

May 5, 1925.

1,536,094

W. S. HADAWAY, JR

VAPOR ELECTRIC HEATING EQUIPMENT

Original Filed June 27, 1917

4 Sheets-Sheet 1

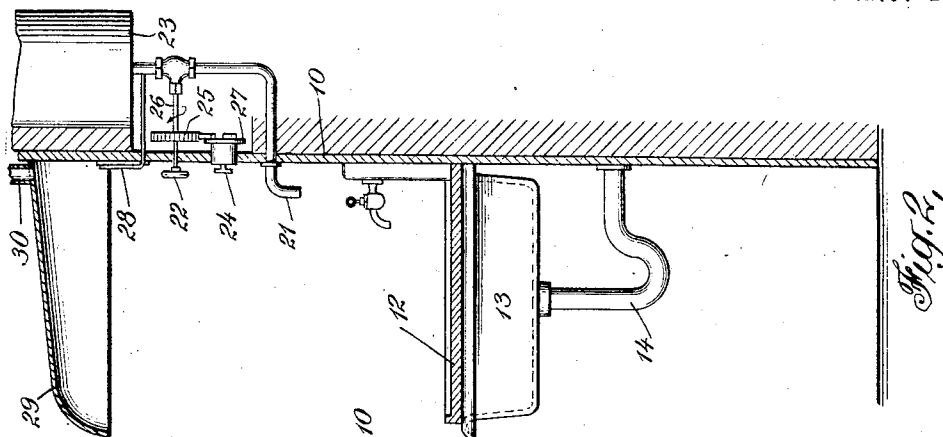


Fig. 2.

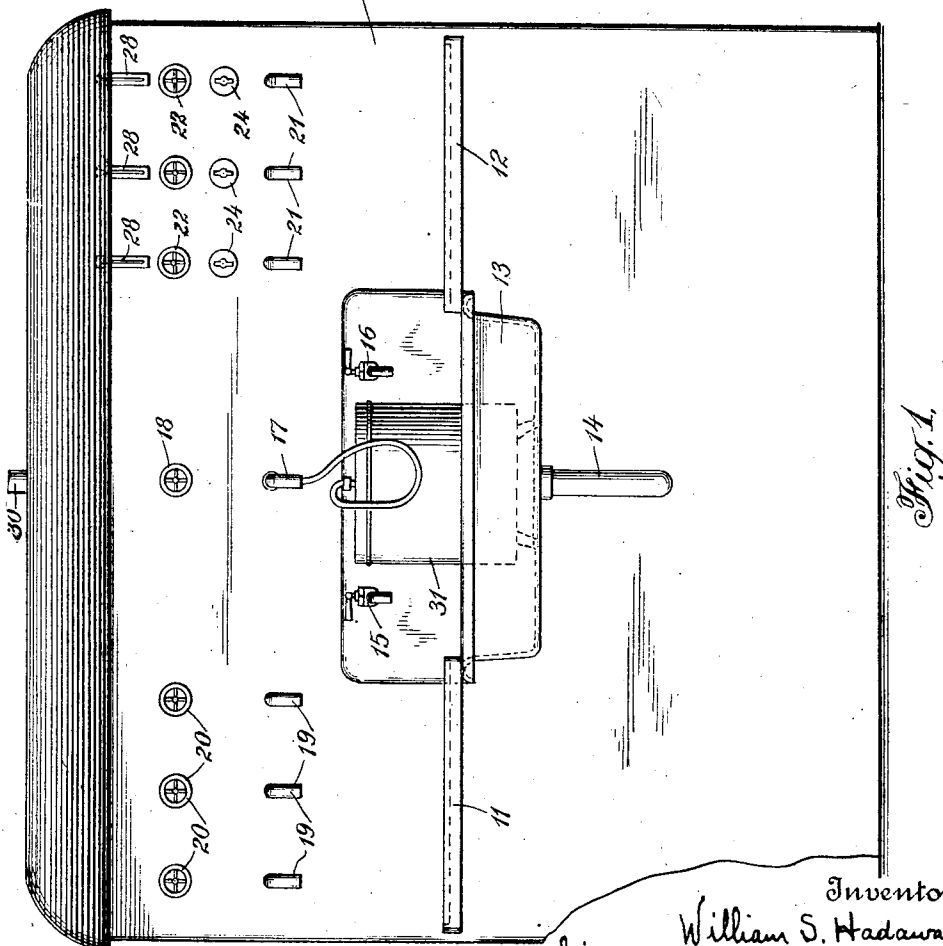


Fig. 1.

