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THERMOMETER

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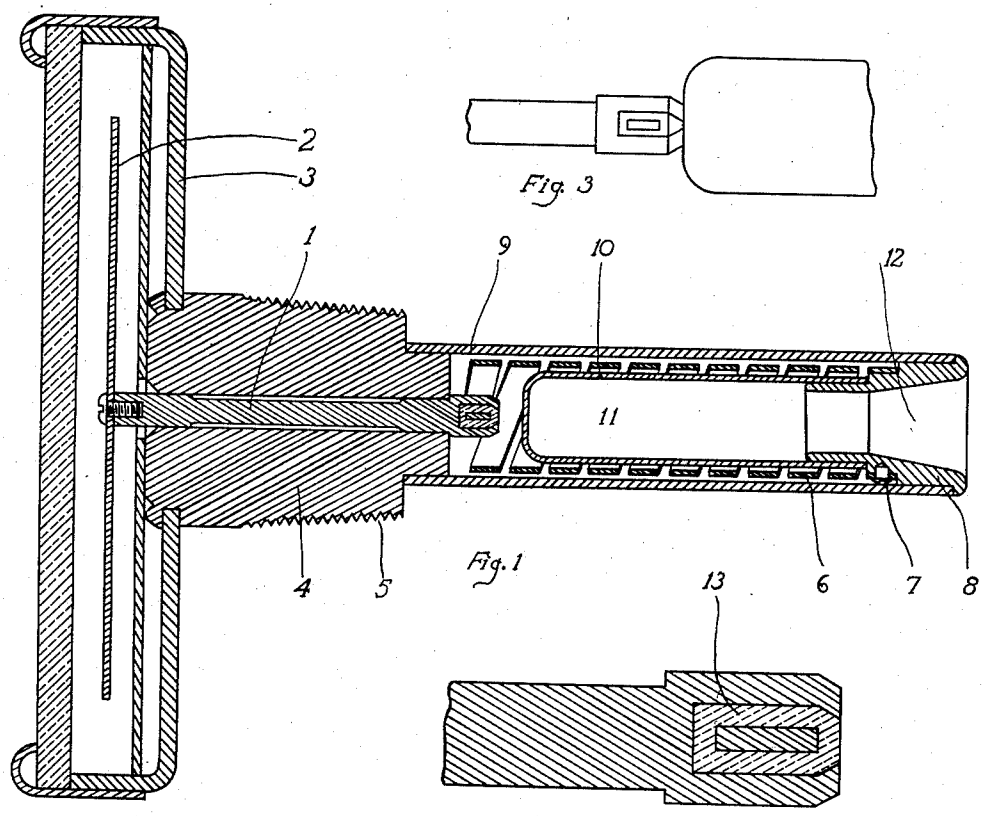


Fig. 3

Fig. 1

Fig. 2

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THERMOMETER

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2 Claims. (Cl. 73—367)

This invention relates to a thermometer, and has to do more particularly with thermometers of metallic construction of the type employing a helical coil of either bimetallic or other construction that is connected to an indicator to effect movement thereof.

One object of the invention is to afford a construction that is of simple and practical design, reliable and accurate, and protected against breakage or damage during shipment.

More particularly, the invention has for its purpose to surround both the inside and outside surfaces of the helical coil with a housing that is close thereto, so as to reduce the amount of lag and give a correct reading and greater accuracy in a shorter period of time than with instruments heretofore employed for the purpose.

Another purpose of the invention is to afford a more sensitive instrument by substantially reducing the dead air space within the helical coil, thus making the heat responsive element more sensitive to any fluid whose temperature is to be determined, and equalizing the effect on the outside and inside surfaces of the coil.

Another object of the invention is to afford a construction in which the heat sensitive element is efficiently insulated from the indicator and indicator-housing, and the parts are so constructed that the helical coil as well as the indicator-shaft are protected against breakage or deformation during shipment, or from excessively rough handling.

To these and other ends, the invention consists in the construction and arrangement of parts that will appear from the following description when read in conjunction with the accompanying drawing, the novel features being pointed out in the claims following the specification.

