

# Loopy Rolling Pins



# Materials

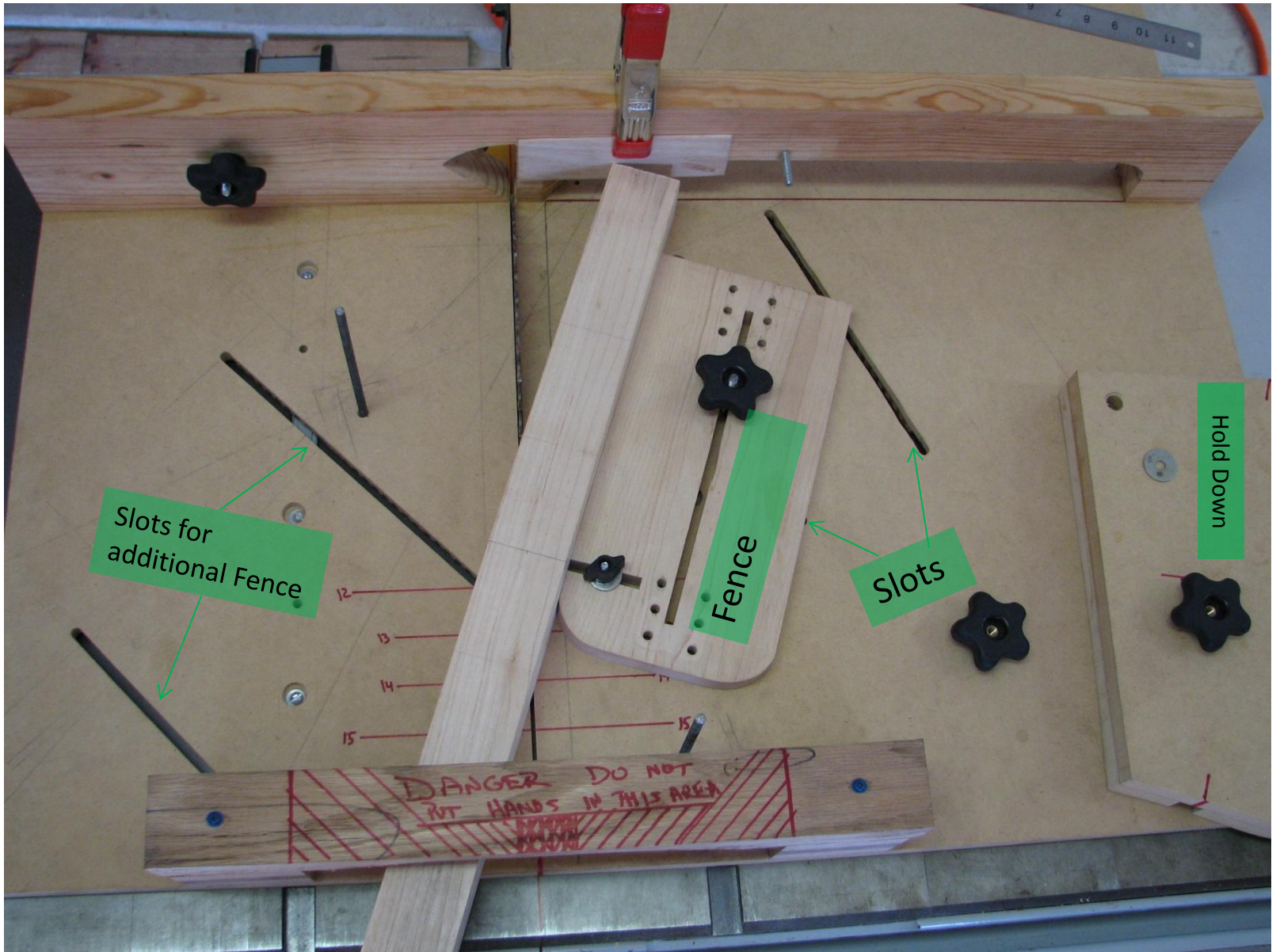
- 2" x 2" x 24" wood blank of desired species for body of pin
- Veneer of desired contrasting species, 2" x ~48" x 1/8" **Veneer thickness needs to match the kerf of your rip blade, or the amount of material that you will remove.**
- Titebond 3 or other waterproof glue
- Mixture (3 to 1 works well) of mineral oil and paraffin or food safe finish of choice

# Tools

- Table saw w/sharp rip blade and a shop constructed ripping jig
- Lathe and chisels as desired – (I use a roughing gouge, bowl gouge, spindle gouge, curve smoothing tool, and a cutoff tool)
- Lathe centers and scroll chuck if possible
- Quick clamps and a long cabinet clamp
- Sandpapers
- A straightedge 2' long (a center finding rule is really good for this project)
- A shorter straightedge
- Calipers
- Pencils

# The Jig

- Build a jig or sled to hold the blank securely. It must hold the blank down w/o interfering with the blade and must adapt to the angles you will need to cut.
- **The next few slides show what I used.**
- Notice how the bottom of the hold down has room for the saw blade.
- The hold down is attached at opposing corners with (2ea) t-nuts, ¼-20 all thread and project knobs.
- The angle fence is attached similarly, but carriage bolts were used.



