SOUTHERN FEDERATION
of
MODEL ENGINEERING SOCIETIES

Formed from the Federation established in 1970 by Model Engineers for Model Engineers
A Company Limited by Guarantee in England and Wales No. 9002737
www.sfmes.co.uk

Remember when . . .

Those days will return again, maybe sooner, maybe later, maybe this year, maybe next but they will return again.

But in this issue, we have,

How to improve your gear with Dockstader,
A little Allchin,
An antiquity,
and being chased down the Suez by an 'Evergreen'!

Editor: David Goyder Tel: 023 8042 1201 newslettereditor@sfmes.co.uk

EDITORIAL

We seem to be getting off to a spluttering start this year with the prospect of some relaxed rules although it is expected that some of the social distancing procedures will be followed for some time. We say 'spluttering' as the highly successful Guildford Rally/ Open weekend gave us a bit more water than we needed! But it was a welcome start to more activity in our hobby.

Unfortunately inevitable that good prospects are accompanied by bad news with the theft of a loco in broad daylight from a residence in Chilworth, Southampton.

We can look forward to the Federation Rally in September, hosted by the Reading Society, and the Midlands Exhibition brought to us by Meridienne. Is Ally Pally on the cards? Let's hope so.

The business of running a society continues to grab our attention. There are issues in the insurance world ably fielded where they can by your committee members. Change does occur however and it needs to be managed. We hope you will enjoy the contrasting articles, one about the 'Little Allchin', for when I first saw it I was amazed at how small a working model can be made and the other by Peter Gardner on using the Dockstader simulations to prove your valve gear. All very technical, this latter subject, but do persevere as the simulations are mesmerising as Peter tells us.

Now is the time to get on with enjoying our hobby after a year and a half!

David Goyder, Newsletter Editor

CHAIRMAN'S CHAT

Hopefully soon after you first read this the Covid rules and regulations will have eased enough that our model engineering clubs, rallies, exhibitions, etc will be able to resemble some semblance of normality.

The period that we have recently been through has been difficult, but because the majority of people have endured some of their activities being restricted, sometimes severely restricted, and the acceptance of modern science in the form of the various vaccines life will eventually return to normal (whatever that is).

Can we as model engineers learn anything from the last 18 months? I think we can. One quite often hears off minor, and sometimes major, squabbles about the running of clubs, what facilities are needed, who should be a member and such like disagreements. Maybe occasionally we need to accept some curtailment of our own views and freedoms for the greater good of the club as a whole. This is not to say that a minority should be allowed to dictate to the majority of club members but that democracy should always be allowed to prevail.

Whatever happens in the future keep on enjoying our wonderful hobby of model engineering

Bob Polley, Chairman

Name changed

At the 2020 AGM held at Swindon, there was a strong appeal from the members present for the workshop session to have the name of the Federation reflect the actual geographical distribution of the membership in the UK.

At the recent 2021 AGM (Zoom), we proposed a resolution at the meeting to change the name of the company to 'Federation of Model Engineering Societies', that being the proper way to do it. This was accepted by the meeting and is being formally implemented through Companies House and the paperwork (letter headings, name change on certificates, etc) will catch up later.

Please be aware that all commitments made by SFMES will be carried forward by FMES so, for example, boiler certificates issued under SFMES remain valid following the name change.

FMES looks forward to continuing to work with the Northern Association of Model Engineers, the 7¼" Gauge Society and others as before in the support of our hobby.

Young Engineers

'Young Engineers' is - or should be - a very important topic for all of us in the hobby. The introduction of new people is the only practical way we can ensure longevity of our clubs while promoting services and support for our hobby and, indeed, survival of the hobby itself.

My youthful interest in model engineering was fostered by a friendly neighbour who took me under his wing, showed me how to use tools and encouraged me to build my first engine. Throughout my lifetime I have done my best to repay this favour by encouraging the next generations of young engineers. (**Ref. 1**).

Using Zoom software, an initial meeting was recently held with a few volunteers interested in the topic to consider how, in particular, the Federation can best support young engineers. This is increasingly important as the passing years mean I must take on a more ambassadorial role by handing over co-ordination to someone younger than myself.

We discussed the Federation's future strategy, the new developing website and planned further meetings. It is evident that there are many possibilities for enhancing what we already do in this respect including publicity, events, guides to good practice, club support and links to other appropriate organisations.

We are particularly interested in forming a team of people who can make things happen. Now is the time for interested volunteers to step forward! The more folk prepared to assist in some way, the less work there will be for the individuals involved and the wider the range of activities we should be able to pursue well.

If you are interested in working with us, please contact me or Ivan Hurst (see elsewhere in this Newsletter for contact information).

(Ref. 1: *So Who's This Mike Chrisp Then? Model Engineer;* Vol.169; No.3931; pp 500-501).

