(No Model.)

M. H. CLIFFORD.

APPARATUS FOR HEATING WATER.

No. 393,819. Patented Dec. 4, 1888.

Fig. 1.

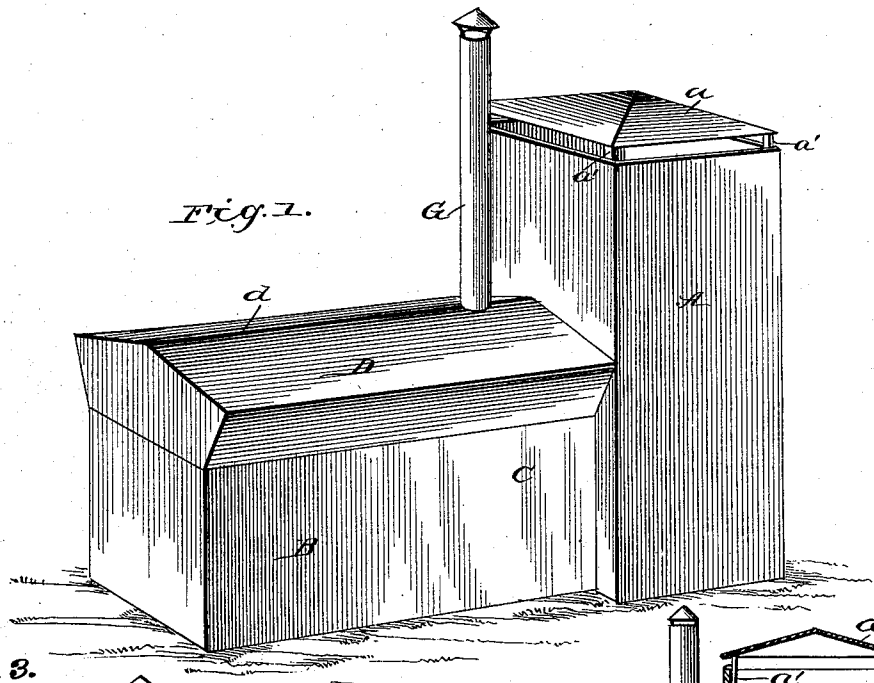


Fig. 3.

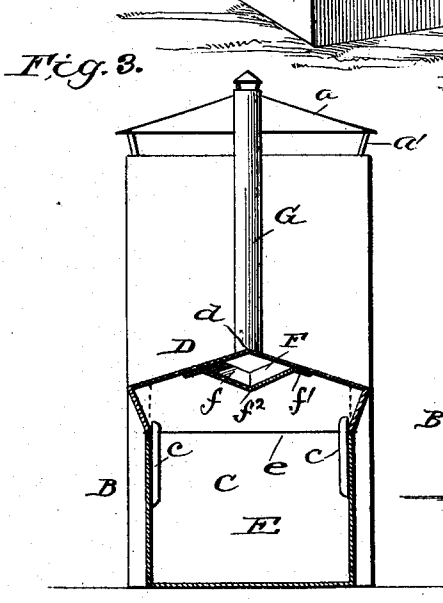


Fig. 2.

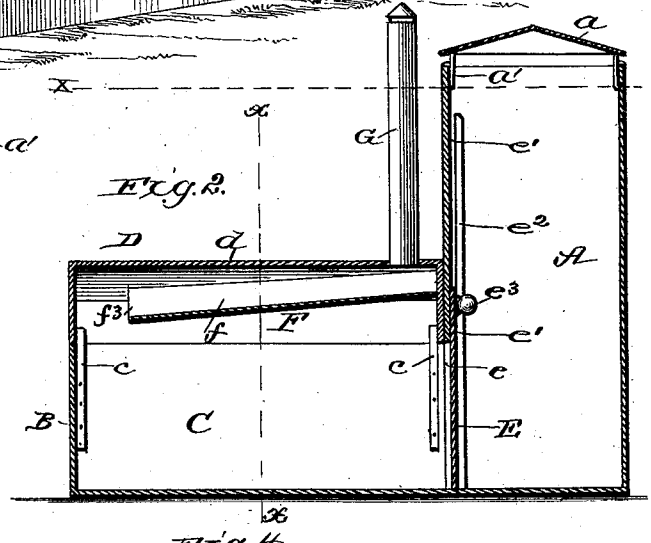
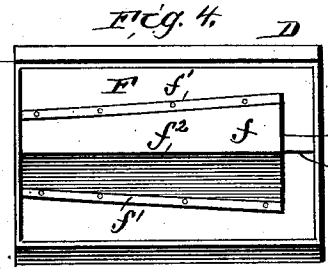


Fig. 4.



