Oct. 1, 1946. P. MARTIN 2,408,667

THERMOSTAT CONTROLLED ALARM

Filed Nov. 30, 1943

Fig. 1

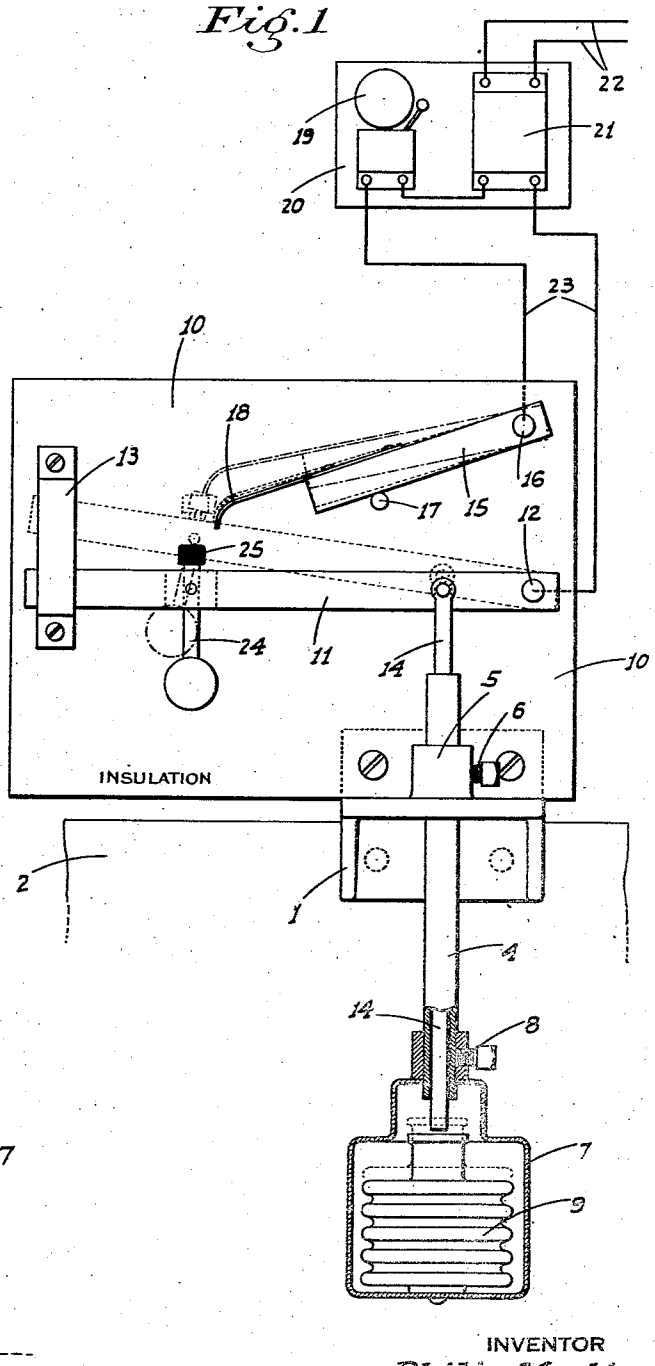
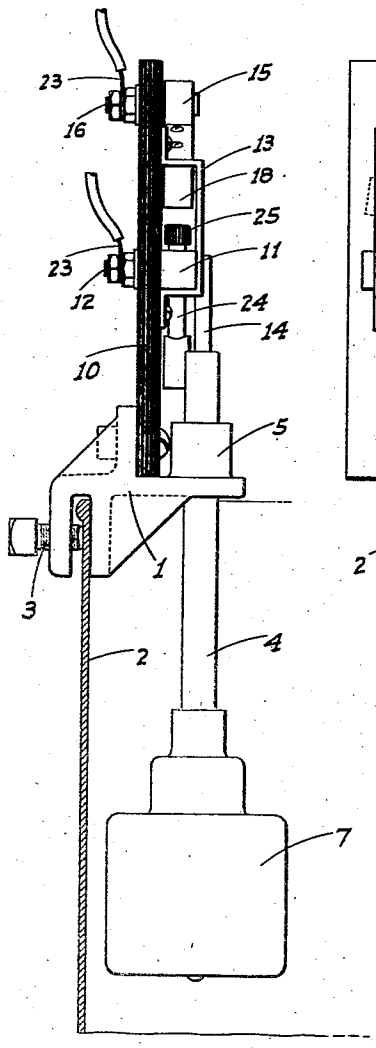


Fig. 2



INVENTOR
Philip Martin
BY
ATTYS

Patented Oct. 1, 1946 2,408,667

UNITED STATES PATENT OFFICE

2,408,667

THERMOSTAT CONTROLLED ALARM

Philip Martin, Camarillo, Calif.

