Fabricating Metal Hardware for a Chinese-Inspired Cabinet

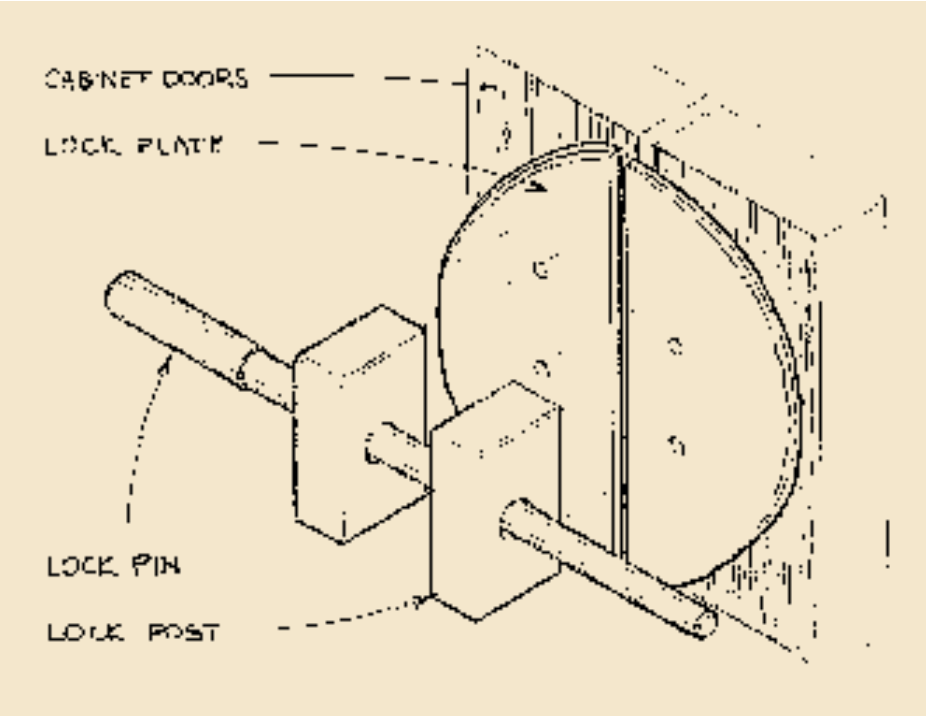
BY THEA GRAY

I was a typical child with atypical furniture, spreading crafts projects out on the Ming Dynasty bridal chest, and putting my feet up on the low table made of *huanghuali* (pronounced "wong wally"). My paternal grandfather was a journalist, and he traveled the world with his wife and three young children. While living in China for a few years, they had the good sense to acquire some beautiful antiques made of *huanghuali*, commonly known as yellow Rosewood.

I didn't know, then, how lucky I was to be able to observe, up close, furniture usually consigned to museums. But while I may not have appreciated the furniture for its history and age, I did, through exposure and observation, recognize the beauty of the forms and the simplicity and strength of the design. When, years later, it was time to design my first piece of furniture at the College of the Redwood's Fine Woodworking program, I naturally turned to the furniture of my childhood for inspiration.

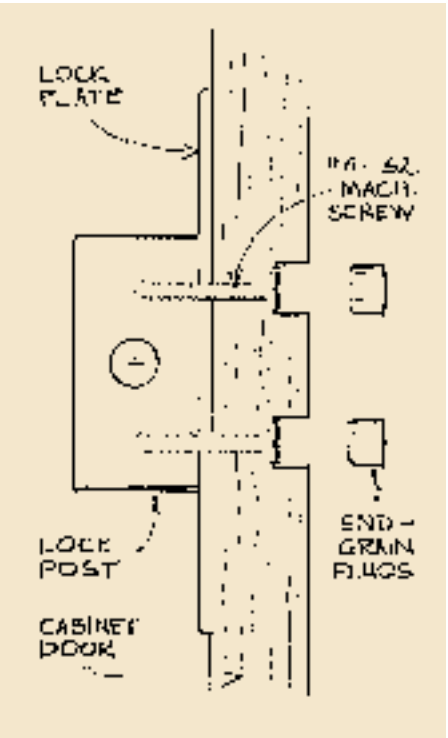
A prominent feature of much Asian furniture, particularly cabinets, is the hardware. While the scale of my piece (which I came to call "Little Tough Guy" for its somewhat robust proportions) was small, I felt that it required distinctive hardware to serve as its focal point. I began to do research, spending hours examining photos of hardware in books on Chinese furniture, such as the wonderful reference *Classic Chinese Furniture* by Wang Shixiang, and the journals from the Classical Chinese Furniture Society, whose excellent collection has lamentably been dispersed at auction. My chest, with two exterior doors and three interior drawers, would need a variety of fittings. I planned to turn some simple pulls for the drawers on a miniature metal lathe, but the exterior hardware proved to be more of a challenge.

