April 9, 1946. E. M. BUTLER 2,397,918

METHOD OF MAKING SELF-ENERGIZING ELECTROLYTIC WATER CORRECTION DEVICES

Filed Jan. 26, 1944

Fig. 1.

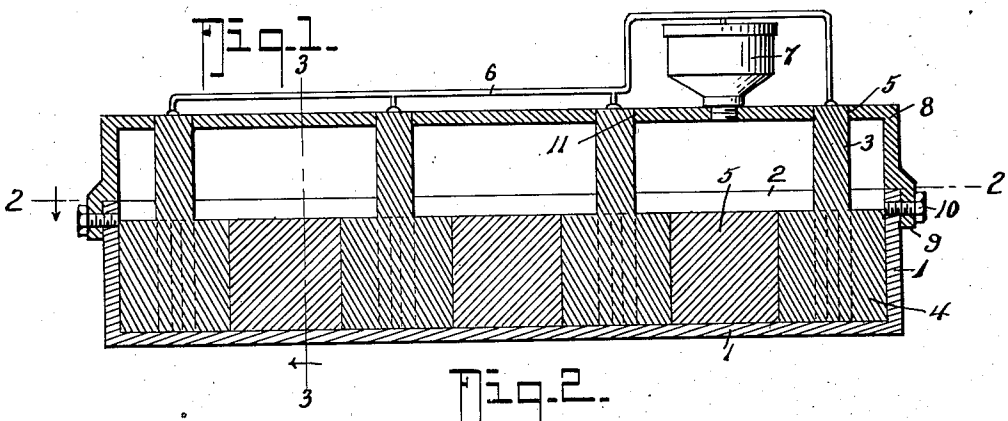



Fig. 2.

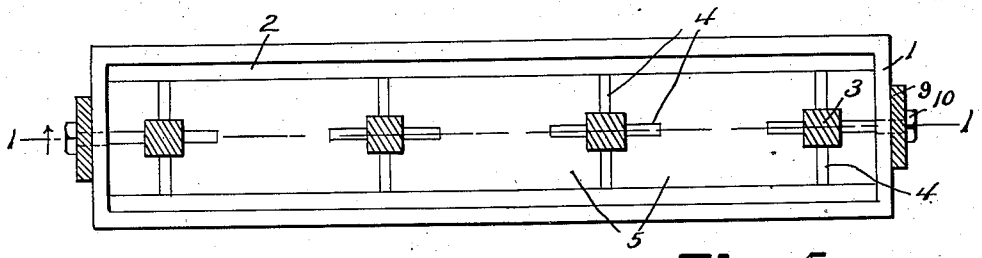



Fig. 3.

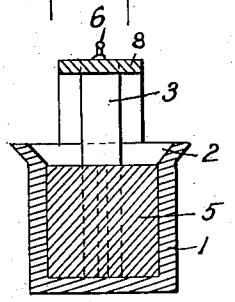



Fig. 5.

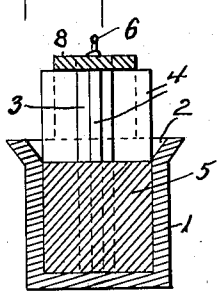



Fig. 4.

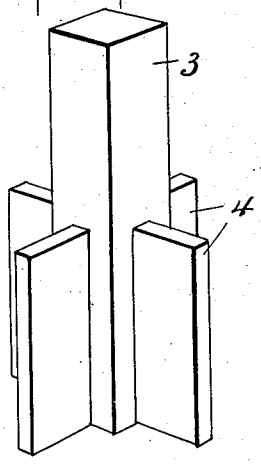
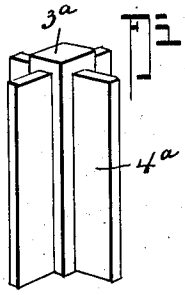



Fig. 6.




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Patented Apr. 9, 1946 2,397,918

# UNITED STATES PATENT OFFICE

2,397,918

## METHOD OF MAKING SELF-ENERGIZING ELECTROLYTIC WATER CORRECTION DEVICES

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Application January 26, 1944, Serial No. 519,815

5 Claims. (Cl. 29—148)

My invention relates to the art of water correction and it especially has for its object to provide a novel method of making a self-energizing water correction device.

In general, the method which comprises the subject-matter of the present invention resides in a new and novel method of preparing and assembling the component parts of the device.

Other objects will in part be obvious and in part be pointed out hereinafter.

To the attainment of the aforesaid objects and ends, the invention still further resides in the novel steps and detailed procedure all of which will be first fully described in the following detailed description and then be specifically pointed out in the appended claims, reference being had to the accompanying drawing, in which:

Fig. 1 is a central vertical longitudinal section of a water correction device made by my new method, the section being taken on the line 1—1 of Fig. 2.

Fig. 2 is a horizontal section on the line 2—2 of Fig. 1.

Fig. 3 is a cross section on the line 3—3 of Fig. 1.

Fig. 4 is a perspective view of one of the neutral electrode posts and wings.

Fig. 5 is a cross section similar to Fig. 3 but showing a modified form of the device.

Fig. 6 is a view similar to Fig. 4 but showing the electrode of Fig. 5.

