

P. J. MOONEY.
 DRAFT CONCENTRATOR.
 APPLICATION FILED JUNE 26, 1908.

955,605.

Patented Apr. 19, 1910.

Fig. 1.

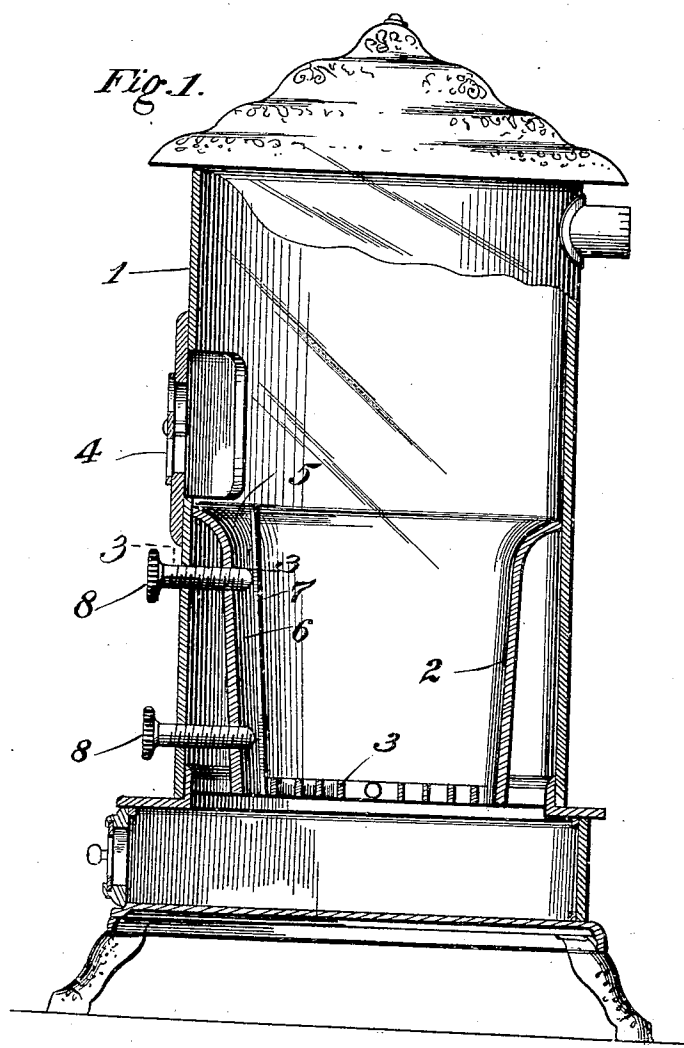
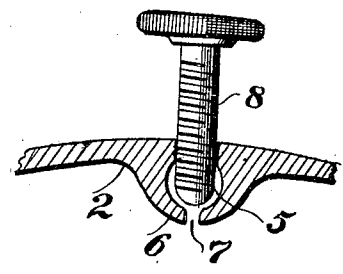


Fig. 2.



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UNITED STATES PATENT OFFICE.

PATRICK J. MOONEY, OF BRAZIL, INDIANA.

DRAFT-CONCENTRATOR.

955,605.

Specification of Letters Patent.

Patented Apr. 19, 1910.

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To all whom it may concern:

Be it known that I, PATRICK J. MOONEY, citizen of the United States, residing at Brazil, in the county of Clay and State of Indiana, have invented certain new and useful Improvements in Draft-Concentrators, of which the following is a specification.

This invention comprehends certain new and useful improvements in stoves and relates more particularly to a novel draft concentrator embodied in the firepot of a stove and constituting an element either integral therewith or separate therefrom and having as its prime object, the increasing of the thermal efficiency of the stove, and more complete consumption of both the solid and volatile constituents of the solid fuel employed within the body of the stove, and the production of an even and uniform heat.

I am aware, that prior to my invention, it has been proposed to provide the firepots of stoves with vertically disposed openings in their interior walls, or with interior tubes, it being particularly noted that such tubes or openings are arranged in series; but the action of these openings or tubes invariably tends toward the simultaneous distillation of all the volatile combustible matter in all parts of the fuel. The cooling effect of this distilled gas, while unlighted, normally maintains the temperature of the top portion of the fuel bed at a point insufficient to support combustion or produce the ignition of the gas at the top of the fire, so that a superabundant volume of gas is being produced which is largely wasted until ignition does finally occur. Such low temperature at the top of the fire necessitates a correlative or corresponding formation of abnormal heat at the bottom of the fuel bed, in order to overcome the coolness at the top. And when ignition does occur the abnormal heat induced causes the fire to burn and heat too rapidly the fuel at the bottom of the bed for the proper distillation and oxidation of the fuel gases, on account of the difference between the specific gravities of such gases and oxygen, and in consequence a large quantity continues unburned and is thus wasted. Hence substantially all the heat that is secured is derived from the solid or coked elements of the fuel; in contradistinction, my invention produces a gradual distillation, and burning of the volatile and

combustible matters blended with or accompanied by the burning of the carbon or coke.

