

Hovarter Custom Vise
VX20F Face Vise
Assembly Instructions

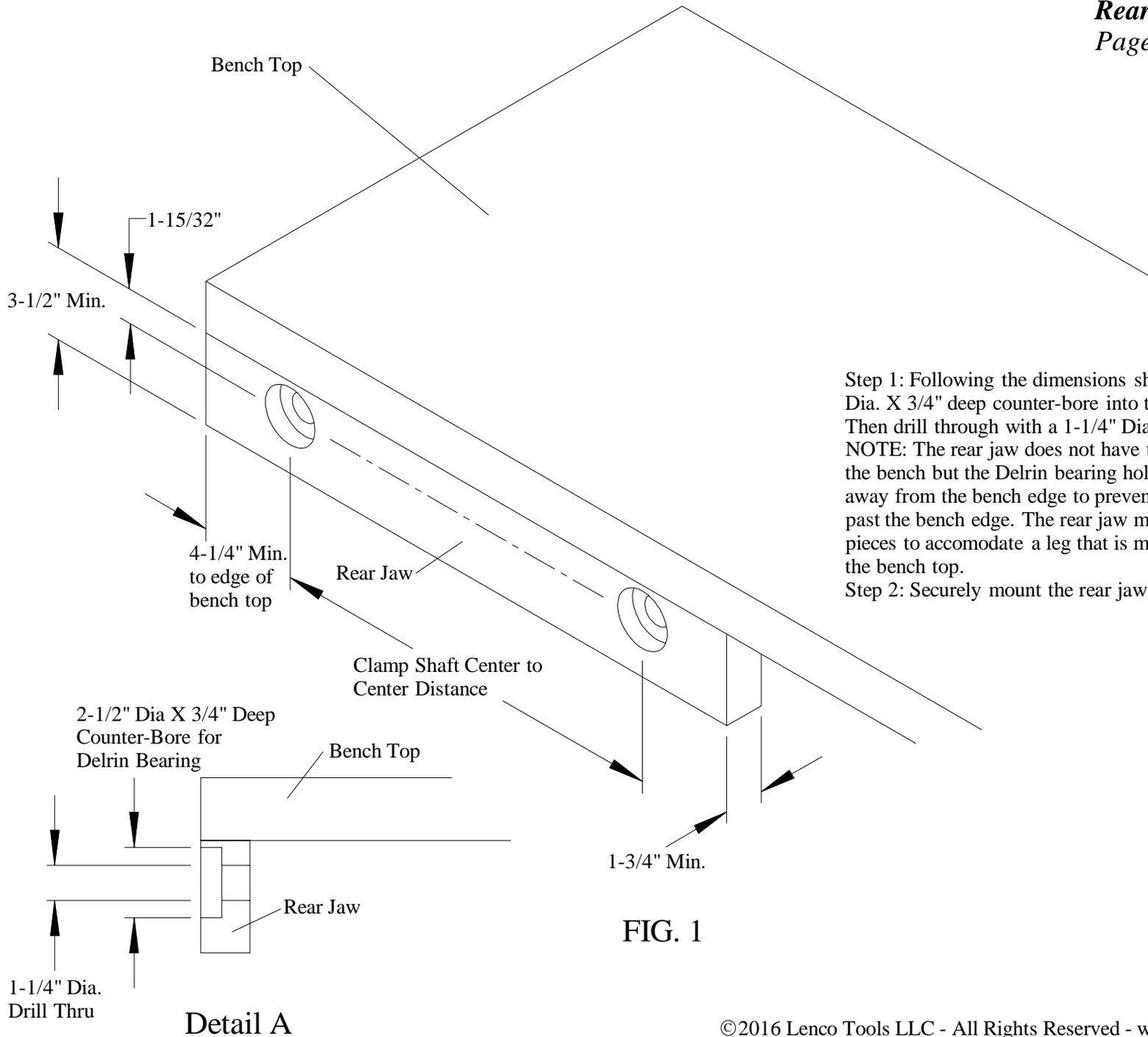
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The Hovarter Custom Vise VX20F is a revolutionary new quick action vise mechanism based off of the popular VX20 leg vise. The VX20F utilizes a special clutch mechanism to allow the vise jaw to be quickly positioned against the workpiece. The two separate vise mechanisms operate in unison by a unique rack bar which travels against the bottom of the bench top. When either clamp handle is turned the clutches simultaneously grip the clamp shafts and securely tightens the vise jaw against the workpiece. When the clamp handle is turned to unclamp the clutch releases and the vise jaw is again free to slide in and out. A work piece may be clamped anywhere between the two clamp shafts without racking.

The VX20F also uses a unique quick release pin to mount the handles to the clamp shafts. This allows the handles and vise jaw to be quickly removed by pulling the quick release pin and the clamp shafts may be retracted flush with the rear jaw. The VX20F clamp shafts are retained in the housings and will not fall out. This is a great feature to have if you need to clamp large items like large doors to the front of your bench. Additionally repositionable shaft collars allow the use of a wooden hubs and handles, metal hand wheels, single handles or custom designed handles to be used with the vise hardware and also easily allows the handles to be interchanged.

The VX20F consists of two housings which mount to the underside of the bench top and bearings at the rear of each housing. There are no front bearings in the housings, instead separate Delrin bearings are supplied which mount to the rear jaw. This allows the weight of the vise jaw, clamp shafts and handles to be supported by the large forward placed Delrin bearing to provide very smooth and effortless movement.

The VX20F vise mechanism does require some clearance to allow it to operate properly. Follow the requirements shown on page 2 to keep the rack bar from protruding past the end of the bench top. Also ensure that the rack bar clears any legs or stretchers that may be in the way. In some cases a slot may have to be made in the stretcher to accommodate the rack bar or the whole mechanism may have to be moved slightly rearward to provide clearance from the rack bar to the leg.



Step 1: Following the dimensions shown in Fig. 1, drill a 2-1/2" Dia. X 3/4" deep counter-bore into the front face of the rear jaw. Then drill through with a 1-1/4" Dia. drill. See Detail A.
 NOTE: The rear jaw does not have to be flush with the edge of the bench but the Delrin bearing hole needs to be at least 4-1/4" away from the bench edge to prevent the rack bar from extending past the bench edge. The rear jaw may also be made in two pieces to accommodate a leg that is mounted flush with the front of the bench top.
 Step 2: Securely mount the rear jaw to the bench top.

