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A concept foreign to the original Welsh Highland? Linda and Lyd run around a Santa Special at Beddgelert, taking advantage of the heritage water tower - Andrew Withers.

Your committee met in January to discuss and plan for the future and also to reflect on the past year. Following past requests for comments from members on potential projects, we included these in the discussion. Our major publishing event was

'Ghosts of Aberglaslyn' the Portmadoc, Beddgelert and South Snowdon Railway history, which was a real team effort. Anyone who has been involved with writing and publishing a book will know that the research, writing and editing is just one part of it. What then ends up on your shelf involves design and print, marketing and distribution. 'Ghosts' seems to have been well received by the book trade and readers alike. We are considering publishing a supplementary volume covering route plans, additional illustrations and short list of corrections and amendments. Our journal editor who did a splendid job in the design and production of 'Ghosts' has been tasked by the committee to look at the feasibility of producing a NWNGR history based on the late John Keylock's manuscript, parts of which have been serialised in the Journal.

With others, including David Tidy, our web master, I have been looking at the Group's web presence. We now have a Facebook page (please be a friend) which has been useful in promoting our activities while some incremental improvements have taken place on the Group's website ranging from changes to the background colour – now vaguely

Nick Booker reports on the Group's progress and future plans.

NWNGR 'red' (!) to PayPal buttons so you can now buy and pay for books etc. electronically and pay your subscription. However, we are looking at more fundamental changes that will lead to a redesign to make it more flexible and useful in the future for

promoting the Group's activities.

Cedric Lodge has done a splendid job in bringing the Beddgelert Water Tank into full working use. Judging by comments and photographs this has proved to be a boon to train crews as well as creating photo opportunities. Some minor works remain including boxing in the blue water pipes, a particular issue with your chairman! (See additional notes on page 2)

At Tryfan Junction we continue to look at opportunities for encouraging additional use and opening and for improving the heritage scene. To this end, it is likely that, subject to the agreement of the WHR, we will install a 'dummy siding' with some representative slate wagons. As part of a plan to improve 'historical interpretation' overall we are liaising with the railway on installing suitable explanatory boards both here and elsewhere along the railway. (See page 9 for more detail regarding developments at Tryfan Junction.)

The saga of the Cambrian Crossing Signal Box at Pen y Mount continues but with an end in sight this year thanks to Mike

Hadley and his WHR Society Midland members. New wooden cladding plus a new exterior quality door have been purchased and are currently being prepared (in dry conditions!) for installation once we have a chance of some dry weather in the Spring.

The remains of buildings at both Betws Garmon Station and Glanrafon Weigh House have been the subject of many emails and telephone calls as well as considerable and energetic discussion at the January meeting. We have agreed that the Group should support the Company's efforts to conserve Glanrafon and that, subject to seeing a budget, we should make a financial contribution, the amount yet to be agreed.

At Betws Garmon, the Committee has decided that, subject to the agreement of the Company, the Group should aim to carry out conservation works to stabilise the building remains. Whether this is by employing a contractor to do so, by volunteers or by a combination of both is for further discussion. The restoration of Tryfan Junction did of course involve both volunteers and contractors. Conservation may not be to the liking of some members who have advocated wholesale restoration or removal of the remains to Waunfawr for use there. However, conservation in situ will provide some

security to what remains on site as well as leaving open some options for the future, whatever they might be. We will therefore be discussing with the Company the next steps for fulfilling our objective.

Finally, it has been of some concern to me ever since I became chairman that we are an unincorporated group. As such we do not have an independent legal identity/personality. Therefore, if the Committee enters into any contractual or other arrangements we do so by contracting in our capacity as Committee members. As a result, we are "jointly and severally responsible" for the affairs of the Group. It is therefore possible for us to be held personally responsible to settle any debts or other liabilities that may occur e.g. fees for professional services, rent under a lease, or damages for breach of contract. While this has not been an issue in the past we live in increasingly litigious times. Furthermore, we are not in a position to claim Gift aid on donations made to the Group. We are therefore taking steps to become a charitable incorporated organisation and will be reporting on progress at the AGM in April.

See:

www.gov.uk/guidance/charity-types-how-to-choose-a-structure

Cedric Lodge has provided this update to his earlier notes on the restoration of the Heritage Water Tower at Beddgelert.

Members visiting Beddgelert during Superpower Weekend would have seen the Heritage Tank in operation, serving the small engines terminating at Beddgelert. The traffic operation was a replica of that which the old WHR operated over much of its life.

I am pleased to say the watering operation worked well, although it did reveal a number of problems which remain to be solved.

The system for locking the valve chain worked, but the arrangement for storing the bag not quite. It is essential that the bag is secured effectively when not in use to prevent it chafing against the concrete tower. I tried a quick fix solution, using a short length of 150 mm. drain pipe with a crafty cut-out into which the bag would be inserted.



The 'missing' photograph showing the centre pop and plum bob.

