

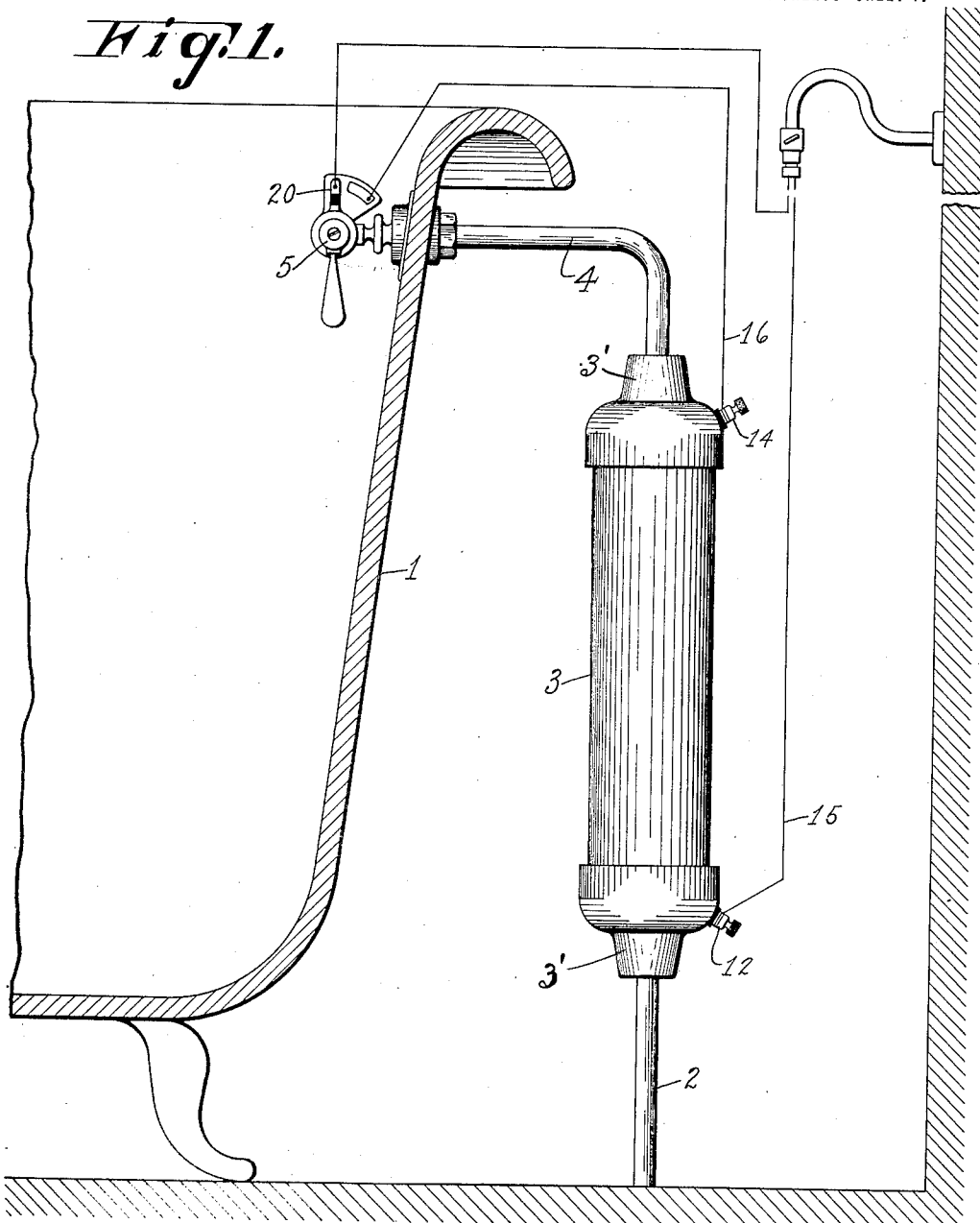
C. M. OSTERHELD.
WATER HEATER.
APPLICATION FILED SEPT. 25, 1915.

1,294,695.

Patented Feb. 18, 1919.

2 SHEETS—SHEET 1.

Fig. 1.



