



International Association of Penturners

## Fish Scales Blank

Author: Roy Quast Uploaded: 2019

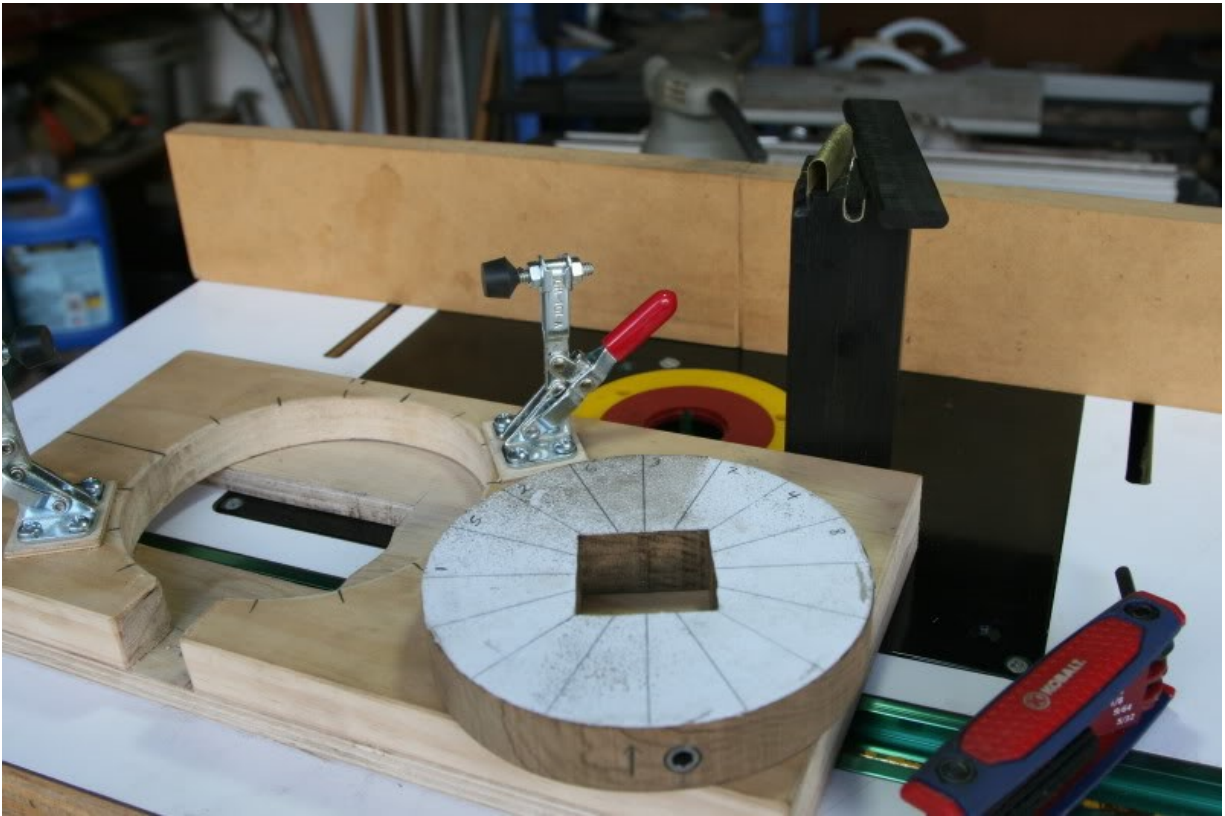
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I made this tutorial back in 2010 and I put it on Penturner's Paradise. That site has since shut down. A few people have asked me to put it here so... here it is. I would hope that if you read all the way through this thread that you learn 2 things. 1... how to make the fish-scale pen and 2... and probably more important is how to NEVER blow up a blank while you are drilling the hole for the barrel, no matter how much you have it segmented, or what kind of glue you use, no matter what size hole you need, all with NO step-drilling needed.

Many years ago, I made a blank that took me about a year to make. It was made from ebony and brass...very thick brass, .040 thick brass to be exact. It took about a year because I would cut a slot for one of the sheets of brass, glue it up and wait a month or two to let the ebony shrink so it would not crack later. I had 8 sheets of brass all coming together in the middle that I had to drill through. I wanted to do it right the first, one and only time. I had too much time and money invested in it. My solution was one of those Duuuuhhh moments, like why hasn't anyone come up with this before? I will tell that secret later on in the tutorial. Here is a pic of the pen I was just talking about:



