

INCRA® HingeCrafter

Any Hinge, Any Size, Any Project!

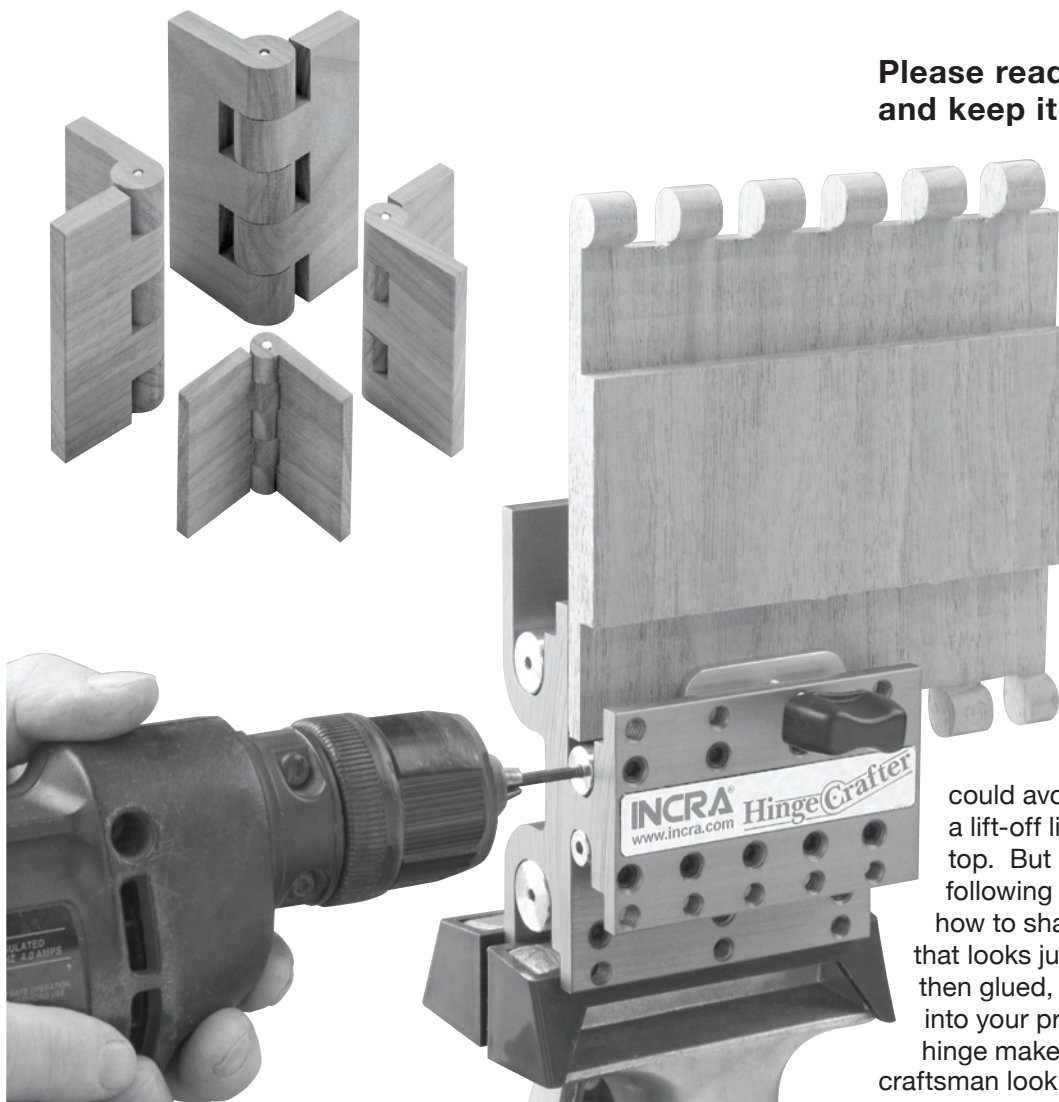
OWNER'S MANUAL

Please read this owner's manual and keep it at hand for reference.

So you've designed and built the ultimate jewelry box or cabinet, and it is with some apprehension that you approach that final step, installing the hinges.

Metal hinges are a pain. Let's face it. It's not so much the hinge itself, it's those darned brass screws. When you finally do get the pilot hole centered properly, the head of the screw is sure to twist right off during installation. It makes you wonder how many brass screw heads are actually glued instead of screwed in the hinge.

What's the solution? Well, you could avoid the problem completely with a lift-off lid, or perhaps a sliding dovetail top. But let's not sidestep the issue. The following set of plans detail step by step how to shape and cut a wooden hinge that looks just like the metal version. It is then glued, not screwed, into mortises cut into your project. The resulting wooden hinge makes both the craft and the craftsman look pretty good.



SAFETY

Important safety instructions for using the INCRA HingeCrafter

- Before attempting to make wooden hinges with the INCRA HingeCrafter, read and follow all of the instructions and safety information in this manual.
- When using the INCRA HingeCrafter in conjunction with any tool, first read and follow all instructions and safety information in that tool's owner's manual.
- Use appropriate safety devices. Keep hands clear of the blade or bit at all times.
- When appropriate, always use a push stick, rubber soled push block, or other safety device to keep your hands safely away from the cutting tool.
- Always work with a full-sized hinge blank. Do not attempt to cut blanks smaller than the sizes recommended.
- Always wear safety glasses and follow all normal shop safety practices.

SUPPLIES

Begin by gathering the necessary supplies to produce your hinges:

- INCRA HingeCrafter (included)
- Router Table
- INCRA Fence Positioner
- #30 (.128") x 6" long drill bit (included)
- Hardwood for hinges
- 1/8" brass rod (available at some hardware and craft stores, as well as all welder's supply stores)
- Fixed INCRAMENT™ Templates for 3/8", 1/2", 5/8" and 3/4" spacing from the INCRA Master Template Library (Templates # 45, 47, 48 and 49)
- 3/8", 1/2", 5/8" or 3/4" bull nose router bit (Bit size corresponds to hinge barrel diameter)
- 3/8", 1/2", 5/8" or 3/4" straight router bit (Bit size corresponds to hinge barrel diameter)
- Rubber soled push block

GETTING STARTED

To better understand the process descriptions to follow, let's first take a look at **Fig. 1** showing the various stages of production.

