To all whom it may concern:

Be it known that I, Charles L. Bastian, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Safety Temperature Controls, of which the following is a specification.

This invention relates to novel and improved safety means for controlling the temperature of a cooling medium in a cooler compartment, and is capable of use in any place where such a compartment is employed. The invention finds particular use in a soda fountain, and I shall describe it in that connection, although I desire it to be understood that I do not consider myself limited thereby.

Soda fountain equipment usually comprises a plurality of compartments, one of which contains the coolers and which I shall therefore call the cooler compartment. It is customary to provide such coolers for both drinking water and carbonated water or other beverages which may be found desirable, such beverages being passed through the coolers in order to be brought to a desired low temperature before passing to the draft arm of the fountain. Various means are provided for bringing the liquid in the coolers to the desired low temperature, this result being normally achieved by surrounding the coolers with a cooling medium which may, for example, be water, brine or air.

Various means have been devised for keeping the temperature of this cooling medium from passing below 32°F, which is the freezing point of water and which would obviously endanger the coolers. While such devices have been generally satisfactory, it is always possible that they should fail and therefore it is a primary object of my invention to provide a safety temperature control by means of which heat will be automatically supplied to the cooling medium before the coolers reach a dangerously low temperature.

A still further object of my invention is to provide a safety temperature control which may be used with any type of cooling medium.

A still further object of my invention is to provide means which may be readily installed in existing fountains without material alteration thereof and which shall efficiently and effectively safeguard the coolers from bursting at all times without reliance upon the ordinary thermostat control or manual controlling means, thereby protecting the coolers at times when water is not being drawn therefrom, as at night, at which time obviously the temperature therein is most apt to reach a dangerously low point.

In the accompanying drawing in which I have shown selected embodiments of my invention:

Fig. 1 is a sectional view through a portion of a fountain showing my invention installed therein.

Fig. 2 is a view similar to Fig. 1, but showing a modified form of my invention, and

Fig. 3 is a view similar to Figs. 1 and 2 showing still another form which my invention may take.

Referring particularly to Fig. 1, the cooler compartment is designated by the numeral 1 and disposed in said compartment are a plurality of containers forming coolers 2 and 3, the cooler 2 being used in connection with carbonated beverages for example and the cooler 3 being used for ordinary drinking water. The compartment is kept at the desired temperature by a suitable cooling medium 4, in this embodiment the medium being considered as water. This medium may be kept cool by any of the well known methods, such methods forming no part of my present invention.

The cooler 2 is provided with a connection 5 extending to a usual draft arm and the cooler 3 is provided with an inlet 6 connected to the city water main, or any other source of drinking water, and is also provided with a connection 7 to a draft arm on the fountain. So long as the fountain is in active use and the water is being drawn from the connections 5 and 7, it is obvious that its place in the coolers is taken by new water of a higher temperature and therefore there is very little danger of the coolers freezing and bursting. However, when the fountain is not in active use, as at night, there is this danger which is customarily intended to be avoided by the use of temperature controls of various kinds for the cooling medium. These controls are either automatic or manual. The best automatic control is apt to get out of order and of course the manual control has to be looked after by the op-
erator and therefore the personal element is involved, making the operation still more uncertain.

To avoid any possibility of bursting of the coolers, I provide means for imparting heat to the cooling medium when its temperature reaches a predetermined low point. For that purpose I provide, in this embodiment, a connection 8 to the inlet 6 through which the ordinary drinking water passes to the cooler 3, this connection terminating at 9 near the bottom of the compartment and also adjacent the coolers, which are normally placed at the bottom of the compartment. In the connection 8 I have placed a suitable valve 10. This valve may be of any desired form, but I prefer to make it of a type such that the pressure of water in the connection 8 will tend to open it. In this embodiment I have shown the valve as provided with a wall 11, having an opening 12 therein, normally closed by the head on the valve stem 13. It is, of course, understood that any other valve performing the same function, may be used instead.

Connected to the valve stem 13 is a sylphon 14 supported in a suitable frame 15, which may be conveniently mounted upon the connection 8. This sylphon is filled with any suitable substance such as butane, this substance vaporizing at approximately 33° F., so that for that temperature and temperatures thereabove, the sylphon will expand and close the valve, maintaining it in said closed position. When the temperature in the color compartment gets to a dangerously low point, such as 33° F., the material in the sylphon will contract, permitting the valve to be opened by the pressure of the water in the connection 8. Heat will then be supplied to the cooling medium 4 by means of the comparatively warm water drawn through the connection 8 and discharged into the cooling medium 4. This water will, of course, pass around the coolers and will circulate upwardly, thereby warming the entire body of the cooling medium, and the surplus water will drain off through a suitable overflow 16, this overflow being of common construction and forming part of the customary equipment for the escape of surplus fluid.

Referring now to Fig. 2, I have shown therein a device substantially the same in principle as that shown in Fig. 1 except that it may be employed with a liquid cooling medium 4 consisting of either water or brine, and also with the so called dry method of refrigeration in which the cooler compartment is kept at its desired temperature by means of cold air. In this embodiment the cooler compartment 1 is supplied with the coolers 2 and 3, having the connections 5, 6, 7 and 8 as in the other embodiment and I have shown therein the cooling medium 4, but this medium may, if desired, be omitted, as when the dry method of refrigeration is employed.