It served, but is too fiddly. My next plan is to use a length of drain pipe cut in half lengthwise, the two halves joined with a longitudinal hinge. The bag may then be stowed by closing the hinged half to the fixed half. We are grateful to Anthony Brierley of the FR Buildings Dept. for the supply of a suitable length of pipe. An added bonus is that it is naturally black, so it will not need painting.

On the Sunday, I was rostered to fire *Prince* in the afternoon. Mike Middleton was driving. The weather was glorious, and we had a good run to Beddgelert. Before uncoupling, we took water, and I



Hudswell Clark No. 1056 - Lautoka No. 19, Fiji - visiting the Welsh Highland from Staffold Barn, fills up at the Heritage Water Tower at Beddgelert. - David Firth

enjoyed the supreme satisfaction of using the tank in traffic.

I mentioned in an earlier article (in *WHH 72*) the significance of locating the centre of rotation of the swivel unit. I have since found the photo shown here, which shows the centre pop on the top elbow which marks the centre of rotation, and the plum bob close to it. The position of the centre pop was established in the workshop, and was vital to the setting of the swivel unit.

Flushed with the success of the Main Line side delivery, we have just received another swivel unit for installation on the Siding Side. This will enable the delivery on that side to be more effective, and allow the bag to swing away and be stored in a pipe casing attached to the side of the concrete tower.

My attention has been drawn to the unsightly pipe work (blue) on the Porthmadog end of the tower, and I sympathise. I have plans for a steel box to contain the pipe work, and now the Tank is operational, this work can proceed.

The Tank was used later in the year during the Santa Trains which ran from Porthmadog, and once again I was fortunate to be able to sample my own work, this time with *Lyd*.

NWNGR Wagons - Slate Stock (2)

Blessed are the slate wagon enthusiasts whose primary interest lies in one of those railways where numerous vehicles are preserved for their study. No such treasure trove awaits NWNGR students who have necessarily to focus on less tangible evidence.

In *WHH 72* we attempted to develop a slate stock overview, noting that the majority, if only a modest majority, of NWNGR slate wagons were probably of the wooden box type rather than the possibly more 'conventional' 'crate' type and we looked at the variety of wooden box wagons that the railway used in its slate trade. This time we will attempt to dissect the 'crate' slate wagons operated by the NWNGR. As with the box wagons, it would appear that there was considerable variation from wagon to wagon even though the total number of such wagons owned by the railway was never more than 'modest'.

Wooden Crate Wagons

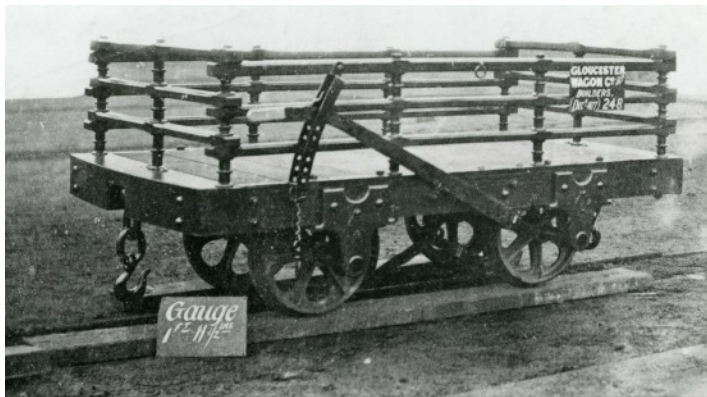
Photographs tell us that, as with the FR, the NWNGR operated a number of wooden 'crate' wagons but, again as with the FR, it would appear that the majority of the 'crate' wagons were fitted with iron superstructures. We have a very clear manufacturer's photograph of a wooden crate wagon purported to be destined for the NWNGR and enough photographic evidence to confirm that the Railway had at least a small number of this type of wagon. Quite how many would have to be speculation, it would

seem. Nevertheless, it seems safe to conclude that of the 'crate' wagons the wooden examples were in the minority.

This manufacturer's photograph is reproduced here (photo no. 1) along with a pair of other images (photos no. 2 and 3) showing wooden slate wagons in service on the NWNGR. A simple assessment of these photographs indicates one clear difference between these wagons – those in service appear significantly wider than that shown in the manufacturer's photo. The in-service vehicles, it would seem, were of a very similar width, if not the same width, as the 'iron crate' wagons, although as will be discussed later this comparison demands care!

Photo 2 shows distinct differences in the buffing arrangements and photo 3 indicates similarly significant differences in the wheel-mounting arrangement. Both indicate a much greater 'overhang' of the solebars relative to the wheels when compared to the manufacturer's photo.

In *WHH72* we showed the equivalent manufacturer's photo of a box wagon for the NWNGR and noted that, apart from one abandoned example photographed in 1897, not one of that type of wagon had been found in operational NWNGR photographs. In the case of this wooden-slate wagon we do not appear even to have photographs of abandoned vehicles, begging the question as to how many, if any, of this specific type actually were delivered to the Railway. Additionally, we are left to speculate as to the source of the wooden wagons that the Railway did have.



