Dec. 4, 1956 R. W. GURRY 2,773,024

METHOD FOR ELECTROLYTICALLY POINTING WIRE

Filed April 8, 1954

FIG. 1.

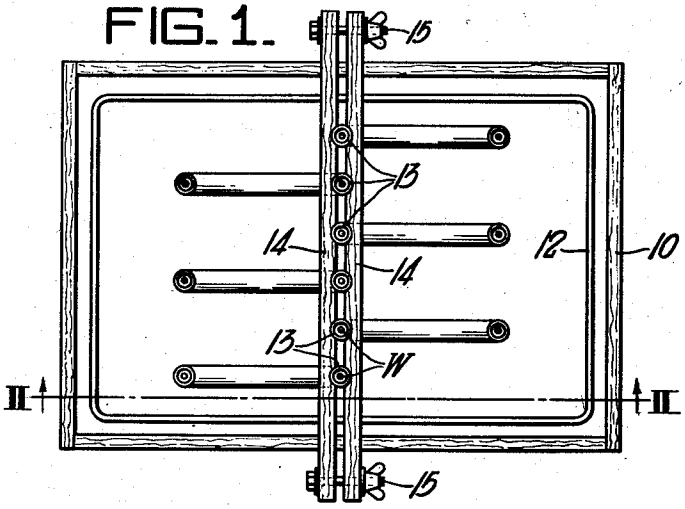


FIG. 2.

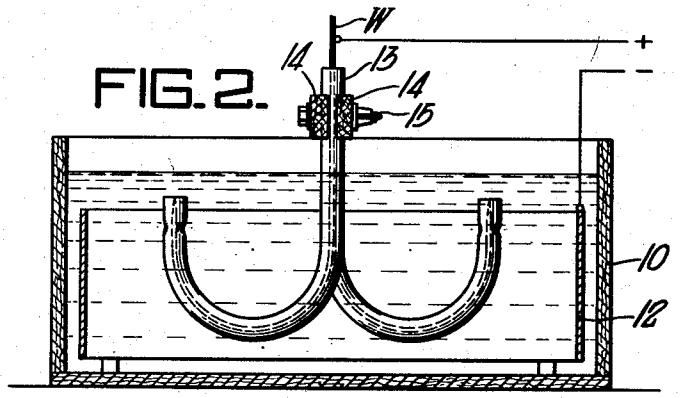


FIG. 3.

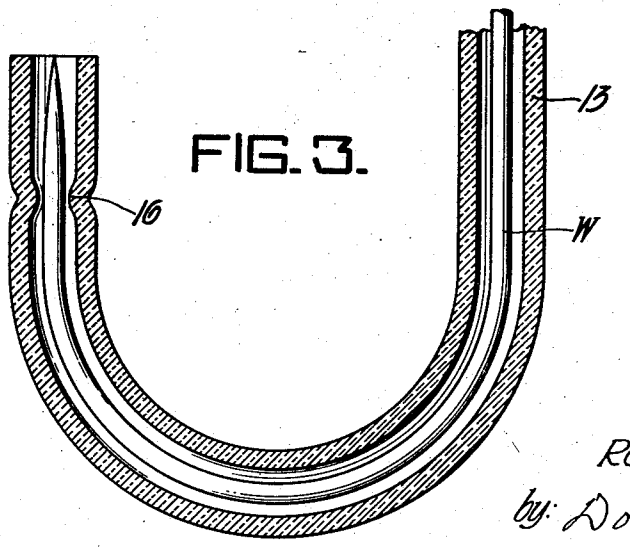
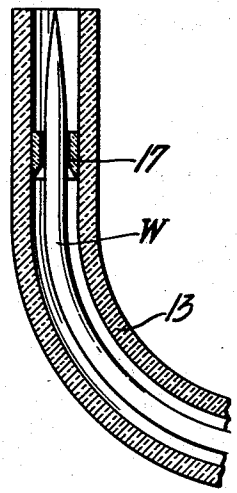


FIG. 4.



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METHOD FOR ELECTROLYTICALLY POINTING WIRE

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2 Claims. (Cl. 204—142)

This invention relates to apparatus and methods for forming points on the ends of wires.

An object of the invention is to provide an improved apparatus and method which are capable of forming a smooth sharp point by electrolytic means.

A further object is to provide an improved apparatus and method for pointing wires in which the taper of the point can be controlled accurately by regulating the current distribution along the length of the pointed portion.

