Feb. 6, 1951 E. M. BUTLER 2,540,074

ELECTROLYTIC WATER CORRECTION DEVICE

Filed March 22, 1946

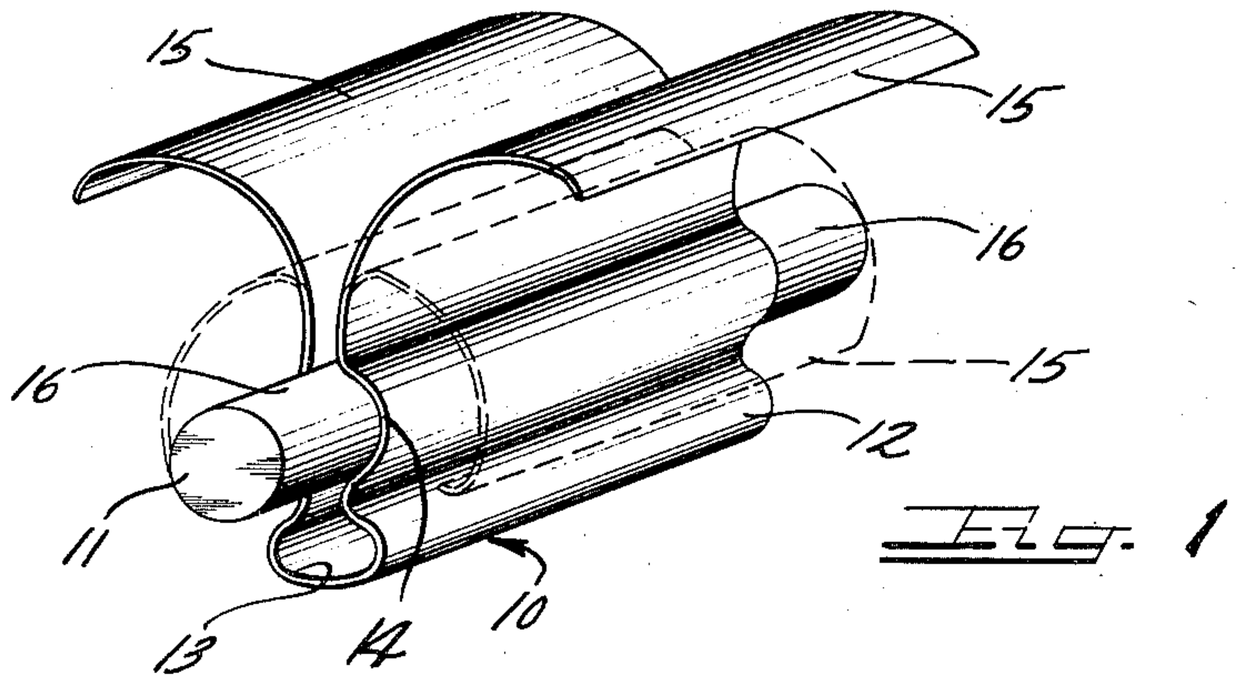

Fig. 1

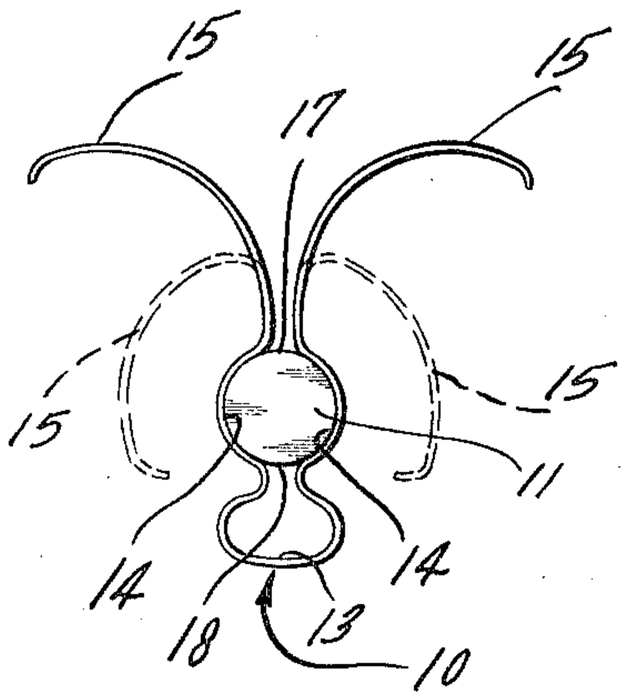

Fig. 2

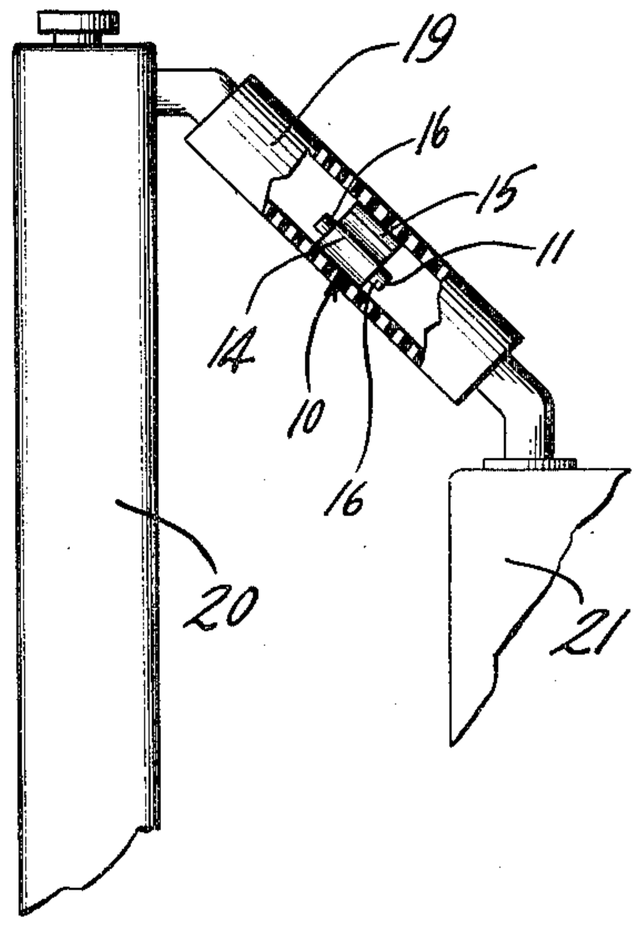

Fig. 3

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ELECTROLYTIC WATER CORRECTION DEVICE

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9 Claims. (Cl. 204—248)

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This invention relates to an electrolytic water correction device, and more particularly to a device so arranged and constructed as to be capable of being mounted and supported in conduits of varying sizes, such as the conduits forming a part of the water circulatory system of internal combustion engines, and the like.

In accordance with my present invention, I provide an electrolytic water correction device comprising a negative element, such as zinc, or the like, in the form of a bar or cartridge, and a removable resilient sheath of a positive element, such as copper or a silver-plated foundation metal, adapted to be clipped upon the negative bar and held thereon by virtue of its own resiliency. The resilient sheath is provided with integral laterally extending curved wing portions that serve to support and mount the device within a conduit or other passageway by resilient, frictional engagement with the walls of such passageways. Due to the resiliency of the wing portions, said portions can be deflected to adjust themselves to passageways of varying diameters. The sheath of the positive element substantially encloses the negative element but leaves sufficient surface areas of the negative element exposed for the electrolytic attack of the water in which the device is immersed.

It is therefore an important object of this invention to provide an electrolytic water correction device having a resilient sheath formed with deflectable arcuate wing portions for accommodating the device to different sizes of conduits in which the device may be mounted in position.