Slots for additional Fence

Fence

Slots

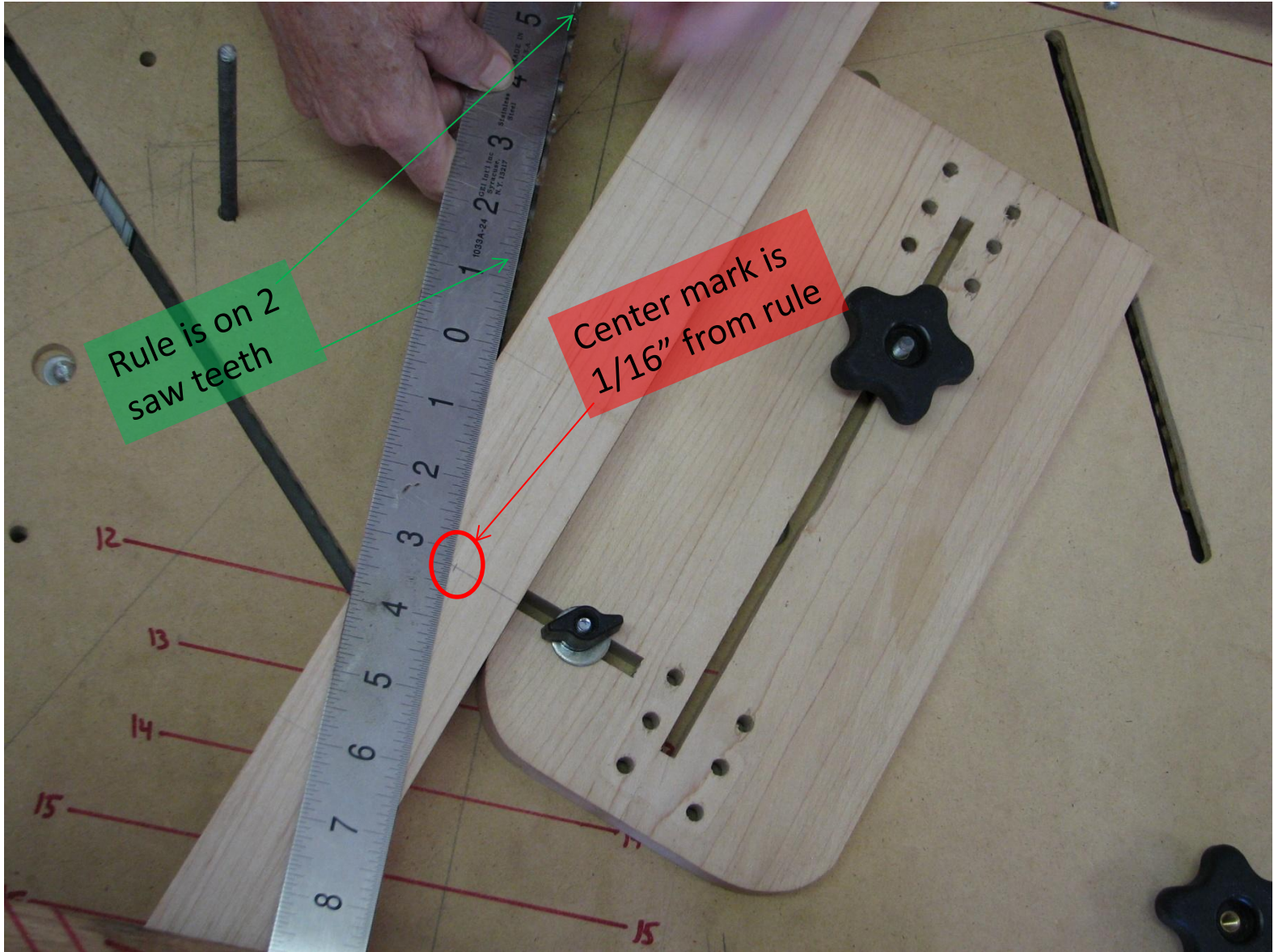
Hold Down

DANGER DO NOT PUT HANDS IN THIS AREA



# Mark the Blank

- If you are going to use a scroll chuck, mark a line  $\frac{1}{2}$ " from one end of and all the way around the blank. This will be the end where you will cut a tenon for the scroll chuck.
- Divide the remainder of the blank in half and mark a line all the way around.
- Mark centers across the last lines drawn on each face (see next slide).
- If desired, you can draw lines around the blank at the approximate desired entry and exit points for the cuts. These can be used as a **general** guide to help set your fence. The loops, especially long ones, in the finished pin, will be quite a bit shorter than these points appear.



Rule is on 2 saw teeth

Center mark is 1/16" from rule



# The Angles

- The exact angle of cuts is not important.
- Two long and two short loops works well.
- Four long loops work fine also, but will make centering more difficult when you get to the lathe.
- It may be good to keep them in pairs.

