

$$V = IR$$

$$\frac{V}{I} \cdot R = \frac{12}{2} = 6 \text{ ohms}$$

A Simple Method of ANODISING ALUMINIUM

By K. D. Rendall

ANODISING is a process that can be carried out by the average home constructor for an initial outlay of about 15s. and, as the chemicals can be used again and again, the cost is even cheaper than painting and there is the advantage that one can carry on work as soon as it is finished and not have to wait for paint to dry.

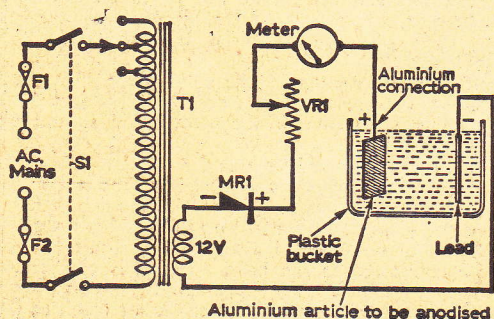


Fig. 1—The apparatus needed in the operation.

Chemicals

The only equipment needed is a couple of containers for the chemicals and plenty of clean water. The author used a plastic bucket for all processing and put the chemicals in bottles as soon as he had finished each stage of the process.

The first and most important rule to observe is absolute cleanliness, or the final product will be smeary and the colour uneven, so at all times keep the article to be anodised as clean as possible. First clean the article by brushing it all over with steel wool so that there is an even matt finish all over the surface. Care spent in ensuring that all parts of the surface are clean will be repaid in the appearance of the finished product.

The cleaned article is next placed in a strong solution of ordinary caustic soda; this is not a critical operation and as long as the mixture is strong enough to etch the metal then it is strong enough. The article is left in this solution for about a quarter of an hour and then it is removed, thoroughly rinsed and placed to one side. It is not advisable to touch it after this operation as greasy finger marks can be caused. Great care must be taken that the caustic soda does not

COMPONENTS LIST

- T1** Transformer—tapped mains primary, 12V 8A secondary (or lower current rating if desired—see text)
- S1** Double pole mains on/off switch
- F1, F2** Mains fuses—2A
- MR1** Rectifier—12V A.C. input to give 8A D.C. (or to suit transformer current rating)
- VR1** about 2Ω 10W—may be several W.W. resistors in series—tapped where required.

splash into the eyes or on to the skin. If this does happen, then rinse it off with plenty of cold water as soon as possible. A preparation of dilute sulphuric acid diluted in the following proportions will then be needed: to one part of acid add seven parts by volume of water. Always add the acid to the water, not the water to the acid or the liquid will become very hot and may splash violently. This dilute acid is then placed on one side and allowed to cool.

A D.C. supply of 12V is needed in order to form the layer of oxide that will accept the dye to give the anodised finish. This layer is formed by electrolysis and the theory of this will not be given as public libraries have many books on the chemical theory. The D.C. supply must be capable of providing 8A or thereabouts. If this is not possible, then the times given by the author must be extended to suit the individual needs of the constructor. The circuit of a suitable supply is given in Fig. 1.

The acid is placed in a plastic bucket and the aluminium article to be anodised placed in it with a connection made with a piece of aluminium. The reason that this metal is specified for the connection is that a piece of copper or steel will be attacked and cause the aluminium article to take on a colour that is not wanted. A small piece of lead is used for the negative connection and the article is connected to the positive lead and the current adjusted to between 6 and 7A. Current is passed for about 15 minutes or longer if a current lower than 6 to 7A is used.

Dyeing

The next stage is the actual dyeing of the metal in the colour that you prefer. The dye used is a domestic dye that is known as "Drummer" the contents of which are dissolved in half a gallon of water that is just below the boiling point to which a spoonful of acetic acid (vinegar) has been added. This assists in the fixing of the dye and helps to render it stable and stop it being bleached out by sunlight. Into this mixture the article is placed and left to soak for about half an hour. It is then taken out and washed. Then it is left in a solution of copper sulphate. The strength of this solution is 2% of copper sulphate in water (by weight). The anodised article is left in this solution for about ten minutes and then washed.

The chemicals can be used again and again until they become discoloured and the dye begins to lose its strength and does not dye to the same strength as before. The anodised article may be bent and drilled, but this is best left to the final operation so that it does not become scratched. Note that the oxide layer must be scratched away before an electrical connection can be obtained to the metal underneath.