

May 8, 1945.

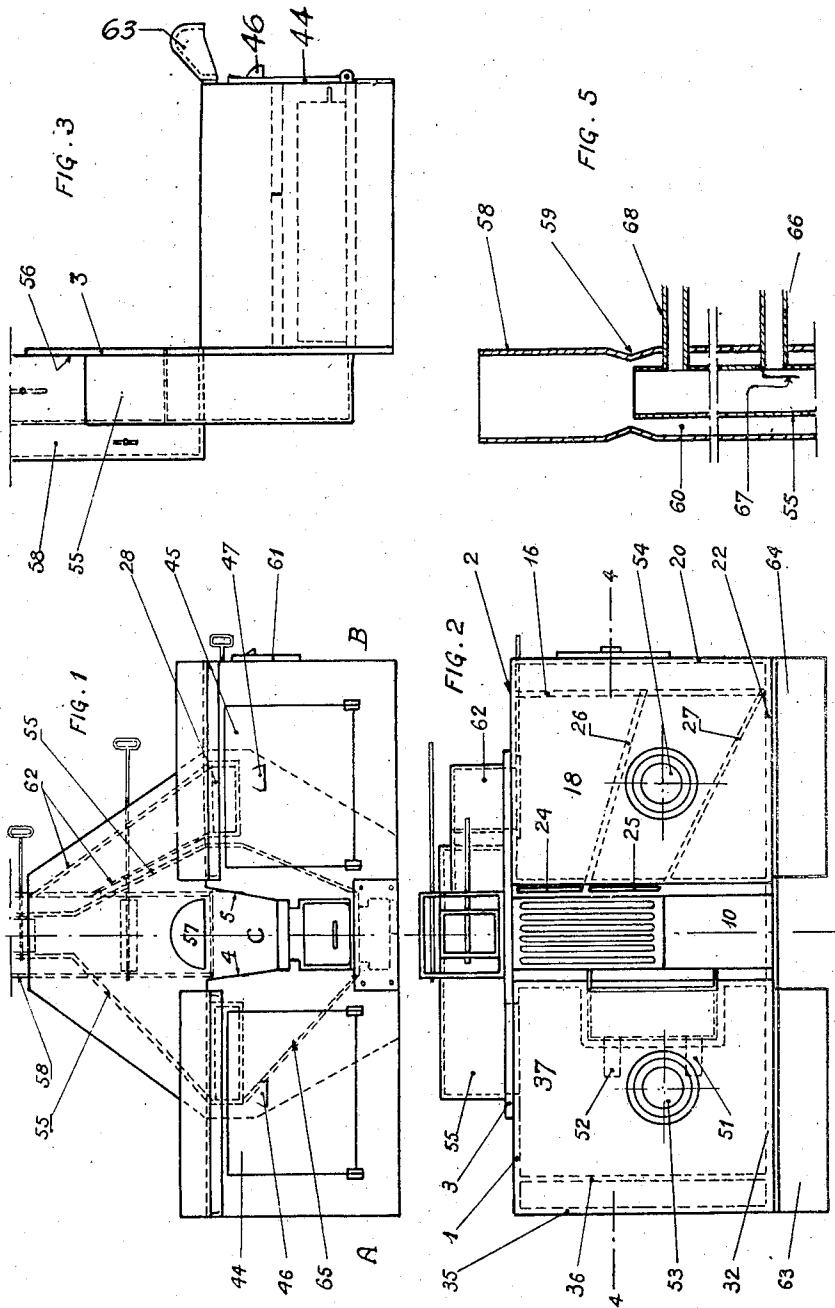
M. CAROL

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RURAL STOVE

Filed Oct. 21, 1941

2 Sheets-Sheet 1



INVENTOR:
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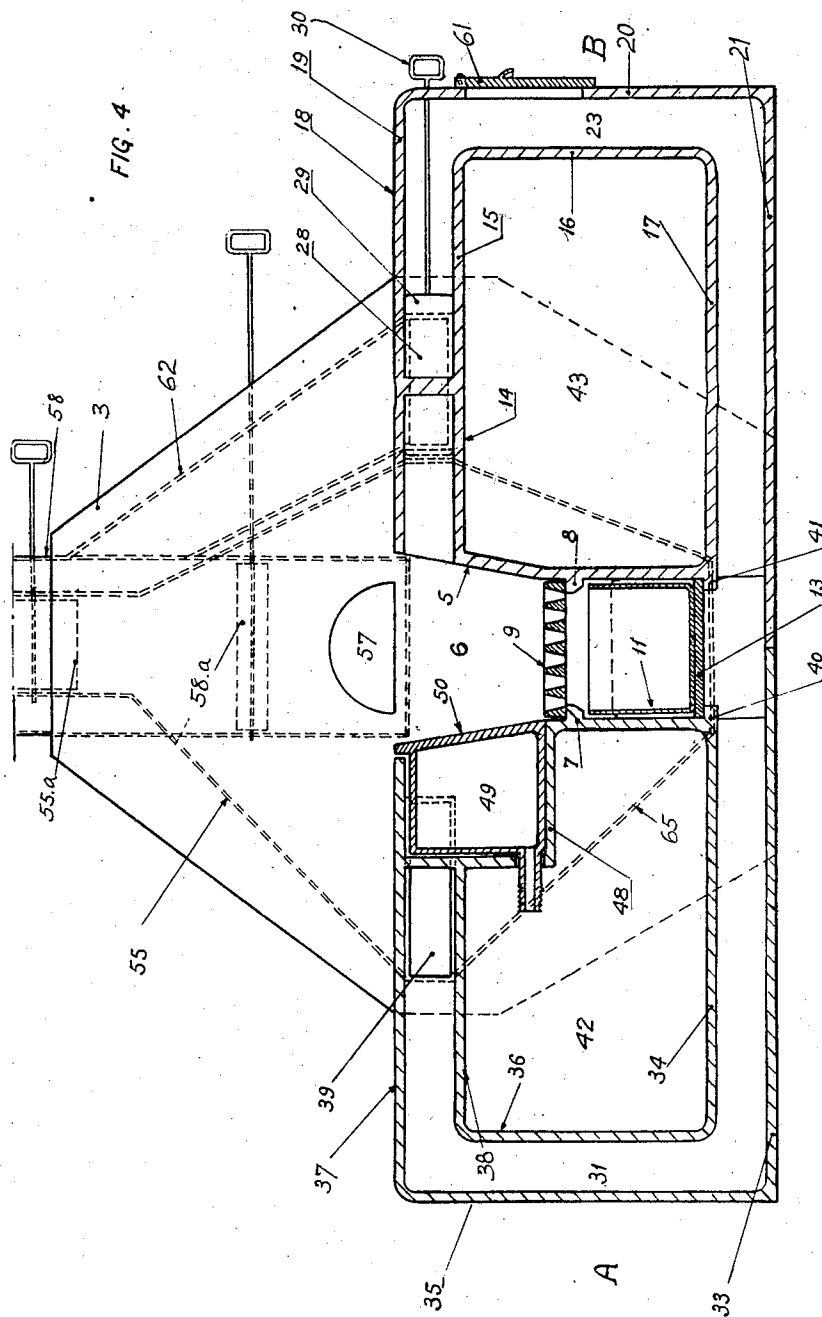
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UNITED STATES PATENT OFFICE

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RURAL STOVE

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vested in the Alien Property Custodian

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3 Claims. (Cl. 126—1)

In the rural districts, an open fireplace is often used for the cooking of food, even to the present day, the fireplace being located below a big chimney, with or without firedogs; while pans or pots are supported on a trivet standing in the fireplace or hang from a pot-hanger.

If such a stove of an extreme simple design allows one to burn branches and logs as they come from the faggots, it does, on the other hand involve certain inconveniences.

It is difficult to warm simultaneously several containers in an appropriate manner, and the heat produced is very small; also there are no regulating means, while the housekeeper has at her disposal neither oven nor any means to produce hot water. This is the reason why, in some dwellings, people use as supplementary apparatus, a heating-apparatus termed a "Dutch-oven." However, this apparatus is seldom used, for it requires coals, or at least, wood cut in small pieces, and it warms the room to excess during the summer, and besides, its fire is not visible, which departs from rural practice.

The object of this invention is to produce a rural stove which in itself provides in the best manner all heating services the country-people may wish, in regards to utility as well as comfort. This stove consists essentially of two boxes that are placed in existing chimneys and are separated one from the other by a certain space. The two boxes are intended to serve as firedogs, but instead of serving as a simple support for the wood as ordinary firedogs do, they are adapted to be employed as ovens, or simultaneously, by means of their upper portion, may serve for the heating of vessels or pots in the same way as dish-warmers.

