F. A. ROBINSON.

ELECTRICALLY HEATED WATER FAUCET.

APPLICATION FILED MAY 29, 1907.

927,755. Patented July 13, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

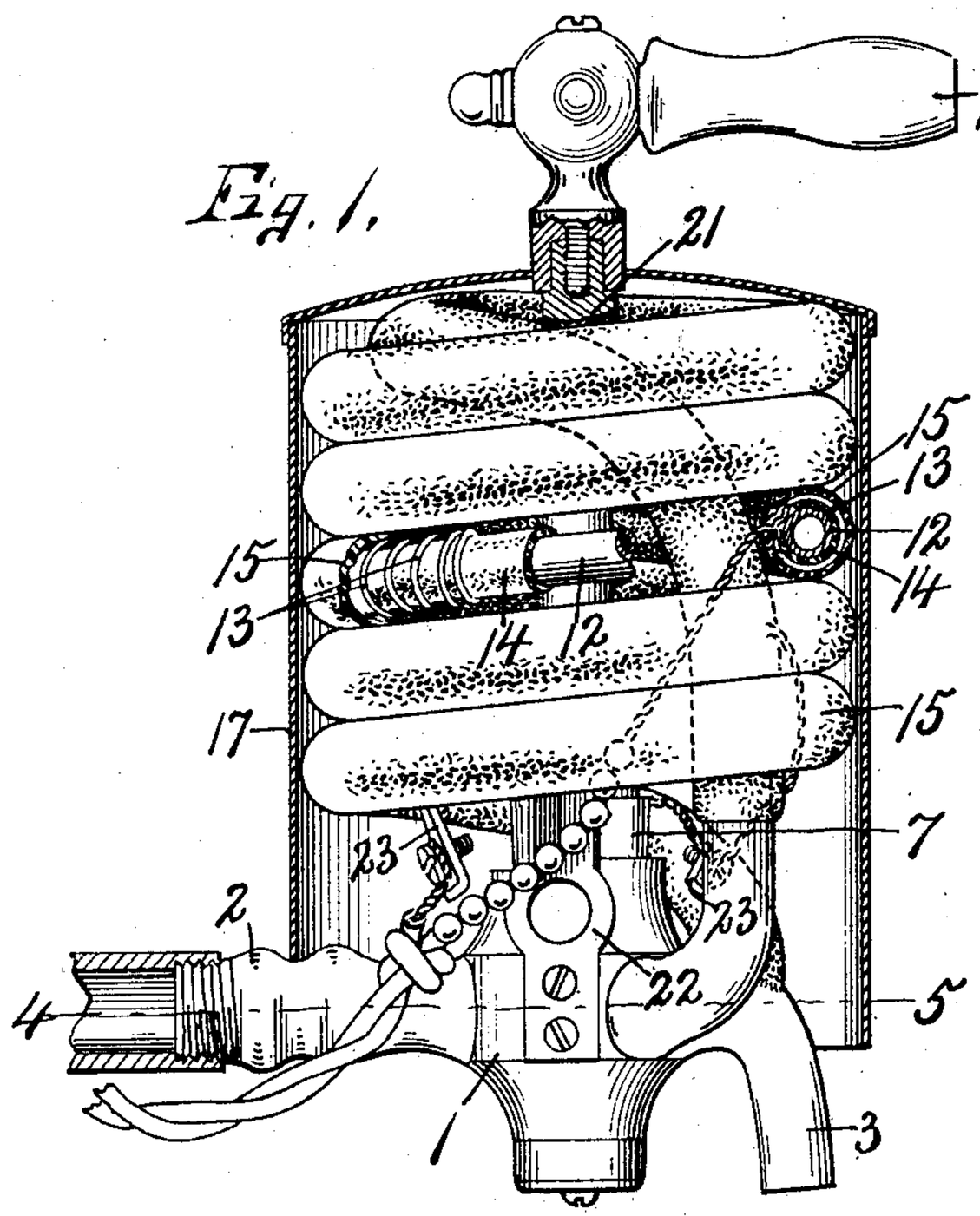
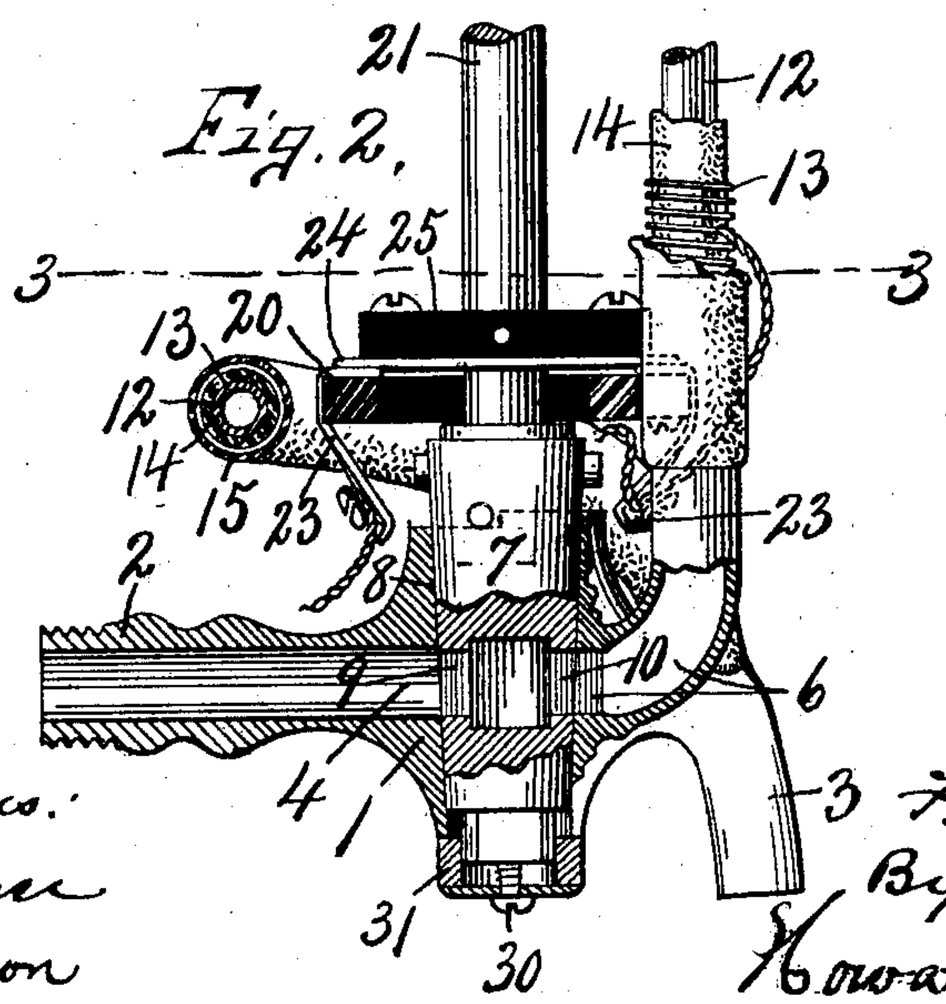


