No. 649,440. Patented May 15, 1900.

H. W. DIERS.

SUBMERGED HEATER.

(Application filed Feb. 10, 1900.)

(No Model.)

Fig 3.

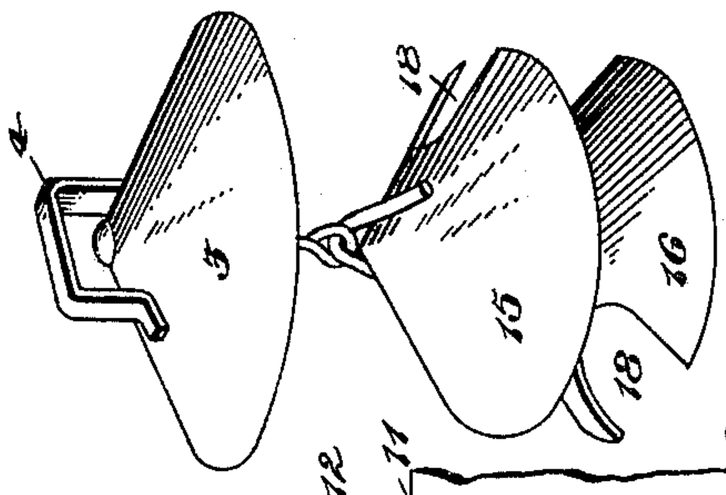


Fig 4.

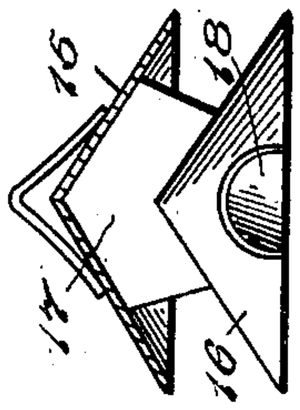


Fig 2.