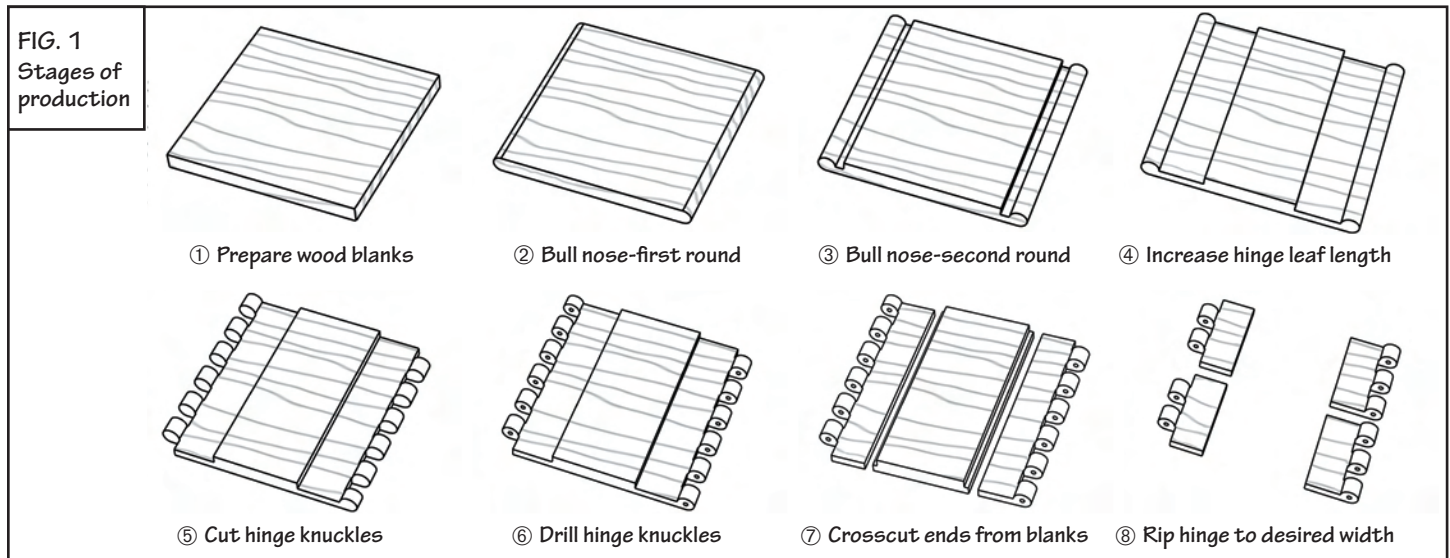
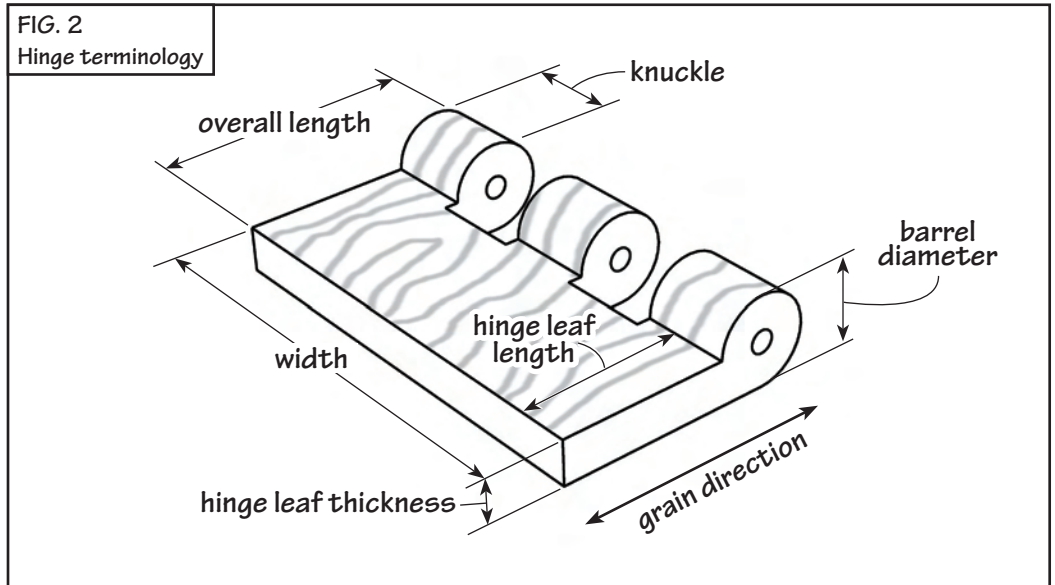


Fig. 2 describes the finished hinge in terms you will see referenced later in this booklet.

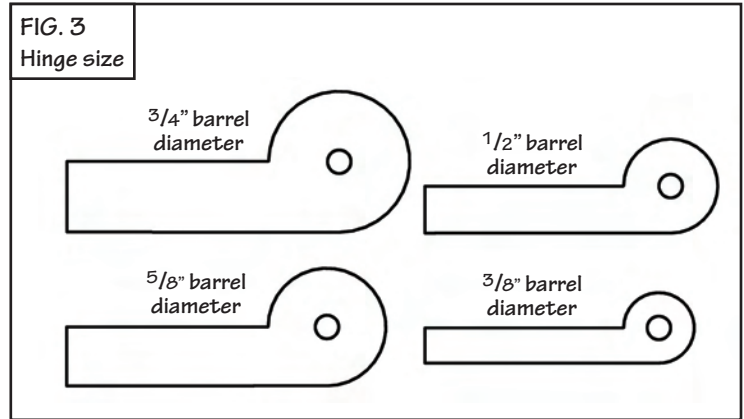
Note:

Width always refers to measurements across the grain, while length measurements are always parallel to the grain.



