

# Unlock the Cove-and-Pin Joint

A clever way to re-create a vintage joint

BY LOU KERN

A few years ago I saw an old dresser with a beautiful and unique joint. I was taken with the joint and did some research. Turns out the cove-and-pin joint, also known as the pin-and-scallop joint or the Knapp joint, was commonly used on factory furniture in the late 1800s. In fact, there was a dovetailing machine patented by Charles Knapp and Nathan Clement that was used to make the joint. I'm not sure why, but in the early 1900s the cove-and-pin fell out of favor and the machines along with it.

Finding one of those relics and restoring it wasn't realistic, so I built a sled and two jigs that allow me to create the joint using the router table and a handheld drill. The rounded fingers on the ends of the drawer sides are simple to make using the sled, which is essentially a finger-joint jig for the router table. The trick is cutting the other part of the joint, the line of semi-circular cutouts in the ends of the drawer front. To rout them I need a template, and I make it by taking a casting of the finger side of the joint. It turns out that casting with epoxy is easy to do and remarkably accurate.

My joint differs from the original, in which the pin was integral to the drawer front; I use dowels for that circular detail, adding them after the joint is cut and the drawer box is glued together.

## Create a master template

My sled rides in the miter track in my router table, but if you don't have a miter track you can screw a piece of hardwood to the top of the router table so that it stands proud and cut a matching dado in the bottom of your sled. Or you could clamp or screw two straight boards to the table so that the sled exactly slides between them.

Once the sled is built, I use it to create a master template that will establish the pattern and spacing that carries through the process. I set my sled's indexing pin to cut on 1-in. centers because of the

## Online Extra

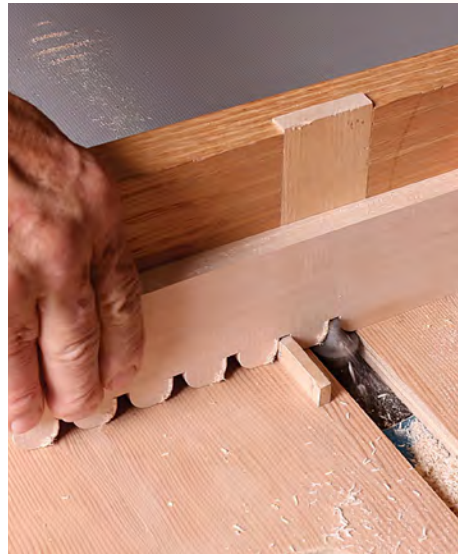
For a members-only article exploring the history of the cove-and-pin joint, go to [FineWoodworking.com/271](http://FineWoodworking.com/271).



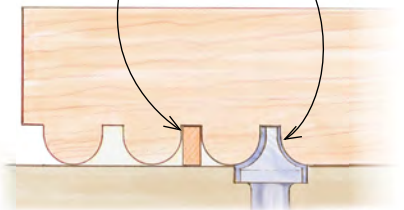
## START WITH THE MASTER TEMPLATE



**Rout the rounded fingers.** On the router table, set up a sled in the miter track and begin cutting the rounded fingers, moving over and registering on the indexing pin after each cut. This will create an overall master that you can use to re-create any of the pieces in the future, just in case.



Indexing pin Router bit



## MAKE THE MOLD TEMPLATE FROM THE MASTER



**Second one is for the mold.** Trace the outline of the master template on a piece of stock. This will be the mold template, used to make a mold to create the mating shape you'll need for the jig to cut the drawer front.



**Waste away between the fingers.** Use a bandsaw to waste out most of the material before you go to the router table. This will make for cleaner routing and extend the life of your bit, mold, and jigs.



**Repeat the router-table process.** With the space between the fingers already removed, go back to the router table and use the sled with the indexing pin to cut them. On the first pass, Kern cuts the fingers a hair short, then raises the bit just a little and does another shallow pass for a cleaner final cut.



# Cast a template for the drawer fronts

To make a routing template that lets you cut the semi-circular sockets in the drawer fronts, you'll first build a mold and make an epoxy casting.

