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M. OSNOS

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TEMPERATURE REGULATING SYSTEM

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Fig. 1

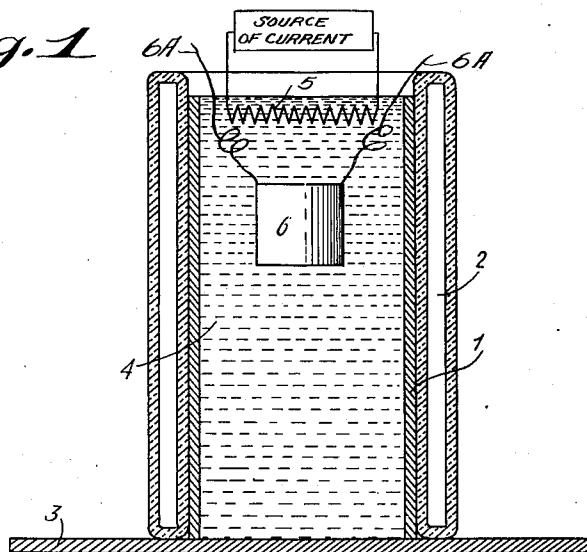
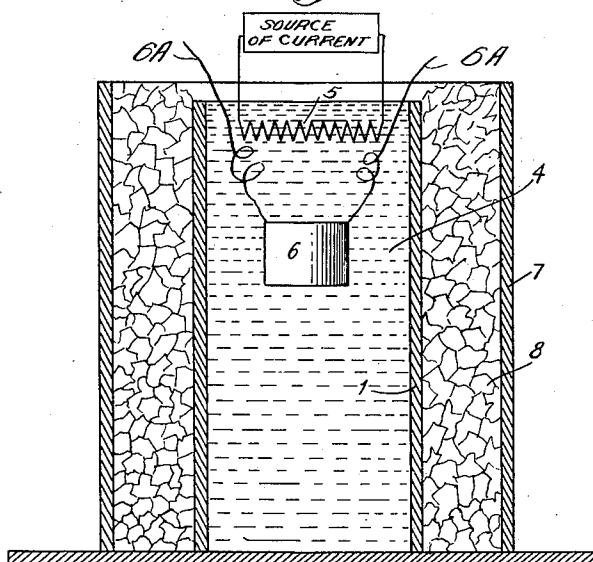


Fig. 2



INVENTOR
MENDEL OSNOS
BY *H.S. Grover*
ATTORNEY

UNITED STATES PATENT OFFICE

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TEMPERATURE REGULATING SYSTEM

Mendel Osnos, Berlin, Germany, assignor to Telefunken Gesellschaft für Drahtlose Telegraphie m. b. H., Berlin, Germany, a corporation of Germany

Application February 14, 1934, Serial No. 711,143
In Germany February 7, 1933

8 Claims. (Cl. 236—1)

This invention relates to an improved temperature regulating system.

This application is an improvement on my co-pending applications Serial No. 589,443 filed Jan. 28, 1932 and Serial No. 589,446 filed Jan. 28, 1932, and is concerned with a further development of and improvements upon the temperature regulating system disclosed in the patent applications mentioned above, in which the walls of the vessel containing the liquid, at the levels of the liquid most important for the thermal action are made as heat insulating as feasible. In the case of the application, Serial No. 589,443, a vessel having a uniform cross-section throughout, it is necessary to take care so that the flow of heat from the top in downward direction should as far as feasible be kept away from the lateral walls. Hence, the latter should be made of heat insulation, and this is attainable by well known ways and means, for instance, by making the lateral walls with vacuous spaces or filling the said spaces with fibrous materials which are poor conductors of heat. The bottom of the vessel should preferably be made of a conductive or metallic material. In the other application, Serial No. 589,446, the temperature regulating system comprises a liquid medium which presents dissimilar temperatures at different points so that the body whose temperature is to be stabilized is brought in the particular position within the medium that has the desired temperature by locating the body in a floating member which is retained within the portion of the liquid medium within the desired temperature zone.

Tests have demonstrated that even with the best of insulation, for instance, when making the vessel in the form of a double-walled (jacketed) glass cylinder with the jacket space being metallized and evacuated, heat will always escape to the outside with the result that the desired fall of temperature of the liquid from the top in downward direction and which should be as uniform (rectilinear) as possible is made impossible. This is liable to have the consequence that the major part of the heat escapes already from the upper layers (strata) of the liquid to the ambient or outside so that the lower strata of the liquid remain quite cold.

The invention has the object to obviate this drawback and the same consists in that good heat conductors, such as metal strips or metal cylinders consisting of copper, brass, aluminum, or the like are placed in a position parallel to the inside wall of the heat-insulating layer, with a view to insure a more uniform or practically rec-

tilinear fall of temperature. These metallic parts or cylinders constitute a very effective heat distribution member which provides uniform distribution of the heat from the floating member or body to be maintained at a constant temperature. Without the use of the metallic cylinder, the heat would leak directly away across the walls of the vessel and would not be uniformly distributed from the top to the bottom of the cylinder.

Two exemplified embodiments are illustrated in the drawing, in which,

Fig. 1 shows a cross section of the improved temperature regulating system.

Fig. 2 shows a cross section of a modification of the improved temperature regulating system.

