



Leeds Lines

Newsletter of The Leeds Society of Model and Experimental Engineers



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Front Cover

Mark Batchelor driving Glyn with

*Mixie (Yorkmix Radio Mascot) on board at
Camblesforth Gala*

From the Chair

Jack Salter

August Get Together

In what seems to have quickly become a tradition the Society will be holding a get together at my farm Sunday 25th August.

For those who have been before, or read the reports from previous years, the format will be the same as previously, for others I will try to describe below:-

Boiler Testing The farm yard is taken over by Boiler Testing using the 6 bay portable steaming bay constructed by members during recent Working Parties held for this purpose.



Contact one of the Boiler Testers listed in the back of Leedslines to book your loco in. This is also a popular spectator sport!

Jumble Sale The Societies Event Shelter is used to house our annual Jumble Sale, please donate items to be sold for society funds, also items can be sold on your behalf for a commission, and it helps if these goodies are clearly labelled.

Barbeque Once again John Hunt is organising a BBQ using

quality ingredients, in aid of Society funds. Donations of cakes and offers of help will be most appreciated; homemade scones have already been promised.

Portable track My 5" gauge portable track will be available for use; I hope that as usual Colin Bowes will bring one of his electric locos to give rides as required.



Car Display Those members who own classic cars and motor bikes bring and display them alongside the barn, I invite friends with interesting vehicles to also bring and display them (and to spend money at the jumble sale and BBQ).

Camping Our members from Norfolk, Richard & Margaret Bethel stay in their caravan, other members are invited to do likewise, by prior arrangement with Jack.

Team Effort This event is very much a team effort, last year I observed that most of our members attending had either helped in setting up, on the day, packing away – or in several cases all three!

Setting up will be on the Saturday (24th) from 10 am onwards, putting up tents and tables, the steaming bay and portable track, everyone is very welcome - I am sure that we can provide some refreshment! Help packing away from 4pm on the Sunday will be especially appreciated this year as I am away on holiday the following week!

Looking forward to a fabulous weekend, please try to attend.

Portable Track, May 2024

Nigel writes: We had a good “do” at the Camblesforth Gala on 25th May; the Portable Track season is getting well underway now. Mark Batchelor had brought “Glyn”, his Sweet Pea locomotive and he ran pretty well all day with it, the club Charlatan only being brought into action for the last few minutes as “Glyn” (and Mark) cooled down for the journey home. It was good to see Nick Morley again; John Hunt had railroaded his immediate family into having a “nice day out at the gala” and all duly helped with the event – thank you, Hunts all, especially Lyn who bought cakes and drinks for us all here and at Bardsey.



Mark did have one rather unusual passenger....

The following day was the Bardsey Gala, and again, Mark provided the steam motive power with Thunderbolt. It was very much on a knife-edge whether the event would go ahead, as rain earlier in the day had moistened the playing field appreciably, and rain threatened all afternoon. Phil Moore’s Volvo took one look at the muddy entrance and dug itself determinedly into an even deeper muddy hole, requiring muscular assistance

to extricate himself. Luckily, the portable track trailer and Thunderbolt were towed on to the scene of action by four-wheel-drive vehicles owned by members. Judith said it was the first time she’d needed to engage 4WD, and the fine coating of mud sprayed all over Thunderbolt and its trailer testified to the efficacy of this. Nigel arrived by one-wheel-drive

bike, having spent the previous three hours with his cycling club in the pouring rain. When after setting up the portable track with the others (Mark, John & Lyn Hunt, Phil Moore, Paul Wellings, Judith and her godson Ben) Karen arrived unexpectedly, the thought of a much needed hot bath, not having to stand around any more in wet clothes and not to have to put on

soaking wet cold cycling shoes for the journey home, proved too much for him and he baled out! The Leeds-Southampton football match had seemingly an adverse effect on attendees at Bardsey, so we didn't make much on the day – certainly not as much as at Camblesforth.

Strensall Gala went well with a good attendance despite heavy downpours halfway through the afternoon. We also got a generous mention in the York Press.



[Strensall Community Carnival and parade entertains families | York Press](#)

More Portable Track events are listed on the 'Dates for Your Diary' and on the Society Website. Shadwell School (7th July) is a new addition to this year's calendar and already has a few volunteers, but more would be welcome.

Come and have a go!

Monday morning breakfast gatherings continue at



Darrington Golf Club - All Welcome - 09:30

Blackout Cover - A Winter Project Revisited

As an add-on to the push bike project I wanted to fit a blackout cover to the front light, an unmistakable WW2 fitting. As it happened I had access to 2 original ones but they were for a larger light. Unwilling to alter them to make them fit and preferring to leave them for someone who had the correct light, I set off to browse the internet.

