H. A. FISKE.
THERMOSTATIC CIRCUIT CONTROLLER.
APPLICATION FILED NOV. 16, 1903.
THERMOSTATIC CIRCUIT-CONTROLLER.

To all whom it may concern:

Be it known that I, Henry A. Fiske, a citizen of the United States, and a resident of Newton, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Thermostatic Circuit-Controllers, of which the following is a specification.

My Invention relates to thermostatic devices for controlling an electric circuit, and is herein illustrated and described as embodied in a device which is adapted to be applied to a journal-bearing or the like and to cause an alarm to be given in case the bearing becomes unduly heated.

More specifically, my device is of that type in which a mass of fusible solder is caused to melt at the desired temperature and close a circuit through an alarm by flowing into simultaneous contact with and thus electrically connecting two insulated terminals, and my improvements are designed to provide a simple and practical device of this character which will be more sensitive and certain in operation than those heretofore used.

My device in its preferred form is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the complete device as applied to a portion of a journal-bearing. Fig. 2 is a central vertical section through the device shown in Fig. 1 detached. Figs. 3 and 4 are horizontal sections taken respectively, on the lines 3 3 and 4 4 in Fig. 2. Fig. 5 is a section similar to Fig. 2, but showing a slight modification.

The working parts of my device are preferably inclosed in a casing comprising a metallic cup-shaped body portion 2 and a removable cover 3, provided with a perforation 4, through which the insulated circuit-wires 5 5 are led from the interior of the device to the alarm-circuit. The body portion 2 is usually made cylindrical in order that the device may be applied to a journal-bearing 6 by drilling a hole in the bearing and inserting said body portion into it, as shown in Fig. 1.

Within the upper part of the body portion 2 is located an insulating disk or plug 7, from the bottom face of which project two metallic contact-terminals 8 8, with their lower ends reaching nearly to the bottom of said body portion. These terminals 8 8 are insulated from one another by a slab 9 of hard rubber, vulcanized fiber, or the like, and said terminals and slab, taken collectively, are preferably turned to cylindrical shape, as shown in Figs. 3 and 4, and their upper ends are inserted tightly into a hole formed in the plug 7, whereby they are held in proper relation to one another and to the body portion 2 at the center of the latter. The circuit-wires 5 pass through the top of the plug 7 and their bare ends 10 are inserted, respectively, into holes drilled in the upper ends of the terminals 8 8, to which said ends are soldered. The lower ends of the terminals 8 8 and the slab 9, taken collectively, are preferably reduced in diameter, as shown in Fig. 4, and at the bottom of the body portion 2 is located a ring 11, of fusible conducting material, such as the fusible solder commonly used in thermostats; this ring being of such size as to fit the lower end of the body portion 2 and having its central opening large enough to receive the lower ends of the contact-terminals 8 8 without touching the same. Just above the ring 11 is located a ring 12, made of material which is an insulator and preferably a poor conductor of heat. As shown in Fig. 2, this ring 12 is adapted to move freely in a vertical direction within the body portion 2 and around the reduced portion of the terminals 8 8 and slab 9, and a coiled spring 13, normally in a state of compression, is interposed between the ring 12 and the plug 7. As thus constructed, when the temperature of the bearing into which the device is inserted reaches the predetermined melting-point of the fusible solder employed the ring 11 is melted and the solder of which it is composed is forced downward and caused to flow laterally by the action of the ring 12 and spring 13, and is thus brought into contact with the lower ends of the terminals 8 8 and completes the alarm-circuit through these terminals. The body portion 2 is shown as provided near its lower end with an inwardly-extending annular shoulder 14, which acts as a stop to receive the ring 12 when forced downward, and thus prevents any tendency to force the melted solder upward between said ring and the body portion 2 or otherwise remove it from contact with the terminals 8 8. The space beneath the shoulder 14 should be so proportioned as to equal the volume of the solder contained in the ring 11.

