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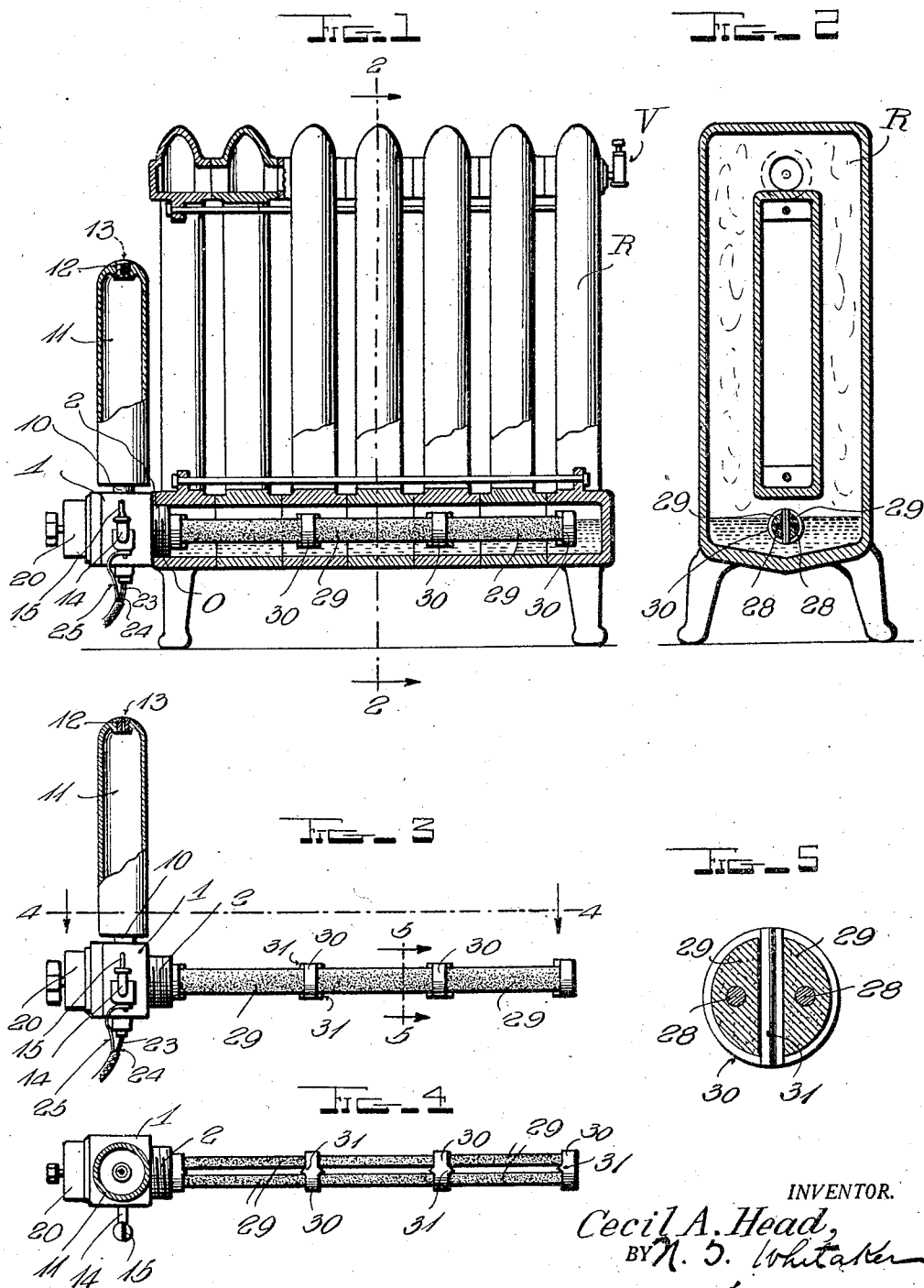
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C. A. HEAD

STEAM HEATING ATTACHMENT FOR RADIATORS

Filed Oct. 11, 1924

3 Sheets-Sheet 1



INVENTOR.