Having therefore, set forth the main object of my invention, and the manner in which the same is to be performed, for a further and detail description of one concrete embodiment of the invention, reference is to be had to the following description and accompanying drawings in which:

Figure 1 is a vertical sectional view partly in elevation of a stove, and the firepot thereof which is equipped with my invention; and, Fig. 2 is a horizontal sectional view through the fire pot.

Corresponding and like parts are referred to in the following description and indicated in all the views of the accompanying drawings by the same reference characters.

Referring to the drawings and more particularly to Figs. 1 to 2, the numeral 1 designates a stove which may be of any construction or design, 2 the firepot of the stove with its grate bars 3, these parts forming no part of my invention, and being therefore of any preferred construction or design, 4 designates the fuel or fire door, or any other door arranged at the top of and, if necessary made especially to assist in the operation of my invention.

In carrying out my invention, the firepot 2 is provided with an air channel 5 which may be more or less vertically disposed and which extends from an air inlet at the grates up to the top of the fire pot and preferably in vertical alinement with the fuel door 4. This air channel 5 communicates throughout its length with the firepot 2 by means of a longitudinally disposed slot 7 formed in the enlarged tube-like portion 6 which, forms an integral portion of the wall of the firepot. It is to be understood that the channel 5 may be of any desired longitudinal or transverse section but that the slot or opening 7 is narrower than the interior of the main portion of the channel.

8 designates one, two, or more dampers which may be provided to extend more or less across the channel 5 to regulate the up-draft therein either at the upper or lower end of the channel or both, said dampers in the present instance being two in number as illustrated in Fig. 1, one being located near the upper end of the channel and one near the lower end of the channel.

In the practical operation of a stove equipped with the draft concentrator of my invention, as the fire burns in the firepot, the air, as it becomes rarefied and heated will establish an upward draft from the bottom to the top of the fire pot through the channel 5 or 5^a much more readily than it would through the devious interstices of said fuel bed. As the air flows upwardly it will collect and carry upward with it, the gas, flame and smoke caused by this ignition and also part of the gas, flame, and smoke from the other parts of the fuel bed. This gas will be ignited as soon as the temperature in the channel becomes high enough, such temperature being reached in the channel very much more quickly than in any part of the fuel bed. At the top of the firepot this lighted gas becomes a flaming torch which ignites the balance of the gas gradually and without exploding the carbonaceous solids and the hydrocarbon gases of the other parts of the fuel bed, being more slowly and regularly distilled than would otherwise be the case, and, being all consumed, a high thermal efficiency is thus secured.

It will thus be seen from the foregoing description in connection with the accompanying drawings, that the purpose of my invention is the concentration of the draft in a fire pot burning coal, coke, wood or other solid fuel, at a given point, so as to promote combustion at that point and ignite the volatile combustible matter and hydrocarbon much earlier in the operation of burning, and more steadily and completely than is done in the ordinary way of burning fuel so as to result in the increased thermal efficiency and also to permit of the use of a deep fuel bed, and the economy of fuel. It will also be noted that by my invention conservation of the heat is caused owing to the elimination of the factor of expelling much of the heat up the chimney, since, on account of there being less soot, smoke, and combustible gases to expel, a slower draft can be used, and there will be, as a consequence more of the heat radiated or utilized. It will also be seen that my invention provides means for maintaining, from the bottom to the top of the fuel bed, a gradually heating and oxidizing current of fresh air which will keep the unlighted gas diluted or aerated as it is being distilled from the fuel, thereby preventing puffs or explosions, the

oxygen necessary to ignite the said gas at the top of the fuel bed being also supplied when the fire reaches the proper temperature.

It is to be noted that the single air channel which is formed in the fire pot is located directly underneath the fuel door of the stove. With this arrangement the slight leakage of air through the crevices of the door will combine harmlessly with the current coming up the channel. If the air channel was to be located at some other point, the air leakage around the crevices of the door would tend to set up cross currents and tend to defeat the object of the invention. The flow of oxygenized burning gas should travel from the bottom of the fuel bed up the air channel at the front of the fire and should pass over the full length of the fuel bed approximately toward the rear or limit of the combustion chamber in the direction of the chimney outlet, thereby exercising an enveloping heat effect on the reserve source of fuel to cause distillation and emanation of the gas therefrom. Furthermore, it is obvious that the location of the air channel directly beneath the fuel door has its advantages in the operation of firing, as a poker could be easily inserted in the air channel in case of clogging and the coal would not be so likely to be jammed into the channel with the channel next to the operator and will also give the best opportunity for removing refuse in the ash pit which was obstructing the inflow of air into the bottom of the air channel.

Having thus described the invention, what is claimed as new is:

A stove embodying a fire pot provided with a single air channel, extending from the bottom to the top of the fire pot outside of the margin of the fuel bed and located at a point directly opposite to the outlet for the products of combustion, said single air channel being open at both top and bottom of the fire pot, being also formed with a slot extending from the bottom to the top thereof and establishing communication between the interior of the fire pot and the channel throughout the length of the latter.

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

PATRICK J. MOONEY. [L. S.]

Witnesses:

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