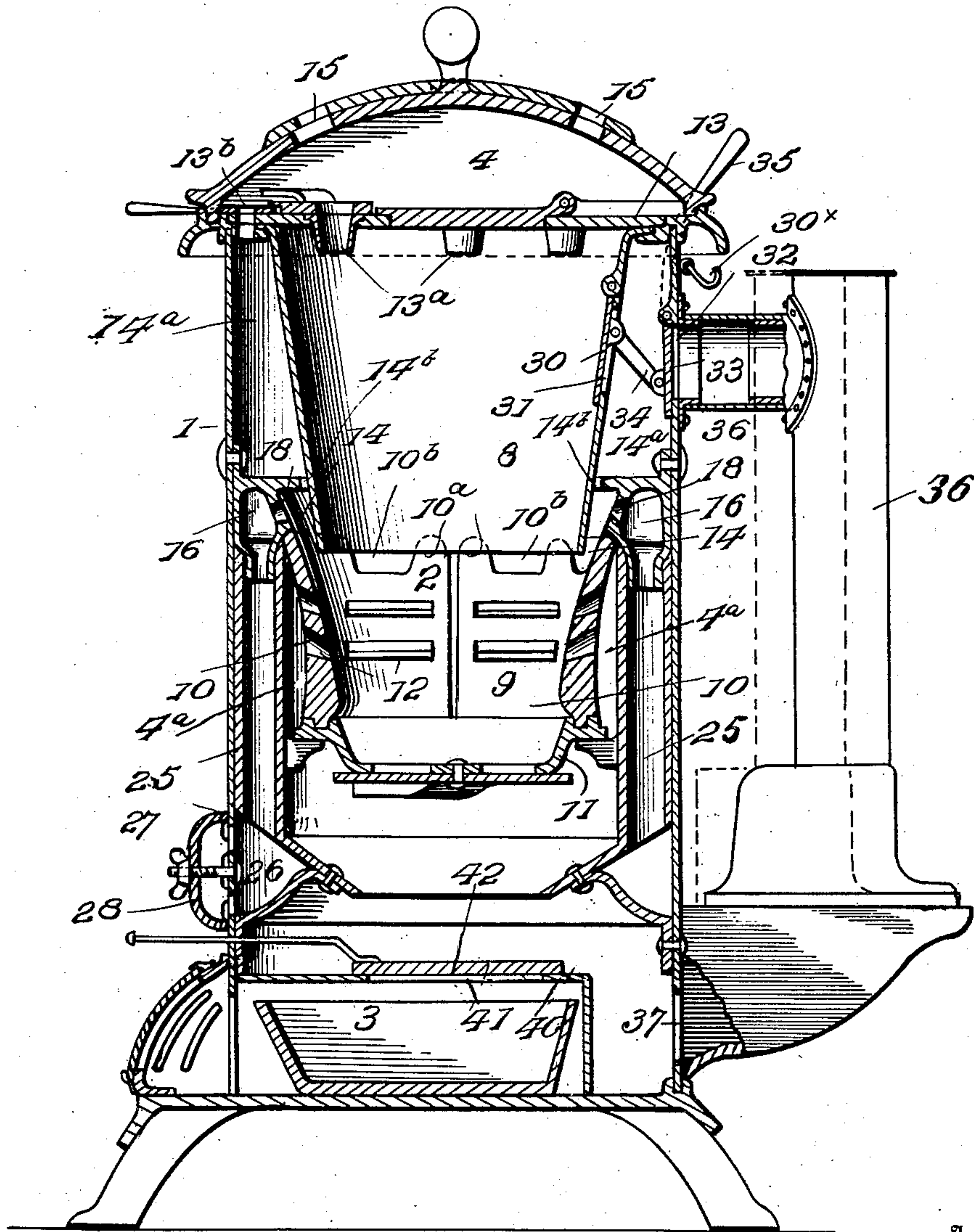


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HEATING STOVE.  
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# UNITED STATES PATENT OFFICE.

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## HEATING-STOVE.

No. 914,923.

Specification of Letters Patent.

Patented March 9, 1909.

Application filed November 20, 1905. Serial No. 288,301.

*To all whom it may concern:*

Be it known that I, EDWIN R. CAHOONE, a citizen of the United States, residing at Troy, in the county of Rensselaer and State of New York, have invented new and useful Improvements in Heating-Stoves, of which the following is a specification.

My invention relates to improvements in heaters adapted to be converted into either an up-burning or down draft stove.

The prime object of the invention is to arrange an air heating chamber around the upper part of the fire pot, and connect said chamber with ducts extending downwardly to take air from near the floor. The specific construction of the fire pot also coacts with the air heating chamber, both elements contributing to promote combustion.