Cecil A. Head,
BY *N. S. Whitaker*
his ATTORNEY

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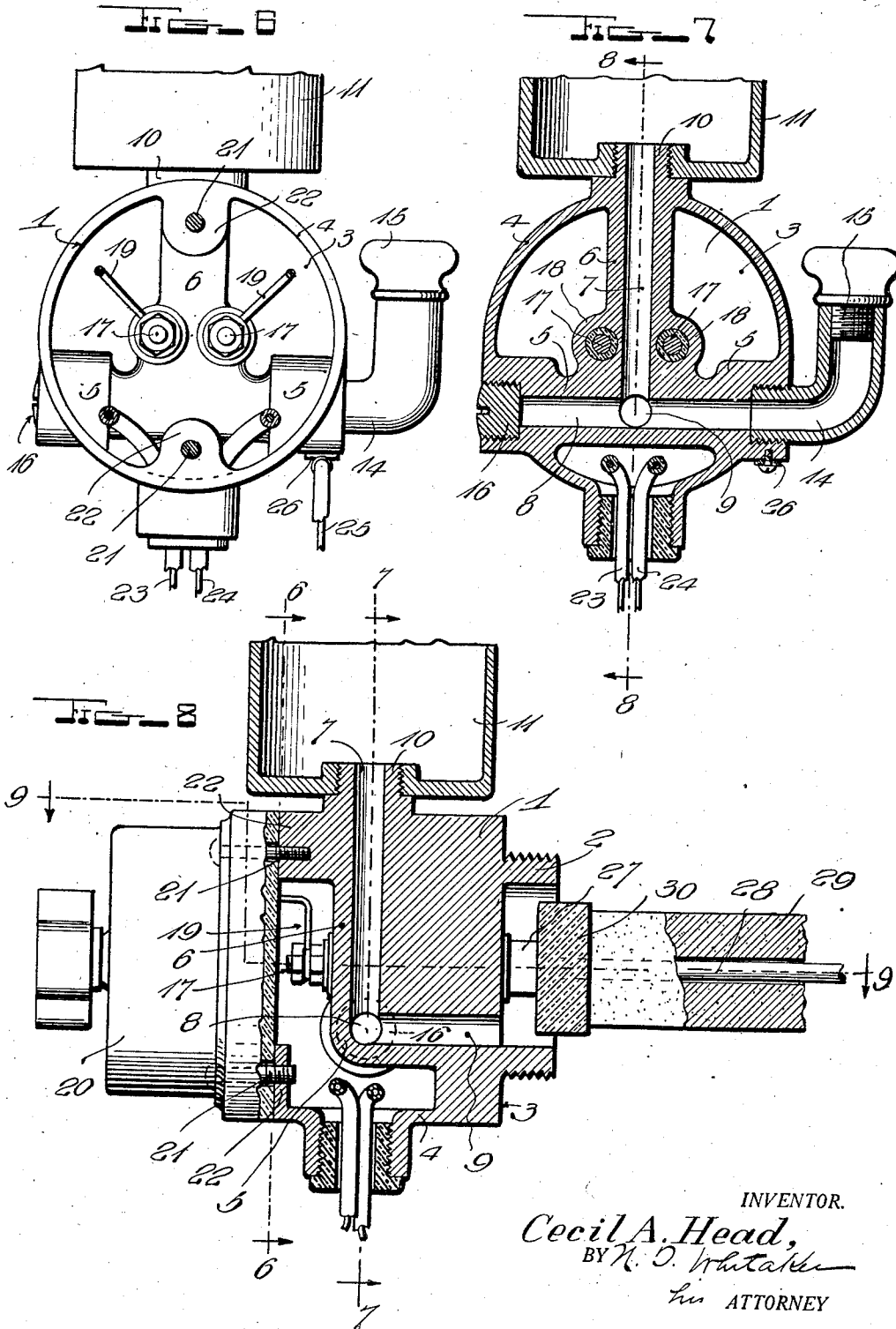
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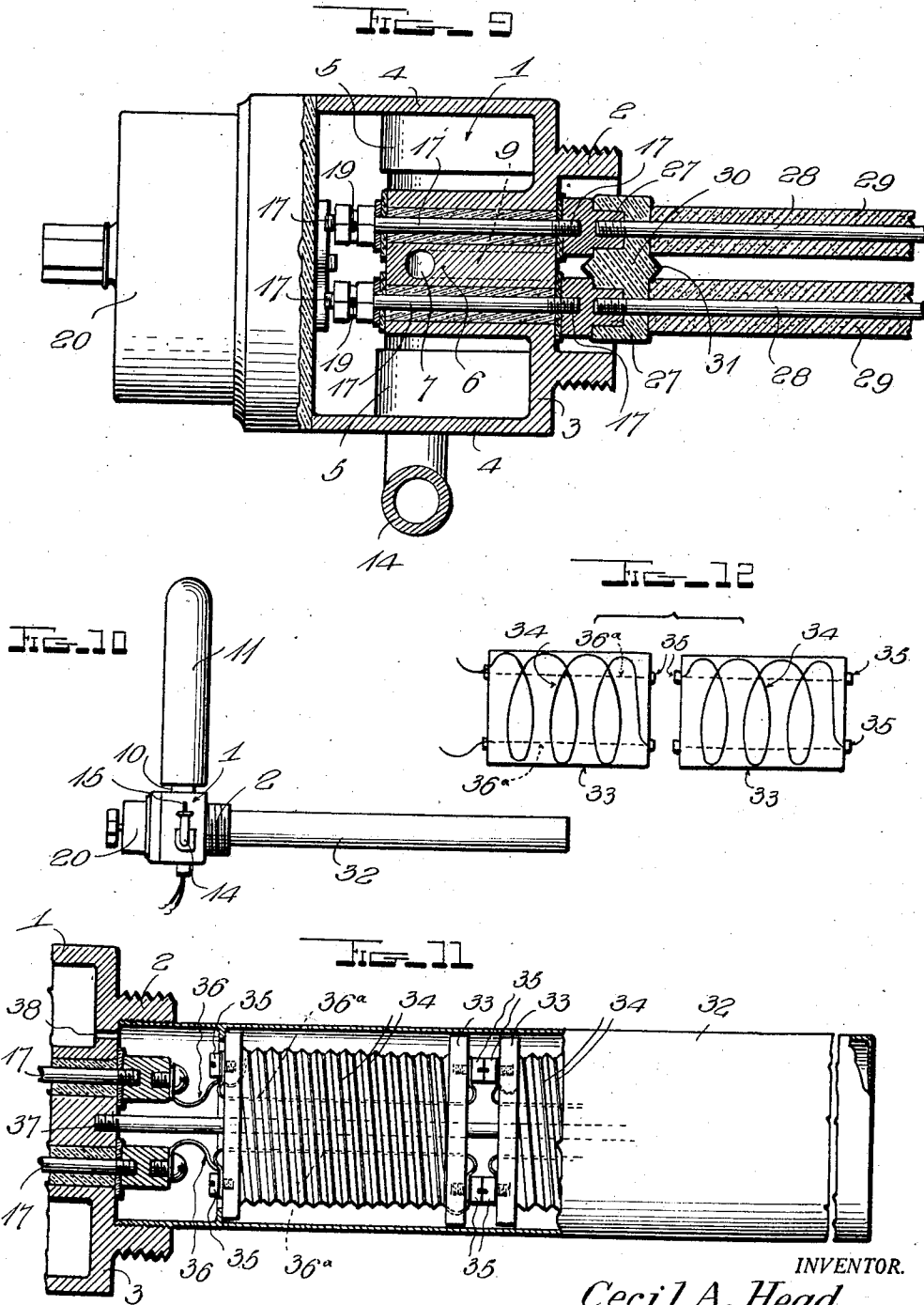
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STEAM HEATING ATTACHMENT FOR RADIATORS

