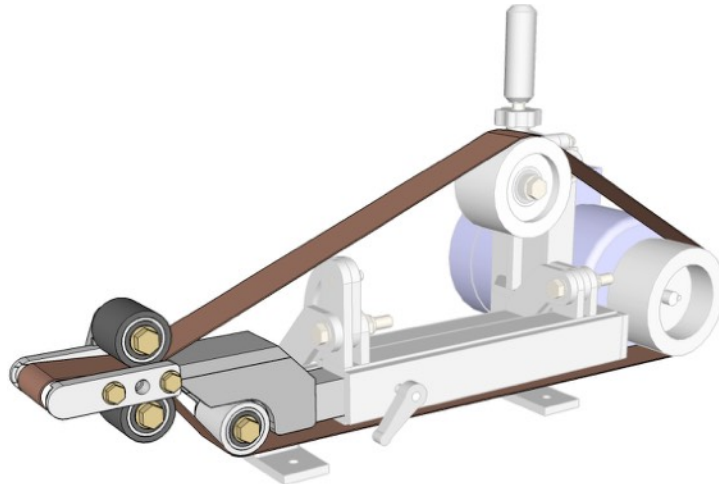


Small wheel attachment plans

An attachment for the 2x72" tilting belt grinder



Some important notes:

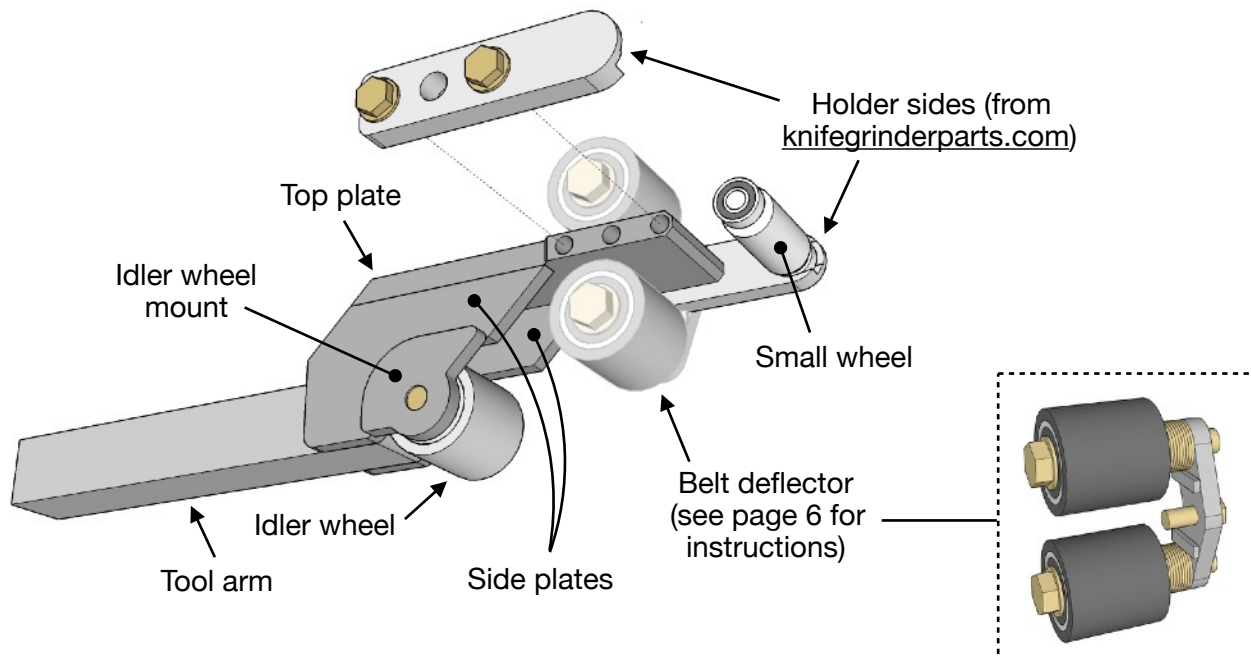
1. To use this attachment, you will first have to build my 2x72" tilting belt grinder. Plans for it (the grayed out part shown above) and the platen attachment are available here: <http://etsy.me/2sm5uvq> Plans & Sketchup models for other attachments and jigs are available on my website, here: <http://jerswoodshop.com/2x72-tilting-belt-grinder/>
2. It is assumed that you will build and use this attachment in a safe manner, therefore, few safety precautions are set forth in these plans. Build and use at your own risk. I am not responsible for any injuries caused by the manufacture and use of the belt grinder or this attachment.
3. Building assumptions: It is assumed that you have a basic knowledge of fabricating and metalworking. These plans will give you a few pointers and what techniques worked best for me, but they will not tell you how to set your welder, etc., since I assume you already know how to do that. All welds on the build may be ground & touched up for looks, so long as you don't grind away the structure of the weld. Everything should be built with good precision, for best results.
4. Painting should be left to the end of the build, after testing is complete. Some parts may need to be modified slightly, so it's best to leave painting for after that's done.
5. If you haven't seen the YouTube build video for this attachment, please watch it: <https://youtu.be/V3ObsWK6dV4> These plans are written with the assumption that you have seen this video, so you'll know at least a little about how the project goes before you start.
6. The small wheel holder, small wheels, and 2" idler wheel that I used are made by knifegrinderparts.com. I recommend buying these same parts for best results, since I designed the attachment around them specifically.
7. If you have any questions, or if you find any errors in these plans, you can contact me at jerswoodshop@gmail.com.