In the drawing in which like numerals of reference indicate like parts in all the figures, 1 represents a trough-like body made of copper, by sand or die casting, and provided along its sides with offset portions 2 forming a collection space for the collection of decomposed zinc and salts.

Within the trough, at regular intervals, are located the neutral electrodes 3 having integral wings 4 at right angles to one another as best shown in Figs. 2 and 4. These electrodes 3, 4 are made of cast steel, and, in accordance with my process, are plated with an admixture of zinc, cobalt and manganese, in approximately the proportions of pure zinc 85 parts, cobalt 10 parts and manganese 5 parts. The wings 4 are of equal lengths and thicknesses and are set in the case part 1 of the device and so spaced apart that the distance between the most adjacent points of the wings of one electrode 3, 4 are equally spaced from any other electrode 3, 4, for example, as shown in Figs. 1 and 2.

In carrying out my method I provide a bridge member 8, having ears 9 to overlie the ends of the base 1 and be secured thereto by cap screws 10 or in any other suitable way. The bridge member has a set of equally spaced apertures 11 into which the upper ends of the electrode posts 3 are forced so as to make good electrical contact and hold the electrodes 3, 4 in proper position in the base trough while the zinc, which forms the negative element of the device, is being poured into the base trough around the post 3 and wings 4 thereby producing a continuous bar of zinc filling the trough of the base 1 and firmly embedding the wings 4. By pouring the molten zinc into the copper base 1 it will adhere to the walls of the base and to the surfaces of the wings 4 and thereby effect a perfect electrical as well as mechanical bond between the copper base and the zinc.

In the device constructed by my new method the posts or bars 3 are connected together by a suitably insulated connection 6 which is also connected to one terminal of a potential booster 7 of any approved construction, preferably a power pack giving from 3.8 to 6 volts; the other terminal of the booster is electrically connected to and removably secured to the bridge 8.

It should be remarked that the most efficient and effective device of the character described should have about 75% of the zinc in good electrical and mechanical contact with the copper and this is accomplished in the device shown in the accompanying drawing and described herein.

By plating the steel posts 3 and wings 4 with an alloy of zinc, cobalt and manganese I find that a more perfect bond is obtained between the copper case and the zinc electrode than has heretofore been found possible in the production of similar water correction devices and hence the internal resistance is correspondingly reduced.

If desired the wings may be approximately the full height of the posts, as shown in Figs. 5 and 6 (see $3^a$, $4^a$).

From the foregoing description taken in connection with the accompanying drawing it is thought that the method constituting my present invention and the advantages thereof will be clear to those skilled in the art to which it appertains, although I wish it understood that when I refer to zinc that word is not to be taken as a word of limitation but shall include any zinc alloy as may be adapted for use as the negative element, or any other suitable metal which is electronegative to copper.

What I claim is:

1. The method of producing a self-energizing electrolytic water correction device which comprises casting the positive element in the form of a mold, placing neutral electrodes in the mold, holding the said neutral electrodes spaced apart

within the mold, and pouring molten zinc into the mold to fill the mold to the desired depth and immerse the part or parts of the neutral electrodes which are within the mold.

2. The method of producing a self-energizing electrolytic water correction device which comprises casting a copper electrode in the form of a mold, taking a steel bar provided with wings and plating it with an admixture of zinc, cobalt and manganese and thereafter placing the bar with its wings in the mold, holding the bar in place and pouring molten zinc about the bar and its wings to fill the mold to the desired depth, thereby permanently uniting the bar, the wings, the zinc and the mold into a unitary structure.

3. The method of manufacturing self-energizing electrolytic water correction device, said method comprising: casting a copper electrode in the form of a trough to act as a mold, placing in the trough neutral electrodes, securing a bridge member to said mold with provision for holding said neutral electrodes properly spaced apart in the mold, and then placing molten zinc in the mold to embrace the portion or portions of the neutral electrodes located in the mold and become united thereto and to the mold, thus forming the negative electrode of the device and permanently uniting the neutral electrodes, the zinc and the mold into a unitary structure.

4. The method of manufacturing self-energizing electrolytic water correction device, said method comprising: casting a copper electrode in the form of a trough to act as a mold, placing in the trough neutral electrodes, securing a bridge member to said mold with provision for holding said neutral electrodes properly spaced apart in the mold, and then placing molten zinc in the mold to embrace the portion or portions of the neutral electrodes located in the mold and become united thereto and to the mold, thus forming the negative electrode of the device and permanently uniting the neutral electrodes, the zinc and the mold into a unitary structure, and mounting a power pack on said bridge member with one pole of the pack in electrical connection with the positive electrode and the other pole of the pack in electrical connection with each said neutral electrode to increase the electrolysis generated by the couple, when the device is immersed in water.

5. The method of producing an electronic water correction device which comprises casting the positive element in the form of a mold, placing at least one neutral electrode in the mold, holding the said neutral electrode in position in the mold and pouring molten zinc into the mold to fill the mold with the desired volume and immerse that part of the neutral electrode which is within the mold and effect an adhesion between the zinc, the neutral electrode and the mold and permanently uniting the neutral electrode, the zinc and the mold into a unitary structure, and mounting a power pack on said mold with one of its terminals in electrical connection with the mold and the other of its terminals in contact with the said neutral electrode in a manner so as to increase the electrolysis generated by the positive-negative couple when the device is immersed in water.

EDGAR M. BUTLER.