Wheelcutting

Adapting the Myford Lathe

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I read with interest the article by Norman Jacklin on manual wheel dividing.[1]

When I first started clockmaking I was fortunate to find a second-hand Myford dividing head with its four plates for the remarkably cheap price of £12. I agree entirely with Norman Jacklin when he says that the best position for this accessory is on the rear end of the lathe mandrel. This is particularly so in the case of wheel cutting as the wheel blank can be turned to the correct outside diameter, the centre hole drilled and the teeth cut all at one setting of the work. It is a pity that Myfords did not supply the fittings necessary for mounting their dividing head in this position.[2] However, the parts for this are fairly simple to make. Norman gives some drawings and I too show my drawings, **Figure 1**, together with some photos of the parts required.

I show the parts removed from the dividing head in **Figure 2 and 3**. The assembly ready for insertion in the rear end of the Myford headstock mandrel where, by means of an expanding plug, it is locked firmly into the lathe mandrel, **Figure 4**.

At this point, I would like to remind readers that Myford produced a five page leaflet on the use of this attachment, including the use of the sector arms.[3] With the four plates, all numbers from 1 to 100 can be obtained. This leaflet also gives the numbers from 101 to 200. Many higher numbers can be obtained and the method of obtaining these is also described. For further numbers it may be necessary to make a new plate, **Figures 5**.

Norman uses my large wheel skeleton clock to demonstrate the cutting of the large wheel with his master plate. One of the other advantages of fitting the dividing head to the rear end of the lathe headstock mandrel is that the cutter can be mounted in a milling spindle mounted on the vertical slide. The spindle which I have used is made by Malcolm Wild and can be run at high speeds.[4] To obtain a high finish on the teeth, the cutter manufacturer Thornton recommends a speed of 3000–4000 rpm and these speeds might be difficult to obtain on the headstock mandrel in some of the cheaper lathes.

The procedure for cutting this large wheel, which is described in my construction book, is to mount a wooden face plate on the lathe's standard face plate. The brass blank has to be machined to an o.d. of 8.64in. This blank is fixed to the wooden disc with four wood screws. To cut 290 teeth you need to use the 29 hole circle in plate 2, and index every six holes. I show the blank being machined in **Figure 6**. Although the thickness of the blank is specified at 1/8in. I have clamped two together here and so am cutting two wheels simultaneously, **Figure 7**. You can also see that it was necessary to raise the vertical slide unit up so that the cutter could reach the top of the blank. Also, it was necessary to mount the cutter itself on an extra-long extension so that it could reach the centre of the wheel. Malcolm Wild can supply this item if required.

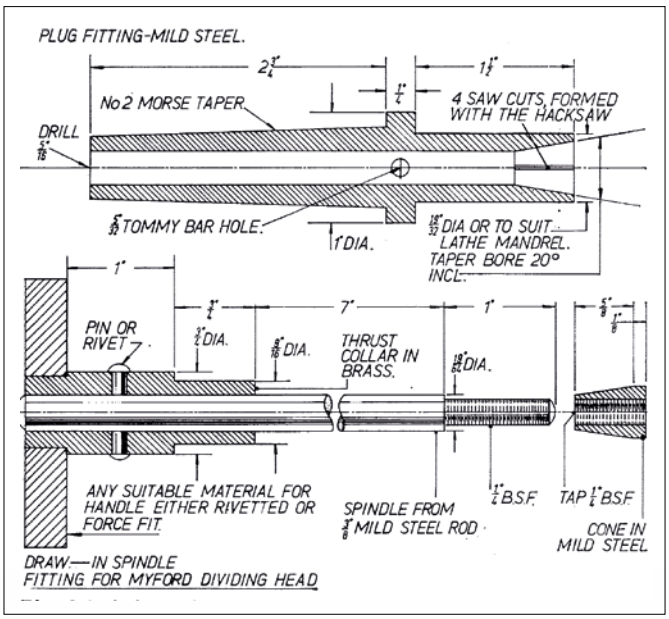


Figure 1. Drawings of parts required to fit Myford dividing head to Myford headstock.