Mike Chrisp - FMES Vice President & Awards Officer

Update on Club and Society Insurance Scheme

During the on-line presentation and subsequent discussion on the Club and Society Insurance scheme with Martin Levers of Walker Midgley Insurance Brokers, FMES delegates raised some topics that required clarification from Walker Midgley.

The full FAQ document with responses is available on the Federation website, this brief article covers the key points of the Q&A forum.

Although there has been a change of Insurance Underwriter from RSA to Travelers Insurance Company Ltd, the three categories of Public Liability Insurance have not changed. They remain as,

Cat A No involvement with passenger carrying railways. Sometimes referred to as intended for '*smaller scale table-top railways'* Walker Midgley have confirmed that operation of larger scale railways where there is only a driver being conveyed on the train, are included in this category. As soon as there is any passenger carrying of any description, even other members or members of the family for example, then Category A is not sufficient, and Category B must be selected.

Cat B Passenger carrying and carrying the public up to 12 times/year. Important to note that activities that only involve carriage of club members does not count towards the "12" events.

Cat C Passenger carrying and carrying the public more than 12 times/year.

Martin Levers has agreed to approach the underwriters to discuss if there is scope for a '*members only'* category if there is sufficient demand. If such a category would suit your club's operations, please contact Martin at Walker Midgley to let him know.

Clarification was sought on the reduced public liability cover for members activities where the club has no involvement.

Martin Levers has confirmed agreement that club members visiting other bona fide model engineering clubs and societies are not subject to the reduced limit of indemnity and that the visited clubs limit of indemnity will apply. He has also confirmed that a member running a loco at his home track for testing purposes on other than a formal event in the club calendar, is deemed to be a normal club activity and therefore subject to the club's normal limit of indemnity. The wording on the members liability certificate is currently under review by Travelers to find a suitable wording that will cover both these scenarios.

The Model Engineering Club and Society policies are the same, there is no difference between the Federation and Northern Association policies other than a badge. A cover note issued by for example, under the FMES Policy, should be accepted by at a club operating under the NAME Policy, and of course vice versa.

I am aware that some clubs have their own rules or Bye Laws restricting such cross acceptance, but there is really no need for that, and I would urge any clubs with such restrictions to review their reasoning for the benefit of all in the hobby.

Peter Squire 24th June 2021



FEDERATION TROPHY AND POLLY MODEL ENGINEERING LTD.

PRIZE

Any active young member of any Club or Society affiliated to the Federation of Model Engineering Societies is eligible provided he or she is no more than 24 years of age at nomination, is an active member of his or her Club or Society and has demonstrated skills in the use of equipment typically associated with the hobby of model engineering.

Please visit:

www.sfmes.co.uk

for details and a nomination form.

POLLY MODEL ENGINEERING LIMITED



The Internet Saga Continues…..

In the last newsletter we boldly stated that the new web systems would be launched in June as a first iteration. After thinking a little more critically, not the least in terms of the time we wish to take to test the new systems prior to launch, we have decided that we would push the launch back to September. Our approach has always been better late and right rather than premature and wrong! Obviously, we (including our contractors) are now highly focussed on this date and I am pleased to say that we have received the first version of the website for internal testing. We have fed back our initial comments, and have also spent a lot of time on the visible content, hopefully to make the launched site more pleasing and of interest. Although this content is our starting point, we hope to be able to add to and change it with your help in the future to keep the website fresh. We are endeavouring to provide a website that portrays our hobby well and that gives a positive introduction to people contemplating Model Engineering as a hobby.

Of course the website is only part of our project: the database and the way authorised people can access and update it (authorised here means FMES managers and also club officials) is a critical part of the system and one that has caused us much concern during the selection process owing to our apparently unusual needs. The database is almost ready, and we are hopefully soon going to receive the first iteration of the access pages.

In the meantime, the current website is still operational (thank you Martin) and we will continue to place news etc. on the site. In addition, newsletters will be available as downloads. We have had some difficulties in updating the database with changes to club officials and we are very grateful for your continued diligence on this. Accuracy is key to any database of course! Please email us with changes (Paul Naylor or Peter Squire) to make sure we get them: we have a reserve database that we are maintaining pending the changeover.

The change of name to 'Federation of Model Engineering Societies' (FMES obviously!) has now been officially confirmed by Companies House and we will be trading using this name from now. If you see 'Southern Federation of Model Engineering Societies' (SFMES) - in the relevant context of course - then please see this as 'us': it will take some time to change everything over. If you have any doubts though, contact us directly (see below for some contact points). We will be making a more formal launch of the new name and other material when the website is fully released to our members and the public.

Our focus clearly has been on sorting out the future systems, and we have burned many zoom and other hours on this activity recently! These new systems, we think, are critical to the future of the 'FMES' in that they will provide a modern, expandable, attractive and hopefully easy to use internet based system. This will then allow us to launch new initiatives, improve traditional services and attract people to join the hobby (for the good of us all!). We hope that it will enthuse YOU to take a greater part in whatever capacity you can!

