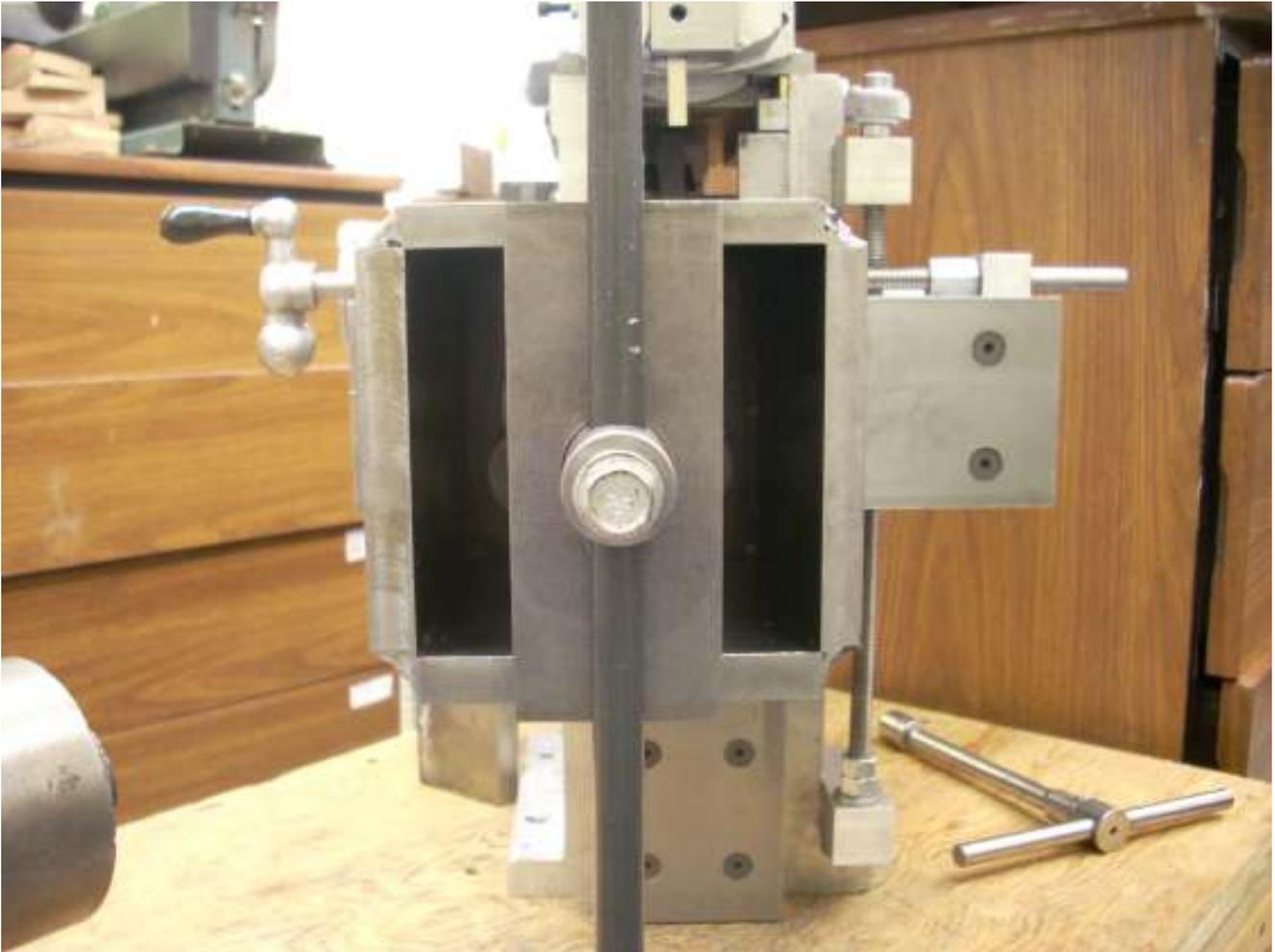


Fitting the Table to the Cross Slide

By R.G. Sparber

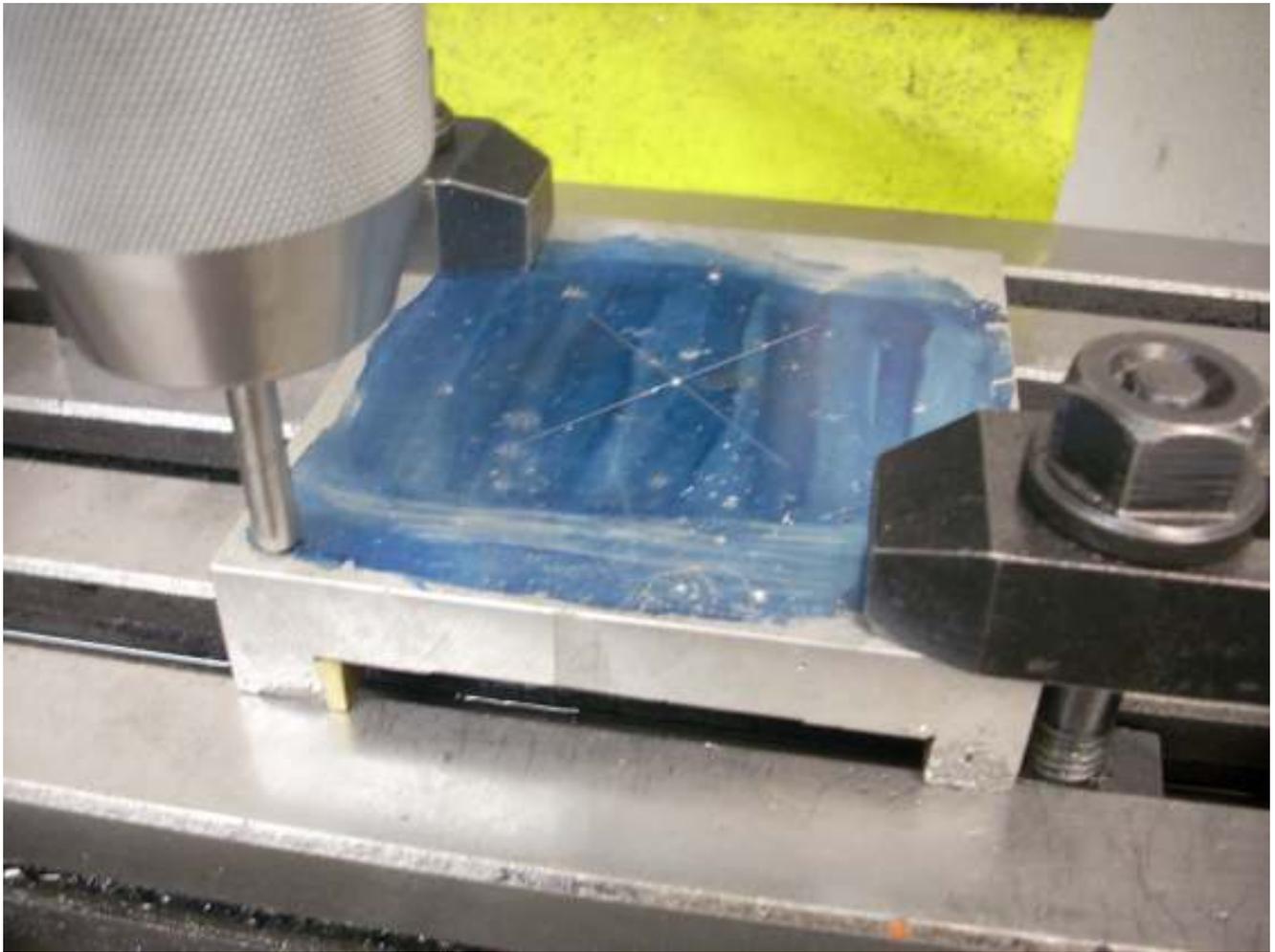
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The table fabricated in the last article is fitted to the cross slide.

