A. TRAVER.

Heating Stove.

No. 110,312. Patented Dec. 20, 1870.

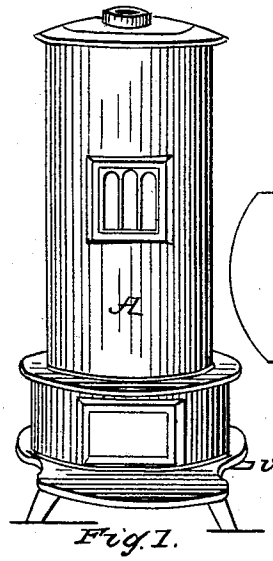

Fig. 1.

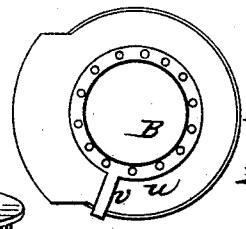

Fig. 10

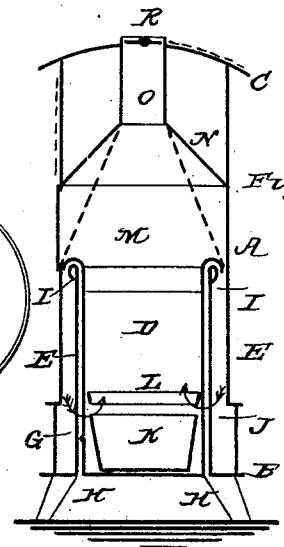

Fig. 2

Fig. 6

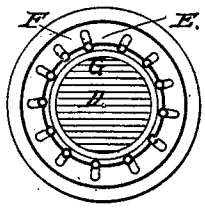

Fig. 5.

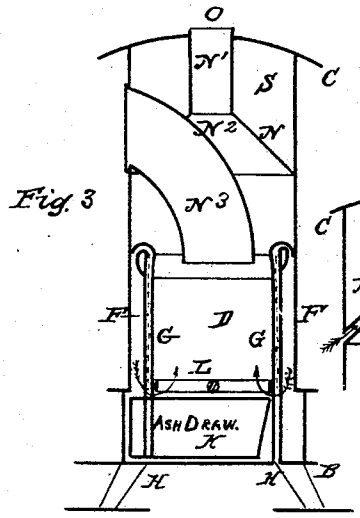

Fig. 3

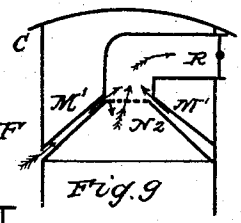

Fig. 9

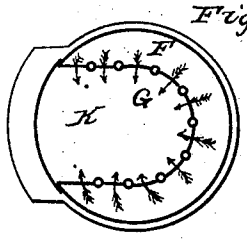

Fig. 4

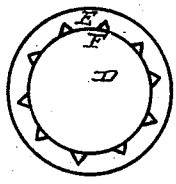

Fig. 8

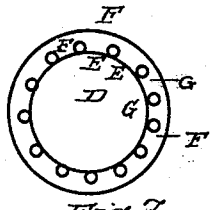

Fig. 7.

Witnesses

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ALVAH TRAVER, OF TROY, NEW YORK.

IMPROVEMENT IN HEATING-STOVES.

Specification forming part of Letters Patent No. **110,312**, dated December 20, 1870.

I, ALVAH TRAVER, of the city of Troy, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Stoves, of which the following is a specification.

The nature of my invention consists in the construction of a fire-pot having a chamber surrounding it, and between it and the walls of the stove. The said fire-pot is so constructed that tubes or their equivalent may be inserted in the wall thereof, all around or partly around, and so that said tubes may come in close contact with the fire, fuel, &c., in said fire-pot when the stove is in operation. It also consists in the employment and construction of the before-mentioned tubes or the equivalent thereof, reaching upward from the bottom of the stove to the said fire-pot, then passing upward from bottom to top of the fire-pot, either incorporated therewith as a part of said fire-pot, or inclosed within the walls of the fire-pot, passing above the walls of the fire-pot to a suitable height; then curving or bending over and returning so as to enter the chamber alluded to before, and which surrounds the fire-pot and occupies and forms the space between it and the outer walls of the stove. At the lower ends of said tubes they pass through the bottom plate of the stove, their orifices being covered or uncovered by means of suitable dampers. Access may be had to said tubes by holes through the bottom plate of the stove, if more convenient. It also consists in the construction of a chamber surrounding the walls of the fire-pot above mentioned, and extending downward to the bottom of the stove, and in such combination with the said tubes as to act therewith, the upper ends of the tubes being open within said chamber, and the chamber being provided with apertures at the lower part communicating with the space below the grate of the stove.

