

**HALESWORTH & DISTRICT  
MODEL ENGINEERING  
SOCIETY Ltd**



**Newsletter**

**Summer**  
**2023**



## H.D.M.E.S. Management Committee

**Chairman** Philip Hall [cornsland@outlook.com](mailto:cornsland@outlook.com)  
**Vice Chairman**  
**Secretary** Brian Sinfield [briansinfield@sky.com](mailto:briansinfield@sky.com)  
**Treasurer** Gary Edwards [treasurer@hdmes.co.uk](mailto:treasurer@hdmes.co.uk)  
**Member Sec.** Peter Joyce [membership@hdmes.co.uk](mailto:membership@hdmes.co.uk)  
**Events Sec.** Andy Belcher [andybelcher2@gmail.com](mailto:andybelcher2@gmail.com)  
**Newsletter Ed.** Julie Williams [newsletter@hdmes.co.uk](mailto:newsletter@hdmes.co.uk)

**Members** Vic Churchill  
Jon Ford [jaf171160@gmail.com](mailto:jaf171160@gmail.com)  
Clive Randlesome [ckr11962@talktalk.net](mailto:ckr11962@talktalk.net)  
David Whitehead [david@dwonline.co.uk](mailto:david@dwonline.co.uk)

### Non-Committee Posts

**Boiler Inspectors** Vic Churchill  
Kevin Rackham  
Clive Randlesome

**Driver Authoriser** (locos) Vic Churchill

**Guard Authoriser** (locos) Philip Hall

**Health & Safety** Neal Davis [neal@nealdavis.co.uk](mailto:neal@nealdavis.co.uk)

**Web Master** Kevin Rackham [webmaster@hdmes.co.uk](mailto:webmaster@hdmes.co.uk)

\*\*\*\*\*

**Cover Photo** the Editor.

Cover photo, top left, shows Mike Kent being presented with an award by Chairman, Philip Hall. The award was for “The Clubman of the Year” and was presented en bloc to The Thursday Gang in recognition of their consistent work in maintaining the Club buildings and grounds. Mike received the award on behalf of The Thursday Gang, of which he is a member. (If you want to become a member of an award-winning group within the club, then just pop along on a Thursday with your lunch – you will be made very welcome).

Cover photo, bottom right, shows John Child receiving his “Engineer of the Year” award from Chairman, Philip Hall. The award was given in recognition of the skill and workmanship displayed in John’s ongoing project of a 90” Cornish pumping engine. The second part of the model construction by John can be found on page 21. This year’s new membership cards, made by Membership Secretary Peter Joyce, have a picture of John’s engine on the reverse side.

**In Memoria**



It is with great sadness that I have to inform you that our vice chairman, Dick Barker, passed away on March 20<sup>th</sup> after a short illness. Dick and his wife Barb have been members of our society for many years. Dick served on the committee as Vice Chairman and he was also a certified boiler tester for the club. He was a regular member of the Thursday Gang and over the years he was involved in a great many building and maintenance projects that have made our premises what they are today. He was also a member of the Lowmex Exhibition

Committee. Dick and Barb were a great partnership, especially when helping at society and outside events. They regularly attended the Henham steam rally and also enjoyed going to other rallies held elsewhere. Dick was a skilled engineer and he was always willing to offer help and advice to others when asked. His various traction engines and steam lorries, that he owned over the years, were always very much admired by club members and public alike. He was a dedicated member of the society and we will all have good memories of Dick; he will be greatly missed. I have sent a letter of condolence, on your behalf, to Barb and the family.

The past year, for the Society, has been one of great sadness because we have, very sadly, lost four of our long-standing members in the passing of Don Black, Ray Ward, David Dean and Terry Fleet. We shall all have special memories of each of them, and they will be remembered for the many ways in which they all supported and helped the Club over the years.

2022 has seen the Club activities return to a pre-pandemic normal. The most notable event was the welcome return of our own Lowmex Exhibition, which was held in October at the exciting new venue of the East Coast College in Lowestoft. It was even bigger than ever, with a large number of wonderful and varied exhibits covering many aspects of modelling. Congratulations to Kevin and his team on a most successful and enjoyable event. Our annual Father's Day BBQ was replaced with a family picnic and steam up and was well attended and enjoyed by all. We also had two visits arranged. Members were invited to visit Steamworks, at Southwold, to see their new steam locomotive "Blyth" which is a modern new build replica locomotive, identical to the original one that worked on the Southwold Railway in the past. A most interesting evening was enjoyed and hopefully a return visit can be made in the future. The second visit was to the East Anglian Transport Museum at Carlton Colville. The evening included a "behind the scenes" tour of the museum and workshops, some tram, trolley bus and train rides and finally a tour of Lowestoft by night in a vintage London

Transport Routemaster bus. A splendid evening altogether. A further visit has been arranged for September 7th. Please consult the events diary for more details.