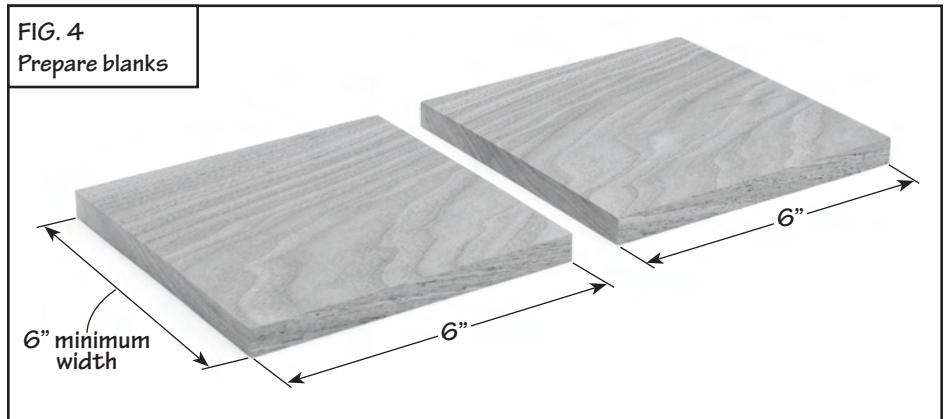
Choosing Your Hinge Size

Your INCRA HingeCrafter will allow you to produce four hinge barrel sizes with hinge widths up to 10 1/2". Use the full-scale hinge profile illustrations shown in **Fig. 3** to select the hinge size that you want to make for your project. The larger 5/8" and 3/4" hinge barrel diameters can be used for vertical hinge applications such as cabinet doors, while the smaller 3/8" and 1/2" sizes are better suited to horizontal applications, such as jewelry boxes and humidors. The hinge barrel diameter you select will require the same diameter bull nose bit and straight bit. For example, if you select the 1/2" barrel diameter, you will need a 1/2" diameter bull nose bit and a 1/2" straight bit for the required cuts.



PREPARE WOOD BLANKS

When selecting stock for your hinges, use close grained hardwoods such as maple, cherry, walnut or mahogany for best results. Avoid highly figured woods such as bird's-eye maple or anything "curly". You'll need at least 6" of width in your selection and at least 12 1/4" of length in order to produce two blanks. In general, the wider the wood blank, the more hinges you'll get. If you want to make extra wide piano hinges, prepare stock up to 10 5/8" in width. (Trimming cuts made later in the process will remove about 1/8" of material width.) Thickness plane the stock to match the hinge barrel diameter that you have selected. For consistent results it is important to thickness plane the stock as accurately as possible. A machinist caliper is very helpful in producing precise thickness. Crosscut the stock to yield two 6" blanks, **Fig. 4**.

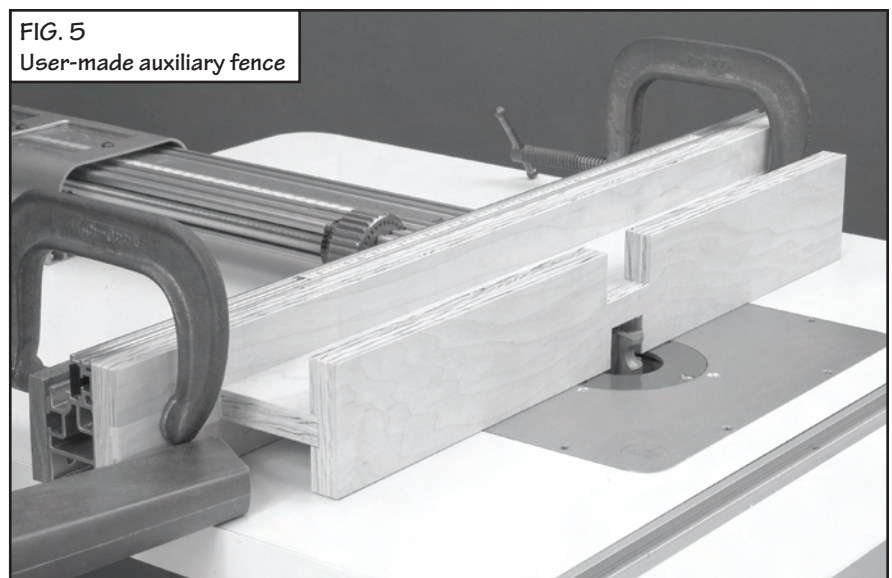


Caution: Always thickness plane the 12 1/4" long blank before cutting to (2) 6" long pieces.

