A PROBLEM SOLVED?

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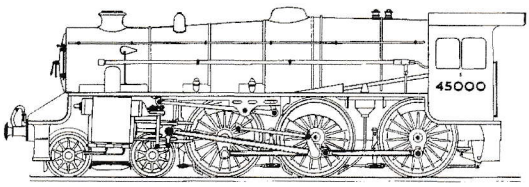
The manufacture of a miniature locomotive seems, at times, to be a long series of problem solving exercises. The words and music never seems to cover the current problem or the magazine covering the particular subject cannot be found when required. I suppose this is one of the reasons our hobby is so enjoyable, the reward when a solution is found can be very satisfying.

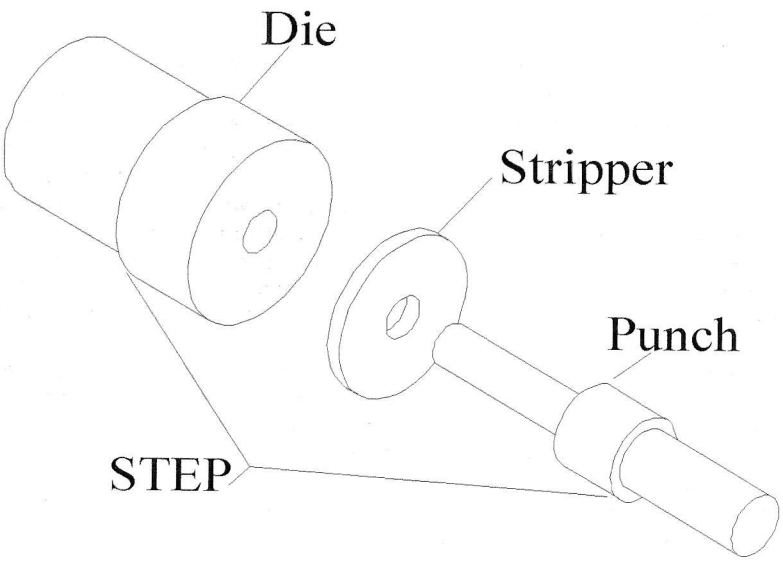
I recently came up against just such a problem building my 3½" Black Five, Doris, and I thought my solution might be of some use to other first time miniature locomotive builders or, who knows, maybe even one or two of the more experienced might find it useful. Having just made the cross shaft and links to operate the drain valves they needed to be screwed into the cylinders with the operating levers in the correct position and tight enough to prevent leaks. As manufactured, when done up tight, the levers, of course, were anywhere but the correct position. What was needed was some shim washers with a 3/16" dia. Hole and just over 1/4" dia. overall. I had some soft copper shim material but how to produce the required washers. Looking at my Myford I realised it could be used as a light press to produce the required shims given the small diameter of the washers and the softness and thinness of the material the lathe should be able to cope.

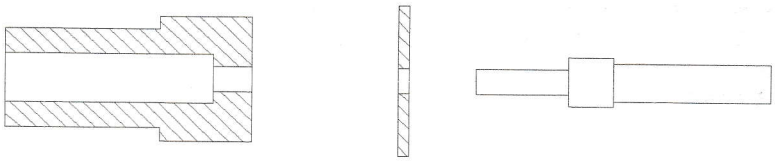
A punch and die were quickly turned up from silver steel to produce the holes [see drawing opposite] the punch being hardened and tempered to dark straw and the die left unhardened. The die is placed in the headstock chuck with the step indicated in drawing up against the chuck jaws and the punch is likewise mounted in the tail stock chuck. With a drop of oil on the punch and a sharp turn of the tailstock wheel I was soon producing holes in both five and fifteen thou material. It will be found advantageous to make the stripper washer shown in the diagram as it both speeds up the process and reduces the likelihood of distorting the soft shim material when removing from the punch.

Flush with success a second punch and die were now made to produce the outside diameter of the washers, the punch having a central pin the same size as the previously punched holes. The central pin could either be turned as an integral part of the punch or produced as a separate pin a light press fit into a hole in the punch, this second option will allow for sharpening the punch as required. The second tooling was quickly set up in the lathe and the required shims produced in short order. On removing the washers from the die, with great care, they will be found to be somewhat dished, this is easily overcome by laying on a flat surface (lathe bed) and rolling with a short length of round bar, say half inch diameter.

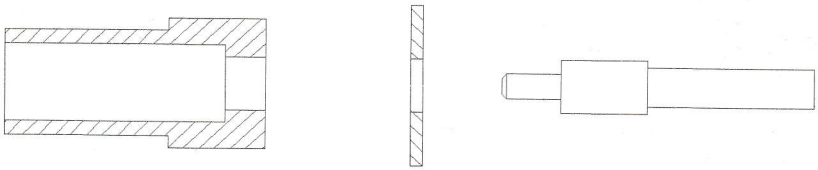
The shims produced have made the positioning of the drain cocks child's play; all I have to do now is work out a way of connecting the drain cocks to the control in the cab. But that's another story.....







TOOLING TO PRODUCE THE HOLES



TOOLING TO PRODUCE THE OUTSIDE