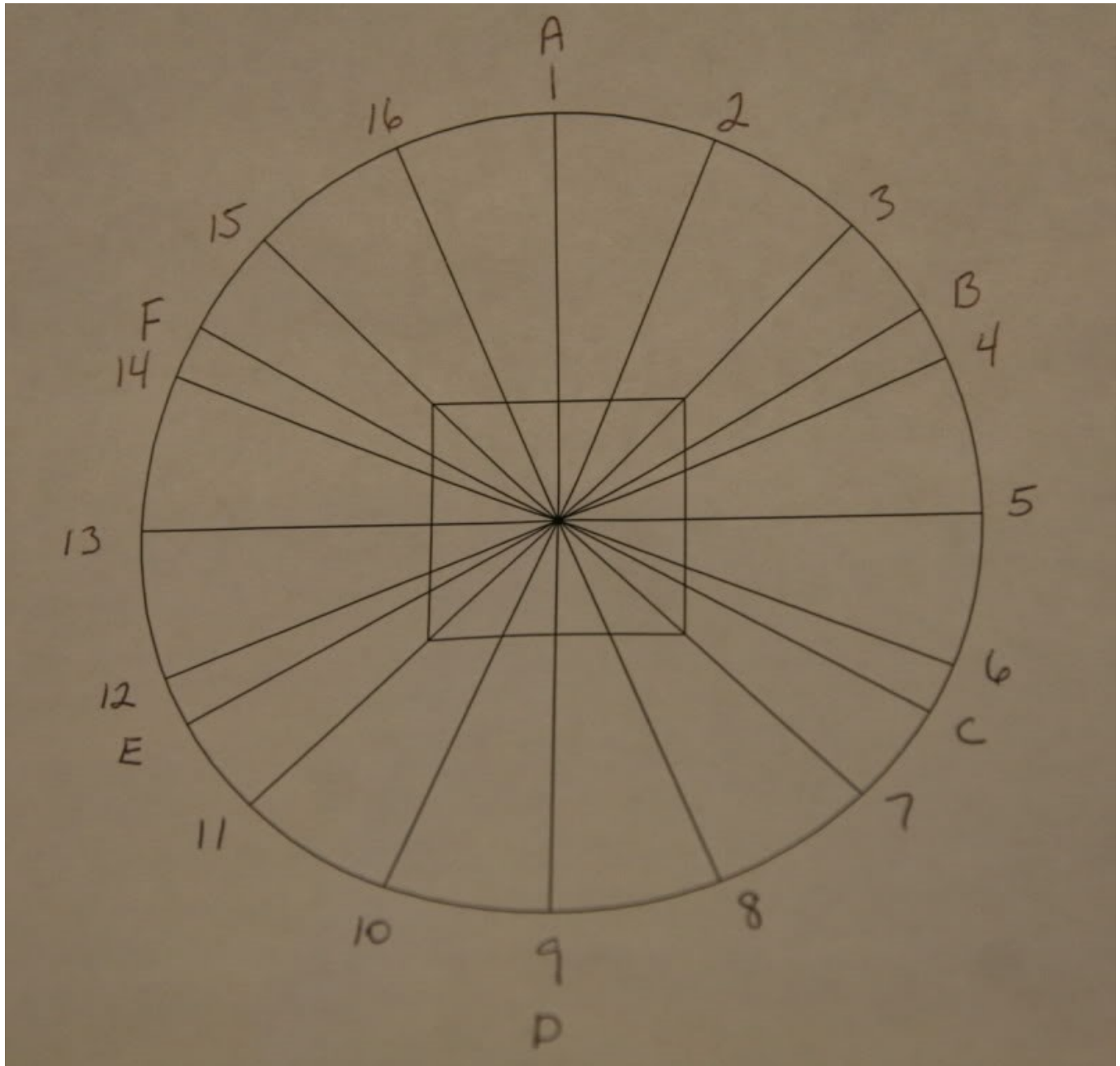
To make the fish-scale pen, you first must make a jig. It should look like this:



It is made for a router table. The jig is 6 1/4" wide and 12 1/4" long. The indexing circle is 4 7/8" across and is 2" from the front of the jig. The hole in the indexing circle is 1.5" square. It also has 2 set screws that go all the way to the hole to hold the blank in place each time you route a new segment. The indexing circle is held in the jig by 2 hold down clamps. The bottom board is 1/2" thick and the top is 3/4". The bottom board should have a 2" slot from the front down past where the blank is held in the indexing circle. It should look like this:



Here are how your lines should be drawn out on the indexing circle.



The router bit doing all the work is a 1/4 round bull nose. The blank in this tutorial uses the numbers on the indexing circle and is meant for 4 segments per level. I also put letters on it in case 3 segments wanted to be tried.