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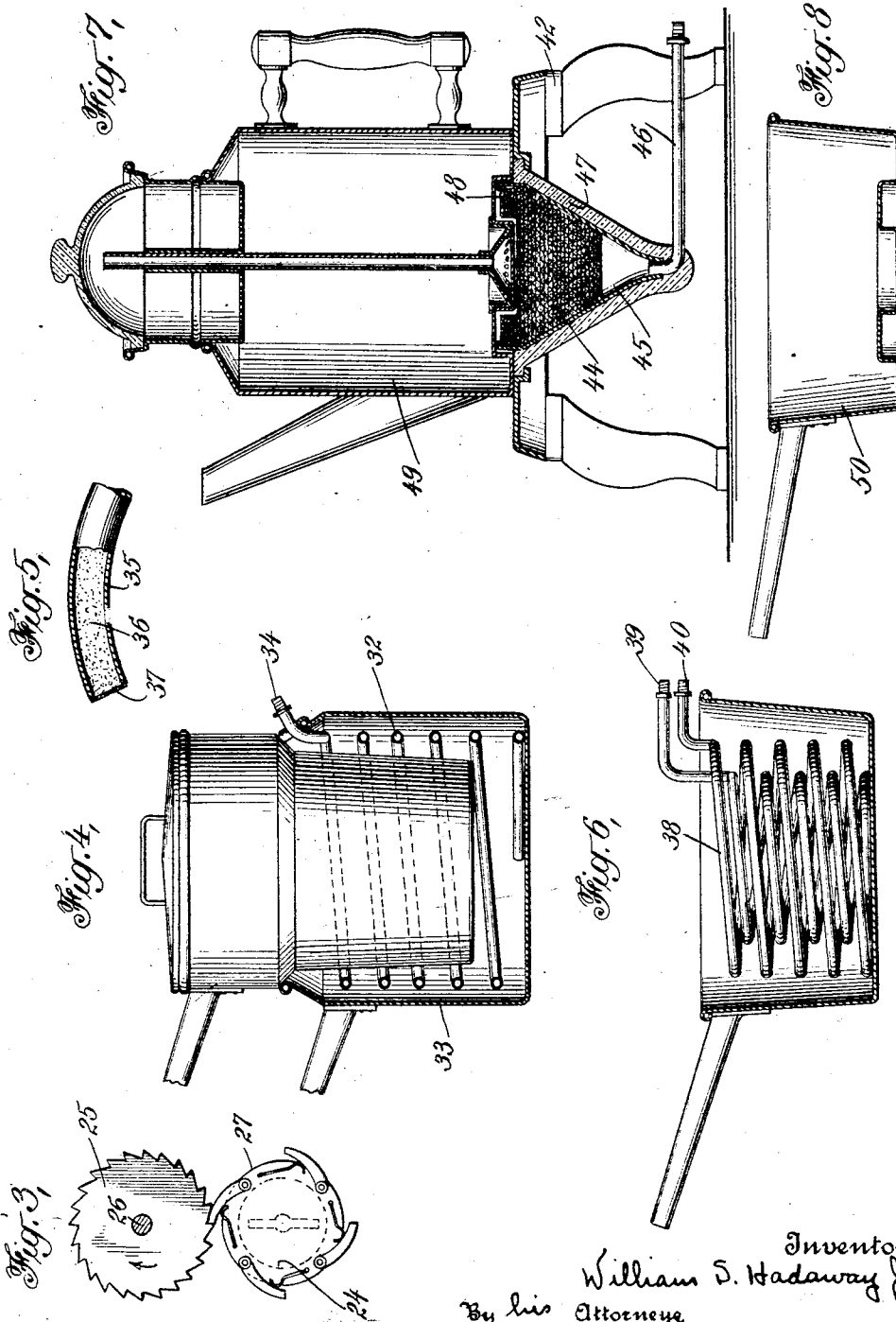
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Fig. 9,

