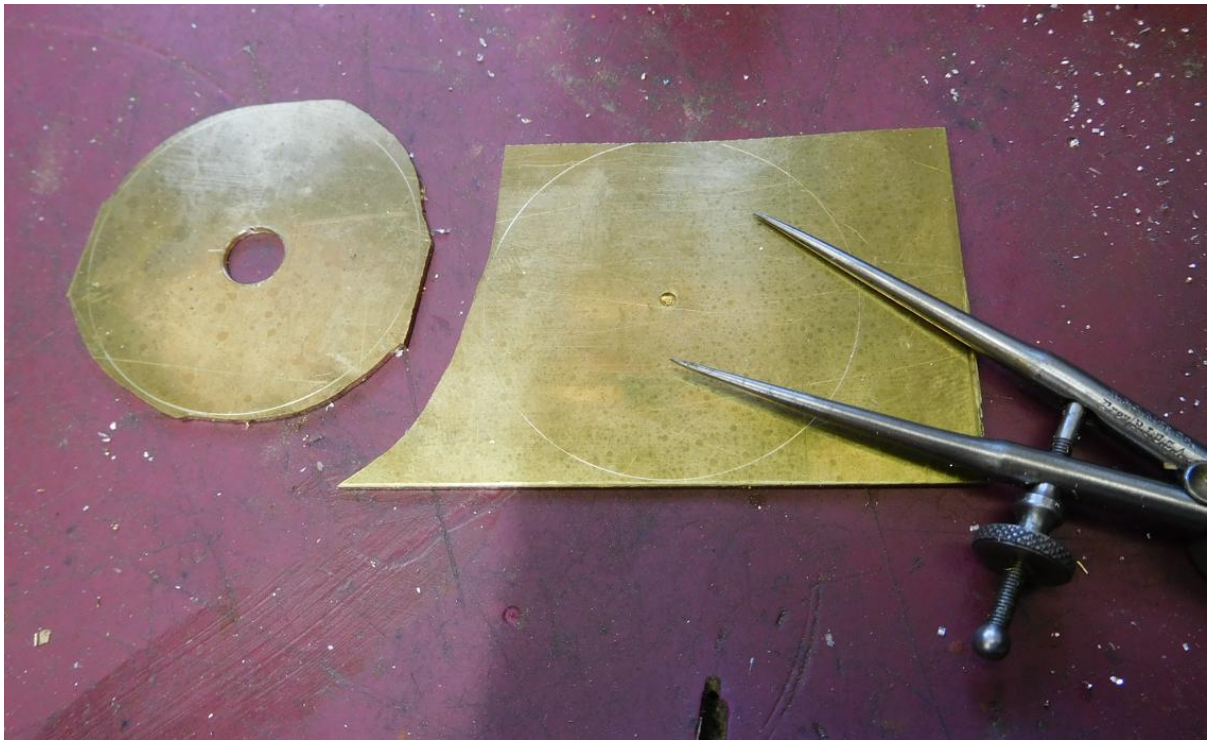
Ashey's Spectacle Glasses, September (just!) 2021

Latest bits for the O2 are the spectacle glasses. Two brass rings, one with a rebate, trap the glass. I've already told the story of the glass-making... Here's the general idea; the 14BA screws that hold it together aren't shown.

So do I make them out of a piece of brass bar, or cut them from sheet? Sheet won as it was much less wasteful of brass. Beside, Hoapit Works was a bit short of 1¾" dia brass bar... I marked out a circle on some 1,2mm brass sheet and cut eight of them roughly to shape on my bandsaw...