FIG. 1

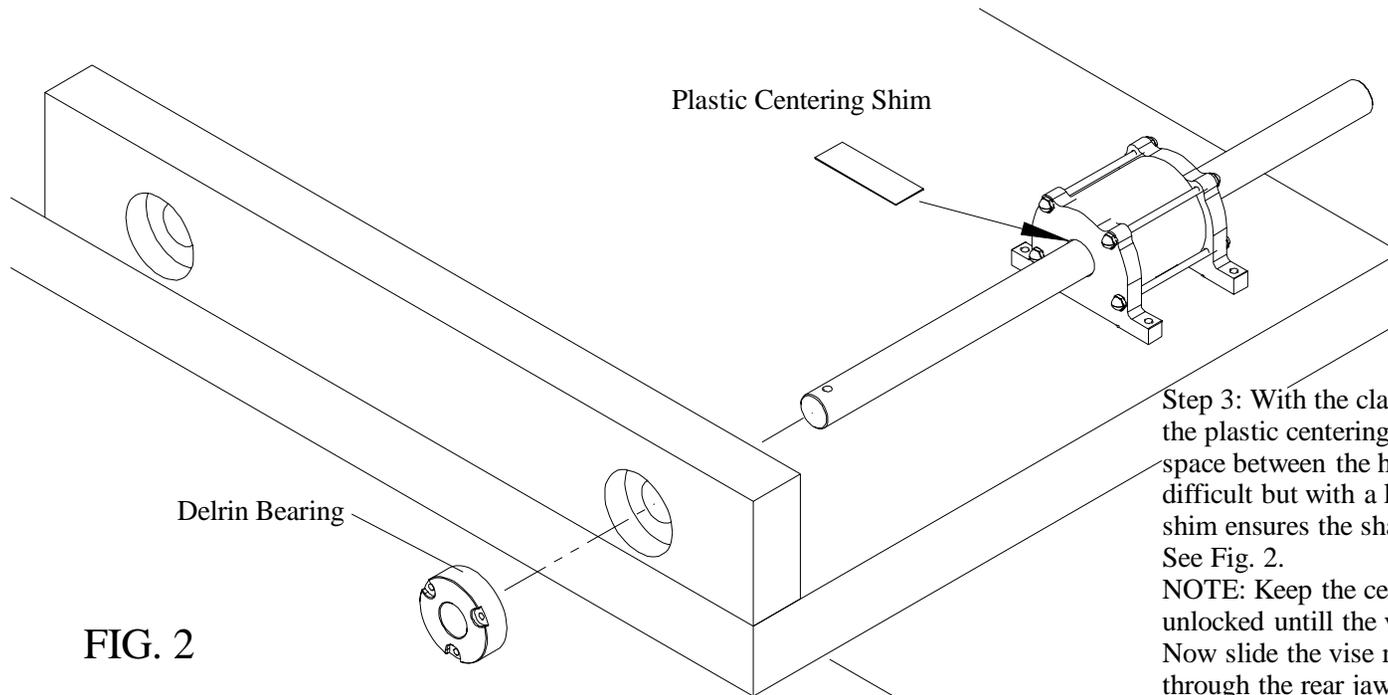


FIG. 2

Step 3: With the clamp shaft unlocked and free to move, spiral the plastic centering shim around the shaft and insert it into the space between the housing and the shaft. This is a little bit difficult but with a little patience can be done. The centering shim ensures the shaft is centered in the opening of the housing. See Fig. 2.

NOTE: Keep the centering shim in place and the clamp shaft unlocked until the vise mechanism is secured to the bench top. Now slide the vise mechanism forward so the shaft protrudes through the rear jaw and slide the Delrin bearing over the shaft and into the counter-bore in the rear jaw as shown in Fig. 3.
NOTE: The bearing should slide into the counter-bore without lifting the vise housing or binding on the shaft. If this happens it means the counter-bore is drilled too high or too low and needs to be corrected.

