

F. L. STEWART.
STOVE.

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1,049,938.

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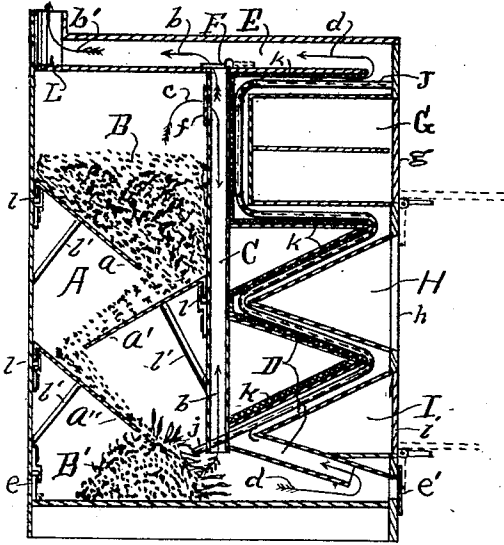


Fig. 1.

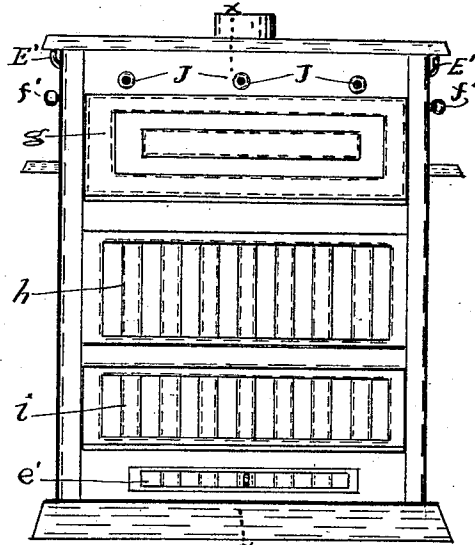


Fig. 2.

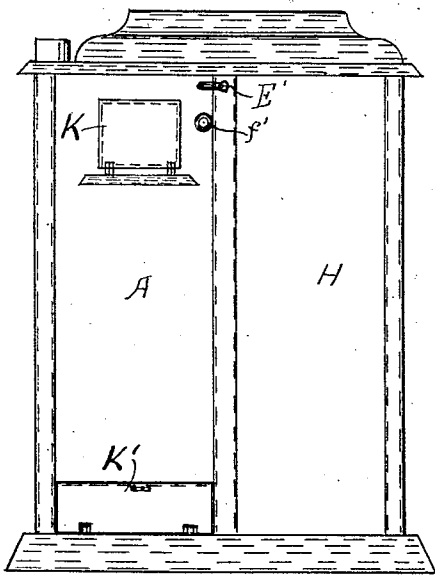


Fig. 3.

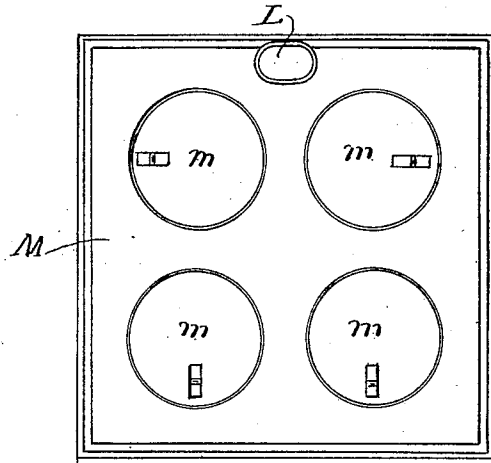


Fig. 4.

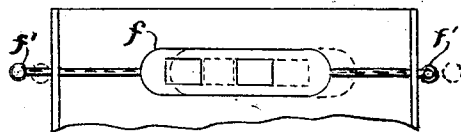


Fig. 5.

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UNITED STATES PATENT OFFICE.

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STOVE.

