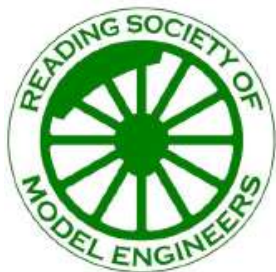


**Reading Society of
Model Engineers
Charity Number
1163244**

The Prospectus

June 2026



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Free to members



**Wednesday
Warriors'
work:
Ground level
track edging**

**The View from the Chair
Building a Claud - Part 20
00 Gauge Group Report
Wednesday Warriors
Hot Oil and Hot Water
Design and Build a Plymouth
Bogie-Mounted Steam Tank Locomotive
An Impossible Goods Shed
The A, Bo, Co, Do of Steam**

Editorial

John Billard has been the Editor of **The Prospectus** for 20 years and has published some 250 issues: this is a tremendous achievement and the club owes a huge debt of gratitude to John for keeping the Reading Society of Model Engineers informed, educated and entertained throughout the ups and downs of the club’s life. It was very sad that April and May passed with no **Prospectus** for us to enjoy: we can not let **The Prospectus** simply be no more. The post of Editor is still vacant. If you know of anyone – friend, relative, work colleague, yourself - who might be interested in producing a well-regarded monthly club newsletter, please let someone in the club know!

You might find some changes in this edition of **The Prospectus**. Microsoft Publisher, used by John to layout **The Prospectus** over the years, reaches its end-of-life in October 2026. It is actually going to be removed from Microsoft 365, so legacy versions can not be used. This edition of **The Prospectus** uses layout software from Affinity instead (and Affinity is *FREE*). I hope that the familiar look and feel of your favourite newsletter has been maintained. We all hope that you enjoy this edition of **The Prospectus**.

One article has a title based on the UIC (Union Internationale des Chemins de fer) wheel arrangement identification applied to Steam locomotives. Those of a Southern Railway or Southern Region persuasion will be familiar with this, as Oliver Bullied considered he could run Southern steam using 2'C1' mixed traffic, C Goods and C'C't suburban tank locomotives (*aka* the 21Cxxx Pacifics and light Pacifics, the Q1s and, of course, the tank engine “Leader”). The UIC classification is now universally used for diesel and electric locomotives and multiple units of all descriptions.

DIARY

JULY 2026

- 5 Public Running
Setting up from 09:30
- 11 Club Running 10:30
- 13 Trustees Meeting 19:30
- 25 Club Running 10:30

AUGUST 2026

- 2 Public Running
Setting up from 09:30
- 8 Club Running 10:30
- 10 Trustees Meeting 19:30
- 22 Club Running 10:30

*Meetings are normally held every Thursday at 19:30 in the club house.
The Wednesday Warriors continue the hard work at the club site
from 09:30 on Wednesdays unless otherwise notified.
The 00 Group meets at the club house on Tuesdays 19:30 to 22:00.*

The View from the Chair

John Billard

Welcome back to Prospectus! Long standing member Alec Bray has volunteered to take over as editor on a short term basis pending a permanent replacement. I have always believed that a frequent communication to members is very important. Emails are OK but not the same thing. But having been brought up in the age of the telegram boy I do recognise that we have moved on a bit!

We have already sent members a trustees report for May. Don't forget that this takes place the Monday after the first club running of the month. Visitors are welcome but also we like to hear questions from members or any comments about the club. The next meeting is on 15th June.

Despite the hot weather some work is still being undertaken outside but we did take the decision to cancel the warriors last week. That was a very rare thing to do but the temperatures outside were exceptional. You can imagine how difficult it is to keep the site looking good in these conditions and full marks to the gardening team for what they do. The next public running is on 7th June and weather precautions may have to apply particularly fire watching if it gets like that.

One of the most important jobs at public running is work on the stations. This is to make sure the trains are loaded safely and quickly if we are very crowded. That puts the responsibility on us to make sure we have enough members helping with that. In hot weather we can't expect people to spend all afternoon on that job. So if you don't have a particular job on that day that is where you should go.

Last year we devoted the income from public running to a local charity and this year we have decided to make the air ambulance a beneficiary. That will be later.

