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C. VAN D. HILL.

ELECTRIC HEATING ATTACHMENT FOR HOT WATER BAGS.

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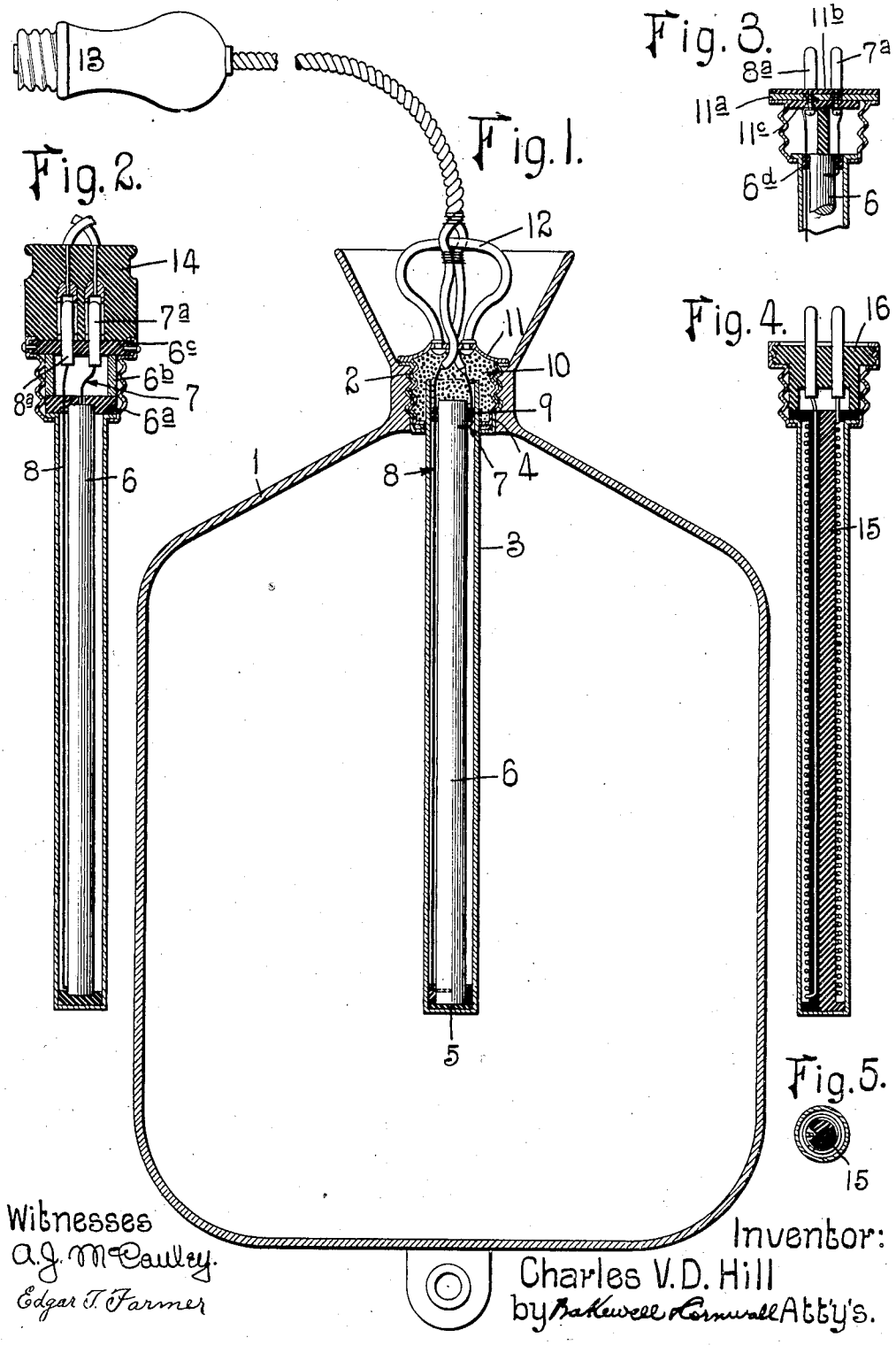


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Witnesses
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ELECTRIC HEATING ATTACHMENT FOR HOT-WATER BAGS.

