**Modifying Drill bits**

**By John Lucas**

 I was teaching a class in how to make Candlesticks. Years ago I purchased a custom made drill bit for drilling the tapered hole in candlesticks. I found out the drill bits were no longer manufactured so I needed a way to modify a drill bit that was easy for anyone to do (OK anyone with a lathe and a Dremel). I frequently modify what are called Spade bits, or Paddle bits. Those flat drill bits you can buy really inexpensively at any hardware. I usually just scribe lines on them and grind as close as possible to the final size or shape. Sometimes I don’t get both sides ground perfectly and drill bit chatters. So I needed a way to get both sides exactly the same. Here is my technique.

 I use a table that fits in my lathe Banjo. You could just as easily build a box that fits on the ways. I built a cradle for my Dremel. I put screws in the front of the cradle for fine adjustment. I clamp a piece of wood to act as a fence on the table. I mark the drill bit as accurately as possible for the final shape. In this case it was a taper to match the candle. I grind as close to the line as possible. Now mount the drill bit in a chuck on my lathe. I rig up a homemade index wheel to lock the drill bit into position. I turned a custom wooden insert for my Nova live center. This holds the drill bit tip very accurately to ensure precision. I put a grinding wheel in the Dremel and slide it up to my fence. I adjust one end or the other until it’s really close to the exact angle I want. I lock the drill bit in position with my index wheel. I lock the drill sides slightly below center to give some ”relief” to the grind to make it cut cleaner. Not I adjust the screws so it takes a small grind and check to see how accurately it’s aligned. If it’s not dead on I adjust the fence. Then make another test run. Once I have it adjusted perfectly all I have to do is make a pass down the drill bit. Rotate it 180 degrees and do the other side. Then make a small adjustment on my screws to grind a little more and do both sides again. Once I get it down to the scribed line and it’s grinding both sides equally then I can stop. I can’t believe how well this Drill bit works.

 This also works to change the size of the drill. I needed a drill .730” to help duplicate parts for and antique clock. Took just a few minutes using the same set up as above and I had my drill. When making stools I needed a drill bit with a very short point. It’s hard to use a Forestner style bit in a hand drill and many turners don’t own a Drill press so I make my own from Paddle bits. I scribe a line down the center of the drill to the point. Then I grind off the point to as short as I need. Then set the grinder table to the angle of the grind already on the drill bit blades. Set the drill bit on the table and move up really close to the factory grind. Push the blunt point up to the side of the grinding wheel and take a little off. Flip the bit and do the same on the other side. Repeat until you have reached your scribed line. Both sides should now be ground the same and you should have a true running point. The point needs to be long enough that it will engage the wood before the wings hit when drilling at an angle.

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