

LIONSHEART

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Lionsmeet 2016 – Nottingham SMEE – Saturday 27th August. See page 4

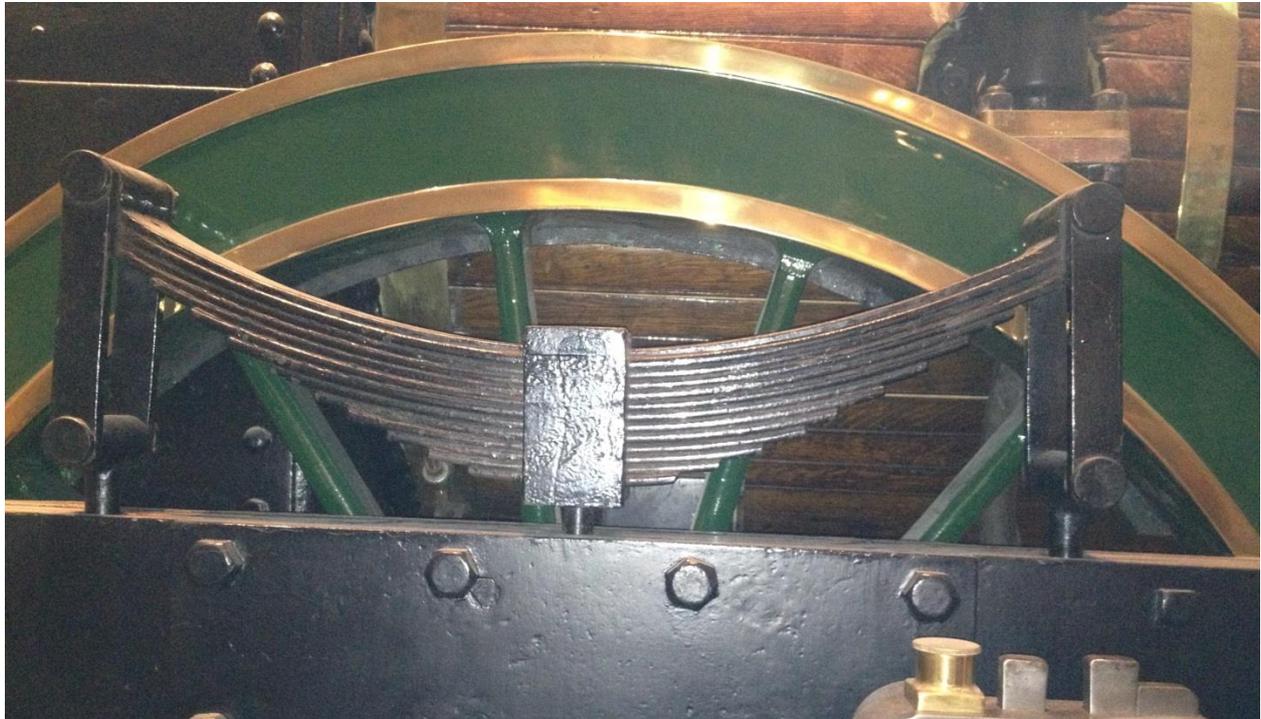


Photo 1 – “Lion” leaf spring (courtesy of the Museum of Liverpool). Left leading wheel leaf spring on the “Lion” locomotive in the Museum of Liverpool. It is this spring which will be the initial focus of Dave Forrest’s design. (See Cover Story, page 2)

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Photo 2. Mick Rowan with his 7¼” Lion on the raised track at Chelmsford. Mick finished his loco last year and I can report it goes magnificently. He is currently making a number (Ten I think) of old fashioned mid 19th Century chauldron coal wagons. This photo, by an unknown photographer, was taken in mid 2015, soon after the nameplates were fitted. (My thanks to Mick and to John Dalton for supplying this information, following John’s discussions with Mick himself. – Ed)



The Editor’s Bit

A slim issue this time, folks. I need to get it out quickly, to advertise **Lionsmeet at Nottingham on Sat, 27th August**.

