PUBLISHED
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G. CATALANI
HEATING SYSTEM
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2 Sheets-Sheet 1

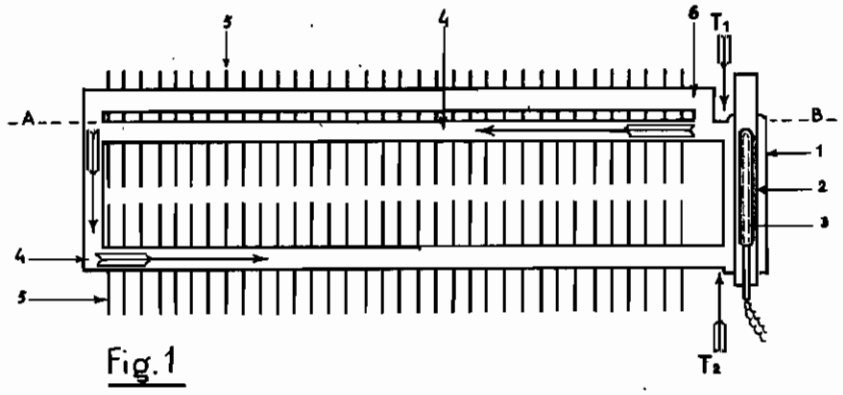

Fig. 1

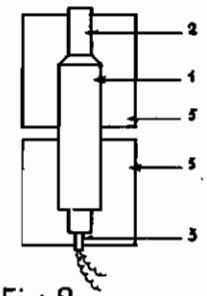

Fig. 2

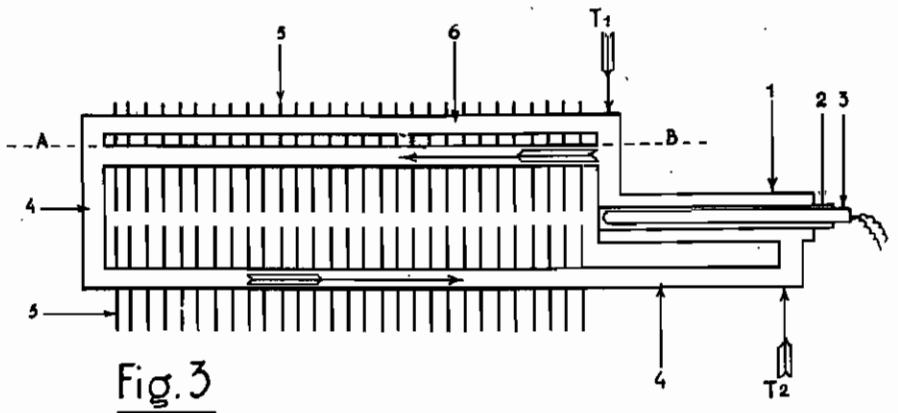

Fig. 3

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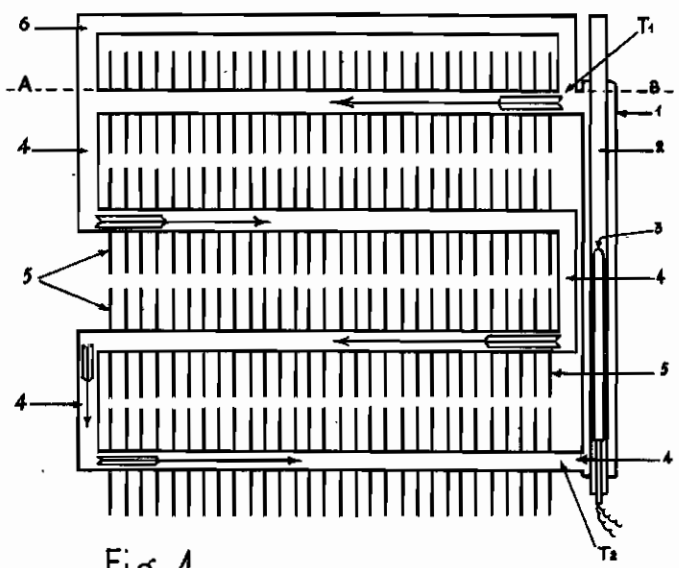

