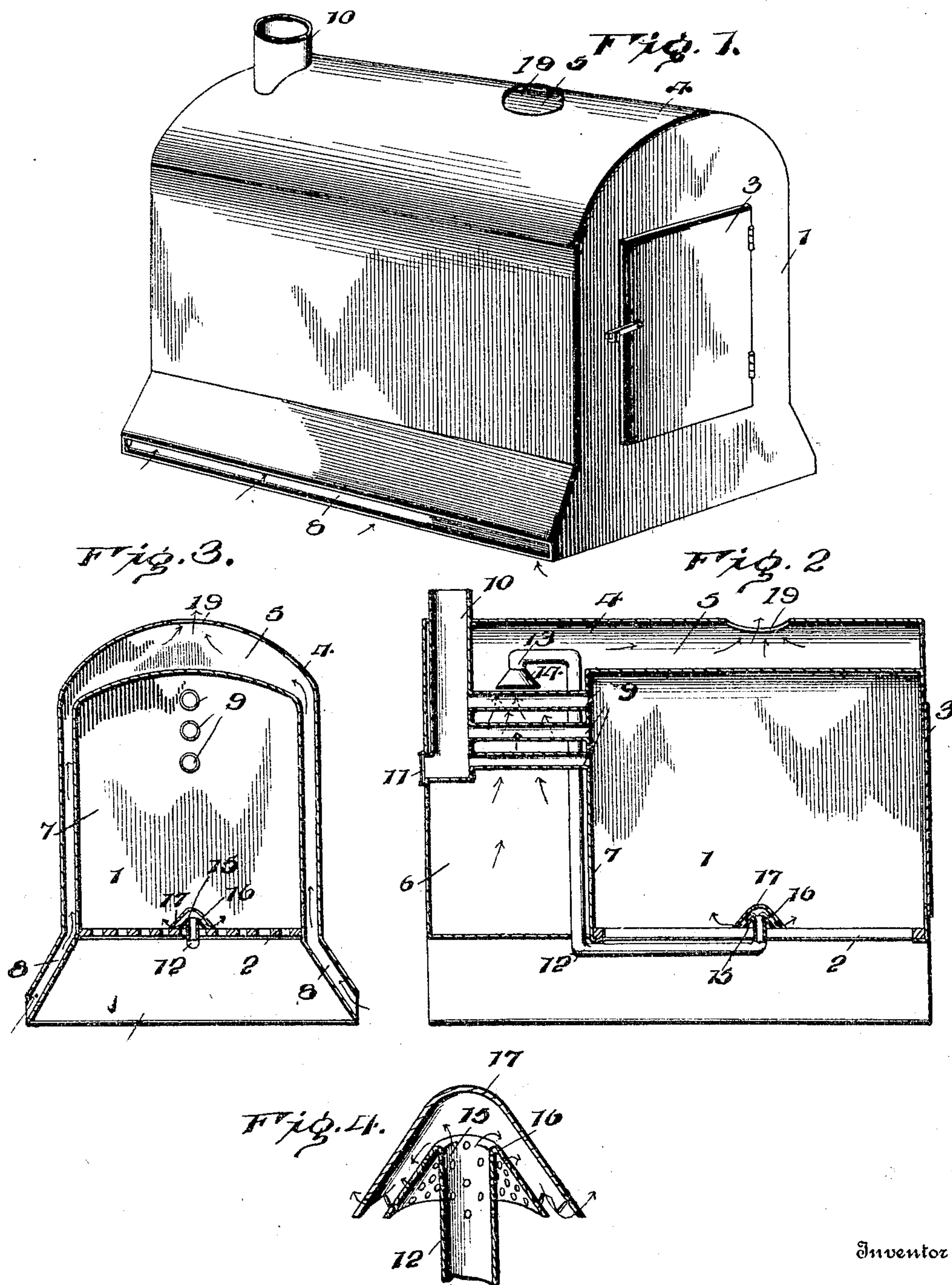


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H. LANDRUS.  
HEATER.

APPLICATION FILED MAY 20, 1904.



Inventor

H. Landrus.

Witnesses

*Johnnie*  
*W. Woodson*

By

*Phad. Racy*, Attorneys



# UNITED STATES PATENT OFFICE.

HIRAM LANDRUS, OF TOPEKA, KANSAS, ASSIGNOR, BY MESNE ASSIGNMENTS, OF ONE-HALF TO L. E. HUMPHREYS, OF TOPEKA, KANSAS.

## HEATER.

SPECIFICATION forming part of Letters Patent No. 784,334, dated March 7, 1905.

Application filed May 20, 1904. Serial No. 208,928.

*To all whom it may concern:*

Be it known that I, HIRAM LANDRUS, a citizen of the United States, residing at Topeka, in the county of Shawnee and State of Kansas, have invented certain new and useful Improvements in Heaters, of which the following is a specification.

This invention relates to improvements in heaters or furnaces; and the primal object of the invention is to promote combustion in consumption of fuel, and thereby to increase and intensify the heat as well as economize the fuel utilized. The perfection of combustion prevents the giving off of black smoke or free carbon from the heater, and this constitutes an important advantageous feature of the heater, which, as represented in the drawings, is in its preferable form.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and accompanying drawings.

