L. B. LAWRENCE & A. G. STRAWBRIDGE.

Stove Attachment.

No. 206,953. Patented Aug. 13, 1878.

Fig. 1

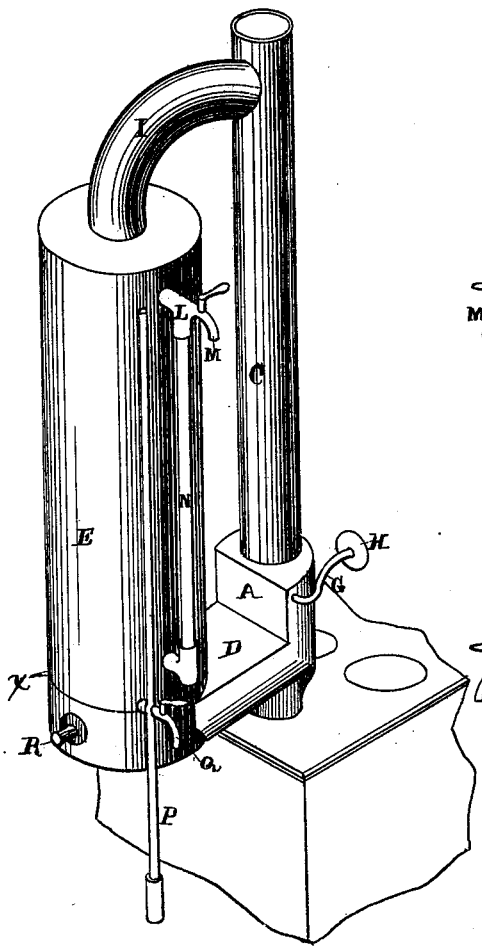
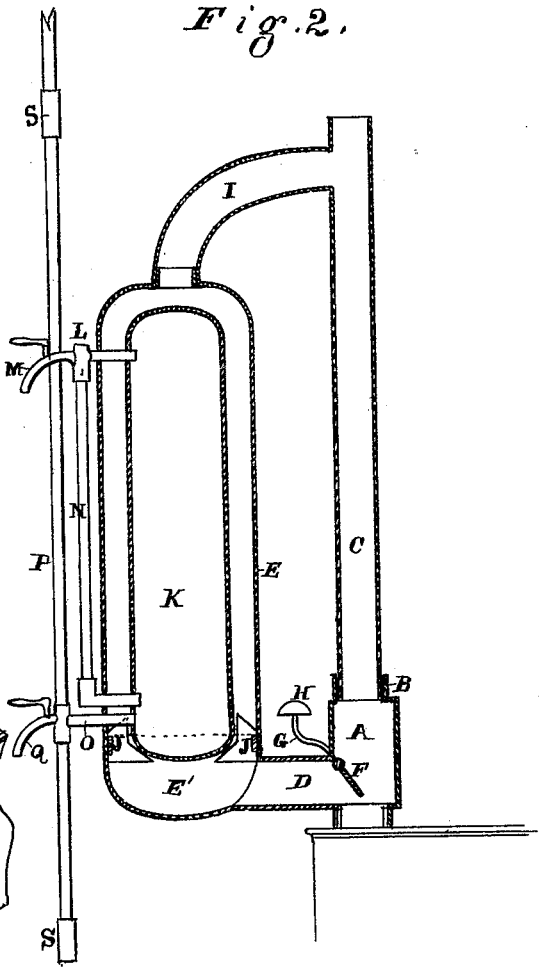


Fig. 2.



Witnesses

Geo. N. Strong.

Frank A. Brooks

Inventor

Lorenzo B. Lawrence and

Alfred G. Strawbridge.

by Dewey & Co.

attys

UNITED STATES PATENT OFFICE.

LORENZO B. LAWRENCE, OF MONTICELLO, CALIFORNIA, AND ALFRED G. STRAWBRIDGE, OF SHARON, PENNSYLVANIA.

IMPROVEMENT IN STOVE ATTACHMENTS.

Specification forming part of Letters Patent No. **206,953**, dated August 13, 1878; application filed June 18, 1878.

To all whom it may concern:

Be it known that we, LORENZO B. LAWRENCE, of Monticello, Napa county, California, and ALFRED G. STRAWBRIDGE, of Sharon, Mercer county, Pennsylvania, have invented an Improved Water Heating and Elevating Attachment for Stoves; and we do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings.

Our invention relates to an improved water heating and elevating attachment for stoves; and consists in attaching to a stove a chamber inclosing a valve for directing the heat either up the stove-pipe in the usual way or through a flue into a cylinder which connects with the stove-pipe at a point some distance above the stove. Inside of this cylinder is placed a tank having a pipe and faucet at the top and projecting through the cylinder, and at the bottom is another pipe connecting with a tube leading to the well, cistern, or reservoir. By directing the heat into the cylinder and around the tank the air in the tank is expanded and driven out. By turning the hot draft out of the cylinder and up the stove-pipe, and admitting cold air around the tank inside the cylinder, a partial vacuum is formed in the tank; then the power of the vacuum will draw the water up into the tank from the well or cistern through a check-valve in a tube. When the tank is filled, the heat may be turned into the cylinder again, and the water in the tank heated for household purposes.

Referring to the accompanying drawings, Figure 1 is a perspective view of the device. Fig. 2 is a vertical section.

