H. A. BARRETT.

TANK HEATER.

APPLICATION FILED DEC. 30, 1916.

1,237,994. Patented Aug. 21, 1917.

Fig. 1.

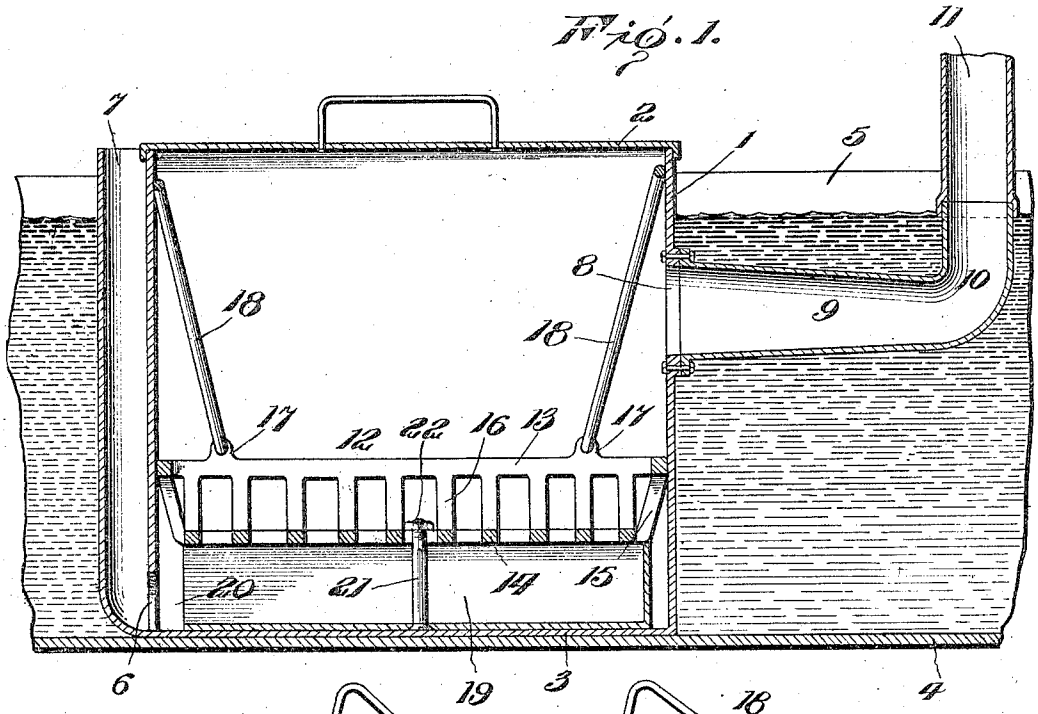
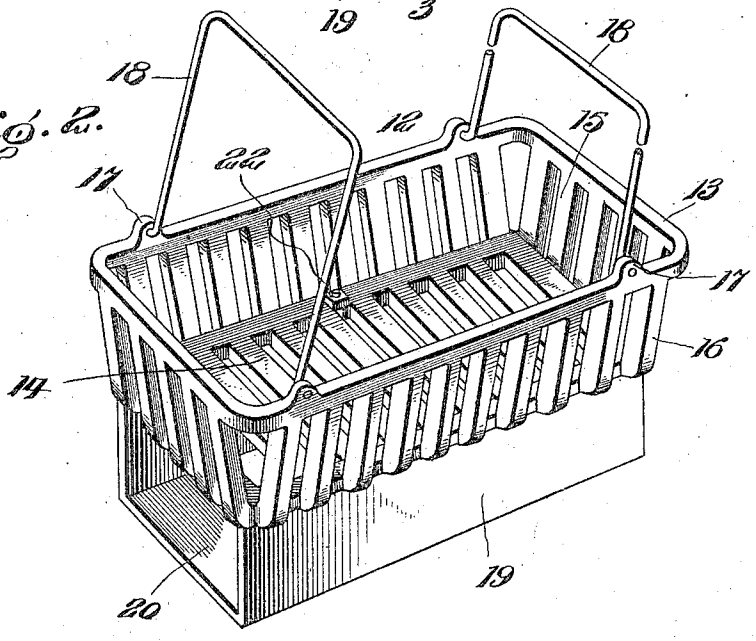


Fig. 2.



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UNITED STATES PATENT OFFICE.

HIRAM A. BARRETT, OF KNOXVILLE, ILLINOIS.

TANK-HEATER.

1,237,994. Specification of Letters Patent. Patented Aug. 21, 1917.

Application filed December 30, 1916. Serial No. 139,870.

To all whom it may concern:

Be it known that I, HIRAM A. BARRETT, a citizen of the United States, residing at Knoxville, in the county of Knox and State of Illinois, have invented certain new and useful Improvements in Tank-Heaters, of which the following is a specification.

This invention relates to tank heaters and has for its object the provision of a simple, inexpensive and efficient device which may be submerged within a tank and utilized to maintain the water therein at a temperature which will prevent freezing of the same. The invention seeks to provide an apparatus for the stated purpose by which the body of the heater, as well as the outlet pipe, will be employed to radiate heat in order to keep the water at the desired temperature, and a further object of the invention is to provide a novel fuel basket and grate whereby the ashes and other deposits may be readily withdrawn from the body of the heater without requiring the removal of the heater from the tank.

The drawings illustrate a device in which the several objects of the invention are attained and the invention resides in certain novel features which will be first fully described and then particularly pointed out in the appended claims.

In the drawings,

Figure 1 is a longitudinal vertical section of a heater showing the same in position in a tank,

Fig. 2 is a detail perspective view of the fuel basket or grate.