No. 839,928. Specification of Letters Patent. Patented Jan. 1, 1907.

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To all whom it may concern:

Be it known that I, CHARLES VAN DYKE HILL, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Electric Heating Attachments for Hot-Water Bags, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a sectional view through a hot-water bag, showing my improved electric heating attachment applied thereto; and Figs. 2, 3, 4, and 5 are sectional views through modified forms of heating attachments.

This invention relates to a new and useful improvement in electric heating attachments for hot-water bags, the object being to simplify and reduce the cost of manufacture of such devices.

In the drawings, 1 indicates a hot-water bag, into the neck portion of which is arranged a threaded thimble 2 for receiving the screw-stopper which is now generally employed.

My improved electric heating attachment consists of a tube 3, secured to the screw-stopper 4 in the bag, which stopper is usually composed of a metallic shell having an outwardly-projecting flange at its upper edge and an inwardly-projecting flange at its lower edge. The tube 3 is soldered or otherwise secured to the lower flange and in the form shown in Fig. 1 projects into the stopper some little distance.

5 is a spacing insulation-button arranged in the lower end of the tube, in which is mounted the resistance 6 in the form of graphite, one end of which is connected to a wire 7 and to the other end of which is connected a wire 8. An insulation-sleeve 9 surrounds the upper end of the resistance bar to hold the same in proper position in the tube. Insulation material 10, preferably in a granulated form, is arranged in the hollow stopper, so as to prevent the wires 7 and 8 from short-circuiting, said insulation material also serving to hold the resistance-bar 6 in position. A cap 11 is soldered or otherwise secured to the outwardly-extending flange of the stopper, and through openings in this cap the wires 7 and 8, which are insulated at this point, pass. A handle 12 is secured to the cap, which handle is in the form of bent wire, as shown, the wires 7 and 8 being bound together above and below the top connecting-piece of the handle, so as to be free to move within the limits of the handle. Wires 7 and 8 lead to a plug 13, which may be inserted in an ordinary lamp-socket.

In operation the water is preferably first heated and placed in the bag, after which the electric heating attachment and stopper are arranged in position and the current turned on. I have found by experiment that to employ a resistance which will generate sufficient heat to raise the temperature of cold water to the required degree within a reasonable time—say five or ten minutes—will require some means for increasing the resistance so as to maintain the proper temperature in the water, else the water will become too hot and the bag will swell on the generation of gases therein. I therefore prefer to so proportion the resistance relative to the current used as to maintain water which is first heated and placed in the bag at the desired temperature. In this manner I avoid all possibility of overheating the water and also obviate the swelling of the bag when the water is overheated. Of course it will be understood that the heat generated by the electrical apparatus would eventually raise the temperature of cold water to the required degree; but as such would require considerable time it is not recommended in practice.

In Fig. 2 I have shown a modified form of electric heating apparatus in which there is a cap-washer 6^a, of insulation material, arranged in the bottom of the stopper-shell for holding the resistance-bar 6 in place. This cap-washer is held in position by a thimble 6^b, of insulation material, which thimble acts as a spacer and bears its upper end against an insulation cap-piece 6^c, held in position by the flange of the stopper-shell which is spun thereover or by the use of suitable rivets, as shown. In this form of my apparatus the wires 7 and 8 lead to terminal posts 7^a and 8^a, which serve as handles for screwing the stopper into and out of position before the electrical connection is made. 14 is an insula-

tion-plug having terminal sockets for coöperating with the posts 7^a and 8^a, which terminal sockets are connected by wires to the plug 13, such as shown in Fig. 1. By this construction it is obvious that the wires may be disconnected from the bag by moving the plugs over the posts.

In Fig. 3 I have shown another modified form in which instead of using an insulation cap-piece for the stopper-shell I employ a metal cap-piece 11^a, and in order to support the posts 7^a and 8^a in position I arrange insulation-pieces 11^b and 11^c above and below the cap-piece. The resistance-bar 6 in this form is held in position by an insulation-piece 6^d.

