April 19, 1932. G. E. WHITE 1,854,322

ELECTRIC FLUID HEATER

Filed Oct. 28, 1930

Fig. 1

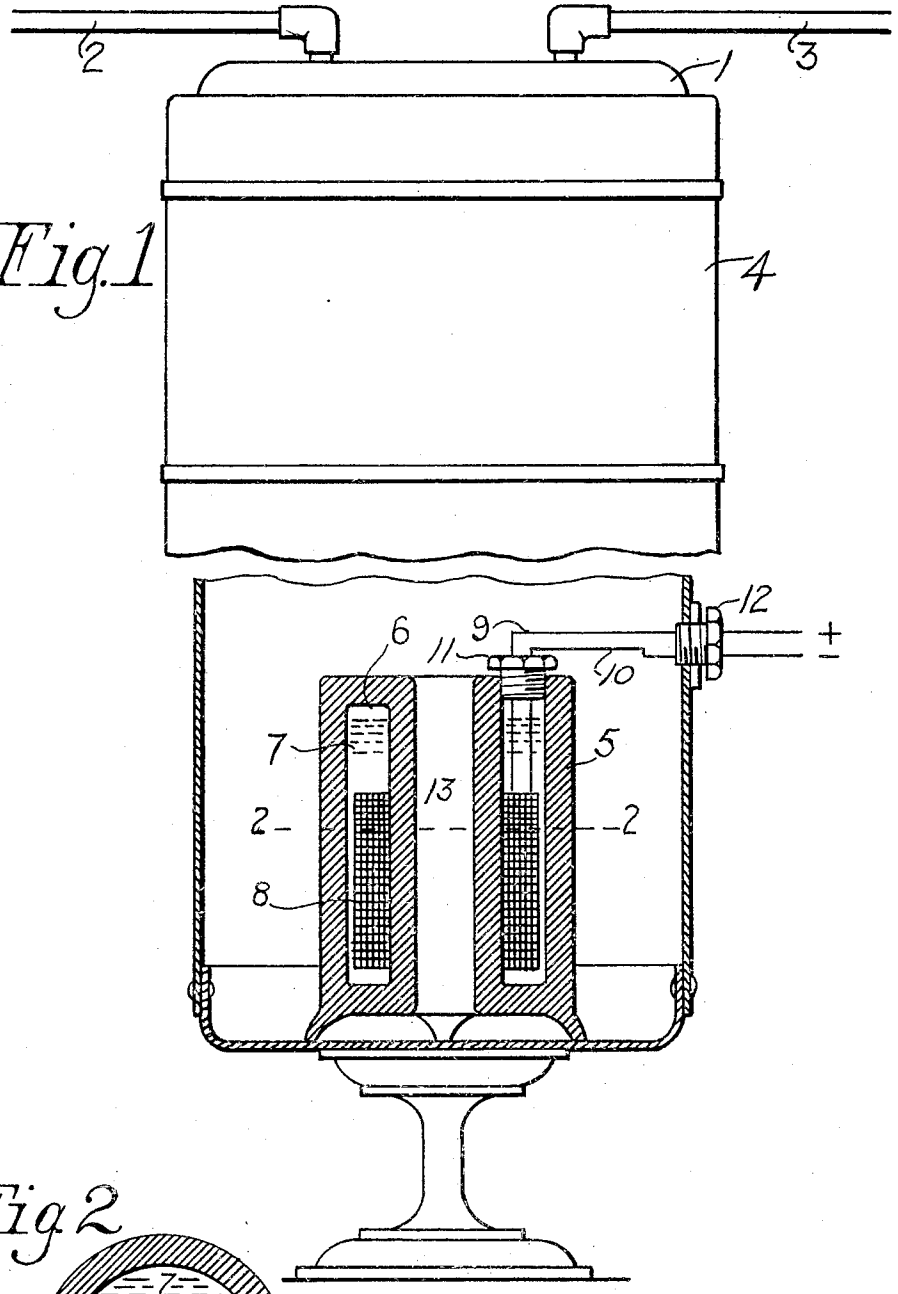
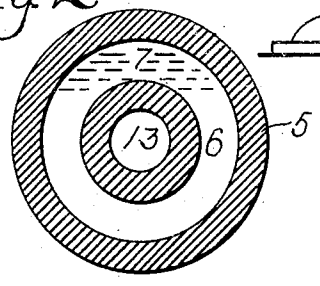


