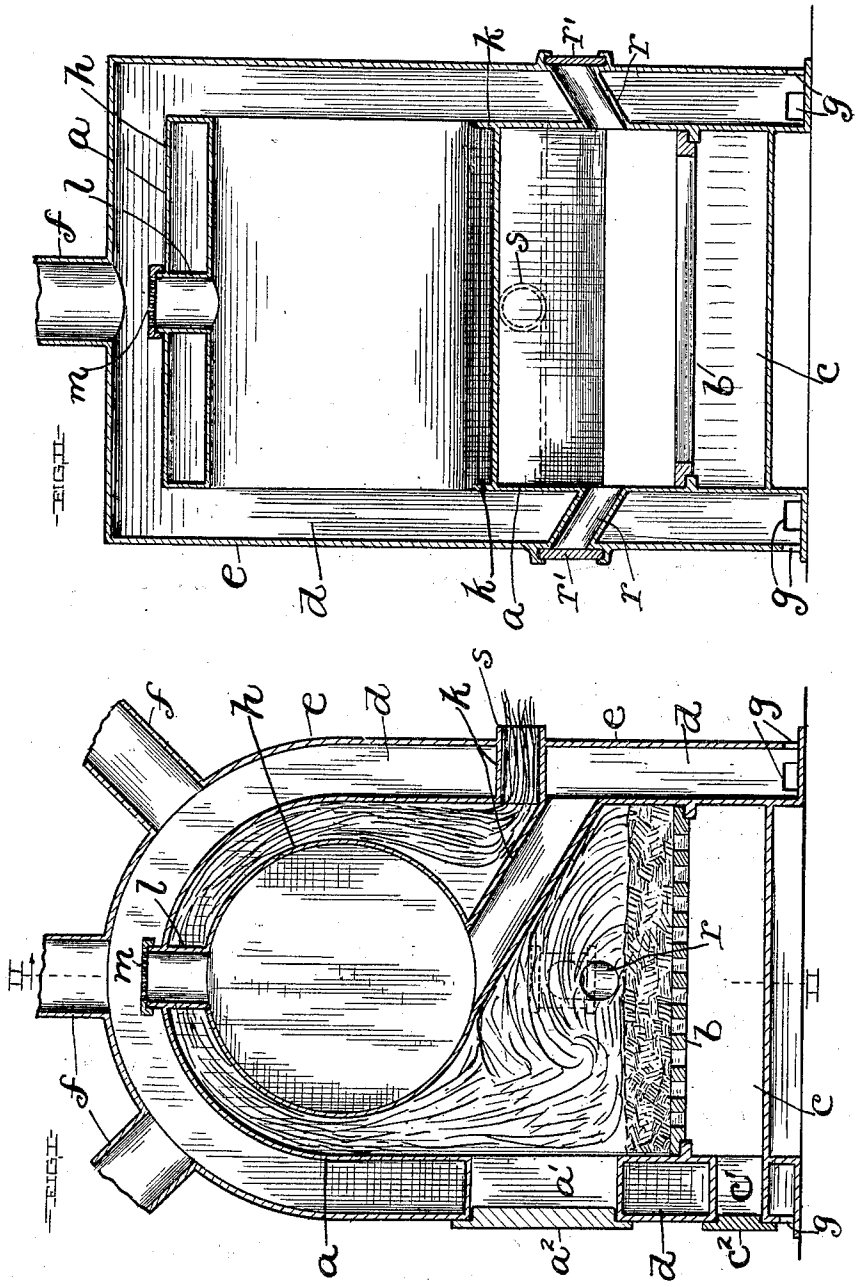
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O. P. MASON.

HEATING STOVE OR FURNACE.

(Application filed June 12, 1901.)

(No Model.)



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HEATING STOVE OR FURNACE.

SPECIFICATION forming part of Letters Patent No. 689,104, dated December 17, 1901.

Application filed June 12, 1901. Serial No. 64,317. (No model.)

To all whom it may concern:

Be it known that I, ORLANDO P. MASON, a resident of Bellaire, in the county of Belmont and State of Ohio, have invented certain new and useful Improvements in Heating Stoves or Furnaces; and I do hereby 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 pertains to make and use the same.

My invention relates to improvements in heating stoves or furnaces.

