A Speed Handle for a RF-30 Mill/Drill, version 1.1

By R. G. Sparber

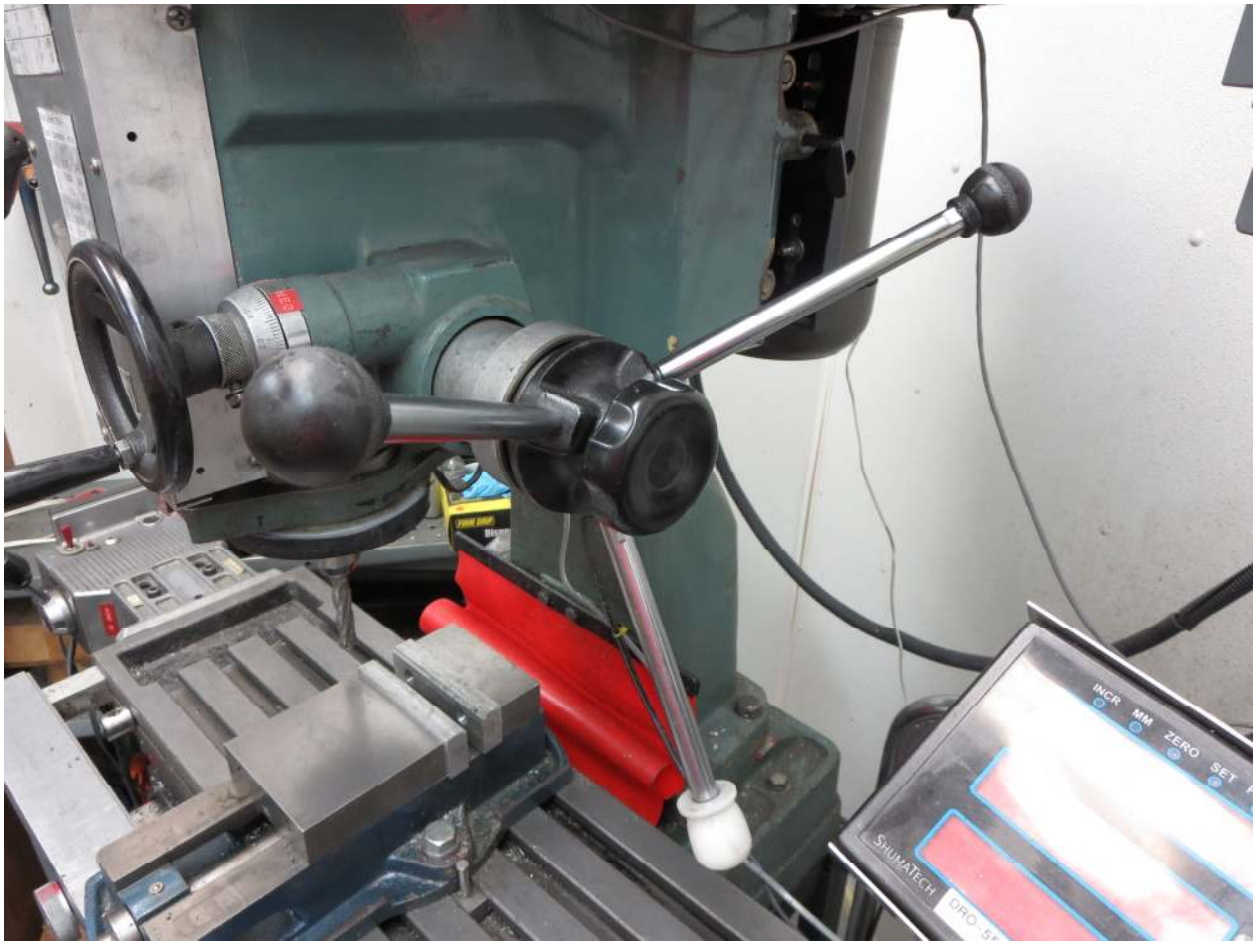
You can get an overview on how this handle works from two YouTube videos:

https://www.youtube.com/watch?v=feCvSwdfvDU

and

https://www.youtube.com/watch?v=7ia5QdhwPF0

The Problem Being Solved



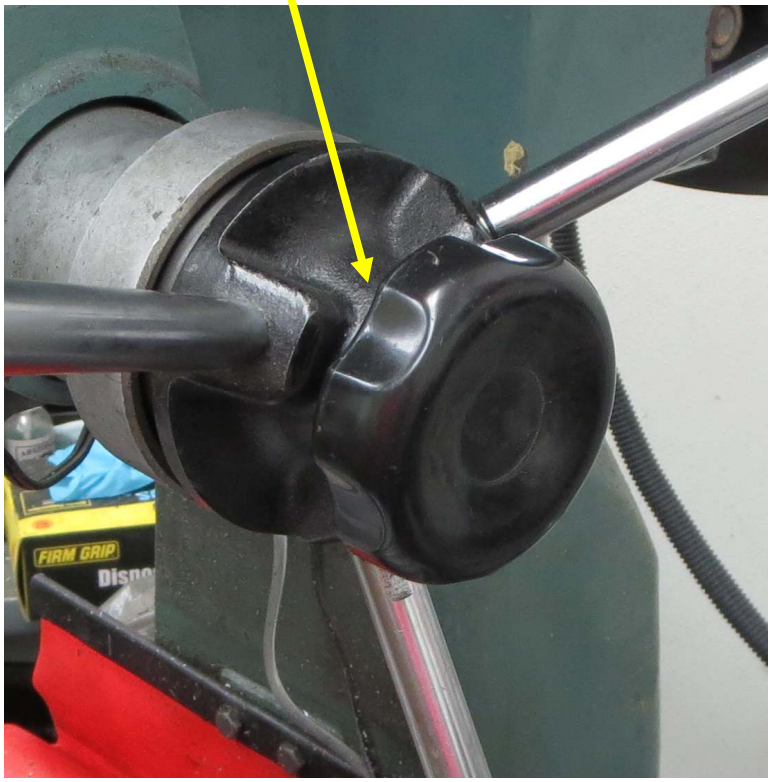
The Z axis feed handles on my RF-30 provide great leverage for down feeding the quill. But sometimes they are in the way and must be removed. Each handle is threaded 11-1/2 threads per inch for about ¾" making for a lot of turning to remove them.

A Solution

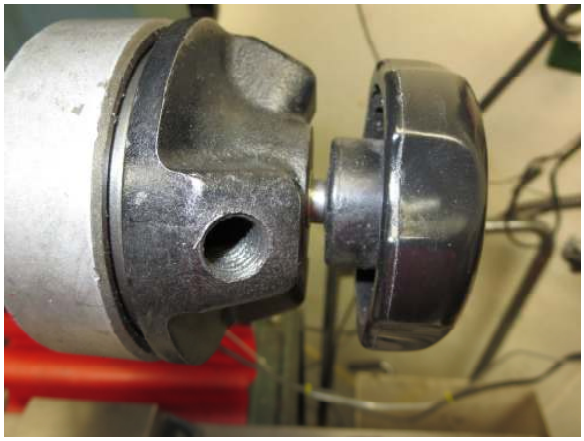
The Speed Handle presented here enables the user to remove all three stock handles. When needed, the Speed Handle can be attached in seconds. The two videos are the only way I know of showing this action.