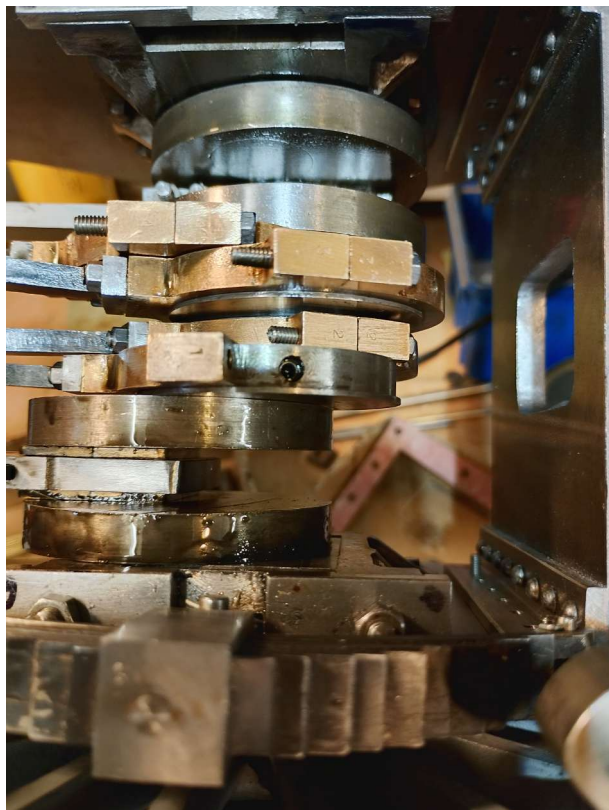
There have been a number of model engineering exhibitions recently around the country, Did any member go? Let us know what you think!

Building a Claud - Part 20

John Billard

It is some time since I reported on progress on this long term project. The latest is that the engine is running on air.

But it was not quite as simple as that. Rightly or wrongly and probably foolishly, I'm working on this engine with what is much of my own work. While I wanted to build a Claud 4-4-0 I considered that the existing Martin Evans design was too far from the



real thing. That real thing no longer exists as the last of these engines was scrapped in 1960. The major changes for me were valves under the cylinders, and not on top, and full size driving wheels, the original being 7 foot.

This entailed a redesign of the Stephenson valve gear. This meant enlarging the eccentrics and sheaves, changing the expansion links from launch to loco type and adjusting the valve rods to match the cylinders. It was modified from indirect drive to direct. In preparation I ran a computer simulation based on what I thought was correct based on the adjusted dimensions and this seemed to work.

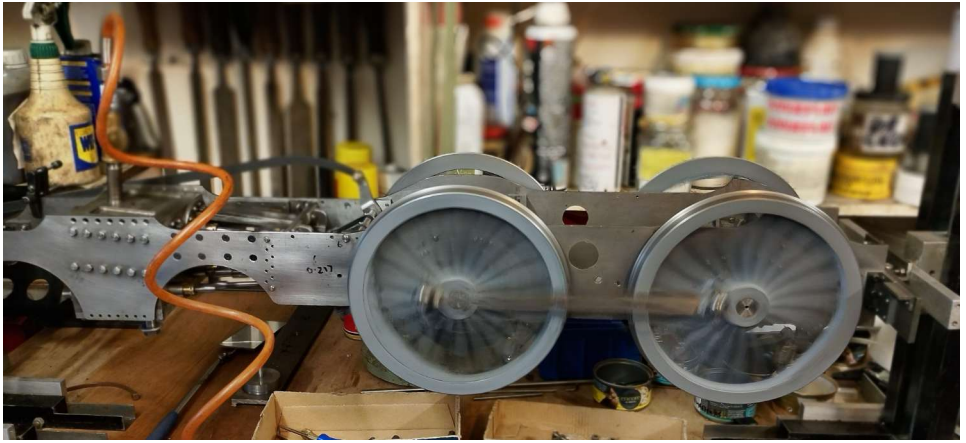
Having had a cylinder cast as from my own pattern and made all the bits, I found the job of valve setting extremely frustrating. It took a very, very, long time but I was told that Stephenson direct drive is like that. I arrived at what was close to a solution only after the help of our colleague John Marrington who was able to iron out some obvious errors for me and provide immense encouragement.

So, having put it all together, bolted up the valve chest, made an air line adapter, oiled up, switched on the compressor, what then? Turn on the air?