Start with a blank of wood that is 1.5" square that fits very tight into the hole of the indexing circle. Cut off squares that are 1/4 thick from the end. Cut off as many as you need for the length of the pen you are making. When you route a segment out, you refill that void with a thin piece of brass and whatever else you are making your pen out of, wood or plastic. Before you cut the brass into strips, sand it with 220 grit sandpaper to give the CA glue or epoxy something to hold onto. I use thick CA glue. Cut the brass strips about 1 inch wide and bend them around the inserts. Make sure that the brass and insert together are tight in the blank but not so tight that they might break the blank when they are gently tapped into it with



a hammer. To round over the wood or plastic insert, I use a 1/8 round over router bit and sand as necessary to make a tight fit. Make sure that each insert is longer than the blank is wide.

Going across the blank only needs to be longer than 1.5", from corner to corner needs to be just a little over 2". This way, the blank will remain solid all the way to the end which is needed so it will not blow up.



When you are ready to make the first cut, draw an arrow on your blank, the part of the blank you have left over after cutting the 1/4" squares off and point it to the #1 position on the indexing circle. Every time you put the blank back in the indexing circle, the arrow should always point to the #1 position. The first cut will be on level 1, so start with #1, on the indexing circle going into the router first.



After you have glued a piece of brass and wood into the first routed section and let it "dry" sand the excess down so the blank stays square.

The second cut will still be on level 1 but this time, route from position 3. The next cut will be from position 5, then 7. Level 1 is complete. Hand sand the next level perfectly flat by putting a piece of sandpaper down on a table saw and going in very small circles.

I say hand sand because my belt sander rounds the corners up just enough to see light coming through when I hold them together. They need to be solid all the way through. After you have level 2 glued on, the next cut will start with position 2 on the indexing circle. The next cut will be from 4 then 6 then 8.



Remember, each time you put the blank in the jig, the arrow should point to the #1 position. When level 2 is complete, the first cut on level 3 will be from position 3,5,7,9. Level 4 will be 4,6,8,10. Whatever level you are on, that is the position on the indexing circle you start the first cut from.

Let's say you are on level 5. The arrow will point to the #1 position and your first cut on level 5 will be from position 5 then 7,9,11. Keep this going until you have the blank as long as you need it.

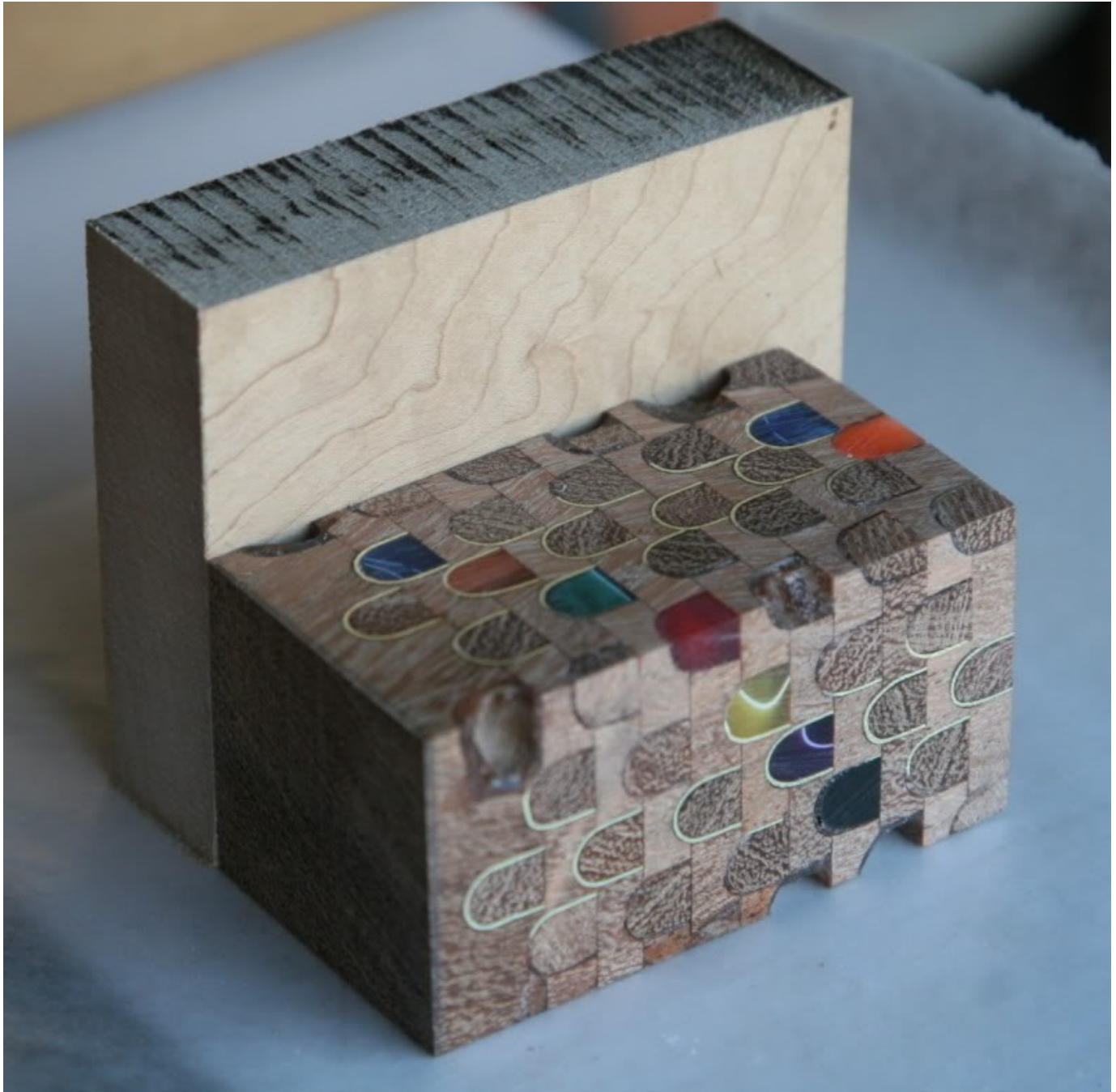
Now comes the secret I told you about earlier...

