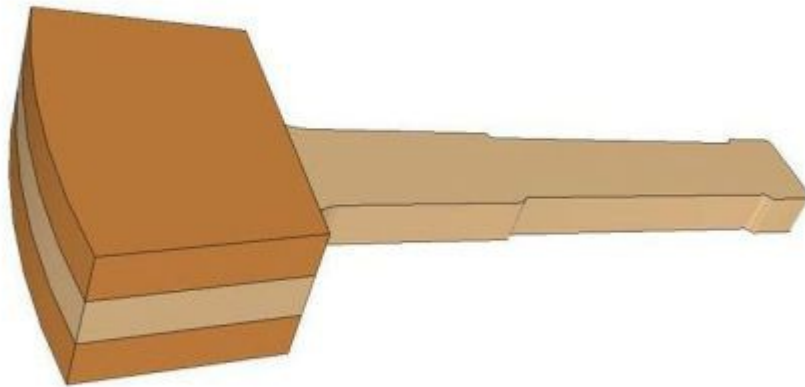
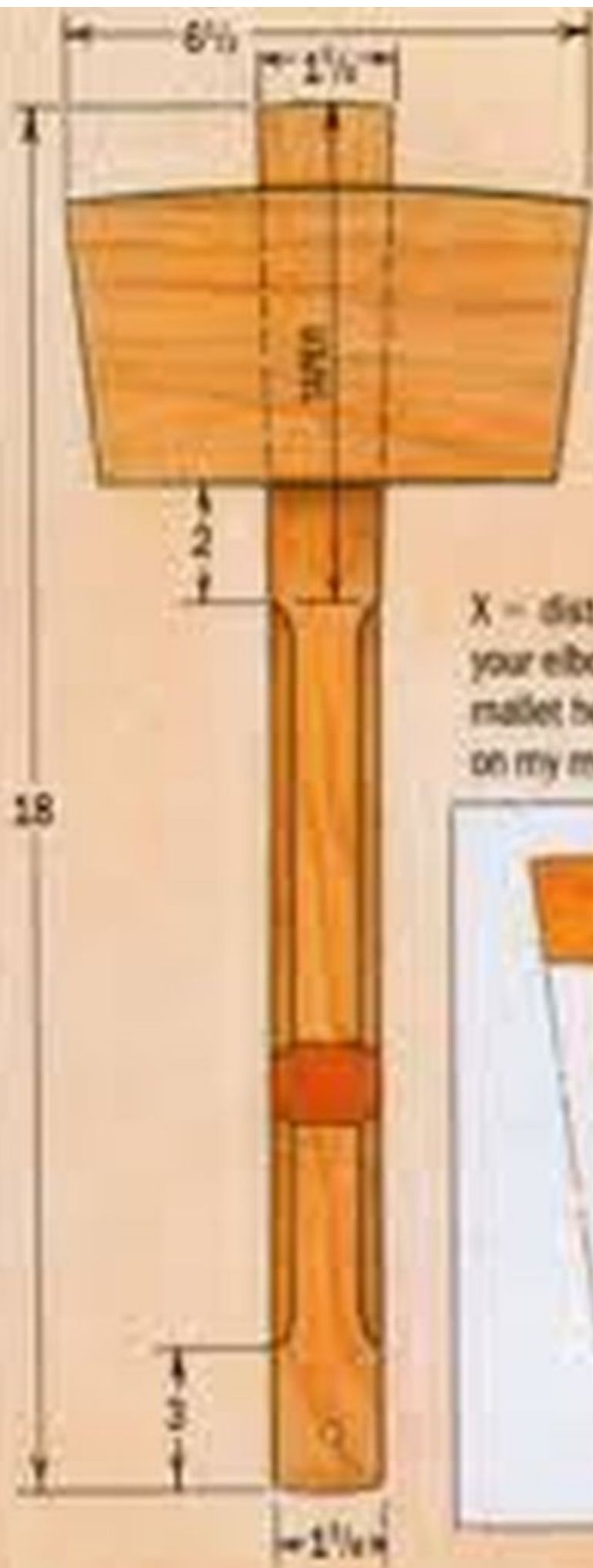


## PLYWOOD MALLET

Slick method of making a mallet - never need to worry about the handle loosening. See my earlier post re ergonomic parameters, apparently you should determine the bevel angle on the striking face based on mallet handle length and the length of your arm from elbow to wrist. Who knew.

