No. 688,658. Patented Dec. 10, 1901.

W. H. LOY & A. B. CARHART.

TANK HEATER.

(Application filed Feb. 27, 1901.)

(No Model.)

Fig. 1.

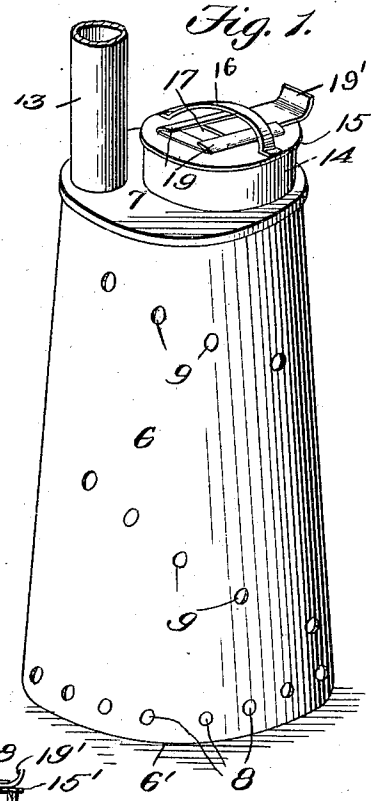


Fig. 2.

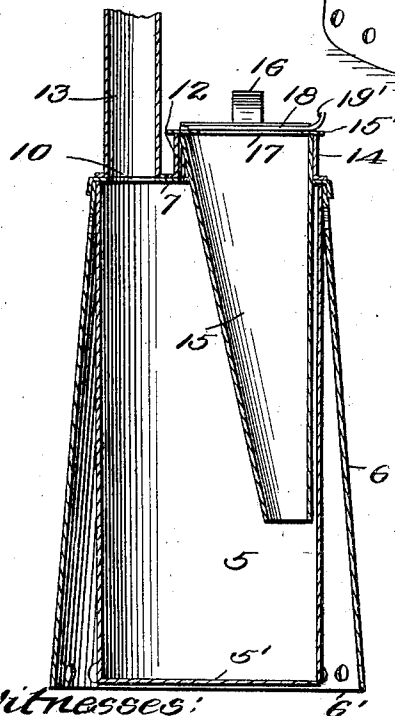
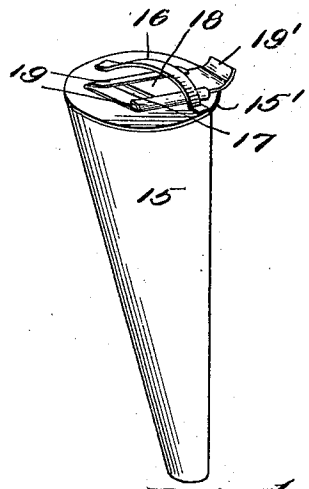


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM H. LOY AND ARLINGTON B. CARHART, OF MANCHESTER, IOWA.

TANK-HEATER.

SPECIFICATION forming part of Letters Patent No. 688,658, dated December 10, 1901.

Application filed February 27, 1901. Serial No. 49,125. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM H. LOY and ARLINGTON B. CARHART, citizens of the United States, residing at Manchester, in the county of Delaware and State of Iowa, have invented new and useful Improvements in Tank-Heaters, of which the following is a specification.

This invention relates to tank-heaters, and the improved device is particularly adapted to heat a large quantity of water evenly and thoroughly with a comparatively small quantity of fuel, and its construction is such that it affords ample circulation for the water without the presence of coils or tubes, and it is simple and not liable to rust or to destruction by heat.

The improved tank-heater includes as one of its essential features separated outer and inner drums, the inner drum being adapted to receive a suitable heating agent and the outer drum having a lower series of perforations for the admission of cold water and having a second series of perforations located above the other ones for the warm water to pass therethrough from said outer drum. These upper perforations provide for a perfect circulation of water as soon as a fire is started in the inner or heating drum. The space between the drums gradually diminishes toward the top thereof, so as to give a momentum to the current of warm water passing out of the upper series of perforations. This reduction in space we may secure by tapering the outer drum toward its top.

The invention includes other advantageous features, which, with the foregoing, will be hereinafter described at length, and the novel features will be set forth in the claims.

In the drawings accompanying and forming a part of this specification, Figure 1 is an elevation of a tank-heater involving our improvements. Fig. 2 is a vertical central section of the same. Fig. 3 is an elevation of the draft-tube detached.

Like characters refer to like parts in all the figures of the drawings.