The Components and their Installation

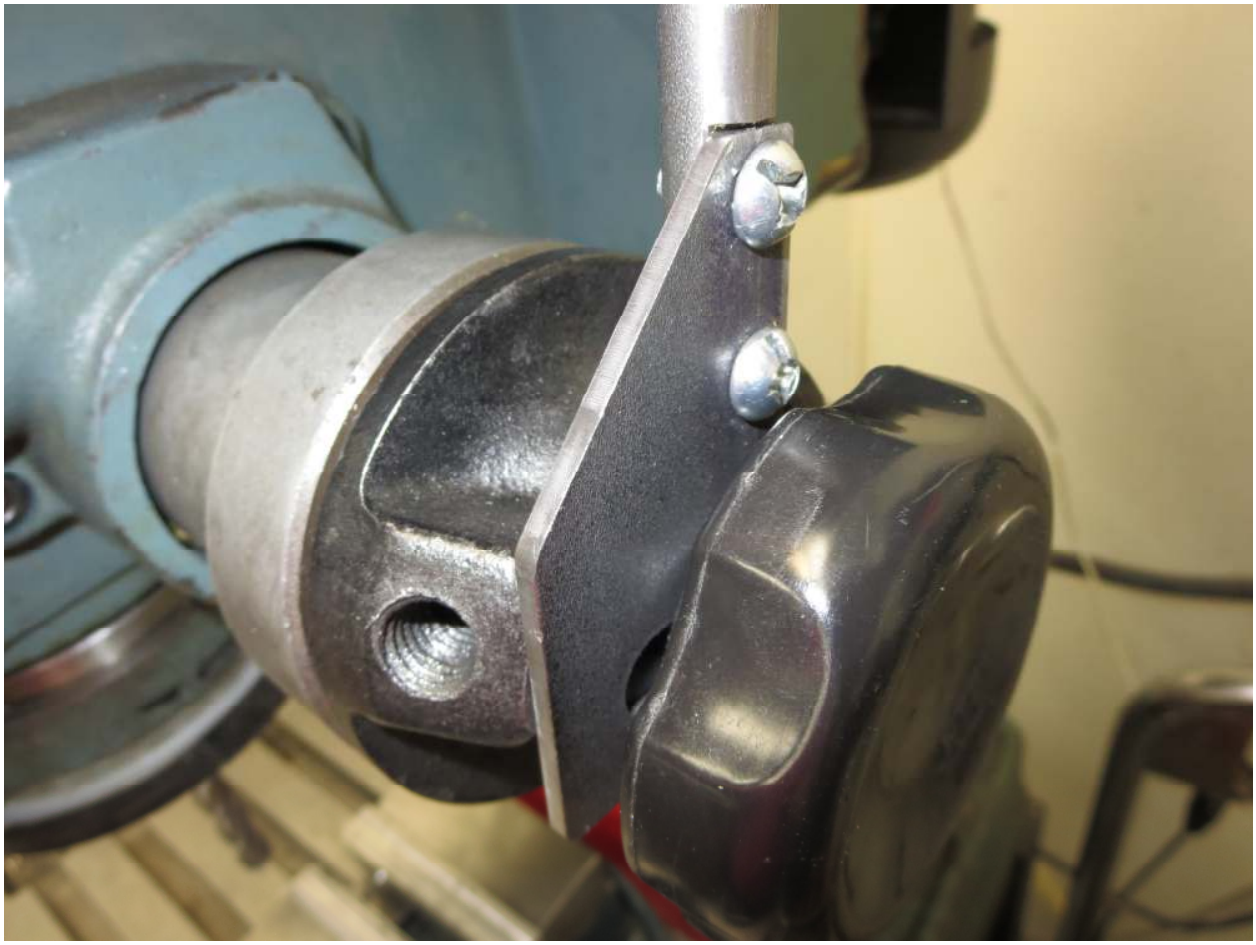
The mill/drill is modified by adding a small washer between the knob and hub.