The object of this arrangement of the tubes, chambers and fire-pot, and construction in this manner, is to provide means for heating atmospheric air to a high temperature before using it as draught-air to the fire; for, except when starting the fire, the draught is supplied only through the tubes and chambers before mentioned.

The operation thereof is as follows: Air is admitted to the tubes at the bottom from below the bottom-plate of the stove, and passing upward within and through the same, becoming highly heated; then, entering the chamber, passes downward and out through suitable apertures to the space below the grate, and thence upward to the fire; the fire being fed in this manner by a highly heated draught-air. It also consists in the employment and construction of a conical cover to the combustion-chamber M, having an outlet at the upper part thereof leading into the pipe-collar, and the said pipe-collar forms a part of the said cone, being cast or constructed therewith; and the object of this cone is to concentrate the products of combustion within said chamber, where they may be useful, as follows: From form of construction, the said cover holds the gases evolved from the burning fuel, brings, holds, and keeps them in direct contact with the flame, so they may become consumed, increases the power of radiating heat from and through the sides of the stove, and also regulating intensity of combustion being carried on in fire-chamber. It also facilitates the escape of gases directly into the exit-pipe, preventing their escape into the room, the stove-pipe covering and fitting around the pipe-collar, which is a part of and a vertical continuation of the cone-cover. It also consists in the formation of a heating-chamber around said cone-cover, to be used for domestic purposes, (baking, &c.,) access being had to the same through the sides or top of the stove.

A damper is used in said pipe-collar at any suitable point, so that the force of the exit may be regulated so as to economize in the amount of fuel used.

A perforated plate may be placed over the exit-aperture, at the upper part of the cone-cover before-mentioned, so that soot and other organic remains of combustion may be retained within until entirely consumed.

The cone-cover may be made double, as shown in Fig. 9, so that air from outside the walls of the stove may be admitted through and by means of apertures in the walls of the stove, which, passing upward between the double plates of the cone-cover, will become highly heated, and by means of apertures around the pipe-collar, above the perforated

plate before mentioned, at inlet to pipe-collar, or at any suitable point below or above the same, the said highly heated air be admitted to the interior so as to oxygenize the gases, and aid in their destruction, and also to increase their heating properties.

It also consists in the employment of a self-feed cylinder or magazine, so constructed that it may be supported both by the cone or dome and outer walls of the stove, and in combination therewith.

Description of the Accompanying Drawing.

Figure 1 is a perspective of my stove exterior. Fig. 2 is a vertical section of the same crosswise. Fig. 3 is a vertical section of the same from front to rear, the chamber ending at lower line of grate. Fig. 4 is a horizontal section below the grate. Fig. 5 is a horizontal section just above the grate. Fig. 6 is an enlarged view of the tubes and a portion of the fire-pot, to show the construction. Fig. 7 is a horizontal section of the fire-pot to show another construction, viz., tubes wholly within the chamber surrounding the fire-pot, but in close contact therewith. Fig. 8 is a horizontal section similar, to show another mode of construction, being an equivalent for the tubes. Fig. 9 is a section showing a double cone-cover for combustion-chamber. Fig. 10 is a view of the bottom plate from below, to show the damper for covering and uncovering, at will, the inlet-apertures to the tubes.

General Description.

A is the outer wall of the stove, which may be square, oval, or cylindrical. B is the bottom-plate of the stove. C is the top-plate of the same. D is the fire-pot. E, the surrounding walls of the same, the shape thereof corresponding with the shape of the stove, and any suitable shape will answer; and, in fact, my invention can be applied to, and is adapted to any of the usual styles of stove-manufacture. F is the chamber surrounding the said fire-pot walls, and its shape may be regulated according to the style of stove used. G are the tubes, having inlet-orifices at H, provided with suitable regulating-dampers; and at I are the orifices through which the air passes from said tubes to the chamber F; and at J are the apertures through which the air passes to the ash-pit or space below the fire-pot, marked K. At L is the grate. At M is the chamber of combustion, or space above the fire-pot.