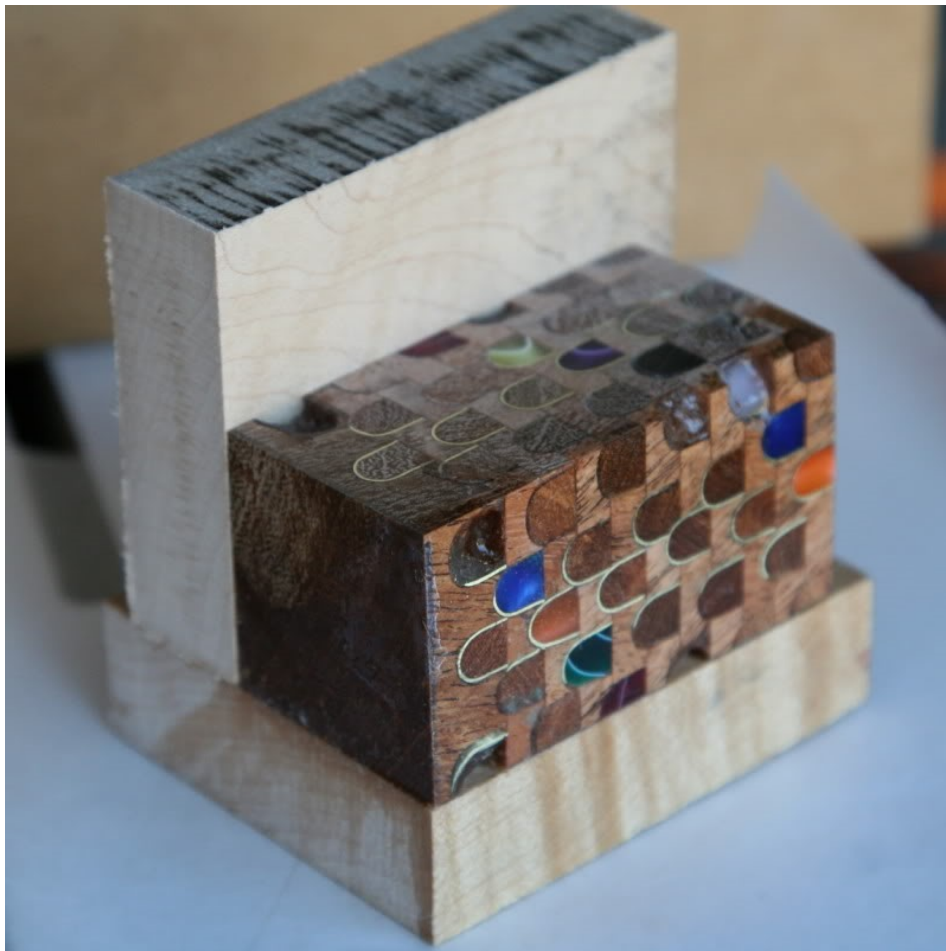


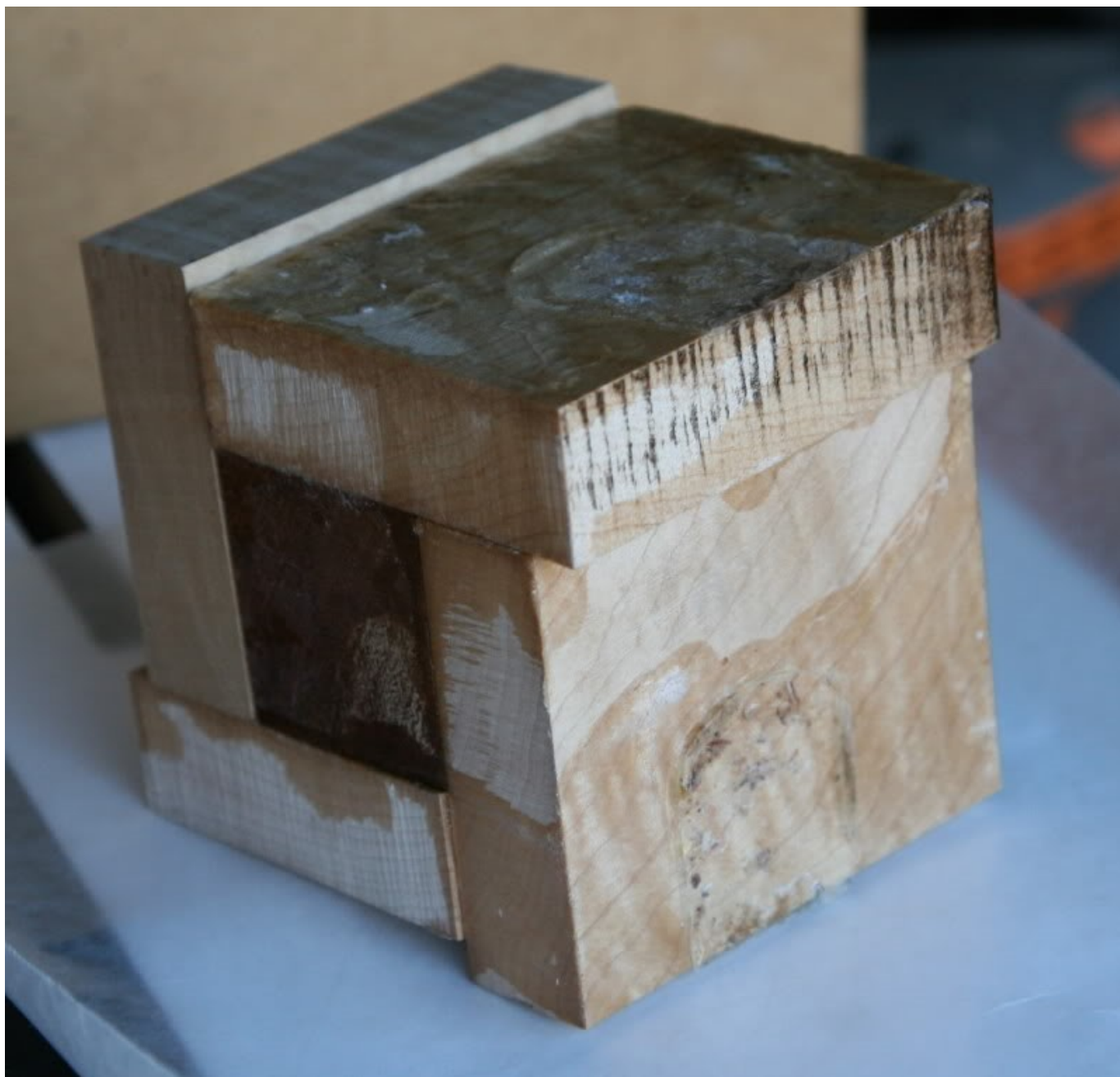
ADD WOOD TO ALL FOUR SIDES OF YOUR BLANK. Put a piece of wax paper down on your table saw and coat one side of your blank with thick CA glue. Use plenty of glue to fill any voids that can't be sanded out.

I use 1" sacrificial maple on all four sides. This is a VERY VERY strong bond. It is solid. It CAN NOT blow up...it has nowhere to go. I have been told that this is over-kill. That might be...BUT...my blanks don't blow up.

After I spent a year making the first brass and ebony pen and at least 2 weeks making each of the fish-scale pens, I don't want to take any chances of a blow out.



