

Shop Notes: Jewelry

Miscellaneous 1



Richard Austin (1936-1990) was a metalsmith and author, with several hundred articles to his credit.

After his death I was given custody of an extensive collection of manuscript material-mostly on the technical issues of metalworking.

This text represents the first effort to organize the material-an attempt merely to group the files by topic. None of this is finished, and the text makes reference to illustrations that were never done-illustrations which were stored separately in any case, making it extremely difficult to bring the parts together.

It is unlikely that I will ever be able to spend the time to sort this all out. But it seemed a shame to let these articles languish unread by those who might benefit from them in some small way. So I have decided to release them in their roughly sorted form in the hopes that someone may find them useful.

This information is provided without warranty of any kind. No liability for its use will be assumed by the publisher. It is provided purely as an historic document.

the carving wax and the stone. No particular care is required and no harm is done if the wax covers a portion of the stone above the girdle. Wax is also flooded in from the back of the model. Next, the wax is carved down to the girdle of the stone.

At this point any attempt to remove the stone by force might damage the wax model. However, if the work is placed in a refrigerator freezing compartment for a few minutes the stone will either fall out or you can force it out using a tooth pick through the hole in the bottom. This approach is not recommended for stones which are porous enough to be stained by the wax. Also, you should not freeze heat sensitive stones such as opal. In the latter case a little gentle pressure from the back will usually pop the stone out of the wax. If you try to replace the stone in the seat you will find that the seat is slightly too small due to the wax shrinkage. Therefore, the next step is to polish the wax seat with eucalyptal or a wax solvent/polish to remove a small amount of the surface. Alternately you can use a small sharp tool to scrape away a few thousandths of an inch of the wax surface. The completed stone seat may then be incorporated in the jewelry model in any desired fashion. This technique is very useful for preparing mountings for tumbled stones. Another variation of the method is to hand press soft sheet wax around the stone and form the stone seat. Most sheet waxes have more "tack" and may be difficult to remove.

Prongs - Once the stone seat is complete it's usually easy to add prongs to the model. Generally you should cast your prongs in place in any situation where they are reasonably accessible for later finishing.

If they are inaccessible the work should be broken down into smaller elements for assembly after casting or the prongs should be soldered in place in the final work. The following sketch illustrates a good set of proportions for the final prong. Note that it is blunt and tapered in shape. This form will be slightly rounded or softened during polishing. To achieve this shape I usually cast the prongs in a rectangular cross section of fairly uniform dimensions. The real secret of the process is to make the prong models out of a material which will stand the heat of being fused to the basic model. There are at least three good materials for this application; balsa wood, plastic, or hard (high melting point) wax. The wood and plastic will be considered in later chapters. The first step in adding wax prongs is to prepare a thin strip of wax 1/4" to 3/8" wide. I usually just saw a small slab about 1" x 1/4" and about 1mm thick. The slab should be filed to about 1/2mm thick and smooth on both sides. As you thin the wax it will tend to bend and become irregular in thickness. If you support the slab on a flat surface you should be able to produce a smooth uniform surface. Next use a jeweler's saw to slice strips off your slab. These should be roughly 1mm wide.

I usually apply the prongs to the model with the stone in place. Put a tiny ball of sticky wax on the tip of a prong and press it in place on the model. Touch the joint lightly with a heated awl to fuse the joint. Next add a little inlay wax with a heated spatula to build up the prong base. Remove the stone and use a heated spatula to smooth the inside of junction between the prong and the base. Use a small knife to trim away any excess inlay wax.

Finally, cut the prongs down to approximate length with the heated spatula. A

Wax Turning - Over the years I observed that my students almost invariably shied away from making mountings for small stones. From an economical and esthetic viewpoint I always considered this a little sad. There are many small cabochon and faceted stones on the market at very reasonable prices which can add a good deal of style and color to any project. For a long time, my own solution was to use commercial, stamped bezel cups or the various small prong mounts available. I soldered these in place as required. After awhile I began fooling around with turning small parts on a lathe. The wax parts were OK but the technique was not too useful. It required a lathe, set up took a long time, the process was inflexible and real skill was required. As is so often the case the answer was really easy. Why not free-hand turn the parts in an ordinary jeweler's hand held power tool. Once I hit on this approach the technique evolved rapidly.

Flexible shaft units, hand held motor drives or small horizontal carving-polishing units may be used. I have found that a flexible shaft unit with a foot power control is easiest to use. Basically, you attach a block of wax to a large headed roofing nail, chuck it up and hold various tools against the spinning wax. The following stepwise directions should help you get started:

1. Wax Block - Begin with an oversize wax block for a blank. Don't try to measure too closely since that just means you will have to center the work very carefully.

2. Mounting - I have made a special set of tools for this operation but all you really need is a large headed roofing nail cut to about 1/2" in length. The less material that protrudes from the chuck or handpiece the better. Heat the nail and the wax block and fuse them together. Flow inlay wax over the joint and allow to cool.
3. Roughing Out - Use a coarse flat file to shape the wax to a slightly tapered octagonal section. Chuck up the part and start turning slowly. Hold a graving tool against the turning block until it is round.
4. Shaping - The final outside shape can be developed with graving tools or files. If you wish to make a hollow form you can hold ball shaped cutters in your hand and use them to work out the inside of your shapes.

The photos illustrate the general steps involved and the following drawings show how turned shapes may be finished into prong mounts for small stones.

Polishing - This is a good time to stop and talk about the general subject of wax polishing. Since every detail of the wax model will reappear in the final casting, it's important to achieve a good finish on the final wax model. Although in some situations the charm or character of the investment casting is obtained by texturing the wax, there are cases where the jewelry requires a highly polished final finish. In these cases a wax polish is very useful. For many years, I used Eucalyptol in my own shop. This material seems to

work for almost all kinds of the waxes used in jewelry modeling. However, it should be applied sparingly since it can actually soften the surface of the waxes to a great depth. Generally Eucalyptol is applied with a soft cotton cloth which has been moistened but not saturated with the material. The softening action can be stopped by wiping the wax model with acetone after polishing is complete. There are also a number of commercial wax polishing compounds. I've tried several of these and they all seem to give a reasonably satisfactory results. In all cases you will find that the polishes have various effects on different waxes. That is, essentially some waxes seem to be more soluble than others.

Another good technique can be borrowed from the candle makers. Lightly buff the work with a women's nylon stocking. This can be used to bring the wax to a very high lustre. A plain cotton cloth can also be used to polish many waxes. If the material tends to soften and smear, try doing the polishing under a flow of cold running water. One other specific situation is worth discussion. If you wish to structure a surface which is going to be flat and highly polished, it's very difficult to build such a surface from wax. First of all, it's hard to bring the wax to a smooth surface, and if you do succeed in filing it or sanding it to a flat plane, the use of the wax polishing agents will tend to cause slight ripples or dulling of the edges. In cases where I'm trying to achieve a large smooth polished surface in a casting I generally go to a material such as acrylic or polystyrene. This can actually be buffed if you desire and it can be maintained in a very flat plane.

The complete model can be carved from plastic, or plastic sheet may be used for the flat areas.