I had spent a lot of time as a child playing with the locks on the family furniture. Often in the shapes of animals, Chinese locks are endlessly amusing—at least to a child—and I wanted to provide the same potential for fun and ceremony by requiring anyone who approached my cabinet to undo a lock or pull a pin. Along with a cabinet which we had at home, the hardware shown in the books I looked at inspired



me to create an ovoid lockplate with square lockposts, which would serve both as handles and as mortises to accept the lockpin. A traditional Chinese lock could also slip through the lockposts to fasten the doors tight, and the ovoid lockplate would complement the small round pulls for the drawers.

I considered and rejected many techniques in my search for the appropriate method to create hardware for my cabinet. One issue of the *Journal of the Classical Chinese Furniture Society* contained the article "Uniting Elegance and Utility: Metal Mounts on Chinese Furniture" by Curtis Evarts, in which he revealed the composition of most of the hardware used on Ming Dynasty furniture: a copper-nickel-zinc alloy known in the West as "paktong." The composition of paktong used on Ming Dynasty furniture varied widely, suggesting the use of natural ores. Tests on old pieces of paktong hardware revealed ranges of proportions, in which copper varies from 40-60%, zinc 22-45% and nickel 6-36%.



Knowing paktong's composition intrigued me, and I carefully studied the photographs in the article which illustrated the traditional sand-casting process used for many hardware parts, including lockposts. In the end, the prospect of casting seemed too daunting, and so instead I considered altering store-bought hardware. I purchased some aluminum tansu hardware which had been used on a fellow student's small jewelry chest to great effect, but once the black enamel paint was sanded off, the weight and feel didn't match my expectations, and I was on the hunt again.

It was not possible to find paktong in the States, but Evart's article suggested a serviceable substitute: nickel silver. In modern-day nickel silver, the proportions of the alloy's elements are dialed in more tightly than paktong, with copper generally coming in at 65%, zinc 17-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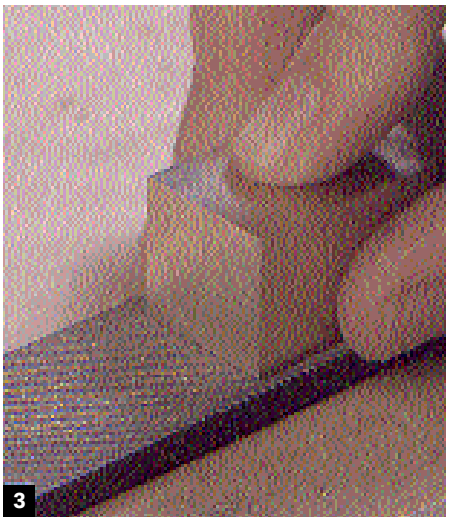
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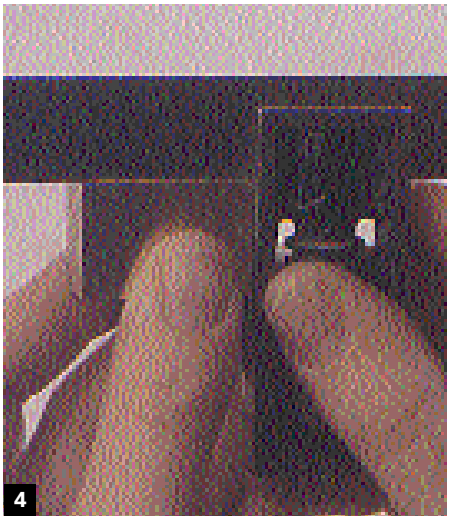
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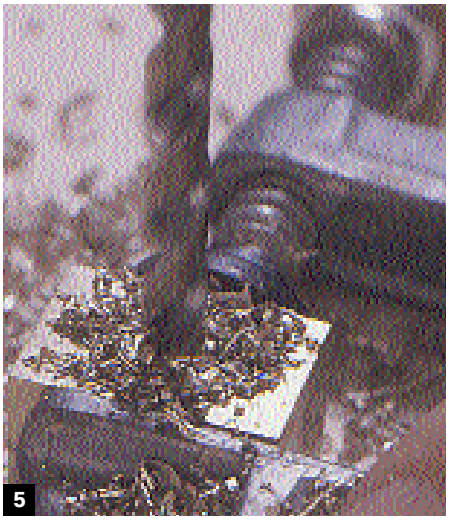
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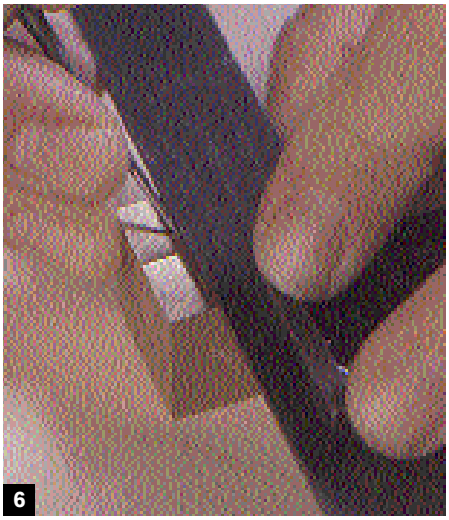
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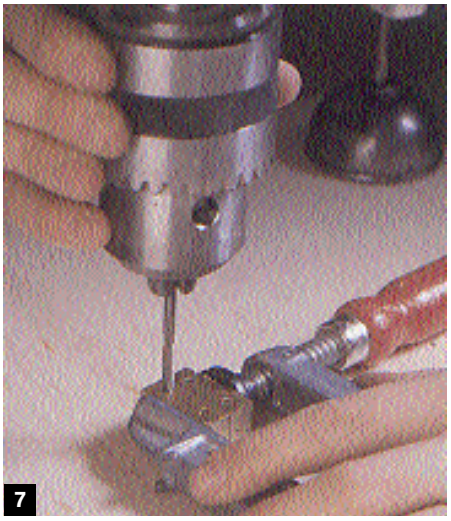
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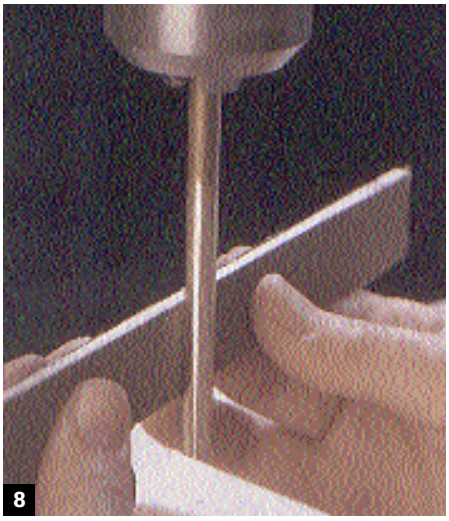
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ALL PHOTOS ON THIS SPREAD BY DAVID MEHLAND