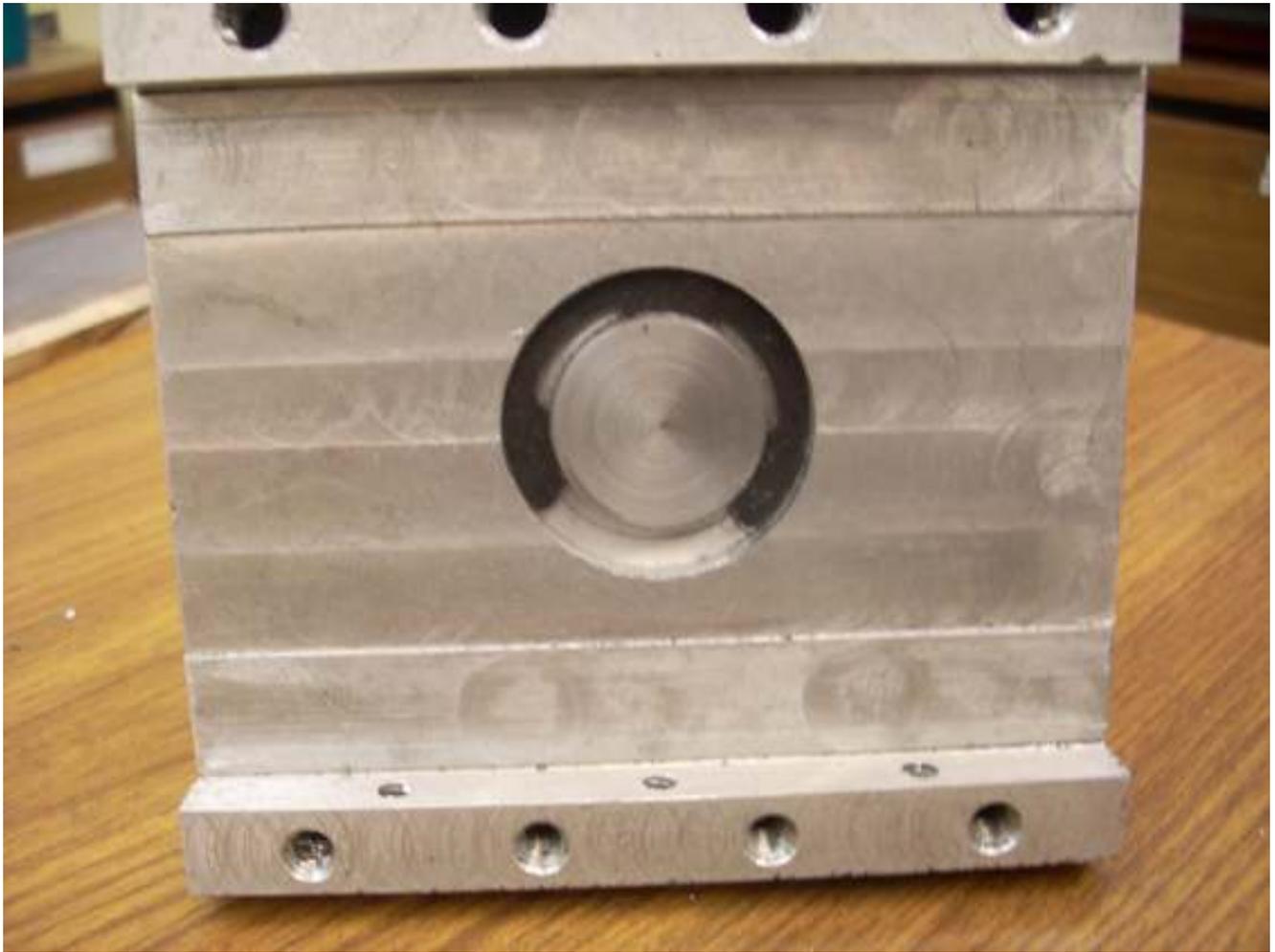
You can also see a neat trick I learned on line that solves an annoying problem I had with my cast aluminum cranks. Each time I turned one of the cranks, my hands got black. This turned out to be finely ground aluminum. I slipped a short piece of heat shrink tubing over the crank and applied heat. The tubing conformed to the crank as you can see on the left side of the picture.