With three layers of 3/4" plywood, it's 2-1/4" wide, maybe just add a 1/2" layer on each side if you need something a little beefier - or maybe build in a cavity and fill it with lead shot?. The handle winds up only 3/4" thick, thinking that maybe an additional 1/4" layer on either side would let you get a little more rounded profile to the grip area - easy enough to do though (maybe make patterns to use on the router table) and Baltic Birch plywood would be the way to go.





X = distance from  
your elbow to  
mallet head — 25 in.  
on my model.



## Mallet Head Angle

By [swirt](#) on March 30, 2011 at 6:30 am in [techniques](#), [tools](#)

I've seen this issue come up and get discussed on several forums. A [joiners mallet](#) is pretty simple to make, so it is a quick and satisfying shop project to get one constructed, but then the question arises, "what angle should be put on the head?" This is an important question with advice ranging from "we don't need no stinking angle" to use the angle that allows it to sit flat on a bench. I discovered the answer to this question in a few old Timber Framing books. It makes sense that a Timber Framer would have the answer, as they do more chiseling than most woodworkers, and certainly heavier chiseling than all. I'll get to the answer to how much angle it should have in a bit. First lets put a mallet together.

### **Constructing a Wood Mallet**

Mallets are nice because they can be constructed from scraps in a short period of time. I had a scrap of white oak that I had intended for some chisel handles, but it turned out to be a bit thinner than I wanted, so I decided to use it for mallet handle. I had already shaped it to an octagon to prep it for the lathe when I decided to use it for a mallet handle instead. The corners being knocked off made it a little more challenging to lay out the cuts for the tenon on the handle, but nothing too difficult.



A white oak handle and a chunk of black walnut are ready to become a mallet

Oak and Walnut are probably not the best choices for a mallet. I'd much prefer a handle of Hickory and a head of Osage Orange or something with interlocking grain like Beech, but my scrap pile contains neither of these at the moment.

I set my marking gauge to a bit more than the height of the mallet head and used that to scribe a mark all the way around the handle. This defines the shoulder of the tenon. I want

the handle to extend a bit beyond the mallet head so it can be planed flush once it is assembled.



Scribing the tenon shoulder around the mallet handle.

With the shoulders marked, I mark the position of the tenon cheeks and scribe those on the end grain. I would have also scribed them on the sides, but I had already planed off the corners back when I thought this wood was destined to be a chisel handle.

With the shoulders and cheeks marked, I used a back saw, filed rip, to cut the cheeks.



Cutting the handle tenon cheeks with a rip filed back saw.

As you can see, the back saw does not quite reach deep enough. I had to do the last view strokes with my [small rip-saw](#). It really is perfect for this kind of thing.



Finishing the tenon cheeks with an Atkins 53 rip saw.

With all the cheeks cut down to the shoulder line, I cut the shoulders with the crosscut side of my Ryoba. With the tenon all created, it was time to cut a relief for the wedge. I follow the safe practice of drilling a stop hole in the handle then sawing down to it to create the slot for the wedge. The stop hole helps prevent a split from running farther down the handle and weakening it.