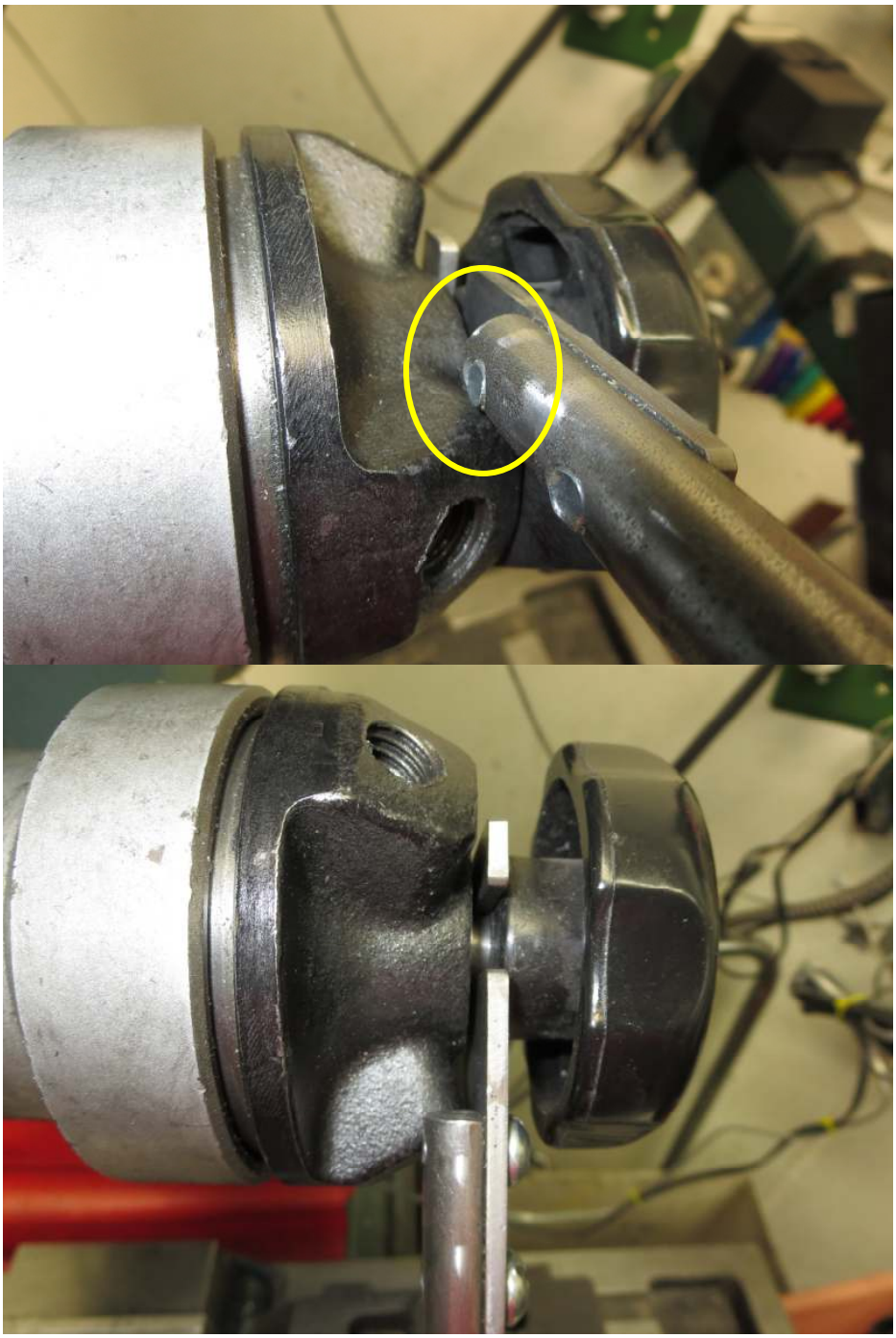
The handle assembly hooks around this washer.



Here you can see the washer installed between knob and hub. This has no effect on engaging the fine feed.

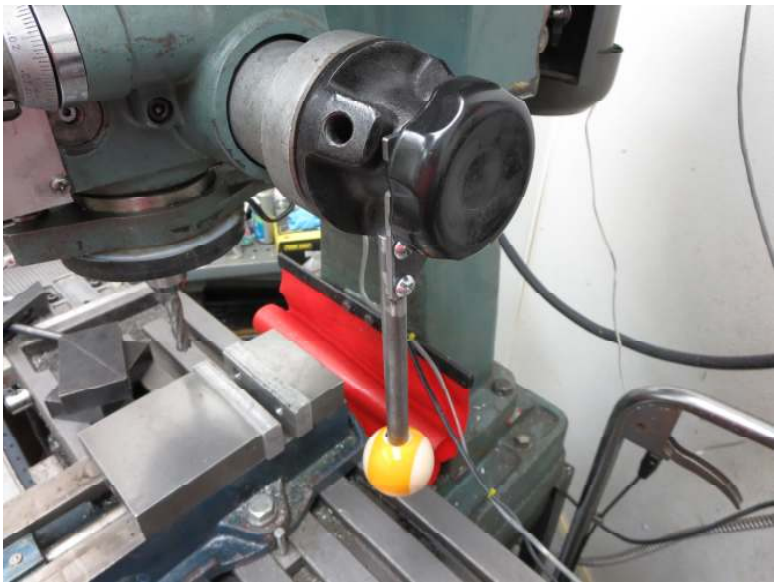


The handle slides between the knob and the hub with plenty of clearance.