In carrying out my invention, I employ a body 1 which is preferably rectangular and of cast metal whereby it will be free of seams which might permit water from the tank to leak into the heater. This body has an open top upon which may be placed a cover 2 and has a flat bottom 3 which is adapted to rest upon the bottom or floor 4 of a tank 5. Any convenient means may be employed to secure the heater to the floor of the tank or to feet or timbers which will support the heater above the floor of the tank as is obvious. In one end of the body 1, and immediately adjacent the bottom or lower end 3, I provide a port or opening 6 which establishes communication between the interior of the heater body and a fresh air flue 7 which is formed upon the outer side of the end wall containing the said port or opening. This flue may be formed integral with the heater body or may be secured to the same, as may seem most desirable, and it may be of any desired shape, but I prefer to make it rectangular having its width equal to the width of the end wall of the heater body and the port or opening 6 will be of like dimensions so as to permit the entrance of air to the heater in sufficient quantities to support combustion. In the opposite end wall of the heater body and near but below the top thereof is an outlet opening 8 which establishes communication between the interior of the heater and the smoke flue 9 which extends laterally from the heater an appreciable distance so that the heat of said flue may radiate through the water surrounding the same, it being particularly noted that the opening 8 is so located as to be normally below the level of the water in the tank. The outer end of the flue 9 is turned upwardly, as shown at 10, and is carried to a stack 11 which may extend to any desired distance and serves to carry off the smoke or other products of combustion.

To hold the fuel, I employ a basket or grate 12 which may be a single integral structure and presents an upper rim 13 of such dimensions and form as to fit closely within the heater body. A slotted or perforated bottom 14, which is similar in form to the upper rim 13, but of less dimensions, is provided, so that the spaced end bars 15 and side bars 16 will be inclined downwardly from the top to the bottom of the grate, as clearly shown in the drawings. When the basket is in position, the formation of the same provides ample space for the flow of air upwardly through the body of fuel and also at the sides of the same so that a draft will be created through every portion of the bed of fuel and the fire properly supported. Upon the side portions of the upper rim 13, adjacent the ends thereof, are perforated lugs or ears 17 in which are pivoted the long bails or handle members 18 by which the grate may be placed in or withdrawn from the heater. The fuel basket or grate is supported in spaced relation to the bottom of the heater by the ash pan 19 and is preferably connected with said pan so that the pan and the grate will be withdrawn from the heater together. The ash pan consists of a suitably shaped hollow body open, as shown at 20, at that end which will be disposed adjacent the opening 6 so

that the fresh air flowing down through the inlet flue 7 and escaping through the said opening 6 will be permitted to spread under the entire bed of fuel and then rise through the same. Inasmuch, however, as the two sides and the opposite end wall are closed, the ashes will be caught in and held by the pan so that when the fuel basket is withdrawn from the heater, the ash pan will also be lifted and the heater thereby cleared of accumulated ashes. To connect the ash pan with the grate, I provide bolts 21 which are fitted in the bottom of the ash pan and project through the bottom of the grate, being equipped with nuts 22 at their upper ends which are turned home against the upper surface of the bottom of the grate and thereby rigidly secure the grate and ash pan together.

From the foregoing description, taken in connection with the accompanying drawings, it will be readily noted that I have provided an exceedingly simple and efficient device which may be submerged within a tank and which will maintain the water at the desired temperature with an economical consumption of fuel. The entire heater and the outlet flue are submerged so that the entire heated surface of the device will radiate heat into the water and, consequently, a less amount of fuel will be consumed in maintaining the water against freezing than is the case with heaters previously employed so far as I am aware. Heretofore, the smoke flue rose from heater and was not submerged so that the heat in the flue was wasted, whereas all the heat generated in my device is radiated into the water. The fuel is placed in the fuel basket or grate and the said basket or grate, with the ash pan 19 connected therewith, lowered into the heater body. The fuel may be ignited either before or after the grate is placed within the heater, and after the cover is placed on the heater body the draft or circulation of air will be necessarily downward through the inlet flue 7, then through the body of fuel and upwardly to the outlet flue so that a positive draft will be established through the fuel and combustion maintained. The handle members extend to the top of the body so that the grate and ash pan may be easily withdrawn and the ashes dumped out without reducing the heat or losing any fuel. The time required for the operation is so short that there will be no appreciable reduction in the temperature of the heater body or flue.

Having thus described the invention, what is claimed as new is:

1. In a tank heater, a heater body, a draft flue opening through one portion of the bottom wall of the body, a smoke flue leading from the opposite side of the body, a fuel basket having foraminous sides and ends, and an ash pan supporting the said basket, the ash pan including a bottom, side walls, and an end wall upon the upper edges of which walls the bottom of the said basket rests, the fuel basket at its top being of dimensions to fit within the body and the sides and ends of the basket being inclined inwardly toward its bottom, and the said ash pan being of less width and length than the said body of the heater whereby to provide air spaces surrounding the walls of the ash pan to permit passage of air currents upwardly through the foraminous sides and ends of the said fuel basket.

2. In a tank heater, a heater body having an inlet flue and a smoke flue, an ash pan disposed within the body and having a bottom, side walls, and an end wall, a fuel basket disposed with its bottom resting upon the upper edges of the said walls of the ash pan, the bottom of the fuel basket being slotted, a bolt passed upwardly through the bottom of the said ash pan with its upper end entering the slot in the bottom of the fuel basket, and a nut threaded on to the bolt and bearing against the upper side of the said bottom of the basket at the opposite sides of one of the slots therein.

In testimony whereof I affix my signature.

HIRAM A. BARRETT. [L. S.]

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."