Nov. 19, 1957 M. J. DE LEONARDIS 2,813,954

CONSTRUCTION OF AN ELECTRODE FOR USE IN A FLUID CONTAINER

Original Filed Aug. 13, 1954

Fig. 1.

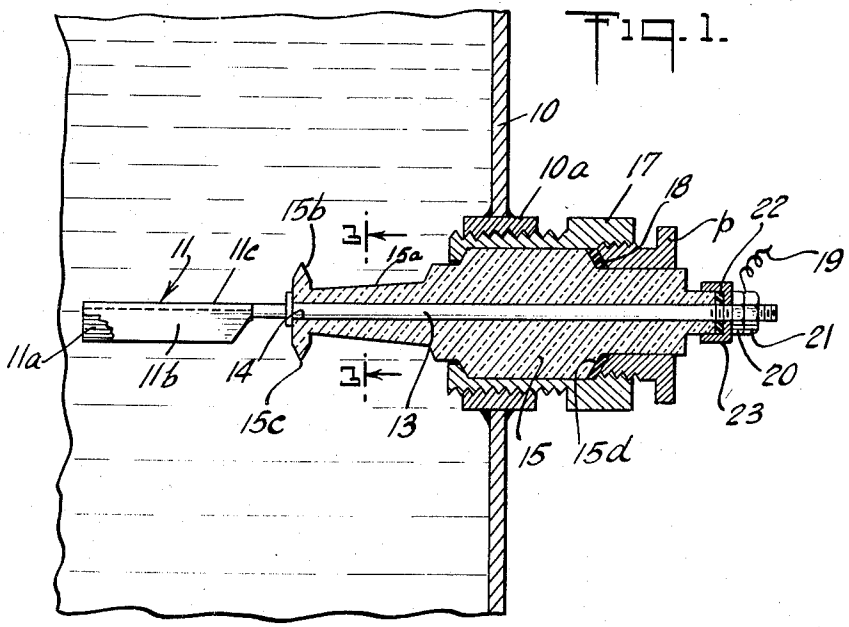


Fig. 2.

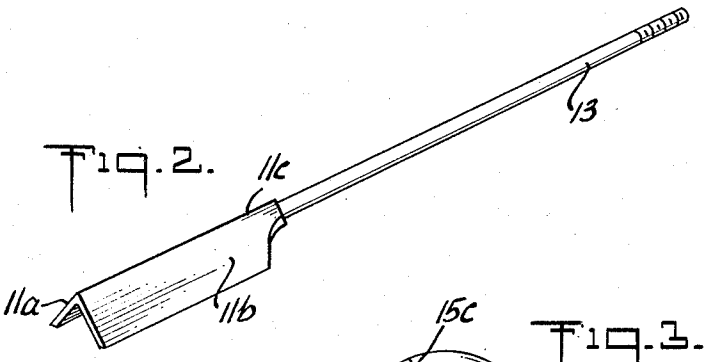
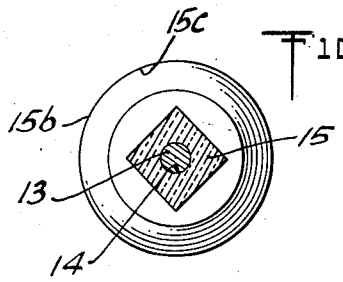


Fig. 3.



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CONSTRUCTION OF AN ELECTRODE FOR USE IN A FLUID CONTAINER

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Original application August 13, 1954, Serial No. 449,592. Divided and this application April 27, 1956, Serial No. 581,172

5 Claims. (Cl. 200—152)

This invention relates to an electrode assembly for insertion in the electrically conductive wall of a boiler, tank or the like, and comprises an electrode assembly adapted to be self-cleaning and to prevent the deposit of sediment, rust, mineral matter and the like from settling out of liquid within the container on to the electrode, and from short circuiting a control circuit of which said electrode is a part. This application is a division of copendng application Serial No. 449,592, August 13, 1954, now abandoned.

In said copending application there is disclosed means for controlling the liquid level within the liquid space of a boiler, tank or the like, said means including one or more electrode assemblies supported within the liquid space of a boiler tank or the like and insulated and spaced from the wall of the liquid space of the boiler, tank or the like, and forming part of a circuit which is completed when liquid in said boiler space or tank bridges the space between two electrodes. Liquid containers are often made of conductive metal, especially the water space of boilers, tanks and the like. Insulating of the wall of such a container from one or more electrode assemblies mounted therein is of obvious importance regardless of the use of the container provided an electrical current is to be passed through a liquid within the container.