I’m also having to collect models for the Bristol exhibition & trying to make a bit of progress on my own model for that show. So, I’ve had to hold over the AGM Minutes and other items until the next issue.

Details of Lionsmeet are set out on page 4. Do please try to come along. I know it is short notice, but this is a ‘well worth visiting’ event and the track and facilities are excellent.

Note: Most important: Let Andrew know if you are coming to Lionsmeet. He needs some idea of numbers for catering purposes, etc. His contact details are set out at the bottom of page 4. Brief details were sent out in June, so you have had some warning!



Welcome to New Members

In this issue we extend a warm welcome to three new members:

Mark Taft, of Solihull, joined at the Doncaster show;

William (Bill) Walker, of far away Sawyers Valley, W. Australia. We'll keep you posted, Bill.

Gavin Whitelaw hails from Dundee.

Welcome to OLCO, gentlemen. We hope that your membership will bring you benefits and items of technical interest. It would help me, as Editor, if, one day, you could submit a few notes detailing your connection/progress/experience with Lion, big or small. See Editor's Contact Details on the back page.



Cover Story.

Dave Forrest continues the notes on building his 5" Lion. In this issue he discusses springs . . .

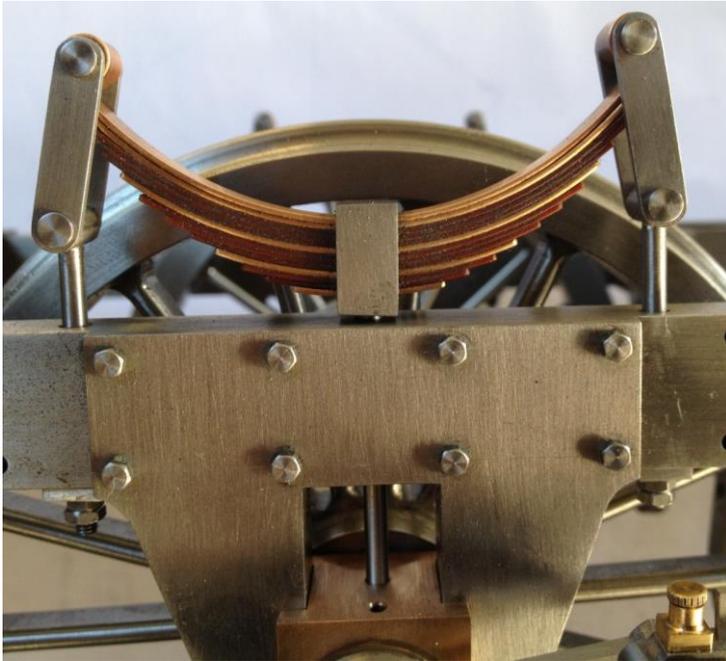


Photo 3 – Finished spring in the 'unloaded' condition



Photo 4 – Main spring components ready for assembly

All photographs in this article are by Dave Forrest

1. Introduction

On scale model locomotives there are benefits (better track holding, weight distribution and traction) from having a proper working spring suspension. Whilst scale replicas can be made of prototype springs they would probably not work as springs in a scale way – they would be far too stiff. The requirement therefore is to design a suitable 5" gauge working leaf spring and still retain as much as possible of the appearance fidelity of the prototype spring.

On the "Lion" locomotive there are two types of leaf spring (excluding tender springs) – four springs located immediately above the coupled wheel axles which are highly visible, and two further springs on the trailing wheels which are somewhat hidden inside the horn plates.



Photo 5- Slots in leaves. NOTE: This is a picture of the trailing wheel leaves and is only intended to show the slots in the leaves.