Parts list:

“Used in...” indicates which step(s) in the plans use this part. Refer to that step or steps for more information about that part. Quantities in parenthesis are only needed if you’re building the optional belt deflector add-on.

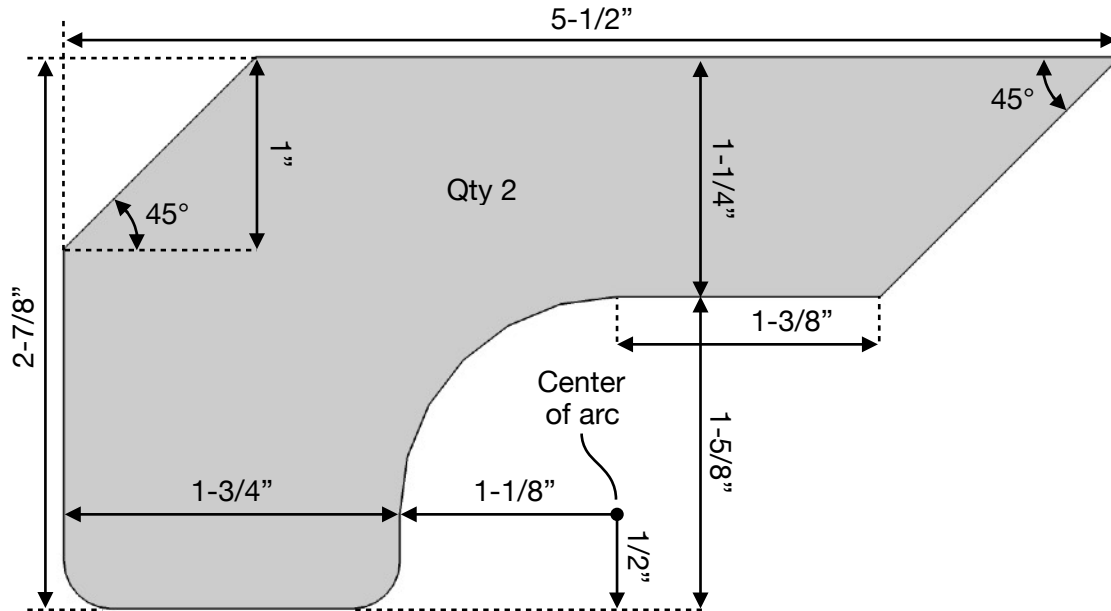
Part/material name	Size	Quantity	Used in...
Small wheel holder	See note #6 on page 1	1	Step 8
Small wheels	To fit small wheel holder	Any	Step 8
Platen wheel	2” diameter, 2” wide	1	Step 8
Steel plate or flatbar	1/2” thick	3” wide, 7-1/2” long	Step 2
Steel plate or flatbar	3/8” thick	3” wide, 12” long	Step 1, 7, deflector step 1
Steel square bar	1-1/2” x 1-1/2”	10”	Step 5
Grade 8 bolt	1/2”-13 x 2-1/2”	1	Step 8
Grade 8 bolts	3/8”-16 x 1”	4	Step 8
Flat washers	3/8”	4 (+1 for belt deflector)	Step 8, deflector step 4
Flat washers	1/2”	2 (+24 for belt deflector)	Step 8, deflector step 4
Grade 8 bolts	1/2”-13 x 3-1/2”	(2 for belt deflector)	Deflector step 4
Grade 8 bolt	3/8”-16 x 1-1/4”	(1 for belt deflector)	Deflector step 4
Rubber-coated wheels	2” diameter, 2” wide	(2 for belt deflector)	Deflector step 4

