No. 731,339. PATENTED JUNE 16, 1903.

F. S. CHAPMAN.

APPARATUS FOR HEATING FLUIDS OR FLUID MIXTURES.

APPLICATION FILED MAR. 28, 1901.

NO MODEL.

Fig. 1.

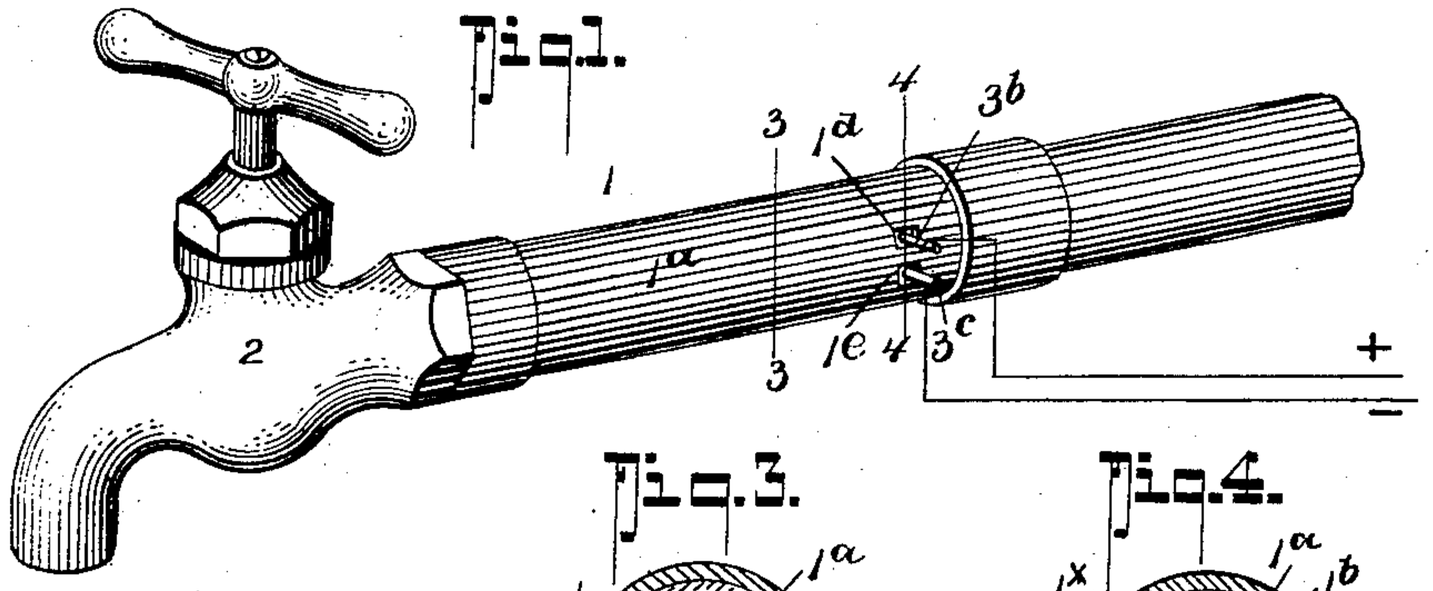


Fig. 3.

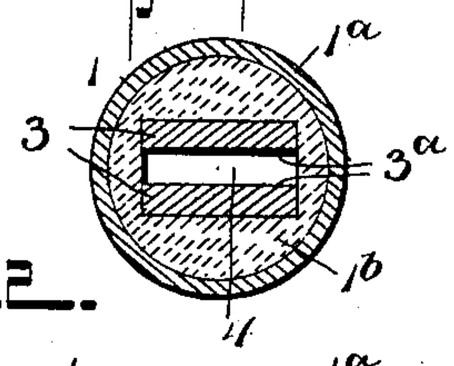


Fig. 4.

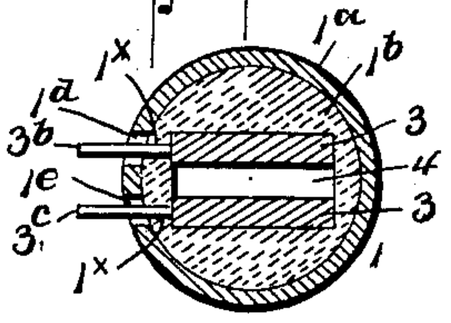


Fig. 2.

