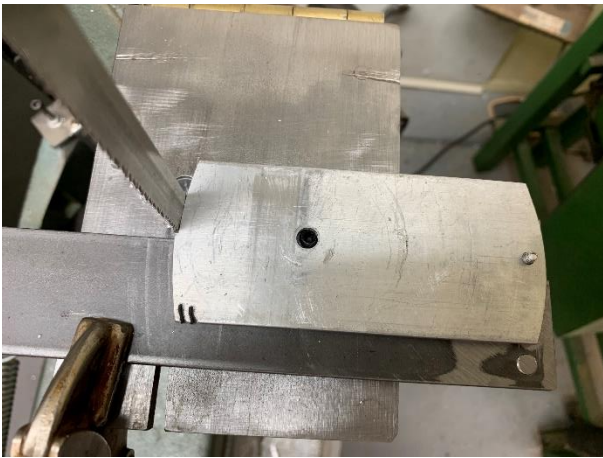


Bandsaw Arc/Circle Cutter, Version 1.0

By R. G. Sparber

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Recently, homemadetools.net had a few interesting circle-cutting attachments. One was for an angle grinder and the other for a plasma cutter. They inspired me to come up with a vertical bandsaw-based arc/circle cutter.



I started by playing with the idea using my prototype bars². I quickly *re*-learned that I must support the stock at the point of cutting. Duh.

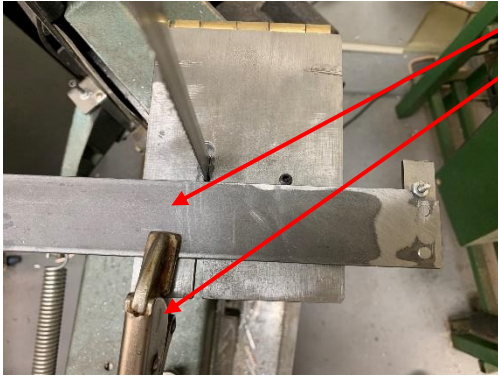


Using a second prototype bar to form a clamp on the right side of the table, I attached my proof-of-concept to my fold-down table³. A Kant Twist clamp secured the left side. As bad as it looks, the arrangement taught me that the center of my pivot point must be aligned with the teeth of the saw. Otherwise, the blade can bind, and the resulting arc will not be centered on the pivot point.

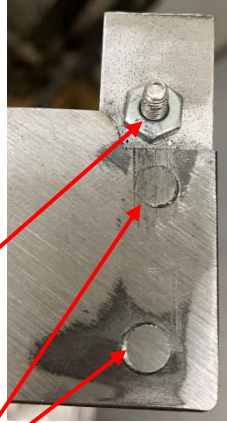
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² See <https://rick.sparber.org/PrototypeBars.pdf>.

³ See <https://rick.sparber.org/FTHV.pdf>.



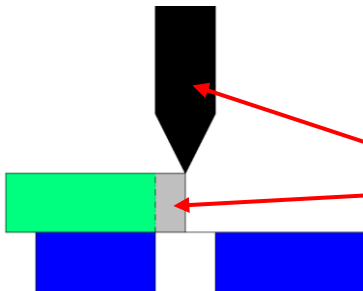
I used 1½ inch wide strap. This let me use a Vise-Grip to secure the attachment to the table. The strap is 1/8 inch thick and 18 inches long.



I attached a piece of ½ inch wide by 1/8th inch thick strap using two ¼-20 bolts on the right end of the tool. The wide strap was drilled and tapped while the small strap

was drilled for clearance. After installing these bolts, I sawed them off and used my belt sander to make them flush.

This arrangement lets me locate a 6-32 screw beyond the back edge of the 1½ inch strap⁴. The small strap was drilled and tapped. The nut locks it in place. Note that the nut is slightly below the surface of the large strap. As I pivot the stock, it only rests on the large strap.

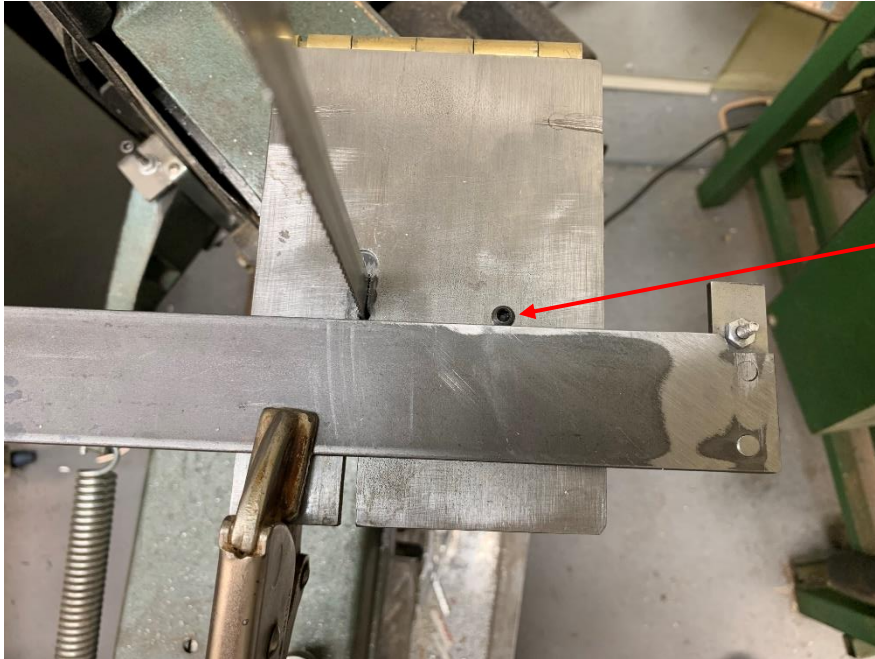


Notice that my 6-32 hole (white) must be drilled close to the back edge of the large strap (green). If I tried to do this, my drill would attempt to cut some of this strap and form a semi-circular hole. That ain't gonna happen. Instead, the cutting force would bend the drill away from the strap and likely break it.