A represents the chamber for the draft-valve, which is so constructed as to fit and rest on the collar usually formed on the back of ordinary stoves for the stove-pipe. On the upper end of this chamber A is formed the collar or flange B, on which the stove-pipe C fits, the chamber A then forming simply a part of the stove-pipe or flue. Extending horizontally from this draft-valve chamber is the flue D, connecting with the base E′ of the cylinder E, which is supported on a pedestal in the proper position, as shown. The cylinder E is detachable from the base E′ at *x*. In this chamber A is placed the draft-valve F, which is operated by the arm G, having a counter-balance-weight, H, on its upper end. The rod on which the arm G is fastened, and which serves as the hinge for the draft-valve, passes transversely through the chamber A at the point where the upper end of the flue D connects with said chamber A. Then, by turning the arm G one way or the other, the heat and flame may be either directed up the stove-pipe in the usual way or into the cylinder E, for the purpose hereinafter described. From the position in which the valve is hung and the peculiar shape of the chamber A, the valve in either position sets at the proper angle to most easily direct the heat on its proper course, and the weight H on the upper end of the arm keeps the valve to its seat.

The large outer cylinder, E, has formed on its upper end a collar, on which is fitted a pipe, I, which connects with the stove-pipe or flue C at its upper part, as shown. By this means connection is made with the stove-pipe for the flame and heat through the flue D, cylinder E, and pipe I, when the draft-valve is turned so as to direct the products of combustion that way. When the valve is turned back the passage through the flue D is closed, and the heat rises through the pipe C, in the usual manner, without passing through the cylinder E.

On the inner lower portion or base, E′, of the cylinder E are placed the lugs or flanges J, which serve as supports for the tank K. By this means the tank K is supported inside the cylinder, so as to leave a space under, around, and above said tank, between it and the inner sides of the cylinder E, leaving a free passage for the heat and products of combustion to pass up into the stove-pipe, as described, while at the same time they entirely surround the tank.

Projecting through the cylinder E, and connecting with the tank K, is the pipe L, having a faucet or valve, M. Connecting with this same pipe L is the gage N, which extends down outside the cylinder E, and shows the height of the water in the tank K. Another pipe, O, projects through the cylinder E, and connects with the lower end of the tank K inside the cylinder.

Communicating with this pipe O is the water-tube P, connecting below with the tank, well, or cistern, and extending up to any desired distance. A faucet, Q, is attached to the outer end of the pipe O for drawing off water. An air-valve, R, is placed in the cylinder E, near the lower end. Check-valves are placed in the pipe P below the faucet Q, and also at the upper end of said pipe.

The operation of our device is as follows: When it is desired to fill the tank with water the draft-valve F is turned so that the heat from the fire is directed through the flue D into the chamber formed by the space between the tank K and the cylinder E, thus circulating entirely around the tank, and finally escaping through the pipe I and stove-pipe C. The heat around the tank expands the air inside said tank, and by turning the cock M the expanded air comes out through the pipe L into the open air, or, if this cock is closed, the air may escape through the pipe O and check-valve S in the upper part of pipe P.

After the heat has been applied to the tank in the manner described for a sufficient time, the cock M is closed, if open; or, when the cool air comes in, the upper check-valve drops and closes, and the draft is turned out of the flue D into the stove-pipe C. The air-valve R is then opened to admit cold air, and the tank K then gradually cools, and the expanded air or vapor in the tank is cooled or condensed, thus forming a partial vacuum in the tank; then the lower check-valve, S, opens, and the water is drawn up through the lower part of the tube P into the pipe O and into the tank K by well-known natural principles.

After the tank K is filled the lower check-valve S in the pipe P holds the water, and the water remains in the tank, whence it may be drawn off by the faucet Q whenever needed. After the tank is filled, by directing the heat around it again the water will become heated for use.

When the tank K is emptied the process, as herein described, may be repeated.

It will be seen that, by resting the tank K on a bell-crank, instead of the lugs J on the cylinder E, the weight of water may be made to operate the bell-crank lever and change the direction of the draft—that is, when the tank is filled to a certain height its weight may depress the lever, close the air-valve, and turn the draft-valve, so that the hot blast from the fire will pass around the tank and heat the water in it. Now, when the tank becomes emptied, and is still hot, it rises by a spring or counter-balance on the bell-crank arm, and turns the draft out of the flue D and up the chimney, at the same time opening, by suitable connections, the air-valve R. A vacuum soon forms, and the check-valves operate automatically, allowing the tank to be again filled, when its weight turns the heat on again, as before.

By this means we provide an arrangement which draws the water up from a reservoir, well, or cistern into a tank, and heats it, all being accomplished by means of the ordinary waste-heat from a stove.

After the water once becomes heated the pressure of vapor or steam in the tank will force the water to an upper story of the house, if the faucet M is closed. If this is open, it may be drawn from the faucet Q.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. The valve-chamber A, fitted to the escape-passage of the stove, and having the collar B for the pipe C, together with the flue D, opening into the base E′, in combination with the valve F, whereby the heat is turned into the chamber E or diverted to the pipe C, substantially as herein described.

2. The chamber A, with its flues C and D, valve F, and the exterior air-cylinder E, with its air-valve R, and the pipe I, in combination with the interior tank K, with its pipes O P, substantially as and for the purpose herein described.

3. The chamber A, with its flue D, valve F, and the base E′, said base being provided with the lugs or flanges J, to support the interior cylinder or tank K, and fitted to receive the air-cylinder E, substantially as herein described.

In witness whereof we have hereunto set our hands and seals.

L. B. LAWRENCE. [L. S.]
ALFRED G. STRAWBRIDGE. [L. S.]

Witnesses:
FRANK A. BROOKS,
WM. H. THOMPSON.