Naturally, the heating of these boxes easily results from their heat conductivity, the parts which directly support the ignited fuel transmitting the heat to the whole wall by radiation from the fire.

In a more improved form, the boxes are provided with a double wall, so that a part of the combustion gas circulates within the space formed by this double wall before going to the chimney. The heating-circuits for the two boxes may according to the case, be disposed serially or in parallel.

In order to insure a good circulation of these gases, it is intended to heat their exhaust pipe in the chimney along a given distance by means of gas issuing directly from the hearth. For the same purpose, a part of the wall of this exhaust pipe is formed by the guard-plate itself, that is to say by a plate which forms an extension of the backside of the boxes. Besides, the said pipe is

with advantage surrounded by the vent pipe of the gas issuing directly from the fireplace, and the gases which have circulated in the space limited by the double wall of the boxes are mechanically carried along by those issuing directly from the hearth by an exhaust effect.

Preferably, the space between the two boxes is provided in order to form a small self-acting hearth for wood or coal, suitable to be used, for instance, when a single vessel is to be heated. It is then provided with plates in order to provide a closed hearth.

In the following, will be described, by way of a practical example a rural stove made according to the invention. In the annexed drawings forming part hereof,

Fig. 1 is a front elevation of the stove.

Fig. 2 is a top plan view of the same.

Fig. 3 is a side view of the stove.

Fig. 4 is a sectional view on greater scale, taken on line 4—4 in Fig. 2.

Fig. 5 shows, in section, the gas exhaust pipes and also the point where the exhaust pipe, after warming the boxes, opens out to the exhaust pipe for the gas issuing directly from the hearth.

The rural stove embodying the invention primarily includes two boxes A and B, leaving between them a certain space C. The rear sides 1 and 2 of these boxes are extended to form a common guard-plate 3, while the opposite sides 4 and 5 have their upper portions mutually inclined towards one another, and together with the guard-plate 3, enclose a small hearth 6. These sides 4 and 5 have opposite projections 7 and 8, which support the grate 9 of this hearth. Preferably, the grate 9 does not extend through the whole depth of the boxes A and B, but only through about the rear half of each. The front half is formed by a fullplate 10, with the result that a better draught is obtained for the hearth 6. Under the grate 9 and the plate 10 an ash-pit 11 is provided, which lies slidably on a plate 13 extending the whole length of the apparatus.

The boxes A and B have two walls 14 and 18 forming a double wall. The inside wall 14 of the box B begins at the inclined side 5 of the said box and has an upper horizontal part 15, a vertical part 16, and a lower horizontal part 17. The box B has an upper horizontal part 19, a vertical part 20, a lower horizontal part 21, a vertical front side 22, and the rearside 2, while the outside wall 18 and the inside wall 14 of said box together define a space 23 which opens to the hearth 6 by means of openings 24 and 25 (Fig. 2). Ribs 26 and 27 carry the gas coming from openings 24

and 25 through the entire depth of the space situated between the vertical sides 16 and 20. On the rear side 2 there is an opening 28 which can be closed by a slider 29 capable of being operated by means of a handle bar 30.

The box A also has a peripheral space 31, bounded by the rear side I, the front side 32, the lower side 33 with a lower horizontal wall 34, a vertical end 35, a vertical wall 36, an upper side 37 and an upper wall 38. The rear side I has an opening 39, while the spaces 23 and 31 intercommunicate beneath the plate 13 throughout the entire depth of the apparatus. Projections 40 and 41 fixed on the plates 34 and 17 serve to support the plate 13.

The interiors of the boxes A and B form ovens 42 and 43 which include, if necessary, usual heating plates and grates, and which are closed by doors 44 and 45 provided with handles 46 and 47 (Fig. 1) preferably insulated against heat. On the inside of the oven 42 a receptacle 48 is provided for a removable boiler 49, having a side 50 turned towards the hearth, and forming part of the wall 4. Tubes 51 and 52 connect the boiler to a hot water fitting. On the upper sides 37 and 18 of the boxes A and B openings are made which are closed by rings and concentrically disposed disks 53 and 54, the disks fitting in the rings in the usual way, and forming the support means on which the vessels to be heated are placed.

From the opening 39 extends an exhaust pipe 55 for the burned gases, having a front side 56 in contact on a very wide surface with the guard-plate 3, or may even form a part of the same plate. The front side of the pipe 55 preferably has waves or corrugations (not shown for preserving the clarity of the drawings) in order to increase the surface, and which cooperate if necessary, with similar waves of the plate 3.