Application November 30, 1943, Serial No. 512,300

6 Claims. (Cl. 177—311)

1

This invention relates to a thermostatically controlled alarm or signal device, and particularly to one primarily designed for use in connection with the sterilizing of various rubber parts of milking machine equipment, especially the teat cup liners.

The health regulations require that such parts shall be immersed for a certain length of time in water of a given temperature (up to the boiling point) after each milking operation. Instant immersion is sufficient for proper sterilization when the water is near the boiling point, but at a lower temperature the parts must be left in the water for a longer time. At present a thermometer is usually employed to indicate the temperature of the water in the sterilizing tank and the parts are ordinarily placed in the tank before the water has reached such heat, since the heat is only turned on temporarily. The temperature of the water continues to rise, however, and if the operator fails to watch the thermometer and the water boils with the rubber parts still in the tank such parts tend to lose their life and deteriorate, and consequently are not efficient for subsequent use.

The principal object of the present invention is to prevent the objectionable and faulty features of the above haphazard indicating system by the provision of a thermotically actuated alarm device which gives an audible signal to the operator when the water has attained a predetermined relatively high temperature.

A further object of the invention is to provide a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawing similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a front elevation of the improved alarm device as installed and partly in section.

Fig. 2 is an end elevation of the control unit of the device.

Referring now more particularly to the characters of reference on the drawing, the device comprises a bracket 1 adapted to be secured on the rim of a sterilizing tank 2 by suitable means such as clamps 3. The bracket overhangs the tank and supports a depending tubular member 4 which slides through a boss 5 on the bracket and is adjustably clamped in position by a set

2

screw 6. A housing 7 is adjustably mounted on the lower end of the member 4 by means of a set screw 8, said housing having a thermostat 9 of the expanding bellows type mounted therein in such position that the thermostat expands upwardly and is held by the housing against expansion in a downward direction.

The bracket also supports an upstanding panel 10 of suitable insulation material on which is mounted a substantially horizontal metal lever 11. The lever is pivoted at one end on the panel by a terminal pin 12, and at the other end is guided by a yoke 13 mounted on the panel, and which limits the downward movement of the lever. Intermediate its ends but relatively close to the pivot pin, the lever is engaged by a depending rod 14 which slidably projects through the member 4 to a termination adjacent the upper end of the thermostat 9, as shown in Fig. 1.

Directly above the lever a metal bar 15 is pivoted at one end on the panel by a terminal pin 16, preferably disposed substantially in vertical alinement with the pin 12. The bar extends lengthwise of the lever but is considerably shorter than the same, and is sufficiently heavy that it tends to assume a downwardly sloping position of itself, being limited in such movement by a stop pin 17 on the panel. A resilient contact finger 18 projects from the free end of the bar toward but normally clear of the lever, so that a certain upward movement of the latter is necessary to effect contact of the finger with the lever.

An audible element, preferably in the form of a buzzer or bell, as indicated at 19, is mounted on a panel 20 which is preferably separate from the panel 10, so that it may be located at the most convenient position on a wall or the like and so that it will be also not subject to vibration, such as is apt to be present adjacent the sterilizing tank, or exposed to the vapor rising from the tank. A transformer 21 to reduce the voltage of the ordinary lighting or operating circuit is also mounted on the panel 20, being connected to the main circuit wires 22, while the bell and transformer are interposed in an auxiliary circuit 23, the terminals of which are connected to the pins 12 and 16, as shown. The lever 11 and bar 15 therefore form a normally open switch interposed in the bell circuit, which will only be closed by the engagement of the lever with the bar, and which engagement can only take place by the expansion of the thermostat due to heat.

