

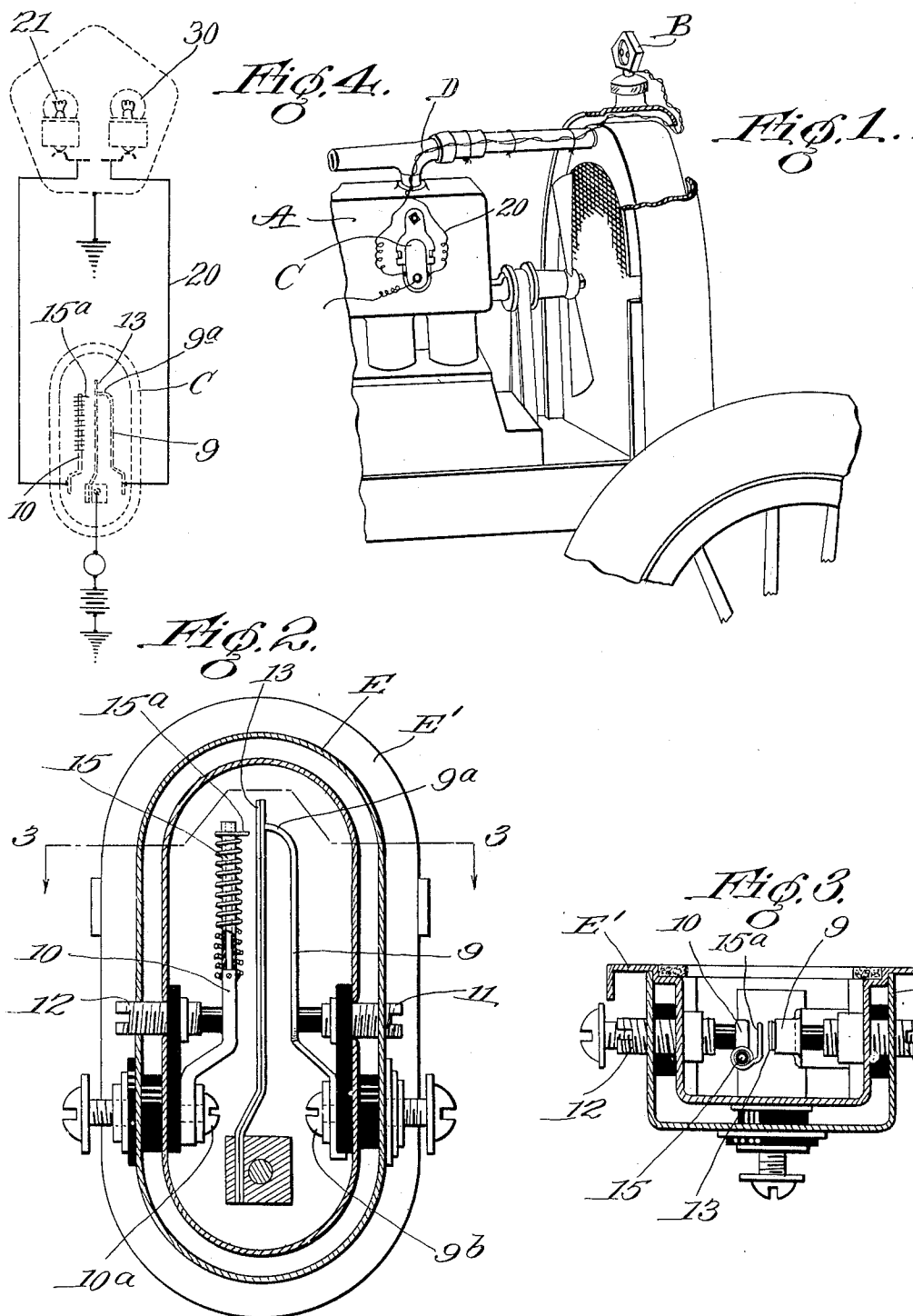
Dec. 27, 1927.

1,653,685

F. G. WHITTINGTON

DEVICE FOR PRODUCING FLASHING SIGNALS FOR ENGINE TEMPERATURE INDICATORS

Filed Dec. 13, 1920



Witness:
P. J. Gathmann

Inventor:
Frederik G. Whittington
By Burton & Burton
His Attorneys

UNITED STATES PATENT OFFICE.