The guard-plate 3 shows, above the hearth 6, an opening 57 which brings the hearth into communication with an exhaust pipe 58, surrounding the vertical part of the pipe 55. The walls of this last pipe are preferably corrugated on the portion which is surrounded by the pipe 58, while the pipe 55 itself ends at a certain limited height and thus opens into the pipe 58. This latter pipe, at the outlet point of pipe 55, preferably exhibits a decrease of its section, as shown at 59, in Venturi fashion, so that the gas passing through the space 60 between the two pipes will produce an exhausting effect and carry along, mechanically, the gas contained in the pipe 55. The pipes 55 and 58 are controlled by registers 55^a and 58^a.

A removable door 61 is advantageously provided in the vertical side 20 of the box B, adjacent to the beginning of the circuit of the gas circulating around the ovens 42 and 43.

The guard-plate has one or several turnable supports, (not shown for the sake of clarity in the drawings) which may be used as pot-hangers to suspend vessels to be heated, and in this way providing a sort of pot hanger rack serving for the suspension of vessels. However, conventional pot-hanger rack may also be used.

To use the stove embodying the invention, the logs or the branches to be used as fuel are placed on the hearth and lighted. A part of the gases and flames resulting from the combustion escapes by means of the aperture 57 towards the pipe 58. Another part of these gases enters the space 23, by way of the openings 24 and 25. In normal conditions, the opening 28 is closed by a slider 29. During the circulation of the gases in the space 23, they heat the oven 43 and the upper plate

19. The gases then pass beneath the ashpit 11 and reach the space 31 bounded by the double wall on the box A, thus heating the oven 42 and the upper plate 37. The gases issue from the space 31 through the opening 39 at the point where the exhaust pipe 55 opens. The circulation in the double wall of boxes A and B is effected in two ways, first by natural draught, and also as a consequence of the heating along an appreciable height, of the pipe 55, due to its contact with guard-plate 3 and of the circulation around the pipe 55 of the gas contained in the pipe 58, and finally by the increase of speed in the narrow section 59, of the gas passing through the space 60. All these factors are added together and ensure an effectual circulation of the hot gas in the double wall of boxes A and B. The ovens 42 and 43 are used for cooking roast joints, pastry, etc., in the usual way. The upper plates 19 and 37 of the boxes A and B, support pans, boilers, etc. Also hot water is permanently at disposal due to the presence of the boiler 49, simultaneously heated with the ovens.

When just a small fire is required, the hearth 6 is used, built in the space C, between the boxes A and B. For open fire heating, if the slider 29 is left shut, the gases escape partly by way of the opening 57 and the pipe 58, and partly by way of the spaces 23 and 31. If the slider 29 is open, the gases escape through the opening 57 and the pipe 58 in part, and partly through the pipe 62.

When a closed hearth is required, the invention includes the addition of an upper plate and a front plate on the hearth 6. If the slider is maintained shut, the stove will then work as a Dutch-oven. If the slider 29 is open, the gases issuing from the hearth 6 escape through the openings 24 and 28 and the pipe 62 which conduct them to the pipe 58.

In a modified form, the pipe 62 is arranged to open into the pipe 55. In this form it is easier to joint the pipes 55 and 62 to constitute a single pipe, wide enough at its base to be capable of receiving the gases escaping from the opening 39, as well as those issuing from the opening 28.

When a decrease in the radiation of the stove is required, for instance during summertime, the door 61 has to be opened, thus opening the circulation so that the spaces 23 and 31, instead of being traversed by hot gas, are then filled with cool air, which comes from the premises which are ventilated, or from outdoors, by means of an air vent. (Not shown.) To produce such circulation, the ports 28 and 39 are opened when the door 61 is opened whereby the cool air passing through the door 61 will be caused by the draft in the chimneys to be exhausted through the space 23 and port 28 to the pipe 62, and through the space 31 and the port 39 into the chimney 55 thereby surrounding both ovens by constantly moving cool air to maintain the ovens cool at all times.

The upper sides of the boxes can of course be covered with insulating material in order to reduce the radiation of the stove, and hence, a brick layer may be provided.

Furthermore, it is desirable to provide extensions on the front sides 32 and 22 of the boxes, particularly in order to prevent falling of the logs lying on the boxes. On the drawings are shown, for this purpose, two runs 63 and 64 (Figs. 1 to 3) which are preferably thermally insulated from the other parts of the apparatus, in order to avoid accidental burns afflicting the attendants.