Nomenclature:



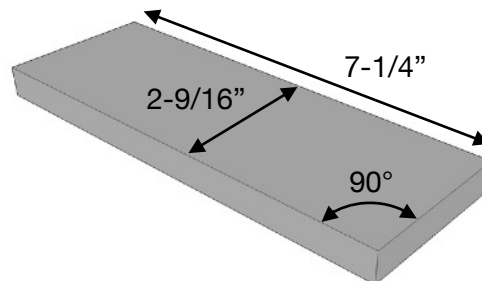
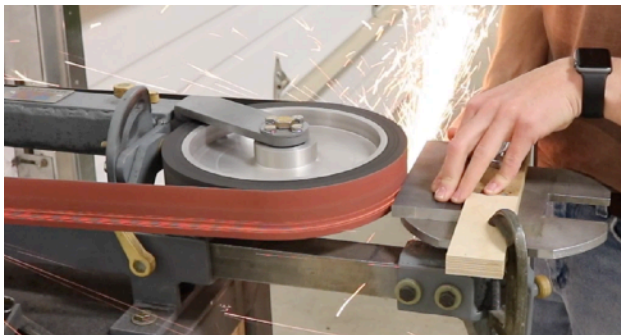
Step 1

Start by cutting out the two side plates. They should be cut from $\frac{3}{8}$ " thick steel. You can print this page and use the drawing below as a template (be sure to check that it printed to scale), or simply transfer the dimensions directly onto your steel. Try to make the top edge of these plates as flat as you can. The unlabeled radiuses on the bottom corners are only for looks.



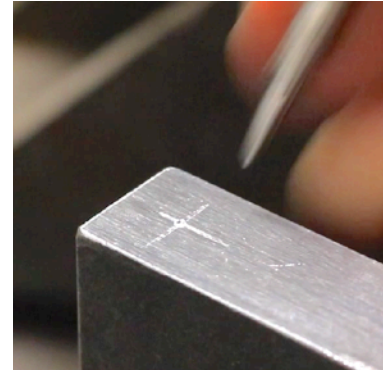
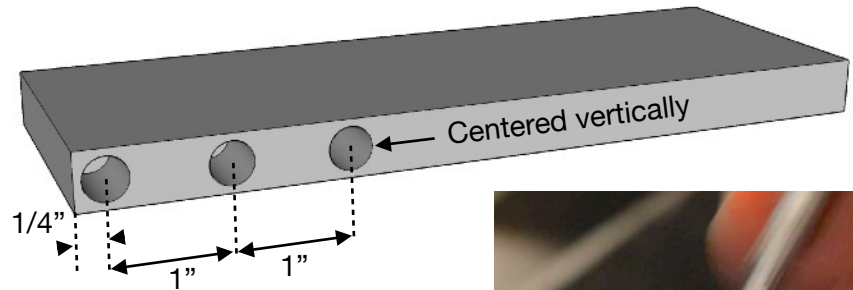
Step 2

Make the top plate next. It will be made from $\frac{1}{2}$ " thick steel, $7\frac{1}{4}$ " long, and it needs to be exactly $2\frac{9}{16}$ " wide. For now we'll just focus on making a very precise rectangle, and finish the shape later. The long sides of the plate need to be perfectly flat, square, and parallel to each other. You could use a mill to straighten and square them, but since I don't have a mill I used my belt grinder with a fence clamped to the table. I tilted the grinder sideways and installed my contact wheel attachment, then fed the top plate between the fence and contact wheel until it was the right width. Use a caliper to check the width as you go, and make it as close to $2\frac{9}{16}$ " as possible. You should also make sure the ends of the top plate are square to the sides (this will be important for step 3).