Three photographs showing NWNGR wooden open-slat slate wagons. Photo 1 (above left) is an 1877 Gloucester Wagon Co. Photo of a vehicle purported to have been built for the NWNGR (Gloucestershire Records Office D 4791/16/1). Photo 2 (above), taken at Dinas Junction (Symons Gems of Wales - 1893 - WHR 98), and Photo 3 (left), taken at Bryngwyn (Keylock Collection - WHR 109), show wooden wagons in service.

However, the wagons in the latter two images differ significantly from the maker's photo, particularly with respect to the vehicles' width. The wagon in the background of the second photo was one of the 'ridge top' covered vans operated by the NWNGR and the wooden slate wagon in the photo to the left is conveniently sandwiched between two of the 'iron crate' wagons and the similarity of their overall widths is striking.

The long rake of wagons to be seen in the un-cropped version of the third photograph shows just one more of the wooden-slatted slate wagons.

Iron-Crate Wagons

(Specimen numbers; 46, 55, 88, 120, 127.)

The 'iron crate' wagons offer us a complex picture indeed – from the photographs we have it would be all too easy to draw the conclusion that no two were alike, so many were the detailed differences between each vehicle. However, despite these detailed differences a number of common features are to be seen across all of the wagons, at least all of those of which we have photographs.

Firstly, the iron work forming the superstructure of these wagons was distinctly different from their Festiniog (for example) counterparts, notably in respect of the treatment of the corner

structures. The NWNCR iron crate structure comprised ten vertical angle brackets – three on each side and two on each end – which tied together two horizontal rectangular flat metal bands and a horizontal top member constructed of angle which provided additional rigidity to the crate structure. There were no vertical metal members at the crate corners.

Photographs suggest that the iron crates came in two distinct sizes – despite the small number of these wagons owned by the Railway it would seem that they operated both 'small' and 'large' iron crate slate wagons, much as did the Festiniog within its very much larger slate wagon stock.

Unlike their equivalent Festiniog examples, these iron superstructures were mounted on to wooden frames and floors.



Photo 4) - One of the ex-NWNGR 'Iron Crate' slate wagons photographed at Dinas Junction after the closure of the Welsh Highland. A number of key features are readily identifiable in this image although the level of detail discernible below the solebars is disappointing - H.C. Casserley - 18th July 1941.



Photo 5) - Another of the crate wagons at Dinas after closure of the WHR. This photograph offers a clear, almost 'square-on', end view of the wagon with significant scaling 'clues'. Detailed structural differences will be noted if the above two photographs are compared carefully. - J.F. Bolton - 1941

If we first consider the 'large' crate wagons, it would appear from the few photographs we have that the geometry of the iron work was developed to fit a wooden sub-frame whose primary characteristic was that the axle boxes were mounted inside the solebars. The six side angles were attached directly to the outside faces of the solebars and the four end angles to the outside faces of the headstocks. Thus the dimensions of the crate were determined directly by the dimensions of the underframes.

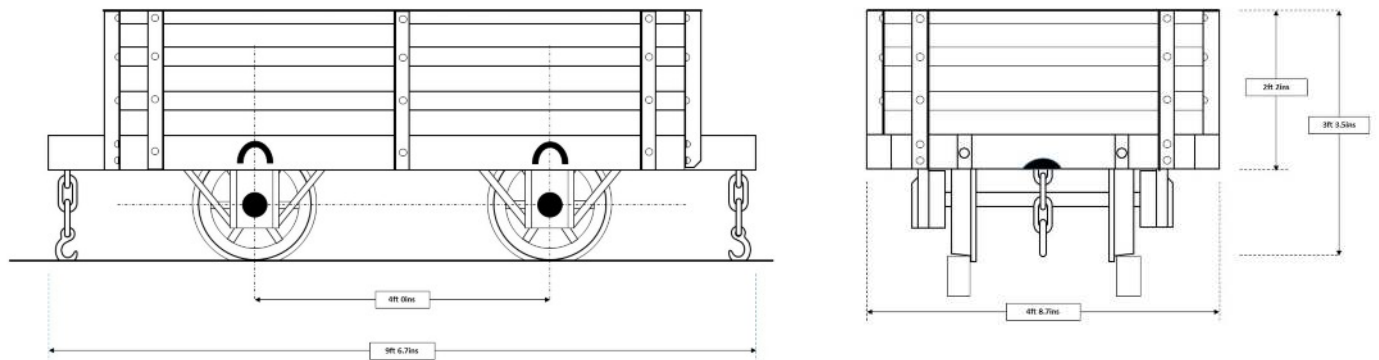
Photographs 4 and 5 give us two views of examples of the large wagons. Photo 5 is particularly useful as it offers an almost direct end-on view with a number of scaling aids clearly visible.

