

Cutting clock gears.

The question I get asked most is (How do you make the gears),or more often, where did you purchase them?

For most of us our first gears (clockmakers call them wheels) will be to a existing plan, so we will have the necessary data

- 1- Number of teeth
- 2- Module or DP of the teeth (the size)
- 3- The size of the blank.

So what tools do we require?

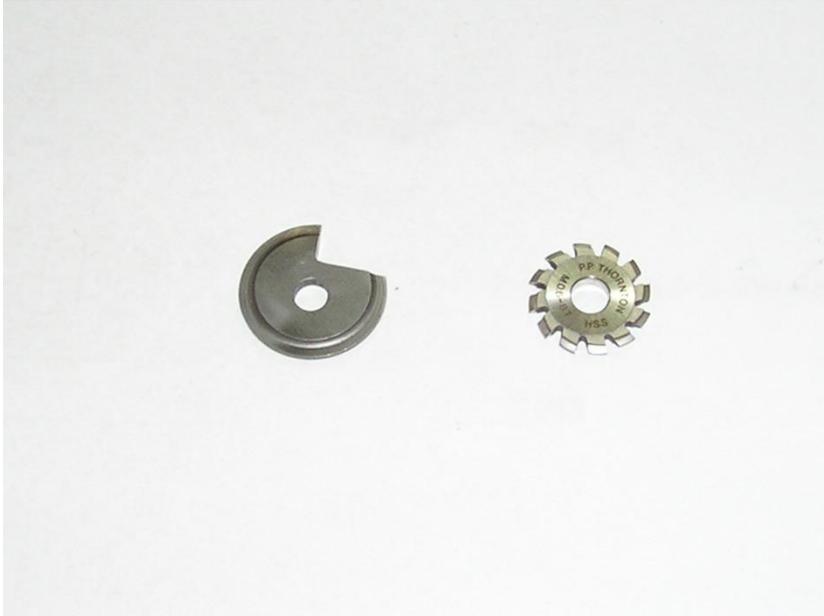
In this case we will be using a mill/ drill.

A dividing head.

A cutter.

Arbours to hold the cutter and the blank.

A lathe, with a collet that also fits the dividing head.



Cutters

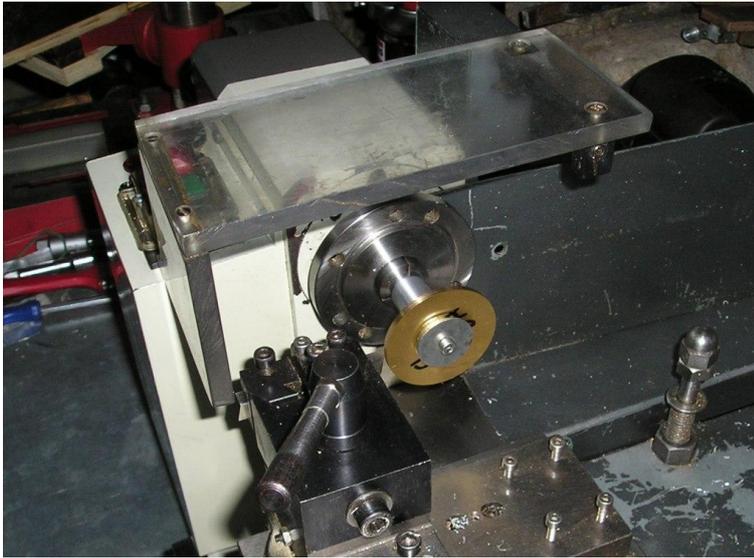
In the photo there are two commercially made cutters, the multi tooth cutter is one I use for making steel Pinions, All my brass Wheels (note the crafty change in

terminology) are cut with the single point cutter. Our cutter for this job is number 1 module.

Arbors.

We will need one for the cutter, and one for the blank that can be changed from the lathe to the dividing head.





