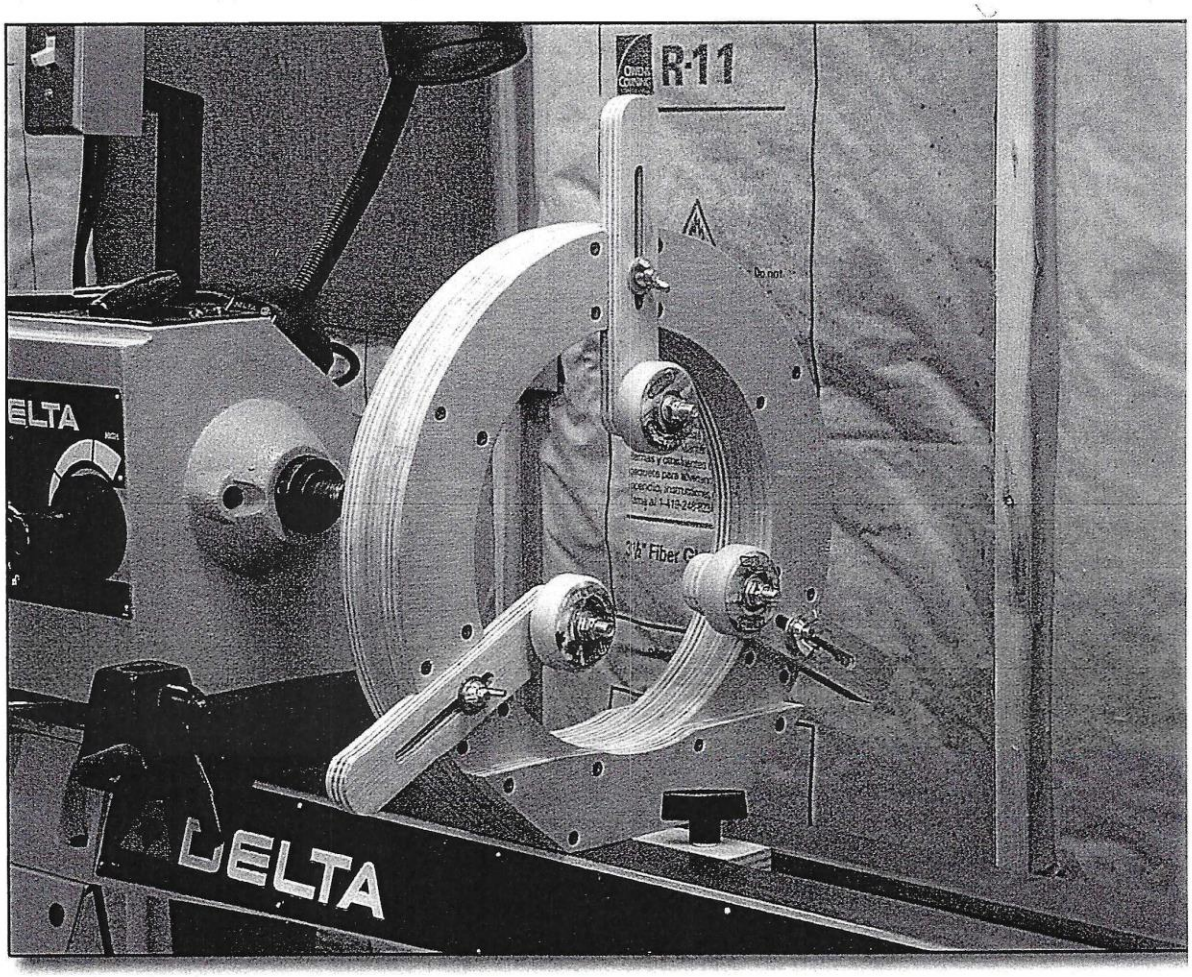
Plywood Steady Rest
Make It Yourself and Save Money

by David Campbell



I turn many different projects, but mainly make custom, segmented peppermills. I soon realized that a good steady rest is needed to make the job both easier and safer, as well as to steady the blank for boring or for parting off the ends to get a finished dimension. But a steady rest is often one of those tools that is needed just when the realization dawns that you don't have one. So, like many other turners, I turned to the Internet and my favorite catalogs to look for one that might meet my needs.

