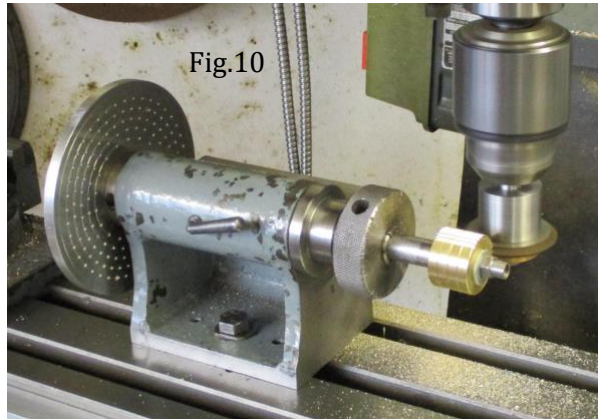


## The Streamlinia Project (3)

Maybe I should mention that I am making two engines with slightly different strokes – 0.2” and 0.25”. This is why you will sometimes see two sets of components in some of the photos.

The next parts on the list are the crankshafts. These are of the overhung type, two per engine and are geared together using the webs. Fig.9 shows the parts (less the crankpins) and the webs still have to have the gear teeth cut. If you look at the position of the holes for the crankpins, you can



just see that the pair on the right have a slightly larger throw than those on the left.

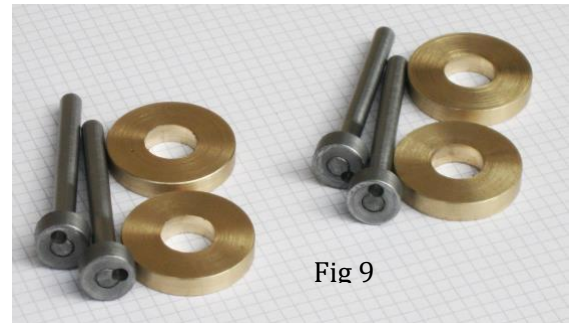
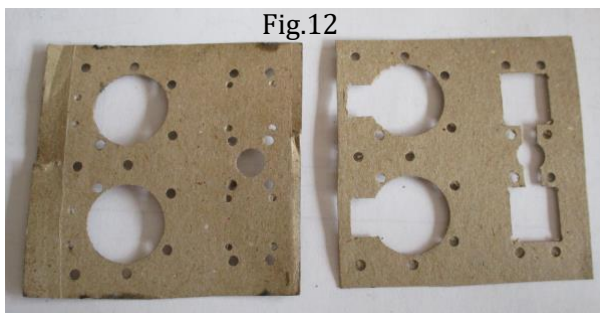


Fig.10 shows the set up for cutting the teeth. The dividing head is homemade. The nosepiece is similar to my Myford lathe and here you can see a Myford collet holding the shaft with the gears on it. The dividing plate is also homemade.

For some reason I decided to make a punch for producing the two gaskets designs I would need. That is two of each for the cylinder covers and steam chest. Years ago I had built a little 4 cylinder side valve petrol engine and struggled for quite a while to make a cylinder head gasket for it. I finally designed a punch to do the job. It took me a morning to make it and produce several gaskets that worked well.

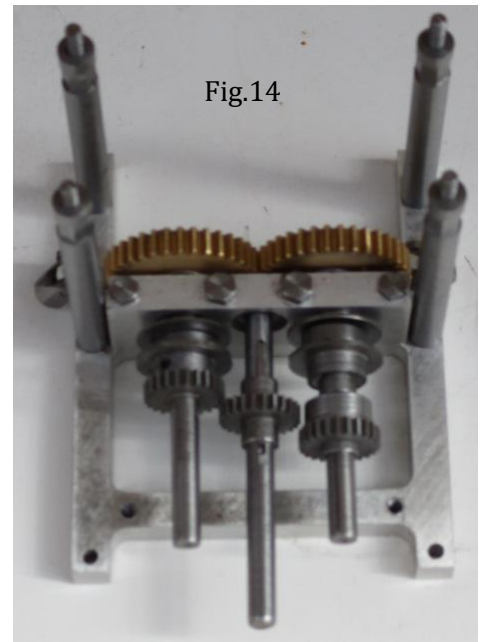


The punch consists of two 1/8” steel plates with all the round holes needed for the two designs. There are four different diameters needed, the smallest just acting as the corners of other cut outs. Figs 11,12 & 13 show the punch plates and punches; gaskets as they come out and cut outs; and the finished gaskets.



