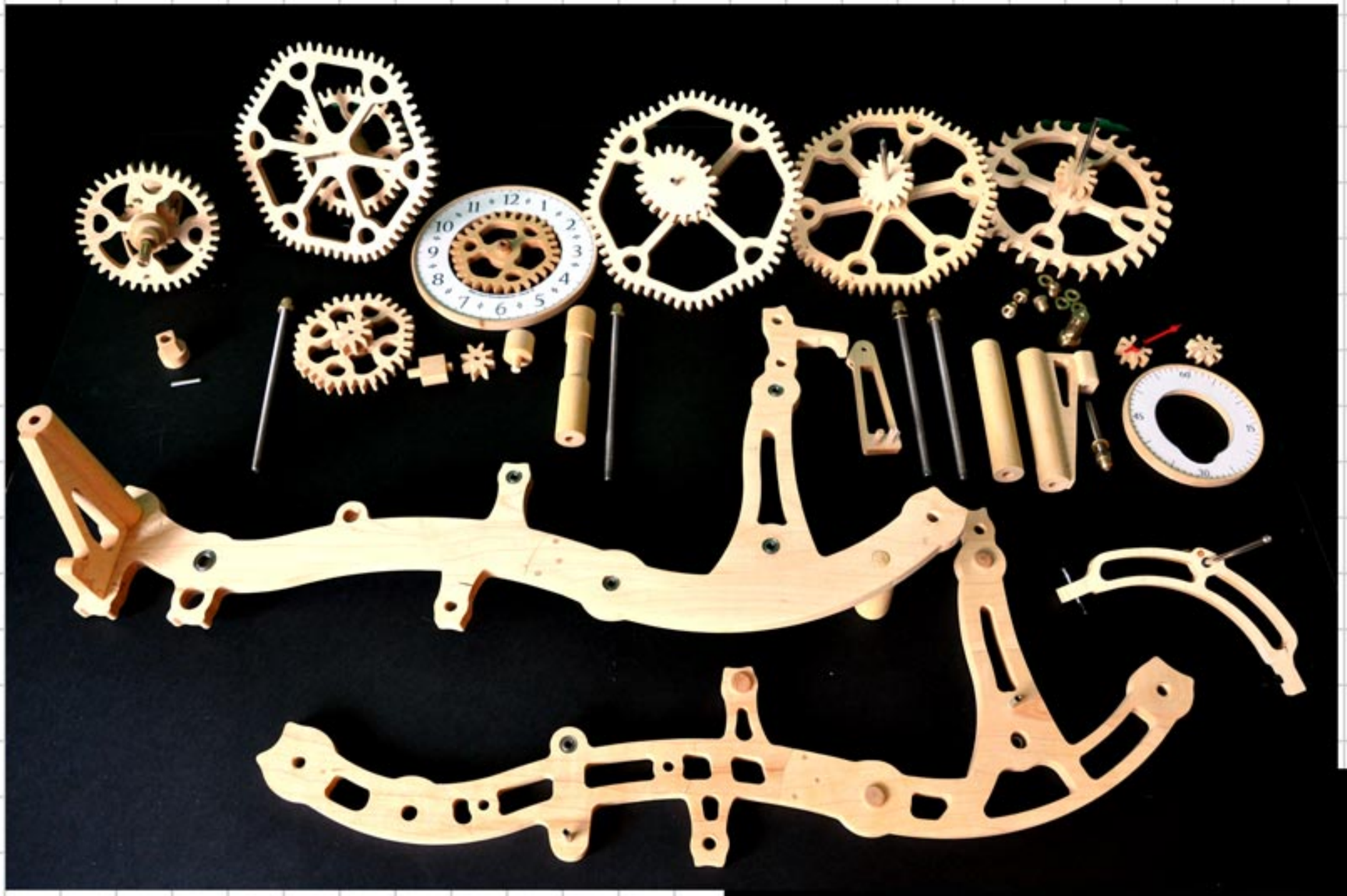
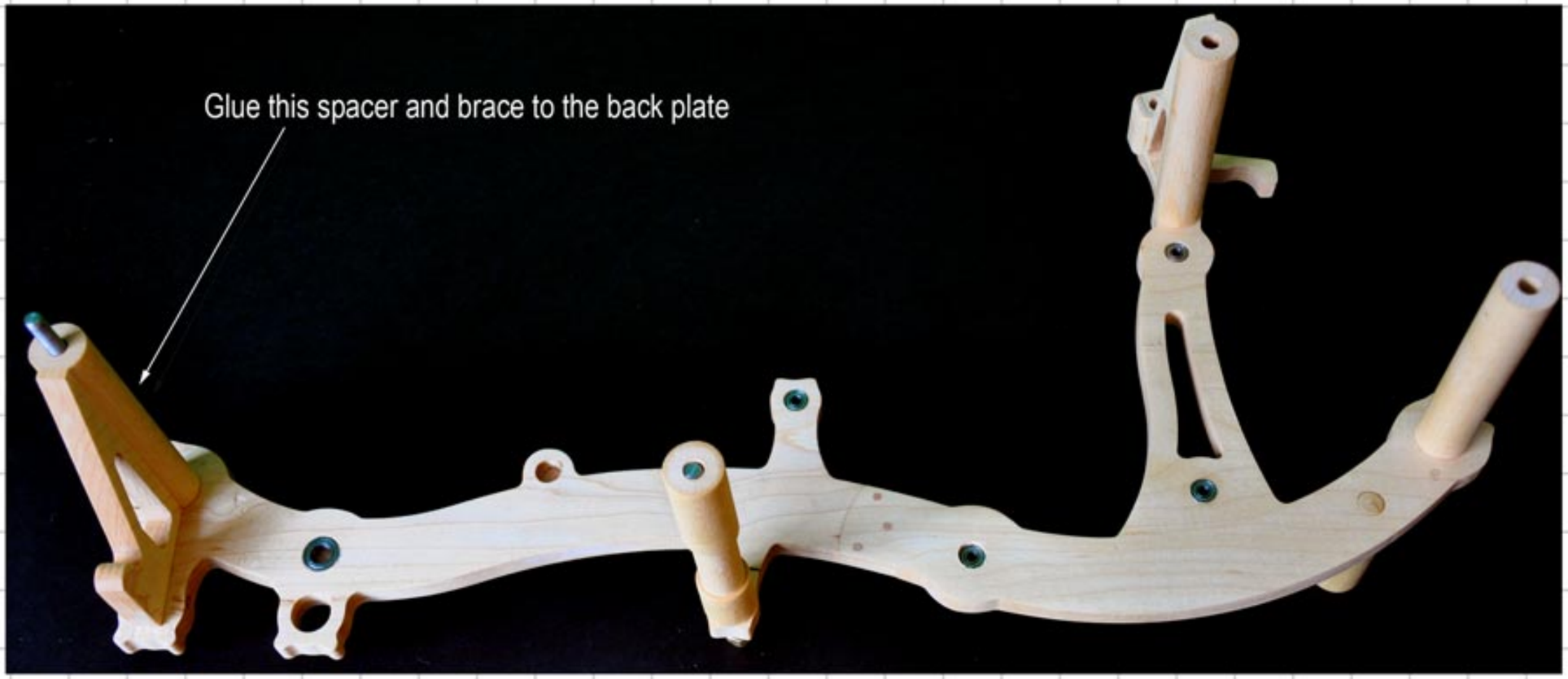
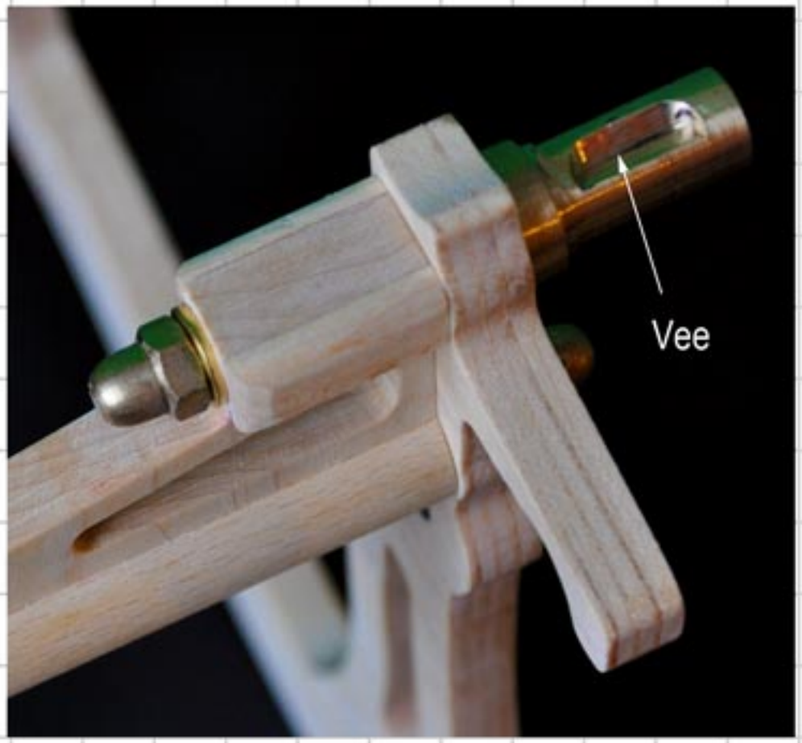
The clock features a drive train composed of non-circular gears, a novel design that poses some difficulties on the path to finding a working arrangement that will function as a clock, and give accurate time keeping. The design shown here and detailed in the attached plans is the result of a fairly lengthy trial and error process to firstly devise gear pairings that will mesh together in the non circular forms,
The clock uses a 1 kg weight, and can be adjusted to be accurate to within approximatly 2mins in 24 hours. It will run for 24 hours if set on the wall with the dial centre 1.6meters above the floor. I have laid out a series of assembly instructions to make it clear how all the different gear assemblies and parts fit together, so that along with the detail drawings and the rendered images it should be clear to the builder how create their own clock. To ensure the minimum of friction in the design Ball races are fitted to all the shaft pivots .