Whilst reiterating my warnings regarding significant differences between individual slate wagons, I have developed the following drawings from analysis of these two photographs. The end detail

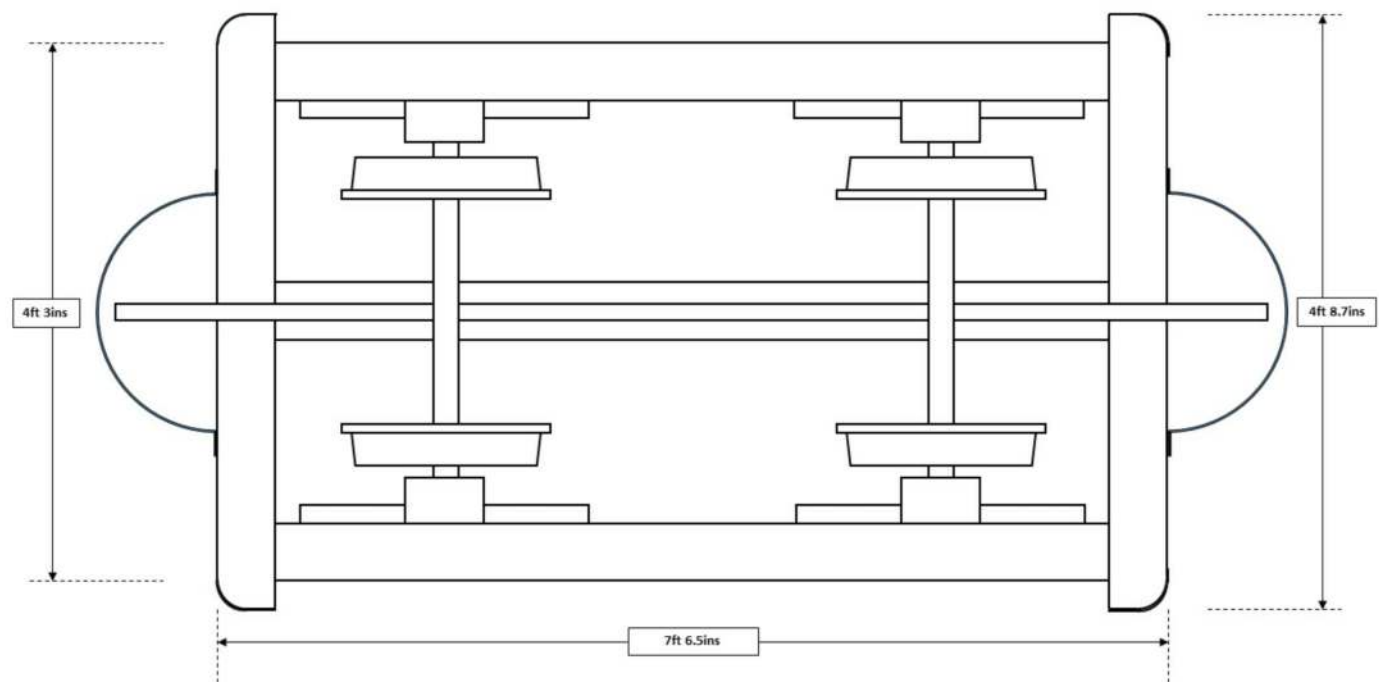
has been taken from photograph 5 but close examination will show that there were differences in this end detail between these two wagons.

The dumb buffers fitted to these wagons were large curved fittings - I have indicated semi-circular buffers but here again there are differences to be seen between wagons. Whether the differences were deliberate or the result of 'wear-and-tear' is a matter for speculation.

As to the 'small' iron crate wagons, photographs show a distinctly different layout of iron crate wagon on the railway in which the crate superstructures were fitted to wagon bases where the solebars were noticeably closer together. These wagon bases were designed with the axle boxes directly below, rather than inside, the solebars.



Side and end views of an NWNGR 'iron crate' slate wagon, based on analysis of Photos 4 and 5. Note that the coupling hooks naturally hung below the height of the rail tops. Photo 5 shows the provisions adopted to prevent the couplings fouling the track work when not in use.



Underside view of slate wagon under frame, derived by removing the iron superstructure from the general arrangement drawings reproduced above. The outside dimensions of the 'crate' matched the dimension over the outsides of the headstocks and the dimension over the outside of the solebars.

