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# Making a Dial by Repoussé and Chasing

*How Hard Can it Be?*

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Figure 1. Polar bear in copper.



Figure 3. Chasing hammer.

Silver soldering is a skill that is useful to a clockmaker. I had been taught the rudiments during BHI short courses, however, I came to realise that I needed to refine my capabilities. It seemed logical to seek a silversmith for guidance, and so in 2017 I met Phil Jordan<sup>1</sup> who runs courses in Leicestershire. My wife and I spent a day doing an introductory course, during which we each made a ring. We were hooked!

After making our rings we progressed to learning other skills and made a variety of items, both useful and decorative (as dictated by William Morris<sup>2</sup>). The particular craft I took to was that of repoussé and chasing, in which sheet metal (usually copper or silver) is shaped by punches to form decorative patterns, often on tableware and religious vessels. I made several decorative items, **Figures 1 and 2**, but it was almost inevitable that, as a clockmaker, I would want to make a clock dial in the Arts and Crafts style using these techniques. At this stage, I asked the two usual questions: ‘how hard can it be?’ and ‘what could possibly go wrong?’ I will give considered answers to these in my conclusion...

The tools used are chasing hammers, **Figure 3**, which have a broad face for striking the punches, and the punches



Figure 2. Fox plaque in copper; citrine eyes and patinated background.



Figure 4. The range of hammers.



Figure 5. The basic punches.



themselves. The hammers come in a range of weights, **Figure 4**. All of the work described in this article was carried out using the one shown, which has a four-ounce head.

Although there are only a few punches that are used for the majority of the work, **Figure 5**, there are a great many shapes, **Figure 6**, each of which has a purpose. Sets of punches can be bought, but those shown were all made in the workshop. The material used is usually silver steel or key steel and the punches are shaped by forging and/or filing. The working faces are hardened, polished and then tempered to the colour of straw.

The work is carried out with the workpiece mounted on pitch, which allows the metal to be deformed. The hardness of the pitch is controlled by two means: the constituents of it and the temperature of it. To soften the pitch, a heat gun is used.

Since both silver and copper are subject to work-hardening, it is necessary to anneal the piece after each course of working. This process, which also burns away traces of pitch, involves heating the piece to dull red and quenching it in water. This leaves the work oxidised, so it is pickled in acid to remove the oxidation and render it clean.

### *The Initial Stage*

The first stage was to draw the dial on paper, which I did using CAD. One of the facilities offered by most CAD programs is that of generating a mirror image, which I used to print the reverse image required to work on the back of the piece. It was when I performed the mirror function that I found that the software did not reverse the text items, which I had to do manually. Having printed the mirror image, I stuck it to the copper disc using photo-mounting aerosol adhesive, **Figure 7**.

The first stage of transferring the design to the copper was to mark the serifs using the lining punches, which was done on a piece of hard plywood. The paper was then removed and the disc mounted on the pitch. Having marked the serifs, I then marked the main strokes using felt-tip pens, **Figure 8**. Two thicknesses were used to reduce the chances of confusion while working on the reverse side.

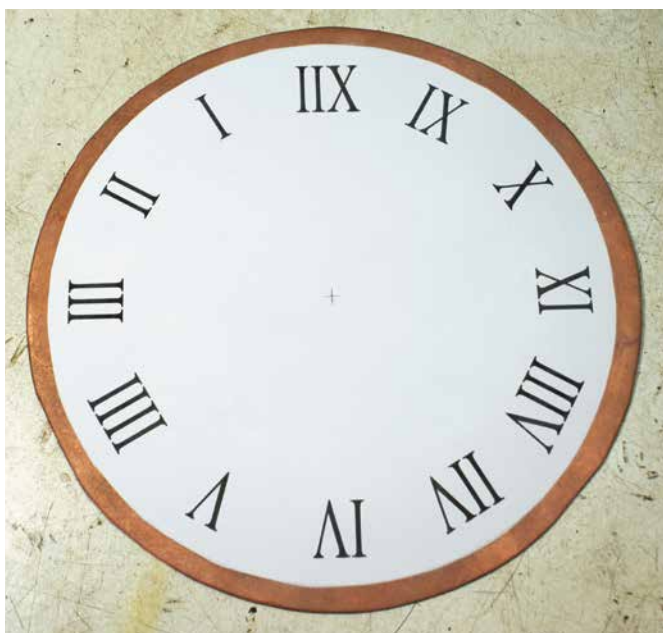


Figure 7. The paper design on the copper disc.



Figure 6. A range of punches.

The next stage was to start the process of punching the characters, taking care to make all of the features of equal depth, **Figure 9**. This was followed by further work to develop the broad strokes, **Figures 10 and 11**, after which the disc was removed from the pitch, annealed, pickled and remounted the other way up, **Figure 12**.

Work on the front of the piece was carried out with the same set of punches to sharpen the characters, **Figures 13 and 14**. Although the characters were rendered clearer, this process had also resulted in an inconsistent background, which was not desirable.

After discussions with my tutor, I decided to planish the area of the chapter ring to produce a suitable consistent background: a process that was carried out using a punch with the work resting on a steel plate. **Figure 15** shows the process partly completed. **Figure 16** shows the result of planishing the numbers on a polished steel block, using punches from the back of the work, then burnishing them.

