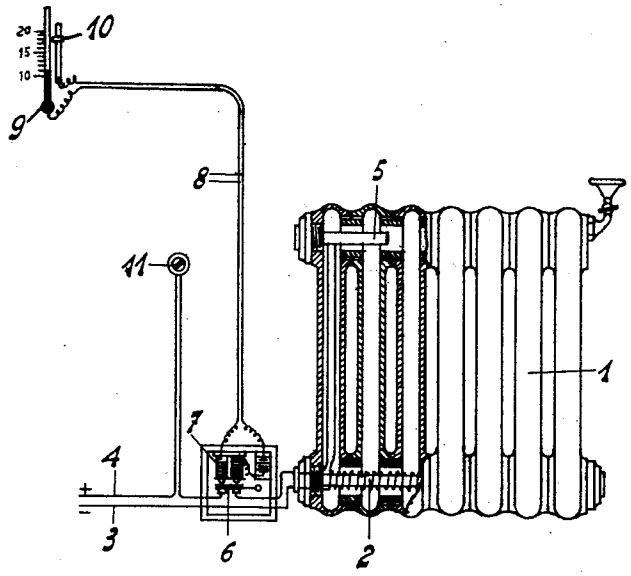
Jan. 27, 1925. 1,524,430

O. GRABER

DEVICE FOR HEATING BUILDINGS BY ELECTRICAL ENERGY

Filed April 11, 1923



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UNITED STATES PATENT OFFICE.

OTTO GRABER, OF LUCERNE, SWITZERLAND.

DEVICE FOR HEATING BUILDINGS BY ELECTRICAL ENERGY.

Application filed April 11, 1923. Serial No. 631,475.

To all whom it may concern:

Be it known that I, OTTO GRABER, a citizen of the Republic of Switzerland, residing at An der Halden, Lucerne, Switzerland, have invented certain new and useful Improvements in Devices for Heating Buildings by Electrical Energy, of which the following is a specification.

The object of the present invention is to provide means to increase the consumption of electric current. The sale of electrical energy might be increased and its cost per unity largely decreased if electrical energy would be used more frequently to heating buildings. The heating of buildings by electricity has been hampered and has been comparatively very scarce until now because known electric heating devices have not fulfilled the hygienical requirements.

The object of the invention is to provide a heating device especially adapted for flats and rooms which has all the advantages of a hot water heating system but none of its drawbacks and which combines the advantages of the hot-water-heating systems with those of the electrical-heating-devices. A further object of the invention is to provide an automatic control of the temperature in the heated rooms thus economizing electrical energy.

A still further object of the invention is to provide means which might be used for heating single rooms and whole buildings by means of electrical energy.

In the accompanying drawings one form of construction is shown in a diagrammatical manner, the drawings illustrating a radiator in side elevation partly in section with the electrical heating and temperature control devices.

In the drawing 1 denotes a radiator composed of a number of similar sections of known construction. Within the radiator an electric heating device 2 is mounted comprising a resistance coil of known construction. The resistance coil is connected to two conductors 3, 4. Within the radiator 1 a thermo-statical-controlling device 5 is arranged which projects into the water of the radiator and which is connected with the conductors 3, 4, being connected in series with said resistance coil 2. The conductor 4 is provided with a gap which is bridged over by the armature 6 of an electromagnet 7 as long as the latter is not excited. From the electromagnet 7 one wire leads to a battery 12 and another wire 8 to the mercury of a thermometer 9 arranged at a convenient place in the room to be heated. Besides the thermometer a slidable contact member 10 is arranged in such a manner that the quick silver may make contact with said member 10 if temperature raises to a predetermined point at which the member is positioned. The contact member 10 is connected by a wire 13 to the battery 12. A switch 11 is arranged at a convenient place to switch in or cut off the electrical supply.

The device works as follows:

If for instance the room has to be heated from 2° C. to say 18° C. the contact member 10 is placed on the scale of the thermometer over the paint 18. The circuit through the thermometer in open as long as the temperature is below 18° C. and the armature 6 bridges the gap in the heating circuit 3, 4. Current is supplied to the heating resistance coil 2 and the radiator is heated radiating heat in the room. The water within the radiator will attain the boiling point ere the room is warmed up to 18° C. To prevent the production of steam and pressure the cut-out-device 5 is adjusted in such a manner that he opens automatically the circuit as soon as the temperature of the water is about 90° C. As soon as the circuit through the coil 2 is broken the water cools and if its temperature is as low as say 85° C. the circuit is again closed by said device 5. The water is kept thereby at a temperature of about 90° C. If the temperature in the room to be heated attains 18° C. the circuit through the electromagnet 7 is closed and the armature 6 is attracted whereby the circuit through the heating resistance is broken. The heating is interrupted until the temperature of the room falls below 18° C. in which case the circuit through the electromagnet is broken and the armature 6 released. The latter closes the circuit through the resistance coil 2 and heating of the radiator re-starts.

The temperature of the room is controlled quite automatically as well as the temperature of the water within the radiator.

The device has the following advantages over similar devices:

1. The supply of current may be automatically controlled in proportion to the outside temperature, the consumption of

electrical energy in each radiator may be controlled corresponding to the size of the room and the desired temperature.

2. To heat a room the least possible amount of water h s to be warmed, the piping etc. of the hot-water-heating systems and its corresponding loss of heat is done away with.

3. The device may be easily set to attain any desired temperature within the room with the lowest consumption of current.

4. The temperature in the room is kept automatically at the desired point.

5. The temperature of the water within the radiator cannot exceed a predetermined point say 90° C.

6. The costs of attendance, etc., of the hot water boilers is done away with, the space for the boiler and for the coal is saved, etc.

The radiators may be made of iron, aluminium or any other metal or metal compound.

I wish it understood that I do not limit my invention to the particular construction of the heating device shown and described but what I wish to secure by U. S. patents is:

The herein described heating system comprising a liquid filled radiator, an electric resistance coil arranged in the radiator to heat the same, a thermostatic device within the radiator and in the circuit in which the resistance coil is included, to automatically control said circuit, an electro-magnet, a thermometer and a slidable contact included in circuit with the electro-magnet, and a make-and-break for the circuit in which the resistance coil is included, said make-and-break forming the armature for said electro-magnet.

In witness whereof I affix my signature.

OTTO GRABER.

In the presence of—

JAMES J. MURPHY, Jr.,

E. CALETTE WACHS.