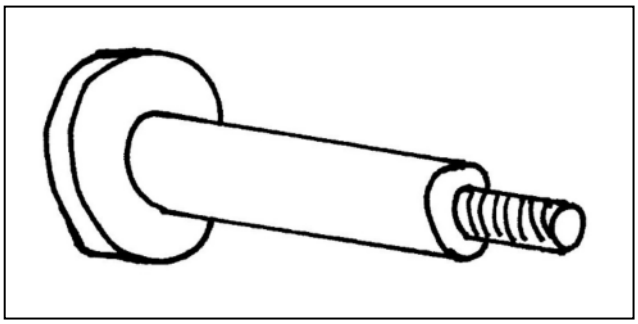
Another little job No 3. Valve motion pins for Princess Marina - Roger Stephen

My Princess Marina has been surprisingly reliable over the years but does fail occasionally. Such was the case at this year's club barbecue when after about three hours running a pin fell out of the joint between the union link (part of the Walschaerts valve motion) and the crosshead. The nut holding it in had come undone allowing the pin to work its way out resulting in no valve movement on the right hand cylinder. Not having a spare to hand – it's a quick job to fit if you have one – it was game over for the day.

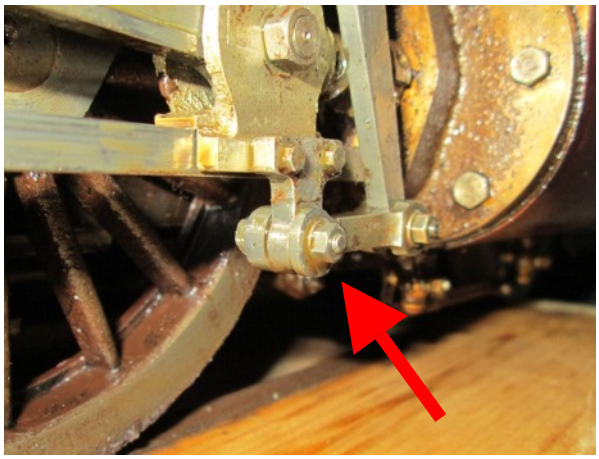
LBSC's instructions for building Princess Marina call for a plain cylindrical pin which is an interference fit in the union link hole, or you can "rivet over slightly if at all slack". I don't think much of that method as it cannot easily be dismantled and could easily work loose. Presumably the builder of my PM thought so too: the pin on my PM had been turned from ¼" silver steel, having a thin ¼" diameter head at one end, a ⅛" diameter body that goes through the union link and the crosshead lug, and an 8BA thread on the other end for a retaining nut and washer. That was OK but it was difficult to hold the pin firmly when tightening the retaining nut – maybe that's why the nut came undone and the pin fell out. The other thing I was not keen on was that the ⅛" diameter bit of the pin needs to be turned accurately to a very smooth finish which I find a bit tricky with silver steel. Is there another way of making a pin?

Of course there is and I think it was club member Bill Langton who gave me the idea. Why not turn a hollow cylinder from ⅛" diameter silver steel slightly longer than the Union link is thick (0.2mm or 8 thou longer in my case) and put a BA screw through it? That is what I decided to do, although I drilled and tapped the cylinder so it would screw onto the 8BA screw. That was a simple turning job retaining the existing accurate polished finish on the silver steel. I then took an 8BA hex head screw, put a washer on it, screwed on the little cylinder and, job done. Fitting was easy too: just push the pin through the joint, put a washer and nut on and tighten with a second spanner on the hex head to stop the pin rotating. The pin was then nice and secure with just a little end float so it does not bind. The photos show the pin I made and the reassembled joint while the sketch shows the original pin. As long as there is clearance for the screw head and the retaining nut this type of pin could be used on any similar joint on a model.



Sketch of the original design of pin turned from ¼"silver steel.

My new pin consisting of a small hollow cylinder of ⅛" silver steel screwed onto an 8BA hex head screw.



The union link joint after fitting the new pin.