

**Reading Society
of Model
Engineers
Charity Number
1163244**

The Prospectus

August 2024



**President
John Billard**

**Secretary
Stuart Kidd**

07966 278968

Editor

John Billard

john@jegbillard

.plus.com

01189 340381

07834 998971

Free to members

230



Members atop an ex Reading Corporation AEC Regent on their way to an Open Day at Fawley, near Henley on Thames. Kindly organised by Stephen Millward the bus was provided by Tim Wale. See also page 8.

**FINAL SUBS REMINDER
TRUSTEE NEWS
STEAM AND DIESEL IN ONE CYL
24 TERMINI
FEDERATION RALLY DETAILS
DIARY**

THE VIEW FROM THE CHAIR

John Billard

I have just returned from the August public running and it was busier than usual for this month. However we were short of members engines this time which meant that we had to have the club electricians out on the raised track and both Baldwins ran with three carriages on the ground level following a couple of failures. We did well to manage in the end.

The latest trustees meeting was on 15th July with a familiar agenda. Developments are that the defibrillator has been received and has been added to the project list for installation. We have been having huge problems with Barclays Bank with the apparently simple request to add another name to the list of trustees so that our account can be kept in order. We are being compensated for their failures but quite simply that is not good enough. The saga continues.

The accounts for June 2024 have shown that the nearly complete workshop refurbishment project is within budget and with the main expenditure recently being the new defibrillator as above. The income for the month exceeded expenditure.

On membership, we had a list of 22 members for which the club has had no record of receiving a subscription. Recognising that this may be partly due to information errors these members have been contacted and a number have renewed. It is likely that the rest will be deleted but that will be a decision for next month.

The question of the HSE advisory document for miniature railways was raised and it was agreed that this would be considered further. The trustees have been aware of this document which is very wide-ranging for small gauge railways.

Private parties have been busy but continued as usual.

The Narrow Gauge Railway Society will be visiting RSME at the club running day on 12th October, and we hope as many members with engines will attend to give a good impression of what we do. For next year we are investigating the possibility of an Open Day. We are considering a suitable date and what arrangements are necessary.

The next meeting will be on 12th August.

SUBS RENEWAL LAST CHANCE

If you are reading this and not paid your £20 for this year there is every chance that you may deleted from membership. To avoid this disaster pay £20 now to any trustee or to our membership secretary Mike Manners. michael.manners2@ntlworld.com or by post to *RSME Membership Secretary, 257 Loddon Bridge Road, Woodley, Reading, Berks, RG5 4BL* Bank sort code 20-78-58 Account number 70796077

CHUFFING UNUSUAL Part 2

by Alex Bray

Bang bang chuff chuff, bang bang chuff chuff

Continued from the July issue

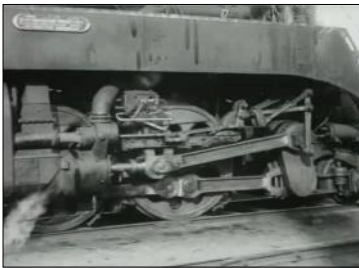
The experimental test locomotive was developed quickly: it used many of the components - such as the driving wheels - and borrowed much of the design - from the current passenger locomotive class being built in the Voroshilovgrad works since 1936 - this was the IS-20, a 2-8-4 express passenger locomotive. The IS-20 was named for Ioseph Stalin, and was apparently the most powerful production-built steam passenger locomotive in pre-war Soviet Union. An example of the IS-20 locomotive has been preserved at Kyiv.



There were some differences - the coupled wheelbase was different, to allow for the opposed piston cylinder assembly to be

mounted midway between along the wheelbase, and so the trailing bogie of the express passenger locomotive was replaced with a pony truck (Bissel truck). The boiler was also different: the IS-20 had a Belpaire firebox, but the experimental locomotive -Number 8000 - had a round-topped firebox and the boiler ran at a higher pressure to compensate for the smaller diameter of the steam cylinders.

There were no external differences between No 8000's tender and those of the IS-20 production locomotives - but internally there were three spaces, one for the solid fuel, one for water and one for the diesel fuel.



This first 2-8-2 prototype "heat" engine had two pairs of outside double-acting outside admission opposing pistons; with valves actuated by Marshall valve gear. Marshall valve gear is a modification of John William Hackworth's 1859 valve gear: this is one of the simplest valve gears, classified as a radial, where the end of the eccentric rod drives a die-block running between straight guides that can themselves be rotated by the reversing gear. Hack-

worth valve gear is used on "Sweet Pea", for example. In the Marshall valve gear, the change of position of the top pivot of the eccentric rod (and thus its angularity) is achieved by using a couple of levers, rather than the sliding die block, which reduces the problem of friction on the sliding surfaces but adds in a couple of pivots - and possibly adding more opportunity for more slop in the system.



