

July 2, 1929.

C. U. LEVIS

1,719,015

WATER HEATER

Filed May 27, 1926

3 Sheets-Sheet 1

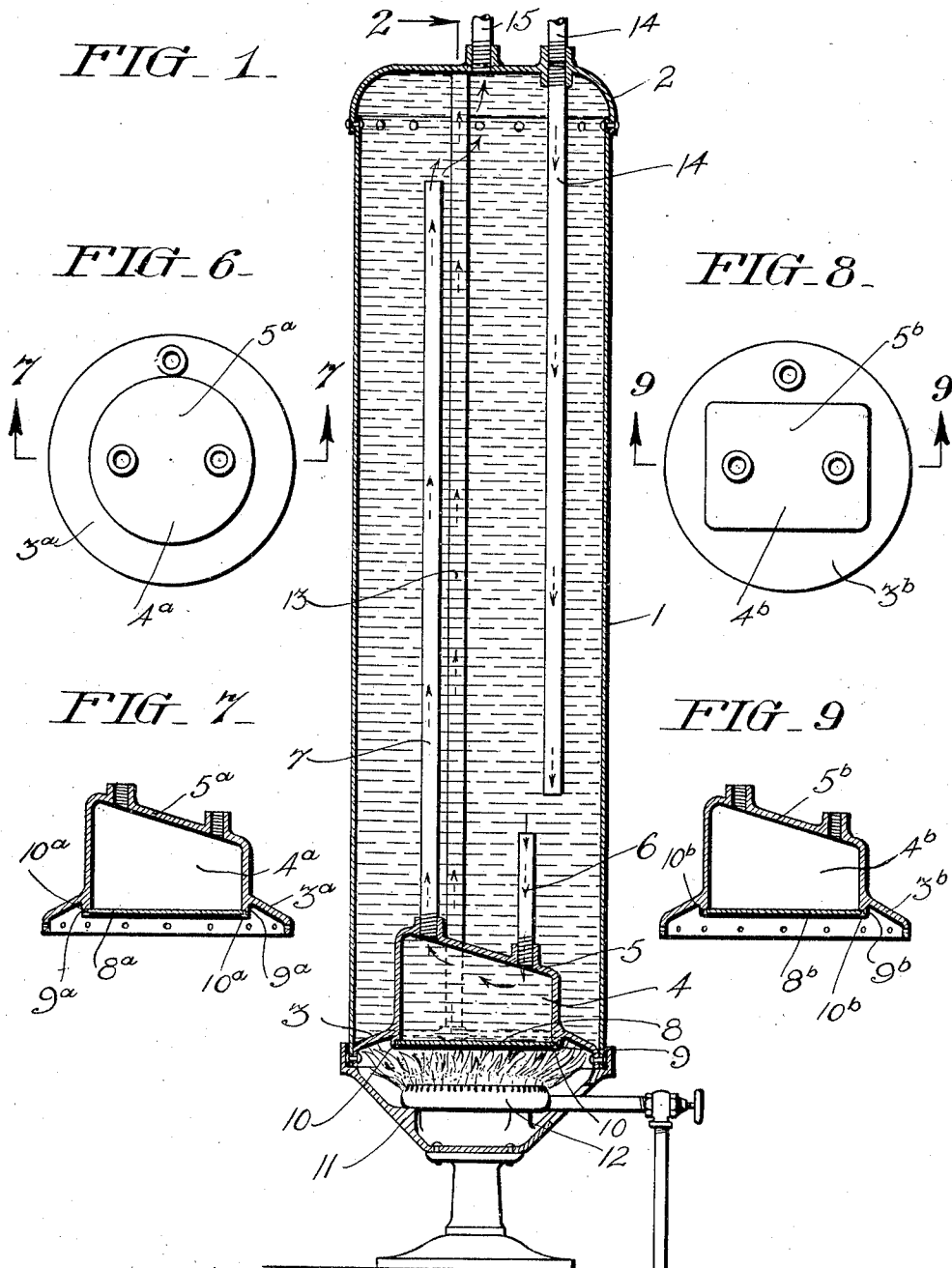
FIG. 1

FIG. 6

FIG. 8

FIG. 7

FIG. 9



WITNESSES:

Alfred E. Lockinger.
George A. Gross

INVENTOR:

Charles U. Levis,
BY
Joshua P. H. H. H.
ATTORNEY.

