

Axle Boxes for the Aspinal Tender – Keith Jones

The Aspinal tender axle boxes should have been bronze castings, but I have made them from a bar of 1 1/2" square cast iron instead (see fig 1)



Fig 1

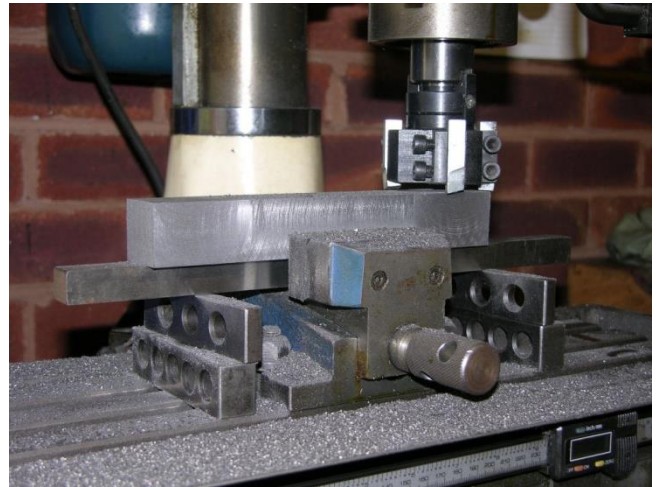


Fig 2

Machining the general shape is straight forward; fig 2 shows lots of swarf and even more dust! These boxes have a shaped pad on the top face which takes the working leaf springs, so these needed to be milled on the rotary table to get the correct shape, fig 3 shows this setup

To work out the point of intersection or where to stop rotating the table and then move the machine table in X or Y mode, I used the CAD (2D Design) system that Mike Brown very kindly gave us. This has been a big help to me with the building of this loco. Fig 4 shows the CAD drawing. If you do not use a computer then these points of intersection can be always be worked out with good old fashion trig. as I had to for many years.



Fig 3

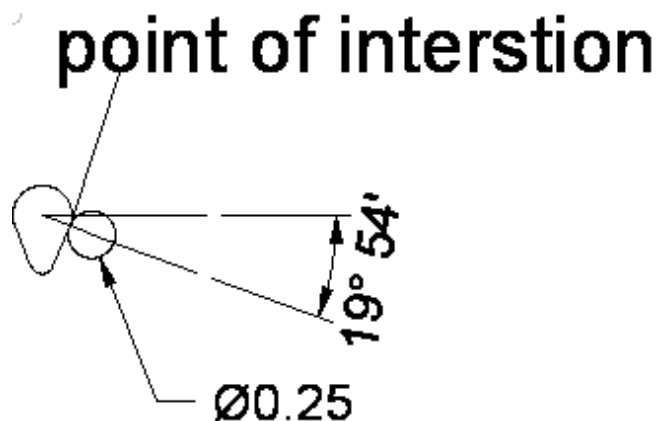


Fig 4

I worked on a Kernley and Trecker 2D Rotary Head milling machine making dies and punches for press tools. I would spend days working out my intersection points before starting a new press tool first with log tables and then with a calculator. The calculator was a big help and did speed the work up. Later came digital

readouts and again this was a very big help as this did away with stick mices(?). Fig 4 shows me using this machine.

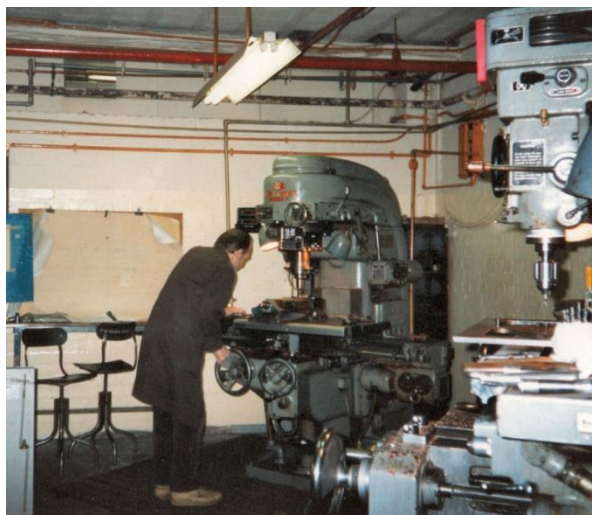


Fig 4

Note the handle above my head, this is the same as on the rotary table; turn this to rotate the head. By offsetting the spindle axis (by the radius plus half the cutter diameter), the tool can track around the diameter of the work. In this case, the head rotates not the work. By moving the table and a top slide (just like a compound slide on a lathe), the work can be moved to different locations so that you can mill radiuses in any position. This top slide can also be used for milling angles just by rotating the head to the angle you need, then winding the top slide. Using the side face of the end mill you can mill the angle, just like using the compound slide on the lathe to machine a taper or angle. Also on this machine, the work table does not hang over the knee or cross slide so there was no droop of the table. This table was just like a saddle on a lathe bed. We also used this machine for all the jig boring in the making of the press tools. This was a long time ago before I got into E D M (wire cutting) and I know I have bored you all with that.

Back to the axle boxes! The next job was to mill the angle on the front face of the box to 12deg. This was done with an adjustable angle vice. The oil pockets where milled at the same time plus two small holes (see fig 5). These are tapped 10BA for the front covers. Figs 6 and 7 show the finished axle box.



Fig 5



Fig 6



Fig 7