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ANODE ASSEMBLY FOR CATHODIC PROTECTION

Filed June 15, 1959

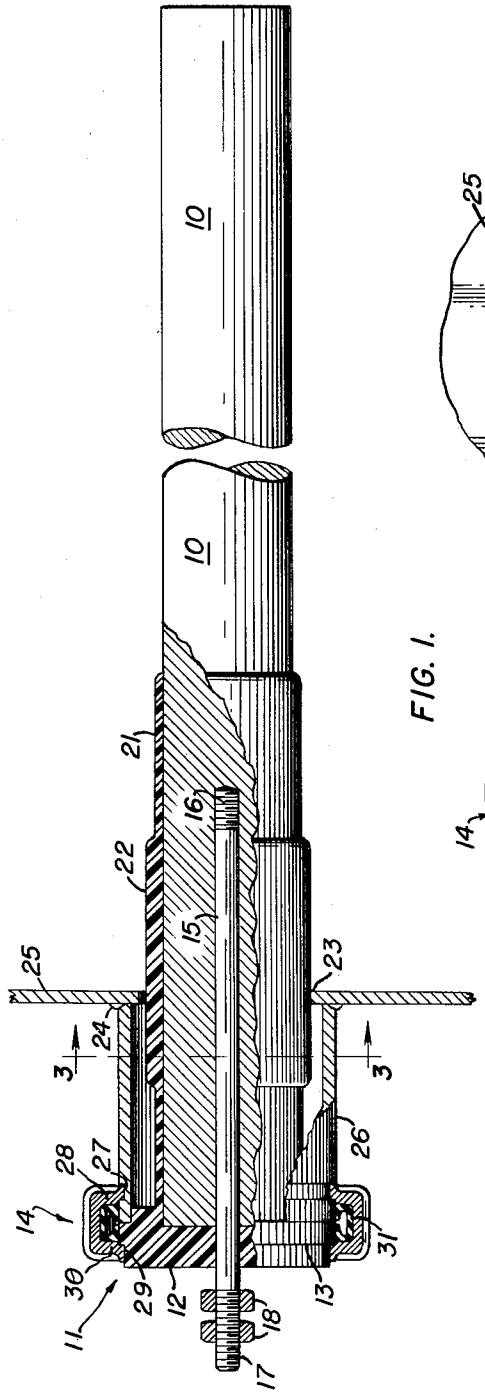


FIG. 1.

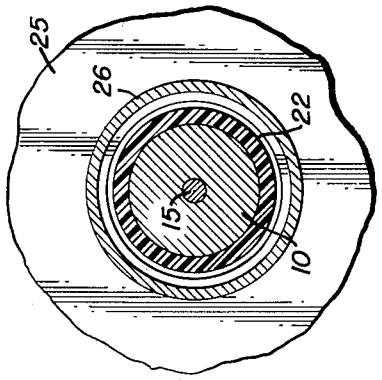


FIG. 3.

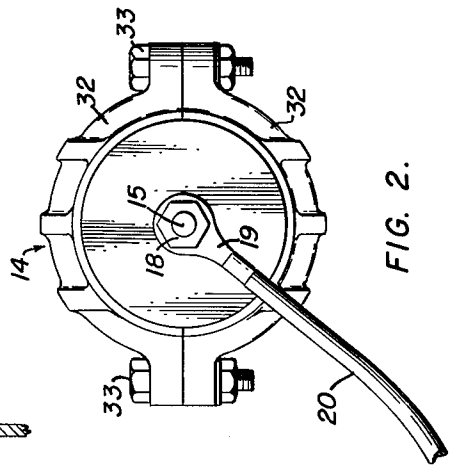


FIG. 2.

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ANODE ASSEMBLY FOR CATHODIC PROTECTION

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1 Claim. (Cl. 204—196)

This invention relates to corrosion control, and has reference to an improved insulating head for supporting an anode horizontally in a metal container such as an oil storage tank, oil emulsion heater treater, filter tank, or other vessel wherein the interior of the vessel is subject to corrosion by reason of galvanic action.

There are two types of cathodic protection systems to which the invention lends itself. One is the use of an external source of direct current which, when impressed on an anode of iron, Durion, aluminum, or graphite causes current to flow from the anode through the electrolyte to the metal surface to be protected. The other type of system operates in the same manner, but creates its own electromotive force by reason of the presence of different metals in contact with the electrolytic solution, that is, the metal surface to be protected and the metal anode in the electrolyte. For example, when the surface to be protected is steel, the anode may be magnesium or zinc.

An object of the invention is to provide an improved dielectric head for horizontally supporting an anode in a vessel for cathodic protection.

Another object is to provide a dielectric head for the described purpose which will eliminate the possibility of contact between the anode and the vessel.