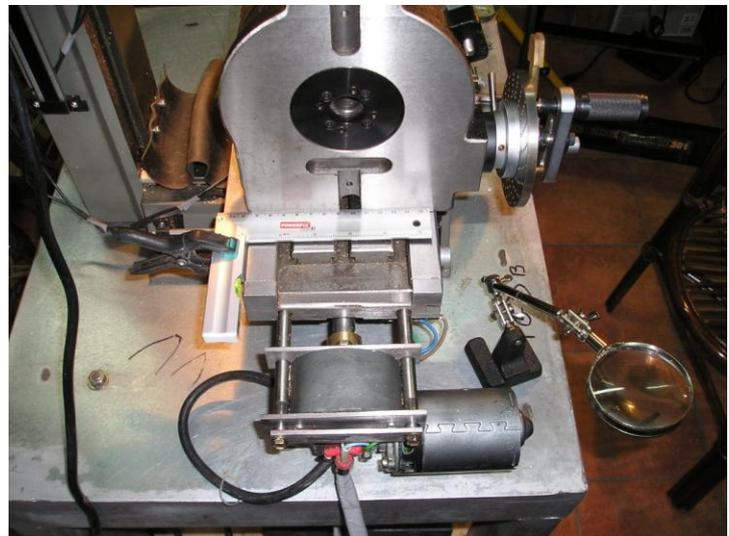
Prepare the blank by turning it to size on the arbor that you will be using in the Dividing Head.

Keep the blank on the arbor and put them to one side.

Setting up the mill.

Ensure the dividing head is square to the table and you have room to get the cutter into position alongside the blank with the cutter rotation working against the arbor, not against the retaining nut.

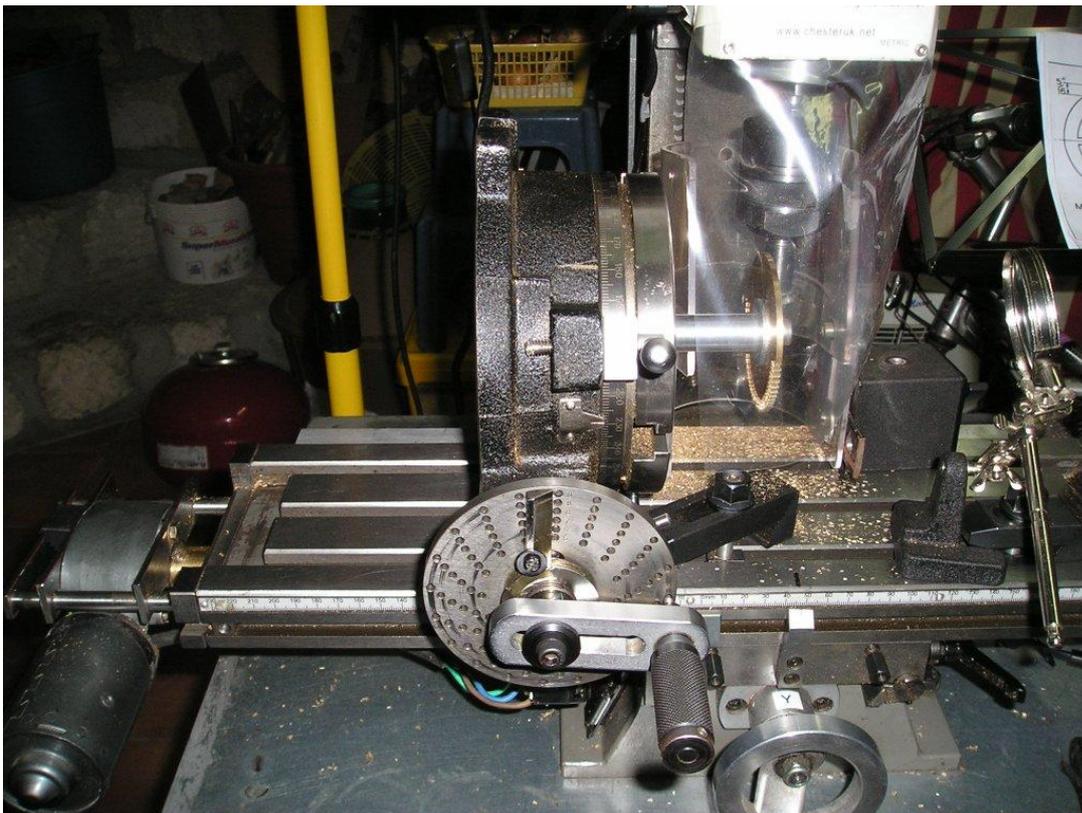
Carefully centre the cutter and lock the Z axis. If this is off centre the teeth will lean to one side.