Gather all of the parts that you have made together ready for the assembly process. The parts shown here are all of the parts from the prototype, some are already glued together and labels and so forth all fitted, in your case these sub assembled parts will need to be completed beforehand. The assembly of the clock is actually quite straight forward, the only tricky part is making sure that the gears are aligned with the mating gears otherwise disaster will ensue.
I have taken some care later on to illustrate the correct process for getting the gears correctly mounted.

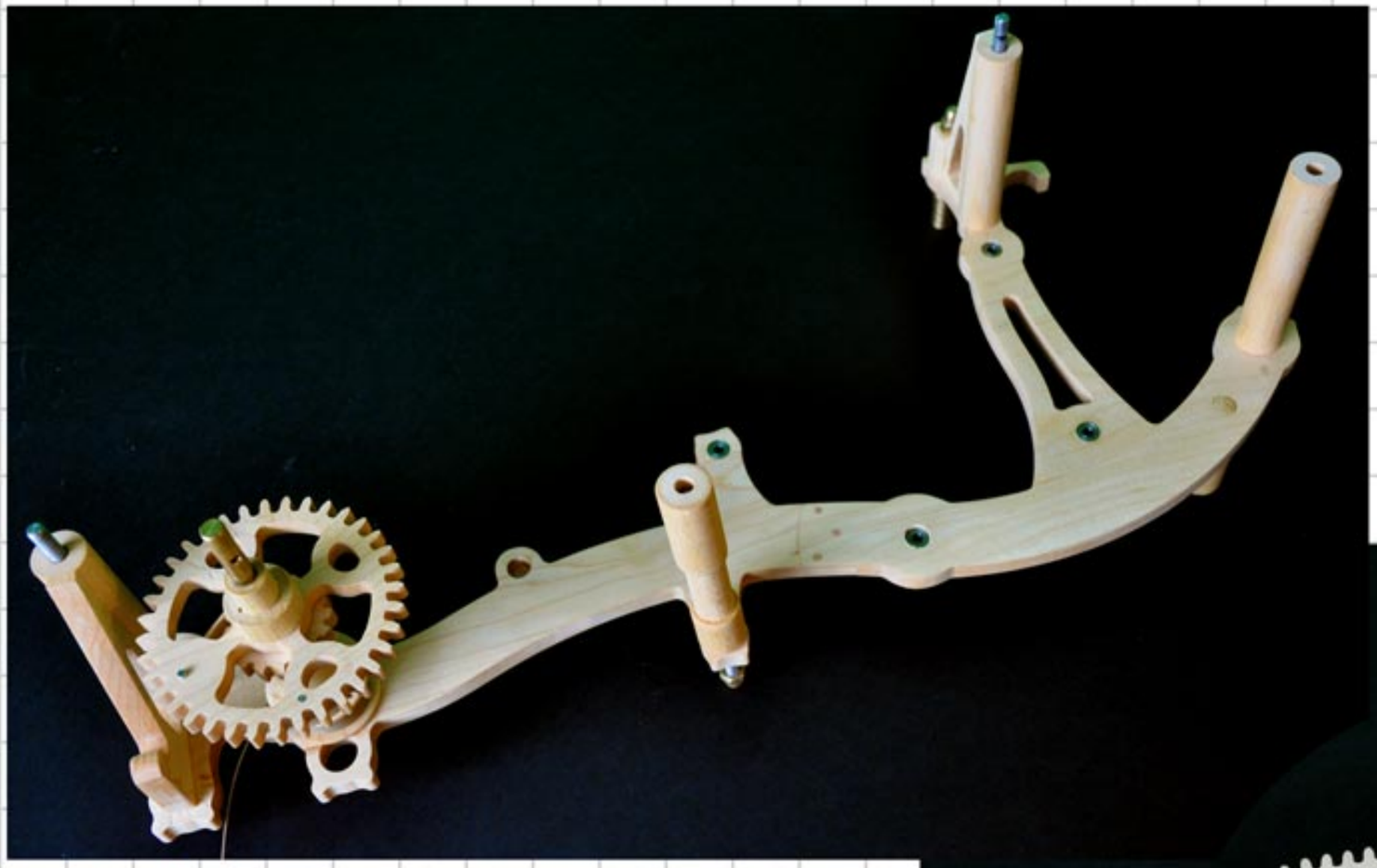
The first step is to glue the spacers and bracket into the Back frame, and to fit the threaded rod into the 4 positions-positions
When that is complete fit the roller bearings into position either as a press fit or using a Loctite or similar steel holding glue.
On the opposite face attach the caps into the bearing holes which will prevent the shafts sliding through.



