

No. 647,427.

Patented Apr. 10, 1900.

H. D. W. SAWYER.  
COOKING AND HEATING STOVE.

(Application filed May 24, 1897.)

(No Model.)

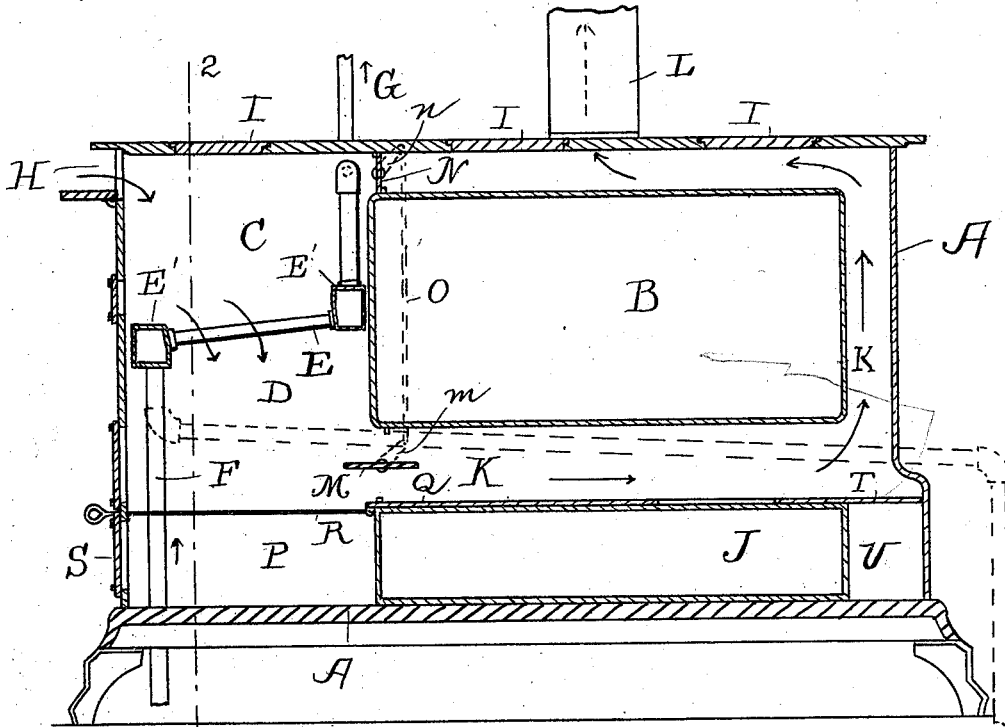


Fig. 1.

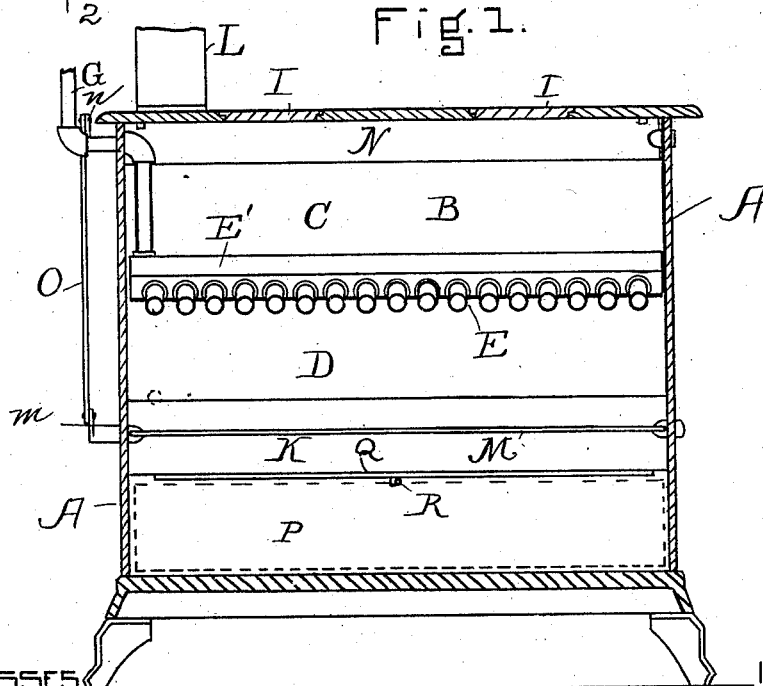


Fig. 2.

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# UNITED STATES PATENT OFFICE.

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## COOKING AND HEATING STOVE.

SPECIFICATION forming part of Letters Patent No. 647,427, dated April 10, 1900.

Application filed May 24, 1897. Serial No. 637,841. (No model.)

*To all whom it may concern:*

Be it known that I, HOWARD D. W. SAWYER, of Revere, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Cooking and Heating Stoves, of which the following, taken in connection with the accompanying drawings, is a specification.

The object of this invention is to provide a most simple and efficient downward-draft cooking and house-heating stove in which complete combustion of the fuel is attained and water circulating through the hollow grate-bars and connecting-tubes is effectually heated. In my present invention I have especially sought to simplify the apparatus, and hence to reduce cost and liability to get out of order, without impairing its efficiency. I have therefore omitted water walls or tables and now use as a grate a succession of parallel water-tubes connected at their ends with larger tubes or water-boxes, with which the inlet or supply pipe and the outlet or circulation pipe respectively communicate. The draft-inlet is through the body of the stove above the grate, either through a griddle-hole or the broiler-opening, and hence the fumes of cooking and the gases generated from the fuel, with all the volatile products of combustion, are normally carried downward through the fire and consumed, the caloric-current passing between the water-containing grate-bars and thence beneath, beyond, and over the oven to the funnel. A high degree of heat attends the complete combustion of the fuel thus attained, a "baking-oven" is always available, and water exposed in the pipes to the intense current within the stove is utilized for the sink or bath-room and for heating other rooms by hot-water circulation. Return-pipes from the radiators may traverse the caloric-passage beneath the oven and the combustion-chamber below the grate for effective exposure to the heat therein. My invention also provides for converting this most effective winter heater into a summer stove when a limited amount of heat is desired and hot-water circulation to the radiators is not required. This I accomplish by closing the caloric-passage beneath the oven at will and opening one above the oven, at

the same time closing the draft-inlet above the grate and opening one below it, thereby reversing the draft-current through the grate and fire-pot and producing a convertible downdraft and updraft cooking-stove.

