

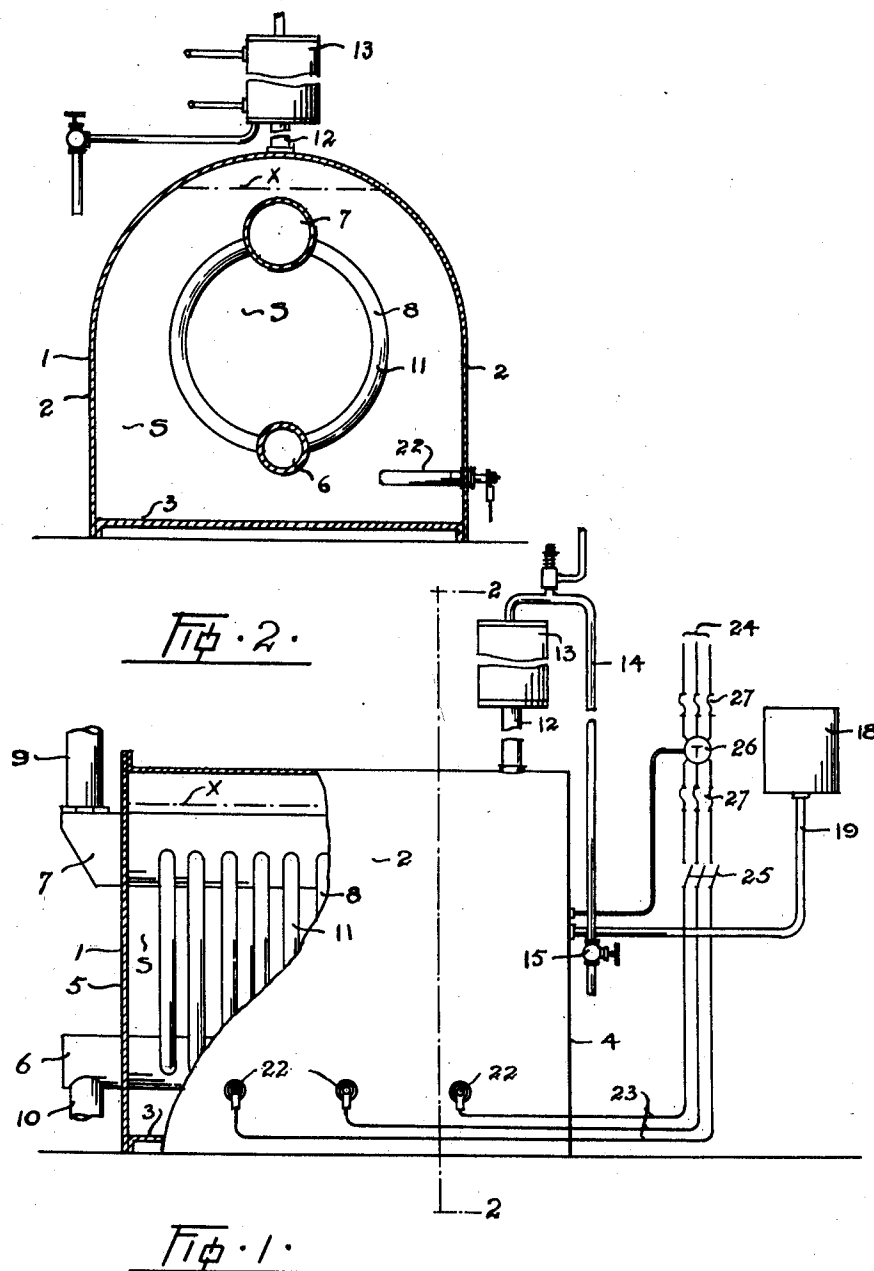
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HEATING SYSTEM

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HEATING SYSTEM

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5 Claims. (Cl. 219—40)

My invention relates to improvements in heating systems which are adapted for use in heating buildings, steam tables, kettles and the like.

The objects of the invention are to provide means for heating a liquid or vapour circulating medium, which will be quick and economical in use and can be installed in any position close to or remote from the point of utilization of the heat generated.

The invention contemplates the use of interrupted or alternating electrical current of any desired voltage and frequency and saline solution through which the current flows to instigate the generation of the primary heat, as will be more fully described in the following specification and shown in the accompanying drawing, in which:

Fig. 1 is a longitudinal elevational view of the invention partly fractionated to show the hot water coil.

Fig. 2 is a transverse sectional view taken on the line 2—2 of Figure 1.

In the drawing like characters of reference indicate corresponding parts in each figure.

The numeral 1 indicates a primary heating chamber or boiler having side and top walls 2, a bottom wall 3 and end walls 4 and 5. The end wall 5 is preferably removable to afford access to the inner parts of the boiler to be described as the specification proceeds.