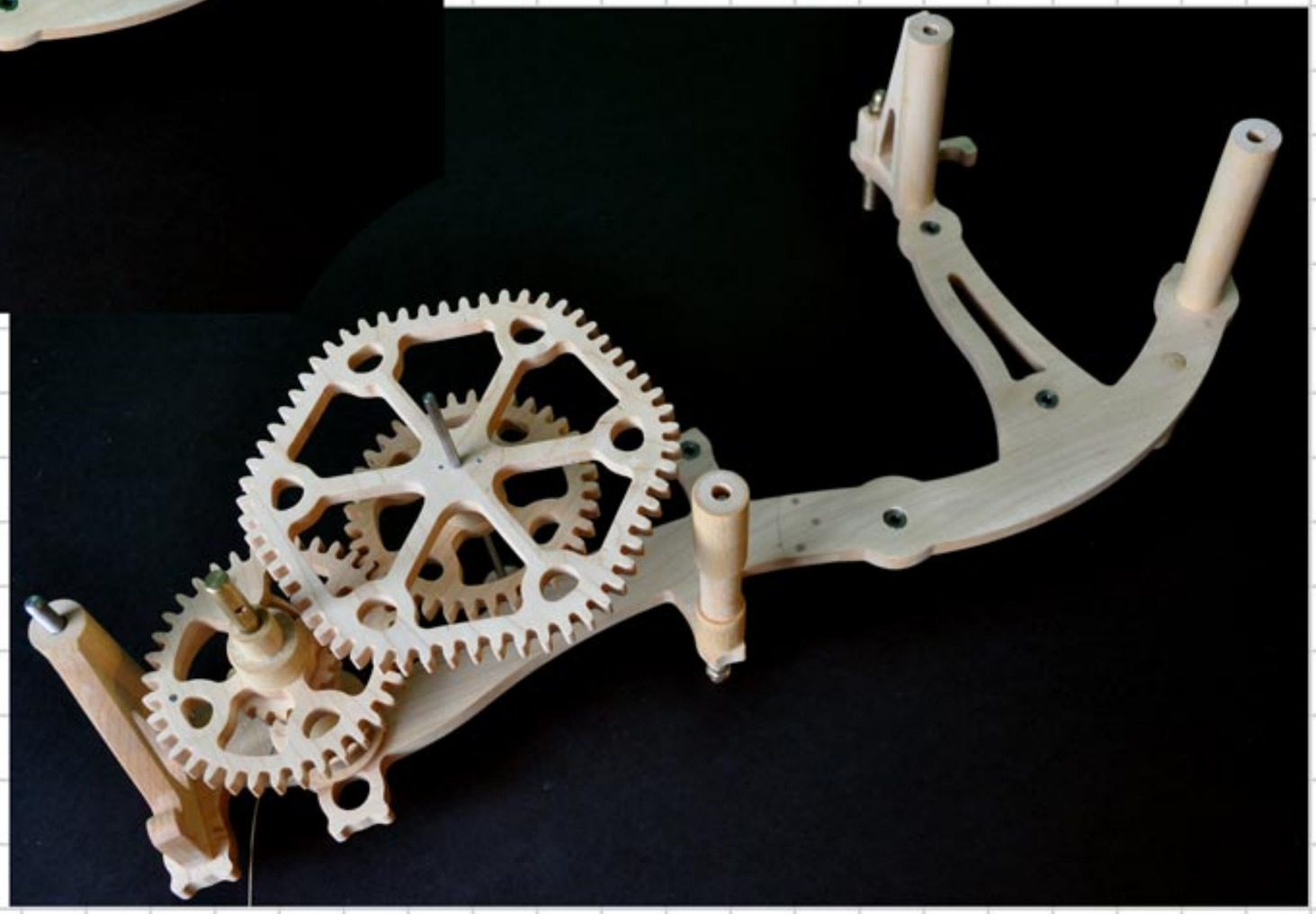


Fit the spacers over the threaded rod and secure the pendulum support in place ensuring that the bottom of the Vee into which the pendulum fits above the escapement pivot hole.
Note the notch cut into the centre spacer in the prototype, in theory its not necessary but the gears do run very close to it so I added the notch just in case.

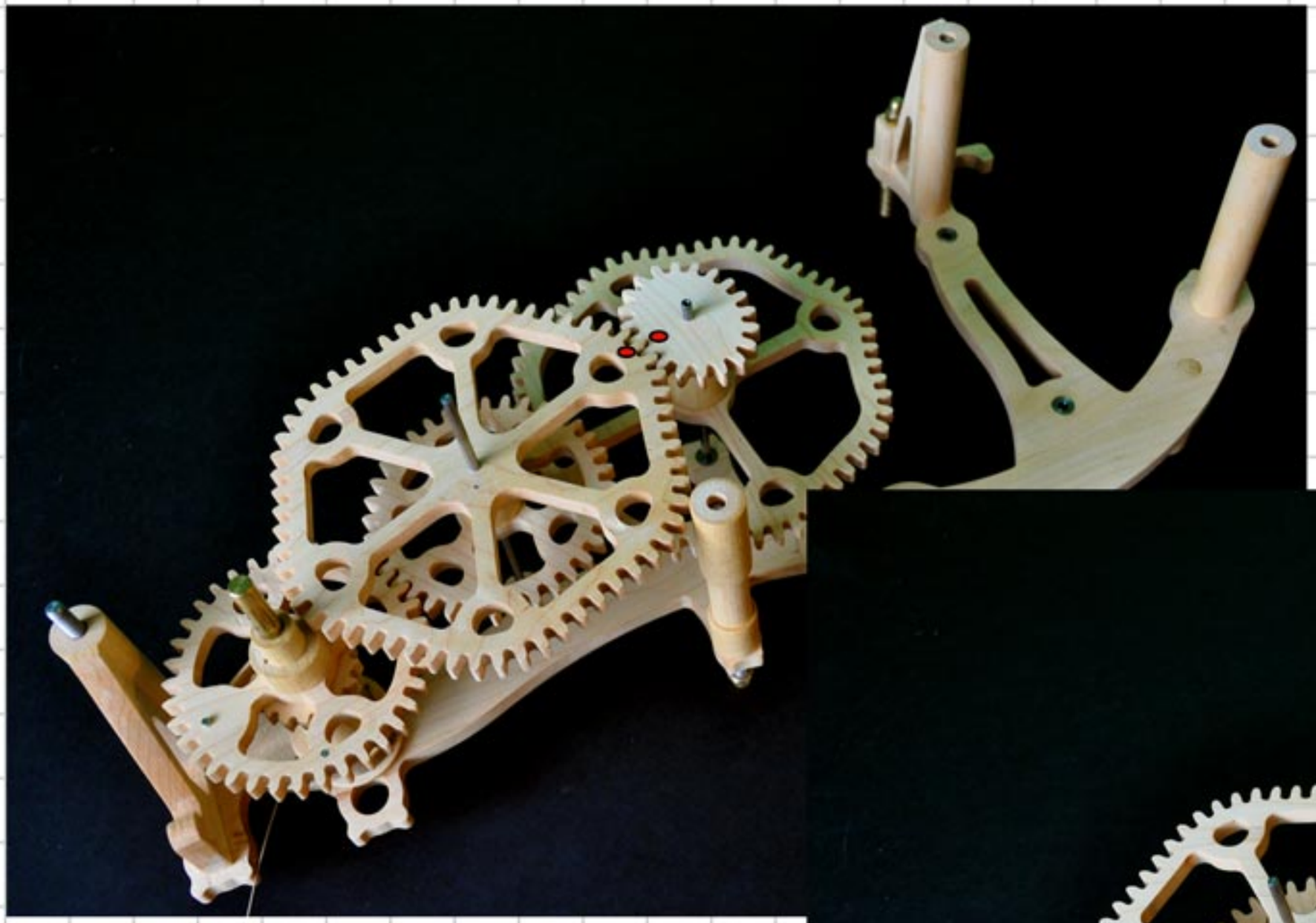
Before proceeding with the next step all of the five gear trains need to be fitted together in accordance with the assembly instructions on the detail drawings. The drawings show the parts and the positioning on the shafts, with each set of gears secured to the shaft with a grub screw to maintain it in its correct position