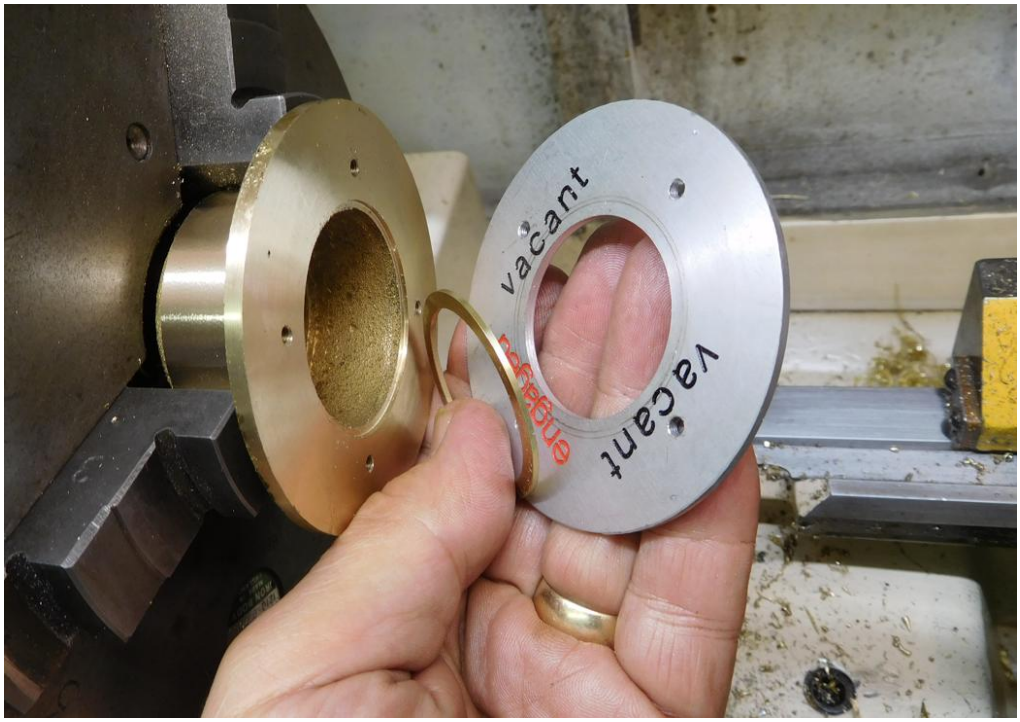


I used a step drill to form an 8mm hole in the middle of each one...