After searching and doing some price comparisons, I found that there are many quality rests available, but t ones I liked most had a hefty price tag. Though sor machinery, such as a lathe, bandsaw, table saw, and d collector, is a necessity, I wasn't prepared to spend t money for a steady rest. Instead, I started thinking ho could make my own from materials and parts availal locally, and came to the conclusion that a reasona good tool could be made at a fraction of the cost commercial models. This article describes the resulti steady rest and provides an explanation of how I built it.

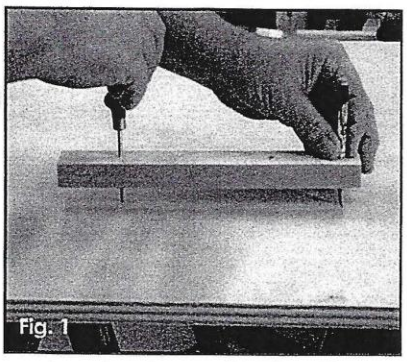


Fig. 1

I made a trammel to draw the half circles for the body rings.

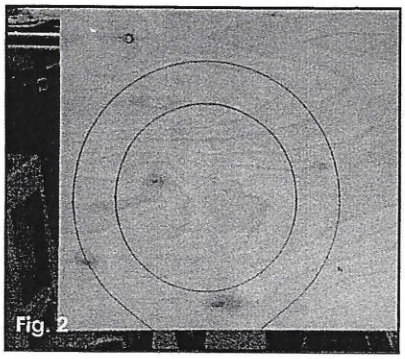


Fig. 2

The body ring after drawing in the tapered bottom.

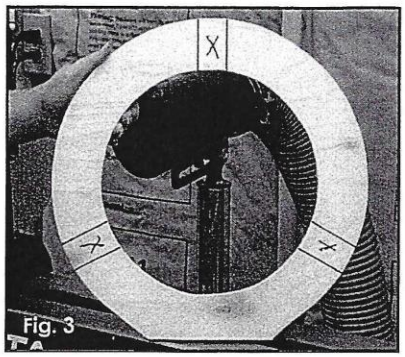


Fig. 3

The roller arms are located 120° apart.

DESIGN CONSIDERATIONS

My lathe is a Delta 14" x 40" iron bed and this steady rest was built to fit it. However, the design and/or sizing of the bottom "bed insert" and the "underbed securing blocks" could be altered to adapt the design to your lathe.

All lathes are made differently, and in order to work properly, this design would have to be either scaled up or down to adapt to your lathe dimensions. The most important thing to remember is that the steady rest must "center" the height of your headstock (spindle). For example, my lathe has a 14" swing, so the steady rest requires a ***minimum*** ID (inside diameter) of 7", or half the diameter of the swing. Nonetheless, it is important to think about what diameters you turn most and adjust your design to accommodate those diameters. Therefore, I increased the ID to 10", which better corresponds to the diameters I turn most.

Furthermore, keep in mind that the three sliding arms to which the skate wheels attach move in and out. You must allow a large enough ID so they can be repositioned to clear the turning easily when it's being installed or removed.

Some suggested dimensions: For large lathes with a 14" swing–10" ID and a 14.5" OD (outside diameter); 16" swing–11" to 12" ID and a 15" to 16" OD; 20" swing–12" to 14" ID and a 16" to 17" OD. For mini lathes, I suggest a 6" ID and a 10" OD. You get the idea here. *Note:* The reference measurements are provided just to illustrate component sizes in general; adjust your dimensions to fit **YOUR** lathe.

MATERIALS

All the necessary supplies needed to build this tool were purchased at my local home center and are listed in the Supplies box.

I purchased my in-line skate wheels from a local skate shop. I like these wheels, because I've found they will not mar the turnings like other materials. If you can't find them locally, you could source them online from retailers such as www.inlinewarehouse.com or www.skatebuys.com. And as a reference, I've provided the dimensions (along with photos) for the wheels I used.

