

Manufacturing Platinum Wire By Hand

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Working with platinum is not as difficult as many people believe. My experiences have been through a series of trial and error. I transferred what I've learned in the past about working with gold and silver to platinum. I read as much as possible about working with platinum. Though platinum has many different characteristics compared to that of other metals. Platinum by far is my most favorite metal to work with.

Preparation

Melting, annealing and casting platinum is very different from gold and silver alloys. Platinum alloys are oxidation resistant, formable and easily anneal. It is very important to maintain cleanliness to avoid contamination, which leads the platinum to become brittle. For the most part, when drawing platinum wire in small quantities you will be cold working. Keep all tooling clean. Do not use excess lubrication. Keep roll surfaces and dies highly polished. Clean drawplates of beeswax, other lubricates and metal particles that could damage a high finish. Make sure annealing are free from other metal particles.

Tools

The following are tools and materials you will need to manufacture platinum wire: a cylindrical block of steel¹ or an anvil, drawplate², drawtongs, rolling mill³, two-pound mallet⁴, Wesco platinum crucible⁵, 12" to 18" long multi-port tip torch⁶ with propane and oxygen mixture capable of melting platinum and standard

welding equipment(eye protection apron and gloves).

Cleaning & Melting

Start by pickling the platinum in a mild nitric acid for at least 15 minutes. This will avoid cross-contamination from residual materials. Melt the platinum using the force of the flame to stir the metal. Make sure that platinum is completely molten. Let it cool for about 20 to 35 seconds and then quench the crucible in water. You will now have separated the platinum from the crucible. Grind or file off thoroughly the silica stuck on the moon-like craters on the bottom of the metal. Place the platinum button with the craters facing upwards on the reverse side of the crucible⁷.

Take the torch and heat the button until the surfaces becomes molten. This is to eliminate the surface pits and to push silica to the edge. Use a circular motion with the flame until all the pits and surface holes are filled. Take caution not to over melt the platinum. You should now have a smooth surface on the platinum button.



Figure 1: Cylindrical block of steel.



Figure 2: Drawplate and drawbench.

Forming

Quickly move the button with a pair of tongs to the steel block and start hammering the button to a rectangle rod⁸. When the platinum button has been reduced 50 percent of the button size, anneal it. Heat the platinum to a bright red and hammer it again to the desired shape. After forming the rectangular shape, heat the platinum so that the surface is smooth at all sides, taking caution not to over-melt the platinum.

Rolling

The platinum can now be rolled down into the wire side of the rolling mill⁹. A few notes when rolling: roll in the same direction as started, reduce the rolling mill about 1 millimeter per pass (all side of the square). Roll the platinum until you achieve the approximate desired size wire.

Drawing

Before drawing, us explore as we examine the current state of

the US platinum jewelry market and where it might be headed in the future. explore as we examine the current state of the US platinum jewelry market and where it might be headed in the future.e a bright blue oxidizing flame to anneal the platinum¹⁰. To avoid damage to the drawplate openings, the wire should be clean and free of residual firescale which can result in a defective draw, scratched wire. Mount the drawplate in its longitudinal direction clamped horizontally to a vise on a well

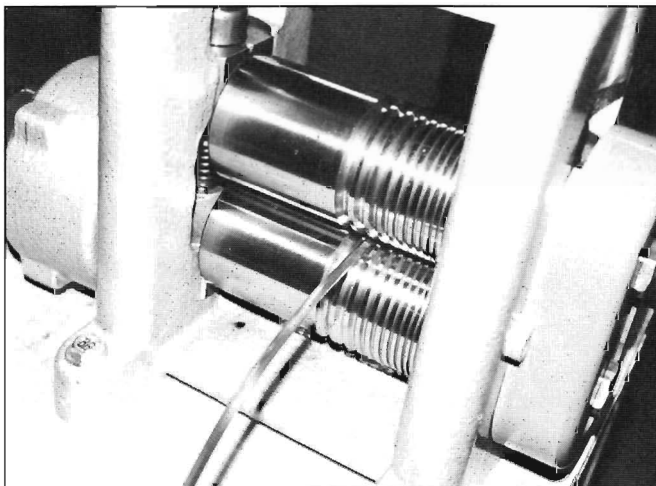


Figure 3: Rolling Mill.



Figure 4: Mallet.



Figure 5: Wesco crucible with handle.

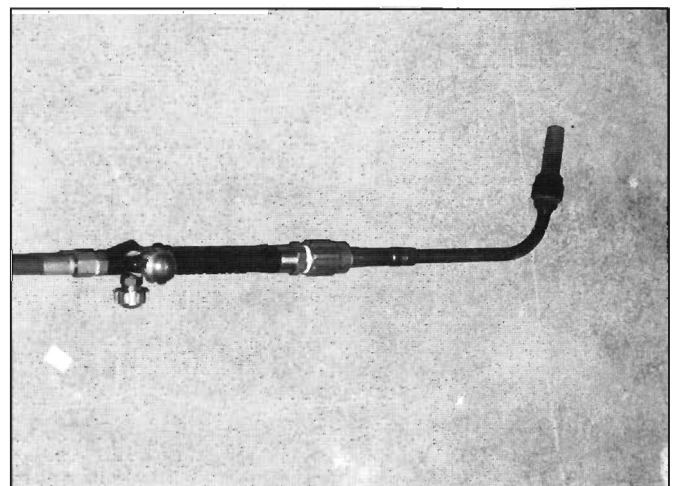


Figure 6: Multi-port tip torch.

