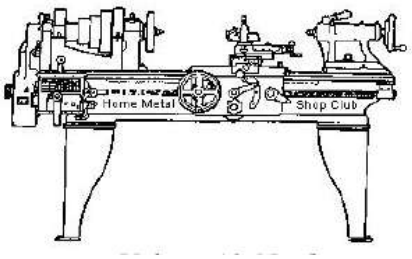
Home Metal Shop Club

March 2007

Newsletter

Volume 13 Number 3



Visit Our Home Page www.homemetalshopclub.org

Statement of Purpose: *Membership is open to all those interested in machining metal and tinkering with machines. The club provides a forum for the exchanging of ideas and information. This includes, to a large degree, education in the art of machine tools and practices. Our web site endeavors to bring into the public domain written information that the hobbyist can understand and use. This makes an organization such as this even more important.* -- Founder - John Korman (deceased)

Next Meeting April 14, 2007

To be announced.

Minutes of the March 10, 2007 Meeting

by Dick Kostelnick

Business Meeting

The business meeting was held at Lyndons BBQ prior to the regular meeting. No business was discussed.

General Meeting

The dog ate my notes this month.

Modifying a Harbor Freight English Wheel
By George Carson

I bought mine at a local store for $250. I think it was a well worthwhile investment.

Those you are familiar with Harbor Freight products realize that there is usually some tweaking involved to get the tool to work as you would like. Sometimes it's a waisted effort, but other times you do end up with a nice piece of equipment at an affordable price. Re-working tools is not an unusual thing to do. Just ask a good cabinet maker how long it took to get his new plane tuned up.

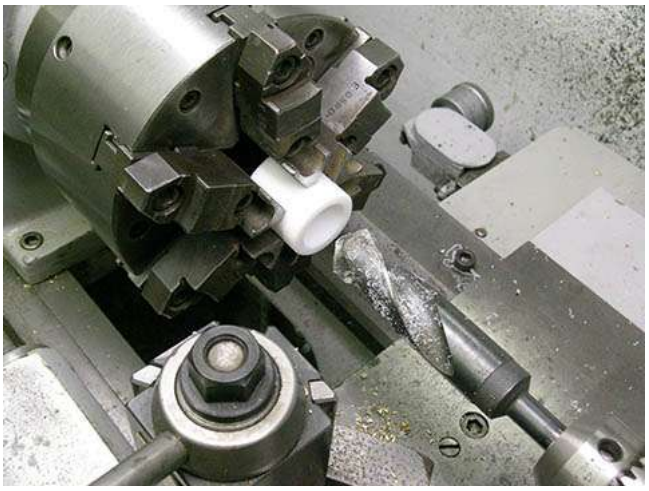
Basically this is a small to mid size English Wheel with a center to frame distance of 27-3/4". It comes with a nice solid stand. The frame and stand are finished with a yellow powder coat, so the finish is pretty rugged. Rust Oleum John Deere Yellow is a very close match, as I found out later. The machine uses full size anvils (wheels). The top wheel is 2" thick and 8" in diameter. It weights about 26 pounds. The bottom anvils are 3" in diameter. It comes with a 2" radius bottom anvil. A set of six bottom anvils can be purchased for only $80. Harbor Freight also sells the top anvil for $40. So If you wanted to build your own E-Wheel, the anvils from HF might make a good starting point.

The first thing I noticed was the tube that supported the lower anvil holder, was a very poor fit. The tube is turned to size and fits in a holed bored in the bottom of the holder. Two screws hold the tube in place. But on mine, the tube was about 0.020" undersize. This caused the lower anvil holder to rock back and forth, no matter how tight the screws were. This had to be fixed. I cleaned the chrome plated off the turned area of the tube and built the diameter up with a few passes of weld bead. Then I put the tube in the lathe and turned OD of the tube to 1 mill over the ID of the holder. Then I pressed the two together with a little locktight for insurance. Now the holder/tube assembly are solid as a rock.