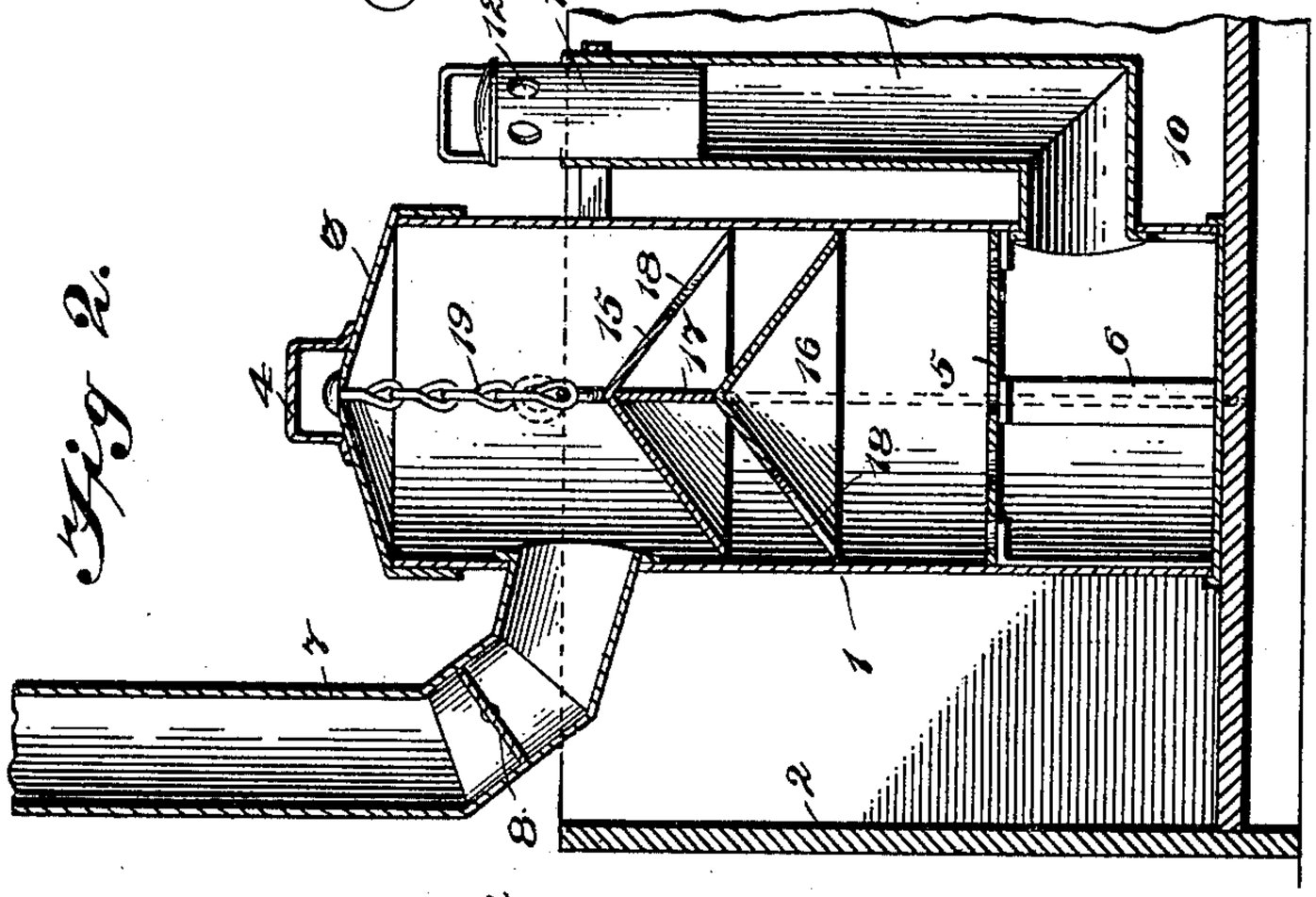
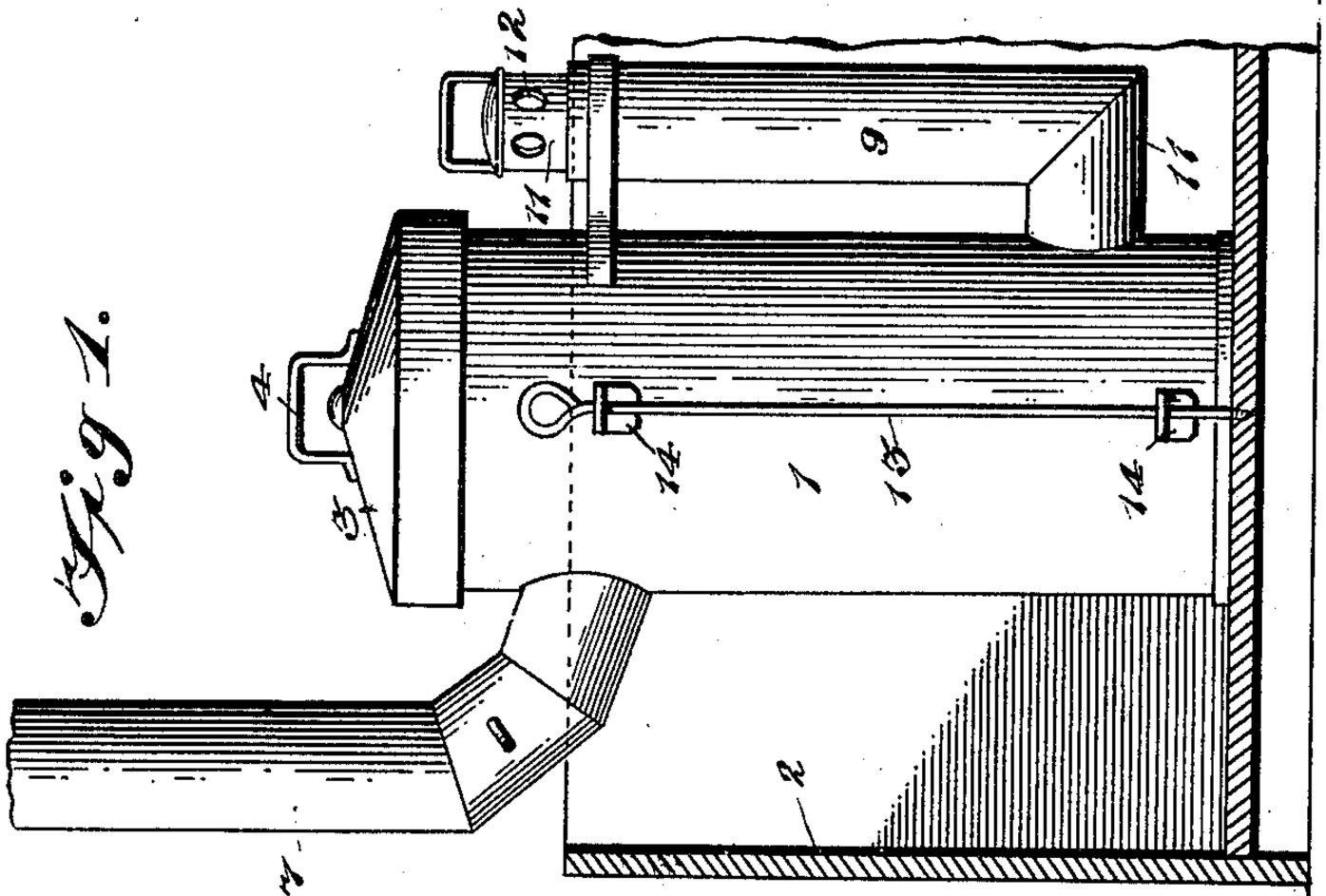