## CREATE A MOLD



**Apply a two-part epoxy filler.** Mix equal parts of the filler, and apply a coat to the template to create a nonstick surface. Make sure to coat between the fingers.



**Spray on shellac and mold release.** After the epoxy filler, spray on a thin coat of shellac. Once dry, spray on a dry film mold release.



**The simple mold comes together.** Cover the base and sides with plastic wrap and screw them in place. The plastic is thin enough that it won't impact the casting. The template should be set perfectly parallel to the long piece that will hold the casting (right). A line of screws in the edge of that piece gives the casting something to grip.

## SOURCES OF SUPPLY



**SMITH'S FILL-IT**  
**SMITH'S CLEAR**  
**PENETRATING EPOXY**  
**SEALER**

**SMITH & CO. LAYUP**  
**AND LAMINATING**  
**EPOXY RESIN**  
[smithandcompany.org](http://smithandcompany.org)

**STONER DRY FILM**  
**MOLD RELEASE**  
[Amazon.com](http://Amazon.com)





## CASTING IS A SIMPLE PROCESS



MIX



**Get the right consistency.** Kern found that Smith & Co. Layup and Laminating Epoxy Resin was too thin on its own, and Smith's Fill-it Epoxy Filler was too thick. So he combines them. Once both products are thoroughly mixed on their own, combine and mix until they are a smooth consistency.



POUR

**Pour and dry.** Pour the liquid into the mold, and poke it down its length to release any air bubbles. Let it dry overnight. Release it from the mold, and then tap the template off the casting.



RELEASE

bit I use (Amana Round Over no. 49704). With the 1-in. finger spacing, your drawer height needs to measure on the  $\frac{1}{4}$  in. (for example  $5\frac{1}{4}$  in.,  $6\frac{1}{4}$  in.,  $7\frac{1}{4}$  in.). Begin cutting the fingers, moving the workpiece over and registering the indexing pin after each cut.

This type of cut often yields tearout. I use a replaceable insert that prevents most tearout on the side that runs against the fence, but there is often still tearout on the front. So I start with my drawer sides slightly thicker than the final dimension and plane them to thickness after the fingers have been cut, removing tearout.

### Make the mold template for the drawer-front jig

Now you'll use the master template to create a duplicate, which will become part of the mold. You could skip making the dupli-

cate and use the master in the mold, but I like to have a perfect master for future use. If anything should go wrong along the way, I can just back up to the master and easily start again. First, trace the master template onto the mold template. Then go to the bandsaw to waste out the space between the fingers. This preserves the router bit and gives a cleaner cut. Sharpening the bit will slightly change its shape and the whole process will have to be redone, so I do anything I can to put that off as long as possible. Buying a pair of bits at the same time helps as well.