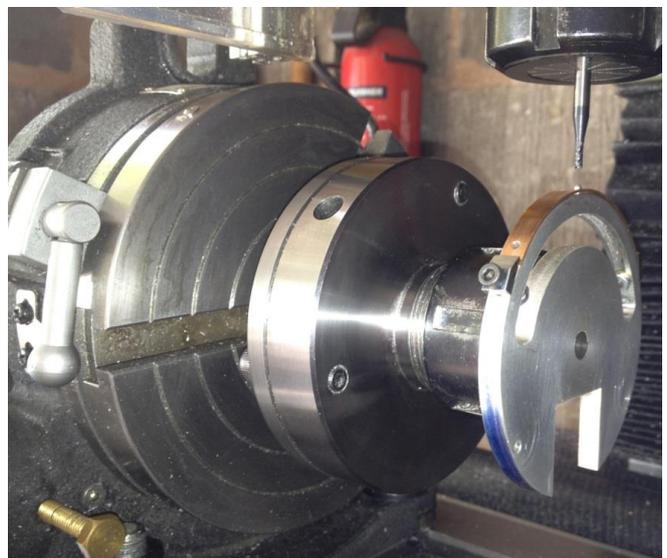
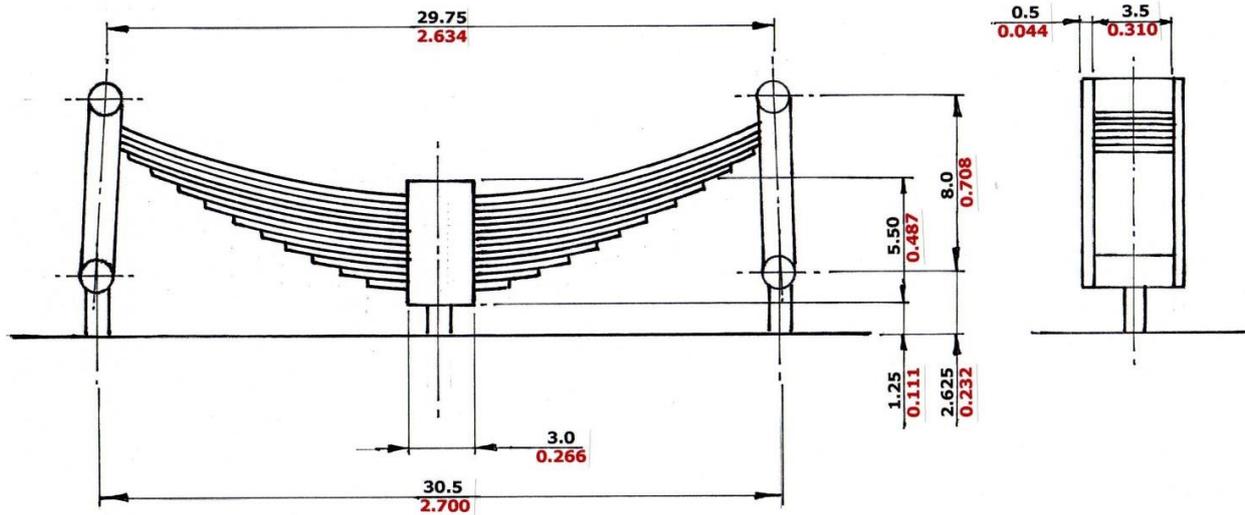


Photo 6 – Milling slots in phosphor bronze leaves

2. Design Considerations

The dimensions of the prototype leaf spring are reproduced in Fig 1 from the JP Hawley drawing “Lion: General Arrangement (Right Side)”



LEAF NUMBER	ACTUAL LEAF LENGTH (in.)	SCALED LEAF LENGTH (in.)
1	29.75	2.634
2	29.75	2.634
3	29.75	2.634
4	28.25	2.501
5	25.875	2.291
6	23.50	2.081
7	21.00	1.859
8	18.50	1.638
9	16.00	1.417
10	14.00	1.240
11	11.50	1.018
12	8.875	0.786
13	6.375	0.564

DIMENSIONS IN inches

Fig 1 – “Lion” prototype leaf spring dimensions

Replicating the overall physical appearance of the spring should be possible (bearing in mind the picture and dimensioned drawing show the spring in a ‘not fully loaded’ condition – the boiler is incomplete and contains no water) but small changes will no doubt be required to the scaled leaf thickness and possibly, width. These changes are conditioned by the need to have a suitable ‘working spring’ and the availability of suitable materials from which to make the leaves - the number of leaves will remain the same at 13 leaves.