It is a further important object of this invention to provide an electrolytic water correction device in which the positive element is in the form of a removable, resilient sheath, or clip, that may be mounted upon the negative element and retained thereon by virtue of its own resiliency.

Other and further important objects of this invention will be apparent from the disclosures in the specification and on the accompanying drawings.

On the drawings:

Figure 1 is a prospective view of an electrolytic water correction device embodying the principles of my present invention.

Figure 2 is an end elevational view, with parts in dotted line showing the deflection of the wing portion to accommodate a particular size of conduit.

Figure 3 is a fragmentary view of a part of a radiator circulatory system of an internal combustion engine, partly broken away and in section, illustrating the positioning of my electrolytic water correction device and the hose connection from the radiator to the jacket of the engine.

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As illustrated in the drawings, the electrolytic water correction device indicated generally by the reference numeral 10 comprises a core 11 of a negative element, such as zinc, or the like, which may be in the form of a cylindrical bar, or cartridge, or may be polygonal in cross section. Said core 11 is encased in the sheath 12 formed of a positive element, such as copper, brass, or the like, or of any suitable foundation metal plated with copper, silver or other positive metal. Other metals and alloys that may be used for the negative and positive elements are suggested in my issued Patents Nos. 2,321,796; 2,321,797; 2,337,151 and 2,348,882.

The sheath 12 is formed of originally flat, relatively thin, resilient sheet metal which has been bent into the form of a clip having a closed loop portion 13, an intermediate segmental cylindrical portion 14 and outwardly and laterally curved end portions 15, 15. The segmental cylindrical portions 14, 14 resiliently engage the cartridge 11 to frictionally retain the clip-like sheath 12 in place on said cartridge. Portions of the cartridge 11 are left uncovered by the sheath 12, such as the end portions 16, 16 and the longitudinally extending surface portions 17 and 18.