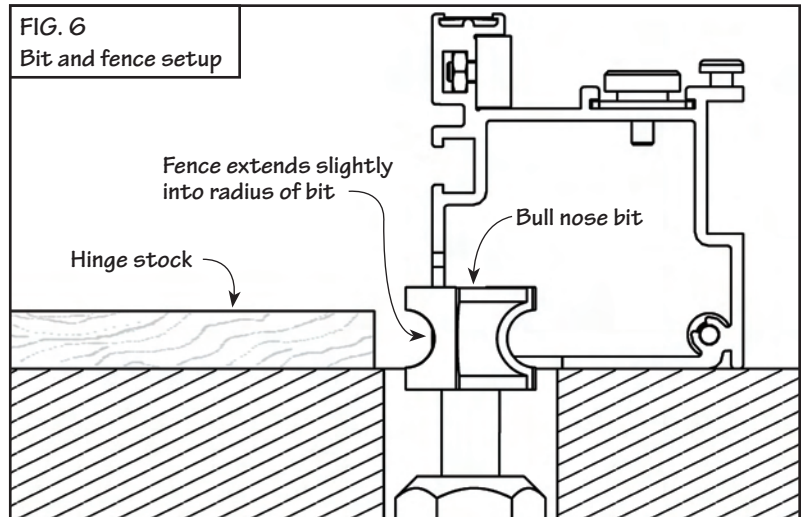
BULL NOSE - FIRST ROUND

Bull Nose Bit And Fence Setup

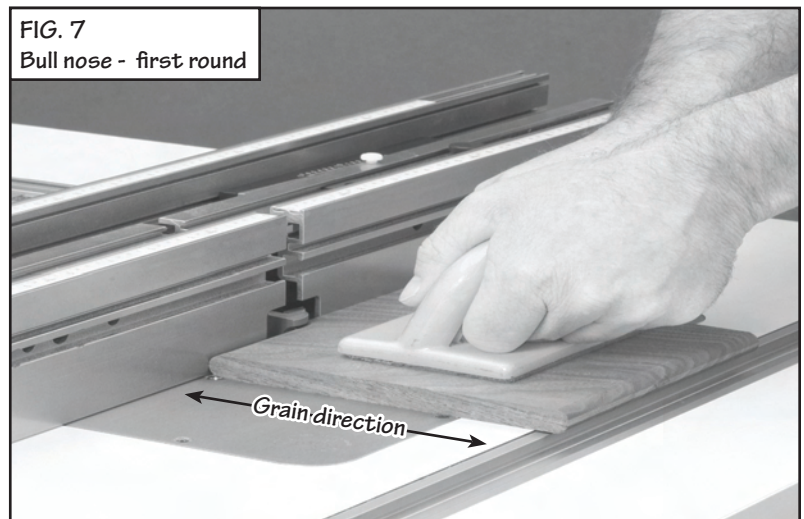
Install in your router the bull nose bit that matches the hinge barrel diameter you have selected. The bull nose bit creates lots of chips in the process of hinge making so dust collection is a must. If you do not have a split fence with dust collection capability such as the WonderFence or the IntelliFence mounted to the front of your Inkra fence positioner, it will be necessary to make and attach the wooden auxiliary fence shown in **Fig. 5**. This design allows for dust collection using a standard shop vac wand. Dimensioned plans for this user-made auxiliary fence are shown on page 8.



Adjust the depth of cut on the bull nose bit so that the roundover is centered on your stock thickness. Sight down the front face of the fence and position the fence so that it extends just slightly into the profile of the bit, **Fig. 6**. This setup will leave a tiny flat on the end of your stock after cutting. This flat is necessary to avoid snipe at the end of the cut. It is a good idea to make a test cut to adjust the depth of cut to match your stock thickness and to adjust the fence position to leave a flat of only about 1/16".

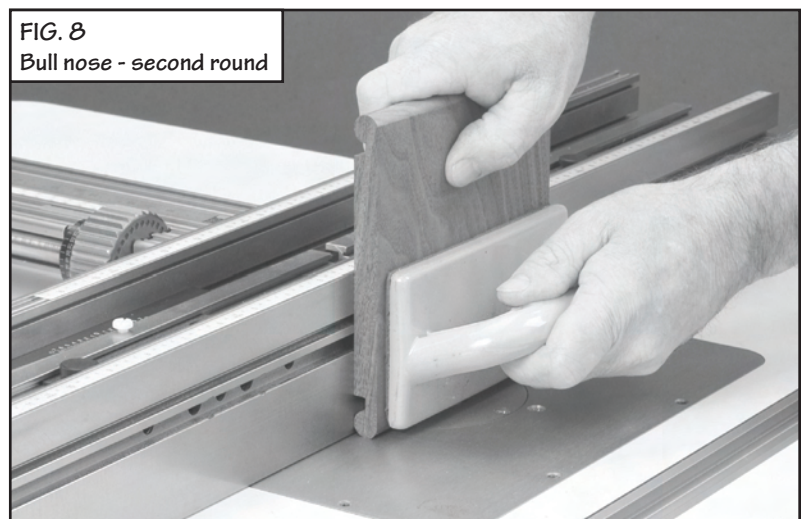


Place the end grain of the hinge blank against the fence and, using a good rubber soled push block, move the stock through the cut. Repeat the cut on the opposite end of the stock, **Fig. 7**. The bull nose cuts should always be made *across* the grain as shown. Attempting to produce hinges with the bull nose cuts made parallel to the grain will result in hinge knuckles that splinter and break easily.



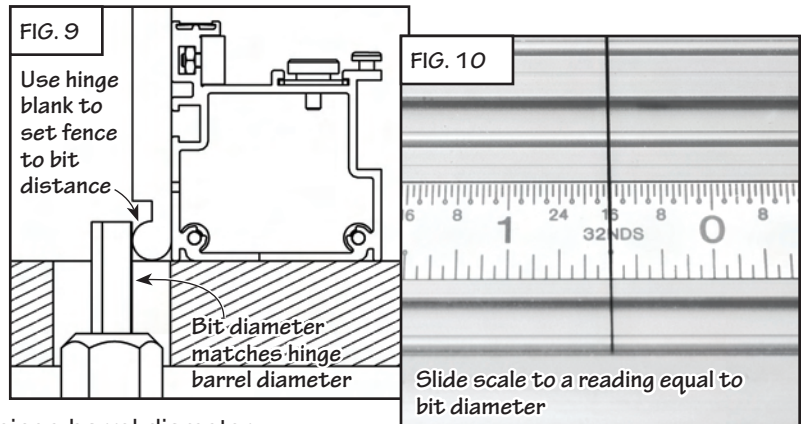
BULL NOSE - SECOND ROUND

Now stand the hinge blank on the rounded end with the face grain against the fence and, using the rubber soled push block, move the stock through the cut, **Fig. 8**. Apply downward pressure to keep the hinge blank on the table. Repeat the cut on the opposite end of the blank. After making the bull nose cuts on all of your blanks, remove the bull nose cutter and any auxiliary fence you may have attached.



