July 21, 1931. L. C. IRWIN 1,815,567

BULB ASSEMBLY FOR TEMPERATURE RESPONSIVE DEVICES

Filed Aug. 1, 1928

Fig. 1.

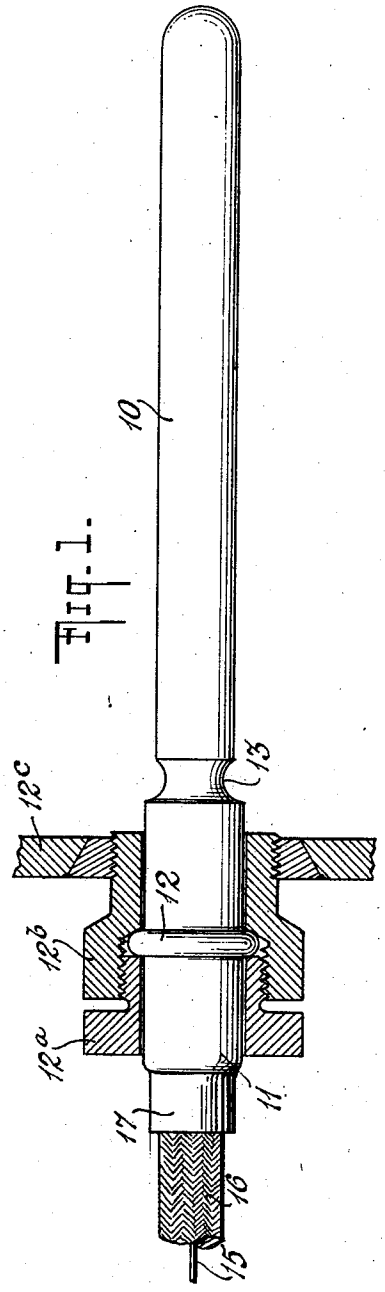
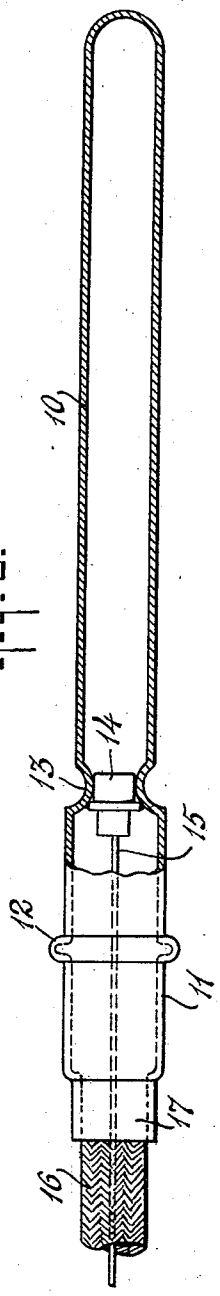


Fig. 2.



WITNESS

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UNITED STATES PATENT OFFICE

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BULB ASSEMBLY FOR TEMPERATURE RESPONSIVE DEVICES

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My invention relates to a bulb assembly including a bulb adapted to contain an expansible fluid and suitable for use in connection with a temperature recorder or controller or similar device, and more particularly to a bulb assembly whose bulb is designed to be positioned within the interior of a vessel containing corrosive liquids or vapors with which said bulb comes in contact and is connected by means of a capillary tube to said temperature recorder or controller.

Bulb assemblies of the type to which my invention relates are usually attached as by means of a fitting or coupling which is generally part of a union connection, to the wall of a tank or other apparatus of which it is desired to obtain temperature readings or whose temperature is to be controlled. The bulb proper, in prior constructions, is usually brazed or soldered to the fitting which is connected to this union, and as the whole bulb is exposed to the liquids and vapors within the tank, it frequently happens, particularly where acids, alkalis or salt solutions are employed in the apparatus, that the bulb is corroded at this brazed or soldered junction, being ultimately eaten away at this point and permitting escape of the fluid contained therein, thus rendering the mechanism of which the bulb forms a part completely useless.

