May 6, 1958 D. MIELKE 2,833,710

ELECTRODE ASSEMBLY

Filed Feb. 15, 1956

Fig. 1

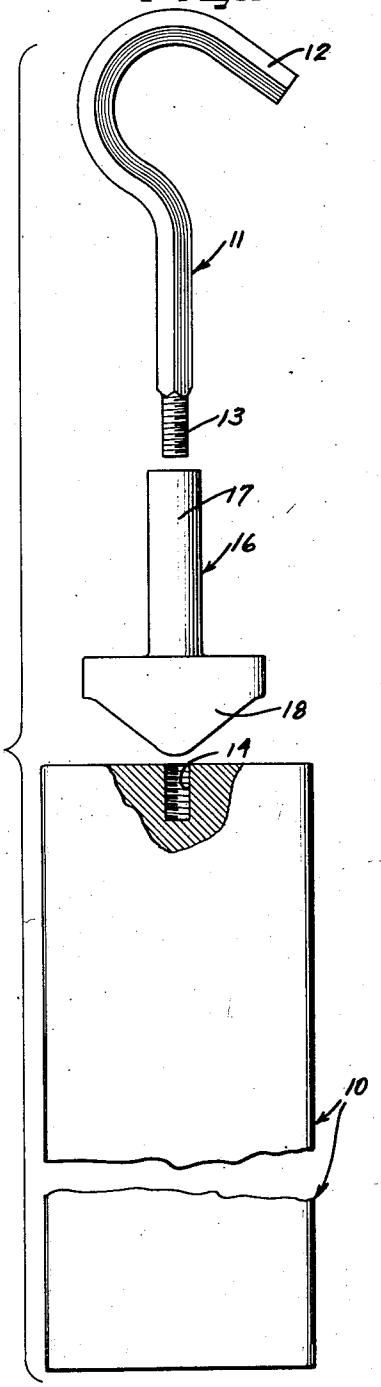


Fig. 2

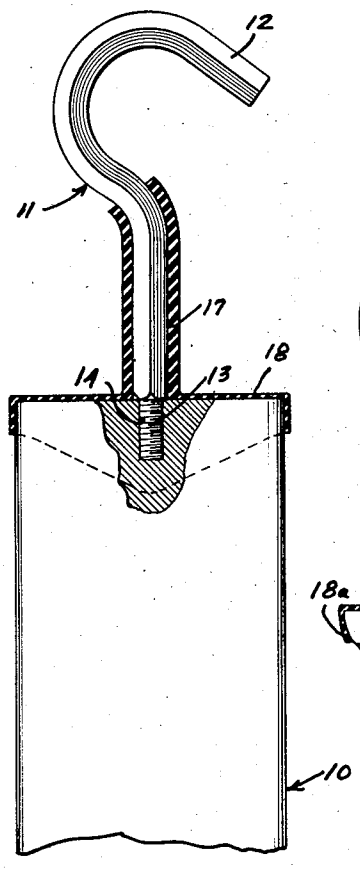
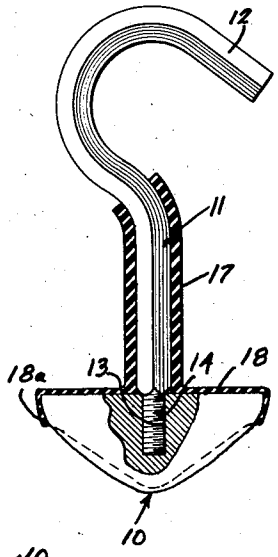


Fig. 3



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ELECTRODE ASSEMBLY

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1 Claim. (Cl. 204—286)

The present invention is concerned with improvements in electrode structures of the type employed in various electrochemical operations.

In a typical electrochemical reaction employing a depleteable electrode, the electrode is normally held suspended in the electrolyte by means of a hook which is detachably secured to the body of the electrode. The hook engages a bus bar and thereby provides electrical connection between the electrode and a suitable source of power.

