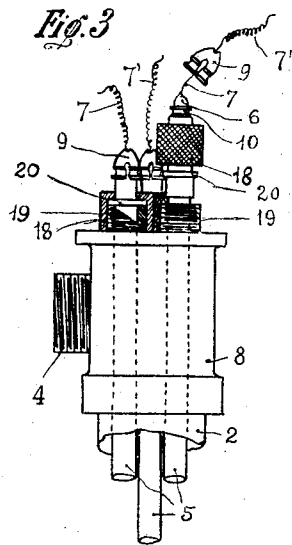
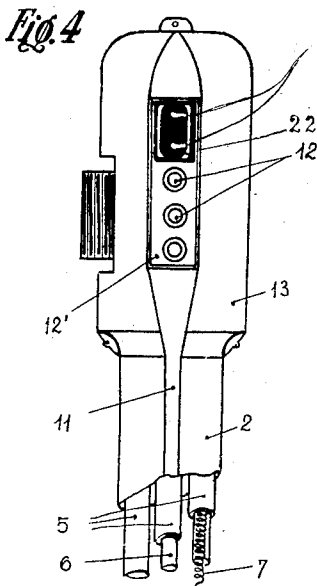
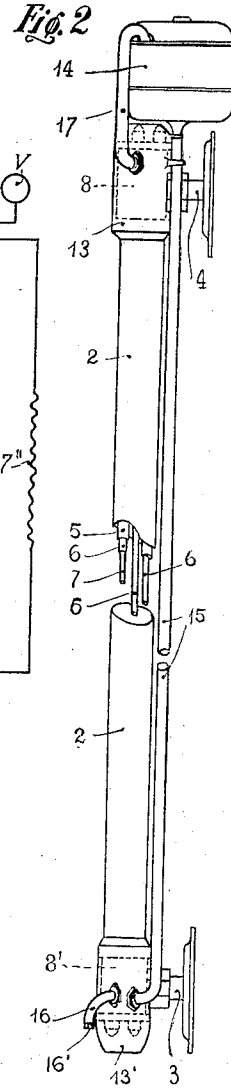
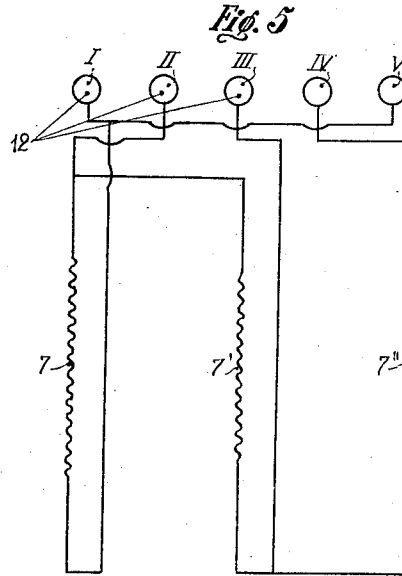
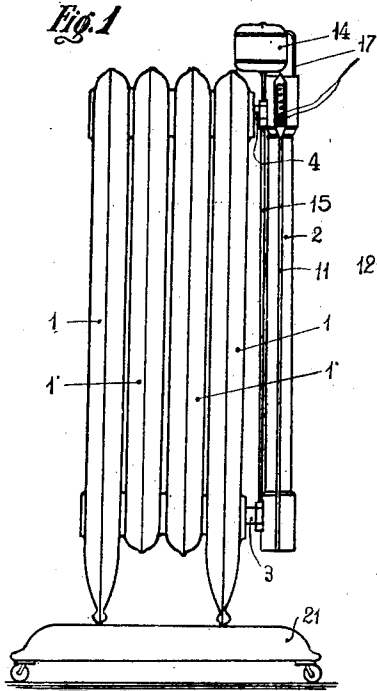


G. MONTE.  
ELECTRIC HEATED THERMOSIPHON RADIATOR.  
APPLICATION FILED DEC. 20, 1919.

1,378,552.

Patented May 17, 1921.



*Inventor:*

*Giovanni Monte*  
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# UNITED STATES PATENT OFFICE.

GIOVANNI MONTE, OF TURIN, ITALY.

## ELECTRIC-HEATED THERMOSIPHON-RADIATOR.

1,378,552.

Specification of Letters Patent.

Patented May 17, 1921.

Application filed December 20, 1919. Serial No. 346,349.