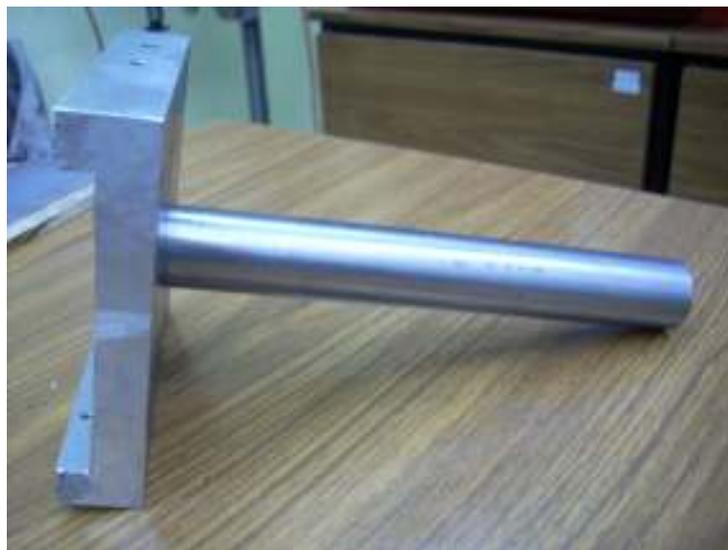
The cross slide casting was placed down on the table. A dowel fit into the drill chuck is being used with the DRO to verify it is bedded. I have scribed and marked the center which will next be drilled and bored to accept the pivot pin. I drilled it out $\frac{1}{2}$ " and then started to open it out to 1" before realizing that my plan had been to only go in 0.2". Time for a quick redesign.

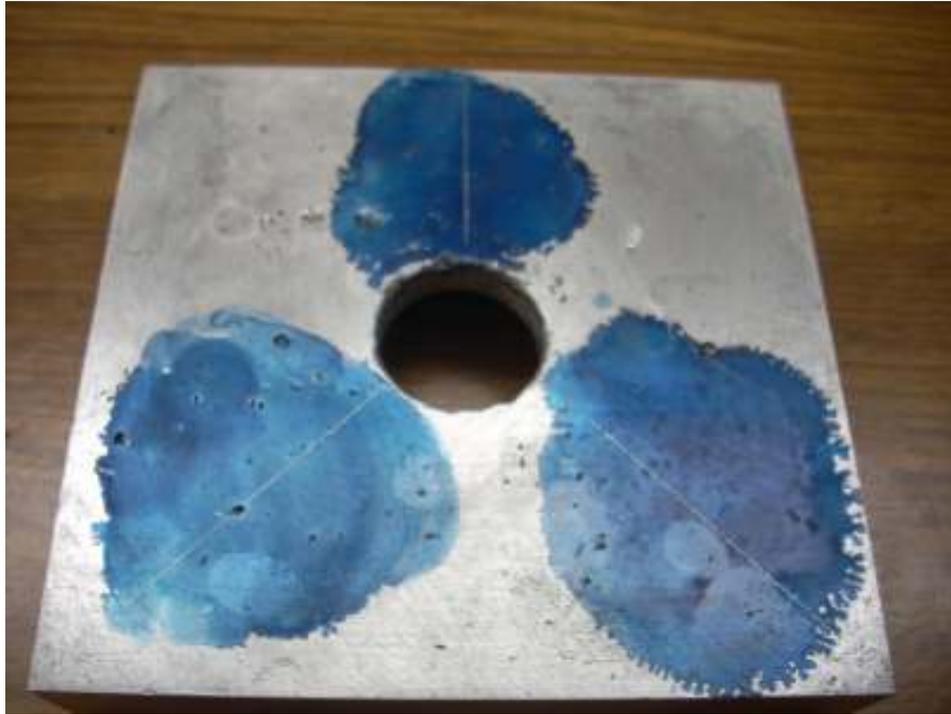


I decided to go with a D ring that would snap into a groove in the pivot pin. The D ring fits snugly into a recess which will keep it closed. This required me to flip the casting over since the recess, which must be concentric with the 1" hole, had to be on the other side.



Here you see the recess and the pin installed. I haven't presented the pin yet but this arrangement worked well.