It is not proposed to go into details of the “technical calculations” (should details be required, arrangements can be made through the editor) suffice to say they were heavily reliant on Tubal Cain’s book “Spring Design and Manufacture”. In the end, the spring design which came closest to replicating the prototype appearance and giving the required deflection (stiffness) when loaded was:-

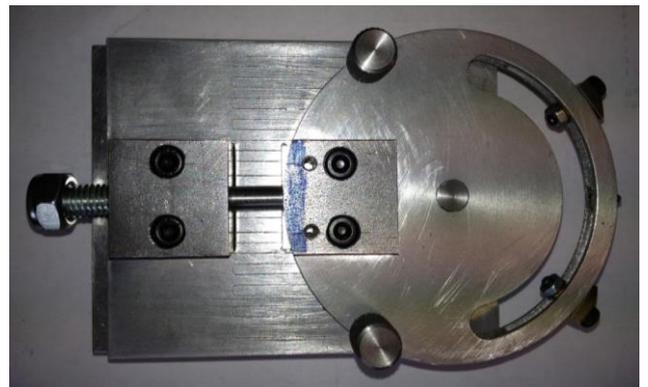
- A composite spring of phosphor bronze and “Tufnol”
- 5 leaves of phosphor bronze with an “effective width” of 0.171 in. x 0.028 in. thick. The “effective width” was achieved by making the leaves 0.125 in. wide with a 2.0 mm wide slot in the middle (see *Photo 5*). The top and bottom leaves have no slots.
- **NOTE:** *Photo 5* is of the trailing wheel spring leaves and is only intended to show the slots in the leaves.
- Remaining 8 leaves made from 0.25 in. wide x 0.028 in. thick “Tufnol” interspersed between the phosphor bronze leaves

The final design step before starting the tooling and spring manufacture is to calculate the “unloaded” shape (curvature) of the spring because this is the curvature to which the leaves of the spring have to be made.

3. Tooling

The main item of tooling is shown in *Photo 7* (right) with the set-up for machining the 2.0 mm wide slots in the phosphor bronze leaves shown in *Photo 4*

Photo 7, right – Combined forming, length cutting, drilling and slot milling fixture





4. Manufacture

The phosphor bronze leaves were 'rolled' to the required curvature – a little work hardening not going amiss. Manufacture of the other spring components is fairly straightforward with perhaps only a mention being needed on the forming of the “Tufnol” to the required curvature. A little research and experimentation yielded the solution shown in Photo 8 (left) which shows the “Tufnol” leaves wired to a former (of a diameter allowing some 'spring-back') before spending 1 hour at 150°C in the oven – preferably when the domestic goddess is not in attendance.

Photo8, left – Forming the “Tufnol” leaves



Lionsmeet 2016 – Nottingham SMEE – Saturday 27th August

An opportunity to meet up and run models of 'Lion' and other early 19th century locomotives.

Lionsmeet is an informal annual gathering of those with an interest in Lion in all its manifestations and gauges. The main purpose of the meet is to allow OLCO members and other interested parties to exhibit models of Lion and other pre-1850 locomotives and, where possible, to enjoy running them on an unfamiliar track. This year the Nottingham SMEE has agreed to host Lionsmeet on Saturday 27th August from 10:00 at their site at the Transport Heritage Centre.

Locomotives of any scale are welcome. Passenger-hauling facilities consist of a raised track of 3½" and 5" gauges and a ground level track of 7¼" gauge. An indoor display area will be available and we invite visitors to bring models (finished or under construction), drawings and railway memorabilia relating to Lion, other early locomotives and the Liverpool and Manchester Railway.

Who's Invited?

OLCO members, of course, & anyone with an interest in railways of the first half of the nineteenth century. If you're thinking of building a model of Lion, please come along and take a look; maybe even have a drive (subject to the owner's permission). If you're part way through building a model, bring it along and discuss your project with someone who's been there already.