Away it went! It was the last thing I expected! All those bits going round and round! Seemingly lots of power too. I haven't got over it....

Next time – making the reverser.

The photo on thre next page shows the Claud running on air:



00 Group Report

Mike Sinclair

The OO group has increased over the last year, both in Adult and Junior members. We have now over 10 members regularly on Tuesday evenings. The full layout is still maintained in good running order.

Currently we are constructing a new terminus on baseboards left over from the defunct N gauge group. This will be much simpler than our current terminus which is becoming a bit cumbersome to assemble on running evenings. The new terminus has encouraged a lot of interest among all members in building a new station and other buildings.

Although I have constructed a number of engines and rolling stock in the past, especially Ian Kirk kits for LNER teak stock, there seems to be a very good supply of models on the market, lessening the need to build from kits.

Finally there is one Tuesday a month focussing on CAD (computer aided design).

STOP for a SMILE

My local railway model/model engineering shop recently had a really good offer. I bought a couple of buffer stops. It was an end-of-line sale.



Wednesday Warriors

The Trustees Report for May noted that the ground level track edging was about to commence. Here are some pictures from Nigel Penford:



Hot Oil and Hot Water

61249



Standard 4 no 75029 'The Green Knight' steaming through Stoke Gifford yard.

The culture of BR in diesel days was that we wished to rid ourselves of the steam heritage which, in work terms, was a “ball and chain”. I well remember the occasion on which “The Green Knight” (BR standard Class 4 75029) ran a hot box on her way to the celebration at Shildon for the 150th Anniversary of the Stockton and Darlington Railway.

The operators took the view that they had a railway to run and recessed the locomotive into Bath Road, somewhat neglecting the fact that we had a depot to run. The locomotive was parked outside my office on a day when we were struggling with our usual problem – a stop list of locomotives that was longer than the list of names we had to work on them.

Immediately “what was possible” and “what was not possible” changed. For instance, it became very possible to get a locomotive moved into a berth road. Sometimes we would wait hours for this, but 75029 could move as if by magic. Secondly, there was an old station seat secreted behind the servicing shed where the layabouts would layabout even if we were frantically busy. It became possible to render this seat unusable by tearing out its horsehair stuffing to produce an impromptu oil pad to replace the rather burnt offering that was on the locomotive.

But the worst effect was that any normal work at all became completely impossible. The locomotive attracted a small crowd, Divisional staff who we seldom saw suddenly found an excuse to come and visit, all our staff on duty wanted a slice of the action and to have their photo taken leaning out of the cab, and then, of course, there were the gricers who leaked all round our non-existent security.

After a couple of hours of complete paralysis we managed to declare 75029 fit to run at low speed to Gloucester and go on the old wheel drop there for proper attention. At least we could then get back to maintaining our fleet and running the railway.

I did learn something important that day though. When you stand under a tap you get wet, when you stand under a steam engine and it drips on you it hurts because the water is hot! They really were horrible things to work on and deserved a lot of their unpopularity for good practical reasons.

Apologies if you have read this story before - but a good story is always worth repeating!

Just to round-off the story, here is an Armstrong Oiler worker showing off a brand-new completed Armstrong Oiler steam locomotive driving axle oiler.

Picture reproduced courtesy of the North Yorkshire Moors Railway (NYMR). Picture credit NYMR and Charlotte Graham.



The Green Knight at Grosmont - minus nameplate

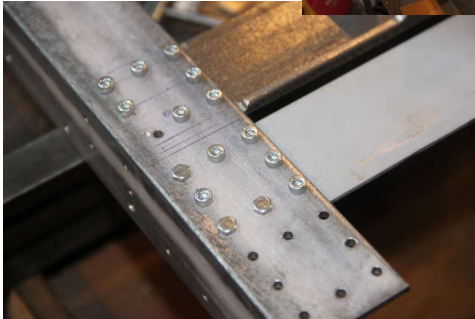
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Author Paul Tomlin

Design and Build a Plymouth

David Scott

An early put together on The Plymouth
for the various angles that hold batteries
and pivots for the 3-point suspension.



Close up of the bolt detail. The ones going down the sides are dummy. All done through a template.