A further object of my invention is to provide dampers to convert the stove into one of either a down draft or up-draft stove; the air inlets being located to distribute streams of heated air at appropriate points, so that in either type of stove the fuel will receive sufficient air to promote combustion.

With these as prime objects in view, the advantages and arrangement of the details of construction will be hereinafter pointed out and be particularly emphasized in the claims.

The drawing illustrates a vertical section of my improved stove.

1, represents a casing; 2 a fire pot; 3, the ash pan; and 4, an air heating chamber formed above the stove top.

The fire pot 2, consists essentially of an upper section 8, and lower section 9, the latter being formed of several sub-sections 10, and a grate 11. The sub-sections 10, are provided with a series of horizontal openings 12, which incline upwardly to prevent the fuel falling therethrough, and are also formed at their upper ends with lugs 10<sup>a</sup>, and adjacent notches 10<sup>b</sup>. When section 9, is set up it is supported on the grate, the latter resting on seats projecting from the casing. Section 8, is mounted in a seat on the top 13, and tapers downwardly, the lower end fitting into the upper end of the section 9, but spaced therefrom to form an air passage 14. The notches 10<sup>b</sup>, provide direct communication between a space 4<sup>a</sup> and the fire pot, the air passing from said space 4<sup>a</sup>, downwardly to the fuel.

Tubes 13<sup>a</sup>, depend from the top 13, to direct streams of warm air downwardly toward the fuel. These tubes receive air from the air heating chamber 4, which takes its supply under the influences of the draft, through the openings 15, direct from the atmosphere.

An air heating chamber 16 surrounds the upper end of section 9, of the fire pot, the upper section 8, extending downwardly below the plane of said chamber. Exit openings 18, are formed in the chamber 16, and through these openings heated air enters the passage 14, where it becomes further heated before being introduced to the fuel. The chamber 16, divides the space between the fire-pot and casing to form the upper passage or chamber 14<sup>a</sup>, and the passage 4<sup>a</sup>.

Ducts 25, communicate with the chamber 16, and a receiving chamber 26, the latter being located just above the ash pit 3, air being admitted to chamber 26, through an opening 27, controlled by a damper 28. The object of positioning the inlet 27, near the bottom of the stove is to take the impure air from the bottom of the room, and utilize it to promote combustion.

The heated air in chamber 4, passes through openings 13<sup>b</sup> in the top 13, to a chamber or passage 14<sup>a</sup>, and then passes through an opening 14<sup>b</sup>, to passage 14, said air meeting and mixing with the streams of heated air introduced through the openings 18, to furnish an additional supply of air to the fire pot.

Near to the top of the fire pot is a damper 30, controlling an exit 31, and opposite exit 31, is an exit 32, in the casing 1, controlled by a damper 33. The dampers 30 and 33 are connected by a link 34, so that when one is moved the other will be simultaneously moved with it. A handle 35, projects through the casing and is fixed to the damper 33, the upper end of the handle being in the horizontal plane of the swinging cover of the chamber 4. Obviously when the swinging top is turned on its pivot its outer edge will strike the lever 35, and the two dampers will be opened and the products of combustion above the fire will escape through the pipe 36, to the atmosphere. This arrangement prevents the gases above the fuel puffing out through the top when the door is opened to introduce fuel to the fire pot. Any means



may be employed to hold the dampers 30 and 33, open when it is desired to have an up-burning stove, such for instance a hook 30<sup>x</sup>.

The lower end of the pipe 36, communicates with the ash pit at 37, by means of which the stove may be, by closing the dampers 30 and 33, used as a down draft burner.

A fire is started in the fire pot and air taken into the chamber 26, passes through the ducts 25, and into the chamber 16, and is discharged through the openings 18 and heated air from the ash pit enters the space 4<sup>a</sup>, and is delivered to the fire-pot through the notches 10<sup>b</sup>.

The air in passing through the chambers and the ducts becomes heated, and by the time the fuel is reached, the air is warm enough to materially assist in promoting combustion.

When the stove is to be used as one of the down-draft type the heated air from the chamber 16, and chamber or passage 14<sup>a</sup>, enters passage 14, and is delivered to the fuel. Air from the chamber 4, is also introduced to the fire through the tubes 12<sup>a</sup>, which mixes with the air introduced through the tubes 13<sup>a</sup>, which mixes with the air introduced through the passage 14. The products of combustion then pass through openings 12, to space 4<sup>a</sup>, to the ash pit, thence through exit 37, to flue 36.

It will be observed that the lugs 10<sup>a</sup> of the lower section 9, of the fire pot fits snugly the inner wall of the air chamber 16, and that the upper fire pot section 8, extends far enough below the joint to cause the air entering the top of the passage 14, to be directed toward the center of the fuel. This is important as it insures a stream of air attacking the fuel from the top when burning downwardly.

