Nov. 14, 1967 M. J. DE LEONARDIS 3,352,989

ELECTRODE ASSEMBLY FOR INSERTION IN A FLUID CONTAINER

Filed Oct. 22, 1965

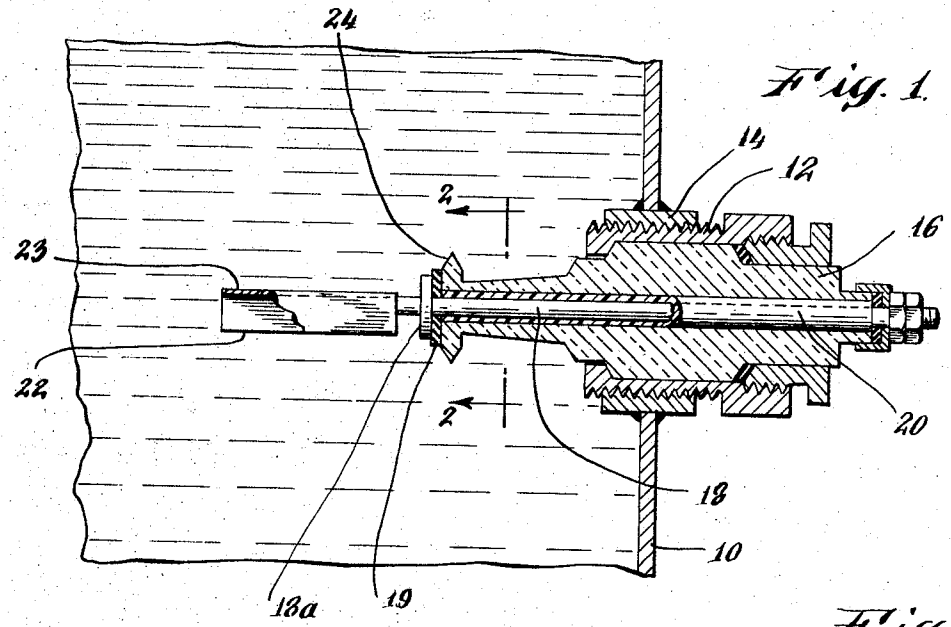
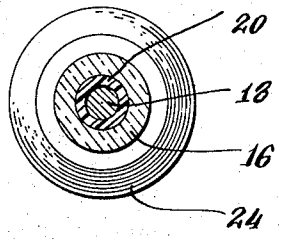


Fig. 1.

Fig. 2



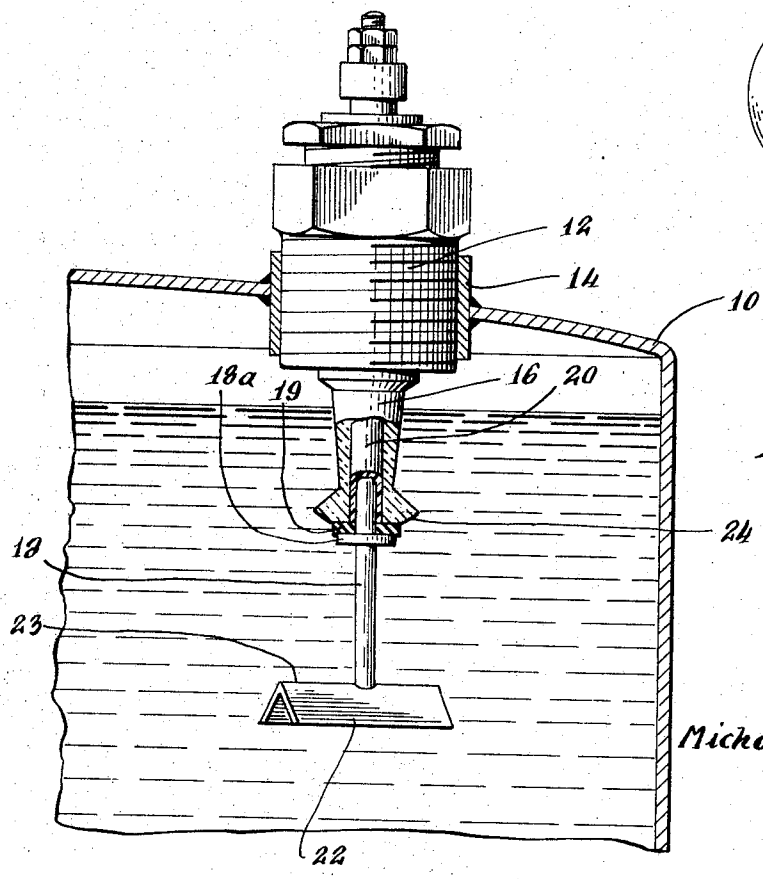


Fig. 3.

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ELECTRODE ASSEMBLY FOR INSERTION IN A FLUID CONTAINER

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ABSTRACT OF THE DISCLOSURE

This invention relates to an electrode assembly adapted for insertion in the wall of a boiler, tank, or other liquid container, to complete a circuit through liquid in the container.