The dividing head

We now have to set the dividing head to give the correct indexing for the number of teeth, in this case 72 a look at the chart tells us we need a 20 hole plate and to advance 1 turn and 5 holes. So we set the index arms to give 5 holes. And advance them after each cut.

Remember it's 5 new holes don't count the one the pin is in.



Place the wheel blank in the collet and tighten the draw bar, place the cutter so it is just touching the blank, zero the "Y" feed screw, and we are ready to go.

Cutting the teeth

At this point we have to set the full tooth depth,

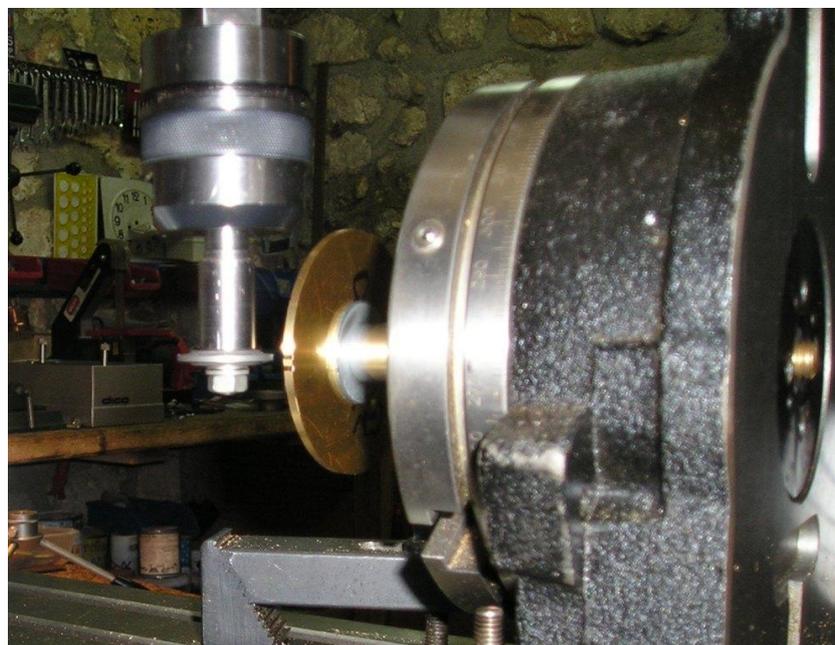
I prefer to use the “John Wilding” method.

