

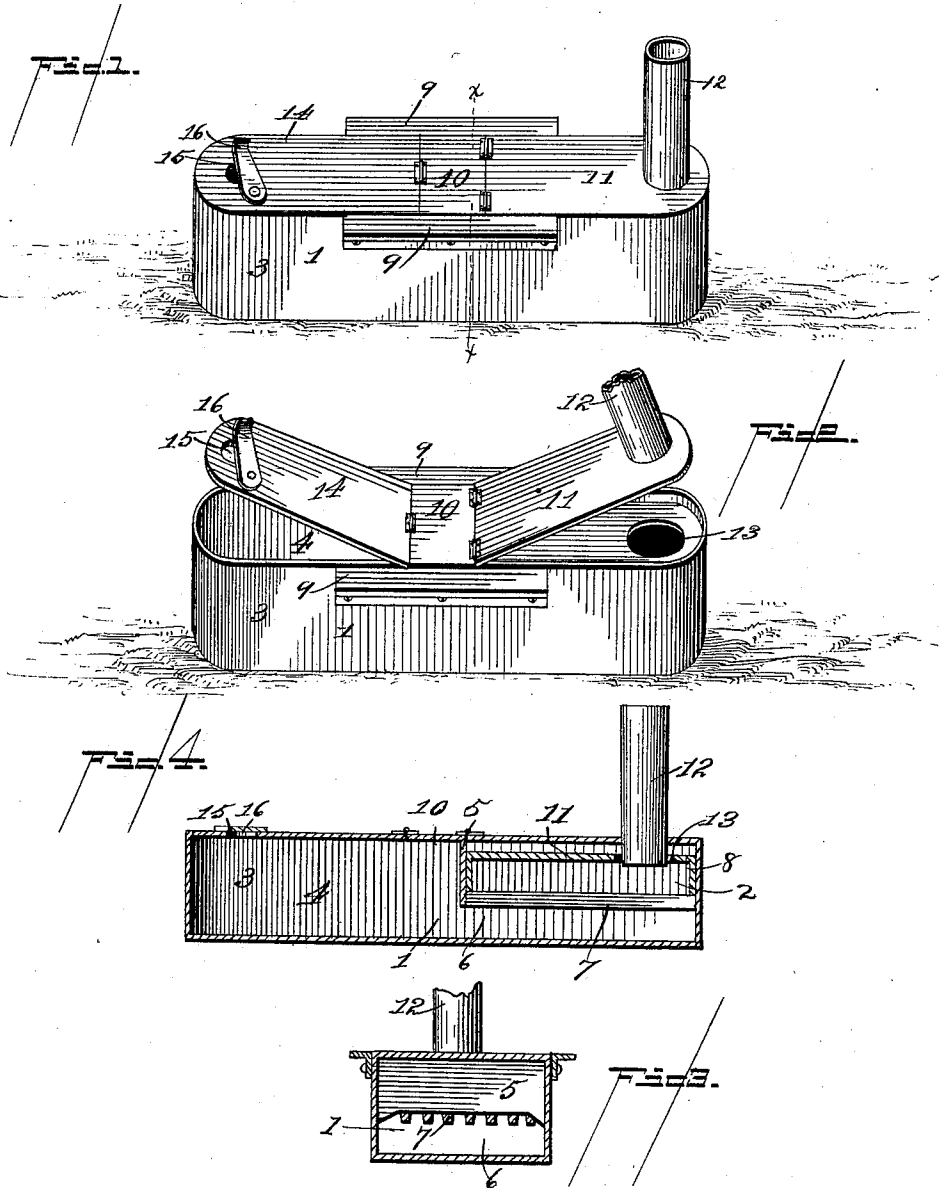
(No Model.)

A. J. UPHAM.

TANK HEATER.

No. 387,462.

Patented Aug. 7, 1888.



WITNESSES.

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UNITED STATES PATENT OFFICE.

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TANK-HEATER.

SPECIFICATION forming part of Letters Patent No. 387,462, dated August 7, 1888.

Application filed February 21, 1888. Serial No. 264,819. (No model.)

To all whom it may concern:

Be it known that I, ANDREW J. UPHAM, a citizen of the United States, residing at Sycamore, in the county of De Kalb and State of Illinois, have invented certain new and useful Improvements in Tank-Heaters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

My invention has reference to certain improvements in tank-heaters; and it consists, essentially, in a fire-chamber so situated as to be projected within the water, and of means for providing ready access to the furnace, and at the same time increasing the radiating-surface of the heater.

My invention is designed to be nearly wholly submerged in the tank of water, and is more especially adapted for use in connection with tanks employed to hold water for stock. The use of wind-pumps for raising and furnishing water to stock has necessitated the adoption of large tanks to hold water in reserve, the pumping not being continuous. During the winter-months, and particularly in very cold weather in the northern and northwestern States, unless some provision be made against the freezing of the water the latter will become solid ice, which not only prevents the use of the tank for the purpose intended, but will cause the pumped water to run off and be lost, and sometimes, by the congelation, the tank is destroyed.