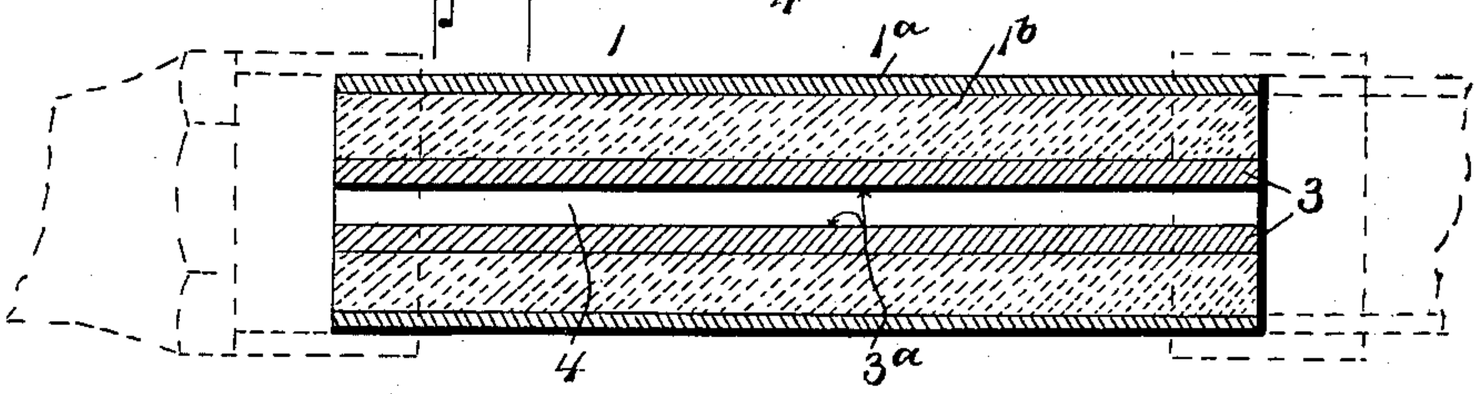


Fig. 5.

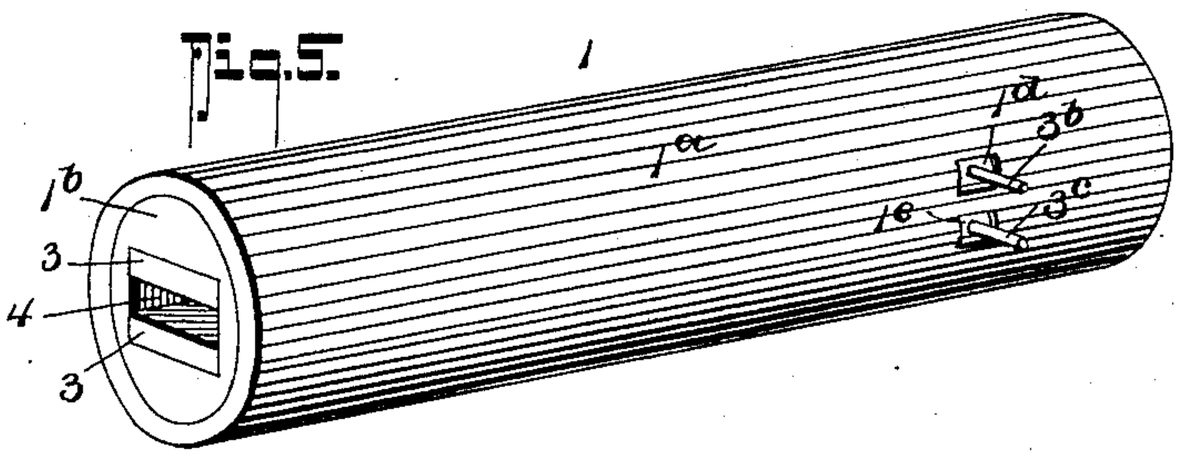


Fig. 6.

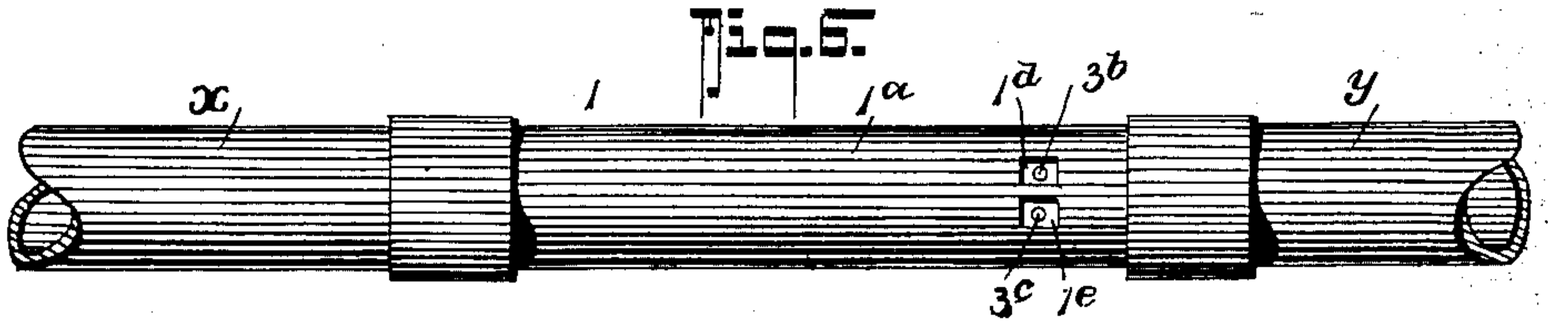
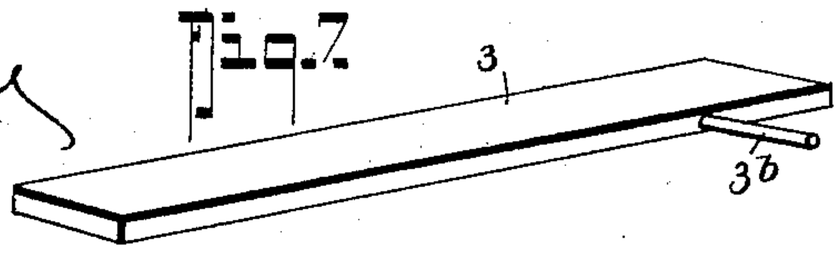


