Federation of Model Engineering Societies

This article is provided by FMES for your interest thanks to the kindness of the original publishers. FMES makes no representations or warranties of any kind, express or implied about the completeness, accuracy or reliability with respect to this document and any sentiments expressed are not necessarily supported by FMES. Any reliance you place on this document is therefore strictly at your own risk

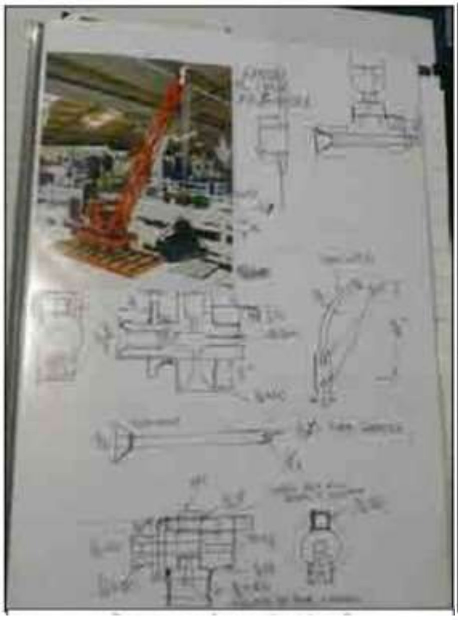
A Booth-Rodley 5 ton crane with a Priestman Mechanical Grab

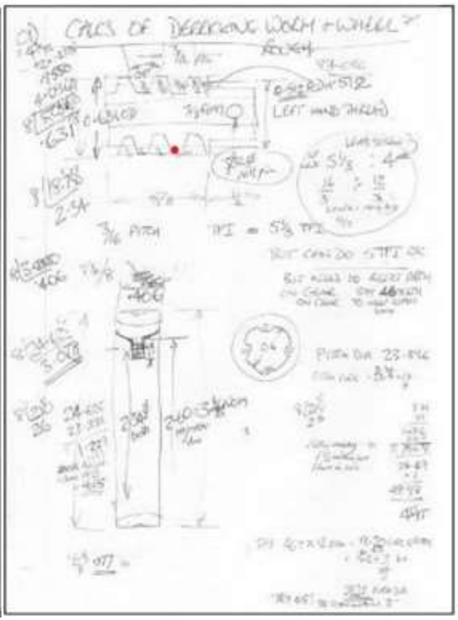
This document was written by the editor and was originally published by the Southern Federation in the June 2017 newsletter.

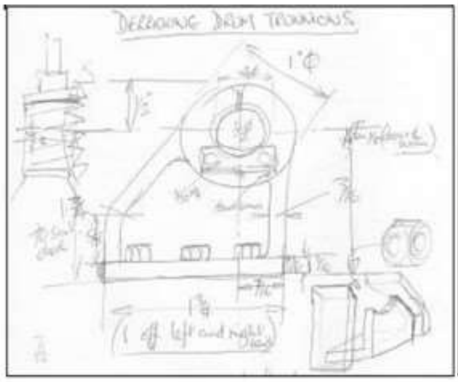
Once in a while one comes across something of rare beauty or superb craftsmanship that has to be shared with a wide audience. Now, not everyone marvels at Beethoven or Genesis and not everyone will be bowled over by a Booth-Rodley 5 tone grab crane but what is worth sharing is Richard Gibbon's work and thoughts in bringing it to life. Richard has kindly let me share some of his work with you.

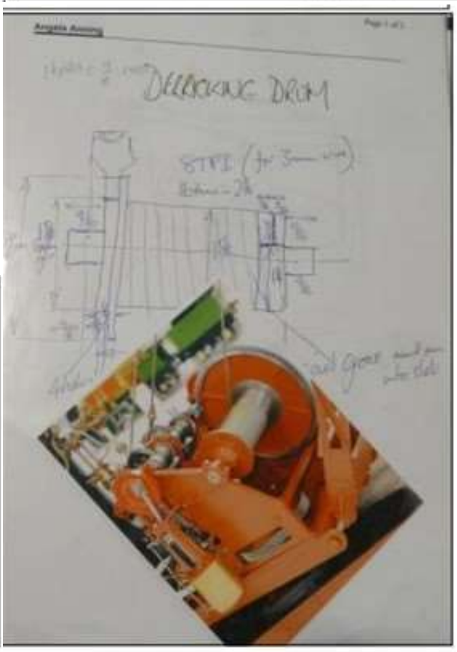
First of all let me introduce Richard Gibbon OBE, BSc, Eng, C Eng, FIMechE. Richard Gibbon is one of the most accomplished and experienced railway and mechanical engineers in the United Kingdom, with a strong focus on heritage equipment. Formerly the Head of Engineering at the National Railway Museum in York, he has been intimately involved in the restoration and operation of a number of important steam and diesel locomotives. He has authored twelve publications and papers and has appeared on many TV programmes as an expert consultant. Amongst the numerous accolades bestowed on him in recognition of his considerable achievements are the Institute of Mechanical Engineers 150th Anniversary Gold Medal (in 1997), the Heritage Railway Association's Plaque for Outstanding Achievement (in 2003), and appointed Honorary Chief Mechanical Engineer to the Friends of the National Railway Museum in 2006. Richard was exhibiting his crane at the Doncaster MEX this year and showing how it worked. But more importantly he showed us how he conceived it in model form and shared his thought process. His words are much better than mine. "Since I was a child, I have been fascinated by mechanical grabs on cranes and the difficulty (or opportunity!) of operating the grab with a single rope crane. I remember sending off my postal order to an advertiser in Meccano Magazine and getting a lovely gold painted bucket grab which claimed to work with any single rope crane (made in Meccano obviously). I can recall my disappointment when I found that the control for opening and closing the bucket was a dangling string that hung from a prop on the bucket! Yet I knew that there were such things as single rope grabs because I had seen them working. The desire to get to the bottom of this had to wait nearly fifty years to be resolved! A lucky chance conversation with Jim Rees when he was at Beamish produced an assembly drawing for a 45 cu.ft. Priestman Grab Bucket, but there were so many dotted lines and hidden surfaces that it still was not clear how it worked. I wondered whether I could guess what all the dotted lines meant and build the model grab for my crane from the drawing, in the hope it would work. You see the result here, and although it didn't quite work first time it very soon revealed its secrets. The resulting mechanism is extremely ingenious and a mechanical design delight. I thought it would be fun to turn it into an interactive toy for the Harrogate Exhibition whilst the grab waited for the rest of the steam crane to be completed.

So come on! Have a go at transferring a bucket load of muck from one container to the adjacent one without a spill! Richard says he wanted to venture into building a model for the first time for which there were no working drawings to purchase. He has not used any castings and the only bought items are the pressure gauge and an injector. He guesses that about 3000 hours have gone into the project over about six years. He also modestly says that fellow model engineers might be quite shocked by the scruffy standard of the sample sketches and calculations that the model has been built from. He adds that this is the way he works through the creative processes so he can envisage the part he is about to make fully in his mind before starting. So, this creative process is revealed!




CALCS OF DERRICKING WORM + WHEEL
LEFT HAND THREAD
PITCH


DERRICKING DRUM TRUNNIONS
1" Φ
(1 off left and right hand)


DERRICKING DRUM
5TPI