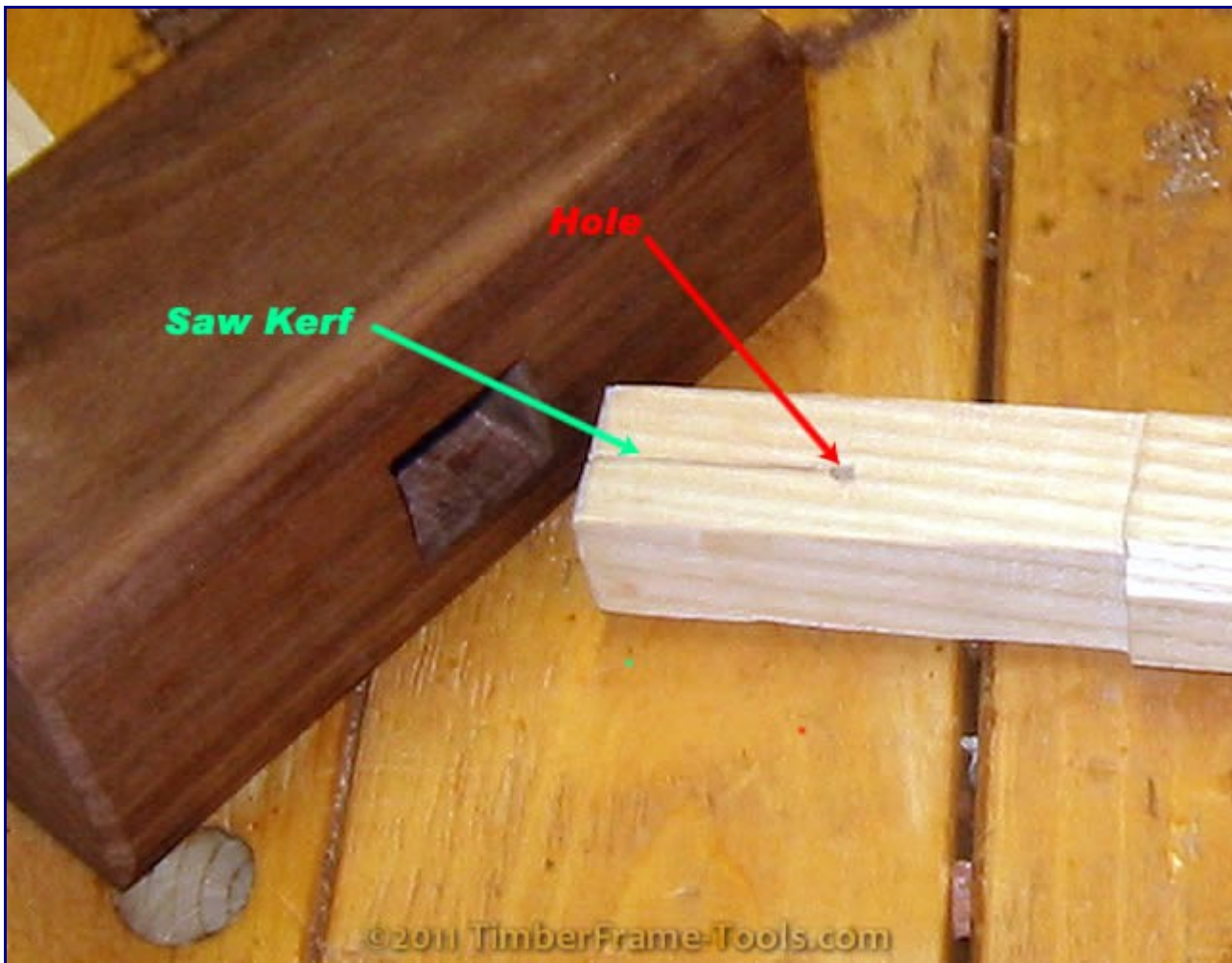
### Drilling the stop hole in the mallet handle

With the stop hole defined, it is a relatively easy cut down the grain to meet the hole. It can be a little tricky to meet the hole on both sides of the cut. To ensure this happens, start the cut on the top corner but then lay the saw down so a surface cut is made with the teeth right to the hole. Then flip the handle around in the vise and repeat the same scoring cut. Being scored on both sides will almost guarantee that your saw will meet the hole as intended.



Sawing the wedge slot in the handle  
The final result should look like this.





Wedge slot with stop hole.

On to laying out the mallet head. After making sure the mallet head sides are at right angles to each other, a few layout lines can be used to mark the center of the bottom. From there the handle tenon can be scribed onto the bottom of the mallet head. It is then pretty simple to use an undersized Forstner bit to remove the majority of the waste from the mortise.



Using a Forstner bit in the drill press to remove the majority of the mortise.