INCREASE THE HINGE LEAF LENGTH

In the next series of cuts you will increase the length of the hinge leaf and determine its final thickness. While the finished length of the hinge leaf can be varied to suit your needs, the leaf thickness is very important to the function of the hinge. If the hinge leaf thickness is greater than half of the barrel diameter, the hinge will not fully close when assembled. Again, measuring accuracy is important here. It is suggested that you set the initial depth of cut described below a little shallow and after the first cut, measure the leaf and adjust the depth of cut as necessary.



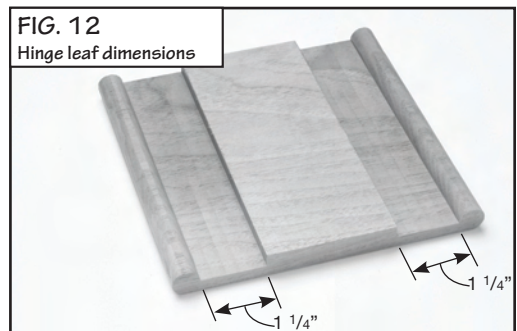
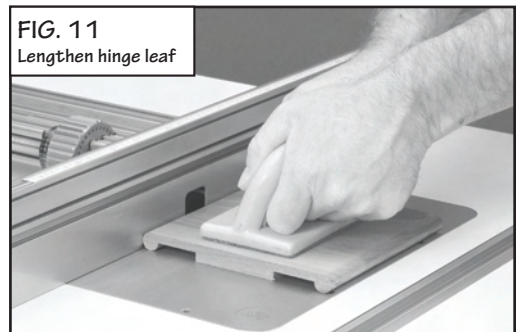
Install in your router the straight bit that matches the hinge barrel diameter you have selected. Set the depth of cut for the straight bit to half of the hinge barrel diameter. For example, if making the $\frac{1}{2}$ " hinge barrel, install a $\frac{1}{2}$ " diameter straight bit and set the depth of cut to $\frac{1}{4}$ ". Set the initial fence to bit distance equal to your stock thickness (use your hinge blank as a gauge), **Fig. 9**. Now slide your inch scale under the hairline cursor to a reading equal to the straight bit diameter, **Fig. 10**.

Place the hinge blank on the router table with the rounded end against the fence as shown in **Fig. 11**. Using a rubber soled push block, move the stock through the cut. Repeat this cut for both ends of both blanks. Now move the fence back $\frac{1}{4}$ " and repeat the cuts. Continue stepping the fence back and cutting, making a final pass at $1 \frac{1}{4}$ " on the inch scale set previously.

TIP: The final fence setting will produce a hinge leaf length of $1 \frac{1}{4}$ ". In other words, the final scale reading is a direct readout of the dado width just cut, **Fig. 12**. To decrease the number of passes when making large quantities of the smaller barrel hinges, you can substitute a $\frac{5}{8}$ " or $\frac{3}{4}$ " diameter cutter. Set up exactly as described above and finish the cuts at the same dimension or any other dimension that suits your custom application. Note: If using a dimension other than $1 \frac{1}{4}$ ", always add $\frac{1}{4}$ " to your final desired hinge leaf length. A subsequent trimming operation will remove the $\frac{1}{4}$ ".

Trim The Edges To Remove Tearout

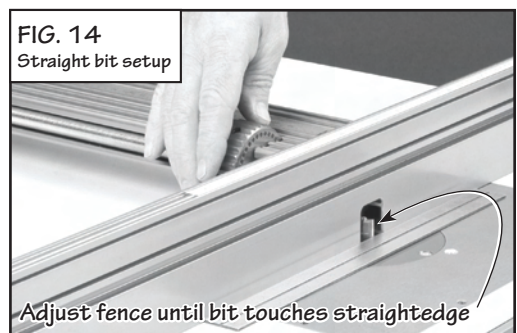
At your table saw, trim about $\frac{1}{16}$ " from each edge of the hinge blanks to remove any tear out that may have occurred during the bull nose or dado cuts, **Fig. 13**. For extra wide hinge blanks, use your miter gauge for these trimming cuts.



CUT HINGE KNUCKLES

Hinge Knuckles - Straight Bit And Fence Setup

Install in your router the straight bit that matches the hinge barrel diameter you have selected. Set the depth of cut to about $\frac{1}{16}$ " greater than the thickness of the hinge blank. Zero the fence to the cutter with the cutter inside the fence opening. To do this, move the fence to cover the cutter then place a straightedge across the fence opening. Now micro adjust the fence backward until the cutter just touches the straightedge, **Fig. 14**. Clamp the fence positioner in place.



Install the Fixed INCRament™ template from your INCR A Master Template Library that corresponds to the hinge barrel diameter you have selected. For example, if you selected the 1/2" hinge barrel diameter, use the Fixed INCRament™ template with 1/2" spacing (Template #47). Slide the template to position cut #1 on the template directly under the hairline cursor, **Fig. 15**.

Cut The Hinge Knuckles

Clamp the two blanks back to back to your INCR A Right Angle Fixture as shown in **Fig.16** and mark the "fence" edges of the pieces. Turn the router on and take a couple of passes to sneak up to cut #2 on the template. Proceed by making cuts at each of the even numbered blue cut marks on the template. Turn off the router.

Unclamp the two blanks and flip to cut the opposite ends. Before clamping, make sure that the marked "fence" edges are against the fence. Now proceed by making cuts at each of the odd numbered blue cut marks on the template beginning with cut #3, **Fig. 17**.