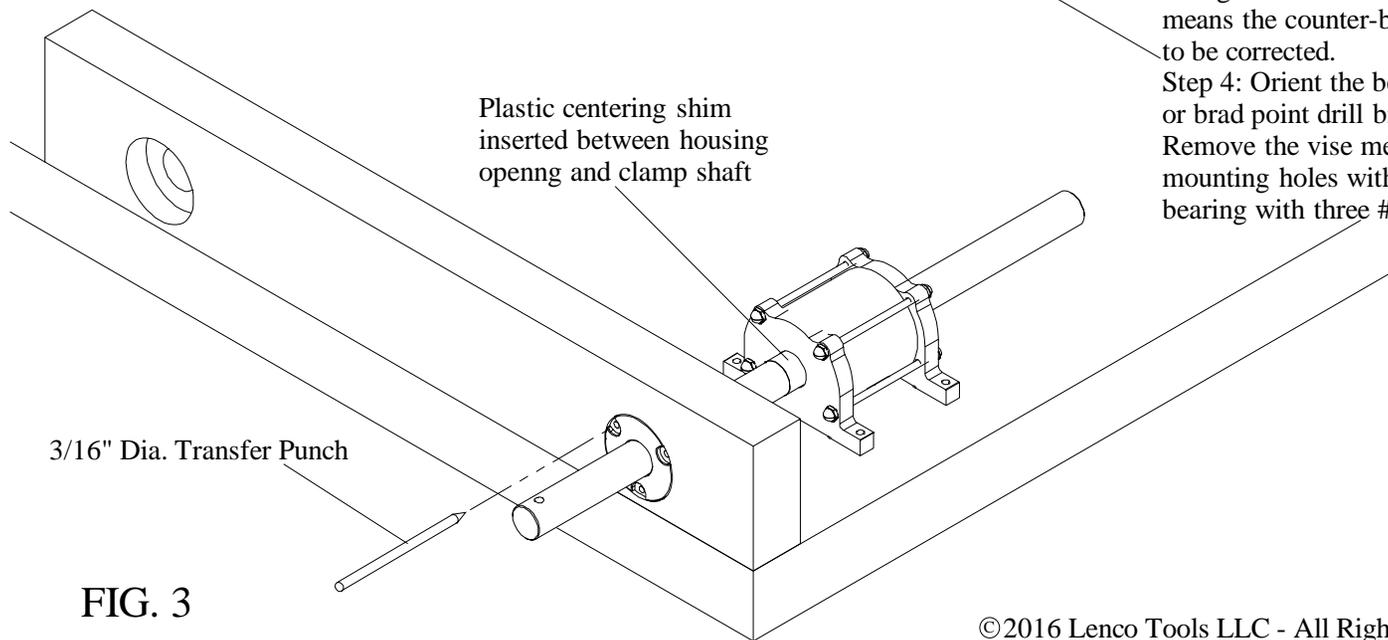
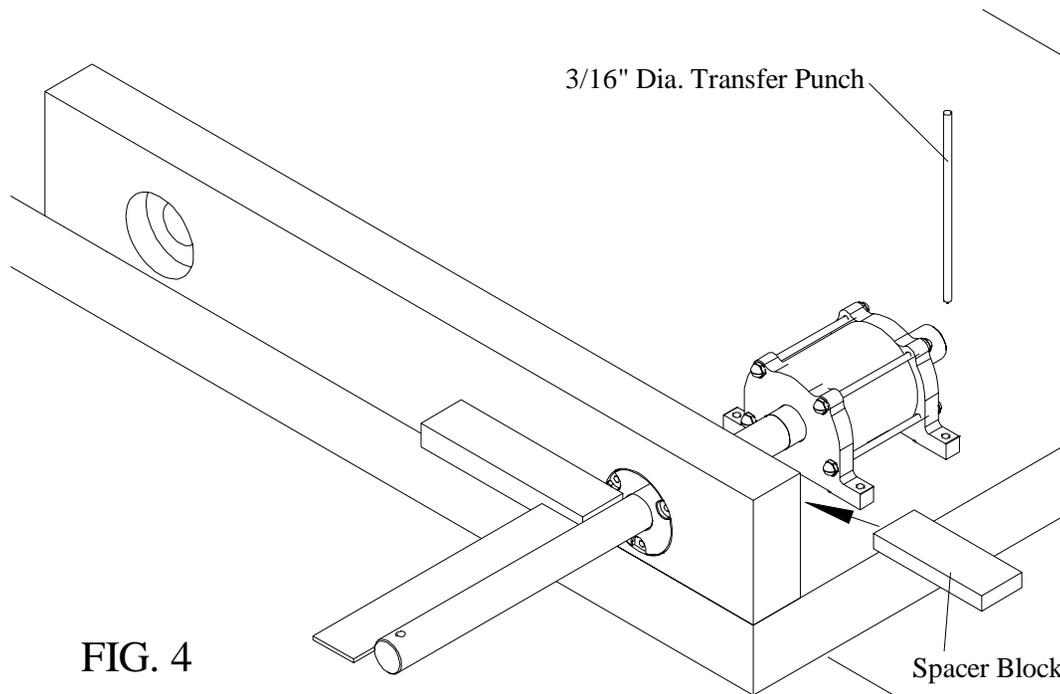


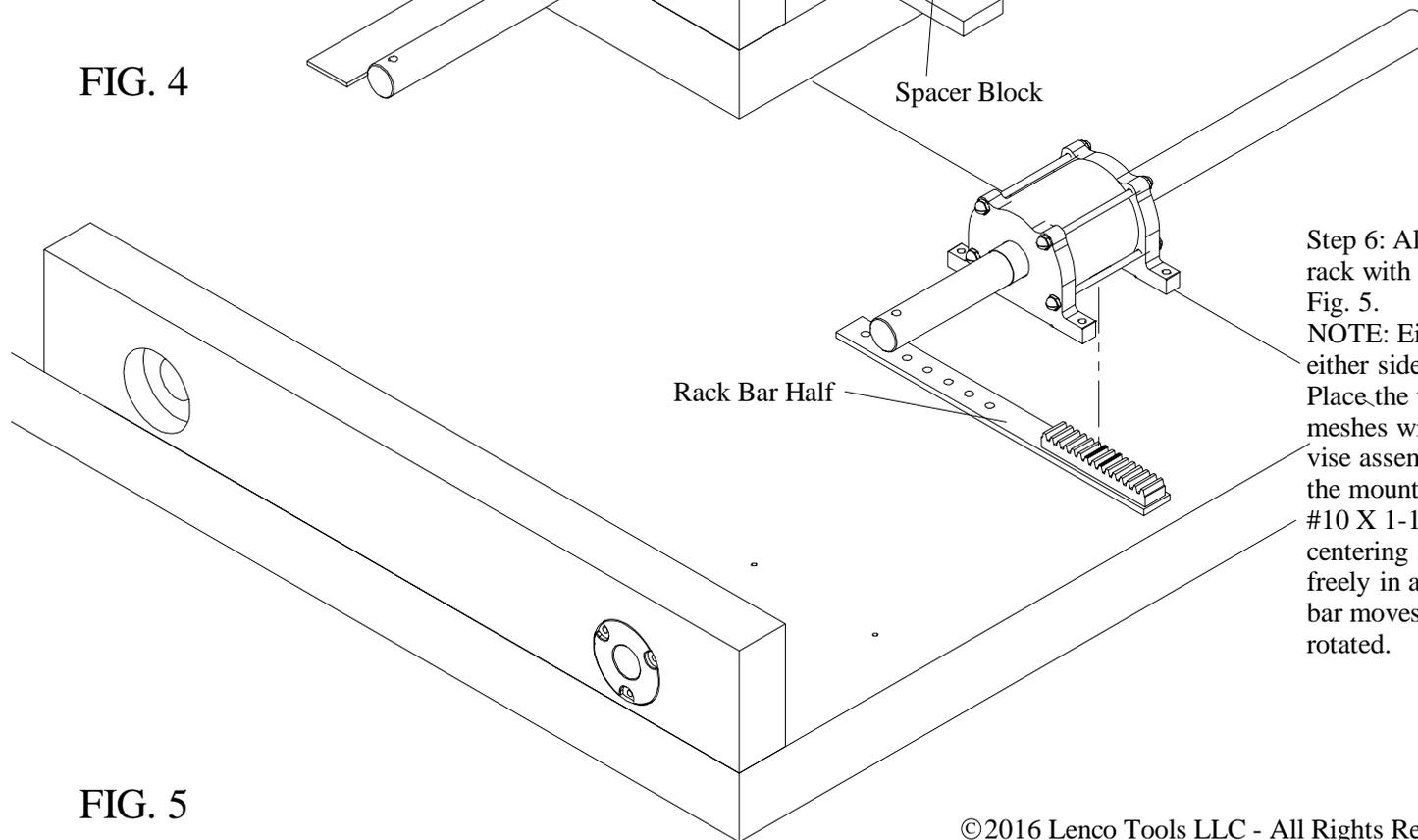
FIG. 3

Step 4: Orient the bearing as desired and using a transfer punch or brad point drill bit, mark the 3 mounting hole locations. Remove the vise mechanism and Delrin bearing and drill the mounting holes with a 1/8" dia. bit 1-1/2" deep. Install the bearing with three #8 X 1-1/2" washer head screws.