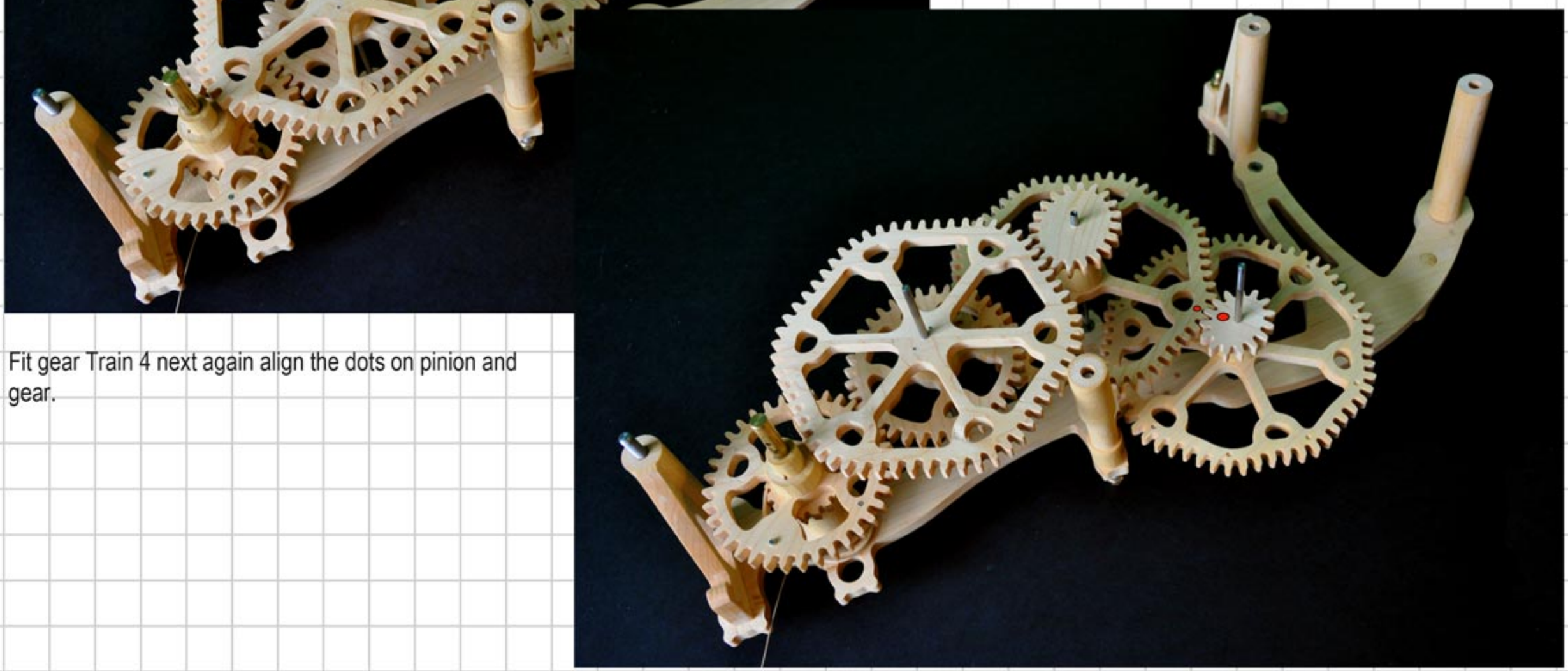
The next step is to fit the Drive Train I which has the ratchet and pawl mechanism fitted to the back of the gear. The gear and the sleeve it is mounted on are free to move on the shaft, but the ratchet and cord drum are fixed to the shaft.



Add Drive Train 2 next, the meshing of these two drive trains is simple as the gears involved are completely circular, I didn't want to mess with these gears as the torque being transmitted is at its highest here.