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To all whom it may concern:

Be it known that I, FRANK L. STEWART, a citizen of the United States, residing at Boyne Falls, in the county of Charlevoix and State of Michigan, have invented certain new and useful Improvements in Stoves, of which the following is a specification.

My invention relates to improvements in heating stoves, and its objects are, first, to provide a stove with which wet peat or muck, or wet saw dust may be readily burned; and, second, to provide a stove with which the radiation of heat may be varied from the least to the greatest possible degree of heat available from a given amount of combustion. I attain these objects by the construction shown in the accompanying drawing in which—

Figure 1 is a sectional side elevation of the stove on the line *x x* of Fig. 2; Fig. 2 is a front elevation of the stove; Fig. 3 is a side elevation of the stove with the entire side inclosed and showing a modified form of top on the stove; Fig. 4 is a top plan, and Fig. 5 is an elevation of the inner partition of the combustion chamber showing the valve that regulates the outflow of gas, steam, &c., from the combustion chamber. Similar letters refer to similar parts throughout the several views.

A represents the combustion chamber of the stove. In this chamber I place several inclined shelves, as *a*, *a'* and *a''*. I prefer that these shelves be made so as to be readily detached, and for this purpose I have shown the shelves as loosely hooked over cleats 1, and supported by braces 1'. The saw dust, peat, or other fuel, is passed through the door K, or its equivalent, into the chamber A above the shelf *a* where it is retained as indicated at B, until it is dried sufficiently to drop down to the shelf *a'* and thence upon the shelf *a''* and to the fire pit B' where it is burned. The fire pit is accessible from the outside through the door K' so that a preparatory, or preliminary wood fire may be built to prepare the first supply of wet fuel for combustion, and to ignite it when it first enters the fire pit; and the door is also useful for removing ashes, &c., it being understood that any form of available grate may be used for supporting the fuel in the fire pit.

It will be noticed that the combustion chamber A is, practically, in the back part

of the stove. This brings the fire back of the center of the stove so that with the damper F open, as indicated by the dotted lines, the draft will be in the direction of the arrows *b b'*, through the flue C so that no heat will be radiated from the front of the stove. This enables me to burn a reasonably hot fire at B' without heating the surrounding room, while with the damper closed, as indicated in Fig. 1, the draft will be diverted through the serpentine flue D, as indicated by the arrows *d*, to the pipe opening L, as indicated by the arrow *b'*, and cause a much greater radiation of heat and a consequent higher temperature in the surrounding room.

e represents a direct draft damper for regulating the combustion of fuel at B', and *e'* represents a cold air damper for deadening the combustion.

When burning very wet fuel, as this stove is designed to do, a large amount of steam and gas will accumulate in the upper portion of the combustion chamber above the fuel B, which must be disposed of to avoid too great pressure in the chamber, and I provide for this by inserting a damper, as *f*, in the back wall of the flue C, near the top, so that the steam or gas may pass out of the combustion chamber into the flue C and out of the stove. When the damper F is closed the steam, &c., passes down into the flue C, as indicated by the arrow *c*, to the bottom of said flue and then following the direction of the arrows *d d b'* is carried off. When this course is taken by the steam it, being previously heated to a high degree, comes in direct contact with the burning fuel in the fire pit and adds greatly to the heat producing qualities of the fire as it passes through the flue D, greatly increasing the radiation of heat from this flue.

At G I have provided for an oven which has a door *g* that may be opened or closed at pleasure, and at I, I have provided for a heating oven for keeping victuals warm, for warming the feet or for any other desired purpose, and provide it with a door *i* that may be opened and closed at pleasure, while at H is a simple radiating chamber. This is provided with an open front preferably with a sliding damper therein, as indicated at *h*, so that heat will escape freely, and I prefer that the door *i* be constructed the same, and that both be so arranged that the openings may be readily closed the same

as any sliding damper. These openings may be made of any desired design, ornamental or otherwise.

