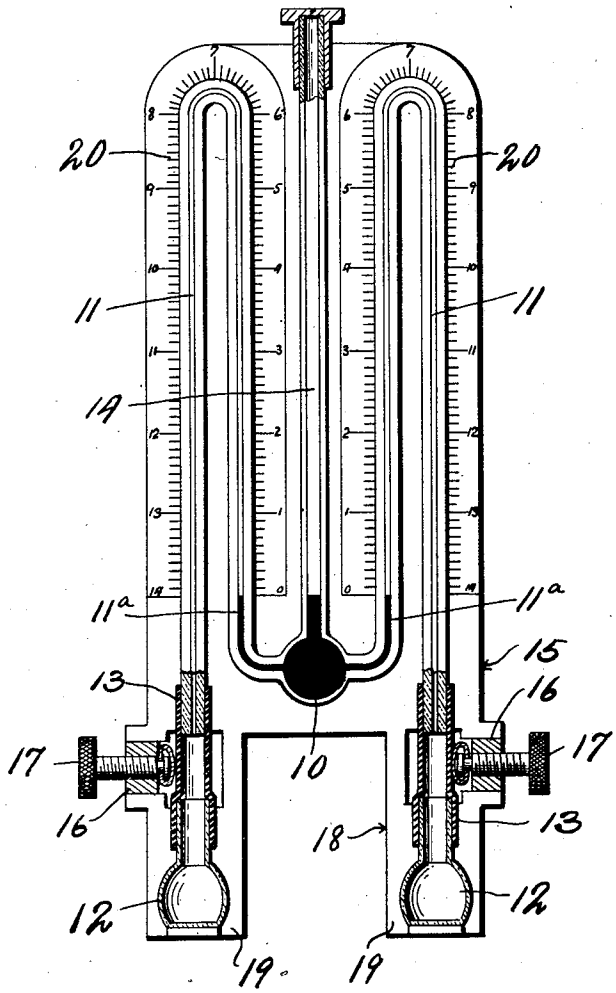
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COMPOUND THERMOMETER

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UNITED STATES PATENT OFFICE.

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COMPOUND THERMOMETER.

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This invention relates to thermometers and more particularly to a compound thermometer for the purpose of determining differences in temperature between two elements or between two portions of the same element.

A further object of the invention is to provide a device of this character which in addition to recording the differences in temperature between two given points as set forth above, normally indicates the true temperature in the manner of an ordinary thermometer.

A further object of the invention is to provide a device of this character which is adjustable so that accurate readings may be obtained and the telltale column of fluids may be adjusted before making the test so that it accurately aligns with a selected graduation of the thermometer sections.

These and other objects I attain by the structure shown in the accompanying drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention and wherein:—

The figure is a front elevation of a thermometer constructed in accordance with my invention, parts of the device being shown in section.

Referring now more particularly to the drawings, the instrument consists essentially of a bulb 10 from opposite sides of which extend a pair of capillary tubes 11, the free ends of which communicate with bulbs 12. In the bulb 10 is arranged a readily expansible liquid of such character that it will be readily discernible through the walls of the tube. In the bulbs 12, there is likewise an expansible fluid preferably in the form of a gas, as air, although any fluid may be employed as will hereinafter be rendered obvious. It will be seen that the fluid within the bulb 10 will expand in response to heat and be forced into the bores of the capillary tubes 11. If the temperature to which the bulbs 12 are subjected are equal the columns 11^a of fluid in the tubes 11 will balance and be of equal length. If, however, the bulbs 12 are subjected to unequal temperatures, the columns will be unbalanced due to the fact that one of the bulbs will subject its associated column to a greater pressure than the other bulb, with the result that the columns will shift until the pressure at opposite sides is equalized.

At the point of connection of each capillary tube 11 with its associated bulb 12 an elastic section 13 is preferably provided so that by manipulation of these sections, pressure can be placed against the column 11^a of the associated tube to force the same into alignment with a given graduation of the tube or as will hereinafter appear of a frame of which the tube is carried. In addition, the bulb 10 is preferably provided with a third or inlet tube 14 through which additional fluid may be introduced to refill the bulb 10 or through which static pressure may be introduced to force the contents of the bulb into the capillary tubes 11.

A frame 15 is provided for the thermometer structure having portions 16 through which are directed threaded elements 17 for coaction with the elastic sections 13 of the tubes 11 with their bulbs 12. By forcing these screws into or out of engagement with the elastic walls of this connection, the height of the associated column 11^a may be regulated as above described. The frame has additionally a cutout section 18 forming legs 19 in which the bulbs 12 are supported, this cutout portion separating these legs so that they are not thermally connected to any appreciable extent. This frame is provided with a series of graduations 20, one for each tube 11.

In the operation of the device, when the sensitive ends are applied to the body of a patient, if there is any difference in temperature between the points of contact, there will be a difference in expansion of the gases enclosed in the bulbs 12 with the result that there will be a difference in the levels of the liquid columns 11^a, thus indicating not only that there is a difference in temperature but what this difference of temperature is and at which point the temperature is the highest. This construction renders the device particularly adaptable for securing the correct location of abscesses and the like which produce a locally fevered condition in the body of the patient.

While I have above described a particular construction which is preferred by me, it will be understood that this structure is capable of a considerable range of change and modification. For example, while two tubes are shown, as many of these tubes may be employed as is desirable and the adjusting mechanism as represented by the flexible connection and adjustable screw may be omitted. Certain other changes being pos-

sible without in any manner departing from the spirit of my invention, I accordingly do not limit myself to such specific structure except as hereinafter claimed.

I claim:—

1. In a thermometer of the type described, a bulb containing an expansible liquid, a pair of capillary tubes, each communicating with the bulb at one end and having at their opposite end bulbs containing an expansible fluid, the tubes adjacent the last named ends thereof having an elastic section and means adjustably bearing against such elastic sections to thereby increase or decrease the static pressure within the last named ends of the tubes.

2. In a thermometer of the type described, a bulb containing an expansible liquid, a pair of capillary tubes, each communicating with the bulb at one end and having at their opposite end bulbs containing an expansible fluid and an inlet tube communicating with the first named bulb and provided at its free end with a sealing cap.

In testimony whereof I hereunto affix my signature.

JOSEPH M. FUSCA.