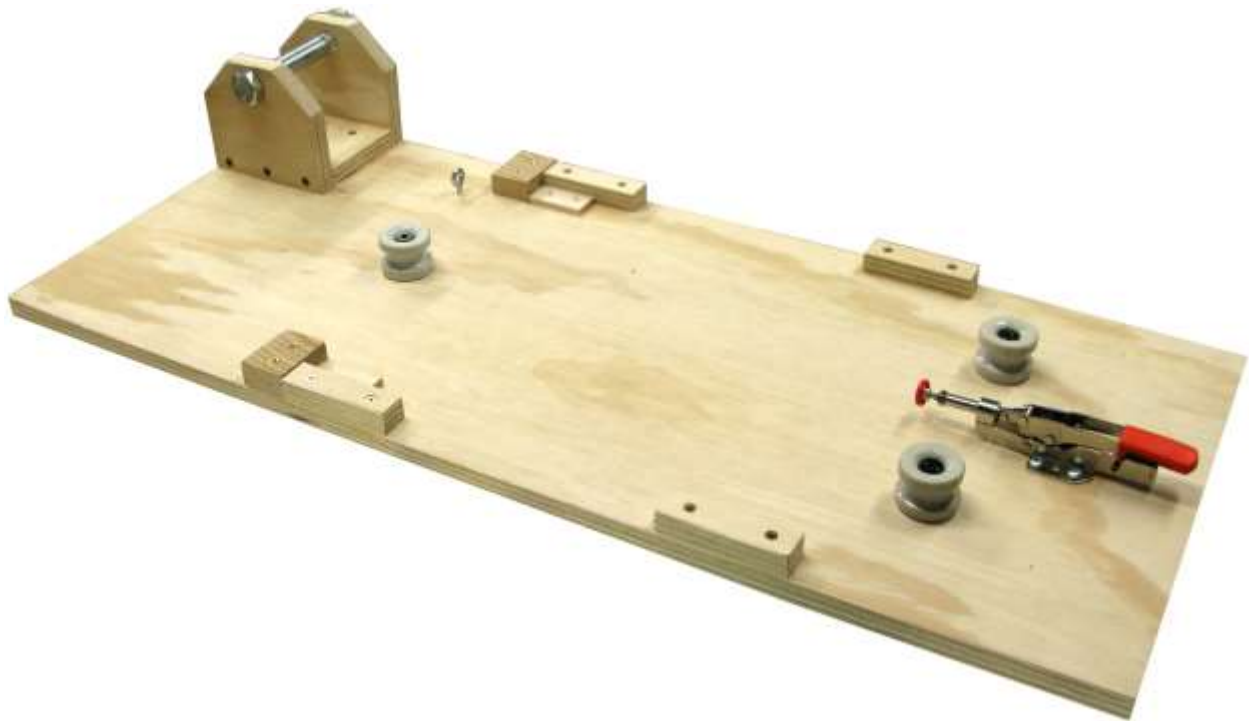




Horizontal Hive

*You can keep bees, naturally!*

## WIRING JIG for Layens Frames



### QC CHECKLIST

- 8 blocks of wood
- bolt fits bracket
- bracket front marked A
- rollers rough side up
- rollers spin, no excessive play
- eye hook fully closed
- frame fits freely (~1/16" gap)
- stoppers squarely attached
- clamp adjusted, nut tightened
- wood edges eased
- no sharp points on bottom

### ENCLOSED

- jig
- bracket – front
- bracket – back
- 6 screws
- bolt, washer, nut
- these instructions

Thank you for supporting us and buying our Wiring Jig for Layens Frames!

We've wired over 100,000 frames using this model.

**These instructions will help you wire frames quickly and tightly.**

### **ASSEMBLY — Re-attach the Sides of the Bracket**

Put the jig in front of you with the clamp to the right. Two walls of the wire-spool bracket in the far left corner have been removed for safe shipping. The wall closest to you is marked with an "A". Re-attach both walls with six screws (provided) into the predrilled holes. Part "A" faces you; screws go into the countersunk holes (cone-shaped depression to hold the screw head). A long manual screw driver with a star bit is best for it. No glue necessary. If you have trouble, detach the bracket bottom from the jig, attach the walls, then screw the assembly back to the jig.