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Paul Naylor& Ivan Hurst

A new camp commander was appointed and while inspecting the place, he saw 2 soldiers guarding a bench. He went over and asked them why did they guard it. "We don't know, the last commander told us to do so. and so we did. It is some sort of regimental tradition"

He searched for last commander's phone number and called him to ask him why did he want guards on this particular bench "I don't know, The previous commander had guards, and I kept the tradition." Going back another 3 commanders, he found a now 100-year-old retired Genera! "Excuse me sir. I'm now the CO of your camp you commanded 60 years ago; I've found 2 men assigned to guard a bench Could you please tell me more about the bench?

"What? Is the paint still wet?!

A little Traction Engine

One of the joys of model engineering is the unexpected call from someone seeking help or advice, usually a complete stranger. Such was the call a few weeks ago when the voice said, "I have been advised to call a model engineering society and you are the closest". The caller went on to explain that he had a little traction engine that he was thinking of disposing of and needed advice on how to go about it. Now I have very little knowledge of traction engines being more of the loco on rails type of person but it seemed a good idea to go and have a look, take some photos so we could find the right sort of expert.

A short trip took us there and we were greeted by a charming chap who introduced himself as Tim Knatchbull and who dug a box from the back of his garage. He suggested we take this into the kitchen and have look at it. Out of the box came a tiny traction engine about a foot long and which even I could identify as a ¾" Allchin, especially as the name was on the side of the model. Tim explained that this had been presented to his grandfather in 1978 when he opened the Model Engineering Exhibition. Of course, by then the rest of the detail came to mind and as Tim had been a little vague about just who his grandfather was, we were able to tell him that we had lived in Romsey and with my naval career it was pretty clear that Tim's Grandfather was Lord Louis Mountbatten. And I think most people will remember the well-known photo of Lord Mountbatten with his grandchildren in 1978. (See p8)

The Allchin seemed a reasonably good representation of the real thing or at least as far a model that small can go as all the controls were there. Stephenson valve gear with proper reversing, the two gear options. Steering was by the usual chains operated by a worm arrangement. A true road engine aficionado would have seen a lot more of the detail and judged its appropriateness but to my eye, as taught by Fred Dibnah on TV, this looked like a lovely little engine.

Tim showed us the correspondence that had passed between Lord Mountbatten and Gospatric Home, the Managing Director of MAP, publishers of the Model Engineer, regarding understanding how to operate the engine. This is a fascinating story in itself (more later) but it did capture an era that is long past and which few of us will remember. What strikes one immediately is the kind

A little Traction Engine, cont'd

and polite tone of these letters. Email seems to generate a brusquely curt way of communicating, not necessary even some 45 years on. But perhaps one of the most revealing aspects of correspondence is that Lord Louis certainly was exceptional as Viceroy of India as well as the First Sea Lord but as master of a ¾ Allchin he had met his match!

Having examined the papers and the traction engine itself, we decided that we ought to do a little more research to broaden the story and the provenance of engine itself. This might lead to Tim successfully disposing of the engine as an item of historical interest rather beyond just a road loco.

Where had the Model Engineering Exhibition which I remember my father taking me to when I was about ten got to? The Model Engineer has passed through some new hands since they put on the Exhibition. The maker's plate on the loco showed a Michael Holden Limited of Banbury, what ever happened to them? There seemed a good case for some research into the related history.

The Michael Holden Story.

A good place to start unravelling seemed to be with Michael Holden and Co of Banbury.

Builder's plate for the presentation engine

During the 1970s, Michael Holden and Co produced a series of kits for a number of traction engines of which the 1906 Allchin seemed to be the most popular. Indeed today there is an owners club in Facebook with around 150 members.

Plate for No 10!

The first one mentioned in FB is No 10 certainly a predecessor to our No 500.

The next one shown here gives us some useful information. *"3/4" scale Allchin Showman's engine. Built from a Michael Holden kit by Taylor Hemmens Ltd who bought the remaining stock and tooling when Holden's ceased trading. Build date unknown. Engine No. 646. Lots of detail, motion all working, whistle, steam blower, designed to run on coal but appears to have never been fired. Copper boiler - no paperwork or history known. Complete with glass display case."*

This is where the two other names associated with the Michael Holden engines come to the fore. These are Taylor Hemmens Ltd and Maxwell Hemmens Ltd. There seemed to be little knowledge of these two. The correspondence will reveal the Paul Taylor. Mr John Hemmens took my telephone call but his mind was on looking after his not too well wife and conversation was difficult. I did find out that his full name was John Maxwell Hemmens! That answered the missing Mr Maxwell.