Fig 1.



Witnesses

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UNITED STATES PATENT OFFICE.

HENRY W. DIERS, OF ROBERTS, WISCONSIN.

SUBMERGED HEATER.

SPECIFICATION forming part of Letters Patent No. 649,440, dated May 15, 1900.

Application filed February 10, 1900. Serial No. 4,780. (No model.)

To all whom it may concern:

Be it known that I, HENRY W. DIERS, a citizen of the United States, residing at Roberts, in the county of St. Croix and State of Wisconsin, have invented a new and useful Submerged Heater, of which the following is a specification.

This invention relates to submerged heaters, and is especially designed for application to stock-tanks as a feed-cooker and also to prevent the drinking-water from being frozen therein. It is furthermore designed to provide improved means for increasing the combustion within the fire-pot of the heater and to confine the heat to the lower portion thereof, and, finally, to automatically accommodate such means to the fuel as the latter is consumed by the fire.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a side elevation of a submerged heater constructed in accordance with the present invention and mounted within a tank, the latter being in sections. Fig. 2 is a vertical central sectional view of the heater. Fig. 3 is a detail perspective view of the baffle device for increasing the combustion within the heater. Fig. 4 is a detail transverse sectional view of the baffle device, taken in a plane at right angles to that of Fig. 2.

Corresponding parts in the several figures of the drawings are designated by like characters of reference.

Referring to the accompanying drawings, 1 designates the body or shell of the present heater, and 2 designates any suitable tank within which the heater is placed. The body or shell of the heater is preferably cylindrical in form and has an open upper end, which is normally closed by means of a removable cover 3, having a centrally-disposed handle 4 for the convenient manipulation thereof.

Located within the shell or body is a removable grate 5, which is designed to support the fuel of any preferred character and is supported a suitable distance above the bottom of the heater by means of suitable leg-standards 6.

Adjacent to the upper end of the heater there is provided a suitable smoke-pipe 7 to carry off the smoke and products of combustion, and has a damper 8 to regulate the draft through such smoke-pipe.

