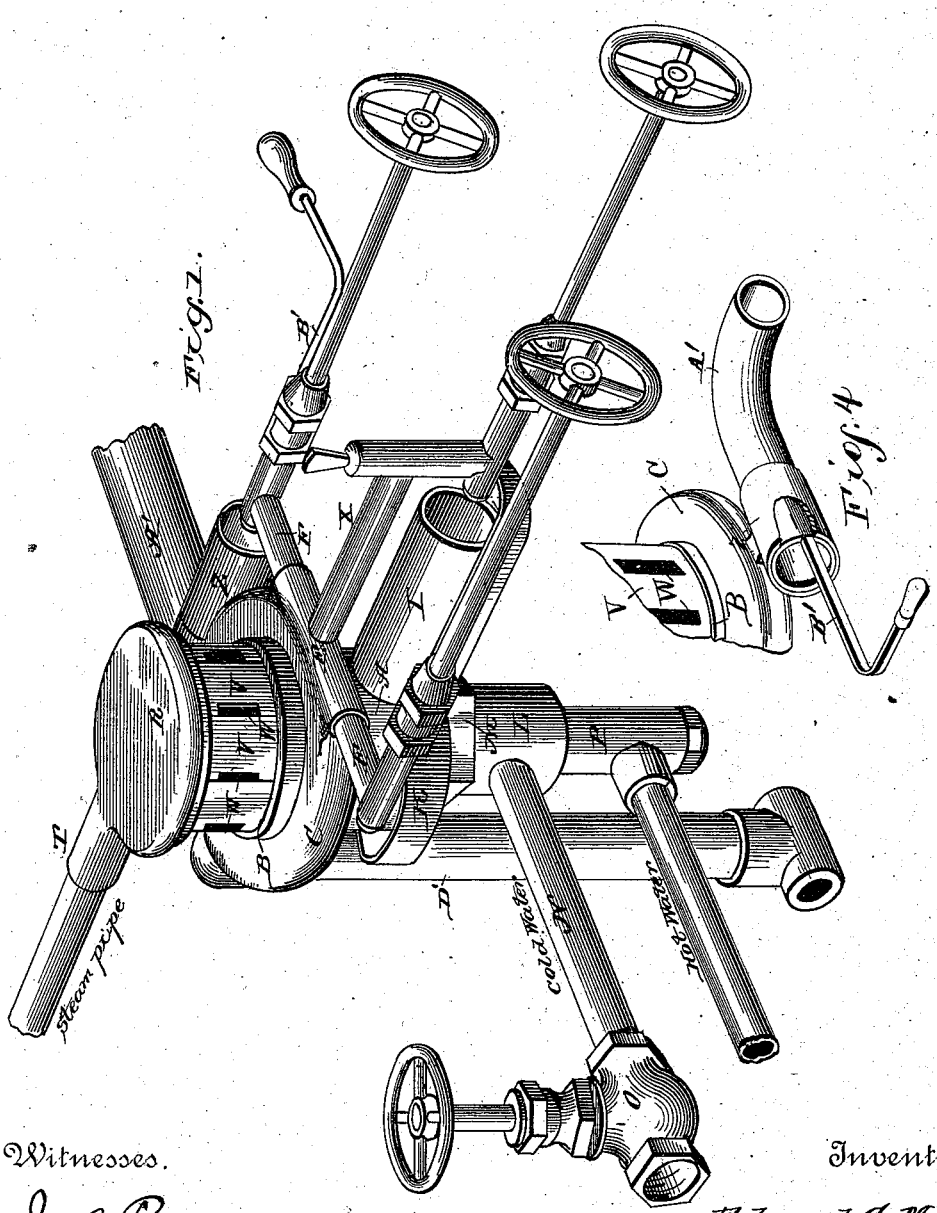
(No Model.) 2 Sheets—Sheet 1.

E. G. MARTIN.

VAPOR BURNER.

No. 381,153. Patented Apr. 17, 1888.



Witnesses.