The tank-heater may be of any suitable size and constructed of any suitable material, such as galvanized sheeting, and it includes in its construction inner and outer drums, as 5 and 6, respectively. The inner drum is adapted to burn wood, coal, or any combustible material or may contain any kind of a heating agent, the draft being regulated in a manner hereinafter described. The bottoms of the drums are denoted by 5′ and 6′, and the walls of the drums and their bottoms are separated a sufficient distance to allow for the proper heating and circulation of the heated water. Said drums are shown as covered by a top 7, having smoke and draft openings. The outer drum has a plurality of perforations, as 8, at or near the bottom extending on a horizontal line completely around the same, through which cold water can pass so as to reach the internal heating-drum 5, the drums being spaced apart at these openings a distance sufficient to allow the cold water to strike the heated surface of the drum 5. Said outer drum 6 has a plurality of perforations, as 9, arranged above the other ones and on diagonal lines which cross each other, the uppermost ones being near the top 7. These perforations 9 permit the warm water to leave the outside drum and cause a perfect circulation as soon as a fire is started in the inner drum. The space between the drums gradually diminishes toward the top thereof, so that the hot current of water passing out of the upper perforations is given a momentum, and this construction may be secured in any convenient manner. For this purpose we have shown the external drum as gradually tapering or decreasing in cross-sectional area toward its top.

The top 7 has openings, as 10 and 12, therein, the former being for the escape of smoke and being surrounded by a collar, as 13, while a collar, as 14, surrounds the opening 12. The opening 12 is adapted to receive a suitable draft pipe or tube, as 15, which extends downward for some distance into the heating-drum 5 and its top having an annular flange, as 15′, adapted to be sustained by the collar 14 when said pipe or tube is in its working position. Said pipe or tube is removable, so that ready access may be had to the interior of the inner drum for the purpose of starting a fire or removing ashes, &c., and its top is furnished with a handle, as 16, by which it may be readily lifted from place or put into working position.

The top of the tube or pipe has a draft-opening, as 17, controlled by a damper, as 18, slidable upon the top and guided by turned-over lips or flanges, as 19, in parallelism. By manipulating the damper through the agency of a finger-piece, as 19′, thereon the draft can be accurately controlled.

The pipe or tube 15 is substantially funnel-shaped, its reduced portion being near the fire or heating agent, and one side of said pipe is shown as straight and is parallel with the wall of the inner drum 5, while the opposite side thereof is angular or slopes toward the lower end thereof. The straight side of the tube or pipe is in proximity to what might be termed the "front" of the heater, while the angular portion thereof is nearest the rear side thereof. This construction throws the draft-current of air more to the front, and the fire is therefore drawn away from the seam (not shown) in the fire-box, which is thereby protected from extreme heat.

The invention is in no wise limited to the exact construction set forth, for many changes may be made within the scope of the accompanying claims.

The heater constituting the subject-matter hereof is exceedingly simple, as it does not involve in its make-up any coils or tubes or like complex structure. It provides for the proper admission of the cold water for action by the heating-drum and the thorough and accelerated circulation of the heated water. It is long-lived and not liable to destruction by rust and high heats and is light and easy to handle and capable of production at a moderate figure.

Having described the invention, we claim—

1. In a tank-heater, an outer drum tapering from its bottom toward the top thereof and having two superposed series of perforations, an inner cylindrical drum, the bottom and wall of which are imperforate, and which constitutes a receptacle for a heating agent, a top common to both the drums, said top having a smoke-opening and a draft-opening, a flange on the top surrounding the draft-opening, and a draft-pipe extending down into the inner drum through the said draft-opening, the top of said pipe having an annular flange resting on said first-mentioned flange and being provided with a damper.

2. In a tank-heater, an outer drum tapered from its bottom toward the top thereof and having two superposed series of perforations, an inner cylindrical drum, the bottom and wall of which are imperforate and which constitutes a receptacle for a heating agent, a top common to both drums, said top having a smoke-opening and a draft-opening, a flange on the top surrounding the draft-opening, a draft-pipe extending down into the inner drum through said draft-opening, the top of said pipe having an annular flange resting on said other flange and also having a draft-opening and a pair of guide-flanges overhanging said draft-opening, and one portion of said pipe being parallel with one of the walls of the inner drum, and another portion of said pipe sloping outward from the top, and a damper guided between said pair of guide-flanges.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

WILLIAM H. LOY.
ARLINGTON B. CARHART.

Witnesses:
JAY W. LEWIS,
EDITH PEMBLE.