Located diametrically opposite the smoke-pipe 7 and exteriorly of the body of the heater is an upright inlet draft-pipe 9, having its upper open end located at or above the upper edge of the tank, so as not to be entirely submerged, and provided at its lower end with an elbow 10, which pierces the adjacent side of the heater at a point below the grate, so as to introduce the draft below the burning fuel. Slidable within the upper open end of the inlet draft-pipe is a hollow plug or cap 11, which is provided at its upper end with a marginal series of perforations 12, which may be closed or partly closed by sliding the plug or cap into the draft-pipe. It will thus be apparent that simple and effective means have been provided for entirely or partly cutting off the draft, whereby the latter may be conveniently controlled to secure a slow or hot fire.

To prevent accidental movement of the heater within the tank, the former is provided with a pair of vertically-disposed rods 13, which are located at opposite sides of the heater and are guided in vertically-alined perforate ears 14, secured to the outer side of the heater, and the lower ends of these rods are pointed and screw-threaded, so as to be set into the bottom of the tank.

In order that the combustion may be increased, there is provided a baffle device comprising the superposed conical-shaped baffle-plates 15 and 16, which are connected by means of a diametric partition 17, the opposite outer ends of which terminate short of the peripheral edges of the conical plates. Each of these baffle-plates is provided with an exit-passage 18, which opens outwardly through the edge of the plate, and the respective exit-openings are located at opposite sides of the partition 17. A chain or other flexible connection 19 is employed to suspend the baffle

device from the cover of the heater, so that said device may be conveniently removed with the cover when it is desired to introduce fuel into the heater. Moreover, this flexible suspending connection permits of a free vertical movement of the baffle device, so that the latter may rest upon the fuel and sink therewith as it is consumed, whereby the baffle device may automatically accommodate itself to the amount of fuel within the heater. The normal position of the baffle device is intermediate of the grate and the stovepipe, so as to be immediately above the fuel, and therefore the smoke and products of combustion are compelled to take a circuitous passage through the exit-openings 18 in the baffle-plates before passing outwardly through the stovepipe, whereby the heat is retained within the lower portion of the heater to more thoroughly heat the contents of the tank, and the unconsumed products of combustion are retained in close proximity to the fire, so as to greatly increase the combustion of the fuel. It will be understood that the two baffle-plates are of substantially the same diameter as that of the interior of the heater, so that the peripheral edges of such plates are in engagement with the inner walls of the heater to prevent escape of the smoke and products of combustion except through the proper exit-openings. However, the plates do not snugly fit the walls of the heater, but are loose enough to permit of the baffle device being conveniently removed and also to accommodate itself to the decreasing fuel. It will also be noted that the partition 17 also forms a baffle-plate intermediate of the exit-openings 8, so that the smoke cannot pass directly out through the exit-opening of the upper baffle-plate, but is checked in its movement and compelled to divide and pass around the opposite ends of the partition, which terminate short of the peripheral edges of the baffle-plate for this express purpose. It is preferable to have the exit-opening in the upper baffle-plate located opposite the smoke-pipe in order that the smoke may not escape directly into the pipe after passing said baffle-plate.

The opening at the upper end of the heater preferably extends for the entire width of the latter in order that large sticks of wood may be introduced into the heater, and by reason of the grate 5 fuel—such as coal, coke, hay, straw, corncobs, &c.—may be effectively employed.

From the foregoing description it is apparent that the present invention provides a simple and durable submerged heater which may be employed for heating water in tanks of any description and is provided with means for increasing the combustion of the fuel and for retaining the heat at the lower portion of the heater, so as to have the maximum effect upon the contents of the tank.

Having described the invention, I claim—

1. A heater, having superposed baffle-plates, and a diametric partition connecting the plates, and having its opposite ends terminating short of the adjacent edges of the plates, each of the latter having an exit-opening located wholly at one side of the partition and opposite the exit-opening in the other plate.

2. A baffle device for heaters, comprising superposed conical plates, having oppositely-disposed exit-openings, and a partition connecting the plates, located transversely between the opposite exit-openings, and having its opposite ends terminating short of the adjacent portions of the marginal edges of the plates.

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

HENRY W. DIERS.

Witnesses:
HUGO NOLTE,
JOHN WEBB.