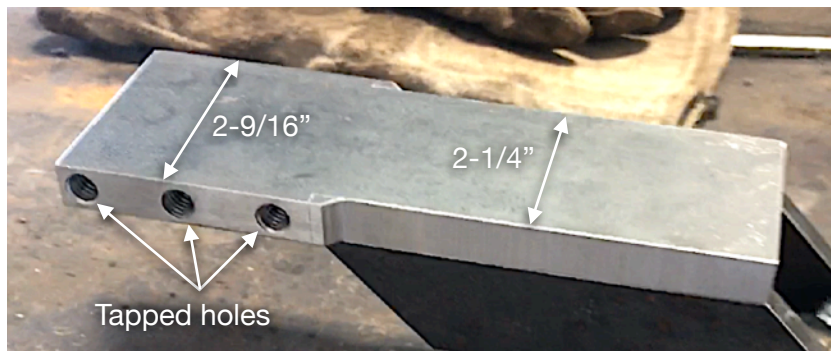
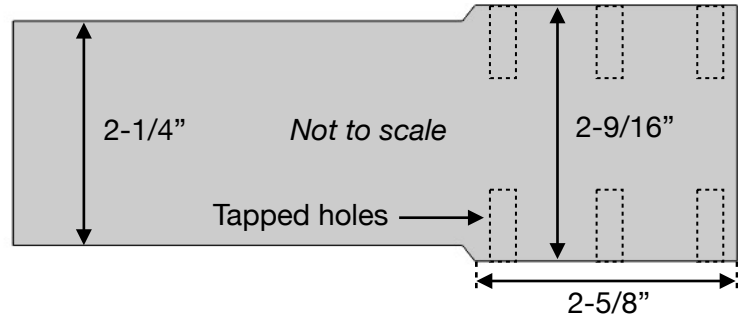
Step 3

Drill and tap three $\frac{3}{8}$ "-16 holes in each of the long sides of the top plate. Refer to the drawing on the right for their positions. These holes will be used to mount the holder sides, so they need to be as precise as possible. I used a cheap caliper to scribe lines for where the holes would be drilled, then carefully center-punched them and drilled them with a drill press. They need to be drilled deep enough that you can tap a clean thread $\frac{3}{8}$ " to $\frac{1}{2}$ " deep, but avoid drilling excessively deep as that will weaken the plate too much.



Step 4

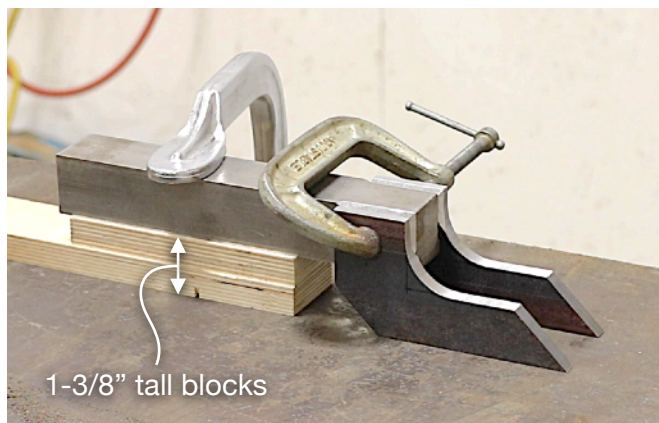
The top plate only needs to be the full $2\text{-}\frac{9}{16}$ " width for the portion where the holder sides bolt on, so the rest of the plate can be narrowed down a bit so it can fit flush with the side plates. Grind $\frac{5}{32}$ " off of each edge of the plate to bring its width to $2\text{-}\frac{1}{4}$ ", but leave it full width where the tapped holes are. Your finished part should look like the photo below.