Fig 2



Inventor

Gerald E. White,

By Samuel F. Davies,

Attorney

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UNITED STATES PATENT OFFICE

GERALD E. WHITE, OF LANSING, MICHIGAN, ASSIGNOR OF ONE-FOURTH TO JOHN T. TYLER AND ONE-FOURTH TO CHARLES T. REED, BOTH OF LANSING, MICHIGAN

ELECTRIC FLUID HEATER

Application filed October 28, 1930. Serial No. 491,770.

This invention relates to an improvement in electric heaters which may be used for heating water or other fluids.

The primary object of this improvement believed to be attained by the special construction and arrangement herein set forth and claimed, is to create a heater of very high efficiency, which will be practically indestructible, which will have very long life, and which may be constructed at a nominal cost.

A heater fashioned according to this invention will, it is believed, accomplish the stated objects for the following reasons:

The heater can be entirely surrounded by water in an insulated tank, and will radiate and conduct any and all heat generated by the heater to the water. The heater has a very large surface exposed to the water which allows it to operate at a comparatively low temperature, and it comprises a large body of heavy metal which will retain the heat for a considerable length of time, thus making it unnecessary for frequent operation in order to maintain the water sufficiently hot as desired. The coil being submerged in oil in the chambered body, any heat generated in the coil itself will be radiated and conducted to the body of the heater and thence to the surrounding water.

The body of the heater being constructed of heavy cast, wrought iron or steel, magnetic materials, is very durable, and the coil being made of low resistance copper wire or the like and being submerged in the oil in the chamber and operating at a relatively low temperature makes it practically impossible for the coil to become over-heated and burned out. The coil being completely surrounded by the body of the heater is further protected from displacement or damage. Any like liquid may be used. The reason for the heavy metal body or oil container is, further, that it retains the heat, and is found to prevent sudden increases or diminutions of temperature.

There are no expensive materials employed, such as high resistance wire, and as the construction is simple and the body being made of solid magnetic material such as cast iron, no laminated construction being used, this invention may be manufactured at very low cost, especially in quantity production.

In the accompanying drawings are illustrated the construction and arrangement of the preferred form of this invention. Fig. 1 represents a tank with this invention applied thereto, showing a front view of the tank partly in vertical section. Fig. 2 is a horizontal cross section on the broken line 2—2 of Fig. 1.

Throughout the description and drawings the same number is introduced to refer to the same part.

A tank 1 of any size or form has an inlet 2 and outlet 3, and if desired a heat insulating covering 4.

The heater comprises a heavy cast iron cylinder 5 with an annular chamber 6 containing a charge of oil 7, with sufficient space in the chamber above the oil to take any expansion. In the oil is a coil 8 of low resistance, and the terminal portions 9 and 10 of the coil may pass out through screw caps 11 and 12 or in any chosen manner. It will be understood that where the terminal portions of the coil pass through the metal screw caps or the wall of the tank the wire is suitably insulated. The chamber 6 is closed, and as shown the chamber surrounds a vertical fluid passage 13 through the body of the heater. Induced currents heat the body 5.

Interrupted direct or alternating electric currents may be applied to the coil, and it is thought the operation is sufficiently clear from the drawings and the foregoing explanation of the invention. Body 5 is heated by currents induced therein.

I claim and seek to protect by Letters Patent:—

1. In an electric heater, a chambered heavy unitary metal body portion, said body having an upright fluid passage, said chamber surrounding the said passage, the said chamber containing a charge of oil, electric conductors arranged in the oil in said chamber, the terminals of the conductors passing out of the chamber, and means for closing the chamber and permitting the passage of the end portions of the conductors.

2. In an electric heater, a chambered heavy unitary cast iron body portion having relatively thick walls, said chamber containing a charge of oil, electric conductors arranged in the oil in said chamber, the said body having a vertical fluid passage, the said chamber surrounding the said passage, the said conductors being immersed in the said oil and having terminal portions passing out of the said chamber, and the said chamber being closed to prevent the escape of the oil.

In testimony whereof I affix my signature.

GERALD E. WHITE.