The locomotive is double ended, similar to the Plymouth CR-8, with batteries housed at both ends under Ikea baking tins. She grew to house all the bits and then grew again to have the walkways. So useful for access to many parts.

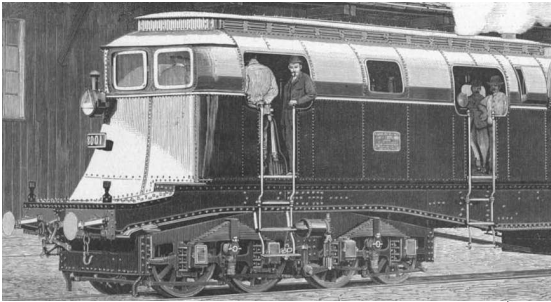


CR-8
Series
45-65
tons

The Plymouth CR-8 was a class of 4-axle B'B' centre cab locomotives, built by the Plymouth Locomotive Works in the United States.

*If you like Computer-Aided Design, you could be an editor of **PROSPECTUS**.*

Bogie-Mounted Steam Tank Locomotive

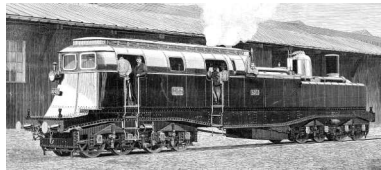


A driving cab at the front with a clear view ahead for the driver. A door part-way along the side for the fireman to gain access to a hot, confined cab. Smooth sides. Steam boiler mounted at one end. All mounted on twin bogies. Sounds familiar?

This pre-dates "Leader" by some **49** years, being completed in 1897. Nos 8001 and 8002 were Steam-Electric locomotives built for French l'Ouest. The compound steam engine had two-stage expansion and powered a Brown-Boverie generator rated at 500 kW which in turn powered eight traction motors in the two four-axle bogies of the locomotive (Do'Do't). Later the locos were scrapped due to weight and complexity.



Like "Leader", only two locomotives were built (the second "Leader" was almost complete). The locos, like "Leader", were overweight, but unlike "Leader" the boiler was not shrouded.



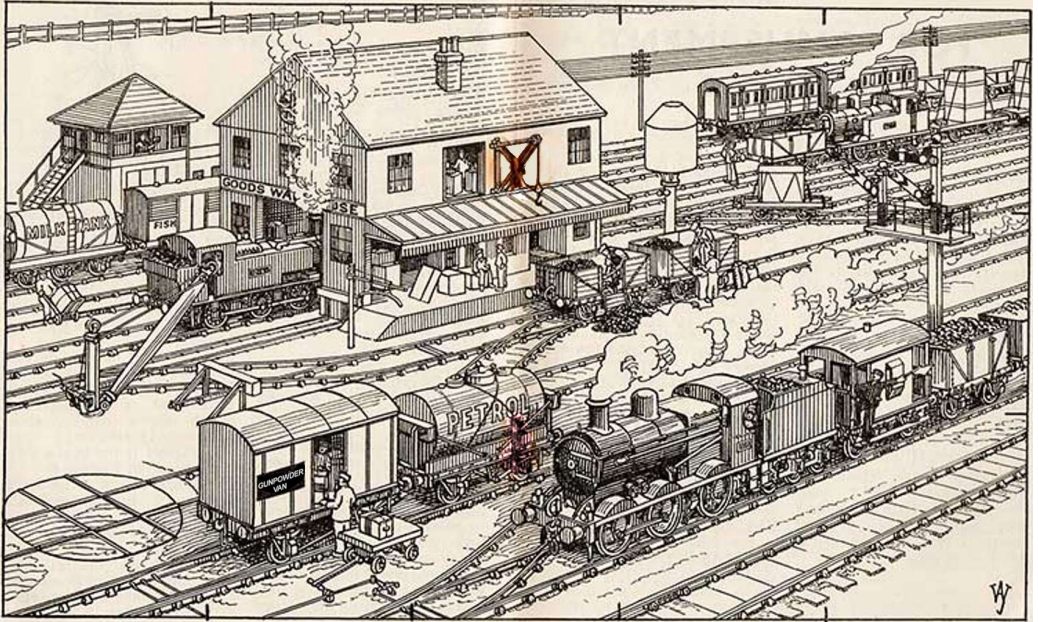
A story to tell? "I was there" at a significant event - the arrival of the first HST, the first or last take-off of Concorde from Heathrow, an inaugural run on the Elizabeth line?