I now come to what I feel is the most important part of my report. This is where I must thank, on your behalf, all the people without whom the Society would not be able to function successfully. Firstly, thanks go to Brian Sinfield who, as Secretary, keeps all Club matters carefully in hand. Thanks also to Gary Edwards for ensuring that Club finances are in a healthy condition, and also to Ruth Walton for her work preparing and checking the annual accounts. Thank you to Peter Joyce for your role in keeping the membership list updated regularly. The latest number of members now stands at 115. This relates to 6 honorary, 20 seniors, 70 full, 16 associate and 2 juniors. I feel that this is very encouraging for the Club. The Club programme for this year looks very interesting, so thank you Andy Belcher for your input and ideas as Events Secretary. The Newsletter continues to be an informative, interesting, and vital publication that keeps members up to date and in touch with the Club, thanks to Julie Williams for your hard work. The Club website is also an integral part in getting information to members regarding Society activities. Thanks to Kevin Rackham for keeping this regularly updated.

I am pleased to say that all the committee members are continuing to serve for the coming year, thank you gentlemen. Finally, I must extend grateful thanks to all who regularly turn up and give their time for the Thursday Gang. You only have to look around our site to see the extensive work that has been done during the past year. Particularly of note is the almost finished work on the ground level track embankment. In the past, a large quantity of rubble and hardcore, from previous works at the Club, had been buried in the earth to help support the soil of the embankment. This has all been dug out and transported, to be used elsewhere at no cost to the Club. The retaining wall of concrete sections are now in place and the whole area has been landscaped and finished, with the planting of a fine laurel hedge. When the hedge thickens up it will screen the entrance area from the outside road. The remaining part will be laid with turf and will provide some valuable extra parking. May I invite any of you who have a few hours to spare on a Thursday to come along and enjoy the company of other members of the Thursday Gang and help your Club. Tea and coffee will be provided and you will find it very worthwhile and rewarding.

I am pleased to say that we are now again able to present the Society trophies relating to Model Engineer of the Year and Clubman of the Year. The committee have decided that the awards will be made as follows : - Model Engineer of the Year is presented to John Child for his excellent model of the 90" Cornish pumping engine which is in preservation at Kew Bridge Pumping Station. This was exhibited at Lowmex in October 2022.

Clubman of the year is this year presented not to an individual but to a group of members known collectively as The Thursday Gang, for their hard work and commitment maintaining our site in good order.

Thank you for your continued membership and support for our Society, and I wish you all a very happy and enjoyable club season for 2023.

\*\*\*\*\*

**Secretary's Scribblings**      Brian Sinfield

So much has happened over the past few weeks, that it is difficult to know where to start. I don't want to dwell on it, but I am sure that you will have read the obituary for Dick Barker. I joined the Society in, I think, 2004, and my records indicate that Dick had been a member since at least 1998. There can be no question that he had become a cornerstone of our Society, rarely missed a Thursday Gang meeting, and had served as Vice Chairman for as long as I am aware. He will be sorely missed. The Committee is not intending to appoint a replacement Vice Chairman at the moment, we shall see how things pan out.

The A.G.M. this year was short and sweet, which implies to me that you, the membership, are content with how things are running. If there are ever any matters that give you cause for concern, or you might want to raise with the Committee, never be afraid to get in touch. We are here to support the Society which primarily is you, our members. Moving on even more, once the summer draws to a close, and following on from last year's great success, it will be even more interesting to see – and take part in – LOWMEX this year. I'm sure Kevin will be updating the website – new dates, with a new venue last year which was extremely well received and, with Kevin and his team continuing to beaver away, I am sure it will be another vibrant and exciting exhibition. So do come along and you can be part of the leading exhibition in the east of England. There are handbills and posters available in the Clubhouse.

I am pleased to say that I have managed to spend a few hours in the workshop – the fruits of my labours I intend to enter for LOWMEX – nothing on the loco, I'm afraid, but I have finished some useful tooling. The bit that seems to give me the most worry is preparation for and painting. Like so many jobs, preparation (seems to) take hours, but the application of the topcoat – the last bit – is over in seconds. I mentioned this last year, if you have managed this last bit successfully, why not spread the word around? An article for the Newsletter perhaps, or how about giving a talk at the Club one night; I'm quite sure that Andy would love to hear from you.

Best wishes to you all and keep well.

\*\*\*\*\*

**Our Exhibition is again in the Energy Skills Centre at East Coast College, NR32 2NB.  
Sat 28<sup>th</sup> & Sun 29<sup>th</sup> Oct 2023.**

Kevin Rackham



**An entry form for Club Members is enclosed with this newsletter. To help us, please return the form as soon as you can to me or any other Lowmex committee member, or you can e-mail me the information directly if you prefer. Further forms are available in the clubhouse.**

We would love to see what models you have got or projects that you have progressed with. Unfinished projects are more than welcome and are just as interesting, as visitors can see what it takes to make a model. Let's face it most of us have got at least one unfinished project under the bench. So, bring it along, it may be just the catalyst you need to progress it towards completion.

This is our chance to really showcase what we and the Society get up to. So, if you are in any doubt about entering, please do enter and support your society, you may even enjoy it. The exhibition is on track to be as big as last year; therefore, we need as many volunteers as possible.

**If you have not already volunteered and can spare any time over the weekend, please fill in the form, e-mail me or let one of the committee know, it's our**



**exhibition, and we do need your help. Whether it is stewarding, talking to the public, helping on the entrance etc. you will be more than**

**welcome. The more people we have helping, the easier it is for all of us. You can still just turn up and help, but knowing in advance just helps the planning.**

See the web site for the latest list of exhibitors ([www.lowmex.co.uk](http://www.lowmex.co.uk)).