As the electrode becomes depleted, either by the attack by the particular electrolyte involved, or by electrochemical reaction, there is a possibility of attacking the joint between the hook and the body of the electrode. In some instances, the formation of oxides at the joint renders it very difficult to remove the depleted electrode from the hook. In other cases, the attack may be so severe as to damage the metal of the hook, necessitating a replacement. Accordingly, it has been common practice to avoid any possibility of damaging the supporting structure by terminating the use of the electrode while there is still considerable metal in the electrode. This procedure, of course, is wasteful because it reduces the effective life of the electrode, and results in a larger waste of material.

Accordingly, an object of the present invention is to provide an improved electrode assembly with means for protecting the union between the electrode and its supporting structure.

Another object of the invention is to provide an electrode structure with a detachable hook assembly, and to protect the union between the two by means of an improved sealing member.

Another object of the invention is to provide a protector for electrodes which permits longer usage of the electrode structure and consequently less waste.

Other objects and features of the present invention will be apparent to those skilled in the art from the following description of the attached sheet of drawings which illustrate one embodiment of the invention.

In the drawings:

Figure 1 is an exploded view of the components of the electrode assembly;

Figure 2 is a fragmentary, cross-sectional view of the components after assembly; and

Figure 3 is a view similar to Figure 2 but illustrating the condition of the elements after considerable depletion of the electrode body.

As shown in the drawings:

In Figure 1, reference numeral **10** indicates generally an elongated metal electrode which is depleteable by the action of the electrolyte in which the electrode body

is arranged to be immersed. Supporting the electrode **10** is a support structure **11** which includes a hook portion **12** and a threaded shank portion **13**. The latter is arranged to be received in threaded engagement with an internally threaded socket **14** on the electrode **10**. To protect the union between the electrode **10** and the support structure **11**, the assembly is provided with an elastic protector **16** composed of rubber or rubber-like material which is resistant to the action of the electrolyte. The protector **16** has a generally tubular portion **17** arranged to engage tightly the threaded shank **13** on the support structure. The protector **16** also includes a highly elastic skirt portion **18** which, in its relaxed condition illustrated in Figure 1, has a periphery of substantially less than the periphery of the electrode **10** which it engages. As best seen in Figure 2, the skirt portion (which is defined by a laterally extending roof portion and a depending peripheral portion) **18** has a uniform wall thickness substantially less than the thickness of the wall of the tubular portion **17**, for added flexibility.

In assembling the electrode structure, the tubular portion **17** is slipped over the threaded shank portion **13** of the electrode, and the skirt portion **18** is stretched a sufficient amount to be received over the top of the electrode **10**, as illustrated in Figure 2. The skirt portion **18** is thus under considerable tension and thereby provides an effective seal of the electrode end and the junction between the electrode and the support structure **11** against the corrosive action of the electrolyte.

As the electrode becomes more and more depleted by the action of the electrolyte, the protector **16** prevents corrosive attack at the top of the electrode and the union between the electrode and the support structure. When the depletion of the electrode **10** has continued until the metal enclosed within the skirt portion **18** begins to be depleted, as illustrated in Figure 3 of the drawings, the natural resilience of the skirt portion **18** causes the skirt portion **18** to be drawn inwardly as indicated at numeral **18***a* and serves to protect much of the remainder of the electrode from further attack by the electrolyte. At this point, the electrode may be disengaged from the support structure **11** and a new electrode put in operation.

From the foregoing, it will be apparent that the electrode structure of the present invention provides a convenient means for preventing extensive depletion from the electrode structure, particularly at the union between the electrode and its supporting structure while still permitting the electrode to be used for longer periods of time than were heretofore considered practical.

It will also be evident that various modifications can be made to the described embodiment without departing from the scope of the present invention.

I claim as my invention:

An electrode structure comprising an elongated electrode body, a support hook detachably secured at one end of said body, an elastic sleeve tightly engaging a portion of said hook, said sleeve having a skirt portion defined by a laterally extending portion with a depending peripheral portion tightly engaging the upper end of said electrode, the wall thickness of the entire skirt portion being uniform and substantially less than the wall thickness of the remainder of said sleeve.

References Cited in the file of this patent

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