The housing 7 is immersed in the water of the tank, and the heat of the water attained before the alarm circuit is closed will depend on the

relative initial spacing of the rod 14 from the thermostat. This is because if the rod is initially some distance above the thermostat, the latter must expand a greater amount to move the rod and lever sufficient to close the alarm circuit than if the thermostat and rod were intially in actual contact. Such initial difference in the position of the thermostat relative to the rod may be attained by adjusting the housing 7 on the member 4, and such adjustment is determined by the water temperature desired to actuate the element.

In order to break the element circuit without the use of an additional switch and so that no subsequent resetting of the switch members are necessary, I provide the following means:

Pivoted on the lever 11 just beyond the free end of the finger 18 is a pendulum 24, the upper end of which is above the lever and is covered by an insulation cap 25. The lever and bar 15 are arranged relative to each other and to the pendulum so that when said lever and bar are in their lowermost or separated position, the cap is below and clear of the finger as shown. When, however, the lever is raised by the expansion of the thermostat so that contact with the finger is made, the cap is then above the contacting end of the finger. In order to break the alarm circuit it is only necessary for the operator to lift the bar so that the finger is above the cap, tilt the pendulum so that the cap is under the finger, and allow the latter to come to rest on the cap. This will hold the circuit broken until the lever drops with the cooling of the water and the contraction of the thermostat, whereupon the cap moves from under the finger and the pendulum returns of itself to its normal position or out of the way of the finger.

While the device as shown and above described is particularly intended for use with the sterilizing tanks employed with milking machine equipment, it will be obvious that the device may also be of value in controlling circuits or valves for other purposes, such as the heating circuit or valve of an electric or gas hot water heater or boiler.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention, what I claim as new and useful and desire to secure by Letters Patent is:

1. A thermostatically actuated switch unit comprising an expansible thermostat, means to mount the thermostat in a fixed position in a zone of heat, an upstanding panel above the thermostat mounted with the thermostat mounting means, a substantially horizontal lever pivoted adjacent one end on the panel, a bar pivoted on the panel and overhanging the lever, the bar and lever being insulated from each other and adapted to be separately connected in a circuit to form a switch therein, a finger projecting from the free end of the bar, means normally supporting the bar against downward tilting movement beyond a predetermined position, the finger being then spaced from the lever when the latter is in its normal position, and means between the thermostat and lever to swing the latter upwardly upon expansion of the thermostat.

2. A structure as in claim 1 in which the thermostat is disposed to expand upwardly; said last named means comprising a rod depending from the lever in position to be engaged and lifted upon upward expansion of the thermostat.

3. A thermostatic alarm device comprising an expansible thermostat, means to mount the thermostat in a fixed position in a zone of heat, an electric alarm, a circuit for said alarm, an upstanding panel above the thermostat mounted with the thermostat mounting means, a substantially horizontal lever pivoted adjacent one end of the panel, a bar pivoted on the panel and overhanging the lever, the bar and lever being insulated from each other and separately connected to the circuit to form a switch therein, a finger projecting from the free end of the bar, means normally supporting the bar against downward tilting movement beyond a predetermined position, the finger being then spaced from the lever when the latter is in its normal position, and means between the thermostat and lever to swing the latter upwardly upon expansion of the thermostat whereby the lever will engage the finger and the circuit will be closed, and manually operable means on the lever to support the finger clear of and in insulated relation to the lever upon first lifting the finger from contact with the bar and allowing the bar and finger to reassume their normal relationship to the lever upon a lowering movement of the latter to normal.

4. A structure as in claim 3, in which said last named means comprises a pendulum pivoted on the lever adjacent but beyond the finger, and an insulation cap on the upper end of the pendulum and above the lever.

5. A thermostatically actuated switch unit comprising an expansible thermostat, means to mount the thermostat in a fixed position in a zone of heat, a switch comprising a pivotally mounted contact lever, a pivotally mounted bar spaced from the lever, a contact element projecting from the bar into the path of movement of the lever in one direction, means normally engaging the bar to maintain the element spaced from the lever, and means to move the lever in said direction upon expansion of the thermostat.

6. A structure as in claim 5 in which the contact lever is normally substantially horizontal and the bar is above said lever and extends lengthwise thereof, whereby said bar and lever tend to assume their normal positions of their own weight.

PHILIP MARTIN.