The canteen will be in the adjacent building, the 6<sup>th</sup> Form College, also we have Sizzlers again and they will be serving hot & cold food and refreshments on Sat. & Sun.

Outside, weather permitting, there will be miniature traction engines and lorries. There will also be a display area for helicopter flying displays. If the weather is bad there is room under cover for all exhibits.

The setting up times will be the same again this year. We will start to set up on Thursday and Friday from 09:00 in the morning. The Exhibitors have been told they can now turn up from 12:00 on Friday.

Set up will be Thursday 26<sup>th</sup> Oct from 09:00 till 17:00, Friday 27<sup>th</sup> 09:00 to 20:00 and Saturday 28<sup>th</sup> Oct from 07:00 till 10:00.

Public opening will be Saturday 28<sup>th</sup> Oct from 10:00 till 17:00 and Sun 29<sup>th</sup> Oct from 10:00 till 16:00.

Dismantling will be Sunday 29<sup>th</sup> Oct from 16:00 till 20:00 and Mon 30<sup>th</sup> Oct from 09:00 till complete.

\*\*\*\*\*

### **Boiler Insurance Reminder**

For those who run steam engines on HDMES insurance, whether at Reydon or visiting other clubs, please remember that only current members are covered by club insurance.

If you let your membership lapse then you will have to arrange alternative insurance.

**Without current membership your cover by club insurance lapses.**

Now that the deadline for membership renewal has passed, there is an administrative surcharge of £10, as well as the club subscription, to renew your membership - if you have not already done so. For those who have not – your club insurance is invalid.

\*\*\*\*\*

### **IMES Visit**



The Sunday of the Coronation weekend saw the annual visit from IMES. The weather was kind, the lunch was

delicious (a big thank you to Mary and Marion for all their hard work), the rides were plentiful and the talk was of engines of all kinds. It was almost a challenge to know who belonged to which society! The photo (page 7) was taken before anyone else left at the end of the afternoon – there are a lot of camera-shy modellers out there.

**Sylvi**            Maurice Constantine    IMES

This is loosely based on a Don Young's rail motor. They were built with carriages attached and they had them all over the place until they fell out of favour. Then they took the carriages off and made it into a shunter, but they put on an extra wheel so it was never like this, there were six wheels instead of these four. It is a 5", 0-4-0 tank engine. The baked bean tin on the chimney creates a vortex and stops smoke getting out – I think James Dyson copied my idea(!)



I started off building two engines at a time, thinking that I could sort out any problems just once. That didn't work, so I built a black one, Mahaja, a blend of our grandchildren's names, (details in the 40<sup>th</sup> Anniversary Newsletter, 2017, p.13) and ran that. This one is Sylvi, named after The Boss, so I made it a bit prettier, I put a brass dome on and painted it red, she loves red. I bought the wheel castings but everything else I made from scratch, making my own patterns. I made the boiler from 10-gauge copper so it's like a tank, the whole thing is very sturdy. I fitted an odd steam brake and designed opening windows in the cab, useful when it gets hot, and I have crammed an injector and steam whistles under the footplate, (photo above) that took a bit of doing!

**Maid Marian**            Tom Rose            IMES

This is a 5" gauge Maid of Kent designed by LSBC (Lillian "Curly" Lawrence). It's been running about six years now, but it took me 23 years to build it. My wife bought me the plans for it, she bought me the lathe, and at one point she ordered me into my workshop to get on and finish it – because she likes to drive it! A lot of the guys in the





club drive it, and I love seeing that. (The photo, bottom of page 8, shows Tom driving, with Mary Edwards having coffee in the catering section)

It is a 4-4-0 with a tender and I bought the castings and made everything else from scratch, including the boiler, that took a year or so to make. I made the boiler so that it is actually higher than the design pressure because I had some thicker copper to make it out of, so it was redesigned for 90psi instead of 80psi.

It should be green, the Southern L1 is green, and the other members of the club have green ones, but I come from the Cotswolds, which is Midland Region, so I wanted a red one. It is made to look a bit like the Midland Compound, but without the middle cylinder. I got bored with doing the twiddly bits, so it's usable - not pretty.

I sprayed it with an airbrush and redesigned it so that the cab running boards and boiler can all be removed without damaging any paintwork – all the screws are underneath. She has pulled eight people, and I thought she would have pulled more, but we didn't have any more people to pull, there were only eight available!

I haven't done the headboard for her yet, but she is called Maid Marian, Marian is my wife's name and, as she is my main sponsor, I thought I would name it after her.

**Jock**          Steve Silcock          IMES



This is a Silver Crest Jinty, a 5" gauge 0-6-0 tank engine (photo, left, with Steve driving). I got it in January and this is how it came straight out of the box; the only thing I've done is to check all the nuts and bolts. The nickname for it is 'Jock' as a lot of the (full size) engines were made in Scotland, so the LMS drivers called them 'Jocks'. This is its third run. I ran it for the first time at the end of March and this is its first time here and its third run, and I'm interested in seeing how it does, I'm on a learning curve with this one. I've

made no modifications yet, but I will be putting softer springs on it, just to soften it up, as the suspension is too hard.