Jos. A. Ryan

J. W. Garner

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C. L. Crowell & Co

(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

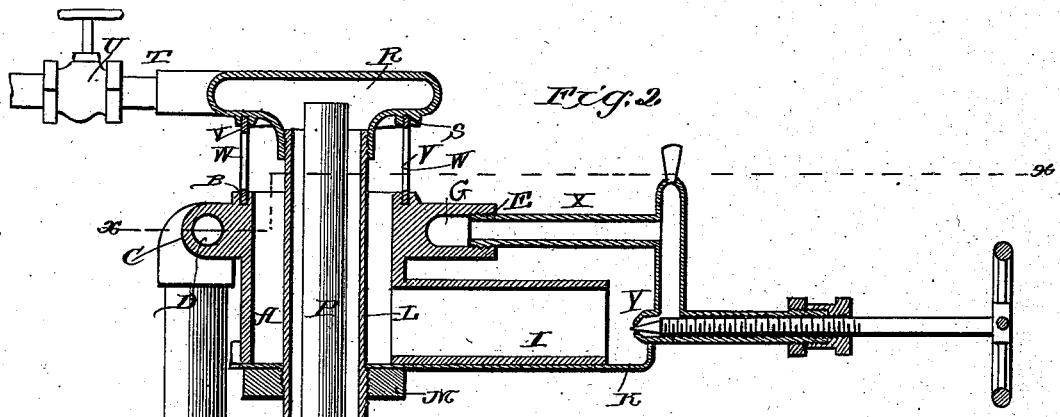
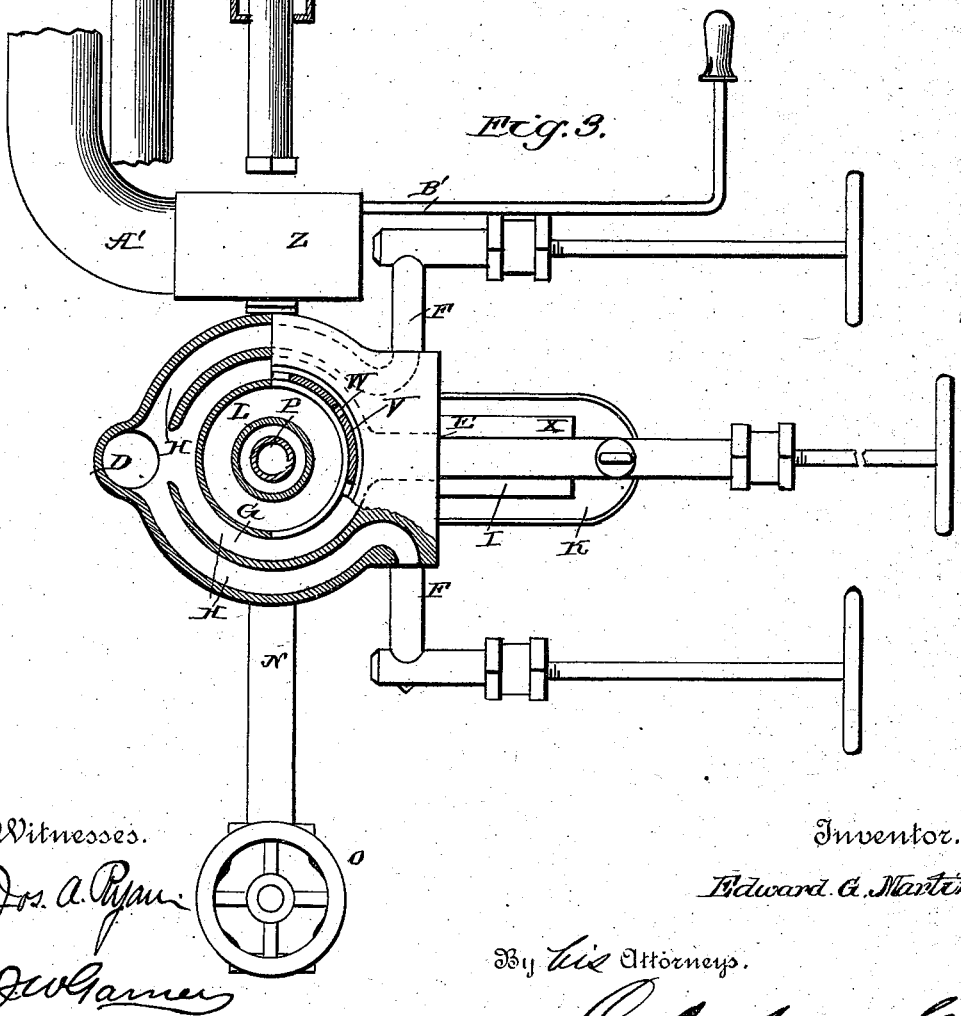


Fig. 3.



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C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

EDWARD GEORGE MARTIN, OF CONCORDIA, KANSAS.

VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 381,153, dated April 17, 1888.

Application filed June 17, 1887. Serial No. 241,649. (No model.)