The connection 8 is provided with the sylphon 14, as in the other embodiment, this sylphon operating the valve 10, similar in all respects to that described above. The end 9 of the connection 8 is, however, joined to a coil 17 disposed in the compartment 1 and terminating at 18 in a connection to the overflow 16, thus imparting heat to the cooling medium in which the coil is disposed. The operation will be the same whether there is a liquid cooling medium present in the compartment 1 or whether a dry medium is used.

In Fig. 3 I have shown a modification in which an electric heater is employed and this heater may also be used with either liquid or dry refrigerants. In this form the sylphon 19 is connected by a suitable tube 20 with a thermostat bulb 21 adjacent the coolers 22 and 23, which are placed near the bottom of the compartment 1, as is customary. Adjacent the bulb 21 I have placed a suitable water-tight receptacle 24 communicating with the exterior of the compartment 1. In this receptacle is placed an electric heating unit 25 which may be inserted from the exterior of the compartment.

The circuit 26 controlling the heating unit 25 is provided with a switch 27, which is normally open as shown in Fig. 3. This switch may be of any desired form, but I have shown it as comprising an arm 28 pivoted upon the compartment wall and normally urged to an open position by a stem 29 controlled by the sylphon 19, the arm being urged to closed position as by a spring 30.

The operation of this device will be obvious. When the temperature in the cooler compartment approaches a dangerously low point, the material in the sylphon and bulb will contract, thus permitting the spring 30 to close the switch 27. Heat will then be generated in the heating unit 25 and this generation will continue until the desired temperature is again reached, at which point the switch will again be opened through expansion of the material in the sylphon.

From the above it will be apparent that I have provided a novel and improved means for effectively preventing bursting of the coolers due to a dangerously low temperature of the cooling medium and that this means is entirely automatic and foolproof. In the embodiments of Figs. 1 and 2, the valve is automatically opened, thus supplying heat by the admission of fresh water, which is normally at a much higher temperature than the water in the coolers, and when the desired temperature is reached, the valve will automatically close.
same result is achieved by the electric heater as just described above. The modifications of Figs. 2 and 3 are both of use with any kind of refrigerant. By placing the sylphon 14 or the thermostat bulb 21 closely adjacent to the coolers and at a level where they will be subjected to the same temperature as the coolers, the control is made dependent for its operation upon the temperature of the coolers, to all intents and purposes, although operated directly by changes in temperature of the cooling medium.

I am aware that changes in the form, construction and arrangement of parts may be made without departing from the spirit and without sacrificing the advantages of the invention and I reserve the right to make all such changes as fairly fall within the scope of the following claims.

I claim:

1. In a device of the class described, a compartment, a container in said compartment, a cooling medium surrounding said container, and means to supply heat to said medium, said means being operated when said medium reaches a predetermined temperature.

2. In a device of the class described, a compartment, a container in said compartment, means to pass liquid through said container, a cooling medium surrounding said container, and means to supply heat to said medium, said means being controlled by the temperature of the medium.

3. In a device of the class described, a container, a cooling medium surrounding said container, an inlet for drawing liquid into said container, a connection to said inlet and having a valve there in, means holding said valve closed and controlled by the temperature of said cooling medium, said connection being provided with an extension beyond said cooling medium, and passing through said cooling medium to heat the same.

7. In a device of the class described, a compartment, a container in said compartment, a cooling medium surrounding said container, an inlet for drawing liquid into said container, and a connection to said inlet and disposed in said medium for imparting heat thereto by passage of water through said connection.

8. In a device of the class described, a compartment, a container in said compartment, a cooling medium surrounding said container, an inlet for drawing liquid into said container, a connection to said inlet and disposed in said medium to impart heat thereto by passage of water through said connection, a valve in said connection, and a thermostatic element controlling said valve and operated by the temperature of said medium.

9. In a device of the class described, a compartment having an overflow, a cooling medium in said compartment, a container in said compartment and surrounded by said medium, an inlet for drawing liquid into said container, a connection to said inlet disposed in said medium and discharging into said overflow to transmit heat to said cooling medium.

10. In a device of the class described, a compartment having an overflow, a cooling medium in said compartment, a container in said compartment and surrounded by said medium, an inlet for drawing liquid into said container, a connection to said inlet disposed in said medium and discharging into said overflow to transmit heat to said cooling medium, a valve in said connection, and a thermostatic element controlling said valve and operated by the changes in temperature in said medium.

11. In a device of the class described, a compartment, an overflow in said compartment, a container in said compartment, a cooling medium surrounding said container, an inlet for drawing liquid into said container, a connection to said inlet and provided with a coil disposed in said medium and having an end discharging into said overflow, a valve in said connection, and a thermostatic element controlling said valve and operated by changes in temperature in said medium.

CHARLES L. BASTIAN.