(No Model.)

S. TURNER.

MEANS FOR SUPPLYING HEAT TO BOILERS OR STOVES.

No. 579,413. Patented Mar. 23, 1897.

FIG. 1.

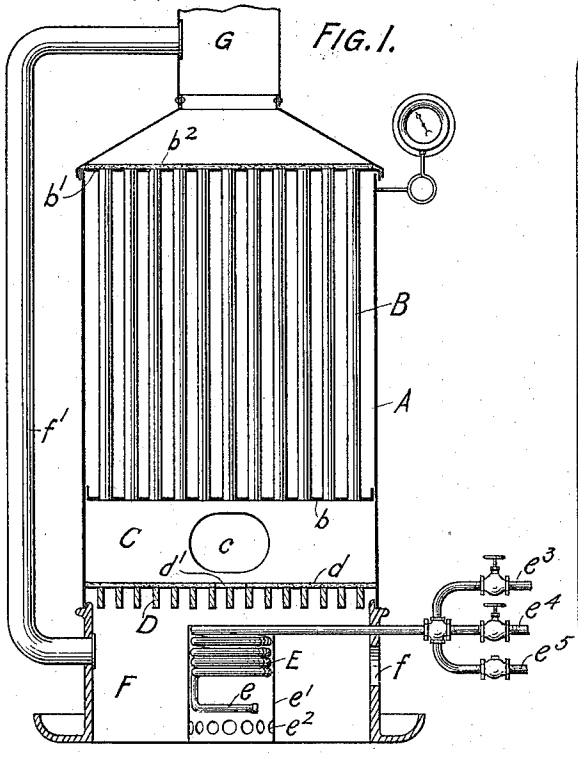


FIG. 2.

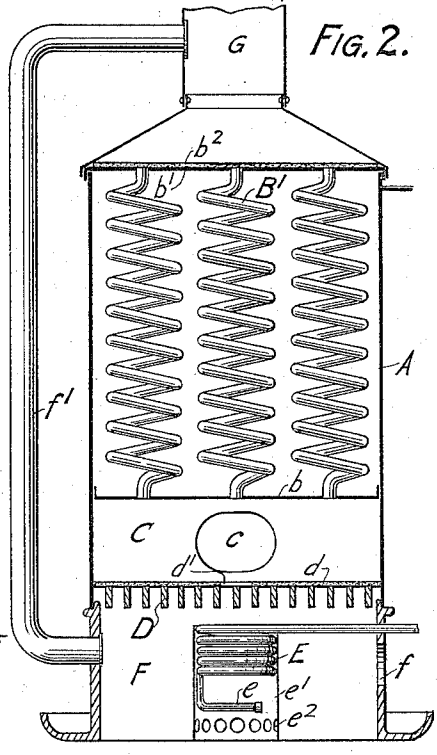
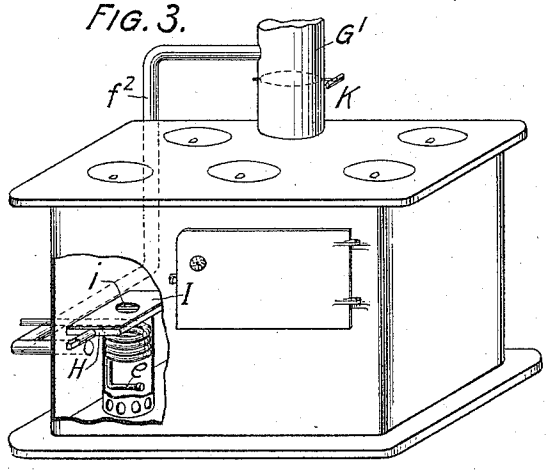


FIG. 3.



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UNITED STATES PATENT OFFICE.

SAMUEL TURNER, OF LONG BRANCH, NEW JERSEY, ASSIGNOR OF ONE-HALF TO CORA L. TURNER, OF SAME PLACE.

MEANS FOR SUPPLYING HEAT TO BOILERS OR STOVES.

SPECIFICATION forming part of Letters Patent No. 579,413, dated March 23, 1897.

Application filed July 30, 1895. Serial No. 557,615. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL TURNER, of Long Branch, in the county of Monmouth and State of New Jersey, have invented a new and useful Improvement in Means for Supplying Heat to Boilers or Stoves, of which the following is a specification.

My invention relates to an improvement in means for supplying heat to boilers and stoves, and more particularly where the heat is developed by a hydrocarbon-flame.

In boilers and stoves of ordinary type the products of combustion are passed through the fire-chamber and through the tubes or flues which communicate with the fire-chamber by the force of a draft established in the uptake.

My present invention contemplates a boiler or stove in which the fire-chamber or the tubes or flues leading from the fire-chamber are closed at the ends or portions farthest from the fire to effectually prevent any draft or passage of the products of combustion in that direction, so that the heated products of combustion are held continuously in contact with the walls of the fire-chamber and of the tubes or flues communicating therewith.