Referring now to Fig. 1, the constituent parts are denoted by 1 which is a substantially heavy-walled metallic cylinder, for instance, made from copper, brass, aluminum, etc. The substantially heavy wall of the cylinder tends to stabilize the temperature so that it will not be subjected to the response of frequent changes in temperature. 2 is a double-walled (jacketed) evacuated and optionally polished or metallized cylinder of glass, 3 the metallic bottom, 4 the liquid, 5 a heater which is connected to a source of current, 6 is a float inside which the article or object which is to be kept at a constant or stabilized temperature is included. Electrical connection is made from the article to be maintained at constant temperature by the leads 6A which may be of flexible insulated wire.

In the embodiment shown in Fig. 2 the heat insulating outside shell consists of a mass such as rock wool fiber or the like being a poor heat conductor and enveloped by a cylinder consisting of cardboard, glass, or the like indicated at 7.

A further improvement would be to enlarge the contour of the metallic base 3 by providing it with extensions or ribs in order that the exposed surface area is increased so that its temperature may be as far as feasible equal to that of the ambient.

I claim:

1. A temperature regulating system comprising a container for a device to be maintained at substantially a desired uniform temperature, a heat insulating layer surrounding said container, a heating element located near the top of said container, a liquid within said container and surrounding said heating element, a metallic cylinder placed parallel to the inside wall of said container thereby producing a uniform temperature gradient vertically of said liquid in said container, a floating member within said container,

the device to be maintained at constant temperature located within said floating member, the floating member being arranged to rise and fall with temperature variations in said liquid so as to float in a region of desired uniform temperature and a metallic base extending beyond the side wall of said cylinder.

2. A temperature regulating system comprising a container for a device to be maintained at substantially a desired uniform temperature, a heat insulating layer surrounding said container, a heating element located near the top of said container, a liquid within said container and surrounding said heating element, a brass cylinder placed parallel to the inside wall of said container thereby producing a uniform temperature gradient vertically of said liquid in said container, a floating member within said container, the device to be maintained at constant temperature located within said floating member, the floating member being arranged to rise and fall with temperature variations in said liquid so as to float in a region of desired temperature, and a brass base extending beyond the side wall of said cylinder.

3. A temperature regulating system comprising a container for a device to be maintained at substantially a desired uniform temperature, a heat insulating layer surrounding said container, a heating element located near the top of said container, a liquid within said container and surrounding said heating element, a copper cylinder placed parallel to the inside wall of said container thereby producing a uniform temperature gradient vertically of said liquid in said container, a floating member within said container, the device to be maintained at constant temperature located within said floating member, the floating member being arranged to rise and fall with temperature variations in said liquid so as to float in a region of desired temperature, and a copper base extending beyond the side wall of said cylinder.

4. A temperature regulating system comprising a double walled insulating container for a device to be maintained at substantially a desired uniform temperature, a heat insulating layer within said double walled insulating container, a heating element located near the top of said container, a liquid within said container and surrounding said heating element, a metallic cylinder placed in parallel relationship with the inside wall of said container thereby producing a uniform temperature gradient vertically of said liquid in said container, a floating member within said container, the device to be maintained at constant temperature located within said floating member, the floating member being arranged to rise and fall with temperature variations in said liquid so as to float in a region of desired temperature.

5. A temperature regulating system comprising a container for a device to be maintained at substantially a uniform temperature, a heat insulating medium surrounding said container, a heating element located near the top of said con-

tainer, a liquid within said container and surrounding said heating element, a plurality of metallic members placed parallel to the wall of said container thereby providing a uniform temperature gradient vertically of said liquid in said container, a floating member within said container, the device to be maintained at constant temperature located within said floating member, the floating member being arranged to rise and fall with temperature variations in said liquid so as to float in a region of desired temperature, and a metallic base extending beyond the side wall of the outermost metallic member.

6. A temperature regulating system comprising a container for a device to be maintained at substantially a uniform temperature, a heat insulating medium surrounding said container, a heating element located near the top of said container, a liquid within said container and surrounding said heating element, a metallic member placed parallel to the wall of said container thereby producing a uniform temperature gradient vertically of said liquid in said container, a floating member within said container, the device to be maintained at constant temperature located within said floating member, the floating member being arranged to rise and fall with temperature variations in said liquid so as to float in a region of desired temperature.

7. A temperature regulating system comprising a container for a device to be maintained at substantially a desired uniform temperature, a heat insulating layer surrounding said container, a heating element located near the top of said container, a liquid within said container and surrounding said heating element, a metallic cylinder placed parallel to the inside wall of said container thereby producing a uniform temperature gradient vertically of said liquid in said container, a floating member within said container, the device to be maintained at constant temperature located within said floating member, the floating member being arranged to rise and fall with temperature variations in said liquid so as to float in a region of desired uniform temperature.

8. A temperature regulating system comprising a container for a device to be maintained at substantially a desired uniform temperature, a heat insulating layer of rock wool fiber surrounding said container, a heating element located near the top of said container, a liquid within said container and surrounding said heating element, a metallic member placed in parallel relationship with the inside wall of said container thereby producing a uniform temperature gradient vertically of said liquid in said container, a floating member within said container, the device to be maintained at constant temperature located within said floating member, the floating member being arranged to rise and fall with temperature variations in said liquid so as to float in a region of desired uniform temperature.