To avoid this bit of drama, I notched out a little of the large strap, so the drill is only going into the small strap. This notch was wide enough to clear the locking nut.

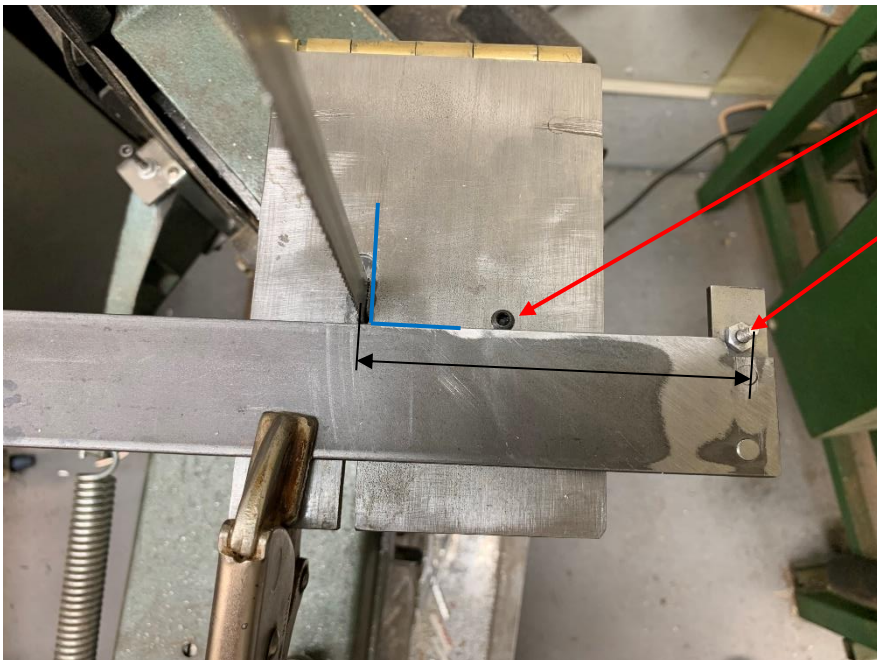
⁴ The alternative would be to saw off about ¼ inch along the back edge. That sounded too much like work.



I happened to have a 1/4-20 tapped hole in the table at just the right place. By adding a grub screw that sticks up about 0.1 inches, it became a stop. With this stop on the right and the Vise-Grip on the left, the strap doesn't slide around.



In preparation for sawing an arc or circle, I first drill the center using a #27 drill.



With the attachment pressed against the set screw and perpendicular to the saw blade (blue lines), I measure from the center of the 6-32 pivot pin to the right face of the saw blade (black double arrow) to set my radius.

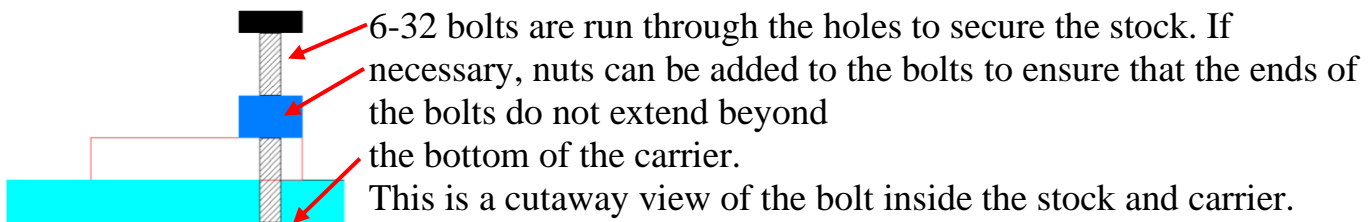
Since my blade is 1/2 inch wide, my minimum radius is 2.5 inches⁵.

⁵ See <https://www.doityourself.com/stry/band-saw-blade-radius-guide#:~:text=If%20the%20blade%20width%20is%201%2F8%2Dinch%2C%20then,is%205%2F8%2Dinch.>

The wide strap is about 18 inches long which enables me to cut up to a 17 inches radius.



Consider making a sacrificial carrier if you cannot tolerate having a hole at the center of the arc. The carrier must be wider than the stock (red rectangle). A 6-32 tap hole is drilled into the scrap beyond the arc (left red circle). A second tap hole is drilled beyond the center of the arc (right red circle). These holes are tapped through the carrier. The holes in the stock are opened out to clearance and the pivot hole is also this diameter. The left end of the carrier (white area) will be sawn off as the stock is cut. Adjust the pivot pin's height so it only pass through the carrier.



6-32 bolts are run through the holes to secure the stock. If necessary, nuts can be added to the bolts to ensure that the ends of the bolts do not extend beyond the bottom of the carrier. This is a cutaway view of the bolt inside the stock and carrier.

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