The deflectors, slides, or dampers by which the caloric-passages are opened and closed are preferably connected for simultaneous operation, so that one will always be closed when the other is open; but they may be operated independently by the attendant.

Another feature of my present invention is a sliding cover for the ash-pit, by which when ashes are to be removed the downward draft is not interfered with and ash-dust is prevented from drawing into the caloric-passage. A similar slide covers and uncovers a soot-box or dust-box within the rear part of the stove, said slides resting at other times on top of the hot closet in the base of the stove and being operated when desired by protruding rods with terminal knobs.

In the drawings, Figure 1 is a vertical longitudinal section through the stove-body, and Fig. 2 a transverse section on line 2 2 of Fig. 1.

A represents the stove-body, which may be of any ordinary pattern having the interior oven B.

C is the fuel-chamber, and D the combustion-chamber, together forming the fire-pot occupying the front end of the stove.

E is the water-grate, arranged obliquely between the chambers C and D and formed of a succession of parallel tubes entering larger pipes or water-boxes E' and provided with a supply-pipe F and an outlet-pipe G for a continuous water-current through the grate and connecting-pipes. The water circulation thus insured supplies the sink, radiators, and bath-room with abundance of hot water and at the same time prevents burning out or melting the grate-bars. The supply-pipe or return-pipe may traverse the caloric-passage, as indicated in dotted lines, Fig. 1.

H is the broiler-opening, serving as a draft-inlet through the stove-body above the grate, and I I are covers for the griddle-holes in the stove-top. Partial removal of one of these covers over the grate provides a suitable inlet, or lateral openings controlled by slides will be provided. In either case the draft is

normally downward between the tubular grate-bars E, on which the fuel rests, which insures not only that the gases and light combustible matter shall pass downwardly into the fire to be consumed therein instead of contaminating the external air, but also that the draft-current shall be an intensely-hot instead of a cold blast against the grate-bars and shall tend to free the upper surface of such bars from ashes, and thereby keep the lower part of the fire very much hotter than usual.

J is a hot closet in the base of the stove under the oven. Between the two is the caloric-passage K, leading horizontally from the combustion-chamber D, and such passage is continued upwardly beyond the oven and horizontally above its top to the funnel L, so that the caloric-current completely encircles the oven and in its normal course passes over the hot closet and the oven. I, however, provide for deflecting the current out of this course when a small fire only is required—as, for instance, during much of the summer season. At such times the deflector or damper M at the inlet to the caloric-passage is closed, and a like device N is opened at the top of the fuel-chamber, so that the caloric-current is quite direct to the funnel and not downwardly between the grate-bars. These deflectors are represented as pivoted dampers, and they may be separately operated; but I prefer to connect the crank-arms *m n* on their axes by a rod O, which will open one when the other is closed. This convertible feature is very advantageous, giving as it does to a single stove the varying heating capabilities of two distinct heaters. The draft will ordinarily be admitted below the grate rather than above it when the limited fire is desired.

The ash-box P at the base of the fire-box is provided with a sliding cover Q, which normally rests on top of the hot closet J, but may be drawn forward by a rod R when the ashes are to be removed. By this device the downward draft is not interfered with in opening the ash-door S to take up the ashes, since the ash-pit is at that time cut off from the combustion-chamber by said slide. A similar slide may be provided at the other end of the hot closet to open and close the top of a dust-box U.

I claim as my invention—

1. The improved cooking and house-heating stove described consisting of the stove-body proper, the fire-box within such body and comprising the fuel-chamber above and the combustion-chamber below the grating, the tubular grate therein with connecting-pipes for continuous water circulation through such grate, a draft-inlet through the stove-body above the grate and an ash-door below it, in combination with the oven, the hot closet beneath it, and the caloric-passage from the grate downwardly, thence between the oven and hot closet, and upwardly beyond and over the oven, substantially as set forth.

2. The described convertible downward and upward draft stove, consisting of the stove-body proper, the fire-box within such body and comprising the fuel-chamber above and the gas-combustion chamber below the grate, the draft-inlet and ash-door similarly disposed, the tubular, water-containing grate between said chambers and provided with water-circulation pipes, in combination with the oven inclosed within the stove-body, the caloric-passage from said chambers entirely encircling the oven, and with the deflecting-dampers adapted to control said passage and reverse the draft through the grate, substantially as set forth.

3. In a downdraft cooking and heating stove the stove-body proper having within it the oven and the fire-box at substantially the same height, the water-circulation pipes with tubular grate dividing the fire-box into two chambers, the draft-inlet opening into the upper and the ash-door into the lower chamber, and the caloric-passage leading from the lower chamber beneath beyond and over the oven, in combination with a movable slide or cover adapted to be interposed between the combustion-chamber and the ash-space when desired, and at other times to form part of the bottom wall of the caloric-passage, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HOWARD D. W. SAWYER.

Witnesses:

A. H. SPENCER,  
D. W. WORMWOOD.