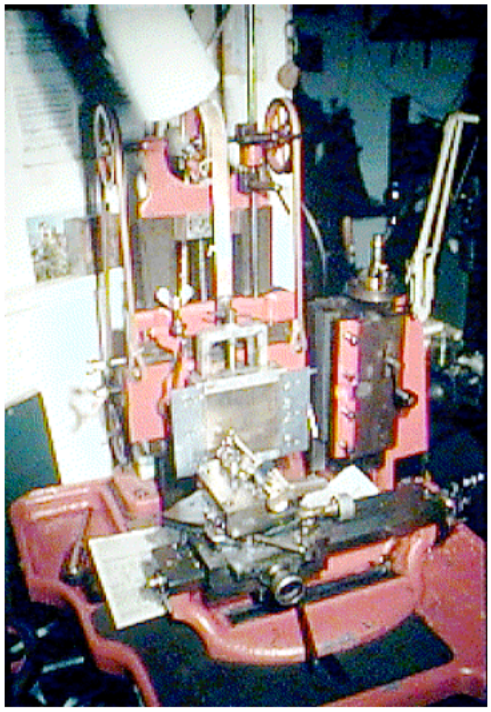
2. *Cutting Lines: The basis of all engine turning*

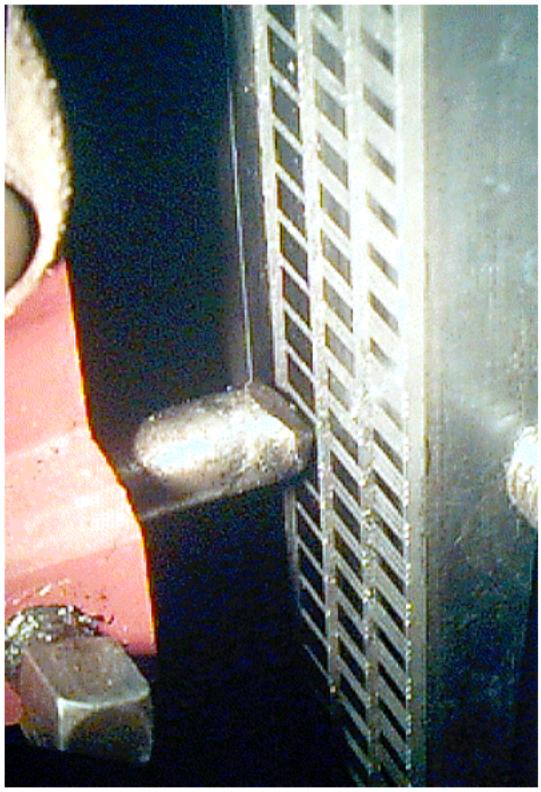
How Multiple and 3D Pattern Bars Work.

Multiple and 3D Pattern Bars

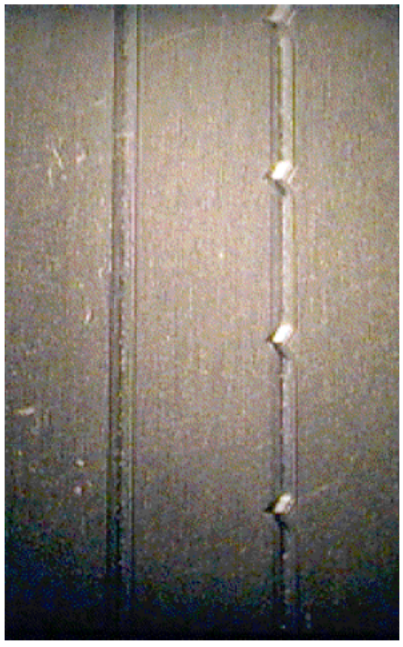
By using a bar with multiple faces, cuts with different profiles can be cut adjacent to each other to build up quite sophisticated patterns. There are bars which can produce the whole alphabet in upper and lower case, though it is very hard to use them without making mistakes! Here a simple bar with three faces plus one plain has been chosen to demonstrate the principle.