**Margaret**          Colin French          IMES This is a Ride On Railway, it's a loco for old men! It comes to bits ever so easy and nothing weighs heavier than 12Kg. It did have lights on it, but I dropped it last year and they haven't worked since; but everything else has worked! I have been running her for about five years now and she runs on two leisure batteries. A car battery has a sort of quick discharge but the leisure batteries, the sort

they use in caravans, have a slower discharge. I've been running round here several times and it hasn't touched the battery yet. (Photo, below, shows Margaret and Colin going round the club ground track).

I built part of it, but I bought most of it ready to run because it was just as cheap as getting it in parts. It is a 5" Bo-Bo diesel called Margaret, my wife's middle name, and it's got two axles at the front and two axles at the back, and they've got connecting rods. Basically, it's a model of a narrow-gauge continental tram engine. It has a handheld controller which plugs into the engine, and it has a dead man's handle so, if you let go of it, or drop it, it will automatically stop.



I made a Maxitrak steam engine before and ran it on the line we have at home, but I was really a bit too big for that. There is a public footpath the other side of the hedge and I nearly always emptied the fire coming up and the sparks would go over the hedge; the insurance company didn't like that! If you took it out it became a lot of hassle – so I made a Maxitrak battery loco after that, we like the battery loco's.

**Sherwood Forester**      Dean King      IMES



I've been a member of the Ipswich club for about five years now and this is the first time I have bought a model. I have got small gauge, 45mm, and I wanted something bigger. I did want steam, but couldn't afford steam, and I saw this being advertised and bought it. I got it on Friday so I have only had it for two days and this is only the second time I have run it.

It is a 'Peak' 45 (British Rail Class 45 or Sulzer Type 4, D100 with a short snout, the 47's had the long snout) and was scratch built eight years ago by the man from Chesterfield who I bought it from. It is driven by two batteries, not car batteries, and I drove it yesterday on his garden railway, running for about an hour and a half, and it is running here on the same original charge. I want to buy a new sound card for it, the sound is pathetic.

I did want a steam model so I'll keep this for a couple of years and then maybe trade it up, I'll see what happens.



### What is it?

Gary Edwards

It is a shipwright's tool, used for measuring up to two angles at a time, so that the angle of the wood that was being cut to fit in, was accurate. The tool is a foot long and the arms



fold into it, so that it can be slipped into the rule pocket on the side of the overalls' trouser leg. This tool belonged to one of my grandfathers; both of my grandfathers were shipwrights, and they would use it at work during the 1920's and 1930's.



The shipwright would place the tool flush onto 'the job' and adjust the metal arm to measure the required angle. The arm stayed in place and became a template for that angle, either acute or obtuse. If two angles were needed, the arm at the other end was used as well – so two angles could be measured at the same time. The tool was then placed onto the plank or piece of wood that was being cut, the angles could be marked and then the wood could be accurately cut.

Through use, the arms would slacken off and not hold the angle, so the shipwright would give the end rivet a tap, to squeeze it together a little, to make them stiff again.

### Traction engine on test Ian and Daniel Snowden

Daniel - This is a 4-inch Garrett traction engine, here for a steam test. I bought it about ten years ago from a Club member. Since we've had it, we've had to put a new piston ring on it, a new plug and, unfortunately, the crosshead broke at an event, so we had to replace that; but apart from that, that's it. We try to take it to Strumpshaw, Henham, Stonham Barns and we will be taking it to the Long Shop Museum at Leiston as well. We also do the local events; we steam at Dennington village fete and we have done Framlingham Gala Fest as well, so it gets a good workout during the season. We also steam it in the garden and my six-year-old son steers it, he hasn't really driven it yet but he steers it. He enjoys steering it and sitting on it – just not so enthusiastic about cleaning it!



Ian – We have also been members of the Norfolk and Suffolk Steam Engine Club for some years now and have helped to renovate the 1910 'Woodton Lady'. She is a full-sized Marshall traction engine, one of only two Marshall traction engines of its class, which is a regular at Strumpshaw.

## On test

### Maxitrak 'Opal'

Oliver Densham

I help look after two small 7¼" gauge steam locomotives for the Southwold Railway Trust, which we use for hauling passenger trains on our little 7¼" gauge line – known as the 'Blyth Valley Light Railway' - on our open days at Steamworks. This loco, an 0-4-2 Maxitrak 'Opal' is one of them, the other, 'Rosie', being an 0-4-0 and a 'narrow gauge' interpretation of a Ken Swann 'Jessie' - but more of that, perhaps, another time. These two share their duties with another Maxitrak loco', a battery electric 'Planet'.

We've owned the Opal for a few years now and, by and large, it's been quite a handy little loco', although slightly undersized for our needs. We generally pull four passengers at a time - plus driver, plus guard - and although our loop is quite short, we



have both gradients and tight curves, which mean that sometimes it's a bit of a challenge. Really, both our locomotives belong at the larger end of the hobbyist scale of models, rather than being designed for commercial use, so they tend to get worked hard although, by and large, they hold up well.