SUPPLIES

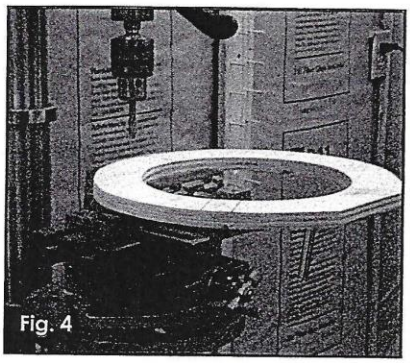
Wood: 3/4" x either 4' x 4' or 4' x 8' plywood (either Baltic birch or golden viola are suggested)
Tools: lathe, portable circular saw, table saw, jig saw with a sharp blade, drill motor with assorted drill bits, router with assorted router bits, clamps, chisels, mallet, wood rasp, milling machine (*optional*), X-Y compound slide table (*optional*), awl, vise
Screws: twenty 1-1/2" x No. 6 wood or coarse thread drywall screws, ten 1-1/4" x No. 6 wood or coarse thread drywall screws
Bolts: three 5/16" x 3" long carriage bolts, three 5/16" wing nuts, three 5/16" flat washers
Other bolts: three 5/16" x 2-1/2" long hex head bolts, three 5/16" stop nuts with nylon inserts, two 5/16" x 1-5/8" long carriage bolts, two 5/16" flat washers
Two 5/16" threaded knobs
Three in-line skate wheels
Assorted grits of abrasive paper
Flexible tape measure
Cyanoacrylate glue (CA or superglue) or wood glue
Paste wax
Pencil

Please refer to all manufacturers' labels for proper product usage.

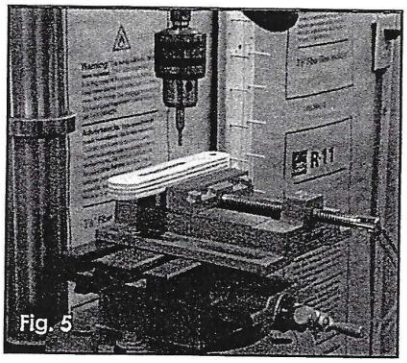
TIPS AND SUGGESTIONS

A jig saw with a new blade was used to cut all the pieces for this project, but a handheld router with the appropriate bit could also be used. And a router mounted roundover bit used on all exposed edges would give the steady rest a finished, more professional appearance.

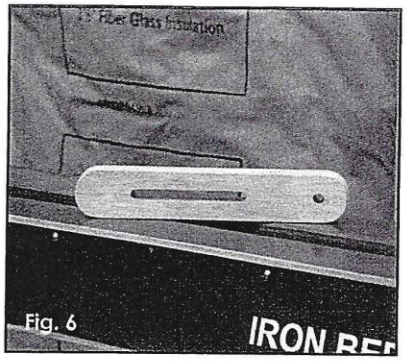
It is important to note also that the body rings are NOT perfectly symmetrical, but are actually tapered toward the bottom, which allows the rest to "sit and slide" on the lathe bed. You should take this into account when sizing the rings to the spindle center height of your lathe. Before starting, I suggest you measure your bed width (crosswise)



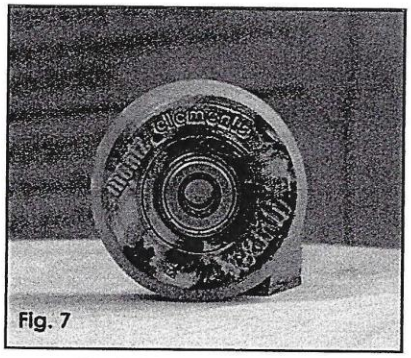
I used an X-Y table to hold my ring to mill the recesses.



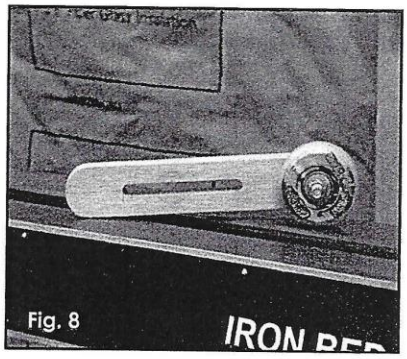
A groove for the bolts must be milled into the roller arms.