Owing to the inherent resiliency of the sheet metal of which the wing-like portions 15, 15 are formed, said portions may be readily deflected, as shown in dotted lines in Figure 2, to accommodate the device to various diameters of conduits in which the device may be positioned. As shown in Figure 3, one of the devices 10 may be positioned in the hose connection, indicated at 19, leading from the radiator 20 to the water jacket of an internal combustion engine 21. The wing portions 15, 15 will initially define a diameter larger than that of the hose connection 19, but may be deflected inwardly to permit the device 10 to be inserted in said hose connection. Thereafter, the wing portions 15, 15 resiliently and frictionally engage the inner wall of the hose connection to hold the device 10 in position therein. It will be understood, of course, that the device 10 may be positioned in some other part of the water circulatory system.

The electrolytic water correction device described herein, when submerged in the heated water of a water circulatory system, such as that of an internal combustion engine cooling system, functions to reduce the formation of hard

scale and the deposition of such scale upon the surfaces of the cooling jacket. Due to the electrolytic action set up between the positive and negative elements, dissolution of the negative element into the water takes place. In the case of zinc as the negative element, zinc ions are caused to go into solution as a result of the electrolytic action, with the consequent formation of zinc oxide or zinc hydroxide. The presence of the zinc oxide or zinc hydroxide causes the formation of a sludge with the scale forming minerals present in the water, rather than the formation of a hard scale. This sludge can easily be flushed out of the system. The result is that a better heat transfer efficiency is maintained between the engine and the water circulatory system.

The term "positive" as used herein designates metals positioned below hydrogen in the electromotive force series of metals. The term "negative" as used herein designates metals positioned above hydrogen in the electromotive force series of metals.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

What I claim is:

1. An electrolytic water correction device comprising a core composed of negative metal of the electromotive force series, a sheath of a positive metal of the electromotive force series partially enclosing said negative core, said sheath being formed of resilient sheet-like material for frictional mounting upon said negative core and having wing-like portions that are resiliently deflectable for accommodating the device to passageways of varying diameters.

2. An electrolytic water correction device comprising a bar of a negative metal of the electromotive force series, and a sheath of a positive metal of the electromotive force series resiliently clipped upon and partially enclosing said bar and having wing-like portions extending therefrom.

3. An electrolytic water correction device comprising a cylindrical bar of a negative metal of the electromotive force series, and a clip-like sheath of a positive metal of the electromotive force series having semi-cylindrical intermediate portions frictionally engaging said bar and deflectable wing-like portions extending therefrom.

4. An electrolytic water correction device comprising a bar of a negative metal of the electromotive force series and a clip-like sheath of a positive metal of the electromotive force series enclosing a substantial surface area of said bar while providing exposed surface areas of said bar, said sheath having arcuate shaped wing portions that are resiliently deflectable to accommodate the device to conduits of various diameters.

5. An electrolytic water correction device comprising a bar of a negative metal of the electromotive force series and a sheath of a positive metal of the electromotive force series enclosing a substantial portion of said bar and forming with said bar water passages extending the length of said sheath, said sheath having bowed wing-like portions extending laterally from said bar and inwardly collapsible to accommodate the device to the particular size of passageway in which the device may be mounted.

6. An electrolytic water correction device comprising a bar of a negative metal of the electromotive force series, and a sheath of a positive metal of the electromotive force series enclosing said bar with a resilient, frictional engagement, said sheath having a closed loop portion lying on one side of said bar and bowed wing-like resilient portions lying on the opposite side of said bar, said wing-like portions being deflectable to accommodate the device for mounting in passageways of various diameters.

7. An electrolytic water correction device comprising a bar of a negative metal of the electromotive force series, a clip-like sheath of positive metal of the electromotive force series partially enclosing said bar and in resilient frictional engagement therewith, said sheath including wing-like portions that are sufficiently flexible to enable the device to be mounted in passageways of various diameters.

8. An electrolytic water correction device comprising a bar of negative metal of the electromotive force series and a sheath of a positive metal of the electromotive force series, said sheath having intermediate portions resiliently and frictionally engaging said bar and having a closed loop portion and bowed wing-like portions for cooperation in the mounting of said device in a conduit by frictional engagement of the walls of said conduit.

9. An electrolytic water correction device comprising a core of negative metal of the electromotive force series, a sheath formed entirely of a single unitary sheet of resilient positive metal of the electromotive force series and having a general U-shape, said positive sheath partially enclosing said negative core for frictional mounting upon said negative core, the ends of said sheath providing wing-like portions that are resiliently deflectable for accommodating said device to passageways of varying diameters, the intermediate portions of said sheath being resiliently deflectable for receiving said negative cores.

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