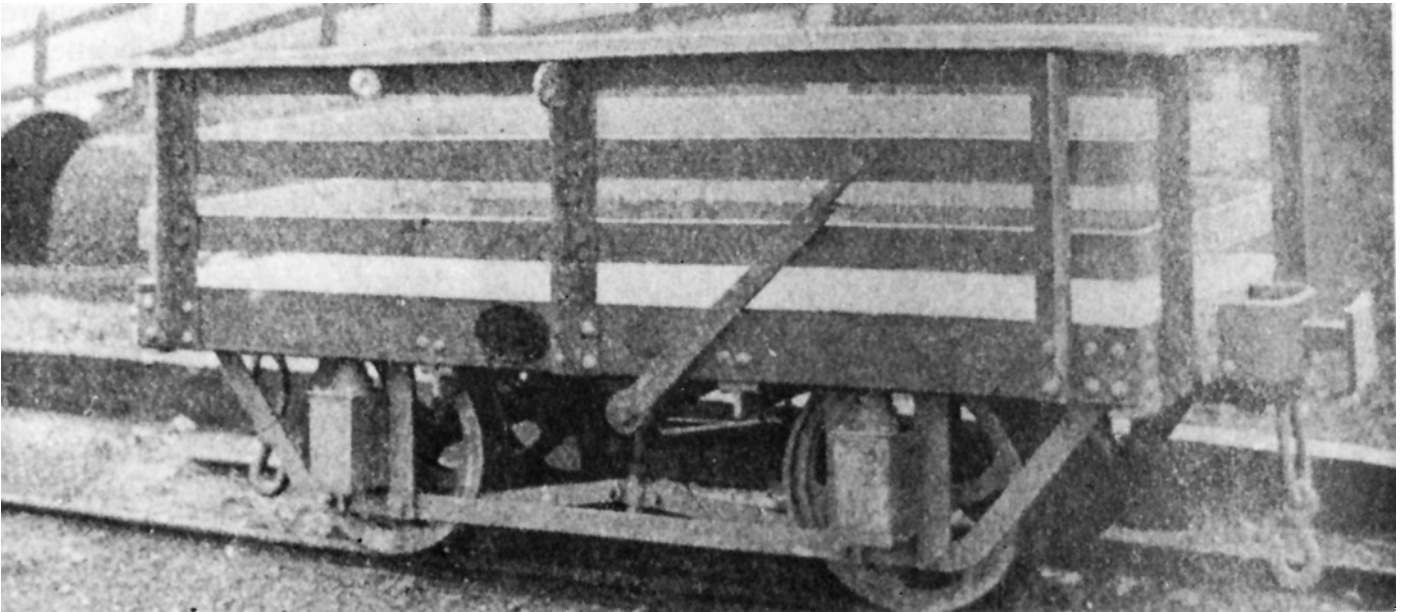


Photo 6 - This picture has often been published as indicative of NWNGR slate wagon practice. It is apparent that the wagon shown here differs significantly from those that we can see in surviving images. For example the 'crate' fitted here is noticeably narrower than on the vehicles in the previous photos. An initial assessment suggests that the vehicle here was between 1ft and 1ft 3.75ins narrower than that shown in the drawings above, i.e. its width was between 3ft 5ins and approximately 3ft 9ins. The couplings are fundamentally different and the chassis structure is quite distinct, showing what appears to be a metal under frame. Despite there being no photographs of wagons in this precise form on either the NWNGR or WHR, chassis such as these can be seen in some of the 'demolition' train photos taken in the early 1940s.



Photo 7 - NWNGR slate wagon no. 88 at the mills below Hafod y Wern Quarry, Bettws Garmon. The photograph was taken at some time between the summer of 1890 and March 1898 - Dafydd Walter Dafis collection/Gwynfor Pierce Jones.

This vehicle seems to comprise the same narrower body seen in photo 6 together with similar buffers, although the chain detail does not match. However, the body here is fitted to a wooden under frame and there is evidence of there being some packing between the iron work and the solebars, although this is not as pronounced as in the case of no. 120 (photo 8).

There is a much-published photograph (photo no. 6) which appears to be a manufacturer's photo of a slate wagon apparently built to NWNCR requirements. Precisely who the manufacturer was or where the photo was taken appears not to have been recorded. Whilst superficially similar to the crate wagons discussed above there were a number of obvious differences. First, the wagon superstructure was noticeably narrower than those discussed above and second the metal superstructure appeared to be mounted on a metal underframe. The buffing arrangements were distinctly different, as was the structural arrangement providing a longitudinal link between the axle box supports.

I am not aware of any photographs that show wagons like this in either NWNCR or WHR service. However, chassis of this type can be seen in photographs of the demolition trains in the early 1940s where at least a couple of these wagon underframes appear to have survived as 'flats'. However, photograph 7 does show what is clearly an NWNCR slate wagon (no. 88) of the narrower design and fitted with sprung buffers but in this photograph the metal superstructure is tied to a wooden underframe. The axle boxes mounted directly below the solebars are clearly visible.

Having identified two basic types of iron crate wagons, photographs do show a third variation. Before we look at this, let us remind ourselves that in WHH72 we quoted from Williams' 1923 Report on stock at Dinas as follows:

Iron Crate Wagons 29, Box Wagons 46, Coal Wagons 13 (bottoms very bad), Goods Wagons 5, in fair condition. Timber trucks 12 Bolsters, the whole in bad

state, solebars broken and roughly patched. Check trucks 11. The 11 are in a very dilapidated state as far as the woodwork is concerned, but several good wheels and axles. A large proportion of the wagons with bad wheels much worn, flanges too high, flats, and require re-turning and new wheels. There are 15 Iron Crates, tops minus bottoms, and wheels in good condition.