It has also come to be an accepted fact that in extreme cold weather very cold water is injurious to stock, even if they can be induced to drink a sufficient quantity thereof, and therefore it has become both necessary and desirable to heat the water in the tank to a sufficient degree to prevent its freezing and render it more healthful for the stock. As these tanks are of wood and seated usually on or slightly beneath the ground, it is impracticable to heat the water therein from beneath, and the only practicable mode of accomplishing such heating is by submerging the heating mechanism in the upper portion of the water.

There are difficulties in the situation which do not obtain in the use of ordinary heating-stoves. The fire, to properly economize the heat, must be placed below the water-line, and the water of course excluded from the fire. Air must be furnished from above to the grate, and also access to portions of the fire must be afforded in order to properly provide and keep the necessary draft. Coal is usually employed for fuel, as requiring the least room and attention, and those familiar with the management of coal-fires are aware that the care of the grate and ash-pan are essential for the proper control of such fires.

In the drawings, Figure 1 is a perspective of a heater embodying my invention. Fig. 2 is the same with the top open. Fig. 3 is a cross-section in the line *x x* of Fig. 1. Fig. 4 is a longitudinal section view thereof.

1 is an oblong chamber constructed of sheet-iron, cast-iron, or other suitable material, having a closed bottom and sides, and contains at one end the furnace 2, and at the other the fire-shield 3, inclosing the draft and access chamber 4. A partition, 5, (see Fig. 3,) is placed about centrally transversely across the upper portion of the interior of the chamber 1, leaving an opening, 6, thereunder for access to the grate 7 and fire-pot 8 from the chamber 4.

On the sides of the chamber 1 and near the top of the latter are suitably attached outwardly-extending horizontal flanges 9, which flanges respectively are placed and rest upon the slats suitably fastened across and to the tank at such altitude that when the chamber 1 rests with its flanges 9 on the upper surface of such slats the water in the tank will be about the height of the lower surface of the flanges 9 and nearly even with the top of chamber 1.

A transverse brace, 10, is suitably fastened centrally to the top of the chamber 1. On the rear portion of the chamber 1, and over the interval in the top thereof between the adjacent sides of the brace 10 and the rear end of the chamber 1, is fitted a lid, 11, which is suitably hinged to the brace 10 and provided with the usual smoke-stack, 12, which communicates at its lower end through the lid 11 with the furnace directly beneath. An ordi-

nary grate, 7, and fire-pot 8 are seated removably in any obvious manner within the rear end of the chamber 1 and directly under the lid 11. In the upper end of the fire-pot 8 (see Fig. 2) there is formed a central opening, 13, which communicates with the lower end of pipe 12 when lid 11 is closed, and by grasping the fire-pot 8 in the hole 13 therein, such pot can be lifted from the chamber 1 for convenience in starting the fire, and then replaced, or can be removed for any other purpose.

The front portions of the vertical walls of the chamber 1 form a shield, 3, which excludes the water in the tank from the furnace-chamber 2. Within the shield 3 and between it and the partition 5 is provided a chamber, 4, through which ready access is afforded to the fire-pot 8 and grate 7 under the lower edge of the partition 5 for the purpose of removing the ashes and clinkers, thus affording draft to the lower portion of said grate and fire-pot. A lid, 14, is suitably hinged to the brace 10 at the side thereof opposite to the hinged connection thereto of lid 11. The lid 14 is adapted to close the top of the access-chamber 4. In the lid 14 is formed an air-entrance, 15, and the admission of air therein is governed by a sliding plate or cut-off, 16, pivoted on the upper surface of the lid 14 and adapted to adjustably cover the opening 15 and to regulate the size of said opening, as may be desired.

In the advantages of my invention the shield 3 not only provides a sealed access-

chamber 4, but also increases the radiating-surface of the device. Hot coals and ashes can be drawn from the fire-pot 8 out into the bottom of the access-chamber 4 and there allowed to remain until the heat therein has been utilized in heating the surrounding water. The ready access to the fire-pot 8 through the chamber 4 renders it unnecessary to take out the fire-pot for the purpose of removing said ashes and clinkers and other refuse at the bottom thereof, which otherwise unremoved would choke out the fire, and as the fire can be readily started in the pot 8 while in place, the heater can be permanently fastened in the tank.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

The water or liquid heater, consisting of a chamber provided with a grate and a removable fire-pot resting thereon, said fire-pot being provided with an opening in its top, a hinged cover and a smoke-pipe attached thereto, said pipe being adapted to rest in the opening in the top of the fire-pot when the cover is in a closed position.

In testimony whereof I affix my signature in presence of two witnesses.

ANDREW J. UPHAM.

Witnesses:

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