Outboard Turning Rig for Jet 1642

This was a project based on a design found on the web. As of yet I have not put it though all its paces, but from what I've done with it, it appears to be a fine apperatus.

The following is a list of materials and how I went about putting it all together.

Matterials: All metal is cold rolled steel

1 piece of 4”x4”x8” angle iron (depending on lathe may want to go longer)

2 pieces of 2 1/2” x 2 1/2” x 14” x 3/16” wall thickness square tube (for more reach longer sections needed)

1 piece of 2” x 2” x 10” x 3/16” wall thickness square tube (holds the solid tool rest bar)

1 piece of 1 1/2” x 1 1/2” x 41” solid square bar (length depends on spindle center height)

One 1/2” x 6” grade 8 bolt	Four 3/8” x 1 1/2” bolts
One 1/2” x 4” grade 8 bolt	Eight 3/8” washers
Two 1/2” grade 8 nuts	Eight 3/8” nylon lock nuts
Two 1/2” fender washers	Two 3/8” x 16tpi nuts for locking levers

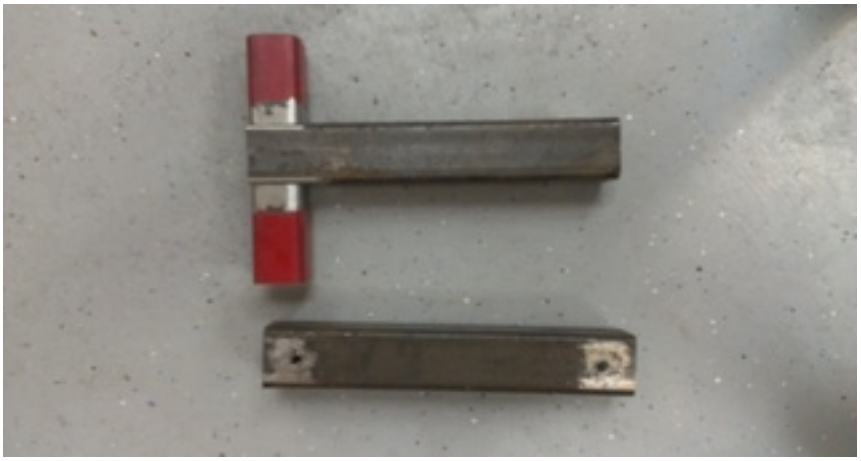
Two 3/8”-16 tpi locking levers purchased (or two 3/8”-16tpi x 6” bolts bent to make levers)

1 piece of 1/2” inside diameter black pipe, 12” long. (to be cut into 3 sleeves)

Various drill bits, a drill press, tapping fluid, metal cutting saw, 3/8”-16tpi thread tap, files, and an angle grinder with grinding wheel and flap sander wheels.

After all parts were cut to length, I started with the arm that accepts the T head. I used my jig saw with a bi-metal blade for cutting a notch out of it 2” wide and 2” deep. The top and bottom are cut out leaving the sides for support and more welding area. This could also be done a number of other ways.

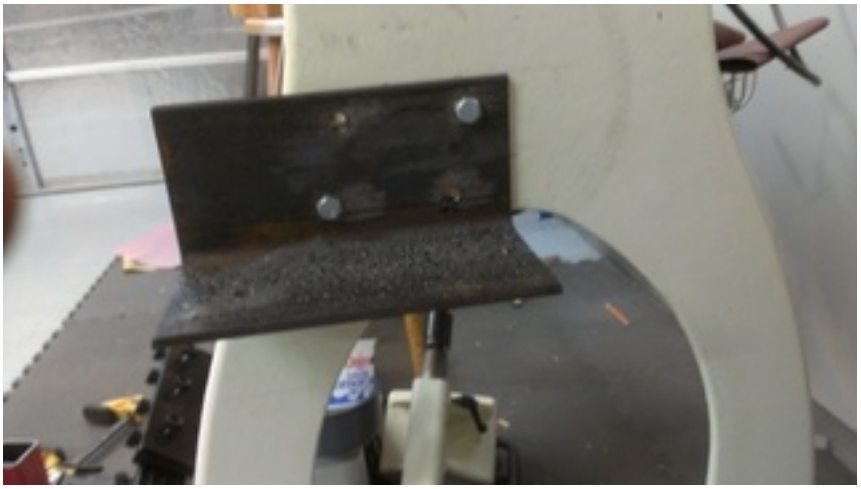
Note: For all drilling proceedures you should use a cooling lubercant. I used tap ease as that lubercant, but you may use what ever you think is best.