This proved a failure . I found every size, shape design you could think of, mainly cars and Lorries but nothing for my project. Next step try to make one!

Taking some sheet metal I ran through the possibilities tin sheet, brass or even plastic? A constant nagging in the back of my head kept saying there was something in the workshop that would work. So the sheets went back on the shelves and I kept looking at the accumulated bits and pieces.

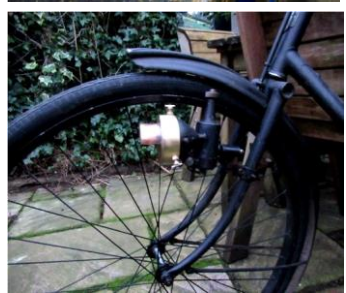
Finally I saw an off cut of a shell case from making a mounting for some trench art, the old fuel-tank from a gauge 1 locomotive, some ex BR 2BA screws, brass wire, brass off cut and a piece of high density thin rubber.

The casing would be a perfect fit over the lamp once cut to size and the rubber glued into the inside to cushion the fit. The fuel tank, cut in half and split sideways would make the hood. The 2BA screws with wire soldered across the slots would make an interesting wing nut. All this was soldered together in one go (lot of creative wire bending) with the three screws clamping the cover onto the lamp.

This was first painted black all over with

white for the inside of the hood,. The exterior was repainted with model rubber paint and then rubbed with a soft cloth to age it. A last rub around all the edges with wire wool gave it some wear.

Mounted on the bike it looks the part and cost nothing but time. Once again throwing nothing away has paid dividends!





Invicta's Crossheads

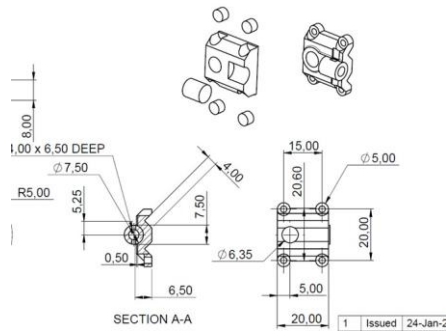
Some Members will have seen the crossheads and slidebars, which I brought to a meeting in February. The miniature crossheads are made from bronze. The prototype's are said to be bronze, but they look more like cast iron to me in the photograph. They are in two halves, front and rear, with Vee grooves in them to run on the slidebars and are bolted together. The slidebars are square section, arranged diagonally and virtually identical to the famous Rocket. The crossheads on Invicta are

originals, unlike much of the motion work. (The connecting rod here dates from the late 1890s, well after Invicta was preserved.)



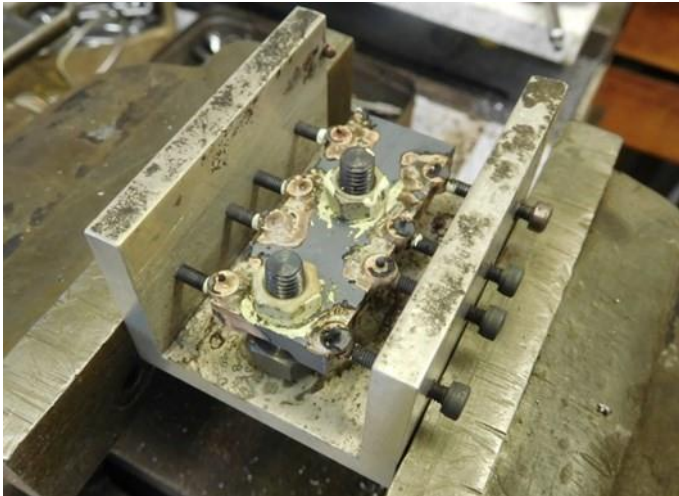
It was easier for me to fabricate the crossheads from several parts rather than machining them from solid. It wouldn't have been practical to cast them. The part drawing shows the way I constructed them. Turned bosses were made to locate in machined slots in the over-thick body; the front crossheads were slightly thicker than the rear ones and had an additional boss for the piston rod.

Crosshead front fabrication.