Location

Nottingham SMEE's site is within the Transport Heritage Centre which is accessed from the A60 just south of Ruddington, which is itself about five miles south of Nottingham city centre. Postcode NG11 6NX will get you close. Please see the NSMEE website for a map and directions and other information about the society: www.nsmee.org.uk

Track and Facilities

The NSMEE raised track of 3½" and 5" gauge is a continuous circuit of 2270ft of aluminium rail with a maximum gradient of 1:115. The track is supported on a 9½" wide structure at a minimum of 17½" above ground level, with anti-tip rails located 12" below rail height and 15½" across outside edges. The ground level track is a continuous circuit of 2350ft of steel rail with a maximum gradient of 1:85. Steaming bays for both tracks have 12V DC electrical and compressed air supplies available.

Boiler Certificate and Insurance

Anyone wanting to steam a locomotive must bring a current boiler certificate for inspection. OLCO does not carry insurance cover of its own so all locomotive drivers are advised to ensure that they have adequate public liability insurance cover. Members of a model engineering society may find that their society's insurance will suffice. The host club will need to see evidence of this.

Food

Tea and coffee will be available throughout the day. A light lunch can be provided if ordered in advance. As usual, an early evening meal will be arranged at a local pub for those who can stay, probably at about 17:30. Again, this must be arranged in advance.

Overnight Accommodation

The nearest hotel is the Nottingham South Premier Inn (my father and I will be staying there on the Friday & Saturday nights).

Event Organisation

If you're thinking of attending, please contact me, Andrew Neish, so that we have an idea of numbers.

E-mail lionsmeet@neish.org.uk (my other e-mail addresses are still valid).

Home phone 01428 723 483 Mobile phone 07779 360 393

I look forward to meeting both old and new members at this event.

Finally, if you're planning to stay, the Papplewick Pumping Engines just north of Nottingham are scheduled to be in steam on the Sunday: <http://papplewickpumpingstation.co.uk/index.htm>



7 ¼ “Lion for Sale

Dave Forrest has sent me this:

Our Club (Leyland SME) has just been offered a partially complete 7 ¼” ‘LION’ for sale. I’ve attached a scanned photo of the model and the contact details are:- STUART 07860 366310

He is asking £4250 O.N.O with the consensus being he will accept something less – he just wants rid of the model.

I would be grateful if you could advertise this model in the next issue of “Lionsheart” and/or make it known to as many of your contacts as possible.