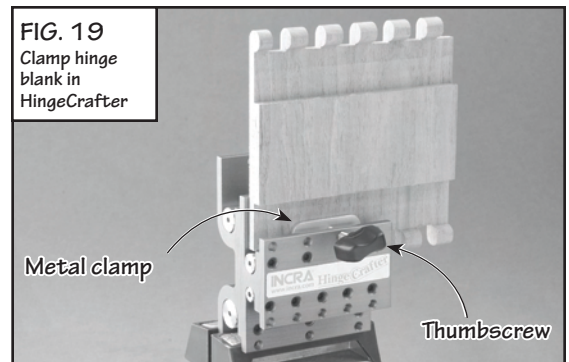
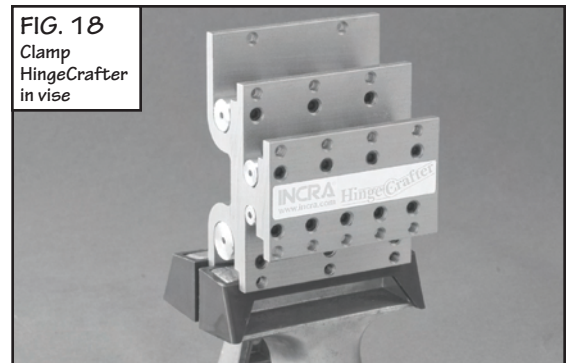
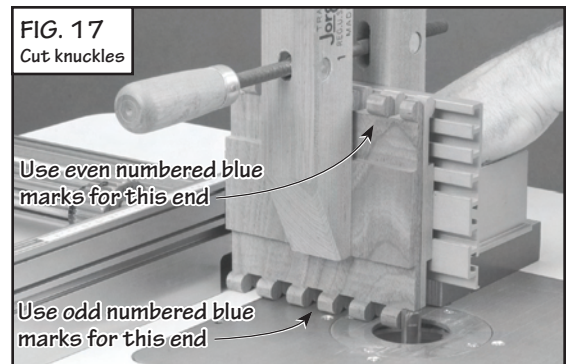
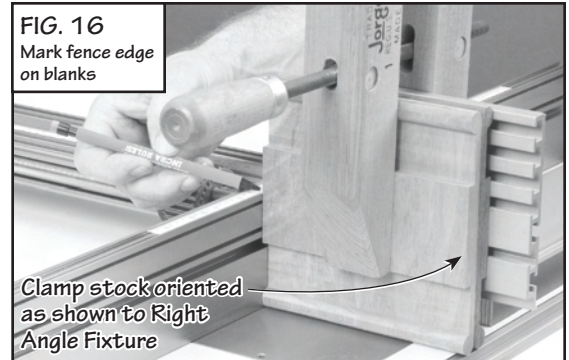
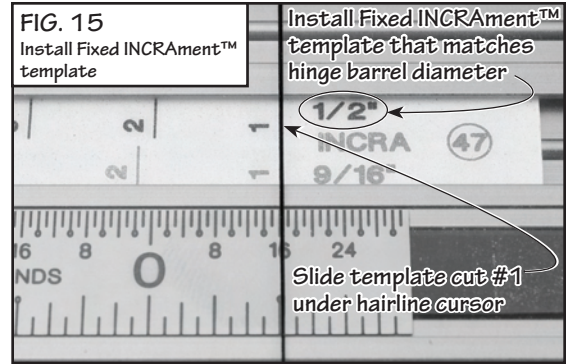
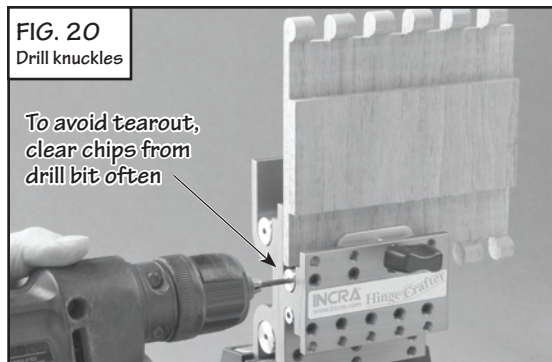
DRILL HINGE KNUCKLES

Your HingeCrafter is equipped with four different bushing sizes, one for each barrel diameter (3/8", 1/2", 5/8", and 3/4"). The spacing set for the bushings within the HingeCrafter makes matching the barrel diameter to the correct bushings easy. Just find the bushing section that allows your hinge knuckles to slide in between the bushings. After identifying the correct section, clamp the HingeCrafter in a bench vise as shown in **Fig. 18**. If you don't have a bench vise, just clamp the HingeCrafter to the corner of your workbench to allow drilling from both sides of the fixture.

Slide your hinge blank into the drill guide as shown in **Fig. 19** and use the thumbscrew in one of the threaded holes to clamp the hinge blank in place. To protect the hinge, slide the provided metal clamp pad between the hinge and the thumbscrew before tightening. Make sure that the hinge blank is pressed firmly and squarely into the bushings before tightening the clamping thumbscrew.

Install the provided #30 (.128") drill bit in a hand drill and drill the hinge blank, **Fig. 20**. **Clear the chips from the drill bit often.** If the chips are not cleared from time to time, the drill bit will load and create tearout on the backside of the knuckle, or worse, crack the hinge. Remember, a clean drill bit drills while a loaded drill bit just pushes hard. For hole position accuracy, never drill more than one knuckle beyond the last bushing of the drill guide. To complete the hole, unclamp and reposition the hinge blank, then drill through the opposite end of the drill guide.

IMPORTANT:
Whenever repositioning the hinge blank, always blow sawdust and wood chips out of the drill guide before reinserting the hinge blank.



For extra long hinges, first drill one end of the hinge blank, then unclamp, reposition and drill the opposite end of the hinge blank. Finally, unclamp and reposition with the center of the hinge in the HingeCrafter and drill through the existing outer holes to reach the center. For the longest hinges it will be necessary to complete the holes in the center by drilling from both ends and in a few cases a third repositioning is required, **Fig. 21**.

CROSSCUT ENDS

Before removing the hinges from each end of the blank, make the safety push stick described in the full-scale plan included with this manual. Use $\frac{3}{4}$ " plywood and cut out the push stick with a band saw or scroll saw. Sand the push stick to remove any sharp edges around the handle.