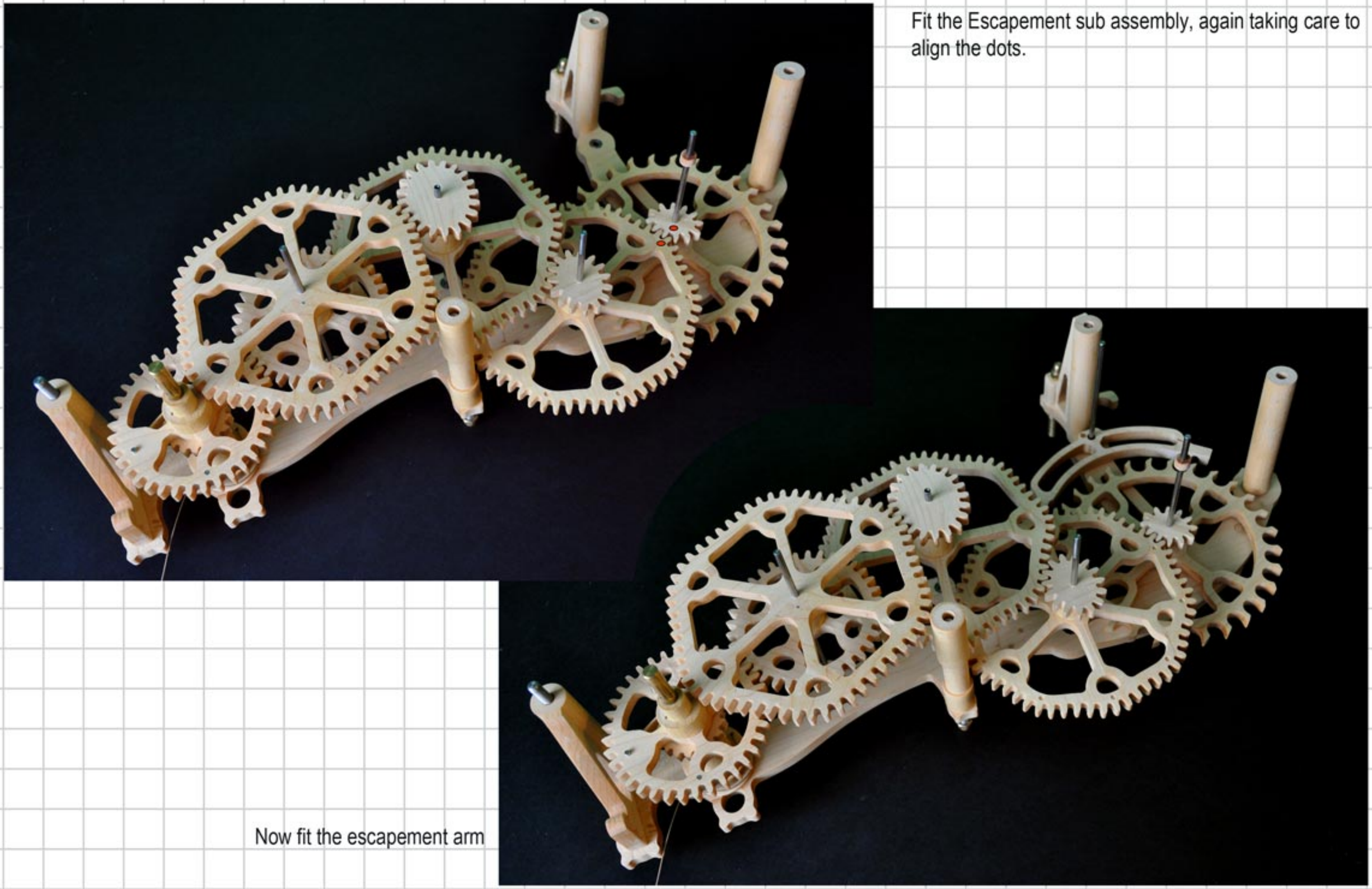


Fit Drive Train 3 taking care to align the dot on the pinion to one of the dots on the gear. The dots are highlighted in red here.



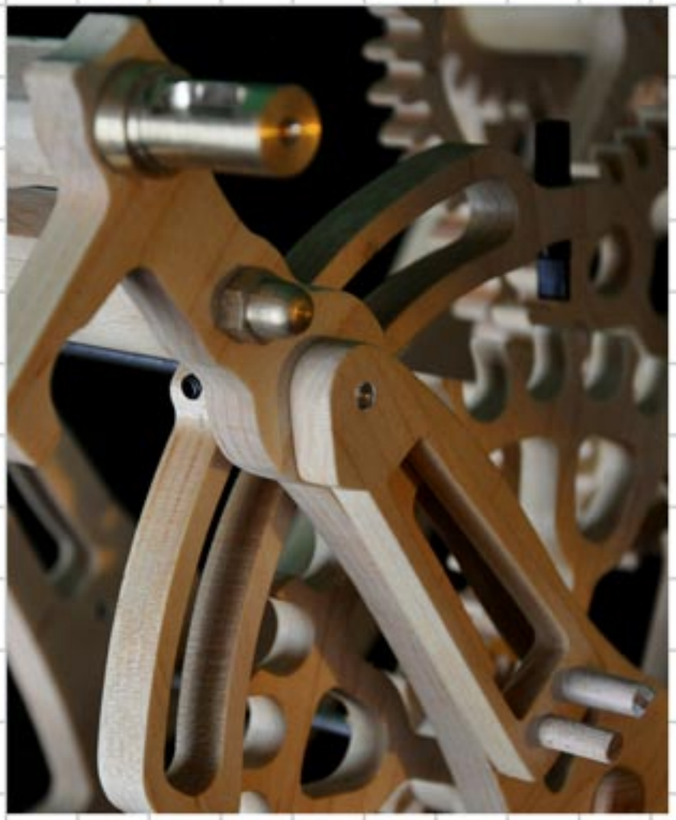
Fit gear Train 4 next again align the dots on pinion and gear.

Fit the Escapement sub assembly, again taking care to align the dots.



Now fit the escapement arm

Now to fit the Front Plate, its not really hard but very awkward aligning all the shafts and feeding the front plate down. Take care that non of the gears move out of engagement with its mate at this stage, easy to do , I know from experience because if it happens you probably have to strip the whole lot and start again.