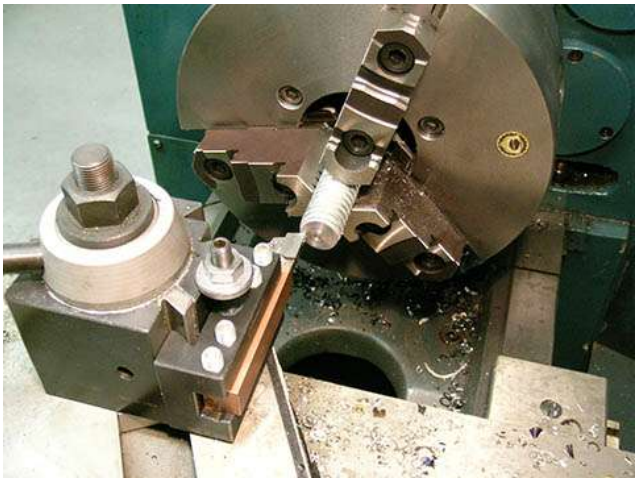
I was curious about the hardness of the rolls. Are they really made from heat treated alloy steel? I measured the hardness on my Rockwell hardness tested and found that both the upper anvil and lower read from 31 to 34 RC. This is what you would expect from pre-hardened 4130. I notice that most of the anvils available for sale are in this range, so I suspect the HF anvils will work just fine.

I also wanted to check the anvils to make sure they ran true. I measured both the upper and lower anvils and found that they had no more than 0.002"TIR of runout. The bearings are type 6004ZZ, which are readily available at Grainger's or local bearing suppliers. So if the bearing ever give trouble, they should be easy to replace.

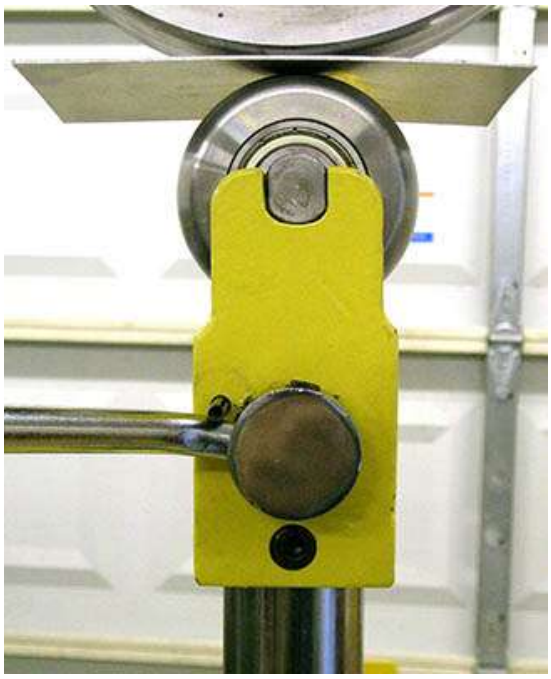
It became obvious that the lower anvil support has some basic design flaws. The quick release was not usable, in fact, in the manual they didn't even call it a quick release. Instead, they said it was used for small adjustments to the anvil distance. It didn't work well for that either. Two simple fixes makes the quick release much more usable.



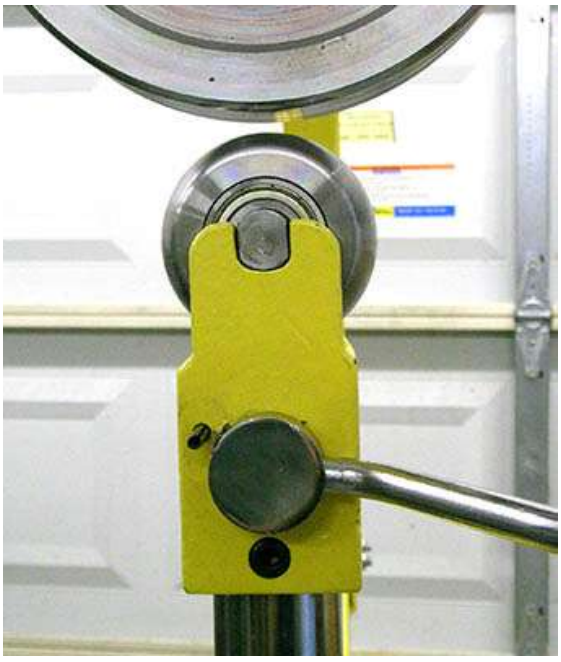
The first problem with the release is that the eccentric operates against the end of the jack screw which was unsupported. Other than the nut, 12" from the end, there is no other support for the screw. I turned a bushing from Teflon and pressed it into the support tube until is was just touching the screws that fasten the anvil holder to the tube. Almost any material could be used for the bushing. I just happened to have a piece of Teflon in the scrap box. Delrin, PCV, bronze, aluminum, even hard wood would do the trick.