While the essential and characteristic features of the invention are susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a heater embodying the invention. Fig. 2 is a longitudinal sectional view of the heater. Fig. 3 is a transverse sectional view of the heater. Fig. 4 is a detail sectional view bringing out more clearly the construction of the outlet end of the air-pipe and adjacent inner and outer hoods.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

In its practical embodiment my invention may be applied to any style of ordinary heater or furnace, either portable or stationary, and in its adaptation as illustrated in the drawings a common form of stationary heater is shown. This heater or furnace comprises the combustion-chamber or fire-box 1, within which is the grate 2. The combustion-cham-

ber 1 is provided with the usual door 3, leading thereto, and this chamber is entirely surrounded by means of an outer jacket or shell 4. The shell 4 forms an upper air-space 5 just above the combustion-chamber and a hot-air chamber 6 adjacent the inner end of said combustion-chamber. The rear wall 7 separates the combustion-chamber 1 from the hot-air chamber 6 and serves to no small extent to heat the air within the chamber 6 in a manner which will be readily comprehended. The jacket 4 is also spaced from the sides of the fire-box, so as to form air-spaces at these portions, and cold air is supplied to the chambers 6 and 5 by having the lower portions of the shell open and spaced from that upon which the heater rests. The open portions of the shell which form the inlet means for the cold air are represented at 8. Smoke-flues 9 lead from the combustion-chamber 1 of the heater, communicating with a smoke-pipe or chimney 10. The smoke-flues are projected across the hot-air space in the chamber 6, and thus radiate the heat, so as to assist in heating the air in the chamber 6 aforesaid. Any suitable damper means, as shown at 11, may be used in connection with the chimney 10 for regulating the heat.

So as to promote combustion in the chamber 1 to a maximum extent an air-pipe 12 is provided, the inlet end of which is projected into and across the hot-air chamber 6, having its extremity turned downwardly, as shown at 13. The extremity 13 of the pipe 12 is provided with a funnel-shaped receiver 14, which facilitates the entrance of the hot air into the pipe 12 to be conveyed to the combustion-chamber. The outlet end of the pipe 12 extends upwardly adjacent the grate 2, being provided with a deflecting-hood 15, the hood 15 being provided with a plurality of apertures, through which the heated air passes from the pipe 12 into the combustion-chamber. The outlet end of the pipe 12 is upwardly turned, as indicated at 16, being also formed with a series of apertures for escape of the heated air. The hood 15 rests directly upon the grate 2, and in order to house and protect the hood the same is covered by



a conical cap or outer hood 17, which latter also rests upon the grate, being provided with extensions at the lower portion thereof, which form legs upon which the part 17 rests and  
 5 which form means for spacing the cap from the grate. In the provision of the cap 17 the hood 15 is prevented from clogging and does not directly receive the heat of the fuel which is being burned within the chamber 1. The  
 10 cap 17 may be made of fire-clay or like substance to resist the intense heat as it rests upon the grate 2.

The cold air as it passes into the hot-air chamber 6 is thoroughly heated, and suitable  
 15 outlet means in the form of an opening or openings 19 at the upper portion of the shell may be provided to admit of escape of the hot air from the hot-air spaces 5 and 6, so that under all conditions of service cold air is constantly  
 20 being drawn into the chambers 5 and 6 and passing off from these chambers in a heated condition. A thorough circulation of air into a room is thus produced, and this circulation forms an upward draft in the chamber 6, which  
 25 causes the heated air to constantly flow into the air-pipe 12, being received at the end 13 thereof, as before described. The funnel 14 at the inlet end of the air-pipe 12 greatly facilitates the passage of the heated air into the  
 30 pipe 12, and the draft which is produced in the chamber 6 in the manner which has just been set forth and which causes a constant flow of air through the pipe 12 is assisted in the performance of this function by the draft  
 35 which passes directly up through the grate 2 into the combustion-chamber. The direct draft through the grate 2 passes the outlet end 16 of the pipe 12 and circulating about this end portion of the pipe 12 assists in inducing  
 40 the passage of the heated air from the hot-air chamber 6 into the combustion-chamber 1, and this heated air combining with the carbon gases greatly promotes the thorough combustion within the chamber 1 in the usual  
 45 manner.

It will be noted that the air passing through the pipe 12 is pure air which has been thoroughly heated in the chamber 6 and which is carried by two separate drafts, so as to be  
 50 forcibly directed from the outlet end of the

pipe 12 just above the grate 2, and the structure of the heater is particularly advantageous in view of the foregoing. The enlarged area of the funnel 14, at the inlet end of the air-pipe 12, as compared with the area of this pipe  
 55 12, is also advantageous in increasing the amount of heated air drawn from the hot-air chamber into the combustion-chamber, and the provision of the apertured hood affords a thorough distribution of the hot air as same  
 60 passes from the outlet end of the pipe 12.

Having thus described the invention, what is claimed as new is—

1. In a heater of the class described, the combination of a combustion-chamber, a hot-  
 65 air chamber, a grate disposed in the combustion-chamber, an air-pipe leading from the hot-air chamber into the combustion-chamber and extended through the grate aforesaid, the inlet end of the air-pipe being projected down-  
 70 wardly within the hot-air chamber and provided with a funnel-shaped receiver, and a cap or hood inclosing the deflecting-hood at the outlet end of the air-pipe aforesaid.

2. In a heater of the class described, the  
 75 combination of a combustion-chamber, a hot-air chamber having an inlet at its lower portion and an outlet at its upper portion, an air-pipe leading from the hot-air chamber into the combustion-chamber, the inlet end of the  
 80 air-pipe being projected downwardly in the spaces in the hot-air chamber at a point between the outlet and the inlet of the said hot-air chamber, a funnel-shaped receiver carried by the inlet end of the hot-air pipe, a grate  
 85 disposed in the combustion-chamber, the outlet end of the air-pipe extending upwardly through the grate aforesaid and provided with apertures, an apertured deflecting-hood disposed at the outlet end of the air-pipe, and a  
 90 protecting-hood of conical form covering the deflecting-hood aforesaid and resting upon the grate.

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

HIRAM LANDRUS. [L. s.]

Witnesses:

F. A. LAKE,

D. C. TILLOTSON.