The locomotive started with full steam power at both ends of the piston, but at about 20 km/h (12 mph), diesel fuel was injected into the centre portion between the pistons (steam to this volume being shut off), which thus became the compression-ignition chamber, while the outer ends of the cylinders continued

to receive steam in the normal way. To supply diesel fuel, the locomotive was built with Arshaulov type gas-plungers (pumps). On each side of the locomotive, the diesel ran as a 2-cylinder 2-stroke forcing the pistons apart, the steam engine running as two single-acting cylinders pushing the pistons together. Both pistons on one side drove jackshafts at the ends of the wheelbase, the leading jackshaft including a lever to reverse the thrust of the opposed piston. With the lever to reverse thrust and the levers for the Marshall valve gear, there were a lot of moving levers when the locomotive was in motion.

The diesel engine part was started at speeds between 15 and 25 km per hour. On trial it was established that, with a wheel diameter of 1850 millimetres, the internal-combustion (diesel) engine picked up the load at a speed as low as 12 kilometres per hour, while the locomotive only needed to move some 100 to 250 metres to get up to a speed at which the diesel engine could be started.

Interestingly, in most applications, a diesel engine normally needs to have its crankshaft rotating somewhere between 150 and 250 rpm in order to start firing. In this locomotive, the revs per minute at 20 km/hr is 59, so the diesel engine for the locomotive was being started at a lower-than-expected rpm. However, the cylinders were already heated from the steam, and the steam cycle was providing the necessary compression for the fuel ignition.

According to the Soviet documents, the estimated power of the locomotive was 3000-3500 hp (1500 hp for the steam engine and 2000 hp for the diesel engine), at a road speed of 130 km/h. In the event (according to the CIA), the locomotive developed its peak power of 3,000 horsepower at 78 to 80 kilometres per hour. The Soviets reported (again, according to the CIA), "...But the Mayzel steam-diesel locomotive, like any other new machine, is not free of certain more or less substantial faults of design, which do not permit putting it into regular service. Our best designers are energetically working with the designer of the locomotive to eliminate these defects...."

The usual power measure for steam traction is tractive effort, usually a calculated value rather than a measured value. The experimental locomotive No 8000 had a tractive effort of **40512** lbf. This can be compared to British Railways Standard 9f 2-10-0 which had a tractive effort of 39,667 lbf.

Although the No 8000 remained in passenger service, it only ran intermittently until 1946, when it was tested again. It was put into storage in 1948. It was not considered a success as its 25-tonne axle load was too high, it rode hard on the tracks and was prone to cracking cylinders. The authorities closed down this passenger heat steam locomotive project because of the number and nature of the problems that could only be addressed by creating a completely new locomotive. This was number 8001, a 2-10-2 freight locomotive which had the centre space in the cylinders, between the opposed pistons, intended to combine compression ignition **and** steam expansive working in the **same** chamber. It was reportedly almost a complete disaster and placed in storage in 1948.

Locomotive 8000 managed to combine the dirt and inefficiency of the steam engine with the complexity and first cost of the diesel engine, and it was difficult to operate, maintain and repair.



A third Soviet experimental steam-diesel locomotive, TP1-1, was a cab-forward condensing 2-10-2 from the Kolomna works, used gas produced from an anthracite coal plant in the tender to fuel its spark-ignition internal combustion cylinders, along with anthracite pulverised in the gasification plant to heat the boiler. There was a total of eight pistons in four cylinders in an opposed-piston configuration: two steam cylinders

and two coal gas cylinders. It was reported to have only functioned properly at speeds of 25–30 km/h and below, because travelling any faster for about 10–15 minutes would cause the gas mixture to combust prematurely when entering the combustion chamber. Issues were reportedly sorted out by 1941 but the project was abandoned during the outbreak of WW2 on Soviet territory.

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The tractive effort calculation has been provided by Alec and can be forwarded on request from the editor.

Federation of Model Engineering Societies Rally 31st August 2024.

The Nottingham Society of Model & Experimental Engineers have accepted FMES's invitation to host the FMES Rally this year. They have much pleasure in inviting any member of RSME to come and enjoy the day with NSMEE on Saturday 31st August 2024

Please contact Tony Knowles for further details

tony.knowles12@btinternet.com

LONDON—ALL STATIONS?

By John Spokes

For certain, my readers will have at some time played the board game MONOPOLY. The London edition that is. Once one has passed GO then the circuiting of the board covers four London rail termini: Kings Cross, Marylebone, Fenchurch Street and Liverpool Street. A somewhat unusual selection when major stations such as Euston, Paddington and Waterloo might have been logically included. However, all the stations on the game board were, before the 1947 rail nationalisation, owned by the London North Eastern Railway. Why Waddingtons, the UK manufacturers of Monopoly, took this path is not clear. At one time the station sites had (LNER) under the station name and probably this was an advertising ploy by the railway, for which Waddingtons were remunerated.