***Install Vise Mechanism and
Rack Bar Half***
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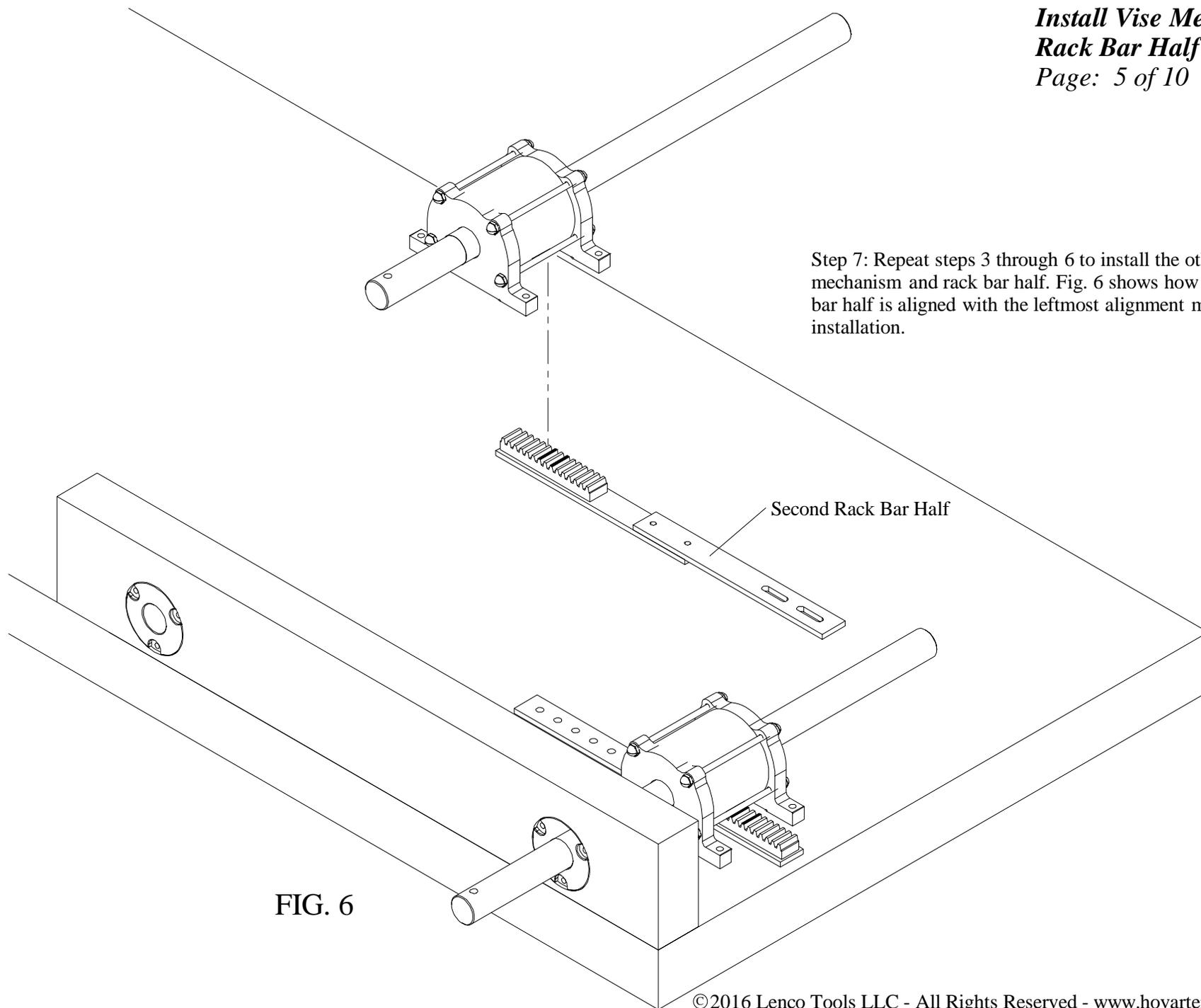
Step 5: Make a spacer block that is 1/2" thick or less by about 4" long with a width equal to the amount of setback from the front housing to the rear jaw. Slide the clamp shaft forward and insert the shaft through the Delrin bearing. Slide the housing forward until it traps the spacer block against the rear jaw. Use a square to ensure the clamp shaft is perpendicular to the rear jaw. See Fig. 4. Use a transfer punch to mark the 4 mounting hole locations. Remove the vise assembly and spacer block and drill 9/64" Dia. X 1" deep holes at the 4 marked hole locations.



Step 6: Align the leftmost alignment mark on the rack with the lower vise mechanism stud. See Fig. 5.

