

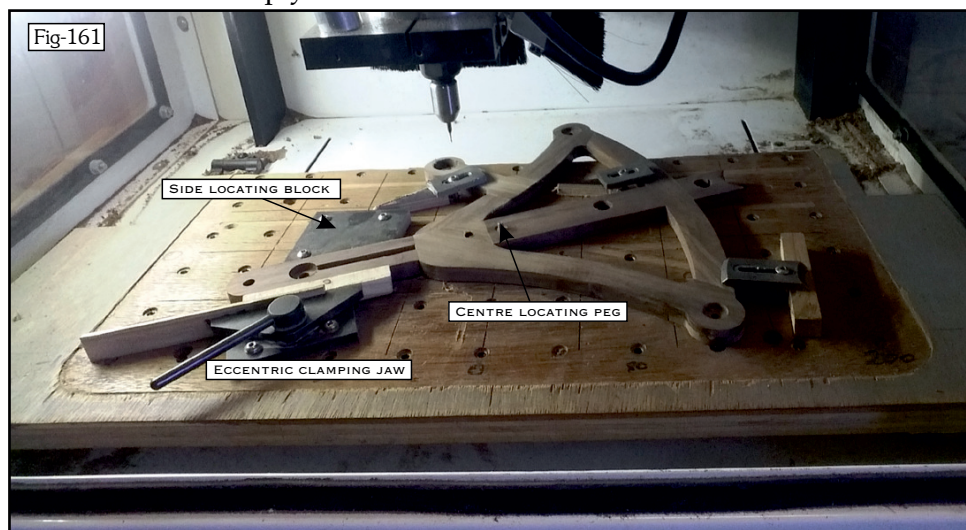
19TH DEC

Yesterday was taken up mostly with bringing the WIP up-to-date but I also spent some time making a pair of 20T Gears for a Startrite Mercury 2 drill which is being restored and the owner was having problems finding replacements at a sensible price. I did get the drawing of the Rear Frame converted to a .DXF file though.

Due to other pressing issues (Strictly Final :)) I only got 3 of the four Rear Frames machined today and even then made an error on the first because I forgot to change the Profile MOP from the default [Outside] to [inside] ! - I let the Denford finish the first recess which made it 14mm Ø instead of 12mm Ø. Since I hadn't actually cut the Maple inserts it made little difference - I just had to remember to make one of the Maple buttons larger.

20TH DEC

The fourth Rear Frame was machined ready for plugging with Maple buttons this morning and I remembered to take photo's so you can get a better understanding of how I use the Screw Hole Grid on the Denford table to make location jigs along with clamps. Although the Eccentric Clamping Jaw in Fig-161 has fixing holes at 40mm centre (which fits the grid) in this case I needed it to be at 20° so one screw went into a grid hole but for the second I used a woodscrew into the ply sacrificial table.



Because I needed to re-position the frames once the Maple Insert Buttons had been glued in so as to cut the Bearing recesses I did not want to disturb the side locating block but at this time I hadn't made the Maple Buttons. These buttons are 12, (14) & 18mm Ø and 6mm thick so can come out of offcuts.

In Fig-162 you can see the 12 buttons I need which have been machined using an 'up-cutting' end mill. The benefit of 'up-cutting' is that it lifts the waste

material out which would otherwise be pushed into the narrow grooves potentially jamming the cutter but as you can see, the downside is that it leaves some tear-out. This is no big deal really as they will be glued into the Frame and sanded off flush before I cut the Bearing Recess. To make it easy to glue them into the Walnut I do need to 'ease' this torn-

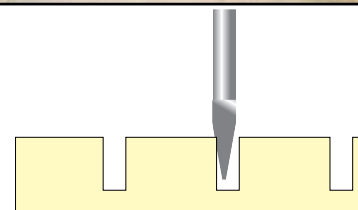
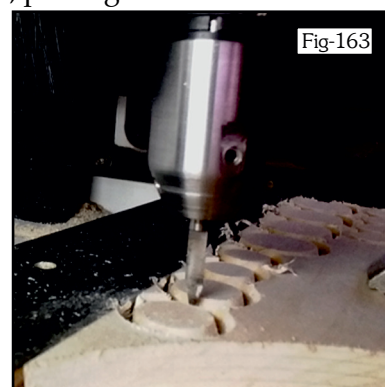


out edge because the recess and the button are cut to the same size. Up to now I've done this by hand with a 2nd Cut file, however, I suddenly had a 'light-bulb' moment and realized that it would be a simple matter to use an engraving cutter - which has a 20° relief angle (Fig-163) - to simply trim the edge, putting a small chamfer on it which would provide an easy squeeze under the bench press. Taking photo's inside the Denford is not the easiest job so I've drawn a cross-section below the photo' to make what I'm talking about as clear as possible.