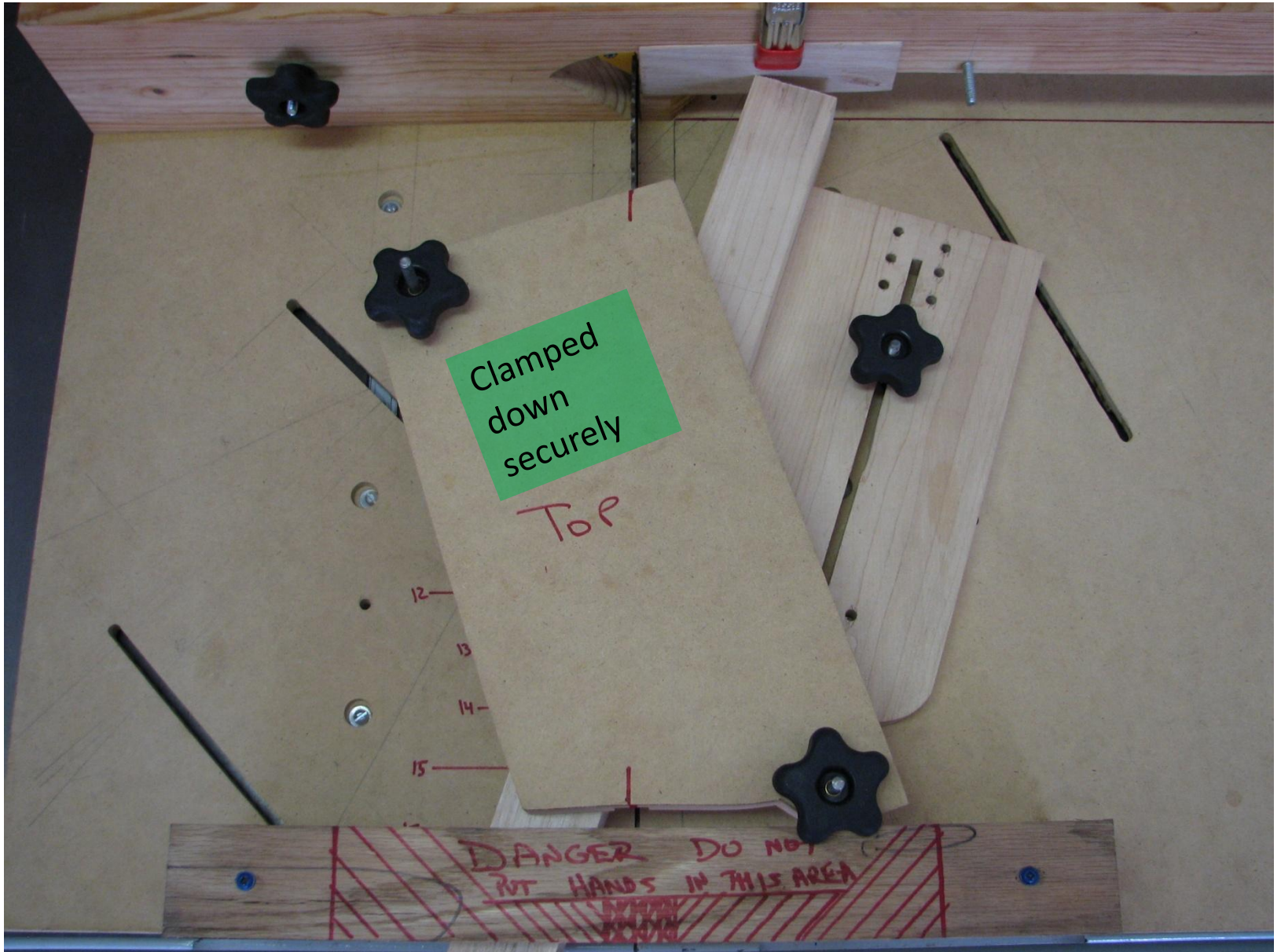


# Centering for Cutting

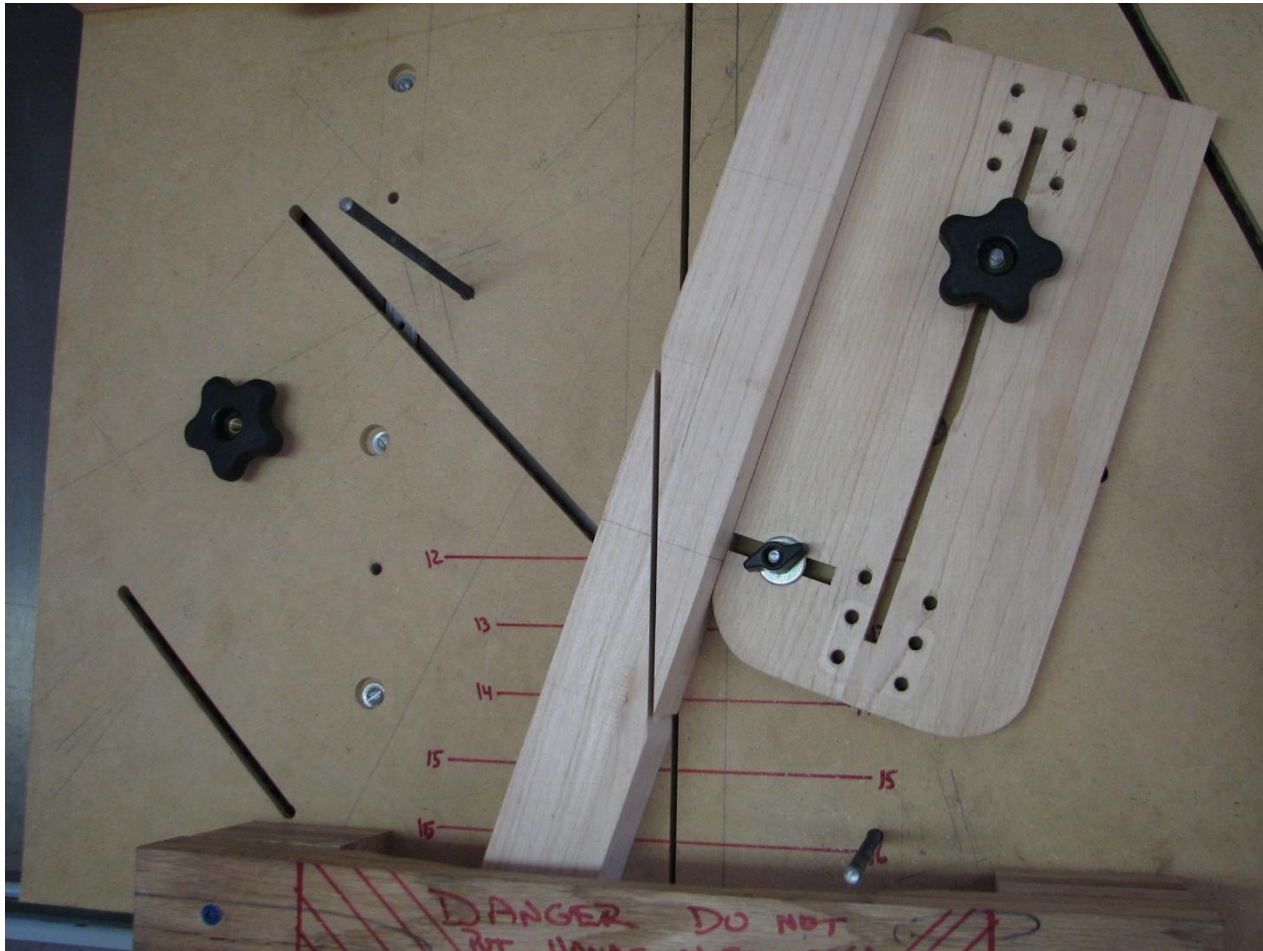
- Set the jig fence to hold the blank at the desired angle. Make the cuts for the short loops first.
- Make reference marks or apply tape alongside your fence. --(well, out just a little so you can see them during adjustment)
- Using your reference marks to maintain your angle and using a long straight edge set against 2 saw teeth, adjust the fence so that the edge of the ruler falls  $\frac{1}{2}$  of the width of your saw kerf from the center mark on the top face (Remember slide 8 ?).

# Clamp and Cut

- While holding the blank in position, clamp it down securely (see next slide).
- Make your cut as smoothly as possible, maintaining a constant feed rate. **Don't force the cut. Let the saw do the work.**
- Your kerf should be centered on and obliterate the center mark.
- Inspect the cut surfaces.
- Sand **only** if needed, removing as little material as possible.