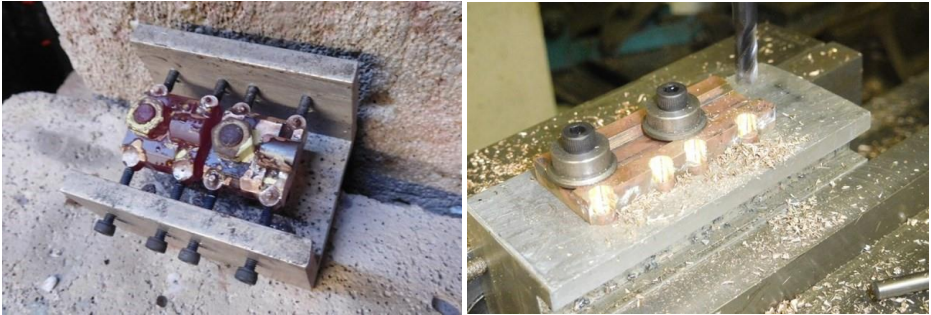
As can be surmised from the drawing, I needed a fixture to hold the parts in place for silver-soldering. I found a length of aluminium channel which did the job nicely; a few screws through the webs served to locate the round lugs. These were left a little long (complete with parting-off pips) as they would all be machined flat with the main body after silversoldering.

Crosshead (rear) soldering fixture



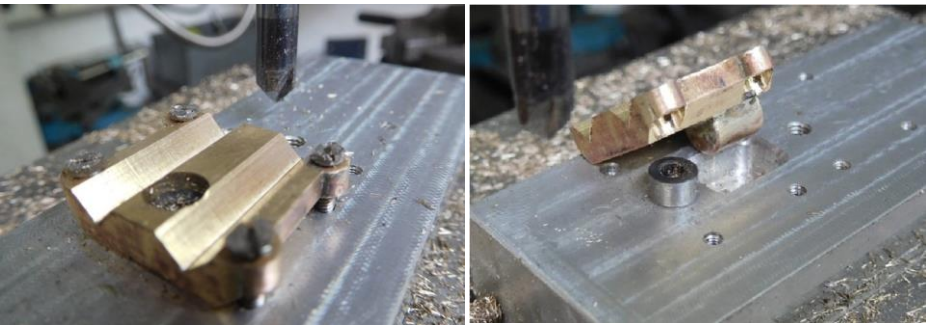
I fabricated the rear crossheads as a pair, so there were 9 pieces to hold together. The slot-drilled half-holes for the retaining screw bosses were not drilled through (as per the drawing of the front ones) so that the bosses located on the bottom of the half-hole. Eight M3 screws then

retained the bosses. They were made over-long as the entire face would later be skimmed level.



This photo shows the front crossheads – and the retaining screws - cooling down in the brazing fixture. Tipp-Ex was used to stop solder flowing where it wasn't wanted. Mr Newton kindly provided some gravity to hold the piston rod bosses in place until the solder stuck.

The rear faces – i.e. the mating faces with the Vee grooves – of the crossheads were then machined flush. The rears – still in one piece – then had the screw bosses machined to depth and were drilled for the securing screws.



A machining fixture was needed to hold the now awkwardly-shaped component to spot-face and drill the attachment bosses and machine the Vee grooves. The component is located in the fixture by two stepped bushes which are a close fit in the reamed little end holes. I had pondered over how to cut the Vee grooves, originally thinking that I'd either tilt the machine head at 45° or mount the crosshead at 45° and use a standard

slot drill or end mill. I couldn't think of an easy way to relate the cutter positions to the reamed little end holes. However, I had a carbide 45° cutter, which they used to use at work for deburring in a CNC machine. (After machining a pocket in a component, they'd simply program the deburring cutter to run round the pocket, removing half a millimetre or so all round the pocket profile.) Anyway, I'd pinched a cutter out of the "scrap carbide box" and I used that to good effect.

The 45° cutter isn't well-shown, but it looks a bit like a four-flute 90° countersink. However, it comes to a point and as can be seen, it did the job quite well. The fixture was drilled and tapped to suit the securingscrew holes in the crosshead, and I was able to use these to hold it in place after it was located on the turned head of a cap-head screw in the little end position.

The next photo shows how I had to machine a small pocket in the fixture to accommodate the piston rod boss on the front crossheads. I seem to have run round the pocket with the deburring cutter in the manner described earlier! The cap-head screw mentioned was turned to be a close fit in the small end hole in the crosshead to locate the job and is at the zero datum.

After closely interrogating that nice Mr Pythagoras, I machined the Vee grooves to the theoretically correct depth to suit the slidebars, which are 4mm square. Using the same fixture at the same set-up for the front and rear crossheads gave me a fighting chance that the grooves on the front and rear components would match up when assembled.

I was much gratified to find that the crossheads just nipped up on the slidebars when screwed together and it only required a little attention with needle files and a scraper to get them to run freely. Taking up wear can be relatively easily done either by skimming a small amount off the mating face of the rear crossheads or shimming the grooves.



