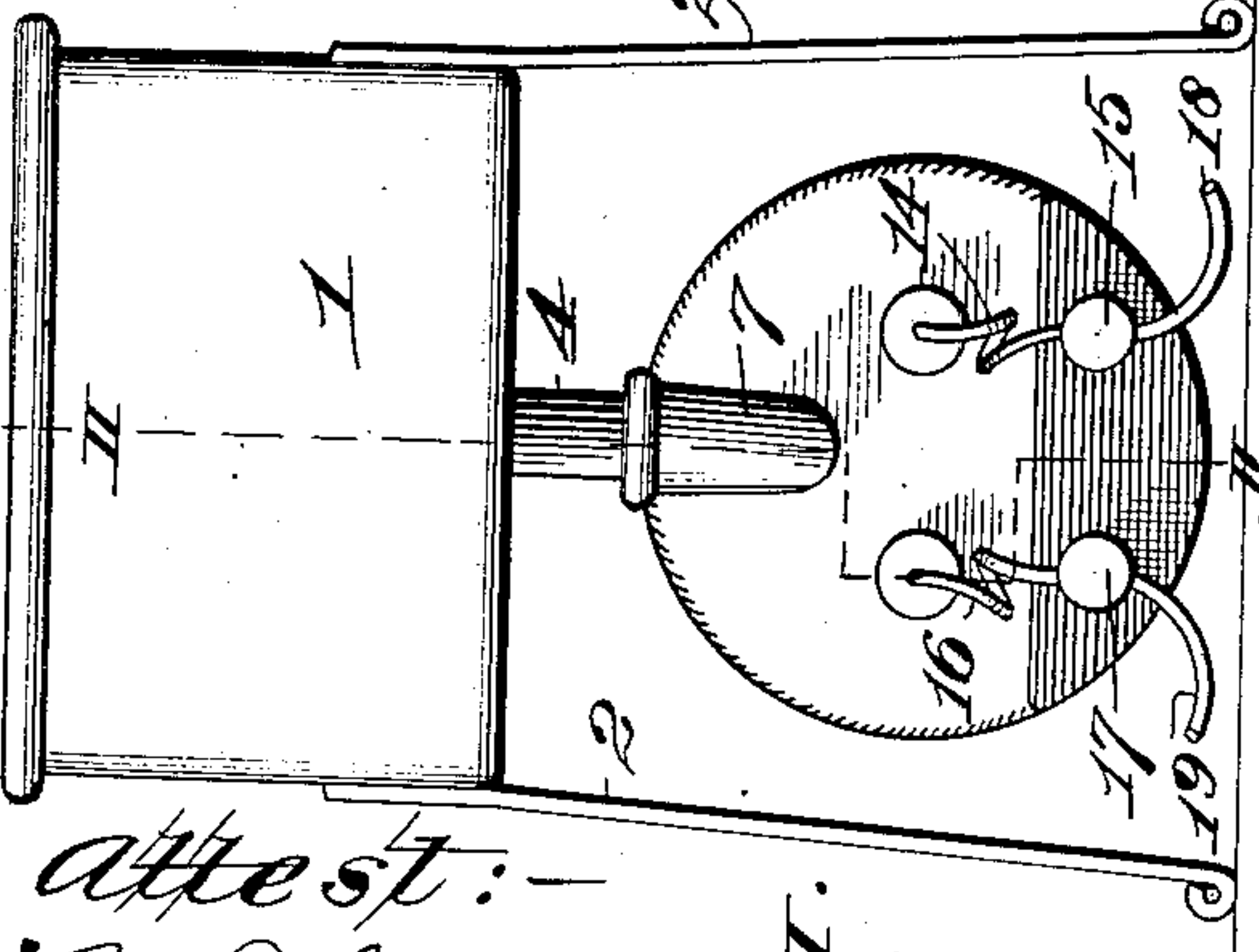