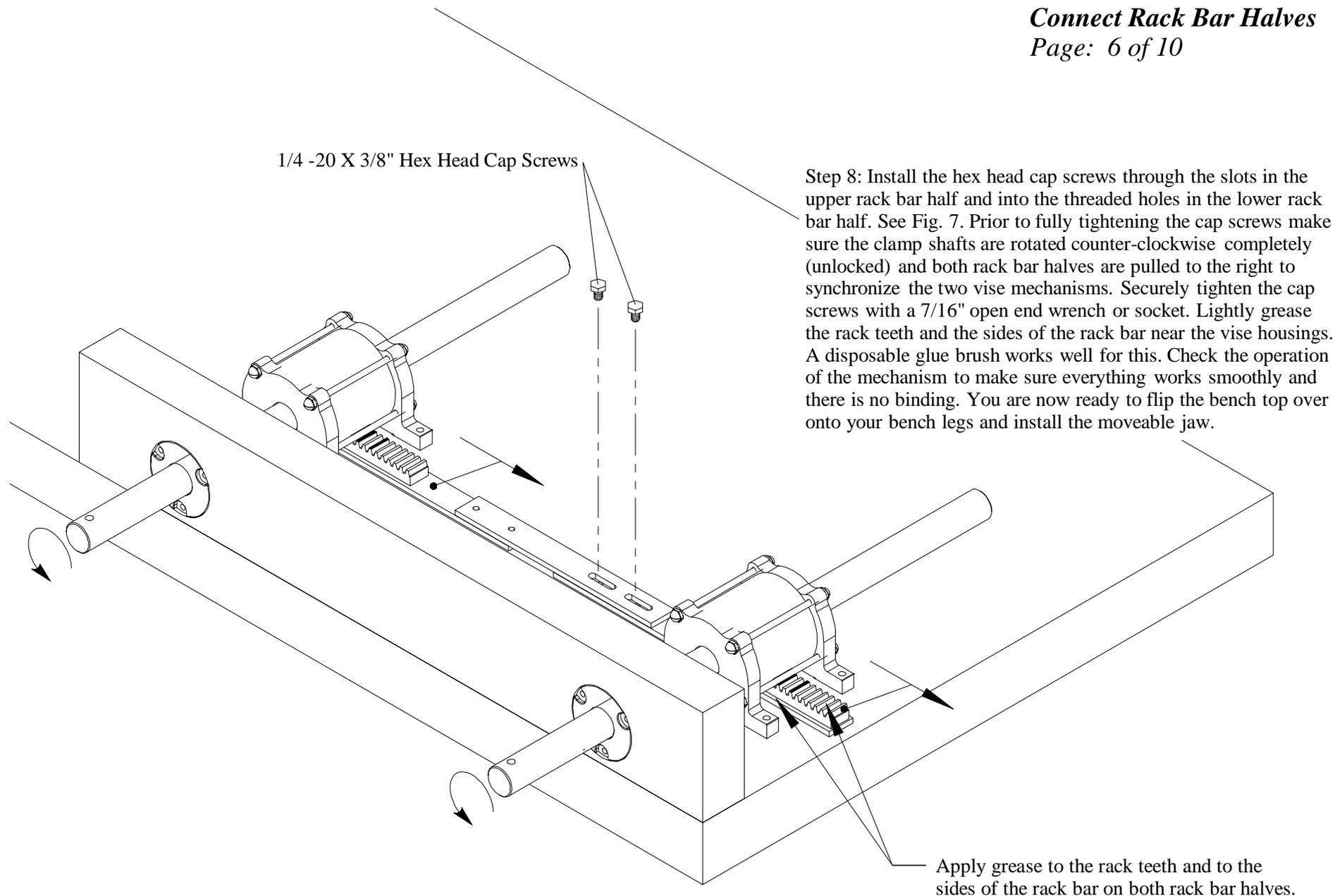
NOTE: Either rack bar half may be used on either side.

Place the vise mechanism on the rack so the rack meshes with the pinion in the housing. Slide the vise assembly and rack bar forward, align with the mounting holes and firmly secure with four #10 X 1-1/4" washer head screws. Remove the centering shim. Make sure the clamp shaft slides freely in and out when unclamped and the rack bar moves freely when the clamp shaft is rotated.



Step 7: Repeat steps 3 through 6 to install the other vise mechanism and rack bar half. Fig. 6 shows how the other rack bar half is aligned with the leftmost alignment mark prior to final installation.