The correspondence reveals much of the story. It is worth mentioning however that Maxitrak eventually acquired the drawings circa 1990 and perpetuated the engines today albeit in an scaled down version, perhaps to keep them affordable as much as anything else. 'Andy' with whom I spoke, much admired the Holden kits for their detail and functionality. More of that later from the correspondence.

There is also the tantalising comment from some one I will keep anonymous, "I remember Dad's workshop . . .". Oh to have her here to tell us about the Michael Holden days. These kits came as coal or gas fired. No 500 came as a coal fired version but was soon converted to gas fired with a gas bottle in the living van.

It appears reasonable to conclude that Michael Holden sold his 3/4" traction engine business to Taylor Hemmings Ltd toward or at the end of 1978. The presentation of No 500 to Lord Mountbatten might have been his closing glory, for in 1979 the name Taylor Hemmens Ltd appears in the Facebook page as mentioned previously and in the correspondence. However before we go into the correspondence we should briefly mention the Model Engineering Exhibition.

Alas the exhibition as we might have known it in our youths is no more. We know of Percival Marshall founder of the Model Engineer magazine, the Society of

A little Traction Engine, cont'd

Model and Experimental Engineers (SMEE) and the Model Engineering Exhibition. The exhibition was first held in 1907 at the old Horticultural Hall moving to the New Hall in 1946 and to various venues including Seymour Halls, Wembley Conference Centre, Wembley Exhibition Hall, Alexandra Palace and Olympia, then to Ascot and Sandown Racecourses until the last that was held at Brooklands in 2016 following declining duration, attendance and content.

Thankfully, Meridienne Exhibitions has maintained a London based event at Alexandra Palace (Ally Pally) in North London and we look forward to the next in 2022. Over the years it has been opened by notables including Sir Josiah Stamp in 1935, Sir Nigel Gresley in 1937, HRH the Duke of Edinburgh in 1948 and Lord Louis Mountbatten in 1978.

The Correspondence.

The engine came with a set of "Operating instructions — Coal Fired Engines". These are headed Michael Holden Limited. Here Lord Mountbatten had noted, "terms underlined not known, perhaps a diagram of the engine is available." The underlined items included, pump bypass, displacement lubricator, steam cheat, drain plug and small electric steam raising blower.

Gospatric Home, Managing Director of Model and Allied Publications, then publisher of the Model Engineer magazine, writes on 16th January 1979 forwarding the above to Mr Paul R Taylor at Taylor Hemmens at Market Harborough. We can see that Taylor Hemmens Ltd have taken over the assets of Michael Holden Ltd, at the end of 1978. The blower was provided and the diagram promised.

Gospatric Home writes also to Lord Mountbatten to confirm the above.

The next important letter, dated 16th March 1979, is Gospatric Home forwarding the diagram of the engine to Lord Mountbatten for his grandsons.

The diagram shows a very useful sketch, see overleaf. As usual and with great politeness , Lord Mountbatten thanks Gospatric Home for his kindness and attention.

There follows a gap in the correspondence now and the reader know why, for Lord Mountbatten and members of his family were killed whilst on holiday in Ireland, the most utterly unnecessary and sad happening ever.

