



Federation of Model Engineering Societies

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Propellor, Anchors

This document was written by Paul Naylor and is published here for FMES online viewing, and was written during 2025.

Sundowner – 9

Whilst waiting for the gears I ordered, without which I cannot glue the deck down (!), I thought I would make something else that I had some trepidations about: the propeller.

Yes, I know you can buy nice ones, even up to the size I wanted, but they are quite expensive and I thought I would have a go at making one. However, just to be on the safe side, I gave up all ideas of making the prop fit on the shaft with a taper and nut, as this is not 'universal' so decided to adopt a standard fitting (M4 RH thread) for when (if?) mine proves to be no good.

Sundowner seems to have had a few props judging by a few photos of different vintages I have seen: I decided on a 3 bladed 'vintage style' prop with large-ish blades that scaled at around 75mm diameter (not the 60mm I thought first, making a motor gearbox more necessary). Brass seemed the obvious choice, but I did not have any 2mm thick or thereabouts to make blades. I did, however, have some 2mm stainless steel, and also 12mm diameter stainless for the hub. This was a chance to do a bit more TIG welding (I have recently acquired a TIG attachment for my inverter welder and need practice), although perhaps a prop is not, in hindsight, an ideal practice subject.



I cut out the blades from a cardboard template I made from a photo, and a functional hub in the lathe. How to cut the slots necessary to locate the blades while welding? I was too impatient to set up an angled rotary table (I mean improvise it really) and use a slitting saw. I thought I could simply mark out where the slots should go then using a hacksaw and a needle file get



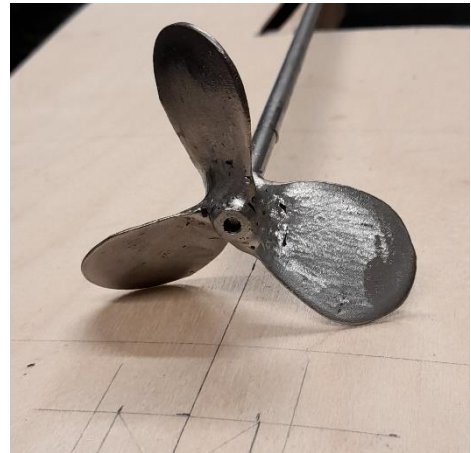
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them right. The results of this bit of the work can be seen in the photos. I made up a simple jig using engineers clamps to hold each blade in position whilst I welded them up. Now at this stage, I am not going to show you the photos! After I reminded myself on the best settings for the welder and trying to avoid melting the blade edges away (and building them up when I did), I ended up with three blades attached to a lump of hub with much weld attached. Stainless steel is strong stuff and filing this away to make something that looked reasonably like a prop was not a five-minute job. My little Dremel type mini-drill with burs and grind stones helped, but it was mainly filing...

The result looked like a prop (that 6 feet rule I adopted remember), but did it work like a prop? I mounted it onto a threaded shaft and put it down on two parallel metal bars: did it move? Of course it did, so I marked the lowest blade and ground a little off and tried again. After grinding quite a lot off the

same two blades with no perceptible change, it dawned on me that if the blades were not at 120-degree intervals it would never balance without 'significant loss of blade'. Measuring it up carefully, I realised that the spacings were more like 130-130-100. Bending one blade a little (it had got a little distorted) helped a little but not to an unambiguous balance. The next step was to see exactly what sort of vibration I got, so I put it into my electric hand drill and tried some speeds. Although there was some vibration, it was not at all ridiculous and well within the ability of my shaft bearings to manage, and trying it in a sink full of water showed it provided some satisfactory water movement, so I will take it to the next step and use it until it proves, in anger, to be no good. If it is no good, it will make an ideal paint stirrer! The photo shows it as finished as I intend to make it. It is all stainless steel and has a finish that shows grinding marks like real ones as well as some imperfections caused by my welding...they are not cracks, just depressions where I did not want to grind away too much metal, or build up any more weld. It is not as bad as it looks in the photo! I can no doubt refine the shape and peripheral angle of the blades in due course if necessary.



At the time of writing, I was still waiting for the gears, and so I occupied myself with making some anchors(!). These are made from brass sheet and bar and were soldered up in a planned order, with silver solder being used here and there to fix all of the brass bits together so it did not all fall apart



when I ran soft solder into all the joints. The photos show a half way rough looking stage, and fully soldered stage but not yet filed and then the finished items after painting...anchors are not usually this colour in practice, being rusty and barnacle encrusted, but



that is the colour in the photos of the prototype I am following! They have ended up quite large and although they probably are a *little* large, the photo makes them look huge and I need to check these! They are not fastened to the boat: using a 'wedge' fit for the photo and will use an anchor chain when completed.