The actual walls of the mortise get squared up with a [chisel](#). Since the chopping is fairly heavy, I use a pair of [handscrews](#) to clamp the mallet head to the workbench top. This way the surface of the workbench takes the impact rather than the bench vise.

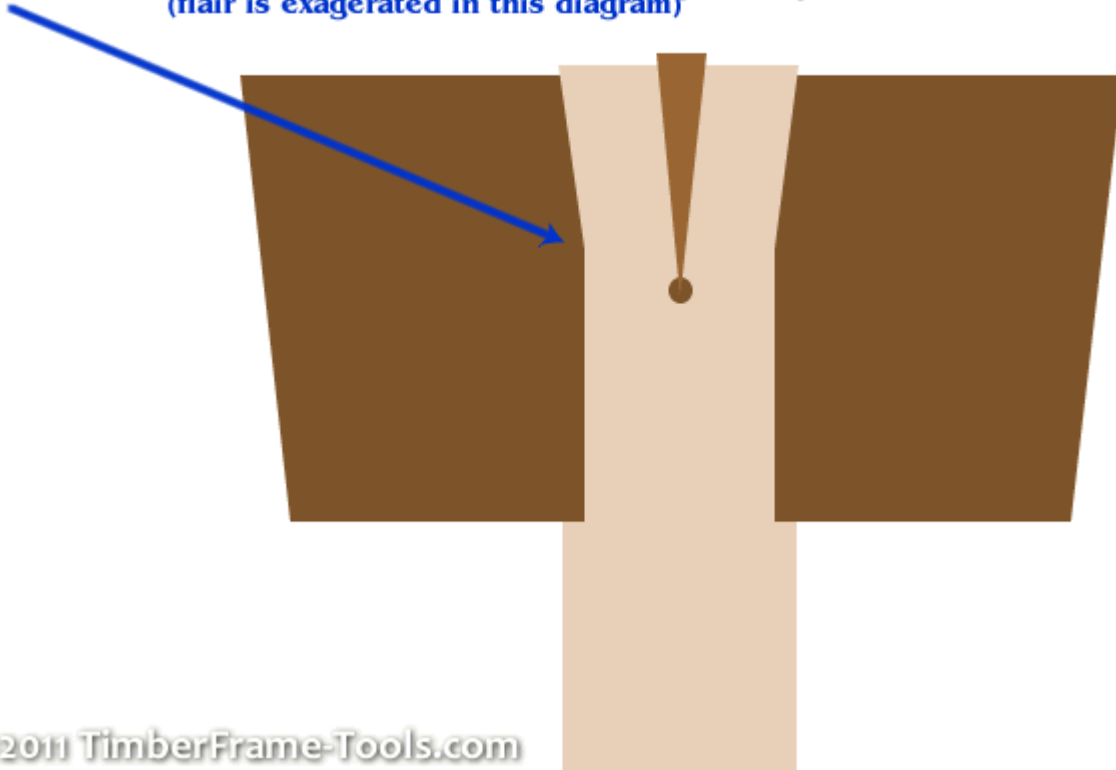


Squaring up the mortise with a chisel.

The mortise does flair out slightly from the midpoint toward the striking faces as you go toward the top of the mallet head. This gives a bit of safety to make sure the handle is wedged in securely once the wedge is driven in.

## Flair the mortise slightly

(flair is exaggerated in this diagram)



The flaired mortise on the hammer head keeps everything locked together securely once the wedge is driven in. Notice that the stop hole in the handle is beneath the flair in the mortise. This helps prevent any further splitting of the handle.

With the mortise complete, the handle can now be inserted. It should fit tight without the wedge, but not require more than a few taps to get it in place. The wedge will do the work of holding it in place.



Here you can see the mortise in the mallet head and the layout lines that created it. I wanted rounded corners on the non-striking faces, so I ran an old hollow plane over the edges a few times until it had the shape I wanted.



Using a hollow plane to radius the corners.

