

G. E. HARRISON & J. TEMPLETON.
HEATING SYSTEM.
APPLICATION FILED JAN. 29, 1915.

1,174,714.

Patented Mar. 7, 1916.

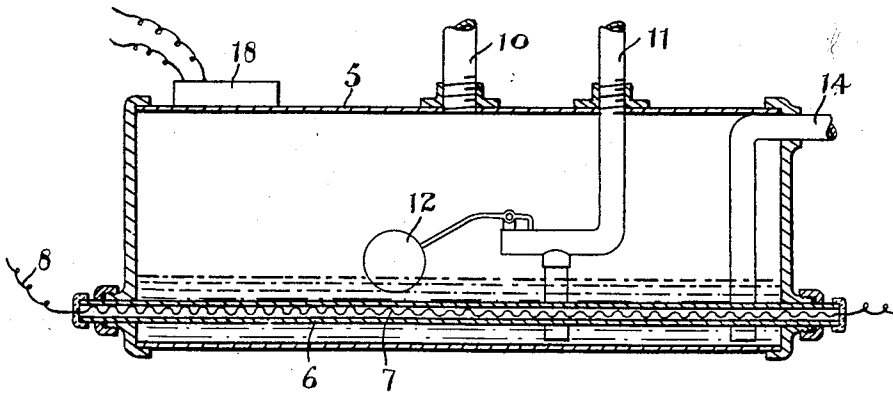
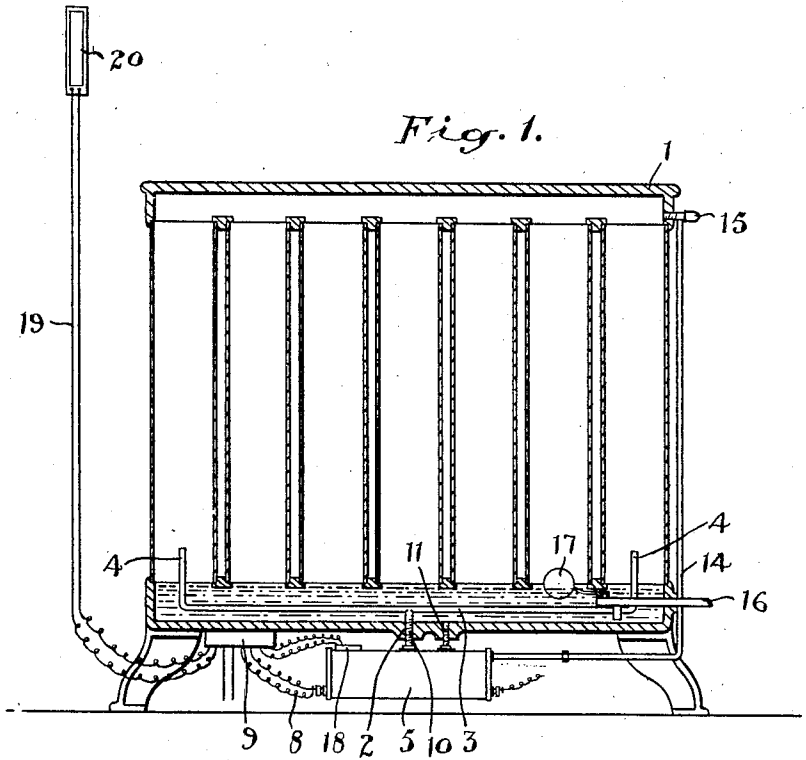


Fig. 2.

Witnesses.

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UNITED STATES PATENT OFFICE.

GEORGE E. HARRISON AND JOHN TEMPLETON, OF TORONTO, ONTARIO, CANADA.

HEATING SYSTEM.

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Specification of Letters Patent.

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Application filed January 29, 1915. Serial No. 5,017.

To all whom it may concern:

Be it known that we, GEORGE EDWARD HARRISON and JOHN TEMPLETON, subjects of the King of Great Britain, and residents of the city of Toronto, county of York, Province of Ontario, in the Dominion of Canada, have invented certain new and useful Improvements in Heating Systems, described in the following specification and illustrated in the accompanying drawings, that form part of the same.

The principal objects of the invention are to localize the heating equipment in a building, operating the heating apparatus in individual units, thereby effecting a saving in cost of installation and operation and insuring uniform temperatures throughout.

A further and important object is to eliminate the disagreeable and wasteful features incident to the operation of a centralized heating plant, and to devise a heating equipment which will operate indefinitely without attention.

The principal feature of the invention consists in the novel construction and arrangement of parts, whereby a small body of water is brought into contact with heating surfaces and converted into steam and the steam is directed into a radiator, the radiator and steam plant comprising an individual unit.

In the drawings, Figure 1 represents a part sectional elevational view of a heating device constructed in accordance with this invention. Fig. 2 is an enlarged longitudinal section of the boiler.

Referring to the drawing, 1 is a radiator which may be of any suitable design having an opening 2 preferably arranged in the bottom thereof.

3 is a pipe arranged within the radiator and connected centrally of its length by a suitable nipple to the opening 2. The outer ends 4 of the pipe 3 are turned upwardly a short distance.