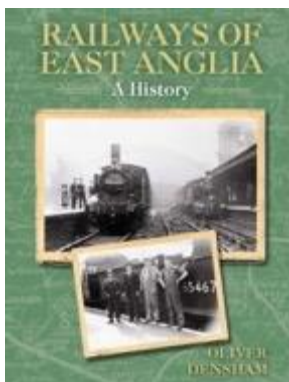
It's a kit-built loco, albeit not built by us as we purchased it secondhand, but it was assembled to a high standard by its previous owner. Being designed for ease of both production and assembly does, however, lead to some shortcomings; as an example, the valves are located on their stainless-steel spindles by shaft collars and grub screws, rather than the more conventional buckle or threaded block, which gives rise to a tendency to slip the timing when working with a heavy load. Drilling a couple of locating divots in the valve spindles has mitigated this problem to a considerable degree - re-setting the timing on a small loco when in steam is not an enviable pastime and leads to many colourful words and a brace of burnt fingertips!

The valve gear itself is something of a novelty - it uses Marshall gear, which is essentially similar to Hackworth in form and function, but uses a swing link in place of the die block, the fulcrum of which can be moved relative to the gear by an arm on the weighshaft. Like Hackworth, it has the inherent disadvantage that movement of the sprung axle alters the valve timing, although Orenstein & Koppel patented a version of this gear that carried the weighshaft in hornblocks which followed the movement of the axle, obviating this problem. Marshalls seemed to have had a thing about odd valve gears - they patented another one for road engines that used a cylindrical die-block and a bell crank to provide the 90-degree phase shift - but it's simple to make and maintain, which is presumably why Maxitrak used it.

The 'Opal' is a compact side tank loco' - there is a saddle tank equivalent, the 'Pearl' which is mechanically identical but equipped to resemble a Kerr Stuart 'Wren' type locomotive. I suspect the 'Wren' design came first, as on the latter the clacks, which are just ahead of the throat plate on each side of the boiler, are nicely accessible. On this engine, they are hidden behind a dummy section of the side tanks, which makes them almost impossible to get to without taking the tanks off. If one sticks whilst in steam you have something of a problem - see my comments above about adjusting the valves.

As for the other engine, that's currently in pieces all over the bench - she's coming up for her hydraulic soon as well, once we've put everything back together. Overall, keeping the two of them running under such heavy use has proven something of a challenge, but between the two of them they've handled the bulk of our trains for something like five years or so now - no mean feat for such little locomotives!

**Railways of East Anglia - A History** Oliver Densham ISBN 9780719840333 RRP £20



This new title by Oliver Densham, published by Crowood Press in June of 2022, summarizes the convoluted history of East Anglian railways in a 192-page volume, accompanied by over 140 images, including archive photographs and new illustrations by the Author.

Beginning with the earliest horse tramways in Essex and continuing up to the present day, it covers the tribulations of the pioneer companies and the process of consolidation and rationalization to which the railways were subject. It also covers some of the more obscure and entertaining byways of local railway history and attempts to make the whole narrative both informative and engaging, in a way that should appeal to the enthusiast and the casual reader alike.

This loco was bought new from Hattons in London in 1966 for the Earl Soham Light Railway and has been there ever since. (An article on Black Knight on test can be found in the Autumn Newsletter 2022). The boiler certificate for this loco doesn't run out until July, but we decided to bring it forward because otherwise we end up having the boiler test in the middle of the running year, and that is a bit of a nuisance.

Kevin's records showed that it was due for an hydraulic test this year as well, it was the four year point, so we were going to do both. We did the hydraulic test first and Kevin did a visual check on it and was a little unhappy about the boiler drain down fitting; it was showing a lot of corrosion. He asked if we could take it out so that he could inspect the threads, as he was suspicious that it was suffering from de-zincification. (Brass has a certain amount of zinc because it is an alloy, copper, zinc, and tin. The zinc over time, particularly with the application of the hot and cold water on a boiler, starts to deteriorate and corrode and you get wasting of the material).

So, we did something rather unconventional – we pulled the loco out and rolled it over, turned it upside down. We were then able to take apart this lower fitting and, true to form, Kevin was absolutely right, the threads were very, very thin because of de-zincification. It also looked as though it had been modified at some point, and not very well. So, all in all, it was a mess.



Kevin wasn't happy with it and, as I'm the Health and Safety Officer of the Club, I'm not going to argue with the boiler inspector!

We decided that I would take it back home, remake the lower boiler, wash out fitting, and re-tap the threads the next size up before bringing it back for a retest. The last thing you want is one of these fittings failing under full steam pressure, because they are very dangerous.

## Little Nell

Neal Davis

Little Nell was purchased from an auction in Bury St Edmunds, again around 1966, for the Earl Soham Light Railway, so she is around 60 years old as well. Unusually for this gauge of locomotive she has a steel boiler, and she has had three of them, she is on her third. Steel boilers do deteriorate more quickly than copper boilers, depending on how they are made, but they do have their advantages because a steel boiler is cheaper than a copper boiler to build.

Copper boilers just go on until they don't, until they deteriorate or something major fails on them, and copper boilers can be repaired. You are not allowed to weld steel boilers yourself; they have to be sent away to a boiler manufacturer and be welded by a coded welder if you need them repaired. Generally, though, it's considered that once a steel boiler has failed in some sort of bad way, it's scrap – you should get a new one. What tends to happen is that you get rust wastage around the base of the firebox, where the water hangs; and if they have a barrel seam, the seams tend to waste.

The steel boiler must be hydraulically tested every two years, as distinct from a copper boiler which must be done every four years. Little Nell's boiler was hydraulically tested last year, so it only needed to have a steam test this time.