FIG. 6



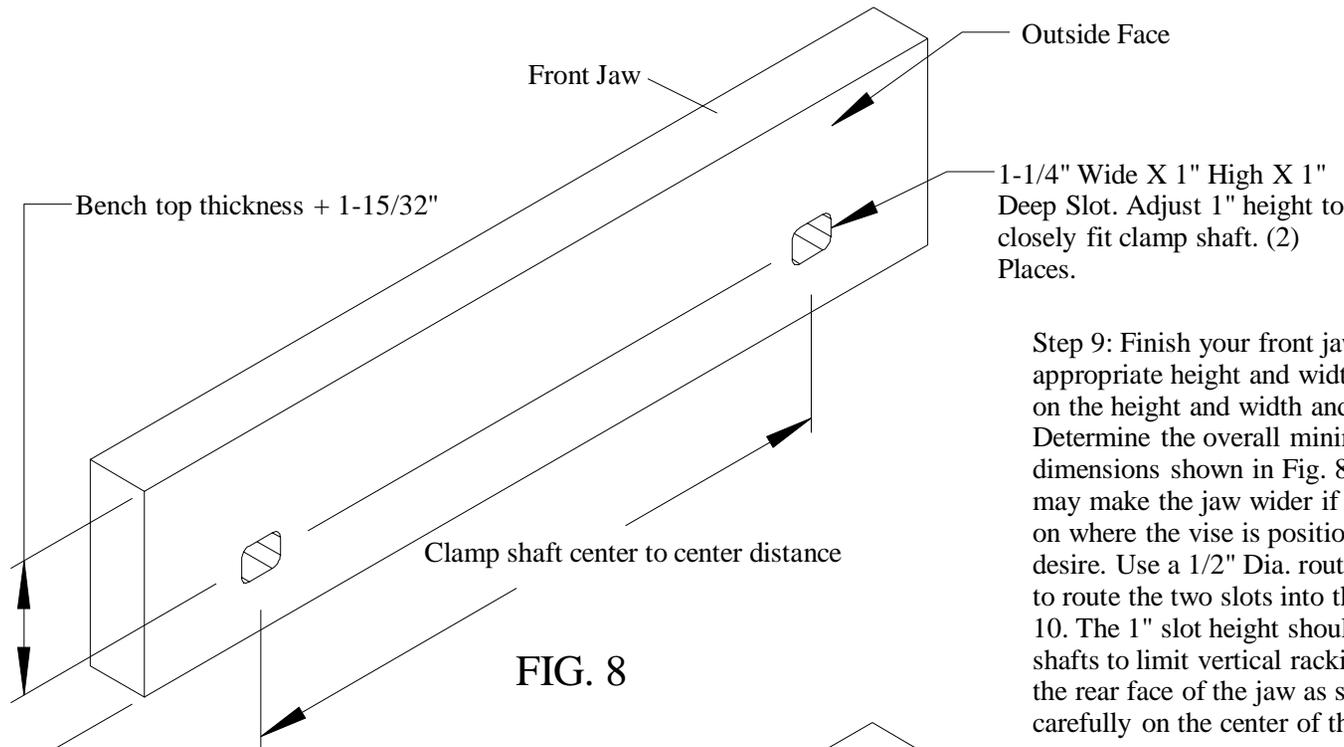


FIG. 8

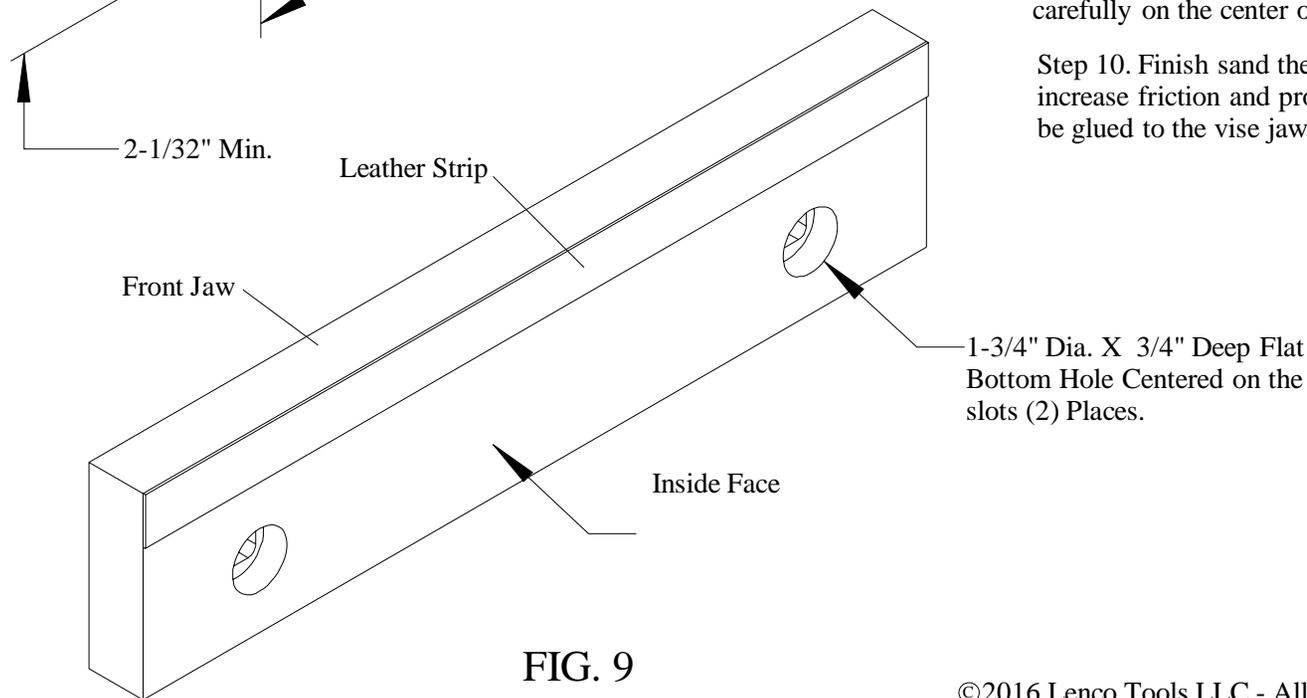


FIG. 9

Step 9: Finish your front jaw stock to 1-3/4" minimum thickness and the appropriate height and width. It is beneficial to leave a little extra stock on the height and width and trim it after the installation is complete. Determine the overall minimum height of the vise jaw using the dimensions shown in Fig. 8. NOTE: This is the minimum height, you may make the jaw wider if desired. Determine the front jaw width based on where the vise is positioned on the bench and how much overhang you desire. Use a 1/2" Dia. router bit in a router with a micro adjusting fence to route the two slots into the front face of the jaw as shown in Fig. 8 & 10. The 1" slot height should be carefully made to fit closely to the clamp shafts to limit vertical racking. Drill two 1-3/4" diameter holes through the rear face of the jaw as shown in FIG. 9 & 10. Center these holes carefully on the center of the slots.

Step 10. Finish sand the front jaw and apply the finish of your choice. To increase friction and protect your work, a 1-1/2" wide strip of leather may be glued to the vise jaw. Contact cement works well for this. See Fig. 9.

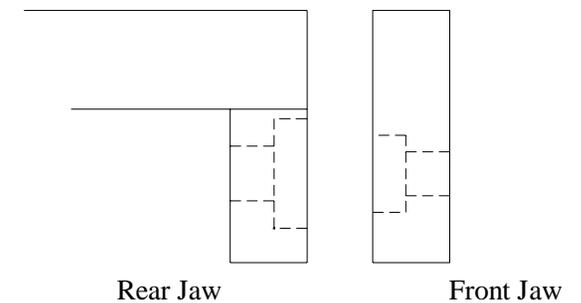


FIG. 10
 Side View

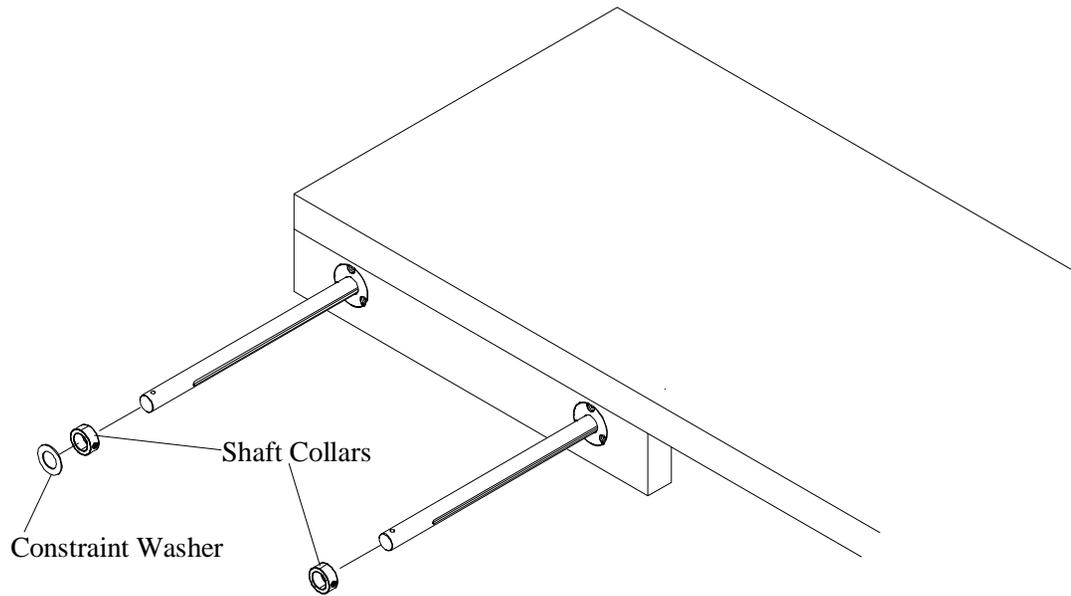


FIG. 11

Step 11: Place a shaft collar on one clamp shaft and a shaft collar and 1-3/4" dia. constraint washer on the other clamp shaft as shown in Fig. 11. Install the jaw on the clamp shafts so the clamp shafts protrude through the jaw a couple of inches. The constraint washer should fit into the 1-3/4" diameter hole drilled in the back side of the jaw.