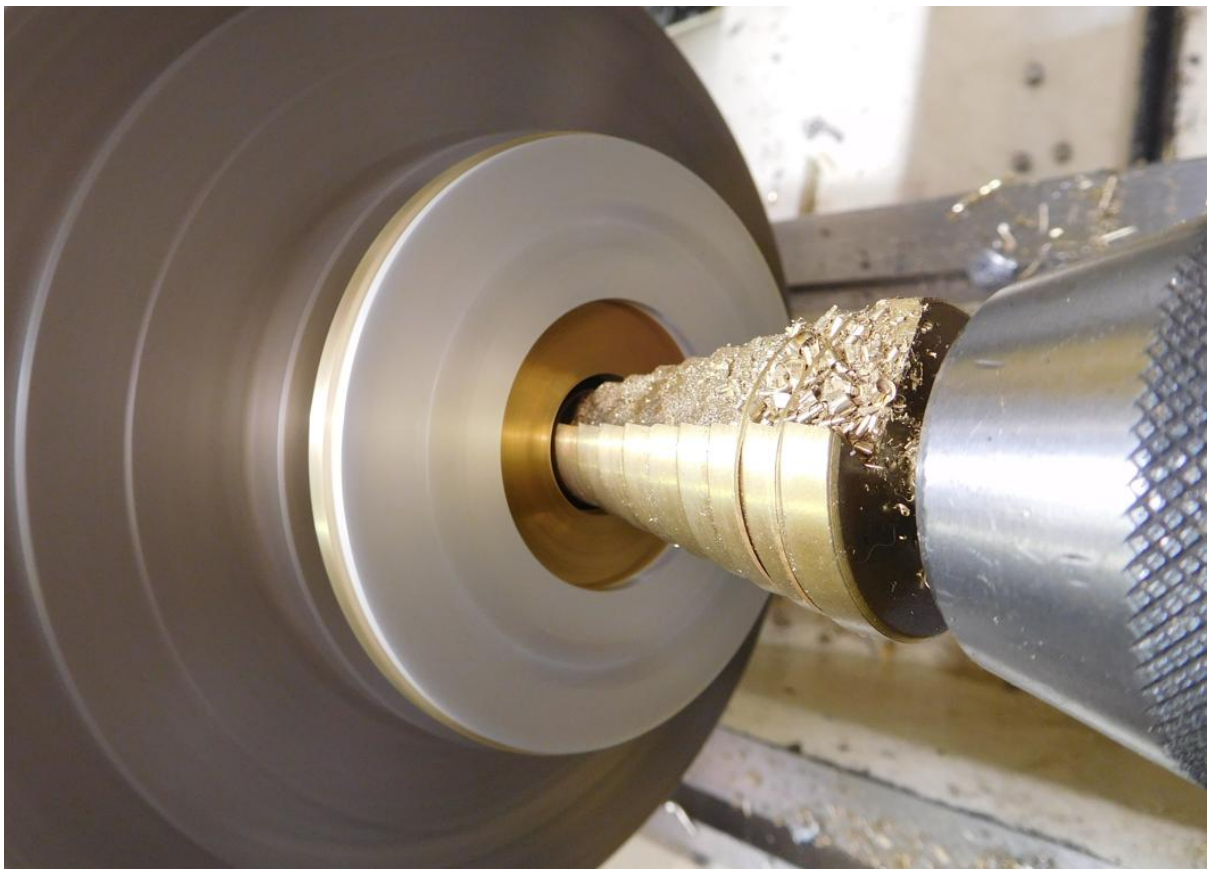
...and I mounted them all on a piece of 8mm studding, held together with nuts to turn the OD, taking it very gently as it wasn't the finest example of precision engineering I've done. Here's one I had to make later, following a Disaster... I should have made some spare blanks from the word go, which is a procedure guaranteed to ensure that no errors are made and you end up with some spare blanks. You can't win!

Next step was to make a turning fixture. You haven't a hope in hell of holding 1,2mm thick brass sheet of these dimensions in a chuck because if you tighten the chuck sufficiently to stop the job flying off somewhere when the tool hits it, you distort the job and it ends up looking like an Austin Allegro steering wheel rim... Remember those?