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INVENTOR.
Cecil A. Head,
BY *N. J. Whitaker*
his ATTORNEY

UNITED STATES PATENT OFFICE.

CECIL A. HEAD, OF ROYAL OAK, MICHIGAN.

STEAM-HEATING ATTACHMENT FOR RADIATORS.

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My invention has reference broadly to steam generating devices and the present disclosure relates specifically to an attachment for an ordinary steam or hot water radiator for the purpose of generating steam therein for heating purposes.

The principal object of the invention is to provide a unique association of parts in which a small amount of water is heated in a radiator or other steam generating and collecting chamber by means of a heater in the lower end thereof, and in which the water is forced away from the heater into a water receiver by the generated steam pressure, when the latter has reached sufficient pressure. Thus, the heater is relieved of a great deal of work which is particularly advantageous when said heater is electrically operated, which is preferable, as a great saving in current is effected.

Another object of the invention is to provide a common carrying member for the heater and the water receiver which also acts to place the water receiver in communication with the radiator or other chamber.

A still further aim is to provide a structure in which the above named carrying member supports a controlling switch for the heater.

Further objects are to provide for the escape of pressure to prevent possible breakage of any parts, to provide for supplying only the proper quantity of water to the radiator or the like, and when the invention is embodied in the form of an attachment, to have the carrying member, above referred to, provided with the water inlet means.

Yet another object is to produce a device which is extremely simple and inexpensive, easy to install, economical in operation, fool proof and excellently adapted for use in the generation of steam for numerous purposes, but primarily for heating.

With the foregoing and minor objects in view, the invention resides in the novel subject matter hereinafter described and claimed and shown in the accompanying drawings.

Figure 1 is a sectional view through the radiator, showing the steam generating device attached.

Fig. 2 is a vertical transverse section on line 2—2 of Fig. 1.