Ultimately there were 24 terminus stations in London, most of which survive.

At first the early railways were constrained by financial considerations to terminate at the boundaries of the then limits of built-up areas. Cognisant of their shareholders, railway companies avoided the considerable cost of attempting to buy-up land and properties in what were fashionable areas such as Marylebone and Bloomsbury. However, during the years of Railway Mania, 1844/45, many schemes were projected for terminal stations within the London central area and at one time a large central station was being proposed, located at what would become the Victoria Embankment. Victoria's Government took fright at this and set up a Royal Commission (*The Commissioners on Railway Termini within or in the immediate vicinity of the Metropolis, 1846*). It was they who set the boundary limit on overground railways, which is apparent from the map.

North of the Thames, the fashionable part of London was already much developed, and the northern termini were relatively far out. However, south of the Thames this was not the case, properties were less expensive and thoroughfares less congested and termini such as London Bridge and Waterloo were much closer in, and the Commissioners even permitted some encroachment over the Thames to Charing Cross, Cannon Street and Holborn Viaduct, via Ludgate Hill. Liverpool Street and Fenchurch Street were allowed

up to the boundary of the City of London and its commercial area, However, and true still today, no surface railway crossed the London metropolis.

This pattern of termini inevitably led to the piecemeal development of the then steam-hauled Underground Railway. First the Metropolitan Railway, linking Paddington with Kings Cross and then Liverpool Street, and then the Metropolitan District Railway from Paddington via Gloucester Road to Victoria and Charing Cross, ultimately complete a full circulation of the principal London Stations in what became known as the Inner Circle (yellow line). However, there was always a thriving trade for taxis and buses, horse-drawn initially, between the various terminals, especially north-south. Many of the railway companies provided their own inter-terminal transport as part of their ticketing arrangements.

This Victorian *nimbyism* against these new railways was somewhat justified; railways were dirty, smoky and noisy and the Duke of Wellington, PM at the time of the opening of the Manchester to Liverpool Railway in 1830, expressed his anti-railway sentiments. "This will only encourage the common people to move about needlessly", he remarked. There was some validity in his assertion, as the areas around many of the London termini became notorious for all sorts of vices and debauchery. In that respect, not a lot has changed.

One station that bucked this trend was Marylebone, the last mainline terminus (1899) and the brainchild of Sir Edward Watkin, who was Chairman of the Metropolitan Railway and the Great Central Railway (GCR). The latter constructed a railway from just north of Nottingham to London via Loughborough, Leicester and Rugby. Its mission was to provide an alternative route to London from Manchester, Sheffield and Bradford and was built to continental loading gauge with the intention of eventually crossing The Channel, via a tunnel, and connecting these northern cities directly with Paris. To traverse the last mile into Marylebone, three cut-and-cover tunnels were proposed under the Nursery End of Lords Cricket Ground. The Board of the MCC yelled, "NOT IN MY BACK YARD!". They relented when the GCR agreed to provide a new pitch once the tunnels were completed. These tunnels, of which only one is now in use, are currently subject of legal wrangling about ownership of the 200m by 28m strip of land above the disused tunnels. The arguments are complicated by the fact that the MCC have a lease for only the top 18 inches of soil over the tunnels and no right of possession to the land below.

Unfortunately for the GCR, the English provincial towns it served were better provided for by more established and prestigious railways and Watkin's railway never paid a dividend. During the early 1960s the line was run-down by British Railways and in 1966 was abandoned completely just north of Aylesbury. Ironically, much of the southern part of HS2 parallels this old route. Another example of British long-term, joined up transport strategy! I'll say no more.



Happy members on their way to a Fawley Open Day. 29 July 2024. AEC Regent kindly provided by Tim Wale. Photo Richard Coleman

DIARY

AUGUST 2024

Sunday	4th	Public running	Setting up from 09.30 onwards
Thursday	8th	On the Bench Night	19.30
Saturday	10th	Club running	10.30 onwards
Monday	12th	Trustees meeting	19.30
Saturday	26th	Club running	10.30 onwards

SEPTEMBER 2024

Sunday	1st	Public running	Setting up from 09.30 onwards
Thursday	5th	On the Bench Night	19.30
Saturday	7th	Club running	10.30 onwards
Monday	9th	Trustees meeting	19.30
Thursday	26th	Club Talk Bill Richardson Iron Ore Mining in West Cumbria	20.00
Saturday	28th	Club running	10.30 onwards

Opinions expressed in PROSPECTUS are the personal views of the contributor and cannot be taken as reflecting the views of the trustees or editor.

The deadline for the September issue is 20 August
 Contributions may be submitted in had or soft copy to the editor.
 John Billard Old Station House Twyford Reading RG10 9NA
 01189 340381 or 07834 998971
 john@jegbillard.plus.com