Witnesses,

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UNITED STATES PATENT OFFICE.

MARTIN H. CLIFFORD, OF NORTH HAVERHILL, NEW HAMPSHIRE.

APPARATUS FOR HEATING WATER.

SPECIFICATION forming part of Letters Patent No. 393,819, dated December 4, 1888.

Application filed April 12, 1888. Serial No. 270,394. (No model.)

To all whom it may concern:

Be it known that I, MARTIN H. CLIFFORD, a citizen of the United States, residing at North Haverhill, in the county of Grafton and State of New Hampshire, have invented new and useful Improvements in Apparatus for Heating Water, of which the following is a specification.

The invention relates to improvements in apparatus for heating water for the use of horses and stock in winter; and it consists in the construction and novel combination of parts, hereinafter described, illustrated in the accompanying drawings, and pointed out in the claim hereto appended.

In the drawings, Figure 1 represents a perspective view of an apparatus embodying the invention. Fig. 2 represents a central vertical longitudinal section of the same. Fig. 3 represents a vertical section on the line $x\ x$ of Fig. 2, showing the sliding gate and the horizontal flue. Fig. 4 is a plan view of the under side of the roof.

Referring to the drawings by letter, A designates a rectangular vertical casing, of sufficient size and height, having upon it the removable hood a, which hood rises to an apex from all four sides, and is supported on the upper corners of the casing A by the short posts a', leaving an inward air-draft space between the lower edge of the hood and the upper edge of the casing.

B is a horizontal casing extending from one side of the casing A and composed of the lower fixed horizontal section, C, and the upper detachable section, D, fitted water-tight upon the lower section and held in place by the posts c, rising in or near the corners of the lower section, projecting thereabove, and entering the corresponding corners of the upper section. The said upper section has outwardly-inclined sides, a roof converging upwardly from each side to the central longitudinal ridge, d, and closed ends.

The side of the casing A adjacent to the casing B is cut away to a point flush with the upper edges of the casing B, forming the communicating opening e between the two casings, which opening may be entirely or partially closed by the gate E, sliding in the ways e', formed by vertical strips e^2, secured to the adjacent side of the casing A. The said gate has secured to it, near its upper edge and within the casing A, the knob or handle e^3, by means of which it may be raised and lowered to the inner side of the roof of the section D. The air-flue F is formed by the metallic plate f, secured through openings in its flanges f' to the roof, and having the central longitudinal depending ridge, f^2, vertically below the ridge d of the roof. The said flue is open at its outer end, f^3, but closed at its inner end, and decreases regularly in area of cross-section from the former to the latter.

G is a vertical chimney rising from the roof of the section D to a suitable height above the casing A and opening below into the flue F, near the inner end thereof. The said chimney is provided on top with a suitable cap provided with legs secured to the top of the chimney. The bottom, top, and walls of the apparatus are of sheet metal, preferably of sheet-iron so prepared on the outside that it will not oxidize.

To heat the water, the apparatus is placed in a sufficiently large tub and water poured in till the same reaches the level of the horizontal line x on the casing A. The hood of the said casing is then detached and a suitable lamp is placed on the floor. The lamp is then lighted and moved into the casing B, the gate E placed at the proper height to produce the desired draft, and the hood replaced. The cold air then passes in between the hood and casing A, down said casing, and under the gate E to the lamp, where it becomes heated, and passes along the roof of the section D, through the flue F, escaping into the open air through the chimney G. In its progress the hot air imparts its heat to the sheet-metal walls and roof of the apparatus, and the latter impart it to the surrounding water. The rapidity with which the water is heated and the amount of heat imparted thereto can be regulated by adjusting the gate E to different heights.

Having described my invention, I claim—

In an apparatus to heat water for stock, the combination of the vertical casing A, having the hood a, the longitudinal casing B, opening into the side of the casing A and composed of the lower and upper sections, C D, respect-

ively, the latter having the central longitudinal ridge, *d*, the sliding gate E, moving in ways formed by vertical strips secured within the casing A, the flue F, open at its outer end, closed at its inner end, and gradually decreasing in transverse area from the former to the latter, and the vertical chimney G, rising from the roof of the section D and opening into the flue F, near the inner end thereof, the walls and roof of said casings being of sheet metal, substantially as described.

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

MARTIN H. CLIFFORD.

Witnesses:

NEWELL C. WRIGHT,

ENOCH R. WEEKS.