Fig. 2.



Witnesses:
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2 SHEETS—SHEET 2

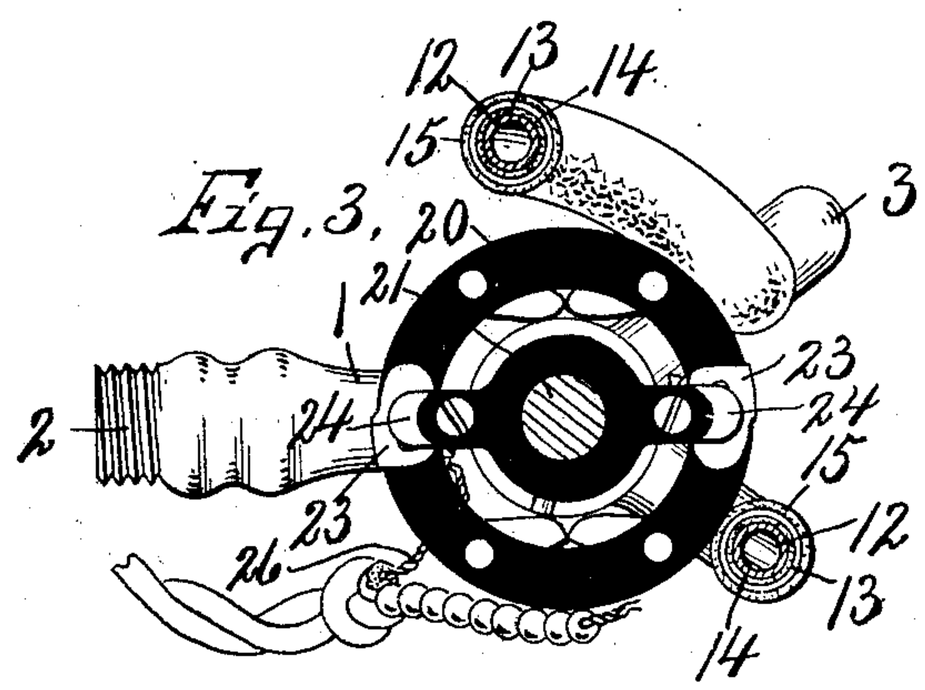

Fig. 3.

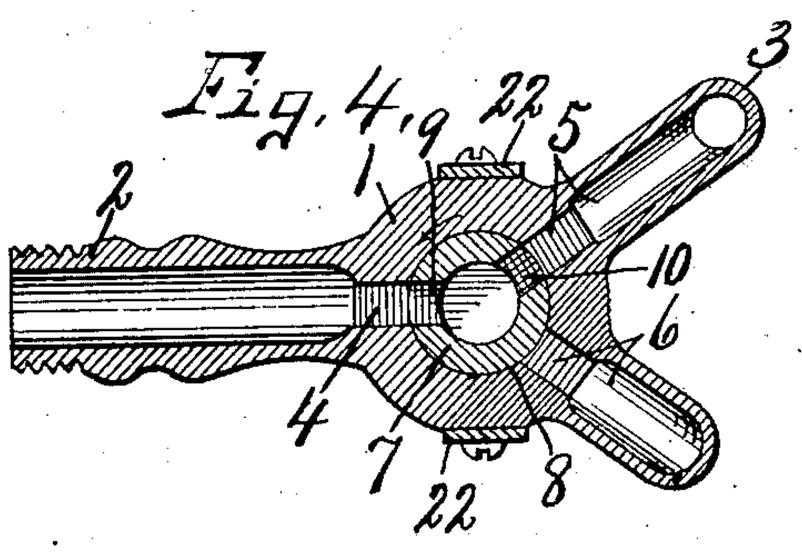

Fig. 4.

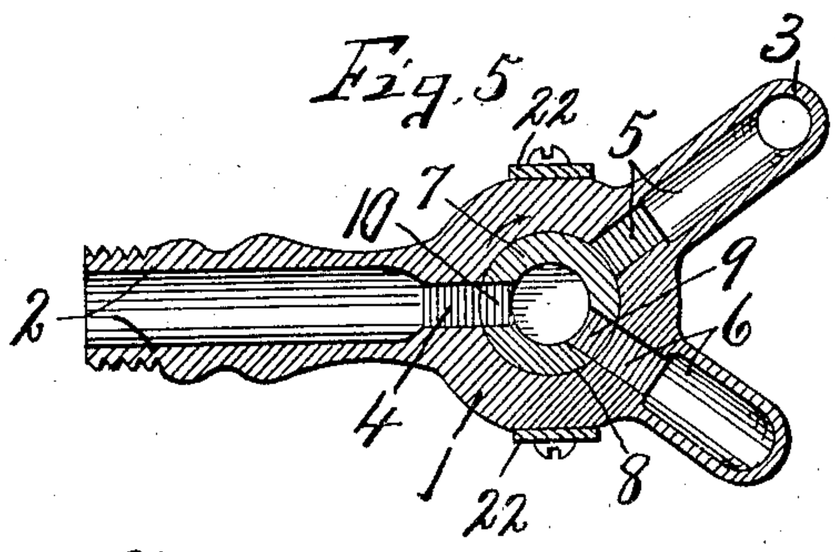

Fig. 5.