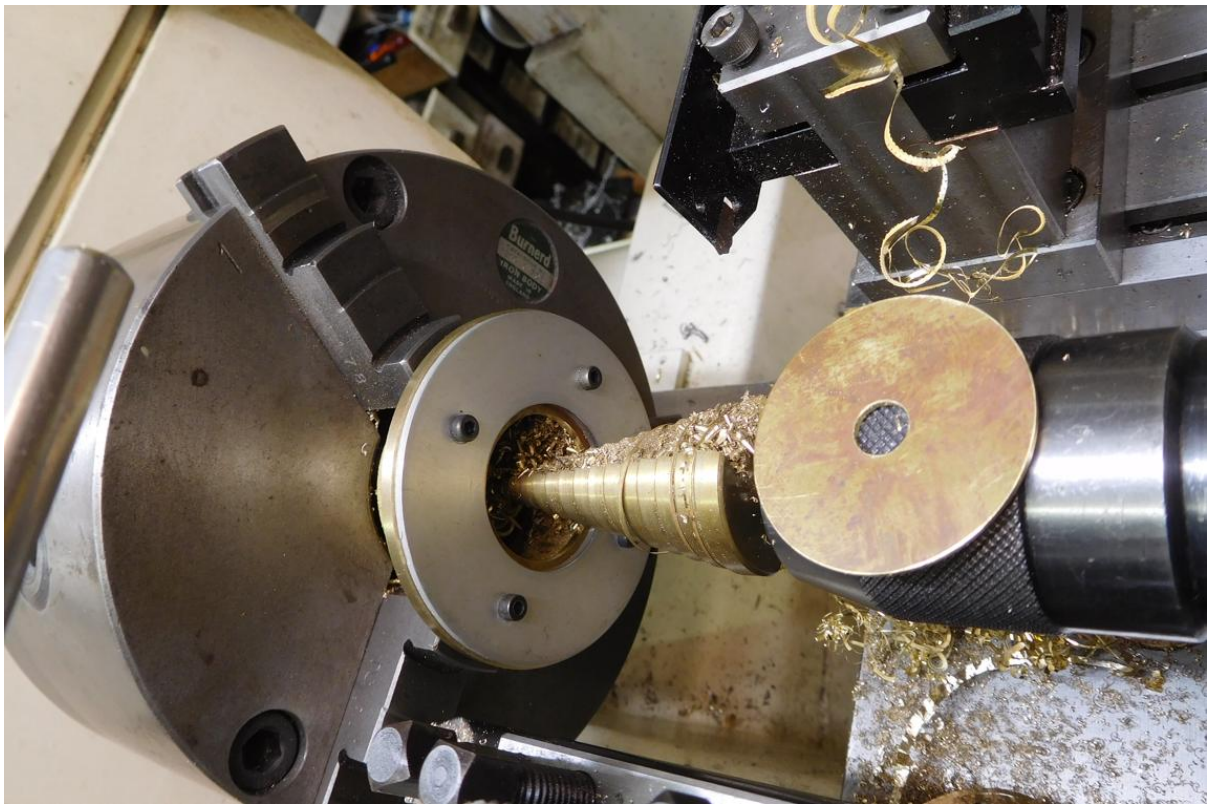
The former role of the aluminium clamping plate is clear to see; the brass bit was a faulty casting from work. The OD of the rings had been carefully done so that they fitted the fixture accurately to ensure even wall thickness and concentricity.



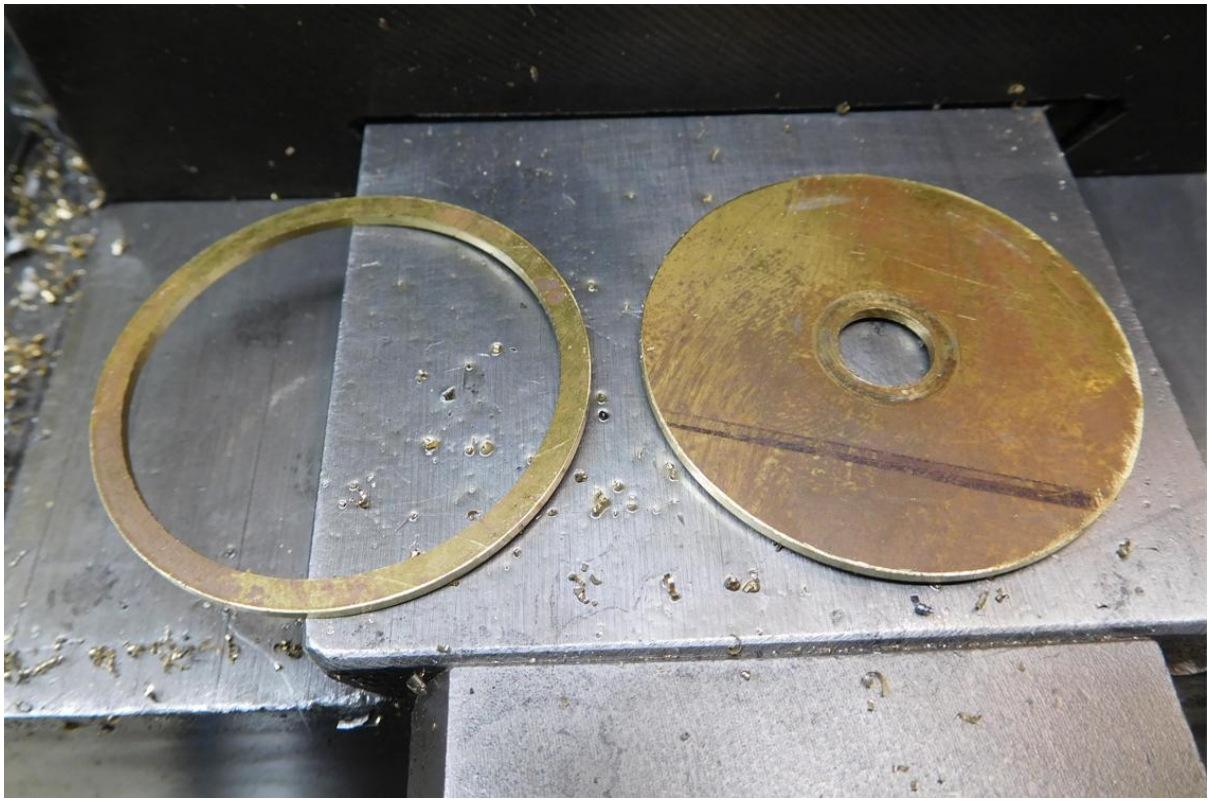
The job was held securely in the small rebate in the brass casting, and a step drill used to hog out most of the inside. I think it was one I got from Lidl or somewhere... it goes up to 32mm, and I went all the way.