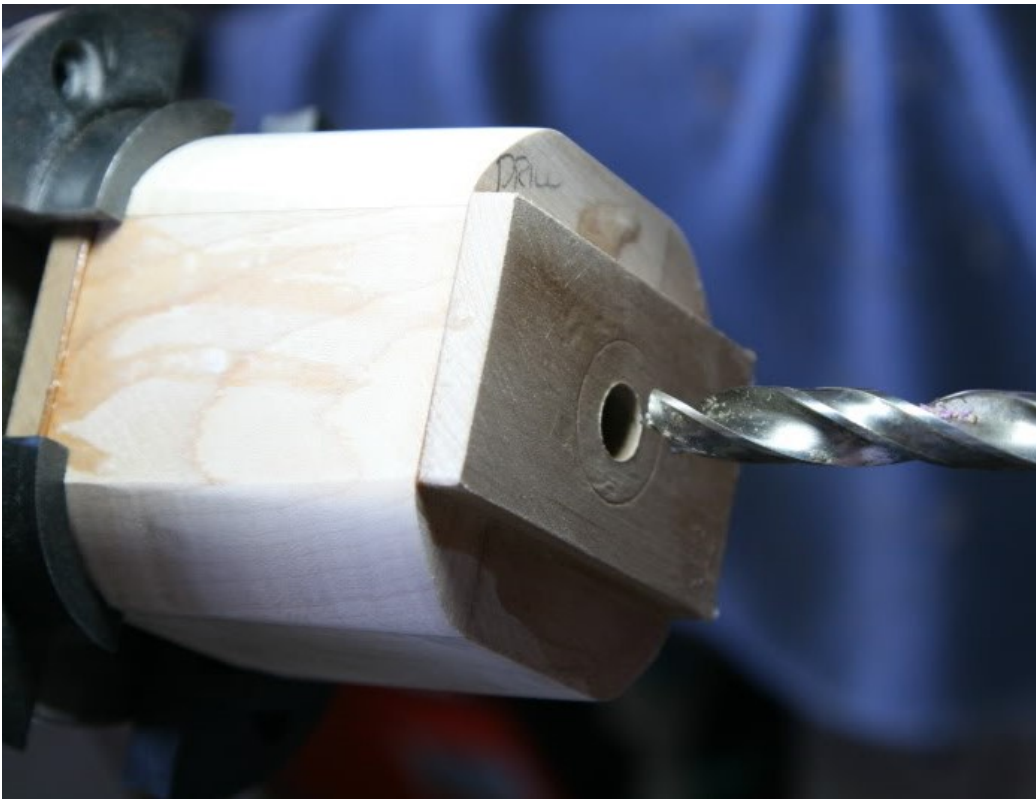
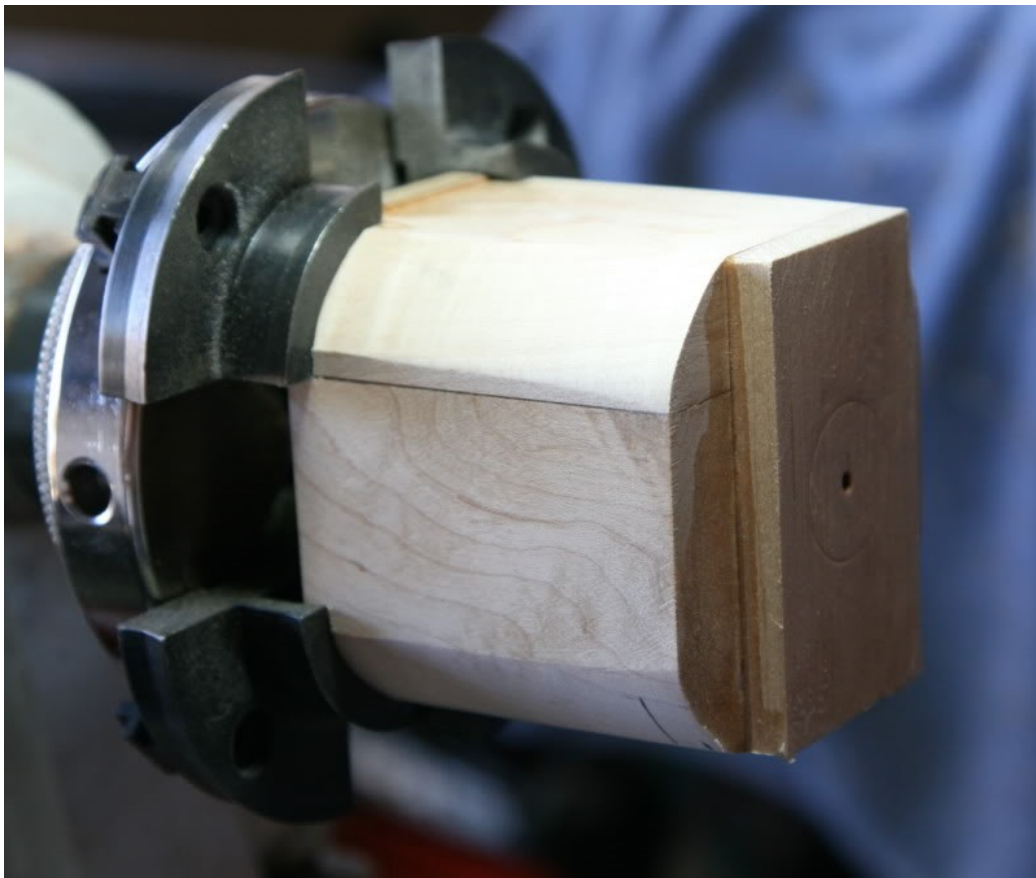