# The 1<sup>st</sup> Cut Completed

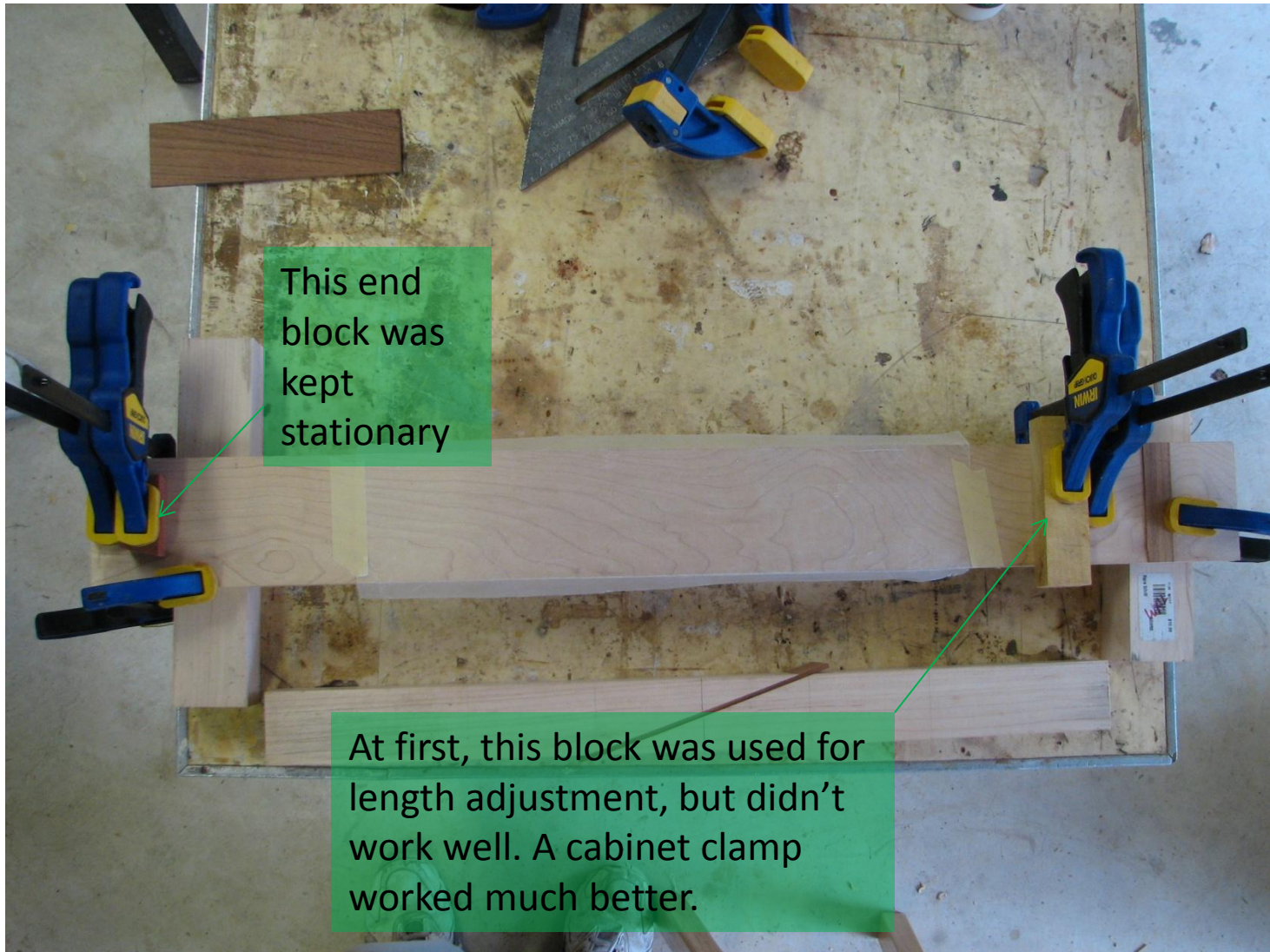


# Glue Up

- Have everything you need at hand before applying any glue. ....glue, waxed paper, lots of clamps, one long cabinet clamp is handy, a marker, a small square, paper towels and..... (a bowl of water?) ....
- The veneer needs to be about an inch longer than the cut surfaces and it is best if it is the same width, but not wider.

# Glue Up Tray

- A gluing tray covered with clear shipping tape is useful. The example in the next slide was covered with waxed paper instead of tape and has stops on both ends. The left hand stop remains stationary, while the right one could be adjusted. This jig didn't have them, but several small spacers covered with clear shipping tape should be placed across the tray to hold the entire assembly up off the tray an 8<sup>th</sup> of an inch or so. This will leave a place for the glue squeeze-out from the bottom to go, and will make it easier to keep the assembly clamped down flat.



This end block was kept stationary

At first, this block was used for length adjustment, but didn't work well. A cabinet clamp worked much better.



# Ends of the Veneer Should Stick Out a Little



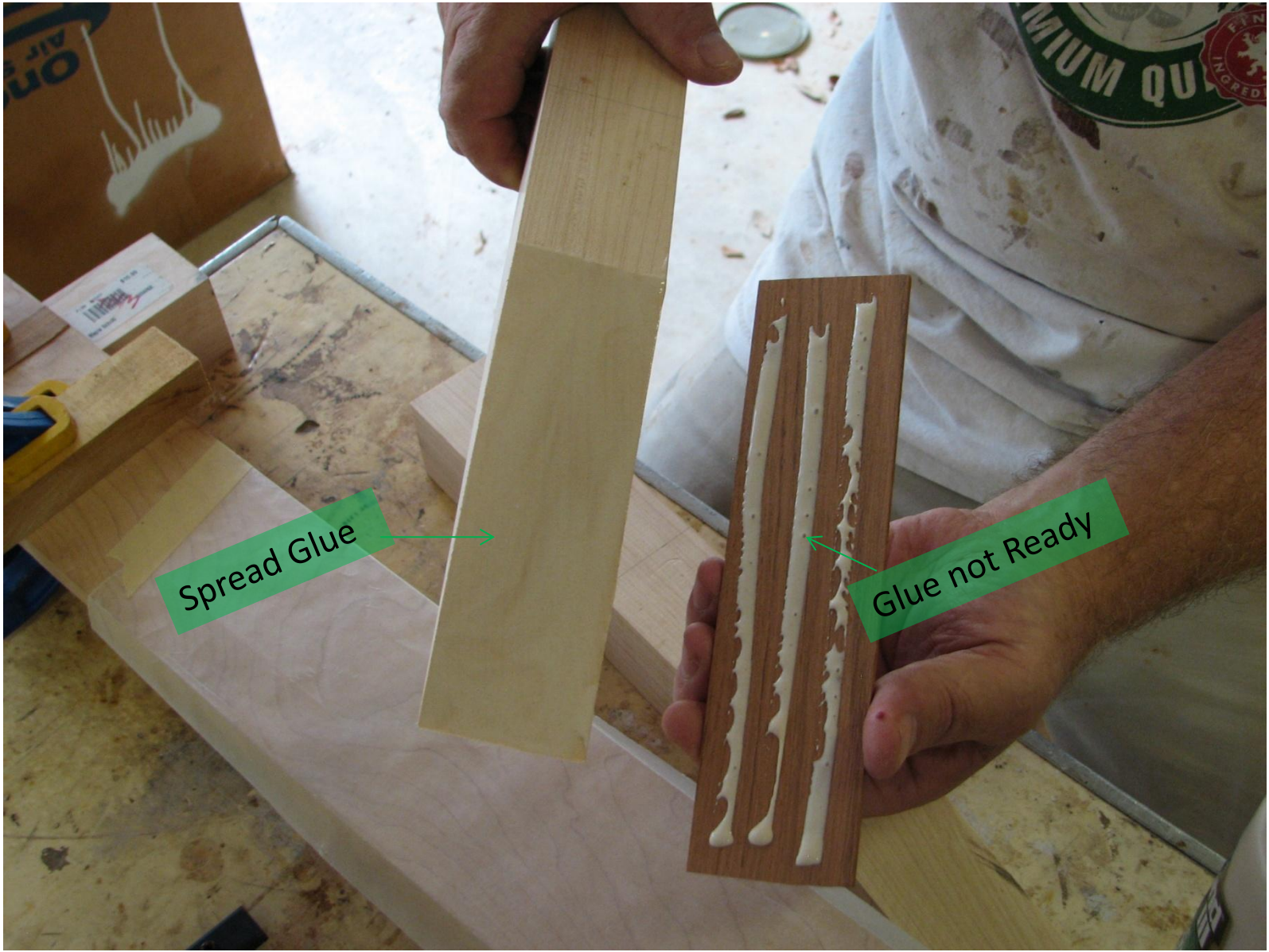
# Dry Fit With Clamps

## Notice Hold Down Clamps



# Ready to Glue

- The objective is to end up with these pieces glued together with the sides aligned, the ends of the veneer sticking out about ½ inch, and the center of the blank in perfect alignment.
- Have clamps preset to lengths needed.
- Apply and **spread** glue to all four surfaces and assemble loosely. Use **plenty** of glue
- The ‘glue clock’ accelerates when you start squeezing the parts together