### **ADJUSTING & USING THE CLAMP**

The clamp should hold the frame firmly in the jig during wiring. Pull up the handle, insert the frame with the top bar toward the clamp, then push the handle down, clamping the frame. When the clamp is properly adjusted, the frame is firmly clamped in place but it does not take much force at close the clamp (you can do it with one finger).

- If the frame is not clamped tightly with the clamp handle fully down: open the clamp, remove the frame, loosen the nut at the front of the clamp — use a small wrench to rotate it counter-clockwise, away from you. Slightly extend the threaded rod in the front of the clamp by rotating it counter-clockwise, away from you. Tighten the nut.
- If you require force to move the clamp handle down: open the clamp, remove the frame, loosen the nut at the front of the clamp — use a small wrench to rotate it counter-clockwise, away from you. Rotate the threaded rod in the front of the clamp clockwise, toward you, to shorten it. Tighten the nut.

### **IMPORTANT:**

1. Never force the clamp handle down as it can damage the clamp. If it does not easily close, adjust the clamp as described above.
2. Only move the clamp handle up and down, do not use any lateral pressure as it will bend and damage the clamp.
3. **Important:** Every time you close the clamp with your right hand, lift the front (left) tip of the clamp up with a finger of your left hand. The barrel of the clamp has some vertical play; it should be clamped with the barrel in the topmost position (the red plastic washer as high on the top bar as it goes) to hold the frame best.

### **HOW TO USE YOUR JIG**

**Attach the jig to the bench top** with two clamps or two 1-1/2" construction screws.

**Put a spool of wire** into the bracket, insert the bolt, secure with washer and nut on the other side (no need to tighten). The wire should be coming from the *bottom* of the spool toward the eye hook. Stainless steel wire is available from [HorizontalHive.com](http://HorizontalHive.com)

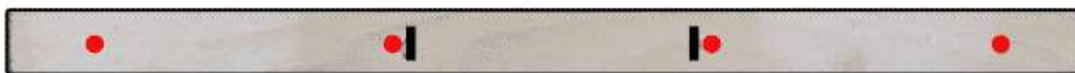
## Prepare the frames

Make sure the top bars and the bottom bars are stapled as shown below. These staples, positioned 1/16" from the holes through which the wire will go, prevent it from cutting into the wood when tensioned. Preferably staple the top bars and bottom bars before frame assembly, but you can also staple the assembled frame after giving glue 24 hrs to set. Wait 24 hrs after assembling/gluing the frame before you wire it.

Top bar, top view:



Bottom bar, bottom view:

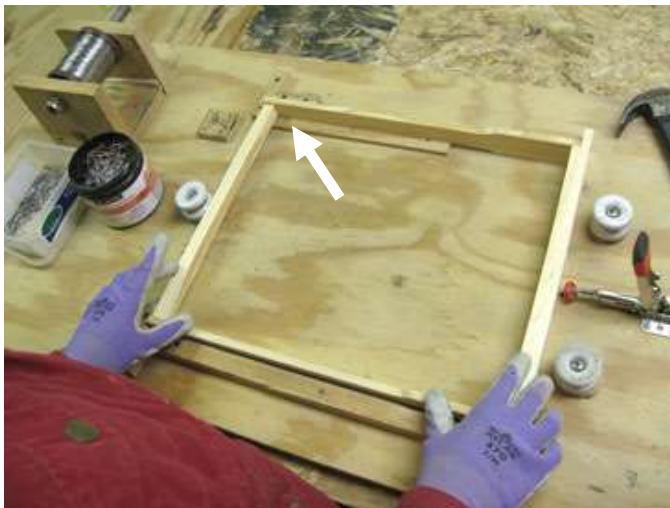


● = drilled hole      | = staple (3/8" leg, 1/4" crown), 1/16" from the hole

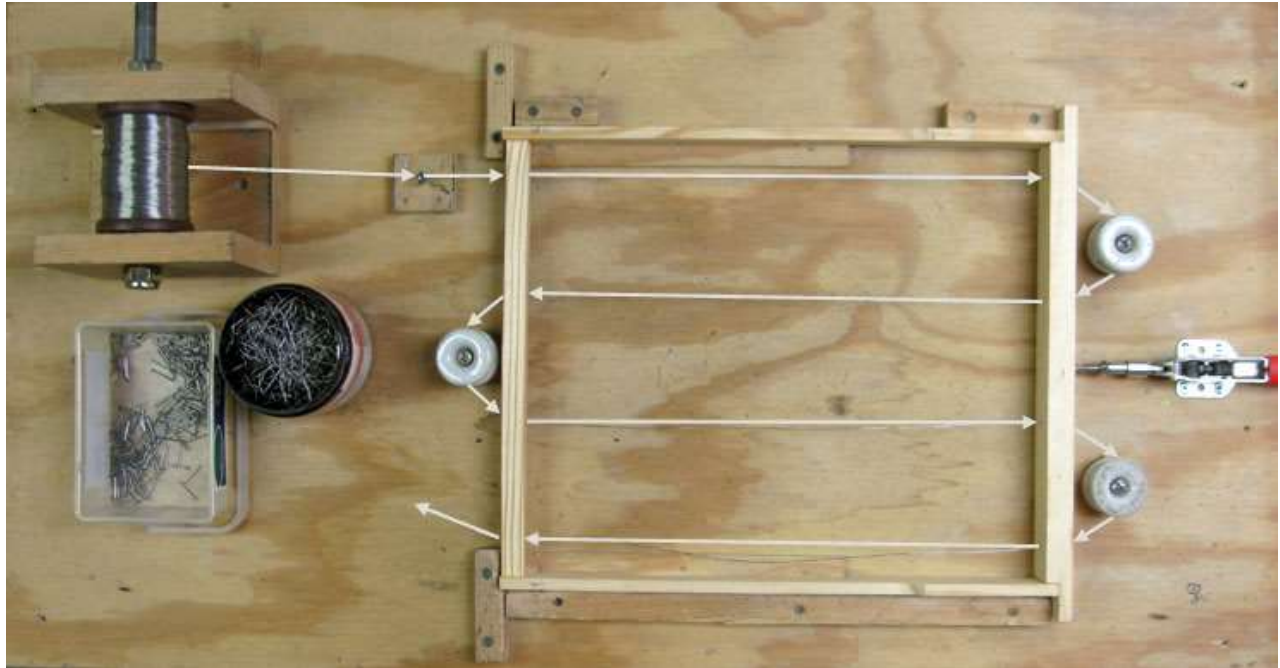
## Wiring a frame

*Step 1.* Place the Layens frame into the jig, pressing it lightly into the corner marked with an arrow. Clamp it. There will remain a 1/16" gap between the frame and the blocks of wood closest to you so you can move the frame in and out easily.

