2 Sheets—Sheet 1.

# D. K. BOSWELL.

## Cooking, Heating and Drying Apparatus.

No. 197,321. Patented Nov. 20, 1877.

Fig. 1.

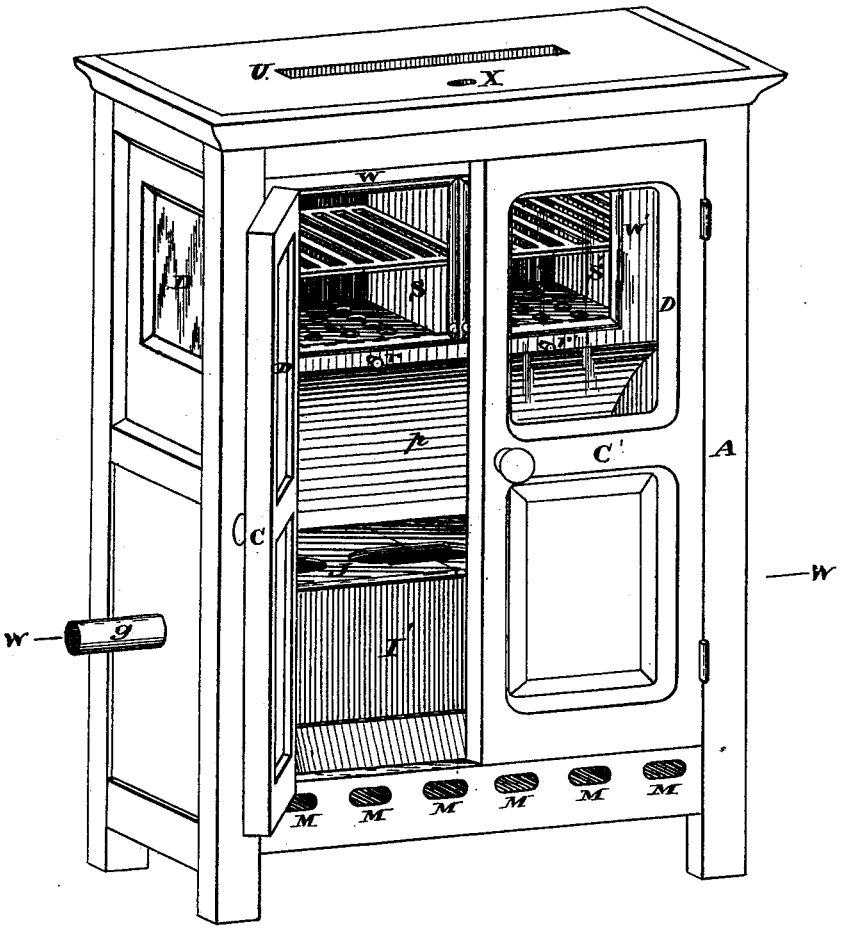
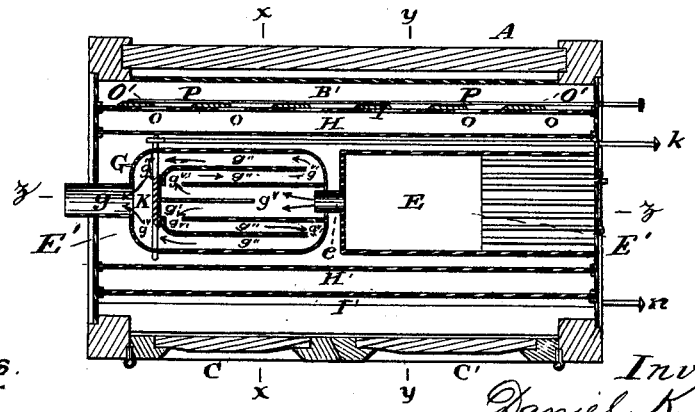



Fig. 2.

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## Cooking, Heating and Drying Apparatus.