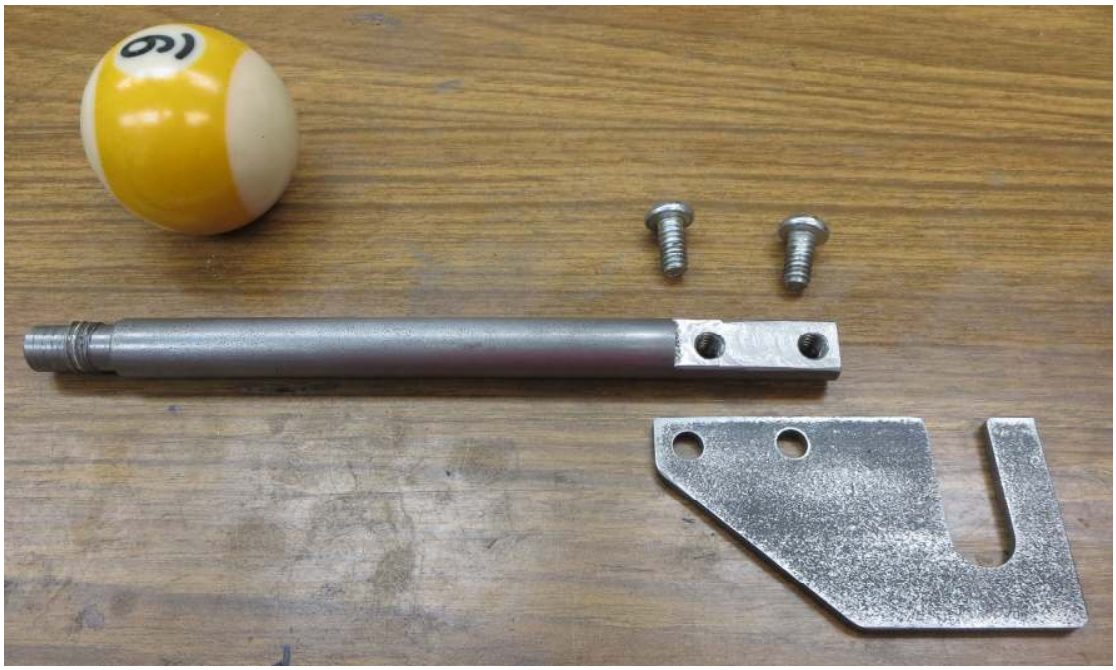


As the user pulls down on the knob, the end of the bar contacts a threaded bosses. Further pulling causes the hub to rotate as if the user was using a threaded in handle.

The Speed Handle can be installed in any of the 3 positions.

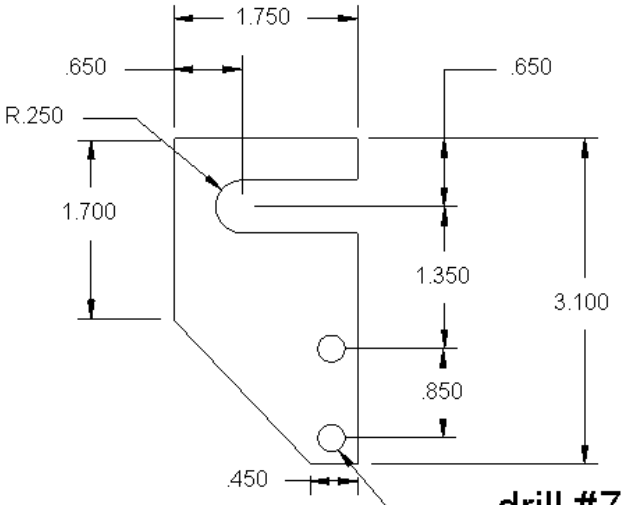


Construction



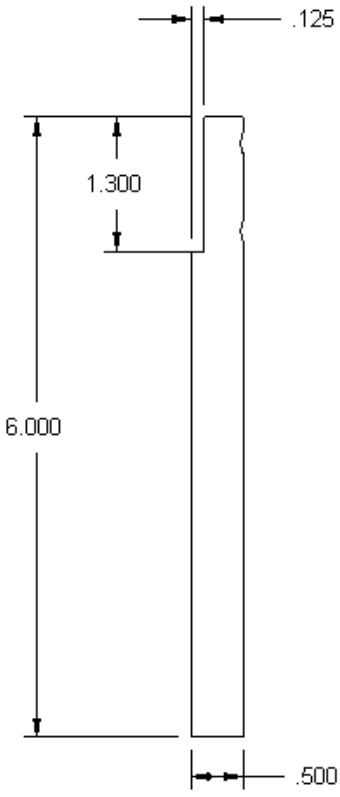
The handle is made from three machined pieces. The plate is 1/8" thick steel. The bar is ½" diameter steel, and the grip is a toy billiard ball.

Before you start to cut metal, I suggest you make a model of the plate out of thin scrap sheet metal or cardboard and verify the dimensions work on your machine.