To also make it very clear how these Maple buttons fit into the frame, in Fig-164 you can see the top two ready to be trimmed down before going back on the Denford to have the Bearing recesses cut.



Once the Bearing recesses had been cut it only remained for me to prepare a new jig to hold the Frame perpendicular to the table so that I could cut the last two recesses for the Frame Spacers and I completed those late in the evening so tomorrow I hope to be in a position to build the basic frame.





Since I didn't photograph the Front Frame in position for machining the top threaded inserts - resorting to a drawing - Fig-165 is a photo' of the rear frame in the similar orientation to have the Spacer Recesses cut. They are ostensibly in the same relative location since they are at opposite ends of the Frame Clamping screws.



21ST DEC

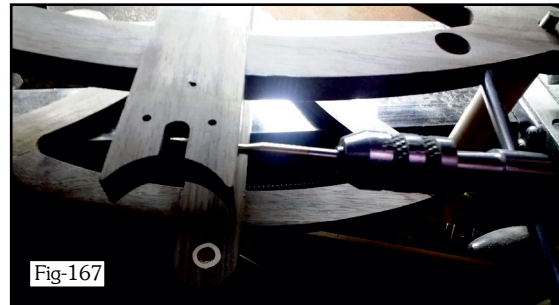
The first attempt at assembling a frame mostly went as expected and I was pleased to see that the holes for the main centre spindle aligned spot on but I then noticed that I'd forgotten to drill & tap the holes for the 'beat' adjustment so that will be a challenge to overcome shortly - certainly before I do any glue-up of the spacers or the Frame Brace. The tentative assembly has revealed that the attention to detail as far as using jigs has paid off since I was easily able to slide the front frame down the spacer screws bringing both frames face-to-face. I will however need to do some 'fine adjustment' to things like the Frame Brace, Bottom Frame Spacer and Vertical Adjuster block - this is not unexpected since although I'm using CNC for much of the manufacture, some parts have to be done on the Mill or Lathe so are subject to my personal reading of machine dials.



The part assembly does not have a 'natural' base which would enable it to stand alone so I had to take it a little further and fit the components which will ultimately fix it to the wall.

There is a Wall Plate with 'Key-hole' slots - see Fig-116 in WIP-24 - and I was again thankful to find that the two Mounting Buttons (Fig 117/8) dropped easily into the key-hole plates with no further adjustment so I could quickly screw the Wall Plate to a door and hang the part assembly to take a photo'.

I have to hope that the Dial Mounting Pads will align as easily!



Well that is very fortunate! My concerns over drilling and tapping the beat adjusting holes was unfounded.

It was a simple

matter of using a slightly extended holder for a 2.5mm Ø drill in the mill and my standard T-wrench tap holder just cleared the top of the frame while still getting the tap through the one side. The two holes do not need to be absolutely aligned as there will be two separate grub screws acting on each side of a brass plate.

Before I can start a real assembly (glue-up) I will have to spend quite some time in sanding all the components to 320 grit, apply sanding sealer and MC Wax. The frames have been sanded to 120g but the rest are pretty much all straight off the tool.

22ND DEC

I didn't expect to get much done today due to other work that was temporal but I did find the time to do an assembly of the parts that - although not properly finished - are at least pretty much to size. That does not include the Dial because I haven't yet made the Dial Pads.

I will have to do some fine fettling of some of the Gear teeth to ensure that there are no 'bindings' at some parts of each rotation but overall the first mock assembly proves that they are free to run for at least 95% and all the spindles do fit into the bearings when the frames are clamped together with the spacers!

Fig-168