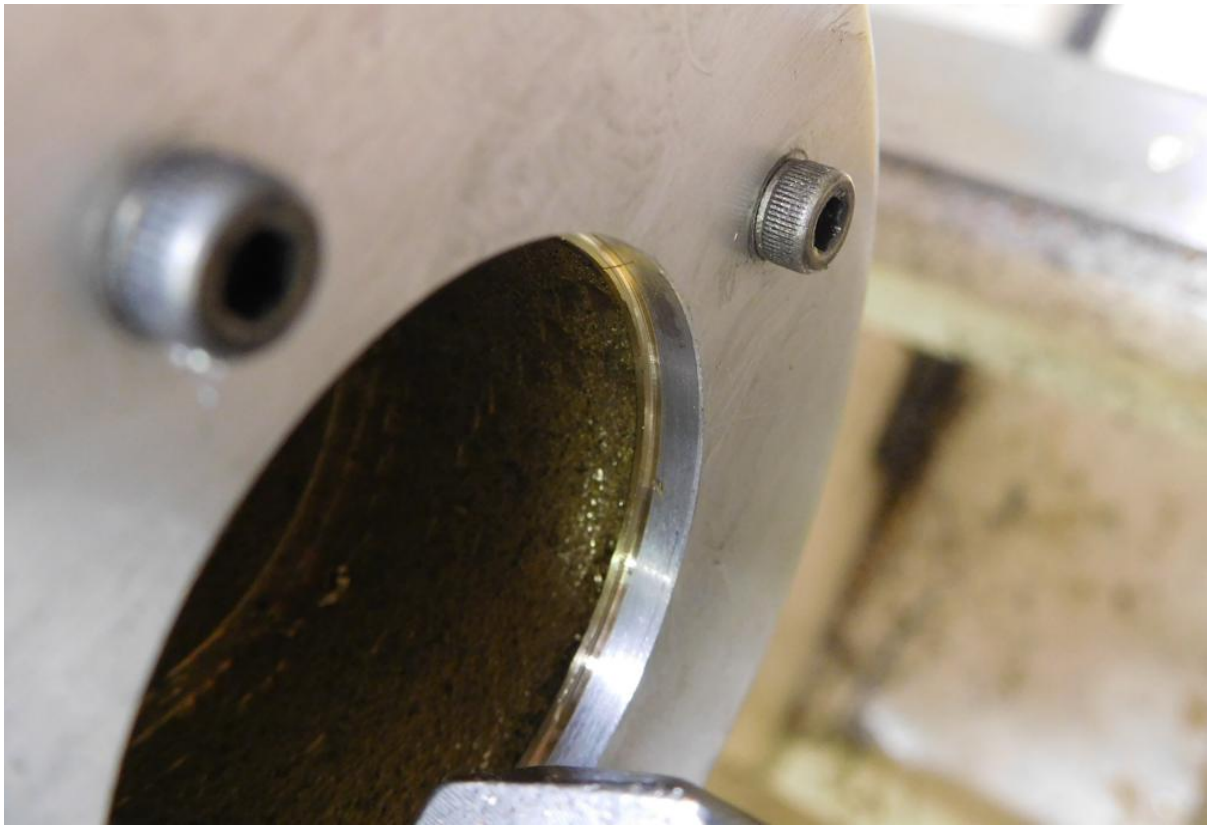
One step-drilled out, and the next one waiting. At the same setting I bored out the middle to 34mm as accurately as I could with a boring tool. (Yawn...)