To all whom it may concern:

Be it known that I, EDWARD GEORGE MARTIN, a citizen of the United States, residing at Concordia, in the county of Cloud and State of Kansas, have invented a new and useful Improvement in Vapor-Burners, of which the following is a specification.

My invention relates to an improvement in vapor-burners; and it consists in the peculiar construction and combination of devices that will be more fully set forth hereinafter, and particularly pointed out in the claims.

The object of my invention is to provide a vapor-burner which is adapted to heat water and to generate steam at the same time that the flame is used for ordinary cooking purposes, thus enabling the vapor-stove to be supplied with steam and hot water without any greater expense than that incidental to maintain the flame ordinarily used, and thereby effecting a great economy in fuel and enhancing the convenience and utility of vapor-stoves.

In the accompanying drawings, Figure 1 is a perspective view of a vapor-burner embodying my improvements. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a horizontal sectional view taken on the line *x x* of Fig. 2. Fig. 4 is a detail view.

A represents a cylindrical cup, which is made of metal and is provided in its upper edge with an annular groove, B.

C represents an annular chamber, which is formed on the outer side of the cup and is integral therewith. The said chamber, which constitutes the generating-chamber, is provided on one side with an inlet-opening, D, and on the opposite side with an outlet, E, and has tubes F extending horizontally therefrom in opposite directions.

G represents an annular channel which is formed in the vapor-generator and communicates with the opening E, and the other side of the annular channel communicates with the inlet-opening D.

H represents a pair of curved channels, which are formed in the vapor-generator on the outer side of the channel G. The said channels H communicate at one end with the tubes F, and the other ends of the said channels communicate with the inlet-opening D. The cup A constitutes a commingling-chamber and is provided on the side opposite the inlet-opening D with an induction-tube, I, which extends horizontally from its lower side.

K represents a drip-cup, which is arranged on the lower side of the cup A.

L represents a short vertical tube, which is of considerable diameter, has its upper end open and its lower end closed, and passes up through the cup A and drip-cup K. The outer side of this tube L is provided with screw-threads at a suitable distance from its lower end.

M represents a clamping-nut which screws on the tube L and bears against the under side of the drip-cup, and serves to support the said drip-cup and hold it close against the cup A or commingling-chamber, as shown, the drip-cup K forming the bottom of the cup A.

N represents a cold-water pipe, which communicates with the lower end of the pipe L, is adapted to convey water thereto from a suitable reservoir or other source of water, (not shown,) and is provided with a stop-cock, O, by means of which the supply of water to the pipe L may be regulated.

P represents a pipe, which is of considerably less diameter than the pipe L and extends upward through the same, and is fitted snugly in an opening in the bottom thereof. This pipe P is designed to be connected to a suitable receiver for hot water, which is also not shown, as it forms no part of my present improvement.

R represents a hollow circular cap, which has a threaded opening in its lower side adapted to engage the upper end of the pipe L. On the lower side of the cap R, at a suitable distance from the edge, is formed an annular groove, S, the diameter of which is equal to the diameter of the groove B. The upper end of the hot-water pipe E extends a slight distance above the upper end of the cold-water pipe L, as shown in Fig. 2. From one side of the cap R extends a steam-pipe, T, which may be connected to any desired receptacle for steam, and is provided with a stop-cock, U. The space between the upper edge of the commingling cup or chamber A and the lower side of the cap R is closed by a series of

segmental burner-plates, V, which are made of steel and have their upper and lower edges secured respectively in the grooves S and B. Each of the said burner-plates V is provided on one side with a narrow vertical opening, W, so that spaces are left between the opposing edges of the burner-plates.

From the foregoing description it will be readily understood that the cap R may be screwed from the upper end of the pipe L, so as to uncover the commingling-chamber and permit the burner-plates to be removed and cleaned or replaced by new ones. This removable cap R also enables access to be readily gained to the interior of the burner, so that the same may be cleaned when necessary in very short time and with little trouble.

The tubes F, which project from opposite sides of the vapor-generator, are provided with horizontal openings, which are arranged at right angles to and intersect their bores, and in the said openings are located needle-valves of the usual construction, which are provided with stuffing-boxes, such as are commonly employed.

X represents a pipe which extends from the opening E, and is bent downward and communicates with a valve case or socket, Y, which is arranged opposite the outer end of the induction-tube I. In this sleeve or socket is located a third needle-valve, as shown. On one side of the vapor-generator is secured a horizontal sleeve, Z, one end of which is opposed to one of the needle-valves in the tubes F.