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C. U. LEVIS

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3 Sheets-Sheet 2

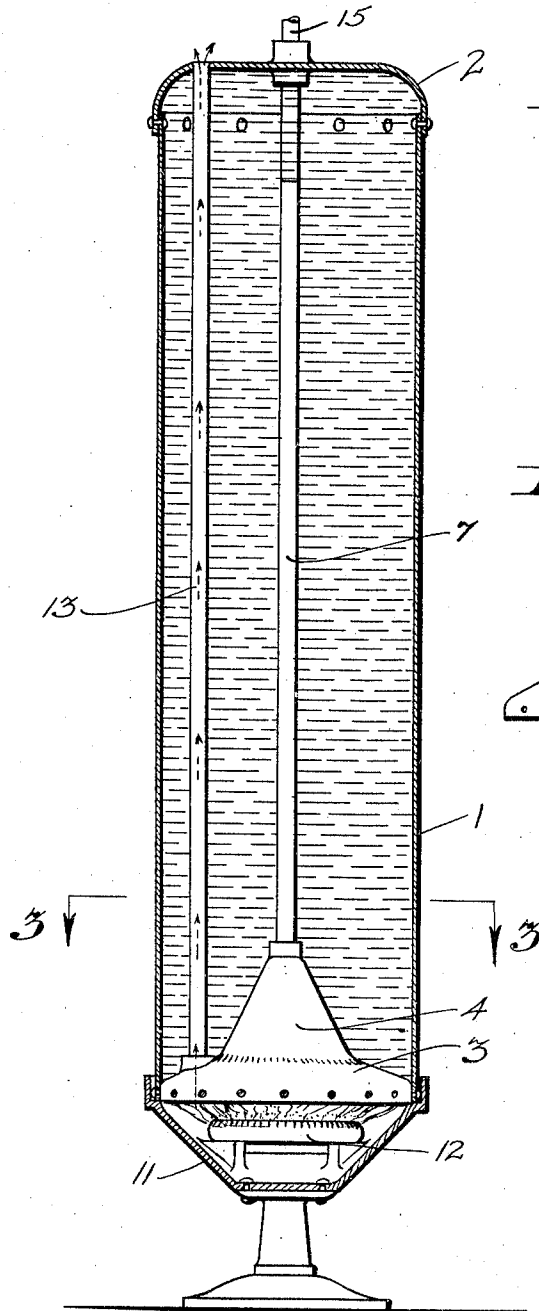
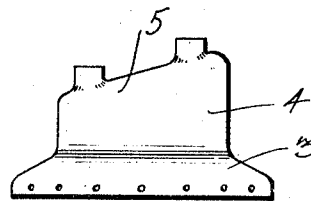


FIG. 2

FIG. 5



WITNESSES:

Alfred E. Schinger
George A. Gross

INVENTOR:

Charles U. Levis
BY
Joshua R. H. H. H.
ATTORNEY.