Next I drilled a 1/2” hole through the the top and bottom of the oposite end, and through the top and bottom of both ends on the second arm. These hole were located in the center of the 2 1/2” tube at a distance of 1 1/4” from the ends. The holes were step drilled, starting with a 1/4” bit and working my way up to the 1/2” bit.

I then possitioned and centered the 2” tube in the notch and welded it in place along the top, bottom and sides. I came back to it later and fill welded the ends.

I proceeded on by making the bracket to attach the rig to the lathe. As to where it goes on your lathe will depend on mounting locations, and how much swing you are trying to achieve. I settled on a distance of 9 1/4” from the top of my ways (bed) to the top edge of the angle iron. By mounting the angle iron the way that I did, I have a total of 16 1/4” from spindle center to the top arm (or and easy 32” swing). I felt with the Jet lathe that I have this was the best location for mounting. It puts the top two bolts on top of a support web on the inside of the leg and the bottom two under the web. Sounded like a good idea at the time. I then proceeded to drill out the 4 mounting holes at 3/8”. It turns out I had to go back and go up to the next size to get the bolts through the holes. While I was drilling, I went ahead and drilled the hole for mounting the bottom arm. I did this by step drilling it like I did the other holes. The arm hole in the angle iron was located 1 1/2” in from both sides near the outward corner. This allows the arm to pivot freely and clear of the uprising angle iron. Once all the holes were drilled in the angle iron, I clamped it in place and used it as a drill template to drill through the lathes leg. In the following picture you will notice the upper left corner of the angle iron is protruding out there a bit. In the end, I ended up marking the profile of the leg on it and cut a good chunk off. By doing this I added another 1 1/2” of swing to the bottom arm, allowing me better access to the bottom of a chucked bowl (for re-truing)



I screwed sacraficial screws into the two 1/2” nuts and had them protude out one side by about 3/8”. I then possitioned one on the bottom side of the angle iron so as the protuding threads went down into the hole. I hit a couple of spots with the welder and then backed the screw up a tad. I then proceeded to weld completely around the nut. The same procedure was used on the bottom arm (the one without the notch). If done right, the nut will be center with the 1/2” hole. Check for bolt clearance through the hole before welding all the way.

Next I drilled a 3/8” hole 1 1/2” down from the top edge of the T head for the bar locking lever. I then proceeded to weld a 3/8”-16tpi nut to it in the same manner as above. Adding a second hole and nut to one of the other sides may come in handy for possitioning of the lock lever on larger turnings.

I saved the hardest for last. I'm not going to lie, it takes some time drilling out the solid bar for the tool rest. Care must be taken in making sure you allign the bar to the bit for a nice straight hole.

In order to be able to drill the bar with my drill press, I had to swing the head over the side of the base. As can be seen in the picture below, I set my table totally vertical. Once I had every aspect in allignment, I used a clamp on the bar at the top and bottom of the table. Drilling the post hole began with a 1/4" bit. I drilled as deep as I could go with the 1/4" and then changed it out for one a couple sizes bigger. This continued on until I had drilled with the 1/2" bit. At this point my next size bit was 3/4". I found that I had to slow my downward pressure quite a bit here, but I made it to the bottom, I followed this with the 1" bit and after nearly 2 hrs of drilling I had a 1" hole 4 3/4" deep. I then drilled two holes in adjesent sides 5/8" down from the top with a 5/16" drill bit. I then proceeded to thread these holes with a 3/8"-16tpi tap for the tool rest locking lever. All that drilling ate up a good amount of lubercant, so make sure you have at least a few ounces on hand. At no point though the drilling did I move the bar possition.

Instead of going back and chancing messing everything else up here, I'm showing the black pipe sleeves below. These sleeves go into the square pipes so that the 1/2” bolts pass through them. Having these in place will add stiffness to the square pipes when the bolts are tightened down, lessening the chance of deflection in the pipes. You need to make 3 of them.

The next step is to grind and sand all the weld joints smooth and add paint if you want. All that is left is to assemble it all and start turning. Make sure to tighten down the pivot bolts well and the locking levers and you should have years of enjoyment from this rig.

After thoughts: This turned out to be steadier than I had anticipated. There is no more vibration in the tool rest than what I get when it is mounted in the banjo. I am still waiting for some decent painting weather, but in the meantime I conteplate welding end caps on the pivoting arms. I have a couple other ideas for them as well, wood caps perhaps. If you were to weld caps on, you would first need to fix the bolt sleeves in place in case you were to ever remove the bolts. This rig could easily be addapted for a number of lathes out there. The powermatic would be a real breeze for mounting, being it has mounting holes already there. You would only need a longer angle bracket. Speaking of the bracket.... it should be in such a possition that the arms can be swung in front of the lathe so that you have full access to the bottom of a mounted bowl. Another project down, on to the next....