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A Simplified Larrivee-Style Binding Jig

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This binding jig is a variation on a popular jig attributed to Jean Larrivee. Many of us have made our own versions over the years, though nicely made commercial offerings are now available from several suppliers (Elevate Lutherie and Canadian Luthier Supply, among others). The jig consists of a router mounted horizontally, with a guide rod that is parallel with the router axis. The guitar body is slid along the guide rod, with the router bit protruding above the rod to cut the binding ledge. The rod is usually relieved in the middle so that the body rides on just the ends, to avoid any rocking that might occur from sides that aren't perfectly flat.

Two variations of the jig exist, differing in how the depth of cut is adjusted. In the classic Larrivee-style jig (Figure 1, sold by Canadian Luthier Supply), the guide rod is perfectly concentric with the router axis, and guide rods of different diameters are used to set the binding groove depth. If the router bit diameter is 1", and a binding groove depth of 0.070" is desired, then a guide rod with diameter 0.860" is used. The router bit will then extend 0.070" outside the guide rod around its whole circumference.

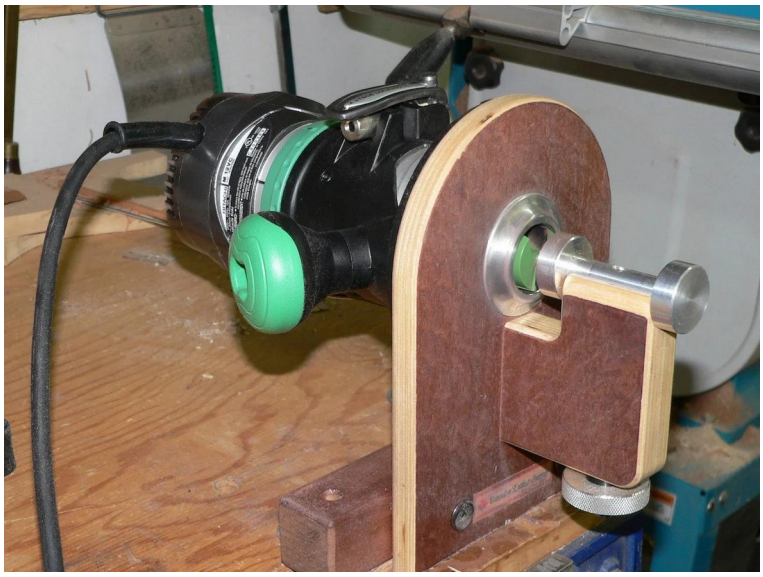

Figure 1: Larrivee-style binding jig offered by Canadian Luthier Supply

A very nice feature of this arrangement is that it doesn't matter at what position on the circumference the guitar side contacts the guide rod – the bit extends the same 0.070" in every direction. This is especially useful given the convex curve at the waist of a guitar, which "wraps" around the guide bar. However, this position-independence holds only if the guide bar is exactly concentric with the router axis. If the bar is shifted by say .020" to the left of the router axis, then the router bit will extend 0.050" beyond the guide bar on the left side and 0.090" on the right (Figure 2). As a result, the depth of cut will vary depending on which point on the circumference of the guide bar the guitar side contacts. This won't be a problem as long as you use the same point of contact – say, directly vertical – all along the side, but this can be tricky given the curvaceousness of the guitar sides. If the sides happen to contact the guide bar where the cut is too shallow, this can be corrected with another pass contacting at the desired vertical point; but if the sides should accidentally contact at a point where the cut is too deep,

this will leave a spot of unevenness in the binding groove. Thus near-perfect alignment of the guide bar and router axis is quite important for this jig to provide good results. This is not an issue with a well-made jig like the one from CLS, but can be tricky to achieve with a shop-made jig. Additionally, multiple guide rods of different diameter are needed to provide different depths of cut.