In the accompanying drawings, Figure 1 represents a boiler of the vertical tubular type, in longitudinal vertical section, embodying my invention. Fig. 2 represents a similar view of a boiler in which the tubes or flues are coiled; and Fig. 3 represents in perspective a stove, the wall being partially broken away to show the position of the burner therein.

Referring to Fig. 1, A represents the wall of the boiler, which may be of ordinary cylindrical form, in which vertical fire-tubes B extend between the heads b and b'. I have chosen a boiler of this type for the purpose of showing the ready application of my invention to boilers already in use; but it will be understood that boilers may be built especially for the purposes of my present invention without presenting some of the ordinary features found in boilers where the heat is generated by coal or solid fuel. The lower ends of the tubes B are in open communication with the fire-chamber C, while their upper ends are tightly closed in the present instance by a sheet b^2, of asbestos or other suitable non-combustible material. c represents the position of the door which leads into the fire-chamber C and which, while the heating up of the boiler is taking place, is assumed to be closed. Over the grate D, I spread a sheet of metal, or it may be a heavy sheet of asbestos d, which has formed therein a number of openings d', corresponding to the number of burners employed for heating the boiler. In the present instance I have shown one burner centrally located and one opening d' through the sheet d, which covers the grate.

The burner which I have shown is that which is shown, described, and claimed in my United States Letters Patent No. 540,369, and consists of a pipe-coil E, terminating at a point below the coiled portion in a centrally-located burner e, from which the flame extends upwardly within the coil E and through the opening d' into the fire-chamber C. The coil E is surrounded by a casing e', provided with air-openings e^2 for the admission of a supply of air to the burner e. The branch pipe e^3 leads to a supply of liquid hydrocarbon, (not shown,) the pipe e^4 to a supply of water, (not shown,) and the pipe e^5 to a pressure-chamber. (Not shown.) I have omitted to represent the supplies for the liquid hydrocarbon and the water, and also have omitted to show the return-pressure chamber, for the reason that they form no part of my present invention and are clearly illustrated and described in Letters Patent above referred to.

The burner is located within the ash-pit F, and air is admitted freely to the ash-pit through an opening f in one wall, while a draft is established by means of a flue f', leading from the ash-pit F to the uptake G.

In operation air is supplied to the burner at or near the bottom of the casing which surrounds it, and the supply of fresh air is insured by the draft established by the uptake, which continuously draws a fresh supply into the subchamber or ash-pit beneath the fire-chamber. The hot products of combustion are continuously reheated by the flame in the fire-chamber and are held in the tubes or flues

without waste, save the intentional escape of heat into the surrounding body of liquid, which is rapidly raised to and kept at the boiling-point. The opening through which the jet of flame passes into the fire-chamber is sufficiently larger than the jet to admit of the downflow of the carbonic-acid gas which results from the combustion, and which, because of its specific gravity, naturally seeks the lower portion of the fire-chamber.

In the form shown in Fig. 2 the tubes B′ are made in the form of coils instead of straight, as shown in Fig. 1. In other respects the structure shown in Fig. 2 is quite similar to that already shown and described.

In the form shown in Fig. 3 the grate H of the stove is covered by a sheet I of non-combustible material, through which there is an opening *i*, formed for the passage of the flame from the burner *e* into the fire-chamber of the stove. Draft through the fire-chamber and flues of the stove is completely cut off by the damper K, while a supply of air is drawn into the burner *e* by the action of a pipe f^2, which communicates with the subchamber or ash-pit and with the uptake G′ at a point above the cut-off damper K.

It is obvious that other forms and arrangements might be employed than those hereinabove represented and described without departing from the spirit and scope of my invention. Hence I do not wish to limit myself strictly to the structure herein described; but

What I claim is—

1. A boiler or stove provided with a fire-chamber having an opening in its bottom for the reception of a heating-flame, a subchamber below the fire-chamber and provided with an offtake or draft-flue, a burner situated within said subchamber and adapted to direct a flame into the fire-chamber and one or more tubes or flues leading from the fire-chamber, the said fire-chamber and the tubes or flues leading therefrom being permanently closed at the top to prevent a draft through them and the opening in the bottom of the fire-chamber being sufficiently larger than the jet of flame to permit the downflow of the carbonic-acid gas resulting from the combustion, substantially as set forth.

2. A boiler or stove, comprising a fire-chamber, a subchamber in communication with the fire-chamber, a hydrocarbon-burner located in the subchamber in position to direct a flame into the fire-chamber, the said fire-chamber being closed against a draft therethrough, and the said subchamber being provided with an air-inlet and a draft-flue, substantially as set forth.

SAMUEL TURNER.

Witnesses:
I. B. DECKER,
FREDK. HAYNES.