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C. U. LEVIS

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3 Sheets-Sheet 3

FIG. 3

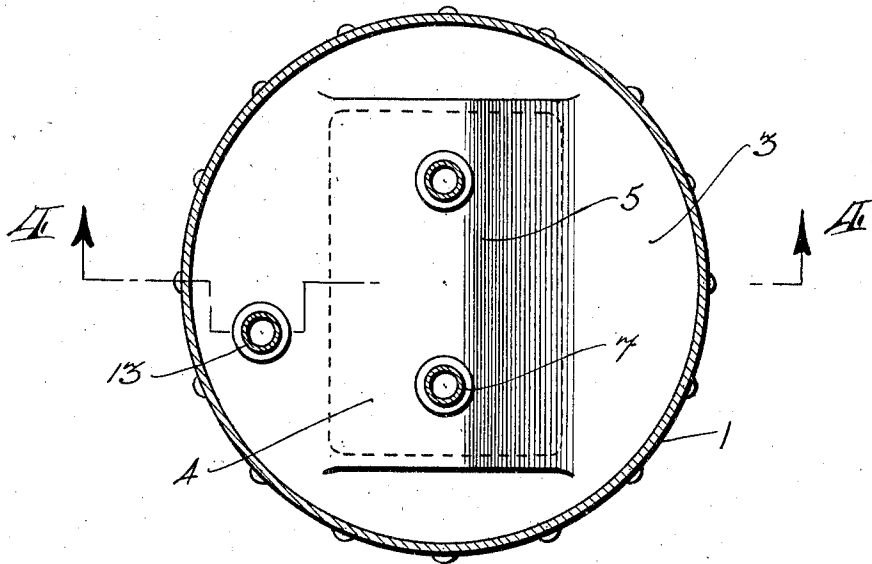
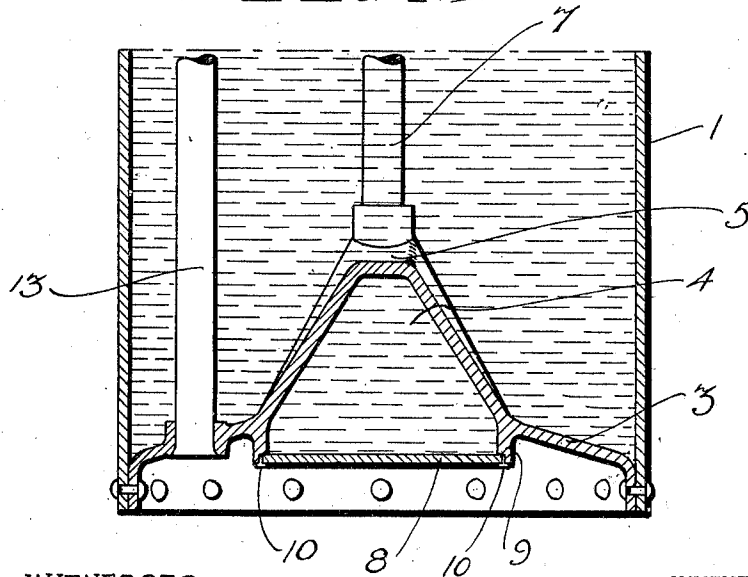


FIG. 4



WITNESSES:

Alfred E. Ischinger,
George A. Gross

INVENTOR:

Charles U. Levis,
BY
Joshua R. H. Hottel
ATTORNEY.

UNITED STATES PATENT OFFICE.

CHARLES U. LEVIS, OF PHILADELPHIA, PENNSYLVANIA.

WATER HEATER.

Application filed May 27, 1926. Serial No. 111,914.

This invention relates to water heaters especially adapted for domestic use.

The objects are to provide a water heater which may be regulated to heat any desired quantity of water with a minimum consumption of fuel and maintain the water at any desired temperature; which will heat the water without causing agitation of the rust sediment settling at the bottom of the tank and which is simple and durable in construction.

These objects, and other advantageous ends which will be described hereinafter, I attain in the following manner, reference being had to the accompanying drawings in which

Figure 1 is a central section through a heater constructed in accordance with my invention,

Figure 2 a section on line 2—2 of Figure 1, certain of the parts being shown in full,

Figure 3 an enlarged section on line 3—3 of Figure 2,

Figure 4 a fragmentary section on line 4—4 of Figure 3,

Figure 5 a side view of a head which forms a part of my invention,

Figure 6 a plan view of a modified form of head,

Figure 7 a section on line 7—7 of Figure 6,

Figure 8 another form of head, and

Figure 9 a section on line 9—9 of Figure 8.

Referring to the drawings, 1 indicates a drum of a water tank, 2 a top head secured to and closing the upper end of the drum and 3 a bottom head secured to and closing the lower end of the drum. A water heating chamber 4, integral with the bottom head and extending into the drum, has an inclined top 5 to which an inlet pipe 6 and an outlet pipe 7 are connected. The inlet pipe is short and is connected to the lowermost part of the top and the outlet pipe is long and is connected to the uppermost part of the top. The bottom of the chamber is made from a non-ferrous plate 8, such as copper, which bears against the shoulder of a shouldered edge 9 and is secured to the edge by brazing it with hard solder 10. The lower end of the drum may be mounted on a suitable support 11 which may also carry a burner 12 for heating the non-ferrous plate. The hot gases coming from the burner pass upward through a tube 13 se-

cured to the top and bottom heads and disposed within the drum. Water may be admitted to the tank by a supply pipe 14 and may be discharged from the tank by a discharge pipe 15. The lower end of the supply pipe preferably terminates near the upper end of the short inlet pipe 6 adjacent the lower end of the drum. The discharge pipe 15 stops short at the top head, and the outlet pipe 7 of the heating chamber extends upwardly to a point adjacent the top head.