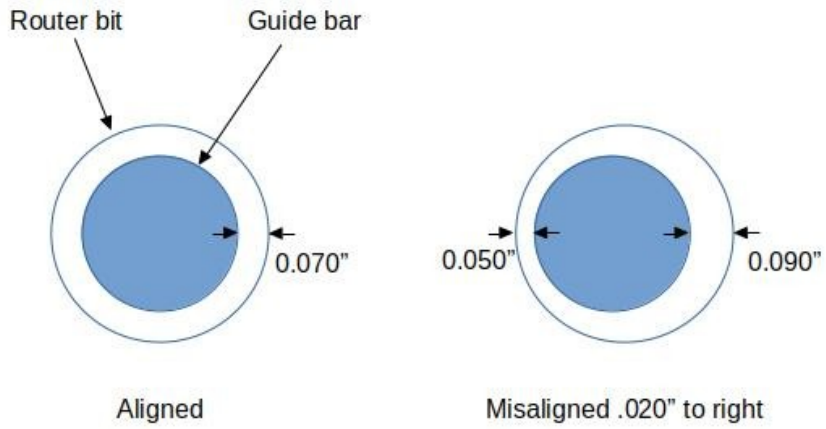

Figure 2: Misalignment of guide bar and router bit

In a variation on the traditional Larrivee jig (Figure 3, sold by Elevate Lutherie, shown without router attached), a single guide rod is supplied that has the same diameter as the router bit. To set the depth of cut, the vertical position of the guide rod is adjusted by a vernier screw so that the router bit extends above the guide bar by the desired amount. For a 0.070” groove depth, the guide bar is lowered by 0.070” so that the router bit extends that far above the rod. However, since this deliberately mis-aligns the guide bar with the router axis, it presents the same challenge discussed above: the depth of cut will be greatest at the vertical position (12 o’clock) and less toward the sides, so it’s important to make sure the point of contact is always at the vertical position. To help ensure this, the instructions specify that the body should be run around the jig 3 times in the conventional-cut direction, and then once in the climb-cut direction, with the body contacting at the vertical position on the guide bar; even if it’s slightly off vertical on one pass, it’s likely to be corrected on one of the subsequent passes.

Figure 3: Elevate binding jig with adjustable guide rod

Since I began building before these jigs were available from suppliers, I made my own Larrivee-style jig based on a photograph in a 1988 guitarmaking article by Grit Laskin in Fine Woodworking magazine. I used a brass rod with nesting pieces of tubing at the ends for a guide bar; the bar diameter was adjusted by adding tubing segments at the ends of the rod (Figure 4). The jig actually served me quite well for the next 30 or so years, but I struggled with getting the router and guide bar aligned accurately, and often ended up with some variation in the binding groove depth. I considered taking the plunge and buying one of the commercially-available jigs when they became available, in the hope that they might produce better results, but the jigs I found were quite expensive (~$400), and I have a frugality and DIY bent that's carried over from my "salad" days.