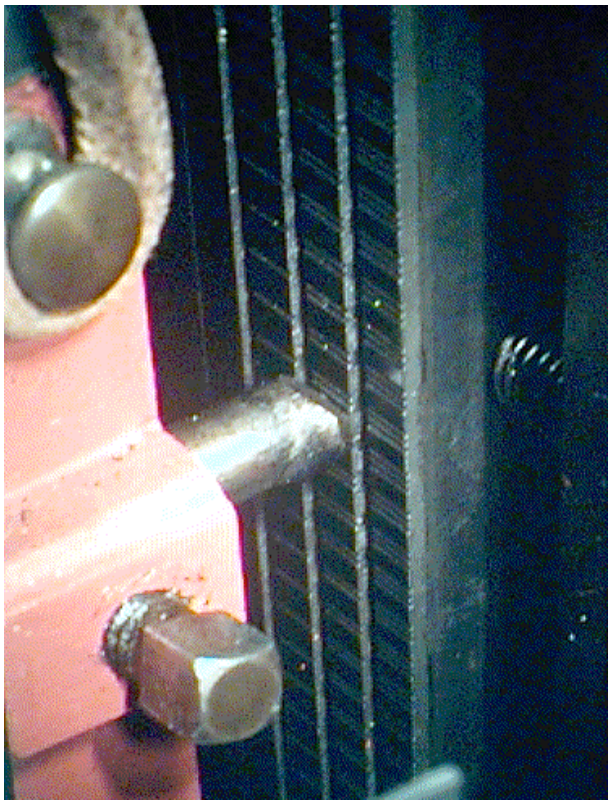
Straight line machine set up for cutting a brass sample plate with a multiple pattern bar held in the clamp on the right of the picture In this example all the cutting will be parallel



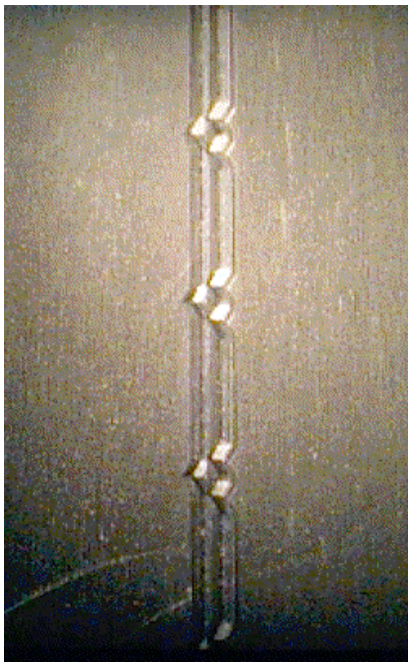
Closer view showing the multiple faced pattern bar Note the design on the bar, which is reflected clearly in this simple example The touch is set at the single notch face and the image below shows the result in a single cut



A first cut, to the right of the single straight line cut earlier, from the single notch face on the multiple bar Note that the guide mark can be seen running close to the right edge of the vee cuts The guide mark is the evidence that full depth of cut has been maintained Work to minimize the guide mark being visible on a finished piece

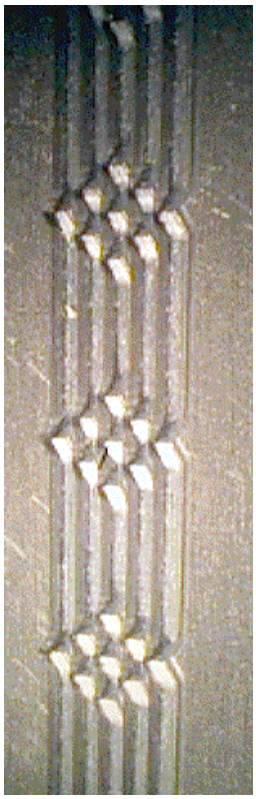


The pattern bar has now been moved horizontally away from the operator to bring the double notch face in line with the touch As a guide to scale, the width of each individual vee cut - i e the pitch set on the sliderest ratchet - in this set of images is 0 45mm (018 inch), a typical size for many engine turning jobs, chosen for ease of centring the pattern because it is 16 teeth out of 64 on a 14 tpi sliderest