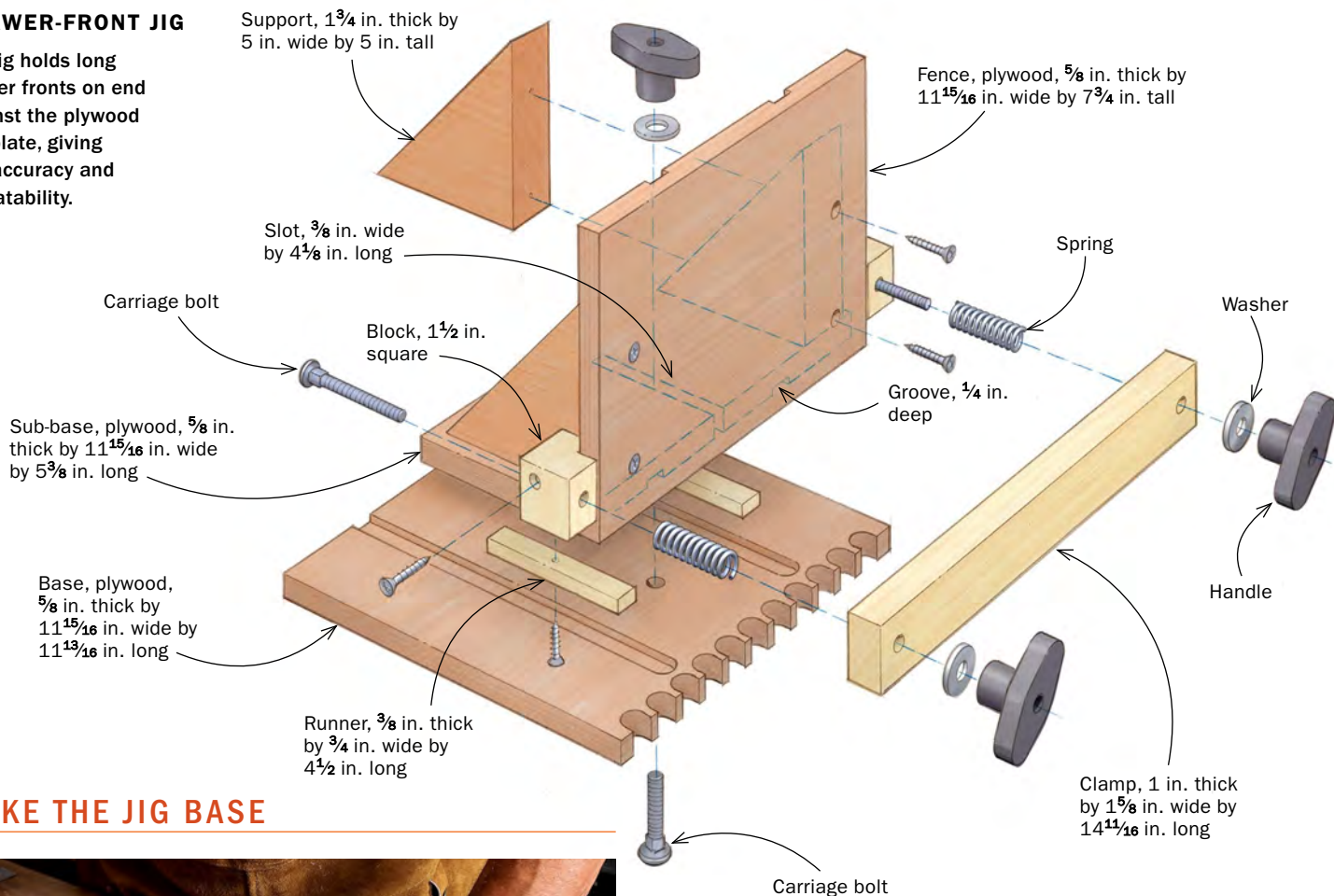
Once I finish on the bandsaw, I go back to the router table and cut the finger shapes into the mold template as I did on the master template, using the sled and moving across the board by locating the most recent cut on the indexing pin.



# Use casting to make the jig for the drawer fronts

## DRAWER-FRONT JIG

The jig holds long drawer fronts on end against the plywood template, giving you accuracy and repeatability.