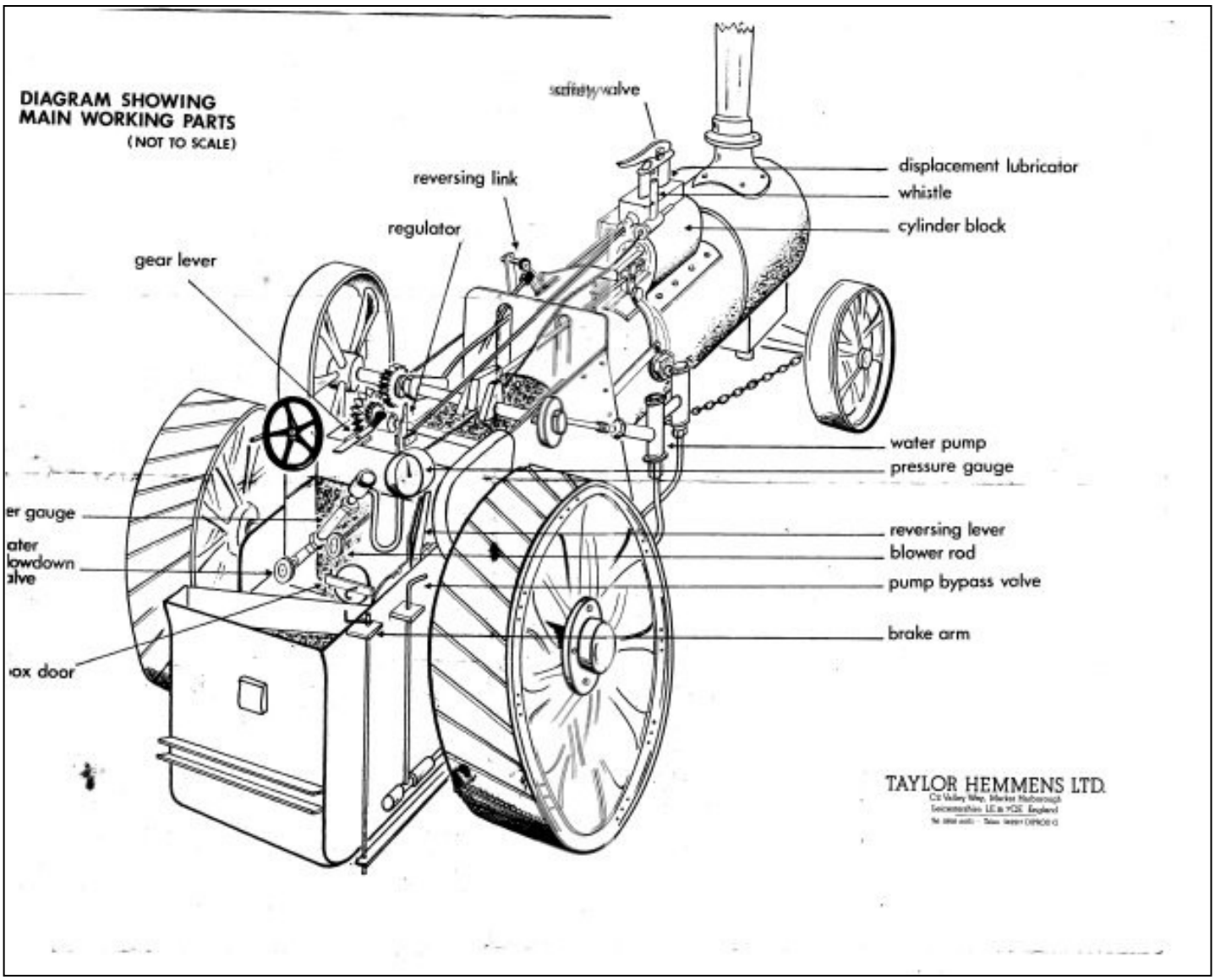
Having survived, Tim Knatchbull bravely carries on the correspondence with Gospatric Home in early October 1979. He reports that the engine is a success and they are enjoying it. There are a few problems needed to be fixed and he arranges for it's return to Mr Taylor.

Mr Home replies six days later with a most kind and sympathetic letter. In this he suggests that it is difficult to keep the coal fired engine in steam and that he will arrange conversion to gas firing.

Mr Home tells Tim that earlier Lord Mountbatten continued to show interest in the Exhibition and agreed to a silver cup to be named the Earl Mountbatten Trophy to be awarded for the best naval model ship in the Exhibition and allowed his cypher to be used on the cup. Additionally Lord Mountbatten wrote to the winner and Gospatric Home suggests that Tim's mother might agree to continue the role.

The rest of the correspondence deals with getting the engine to Taylor Hemmens for conversation to gas firing and to confirm that Tim's mother agrees to writing to the annual winner of the Earl Mountbatten Cup.

Number 500, the 'presentation' Michael Holden Allchin engine complete with the living trailer that houses the gas bottle.



The original sketch done for the Mountbatten presentation engine in 1979. This may be the only one as it was not readily available at the time of the presentation in 1978 and the correspondence suggests it was done especially. Perhaps a historic document indeed.

Rallies—Polly Owners, Dreaming Spires, IMLEC, Bedford

BRIDGEND AND DISTRICT MODEL ENGINEERING SOCIETY

Polly Rally

The first post-covid Polly Rally will be held at Bridgend and District Model Engineering Society
on Saturday 11th September 2021.

10 am start
990 m ground level track – shorter loop available
120 m raised level track
Raised and ground level steaming bays
Drinks and snacks throughout the day
Buffet Lunch (donations appreciated)
Ground and raised steaming bays
Height adjustable hydraulic load/unload platform
Some ground level and raised level driving cars are available but please bring your own if you can

www.bridgendminiaturerailway.com

Five minutes from M4 junction 36

M4 Eastbound – keep right on the slip road and follow signs to Maesteg. M4 Westbound – take first exit on roundabout. Follow dual carriageway downhill to roundabout, take second exit to Kenfig Hill. Take the second right, over the level crossing and the club is at the top of the hill, on the right opposite Parc Slip Nature Reserve.

Sat Nav – CF32 0EH

What Three Words App – mixer, marginal, weary

City of Oxford Society of Model Engineers

Dreaming Spires Rally

23rd, 24th, 25th July 2021

We would like to invite friends old and new to our great track and facilities in Cutteslowe Park, Oxford. Come for a weekend or just a day!