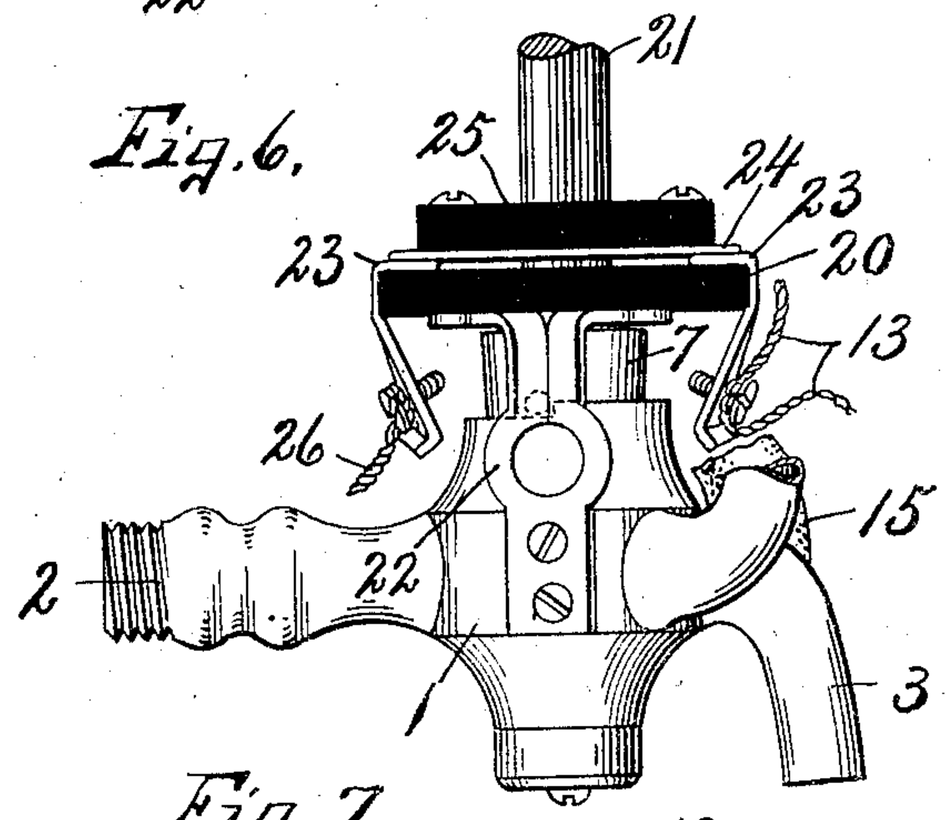

Fig. 6.

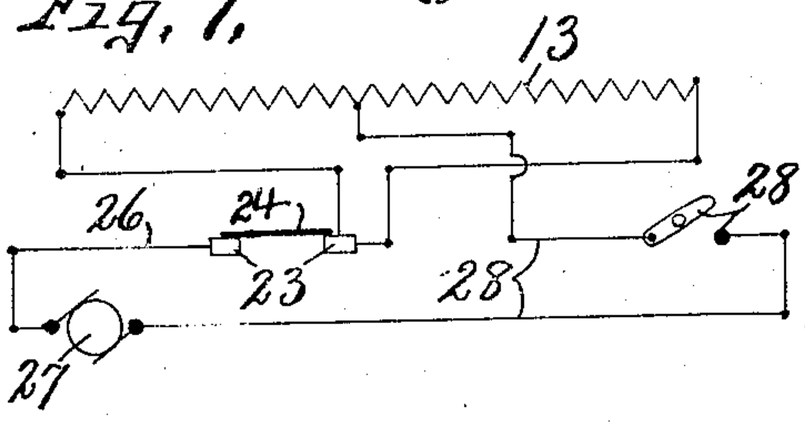

Fig. 7.

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UNITED STATES PATENT OFFICE.

FRANK ALEXANDER ROBINSON, OF PITTSFIELD, MASSACHUSETTS, ASSIGNOR TO ROBINSON ELECTRIC FAUCET COMPANY, OF COHOES, NEW YORK, A CORPORATION OF NEW YORK.