5 is a steam boiler of miniature design preferably of cylindrical form having tubes 6, only one of which shows in the section, arranged adjacent to the bottom and extending from end to end, the ends thereof extending through suitable packing glands to allow for expansion and contraction. These tubes are open at the outer ends and are formed of a suitable electrical insulating material which will stand extremely high

temperatures, such as quartz. Any desirable number of tubes may be used and arranged in these tubes are suitable electric heating coils 7 connected by wires 8 to an electrical contact box 9 which is here shown secured to the bottom of the radiator.

10 is a steam pipe leading from the top of the boiler to the opening 2 in the bottom of the radiator to direct the steam generated in said boiler into the pipe 3.

11 is the feed water pipe leading to the boiler and here shown connected to the bottom of the radiator. The flow of water to the boiler is controlled by a float valve 12 of any suitable design. The valve 12 is here shown inside the boiler but may be otherwise arranged if desirable or necessary. The valve 12 is arranged to definitely control the inflow of water to the boiler and to regulate the high water level. A suitable gage glass may be arranged upon the boiler to determine the level of the water therein.

14 is a pipe leading from the top of the radiator downwardly and discharging into the boiler below the low water level. This pipe is provided with a suitable relief valve 15 to relieve any excessive pressure of steam.

16 is a water supply pipe leading to the radiator from a suitable water supply and controlled by a suitable float valve 17 which maintains a constant level of water in the radiator.

18 is a thermostat located upon the boiler above the high water level and electrically connected to the contact box 9, said thermostat being adapted to break the electrical connection to the wires 8 and heating coils 7 in the event of the temperature of the boiler rising above a certain predetermined point.

20 is a regulating thermostat arranged at any suitable point in the apartment electrically connected by wires 19 to the contact box 9 and arranged so as to cut in and cut out the current to the boiler according to the fall and rise of the temperature in the apartment.

In the use of this device the individual equipments are installed in the desired position and when it is desired to heat the apartment the electric current is turned on. The electric heating element at once commences to heat the tubes in the small tubular boiler and as the level of the water within the boiler is maintained by reason of the float

valve therein so as to just cover these tubes, the water therein will be heated very quickly and converted into steam. The steam rising to the top of the boiler passes into the pipe 5 10 and flows through the pipe 3 into the radiator quickly heating the same. The steam in passage through the pipe 3 transmits a certain amount of heat to the water in the bottom of the radiator and is itself 10 partly condensed and the condensed steam mingles with the water in said radiator assisting in raising its temperature.

The temperature of the water in the radiator is raised very quickly, consequently the 15 heating value of the plant comes into operation without undue loss of time and the apartment is heated very quickly. The level of the water within the boiler is maintained constant by means of the automatic float 20 valve and the feed water is taken from the radiator consequently the circulation is complete and the condensation of the steam is returned direct. The return pipe 14 is provided so that in the event of the pressure of 25 steam rising beyond a point of safety the relief valve will operate and any condensation from the relief valve will be carried back to the boiler.

The operation of the electrical controlling 30 contacts are not herein shown or described as such devices are common. The electric circuits are so arranged as to pass through the circuit to the safety thermostat 18 on the boiler so that in the event of the water 35 supply to the boiler failing or in the event of the steam pressure rising to too high a point, the said thermostat will cut out the current.

An equipment such as described forms a 40 complete unit so that the heating of the individual apartments can be controlled independently and all the heat generated is directly applied. The maintenance of the room temperature is automatically controlled 45 and the device is rendered perfectly safe in operation.

The boiler herein shown is of the tubular type with electric heating elements arranged in the tubes but it must be understood that 50 other forms of boiler or heating element may be used if desired.

What we claim as our invention is:—

1. A heating system, comprising, a radiator, a water supply connected to said radiator, means for maintaining a constant level 55 of water in the radiator, a steam boiler, a steam pipe leading from said boiler to said radiator and extending above the high water level therein, a water supply to said boiler, means for automatically regulating 60 the level of water in said boiler, means for heating the water in said boiler, and automatic means for controlling said heating means.

2. A heating system, comprising, a radiator, a water supply connected to said radiator, automatic means for maintaining a 65 constant level of water in the radiator, a steam boiler, a water supply pipe leading from said radiator to said boiler, means for 70 automatically controlling the level of water in said boiler, a steam pipe leading from said boiler to said radiator and extending above the high water level therein, means for heating the water in said boiler, 75 and automatic means for controlling said heating means.

3. A heating system, comprising, a radiator, a water supply connected to said radiator, automatic means for maintaining a constant level of water in the radiator, a steam 80 boiler, a water supply pipe leading from said radiator to said boiler, means for automatically controlling the level of water in said boiler, a steam pipe leading from said 85 boiler to said radiator and extending above the high water level therein, means for heating the water in said boiler, a thermostat arranged on said boiler above the high water level, means operated by said thermostat for 90 cutting out said heating means on an excessive rise in temperature, and automatic means for regulating said heating means.

Signed at the city of Toronto, county of York, Ontario, Canada, this 25th day of 95 January, 1915.

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Witnesses:

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