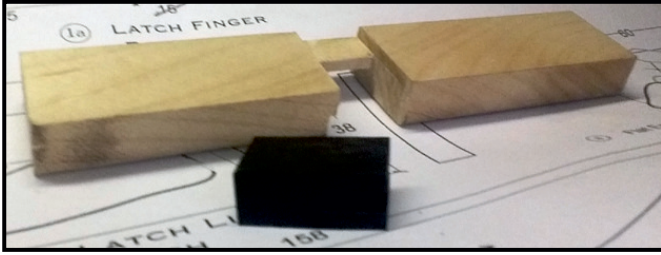


10TH SEPT

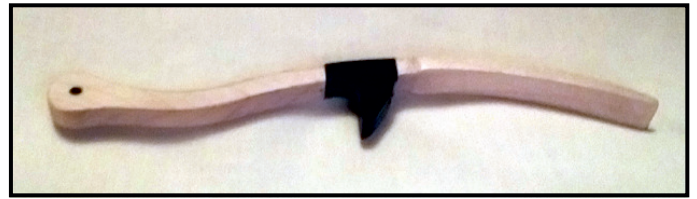
Not a great deal done today just another [Latch] made, this time in Beech and African Blackwood.

Fig-6



MACHINED BLANKS BEFORE ASSEMBLY

Fig-7



FINISHED LATCH

Tell a lie - I did also prepare some blanks for the next two components to put on the Denford, These will be the Lift & Finger which form the top of the Pendulum and enclose the pivot. I have left a little more 'meat' on them so they don't get fully cut through. The two parts will ultimately fit together and need second operations for fitting the Pivot Pin Block and Pendulum so it makes sense to make them simultaneously. One is from Beech, the other from Maple and the only reason for being in two parts is down to the direction of the grain - just one of the factors that impose themselves upon you when making items from materials that wouldn't be a normal first choice.

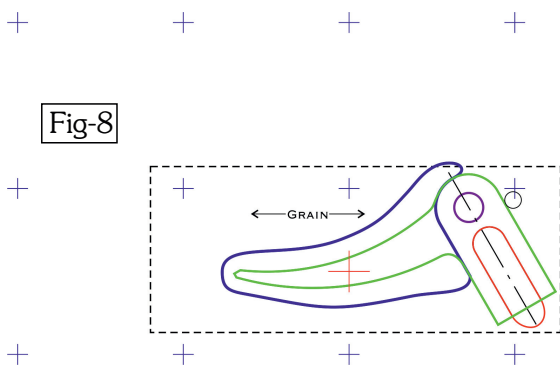
I placed an order for some 3mm dia. long series end-mills with a 22mm flute length. The reason being that I'm not happy with the finish produced by the 'Burr' I used to cut the latch. I had anticipated that the teeth on the burr would be staggered and therefore produce a fairly flat surface but the ones I have currently leave very distinct ridges and I don't have a spiral flute end-mill long enough to cover the 10mm needed. The 1 and 2mm dia end-mills I have will cover 6mm so will be OK for the gear teeth but I will need at least a 12mm flute-length for the main frames.

11TH SEPT

As I'm preparing the drawings of the [Latch Lift] and [Finger] for export to .DXF files it occurred to me that you may be interested in my methods for positioning the blanks on the Router Table - particularly since Alpha-Dave has commented upon the issue - so, the first thing I did when I bought the Denford was to make a sacrificial table (I see some refer to such as a 'Spoil Table') and machined a 40mm square grid of holes into which I put 'M4 Thread Inserts'. I later added an M6 Insert in the centre once I'd decided that using that as X0Y0 made good sense.

This gives me the opportunity to move an outline drawing of a component imposed upon the 'blank' size such that I can position a clamping hole (or 2) and fix the 0-0 datum which also gets exported in the .DXF file. Fig-8 shows the Latch Lift against the grid.

Fig-8



The blue crosses show the positions of the M4 inserts, the red cross is X0Y0 and the black dotted line is the blank size.

The component outline is shown in green and the red and blue lines show where 'pockets' will be machined. The two crosses within the dotted line is where I'll drill holes in the blanks for clamping down. The second component is now made and the mistakes I'm making are getting less but because the methodology of 'Touch & Zero' to set the Z axis is new to me I've forgotten to [Zero] on about 4 occasions :((. At least it hasn't caused a broken tool or a serious dent in my sacrificial table as I've noticed in time to stop the run and no doubt as I do more it will become second nature (one can but hope anyway).

Having an engineering background, I thought that I had always taken care to consider all the potential pitfalls when deciding how to manufacture a component but I'm finding that using CNC is making me look at this aspect very closely indeed. Particularly in respect of the order in which I take cuts and the tools I use.

When I'd spent quite some time making the [Latch Lift] component and having prepared 4 blanks, I decided to put a stop-watch on the next attempt. It took me 48 minutes and I was aware that much of that was dealing with 4 tool changes. A little tweak of the parameters I'd set in CamBam meant that I could do the same thing with only one, resulting in the next taking less than 20 minutes.

Fig-9 shows the three attempts but the middle one proves that I was right in deciding that the direction of the grain was an important aspect. The four blanks came from the same piece of 100mm wide Maple cut as two 12mm thick slices but when I cut the first piece down the middle I cut across the grain rather than along it! I realised immediately and the second piece was cut correctly. It made little difference when CNC machining but as I came to 'finish' it, the tip very quickly broke away.



## 12TH SEPT

Each day's experience brings more understanding. The third component needed a little more tweaking once I had the .DXF file loaded into CamBam - or at least I thought it did. This is the part the mates with the Latch Lift so is a little thicker as it has the 'tenon' rather than the mortice, making the blank 13mm thick. The first cut I made showed that the HSS end-mill was less than pristine and even at a low feed rate caused the wood to burn (only surface, but sufficient to be noticed). I've been using the metal-working HSS end-mills up to now along with small burrs or solid carbide micro-drills - one modified to become an end-mill. Since I also have a Router Table in my 'other' workshop, I thought to borrow one of the TCT cutters I have for that machine. It's a fairly new 6mm dia. item so a direct replacement for the 6mm HSS end-mill, though naturally I had to re-zero the Z axis.

## WHAT A DIFFERENCE!!

Cleaner cut at a higher feed rate - so much so that I modified the CanBam file to use just this one cutter for both roughing and finish passes rather than having to switch to a 2mm dia. cutter for the finish. I've just ordered 3mm and 4mm TCT cutters but I'll still use 1mm solid carbide micro end-mills to cut the more finely detailed teeth when I get to making the gears.

The [Latch Lift - 2] and [Finger - 3] are now made and are ready to be glued together.



Once that is done, the hole, *which will ultimately house the Pendulum Pivot*, can be machined to size (it's currently 7mm dia but will be 8mm). This has been left so that any discrepancy in putting the two parts together will be ameliorated by reaming the assembly as one. Two other operations are also needed, the 5mm hole to take the Pendulum Rod and the slot in the top to carry the brass pivot pin block.

I doubt that I'll get any more done today since I'm being pressured to assist with making some shuttering for a garden feature - so I'll post this and hope that there may be some comments when I next log on.