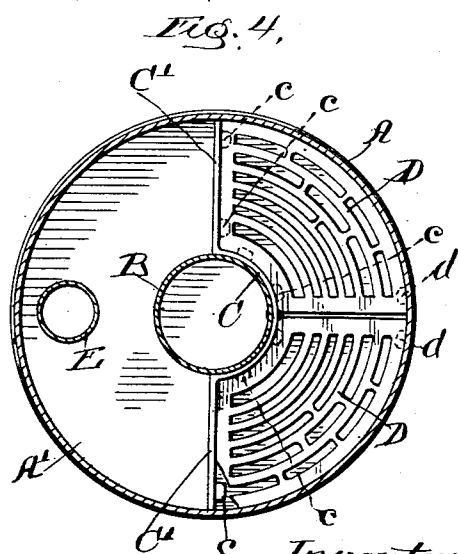
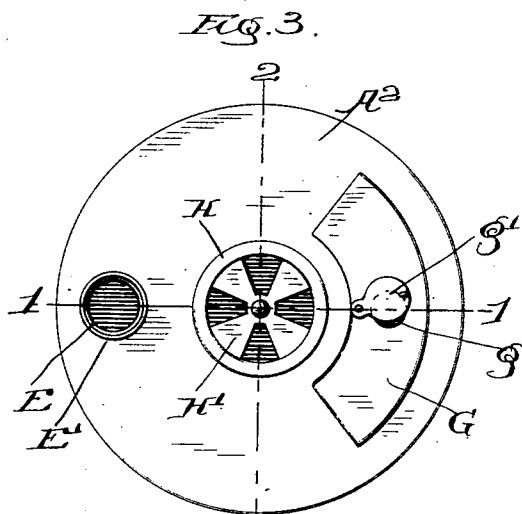
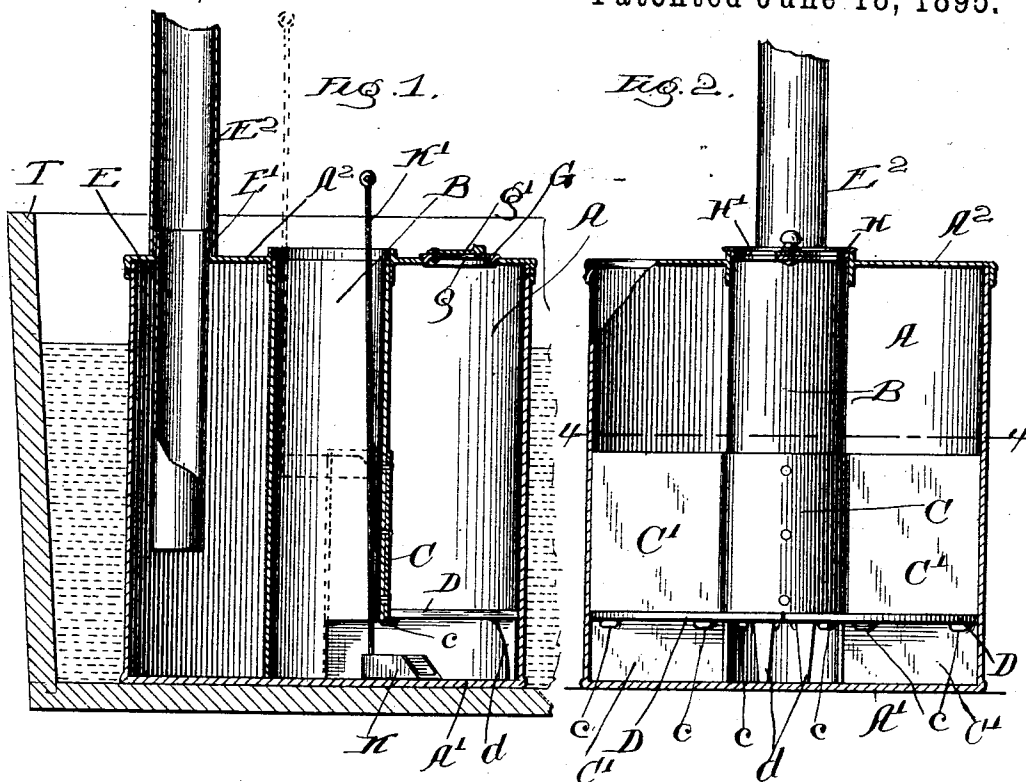


(No Model.)

H. L. FERRIS. TANK HEATER.

No. 541,269.

Patented June 18, 1895.



Witnesses:
Chas. Sherway
A. H. Ebbesen

Inventor:
Henry L. Ferris
by Miles J. Smith
Attys

UNITED STATES PATENT OFFICE.

HENRY L. FERRIS, OF HARVARD, ILLINOIS.

TANK-HEATER.

SPECIFICATION forming part of Letters Patent No. 541,269, dated June 18, 1895.

Application filed March 11, 1895. Serial No. 541,264. (No model.)

To all whom it may concern:

Be it known that I, HENRY L. FERRIS, a citizen of the United States of America, residing at Harvard, in the county of McHenry and State of Illinois, have invented certain new and useful Improvements in Tank-Heaters, of which the following is a specification.

My invention relates to improvements in tank heaters, that is to say, heaters adapted for warming the water in tanks used for watering stock.