*To all whom it may concern:*

Be it known that I, GIOVANNI MONTE, a subject of the King of Italy, residing at Turin, Italy, have invented certain new and useful Improvements in Electric-Heated Thermosiphon-Radiators, of which the following is a specification.

This invention relates to electrically heated thermosiphon radiators and has for its object a radiator of said type for heating rooms in which the water is heated and held in circulation therein by heat developed by means of electric resistances.

The annexed drawing shows by way of example an embodiment of this invention and Figure 1 is a side view of the improved radiator; Fig. 2 is a fragmentary view on an enlarged scale of the heating device; Fig. 3 shows to a further enlarged scale one of the heads of said device; Fig. 4 is a view of the cover encircling the upper end of said device; Fig. 5 is a diagrammatic view of the connections of the electric resistances.

As shown by Fig. 1 the apparatus comprises a radiator of any known and suitable type and shape consisting of end sections 1 and of intermediate sections 1' communicating with each other at their top and bottom ends. A tubular casing 2 is connected to one of said end sections 1 by means of connecting pieces 3 and 4 opening at the lower and upper ends of said section respectively.

Within said tubular casing 2 (see Fig. 2) are located three metal tubes 5 each inclosing an insulating pipe 6, say of glass, within which is located a resistance 7-7'-7'' respectively.

Each of said metal tubes 5 is tightly connected with the heads 8-8' of tubular casing 2, the upper one of said heads being shown by Fig. 3, by means of a screw-threaded collar 18 adapted to engage a cooperating projection 19 on said head and to also engage a flange 20 on the tube 5. The glass pipes 6, which at their ends are fire-sealed on the resistance, are clamped in the associate tubes 5 by means of caps 9 fitting over the ends of the glass pipe and adapted to engage grooves 10 provided on the ends. Said caps are each provided with a cut imparting them the required resiliency for expanding and engaging said grooves 10 as shown by Fig. 3 in which the clamping parts for the left tube 5 are shown in position while the clamping

parts for the right tube are shown apart from each other for sake of illustration.

Suitable covers 13-13' encircle the heads 8-8' and associate parts.

For feeding water into the radiator a receiver 14 is provided at the top of the casing 2, this receiver having a depending pipe 15 leading to the lower head 8' of said casing 2; and said head 8' is further provided with an exhaust pipe 16 having suitable closing means as a screw plug 16'. The upper head 8 of tube 2 is finally provided with a duct 17 opening into receiver 14 for the purpose of discharging thereinto the steam produced in the radiator and casing 2.

The ends of resistances 7-7'-7'' lead to sockets 12 located in a plate 12' mounted on the cover 13, the lower ends of said resistances being connected with said sockets by means of conductors arranged within a covering strip or tube 11, and said resistances are interconnected with each other and with said sockets, as shown by Fig. 5 so that by engaging with either of the pairs of sockets an ordinary two-pin plug 22 said resistances may be inserted in the electric circuit in any appropriate manner so as to give rise to the desired heat development.

As shown by Fig. 5, by engaging the plug with sockets I and II the resistance 7' is inserted in circuit; when the plug is located in sockets II and III, the resistance 7' is inserted and the resistance 7'' is inserted in the electric circuit by engaging plug 22 with sockets III-IV; finally by engaging said plug with sockets IV and V the resistances 7-7'-7'' are inserted all in series in the electric circuit.

As it is obvious the water filling up casing 2 is heated by heat development due to the resistance or resistances and rises in said casing, the hot water being supplied through the connecting piece 4 to the radiator sections while the cold water which has reached the lower end of said sections of the radiator is fed to casing 2 through the connecting piece 3. Thus the water is caused to circulate in a continuous manner, the water vaporized within said casing being carried by duct 17 into receiver 14 and being condensed therein in contact with the cold water contained in said receiver.

The radiator may be mounted on a support 21 having wheels or rollers so that the same may be easily moved to any required place.

The construction according to this invention provides a thermosiphon radiator in which the heating device may have the required size without modifying the general shape or outline of the radiator, the same consisting of a casing mounted parallel with and adjacent to the radiator sections.

This construction has also the advantage that said heating device is independent of the radiator so that it may be used in connection with radiators having different numbers of sections and also with the usual radiators which are mounted in the ordinary manner.