It is an object of the present invention to provide a bulb assembly which is so constructed that the portion thereof which is exposed to the corrosive fluids within the apparatus is completely free of external soldered, brazed or welded joints throughout its entire length, so that corrosion and the possibility of leaks, such as occur in bulbs now in use, are eliminated. It is further an object of the present invention to provide a one piece bulb having an extension integral therewith and adapted to pass through the wall of the apparatus, the extension having an external ring or flange thereon whereby the union connection for clamping the bulb to the wall is greatly simplified. A still further object of the invention is to provide novel means for connecting the capillary tube to the bulb interiorly of the latter so that the juncture is inside of the bulb and is never exposed to the corrosive action of the material within the tank or apparatus.

In the drawings which illustrate by way of example a preferred embodiment of my invention without defining its limits, Fig. 1 shows an external view of my improved bulb connected to the wall of a tank or similar vessel, and Fig. 2 shows a more detailed view of the tube, shown partly in section.

Referring to the drawings my improved bulb assembly includes a bulb portion 10 which is made of a single piece of material, preferably of metal, and is made in a manner well known in the art, as in a draw press and finished in a swaging machine. The bulb 10 is provided with an integral extension 11 which is adapted to extend through the wall of the apparatus to the outside thereof. A ring 12 on the extension, preferably formed integral therewith, serves as a seat for the union connection 12*a*, 12*b* which is used to mount the bulb and its extension on the wall 12*c* of the apparatus.

The inner end of the bulb portion 10 is constricted as shown at 13, thereby forming a section of reduced internal diameter and to the interior surface of this constructed section is connected the plug 14 of the capillary tube 15 which is connected to the recording or controlling mechanism (not shown). The preferred method of connecting the plug 14 to the constricted portion 13 is by brazing or soldering, although it will be obvious that other forms of connection, such as welding, may be employed to make the junction fluid-tight. A protective casing 16 encloses the capillary tube and fits within the end 17 of the extension 11.

It will be seen from the above construction that I have provided a bulb assembly including a bulb and an extension integral with such bulb, and a capillary tube attached to the bulb in such a manner that no joint of any kind extends to the external surface of the portion of the assembly located within the apparatus so that the danger of the corrosive action of the material in the apparatus upon such joint is eliminated. It

will also be seen that I have provided an assembly which will extend completely through the wall of the apparatus and is so constructed that no threaded connections of any kind are exposed to the corrosive influence of the liquids or vapors in the apparatus to which the bulb is applied and that, furthermore, the number of parts necessary to connect the bulb to the capillary tube and to the wall of the vessel are few in number and simple in construction.

It will be understood that the fluid within the bulb 10 may be such as will vaporize at the temperature of the material within the apparatus or will expand like mercury, without vaporizing to an appreciable extent, and actuate the recording or controlling mechanism.

While I have shown a form of my invention particularly adapted to be supported upon a wall of the vessel to which it is applied, it will be clear that my improved bulb assembly may be suspended within such vessel in any desired way.

Variations and modifications may be resorted to within the scope of the claims without departing from the spirit of the invention.

I claim:

1. A bulb assembly adapted to be supported so as to project into a container and including a tubular member having at least a portion thereof including the section which extends within the container formed of one piece free of exterior joints, a capillary tube one end of which extends into said portion, and a plug on said tube for holding said tube within said portion, the latter having a constricted section, and said plug being adapted to fit against and be secured to said constricted section, said constricted section being so located that when the bulb assembly is in position upon the wall of a container the capillary tube is in communication with a portion of the tubular member located wholly within such container.

2. A bulb assembly adapted to be attached to a wall of a container and project thereinto and including a tubular member adapted to project outwardly of the container wall and formed of one piece free of exterior joints, a capillary tube one end of which extends into said portion, a plug on said tube for holding said tube within said portion, and an integral ring on the outwardly projecting portion of said tubular member arranged to form an abutment for a union connection employed to attach the assembly to the wall of a container, said plug extending into said tubular member to such a point that when said bulb assembly is in position upon a wall of the container the capillary tube is in communication with a portion of such member which is located wholly within said container.

LAWRENCE C. IRWIN.