If I can go through all the segmenting of both of the fish-scale pens with one pass, I'm sure you can go through just about anything you want with no problems. I said one pass meaning that I did not have to step drill it. I think I used a 27/64th's drill bit. I had to back it out several times to clean the waste chips out and to let it cool down. For drilling... use the sharpest bits you have, it keeps the heat down.

I also add sacrificial maple to the ends of the blank to prevent tear out from drilling. To get the end maple centered, put a pin in the very center of the blank. Drill a small hole in the end piece. Put glue all over the end of the blank and the end piece and then slide the end piece over the pin and down onto the blank. Do this on both ends. I used the pin holes to center the blank in my lathe so that I could knock the corners off. I drilled the blank on the lathe to keep the design straight down the middle.





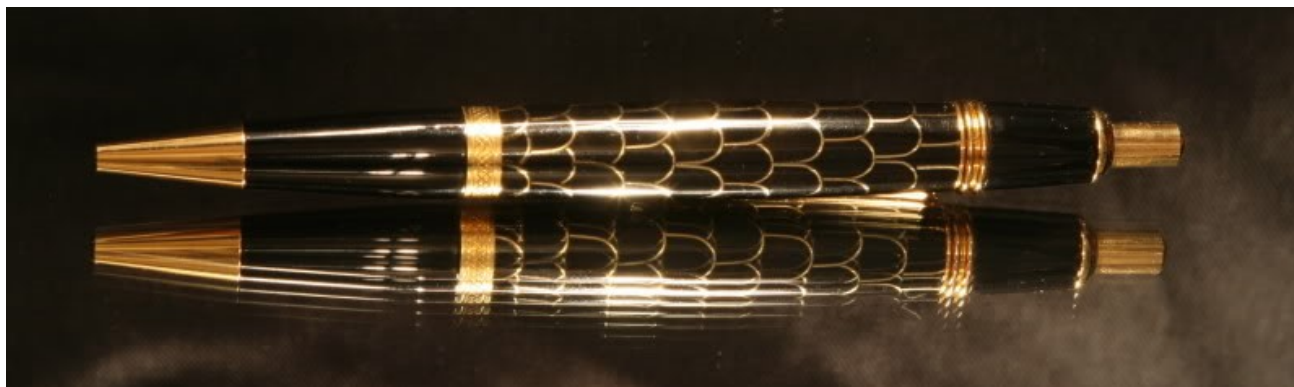
After you have it drilled, cut the end pieces off with your band saw. Sand the ends flat. From this point DO NOT.....DO NOT use a gouge or a skew. If you do, all your hard work will be for nothing.



No matter how sharp you think you have your gouge or skew, the second it hits any kind of metal, the sharpness is history. From this point, only use sandpaper. Start with 80 grit and go all the way through 600 grit. Then use MM, WET sanding all the way through 12K. Wet sanding will clean out all the dust and polish the brass or any other metal you are using. YES, it will take little longer, but in the end, you will have a beautiful pen and not need to start all over again.

I have read on here where some have said to put popsicle sticks around your blank to keep it from blowing up. Popsicle sticks can be bent and broken with your own two hands. Can anyone bend or break one inch thick maple??? Some have also said to wrap the blank with gauze and soak it in thin CA glue. I'm sorry, but to me, that's more flimsy than popsicle sticks. 'Nuf said!

Here are the 2 fish-scale pens I have made.







I hope you have enjoyed this tutorial as much as I have had putting it together for you. Some people have asked me about putting this tutorial in the library. By all means, please, be my guest.

Roy

## Comments

### [wood128](#)

WOW !! A very creative idea . Thanks for sharing . That gives me another idea on how to help the segmented blanks stay together for drilling the center hole, etc. I segment my blanks , then put them on the lathe and turn to approx. 7/8 " diameter . The pen maker could get a large dowel or turn a maple dowel to about 1 1/8 " dia . While on the lathe , drill a hole 7/8 " dia and glue the blank with CA inside the hole. Then drill the center hole and complete making the pen. One idea leads to another.