Step 5

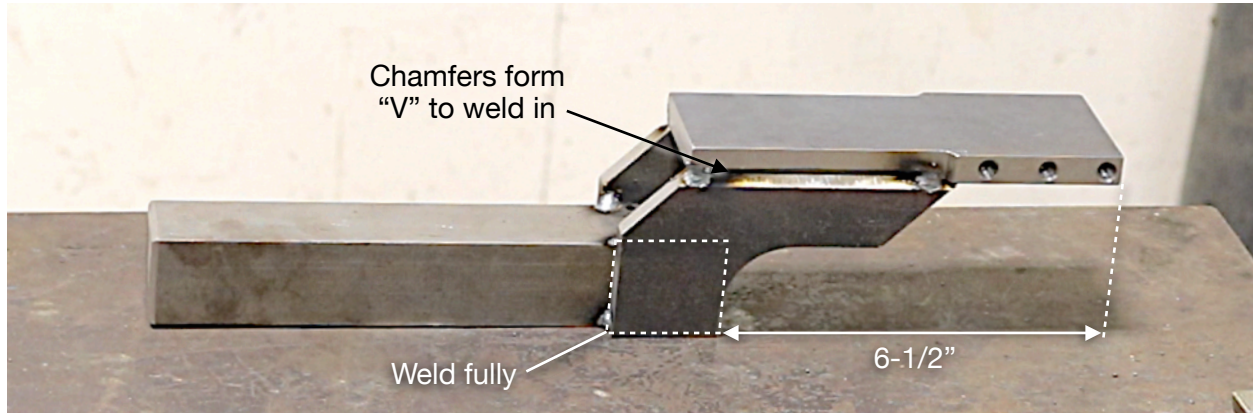
Cut a piece of $1\text{-}\frac{1}{2}$ " square bar to 10" long to use as the tool arm. In preparation for welding the parts together, you need to chamfer the edges of the parts that fit flush to create a "V" to fill with weld. You can hold all of the parts together and observe

which edges need this chamfer. Once that's done, set up a $1\text{-}\frac{3}{8}$ " high block on a flat table, and clamp down the tool arm upside down on top of it. (you can stack several blocks to make $1\text{-}\frac{3}{8}$ " height, but be sure they're flat and smooth) Set the side plates upside down directly on the table. This will establish the correct offset to make sure your small wheels will end up inline with the grinder's main hinge. Line the side plates up to the end of the tool arm and clamp them in place. Tack weld them on in several places, but don't weld them solid just yet.



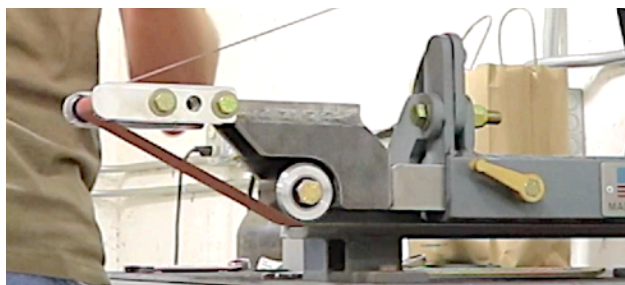
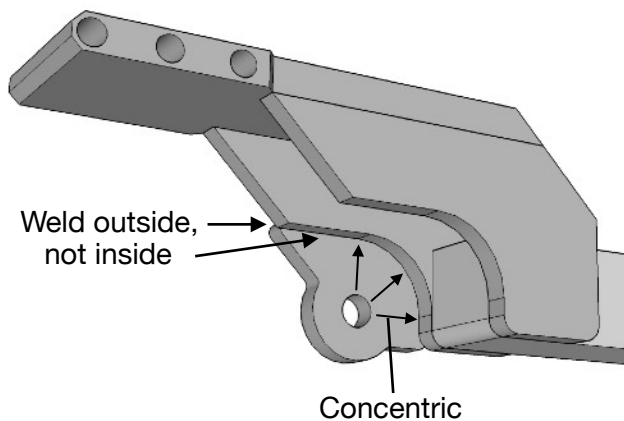
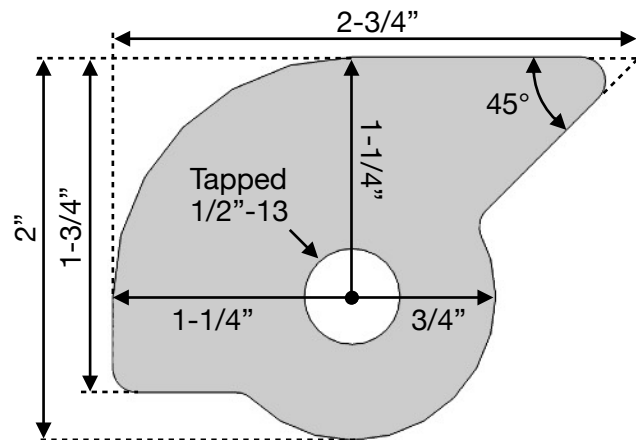
Step 6