June 1923

The last sentence here is particularly interesting as there appears to be a strong possibility that at least some of these 15 iron crates were combined with 'spare' wagon bases to create 'new' slate wagons, presumably after Williams carried out his analysis, i.e. under WHR auspices. In some cases, these 'spare' bases clearly did not fit the surviving crates, particularly across their width, and blocks of wood had to be inserted to build up the solebars locally to the required dimension.

Photo 8 below shows a dilapidated slate wagon outside the Dinas carriage shed in 1939. This photo clearly shows the mismatch between the iron crate and the solebars and, indicative of reuse of the crate on a 'spare' underframe, it also shows the packing used to restore the original solebar width. There is no evidence of any packing at the ends of the vehicle, indicating that the frames used in these rebuilds, or at least in this rebuild, had the correct dimension over the headstocks. The photograph also begs the question as to whether the clearly visible wagon number (120) was inherited from the original vehicle whose sub-frame this was.

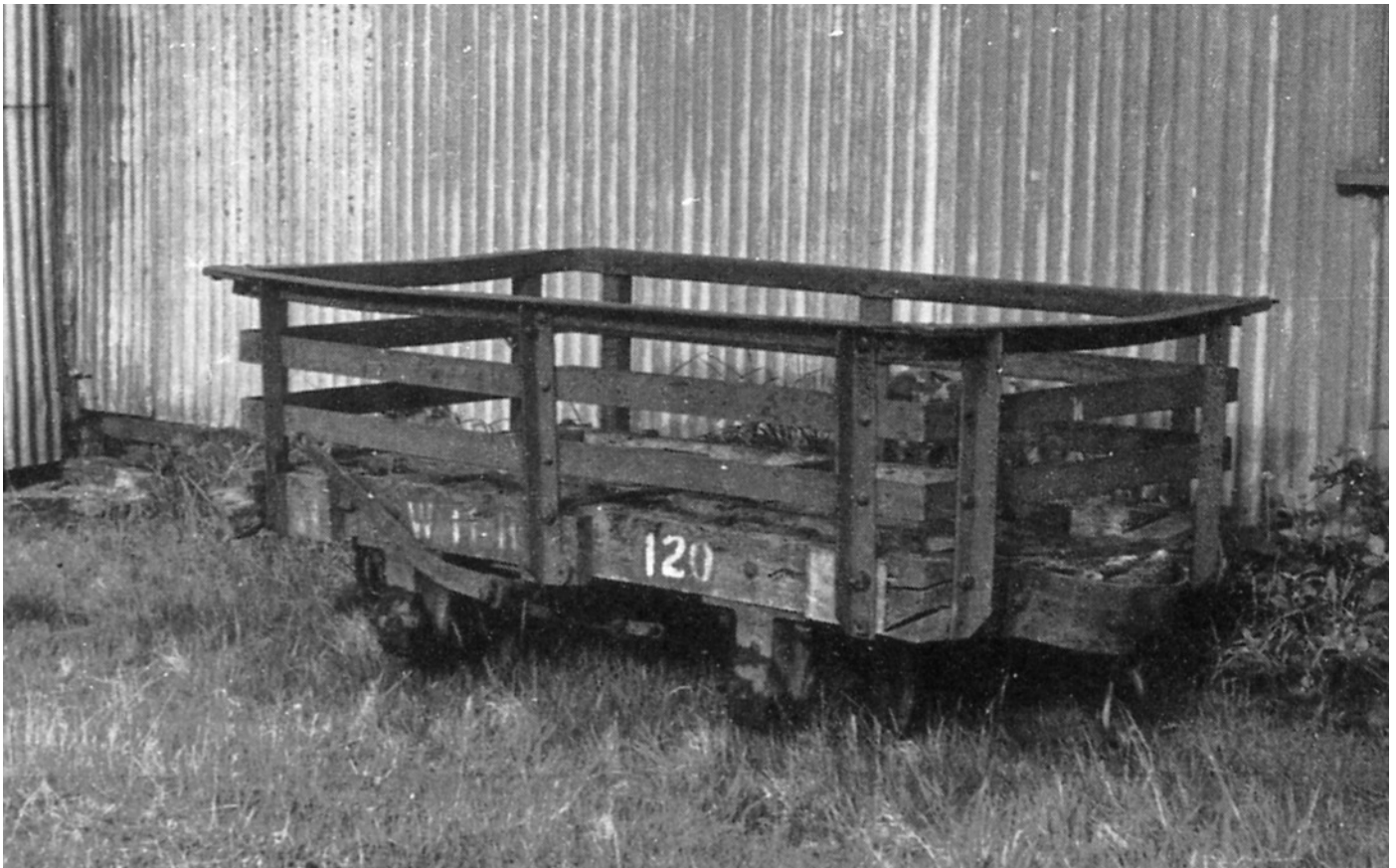


Photo 8) - Another post-closure view, this time showing one of the 'crate' structures attached to a narrower underframe. Note that the axle-boxes are mounted directly below the solebars and that there are packing pieces between the vertical side brackets and the solebars to make up for the difference in underframe width. - F.M. Gates - 1939 (WHR 53)

The Capricious Coalman of Nantmor.