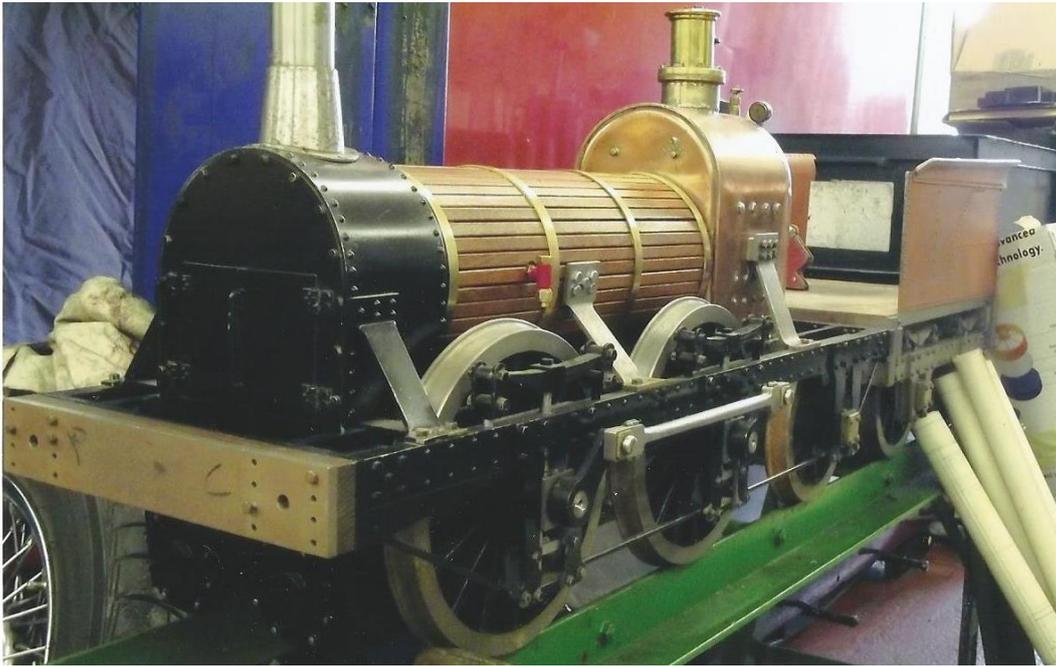


Photo 9. This looks to be fairly complete at first glance. Any takers? Is that a ‘JPH’ boiler I see before me? Does anyone know who built it, where, when, etc? Photo supplied by Dave Forrest



Readers’ Letters

Letter from Geoff Brazendale, of Cumbria

Geoff notes that the picture of Lion and Duchess (of Hamilton) in the January 2016 issue of Lionsheart (LH84, page 1) is at Crewe railway station. “Look at the brickwork.”

He continues: “As a native of Liverpool, who regularly crossed the Mersey when the ferry went from the Landing Stage at Pier Head to Birkenhead Woodside in the 1950s I recognise several features on Jon Swindlehurst's photo. (LH85, page 6. – Ed)

The church in the background is Liverpool Parish Church - St Nicholas. The steel bridge forms part of the access to the Landing Stage (which floated on pontoons) where ferries, IOM boats and Cunard liners etc bound for the USA tied up. Liverpool has a tidal range of some 30 feet so the ‘bridge’ is one of the pivoted access bridges which went up and down depending on the tide. When this photo was taken in the 1920s it was ‘High Tide’ and the bridge is horizontal. At low tide it was quite a steep hill especially pushing my bike!

The gateway – gatestoops – are the entrance to a dock (probably Albert) Dock.

The shadowy building in the RH distance is the Royal Liver Buildings where Cunard had their offices - only just visible in the photo. The photo is it looking N Eastwards. The museum where Lion now stands, resplendent and shiny, stands just about Lion is on the photo!! (I think).

So in 90 years she's back to where OLCO all started. How appropriate.

PS. I first saw Lion in Liverpool Exchange Station about 1952.



Dates for your Diary

Fri 19th –Sun 21st Aug 2016. Bristol Model Engineering & Hobbies Exhibition.

Location: Thornbury Leisure Centre, Thornbury, Bristol, BS35 3JB.

Website: <http://www.bristolmodelengineers.co.uk/Exhibition/exhib.htm>

Times: Fri: 10am - 6pm; Sat: 10am - 5pm; Sun: 10am - 4pm

Sat 27th Aug 2016. Lionsmeet.

Location: Nottingham SMEE, within the Transport Heritage Centre which is accessed from the A60 just south of Ruddington, which is itself about five miles south of Nottingham city centre. Postcode NG11 6NX will get you close.

Website: www.nsmee.org.uk

Times: 10am onwards. But try to come to the evening meal as well, at about 5.30pm. See page 4 for details.





Photo 10. This was the OLCO stand at the Doncaster Exhibition in May. Chairman John Brandrick was very pleased with the stand and the number of people who came and expressed interest in the exhibits. Photo - John Brandrick



Photo 11. "The cat that got the cream". Huh! Some people have all the fun. Chairman John's either been eating magic beans or he's at the Romney, Hythe & Dymchurch Railway. Our illustrious chairman (left) gets a footplate ride on Hurricane, 7th June. Though why he's smiling with all that water pouring down his back, I can't imagine. Photo – Adrian Banks

Further Lionsheart Reading

If you would like to read earlier issues of Lionsheart, you can find them on the OLCO website:

<http://www.lionlocomotive.org.uk/>. (Better still, just click on the website at the top of the attached newsletter). When the site comes up, click on the member's only [secure folder](#), near top right. You will be asked for a username, which is: 'oldlocomotive' and a password, which is: 'lion1838'. Just like that, all lower case. Happy reading.

Editor's Contact Details

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