With the side plates tacked to the tool arm, you can now weld the top plate onto the side plates. Just center the top plate on the side plates, and position it so the front edge of the top plate sticks out 6-1/2" ahead of the end of the tool arm. Make sure it is sitting straight (not turned to the left or right). Tack the top plate on in several places, and then finish welding all of the joints. You should weld all the way around the connection between the tool arm and the side plates, but just one bead on each side of the top plate is all it needs to hold securely.



Step 7

Cut out the idler wheel mount from 3/8" steel plate, to the shape shown on the right (this can be printed and used as a template). Position it against the outside of the left side plate, with the tapped hole concentric with the curve in the side plate. Weld it on, from the outside only.



Step 8

All of the welding is done, so you can assemble and test it. Attach the holder sides to the top plate using two 3/8"-16 x 1" bolts with 3/8" flat washers for each side. Attach the idler wheel using a 1/2"-13 x 2-1/2" bolt, and two 1/2" flat washers (one on each side of the wheel). Put in a small wheel, put a belt on and try running it by hand. If the belt does not track correctly, you can adjust it by moving the holder sides up or down, which will change the angle of the small wheel. Once you confirm it is working correctly, you can take it apart and paint it. Mask off the tool arm and the side faces on the top plate where the holder sides mount. Paint, then reassemble.

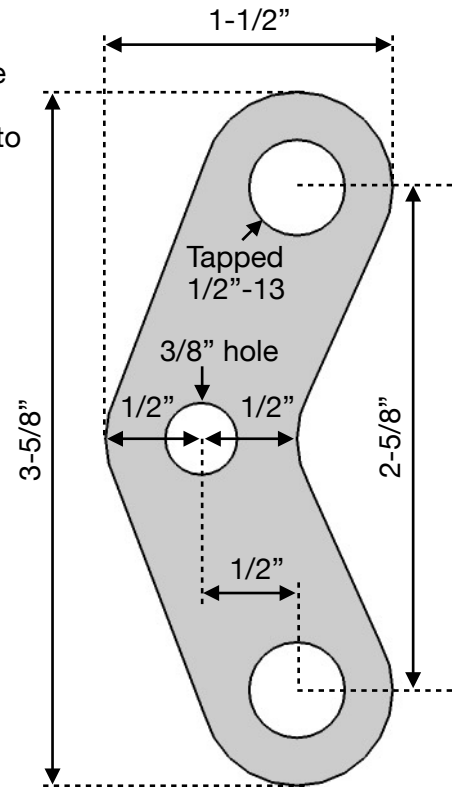
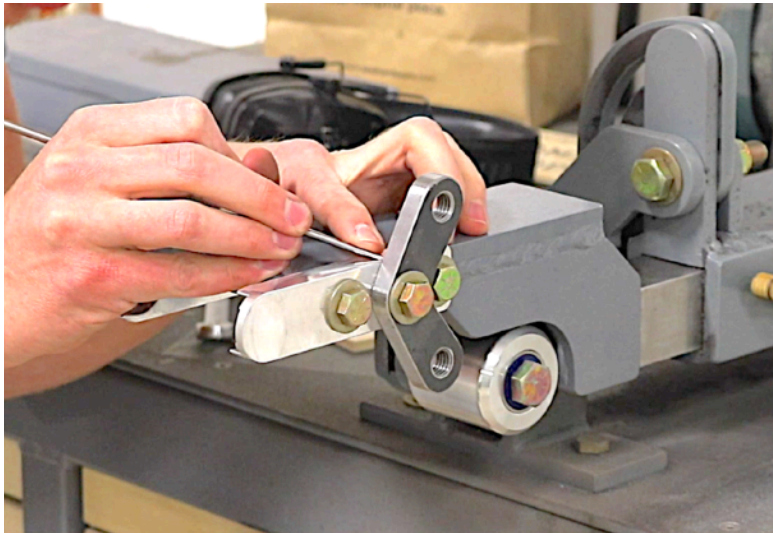
Your small wheel attachment is now complete and ready to use. The following instructions will tell you how to make the belt deflector assembly, however, I recommend you use the small wheel attachment for a while to see if you actually need the deflector. If you decide you need it, follow the instructions below to build it.