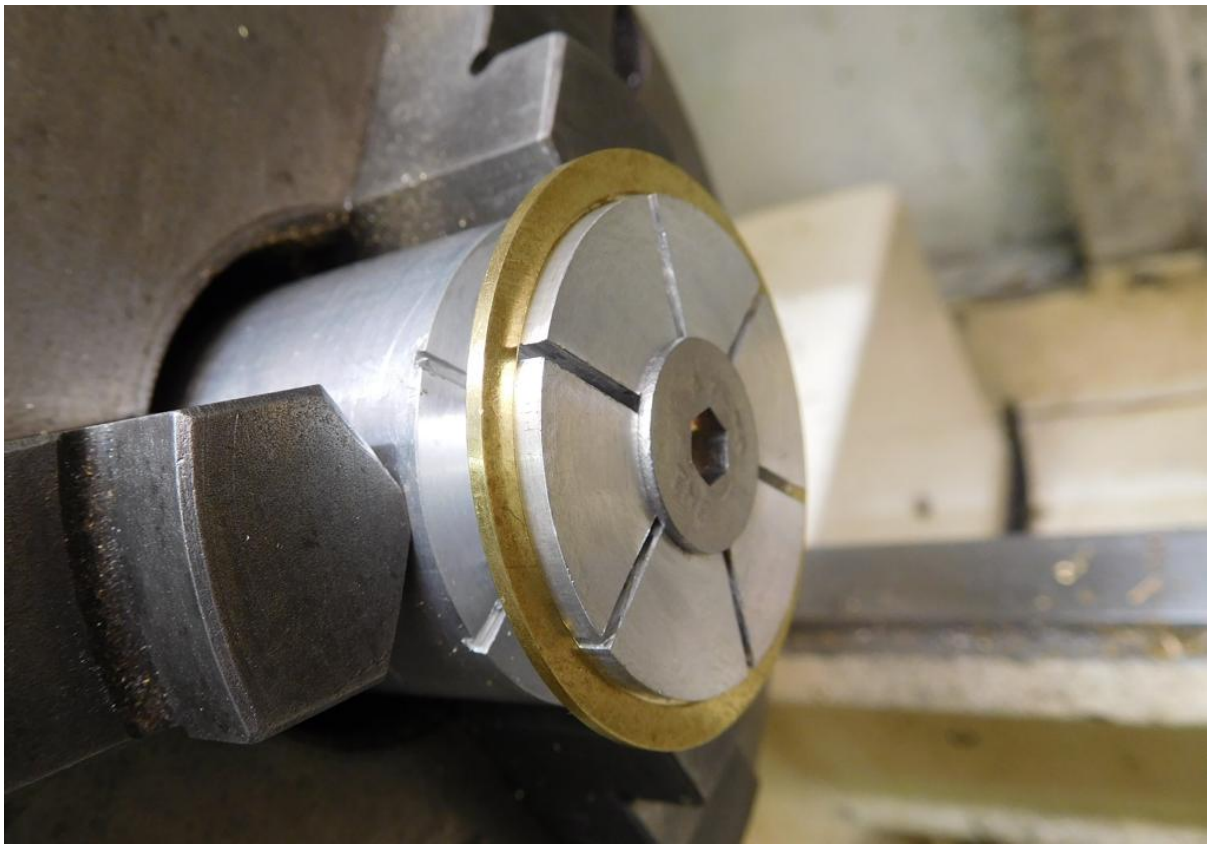
Before and after – see what I meant about trying to hold it in a chuck?