The current which can be transmitted between two electrodes inserted through the wall of a liquid container, or between one such electrode and the conductive, grounded wall of a liquid container, is very small and on the order of from 4 to 10 watts. Such water may contain minerals and sediment of various kinds including particles of rusted material separated for example from the wall of a boiler or other container. I have found that an ordinary electrode assembly, for example one employing a cylindrical electrode, inserted through the wall of the water space of the boiler and forming part of an electrical control circuit, is very unsatisfactory even if the electrode is insulated from the wall by an insulating sleeve, since solid matter from the boiler water is deposited upon it and in a remarkably short time buids up sufficiently to bridge the space between the uninsulated electrode and the wall through which the electrode assembly is inserted and in which the assembly is supported, thus forming a short circuit and causing failure of the circuit of which said electrode forms a part.

Accordingly it is the object of this invention to provide an electrode assembly which is well adapted for use in the water space of a boiler, tank or the like and is substantially self-cleaning.

Another object of the invention is to provide an electrode assembly for use in an electric control circuit, which is capable of long service without cleaning and without danger of short circuiting the control circuit of which it forms a part.

The invention will best be understood if the following description is read in connection with the drawing in which,

Figure 1 is a vertical cross section of an electrode assembly.

Figure 2 is a perspective view of the electrode element, and

Figure 3 is a vertical cross section taken on the line 3—3 of Figure 1.

The electrode assembly shown in Figure 1 includes the two surfaces **11***a* and **11***b* which are sharply inclined and meet in the line of contact **11***c*. The electrode contact blade member **11** is connected as by silver solder to one end of a non-corrosive stainless steel rod **13**, which is received in, and extends through, a central bore **14** in a ceramic plug **15** which has a tapered portion **15***a* terminating in a disk-like portion **15***b* of increased diameter, and having a sharp peripheral edge **15***c* which serves to shed dirt or sediment building up on the portion **15***a*, thus preventing accumulation of sediment from bridging over between the container wall **10**, through which the electrode assembly is inserted, and electrode blade **11** and rod **13**.

Surrounding the ceramic plug **15** is a brass sleeve **17** which is externally threaded to engage within the pipe fitting **10***a* in the wall of a boiler or tank. Sleeve **17** surrounds a gasket **18** held in place against a shoulder **15***d* of the ceramic body **15** by the brass plug *p* which has external screw threads for engaging threads on the inner surface of sleeve **17**. A lead wire **19** is secured to the conductive member **13** adjacent its rear end between the two nuts **20** and **21**. Between the outer end of ceramic body **15** and nut **20** the gasket **22** is provided and held in place by the cup shaped retainer **23**.

It has been found that the electrode construction described above is remarkably efficient in shedding sediment or other solid material which collects upon the electrode blade and the adjoining portion of the plug assembly. It is effective in preventing building up of such sediment and preventing such accumulation from causing a short circuit between said electrode blade and the conductive wall of a liquid container through the liquid in which electric current is passed between two spaced electrode blades, or between one such blade and the container wall.

There has thus been provided an electrode assembly in which the above mentioned objects are embodied together with many practical advantages.

What I claim is:

1. The assembly comprising, an inverted V electrode adapted to shed sediment tending to settle on it from liquid in a water space in which said electrode is disposed, a conductor connected to said electrode, and an insulator surrounding said conductor and having adjacent its connection to said electrode a portion with an inverted V periphery.

2. An electrode assembly comprising, a conductive angle member the faces of which are inclined downwardly from its apex, a conductor connected to said member, and an insulator surrounding said conductor, said insulator having an externally threaded portion for insertion in the wall of a liquid container, a radially extending flange portion having a thin peripheral edge, and a portion of less diameter than said flange disposed between said threaded portion and said flange.

3. In an assembly comprising, an electrode, a conductor connected to the electrode and an insulator surrounding the conductor, a triangular electrode the apex of which is uppermost adapting it to shed sediment when it is inserted into the water space of a boiler, and an insulator comprising a radially projecting portion adjacent the electrode disposed at right angles to the axis of the conductor and characterized by having its opposite faces sharply inclined from its peripheral edge to shed sediment and prevent sediment from bridging over between the electrode and the boiler wall defining the said water space.

4. An electrode characterized by being triangular in

cross section and comprising two sides sloping downwardly and outwardly from its apex to its base.

5. In an electrode assembly comprising, an electrode, a conductor connected to the electrode and an insulator surrounding the conductor, an electrode characterized by being substantially triangular in cross section and comprising two sides sloping downwardly and outwardly from its apex to its base, and an insulator having a projecting flange portion adjacent said electrode characterized in that a cross section through it is substantially triangular and comprises two surfaces meeting in a sharp edge and diverging downwardly and outwardly to shed sediment and prevent sediment from bridging over between the electrode and a conductive wall of a container through which said assembly is inserted.

References Cited in the file of this patent

UNITED STATES PATENTS

824,098	Dawes	June 26, 1906
2,119,348	Parsons	May 31, 1938