

subtle adjustments of pressure and tilt. Attempt to remain relaxed as you cut, keeping your shoulder and arm muscles loose.

If the graver is properly sharpened it will slide through even tough metal relatively easily. If you are driving the tool with brute force something is wrong and the tool probably needs to be resharpened. Recognize this as a necessary part of the process and stop as soon as it is needed. Again think of a pencil - if the point has gone dull there is nothing for it but to stop and sharpen it!

To learn engraving, prepare many panels of copper or aluminum roughly 40 x 40 mm (1.5 x 1.5 inches) and 1.5 to 2 mm thick (16-12 gauge B&S). Secure a piece to a pitch stick or in a gravers block and practice making straight parallel lines such as shown in the top row of samples in figure below. Avoid the temptation to "scoop" with the tool, allowing it instead to glide along its path. Stop when you get weary and return fresh another day.

Engraving exercises Next test your skills at making curved lines, following the patterns shown in the second row of the illustration. Strive for smooth curves and consistent line width. You will find this easiest if the metal plate is moving into the graver as the tool is sliding across the metal.

Finally, train yourself to create a cut line that goes from narrow to broad and back to narrow again.

This "line of beauty" is a staple of engraving and will justify whatever time it takes to learn it. Some people make the cut in two stages, cutting a thin line first, then recutting over the same line, this time rolling the



graver over slightly onto its side to broaden the line. The tool is rolled and pressed forward in a smooth motion, then straightened gradually to return to a narrow line.

The samples in the bottom row of figure above offer some examples of patterns to be cut.

Having mastered these strokes you will be able to assemble them into almost any pattern. Figures below show some examples of decorative engraving intended to inspire your practice.

### Engraved Object

Engraved object / Designs for machine engraving

### Engine turning

This technique can be thought of as an extension of engraving in that a sharpened steel tool is used to cut away small bits of metal to create decorative patterns. The principal difference is that the work is guided under the tool by a machine set up in such a way that it produces regular, often repetitious strokes. The results, are hypnotically rich. Though rarely seen today outside of museums, the elaborate machines, called rose engines, that were developed.



The technique can be used to carve forms, for instance in plastic or ivory, but our focus here will be on its decorative use on flat surfaces. The technique is especially appropriate for decorative boxes, watch cases, writing implements, and similar objects that will be handled because the decorated surfaces disguise wear better than smooth surfaces. Transparent enamels appear very precious indeed upon engine turned surfaces.

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