Fig 4

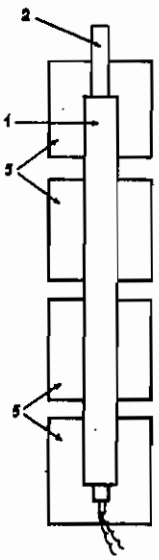

Fig. 5

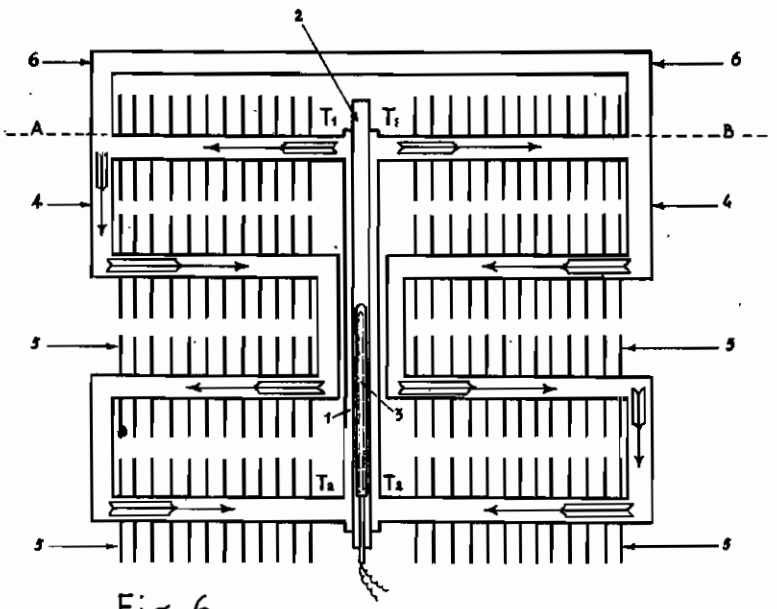

Fig. 6

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ALIEN PROPERTY CUSTODIAN

HEATING SYSTEM

Giusto Catalani, Genova-Bolzaneto, Italy; vested in the Alien Property Custodian

Application filed March 14, 1940

The present invention relates to a heating system and more particularly to an independent heating system including one or more radiator apparatus and a boiler apparatus which can be fed by any suitable source of heat.

The main object of the invention is to provide an independent heating device, small in size and with a closed circuit and having a high efficiency.

A further object of this invention is to provide a heating device by which the radiation of heat is made continuous and in which the source of heat employed in the boiler may be of any suitable type.

Other objects and other advantages of the present invention will be better understood from the following detailed description with reference to the accompanying drawings wherein:

Fig. 1 is a longitudinal section of a very simple embodiment of the present invention;

Fig. 2 is a side view of the device shown in Fig. 1;

Fig. 3 is a section similar to that of Fig. 1, of an alternative embodiment of the invention;

Figs. 4 and 5 show respectively a longitudinal and a side view of another embodiment of the invention.

Fig. 6 is a longitudinal section of another form that the invention may assume.

Referring to the drawings, where the same characters in the various figures represent equal elements, it is to be seen how the heating system is formed in all cases by a heating element of reduced size, where the heat, developed by any suitable type of heating source, is transmitted to a liquid, obliged to run the length of a closed circuit chiefly formed by the radiator apparatus.

In Fig. 1, for instance, the heating element or small boiler consists of two tubes which are practically concentric. In the inner one of said tubes, shown by 2, the source of heat 3 is placed, and such a source may be obtained by an electrical resistance as shown in the drawings or by a gas burner or by a flame obtained by means of any suitable fuel.

The outer tube 1, enclosing tightly the tube 2, contains the heating liquid and is connected directly to the radiator. This radiator may be of any suitable type but must preferably be formed of a tube 4 provided with fins 5 which will insure good radiation of heat.

In the upper part of the radiator, a tube 6 in parallel relation therewith is provided, which is not ordinarily filled with the heating liquid but acts as an expansion chamber.

The operation of the system is as follows: the system is filed up to the level A—B with a suitable liquid, the boiler is then heated, for instance by connecting the electrical resistance 3 to the electric light feeding system, if an electrical source of heat is used, as illustrated in the accompanying drawings. Then the liquid contained in tube 1 and which surrounds the heating element, becomes heated and upon reaching, for instance, a temperature T_1, starts circulating in tube 4, as indicated by the arrows. In going through this procedure, the liquid heats by conduction the walls of tube 4 and the fins 5 which then tarnsmit the heat to the room by radiation.

When the liquid reaches the end of its circuit, its temperature will be of T_2, less than T_1 and will then return to the lower portion of the boiler, where it will again be heated repeating the cycle described above. The increase in volume which the liquid has acquired through heating as well as the steam which may develop are collected by tube 6.

The quantity of liquid being very small, the time necessary for the normal operation of the system is minimum thereby constituting an enormous advantage. Further, for the purpose of increasing the efficiency, the liquid should preferably not be composed of pure water only, but rather water containing a solution of salt or hydrate which will allow the water to reach a temperature higher than 100° C, for instance 150° C, without reaching its boiling point. In this way too, the metal composing the radiator must be a good thermic conductor, such as copper; if, however, owing to economical reasons the radiator were to be made of iron, the surface of the iron should be copper plated thereby allowing for an increase in the efficiency of the transmission of heat.

In Fig. 3, another embodiment of the invention is shown, quite similar to that of Fig. 1, but by which the elements 1, 2, 3 constituting the boiler, are arranged horizontally instead of vertically.

Figs. 4 and 5 show a more powerful system by which, the length of the tube 4 provided with radiating fins 5 is greater.

The embodiment represented by Fig. 6, shows the radiator divided into two parts arranged symmetrically in respect of the boiler 1, 2, 3, and in parallel to each other, these two parts are able to constitute two separate radiators.

Naturally, in these last two cases, the power of the heating element 3 must be greater and in any case will depend upon the total length of the radiating tubes 4.

While I have illustrated and described some preferred embodiments of my invention, I do not wish to be limited thereto, since it will be readily apparent to those skilled in the art, that certain changes may be made therein without departing from the spirit of the invention.

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