In mid December 1923, Robert Roberts, the local Nantmor coal merchant, submitted an application for a coal yard at Nantmor station, and met with Permanent Way Inspector G. Lewis Griffith on the 19th to discuss the matter.

In his report to John May, Superintendent of the FR and WHR, two days later, Griffith stated that the space that Roberts had in mind was the area between the end of the siding and the old sheepfold.

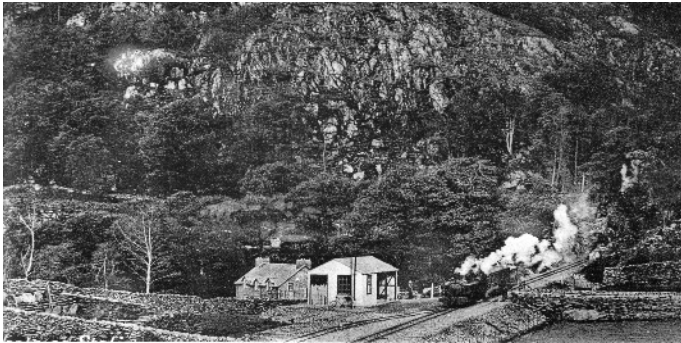
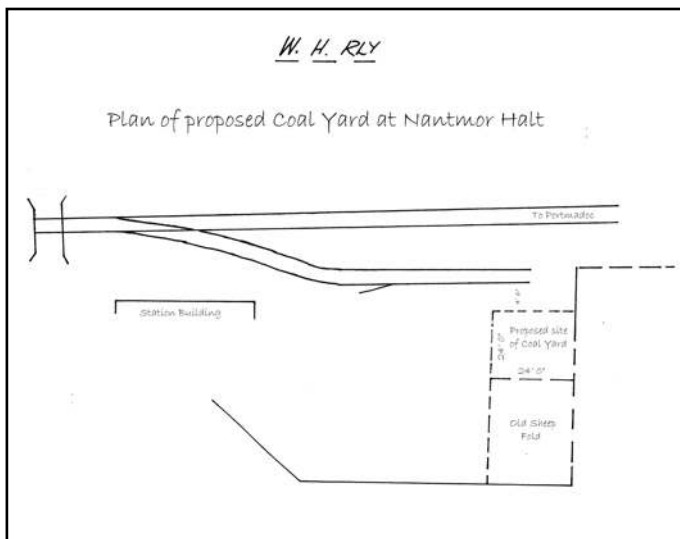


Figure 1 - Russell, in original condition, on a short train entering Nantmor on an Up (southbound) in 1923. Sheepfold clearly visible in the bottom left corner - WHR 156.

He calculated that the available space was eight yards square, which allowed a clearance of 4ft 6ins between the yard and the siding.



He indicated that the yard would have to be fenced on two sides with upright palings, with a gate at the side for unloading coal from the railway wagons, and another at the end to provide access for a cart. The other two sides were formed by the existing boundary wall and that of the sheepfold, but he considered that for additional protection, barbed wire be erected on top of these. The floor of the yard required filling to a height of about 3 feet to the level of the siding, and Roberts indicated that he would like it concreted.

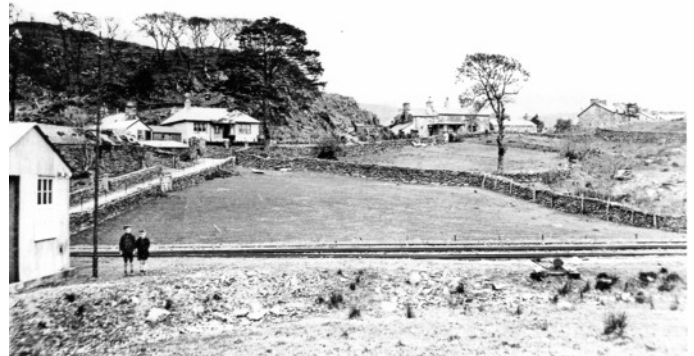


Figure 2. View of Nantmor taken from front of sheepfold, showing goods siding and difference in ground levels.

Roberts anticipated being able to sell about two trucks of coal per month, which amounted to some 16 tons. He also wanted to enter into an agreement for a piece of railway land some 30ft by 15ft on which to erect a refreshment room. He proposed to erect the building himself and to have a lease drawn up for a period in the order of 10 years. The land he had his eye on lay between the sheepfold and the station building, a site which Griffith thought to be the least inconvenient to the WHR, unless the company had other designs on it.

After all this, Roberts promptly changed his mind and by January 1st had bought a plot of ground near Nantmor on which he was to site his proposed coal yard. He did not want the wharf at the station (nor presumably the refreshment room either), but all the coal he sold would be carried by the railway.