At this point it was time to **temporarily** put it together and get a feel for where I wanted to grip the handle. Unfortunately, I got excited and in a momentary lapse of reason, I pounded the wedge all the way in. (*Grrr that will make things difficult later on.*)



*Don't drive the wedge in place until the absolute LAST step. After this I planed the tenon flush with to the top of the mallet head.*

### **Stringing the Mallet for the Right Angle**

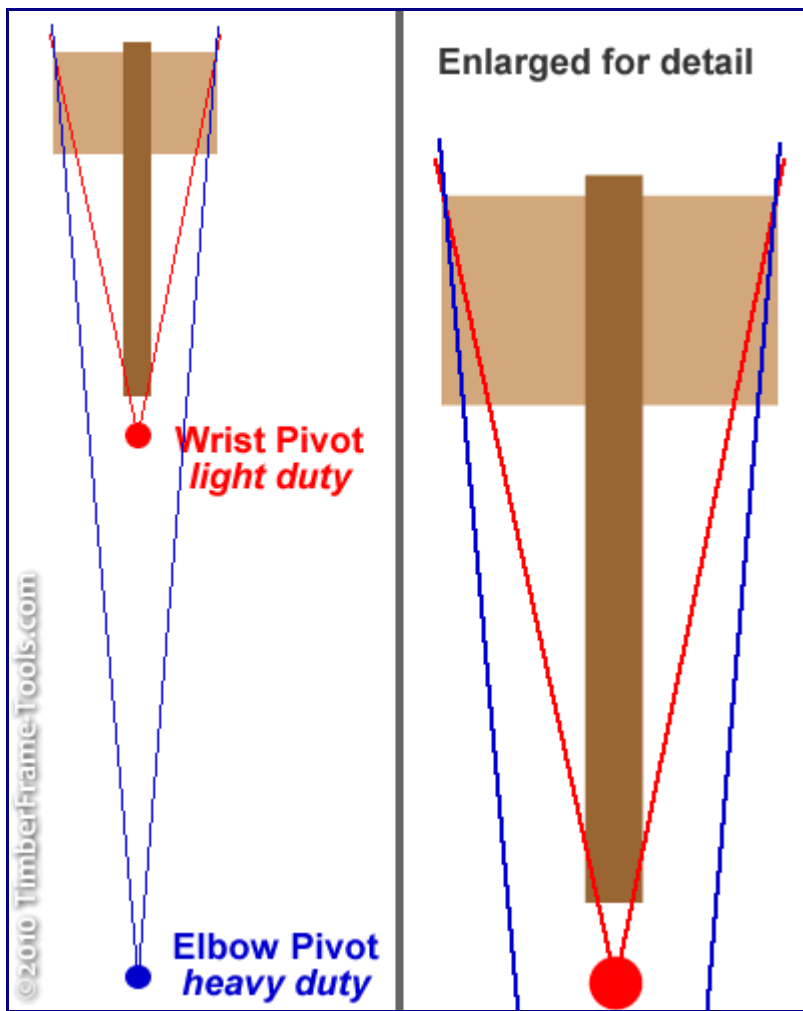
Okay, so now that the basic construction is ready, it is time to get back to the main topic of "What is the proper angle for a mallet head?" The proper angle is based on the idea that a mallet is either swung in an arc from the wrist for light tapping or swung from the elbow for heavier chopping. The other possibility is that it is swung in an arc from the shoulder, but in most cases if you are swinging from the shoulder you are using a two handed approach with a long handle, like a sledge hammer. The basic idea is that any mallet travels in an arc before striking the handle of a chisel. When it strikes the chisel handle, you want the face to be square to the handle (math and physics people would say the chisel handle is "Normal" to the face of the mallet.. If the chisel handle is Normal, then the mallet does not twist and the chisel handle does not get deflected away off its line, which would skew the cut and result in a crooked mortise.



Here you can see the mallet traveling in an arc, and striking the chisel handle straight on.

Fortunately, the method for finding the proper angle for YOUR mallet is easier than describing why it is the proper angle. I emphasize YOUR mallet because the angle is specific to both your mallet and your use of the mallet. You have to decide where you want to grip the mallet and how you plan to swing it. Typically chiseling is done from the elbow, but some fine detail work or carving can be done with the wrist. You can see in the diagram below how the geometry of the head would change based on whether you swing from the elbow or the wrist.