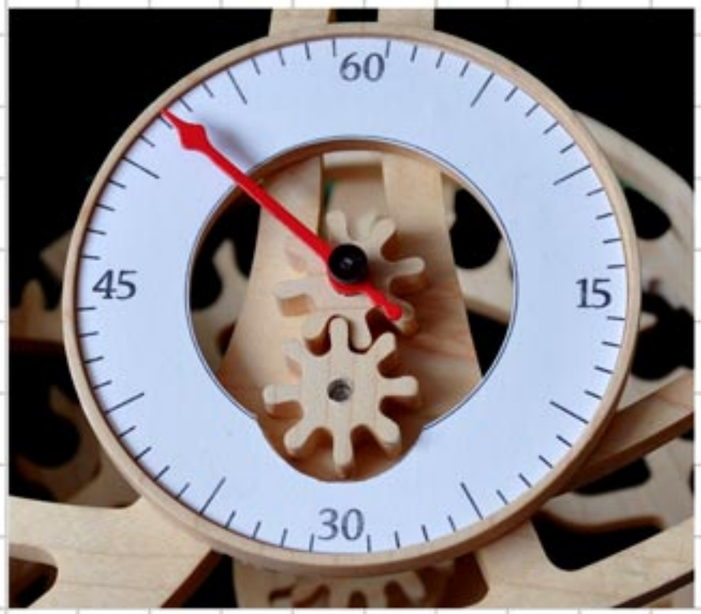


Fit the Yoke

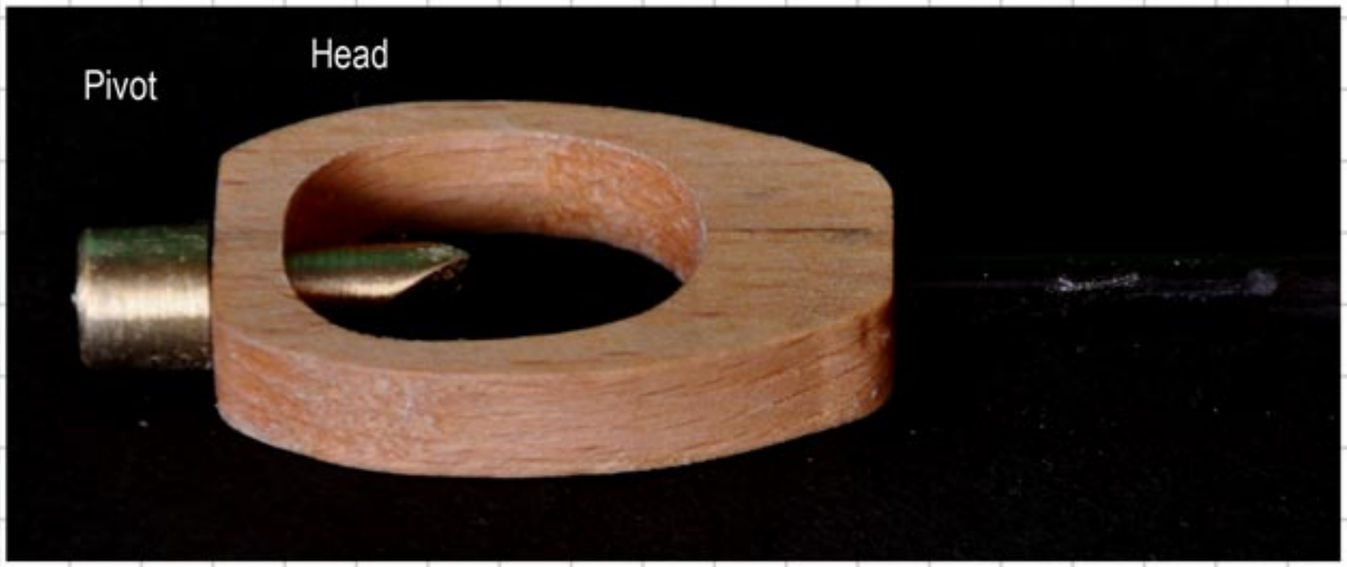
Fit the Hour Gears

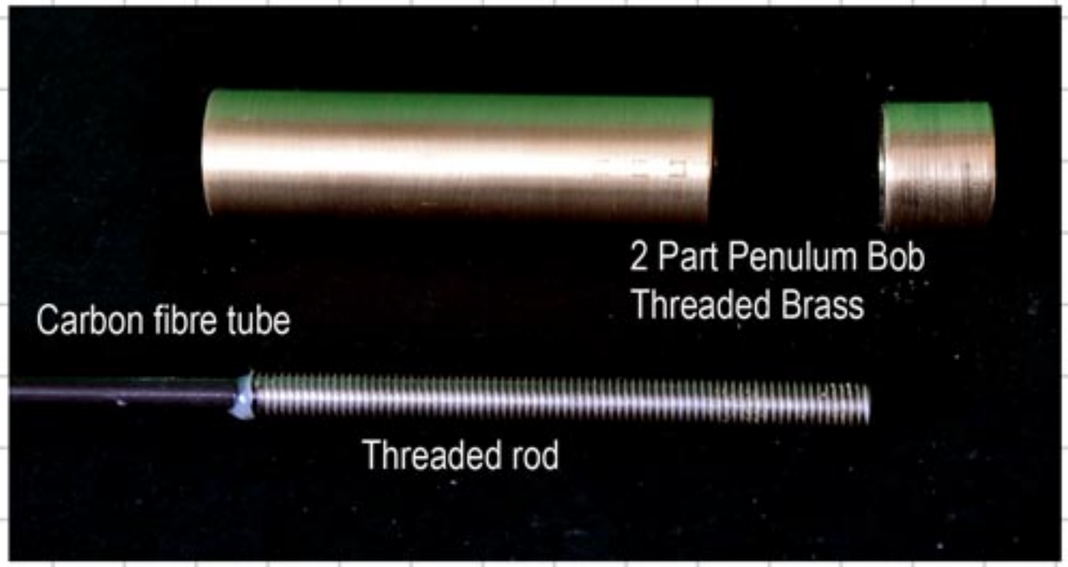
Fit the Pallets and adjust so that they protrude 11 mm below the underside of the escapement

Fit the dials and the Hands



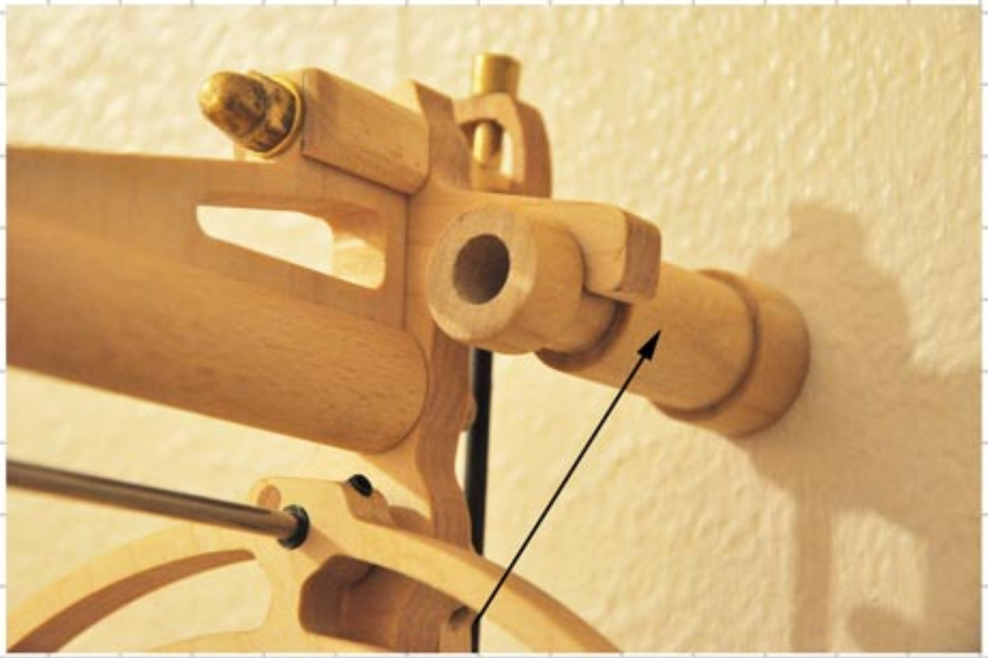
The weight used for this clock was constructed from a 2” plastic tube covered with sticky backed vinyl film in Gold. Two end caps were made the bottom one threaded for the 6mm threaded rod and the top one clearance. A brass screw on hook was used to hold it all together . The weights used were lead sash weights 1” dimeter with sections cut to give a total weight of 1.0 KG.