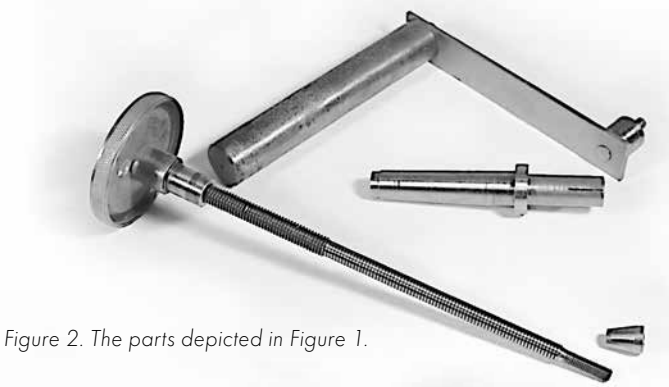


Figure 2. The parts depicted in Figure 1.

Figure 3. The parts fitted to the Myford dividing head.

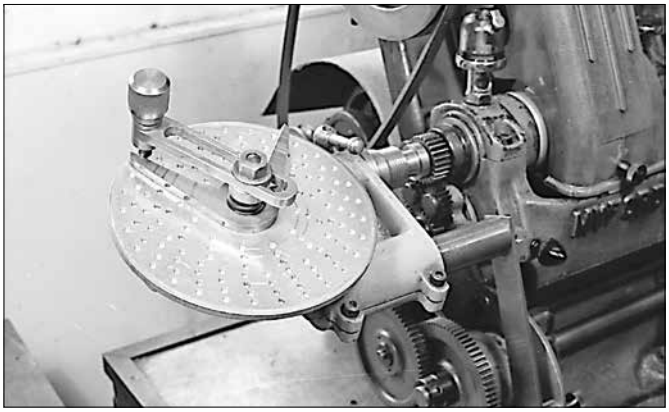
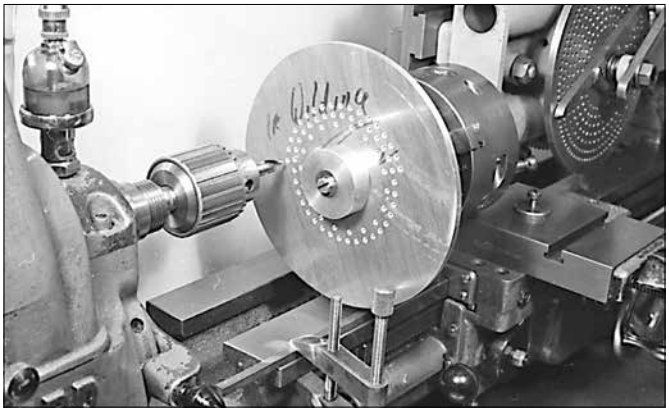


Figure 4. The assembly mounted on the lathe.



Figures 5. Drilling holes in a special plate using the dividing head.

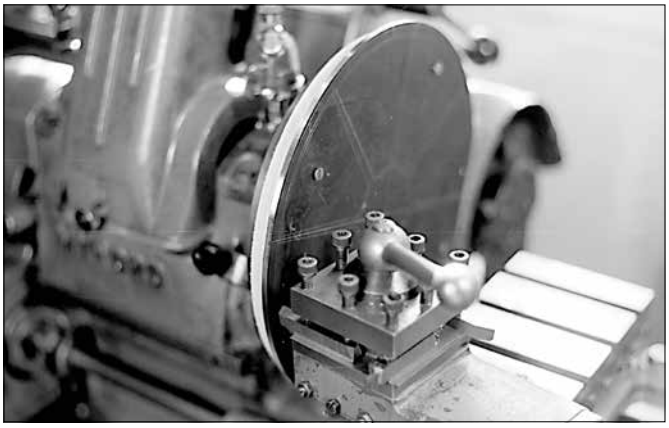


Figure 6. Turning the brass blank (CZ120) to size.