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Fig. 3.

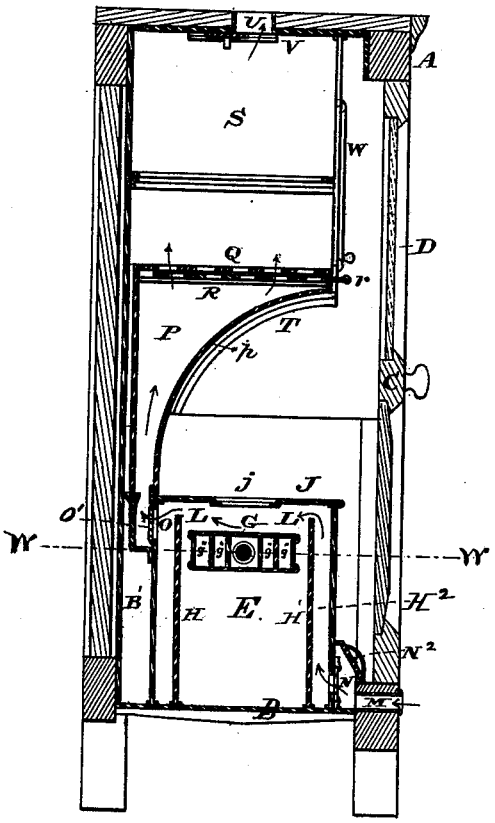
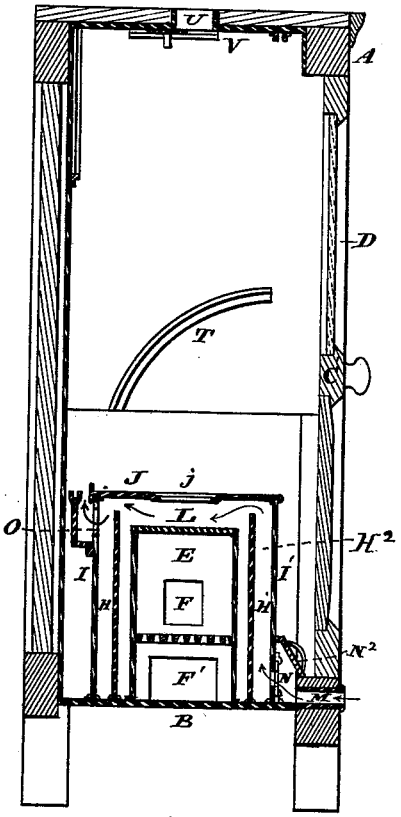



Fig. 4.



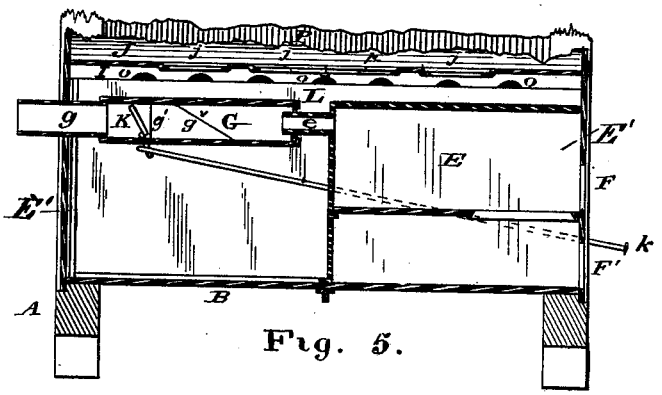




Fig. 5.

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# UNITED STATES PATENT OFFICE.

DANIEL K. BOSWELL, OF INDIANAPOLIS, INDIANA.

## IMPROVEMENT IN COOKING, HEATING, AND DRYING APPARATUS.

Specification forming part of Letters Patent No. **197,321**, dated November 20, 1877; application filed October 20, 1877.