ELECTRICALLY-HEATED WATER-FAUCET.

No. 927,755. Specification of Letters Patent. Patented July 13, 1909.

Application filed May 29, 1907. Serial No. 376,413.

To all whom it may concern:

Be it known that I, FRANK A. ROBINSON, of Pittsfield, in the county of Berkshire, in the State of Massachusetts, have invented new and useful Improvements in Electrically-Heated Water-Faucets, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in electrically heated water faucets as a separate article of manufacture adapted to be attached to any water-pipe fitting capable of receiving any ordinary water faucet and comprises essentially a two-way valve, one of which ways or passages is direct for the discharge of cold water while the other way is more extended and surrounded by an electric heater, the current through which is controlled by an electric switch moving simultaneously with the valve so as to close the circuit when the valve is moved in one direction to open the extended passage for heating the water in transit to the discharge nozzle, and when said valve is moved in another position to open the direct passage for the cold water the circuit through the heater will be broken.

My object, therefore, is to provide a faucet with an electric heater and an electric switch adapted to close the circuit when hot water is desired, and to open the circuit when cold water is desired.

A further object is to assemble all of the essential parts or elements into one compact unitary structure constituting a complete article of manufacture capable of being substituted for any ordinary faucet or valve whereby hot water may be instantly supplied from any water system without the use of what is commonly known as "hot-water boilers," and expensive hot-water piping systems.

In other words, I have sought to provide a simple, economic and efficient substitute for the more expensive hot-water heating systems now in general use, and by which hot water may be drawn from any cold water circulating system through the same faucet as the cold water is drawn without unnecessary waste of fuel other than that required to heat the water while flowing through the faucet, this economical result being brought about by the fact that the electric current is used only for heating the amount of hot water desired, such current being shut off at other times.

Other objects and uses relating to the specific parts of the invention will be brought out in the following description.

In the drawings—Figure 1 is an elevation of an electric water heating faucet embodying the various features of my invention, the case for inclosing the water being shown in section and a portion of the insulation around the hot-water pipe being broken away to show a portion of the electric resistance coil. Fig. 2 is a sectional view of the lower portion of the apparatus seen in Fig. 1, showing particularly the valve passages and terminal ends of the extended hot-water pipe, and also showing the electric switch and contact terminals in elevation, as mounted upon the valve stem. Fig. 3 is a sectional view taken on line 3—3, Fig. 2, showing particularly the electric switch and its connections with the heating coil. Figs. 4 and 5 are sectional views taken on line 4—5— Fig. 1, showing the valve in its different positions. Fig. 6 is a side elevation of a lower portion of the faucet and switch, showing particularly the supporting frame for the insulating ring carrying the terminals of the switch. Fig. 7 is a diagrammatic view of the electric heating system.

In carrying out the objects stated, I provide a valve-casing —1— with a threaded nipple or lateral extension —2— at one side and a discharge nozzle —3— at the opposite side, said valve casing being formed with an inlet port —4— extending through the nipple —2— and with opposite outlet ports —5— and —6—, which in this instance, are in substantially the same horizontal plane as the inlet port.

A rotary taper valve —7— is fitted in a vertical taper socket —8— in the valve casing —1— and is provided with ports —9— and 10— in the same plane as the ports —4—, 5— and 6— with which they are adapted to be brought into registration by the rotation of the valve; that is, the valve casing is provided with a series of three ports —4—, —5— and —6—, while the valve is formed with two ports adapted to connect

the inlet port with one or the other of the ports —5— and 6—.

The port —5— leads directly into the nozzle —3—, while the port —6— is extended into a continuous coil 12— of comparatively small tubing of high heat conductivity, as copper, which is easily bendable into the coil —12— and its helices are preferably concentric with the axis of the valve —7— and disposed in a plane immediately above the valve casing —1—, the other end of the coil being brought around on the outside and terminates in the discharge nozzle —3— with which it communicates so that one end of the coil communicates with the port —6—, while the other end of said coil communicates with the port —5— leading into the nozzle 3.

