No. 858,562. PATENTED JULY 2, 1907.

C. F. BILHORN.

WATER HEATER.

APPLICATION FILED JUNE 7, 1906.

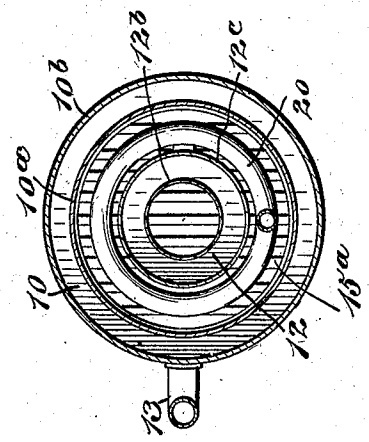

Fig. 2.

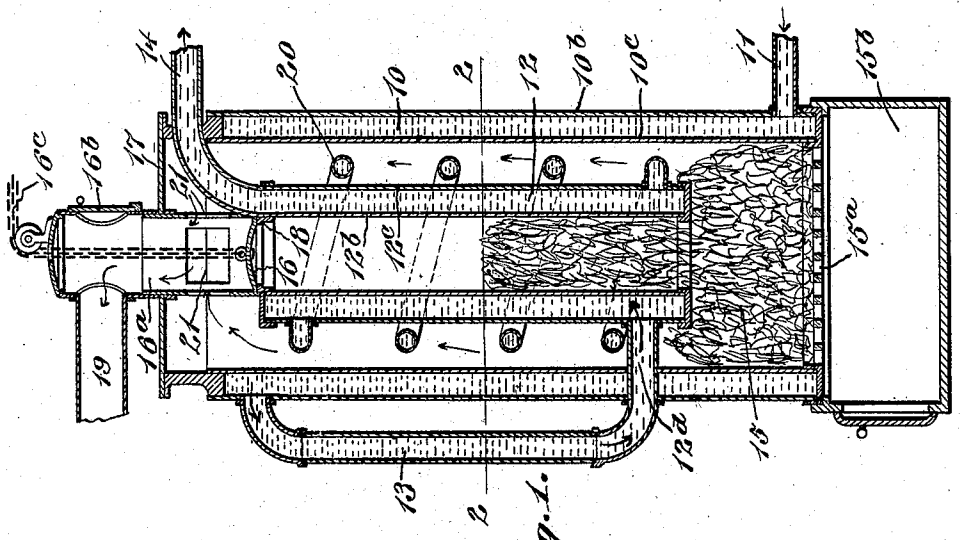

Fig. 1.

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CHRISTIAN F. BILHORN, OF CHICAGO, ILLINOIS.

WATER-HEATER.

No. 858,562. Specification of Letters Patent. Patented July 2, 1907.

Application filed June 7, 1906. Serial No. 320,552.

To all whom it may concern:

Be it known that I, CHRISTIAN F. BILHORN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Water-Heaters, of which the following is a specification.

The present invention relates to a device for heating water, in which are embodied certain novel and simple features of construction, among which are two double walled cylindrical or annular casings for containing the water and means for providing a continuous circulation of the water from the outer cylinder to the inner one from which it is discharged, and also means for heating the device.

In the accompanying drawings, Figure 1 is a vertical section of the device. Fig. 2 is a horizontal section on the line 2—2 of Fig. 1.

Referring specifically to the drawings, 10 refers to an outer double walled annular water chamber, 10^b and 10^c being the cylindrical casings or walls of the same.

11 is a water supply pipe leading into the lower part of the chamber 10.

12 is an inner double walled annular water chamber formed by walls or casings 12^b and 12^c.

13 is a pipe leading from the upper part of the chamber 10 to the lower part of the water chamber 12. Said pipe is located outside the outer casing, and is connected into the chamber 12 by means of an intake pipe 12^d.

14 is a discharge or distributing pipe leading from the upper part of the chamber 12.

15 is the fire box or furnace which is intended preferably to be fed with coal.

15^a is the grate, and 15^b is the ash pit. The inner chamber or vessel is shorter than the outer, so that the lower end of the latter surrounds or forms the wall of the fire box.

The inner wall 12^b of the inner water chamber forms a tubular magazine for fuel, said wall having an extension 16^a which projects upwardly through a cap 17 at the top of the heater. The extension or chute 16^a is provided with a bell 16 which works up and down in said chute and closes against a shoulder 18 at the upper end of the wall 12^b. The bell may be raised or lowered by the chain 16^c. The chute has a side door 16^b through which coal may be fed therein, and also has a smoke pipe 19 leading therefrom, and also, below the head 17, has openings 21 through which the products of combustion flow to the smoke pipe.

A circulation device from the upper to the lower part of the inner water chamber is provided, consisting of a coil pipe 20 which extends spirally through the space between the water chambers, leading from the upper part of the inner water chamber to the lower part thereof. This pipe is located directly in the combustion chamber and consequently the water therein is quickly heated. It aids in the circulation of the water, and also acts to some extent as a baffle to cause the products of combustion to flow spirally in the upward course thereof through the space between the chambers.

The products of combustion from the fire box pass upwardly, in the manner described, between the inner and outer water chambers, and heat the water therein, a circulation being provided between said chamber by means of the pipe 13, the water in the outer chamber receiving a moderate degree of heat before its passage into the inner chamber, from which it is supplied as desired. The device is particularly intended to be used with a low fire, as a hot water heater for laundry and other domestic uses, but it may also be applied to any other use, such for example as a hot water heater for heating buildings. As fuel in the fire box is consumed, that contained in the magazine feeds down in an obvious manner.

I claim:

1. In a water heater, in combination, an inclosing casing, a fire box, and an annular water chamber standing vertically above the same and forming a fuel magazine, the inner wall of the chamber being extended upwardly through the top of the casing and connected to the smoke flue and having inlet openings for the products of combustion from the upper space in the casing, and also having a fuel door and a bell movable up and down above or below said door and openings.

2. In a water heater, in combination, a series of upright cylinders forming inner and outer annular water chambers with a space for products of combustion therebetween, an inlet for water to the bottom of the outer chamber, an outlet therefor from the top of the inner chamber, and a circulation pipe extending from the top of the outer chamber, downwardly on the outside thereof, and into the bottom of the inner chamber.

3. In a water heater, in combination, a series of upright cylinders forming inner and outer annular water chambers with a combustion space therebetween, a water inlet to the bottom of the outer chamber and a water outlet from the top of the inner chamber, a connecting pipe extending from the top of the outer chamber into the bottom of the inner chamber, and a circulation pipe extending through said combustion space from the bottom to the top of the inner chamber.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHRISTIAN F. BILHORN.

Witnesses:
SIGNA FELTSKOG,
H. G. BATCHELOR.