The walls E, surrounding and forming the fire-pot, may be constructed in sections, so that, where they join, hollows are formed, within which the tubes or pipes may pass. This construction is shown in Fig. 6. Or, the tube may be cast as a part of the said walls. The part or plate covering the chamber may be a flange formed along the upper edge of the plate or plates forming the fire-pot, cylinder, or walls E, and reaching outward therefrom, covering the chamber F, and having perforations through which the return of the tubes G passes, a tight joint being made, so that no air can enter said chamber except through the said tubes. I prefer to have the tubes pass upward through the combination with the walls E of the fire-pot, but they may be constructed so as to pass upward entirely within the said chamber, passing outward at the top, and re-entering said chamber F before discharging the air to said chamber F, and in that case I carry the tubes G in close contact with the walls E of the fire-pot. A horizontal section of such construction is shown in Fig. 7, and another way is shown in Fig. 8; and in this case the tubes, or the equivalent thereof, are shown of different forms, viz., triangular, and the air may pass upward therein, or may be conducted through pipes enveloped by the triangular construction shown. In all these modes of construction the tubes or their equivalents are hermetically sealed so that no air can pass therefrom except through orifices I at their upper ends. N is the cone-cover to the combustion-chamber. This may be made in the form of a dome, and at N^1 the upper part is the outlet into the pipe-collar O. The said outlet is closed partially by the perforated plate N^2 or its equivalent, through which the escaping products of combustion pass, and thence upward through the pipe-collar O escape into the exit-pipe, which forms a combination thereof. The damper in said pipe-collar is shown at R. This pipe-collar O may pass upward vertically, or be bent over and pass off horizontally, as desired. At S is shown the heating-chamber, which may be used for cooking purposes, if desired, a door being made in the walls of the stove, or a part of the top of the stove being removable for the purpose. C is the top plate of the stove, made of any desirable form. The pipe-collar O passes upward through the same. At U is shown a damper suitable for a base-burner stove, or for any stove which is cylindrical in shape. This damper is constructed so as to revolve around a depression in the bottom of the stove, and, by revolving, cover or uncover the openings or orifices at the lower ends of the tubes G. They may be constructed so as to revolve in any suitable way, without a depression in the bottom plate, according to the style of stove used. At V is shown a projecting lever or handle, to which the power is applied in opening and closing the apertures or orifices, as above mentioned. The dome or cone-cover N may be constructed so as to spring from the fire-pot walls E, so that the chamber S may continue down to the top of the fire-pot, and by this means the chamber of combustion be surrounded by a hot-air chamber. This arrangement is shown by dotted lines in Fig. 2.

My arrangement of chambers around the fire-pot, and, as just above mentioned, around and over the chamber of combustion, is very useful in preventing the escape of noxious gases into the room, and as the outer plates

or walls of the stove never can, in this case, become red-hot, no injury is done to the air in the room, as has been found to be the case when air is brought in contact with red-hot iron, and then breathed into the lungs. It has been scientifically demonstrated that the air so heated becomes a slow poison.

At N^3 is the coal-chute, through which coal is fed to the fire. The chute I construct as shown, curved, but may be made in any other style. It passes through the cone-cover N, and reaches from the outer wall A of the stove down to the top of the fire-pot D. The inlet-opening thereto is covered by a suitable door, as shown in Figs. 1 and 3. At M′ is shown an arrangement for heating and conducting air to be used as a promoter of combustion at the upper point of the cone N. I construct a cone to fit over the cone N in such manner that a space is left between, forming the sheet-flue M′. Apertures are formed all around the outer wall A. Air enters, rises, and is admitted to the exit-pipe O just above the perforated plate N^2, through proper apertures, the air in its passages becoming sufficiently heated; and it also has the effect of preventing the cone-cover N burning out by the intense heat below. The chamber F may be discontinued at the bottom line of the grate, and communicate at that point with the chamber K, the air passing through suitable apertures; or, the bottom of chamber F being left open all around, the heated air passes freely into the chamber or ash-pit K, and thence to the fire.

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

1. The bent or siphon tubes G or their equivalent, with inlet-orifices, dampered or not, extending from or through the bottom-plate of the stove, along the fire-box on either its inner or outer surface, entering into the outlet-draft chamber F, and in combination therewith, all constructed, arranged, and operating substantially as described and set forth.

2. The tubes G, bottom plate B, damper U, outer walls of stove A, combustion-cover N, pipe-collar O, perforated cover N^2, single or double, and outlet-damper R, as constructed and arranged, all in combination and operation substantially as described and set forth.

3. The combination of the top plate C, walls A, dome N, perforated cover N^2, pipe-collar O, and chute N^3, when constructed and arranged as described and set forth.

ALVAH TRAVER.

Witnesses:

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