The ports —9— and 10— are arranged so that when the valve is moved to one position, as shown in Fig. 4, the ports —9— and 10— communicate respectively with the inlet and outlet ports —4— and —5— of the valve casing, thereby establishing direct communication between the inlet port —4 and discharge nozzle —3— for the passage of cold water, while the other port —6— leading to the extended passage or coil —12—, is closed. On the other hand, when the valve is moved to another position as shown in Fig. 5, the ports —10— and —9— are registered respectively with the inlet and outlet ports —4 and —6—, thereby establishing communication between the inlet port and extended passage or coil 12—, which latter is surrounded by an electric resistance coil 13— adapted to be connected to any available source of electric energy for supplying current to the heating coil 13—. This heating coil or electric resistance wire is insulated from the pipe coil 12— by an intervening wrapping or filling 14— of insulating material, as asbestos or equivalent substance, which is indestructible by heat, said resistance wire being also covered by a similar wrapping or layer of insulating material 15— to retain the heat, and also to protect the operator against accidental contact with the wire, and furthermore, to insulate the wire from an inclosing jacket or hood 17— which is shown in section in Fig. 1, said jacket also serving to prevent malicious or accidental interference with the heating coils, and may be finished to give the faucet a pleasing external appearance.

Mounted upon the valve casing is a ring —20— of insulating material which is concentric with and surrounds the valve stem, as —21—, of the valve —7—, said insulating ring being supported a slight distance above the valve casing —1— upon suitable brackets —22—, which, in turn, are secured to opposite sides of the valve casing —1— for supporting the insulating ring —20— in fixed relation to said valve casing, and upon this insulating ring is secured a pair of diametrically opposite contact terminals —23— which are adapted to be connected by a rotary switch member —24— of copper or other electric conducting material, which, together with the terminals —23—, constitute an electric switch, the contact-plate —24— rotating with the valve —7—, and for this purpose is secured to an insulating block or head —25—, which, in turn, is secured to the valve stem 21— directly above the terminals —23—.

The insulating ring —20— serves to insulate the terminals —23— from each other and from the valve casing, the opposite ends of the resistance wire 13— being electrically connected to one of the terminals —23— while the other terminal is connected by a wire —26— to the source of electric energy, as a dynamo —27— shown diagrammatically in Fig. 7, said source of electric energy being also connected by a wire —28— to the resistance coil or wire 13— intermediate between its ends, and preferably near the center of the coil, thereby dividing the electric resistance coil or winding into two practically separate heaters, whereby I am enabled to obtain a more even distribution of the current throughout the entire length of the wire without carrying such current through an excessive length of such wire. These electrical connections are best shown diagrammatically in Fig. 7 in which I have indicated the contact terminals —23— as electrically connected in circuit through the dynamo —27— and a switch 28—, the resistance coil 13— being shown as unwound or extended, but the wire 26— is here shown as connecting the resistance substantially midway through the interposed switch —28— which may be of any construction for opening and closing the circuit.

I have shown in Figs. 4 and 5 the valve —7— as in its two extreme positions, one position for connecting the inlet port —4— with the outlet port —5— for direct passage of the cold water therethrough, while Fig. 5 shows a valve in its position for diverting the water from the inlet 10—through the tubular heater coil, but it is evident that said valve —7—may be adjusted to an intermediate position to cut off communication between the inlet port and both of the outlet ports

As previously stated the contact piece —24— of the electric switch is secured to the valve stem —21— through the medium of the insulating block —25— and, therefore, rotates with the valve —7—, and this contact piece and associated terminals —23— are arranged relatively to the valve ports —9— and 10— so that when these valve ports are registered respectively with the inlet —4— and extended outlet —6—, or tubular heater-coil 12— the contact piece —24 electrically connects the terminals —23—, thereby closing the electric circuit

through the electric heater coil 13—, thereby heating the water as it passes through the tubular outlet extension 12— to the discharge nozzle —3—. On the other hand, when the valve —7— is turned to establish direct communication between the inlet —4— and nozzle —3— through the port —5— the contact piece —24— is simultaneously thrown out of electrical connection with the terminals —23—, thereby breaking the electric circuit through the resistance coil or electric heater —13—, allowing cold water to pass directly through the nozzle —3—. Again, when the valve is turned to an intermediate position so as to cut off communication between the inlet port —4— and both of the outlets ports —5— and —6, the contact member —24— is still out of contact with the terminals —23—, the object being to keep the electric circuit open at all times except when hot water is desired, or when the valve is in the position shown in Fig. 5 with the valve ports 10 and —9— in registration with the inlet and outlet ports —4— and —6— respectively.