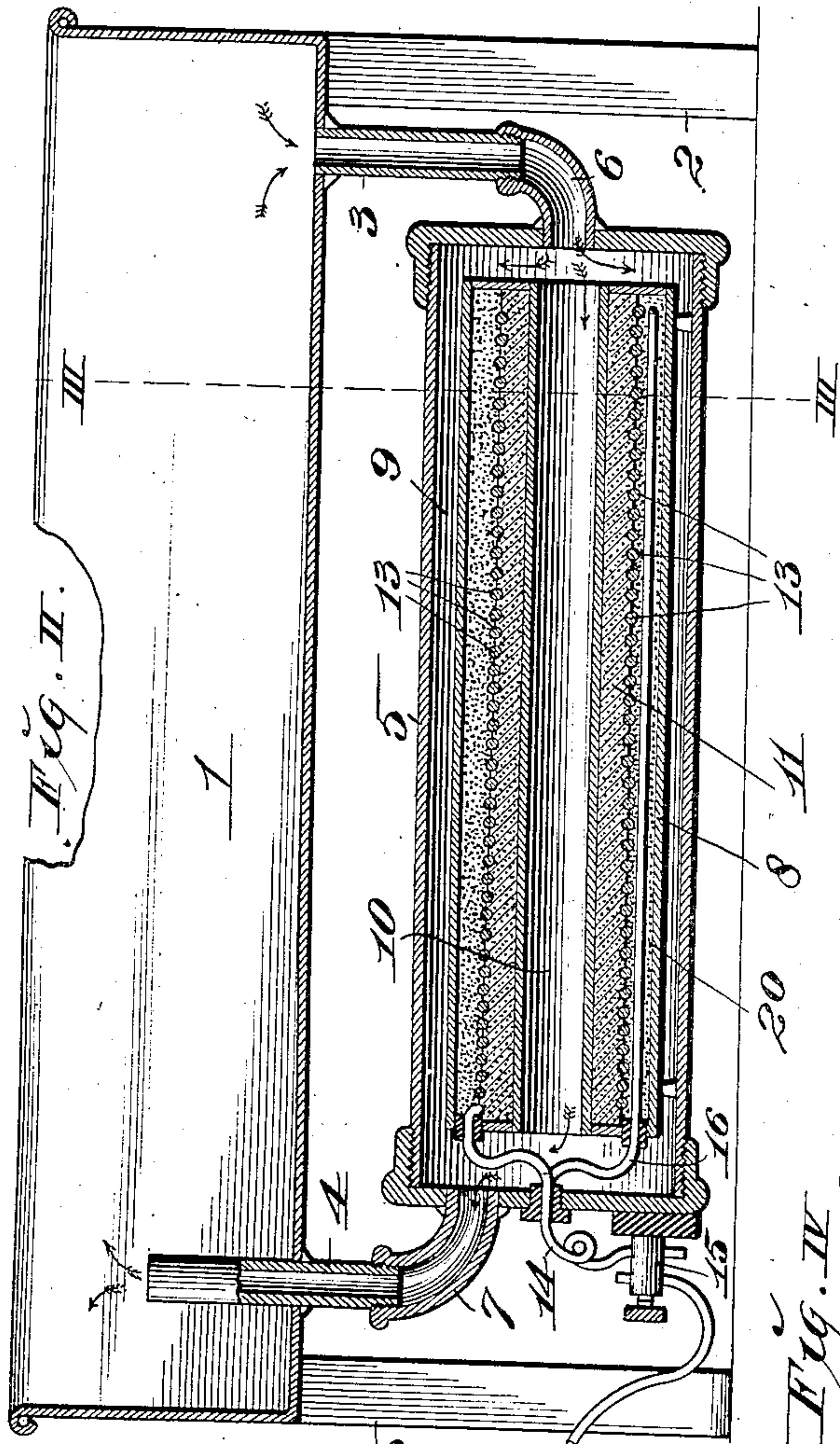