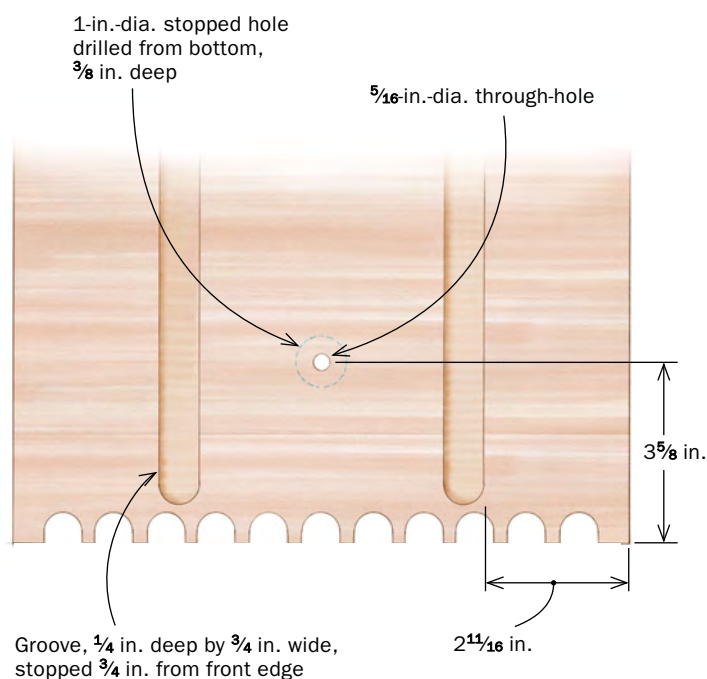


## MAKE THE JIG BASE



### Trace and cut.

Trace the casting onto a piece of high-quality plywood. This will become the base of the jig. Use the bandsaw to remove most of the waste. Then go to the router table and use a straight bit with a bearing on top to exactly transfer the casting to the plywood.



BASE TOP VIEW



## CUT THE DRAWER-FRONT SOCKETS



**The base of the jig.** Use the plywood piece you just routed as the base. Technically you don't have to have a jig; you could use the template clumsily clamped to the drawer front. But the jig holds the drawer front upright and is worth the extra effort for the precision it gives.



**Position and cut.** Tighten the drawer front in the jig, making sure it is positioned so the edges line up at the outside of pins. Using a bottom bearing-guided straight bit, cut the sockets in both ends of the drawer front.

### Prepare the mold template for casting

Once the mold template is cut, it's time to create its reverse shape by casting with an epoxy-based mix. First you will build a simple mold. My mold is a plywood base with side pieces screwed in place, the mold template screwed between the side pieces, and a strip of hardwood parallel to the mold template with screws on one edge to grip the casting. Before screwing the mold template down, coat it with a two-part epoxy resin. Once that's dry, spray it with a shellac sealer, and when that dries, spray it with a dry film mold release. I've experimented with a lot of products and product combinations, and I have had great success with this recipe. I mix two different two-part products for the right consistency, pour them into the mold, and let it dry.

### Use the casting to make the jig for the drawer front

Once the casting is dry, I pop it out of the mold and use it to template-route the base of the next jig. I make the base from a sheet of plywood—Baltic-birch, marine-grade plywood, or the like. As with the other steps, you'll trace the casting and waste away close to the line on the bandsaw before moving to the router table. I use a straight bit with a top-guided bearing to cut the semi-circular



## Move on to the sides



**Back to the template.** Use the mold template to trace the finger pattern onto the front of each drawer side. Cut out the waste on the bandsaw.

sockets. After completing these cuts, build the jig and use it to cut the sockets in both ends of the drawer front. The depth of cut should equal the thickness of the drawer sides.

### Cut the drawer sides

Once the sockets are cut in the drawer front, go back to the mold template and use it to trace the finger pattern onto the front of the drawer sides. Cut out the waste on the bandsaw, and then use the router-table sled to cut the fingers in the front of the drawer sides, indexing on the pin. The drawer back is inserted into dadoes in the sides.

### Pinning it all in place

I use what is essentially a doweling jig to drill holes in the center of the fingers and then glue a dowel in each hole and cut them flush with a handsaw. Though this joint isn't as mechanical as a dovetail joint, it is a very tight-fitting joint. The pins add a mechanical element to it, but they are also an aesthetic addition. □

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**Back to the router table and sled.** Strike a reference line on the sled for the first shoulder. Position the front of the drawer side on this line, and make the first cut.



**Finish the side.** Once the first cut is made, begin registering off the indexing pin to make the rest of the cuts.



# Assemble and pin

**Glue up the drawer box.** The front and sides go together the same way a traditional dovetail does. Kern sets the drawer back in a dado and glues and screws it in place.



**Match centers.** Mark the centers of the fingers, then extend the lines down. Position an L-shaped jig (very similar to a doweling jig) with the same spacing as the finger centers on the drawer box.



**Drill and pin.** Using a brad-point bit, drill the holes for the pins. Glue the pins in place, and cut them flush with a handsaw.