The invention is fully described and explained in this specification and shown in the accompanying drawings, in which—

Figure 1 is a central vertical section of a heater embodying my invention, the plane of section being through the line 1 1, Fig. 3. Fig. 2 is a view partly in vertical section and partly in elevation, the plane of section being through the line 2 2, Fig. 3. Fig. 3 is a top plan of the heater. Fig. 4 is a horizontal section through the line 4 4, Fig. 2, the view being downward.

In the views, A is a preferably cylindrical casing having a tight bottom, A', the casing and its bottom being either formed in a single piece, or united in any suitable manner, as, for instance, by casting the bottom upon the lower edge of the casing. The casing is provided with a top, A², formed with three openings adapted, respectively, for the ingress of air, the insertion of fuel and the escape of smoke, as hereinafter explained.

One of the openings in the top, A², is preferably circular and at the center of the cover and from this opening extends downward a preferably cylindrical pipe, B, resting on the bottom, A', but having the lower portion of its periphery cut away around an arc of about one hundred and eighty degrees as shown in Fig. 1. That portion of the pipe, B, immediately above the part thus cut away, is protected by a metal plate C, conforming to the surface of the pipe, and riveted or otherwise fastened to it, and wings, C', C', extend from the lateral edges of the plate, C, to diametrically opposite points in the wall of the casing, A, these wings, C', C', being integral with the plate, C, and secured in proper relation to it in any desired manner. The lower edge of the curved plate, C, is coincident with the

lower edge of the cut away portion of the pipe, B, but the wings, C', C', extend downward to the bottom, A', a partition across the center of the lower portion of the case being thus formed by the two wings and the portion of the pipe, B, which extends downward to the bottom, A'. Upon the lower edge of the plate, C, and at points on the same level upon the wings, C', C', are formed suitable lugs, c, c, on which rests a preferably two-part grate, D. Clearly shown in Fig. 4. In order to complete the support of the grate, its parts are provided with legs, d, d, placed at the edge opposite the plate, C, and resting upon the bottom, A'.

In the space on the side of the wings, C', C', opposite the grate, D, is a smoke flue, E, extending downward from one of the openings in the top, A², the lower end of this smoke flue being preferably below the upper edge of the wings, C', C'. The upper end of the smoke flue, E, is preferably encircled by a collar, E', formed on the top, A², and a smoke pipe, E², encircles the collar, E', and is adapted to carry away products of combustion. The third opening in the top, A², is immediately over the grate, D, and is of the same general shape as the grate, but of less area. This opening is provided with a cover, G, formed with a check draft opening, g, having a cover, g', by which it may be closed. The central opening in the cover is also provided with a cover, H, having a rotatable register, H', adapted to regulate the ingress of air through the pipe, B.

The heater thus described may evidently be set in a tank, T, filled with water to any level below that of the top as illustrated in Fig. 1. The cover, G, being removed, a fire of any suitable fuel may be built upon the grate, D, and the cover being then replaced, air will pass downward through the pipe, B, thence upward through the grate, thence over the wings, C', C', and downward to the mouth of the smoke flue, E, through which the products of combustion will escape. The draft may evidently be regulated by means of the register, H', and the fire may be checked by the admission of a suitable quantity of air through the opening, g, in the cover, G. The heater constructed as described is extremely

economical for the reason that the heat, which it develops, is applied in the best possible manner, the cold air being received through the central pipe, B, and the heat being brought into direct contact with the casing, A, first when it is developed in the fire pot and afterward when it passes to the lower end of the smoke flue, E.

One matter of great inconvenience in nearly all tank heaters has been the removal of ashes and cinders, during the operation of the heater. This difficulty is completely overcome in the heater shown and described, the ashes in the space beneath the grate being readily removable by means of a shovel, K, adapted to rest upon the bottom of the heater and provided with a handle, K', at right angles to the shovel proper and extending vertically upward, when the shovel rests upon the bottom of the heater. The shovel may evidently be inserted and removed through the pipe, B, and when resting upon the bottom of the heater may extend under the grate, D, and remove the ashes from the ash-pit of the heater.

I claim as new and desire to secure by Letters Patent—

1. The combination with the casing having water tight walls and bottom and a suitable top, of an approximately central pipe, B, cut away at its lower end as described, suitably supported wings, C', C', interposed between said pipe and the wall of the heater and forming a partial partition therein, a grate, D, supported in the space at one side of said partition and a smoke flue opening from the space on the opposite side of said partition, the cut away portion of the pipe, B, being adapted to form a communication between

the interior of the pipe and the space below the grate.

2. The combination with the case, A, having the bottom, A', and top, A², of the approximately central pipe, B, cut away at its lower end as described, the protecting plate, C, and wings, C', C', forming a partition in the lower end of the heater, the grate, D, supported in the space at one side of said partition and a smoke flue lying on the opposite side of the partition and extending upward to a corresponding opening in the top, the cut away portion of the pipe, B, being adapted to form a communication between the interior of the pipe and the space below the grate.

3. In a heater of the class described, the combination with a casing comprising a watertight wall and bottom and having a suitable cover formed with openings substantially as described, of the approximately central pipe, B, extending downward from one of the openings and cut away at its lower end as described, the plate, C, and wings, C', C', forming a partition separating the space in the bottom of the heater into two parts, one of which is the fire pot of the heater and is in communication with the pipe, B, through the cut away portion thereof, the grate, D, supported in the fire pot above the cut away portion of the pipe, B, the smoke flue, E, extending downward from a second opening in the top and covers adapted to close the central opening in the top and the opening above the fire pot; substantially as shown and described.

HENRY L. FERRIS.

Witnesses:

N. N. TURNER,
J. L. KINSON.