Fig. 3 is a side elevation of the device, partially in section.

Fig. 4 is a horizontal section on line 4—4 of Fig. 3.

Fig. 5 is a detail, transverse, vertical section, on an enlarged scale, taken on line 5—5 of Fig. 3.

Fig. 6 and Fig. 7 are transverse vertical sections, on an enlarged scale, taken on lines 6—6 and 7—7 of Fig. 8.

Fig. 8 is a fragmentary longitudinal section, taken on line 8—8 of Fig. 7.

Fig. 9 is a horizontal sectional view, taken on line 9—9 of Fig. 8.

Fig. 10 is a side elevation of the device, showing a slightly modified form of the heating elements.

Fig. 11 is a fragmentary section on an enlarged scale, parts being shown in elevation.

Figure 12 is a diagrammatic view, disclosing more particularly the wiring of the modified heating units.

The construction disclosed is hereinafter specifically described, with the understanding at the outset however, that within the scope of the invention as claimed, numerous modifications may be made both in structure and in use.

R designates a well known form of heating radiator having the usual opening O in its lower end and provided with an air escape valve V which preferably closes automatically after the air has been forced out by the steam generated. My improvements are designed primarily for use with this radiator of a general type, but also may be adapted to other chambers in which steam may be generated and collected.

The numeral 1 designates a preferably cup shaped body usually in the form of a casting, said body having a threaded flange 2 projecting outwardly from the side wall 3 opposite its open side and adapted for reception in the opening O. Formed across the inner side of the wall 3 and joined to the continuous side wall 4, are a horizontal rib 5 and a vertical rib 6, the lower end of the latter being joined to the former. The rib 6 is formed with a passage 7, a passage 8 extends longitudinally through the rib 5 and communicates with the passage 7, and a passage 9 leads from these communicating passages through the wall 3 within flange 2, for open communication with the radiator R.

A suitable threaded connection 10 is formed on the body 1 in registration with the passage 7 and supporting a water receiver 11 whose upper end is preferably provided with a screw plug 12 having a vent

13. A filling neck 14, normally closed by suitable means such as the plug 15, is capable of being screwed into either end of the passage 8, the other end of this passage being closed by a suitable plug 16.

A pair of binding posts 17 pass through suitable bosses 18 on the rib 6 at opposite sides thereof and are insulated therefrom, the outer ends of these posts being connected by suitable conductors 19 to a switch 20 which closes the open side of the body 1 and is secured to the latter by screws or the like 21, threaded into lugs 22 extending inwardly from outer wall 4 of the body 1 (see Fig. 8). The switch controls the supply of current to the posts 17 from current conducting wires 23, 24 and 25. In the wiring circuit as shown the neutral wire 25 is grounded at 26 to the body 1. The wires 23 and 24 pass through a depending boss carrying an insulation bushing, and are connected with the terminals of the switch in the usual manner.

As shown more particularly in Fig. 9 the outer ends of the binding posts 17 are provided with heads 27 in which metal rods 28 are threaded, said rods carrying heating elements or electrodes 29 of carbon or other suitable material and insulators 30 between said elements. The elements 29 are preferably disposed in groups on the rods 28, and an insulator 30 is disposed between each pair of adjacent groups of said elements, all of said insulators having radial ribs 31 received between the insulators of the aforesaid groups to laterally space them.

In Figs. 10, 11 and 12 a closed copper tube 32 is threaded into the flange 2 and contains insulating cores or spools 33 upon which resistance wires 34 are wound, these wires being connected to contacts or binding screws 35 on the ends of the spools. Current conducting wires 36 lead from the binding posts 17 to the screws 35 of the first spool 33, other wires 36^a lead to two of the screws 35 of the next spool, and preferably the adjacent screws 35 of the separate spools are held in contact with each other by a tie rod 37 which ties the spools together and is threaded into the wall 3. An air vent 38 is provided through this wall to permit circulation of air around the heater to prevent overheating.

It may be here explained that any desired number of groups of the elements 29 and any suitable number of the spools 33 with their heating elements 34, may be used.