FREDERIK G. WHITTINGTON, OF CHICAGO, ILLINOIS, ASSIGNOR TO STEWART-WARNER SPEEDOMETER CORPORATION, OF CHICAGO, ILLINOIS, A CORPORATION OF VIRGINIA.

DEVICE FOR PRODUCING FLASHING SIGNALS FOR ENGINE-TEMPERATURE INDICATORS.

Application filed December 13, 1920. Serial No. 430,236.

The purpose of this invention is to provide an improved construction in a signaling device for indicating automobile engine temperature for the specific purpose of giving the signal, particularly of the dangerous temperature, by an intermittent or flashing light. It consists in the elements and features of construction shown and described, as indicated in the claims.

10 In the drawings:—

Figure 1 is a diagrammatic view showing an engine temperature indicator upon an automobile, and having the signal operating device constructed according to this invention.

15 Figure 2 is a section through the casing of the temperature-responsive circuit-making-and-breaking device by which the signal is operated, showing the circuit-making-and-breaking devices equipped with means for producing the flashing light.

Figure 3 is a section at the line, 3—3, on Figure 2.

25 Figure 4 is a wiring diagram of the construction illustrated in the preceding figures.

The general arrangement, and in some respects the detail construction, of the signaling apparatus shown in the drawing, is substantially that of my pending application No. 420,330 filed October 29, 1920. And as to the general arrangement, only very brief descriptions will be necessary here.

30 In the drawings the engine is conventionally shown at A, the signal device proper at B, the thermostatic or temperature-responsive device for making and breaking the electric circuit by which the signal lamp is energized is seen in its casing at C, and cabled circuit wires at D, these reference letters being employed in Figure 1. In the detail figures the circuit wires are separately denoted.

40 The thermostatic or temperature-responsive device as a whole comprises a casing, E, having a hollow wall for insulation against exterior temperature, said casing being mounted by means of its flange, E¹, with its open side against the metal base of the engine, so that the temperature responsive element therein is exposed directly to the heat radiated from said engine.

50 Within the hollow wall casing described, there are mounted three terminal contact

members of the electric circuits for energizing the signal lamps. Two of the contact members, 9 and 10, are secured by insulated binding posts, 9^b and 10^a, to the inner wall of the casing, and project lengthwise of the latter substantially parallel to each other, the end of the first member, 9, being bent inwardly to form its terminal 9^a, the second member, 10, being provided with a contact terminal, 15, which preferably consists of a coil of metal having high electrical resistance, so that it becomes heated quickly upon the passage of electric current through it, causing it to become lengthened in the direction of the coil so as to carry the outer end, 15^a, which is bent out radially with respect to the coil, away from the third of the contact member, 13, which is positioned between the first two, and is bi-metallic, consisting of two laminae of metal having different coefficients of expansion upon temperature change, the lamina having the higher coefficient being on the side remote from the contact member whose contact terminal or electrode consists of the high resistance coil, so that the rise of temperature of said third or intermediate member causes it to be flexed toward and into contact with the outer end of the helical electrode terminal of the second member; whereupon said helical electrode becoming heated by the current withdraws its terminal and breaks the circuit. As illustrated the two members, 9 and 10, are provided with means consisting of adjusting screws, 11 and 12, as shown in my said pending application, and constituting no part of the present invention, though may cooperate with it.

The operation of the device is that at ordinary temperatures of the engine when running normally, the temperature-responsive member, 13, is in contact with the inner end, 9^a, of the electrode or contact member, 9, thereby closing the circuit, through the wire, 20, which energizes the signal lamp, 30, which is of the color customarily employed to indicate safety, namely, green; but when the temperature of the engine arises beyond the point of safety the resulting flexure of the temperature-responsive member, 13, carries it into contact with the helical electrode or contact member terminal, 15, thereby causing the current to pass

through said helical member, heating it quickly, causing the wire which constitutes it to become elongated in the circular direction of the helical coil, which immediately carries the projecting terminal finger thereof rotatively about the axis of the coil away from contact with the bimetallic electrode or contact member, 13. Immediately upon leaving contact with the member, 13, thereby breaking the electric circuit, the helical member, 15, relieved of the heating effect of the current becomes cooled and the wire of which it is constituted is shortened in the circular course of the coil causing its radially projecting terminal finger, 15^a, to move rotatively about the helix axis back into contact with the temperature-responsive electrode, 13, restoring the circuit, causing the helical member to be again heated, and elongated and again withdrawn to break the circuit, thus alternately energizing and de-energizing the signal lamp, 21, which is of color to indicate danger, namely, red, and causing a flashing of the red light in the face of the driver, giving him warning of the dangerous condition of the engine, and attracting his attention by the flashing and intermittent glowing of the lamp more certainly than it would be attracted by the mere steady illumination.