The end of the screw that touches the eccentric is unfinished. This uneven surface is a problem. So I faced mine off in a lathe and beveled the edges to help protect the threads. You don't need a lathe, a grinder or belt sander could be used to do the same thing.



The next fix addresses the fact that the lower anvil does not lock in the up position. I solved this by making a stop for the lever. The stop is positioned so that the lever is just over-center on its travel. In other words, I moved the lever until the lower anvil reached its highest position, then went just a hair further. Then I drilled a 3/16" hole and pressed a spring pin in the hole to act as a stop. The phot above shows the lever against the stop. The photo below shows the lever in the release position.



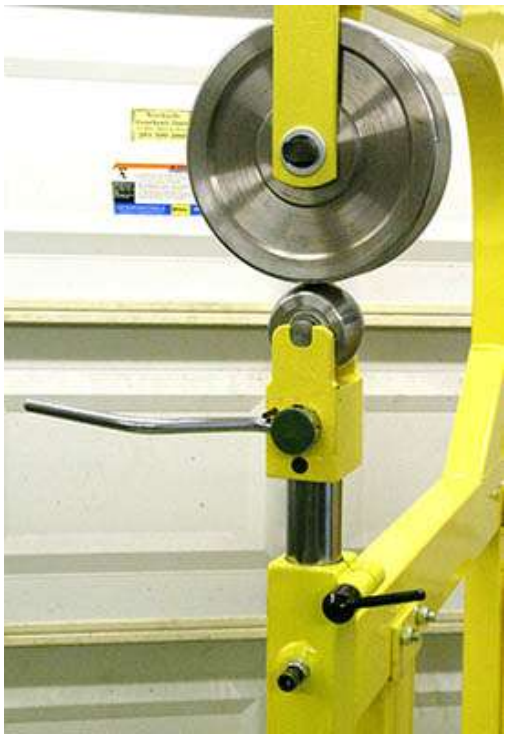
The next fix is more complicated, and probably not necessary. But I wanted a way to lock the position of the lower anvil very solidly.

The photo above show the locking device ready for welding. It was made from a 2-1/2" length of 1" CRS. The rod was drilled through using a 13/32" drill. Then in the mill I flattened one side and cut a shoulder on the back end. This shoulder catches a hex flat or the retaining bolt. This allows me to adjust the position of the bolt so that the tightening handle is in a good position.

This photo shows the device welded in place. A 3-1/2" 3/16 bolt is used. The handle acts like a nut to tighten the device. Note that in this photo, the slit has not yet been sawed through the barrel and lower support.

The photo above shows how the shoulder milled in the bar holds the bolt head and keeps it from turning.

In this photo you can see the slit the was sawed. Tightening the handle securely locks the lower anvil support. Note that I replaced the old locking device with a cap screw and jam nut. The screw had to be machined into a dog point, just as the original had been. The handle used to tighten the lock was powder coated (more HF equipment).



All in all. I think this English Wheel is quite a bargain. Someday I may want to build a larger wheel from scratch. If I do so, I will use the anvils supplied with this machine.

Since I don't need to use my wheel everyday, I wanted a way to move the machine around the shop. Putting casters on the legs didn't seem to be a good idea. The machine is very top heavy, adding casters could only lead to stability problems. Besides, I wanted to be able to secure the machine to the floor if I needed to do larger pieces. Here's what I came up with

I installed simple 4" fixed casters to the front side of the front legs. To move the machine I just grab the top, tilt it forward, and away it goes! To secure machines to the floor I usually use Red Head Drop-In anchors. These are female threaded devices that drop into a hole and locked in place using a punch. They're great because they do not project above the floor when not in use. So you can install them around the shop, and they'll be there when you need them. If you move, just fill them with grout, and they disappear.