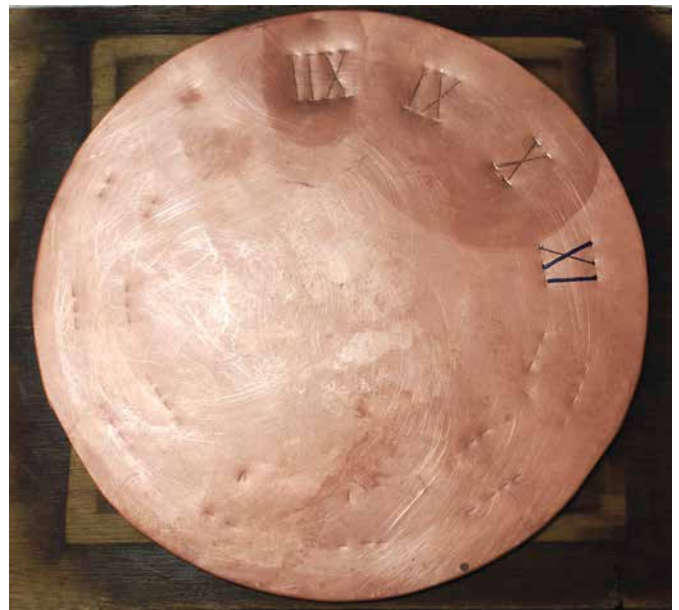


Figure 8. The copper disc on pitch with initial marking in progress.





Figure 9. The disc with the first round of punching complete.



Figure 10. Development of the broad strokes.



Figure 11. The first stage complete.

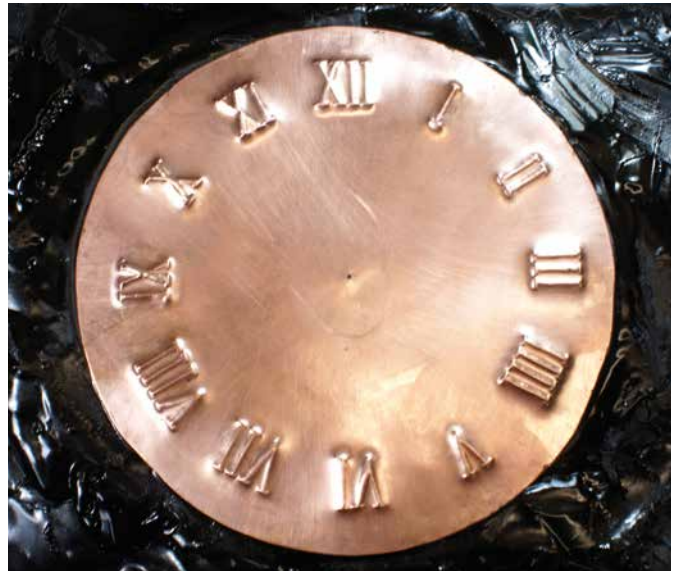


Figure 12. The front of the disc.



Figure 13. How the numbers are sharpened by chasing.



Figure 14. The disc with chasing complete.





Figure 15. Planishing the background on a steel plate.



Figure 16. The numbers planished and burnished.

### ***Finishing the Dial***

Having completed the work on the numerals and chapter ring, I had to consider how to finish the dial. To make it easily readable and to maintain the period appearance, I decided to patinate the chapter ring area.

My choice of patination was matt green using a recipe from the book *The Colouring, Bronzing and Patination of Metals*<sup>3</sup>. This is out of print, but may be found in college libraries and on the internet. The recipe I used was number 3.128.

**Figure 17** shows the final result, with the plate held in an MDF chuck for drilling the central hole and graining the central area, while **Figure 18** shows the dial with a pair of hands in place. Over time I expect that the surfaces will acquire natural patination.

As to those two questions: ‘how hard can it be?’ and ‘what could possibly go wrong?’ the answers I now know to be ‘much harder than it looks’ and ‘lots’. I think that this explains why I could find no examples to copy. Although I am pleased with the result, the effort required is out of proportion to it.

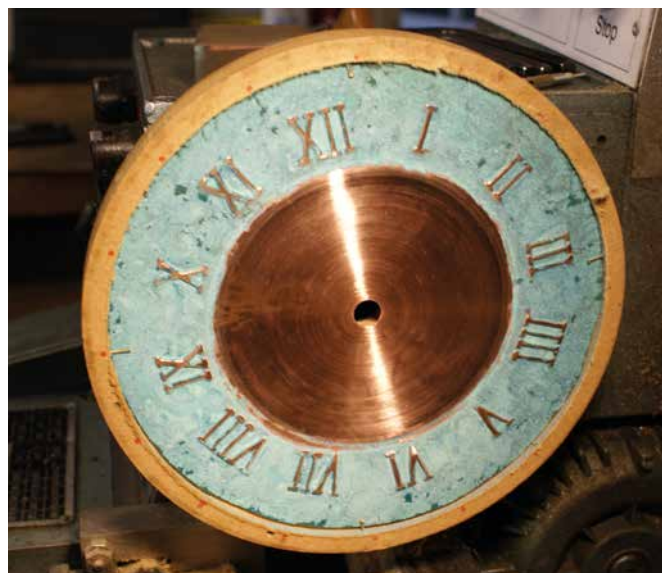


Figure 17. The disc in an MDF chuck to grain the central area.

### REFERENCES:

1. [www.philjordsilverware.co.uk](http://www.philjordsilverware.co.uk).
2. ‘Have nothing in your house that you do not know to be useful, or believe to be beautiful.’
3. *The Colouring, Bronzing and Patination of Metals* by Richard Hughes and Michael Rowe (Thames and Hudson, 1991), ISBN 0-500-01 501-5.



Figure 18. Completed dial with hands.