*To all whom it may concern:*

Be it known that I, DANIEL K. BOSWELL, of the city of Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Cooking, Heating, and Drying Apparatus; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

My device consists, exteriorly, of a case, which may be of wood, having doors with glazed windows or panels, and inclosing the various members of my cooking, drying, and warming apparatus. These include a furnace or stove proper, communicating with a flue or smoke-box, and with said smoke-box completely incased by a shell that forms around said box and furnace an annular space or jacket, whose horizontal top may have the customary circular or oblong openings for the reception of pots, pans, boilers, or other cooking-vessels.

Between the sides of the box and furnace and those of the shell I interpose vertical plates, which, with said shell sides, constitute heating-chambers for air admitted through suitable registers. These plates serve, moreover, the purpose of shields, to prevent the entering air from becoming overheated or "burned." The external apertures that admit the cold air are located in the front of the outside case, at a sufficient height above the floor to avoid drawing up dust therefrom.

The heating-chambers communicate, by suitable orifices, with a hot-air duct, whose upper end communicates with a horizontal chamber, the top of which is perforated, and becomes the floor of an oven. This perforated floor is provided with registers, which may coact with dampers at the exit, to control the heat in the whole oven, or in any compartment of it.

The interior of the flue-box is partitioned off into passages, by which, in conjunction with a suitable damper, the smoke may be either compelled to circulate to and fro through said box, so as to utilize the heat, or be permitted to escape into the smoke-exit pipe direct. These return-flues are formed with concave end walls, so as to avoid eddies.

My device is so arranged that neither smoke, nor soot, nor other deleterious products of combustion can reach any vessel or the food to be cooked, and hence all of the vessels are, at all times, clean and convenient to handle. Moreover, as no flame or fire has direct access to any vessel or viand being cooked, the heat becomes so tempered as to avoid scorching the contents, which are cooked with their juices and natural flavors intact. At the same time, the entire cooking apparatus proper, being enveloped in a close case, which can be shut tight at any time, and whose walls are, to a large extent, non-conductors of heat, the caloric liberated in the furnace and flues is almost wholly retained and utilized, instead of being wasted into and overheating the room. Moreover, the heated air, after doing duty below, is still further utilized and made available for heating the elevated ovens, which, being subjected to a high, but at the same time equable and diffusive heat, whose escape is prevented by the exterior case, becomes very effectual for expeditious baking of bread or other viands, without scorching the same.

My apparatus is, further, so arranged that, when not required for cooking purposes, the entire space above the stove proper may be utilized for drying of fruit, of clothes, or other articles, or for simple heating purposes.

In the accompanying drawings, Figure 1 is a perspective view of an apparatus embodying my improvements, one of the outside doors being open. Fig. 2 is a horizontal section at the line *w w*. Figs. 3, 4, and 5 are vertical sections in the lines *x x*, *y y*, and *z z*, respectively, of Fig. 2.

A is a closet-like case, preferably of wood or other non-conducting material, and of oblong form. B B′ represent the metallic floor and lining to the same. C C′ are folding doors, which, being opened, afford access to the stove or oven, or, being closed, preserve the heat therein. These doors and the ends of the case may have glazed panels or windows, D. A portion of the case-floor B becomes, in my arrangement, the ash-pit floor or hearth of a grated furnace or fire-box, E, to which doors F F′ in the side of the case afford the proper access. A neck, *e*, conducts the products of combustion into a flue-box G, whose exit-pipe *g* conducts into any suitable stack or chimney.

Vertical plates or guards H H′ flank the furnace or fire-box E and the flue-box G, and extend somewhat higher than said fire and flue boxes, in the manner shown.

The said fire and flue boxes and guards are inclosed by the walls I I′ and top plate J of my stove proper. The stove-top J has the customary series of circular and oblong openings *j* for cooking-vessels.