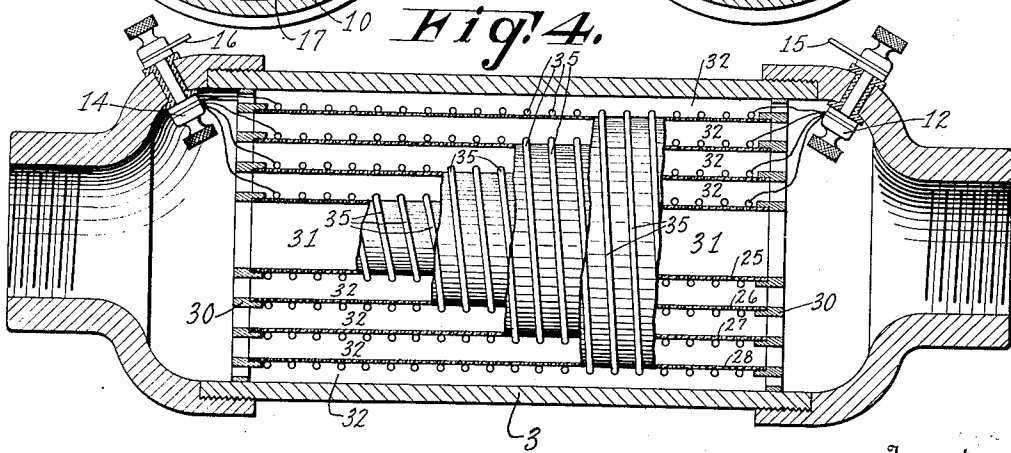
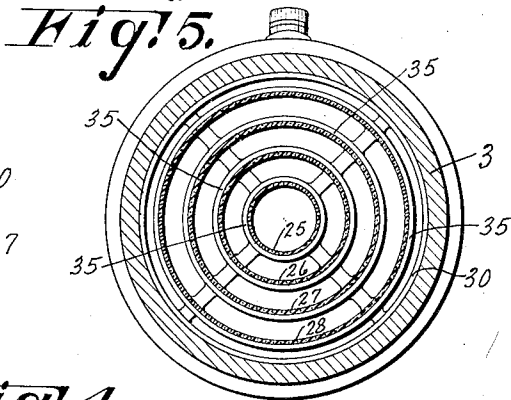
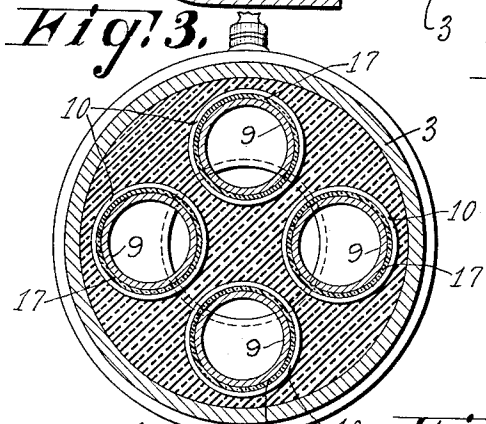
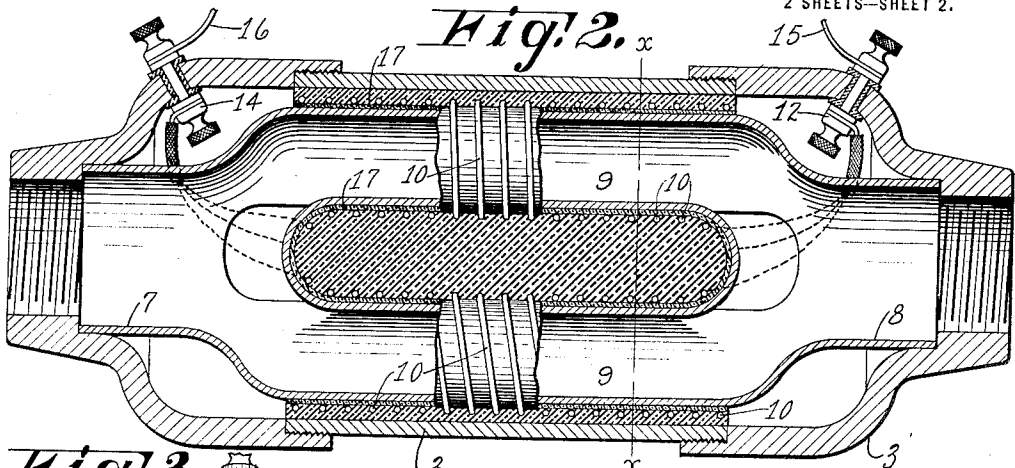
Inventor

Witnesses
Haas,
J. D. Bremer

Clark M. Osterheld
By *Erwin E. Wheeler*
Attorneys

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 2 SHEETS—SHEET 2.



Inventor

Witnesses
J. D. Bremer
 J. D. Bremer.

Clark M. Osterheld
 By *Erwin & Wheeler*
 Attorneys

UNITED STATES PATENT OFFICE.

CLARK M. OSTERHELD, OF STOUGHTON, WISCONSIN.

WATER-HEATER.

1,294,695.

Specification of Letters Patent.

Patented Feb. 18, 1919.

Application filed September 25, 1915. Serial No. 52,606.

To all whom it may concern:

Be it known that I, CLARK M. OSTERHELD, a citizen of the United States, residing at Stoughton, county of Dane, and State of Wisconsin, have invented new and useful Improvements in Water-Heaters, of which the following is a specification.

My invention relates to improvements in so called instantaneous water heaters of that type in which the heat is applied to the water in a pipe or passage leading to a faucet, the heat being applied only during the water delivering periods when the faucet is open and the heater having such capacity that the water is sufficiently heated while on its way to the point of delivery.