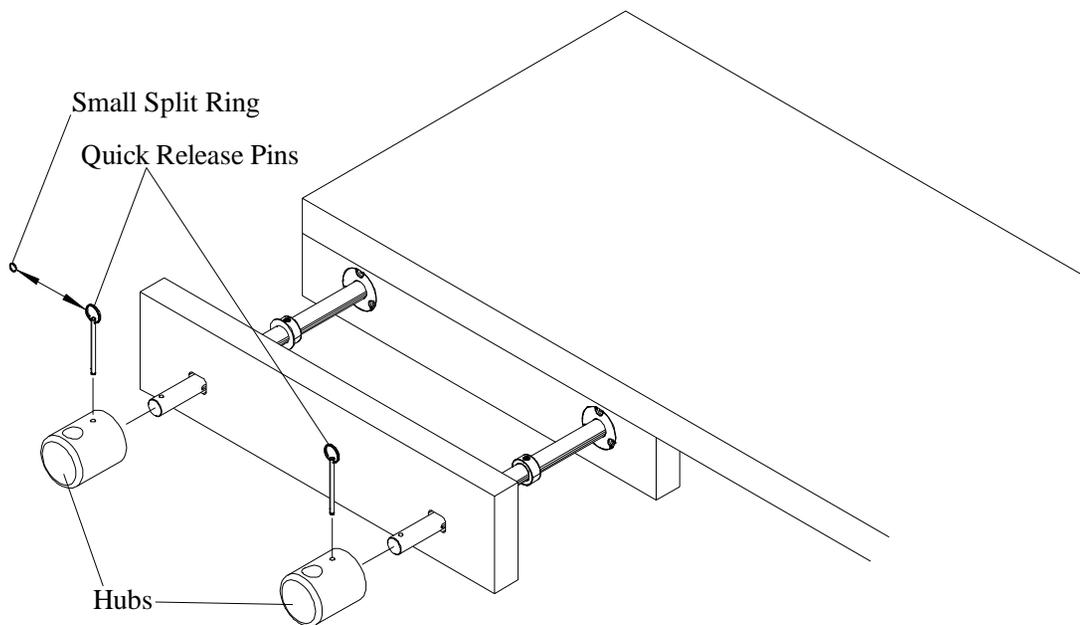


FIG. 12

Step 12: Place the wooden hubs on the clamp shaft and visually line up the cross holes. If you are using a metal hand wheel or using a single handle cap to make a single handle vise this process is the same. Insert the quick release pin into the cross hole in the hub and make sure it is completely through the clamp shaft and protrudes slightly out the other side of the hub. See Fig. 12. If desired, the small split ring may be installed in place of the large split ring.