I claim:—

1. In combination with an electric signal lamp and the circuit in which it is energized, a circuit making and breaking device comprising a heat-responsive member mounted for response to the temperature of which a signal is to be given and constituting a movable electrode in said circuit, and a second electrode with which the heat-responsive member makes and breaks contact upon change of temperature, the contact-terminal of one of said electrodes being a metal of sufficiently high electrical resistance to be heated by the passage through it of current adequate to energize to illumination the signal lamp, sufficiently to cause a substantial expansion of said terminal, and thereby a substantial movement of the contact point thereof, said terminal being formed and mounted on the member to which it pertains for rendering said movement away from the other electrode; whereby the circuit is broken at a short interval after it is closed by the temperature-responsive action of said temperature-responsive member and again closed upon the cooling of said terminal.

2. An electric circuit-making-and-breaking device comprising a heat-responsive member mounted for exposure to varying temperature, and constituting a movable electrode adapted to be moved by change of temperature, and a second electrode with which the heat-responsive member makes and breaks contact by said movements; an

electric circuit in which said electrodes are contained, comprising a source of electrical current, the contact terminal of one of said electrodes being a metal of sufficiently high electrical resistance to become heated by the passage through it of the current from said current source to cause expansion of said terminal adequate for movement of its contact point to break the contact with the other electrode, said terminal being formed and mounted on the member to which it pertains for circuit-breaking movement upon expansion and circuit-closing movement upon the contraction resulting from cooling while the circuit is broken.

3. In the construction defined in claim 2, the high resistance metal terminal being in the form of a coil having an end secured rigidly to the member of which it forms the terminal and the other end free for movement with respect to said member.

4. In the construction defined in claim 2, foregoing, the high resistance metal part being a helical coil mounted by its inner end rigidly upon one of the two contact-making-and-breaking members, and its outer coil provided with a finger projecting out of the helical course for movement to contact and withdraw from the other of said members.

5. In a temperature indicating device an electric signal lamp, a circuit and a source of electrical energy, a movable thermostatic element in said circuit responsive to the temperature of something whose temperature is to be indicated, and means for flashing said signal lamp on the movement of said thermostatic element to a position dependent upon a predetermined temperature, including said elements recited and a second thermostatic element with which the first named element makes contact at said predetermined temperature.

6. In the construction defined in claim 5, the second thermostatic element being adapted to respond by circuit-interrupting movement to a change of its temperature due to contact with the first mentioned thermostatic element.

7. In the construction defined in claim 5, the second thermostatic element being adapted to respond by circuit-interrupting movement to change of its temperature due to its contact with the first mentioned thermostatic element, and having a sufficiently high electrical resistance to become heated for causing said circuit-interrupting movement by the current flowing through it at its circuit-closing position.

8. In the construction defined in claim 5, the second thermostatic element being a spirally-coiled conductor having one end fixed and the other end constituting the contact with the first mentioned thermostatic element and positioned with respect to the latter for being carried away from the latter

by elongation of said second element upon increase in its temperature due to contact with the first mentioned element.

5 9. In a construction for the purpose indicated, an electric circuit and two temperature-responsive elements therein constituting separable contacts movable for opening and closing the circuit, the first of said elements being mounted for deriving change of tem-
10 perature from a part whose temperature changes are to be indicated, the second tem-

perature responsive element being an electrically conductive coil having one end fixed and the other constituting a contact co-operating with the first mentioned element for 15 making and breaking the circuit, and positioned for circuit-breaking movement by elongation upon increase of temperature due to contact with the first mentioned.

In testimony whereof, I have hereunto set 20 my hand this 8th day of December, 1920.

FREDERIK G. WHITTINGTON.