The object of this invention is to utilize more thoroughly the products of combustion before the same reach the smoke-flue of the stove or furnace and to increase the air-heating capacity of the stove or furnace.

Another object of the invention is to simplify the construction of heating stoves or furnaces, to materially reduce the cost of the same, and to render the same more durable.

With these objects in view and to the end of realizing other advantages hereinafter appearing the invention consists in certain features of construction and combinations of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure I is a side elevation, in central vertical section, of a stove or furnace embodying my invention. Fig. II is a front side elevation, in central vertical section, on line II II, Fig. I.

Referring to the drawings, *a* designates the casing of the combustion-chamber of a stove or furnace embodying my invention; *b*, the grate at the bottom of the said chamber; *c*, the ash-pit formed by the extension of the said casing downwardly below the combustion-chamber. An air-chamber *d* surrounds the casing *a* and is formed in the usual manner by another casing *e*, surrounding and extending over the top of the combustion-chamber a suitable distance from the casing *a*. Air-conducting flues *f* lead from the upper portion of the air-chamber, and the said chamber at its lower end is provided with the usual air-inlets *g*.

The casing of the ash-pit *c* is provided at the front in the usual manner with a doorway *c'*, which extends through the air-chamber *d* and at the outer side of the said chamber is closed by a suitably-applied door c^2.

The casing of the combustion-chamber is provided at the front in the usual manner with a doorway *a'*, affording access to the said chamber a suitable distance above the grate and extending through the air-chamber and closed at the outer side of the last-mentioned chamber by a suitably-applied door a^2. The fuel which is to be burned within the combustion-chamber is of course introduced through the said doorway *a'*.

The right-hand and left-hand side walls of the casing of the combustion-chamber are preferably vertical. The upper portions of the forward and rear walls of the said chamber slope preferably upwardly and inwardly toward each other, so as to form a casing semi-cylindrical at the top.

An open-ended air-heating drum *h*, extending laterally through the upper portion of the combustion-chamber between the right-hand side wall and left-hand side wall of the casing *a* of the combustion-chamber and arranged horizontally and cylindrical in end elevation or cross-section, is in open relation at each end with the air-chamber or air-space surrounding the said casing of the combustion-chamber; but there is no communication, of course, between the chamber of the said drum and the combustion-chamber, so that there is no liability of products of combustion obtaining ingress to the said drum. The openings at the ends of the drum form the main air-outlets of the drum. Air enters the chambers of the drum *h* at the bottom, as will hereinafter appear, and after becoming sufficiently heated within the drum is forced by the incoming air from the drum at the ends of the drum into the air chamber or space surrounding the stove or furnace.

An air-supply duct or flue *k*, arranged below the rear portion of the drum *h*, extends from the air-chamber *d* a suitable distance below and rearward of the said drum inwardly and upwardly to the bottom of the drum *h*. The duct or flue *k* establishes open relation between the chamber of the said drum at the bottom of the drum and the air chamber or space externally of the casing *a* and extends,

preferably, from the right-hand side wall to the left-hand side wall of the said casing over the rear of the fuel-receiving or lower portion of the combustion-chamber. Preferably, also, the openings at the ends of the drum *h* are not the only outlets for the air heated within the said drum, and another air-outlet is provided in the top of the drum centrally between the ends of the drum by a short flue *l*, extending from the chamber of the drum through the casing of the combustion-chamber above the drum to the air-chamber *d;* but the flue *l* is preferably provided at its upper or outer end with a screen *m* to retard the passage of air from the said flue to the air-chamber. The drum *h* may also have its ends provided with screens. (Not shown.)

As shown, the fuel-supply doorway *a'* of the combustion-chamber is located at an elevation below the air-heating drum, preferably directly opposite the air-receiving end of the duct or flue *k*. The provision of the said flue or duct *k* at the bottom of the said drum and over the rear of the fuel-receiving portion of the combustion-chamber is of vast importance, not only in that it supplies air to the chamber of the drum *h*, but because the products of combustion below the forward or lower wall of the said duct or flue are reverberated over the burning fuel within the said chamber below the drum *h*, and the combustion is thereby greatly improved.