Next are the eccentrics, gears and associated parts. These consist of various parts assembled on a tube 1/4” o.d. 3/16” i.d. arranged slightly differently for each cylinder. A spacer, free to rotate on the tube with a flange so the eccentric strap doesn't ride off the eccentric; the eccentric loctited to the tube; another spacer with a flange and a grub screw that passes through the tube to lock the eccentric in the correct place; and a gear loctited to the tube. This is just for one cylinder. That for the second cylinder does not have the gear which is on another piece of tube together with a grub screwed ring, On the output shaft which lies between the two crankshafts is another gear loctited to another piece of tube. There is a key in this shaft and a

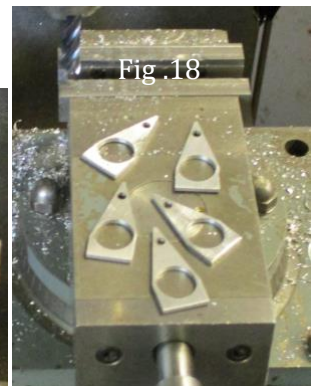
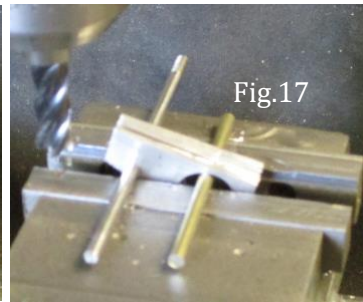
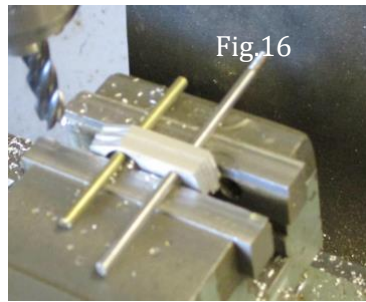
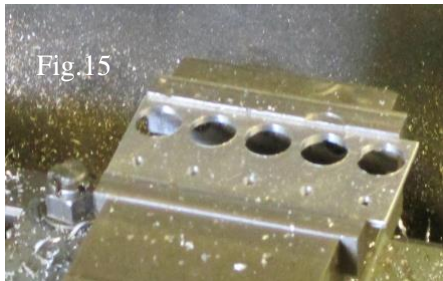
keyway in the tube so the gear can be slid into engagement with one or other of the crankshafts to give forward or reverse – there is a neutral between them. Unfortunately I assembled the parts without thinking to photograph the individual items, but never mind, Fig.14 shows the assemblies in position on the various shafts. Note that the bearings at the output end are omitted.



The connecting rods and eccentric straps are machined from light alloy sheet. Figs 15 – 18 show the how they were machined, not shown is the rounding off of the ends which was done on the radiusing tool seen in Fig.5.

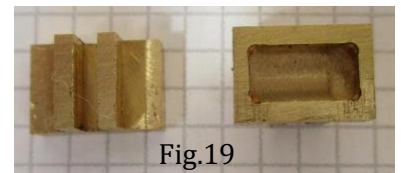
The parts shown here are the eccentric straps. A bronze bush will be fitted in the small end and a bronze bush in the big end. The con rods are similar, but are sized to fit ballraces in the big ends.

I made five in case one went wrong. It did! When rounding the big end I took too much off and had no complete hole left for the bush.

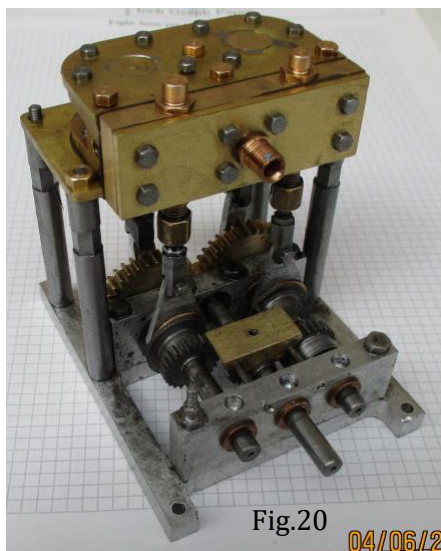


The forks for connecting the piston rods to the con rods and the valve rods to the eccentric straps came next. These were made from short lengths of hexagon steel. Nothing special here.

The valves were next. With small parts like these I find it easier to machine them all from a larger piece of material then finally separate them. Just two of them shown in this Fig.19. That's 1/8" graph paper they are on



Now it's time to assemble an engine and see if it works. Some graphite yarn for the glands and O rings on the pistons and put it all together. Rather fiddly and not much room, then OH!!! The con rods are too long! So a quick temporary pair from a strip of 1/8" dural ; no bushes at either end, just straight on the steel. Now I think about it, I realise that the little two stroke diesels I played with many years ago had light alloy rods and no bushes and worked really well. So we will see how long the temporary con rods last.



Finally a couple of shots of an assembled engine Figs 20 & 21. There are still a few parts to make – the gear operating bits and a casing around the cylinders. But first will see if it runs. Results in the next episode