My flue-box is capable of discharging directly into the exit-pipe *g* through hole *g′*, or, said hole being closed by damper K, by means of handle *k*, the product of combustion or heat may be compelled to circulate through the passages *g″*, whence it finds vent, at *g‴* *g*$^{iv}$, into the same exit-pipe *g*. An acclined central flue-strip, *g*$^{v}$, serves to separate the smoke into two equal streams, and breaks up any eddies, and curved walls *g*$^{vi}$, at the turnings of the flue-passages, are also effectual in preventing eddies and consequent lodgment of soot.

The perforated plate J, which is above the fire and flue boxes, forms, with the top of the fire-box E and flue-box G, an air-heating chamber, L, which communicates at its front part, by means of a duct, H$^{2}$, formed by the plates H$^{1}$ and I′, with the atmosphere, through registered inlets M in the front of the case A, a sufficient height above the floor to avoid the suction of dust. N represents the register-plate which controls the inlets M, and is operated by handle *n*.

The hot-air chamber L discharges at its upper rear portion, through orifices O, into a hot-air chamber, P, whose front wall *p*, curving in the form of a half-arch, and being faced with tin or other good reflector, constitutes a hood or canopy to the boiling-space, which expedites the cooking, or which, when the doors C C′ are thrown open, operates to project heat downward and forward, so as to heat the lower part of the room or apartment in which the apparatus is situated. This form of the chamber P is further useful in causing its upper part to extend nearly the entire breadth, as well as length, of the case, where it is surmounted by a registered plate, Q, under which slide two correspondingly-perforated damper-plates, R R′, controlled by handles *r r′*, whereby hot air from said chamber P may be admitted into either or both of two elevated ovens, S S′, which occupy the upper part of the case.

The double oven S S′ simply rests upon the hot-air and reflecting chamber P, and the latter upon the stove and upon curved flanges T on the interior wall of the case. Each oven has at top a ventage, U, closable by a damper, V. Each oven has a glazed front door, W W. An orifice, X, in the top of the case, in front of the elevated ovens, may be furnished with a tube or pipe, communicating with the chimney or with the ash-pit, so as to conduct off all cooking effluvia when desired.

When the apparatus is to be used for drying clothes, fruits, or other analogous purposes, the oven and hot-air flue P are removed, and the apparatus appears as shown in Fig. 4, and the space above the fire and flue boxes is formed with portable clothes-bars or drying-cases, and held in position in any suitable or well-known manner.

It will be observed that the heated air is not only used to heat the culinary vessels from below, but also to heat the curved deflector *p*, which sheds, in turn, a gentle heat downward onto the top of said vessels, and thus, by applying a uniform heat on all sides of the vessels, no violent ebullition can occur, and the articles in said vessels will be speedily and uniformly cooked. After performing these services the air, having retained most of its caloric, is made to pass into the elevated ovens, where it comes in contact with the articles to be baked, and, by reason of this intimate contact, the heat will be gently but speedily absorbed by the viands; and, further, the heat being absorbed by conduction, it follows that the food will not be scorched, as in the common cooking-stove, where the heat is radiated from the sides of the oven.

Passing out of the ovens, through openings U, the hot air may still be utilized for warming the room, or it may be conducted by pipes to other apartments, or to a drying-chamber, or chambers for drying either fruit or clothes or lumber, if desired.

In warm weather it may be conducted directly into the smoke-flue by means of a suitable pipe leading from U to smoke-pipe *g*, thus doing away with the warm atmosphere in the kitchen. This process of using the same air throughout, and inclosing it in a tight closet, is a means of economizing fuel to an extent which, to my knowledge, has never before been accomplished in a cooking-stove; and, by the construction of the apparatus, the heat is so deflected and redeflected that it loses most of its ray power, and becomes equally diffused throughout the apparatus.

While my apparatus has, by virtue of its upright construction, several times as much oven-room as an ordinary cooking-stove, yet the heat may be confined to the heat-generating portion of the apparatus or stove (designated in the drawings by the letter E′,) or may be regulated to apply to any portion of the apparatus by means of the several dampers.