The general psi standard for 7¼" loco's is around 80lbs psi on the boiler, whereas these two are both 90lbs psi on the boiler, that's what they are certificated for, so you have that extra 10 psi which makes a huge difference in power.



She is a lovely locomotive: a near scale model of a Hunslet quarry locomotive, an 0-4-0 with a four-wheel ride in tender, which is not scale, that was built to make it practical to drive. It is a narrow gauge and probably represents a two-foot gauge locomotive in real time; which means that it is around twice the size on the track as a scale 7¼" model would be. It also means that it runs comfortably on the ground

level track. She's a fun loco to drive and it's nice that such a loco of such an age is still working and running really nicely; and it's very powerful, we've got two double ride-in trucks and it will pull ten passengers and the driver easily, it could pull twenty!

## Making a new bevel gear for milling machine

Andy Lockwood

Firstly, can I thank all the individuals who freely gave advice on helping me complete this project.

I bought my existing Boxford VM30 milling machine around 1988/90 and it has served me well for over 30 years, but it was time for a change and is now up for sale.

Having recently taken on another project of a 4" Burrell traction engine, I decided I needed a more versatile milling machine. One that had a larger table, ideally a tiltable table and also, if possible, a drilling/milling head facility, so I could machine the Burrell cylinder casting myself.



I was, therefore, looking out for a new milling machine. Fortunately, after a few months, I located a Schaublin 13 for sale on the outskirts of Norwich, which had a fixed table, as well as the benefit of a universal tilting table, a dividing head, and many accessories; when I saw it, I bought it and duly got it home. Photo 1, left.

The Schaublin was complete and working and had its original tilting head, plus the bonus of a Centec 2B milling and drilling head, which could potentially be adapted to fit the Schaublin mill.

An attempt had already been made to machine an adaptor plate for fitting to the Schaublin. This was a project waiting to be completed! The Centec head, on internal inspection, was missing the main drive gear (mill to head), as well as having 6 damaged teeth to the phosphor bronze spindle drive collar and bevel gear. Photo 2, right.



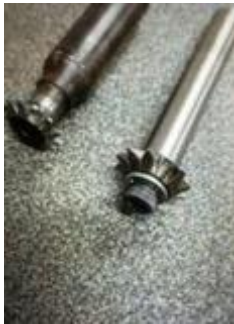
After Google searches and discussion with other club members I had a potential way forward for the repair. I then purchased "The Green Bible" (Machinery Handbook 16th edition) and, after a few hours of reading, I was calculating what module cutters I needed to achieve the finished results.

In order to make a bevel gear the cutting process requires the initial central pass of the cutter, and then the gear has to be rotated, or offset, by "x" thou, or a proportion of a degree, so that a portion of the cut tooth is now further shaped so that the tooth profile is narrow at its centre point and widest at the outer diameter.



As 32 teeth were required, that meant a total of 96 cutting passes! Not a 5-minute job.

The “x” thou of offset was calculated but I finally set this by trial and error. I found the calculated figures of offset too large.



After various discussions with the crew of the “Thursday Gang,” I decided the best way forward was to experiment by making my own gear cutter, and then test trial cutting a gear in aluminium, rather than the phosphor bronze that would finally be required. Photo 3, left.

Initially I machined, on the lathe, a complete cutter, made out of silver steel, to provide the cutter profile shape. I then milled 12 teeth, using the new milling machine and original head. The cutter was heated to cherry red, quenched in oil and tempered.

This produced some reasonable results, but I was unable to maintain a sharp cutting edge. The selected steel was obviously not the correct grade of steel!

This time, I made a new mandrel to hold the replaceable cutter rings. I then made, out of tool steel, a total of two cutters which were made like the clock maker Thornton cutters. Being tool steel, I heated these to cherry red and quickly dunked then in oil and then tempered them. This finally produced an acceptable cutter. Photo 4, right.



I decided that it was too risky to jump in and try repairing the original phosphor bronze gear wheel without first trying to cut a new wheel in aluminium. If it worked in aluminium then I knew I could make a complete bevelled gear with internal splined collet out of phosphor bronze. I bought a slug of phosphor bronze sufficient to make the whole unit in one, as well as sufficient material to machine out two doughnut rings.

The first aluminium blank was turned to the full profile of the existing phosphor bronze drive collar. I then set about cutting the 32 teeth bevel gear, using the new tool steel cutter that I had made. The aluminium blank was mounted in the dividing head on the new mill. The resultant gear teeth were good, but the backlash was too much! so I machined the gear tooth off ....and press fitted another blank aluminium doughnut ring on the end and cut another gear wheel. Photo 5, above.



On assembling the head, the clearance was too tight so back for a third attempt.

Finally, the offset was correct, and I knew I could make what I needed.

I now had three choices: -

- 1.. Try and repair the existing bronze gear teeth by brazing a minimum of 6 teeth and recutting and shaping the teeth.
2. Machine off the bronze gear teeth completely and silver solder on a new doughnut ring of phosphor bronze and cut the new teeth.
3. Make a completely new drive collar with internal splines and a 32-tooth bevel gear wheel.

I started with option 1.

I did try brazing in a segment to replace the 6 teeth which were then recut, but it was not overly successful, especially when you realise it's going to be running at 2000rpm.

Option 2.

Well, the photos 6, 7, 8, and 9 below, show the stages, machined phosphor bronze collar ready to take the new pb doughnut ring.