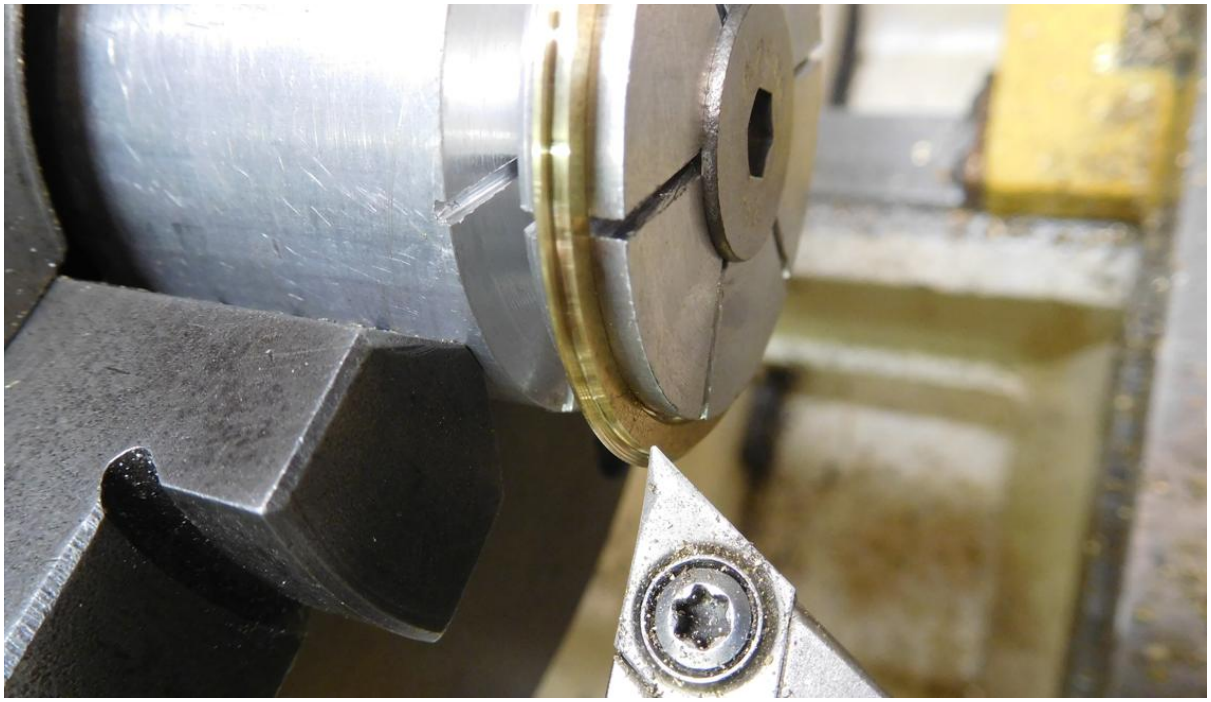
The rebate for the glass was machined in the same fixture:



Then I needed to hold it by the *inside*, so I made another fixture from aluminium, slotted as shown with a hacksaw; tightening the countersunk M8 screw expands the fixture to grip the inner diameter securely – hence why I made them as near to size as possible. I had to machine a substantial groove behind the locating diameter down to about 12mm in order for the fixture to expand without having to put a six-foot pipe on the Allen key to secure it.