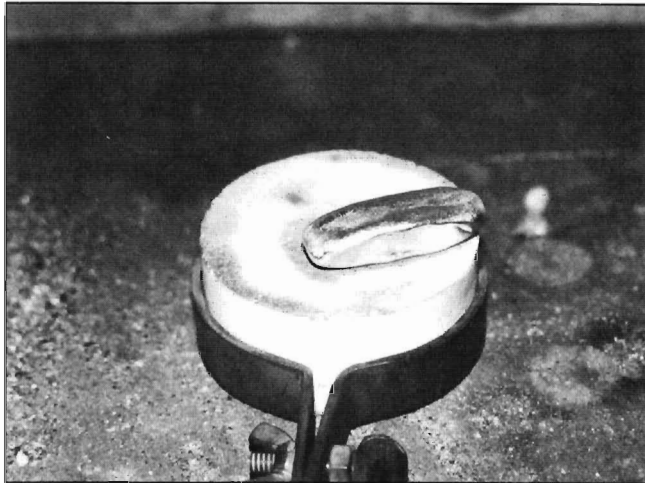


Figure 7: Using the reverse side of the crucible as a stand.

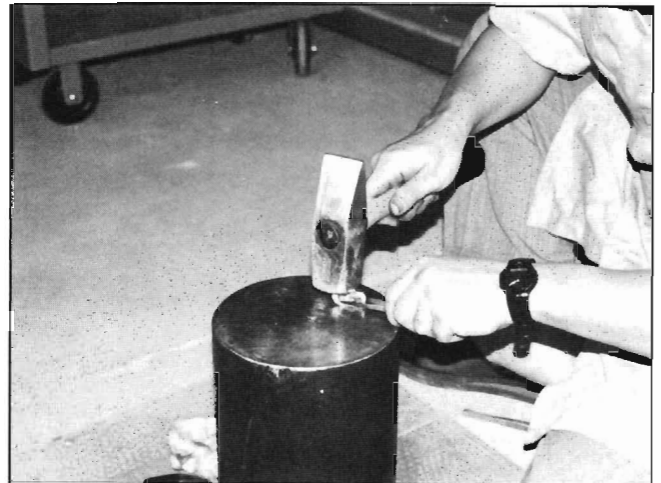


Figure 8: Hammering the button.

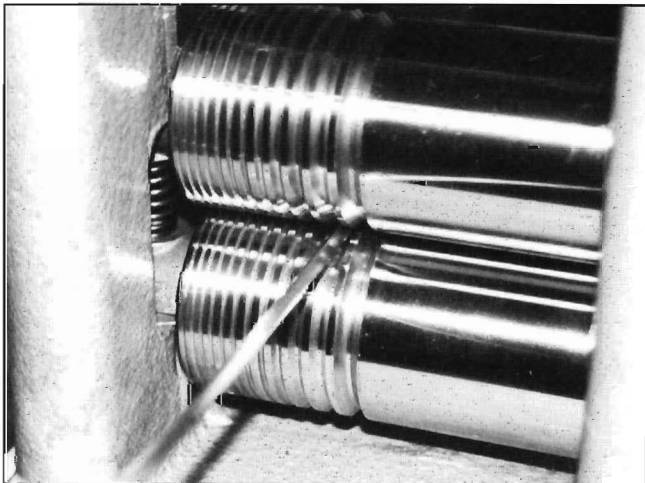


Figure 9: Rolling into wire.

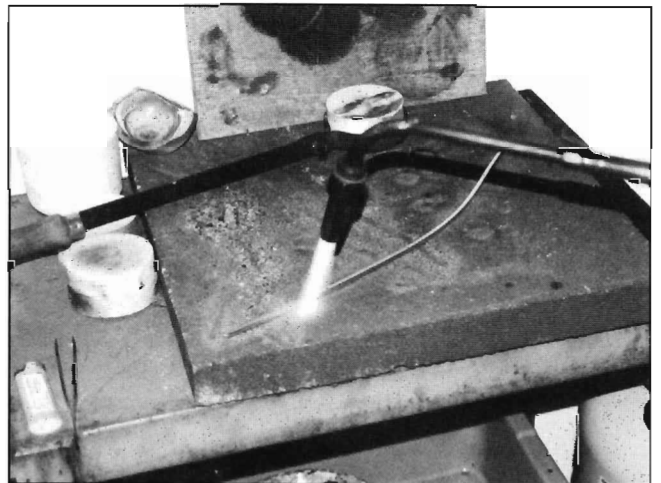


Figure 10: Annealing the reduced wire.



Figure 11: Tapering the wire.



Figure 12: Coiled wire.

anchored bench. The drawplate must be mounted at hand-pulling level.

The first step in drawing wire is the forming of a tapered shape at one end of the wire so that it can pass through the beginning hole of the drawplate. The tapered wire¹¹ should protrude at least 1/4 inch at the drawplate's face so that it can be pulled without breaking off. Lubricate the wire with beeswax or Bur-Life.

Grasp the wire with a drawplate tong or drawtong and pull the wire through. It is important to draw perpendicular to the drawplate and avoid jerky pulls. Damage will occur if the wire is drawn at an angle. Remember to draw the wire all the way through. Re-file the tapered end if it breaks off. Repeat the drawing process successively passing through the openings until you have reached your desired size.

Final

Anneal the finished platinum wire in a coiled form.¹² In the process of annealing you are also burning off the wax on the platinum. The platinum can be air cooled or quenched in water after annealing.