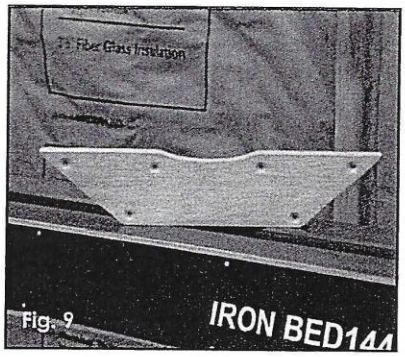
The finished roller arm.



The in-line skate wheels will not mar your turnings.



The skate wheel is attached to the roller arm with a bolt and stop nuts.



The baseplate provides additional stability to the rest.

so you will know how much to taper them. For example, my bed measures 5-3/4" across both rails.

I milled out the wood for the "roller arms" and the "underbed securing blocks" using various diameter end mills on an X-Y compound slide table mounted on my drill press. This could be accomplished with a router and either a jig or a straightedge with the appropriate bit installed. The objective here is to create a flat recess that will allow the components to lock or slide so they can move in relation to one another within very close tolerances.

When laying out the circular body rings, remember to only draw "half rings" for the outside diameter, because the bottom of the rings will taper down to your lathe bed width. After the first half ring is drawn, you can then carefully draw the tapered bottom section freehand. Once done, cut it out and use it as a template to fabricate the other two rings.

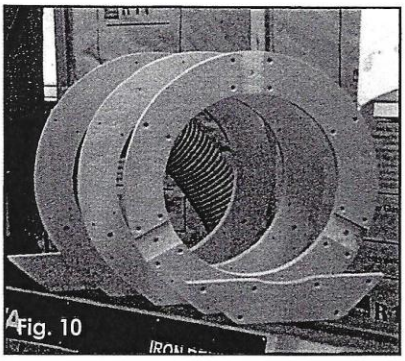
I suggest making a trammel from a short board with an awl (or a compass from a short length of string with a nail or screw) attached at one end and a pencil at the other to lay out the circular body rings. For example, to create a 14-1/2" diameter circle, place the nail on the center of the circle (ring) and move the pencil out to 7-1/4" on either the string or board, and with an arcing motion, draw the half circle. Use the same method for the inside diameter.

MAKE THE PARTS

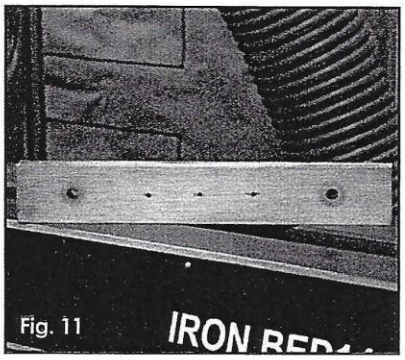
Start to lay out the parts for this very practical tool once you have the appropriate dimensions and sizing diameters all worked out for your lathe. Unless otherwise mentioned, 3/4" Baltic birch or golden viola plywood was used for all the wooden parts.

MAIN BODY RINGS LAYOUT

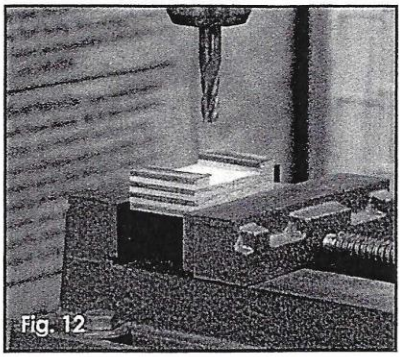
Place the plywood sheet on a solid flat surface. Using one of the drawing methods described previously, draw the inside and outside diameters of the first half ring (see **Fig. 1**). At this point, go ahead and draw the complete inner circle, but remember to taper down the bottom of the larger outside diameter. The completed drawing of the profile of the first ring can be seen in **Fig. 2**, and it is now ready to be cut out.



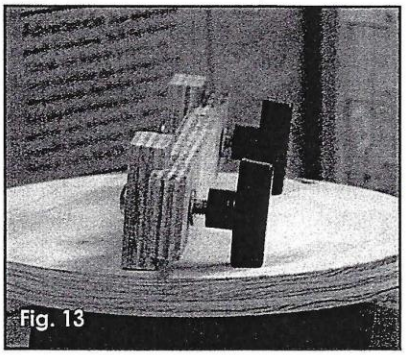
All the parts are finished and ready to be assembled.



