

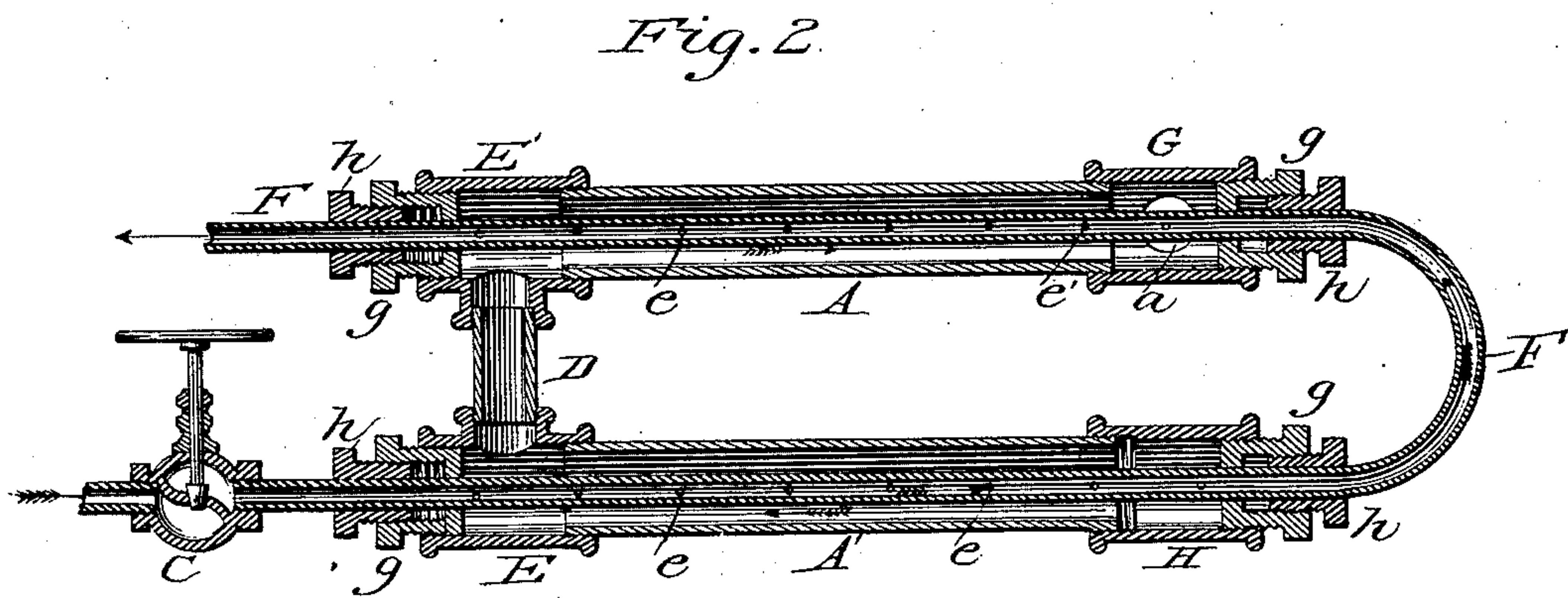
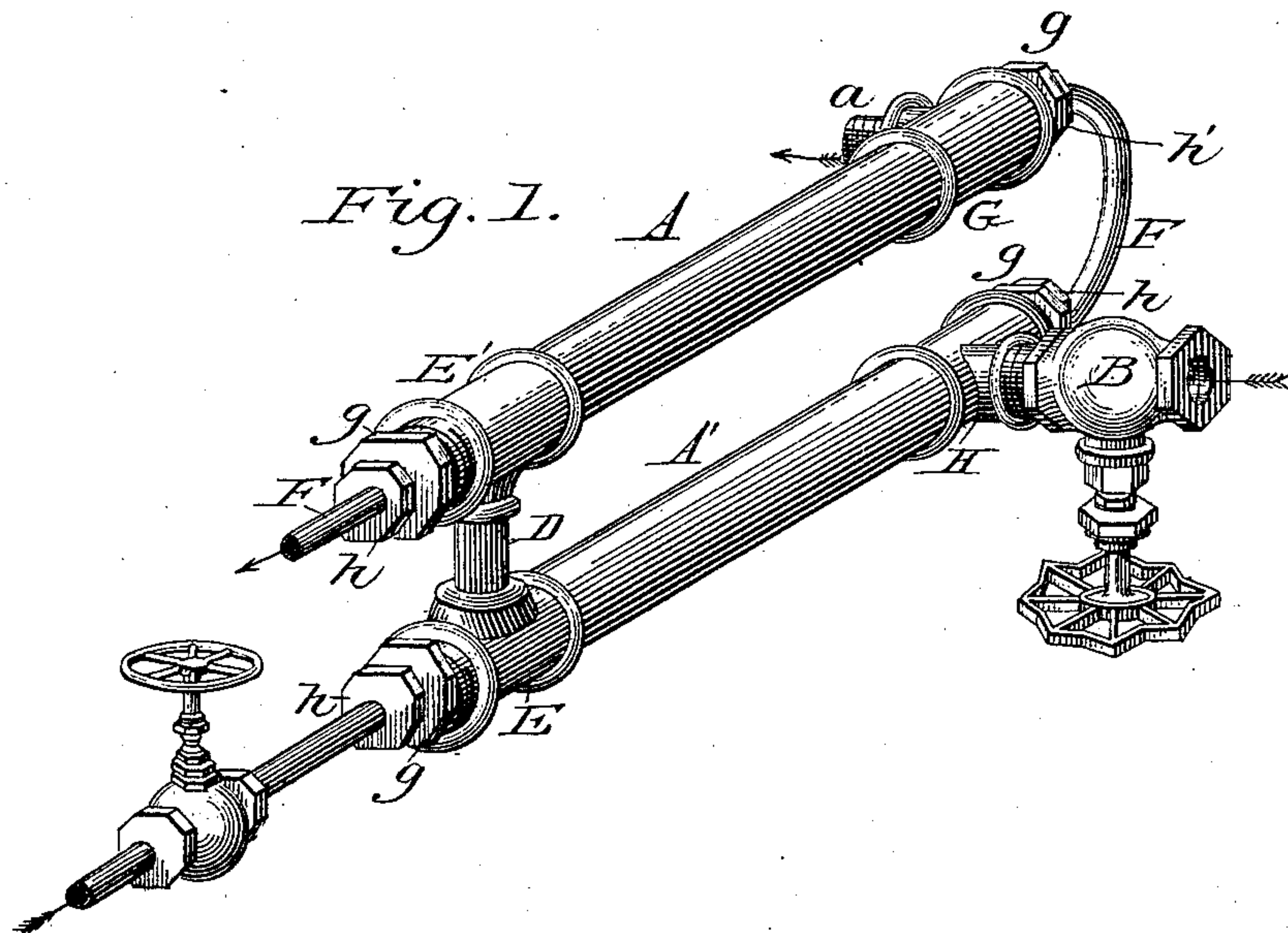
(No Model.)