Some ongoing engineering construction work in the shed? A piece of design work that is unique, solves a problem or is just plain interesting?

Photos of work in progress, completed construction, visits to interesting sites here and abroad? A piece of artwork with some engineering or society connection?

Please let the **PROSPECTUS** have your articles for publication!

An Impossible Picture In the past and in the present



Do you remember...?

A country station... the local pick-up Goods train has recently called, and dropped off a few wagons. You can almost see the snatch of the couplings, you can almost hear the clash as the wagon buffers collide ...

But this is an Impossible Goods Shed ...

This is a drawing by R Barnard Way, and he was asked to include as many errors as possible - and he certainly fulfilled his brief!

Can you find all the errors?

Look to the future ...

The local pick-up Goods train and the trip workings between sidings are things of the past. No more fussing little locomotives, no more "clickety-clack" as the coach bogie wheels hit the rail joints...

What else has changed?

Assuming that this picture represents a local Goods Shed around the 1940s - 1960s, what has changed in today's modern railway?

What has gone, what remains and what improvements have been made?

What is the railway landscape like today?

(answers in the next edition of "The Prospectus")

What's the difference between a teacher and a railway guard? One trains the mind, the other minds the train.

STOP for a SMILE

If it looks like a duck, walks like a duck, and quacks like a duck, it probably isn't Mallard....

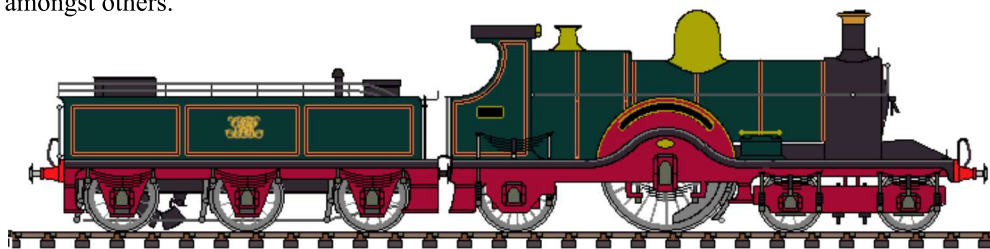


The A, Bo, Co, Do of Steam (Part 1)

Alec Bray

One of the trickiest things when building a miniature or model steam locomotive is to construct a sweetly-running chassis with coupled driving wheels. Any small inconsistency or inaccuracy with the drawing, marking out, machining, fabrication or assembly with the coupling rods can cause the wheels to bind. Slight inaccuracies in the placement or sizing of the crankpins - and the wheels lock up. And the most problematical part for some of us is the actual placement of the driving wheels on the axles, to make sure that the left and right wheels are forced onto the axle with their crankpins at exactly the correct angle to each other, and to any other cranks in the drive train. Get it all right and all the wheels spin freely: get it wrong and the chassis jumps and jerks and even binds completely on its way round the track.

It seems that it's not only in the miniature and model locomotives that this can be a problem. On the full-sized railway, drive wheels are nowadays rarely coupled together mechanically, but back in steam days there were a large number of steam locomotive types which tried various ways to avoid this problem. The simplest way was to have just a single drive axle. The "Rocket" led the way, of course (but this was mainly to reduce the total weight of the machine!), but at the end of the nineteenth century there were the Dean singles on the GWR, the Stirling singles on the GNR, the Midland Spinners, the Caledonian Railway number 123 amongst others.



GWR Dean Single (wheel arrangement 2'A1 in UIC)

As train weights increased with more passengers and better equipped coaching stock (and more coaches on the trains), the single driving wheels ("A" wheel arrangement (UIC)) were insufficient to pull the trains. More driving axles were needed.

One approach was to power the individual axles independently. Francis Webb on the London and North Western Railway (LNWR) thought he had the answer. The "Experiment" class were compound locomotives with three cylinders. Two high pressure cylinders with Joy valve gear (which was all outside the frames) drove the rear wheels on one axle: the single low pressure cylinder, inside the frames to provide automatic reversing of the inside

low pressure cylinder.. There was no coupling rod between the front and rear driving wheels (this is the "Bo" wheel arrangement (UIC)): Webb claimed that this was to reduce friction, but apparently few engineers actually believed this...