Extending through the end wall 5 into the boiler is a lower header 6 and an upper header 7, which latter would serve as a water header in case of a water circulating system and as a steam header when used as a steam heating system. Connecting the headers 6 and 7 are curved water tubes 8. One or more risers 9 are taken off from the header 7 to the points of use of the secondary heat and one or more wet return pipes 10 are connected to the header 6. The headers 6 and 7 and their component parts constitute a heating coil 11 and will generally be referred to as such.

The boiler 1 is provided at its uppermost point with a pipe 12 which connects with a condenser 13 of any suitable type and a gas outlet pipe 14 having a blow off valve 15 connected with the upper part of the condenser. An expansion tank 18 is provided, which communicates with the boiler through a pipe 19 which enters said boiler well below the normal liquid level indicated at X. The condenser would be placed above the level of the expansion tank to insure that vapours only enter the condenser from the boiler. Ex-

tending through one or both of the side walls 2 are electrodes 22 which are connected to the leads 23 of a three phase alternating current supply line 24. The current flow through said leads is controlled by the usual switch 25 and also by a suitable thermostatic switch 26 cut in on the line so that when a desired temperature is attained the current supply will be cut off. Fuses 27 are cut in on opposite sides of the thermostatic switch 26.

The boiler is filled to somewhat below the line X with a solution S consisting of water and from one half to ten per cent of mineral salts, preferably sodium chloride, of the water content. Other mineral salts which are water soluble may be used. When the switch 25 is closed electrons pass from one electrode towards another and reverse their direction with each alternation of the current. The electrons cause dissociation of the molecules of the solution at approximately the frequency of the current and the dissociated molecules become atomic ions and surge towards the electrode which has their opposite charge. Due to the alternation of current flow these atomic ions or charged atoms move back and forth between any pair of electrodes at high speed causing friction which results in heat in the solution S. Where an aqueous solution of sodium chloride is used the dissociation of the molecule of the aqueous solution of sodium chloride leaves some charged atoms of Na, some charged atoms of Cl, some of O and some of H which will flow towards their opposite electrode and on reaching said electrodes these respective atoms will give up their charges and are for a period free atoms. Atoms of hydrogen and chlorine form molecules of hydrogen and chlorine gas which are given off and pass through the condenser 13 and are liberated through the pipe 14, the valve 15 of which would be left open until all of said gases have escaped and may still be left open if temperatures less than that of steam at atmospheric pressure is required in the solution. The sodium atom being very active in water dissociates some of the hydrogen from the water, leaving hydroxyl molecules, the hydrogen escaping, while the hydroxyl combines with some of the sodium salts to form sodium hydroxide and probably some hypochlorite, which formation generates further heat. When all the chlorine and liberated hydrogen has escaped the solution within the boiler becomes an aqueous solution of sodium hydroxide. Such water as is carried off in vapour

form, will be condensed in the condenser 13 and returned to the boiler 1, and any chlorine and hydrogen gas carried over will be vented through the pipe 14. Heat therefore is obtained by the dissociation of the chemical reagent in water due to electron flow from one electrode to the other through the solution, also by the formation of matter from said reagent and its component parts, from the solution of components and from the friction caused by violent agitation incidental to these processes.

Experiment shows that increasing the frequency of the current increases the frequency of dissociation, formation and solution of molecules of the metallic solution.

When the unwanted amount of hydrogen and the chlorine gas have been driven off from the boiler, the boiler can be used as in a pressure system so that temperatures may be attained sufficient for the generation of steam in the coil 11.

What I claim as my invention is:

1. The method of heating which consists of dissociating some of the molecules of a sodium chloride solution contained in a sealed vessel by passing an alternating electric current through said solution, venting off corrosive gases from the solution, heating the solution by said current to more than atmospheric pressure.

2. The method of heating which consists of dissociating some of the molecules of a sodium chloride solution contained in a sealed vessel by passing an interrupted unidirectional electric current through said solution, venting off corrosive

gases from the solution, heating the solution by said current to more than atmospheric pressure.

3. The method of heating which consists of dissociating some of the molecules of a sodium chloride solution contained in a sealed vessel by passing an alternating electric current through said solution, venting off corrosive gases from the solution while maintaining a substantially constant pressure in the vessel, heating the solution by said current to more than atmospheric pressure and transferring the heat from the solution into an indirect heating medium.

4. The method of heating which consists of dissociating some of the molecules of a sodium chloride solution contained in a sealed vessel by passing an interrupted unidirectional electric current through said solution, venting off corrosive gases from the solution while maintaining a substantially constant pressure in the vessel, heating the solution by said current to more than atmospheric pressure and transferring the heat from the solution into an indirect heating medium.

5. A heating device comprising a primary heat generator, a secondary heating coil within the generator and having a steam outlet and a water inlet, said primary heat generator having totally immersed electrodes and fitted with a top outlet, a condenser directly connected with the top outlet by a pipe, a vapour discharge communicating with the generator through the condenser, said pipe serving to convey condensate from the condenser back to the primary heat generator.

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