



# Barley Twist Candlestick Holder

## Materials:

- (1) 1 1/2" x 1 1/2" x 12" - Top
- (1) 3" x 3" x 1" - Base

## Router Bits:

- 1 1/2" Barley Twist
- 3/8" Upcut Spiral
- 1" Surface Planing

## Techniques:

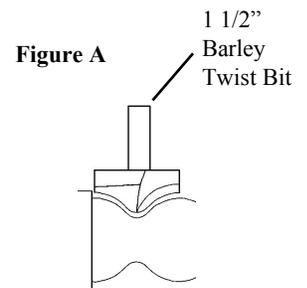
- 2 Start Spiral
- Indexing



**Preparation:** Cut the corners off of the stock for both the base and the top, and then mount the hubs with 1" screws. You'll want to use a drill press on the base to create the mortise for the tenon and the hole on the top of the cup for the candlestick. When you mount the stock into the machine you will insert your tailstock center into these mortised holes.

**Machine Setup:** Use the 3" gear pitch and a 1 1/2" barley twist bit. Set the stop on the right side at 2 1/2". This will leave you enough room on the headstock end so that you don't run into the mounting screws and will give you a 1/2" tenon to attach the top into the base. Set the left stop at 10 1/4". Set the stop on the y-axis at 0. Set the plunge depth so that you will be milling into the stock approximately 1/8".

**STEP ONE:** With the split-nut open, plunge to the side of the stock, start your router and bring it to center using the y-axis handwheel while pushing the carrier tray against the right stop. Mill the cove (Fig A) around the circumference of the stock.



**STEP TWO:** With the router plunged to the side, lock the x-axis split-nut onto the linear drive screw. Set the carrier tray to the beginning stop and bring the router over the center of the stock (the bit should be rotating freely in the previously milled cove).

As you rotate the stock the router will mill the first bead of the barley twist. When you get to the end of the milled section (the left stop set at 10 1/4") lift the router off of the stock, open the split nut and slide the carrier tray back 1 1/2" (the diameter of the bit) and lock it into place. Drive the router back to the beginning. As you do so, check to see that the bit is traveling above the unmilled section of the stock.

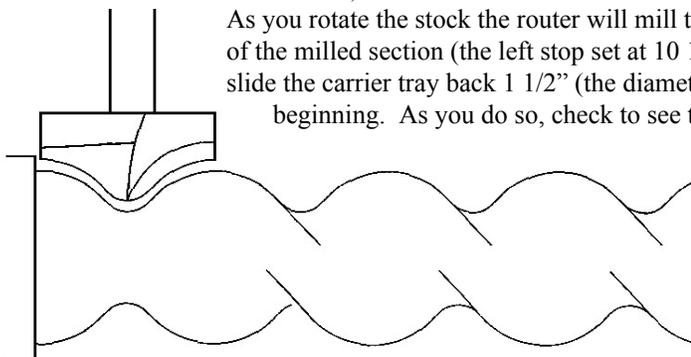


Figure B

**STEP THREE:** Repeat the process to mill the second pass of the barley twist. When you get to the end, open the split-nut and mill the second cove (Fig B).

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**STEP FOUR - Milling the Top:** Use the 1" surface planing bit to mill the top of the candlestick. The flair at the top of the piece will be created by leaving the bit offset on the y-axis by 1/2" (Fig C)

**STEP FIVE:** The lip on the top of the candlestick is milled using a 3/8" point-cutting roundover bit. Place the point of the bit on the end of the workpiece. Set the plunge depth so that the shoulder of the bit sits on the top of the stock.

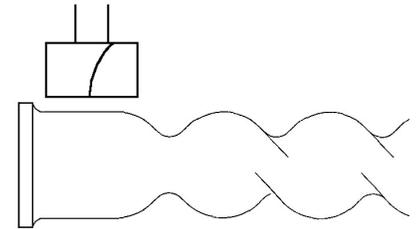
**STEP SIX - Milling the Tenon:** The last step will be to mill a tenon on the headstock end of the workpiece. The final measurement for the tenon should be 1/2" diameter and 1/2" long. This is where a set of calipers is very useful. Set the right stop at 1" to avoid running into the screws that are holding the stock to the mounting hub. Use the 3/8" upcut spiral bit and start the tenon at the right edge of the cove that was milled in step one. Mill the tenon a little at a time so as not to put too much torque on the router bit (Fig D).

**STEP SEVEN - Milling the Base:** With the right stop set at 1" use the 1 1/2" barley twist bit to mill the base to a round disc with a contoured profile (Fig E).

**STEP EIGHT:** To add the decorative flutes to the base leave the plunge depth set at the same level, lock the router into position over center, and move the stop to 7/8". Using the 24 position indexing plate, lock the stock into place. Turn the router on and gently bump the carrier tray against the stop, creating a light flute on the base. Back the router off of the piece, and index the stock 1 hole position on the indexing plate. Repeat this process until you have completed the 24 flutes around the profile of the base.

**STEP NINE:** To create the flutes on the top of the base, change the router bit to the 3/8" upcut spiral. Reset the plunge depth so that the bit is approximately 1/2" from center (Fig F) and adjust the right stop so that you are lightly milling the surface. It's a good idea to set your left stop so that you don't inadvertently mill into your tailstock. Repeat the indexing as described in step eight.

Figure C - Milling the top -side view



Top view

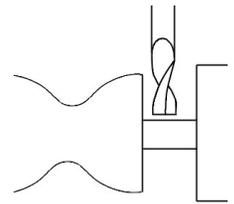
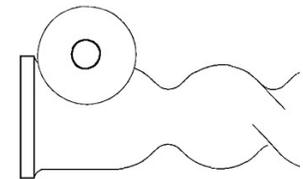


Figure D -  
 Milling the tenon

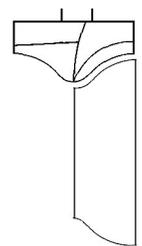


Figure E -  
 Base, side view

Set the stop so that you are lightly milling the surface.

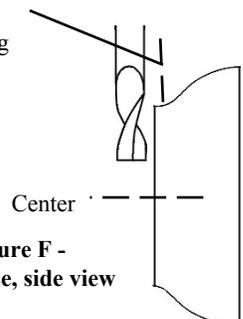


Figure F -  
 Base, side view