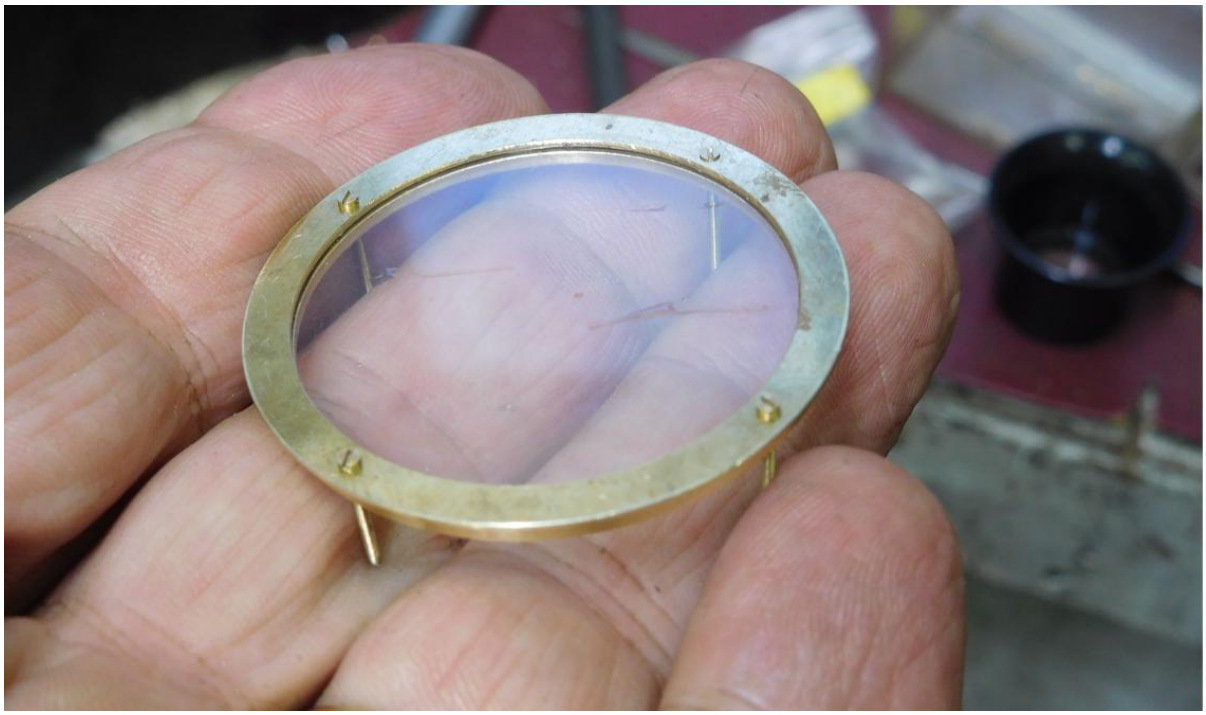


Outer rebate machined:



Then transfer the fixture to the milling machine to drill the 14BA screw holes. Luckily, the Disaster I had with one of the parts came in useful; I used the scrap one for setting-up. After drilling I checked very carefully that the holes were in the right place. I wasn't happy with the first iteration, so a small adjustment was made, further holes were drilled in the scrap part and once I was happy, I drilled the rest.

I only had one 14BA tap; I don't think I've ever used it! I ordered another one anyway as I envisage using some more 14BA screws (also on order) for other jobs. So here's the first one assembled with temporary screws:



...and temporarily parked on the loco with the coal rails also parked in position.

Don Young says to “press fit” the spectacles in the holes, but the real ones actually hinge at the top; there’s a catch in the cab roof so that they can be swung up inside and latched in the open position – see below. And no, I’m not doing that. I will solder some little pieces of brass sheet (fixed dummy hinges) on to the inner rings as per the real one and just screw them on to the cab, front and back.

So nearly there; it was a surprisingly fiddly and time-consuming job – and that’s so far!

Nigel 30-Sep-21