23% and nickel 18-12%. In search of nickel silver, I called all over the San Francisco Bay Area, to jeweler's supply stores, metal suppliers and any other likely-looking place I could find in the phone book, but the thickest sheet stock I could find was 8-gauge, approximately 3/16" thick. With no thick nickel silver available to craft the hardware from solid stock, I flirted briefly with the idea of attempting some hollow fabrication in either sterling or nickel silver, but dropped the idea as I realized that my soldering skills were rusty, and time constraints wouldn't allow me to brush up on them. Finally, it became apparent that my best option was to make the hardware out of solid brass, and either patina it, as many of my friends did with their pulls, or have it plated.

Once I settled on the solid stock construction, manufacturing the hardware was relatively simple. I bought some thin stock for the lockplates, some

thicker brass for the lockposts, and brass rod for the lockpin. Rather than solder the posts to the plates, I decided that since the plates needed to be affixed to the doors anyway, I would simply sandwich the lockplate between the lockpost and the door. Screws fitting in holes drilled and tapped into the back of the posts would hold the posts to the plates, and the plates to the doors.

I started cutting each half of the lockplate's ovoid shape with a jeweler's saw, but soon abandoned that slower technique for the bandsaw, which I also used to cut out the two lockposts (1). To make sure all matching pieces were identical, I stuck the two lockposts together with doublestick tape, and did the same with the lockplates.

I placed the lockplates in a vise and smoothed out their bandsawed edge with a series of successively finer files (2). To make the lockposts true and square, I laid a file on my bench and ran the pieces over it (3), which is easier than holding the file in your hands and trying to prevent yourself from accidentally putting a curve into what is supposed to be a flat side. I checked my progress with my square (4), and used a finer file to smooth out the surface when I had achieved the proper proportions.

With the lockposts still stuck together, I carefully drilled a 1/4" hole through their sides for the lockpin (5), making sure to use enough oil and to back out the brass shavings in order to keep the drill bit cool and unclogged. Next, using a scribe and a center punch, I marked on the back of each lockpost the position of the two smaller holes (6), which would then be tapped to receive screws to hold the whole works together. I selected the recommended drill bit size stamped on the shank of the tap I had, and following the same precautions as with the 1/4" holes, I drilled these four holes slowly, and with enough oil to keep everything nicely lubricated.