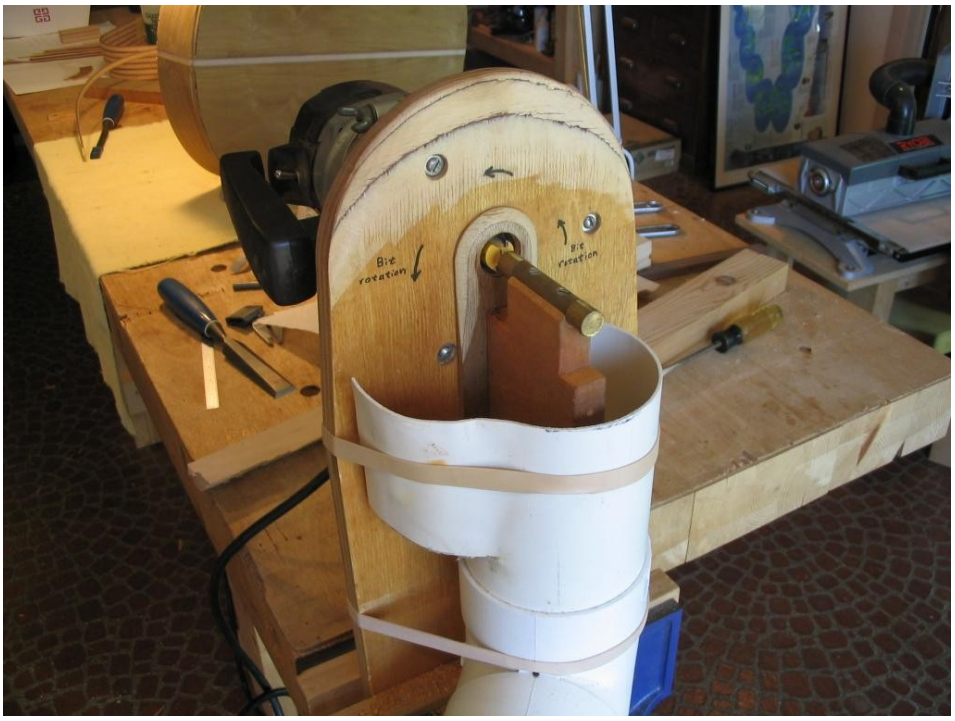

Figure 4: Shop-made Larrivee-style binding jig

I did however take a (short) detour to try a completely different style of jig that many luthiers have been using in recent years, either shop-made or available commercially (from Stewart-MacDonald, Elmer Guitar, and others). The jig consists of a router mounted vertically on a tower bolted to the workbench, with linear bearings that allow it to move freely up and down (Figure 5). The guitar body is mounted horizontally on a sled which is slid along the workbench, with a rabbet bit with bearing cutting the groove. There are bits intended specifically for guitar binding such as the Amana 49342 and 49346 bits; these come with 3-flute cutters and a set of bearings for cutting depths typical for guitar binding and purfling. The jig provides a bushing on the base of the router that contacts just at the edge of the top or back, so the depth isn't affected much by the domed tops and backs commonly used today; the router floats up and down on the column as needed to keep contact. I chose to purchase the jig offered by Elmer Guitar, as the design seemed solid and the price was right.

Figure 5: Elmer Guitar tower-and-sled binding jig

However, I discovered that the jig performs well only if the guitar body is mounted in the sled so the sides are perfectly vertical. If there's any variation in this alignment, the router axis will be at an angle to the sides, and the binding groove will be cut at an angle. Since the bearing contacts the sides at the bottom of the groove, the depth will be approximately correct there, but because of the angling of the side the top edge of the groove will be too deep or too narrow (Figure 6). Since I build without a solid outside mold, my sides are often at a slight angle from vertical, so I wasn't completely satisfied with the results I was able to produce with this jig.

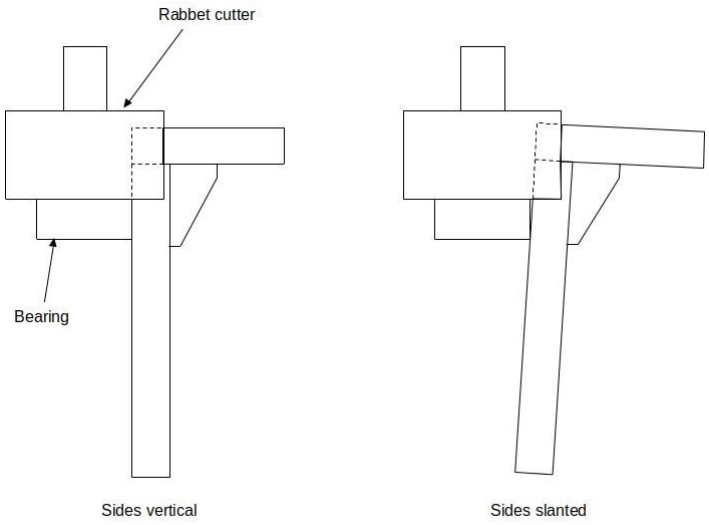

Figure 6: Sled jig: angled cut when sides not vertical

This got me to thinking about how to address the alignment issues I had had with my original Larrivee-style jig. I realized that the binding rabbet bits I had bought for the sled-style jig could be used in this jig, with the bearing on the router bit serving as one end of the guide bar and an identical bearing serving as the opposite end (Figure 7). In this way the alignment at the router bit was guaranteed, since the bearing was attached to the router bit. The alignment of the outboard bearing is much less critical; it just needs to be roughly in line with and level with the inboard bearing on the router bit. The construction of the jig is simpler too, using just a couple of hefty L brackets to mount the outboard bearing.

