or secured upon the top of said fire-chamber and having a diameter greater than said fire-chamber and projecting over the same, vertical flue-pipes extending up through the said combustion-chamber where the same extends over the fire-chamber, and the flues 21 and 22 at the side of the combustion-chamber, all arranged and combined as shown and set forth.

3. An improvement in hot-air heaters, comprising the combination with an outer cylindrical sheet-metal casing having a pipe connected to the top to carry off the heated air and a door in the side, of a base-plate of sheet metal removably secured within the base of said casing and having air-holes therein, a flange and bridges secured in the center of said base-plate, a wire screen supported upon said bridges, a burner placed on top of said screen, a vertical fire-chamber of sheet metal having therein a sheet-metal lining of heavier material than the body of the chamber engaging the flange on said base-plate, a door in said chamber opposite the door in the casing, a combustion-chamber formed or secured to the top of said fire-chamber which has a diameter greater than the fire-chamber and projects over the same, vertical flue-pipes extending up through the combustion-chamber where the same projects over the fire-chamber, an inverted conical top formed on said combustion-chamber, and the flues 21 and 22 at the side of said chamber, all arranged and combined as shown and set forth.

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

EDWARD A. KLAUSS.

Witnesses:

W. J. FAWCETT,
JAS. J. MCAFEE.