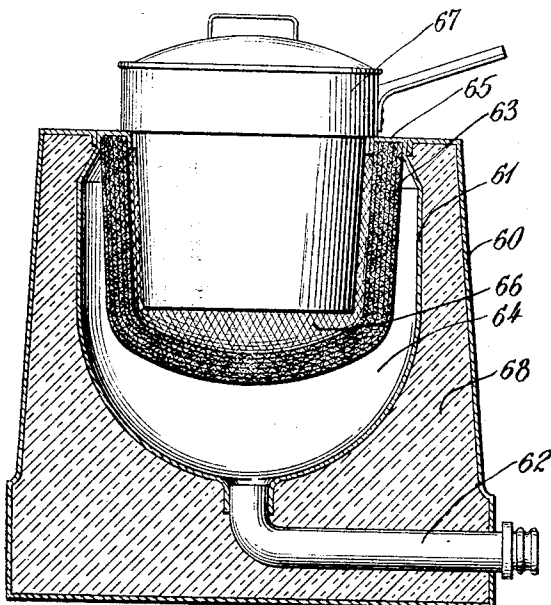


Fig. 11,

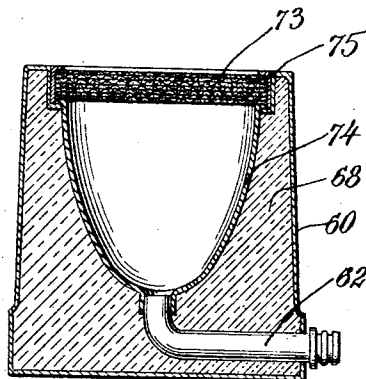
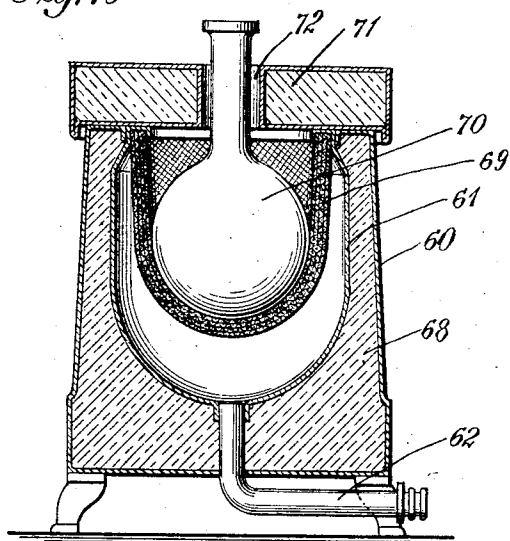


Fig. 10



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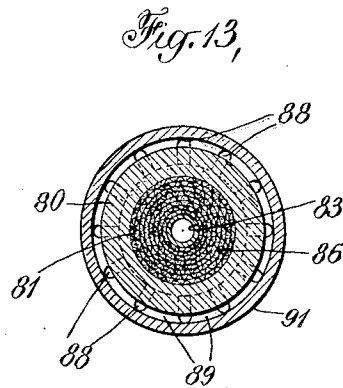
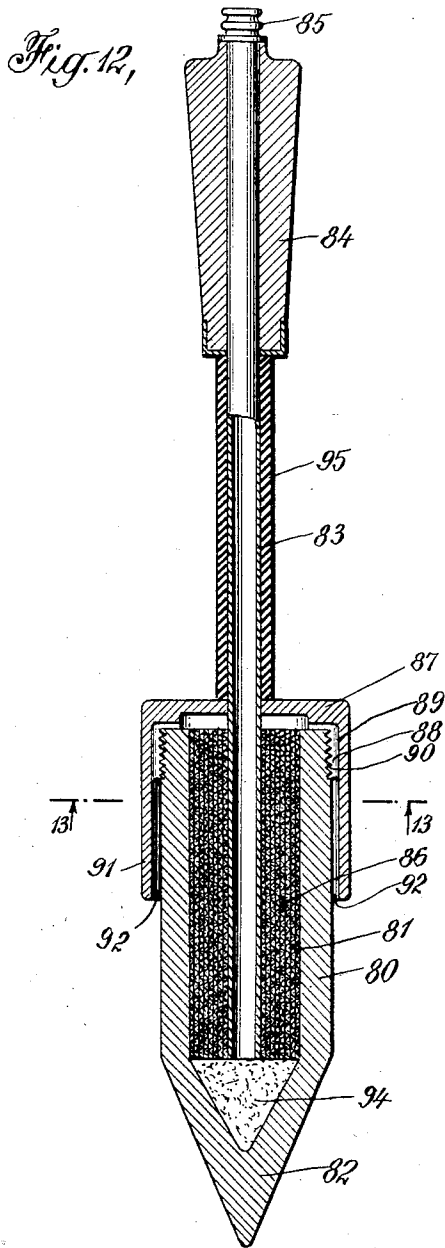
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Original Filed June 27, 1917 4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE.