Webb Experiment Class Locomotive

Because the inside low-pressure cylinder had slip eccentric valve gear, if the locomotive reversed on to a train and then tried to move forward, the low-pressure cylinder would initially remain in reverse gear. There were tales of the two axles actually contra-rotating documented by well-respected engineers and authors. E.L. Ahrons described the two drivers rotating in opposite directions: Tuplin was another. Ahrons trained as a draughtsman at Swindon under William Dean, and later attained senior engineering draughtsman posts in industry, including at locomotive builders Beyer Peacock. Hamilton Ellis recounts a story that one little girl, visiting Webb's house for a tea party, innocently asked Webb why his new engines sometimes turned their four big wheels in opposing directions at starting, and got a spanking for her pains. A modification using a by-pass valve is said to have partly solved the starting problem – but starting seems to have been a recurring issue.

Based on historical records, Webb compounds using slip eccentrics for the low pressure cylinder included the Experiment class (1882, 30 locos), the Dreadnoughts (1884, 40 locos (early examples used Joy valve gear)), the Teutonic class (1889, 10 locos (although some used Joy valve gear for the low pressure cylinder)) and the Greater Britain class (1891, 10 locos). (There was also a one-off tank locomotive ((2-2-2-2T (1Bo1t (UIC)) number 600)).

Even where the classes did not use slip eccentrics (such as some of the "Teutonic" class), the Webb compounds were often difficult to get started, due to issues with the compounding system used. Sometimes, if the locomotive had stopped with one high pressure cylinder at "dead centre", there was not much steam in the second high pressure cylinder that could feed to the low-pressure cylinder, and the ports to the low-pressure cylinder remained closed. In this situation, there was insufficient power to get the train moving. Once the train actually started moving, everything started to function normally.

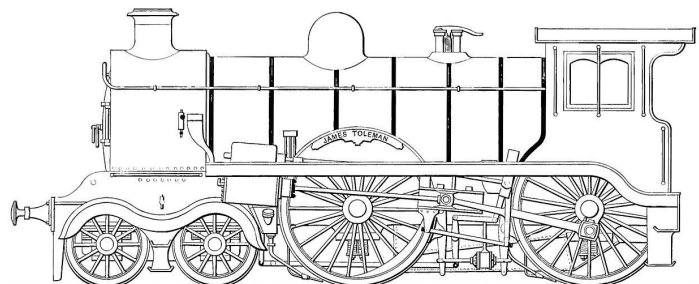
A Webb compound 2-2-2-0 (1Bo in UIC) locomotive also ran in the United States. The Pennsylvania Railroad no. 1320, purchased in 1889, was based on the LNWR “Dreadnought” design. It was built by Beyer, Peacock and Company in Manchester and shipped to the States (since Crewe works was not legally allowed to sell the locomotives it built to other companies). This purchase was unusual, since the Pennsylvania Railroad was conservative in its locomotive choices and designed and built most of its steam locomotive classes itself. The high-pressure cylinders drove the rear wheels and the low-pressure cylinder drove the leading driving wheels. As the two pairs of driving wheels were not connected, the locomotives were "duplex drive" or "double-singles". The “duplex” drive was a feature of many later large American steam locomotives.



Pennsylvania RailRoad No 1320

The locomotive performed poorly in the U.S., as it was slower and weaker than the other locomotives, and it was unsuited to the rougher trackage of the railroads. It also proved difficult to operate and maintain, the locomotive was scrapped in 1897 – after just eight years.

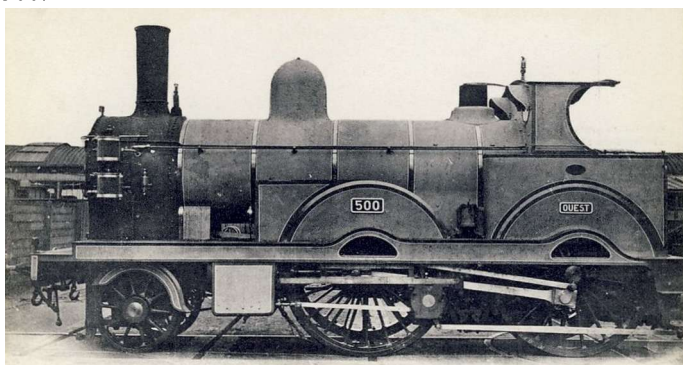
Another locomotive that performed poorly in the US was the “James Toleman” of 1893, designed by Frederick Charles Winby and built by Hawthorn, Leslie & Co. Only one such loco was built, and it was intended to test the installation of a long firebox between the uncoupled driving axles.