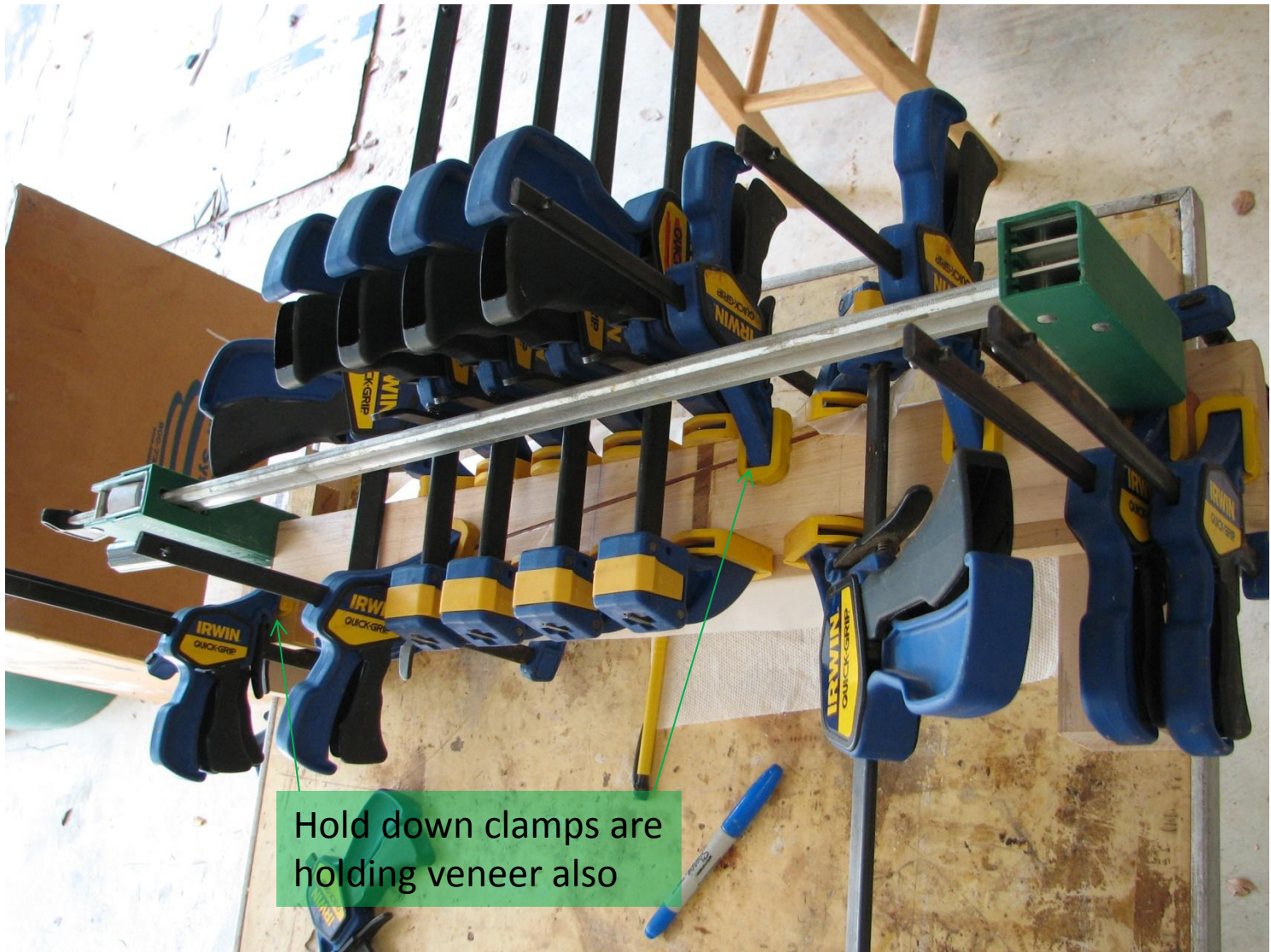


Spread Glue

Glue not Ready

# Gluing It All Together

- The glue will be slick and the pieces will slide around. Check continuously to keep the parts in position.
- Clamp pieces together squeezing out excess glue.
- Apply vertical clamps to hold the pieces down and in alignment. Notice in next slide the vertical clamps are holding the veneer down also.
- As pressure is applied to the sides of the glue up, it will be hard to maintain alignment of the **centerline**. It is good to let it slip downhill just a little (1/4" or less) to be adjusted with a cabinet clamp.
- Use a long cabinet clamp to force the **centerline** back into alignment (see next slide). Try not to go past the aligned position.
- At this point, **it is necessary to retighten** each clamp several times. As glue is squeezed out, they will loosen and more pressure must be applied. Tighten the cabinet clamp only as needed to maintain c/l alignment.



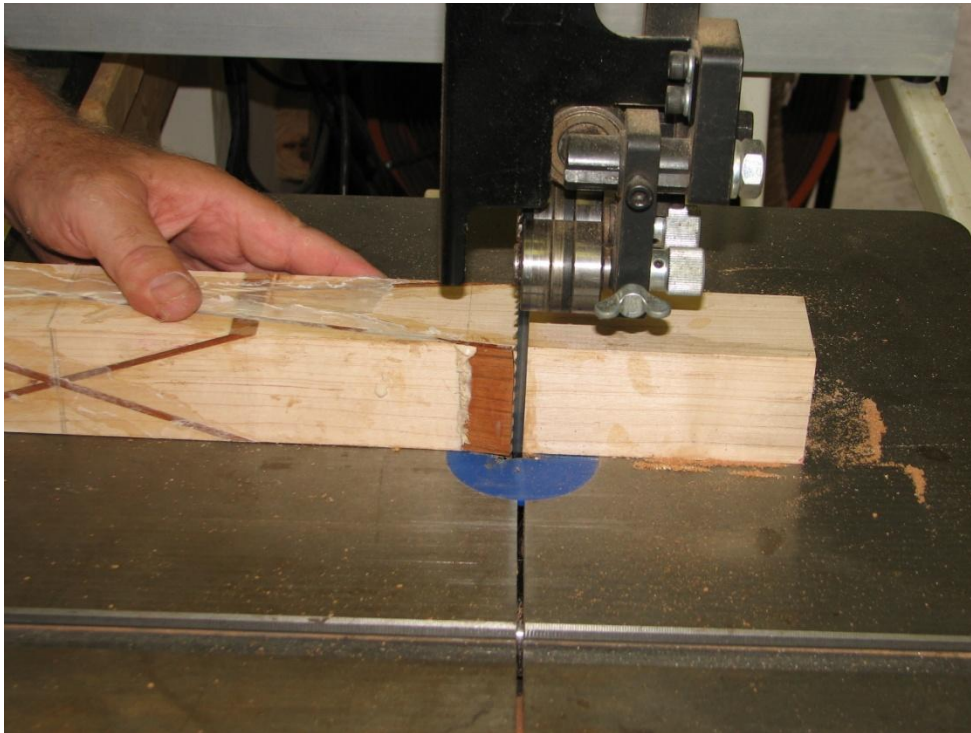
Hold down clamps are holding veneer also

# Completing Inlays

- Allow the glued up assembly to dry for at least an hour.
- If the next inlay is to be at the same angle as the previous one, don't change the angle of the fence on the ripping sled.
- Repeat the steps covered on slides 10 through 22, creating the inlays in pairs of equal lengths.
- On the 2<sup>nd</sup> of each pair of cuts, you will need to remark the 'center target'. It will have been cut away and should fall centered on the previous inlay.