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VAPOR ELECTRIC HEATING EQUIPMENT.

Application filed June 27, 1917, Serial No. 177,168. Renewed September 21, 1922. Serial No. 589,684.

To all whom it may concern:

Be it known that I, WILLIAM S. HADAWAY, Jr., a citizen of the United States of America, and a resident of New Rochelle, county of Westchester, and State of New York, have invented certain new and useful Improvements in Vapor Electric Heating Equipment, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to heating appliances and has special reference to the application of heat for the purposes of household cooking and cleansing including the operations usually performed on a range, and in a kitchen sink.

One object of my invention is to provide a simple and compact heating and heat distributing apparatus suitable for the aforesaid purpose and adapted for use where the cost of electric energy is relatively high.

Another object is to provide heat distributing and control apparatus adapted to deliver hot vapor so as to be available for individual cooking and cleaning operations in conjunction with working members or heat radiators which are formed and constructed so as to adapt them to the various household uses ordinarily met by a range and a kitchen sink.

It has been my aim to place at the disposal of the person engaged in the kitchen work a plurality of sources of heat of unlike temperatures, which sources may be selected according to the work to be performed and utilized as a source from which heat may be transmitted through a suitable hose connector to the heat radiator or working member which is placed in the cooking vessel or built into a small stand on which the device to be heated is set.

Furthermore, the heat is available for the purpose of cleansing dishes and sterilizing, and the like.

While my invention is not restricted to any particular arrangement I aim to do away with the sink in the ordinary sense of the word and provide a sanitary receptacle to which hot and cold water and hot vapor is supplied in connection with suitable shelves or plates on which the cooking may be done together with a suitable drain from such receptacle.

Another object is to provide a vapor

heated utility that shall be arranged and constructed to absorb the heat of the steam or other hot vapor and make it available when the utility is utilized for its intended purpose.

Another object of my invention is to provide a device in the form of a receptacle into which the vessel to be heated may be set, the heater receptacle being composed of a relatively large mass of material formed and constructed to permit the steam or other vapor to flow slowly therethrough.

Other objects and advantages of my invention will be set forth hereinafter, and in order that my invention may be thoroughly understood I will now proceed to describe the same in the following specification and then point out the novel features thereof in appended claims.

Referring to the drawings:

Figure 1 is a front elevation and

Figure 2 is a sectional side elevation of a vapor electric apparatus arranged and constructed in accordance with my invention and constituting one embodiment thereof.

Figure 3 is a detail view of the interlocking control mechanism.

Figures 4, 6, 7 and 8 are sectional elevations of cooking appliances which are adapted to be used with the mechanism of Figures 1 and 2.

Figure 5 is a detail drawn to a larger scale of the working or heat radiating member of Figure 4.

Figure 9 is a sectional elevation of another heater arranged and constructed in accordance with my invention.

A modified heater particularly adapted to receive flasks such as are used in a chemical laboratory is shown in Figure 10.

Figure 11 is a view corresponding to Figures 9 and 10 showing another modification of my invention, arranged to provide a flat heating surface.

Figure 12 is a sectional elevation of still another utility arranged and constructed in accordance with my invention and constituting an embodiment thereof.

Figure 13 is a transverse sectional view, taken on the line 13--13 of Figure 12.

Special reference may first be had to Figures 1 and 2 in which 10 represents the face plate of the apparatus which may be flush with the wall of the room or set out

from the wall if necessary, to give room to the other apparatus which is behind the face plate.

11 and 12 represent shelves on which the cooking appliances may be placed. 13 is a receptacle which corresponds somewhat to a sink and may perform similar functions, although it is adapted to be sterilized at all times by the application of hot water and steam. 14 is the waste pipe connected to the receptacle or sink. 15 and 16 are hot and cold water faucets, and 17 is a steam outlet which is controlled by the valve 18. Over the shelf 11 are a plurality of similar outlets 19 controlled by valves 20 and over the shelf 12 are outlets 21 which are controlled by valves 22.