When the stove is used as an upburning stove, the dampers 30 and 33, are held open and the air from the chambers 16 and 4, is discharged the same as before described, but takes a different course. The air coming through the chamber 16, is divided, part of it is delivered downwardly to the fuel, while another part passes through the openings 14<sup>b</sup>, to the passage or chamber 14<sup>a</sup>, and through the opening 32 to the exit pipe 36. That part of the air which ascends in the fire pot meets the air coming from the tubes 13<sup>a</sup>, the intermingling action serving to thoroughly mix and ignite the products of combustion before they reach the exit flue, while that portion of the gases which rises in the passage or chamber 14<sup>a</sup>, will be mixed with the air introduced through the openings 18, and ignition takes place, and the casing 1, is thoroughly heated which provides a large radiating surface for heating a room.

A stove constructed as described is well adapted for burning various grades of fuel and is extremely economical. Certain grades of fuel burn better in a down draft stove,

while with other fuel the same results can only be attained by converting the stove into one of the up-burning type. By my present improvement both these conditions are successfully met.

A partition 40, is located over the ash pan, and it is provided with an air opening 41, over which operates a slide 42. When it is desired to remove the ashes, the slide is withdrawn and the ashes fall into the pan 3, after which the opening is closed. A further function of the slide is, that it insures the draft through the exit 37, when burning the fuel downwardly.

What I claim as new is:

1. In a stove, the combination with a casing, a fire-pot formed in sections and spaced from the casing, the lower one of said sections being formed with openings, and the ends of said sections being spaced from each other to form a passage 14, an air heating chamber formed with openings and located in the space between the fire-pot and the casing, the openings in the air heating chamber introducing air to passage 14, said air heating chamber dividing the space between the casing and the fire-pot into a passage or chamber 14<sup>a</sup> which surrounds the upper section and a passage 4<sup>a</sup> which surrounds the lower section, the openings in said lower section communicating with said passage 4<sup>a</sup>, means for supplying air to the air heating chamber, an exit flue, and means for directing the products of combustion to the exit flue, either above or below the fire-pot.

2. In a stove, the combination of a casing, a fire-pot having openings and located within and spaced from the casing, an air heating chamber having openings and located in the space between the fire pot and casing and dividing the latter space into an upper passage or chamber 14<sup>a</sup> and a lower passage 4<sup>a</sup> which is in communication with the fire-pot by the openings therein, an air receiving chamber near the bottom of the stove, ducts in the passage 4<sup>a</sup> connecting the air receiving chamber and the air heating chamber, means for supplying air to the passage or chamber 14<sup>a</sup>, heated air being supplied to the fire pot from the air heating chamber through the openings therein, means for supplying air downwardly toward the fire-pot, an exit flue, and means for directing the escaping products of combustion upwardly to the exit flue or through the passage 14<sup>a</sup> around the fire-pot to the exit flue.

3. In a stove, the combination of a casing having an exit opening, a grate, a fire-pot within and spaced from the casing, said fire-pot formed of an upper and lower section, the lower end of the upper section being spaced from the upper end of the lower section to form a passage, the lower section having openings and is spaced from the casing to form a passage 4<sup>a</sup>, the openings form-



ing communication between said passage 4<sup>a</sup> and the interior of the fire-pot, the upper section depending within the upper end of the lower section and formed with an exit opening which is located adjacent the exit opening in the casing, an air heating chamber located adjacent the ends of the fire-pot sections and dividing the space between said fire-pot and the casing into a passage or chamber 14<sup>a</sup> which surrounds the upper section and the passage 4<sup>a</sup> which surrounds the lower section, the passage formed between the upper and lower sections forming communication between the interior of the lower section and the passage or chamber 14<sup>a</sup> around the upper section, an exit flue communicating with the chamber below the fire-pot and the opening in the casing above the fire-pot, means for directing the escaping products of combustion to the exit flue either upwardly through the fire-pot and passage or chamber 14<sup>a</sup>, or downwardly through the fire pot and passage 4<sup>a</sup>.

4. In a stove, the combination with a cas-

ing formed with upper and lower openings, of a fire-pot spaced from the casing and formed in sections, the ends of the fire-pot sections overlapping and spaced from each other, to provide a passage 14, an air heating chamber located in the said space formed between the fire-pot and casing, said air heating chamber being spaced from the upper fire-pot section and formed with air exit openings, the upper section being formed with an opening adjacent the upper opening in the casing, dampers cooperating with the opening in the casing and the opening in the upper fire-pot section, means connecting the two dampers, and an exit pipe with which the upper and lower openings in the casing communicate, substantially as described.

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

EDWIN R. CAHOONE.

Witnesses:

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WM. S. HOPKINS