Set the fence to blade distance at your table saw equal to the hinge barrel diameter plus 1". (Example: For the $\frac{1}{2}$ " barrel diameter set the fence to 1 $\frac{1}{2}$ ".) With the rounded end of the blank against the fence and the hinge leaf dado face up, use the push stick to move the blank through the cut, **Fig. 22**. Repeat for the opposite end.

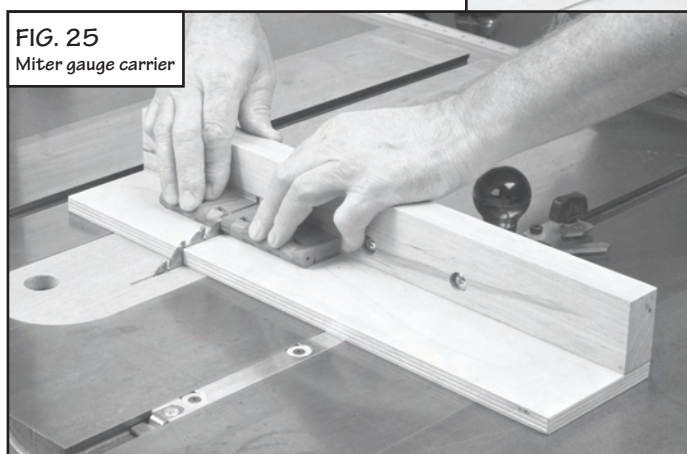
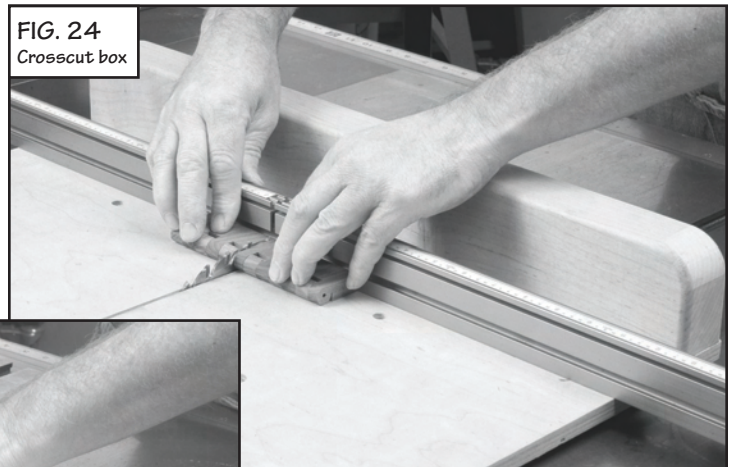
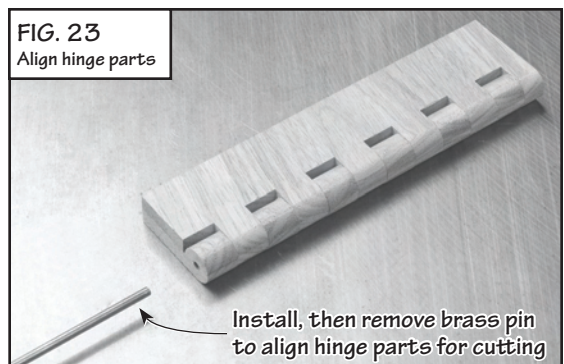
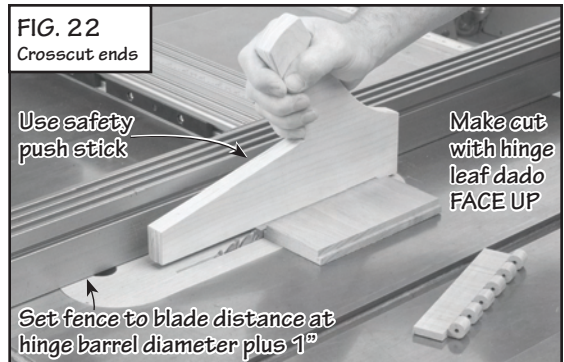
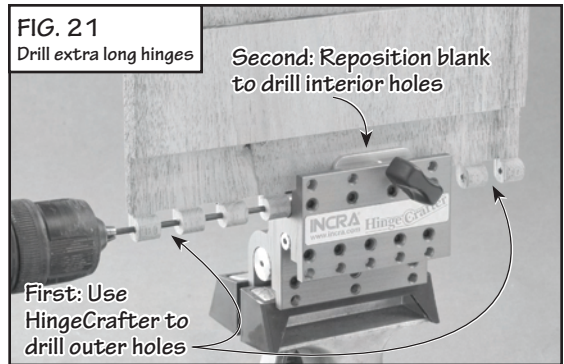
CAUTION: Never make the above-described cut with the hinge leaf dados face down.

RIP HINGE TO FINAL WIDTH

Before cutting your finished hinge to final width, carefully assemble the two halves of the hinge blank and install the brass hinge pin. If you experience any difficulty installing the hinge pin, you can run the drill bit back through the hinge to clean out any chips that may be blocking the holes. After installing the brass pin, close the hinge and carefully remove the hinge pin. This aligns the hinge parts for cutting, **Fig. 23**.

CAUTION: Never make final sizing cuts with the brass pivot pin installed.

The final sizing of your finished hinge must be accomplished by making the cuts using a crosscut box or miter gauge carrier as shown in **Figs. 24 and 25**. Although these cuts appear to be crosscuts, they are in fact short grain rip cuts and require backing support for safe cutting. Each of the methods of cutting shown provides necessary backing support for the hinge blank on both sides of the cut. Dimensioned plans for the miter gauge carrier can be found on page 8. Hold the squared end of the hinge assembly firmly against your crosscut box or miter gauge carrier back fence as you make the cut. Determine the final cut width depending on the requirements for your application. In general, the smallest hinge should have five knuckles for maximum strength (three on one side and two on the other).



NOTE: Owner's manual photos show the blade guard removed for instructional clarity only. You should use your blade guard and other safety equipment whenever appropriate to protect yourself. Refer to your equipment manuals for proper safety instructions.