F. W. MOMBURG.

WATER HEATER.

No. 348,989.

Patented Sept. 14, 1886.



Witnesses.

H. Haupt
S. W. Whitney

Inventor:
Fred. W. Momburg

Haupt Brothers
Attorneys

UNITED STATES PATENT OFFICE.

FREDERICK W. MOMBURG, OF SAUK RAPIDS, MINNESOTA.

WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 348,989, dated September 14, 1886.

Application filed November 27, 1885. Serial No. 184,082. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. MOMBURG, a citizen of the United States, residing at Sauk Rapids, in the county of Benton and State of Minnesota, have invented a new and useful Water-Heater, of which the following is a specification.

My invention relates to water-heaters in which a column and jets of steam are brought in contact with a column of water moving in an opposite direction from the said column of steam, thus heating the column of water rapidly. I attain this object by means of the device illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of the complete machine. Fig. 2 is a vertical sectional view of the machine.

Similar parts are indicated by similar letters.

I make a U-shaped tube of iron pipe, consisting of the two long pieces A and A' and a shorter piece of pipe, D. The pieces A and A' are united to the piece D by T's E and E'. At the end of the pipe A is a second T, G, and at the end of the pipe A' is a T, H, provided with a globe-valve, B. The ends of the pipes A and A' and their corresponding T are plugged by bushings g g g g, each of which is perforated, and provided with a cap, h h h h, which caps are perforated to allow for the passage through them of the steam-pipe F. I then take a piece of brass or copper pipe and bend it into a U shape, to fit the U-shaped iron pipe A A' D, passing through the perforations in the caps h h h h. At certain points at regular distances along the pipe F, in those portions of it that are within the pipes A and A', I make small perforations, as e e e e. On one end of the pipe F, I secure a globe-valve, C. The other end is closed by a plug.

Having thus described the parts of my invention, I now proceed to explain the method of using my machine, having introduced the

pipe F through the perforations in the caps h h h h, so that the perforations e e e e are within the space inside of the pipes A and A', and screw in the caps so as to make the joint tight. This being done, the machine is complete, and to valve B, I secure a pipe from a water-main. A stream of water is then passed through the apparatus by opening the valve B. The water passes into one end of the pipe A'. Moving along this pipe, it flows up through the pipe D, then along the pipe A, and out at the orifice a. At the same time I connect the pipe F with a steam-conduit, and by opening the valve C steam passes throughout the tube F, heating by radiation, and also passing through the holes e e e e into the water it heats by direct contact. The current of steam is made to pass in a direction opposite to that taken by the water, and so arranged in the apparatus that the coldest water meets the hottest steam, thus quickly heating up the water.

I am aware that heaters for water using steam as the means of carrying the heat have been used prior to my invention. I do not, therefore, claim the use of steam for heating water in the broad sense; but

What I do claim, and desire to secure by Letters Patent, is—

A new article of manufacture for heating water, consisting of the U-shaped pipe A and A' and D, as a jacket, and the U-shaped pipe F, within the pipe A A' and D, the said pipe F being provided with holes e e e along its entire length within the pipes A A', the whole arranged and operating so that a current of steam is admitted into the pipe F and issues through the perforations e e against the column of water in the outer pipe, substantially as and for the purpose set forth and described.

FRED. W. MOMBURG.

In presence of—

H. HAUPT, Jr.,
JOHN A. SPENCER.