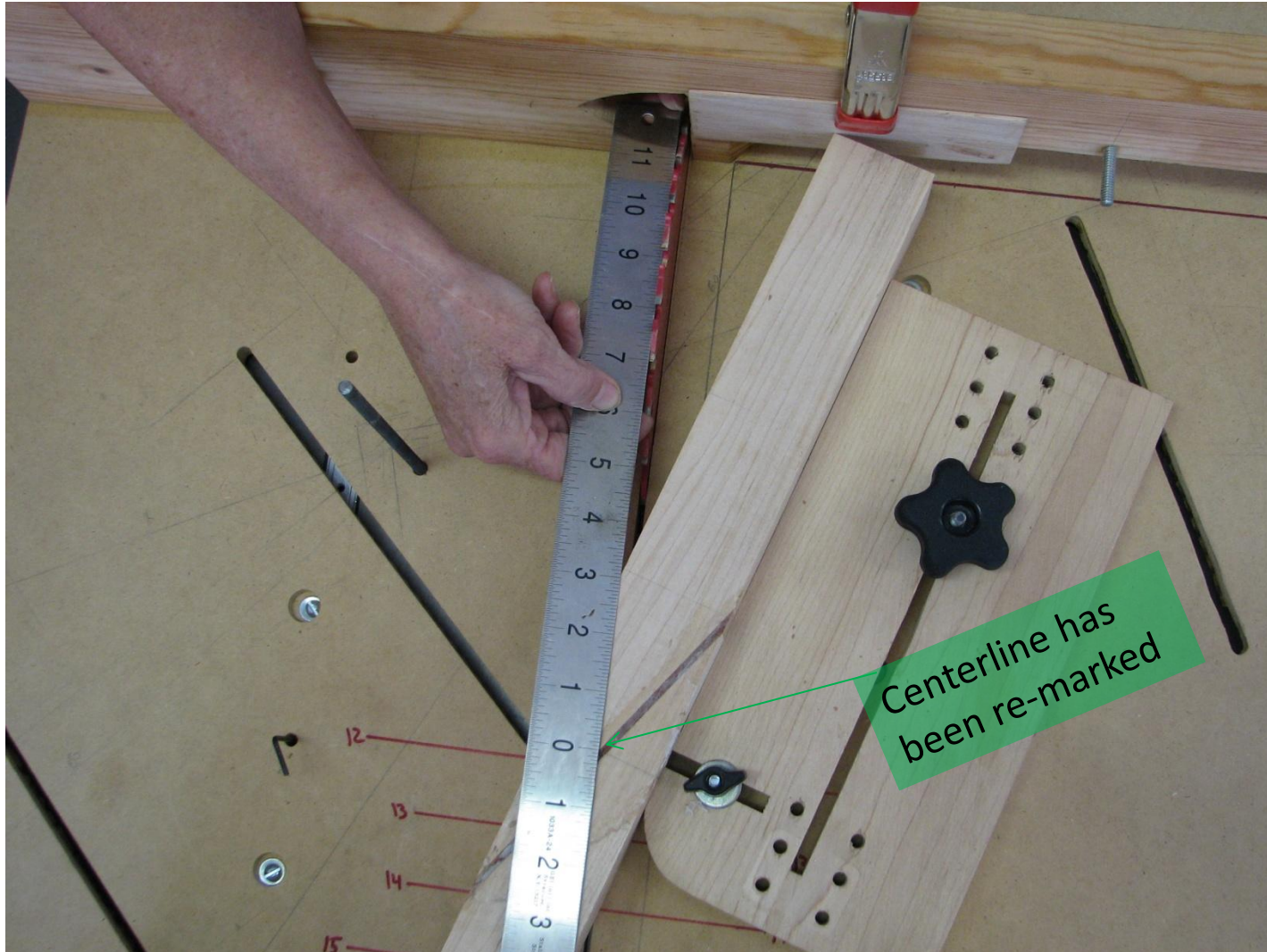
# Cut Away the Excess Inlay

- Excess inlay can cause problems during successive cuts. Cut it away after each glue up