The cooking-vessels not being immersed in the stove or furnace, it follows that their surfaces, instead of being coated with soot by the smoke or oxidized by the flame, will remain clean and bright, thus being better able to absorb the heat from the surrounding air. Moreover, it is evident that the air confined between the top of the furnace or fire-box E and the top plate J is not subject to the sudden changes of temperature that the air in the furnace or fire-box E necessarily is.

By drawing the air in near the bottom and allowing it to escape at the extreme top of the case, a complete circulation is created in the room.

The ovens being of sectional construction, they may be easily removed, as well as the

flue-box P, which leaves a space, as shown in Fig. 4, for the introduction of shelves for drying fruit, or of bars for drying clothes.

If greater capacity be desired, two of my stoves may be combined by removing the rear boards and putting the apparatus back to back.

The oven is made with open ends, and these ends are made to abut against the panes of glass set in the ends of the outer case, and thus the interior of the oven, from its ends, can be inspected from the outside of the case, and the expense of having plates or panes of glass at the ends of the oven is avoided.

The stove proper or heat-generating apparatus, E′, is constructed separate from the oven and flue which connects the oven with the stove, and is arranged in line with apertures formed in the ends of the outer case, and thus, when repairs are necessary, or it is desired to withdraw same for cleaning or repairs, the stove can, by raising the plate $N^2$, be withdrawn bodily from the case through these end openings.

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

1. The combination of the stove E′, flue P, elevated oven S, and case A, substantially as set forth.

2. The hot-air flue P, in connection with the hot-air chamber L below, and perforated bottom Q of oven S above, and damper O′, in manner and for the purposes specified.

3. The elevated oven S, connected at its bottom with hot-air flue P, and having sliding registers R and V, for regulating the admission and escape of hot air, substantially as shown and described.

4. The described furnace or fire-box E and flue-box G, inclosed within a hot-air chamber, having a registered inlet or series of inlets, N, in the front of the case.

5. The described series of reverted or return flues $g''$ $g''$ $g''$ $g''$, with inlet $e$, damper K, having rod or handle $k$, for actuating said damper, central flue-strip $g^v$, and exit $g$, substantially as set forth.

6. The shields or guard-plates H H′, extending above the stove, and interposed between the stove sides and the walls I′ of the inclosing-shell, with which they form chambers, the front one of which communicates exteriorly with the atmosphere, and interiorly with the various cooking-places, in the manner set forth.

7. In combination with the duct $H^2$ and hot-air chamber L of the stove, the passage P, oven or baking-space S S′, and registers R R′, and dampers V V, substantially as and for the purpose designated.

8. The combination of the vertical duct, formed by deflecting-plate $H^1$ and inclosing-plate I′, and the chamber L, between the top of the fire-box E and the plate J, said chamber being formed to contain heated air without communicating directly with the fire or smoke of the stove, but being in communication with the air of the room, substantially as and for the purpose set forth.

9. The removable hot-air flue P and oven S S′, applied within the external case A and in relation to the stove E, whereby the entire space above the boiler-plate is convertible from a cooking and baking chamber to a drying-chamber, substantially as set forth.

10. A stove constructed with a vertical duct, formed by deflecting-plate $H^1$ and inclosing-plate I′, said duct being in communication with the atmosphere of the room, and with an air-chamber, L, formed by the top of the fire-box E and top plate J, the latter having openings therein for the insertion of sauce-pans and similar utensils, so that the lower parts of such vessels may come in contact with the hot air in chamber L, substantially as set forth.

11. The combination of the outer closet-like case, having glass windows in its ends, and the removable oven having open ends, against which windows the said open ends abut, and are thereby closed, substantially as set forth.

In testimony of which invention I hereunto set my hand.

DANIEL K. BOSWELL.

Attest:

GEO. H. KNIGHT,

L. H. BOND.