In Fig. 5 the ring 12' is shown as making a closer fit with the body portion 2 and with the terminals 8 8 and slab 9, the spring 13
being omitted. Otherwise this modification of my device has the same construction as is shown in Fig. 2, and in this case when the ring 11 melts the solder is caused to flow into contact with the terminals 8 8 by gravity only. The operation of the arrangement shown in Fig. 1 is, in effect, independent of gravity, so that the device may be located in any desired position. With either arrangement, however, the ring 12 or 12' performs the desirable function of a heat-insulating backing, which prevents heat from escaping or radiating upward from the ring 11, thus promoting the sensitiveness and certainty of operation of the device. Said ring also serves to prevent any possibility of lateral movement of the contact-terminals which might bring them into contact with the solder ring 11. I consider the employment of the solder in the form of a ring, in connection with the retaining-receptacle which incloses it, to be one of the features of my invention, because it thereby prevents from becoming displaced and brought into accidental contact with the terminals 8 8, and it is also equally exposed in all directions to the flow of heat from the journal-bearing. Furthermore, when it melts the tendency of the melted solder is necessarily to flow toward the open center of the ring, so that it must instantly make contact with the terminals 8 8 and cannot flow around or to one side of the same. It will be evident that the metallic body portion 2 is itself capable of serving as one of the contact-terminals in case the machine to which my device is attached is included in the alarm-circuit and that the device may be modified in various other ways without departing from my invention.

I claim as my invention—

1. In a thermostatic circuit-controlling device, the combination of a cup-shaped body portion, providing a solder-retainig receptacle, a ring of fusible solder contained therein and located adjacent to the walls thereof, and circuit-terminals located at the interior of said ring in position to be electrically connected by contact with said solder when melted, substantially as set forth.

2. In a thermostatic circuit-controlling device, the combination of a cup-shaped body portion, a ring of fusible solder contained therein and located adjacent to the walls thereof, a heat-insulating ring covering said solder ring, and circuit-terminals adapted to be electrically connected by contact with said solder when melted, substantially as set forth.

3. In a thermostatic circuit-controlling device, the combination of a cup-shaped body portion, insulated contact-terminals contained therein and adapted to be included in an alarm-circuit, and a ring of fusible solder surrounding said terminals and located adjacent to the walls of the body portion, substantially as set forth.

4. In a thermostatic circuit-controlling device, the combination of a cup-shaped body portion, insulated contact-terminals contained therein and adapted to be included in an alarm-circuit, a ring of fusible solder surrounding said terminals, and an insulating-ring covering said solder ring.

5. In a thermostatic circuit-controlling device, the combination of a cup-shaped body portion, insulated contact-terminals contained therein and adapted to be included in an alarm-circuit, a ring of fusible solder surrounding said terminals, a supplementary ring in contact with said fusible ring, and a spring tending to press said rings together.

6. In a thermostatic circuit-controlling device, the combination of a cup-shaped body portion, an insulating-plug contained therein, two contact-terminals adapted to be included in an alarm-circuit and a slab insulating said terminals from each other, said terminals and slab having, taken collectively, a cylindrical form and being held in a hole formed in said plug, and a mass of fusible solder located adjacent to said terminals but normally out of contact therewith.

7. In a thermostatic circuit-controlling device, the combination of a cup-shaped body portion, containing an insulating-plug 7, contact-terminals 8 8 carried by said plug and projecting from the lower side thereof, circuit-wires 5 5 connected to said terminals respectively, an insulating-slab 9 located between said terminals, a ring 12 surrounding said terminals near their lower ends, and a ring of fusible solder confined between said ring 12 and the bottom of the body portion, substantially as described.

8. In a thermostatic circuit-controlling device, the combination of a body portion 2, plug 7,contact-terminals 8 8, insulating-slab 9, circuit-wires 5 5, fusible ring 11, insulating-ring 12, and spring 13, substantially as described.

9. In a thermostatic circuit-controlling device, the combination of a body portion 2, plug 7, contact-terminals 8 8, insulating-slab 9, circuit-wires 5 5, fusible ring 11, insulating-ring 12, spring 13 and shoulder 14, substantially as described.

In testimony whereof I have hereunto subscribed my name this 22d day of October, 1903.

HENRY A. FISKE.

Witnesses:

E. D. CHADWICK, JOSEPH T. BRENNAN.