

S. E. HEWES.

Improvement in Heating-Stoves.

No. 115,957.

Patented June 13, 1871.

FIG. 1.

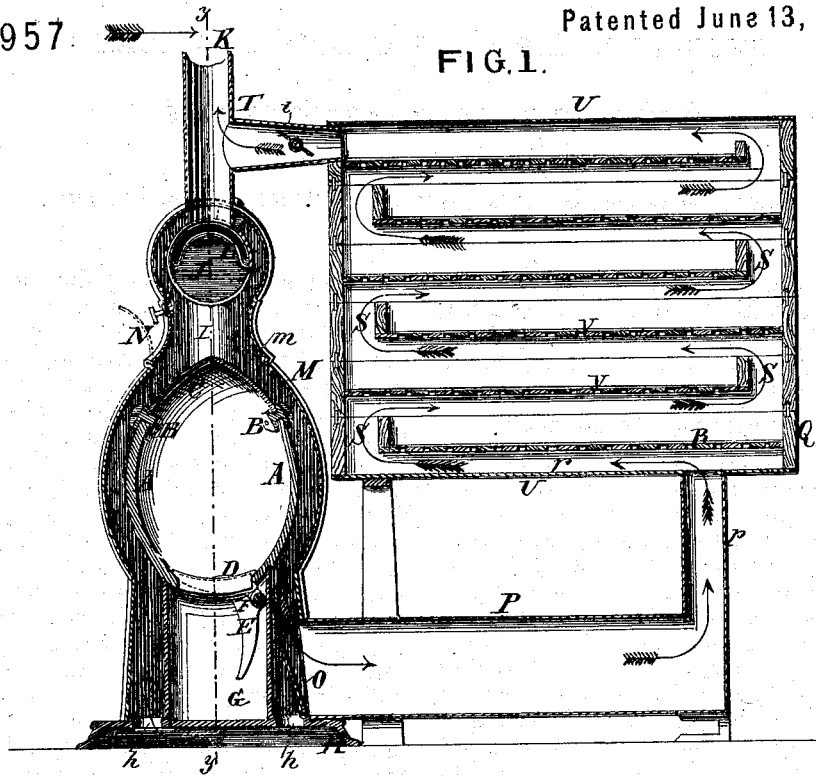


FIG. 2.

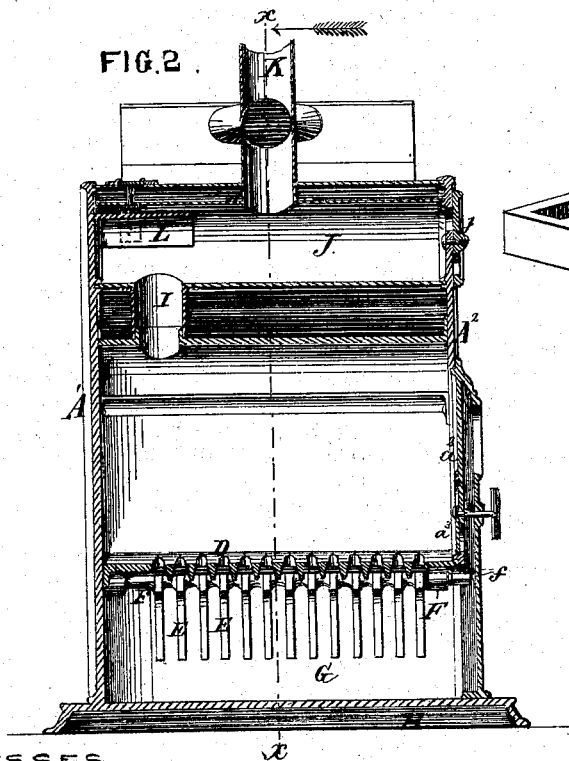


FIG. 3.

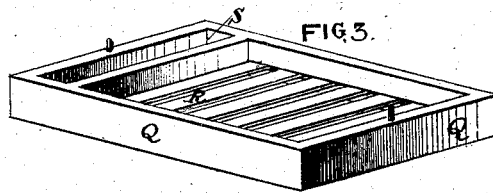
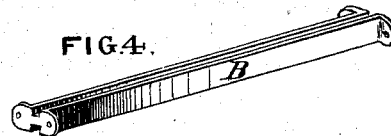


FIG. 4.



