ROBERT ACHARD, OF LYON, FRANCE.

HEATING OR COOLING APPARATUS.

1,332,092.


To all whom it may concern:

Be it known that I, Robert Achard, a citizen of the Swiss Republic, mechanical engineer, residing in Lyon, France, have invented certain new and useful Improvements in Heating or Cooling Apparatus, of which the following is a specification.

This invention relates to heating or cooling apparatus.

10 The improved apparatus is composed of a variable number of elements arranged horizontally and each composed of double walled tubes or rings, varying in diameter and length according to the size of the apparatus. These elements are connected together alternately at their right and left ends by means of conduits to allow the circulation of the heating or cooling fluid between the walls, the fluid being fed and exhausted through common feed and exhaust pipes. The annexed drawings illustrate the invention.

Figure 1 is a front view of the heating or cooling apparatus composed of a certain number of horizontal elements arranged in vertical rows. Fig. 2 is a side view of Fig. 1. Fig. 3 is a perspective view of a vertical row of elements. Fig. 4 is a vertical section of an element drawn to an enlarged scale. Fig. 5 is a section on line A—A of Fig. 4. As shown more particularly by Figs. 4 and 5, each element a is composed of two concentric metal rings b, c connected at their ends by bending down the edges of the outer ring on to the periphery of the inner ring, said ends being joined together by soldering. In the annular space between the two rings the water or steam serving for heating or the air or liquid used for cooling circulates the heating or cooling fluid arriving through the pipe d through the tube e and being exhausted into the outlet pipe f by means of the tube g.

These elements are arranged at a short distance from each other and are connected together by the tubes g and the ties h. The elements are constructed of sheet metal, galvanized or leaded, of copper, brass, aluminium, etc. the connecting tubes being of similar metal.

It can be seen that the apparatus is composed of a variable number of horizontal elements, arranged one above the other and in one or more vertical rows as shown by Fig. 1. It can be screened and surrounded by any perforated covering metal or otherwise.

The apparatus is suitable for water or steam heating for dwellings, public buildings, workshops, factories, ships, etc., or as a heating device for forcing-houses, drying kilns and drying rooms, or for its application to cooling.

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

A heating or cooling apparatus comprising in combination a number of series of superposed horizontal elements, each composed of relatively short concentric tubes between which is a relatively thin space through which the heating or cooling fluid flows, vertical fluid conveying tubes connecting alternate ends of the elements of a series so that the fluid flows in contrary directions through successive elements of a series and inlet and outlet pipes for conveying the fluid to and from the series of elements.

In witness whereof I have signed this specification in the presence of two witnesses.

ROBERT ACHARD.

Witnesses:

JEAN GERMAIN,
GRADY CORBITT.