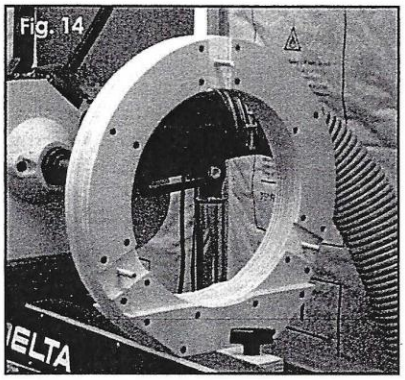
The bed insert helps lock the rest to the lathe bed.



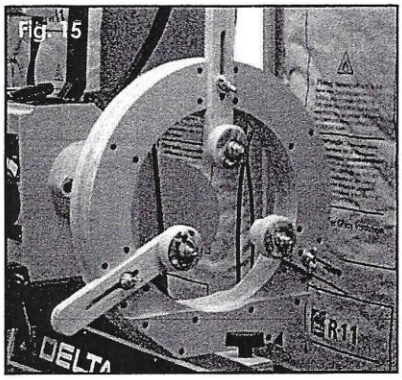
The depth of the recess in the securing block is critical.



The assembly is held together with carriage bolts and threaded knobs.



The rest is locked into position.



The roller arms have been added to the ring assembly.

After the ring has been cut out, lay out the location for the slots for the sliding roller arm assemblies (see **Fig. 3**). The roller arms will move freely within each of the three recesses and can be adjusted to conform to the outside diameter of the turning. Each slot is about 1-5/16" wide and roughly 5/16" deep, and should be equally spaced, approximately 120° apart around the perimeter. (A perfect circle equals 360°—if you divide 360 by 3, you get 120°).

You can easily locate the slots by using a flexible tape measure to measure down 15" from the very "top center" slot in each direction on the outside circumference to locate the center point of the other two slots. If your steady rest diameter is larger or smaller, the numbers will need to be adjusted accordingly.

MILL THE SLOTS

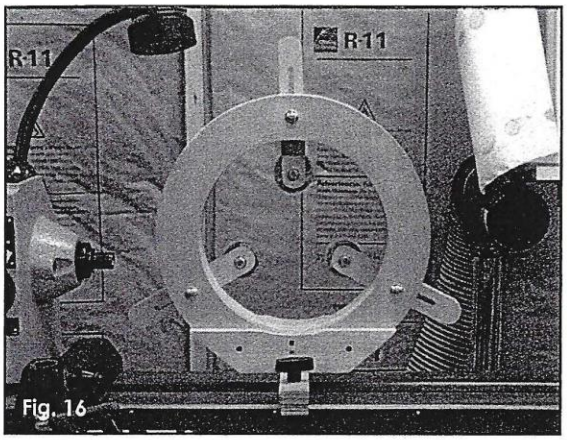
The slots must be milled next and a number of methods can be used to do this. For example, you could use a sharp chisel and mallet to cut the slots, or you could use a router. I don't have a router (and I certainly wasn't going to do it by hand), so I used my X-Y table and drill press fitted with a 5/16" end mill (see **Fig. 4**) to cut mine. The green-colored vise bolted to the X-Y table held the ring securely.

Whatever method you choose, it is especially important that the ring be truly level with the plane of your tool or the slots could slant off somewhat. This will cause the roller arm/wheel assembly to track improperly against your turning.

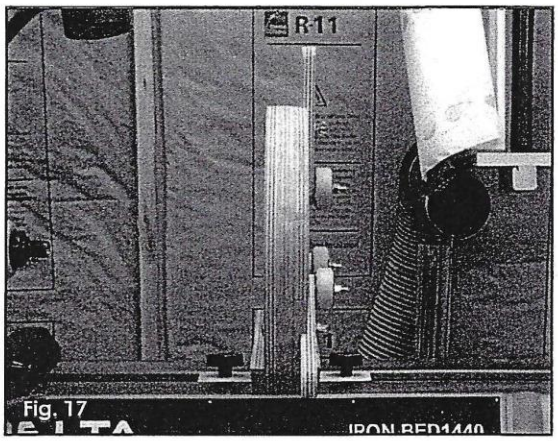
ROLLER ARMS

Make and mill out the roller arms (see **Fig. 5**). Cut three pieces of wood to the same width as the slots milled in the ring earlier. Each arm should move freely, yet snugly, without much play in the slots for best results. If they are too wide and don't fit or slide freely within the slots, use some abrasive paper to sand down the sides.