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SHUBAEL E. HEWES, OF ALBANY, NEW YORK.

IMPROVEMENT IN HEATING-STOVES.

Specification forming part of Letters Patent No. 115,957, dated June 13, 1871.

I, SHUBAEL E. HEWES, of the city and county of Albany, in the State of New York, have invented a new and useful Heating, Cooking, and Drying Apparatus, of which the following is a specification:

Nature and Objects of the Invention.

The first part of my invention consists in an improved mode of connecting the cast sides and the crown piece of the furnace. The invention further relates to swinging arms so constructed and arranged that they may be placed in position between the grate-bars to form, in connection therewith, a continuous bottom for burning wood, or may be elevated to a further extent for the purpose of stirring or shaking a coal-fire. The invention further relates to a device for allowing the ingress or egress of air from the lower part of a heated air-chamber surrounding the furnace, and to a novel construction and arrangement of cooking, heating, or drying trays, air-conductors, and flues. The invention further relates to a provision for permitting the escape of heated air from the upper part of the heated air-chamber. The invention further relates to the construction and arrangement of plates constituting the ends of the furnace and air-heating chamber, in connection with a jacket or casing constituting the sides of the chamber. The invention further relates to a shield placed within a heating-drum for the double purpose of protecting the sheet-iron of the said drum and imparting heat to air, which is admitted therein for the purpose of consuming the inflammable gases. The invention further relates to a device for admitting cold air within the drum to regulate the draft.

Description of the Accompanying Drawing.

Figure 1 is a transverse section of the apparatus on the line $x x$, Fig. 2. Fig. 2 is a longitudinal section of the same at $y y$, Fig. 1. Fig. 3 is a perspective view of one of the trays hereinafter described. Fig. 4 is a perspective view of a coupling-bar employed to connect the crown-piece with the sides of the furnace.

General Description.

The furnace is constructed with sides $A A$, connected by means of grooved coupling-bars $B B$ to the crown-piece C . This mode of con-

structing and connecting the parts enables me to cast the crown C in one piece, and to cast both the sides $A A$ in one pattern. The particular form of the coupling-bars to adapt them to secure the parts together with joints sufficiently air-tight is clearly represented in Fig. 4. The bars of the grate D may be made of any suitable construction. $E E$ is a series of arms mounted upon a shaft, F , which may be formed at one end with a square, f , to adapt it to be turned by means of a suitable key. The arms $E E$, being turned up into a horizontal position, fit between the grate-bars, so as to constitute a solid bed when wood is to be used as fuel. By turning the arms up still further they may be employed to shake and stir a fire of anthracite or bituminous coal, and will effectually break the crust or aggregated masses which form in burning coal of the latter variety. G represents the ash-pit, and H the base of the furnace, which is formed with perforations h for the admission of air to be heated. The flue I conducts the gaseous products of combustion from the furnace to the drum J , from whence they are discharged through the flue K . L represents a shield placed within the drum above the flue I , and employed to protect the sheet-iron of the drum from excessive heat, and also to heat the air which is admitted through a number of apertures between the said shield and the inner shell of the drum in order to effect the complete combustion of any inflammable gases which may enter the drum in an unconsumed state. The furnace is thus adapted to completely burn its own smoke. M represents a jacket of sheet-iron completely enveloping the furnace and drum, so as to form a space, m , for the heating of air, which enters through the aperture h . The end plates A^1 and A^2 of the furnace are made continuous from the base H to the top of the drum, and are cast with suitable flanges to receive the casing M , the drum J , and the plates $A A$ and B of the furnace. a^2 may represent the furnace-door, through which fuel is introduced, and which is also provided with a suitable register, a^3 , for the admission of air when burning wood. j is a register in the drum J , through which air may be admitted in order to regulate the draft. N is a door in the upper part of the casing M , by opening which air may be al-