I prefer that the flue D be protected, on the back sides, with asbestos, as indicated at *k*, or other suitable non-conductor of heat, so that a large portion of heat passing through said flue will be radiated toward the front of the stove and out. The pipes J J open from the front of the stove above the compartment G, and extend through the flue D in a zig zag course downwardly to points directly over the burning fuel in the fire pit, as at *j*, so that the draft formed through the flues C and D will draw the cold air through these flues from the outer or upper ends, as at *J*, in Figs. 1 and 2, downwardly through the pipes J to direct contact with the burning fuel and thence out through the flues C and D. By this means the air passing through the pipes J is superheated before it reaches the burning fuel, insuring the most complete combustion, not only of the fuel, but of a large amount of the smoke that would otherwise be carried off through the flues, to the outer atmosphere, as well as accumulated gases at the fire.

E' is the handle with which the damper F is manipulated; *f'* is the handle with which the damper *f* is manipulated, and *m m*, &c., are griddles covering holes in the stove top M, which may be utilized for culinary, or other purposes.

With this stove it is possible to use fuel that is very damp, initially, as the shelves *a*, *a'* and *a''* are placed in the combustion chamber alternately upon opposite sides and the end of each overlaps the ends of the next succeeding ones so that the fuel may be so exposed to heat that the portion immediately upon the upper shelf, *a*, will become sufficiently dry to slide down upon the shelf *a'*, where it is exposed to a greater degree of heat and rendered nearly dry before it slides to the shelf *a''*, whence it slides, in an almost perfectly dry state, to the fire pit where combustion takes place practically as indicated at B'. The triangular spaces between the serpentine flue D and the direct flue C result from the peculiar formation of the serpentine flue, and may be left open, as indicated in Fig. 1, to create greater heat radiation from the stove into the room, or they may be closed, as indicated in Fig. 3, in which case they act as dead air chambers, confining the heat to increase the temperature in the ovens.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:—

1. A stove divided into a front and a back compartment, having a serpentine flue pass-

ing upward through the front compartment, the walls of which form radiating surfaces in position to throw the heat forward into the outer atmosphere, the back compartment divided into a fuel receptacle and a fire pit, a series of alternately inclined shelves forming a serpentine passage between the fuel receptacle and the fire pit, the walls between the front compartment and back compartment being double and arranged to form a draft flue directly upward from the fire pit, a stove pipe on the stove, the top of the stove and of the compartments forming a horizontal flue between them from the serpentine flue and the direct flue to the stove pipe, and a damper in the draft flue to regulate the draft of the stove.

2. A stove having a front compartment and a back compartment, walls forming a direct vertical flue between said compartments from the fire pit to the top of the compartments, the front compartment having a serpentine flue passing upwardly through it and forming an air draft from the fire pit through the front compartment and into the horizontal flue at the top of the stove, air tubes passing through the serpentine flue and into the back compartment, alternately arranged inclined shelves arranged in the back compartment to form a fuel receptacle in the upper end, a fire pit in the lower end, and a serpentine passage-way from the fuel receptacle to the fire pit, the wall between the fuel receptacle and the vertical flue having an opening through it, a damper to regulate said opening, and a damper in the direct flue to regulate combustion.

3. A stove having a combustion chamber, dividing walls therein forming a draft flue leading from the combustion chamber, alternating inclined shelves arranged in the combustion chamber forming a serpentine fuel passage therethrough and a fire pit below them, the dividing wall between the combustion chamber and the draft flue having an opening through it for the passage of steam from the upper part of the combustion chamber into the draft flue, dampers to regulate the draft flue and the said opening, said stove having a stove pipe leading to the outer air, and having a space between the top of the stove and the top of the combustion chamber arranged to form a flue between them from the direct draft flue to the stove pipe.

Signed at Grand Rapids, Michigan, September 15, 1906.

FRANK L. STEWART.

In presence of—

CHAS. E. KRIEBEL,
ITHIEL J. CILLEY.