AUXILIARY FENCE PLANS

These auxiliary fence plans are intended for users who do not own an INCRA WonderFence or another fence with a wide cutter gap to accommodate the larger bull nose router bits and dust collection.

Rip $\frac{3}{4}$ " thick plywood to 3" wide and crosscut to yield two pieces 22" long and one piece 28" long. Cut a $\frac{1}{4}$ " deep groove on the 28" piece and one of the 22" pieces as shown in **Fig. 26**. Adjust the width of the groove for a good fit with the remaining 22" plywood piece. Cut the fence openings on the 22" piece as shown. Glue up the three pieces making sure to check the fence for square before the glue sets. Cut $\frac{1}{4}$ " x $\frac{3}{4}$ " x 3" fillers for the groove openings at the ends of the 28" piece. Glue in place.

To use your auxiliary fence, clamp the 28" piece to your existing INCRA fence with the appropriate sized opening over the bull nose bit. The smaller opening can be used with the $\frac{3}{8}$ " and $\frac{1}{2}$ " bull nose bits. Use the larger opening for the $\frac{5}{8}$ " and $\frac{3}{4}$ " bits. Protect the rear of your INCRA fence by placing scrap wood pads between the fence and your clamps. For dust extraction, slide a standard shop vac wand into the opening on the outfeed side of the fence, **Fig. 27**.

FIG. 26
User-made auxiliary fence

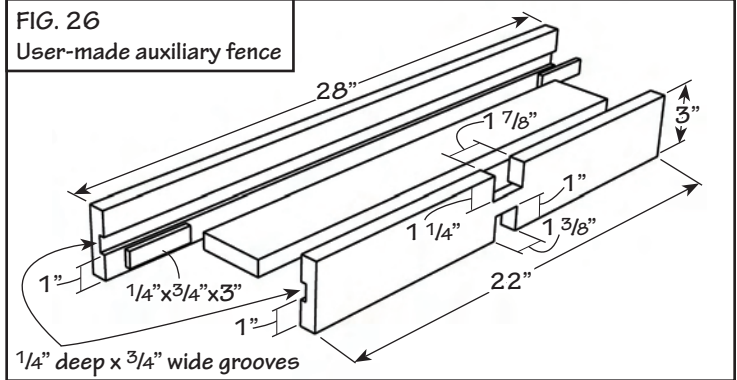
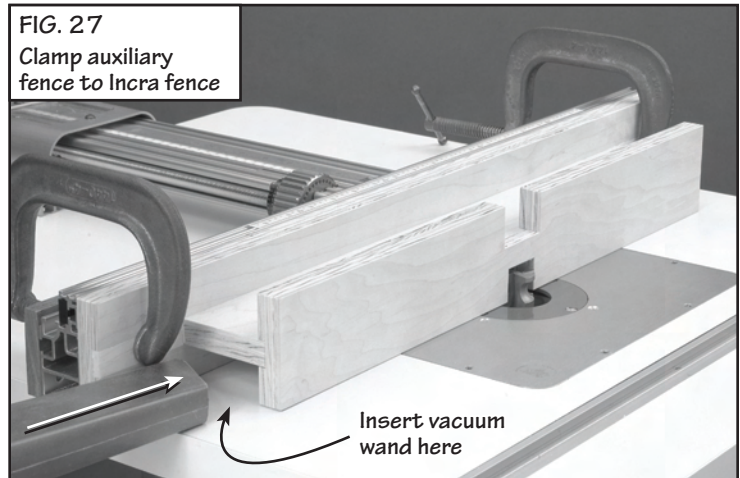


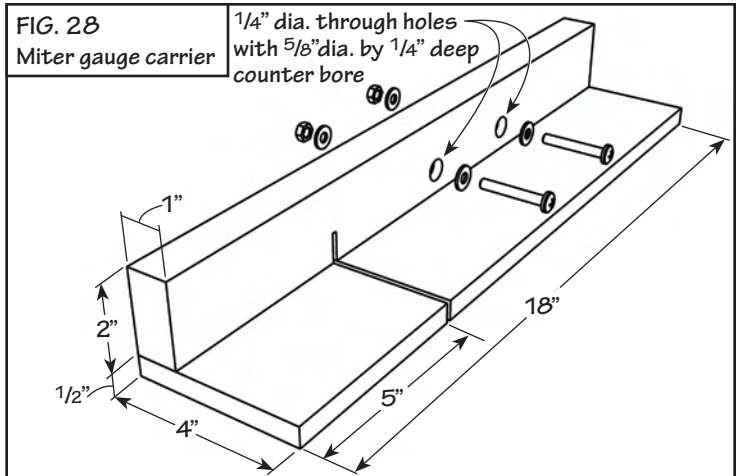
FIG. 27
Clamp auxiliary fence to Incra fence



MITER GAUGE CARRIER

Rip and crosscut the stock as shown in **Fig. 28**. Before gluing the pieces together, dry assemble the parts to your miter gauge at the table saw. Allow 5" of the fence to cross the line of cut. Mark hole locations that will align with those in your miter gauge. Drill the two $\frac{1}{4}$ " mounting holes and then counter bore with a $\frac{5}{8}$ " forstner bit to a depth of $\frac{1}{4}$ ". Glue the fence to the support base, taking care to align the two parts flush along the back edge. Attach to your miter gauge using #10-32 x $1\frac{1}{2}$ " pan head Phillips machine screws with washers and hex nuts. In use, set the blade depth to cut only through the thickness of the hinge blank.

FIG. 28
Miter gauge carrier



WARRANTY

Taylor Design Group, Inc. warrants this product for one year from date of purchase. We will repair any defects due to faulty material or workmanship, or at our option, replace the product free of charge. Please return the failing component only, postage prepaid, along with a description of the problem to the address below. This warranty does not apply to parts which have been subjected to improper use, alteration, or abuse.

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