As a reference, here are the dimensions for one of the roller arms I made for my steady rest: length of arm(s): 7-3/4"; width: 1-1/2"; slot size: 5/16" wide x 3-1/4" long; hole for skate wheel bolt: 5/16" diameter. Further reference points/measurements: distance from end of arm to start of slot: 1-1/2"; distance from end of arm to start of skate



This is what the back side of the steady rest looks like.



The side view looks like this.

wheel bolt hole: 3/4". A photo of the completed roller arms is shown in **Fig. 6**.

WHEELS

One of the in-line skate wheels used in this project is shown in **Fig. 7**. I was able to find my wheels locally, but if you can't, look at the online retailers provided in the Materials section.

Again, for reference, the wheels used measured: wheel diameter (OD): 2-1/8"; width: 1"; center hole: 5/16" diameter. When considering what size wheels to purchase, try to select a wheel with a common size center hole, such as 5/16" ID. This is a very common size and will make the assembly process much quicker and easier. Personally, I have found this size bolt/wheel arrangement very robust.

Fig. 8 shows the skate wheel mounted to one of the roller arms. I used a 5/16" x 2-1/2" bolt with 5/16" washers on either side to mount the wheel to the arm. Next, the wheel is slipped on the bolt, followed by another 5/16" washer, and then by the 5/16" stop nut to secure everything. I have found the stop nuts with nylon inserts to be excellent for this application. Because the nylon inserts will not allow the nuts to back off the threads, I think they are far superior to lock nuts. The stop nuts allow you to remove any play, yet still permit the wheels to turn freely on the axle.

BASEPLATES

Make two of what I call the "baseplates" next. These are shown in **Fig. 9**. These were added because I think the extra stability is needed both in front and behind the steady rest. The baseplates add some bulk, give the rest more mass, and have proved to be a good decision. For reference, the exact measurements for the plates used on my rest are the following: height: 2-1/4"; length across the top: 10-3/4"; and length across the bottom: 5-3/4".

ASSEMBLY

JOIN THE BODY PARTS

Fig. 10 shows how the larger components go together to make up the body of the steady rest. The three main body rings are joined with 1-1/2" x No. 6 drywall screws. I drilled and countersunk the screws around the perimeter of the steady rest body to guarantee that all three rings were joined securely. These screws attached all three rings together from the front side without the need for any additional screws from the back. To attach the two baseplates, use the 1-1/4" x No. 6 drywall screws. The plates can be attached from either side of the rings.

BED INSERT

The bed insert (see **Fig. 11**) is screwed to the bottom of the body rings and serves to help keep the steady parallel to the lathe bed. My insert was made 1-1/2" wide by 9-1/2" long, but you might have to adjust the measurements to fit your lathe. The three holes shown were drilled to accept the screws used to attach it to the bottom of the steady rest.

UNDERBED SECURING BLOCKS

The two underbed securing blocks lock the rest down to the lathe bed and are secured to both ends of the bed insert.

Begin by looking underneath your lathe bed to determine the required width for the blocks and to check if the underside of the bed is flat enough to permit blocks to "catch" the edges of the bed and to lock the rest into position. The blocks must be wide enough so the edges of the blocks, when in the "tightened" or "locked-up" position, will catch the underside of the bed securely.

A recess that matches the width of your bed insert must be milled in both blocks (see **Fig. 12**). The depth of this recess is important too, because when tightened, the blocks must catch the bed and pull the rest down tightly onto the top of the bed with little or no play. The blocks I made for my lathe measured 1-5/16" wide by 2-5/16" long with a 3/16" deep recess.

Fig. 13 shows the parts that make up the entire underbed securing block assembly and the associated hardware in the locked position. I used 5/16" x 1-5/8" carriage bolts here, because the square shank can be driven into the wood and will prevent the bolt from turning. Cyanoacrylate glue (CA or superglue) or wood glue could be used to further secure the bolts.