The outlets 17 and 19 are all connected to a source of low temperature steam such as a low pressure boiler. The outlets 21 as shown in Figure 2, are each connected to vapor electric heaters 23 which may be formed in any suitable manner, as for example, that shown in my Patent No. 1,356,818, issued October 26, 1920, the application for which was copending with this application.

Steam is supplied to these heaters from a low temperature source and emerges therefrom as highly superheated vapor, the electric energy used for superheating the steam being controlled by a switch 24. Each one of the switches 24 and the corresponding valve 22 are interlocked by a ratchet wheel 25 on the stem 26 of the valve, and a pawl carrier 27 mounted on the switch. The arrangement of parts is such that the switch may be turned on only when the valve is open. Consequently the electric energy may be supplied for heating the vapor only when the vapor is free to flow and furthermore the valve cannot be closed until the electric energy is first shut off. Thermometers 28 indicate the temperature of the vapor as it leaves the heaters 23. A hood 29 is preferably provided to overhang the shelves and the sink and is connected to a flue 30 through which the waste vapors escape.

In Fig. 1 a dish washer 31 is shown mounted in the sink and is connected to the steam outlet 17. The steam may be used in this way after a certain amount of water is supplied to the washer. Thus the water is kept very hot and the dishes are sterilized as well as cleaned.

Assuming a cooking operation is to be performed in a double boiler or the like, a heating coil or working member 32 such as shown in Figure 4 may be utilized. The outer receptacle 33 of the double boiler is mounted on one of the shelves such as the shelf 11, and the coil 32 is connected at its intake end 34 to the discharge member 17. Steam is thus supplied to the member and its heat is given up directly to the water contained in the double boiler. The coil in

this case may comprise a coil pipe 35 which is filled with sand 36 as shown in Figure 5, and is covered at its exhaust end by a screen 37. By this means all of the steam is utilized in heating the water, being discharged directly thereinto after it percolates through the sand. The sand prevents the too rapid flow of the steam, and gives the coil a large heat capacity.

The heating coil may be modified in case it is to be used for heating soup or other liquid into which it is not desirable to discharge the steam. A double coil 38 as shown in Figure 6 is suitable for this purpose and steam is then supplied to an inlet 39 and is led out through an outlet 40 which is preferably connected to discharge into the sink.

The arrangement of Figure 7 comprises a stand 42 having a heat distributor 44 in the form of a porous mass. This may be built up of wire screens for example, similar to that shown in my copending application Serial No. 182,816 filed July 26, 1917.

Hot vapor is supplied to the chamber in which this mass is disposed, through a pipe 46 which is adapted to be connected to one of the outlets 21, for example. The highly heated vapor percolates slowly through the porous mass 44 and raises it to the temperature of the vapor.

The chamber 45 is surrounded by insulation 47 at the sides and is enlarged near the top and provided with a recess which produces an annular projection 48. The bottom percolator pot 49 or sauce pan 50 may be formed to fit onto the annular projection 48 and by this means a large amount of heat is transmitted to the center of the pot or sauce pan.

Reference may now be had to Figures 9, 10 and 11 in which other structures, which are adapted to receive hot vapor and give up heat to working vessels or bodies, are illustrated.

The heater shown in Figure 9 comprises an outer casing 60, an inner receptacle casing 61 to which steam or other hot vapor is supplied through an inlet pipe 62. Suspended within the chamber of the receptacle 61 is a porous mass 63 which also has the shape of a receptacle but is smaller than the receptacle 61 so that a steam space 64 is provided between the two. The porous mass 63 is supported from its upper edge and may be formed in any suitable material. It may, for example, be composed of wire screens pressed into a mass and held by a flange 65 at the top of the inner receptacle 61. The porous mass whether formed of screens or otherwise, is adapted to permit the hot steam to percolate through its pores into a space 66 into which the bottom of a sauce pan or other cooking vessel 67 extends.

The porous mass prevents the too rapid

escape of the steam and on account of its mass holds considerable heat adjacent to the walls of the vessel and maintains the vapor at high temperature immediately around the vessel.

The space between the outer and inner casings 60 and 61 is filled with mineral wool or some other suitable material designated 68.

The structure of Figure 10 is similar to that of Figure 9, and like parts are designated by the same reference characters.