lowed to escape for heating purposes. A similar door may be supplied on each side, if desired. O is a door in the lower part, which, when placed in the position shown in Fig. 1, causes the current of heated air to be delivered into the conductor P to be carried to my drying or cooking apparatus. A similar door may be formed on the other side of the casing, if desired, in order to admit air above the base H instead of taking it up from beneath, as in the present illustration. The air-conductor P may preferably be constructed of paper protected by a coating of soluble glass, which serves also to render it a more perfect non-conductor of heat. If preferred, the said conductor may be made of wood coated in a similar manner, or of sheet metal protected on the outside with felt or any other non-conducting material. The flue *p*, which rises from the back of the conductor P, delivers the heated air into the lower part of a series of trays of peculiar construction. The sides Q of these trays are formed of wood, and they are provided with screen or slat bottoms R, and each with a flue, S, at one end.

It will be observed from the representations given in Figs. 1 and 3 that the screen bottoms R are elevated sufficiently above the lower edges of the sides Q to leave a space, *r*, for the passage of air beneath the slats, and the trays are arranged with the flues S alternately at opposite ends. The sides Q of the trays thus form a continuous wall from the bottom to the top of the series, and the hot air is caused to pass from end to end of the trays in the serpentine course indicated by the arrows. When the trays are empty a considerable part of the heated air would pass through between the slats. In order to prevent this, when the apparatus is used for drying clothes for laundry purposes I spread the clothes, neatly folded, over the slat bottoms as high as the top of each tray, leaving the space beneath the slats for the passage of air. The clothes are thus made to complete the tight serpentine flue formed by the series of trays.

If the apparatus is to be used for baking or other cooking purposes I cover the slat bottoms either with the pans in which the material to be cooked is placed, or with sheet-metal plates, or preferably with asbestos paper or cloth, as shown at V in Fig. 1, in order to form a sufficiently perfect non-conductor of heat.

It will thus be seen that in all the various uses of the apparatus the provision for a serpentine flue or passage for the heated air is maintained.

T represents the air-discharge pipe. The said pipe is provided with a damper, *t*, and discharges into the exit-flue K of the furnace. The upper and lower plates U of the cooking and drying chamber are to be made of or protected by non-conducting material; and it is preferred to coat the wooden sides S of the

tray with soluble glass as a protection to the wood from the heat and preventive of conduction and radiation.

By this mode of making or coating the conductor P *p*, and the top, bottom, and sides of the cooking or drying chamber of a non-conducting material, I am enabled to utilize practically the whole amount of heat produced by the furnace with scarcely any loss.

My flue system, as constituted of the slat or screen bottom trays Q R S, differs essentially from a drying-house provided with perforated or slat shelves, through which the air is caused to pass. The sides Q of the trays constitute the walls of the flue or chamber, and the articles placed upon the slat bottoms R, while they are exposed to hot air above and below, themselves serve to complete the continuous serpentine flue by cutting off all communication excepting through the passages S.

The large capacity of the drum J permits the gases from the furnace to expand within it, and to be completely consumed by contact with atmospheric air delivered in a heated state over the end of the shield L. The drum thus constitutes a combustion-chamber for the gases, the force of draft, and consequently the heat produced, being controlled by the air-register or damper *j*. The fuel is thus burned to the best possible advantage.

Claims.

I claim as my invention—

1. The coupling-bars B, employed to connect the sides A and crown C of the furnace, substantially as herein described.

2. The pivoted arms E, when constructed and arranged, as herein represented and described, to form a close or continuous bottom in connection with the bars of the grate D, or to pass up between the said bars for the purpose of stirring or shaking the burning fuel.

3. The combination of the furnace A, door or damper O, conductor P *p*, hot-air flue formed of the trays Q R S, and discharge-flues T K, substantially as and for the purposes set forth.

4. The air-discharge door or register N, one or more, in combination with the furnace A and casing M, substantially as described.

5. The continuous end plates A¹ A² extending from the base H to the top of the drum, cast with flanges for the reception of the drum J, casing M, and the plates A B of the furnace, substantially as described.

6. The shield L for protecting the sheet-iron drum and heating air admitted within the latter to effect the combustion of the gases.

7. The register *j*, in combination with the drum J and furnace A, substantially as described.

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Witnesses:

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