Wimby's The James Tolman

The inside cylinders drove the first driving axle, the outside cylinders powering the rear drivers. The locomotive was exhibited at the Chicago “Columbian” World Fair in 1893 (also attended by LNWR engine No. 2054 ‘*Queen Empress*’ (2-2-2-2)) after which it was given to the Milwaukee Railroad for trials. It produced, however, too little steam, and parts regularly broke. Wimby couldn’t improve matters - and it was eventually scrapped by 1912.

The Webb compounds with their uncoupled axles seemed to work for the LNWR: there were about 100 of these divided-drive Webb compounds on the London North Western Railway. This led to another short-lived experiment: the French Western Railways (Ouest) - number 500.



French Ouest No 500

This was a Webb-type compound but built by Sharp, Stewart and Company in 1884. Once again, the two small outside high-pressure cylinders drove the rear axle and the single large inside low-pressure cylinder turned the leading driving axle. The locomotive was retired in 1901, even after a rebuild.

As the French locomotive was retired, a class of five “double-single” locomotives were introduced on the London and South Western Railway – the E10 class – following on from the T7 of 1883. The locomotives, designed by Dougal Drummond, were simple expansion, with a pair of inside cylinders using Stephenson valve gear and a pair of outside cylinders using Joy valve gear. Apparently, Joy valve gear was quite wide, which made the use of coupling rods foul the UK structure gauge.

The French, however, were not done with individual axle drive experimentation. Engineers du Bosquet and de Glehn combined to design a divided-drive compound locomotive based on Webb's LNWR 2-2-2-0s, but which used two smaller low-pressure cylinders. These were mounted outside the frames, powering the rear drivers, while the inside high-pressure cylinders drove the leading driving axle: de Glehn kept this divided drive because of the

lower stresses on the driving axles. Unfortunately the low-pressure cylinders’ volume was too small to accept all the steam exhausted from the high-pressure cylinders. The long exhaust pipes from the rear-mounted low-pressure cylinders caused an undesired back pressure, and, like Webb's engines, they tended to slip when starting. In 1892, 701 received a leading bogie and carried on for years in that configuration.

And there things rested until the mid 1930s.

(to be continued....)

Locomotive Wheel Classification

A small selection of steam locomotive wheel configurations and how they are reported:

UIC	Whyte	USA	View	UIC	Whyte	USA	View
2'B	4-4-0	American	oo OO	2'C1'	4-6-2	Pacific	oo OOO o
2'B1	4-4-2	Atlantic	oo OO o	2'C2'	4-6-4	Hudson, Baltic	oo OOO oo
2'B2'	4-4-4	Jubilee / Reading	oo OO oo	D	0-8-0	8-Wheel-Switcher	OOOO
C	0-6-0	6-Wheel-Switcher	OOO	1'D	2-8-0	Consolidation	o OOOO
C1'	0-6-2	---	OOO o	1'D1'	2-8-2	Mikado	o OOOO o
1'C	2-6-0	Mogul	o OOO	1'D2'	2-8-4	Berkshire	o OOOO oo
1'C1'	2-6-2	Prairie	o OOO o	2'D	4-8-0	Mastodon	oo OOOO
1'C2'	2-6-4	Adriatic	o OOO oo	2'D1'	4-8-2	Mountain	oo OOOO o
2'C	4-6-0	Ten-Wheeler	oo OOO	<i>All these locos have coupled driving wheels</i>			

Opinions expressed in **THE PROSPECTUS** are the personal views of the contributor and cannot be taken as reflecting the views of the club committee or the editor

The deadline for the July **PROSPECTUS** is 20 June.
This is the final date.

Contributions from all members are greatly welcomed.
They may be submitted in hard or soft copy to the editor.

*Interested in **LAYOUTS**? You could be an editor of **PROSPECTUS**.*