This shows the rough change in geometry and recommended angle based on whether you swing from the elbow or swing from the wrist.

The method for finding the proper angle for your mallet is simple. It requires only string and a couple of pieces of tape. Hold the mallet in your hand in the manner you imagine using it. Then tape one end of the string to the top corner of the mallet head. Now pull the string tight and tape it to your pivot point (either your elbow or the pivoting part of your wrist). Now simply make a pencil mark at the location that the string crosses the lower part of the head of the mallet. I do recommend you have someone else make the pencil mark so that you can concentrate on holding the mallet naturally.



Stringing the mallet from the pivot point (my elbow) to the far end of the mallet head. With the pencil mark made where the string crosses the lower edge of the mallet, use a [bevel gauge](#) to match that angle and make the mark. Make the same mark on the other side of the mallet too.



Set the bevel to the mark made from the string, then transfer it to the other face of the mallet.

At this point I would have simply just cut the angles with a handsaw, but my mistake of putting in the wedge prematurely made that difficult, so I opted for cutting them on the band saw.



Cutting the mallet angles on my band saw.

I made sure to save the off-cuts as they will be helpful when it is time to glue the leather faces on.

### **Shaping the Mallet Handle**

For this particular handle, I still wanted the octagon shape, but I also wanted the web of my hand along with my thumb and index finger to encounter a more slender waist. This is to help keep the handle from slipping out of my hands. This handle would actually have two hand-holds. One for ordinary chisel work and one for heavy chopping.

I used a [curved soled spokeshave](#) and a [card scraper](#) to get the handle into the shape I wanted. Again this would have been easier if I could have separated the handle from the mallet (*don't wedge it in until last*).



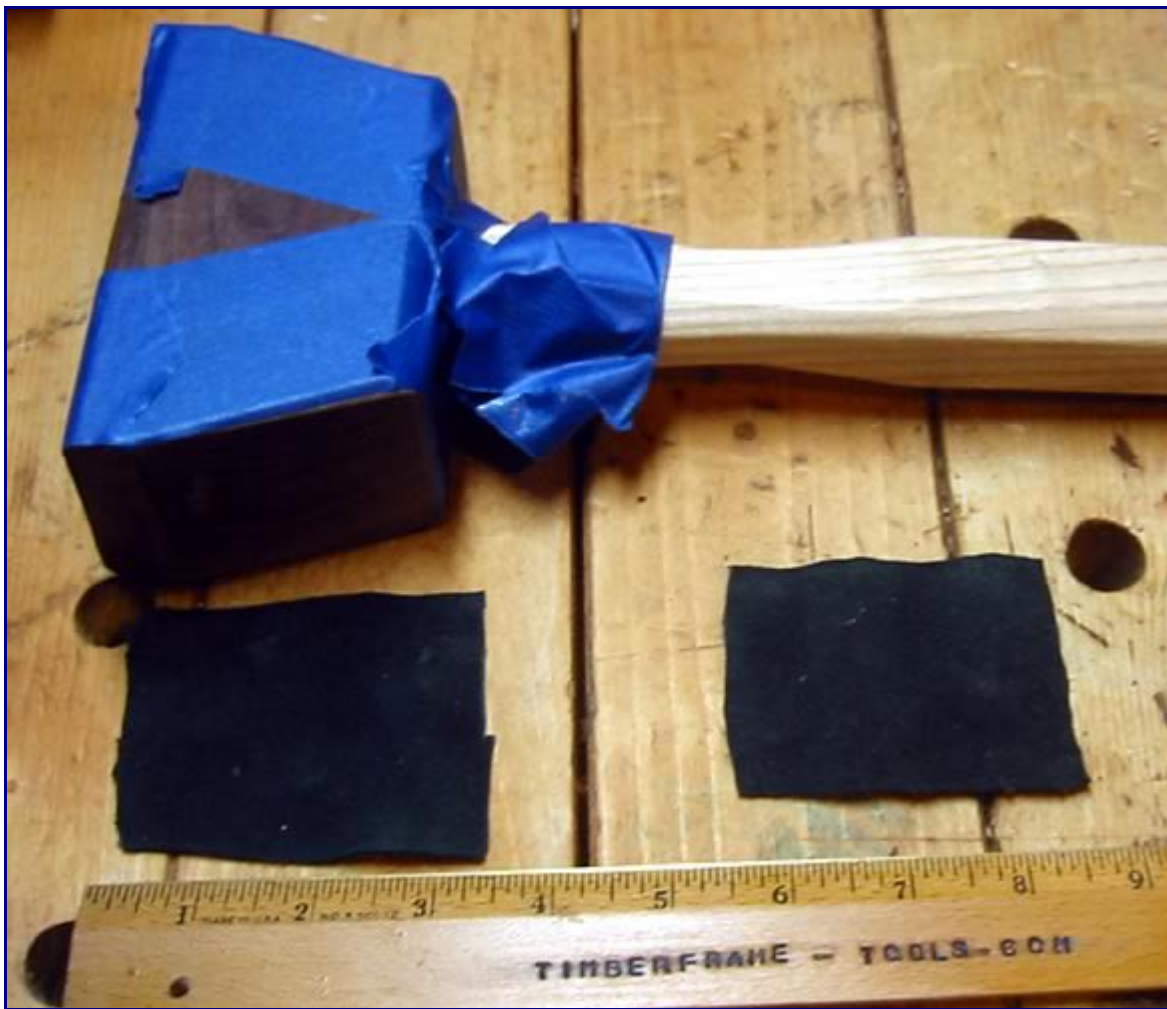
Contouring the handle with a spokeshave and card scraper.