- Minutes away from the M40 and A34.
- Ground level 5" and 7.25", raised 3.5" and 5" locos (with valid boiler certificates for steam).
- Try out our new track extension
- Easy unloading and good steaming bay facilities.
- Paved pathways for road vehicles.
- Caravan and camping facilities - Donation to the cost of the camping field would be appreciated.
- Trade stands have been invited.
- Secure overnight storage facilities for locos.
- Cooked breakfasts and the legendary fish and chip supper on the Saturday evening.
- Good access into Oxford for those who want a break from steam and things!

Booking is essential please and then you can arrive to a great COSME welcome.

More Information - Denis Mulford 07850 062 932 -denis.mulford@btinternet.com

SAT NAV - 0X2 8LH

Flying Scotsman and friend

It must be a good sign when the excursions start running again and indeed seeing the Flying Scotsman running is good news. Ever the favourite, she always draws crowds as indeed she did this day.

But who noticed a passenger sitting on the front platform (we think it is called) as she came into the station?

Yes, this is a badger. A quick word with departing footplate personnel revealed that this, *"was in memorandum of a dearly departed"*

We may surmise that his nick name was 'Badger' and this was a lovely way to see him on.

Odds and ends— Boiler markings, Inspection seminars

Boiler inspectors need to be aware that from 1 Jan 2021, UK pressure vessel manufacturers may be using the UKCA mark instead of the EU CE mark. This new mark shall be treated under the boiler test code as a CE mark, as permitted under the Pressure Equipment Regulations Act. For vessels made after 1 Jan 2022, the EU CE mark is the only valid mark for boilers made in Europe and the UKCA mark is the only valid mark for boilers made in the UK.

Owners of models should be aware that the position of recognition of the UKCA mark within Europe is not yet clear. This may affect those in the future if they are planning to take their model to Europe or to sell it there.

For the latest information including details of the form of the new mark, visit
https://www.gov.uk/guidance/using-the-ukca-mark-from-1-january-2021

The Joint Federation of Model Engineering Societies and Northern Association Boiler Inspectors Seminars have been disrupted by the Covid-19. Our Secretary, Peter Squire, a leader in the seminars will continue with his contribution with the support of NAME and the Federation.
Due to the virus situation, seminars have been postponed but we are crossing our fingers and hope one might be arranged later this year.
It might be wise to indicate your interest now to Peter Squire. At peter@the-squires.co.uk or phone 01327-342167.
And of course, suitable venues are always welcome.

Various open days coming up soon.

Bedford Model Engineering Society

Our Gala Weekend is booked for Friday 3rd September to Sunday 5th September 2021.

We have 2 1/2, 3 1/2, 5in raised and 5 and 7 1/4 in ground level Track available, as well as a private roadway for traction engines.

For more information please e-mail
gala@bedfordmes.co.uk

Reading Society of Model Engineers

18 September 2021 hosting the annual Federation Rally

Meridienne

14 to 17 October Midland Model Engineering exhibition.

Andover & District Model Engineering Society

September 5th – Open running Day

City of Oxford Society pf Model Engineers

Dreaming Spires Rally 24/25/26 July

Bromsgrove Society of Model Engineers

We are holding a Rob Roy Rally open to all those with a Rob Roy engine. Anyone wishing to attend should let me know beforehand so that I can organise parking, lunch and such like.
Can you also let me know what club you represent?

Ian Horsfield. Tel 01386 792628.
meadowsend03@btinternet.com

An unusual and venerable lathe by Paul Naylor

About 8 years ago, a work colleague and her husband asked me if I wanted to buy a lathe from them: I have an interest in old machinery if it's not too large. It turned out to be a complete 'Pittler Model B2' lathe. The lathe was designed in the 1880's and was supplied in the UK by Adams of London between 1905 and 1912. Since mine has an Adams plate on it, this dates it well.

The lathe had been owned by my colleague's husband since he inherited it in 1976 from his grandfather….his grandfather was a noted scientist and invented the 'Dobson Spectrophotometer' for measuring ozone in the atmosphere. This was in the mid 1920's when it was used for measuring circulation in the atmosphere by noting the movement of ozone – and lately became more prominent with our generation's discovery of ozone holes. His prototype instrument was made by him using this lathe. When it came to me, it had been unused for many years and was a 'box of bits' that I renovated and arranged motor drive for.

The Pittler was made in Germany as a high precision machine with unusual features that made it very versatile. Like many lathes of that period, it had some failings compared to modern machines, mainly in that the slides were not calibrated with indexing dials, but it does have some unique features.

It is has a centre height of 3.5" and will take 16" between centres but is quite light for this size. My version is bench mounting and I have made a table top cabinet to mount it on with a drawer for the fittings. The lathe did not come with an overhead frame, and so I made one following pictures of the complete set up I have in the original catalogue and manual that came with the lathe.