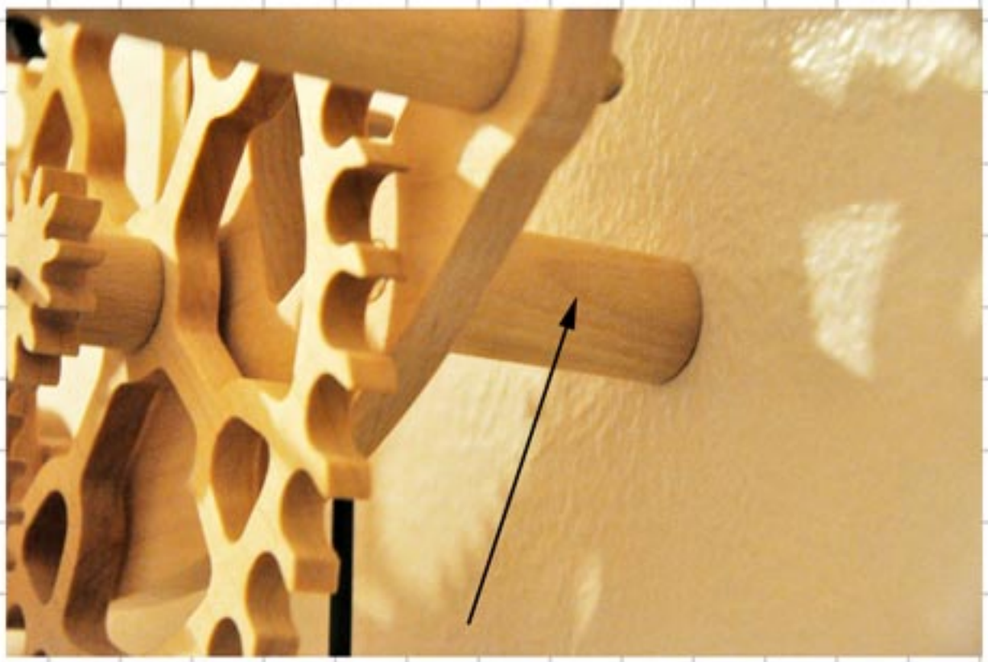


Pendulum is constructed from a length of carbon fibre tubing with a wooden head tht contns the brass blade to act as the pivot when engaged withing the Vee in the pendulum support. At the opposite end is the two part pendulum bob, boh sections are hreaded to enable locking on the threaded pendulum rod.

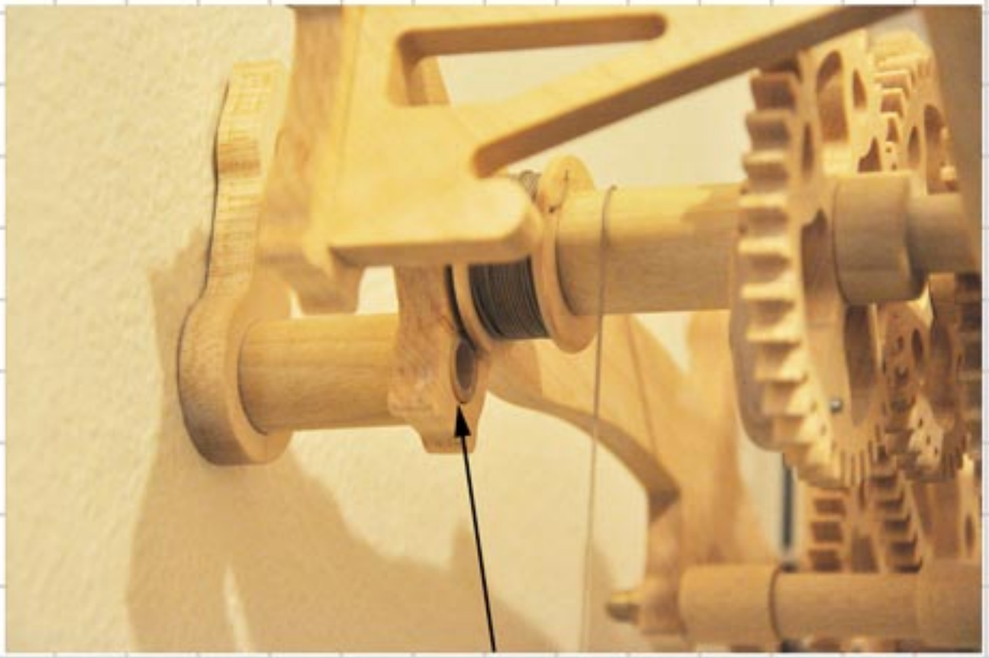
Fitting the clock to the wall



Hook the clock over the wall hanger



Clock rests against the wall on this Spacer



The bottom support is screwed to the wall and plugs into the Back frame

Ensure Pendulum Rod sits between the fingers on the Yoke