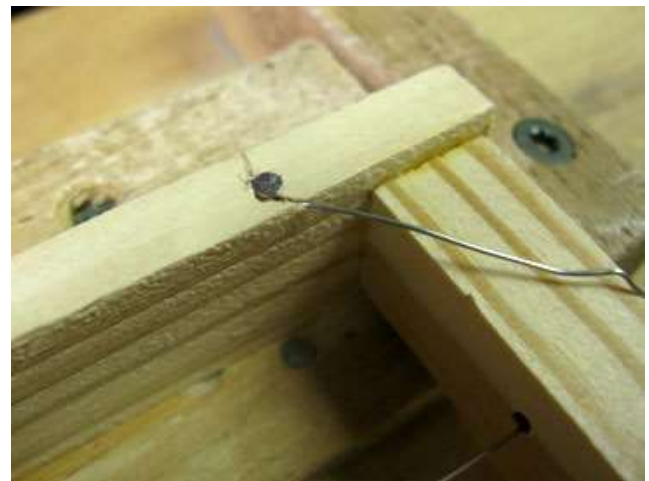
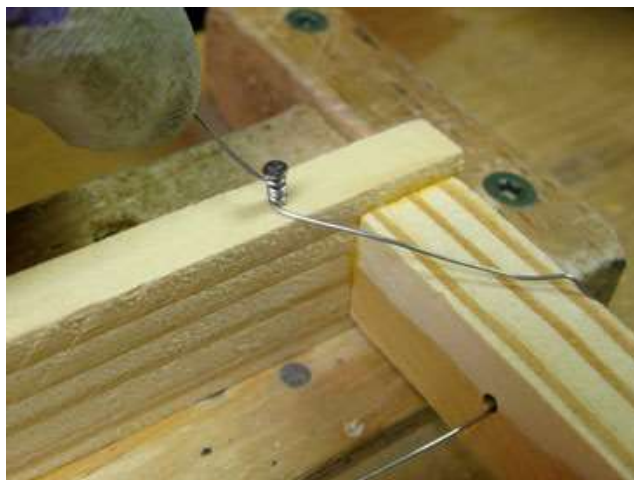
*Step 2.* Drive a 3/4" nail into the lower part of each end bar, about 3/8" from the bottom bar. Leave the nails sticking out by 3/8". Tip: if you don't have 3/4" nails, cut a longer nail to size with a wire cutter. Use only very thin nails or you'll split the end bar.



*Step 3.* Run the wire through the holes and over the spools as shown. The wire should go over the central groove of the ceramic spools. Let the wire protrude 5" or 6" from the last hole in the bottom bar. Tip: if the tip of the wire is bent or wavy, making it difficult to push it through the hole, snip the tip off with a wire cutter or metal shears.

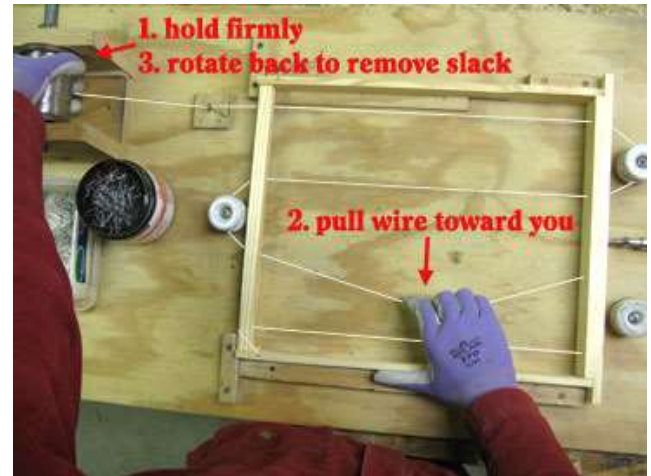


*Step 4.* Grab the loose end of the wire and twist it around the nail closest to you. Make 4 revolutions, going up in a spiral. As you hold the wire tight with your left hand, hammer the nail flush with the wood. Pull the loose end of the wire up and rotate like a tornado, and it will cleanly break off. The wire is now securely anchored; you can now tighten it.

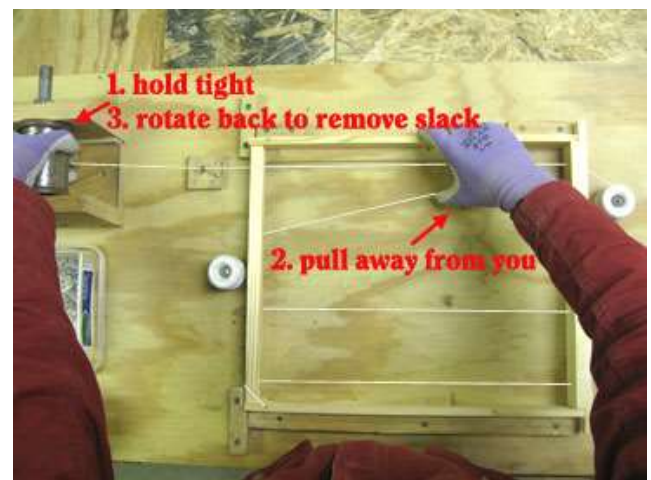


**Step 5.** Tightening the wire is done in several stages. Your right hand manipulates the wire while your left hand rotates the wire spool backward to feed any excess wire back to the spool.