You can see it has a 'prismatic' shaped bed that is actually quite rigid with the leadscrew buried in the bed for protection. The cross slide is mounted onto the saddle with a round clamped casting that allows the cross slide to be positioned at any angle around the bed as well as at an angle to the bed. The tailstock can also be moved along the bed as usual. When used as a 'conventional' lathe, tools can be clamped to the cross slide in the normal way. If that was all, then this lathe would not be any different from many others available of a similar size, but the lathe has a secret. You can see the rather odd arrangement of gears at the outer end of the headstock, linked to a large worm wheel on the mandrel. With this arrangement, the lead screw is driven for saddle movement at varying rates governed by the choice of worm and pinion instead of the usual chain of gears. Forwards and backwards movement is controlled by the handle at the very left in the photo engaging one or other right angle pinion and so screw cutting is possible as well as usual power feed for longitudinal cuts. If the worm wheel is however mounted on the vertical shaft and the pinion on the mandrel, then further gear selections are possible with extreme saddle movement. In this case, the mandrel cannot drive the leadscrew, but if a cutter frame with overhead drive is mounted in the tool post (as in the photo), then spiral cutting is possible by rotating the lead screw with the handle at the right hand end of the bed. In this set up, the motor drives the cutter frame, and the cut is applied by hand. The selection of fittings visible in the drawer allow many different pitches to be cut from normal threads to spirals, multi-start worms and ornamental fittings. There is also a set of collets, choice of chucks etc. too.

Other features of the lathe include adjustable angle headstock and a clever detent type control for the back gear that is a simple handle without the need to mess with bolts etc to engage back gear wheels.

This is an example of the ingenuity of generations past that it is easy to forget. In terms of mechanism design and creativity the Victorians were masters!

Paul Naylor March 2016

Adjustments to Stephenson's Valve-gear with the help of Charlie Dockstader's simulation. By Peter Gardner

Introduction

The late Charlie Dockstader was a remarkable American model engineer who, not content with producing some fine models, also produced user-friendly simulations of every type of steam engine valve gear known to man, or so it seems.

The simulations were written in the early days of Windows with the result that the software is remarkably efficient and economic by today's standards and has proved to be compatible with all the later versions. I was using Windows 3.1 when I discovered his software and the only discrepancy I have found with late versions is that the optional sound effects when running have changed from a "chuff" to a "ping".

The simulations were originally available as freeware and since his death several clubs in the USA continue to make the software available.

The simulations cover both locomotive and boat gears and are scaled for 1:8 and use imperial units. The layouts shown are predominantly aimed at American locomotive practice but the editing facilities provide ready means to adapt to English practice. For example, a linear die-block guide for Stephenson's gear can be approximated by the use of a very long suspension link. All component dimensions and positions are editable.

As you might expect some of the terms for components have to be translated from USA to UK.

What I find very reassuring with this simulation is that it is based on pure geometry (rather than mathematics) and that adjustments can be made one element at a time and the consequences immediately observed. This allows for the sensitivity to tolerances and settings to be appreciated as well as design optimisation.

I have one warning; playing with the simulation can be mesmerising and addictive to the point where it can be a time waster. On the other hand it was the hours of watching and thinking that has led me to the subject of this paper.

Using the Charlie Dockstader Simulation

Assuming that all of the files available have been down-loaded, double clicking on the valve-gear of choice will present you with a default version of the simulation running. There are running adjustments readily apparent such as reverser position and speed and the ability to pan and zoom the image and add visual and sound effects of the exhaust.

There are buttons which when clicked give options to edit "Frame" and "Cylinder" dimensions. The "Frame" is essentially the valve gear. To the right of the task bar are four buttons that give access to presentations of the overall performance. Being a simple minded soul I primarily make use of the cut-off diagrams and occasionally the sine diagrams. This is where the arguments can start with regard to what are the best criteria for success. When a locomotive is running, the by-stander may listen for evenly spaced exhaust beats and this is essentially a measure of exhaust timing. Alternatively, one might reasonably look for equal work to be done by the front and back of the cylinder, which is mainly determined by the inlet cut-off. Unfortunately with some valve gears, optimum cut-off and exhaust events are not available together so you have to make a choice. This may be why early designers, particularly in America, sometimes made use of separate cut-off and exhaust valves. My preference is to equalise cut-off for front and rear end of the cylinders as this leads to nearly equal work done by the forward and rearward stroke.

In the simulation image, the front and rear cut-offs are shown dynamically as the simulation runs; it was watching this dynamic simulation and observing that cut-off as the reverser is adjusted that suggested to me that there may be a way to improve the performance of some versions of Stephenson's valve gear. The effect is most marked for gear with short rods.

The first time that I made serious use of the simulation was for the design and construction of a North East Railway T1 0-8-0 (for which I was delighted to be awarded a silver medal at the ME show in 2002)

The T1 uses loco link gear with relatively long rods and short travel valves. Apart from adjusting the lifting links to represent an approximation to linear drive to the link die block gave very good events without the need to depart from conventional gear dimensions.