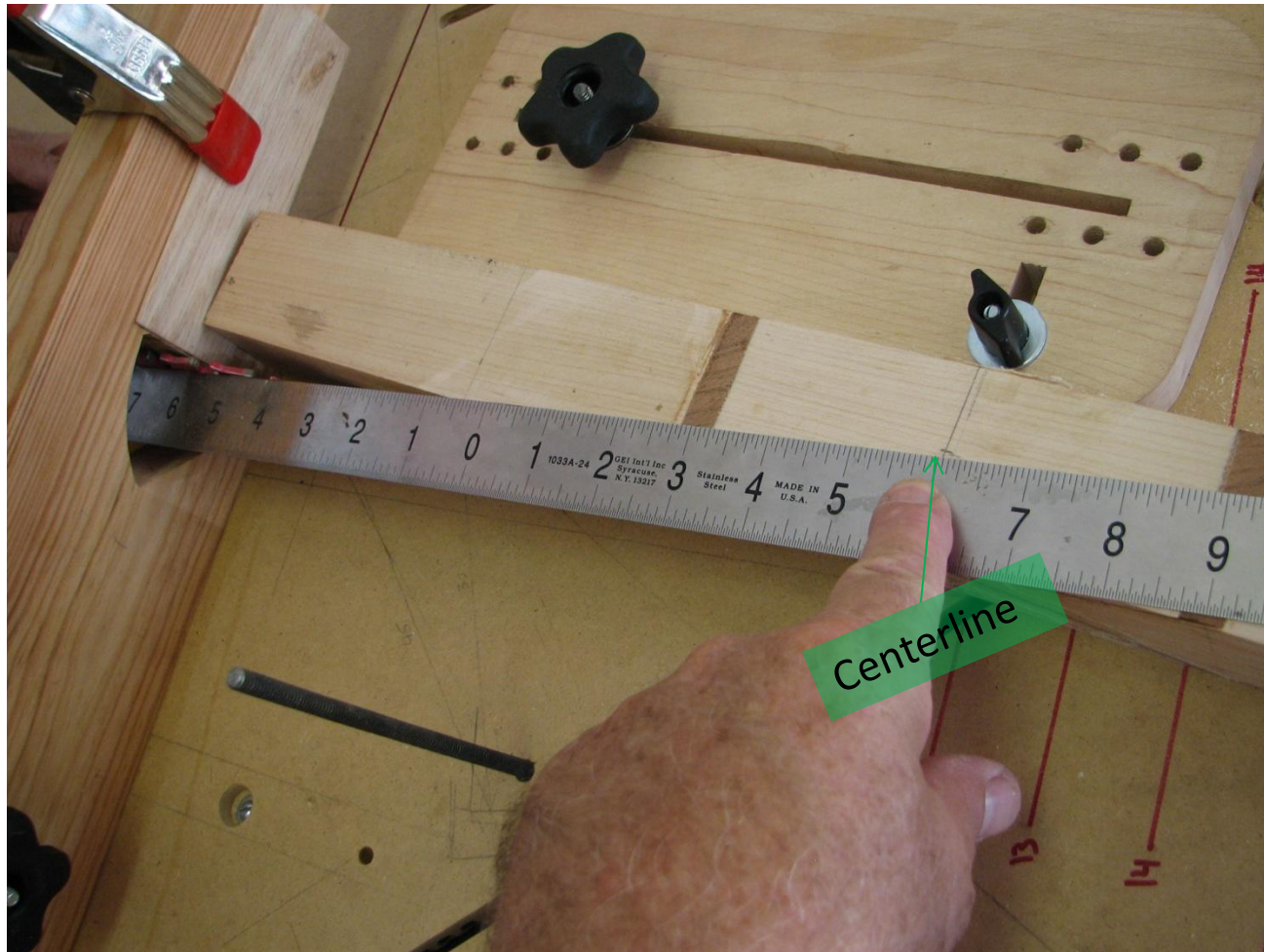
# Preparing for the 2<sup>nd</sup> Cut



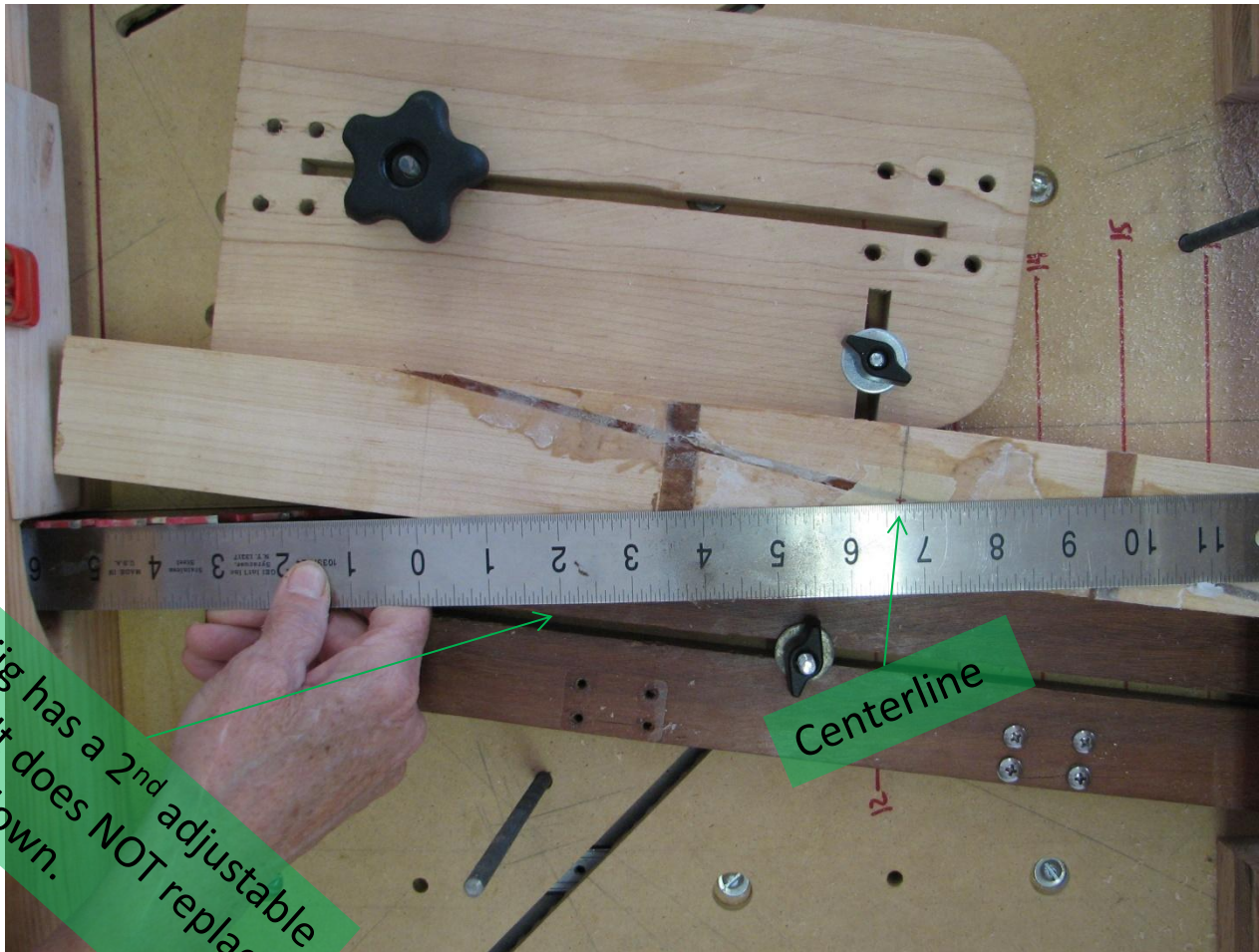
# 2<sup>nd</sup> Inlay Completed



# Preparing for the 3rd Cut



# Preparing for the 4th Cut



This jig has a 2<sup>nd</sup> adjustable fence. It does NOT replace the hold down.

Centerline

# At the Lathe (finally)

- Mark the center of both ends.
- Chuck the square (non-tenon) end or use a spur.



# Rough Centering of the Blank

- Use a live center w/o a point for tailstock support.



- Clamp with fairly light pressure.
- A mark on toolrest can be used as a guide to help **roughly** center the blank.
- When satisfied, tighten the tailstock only enough to spin safely

# Centering the Blank

- Cut a divot at the tailstock end of the inlay with a roughing gouge.



- Using the tailstock for support, spin the blank and make pencil lines on the divots. Make sure they touch the inlays at all 4 corners.
- Measure the width of exposed inlays where the lines intersect them.
- If they are the same, **you're very lucky....** If not, see next slide.

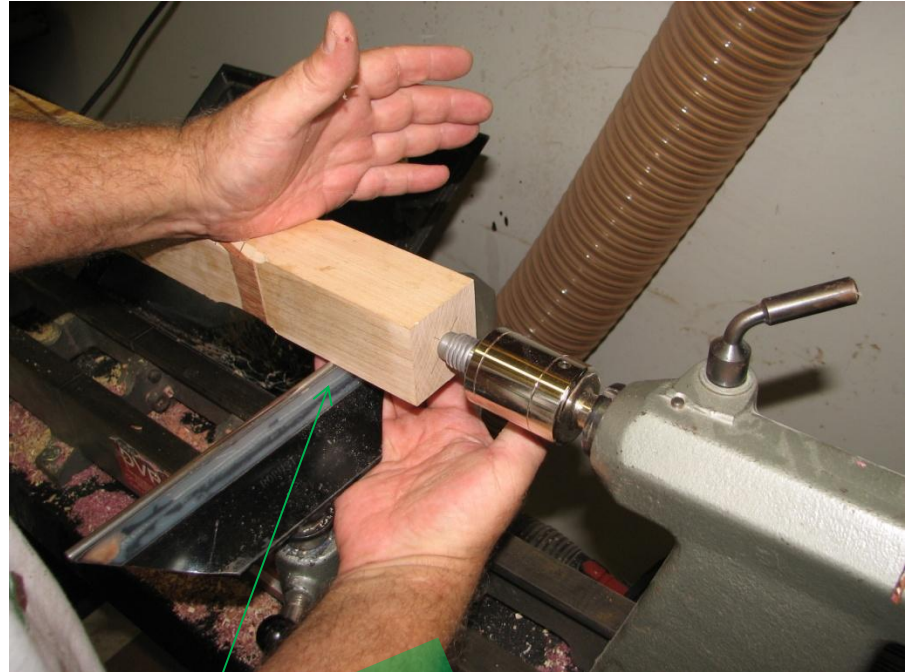
# Centering the Blank (cont)