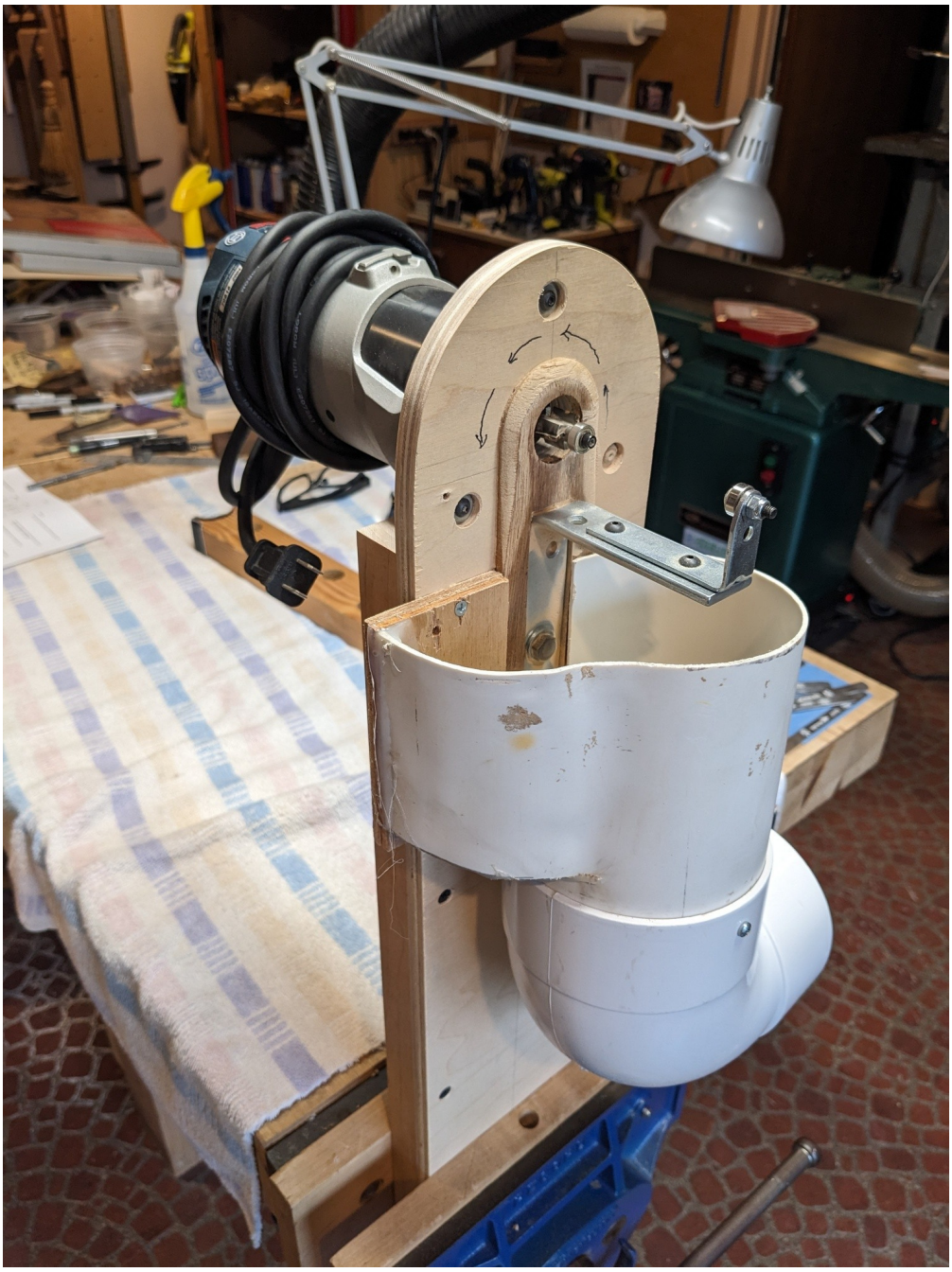

Figure 7: Modified Larrivee-style jig with bearings replacing guide rod

I've used this modified jig on a few instruments, and have been very happy with the results. The channel depth is consistent around the body, and I don't have to be careful about where the body contacts the guide bearings since the inner bearing is guaranteed concentric with the cutter. As with all the jigs of this type, you want to make sure that the sides are in contact with both bearings at all times – in particular, you don't want to lift up off the outboard bearing, as this will tilt the sides into the bit, leaving a divot. One thing to note is that since the bearings rotate freely, you need to keep a tight grip on the body when routing the grooves; there's more friction with the traditional Larrivee-style jig since

the guide bar is fixed. Climb cutting definitely isn't an option except for maybe a final cleanup pass. You also want to be aware of how much downward pressure you're applying as you slide the body around, since you're putting pressure directly on the router bit shaft through the inboard bearing. One constraint is that the available cut depths depend on the bearings available – the Amana bits come with 5 bearings that provide only a limited set of depths. Plus, you need 2 sets of bearings (one for the router and one for the outer guide). Otherwise, I've found the modified jig to be easy to build and effective in use.

References

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