A more specific object is to provide an improved electrolytic wire pointing apparatus which includes an impervious tube preferably of J-shape for housing the end of a wire within an electrolyte, said tube acting to diminish progressively the current reaching the wire away from its tip.

In accomplishing these and other objects of the invention, I have provided improved details of structure, preferred forms of which are shown in the accompanying drawing, in which:

Figure 1 is a top plan view of a wire pointing apparatus constructed in accordance with my invention;

Figure 2 is a vertical section on line II—II of Figure 1;

Figure 3 is a fragmentary vertical section on a larger scale of one of the J-shaped tubes; and

Figure 4 is a view similar to Figure 3, but showing a modification.

My apparatus comprises a vessel **10** which contains an electrolyte and a cathode **12**. Suitable electrolytes for the purpose are well known; consequently it is believed unnecessary to explain in detail those which can be used. One example of a suitable electrolyte consists of the following:

	Parts by volume
Sulfuric acid (sp. gr. 1.84)	34
Orthophosphoric acid (sp. gr. 1.69)	42
Water	24

Nevertheless those familiar with the electroplating art will recognize that many equivalents are possible. Preferably the cathode is a strip of copper gauze which forms a closed loop within the vessel.

In accordance with my invention, one or more J-shaped tubes **13** are supported in the vessel **10**. These tubes are of a rigid impervious material which is inert to the electrolyte, for example glass. Both ends of the tubes are open. They are supported with their two arms vertical and with their longer arms extending above the electrolyte and their shorter arms fully immersed therein all at the same level. The support means illustrated includes a pair of clamping bars **14**, which rest on the upper edges of the vessel walls, and thumb screws **15**, which hold the bars together with the tubes between them. Preferably successive tubes **13** extend in opposite directions from the bars **14**.

Wires W, for example of hard drawn high carbon steel or stainless steel, can be inserted in the tubes **13**, a different wire in each tube. The wires are pushed through the tubes from above and a sufficient length is left protruding above the longer arms to enable an electrical connection to be made thereon. The other ends of the wires terminate approximately even with the tops of the shorter arms of the tubes. Preferably the straight portions of these shorter arms contain means for centering a wire therein. This centering means can be either an integral constriction **16** within the tube bore (Figure 3), or else a separate insert **17** of material inert to the electrolyte (Figure 4).

The cathode **12** is connected to the negative terminal and the wires W to the positive terminal of a suitable source of direct current, for example a six volt storage battery. The current density does not appear critical. The configuration of the point can be controlled by selection of a tube having the proper bore diameter, and by adjusting the temperature of the electrolyte. The larger the diameter of the tube bore, the more gradual the taper of the point. For a wire diameter of 0.01 inch, a bore diameter of a little more than a millimeter is satisfactory to produce a smooth gradual taper. I prefer that the electrolyte temperature be within the range of 80° to 90° C. At these temperatures a sharp strong point is obtained regardless of the length of time the current is applied. Higher temperatures tend to produce a dull point, and lower temperatures an undesirable fine filament. The J-shaped tubes have the advantage that a thin protective layer of spent electrolyte adjacent the wires, being more dense than the remainder of the electrolyte, flows down over the wire away from the tip and protects the wire from electrolytic attack. This spent electrolyte acts in conjunction with the tube to diminish progressively the current which reaches the wire away from the tip.

While I have shown and described certain preferred embodiments of the invention, it is apparent that other modifications may arise. Therefore, I do not wish to be limited to the disclosure set forth but only by the scope of the appended claims.

I claim:

1. A method of forming a point on the end portion of a wire comprising housing the wire within an impervious open-ended tube which is inert to electrolytic action, immersing the tube and wire including the end of the latter in an electrolyte with the end portion of the wire and tube extending vertically upward and the tube housing the entire immersed portion of the wire allowing the electrolyte access to the wire only through the open end, and applying electric current to the wire as an anode and to a cathode surrounding the wire and tube.

2. A method of forming a point on the end portion of a wire comprising housing the wire in a J-shaped impervious open-ended tube which is inert to electrolytic action, the tip of the wire terminating approximately even with the shorter arm of the tube, immersing the tube and wire in an electrolyte with the shorter arm of the tube and the end portion of the wire extending vertically upward and the tube housing the entire immersed portion of the wire allowing the electrolyte access to the wire only through the open end, and applying electric current to the wire as an anode and to a cathode surrounding the wire and tube.

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