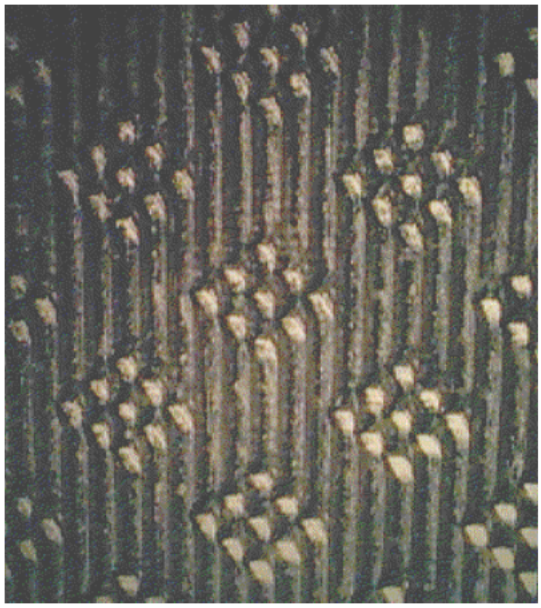


The Sliderest has been advanced to the right and a second cut has been made

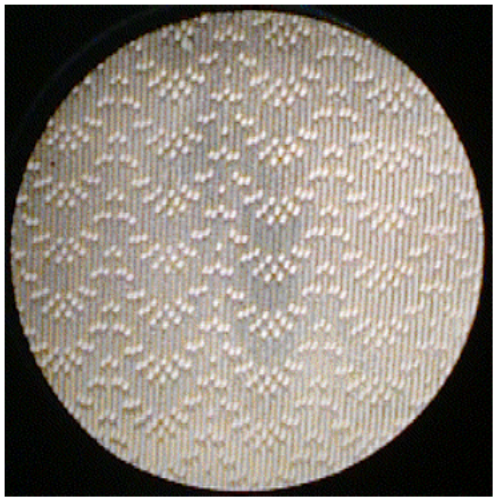
The third cut on tripple notch



Two more cuts, each on the next face back, double then single notch, complete the diamond shape for the repeating pattern

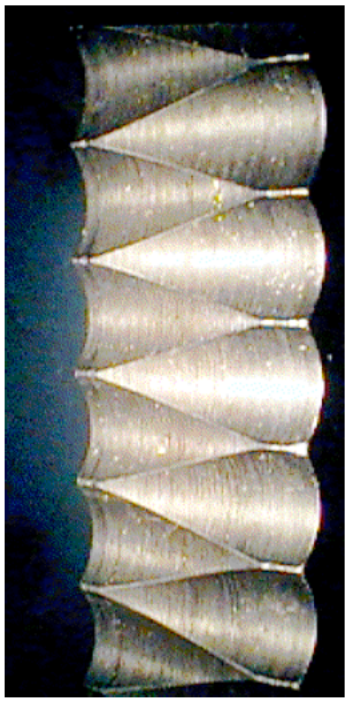


The pattern has now been crossed by half its vertical length and repeated to make a diamond stipple pattern

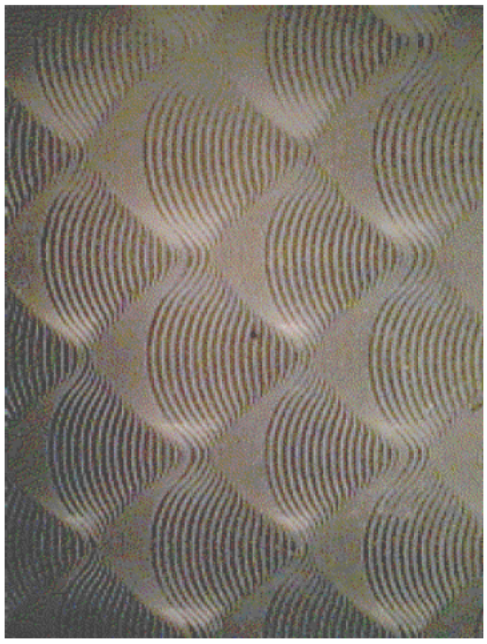


With imagination, the use of the notched multiple bars can create many lovely effects This is a drape stipple made from a bar similar to the first two faces of the bar shown above

A Stage Further: Fully 3D Pattern Bars



Taking the principle of multiple pattern bars further is the 3D pattern bar The touch is ball ended and allows for complex shapes and even images to be created This example is a quite simple repetitive shape



By moving the pattern bar horizontally compared to the touch in the same way as with a multiple pattern bar, but in this case just a small movement per cut and using a ball shaped touch rather than the usual blunt or sharp chisel profile, with a 3D bar the pattern begins to make the engraved surface look three dimensional