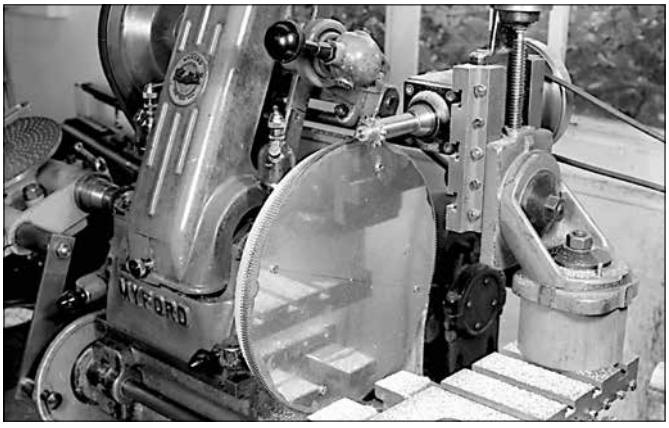


Figure 7. Cutting the 290 teeth.

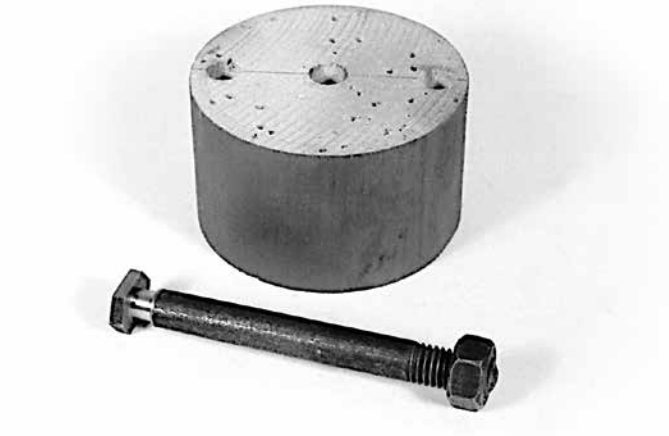


Figure 8. The packing piece to raise the vertical slide.

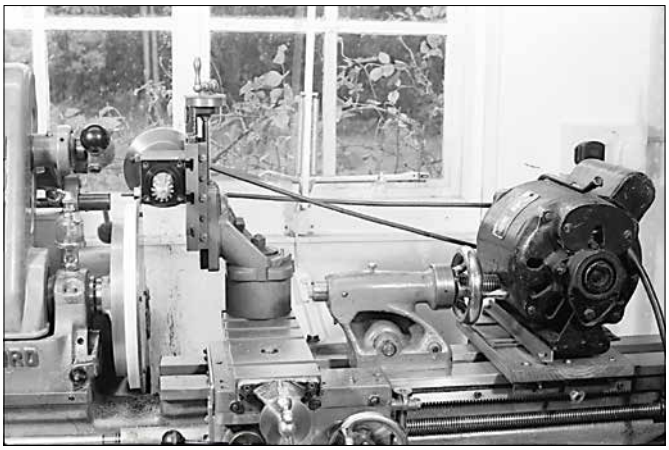


Figure 9. Method of driving the milling spindle.

Figure 8 illustrates the simple wooden packing piece used to raise the milling spindle. **Figure 9** shows the general method of driving the cutter. A standard motor is located on a wooden board at the rear end of the lathe bed and the drive is via a plastic belt which stretches to accommodate the feed of the cutter through the blank. I apologise for the omission of a plain backdrop in this picture. I should have used one to eliminate the garden background!

The third wheel requires 144 teeth and you will need to make a special plate for this number. For occasional use this plate can be made of Tufnol or even hardboard. I illustrate this operation in **Figure 5**. The important points in wheelcutting are to use a blank of free-cutting brass (CZ120), a high cutter speed and a rigid set up.

ENDNOTES

1. N. Jacklin, 'Near Enough is Not Good Enough', *The Horological Journal*, 158 (2016) 202–206.
2. I am happy to advise the reader that Malcolm Wild can supply the parts necessary for fitting this attachment to Myford lathes. www.j-m-w.co.uk.
3. This leaflet can be obtained from Ritetime Publishing Ltd for a small fee. Tel: 01420 487747.
4. A similar milling spindle can be obtained from Arrand Engineering, The Forge, Knossington, Leicestershire, LE15 8LN. Tel: 0664 77 566.