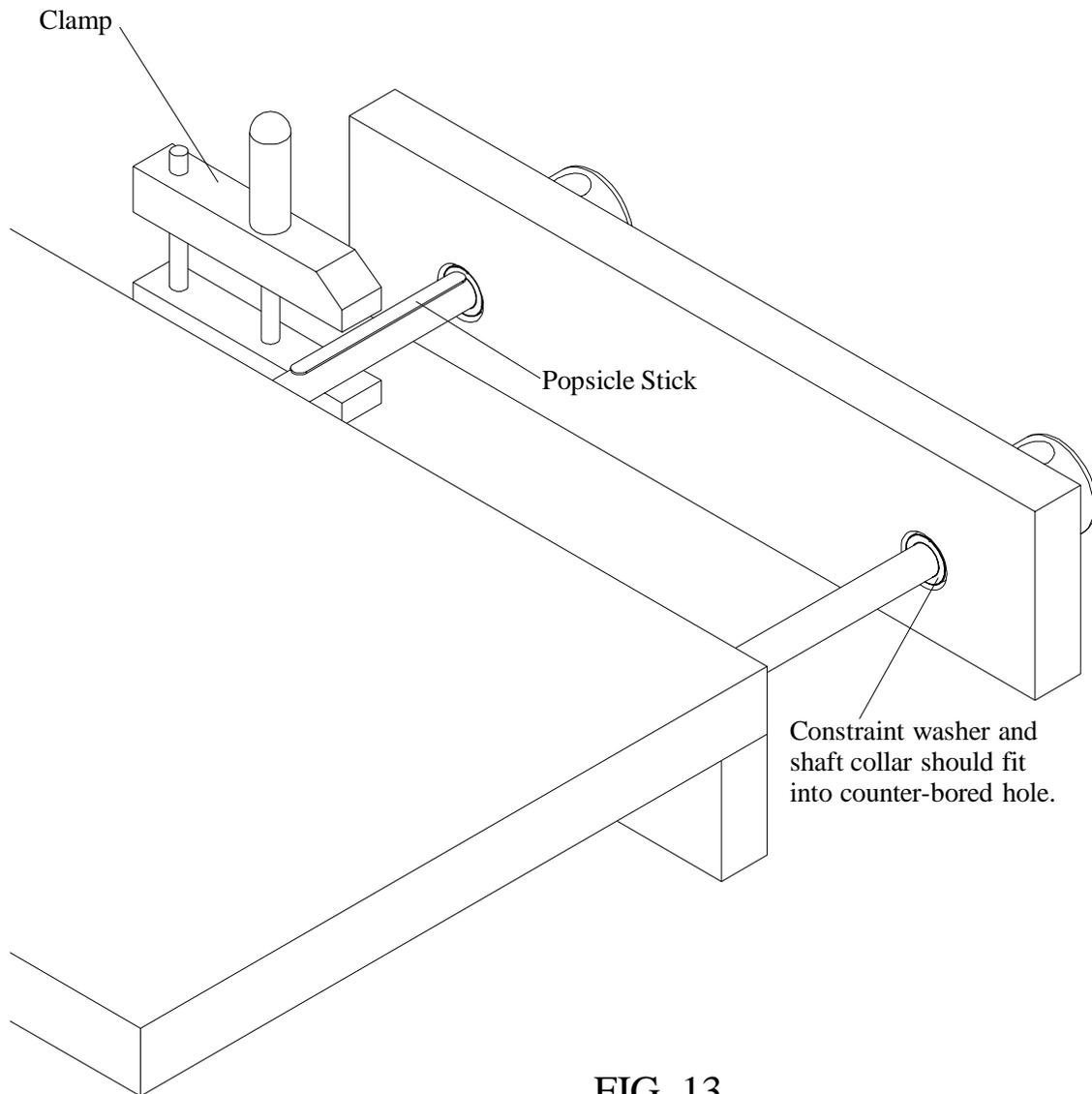


FIG. 13

Step 13: Open the jaw fully so you have access to the shaft collars as shown in Fig. 13. Clamp a Popsicle stick or other thin and narrow stick to one of the clamp shafts so that it holds the shaft collar and constraint washer (or shaft collar alone) tightly against the jaw. There should not be a gap between the jaw and the hub. Pull the quick release pin and remove the hub and jaw. Make sure the shaft collar is tight against the end of the Popsicle stick and firmly tighten the shaft collar using the included hex key wrench. Re-assemble everything and make sure the quick release pin can be installed and removed easily and there is not a large gap between the hub and jaw. Adjust the shaft collar for the proper fit. Repeat this procedure for the other clamp shaft. When you are satisfied the shaft collar is set correctly you can make a wooden gauge to allow you to quickly set the collar depth when you remove the jaw. You can also use a combination square as a depth gauge. If you remove the jaw frequently you can glue the constraint washer into the jaw with a dab of hot melt glue so you don't have to keep track of it. Install the handles to complete the assembly.

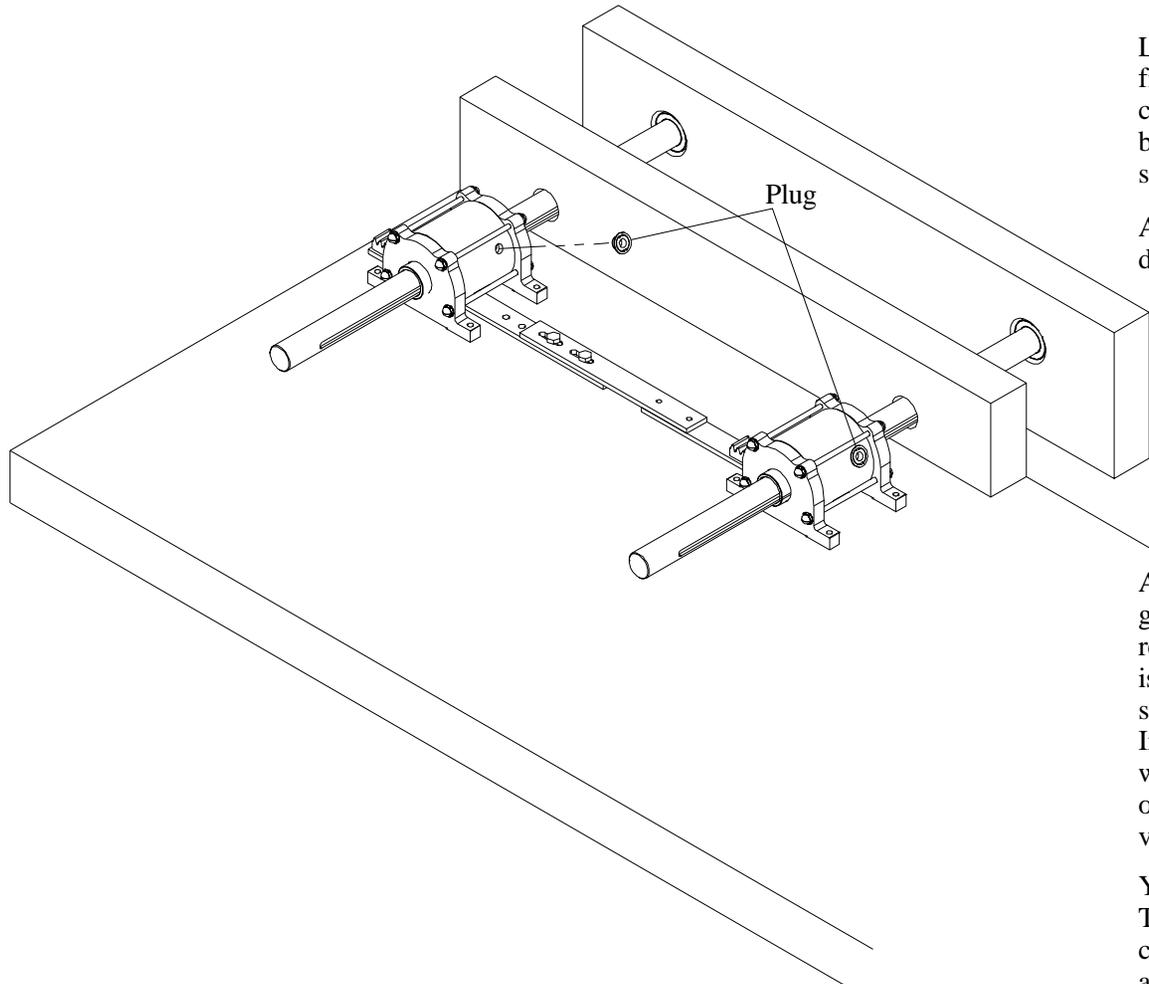


FIG. 14

Lightly polish the clamp shaft occasionally using a Mirlon ultra fine abrasive pad or 1200 grit wet/dry sand paper. Wipe with a clean cloth and apply paste wax to the clamp shafts. Let dry and buff. The paste wax will help prevent corrosion and make the sliding action incredibly smooth and easy.

As needed, apply grease to the racks and to the rack bar as described on page 6.

Annually, or if you notice an increase in mechanism friction, grease the internal cam. The internal cam is accessed by removing the blue plug from the housing. See Fig. 14. The plug is removed by grasping the handle and pulling outward. Use a small blade screwdriver to apply a pea sized amount of grease. Insert the blade of the screwdriver only 1/2" into the housing and wipe the grease onto the cam which is located towards the front of the vise. Pull the vise jaw out a few inches and operate the vise to distribute the grease.

Your vise has been greased using Lucas Oil Products Red "N" Tacky #2 EP grease. This is a smooth, tacky, red lithium complex grease fortified with rust and oxidation inhibitors. It is able to withstand heavy loads for extended periods of time and is especially good for sliding surfaces. This grease is very economical and widely available at home centers and auto parts stores. If you substitute a different brand of grease make sure it is a NLGI #2 EP (extreme pressure).