Photo 6



Photo 7



Photo 8



Photo 9

The next photo, photo 10 which is top left on the next page, is the ring being machined in the first stage of option 3.

Finally, the finished gear collar ready for assembly, shown in photo 11, to the right of photo 10, on the next page,



Photo 10



Photo 11

The head was cleaned, painted, and fitted with new bearings and new oil and has now been used a number of times; so, I now have the benefit of a drilling head as well as the standard original non-drilling head.

I'm very pleased with the results and am enjoying using the new milling machine, photo 12, right.



Photo 12

\*\*\*\*\*

### Class 314

Mike Millward.

HDMES

I got this in memory of someone I knew, who owned a real one. It is a 5" Compass House loco, an early one



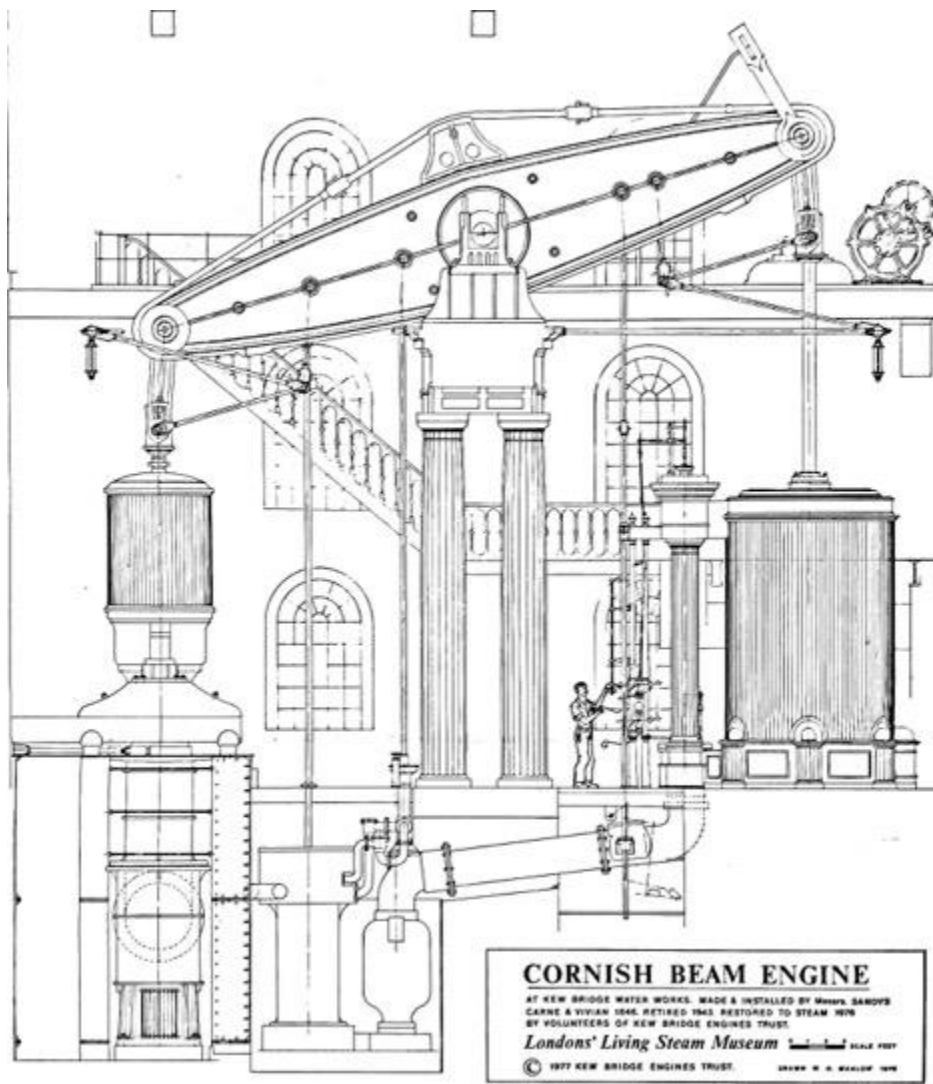
from what I've seen from the bogies, probably about 20 years old, and I bought it at a T.W. Gaze auction in Diss. It's one of those things that started off as "this seems like a good idea – I'll change this bit and then I'll change that bit – and I could do this" so I might as well have built one from scratch in the first place.

There is a fully detailed cab to go in it with a driver and lighting, the desk all lights up, it has an operating fan and all the lights work apart from the 'dead end' – the end you drive from. Unlike most Compass House loco's it has a set of battery boxes underneath – because there was just a big hole there with nothing under it!

I did build the van totally from scratch. I've been fiddling with the springs on it; it tended to throw itself off the rails in certain places because of the length of the wheelbase, but I think I have it working right now. I've got a proper roof for it so it can be a proper model of a BR CCT (covered carriage truck) van or put the seat on it and use it as a riding van.

## Correction from the last issue.

In part one of John Child's article about the Cornish Waterworks Pump (Spring Newsletter 2023, page 13) this side elevation drawing appeared almost blacked out (no idea why). Below is a larger reproduction of that drawing which was made in 1977 during the restoration of the pump, showing the size and scale of the original pump.