After installing the attachment, the plug 15 is removed and the radiator filled through the neck 14 to the extent permitted by the latter, the location of this neck being preferably such that the water level cannot quite reach the upper side of the heater. The plug 15 is then reinserted and when the switch 20 is closed, the heater will immediately come into play to heat the small quantity of water

in the radiator, rapidly converting it into steam. This steam first drives out all air through the valve V which is then closed or automatically closes. Then, as the steam gains sufficient temperature to produce effective heat, and its pressure increases, it forces the water in the radiator down away from the heater, this water escaping through the passages 9 and 7 into the receiver 11. Thus the heater is relieved of its load and will consume comparatively little current, although it will maintain the steam at high temperature for efficient heating. If this temperature lowers and the steam temperature consequently decreases, some water will return from the receiver 11 into contact with the heater and more steam will be generated, as will be readily understood, it being seen that the water leaves the radiator or returns to it proportionately with the temperature and pressure of the steam within the radiator, so that an efficient self governing device is provided. Such device will consume little water as only restricted communication with the outside air is permitted through the valve V and vent 13. This vent permits unresisted rise and fall of water in the receiver 11 and also acts as a safety pressure escape, so that there is no possibility of an explosion.

It will be seen from the foregoing that means have been provided for effectively carrying out the objects of the invention and the many possibilities of the invention in different fields of use will be clear to those skilled in the art.

What I claim is:

1. A steam generating attachment for a steam collecting and generating chamber, comprising a water heater for insertion into the chamber, a water receiver adapted to receive water driven from the chamber by steam pressure, and a common carrier for said heater and receiver having a passage for placing the latter in communication with the water containing portion of the chamber.

2. A steam generating attachment for a steam collecting and generating chamber, comprising a water heater for insertion into the chamber, a water receiver adapted to receive water driven from the chamber by steam pressure, and a common carrier for said heater and receiver having a passage for placing the latter in communication with the water containing portion of the chamber; said carrier having a threaded portion for coupling it to the chamber.

3. A steam generating attachment for a steam generating and collecting chamber, comprising an electric heater for reception in the chamber, a controlling switch for said heater, a water receiver adapted to receive water forced from the chamber by steam pressure, and a common carrying member

for said heater, said switch and said receiver, said member having a passage to place the receiver in communication with the chamber.

4. A steam generating attachment for a steam generating and collecting chamber, comprising an electric heater for reception in the chamber, a controlling switch for said heater, a water receiver adapted to receive water forced from the chamber by steam pressure, and a common carrying member for said heater, said switch and said receiver, said member having a passage to place the receiver in communication with the chamber; said carrying member having a threaded portion for coupling it to the chamber.

5. A steam generating device comprising a steam generating and collecting chamber adapted to contain a quantity of water, a water heater in the water containing portion of said chamber for converting part of the water into steam, and a water receiver communicating with the water containing portion of said chamber, whereby steam pressure in the chamber may drive the water in said chamber away from said heater into said water receiver; together with a water inlet for the chamber disposed at the normal water level thereof and acting as an overflow to prevent overfilling of said chamber, and means for closing said water inlet.

6. A steam generating attachment for a steam collecting and generating chamber, comprising a water heater for insertion into the chamber, a water receiver adapted to receive water driven from the chamber by steam pressure, and a common carrier for said heater and receiver having a passage for placing the latter in communication with the water containing portion of the chamber; said carrier having a water inlet passage for the chamber acting also as an overflow to prevent overfilling, and means for closing said water inlet passage.

7. A steam generating attachment for a steam collecting and generating chamber, comprising a water heater for insertion into the chamber, a water receiver adapted to receive water driven from the chamber by steam pressure, and a common carrier for said heater and receiver having a passage for placing the latter in communication with the water containing portion of the

chamber; said heater extending horizontally from said carrier, the latter having a water inlet for the chamber disposed to prevent filling of the latter to a level above the heater.

8. An attachment of the class described comprising a body having a threaded projection adapted for reception in an opening of the steam generating chamber, said body having three communicating passages one of which opens through the body at a point within the circumference of said threaded projection; a water inlet neck connected to another of said passages, means for normally closing said neck, a water receiver connected with the remainder of said passages, an electric heater projecting from said body, in substantial alinement with said threaded projection, and current supply means for the heater passing through said body and insulated therefrom.

9. An attachment of the class described comprising a body having a threaded projection adapted for reception in an opening of the steam generating chamber, said body having three communicating passages one of which opens through the body at a point within the circumference of said threaded projection, a water inlet neck connected to another of said passages, means for normally closing said neck, a water receiver connected with the remainder of said passages, an electric heater projecting from said body, in substantial alinement with said threaded projection, a switch mounted at the side of the body remote from the heater, and conducting means connecting said switch and heater.

10. An attachment of the class described comprising a cup shaped body, an electric switch secured to said body and closing the open side thereof, an electric heater projecting from the opposite side wall of said body, said wall having a threaded attaching projection at the adjacent end of said heater, and current conducting means between the switch and heater passing through and insulated from said wall, the continuous side wall of said body having an opening through which lead wires may pass to the interior of the body for connection to the switch.

CECIL A. HEAD.