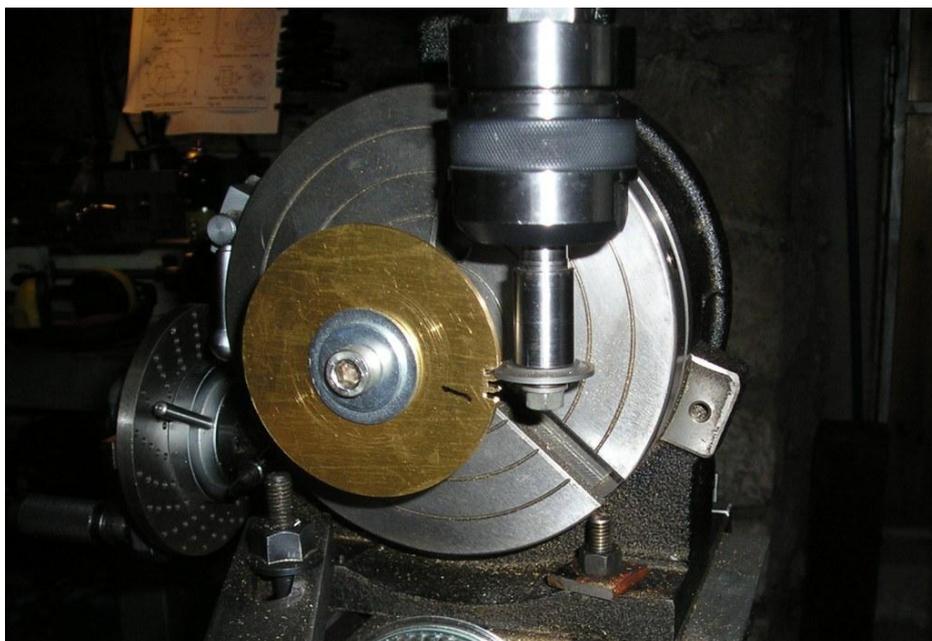
Progressively cut 2 adjacent teeth until the curves just meet at the top of the tooth, Lock up the unused slides and cut the remaining teeth with one pass. Using this method I get a in feed measurement of 3.64mm every time for the mod 1 cutter?

When cutting the teeth and setting the depth, Remember always approach the hole in the dividing head plate Clockwise to eliminate any backlash.

I use 1500 RPM and a slow feed.

Setting the depth

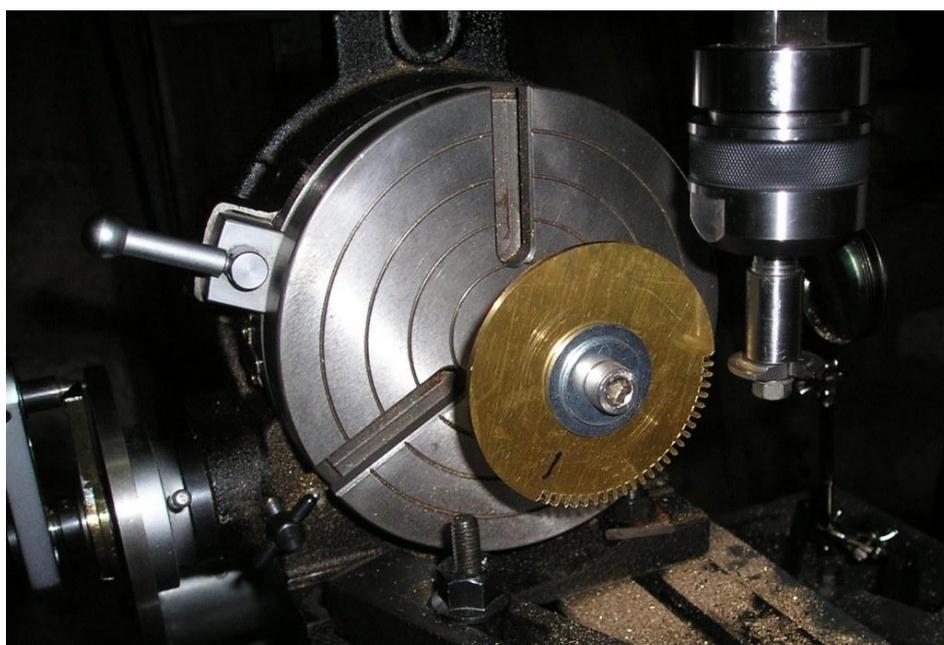




The first full cuts.

Cut —return—
unlock—
move the
sector arms—

1 turn 5
holes---lock---
cut, etc.etc



Well under
way soon
you will have
a full wheel.

Happy gear cutting

BRIAN.