Having decided on the ambitious task of building a scale model of the Ninety Inch Cornish Waterworks Pump preserved at Kew Bridge Pumping Station, the first practical thing I tackled was the beam. The original beam is constructed of two cast-iron flitches, spaced apart, so that the motion-work and connecting rods can be hung between – the prototype beam weighing in at around 28 tons (photo 1, right). The



bracing, seen in the photo, was added after the engine had been modified with a larger pump pole and is therefore not included in the model, which is based on the original, un-modified design of 1846. I made a scale drawing of the beam (the old-fashioned

way, with pen, tracing paper and drawing-board) and made a wooden pattern with the appropriate draft angle and shrinkage allowance (photo 2, left).



After receiving a pair of disappointing castings from a local commercial foundry, I visited L. C. Jay of Oak Street, Norwich (now ceased trading). They seemed altogether more attuned to my needs and produced two good quality, grey-iron castings from my pattern. These were fettled and given a coat of grey primer but remained virtually untouched for the next quarter of a century, along with model engineering in general, which had given way to work and family commitments, plus the demands of other hobbies & interests. Eventually my thoughts returned to model engineering and, to cut a long story short, I now have a heated indoor workshop. This key aspect of my life enabled some more progress with the beam assembly at last, and the six spacers and gudgeon pins were turned.



The middle part of the gudgeon pins on the prototype are octagonal and fit loosely through octagonal holes in the beam flitches, held in place by wedges. For the model I decided that round holes in the beam castings would be more sensible, with octagonal washers fitted to the outside of the centre gudgeon for the sake of appearance (photo 3, bottom previous page, shows the part-assembled beam). The smaller pins carry the motion-work and steady for the 'catch wing' – a device designed to arrest the movement of the engine in the event of an over-stroke.



Manufacturing the catch-wing arms was an interesting exercise which took a bit of head-scratching; but in the end was quite an easy process on the rotary table, plus a bit of hand-filing on the slots (photo 4, above, left). The 'wing' itself was a straightforward milling job, followed by hand-filing of the radiused ends and centre profile. The wing is secured to the arms with small wedges and supported in the correct position by two rods that attach to one of the small gudgeons with a jib and cotter arrangement. The rods were a simple turning job and

although the jib and cotter arrangement, with its split 'bearing' was quite fiddly in this scale, it did not present too many headaches (photo 5, above right). The final thing to make were the profiled 'covers' that fit over the outside ends of the pins. These are mostly decorative in the prototype but act as washers in the model and were again quite a straightforward turning job. Once I had all these bits and pieces, I could



at last assemble the beam (photo 6, above, and photo 7, top of next page).



As the task of completing a model of this complexity is quite daunting, I decided to create a 'Gantt' chart to help convince myself that I have a chance of completing the model before my mortal soul is claimed by the Great Oily-Rag in the sky! The chart lists the various activities so I can estimate the time required for finalising designs, manufacturing components, assembling, testing, and painting. As the project progresses, I am recording the approximate hours spent on each task. The rather staggering result is that, as of November 2022, I have spent around 600 hours on the project, and the total estimated hours are around 2400! There is some encouraging news though as, since I retired from work at the end of 2020, I have managed to spend much more time in the workshop. The challenge now is to keep up the momentum! God willing, I will survive long enough to see it through and if so, I will continue to tell the story – I'm sure there will be plenty more interesting experiences ahead.

\*\*\*\*\*

### For Sale



5" Maid of Kent, full working condition with current boiler certificate,  
£4,200.

Or will exchange for unfinished loco' project.

Contact: Colin – 01986 788403 or mobile 07804 866186

## H.D.M.E.S Events Diary June – Sept. 2023

### June

- Thursday 1<sup>st</sup> Club night.  
Sunday 4<sup>th</sup> Steam up.  
Thursday 15<sup>th</sup> Club night. Talk – Sizewell – Kevin Rackham.  
Sunday 18<sup>th</sup> Fathers' Day/Mid-Summer steam up and picnic.

### July

- Sunday 2<sup>nd</sup> Steam up.  
Thursday 6<sup>th</sup> Club night.  
Sunday 16<sup>th</sup> Steam up.  
Thursday 20<sup>th</sup> Club night - Film night – Gary Edwards.

### August

- Thursday 3<sup>rd</sup> Club night.  
Sunday 6<sup>th</sup> Steam up.  
Thursday 17<sup>th</sup> Club night – Bits and Pieces.  
Sunday 20<sup>th</sup> Steam up.

### September

- Sunday 3<sup>rd</sup> Steam up.  
Thursday 7<sup>th</sup> Club visit to the Transport Museum. Time to be arranged and will be in the next Newsletter and on the website.  
Saturday 16<sup>th</sup> & Sunday 17<sup>th</sup> Henham – Club presence in model tent.  
Thursday 21<sup>st</sup> Club night. Talk – Basics of Flight – Chris Nobbs

**[Check the website – hdmes.co.uk – for updates and changes.](http://hdmes.co.uk)**

Please note that the opinions and views in the articles published in this newsletter are those of the contributors and may not necessarily be those of H&DMES or its members. We reserve the right to edit, or shorten, any material offered for publication in the Newsletter.

Printed by Olympic Print, 217, London Rd. South, Lowestoft, NR33 ODS.

Email: [sales@olympicprint.org.uk](mailto:sales@olympicprint.org.uk)

Tele: 01502 582 487