What I claim as my invention and desire to secure by United States Letters Patent is:

1. A device for heating thermosiphon radiators comprising a casing arranged parallel with and adjacent to the radiator sections, means connecting the upper and lower ends of said casing with the adjacent ones of said radiator and a plurality of electrically heated means, each extending from the top to the bottom of said casing, the heat developed by said means heating the water and maintaining it in circulation through said radiator and casing around said heating means.

2. A device for heating thermosiphon radiators comprising a casing arranged parallel with and adjacent to the radiator sections, means connecting the upper and lower ends of said casing with the adjacent ones of said radiator, a water storing receiver at the top of said casing, a pipe connecting said receiver with the bottom of said casing and a plurality of electrically heated means, each extending from the top to the bottom of said casing, the heat developed by said means heating the water and maintaining it in circulation through said radiator and casing around said heating means.

3. A device for heating thermosiphon radiators comprising a casing arranged parallel with and adjacent to the radiator sections, means connecting the upper and lower ends of said casing with the adjacent ones of said radiator, a water storing receiver at the top of said casing, a pipe connecting said receiver with the bottom of said casing, a duct leading from the top of said casing to said water storing receiver above the water level therein and a plurality of electrically heated means, each extending from the top to the bottom of said casing, the heat developed by said means heating the water and maintaining it in circulation through said radiator and casing around said heating means.

4. A device for heating thermosiphon radiators comprising a casing arranged parallel with and adjacent to the radiator sections, upper and lower heads at the ends of said casing, means connecting each head

with the adjacent end of the radiator, a plurality of metal tubes in said casing, the ends of said tubes being tightly jointed with the heads, an insulating lining in each tube, a resistance within said insulating lining of each tube, and means for inserting said resistances in an electric circuit, the heat developed by said resistances heating the water and maintaining it in circulation through said radiator and casing around said tubes.

5. A device for heating thermosiphon radiators comprising a casing arranged parallel with and adjacent to the radiator sections, upper and lower heads at the ends of said casing, means connecting each head with the adjacent end of the radiator, a plurality of metal tubes in said casing, the ends of said tubes being tightly jointed with said heads, a glass pipe in each tube and a resistance in each glass pipe, means for clamping said glass pipes in position within said tubes, and means for inserting said resistances in an electric circuit, the heat developed by said resistances heating the water and maintaining it in circulation through said radiator and casing around said tubes.

6. A device for heating thermosiphon radiators comprising a casing arranged parallel with and adjacent to the radiator sections, upper and lower heads at the ends of said casing, means connecting each head with the adjacent end of the radiator, a plurality of metal tubes in said casing, said heads having screw-threaded collars through which extend said tubes, flanges on the ends of each tube and screwthreaded sleeves adapted to fit on said collars and tightly engage said flanges, a glass pipe in each tube, caps adapted to couple each end of said glass pipes with the adjacent end of the associated tube to clamp said pipes in position, a cover encircling each head and associated parts, a resistance in each glass pipe, and means for inserting said resistances in an electric circuit, the heat developed by said resistances heating the water and maintaining it in circulation through said radiator and casing around said tubes.

7. A device for heating thermosiphon radiators comprising a casing arranged parallel with and adjacent to the radiator sections, upper and lower heads at the ends of said casing, means connecting each head with the adjacent end of the radiator, a plurality of metal tubes in said casing, the ends of said tubes being tightly jointed with said heads, an insulating lining in each tube, a resistance inserted within the insulating lining of each tube, a cover encircling each head and associated parts, and a plate on one cover, having connecting means to which lead said resistances for inserting the same in an electric circuit, the heat developed

by said resistances heating the water and maintaining it in circulation through said radiator and casing around said tubes.

5 8. A device for heating thermosiphon radiators comprising a casing arranged parallel with and adjacent to the radiator sections, upper and lower heads at the ends of said casing, means connecting each head with the adjacent end of the radiator, a  
10 water storing receiver at the top of said casing, a pipe connecting said receiver with the lower head of said casing, a duct leading from the upper head of said casing to said

receiver above the water level therein, a plurality of metal tubes in said casing, the 15 ends of said tubes being tightly jointed with the said heads, an insulating lining in each tube, a resistance within the insulating lining of each tube, and means for inserting said resistances in an electric circuit, the 20 heat development produced by said resistances heating the water and maintaining it in circulation through said radiator and casing around said tubes.

In testimony whereof I affix my signature. 25  
GIOVANNI MONTE.