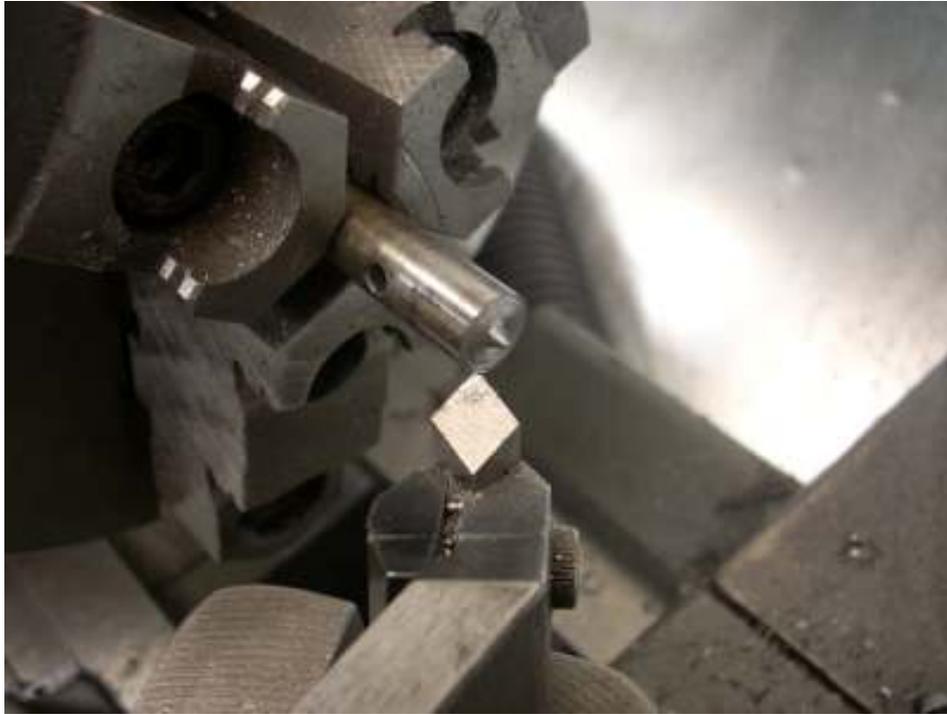




I removed the pin so the radial location of the mounting bolts could be scribed.



You might be able to just make out the scribed lines here. We are looking down into the cube which has been mounted on the pivot pin. The trick is to mark the center line of each arc on the line.

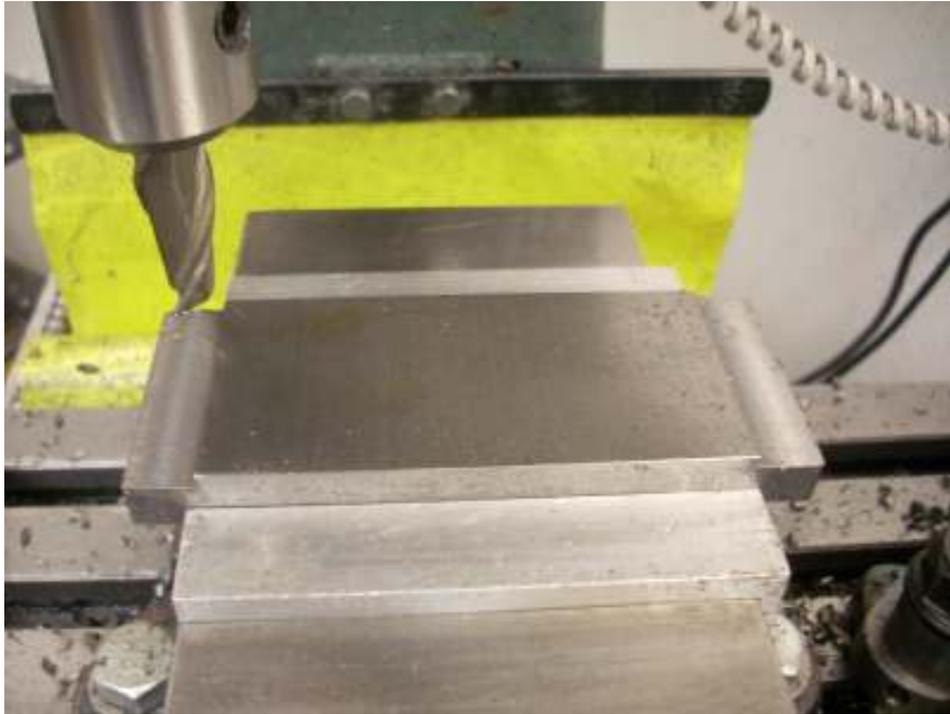


Since I am marking cast aluminum, there is no need for a hardened transfer punch. I just turned one out of CRS that is a close fit to the slot.

The problem I ran into was trying to see the scribe line and hit it with this punch. In the end I didn't get very close to the scribed lines and didn't even get close enough to the centerline of the arc. I would have been better off using my DRO and just dialed in the coordinates. That and using the wider arcs as mentioned in the last article would have saved me grief.



In the end the bolts all fit but you can see the mess I made of those nice, even slots.



The next step was to make the removable front plate. Steps have been cut in the ends so it can't rotate. A loosely fitting hole was then bored in the center so the pivot pin can pass through.