An object of the invention is to provide a simple, dependable and durable assembly of the said kind which will be capable of withstanding high pressure as well as being self cleaning to prevent the deposit of sediment or the accumulation of rust or other foreign matter which might create a short circuit completing a circuit through the electrode when the liquid level in the container is below the electrode. Completion of a circuit when the liquid level has fallen below the electrode would prevent the operation of safety control circuits, such for example as are disclosed in my copending application, Ser. No. 501,558, and could lead to overheating of the container and a dangerous explosion if liquid were introduced into the overheated container.

The invention will best be understood by reading the following description in connection with the drawings in which:

FIGURE 1 is a side elevation of an embodiment of the invention, largely in cross section, inserted in the wall of a liquid container,

FIGURE 2 is a cross section taken on the line 2—2 of FIGURE 1, and

FIGURE 3 is a view similar to FIGURE 1 showing another embodiment of the invention with the assembly, except for the electrode blade, disposed vertically within the liquid container.

In the embodiment of the invention illustrated herein the assembly extends through the wall of a boiler **10** and may be supported therein as by a surrounding collar **12** threaded externally to engage the interiorly threaded sleeve **14** welded within an opening provided in the container wall.

The assembly comprises an outer insulator plug **16** of ceramic or other suitable insulating material, which is bored longitudinally to receive a conductor **18**, preferably, but not necessarily, a rod of stainless steel, surrounded by a pliable insulating sleeve, shown as a plastic sleeve **20**, which is important to provide insulation of the conductor within the ceramic plug even if the plug becomes cracked. The conductor will expand and contract with changes in temperature and the sleeve should be able to stretch and contract in order to continuously provide a tight fit around the conductor. It should be possible to stretch the sleeve for the insertion of a conductor. I have had good results using a "Teflon" sleeve bonded to a stainless steel rod conductor by an epoxy resin.

At the inner end of the conductor is the electrode blade **22**, preferably of stainless steel, shaped to shed foreign matter of any kind which might otherwise settle on it and form a deposit, which in time might bridge the space between the blade and another conductor such as the container wall or another electrode disposed within the container. As shown the electrode blade **22** is an angle member shown in the shape of an inverted V, thus providing four faces for contact with water within a boiler. I have found that a relay connected in circuit with the

electrode blade is actuated sooner when the blade provides more than two surfaces. The inverted V, or chevron shaped blade illustrated herein gives very satisfactory results.

At or near the inner end of conductor **18** a lateral flange **18***a* is provided and it serves as an abutment for gasket **19** which extends around conductor **18** between flange **18***a* and the inner end of sleeve **20** which presses against it. This structure provides an effective pressure seal at the inner end of plastic sleeve **20** and the inner end of the plug **16** which is coextensive with the sleeve **20**. An effective pressure seal at the inner end of sleeve **20** is very important as pressures on the order of 3000 pounds per square inch may be encountered in steam boilers.

At its inner end the plug may terminate in a barrier member **24** tapering toward its periphery, as shown in my Patent 2,813,954, Nov. 19, 1957, to provide a further safeguard against a short circuit caused by accumulation of sediment or any foreign matter bridging between the electrode blade **22** and the container wall.

In the embodiment shown in FIGURE 3 the conductive blade **22** is disposed horizontally and the conductor **18** is suspended vertically in the liquid container. This arrangement is desirable in the many installations where the boilers are tapped only on top, and where for some reason access is more convenient to the boiler top. The inner end of the conductor rod is welded to the ridge or apex **23** of the blade **22**.

The insulating sleeve **20** extends only to the gasket **19**, leaving uninsulated a length of conductor between the electrode blade or chevron **22** and the flange **18***a* of the conductor. This uninsulated portion of conductor **18** is in effect part of the electrode and its length is not important because a circuit between the exposed portion of the conductor **18** and the wall of the boiler through water in the boiler presents no problem. The danger lies in a short circuit at a time when the water level in the boiler is below the electrode **22**.

There has thus been provided an electrode assembly in which the above mentioned objects are accomplished in a thoroughly practical way and form.

What I claim is:

1. An electrode assembly comprising, a conductive blade member, a conductor connected to said blade, said conductor having a laterally extending flange adjacent its inner end, a gasket positioned around the conductor and against said flange, a plurality of concentric insulators surrounding the conductor with the inner ends of both abutting against the gasket, the inner one of said insulators being characterized by being resilient and capable of stretching and contracting to compensate for wide variations in temperature and the expansion and contraction of said conductor without being deformed or cracking, and the outer one of said insulators being characterized by being wear resistant, non water absorptive and impervious to super heated steam, and means for mounting the assembly in the wall of a boiler or the like with the blade and a portion of the conductor and the surrounding concentric insulators extending into the boiler and with the blade spaced from the boiler wall.

2. The device claimed in claim **1** in which the inner sleeve is Teflon and the outer sleeve is ceramic.

References Cited

UNITED STATES PATENTS

838,823	12/1906	Thomson	200—152
2,813,954	11/1957	De Leonardis	200—152

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