- If your measurements are not equal you will need to fine tune the centering .
- If you are doing a pin with 4 long loops, you will need to adjust centering on 2 axes, one at a time.
- More material needs to be removed from the face of the blank where the measurement is greater, so that face will need to move toward the toolrest
- Orient that side toward and support the blank with the toolrest.



# Centering the Blank (cont)

- Use the toolrest to get & keep the blank square and to support the blank so that you can make small adjustments in one axis at a time



Toolrest is up under the blank, holding it square and maintaining height

# Centering the Blank (cont)

- Loosen the tailstock slightly, in stages, just enough so that the end of the blank can be moved forward just a little with a little force.
- Move the blank toward the toolrest as needed.
- Retighten tailstock and repeat the steps on slides 31 through 34.
- When you recut the divots, cut only deep enough to remove all pencil marks that might be confusing. You can also move your divot area a little to keep from cutting too deep.
- If doing 4 long loops measure both axes each time but try to only adjust one.

# Centering the Blank (cont)

- When you are satisfied with your centering, turn a spigot on the tailstock end to fit your scroll chuck.



# Centering the Blank (cont)

- Reverse the blank in the lathe, and omitting the creation of the tenon, repeat the centering process on the other end of the blank.
- Now you are (almost) **READY TO TURN** your rolling pin.

# Plan the Diameters

1	Rolling Pin Adjustment Sheet							
2								
3	distance from center	L -4" End	L -3.5"	L -3"	center	R +3"	R +3.5"	R +4" End
4	Difference in diameters from previous point starting @ center	-0.341	-0.147	-0.011	0	-0.011	-0.147	-0.341
5								
6	Dimensions of a factory made pin 21" x 1.75"	1.278	1.619	1.766	1.777	1.766	1.619	1.278
7								
8								
9								
10	Purpleheart & Maple 19" actual	1.078	<b>1.354</b>	1.725	1.844	1.725	<b>1.354</b>	1.078
11	<b>needs 2B</b>	1.695	<b>1.354</b>	1.207	1.196	1.207	<b>1.354</b>	1.695
12								
13								
14								

# Plan the Diameters

- The Excel spreadsheet on the previous slide is embedded and can be opened in Excel and edited/used as desired.
- The diameters in row 6 will be transferred, by cutting them into the workpiece . The distances from the center and the diameters can be modified as/if desired.
- If you cut too deeply you can use the spreadsheet to calculate new values as shown on rows 6 & 7.
- Row 10 has the actual diameters that were cut.
- The value in **red** was cut too small.

# Re-Plan the Diameters (if needed)

- Row 11 shows new diameters recalculated. based on the one that was cut too small.
- The other diameters were adjusted using the 'difference' values in row 4.
- This spreadsheet can also be used to create dimensions for rolling pins smaller or larger than the one used for a model.

# Turning the Pin

- Turn the blank assembly round.
- You should be able to see the loops now.
- Spin the blank and pencil a line around it EXACTLY at the intersections of the pairs of loops.
- Make reference marks (long and dark enough to see when spinning or all the way around) at each required distance from the center.
- Reference marks on the tool rest of the proper separations can be very useful .



# Turn the Reference Diameters

- If desired, the target reference diameter can be penciled onto the blank near its reference mark.
- Using a small cutoff tool or tool of choice, cut a **NARROW** neck into the blank down to the diameter needed at each reference mark. When you shape the pin, you will cut the profile to these diameters.
- Try to get each pair of reference diameters ( to L & R of center) as equal in size as possible.

# Time to Turn

- Turn 2 slots into the pin to define the ends. Make these a little smaller than the desired diameter at the ends of the pin.
- Keep in mind that the profile between each reference diameter is an arc, not a straight line.
- A roughing gouge can be used to remove a great deal of the excess material.
- Don't try to get right down to the reference diameters . You will likely cut too deep.
- I switch to a bowl gouge for further removal of excess material but stay outside of the desired final profile.

# Turning (cont)

- Switch to a curve refinement tool or use a bowl gouge in shear scrape mode and SLOWLY bring the pin to its final shape and dimensions.
- A 1' straightedge rolled along the profile will reveal flat spots and help you determine where to remove material to get the profile down to the reference diameters cut previously.
- Step back every once in a while and visually inspect the profile. Look for a pleasing curve, kinda flat in the center section and mirrored side to side
- It will probably seem difficult to get the profile down to the reference diameters with a smooth profile, but don't rush. You'll get there!

# Turning (cont)

- If needed, widen the slots and/or turn away a little of the end waste diameter for clearance. Be careful near the chuck. It is undesirable for the base of the tenon that provides support for the chuck jaws to break or for a tool to contact the spinning jaws of the chuck.
- Turn a half bead on the corner at each end of the pin.

# Sanding

- If sanding is needed to further refine the shape, start out using a sanding block turned parallel to and slid along the length of the pin then switch to handheld, using the curve of the palm to maintain a curved profile. Keep checking shape by rolling a ruler over the profile as before.
- Sand on the lathe, starting at 80 grit up through 400
- Inspect the entire surface eliminating tearout, holes, and other imperfections.
- At 150 grit and higher and after all the imperfections have been removed from the surface, hand sand lengthwise w/o spinning, before progressing to the next grit.

# Final Work

- Starting at the tailstock end, deepen the slots leaving just enough to keep the piece secure.
- The slots may need to be widened a little so that the saw blade in the next step can be used w/o damaging the end of the pin.
- Remove blank from the lathe and saw the waste ends away.
- Sand both ends as before, maintaining the half beads that were previously cut.
- With any segmented turning, to help avoid glue ridges (glue creep) from forming after finishing, it is best to wait a week or two before final sanding which should be done lengthwise, by hand with only the higher 2 or 3 grits of paper.
- Sign and date your pin on the end(s) if desired.

# Finishing

- Apply food safe finish of choice . A 3 to 1 mixture of mineral oil and paraffin works well.
- Apply twice a day.
- Check each morning for dryness.
- When the wood has absorbed all it wants, it will feel noticeably wetter one morning.
- Let it sit for 2 or 3 days and wipe off excess finish, rubbing fairly vigorously with a paper towel.
- Allow to dry a few days.
- When it feels dry, buff and carnauba wax if desired.