When a great amount of hot water is required, supplementary boilers may be provided within the stove or behind the guard-plate, and more particularly next to the pipe 58. The occasional operation of chimney-sweeping is made easy by a trap-door 65 in an extension of the pipe 55.

In the described structure, the heating circuits of the two boxes are disposed in series, that is to say, one after the other. After having passed through the channels surrounding the box B, the gases then pass through the space associated with the box A. In another form or modification, the invention includes the arrangement of the two heating circuits, not in series, but in parallel, which will cause the heating of the two ovens to become more uniform.

A gas intake of the gases circulating in the vertical pipe 55 may be obtained by shunting gas out from the stove to supply a drying or an evaporating device. The shunting pipe 66 (Fig. 5) used for this purpose is controlled by a hinged shutter 67, and the return pipe 68 cooperates therewith to return the gases to pipe 55.

The area of the openings 24 and 25 may, if desired, advantageously be controlled by a shutter (not shown) whose opening occurs, for instance, by movement in the opposite direction to that of the guard-plate. The purpose of this shutter is to open, in the case of a very small fire, only the limited part of the openings 24 and 25 corresponding to the hearth and so, to prevent cold air from entering the heating circuit.

The stove made according to the present invention is normally laid directly on the ground. However, in some cases it may be better to support it by means of feet in a raised position, or by putting it on a foundation. In this last case, an opening is provided allowing communication of the ash pit with a receptacle located in the foundation, and whose capacity is sufficient to contain the ashes of several days.

Having now fully described my invention, I claim:

1. A stove comprising a casing comprising a pair of horizontally spaced oven compartments, a hearth located in the space between said oven compartments, an oven supported in each oven compartment, the laterally inward walls of the ovens forming sides of the hearth, and the tops, the outer ends, and the bottoms of the ovens being spaced from the tops, outer ends, and bottoms of the oven compartments so as to define channels for air and products of combustion, the laterally inward ends of the portions of said channels below the bottom of the ovens communicating with each other and the laterally inward end of the portion of the channel above one of the ovens opening into the hearth, laterally inwardly extending partition means dividing the portion of the channel above said one of the ovens into at least two conduits leading from the region of the channel at the outer end of the last

mentioned oven to the adjacent side of the hearth, a closable port formed through the back of the oven compartment containing the last-mentioned oven opening into the rearmost one of said conduits, adjustable obscuring means for said port, dual chimney means comprising a main exhaust chimney formed on the back of the casing and having a port opening directly into the upper part of the hearth, a secondary exhaust chimney having its mouth spacedly surrounded by a portion of said main chimney, said closable port opening into said main exhaust chimney, and a second port in the other oven compartment connected to said secondary chimney to circulate a portion of the hot combustion gases through said channels when said closable port is closed.

2. In a stove, a casing having laterally spaced oven compartments open at their inner ends, a hearth space separating the oven compartments, a grate supported in said hearth space above the bottom of the casing, with an ashpit beneath the grate in said hearth space, a main chimney on the back of the casing closing the back of the hearth space and having a port opening into the upper part of the back of the hearth space above the grate, ovens supported in said oven compartments with their inner walls forming sides for the hearth below the tops of the compartments, said ovens being spaced below the tops, and from the outer ends, and above the bottoms of said oven compartments so as to define channel means leading from the upper part of the hearth space along the top of one of the ovens, down along the outer end thereof, across the bottoms of the ovens, up along the outer end of the other oven, and along the top of the other oven, means establishing communication between the portions of the channel means beneath the ashpit, a secondary chimney on the back of the casing having its mouth spacedly surrounded by the main chimney, a first port formed in the back of the casing and opening into the upper part of the channel means over said one of the ovens and opening into said main chimney, adjustable closing means for said first port, and a second port formed in the back of the casing and opening into the upper part of the channel means over said other of the ovens and opening into said secondary chimney thereby to circulate a portion of the hot combustion gases through said channels when said first port is closed.

3. A stove according to claim 2 wherein said main chimney has a constriction therein and the secondary chimney vents into the main chimney at said constriction to provide a venturi relation whereby the streams of air and gaseous products of combustion issuing from said hearth space and from said channel means, respectively, coact to enhance the draft through the chimneys so that circulation in said channel means and the combustion in said hearth space are advantaged.

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