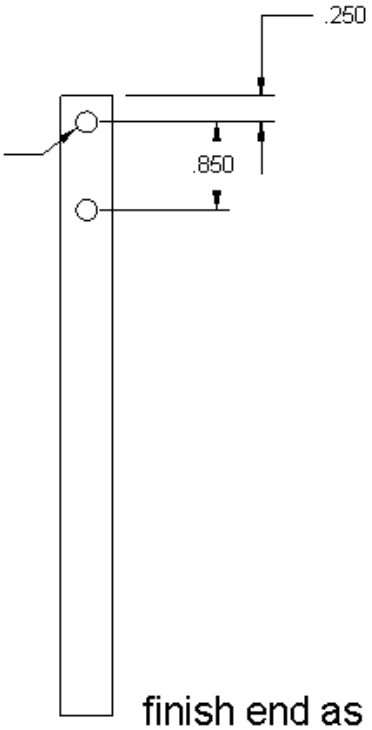


Quantity: 1
material: 1/8" thick steel plate

drill #7 (2) places
and then use these
holes to match drill into bar.
Open out with F drill

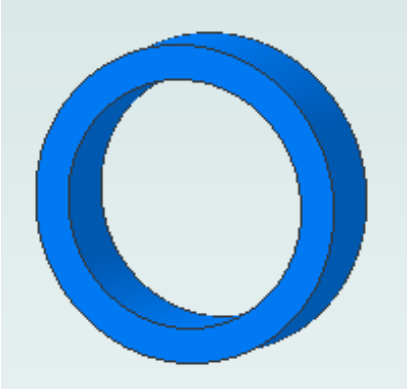


#7 match drill
to plate
(2) places
and then tap
1/4-20



Quantity: 1
material: steel

finish end as desired



The washer has an outside diameter of 0.48" and an inside diameter of 3/8". The thickness is set so the gap between knob and hub is 0.13". My hub has a .005" recess so my washer was cut 0.135" thick. You want a free sliding fit. Not too sloppy.

Shop Work

Start by making a model of the plate from thin sheet metal or cardboard. Verify the dimensions work for your machine. Inspect the hub for that recess and adjust the thickness of the washer if necessary.

Lay out the 1/8" thick steel plate and mark the location of the two holes with a punch. Rough saw the outline of the plate and then mill it true. By using a ½" diameter end mill, you can just cut the slot up to layout lines and not measure anything precisely. Deburr the edges. Drill the two holes with a #7 drill and put the plate aside.

Mount the rod in the mill vise and mill down 1/8" for 1.3". Deburr.

Clamp the plate to the rod in its final position. Trial fit the assembly on your mill/drill. Using a #7 drill, go through one of the two holes in the plate and drill through the rod. Run an F drill through the hole in the plate. Run a ¼-20 tap through the hole in the rod. Deburr. You can then use a bolt to secure the rod to the plate.

Check alignment of the rod on the plate and tighten the bolt. Again using the #7 drill, go through the second hole in the plate and through the rod. Open out the plate hole with an F drill. Tap the hole in the rod ¼-20. Deburr. Secure with second bolt.

I have not specified how to finish the grip end of the rod. You could leave it unfinished, use a crutch tip, or go with a toy ball. If you want fancy, screw on ball ends are available from places like Enco™.

Acknowledgments

This project was a great example of community design. I started the discussion by posting a rather poor idea on the mill_drill Yahoo group for Z axis feed handles. It was met with suggestions from Mike Kolacz and markknx to remove the handles and just use the fine feed. Then other joined in to say that was how they solved the problem.

Next, markknx suggested a way to reduce the number of turns needed to secure each handle. I made one of these adapters and it worked well. But then "CS MO" and Jim (mrjschmidt) independently suggested modifying a Bridgeport™ Speed Handle.

Along the way, rogers92026 suggested using neodymium magnets to secure the arm. Great idea but overtaken by a simpler approach.

CS Mo looked at the design and suggested a means of locking the bar in any of the 3 positions with a push button. Then I figured out why the assembly was a tight fit and the problem was solved.

As you can see, this was a typical design cycle. Had a few false starts and a bit of wasted effort in the shop. But in the end, "all of us are smarter than anyone of us" so a useful attachment was created.

I welcome your comments and questions.

If you wish to be contacted each time I publish an article, email me with just "Article Alias" in the subject line.

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