The smoke-flue *s* of the stove or furnace leads from the combustion-chamber rearward of the upper or forward and discharging end of the flue or duct *k* through the air chamber or space *d*. The smoke-flue *s* is located, preferably, next above the lower and receiving end of the air-supply duct or flue *k*. The aforesaid location of the smoke-flue is important, because thereby the products of combustion, which can only escape from the burning fuel upwardly and forwardly of the air-heating drum *h*, must pass around the upper portion of the drum and adown the rear side of the drum to and over the rear and upper wall of the aforesaid duct or flue *k* before reaching the smoke-flue, and consequently the products of combustion arising from the burning fuel within the combustion-chamber are utilized to the best advantage. I would remark also that two air-ducts *r* and *r* extend, preferably, from outside of the air-chamber *d* inwardly and downwardly into the combustion-chamber at the left-hand side wall and right-hand side wall, respectively, of the casing *a*, which ducts are provided at their outer and upper ends with suitably-applied dampers *r'* for regulating the supply of air to the combustion-chamber through the said ducts. I would remark also that Fig. I of the drawings shows a fire within the combustion-chamber and clearly illustrates not only the action of the forward wall of the duct or flue *k* upon the products of combustion rising or moving against the said wall, but also the travel of products of combustion upwardly at the forward side of the drum *h* and over the top of the said drum and adown the rear side of the drum against the rear wall of the duct or flue *k* and through the smoke-flue *s*. It will be observed also that the smoke-flue *s* is arranged centrally between the ends of the air-heating drum *h*, and consequently the flue *l*, which, as already indicated, is arranged centrally between the ends of the said drum, is instrumental in the division of the draft between the combustion-chamber and the smoke-flue, and desirably avoids a direct and straight path of the products of combustion from the combustion-chamber to the smoke-flue. Moreover, the presence of the flue *l* enlarges the heating radiating surface of the stove or furnace.

I would have it understood that my invention embraces, broadly, a stove or furnace comprising a casing forming a combustion-chamber, an air-receiving and air-heating drum extending laterally through the combustion-chamber over the fuel-receiving portion of the said chamber and in open relation with the air-space externally of the aforesaid casing, and an air-supply duct arranged to form a top wall of a part of the lower or fuel-receiving portion of the combustion-chamber and connecting the aforesaid air-space with the chamber of the drum at the bottom of the drum and extending between and contiguous with opposite side walls of the combustion-chamber and closing the space at the one side of the drum from below, so that the products of combustion are caused to pass up only at the other side of the drum and thence around the upper portion of the drum into a smoke-flue, which extends from the combustion-chamber above and near the aforesaid air-duct.

What I claim is—

1. A heating stove or furnace comprising a casing forming a combustion-chamber; an air-heating drum extending laterally through the combustion-chamber over the fuel-receiving portion of the said chamber and in open relation with the air-space externally of the said casing; a duct connecting the said air-space with the chamber of the drum at the bottom of the drum and extending between and contiguous with the side walls of the combustion-chamber and arranged to close the space at one side of the drum from below, and the smoke-flue leaving the combustion-chamber above and near the said air-supply duct, substantially as and for the purpose set forth.

2. A heating stove or furnace comprising a casing forming a combustion-chamber; an air-heating drum extending laterally through the upper portion of the combustion-chamber over the fuel-receiving or lower portion of the said chamber and in open relation with the air-space externally of the aforesaid casing; a duct adapted to supply air to the chamber of the drum at the bottom of the drum, which

duct extends from end to end of the drum over the fuel-receiving or lower portion of the combustion-chamber, and the smoke-flue leading from the combustion-chamber rearward of the aforesaid drum above and near the outer and air-receiving end of the said air-supply duct, substantially as and for the purpose set forth.

3. A heating stove or furnace comprising a casing forming a combustion-chamber; an air-heating drum arranged in a horizontal plane and extending laterally through the upper portion of the combustion-chamber over the fuel-receiving portion of the said chamber and in open relation at each end with the space externally of the aforesaid casing; a duct connecting the said air-space with the chamber of the drum and extending from the said air-space at the rear of the combustion-chamber forwardly to the drum over the fuel-receiving or lower portion of the combustion-chamber and closing the space at the rear side of the drum from below, and the smoke-flue leading from the combustion-chamber rearward of the aforesaid drum above the aforesaid air-supply duct, substantially as and for the purpose set forth.

Signed by me at Bellaire, Ohio, this 8th day of June, 1901.

ORLANDO P. MASON.

Witnesses:
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