Step 1

Cut out the part on the right from 3/8" steel plate (this can be used as a template). The actual shape of this part is not critical, as long as the holes are all in the right spots relative to one another. In the following steps, I will call this part the "boomerang".

Step 2

Use a 3/8"-16 x 1-1/4" bolt to attach the boomerang to the side of the small wheel holder, as shown below. Make sure it is mounted square to the holder side, then scribe a line across the it above and below the holder side.



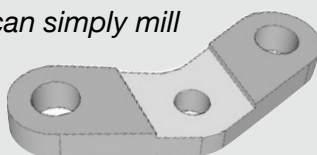
Step 3

Make two small rectangular pieces of steel, approximately 1/4" x 7/8" and 1/16"-1/8" thick. Clamp them to the deflector wheel mount, right

along the lines that you scribed, such that the holder side would fit perfectly between them. Tack weld them in place. These will help the boomerang register straight onto the small wheel attachment each time it is installed. The boomerang can be painted now.

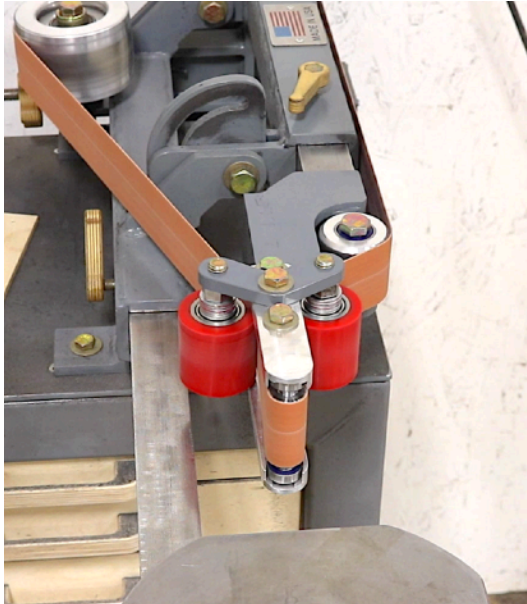


Side note: if you have a mill, you can simply mill out the area between the scribed lines, about 1/16" deep, to serve the same purpose.



Step 4

Assemble the rubber-coated wheels onto the the boomerang using 1/2"-13 x 3-1/2" bolts and 1/2" flat washers. There should be one washer between the head of the bolt and the wheel, and a ~3/4" tall stack of washers between the wheel and the boomerang. This completes the belt deflector.



The belt deflector can be installed on either the left or right side of the small wheel holder, and the boomerang can face forward or backward. To install it, first remove the small wheel from the holder, and put a belt loosely in place. Slip the belt deflector on from the front, and attach it to the middle hole in the small wheel holder using a 3/8"-16 x 1-1/4" bolt. Now you can re-install the small wheel by slipping it behind the belt and into the holder. I recommend watching my video for clarification if this doesn't make sense.