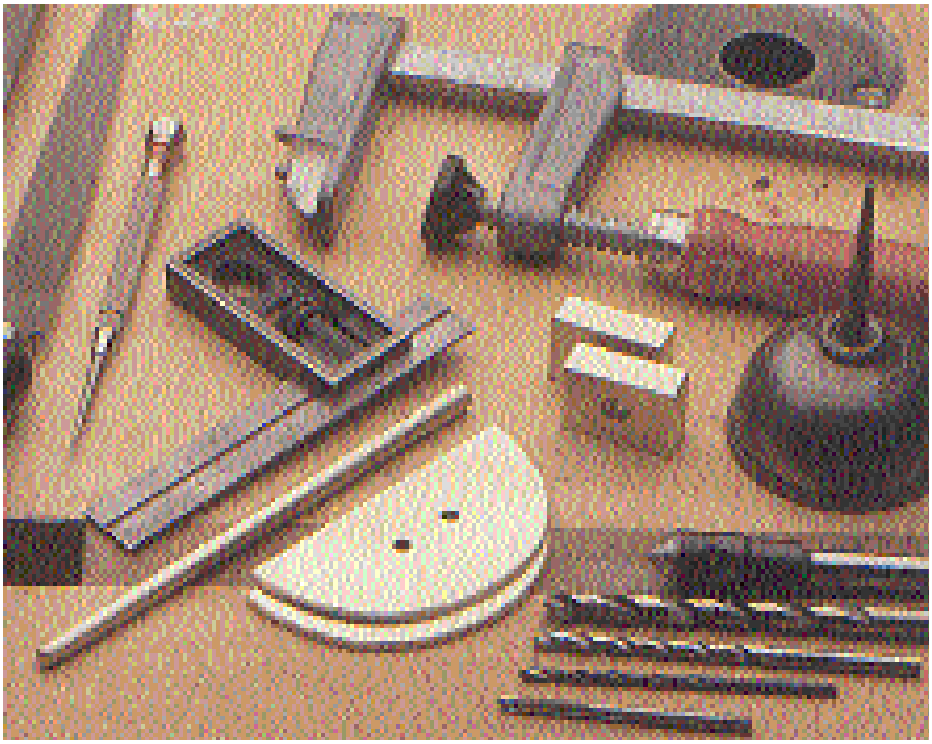
To tap the holes for the screws, I chucked the appropriate-sized tap into the drill press to hold it perfectly vertical. Then, with the drill press off, I worked the tap clockwise by hand down into one of the holes (7), reversing the direction every revolution and a half or so to break the shaving. I recommend using a drill press vise, if you have one available, to hold the pieces you are tapping so that your two hands are free to turn the chuck and lower the quill at the same time.

With all four holes tapped, I then chucked a piece of 1/4" brass rod into the drill press and, with different grits of sandpaper glued to a stick, shaped it to fit inside the posts' holes (8). As much for tactile pleasure as for beauty, I beveled each exposed edge of the lockposts and plates, working from coarse to fine files.

Apart from drilling and tapping holes in the lockposts, the trickiest part of making the lock was correctly marking where to drill holes in the lockplates in order to align them with the lockposts' holes (9). But the lockposts are about three times as wide as the holes drilled into them, which creates a bit of room in case the holes in the plates needed to be enlarged to reposition the posts on the plates.

I sanded all of the pieces to 600-grit to prepare them for the next step, and to clean off any oil from my fingers which might prevent patina or plating from adhering properly. A solvent would also work to eliminate hand oils.

The hardware looked fairly handsome in brass, but I knew that if it was silver-toned it would be more striking against the yellowish-brown Vesi (a species related to Kwila) which I had chosen for the cabinet. I wanted the pulls, hinges, accompanying screws and lock to match, and I made several attempts to hot patina them with silver nitrate by following a recipe I found in *The Coloring, Bronzing, and Patination of Metals,* by Philip Brown. Whether it was my lack of experience or the nature of hot patina work, the results were less consistent than I had hoped for, and after carefully cleaning all of the patina residue off with sandpaper, I brought all of the hardware to a local jeweler to have it plated. I described the effect I wanted: slightly coarser, darker and duller than sterling generally appears. The jeweler plated the pieces twice, and for longer than usual, in order to allow for many years of handling, and he left the fittings unpolished to more closely approximate paktong's look.



CUSTOMIZED BRASS HARDWARE can be fabricated quite readily using a handful of tools and equipment found in most woodshops.

After finishing the cabinet, I attached the hardware, and plugged the holes with small pieces of Vesi endgrain which I turned on a mini-lathe. A small envelope with extra Vesi plugs lives in one of the drawers, in case the hardware ever needs to be removed to be replated.

Thea Gray is a member of Cricket Engine Studios in Oakland, California.