No. 817,593.

PATENTED APR. 10, 1906.

F. F. SHIPP.
ELECTRIC WATER HEATER.
APPLICATION FILED AUG. 10, 1903.



attest:-
M. P. Smith
W. Knight

Fig. I.

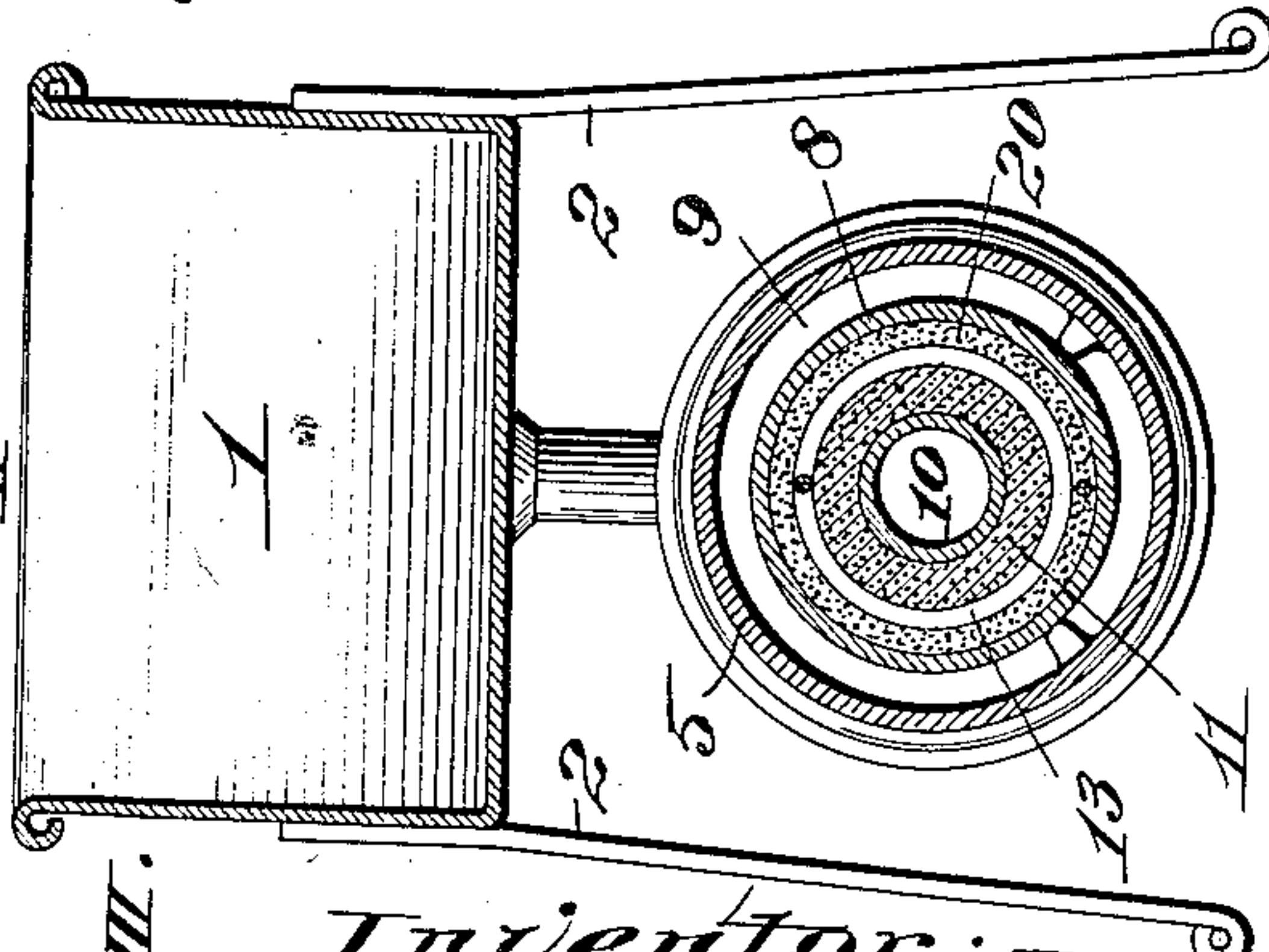
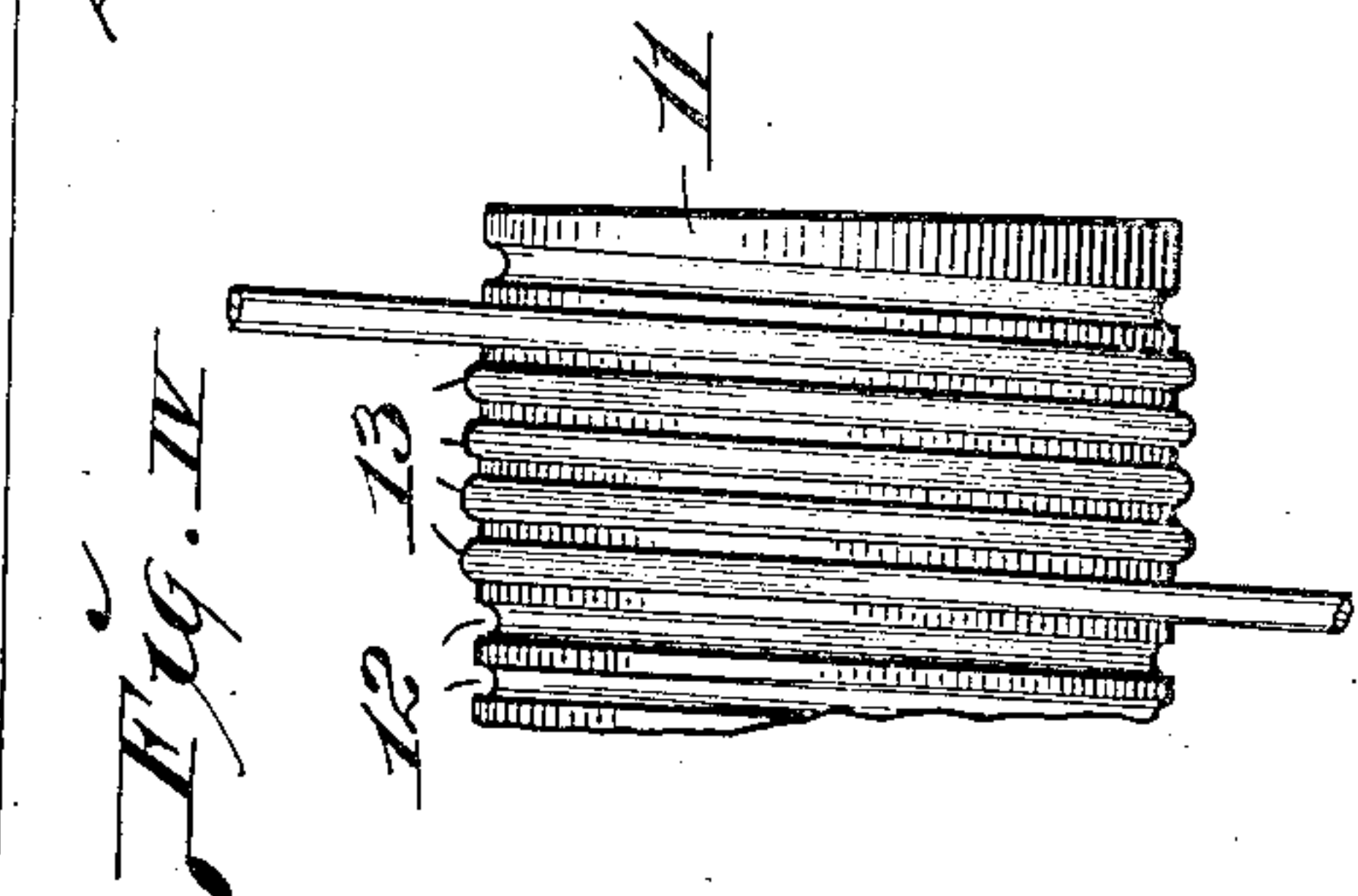