In the drawing:

Fig. 1 is a sectional view of a thermometer showing one practical embodiment of the invention;

Fig. 2 is a detail sectional view showing the connection between the indicator-shaft and helical coil, and

Fig. 3 is a detail view showing the position of the parts when the indicator-shaft has moved endwise into contact with the inner wall of the helical coil housing.

Referring more particularly to the drawing, in which like reference numerals refer to the same parts throughout the several views, 1 designates the indicator-shaft provided with the usual indicator 2 located within the indicator-housing 3. The indicator-shaft 1 is slidably and rotatably mounted in a bushing 4 that is threaded at 5 to permit it to be inserted into a receptacle.

The inner end of the indicator-shaft is connected to the inner end of the helical coil 6, which may be bimetallic, or of hollow fluid-containing metal, or otherwise formed, the outer end of the latter being fixedly connected at 7 to the helical coil housing.

Said housing includes a head or end portion 8 to which are suitably and permanently attached an outer cylindrical wall 9 and an inner cylindrical wall 10, both of suitable thin metal. The inner wall 10 has a closed inner end 11 affording a chamber into which liquids or fluids may enter and circulate through the opening 12. The inner wall 10 is located within and in close proximity to the inner surface of the helical coil 6 while the outer wall 9 surrounds the helical coil and is in close proximity thereto, the inner and outer walls affording a means that effectively prevents distortion or deformation of the coil in either direction transversely of its length, due to jars in shipment or excessively rough usage.

Owing to the cylindrical inner wall 10 and the chamber which it encloses, permitting access of liquids or fluids, the latter are brought into close proximity to the inner surface of the bimetallic coil, causing both the inner and outer portions of the coil to respond quickly and uniformly to the temperature of the fluid that is undergoing test which makes for quicker action and greater accuracy.

With this arrangement, the indicator-shaft 1 is made of minimum length, extending but little beyond the portion of the helical coil to which it is connected, and the endwise movement of the indicator-shaft that may take place due to contraction of the helical coil is limited by the closed end 11 of the inner wall of the chamber, thus affording a further protection against deformation or injury of the delicate parts of the instrument.

In order to afford a still more accurate reading and to insulate the heat sensitive member from the indicator-shaft and indicator-housing, I employ insulating means surrounding the end of the helical coil where it is connected to the indicator-shaft. Such insulating means is shown at 13, and may consist of heat resisting fiber or suitable lacquer, paint or other insulating medium interposed between the surfaces of the coil and the surfaces of the indicator-shaft to which it is joined. This acts to measurably prevent the conducting of heat from the indicator-housing and outside atmosphere through the indicator-

shaft to the helical coil, and tends to insure a more accurate reading of the temperature of the liquid or fluid into which the helical coil and its surrounding housing is inserted.

While the invention has been described with reference to a structural embodiment, it is not limited to the details shown, and this application is intended to cover such modifications as may come within the purposes of the improvement or the scope of the following claims.

I claim:

1. In a thermometer, the combination with a threaded bushing adapted to be secured in a receptacle, of an indicator shaft supported by said bushing and rotatable therein, a housing comprising an outer cylindrical wall mounted on said bushing, a head located within and secured to the outer end of said outer cylindrical wall, an inner cylindrical wall secured to the inner end of said head and closed at its inner end, and a temperature responsive helical coil having its inner end secured to said indicator shaft and its outer end secured to said head at a point between the inner and outer cylindrical walls, the inner closed end of the inner wall acting as a stop to limit endwise movement of the indicator shaft which is free to move thereagainst.

2. In a thermometer, the combination with a threaded bushing adapted to be secured in a receptacle, of an indicator shaft supported by and rotatable in said bushing, a housing comprising an outer cylindrical wall secured to said bushing, a head located within and secured to the outer end of said outer wall, said head having a reduced cylindrical inner end portion and an intermediate cylindrical portion between its ends, an inner cylindrical wall secured to the inner end of said head, and a temperature responsive helical coil having its outer end secured to said intermediate cylindrical portion of the head between the inner and outer walls and its inner end secured to said indicator shaft, the inner end of the inner cylindrical wall being closed and acting as a stop to limit endwise movement of the indicator shaft and said shaft being free to move into engagement with said stop.

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