The object of my invention is to provide electrical means for heating flowing water in a pipe or duct leading to a faucet or delivery aperture.

In the drawings—

Figure 1 is a general view, showing a bath tub provided with water supply connections to which my invention has been applied in order to heat the water while it is being delivered to such tub.

Fig. 2 is a longitudinal sectional view of one form of heater embodying my invention, a portion of the inner lining of said chamber being broken away to expose the outer heating coil.

Fig. 3 is a transverse sectional view, drawn on line $x-x$ of Fig. 2.

Fig. 4 is a longitudinal sectional view of a modified form of heater with the central portion broken away, step by step, to expose the successive heating coils.

Fig. 5 is a transverse sectional view of the same.

Like part are identified by the same reference characters throughout the several views.

In Fig. 1 I have illustrated a bath tub 1 provided with a supply pipe 2, having a cylindrical member 3 considerably larger in diameter than the pipe and inserted between the pipe sections 2 and 4 as a fitting, the connection between said cylinder member and pipe sections being procured by reducing nipples 3'. The pipe section 4 leads from the outlet of the fitting to the bath tub, deliveries being controlled by means of a faucet 5 in the usual manner.

The interior of this fitting is provided with a heater, comprising a chambered member having end portions 7 and 8, having their

inner ends branched to provide a set of tubular ducts or passages 9 connecting said end portions, and disposed concentric to the axis thereof. These tubular end portions and passages 9 preferably comprise a single casing. The members 7 and 8 are fitted to suitable recesses in the interior walls of the reducing nipples 3' and coils of conducting wire 10 are wound about the ducts 9, as shown. These coils are connected up in parallel to binding posts 12 and 14 respectively, said binding posts projecting through the walls of the fitting 3 and connected exteriorly with the conducting wires 15 and 16, communicating with a suitable source of electrical supply. The coiled wires 10 are preferably embedded in suitable heat conducting material 17 which constitutes a protecting covering for the wire.

The water delivered by supply pipe 2 through the fitting is sub-divided within the fitting and passes through the ducts 9 receiving heat from the walls of said ducts, said walls being in turn heated by the coils 10. The wire of which the coils 10 are composed has sufficient resistance to the passage of the electric current to develop the required degree of heat. Owing to the fact that the fitting 3 is enlarged and the ducts 9 have a much larger capacity than the pipe 2, the velocity of the stream of water will be much reduced while passing through the fitting so that it may be delivered to the delivery pipe section 4 in a properly heated condition. An electric switch 20, preferably connected with the handle of the faucet 5, may be operated to turn on the current when the faucet is opened.

The principle of operation of the structure shown in Fig. 4 is the same as that illustrated in Fig. 2, but in Fig. 4, the fitting 3 contains a set of concentric tubes 25, 26, 27 and 28 connected at their respective ends with suitable head pieces 30, whereby the tubes are supported in spaced relation to each other within the fitting, thus forming a central passage 31 and a series of annular passages 32 for the water delivered through the fitting. Conducting coils 35 are wound upon each of the concentric tubes 25, 26, 27 and 28 and connected in parallel with the binding post 12 in the same manner as above described with reference to Fig. 2. Water is delivered through the fitting in the same manner as above described with reference to

Fig. 2, but it will of course pass through the central duct 31 and the annular passages between the respective tubes.

I claim—

- 5 1. In a water supply system, the combination with a water pipe and a control valve therefor, of an enlarged fitting provided with a series of passages for subdividing the water delivered through said pipe, and an
 - 10 electrical heating coil for each subdivision, each coil encircling the wall of one of the passages, a circuit including a stationary contact, and a movable contact carried by
 - 15 the movable portion of the valve and engageable with the stationary contact in various opening positions of the valve, whereby the heat supplied by said coils is constant in various opening positions of the valve, a source of electrical current supply
 - 20 with which said coils are connected in parallel; said passages having a combined capacity in excess of the capacity of the pipe and adapted to permit the water to move slowly therethrough in comparison with the velocity
 - 25 of the water in the pipe.
2. An electric water heater comprising a pair of tubular end sections having their inner ends branched to form connecting ducts, a casing disposed about said sections and ducts, inlet and outlet ports in the casing at the outer ends of the tubular sections, heating coils wound on said ducts and adapted for connection with a source of current, and embedding material surrounding said ducts. 30
3. An electric water heater comprising a pair of tubular end sections having their inner ends branched to form connecting ducts, a cylindrical casing wall disposed about said ducts, reducing nipples at the ends of said wall in which the tubular end sections are seated, and heating coils wound on said ducts and adapted for connection with a source of current. 35 40

In testimony whereof I affix my signature in the presence of two witnesses.

CLARK M. OSTERHELD.

Witnesses:

S. B. HALVERSON,
S. B. SNYDER.