Instead of the porous mass 63 I provide a similar porous mass 69 which is preferably flexible so that it conforms to the shape of the flask 70 or other vessel which is set into it.

When the apparatus is used for heating a flask as shown, an insulating lid 71 is preferably employed having a small opening 72 through which the neck of the flask extends.

Instead of having the porous mass made in the form of a receptacle as shown in Figures 9 and 10, it may be in the form of a flat plate 73. In this case the inner receptacle 74 has the form of a funnel, the porous mass being secured in the opening at the larger end and being held by suitable clamping flanges 75 and substantially flush with the top of the heater.

The low temperature or high temperature outlets may be utilized depending upon the nature of the cooking operation to be performed and the length of time available therefor. It is obvious that the amount of heating vapor supplied to the heating device may be regulated by opening the valve 22 the desired amount.

The steam from the outlets may of course be used for utilities or appliances other than those intended for cooking purposes, and in Figures 12 and 13 I have shown a soldering iron adapted to be heated by steam from one of the outlets.

The structure here shown comprises a pointed body 80 which ordinarily is solid when the iron is to be heated in the fire, but which in this structure is hollow, being provided with a chamber 81, although the walls of the member are preferably thick, particularly near the point which is designated 82. A tubular shank 83 serves the dual purpose of supplying hot vapor to the chamber 81 and as a shank for a handle 84. At the outer end of the tubular member 83 is a connector extension 85 to which a suitable pipe, preferably in the form of a flexible hose, may be connected. The inner end of the tubular member 83 extends near to the bottom of the chamber 81. The tubular member is securely affixed to the body 80 by a porous mass 86 which also serves to hold the tube substantially in the center of the chamber.

The porous mass may be produced in any suitable manner but I prefer to utilize a mass formed of wire screen or relatively fine mesh, wound spirally upon the tube and tightly fitted into the chamber 81. By this means the porous mass has a relatively large volume within the body of the tool and when vapor flows through the tube 83 it percolates through the porous mass and heats the mass to the temperature of the steam. This heat is transferred to the body 80 maintaining it as a temperature suitable for the work for which it is intended.

In order to conserve the heat of the vapor as far as possible, I have provided a cap 87 which has a plurality of passages formed by internal radial grooves 88 which divides its inner surface into sectors 89. The circumferential surfaces of the sectors are screw-threaded as shown at 90 so that the cap may be screwed onto the handle end of the body 80.

The body 80 is of cylindrical form as shown but it may of course be square, hexagonal, or some other suitable shape if desired.

The cap is extended to provide an overhanging skirt or flange 91 and the passages 88 establish communication between the porous mass 86 at its handle end and the space within the skirt 91 around the body 10.

The arrangement of parts is such that the hot steam or other vapor which escapes through the passages after percolating through the mass 86, flows through the passages 87 and finally escapes from the outlet opening 92. Before it is permitted to escape however, it maintains a hot vapor jacket over at least a portion of the body of the tool, only the working surface of the tool being exposed.

The porous mass may be formed of molded fire-clay or in some other suitable manner.

Attention is directed to the fact that there is an open space designated 94 near the point of the tool. This is for the purpose of permitting the hot in-flowing vapor to impinge against the inner surface of this part of the tool and this inner surface may be roughened, if desired, so that the greater portion of the heat will be absorbed.

The mass of the body 80 is sufficiently great so that considerable heat may be transferred rapidly to the point of the tool if heat is being drawn rapidly therefrom.

The tubular shank 83 is preferably provided with an insulating covering 95.

My invention may be embodied in various other structures of similar nature and I intend that only such limitations be imposed as are indicated in appended claims.

What I claim is:

1. A kitchen equipment comprising a sink, a heating panel associated therewith,

a vapor discharge outlet, a vapor supply pipe adapted to be connected to said outlet, and means controllable from the panel for boosting the temperature of the vapor at the discharge outlet.

2. A kitchen equipment comprising a sink, a shelf associated therewith, a heating panel associated with the sink having a plurality of vapor discharge outlets thereon, vapor supply pipes connected to the outlets, and means controllable from the panel for boosting the temperature of the vapor at the discharge outlets.

3. A kitchen equipment comprising a sink, a pair of shelves at the respective ends of the sink, a heating panel at the back of the sink, a plurality of vapor discharge outlets on the heating panel, vapor supply pipes connected to the outlets, and electro-responsive means for boosting the temperature of the vapor at the discharge outlets.