Joe

### [Roy Quast](#)

Hi Guys.... I hope that some of my ideas have inspired you to try new things that you might have thought were risky to segment or even try due to fear of a blow out. Now, if you add WOOD to all 4 sides, you should not have to worry about a blow out.

To Mal... the router cuts are 5/16th's to 3/8th's deep.

### [robutation](#)

Thank you for the tutorial, it certainly gives a good perspective of how important it is to take any steps necessary to prevent your precious segmentation blanks to maintain its structural integrity, when preparing the blank for drilling...!

I have to say that, I don't see often a blank being cut off round on the bandsaw (thin blade)/scroll saw, from the frame/casing used to keep the blank together and that is a great idea if you have the rights saw and blade to do it, if not, you can always remove the frame around the blank, glue your tube and turn it on the lathe, using the "Flap disk system" seen [here](http://www.penturners.org/forum/f30/blowouts-my-solution-110460/) (http://www.penturners.org/forum/f30/blowouts-my-solution-110460/)

I don't know if you are familiar with it or not but, I introduce this system here on IAP or at least, made it more noticeable by all members, that were having consistent and horrifying experiences with turning segmented blanks when metals were used.

When you made it very clear that, turning such blanks using traditional wood turning cutting tools (gouges) method, would be a straight ticket to blowout and therefore, failure, you were speaking the exact same language as I did and do, when people try to handle some of my made blanks, the traditional way.

Those blanks are in the same category of what I call fragile or difficult blanks to handle, in most cases these blanks are very specific in its construction and therefore, have a high degree of self-destruction, if one is not willing the take that extra time and extra steps to protect their investment and time, this was the exact reason why I also made a tutorial about the flap disk system and show of how easy is to go from raw blank to finished product even with the most difficult blanks to handle...!

In my view, this flap disc system, would be ideal to work with the blank, after you had it cut from the "main blank", the time savings, against the hand sanding using all the various grits, is not only considerable but effective, the main issue with the flap disc system and segmented blanks with metal is the heat generated, if the grits are too fine and the disk is maintained in contact with the blank for more than a few seconds at the time.



I strongly suggest the 36/40 grits as the primordial material removing grits, a 100 grit disc can be used to smooth the marks from the 40 grit disc that, are surprisingly not deeper or different than your normal 80 grit sand paper, when used is this rotating motion, that blank of yours, would take me about 1 to 2 minutes to get to regular hand sanding stages...!

At the end of the day, these are all techniques and methods that can be far from "traditional" but work well...!

### Roy Quast

George... that is a fantastic way of sanding. I'm so glad you posted on this thread because now I have shown how to drill any blank without it blowing up and you have backed me up by showing how to use sand paper to take a blank down until it needs hand sanding. Together, I hope we will have encouraged other turners to try segmenting.

### robutation

Thank you for not been upset for me put my information of your thread but, when I saw the steps on your tutorial for maintaining the segmented blanks structural integrity for the safe drilling and saw the blanks that you cut from it and read that you use hand sanding to avoid a possibility of blowout by using cutting tools, as you so clearly indicated at the thread beginning, I felt obligated to let you know that the flat disk is indeed your best method to get it done without any damage.

Now, having said that I should also talk a little more about the tip of the flap disks you find in most hardware store. In general terms you have the red oxide colored disks and the blue ones, I suggest to spend those couple of dollars more and purchase the blue disks, they are made to cut though metal and even stone so, when segmentations have included metals, any sort, the blue disk will cut better and producing a lot less heat that, in these blanks is crucial to prevent to minimize any changes of compromising the glue used on the blank construction.

The coarser the grit, the less heat will produce and off-course, you should always try to main the blank cool, one of the various ways to achieve that is to have a small container with crushed ice and an old sock, put the ice inside the sock and after removing a small amount of material from the blanks with them flap disk, put the icy sock all around the blanks for a minute or so, and continue on bit by bit until you have it ready for the hand sanding process, as normal...!

Some hardware shops sell these blue discs at a ridiculous prices, too expensive when, you can buy the on eBay in boxes of 10 for a fraction of the price, I strongly suggest the 36 or 40 grits for doing to most cutting and then 100 for a few passes with it and you can then go straight to the 240 and so on...!

You are correct, the combination of our 2 methods, will transform the segmentation nightmare, of the processes that will need to be made to transform the blank into a pen, an experience that will assist considerably with the success of every single blank made, and in my view, if you are going to take the time, effort and expense to create these types blanks, I just can't see why, one would be preferring to risk a total failure, by not giving a go at the suggestions and methods, explained...!