Fig. 7.



WITNESSES:

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No. 731,339. Patented June 16, 1903.

UNITED STATES PATENT OFFICE.

FRANK S. CHAPMAN, OF KENTON, OHIO.

APPARATUS FOR HEATING FLUIDS OR FLUID MIXTURES.

SPECIFICATION forming part of Letters Patent No. 731,339, dated June 16, 1903.

Application filed March 28, 1901. Serial No. 53,282. (No model.)

To all whom it may concern:

Be it known that I, FRANK S. CHAPMAN, residing at Kenton, in the county of Hardin and State of Ohio, have invented a certain new and Improved Electric Fluid-Heating Appliance, of which the following is a specification.

My invention relates to that class of fluid-heating means in which heat is generated by an electric current; and it has for its object to provide a simple and economical device whereby liquids may be quickly heated.

My invention comprehends a pair of electrodes incased in a suitable non-electric conducting-body, with their opposing faces separated to form a passage-way for the fluid, and a metallic casing which serves as a solid exterior for holding the electrodes and their surrounding non-electric body intact during the ordinary handling of the complete device and which also serves as a convenient means for joining with the faucet of ordinary house-service pipes.

Subordinately my invention consists in the detailed arrangement of parts hereinafter described, and specifically pointed out in the appended claim, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of my improved heater, illustrating one way of applying it for use. Fig. 2 is a longitudinal section thereof. Fig. 3 is a cross-section on the line 3 3 of Fig. 1. Fig. 4 is a similar view on the line 4 4 of Fig. 1. Fig. 5 is a detail perspective view of the heater detached. Fig. 6 is a detail view, hereinafter referred to. Fig. 7 is a perspective view of one of the electrodes.

In the drawings, in which like numerals indicate like parts in all the figures, 1 designates the heater, which consists of an outer metallic casing or tube 1^a and an inner core 1^b, of porcelain or other non-conducting material. The outer casing 1^a in practice may be threaded or otherwise formed for conveniently joining it to the spigot 2, as shown in Fig. 1, or to the pipe-sections x y, as shown in Fig. 6.

Mounted in the insulating-body 1^b and having their faces 3^a 3^a opposing each other in parallel planes and out of contact to form a space 4 are two electrodes 3, which extend the full length of the tube 3^a, as will be clearly seen by reference to Fig. 2 of the drawings.

Connected to the electrodes 3 3 are two conductor rods or bars 3^b 3^c, which pass through apertures $1^\times$ in the insulating-core 1^b and the apertures 1^d 1^e of the casing 1^a and to which are connected in any well-known manner the terminals of the electric circuit. The space 4 also extends the full length of the heater-casing, whereby to form, as it were, a passage-way for the fluid to be heated.

By providing a porcelain or other non-conducting holder for the electrodes, incasing the electrodes therein, and surrounding the whole by a metallic pipe-casing, as shown in the drawings, it is manifest that the same forms a simple, compact, and cheap device which may be effectively used for its intended purposes. By providing a casing of metal surrounding the insulating material the same will act as a shield or guard for the said insulating material, which in practice is generally composed of porcelain, glass, or other vitreous material, and thereby serves to prevent cracking or breaking of the insulator. The casing 1^a also serves as a convenient means for attaching the heater to the pipe-sections, as aforesaid. The electrodes 3 may be composed of platinum, carbon, or any other suitable conductor of electricity.

As will be seen by reference to Fig. 2 of the drawings, the liquid to be heated passes from one pipe-section to the other through the space or passage-way 4 between the electrodes 3, thereby completing the electric circuit from one electrode 3 to the other. When the current is turned on, the liquid is heated as it flows through the continuous passage.

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

The improved liquid electrical heater consisting of an outer inclosing and protecting metal pipe-section, the hollow non-conducting insulating-case fitting the interior surface of said pipe-section, and the two elongated electrodes arranged directly opposite each other within the passage of such insulating-core, and separated by a space adapted for flow of liquid, and two electric conductors connected with the electrodes, as shown and described.

FRANK S. CHAPMAN.

Witnesses:
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