4. A kitchen equipment comprising a sink, a heating panel associated with the sink, a plurality of vapor discharge outlets on the heating panel, vapor supply pipes connected to the outlets, electric heaters for boosting the temperature of the vapor at the discharge outlets, and control switches on the panel for governing the electric heaters.

5. A kitchen equipment comprising a heater panel or board having a plurality of vapor discharge outlets, a control valve for each outlet, electro-responsive means for boosting the temperature of the vapor at the discharge outlets, and an electric control switch for each of said means.

6. A kitchen equipment comprising a sink, a pair of shelves at the respective ends of the sink, a heating panel associated with the sink, a plurality of vapor discharge outlets on the heating panel, vapor supply pipes connected to the outlets, electric heaters for boosting the temperature of the vapor at the discharge outlets, and control switches on the panel for governing electric heaters.

7. A kitchen equipment comprising a heater panel or board having a plurality of vapor discharge outlets, a control valve for each outlet, electro-responsive means for boosting the temperature of the vapor at the discharge outlets, an electric control switch for each of said means, and an interlocking connection for making each electric switch dependent upon the position of its control valve.

8. A kitchen equipment comprising a heater panel or board having a plurality of vapor discharge outlets, a control valve for each outlet, electro-responsive means for boosting the temperature of the vapor at the discharge outlets, an electric control switch for each of said means, and an interlocking connection for preventing the closing of con-

trol switch except when the control valve is open.

9. The combination with a source of hot vapor, a discharge outlet therefor, a control valve for the outlet and electro-responsive means for boosting the temperature of the vapor at the discharge outlet, of a vapor heating appliance connected to said discharge outlet.

10. A kitchen equipment comprising a sink, a pair of shelves at the respective ends of the sink, a heating panel at the back of the sink, a plurality of vapor discharge outlets on the heating panel, vapor supply pipes connected to the outlets, and electro-responsive means for boosting the temperature of the vapor at the discharge outlets, said discharge outlets being adapted to be connected to one or more vapor heating appliances which may be set on the shelves.

11. A kitchen equipment comprising a heater panel or board having a plurality of vapor discharge outlets, a control valve for each outlet, electro-responsive means for boosting the temperatures of the vapor at the discharge outlets, and an electric control switch for each of said means, said discharge outlets being adapted to be connected to a vapor heating appliance.

12. A kitchen equipment comprising a sink having a drain, a vapor discharge outlet associated with the sink, a vapor supply pipe connected with the outlet and means for boosting the temperature of the vapor at the discharge outlet.

13. The combination with a source of hot vapor, a discharge outlet therefor, an adjustable control valve for the outlet, of a vapor heating appliance detachably connected to said discharge outlet and electro-responsive means for boosting the temperature of the vapor at the discharge outlet.

14. The combination with a source of hot vapor, discharge outlets therefor, a control valve for each outlet, of a vapor heating appliance detachably connected to a desired one of said discharge outlets and electro-responsive means for boosting the temperature of the vapor at at least one of the discharge outlets.

15. A plurality of discharge outlets, means for supplying hot vapor thereto at different degrees of temperature, an adjustable control valve for each outlet combined with a vapor heating appliance detachably connected to a desired one of said outlets.

16. The combination of a utility, means for leading a supply of low cost heating medium thereto, means for leading a supply of high cost heating medium thereto, said heating media being of unlike characteristics, means for boosting the temperature of the low cost medium by the high cost medium as it enters said utility and means

for leading off the used product of said media.

17. Heating equipment comprising a station, means for leading a supply of low cost heating medium thereto, means for leading a supply of high cost heating medium thereto, said heating media being of unlike characteristics, means at said station for boosting the temperature of the low cost medium by the high cost medium, a utility associated with said station, means for discharging the low cost medium through the utility and means for leading off said medium from the utility.

18. Heating equipment comprising a sta-

tion, means for leading a supply of low cost heating medium thereto, means for leading a supply of high cost heating medium thereto, said heating media being of unlike characteristics, means at said station for boosting the temperature of the low cost medium by the high cost medium to obtain thereby different desired degrees of temperature, a utility associated with said station, means for discharging the low cost medium through the utility and means for leading off said medium from the utility.

In witness whereof, I have hereunto set my hand this 21 day of June, 1917.

WILLIAM S. HADAWAY, JR.