Fig. III.

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By Wright, 1878
attys.

UNITED STATES PATENT OFFICE.

FREDERIC F. SHIPP, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF
TO JAMES A. HOWZE, OF ST. LOUIS, MISSOURI.

ELECTRIC WATER-HEATER.

No. 817,593.

Specification of Letters Patent.

Patented April 10, 1906.

Application filed August 10, 1903. Serial No. 168,882.

To all whom it may concern:

Be it known that I, FREDERIC F. SHIPP, a citizen of the United States, residing in the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Electric Water-Heaters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to an apparatus for heating water through the medium of an electrical current passed through a heating-coil in the heater.

The invention consists in features of novelty hereinafter fully described, and pointed out in the claim.

Figure I is an end elevation of my heater. Fig. II is a vertical longitudinal section taken on line II II, Fig. I. Fig. III is a vertical transverse section taken on line III III, Fig. II. Fig. IV is an enlarged view of one end of the heating-coil-receiving core in the heater.

1 designates a water-tank, which is preferably supported by legs 2. Leading from one end of the tank 1 is a downtake-pipe 3, and leading upwardly in the opposite end of the tank is an uptake-pipe 4, the latter of which preferably extends to an elevation above the bottom of the tank, as seen in Fig. II.

5 designates an outer cylinder constituting a part of my heater. This outer cylinder is closed at both ends, and communication between the downtake-pipe 3 and the interior of the cylinder is provided by a coupling 6, connecting said downtake-pipe and the cylinder, and the opposite end of the cylinder has communication with the uptake-pipe 4 through a coupling 7.

8 designates an inner cylinder located within the outer cylinder 5 and supported therein free from the wall and ends of said outer cylinder, so that a space, as seen at 9, Figs. II and III, will be present between the two cylinders. Extending longitudinally through the inner cylinder 8 is a central tube or conduit 10, through which communication from the intake end of the heater is furnished to the outtake or uptake end.

11 is a core surrounding the central tube or conduit 10 within the inner cylinder 8 and provided with a spiral groove 12. (Most clearly seen in Fig. IV.) The groove in this core 11 receives a coil 13 of metallic wire, that

serves as a heating-coil and is wound around said core from end to end, as seen in Fig. II. One of the terminals of said heating-coil, as indicated at 14, leads from the coil to the exterior of the heater and is connected to a binding-post 15, while the opposite terminal, as seen at 16, leads to a binding-post 17. The binding-posts 15 and 17 receive the connection, respectively, of electrical conductors 18 and 19, through which electrical current is passed into and from the heating-coil 13.

20 is a jacket surrounding the heating-coil-receiving core 11 and the coil wound thereon and between which and said core the heating-coil is embedded.

The core 11 and the jacket 20 may be of any good conductor of heat—such as fire-clay, cement, or analogous material—by which heat imparted thereto from the heating-coil will be readily and fully radiated.

In the practical use of my heater water is placed in the tank 1, from which it descends through the downtake-pipe 3 and coupling 6 into the outer cylinder 5 to circulate through the space 9 therein and through the central tube 10 in the inner cylinder 8. Electrical current is then turned on in the heater to heat the coil 13 therein to a high degree, and from said coil the resultant heat passes into the core 11 and jacket 20, in which the coil is embedded, to be radiated therefrom through the inner cylinder 8 and central tube 10 to heat the water that has been delivered into the heater from the tank 1. As the water becomes heated it circulates from the heater through the coupling 7 and uptake-pipe 4 to return to the tank 1, while the cooler water at the bottom of the tank descends into the heater to take the place of the heated water discharged therefrom. Thus by continuous circulation from the tank to the heater through water is efficiently and quickly heated.

I claim as my invention—

An electric water-heater comprising a tank, a cylinder arranged beneath said tank, removable screw-caps located on the ends of said cylinder, tubular connections from each screw-cap to the water-tank, a second cylinder arranged within the first-mentioned cylinder and held therein so that a space is formed between the two cylinders, ends rigidly fixed in said inner cylinder, a tube passing longitudinally through the inner cylinder

and having its ends seated in the ends of the inner cylinder, a heat-radiating core arranged upon the tube and having a spiral groove formed in its periphery, a heating - wire
5 wound in said groove, a heat-radiating jacket surrounding the heating-wire and core, insulated plugs located in one of the ends of the inner cylinder, insulated plugs located on one

of the removable ends of the outer cylinder through which plugs the terminals of the 10 heating-wire pass, substantially as set forth.

FREDERIC F. SHIPP.

In presence of —
E. S. KNIGHT
M. P. SMITH.