In Fig. 4 I have shown another form in which a coil-wire is used instead of the resistance-bar. This wire is coiled on an insulation-spool 15, having heads at its ends, V-shaped grooves being formed in the upper or larger heads for the passage of the wires and a V-shaped groove also being provided in the body portion of the spool for the return-wire of the coil. The insulation material of which this spool is made is preferably of what is known as "lavite" on account of its cheapness and ease of manipulation. An insulation-plug 16, of similar material, is arranged within the shell of the stopper, whose upper flange may be spun thereover to hold said insulation-plug in position.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In an electric heating attachment for hot-water bags, the combination with a stopper-shell, of a tube secured in position in said shell, said tube being closed at its lower end and open at its upper end, a resistance-bar in said tube, means for holding said resistance-bar in position in the tube, and wires connected to the opposite ends of said resistance-bar; substantially as described.

2. In an electric heating attachment for hot-water bags, the combination with a hollow stopper, of a tube secured in position therein, said tube being closed at its lower end and open at its upper end, a resistance-bar arranged in said tube, means for insulating said bar from said tube and supporting the bar in position in the tube, electric conductors connected to the opposite ends of the tube, and a cap-piece closing the hollow stopper and through openings in which said electric conductors pass; substantially as described.

3. In an electric heating attachment for hot-water bags, the combination with a hollow stopper, of a tube secured in position therein, said tube being closed at its lower end and open at its upper end, a resistance-bar arranged in said tube, means for insulating said bar from said tube and supporting the bar in position in the tube, electric conductors connected to the opposite ends of the tube, a cap-piece closing the hollow stopper and through openings in which said electric conductors pass, and a handle on said tube in the form of a loop to the outer connecting-piece of which the said electric conductors are bound so as to have limited movement and relieve the points of connection of said conductors from strain; substantially as described.

4. In an electric heating attachment for hot-water bags, the combination with a hollow stopper-shell and its tube, of electrical resistance arranged in said tube, granulated insulation material in said hollow stopper for holding said resistance in position, electric conductors leading to and from said resistance through said granulated insulation material, and a cap-piece closing said hollow stopper, said cap-piece being provided with openings for the passage of said electric conductors; substantially as described.

5. In an electric heating attachment for hot-water bags, the combination with a hollow stopper-shell and its tube, a resistance-bar arranged in said tube, an insulation-washer engaging the upper end of the resistance-bar for holding the same in position, a cap-piece for closing the stopper-shell, and insulation material interposed between the washer and said cap-piece; substantially as described.

6. In an electric heating attachment for hot-water bags, the combination with a hollow stopper-shell and its tube, a resistance-bar arranged in said tube, an insulation-washer engaging the upper end of the resistance-bar for holding the same in position, a cap-piece for closing the stopper-shell, and insulation material interposed between the washer and said cap-piece, said insulation material being in granulated form; substantially as described.

7. In an electric heating attachment for hot-water bags, the combination with a hollow stopper-shell and its tube, a resistance-bar arranged in said tube, an insulation-washer engaging the upper end of the resistance-bar for holding the same in position, a cap-piece for closing the stopper-shell, and insulation material in the form of a hollow sleeve engaging the washer and cap-piece; substantially as described.

8. In an electric heating attachment for hot-water bags, the combination with a stopper-shell and its tube, of a resistance-bar arranged in the tube, a cap-piece for the shell-stopper, and a post bearing against said resistance-bar and cap-piece for holding the former in position; substantially as described.

9. In an electric heating attachment for hot-water bags, the combination with a stopper-shell and its tube, of a spool-shaped insu-

lation-piece arranged in the tube and provided with a longitudinally-disposed groove, a resistance-wire coiled on said spool and having the return portion of the wire located in said groove, and an insulation-piece arranged in the shell-stopper and bearing against the head of said spool for holding the same in position; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 19th day of February, 1906.

CHARLES VAN DYKE HILL.

Witnesses:
LENORE WILSON,
GEORGE BAKEWELL.