A′ represents the curved elbow-pipe, which has one end fitted in the sleeve Z, and is adapted to turn therein, so as to direct the vapor from the burner in any desired direction. The latter is provided with a projecting handle-rod, B′, whereby it may be turned and thus caused to direct the vapor into either of the series of pipes.

The operation of my invention is as follows: Initial heat is obtained in the ordinary manner by igniting a small quantity of oil in the drip-cup, thus causing the burner to become heated. Oil is then supplied to the generating-chamber through the usual stand-pipe, D′, which leads from a suitable reservoir and communicates with the inlet-opening D. A portion of this oil passes through the channel G and becomes vaporized therein, and is injected by the valve Y into and through the induction-pipe I. A suitable quantity of air is drawn into the commingling-chamber with the vapor, and is then mixed with the same to render the vapor combustible, when it ignites as it passes through the openings W between the burner-plates, thereby supplying heat sufficient for cooking purposes and at the same time heats the cap R to a very intense degree. The remainder of the oil finds its way through and becomes vaporized in the channels H, and is discharged by the needle-valves in the tubes F, to form auxiliary flames or jets. By thus providing the gas-generator with a series of channels, each of which leads to one of the burners, the latter are kept constantly supplied with vapor. Heretofore, as far as I am aware, vapor-burners have been provided with only a single channel to supply oil to the flames, and it frequently happens that a single channel cannot feed vapor to the flames in proper quantities, and consequently the flames go out and permit the escape of vapor and render the burner dangerous.

In order to obtain a supply of hot water, the stop-cock N is opened and cold water is admitted to the pipe L and rises therein to the cap R, where it becomes thoroughly heated instantaneously. If the stop-cock in the steam-pipe is closed, the heated water will descend from the cap R through the hot-water pipe P to the suitable reservoir or receptacle therefor.

If it is desired to obtain steam, the stop-cock in the steam-pipe is opened, and as the cold water reaches the cap R it becomes instantly converted into steam, and the steam escapes through the pipe P, as will be readily understood.

Having thus described my invention, I claim—

1. The combination of the vapor-burner, the chamber or cap R, arranged above the same, the supply-pipe L, communicating with the cap or chamber R and extending through the burner, and the hot-water eduction-pipe P, extending through the pipe L into the cap or chamber R, substantially as described.

2. The vapor-burner having the commingling-chamber, in combination with the water-supply pipe L, extending through the commingling-chamber, the cap or steam-chamber R, secured to the upper end of pipe L and arranged above the commingling-chamber, the steam-pipe T, extending from said cap or chamber R, and the eduction-pipe P, extending through pipe L and communicating with the cap R, substantially as described.

3. The combination of the commingling cup or chamber A, having the groove B in its upper edge, the pipe L, extending up from the commingling cup or chamber, the cap R, screwed to the upper end of the said pipe and removable therefrom, and having a groove, S, on its lower side, the burner-plates V, having openings W, and secured in the grooves S and B, and the eduction-pipe P, communicating with cap R, substantially as described.

4. A vapor-burner having the generating-chamber provided with the inlet-opening D, the chambers G and H, communicating at their inner ends with the said inlet-opening, and the pipes F and X, attached to the outer ends of said chambers, substantially as described.

5. The combination, in a vapor-burner, of the needle-valve, the sleeve Z, secured to one side of the burner-head, the elbow A′, having its inner end pivoted in the sleeve arranged opposite the point of the needle-valve and forming a commingling-chamber in which the vapor is mixed with air, and the handle B′, at-

tached to the said elbow and adapted to turn the same in the sleeve, substantially as described.

6. The vapor-burner having the commingling-chamber A, in combination with the hollow cap R, arranged above the commingling-chamber, the pipe to supply said cap with water, the eduction-pipe, and the burner-plates V, having openings W, and secured between the cap R and commingling-chamber, substantially as described.

7. The vapor-burner having the commingling-chamber, in combination with the needle-valve, the supply-pipe L, extending through the commingling-chamber, the cap or steam-chamber R, secured to the upper end of pipe L and arranged above the commingling-chamber, the eduction-pipe P, communicating with the cap and extending down through the pipe L, the drip-cup arranged against the lower side of the commingling-chamber, and the nut M, secured to the pipe L and bearing against the drip-cup, substantially as described.

8. In combination with the commingling-chamber *a*, the cap R and the burner-plates V, having openings W, and secured between the cap and the commingling-chamber, as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

EDWARD GEORGE MARTIN.

Witnesses:
F. L. CORON,
H. G. MARTIN.