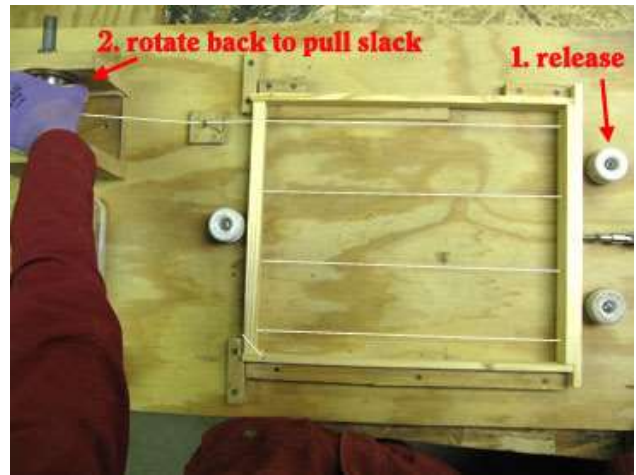
- a. Take the wire off the last roller and rotate the wire spool backward to remove as much slack as you can.
- b. Hold the wire spool firmly as you pull the second-closest-to-you wire toward you. (This tightens the wire *closest* to you.) As you release your right hand, rotate the spool backward to remove the slack. Repeat several times till the closest wire is tight.



- c. Take the wire off the second roller and rotate the wire spool back to remove slack.
- d. Hold the wire spool firmly as you pull the third-closest-to-you wire away from you. (This tightens the second-closest wire.) As you release your right hand, rotate the spool backward to remove the slack.



- e. Take the wire off the remaining roller and rotate the wire spool back to remove slack.



*Step 6.* You need to twist wire around the nail. Grab the wire between the eye screw and the frame and pull it up, releasing only as much wire from the spool as necessary. Pull the wire over the edge of the bottom board toward the nail. Still pulling, twist it around the nail 4 times, drive the nail in with a hammer, then spin the wire until it breaks off.



The frame is ready and sounds like a harp. With some practice you'll be able to wire a frame in 90 seconds or less. Repeat as many times as necessary. Thin nitrile garden gloves help wire quickly without hurting your fingers. Have fun!



## MAINTENANCE AND REPAIRS

- **Hardwood blocks.** When you clamp the frame, all pressure rests on the two blocks the bottom of the frame pushes against. They are made of dense hardwood (oak or maple) and provide long service. They may eventually start to wear down. You can then detach them by removing the two screws, rotate the block 180° and re-attach it. If both sides are badly worn, cut a piece of maple 2" x 1-1/2" x 3/4" (with the grain parallel to the 1-1/2" side), predrill countersunk holes 1/2" on-center from the short side and 3/4" on-center from the long side, and attach with two 1-1/4" construction screws. Do not glue down so you can replace the blocks as needed, which does not happen often.
- **Bracket** holds spools of stainless steel wire available from [HorizontalHive.com](http://HorizontalHive.com) (spool 3-7/16" long, 2-9/16" diameter, with 13/16" hole). If you use different wire, the spool may not fit, in which case you will need to build and attach a similar bracket matching the dimensions of your spool. Do not glue down the bracket so you can swap it if you ever need to use spools of different size.
- **Clamp.** If not abused, the clamp lasts tens of thousands of frames. If you ever need to replace it, it is Bessey model STC-IHH15.
- **Rollers** are Zareba WP36 electric post insulators, installed the glazed side down for better sliding.
- **STORE THE JIG** away from direct sunlight and sources of heat. You can drill a hole in it and hang it on a wall. Note that when the jig is not screwed or clamped to the tabletop, it may slightly bow, which is normal for plywood. When ready to use it again, screwing it to the tabletop will remove most of the bowing.

*With best wishes to you and your bees,*

— Dr. Leo Sharashkin, [HorizontalHive.com](http://HorizontalHive.com)