In Figures 1-5 the heating chamber is shown as of substantially conical cross section so that a small volume of water will be contained therein.

In Figures 6 and 7 the heating chamber is of circular plan section and in Figures 8 and 9 the heating chamber is of rectangular plan section. In all other respects these chambers are similar to the chamber shown in the other figures of the drawing. I have therefore given corresponding parts similar reference characters with the exponent "a" in Figures 6 and 7 and the exponent "b" in Figures 8 and 9.

In use the burner may be ignited in the usual manner and the fuel supplied to the burner from any suitable source. The flames of the burner playing against the copper plate will cause the heat to be quickly transferred to the water in the chamber. The water upon being heated will rise to the uppermost part of the chamber adjacent the outlet pipe 7. Upon further heating, the water will gradually rise through outlet pipe 7 to the top of the tank. As the hot water rises, cold water passes down inlet pipe 6 into the chamber to be heated. A circuit for the water is thus established through the chamber, up pipe 7, down the drum, through pipe 6 and into the chamber again as indicated by the arrows. The dimensions of the chamber are preferably such that the volume of water therein will be quickly heated and will pass upward through the outlet pipe 7 at such rate that the current established will prevent foreign matter, which may precipitate due to the heating, from settling on the copper plate. The chamber is thus kept free of sediment and constantly supplies heated sediment-free water to the top of the tank. Any sediment which may precipitate will settle outside the chamber at the bottom of the tank. The hot gases from the burner may pass upward

through tube 13. The heat absorbed from the hot gases will pass through the tube to heat the water. By regulating the flame of the burner any desired quantity of water may be heated and passed to the top of the tank and kept at any desired temperature.

I have found that by using a non-ferrous plate at the bottom of the heating chamber a comparatively small amount of fuel is consumed in heating the water, thereby effecting a considerable saving in the upkeep of the heater.

While I have described my invention as taking a particular form, it will be understood that the various parts may be changed without departing from the spirit thereof, and hence I do not limit myself to the precise construction set forth, but consider that I am at liberty to make such changes and alterations as fairly come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A water heater including a tank, a head closing the bottom of the tank, a portion of said head comprising a chamber projecting inwardly from the bottom portion of the tank and open at its lower end, a separable wall closing the open end of said chamber, and conduits communicating with the interior of said chamber, the chamber being considerably smaller in cross-section than the tank.

2. In a water heater, a water tank, a bottom head for said tank comprising a unit casting fitting within the lower end of the tank and having a preheating chamber therein open at its bottom and an outwardly extending flange formed at its sides, a non-ferrous plate covering the bottom of the chamber, an outlet to the tank at the highest point in the chamber, and an inlet to the chamber at a lower elevation than the outlet, said inlet and outlet having conduit connections for preventing the depositing of sediment on the plate.

3. A heating chamber forming the bottom head of a boiler, comprising an annular flange adapted to fit within the outer casing of the boiler, walls extending from the flange upwardly in the boiler casing to form the chamber, a material of greater thermal conductivity than that of the boiler casing covering the opening to form a bottom to said chamber, said chamber bottom being capable of sustaining a volume of water measured by its cross-sectional area and the height of the boiler and the annular flange being capable of supporting the remainder of the water in the boiler casing.

4. In a water heater having a casing, a heater including an open-ended chamber in the lower end of the casing, a skirt formed adjacent the lower edges of the chamber, and having its outer edge turned downwardly to form an annular flange for securing the heater to the casing, shoulders formed at the junction of the skirt and the lower edges of the chamber, a non-ferrous plate secured to the shoulders and closing the open end of the chamber, and conduits communicating with the interior of the chamber.

5. In a water heater having a casing, a heater including an open-ended chamber in the lower end of the casing, a skirt formed adjacent the lower edges of the chamber and having its outer edge turned downwardly to form an annular flange for securing the heater to the casing, shoulders formed on the lower edges of the chamber, a plate of greater thermal conductivity than said casing secured to the shoulders and closing the open end of the chamber, and conduits communicating with the interior of the chamber; the greatest cross-sectional area of the chamber being substantially less than the cross-sectional area of the casing whereby a substantial space is provided between the outside of the chamber walls and the casing.

In testimony whereof I have signed my name to this specification.

CHARLES U. LEVIS.