The pivot pin was made from 1" water hardened drill rod. I chose this material because of its nice finish. The uncut rod was fit through the cross slide casting and the cube slid on top. This was followed by the front plate. I then measured an additional 1.1" and marked it for sawing.



After squaring off the end, I used a parting tool to cut a groove for the D ring.





I then drilled a $5/16$ " holes 1" deep and tapped it $3/8$ " -16 to accept the locking screw. This was a mistake as I found out later.



The pin was set up on V blocks on my mill. I used my edge finder with a 1-2-3 block to locate the side of the rod. Then I dialed over 0.500" to find the centerline.



Here you see the finished slot in the pivot pin. The plan was to drill a $\frac{1}{2}$ " hole at each end of the slot and then use my $\frac{1}{2}$ " two flute end mill to clean out the slot in 0.1" deep steps. All went well with the drilling of the first hole until I hit the cross drilled hole. The drill then grabbed so hard it pulled the drill chuck from its tapered shank. I ended up having to step drill this hole in $\frac{1}{16}$ " steps from $\frac{1}{4}$ " up to almost $\frac{1}{2}$ " I was then able to switch to the end mill set in an end mill holder and finish the hole. The second hole was through solid metal so was a lot easier. In hindsight, it would have been much easier to cut the slot first and then go back and drill the hole for the screw. I also could have done with a lot less slot length but I think it is harmless.



The parts fit together fine so far.

To compensate for the weakness of the back plate, I next made thick washers for the bolts that attach the cube to the cross slide casting.



I had some 12L14 of the correct diameter. After facing off, I drilled a 3/8" hole about 1" deep. The cutter was then used to mark off slabs 0.3" wide.



The first washer has been cut. One side was faced on the lathe and the other face is rough and probably not true.



I am using the drill to hold the washer and a set of parallels to set it true in the chuck. The parallels *are* removed before the lathe is turned on.

The face of the washer is then trued.

Before I saw off the next washer, the bar is put back on the lathe and the next face squared up. The cycle is then repeated until I have 3 finished washers.





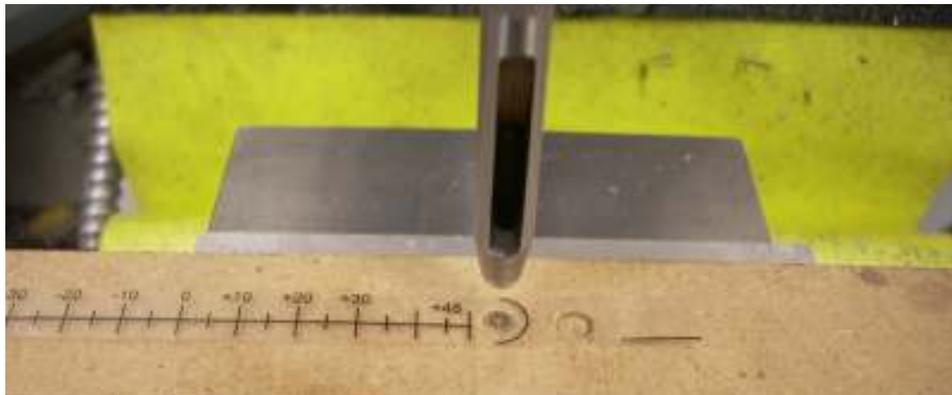
Here you can see how easy it is to loosen these bolts. The bolt heads are the same size as all other bolts needing adjustment in the shaper. The extension is long enough to clear the pivot pin.

When done with these bolts, the front plate is slipped onto the pivot pin and the $\frac{1}{2}$ " support rod slides into the pivot pin's slot. Tightening the pivot pin screw locks the support rod in place and locks the front plate to the front of the table. I will find out if this is solid enough when I start to cut the table with the shaper.



The support rod design is not done yet. I may add a sliding tube on the bottom end of this rod to allow for vertical table travel. However, if I can stand having the rod stick above the table, then I will keep it simple and leave it that way.

Of minor note is the protractor scale. I made it at the same time that I made the down feed dial.



I have a punch fitted into my drill chuck and the plastic gage resting on MDF. Using the downfeed, I was able to punch decent holes. After the fact, my friend Larry suggested I try nylon as the support block. It worked much better.



To locate the scale, I first set the head true with respect to the cross slide. You can see my square clamped in place and the head touching it.



The scale was then attached to the protractor using 6-32 screws.

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