The crosshead assembled on slide bars. The screws in the photo will be replaced with “proper” ones with square heads in due course – it’s just a lot easier to assemble and pull it apart using a hexagon driver!

(I think the 1829-vintage design is “sub-optimal”. The slidebars are out of line with the piston rod, so that there is significant side load on the crosshead and slidebars. This caused a lot of wear on Rocket’s bronze crossheads, which have the wear taken up with brass shims soldered in place. But that’s how it is!)

I still had to machine the piston rod holes in the crossheads, though, and I was under no illusion that drilling them in the position advised by the CAD system would be the best method to guarantee truth with the cylinder centre. No; there were far too many variables and tolerance build -ups. Accordingly I turned up a long dummy piston from a spare length of mild steel. This had a 3.5mm hole drilled accurately in its centre. It was inserted in the cylinder and used as a drill jig to drill the hole in the crosshead in situ on the locomotive, using a long-series drill.

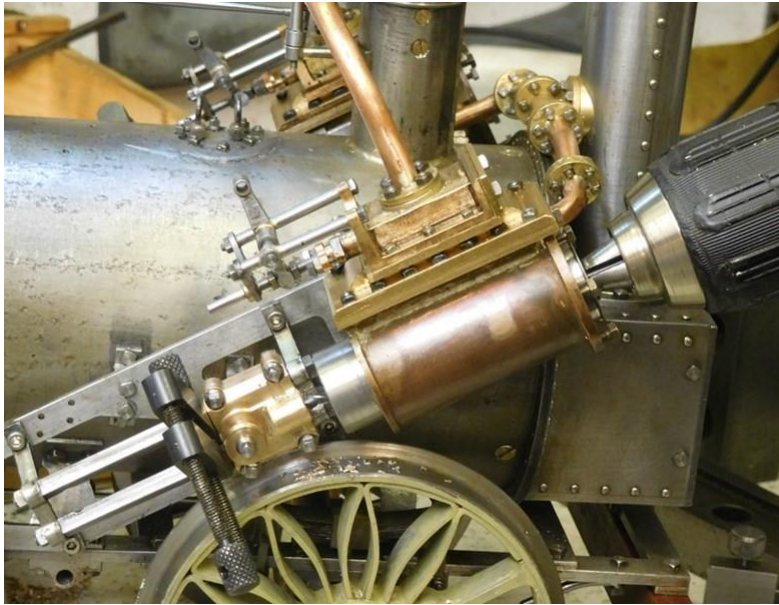
Drilling the crosshead

You may just about spot the swarf on the top of the wheel!

As can be seen, I clamped the crosshead in place with a small toolmaker’s clamp. Before drilling, the drill protrusion from the drill chuck was set

with a piece of bar (equal to the depth of hole I wanted) between the chuck jaws and drill jig so that the drill didn't burst out of the end of the boss; drilling simply stopped when the drill chuck jaws hit the jig.

The crossheads were then tapped M4 x 0.5mm to suit the piston rods. The "dummy piston" jig was re-used for this by opening up the hole to be



a good fit on the tap and counterboring it about 12mm diameter to accept the chuck on the tap wrench as it was a standard length tap. After this I engraved the crossheads L and R as they were now unlikely to be interchangeable.

I thought when I started this project that it would be an interesting one. I am constantly amazed by the difficulties I have encountered in making parts for this locomotive. One would think that an ancient locomotive would be so simple, but very little of it can be described as "straightforward". However, I am so enjoying myself with it!! Nigel

Dates for Your Diary - July - November 2024

7th July

Shadwell School

Sunday - 12:00 - 15:00

12th July	South Milford School Gala Friday 10:00 - 17:00
13th July	Badsworth Gala 10:00 - 17:00
3rd August	Darrington Golf Club Gala 10:00 - 17:00
24th August	Volunteers setting up August Gathering Jack's Farm 10:00 -
25th August	August Gathering Jack's Farm
4th September	Bits and Pieces (3 short talks) Darrington Golf Club
18th September	To Be Confirmed Geoff Shackleton Darrington Golf Club
2nd October	Deadline for AGM Agenda items (in writing)
2nd October	To Be Confirmed Derek Rayner Darrington Golf Club
16th October	AGM Darrington Golf Club
6th November	Jumble Sale Darrington Golf Club
	Society Officers and Committee
Chairman	Jack Salter
Treasurer:	Nigel Bennett*
Secretary	Judith Bellamy
Committee:	Martyn Chapman*

Mark Batchelor

Geoff Rogers*

*** Denotes Boiler Inspector plus**

Steve Russell*

Portable Track Co-ordinator

John Hunt