Another object of the invention is to provide a head of the described class supported outwardly of the vessel and one which is conveniently installed and secured in place.

A particular object is to provide a dielectric head capable of being supported at a point intermediate its ends when horizontally positioned in the side of a vessel.

A further object of the invention is to provide a dielectric head for the described purpose which eliminates the use of washers, gaskets, or the like.

These and other objects of the invention will become apparent from the following description and the accompanying drawing wherein:

FIGURE 1 is a side elevation and broken sectional view of an anode assembly and installation in accordance with the invention.

FIGURE 2 is an end elevation of the invention as viewed from the outside of the tank where the anode is installed.

FIGURE 3 is a transverse sectional view taken on line 3—3 of FIGURE 1.

The form of the invention shown includes a relatively long, round anode **10** having a cylindrical insulating head **11** molded on one end thereof. The head **11** is of a suitable thermosetting plastic such as polyester or epoxy, and the closed end **12** of which is enlarged and flanged, as at **13**, for engagement by a circular clamp **14**, hereinafter described. An example of a suitable resin is described in Modern Plastics Encyclopaedia, September 1958, published by Breskin Publications, page 103, under the heading "A New Epoxy Molding Compound." An electrical contact **15** in the form of a rod extends inwardly through the head **11** and into the anode **10**. Thus, if the anode **10** is of a type wherein applied current is employed the contact **15** may extend only a short distance into the anode, but where the anode is of the self-generating type, it is preferred that the contact extend substantially into the anode, for example, half way of the length thereof, or may extend entirely through the anode if so

desired. Preferably, the anode **10** is cast directly on the contact **15** and threads **16** on the contact help secure the latter in place. The outer end of the contact **15** is also threaded, as is **17**, for receiving nuts **18** between which the terminal **19** of an electrical lead **20** is secured.

In the preferred form of the invention, the threads **17** on the extending end of the contact **15** are threaded outwardly of the head **11** and terminate before reaching the closed end **12** thereof. Integral with the closed end **12** of the head **11** there is a tubular receiver **21** which is molded on the corresponding end of the anode **10**. Intermediate the ends of the receiver **21** there is a shoulder **22**, also of thermosetting resin, for resting on the edge of an opening **23** in the vertical tank wall **25**. It is to be understood that in place of the tank wall **25** the opening **23** may be in a manway or the like, not shown.

Around the opening **23** there is a short, tubular extension or nipple **26** welded as at **24** to the outer surface of the tank **25**, and the outer end of which nipple includes a groove **27** for receiving the inner flange **28** of the circular clamp **14**. Similarly, there is a corresponding outer groove **29** in the flange **13** of the head **11** for receiving the outer flange **30** of said clamp. Between the flanges **28** and **30** of the clamp **14**, and around the connection between the head **11** and the outer end of the nipple **26**, there is an expansible gasket **31**. The clamp **14** is comprised of upper and lower halves **32**, as shown in FIGURE 2, and which halves are held together by bolts **33**.

In view of the foregoing description, it will be apparent that the anode **10** may be installed in and removed from the tank wall **25** by the simple expedient of opening the clamp **14** and inserting or removing the anode **10**. By reason of the location of the relatively long insulating receiver **21**, the anode is fully protected from the metal tank wall. Preferably, and as illustrated in FIGURE 1, the shoulder **22** of the receiver **21** is of a diameter slightly less than the tank wall opening **23**; thus, by reason of the at least slightly flexible construction of the head flange **13**, the weight of the anode **10** will cause the shoulder **22** to rest on the lower periphery of the opening **23** in the tank **25**.

It will also be apparent from the foregoing that since the closed end **12** and receiver **21** of the head **11** are directly molded on the anode, no washers, spacers or means drawing the head **11** against the anode **10** are required.

The invention is not limited to the exemplary construction herein shown and described, but may be made in various ways within the scope of the appended claim.

What is claimed is:

An anode assembly for cathodic protection in a metal vessel wherein a removable elongate anode is horizontally positioned in a hole in a wall of the vessel and extending inwardly thereof, said assembly comprising: an insulating head of dielectric synthetic resin material mounted directly on one end of said anode and including a closed end and an anode receiver of dielectric material integral therewith, said receiver extending through said hole, means tightly receiving one end of said anode in said receiver, the remaining end extending into said vessel and exposed therein, a nipple on the outer surface of said vessel around said hole and adapted to receive said receiver and anode, a circular clamp engaging said head on the outer end of said nipple, an electrical contact extending through the closed end of said head and into said anode, the diameter of said receiver being sufficiently large enough to rest on the bottom of said hole which comprises a support for said receiver inwardly of said head.

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