After a bit of shaping, my son got to use a [rasp](#) to round over the end of the handle. Of course any rasping on his part simply can not be done without a few renditions of the [Rasp Rap](#).



A bit of work with a 4 way rasp.

With the handle fully shaped, I planed off the sharp end of the face with a block plane and chamfered the other edges of the face. This creates a flat surface at the very head of the mallet that can be used for tapping joints together. I also planed the end grain faces smooth and used masking tape to mask off the portions of the mallet that might catch some over-spray when I use the [spray on 3M 77 glue](#).



Leather ready for gluing to the faces of the mallet.

I sprayed the faces of the mallet and sprayed the back of the leather pieces. Let them just dry to tacky a few minutes, then pressed together and clamped them into a large 12" handscrew using the off-cuts as cauls to hold the leather in place while the glue dried.







Marking the date on mallet with a penny from the appropriate year.

The image of Lincoln is solidly cast in 3D in the wood and the date is legible, but is a mirror image. Another option is to use an F-clamp to press the coin into the wood. State quarters are nice, but the year is not on the same side of the coin as the the state



Penny leaves and impression of the year (doesn't show well in this photo).

With the mallet now complete, I wiped it with a few coats of [orange shellac](#) and put it to work.



Another mallet ready for making some dovetails and mortises.

I am sure many are looking at this mallet head and saying, “the angle looks too steep.” I agree it does look too steep, but when you swing it a few times at a chisel, you will realize, it is right where it is supposed to be.

I should point out that the angle for this mallet is only accurate when the mallet is held by the waist closest to the head of the mallet. When held at the lower waist, it has a tendency to deflect the chisel slightly toward my elbow. Ideally for a two grip hammer, I could have set one face angle to the short waist and the other face angle to the long waist, but I have a feeling that would make it confusing to use.

## Wooden Mallet Resources

- A Simple Woodworking Mallet [on WKFineTools](#) – Simple and pretty easy to make, though notice that the angle on the head is not steep enough and you can see it deflecting the chisel in the photo.
- Scrap Wood Mallet [in American Woodworker June '92](#) – Shows the same angle determination I use.
- Making an Offset Mallet [on WKFineTools](#) – an interesting twist on using a lathe to make the mallet head angled
- Collection of Mallets [on Lumberjocks](#) – great for inspiration
- Making a Mallet [on WoodnBits blog](#) – this one is for planes, but it could be scaled up or scaled down easily.
- Deadblow Joiners mallet [from woodworkingonline](#) (PDF)
- Making the Perfect Carvers Mallet [on WKFineTools](#)