The valve stem —21— extends upwardly through the center of the tubular heater-coil 12— above the top of the casing —17— and is provided with a suitable handle 18— whereby the valve —7— may be manipulated, and inasmuch as there is always more or less wear and consequent necessity for repair of the valve I have left sufficient opening in the tubular coil 12— to permit said valve stem with the valve and switch member —24— thereon to be readily withdrawn upwardly through the top of the coil 12— by simply removing a screw —30— and washer —31— by which the valve is held in its taper seat —8—.

It will be seen from the foregoing description that the valve casing —1— is provided with a direct passage for the cold water and an extended passage inclosed within an electric heater for heating the water passing through the extended passage which terminates in a direct passage, thereby discharging hot or cold water through the same outlet —3—, and although I have shown the tubular heater coil as concentric with the axis of the valve, it is obvious that the extended passage may be otherwise formed and located in other relations to the valve-casing without departing from the spirit of this invention, therefore I do not limit myself to the exact relative arrangement or construction of the valve casing or heating means other than the broad idea of providing the valve casing with one direct water-way and a separate extended water-way and electrically heating the extended water-way only when such passage is in communication with the inlet of the valve casing.

What I claim is:

1. In an electric water-heating faucet, a valve casing having an inlet and an outlet and an extended passage leading from the valve chamber to the outlet, electric means for heating said extended passage and a valve for controlling communication between the inlet and said extended passage.

2. An electric water heating faucet comprising a valve casing having an inlet and an outlet, a separate conduit leading from the valve chamber to the outlet, a valve for controlling communication between said inlet and outlet through said conduit, and electric means for heating the separate conduit.

3. An electric water heating faucet comprising a valve casing having an inlet and outlet, a separate conduit leading from the inlet to the outlet, a valve controlling the communication between the inlet and outlet through said conduit, electric means to heat the conduit, and an electric switch connected to the valve to close the electric heating circuit simultaneously with the opening of the valve to said conduit.

4. An electric water heating faucet comprising a valve casing having an inlet and an outlet, an elongated tube leading from the valve chamber to the outlet, a valve controlling communication between the inlet and elongated tube, an electrical heater inclosing a portion of the tube between the valve chamber and outlet and an electrical switch operable with the valve to close the electric circuit through the heater simultaneously with the opening of communication between the inlet and tube.

5. An electric water heating faucet comprising a two-way valve casing having an inlet and a valve for alternately connecting the inlet with one or the other of said ways, a tubular conduit leading from one of the ways and an electric heater inclosing a portion of said conduit.

6. An electric water heating faucet comprising a valve casing having an inlet and an outlet, an outside conduit leading from the valve chamber to the outlet, a valve controlling communication between the inlet and outlet through said conduit, and electrical means outside of the valve casing for heating said conduit.

7. An electrical water heating faucet comprising a valve casing having an inlet and a direct outlet, and also provided with an indirect outlet, a valve controlling communication between the inlet and said outlets, an electric heater inclosing portions of the indirect outlet and an electrical switch in circuit with the electric heater and movable with the valve for closing the circuit through the heater when communication is established between the inlet and indirect outlet.

8. An electric water heating faucet comprising a valve casing having an inlet and an outlet, and also provided with an indirect passage leading to the outlet, a valve con-

trolling communication between the inlet and outlets, an electric heater inclosing a portion of the indirect passage and an electrical switch in circuit with the heater and movable with the valve to close the circuit through the heater when the inlet is in communication with the indirect passage.

In witness whereof I have hereunto set my hand this 14th day of May 1907.

FRANK ALEXANDER ROBINSON.

Witnesses:
FRANK R. STRONG,
KELTON B. WELLER.