My next use of the simulation was for the valve-gear of a 7 ¼ "G LNER B1 which uses Walschaerts valve gear. Having examined Martin Evans' design, the only departure that I made was to reduce the link back-set to scale of the full size as this improved the valve events at short cut-off though at the expense of long cut-off.

The next occasion I had to simulate Stephenson's gear was in the design of a 7 ¼ "G Baldwin 2-6-0. Compared to the T1 this has relatively short rods and Launch links. Playing around with this simulation on my lap-top in front of the television it was apparent that if front and back cut-offs were equalised in full gear then they diverged badly at short cut-off, and vice versa. The usually recommended fudge is to set for 50% cut-off and put up with the results elsewhere. I found that if cut-off was equalised in full gear (75% say) then in mid gear the front cut-off becomes very short or negative whilst the rear cut-off remains longer. Bearing in mind that the valves operate through a rocking

Adjustments to Stephenson's Valve-gear, cont'd

lever, it occurred to me that if the radius of the link was decreased, this would affect the mid gear cut-off whilst leaving the full gear events unaltered. This proved to be the case and the link radius was reduced to 6 inches as against the 7 inches radius that would have been applied conventionally. Whilst it seems to be self-evident that the radius of a Stephenson's link should be equal to the rod centres length plus the off-set, in fact link radius is not very critical and can be changed to compensate for errors that are much more difficult to deduce.

Having satisfied myself of the correctness of my deduction both by simulation and in practice by completing the Baldwin in 2016, I thought it would be interesting to apply the approach to some other popular design.

Holmside, potential modifications.

A very large number of locomotives to the Martin Evans "Holmside" design have been built and shown to be successful. We have two in our society, the Frimley and Ascot Locomotive Club, one of which has been modified to improve the support of the expansion link by lifting from both sides to reduce wear but otherwise they are to drawing. The proportions are not dissimilar to my Baldwin Mogul except for the use of direct drive to the valves for Holmside as against a rocking lever for the Baldwin. A similar discrepancy of front and back cut-off is found using simulation but, because of the direct drive, an improvement is achieved by increasing the radius of the link rather than reducing it. As increasing link radius is a slower function than reducing it with regard to valve position, the required increase in link radius is very large, more than double the original, but he improvement in performance at short cut-off very significant leading to smoother performance. The down-side is that the exhaust timing suffers a little so an uninformed line-side observer may be critical. The builder may also find it more difficult to machine the link slot to the increased radius due to the difficulty of achieving sufficient rigidity when mounted on a small model engineer's rotary table. I have experience of this whilst machining the link for my latest project, a 7 1/4" G Stirling 8 ft Single.

Peter Gardner

Notes on using Dockstader Simulation added by Peter Gardner

1. When you select a valve gear a running simulation will be presented on the screen. It will be typical American lay-out at 1 ½ inch scale and will not have been optimised in any way. It will show the gear running forward but in mid gear and will show the cut off at the front and rear of the cylinder. The speed is set by the step angle slider, the reverser angle slider controls forward/reverse and you will see cut-off change as you adjust.
2. In order to fit the dimensions to your valve gear, you need to call up either "edit dimensions" or click on the third icon from the left for the valve gear (called frame in USA speak) or the fourth from the left for the cylinder and drive dimensions. The tables that pop up have a button to the left of each item which are used to highlight the feature concerned thus translating from American. You can then edit the numbers to match your design.
3. A little creativity is needed to convert the rocking lever design of American Stevenson gear to many British layouts by changing the sign of one end of the lever to be negative. A linear guide can be emulated by very long levers and a very remote suspension point. The eccentric position will have to be changed too of course.
4. Whist it is possible to examine the workings of the valve gear point by point using the driver angle control, my preference is to use the graphical output options; of those I find the one on the furthest right the most useful showing the cut-off at each end of the cylinder with reverser setting. A good aim is to achieve equal front and back cut-off over as wide a range of reverser setting as possible e.g. from 20% to 75%. (American practice is for much longer cut-offs). This may not give equal exhaust cut off but will make the energy input to each end of the cylinder as near the same as possible.
5. The two features that I have found useful in tweaking small errors are the link radius in Stevenson's gear and the link back-set and combination lever ratio in Walschaerts.
6. An entertaining feature of the simulation is the visualisation and sound by clicking the blast symbol. Unfortunately, the "chuff" sound obtained with very early Windows systems is replaced by a "ping" with current operating systems but you can still judge what the beat will sound like.

A bit old hat but you can see why the 'Evergreens' can take the wrong turn and go into the desert, they can hardly see in front of them. Through the mist one can see a huge tanker following these gigantic ships all at about 10 knots!
. . . And on 7 July 2021, the 'Ever Given' is released and sails again.

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