Another little job: No 2, A new grate for Princess Marina – Roger Stephen

Whilst doing the piston rod repair on my Princess Marina I remembered that the grate was starting to look a little second-hand. The grate comprises seven 1/8 inch by 5/16 mild steel bars with 3/32 spacers between them, these being held together by two 1/8 inch diameter studs with 5BA nuts on the ends. After more than 90 hours running in my ownership (and some before that?) the centre bar was badly burnt, down to about 1/32 inch thick in the middle and had bowed upwards by about a quarter of an inch, and the ones either side of it were not much better – see photo. Rather surprisingly the 5BA studs and the spacers were still in good condition for reuse, as were the two outermost bars. So, simple job: cut some new bars, bend them, drill them and bolt the grate back together. Or so I thought.

It turns out that 1/8 by 5/16 inch may have been a stock size at one time but not any more. Chronos do 1/4 and 1/2 inch wide but not 5/16, and Ebay didn't come to the rescue. If I had a friend with access to a guillotine I could have got him/her to chop some bits 5/16 wide off a piece of 1/8 plate (which I have got) but I don't have such a friend. In metric, 3mm by 8mm steel would be fine but the nearest metric stock size that is readily available seems to be 3 by 10 mm – which is OK for thickness (the bar spacing could be adjusted by inserting an occasional 5BA washer on the studs) but its 2mm too wide. So I had a look at what odds and ends of steel strip I've got lying around and found a short bit of 1/8 by 3/8 bright drawn mild steel and some stuff 'rescued' from an old filing cabinet that is almost 1/8 by 1/2 inch. That was no better than current stock steel sizes!

Now I could have just settled for deeper grate bars than the original 5/16, which would probably perform OK and save me some work, but I like to do things right. So I finished up putting five bits of my steel strip on the milling machine and chomped away at it until it was down to 5/16 inch wide. Then I bent and drilled each bar, using an original side grate bar as a template, and cut them to length leaving the simple job of bolting it all back together which was fine – see other photo. Job done, but it did take a bit longer than I intended. I wonder what the stock sizes of steel will be when my Princess Marina has done another 90 hours running. With luck I can get 3mm by 8mm – or find a friend with a guillotine.

The original grate was severely burnt and somewhat distorted after more than 90 hours running in my ownership.

The new grate ready for another 100 hours running? Note the gap in the side of the ash-pan where the rear axle passes through!