Roberts had yet another change of mind just over six weeks later, when he was back asking about land at the station once again. Robert Evans (Audit Clerk and Accountant) wrote to Lt-Col Stephens (the company's engineer) informing him of this latest approach, and referred him to Griffith – "he will be able to give you more information on the place". The Colonel was in full agreement with Roberts' request and was prepared to let the land for 2/- per sq.ft. per annum, to which Evans pointed out that this should have been 2/- per sq.YARD per annum! Acknowledging his mistake, Stephens wrote back to Evans, enclosing a plan of the site and told him to get on with the job!

An agreement was duly sent to Roberts on 2nd March and he was asked to look through it and call to see Evans to discuss arrangements. True to form, he changed his mind once again and returned the agreement saying that he was no longer prepared to go on with his plans. Nothing further was heard from Mr Roberts and Nantmor never had its coal yard or refreshment room! However, the proposed site of the yard was used later by another Nantmor tradesman – but that is another story.

Reference:- Gwynedd Archives XD97/23120.

TRYFAN JUNCTION UPDATE

Mike Hadley has provided this updated view of our activities at Tryfan Junction, including thoughts on possible future developments.

Over the past year the Heritage Group has continued to look after the station building and its site. All developments pass through several phases: design, construction/restoration, and 'use and maintenance'. After the excellent restoration work by the late John Keylock, Lewis Esposito and others, Tryfan Junction Station Building is now firmly in the 'use & maintenance' phase.

The main aim in the relatively near future is to open the station as much as possible so that the public can see what a superb job of restoration the team did. It is too remote to simply unlock and leave for the day, so it does need someone there. Friends of Tryfan Junction has been set up to enable members and others to volunteer at the station. For the laid-back volunteer this is the ultimate job: you are able to boast to others that you spent a whole day working at TJ, when in truth you have been relaxing in the sun (well.....), listening to the cows, watching the birds and enjoying the view interspersed with the arrival of the occasional train, answering a few questions, perhaps a little light gardening followed by a snooze, repeated a few times during the day! We are even thinking of offering a prize to the volunteer who can stay awake on a sunny day!

Practically all of the visitors arrive by train, and are intrigued and have questions to ask about the station, its restoration and about the Slate Trail (the former Bryngwyn Branch). To date, for two years, our efforts have been restricted to the Superpower Weekend because during those weekends there has been an intensive service, including some heritage trains. However, it would be nice to be able to open the building on some of the 'red' timetable weekends when there are three trains each way per day. If anyone is prepared to help out/have a sleep, please let me know (contact details below).

That the building is in its 'use and maintenance' stage does not mean that further works are precluded. The



container used during the construction phase has now been moved and works are being planned:

i) Depending on our being able to obtain the materials, and sufficient volunteers, we are hoping to construct a short length of isolated track immediately to the Waunfawr side of the station building as near as possible to the site of the Bryngwyn Branch upon which we will site a few slate wagons as indicative of the trade that brought the line, and the Junction, into being.

ii) To improve the availability of information, we plan an external information board to give something of the history of the station, and, inside the building, there will be more information, particularly about the signal cabin. There is already an information board describing the Slate Trail by the entrance to the site.

iii) through the WHRS there are plans to replace much of the internal post-and-wire fencing with more traditional picket-style fencing.

We have seriously considered installing a toilet, but we have put these plans on hold for the time being, as currently there is no water supply and no drainage. We will be revisiting this option in the future.

2017 timetable:

<http://www.festrail.co.uk/timetable-whr.htm>

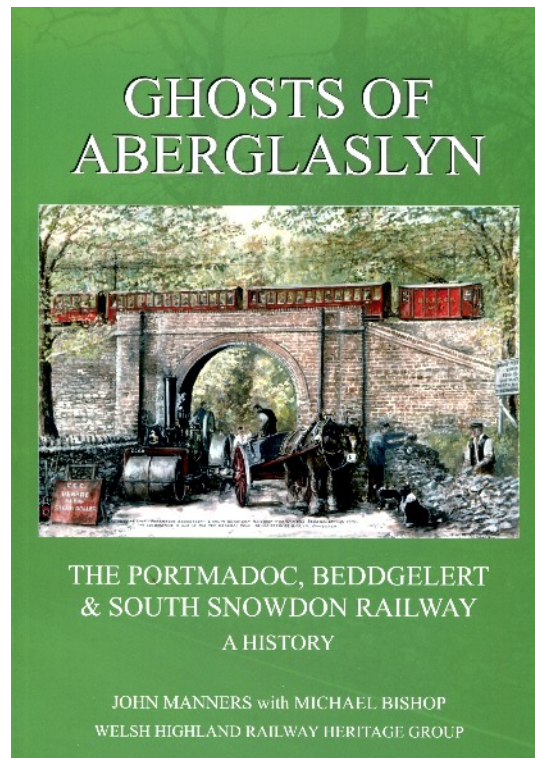
Mike Hadley

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BOOK REVIEW

Michael Davies has been reading our latest book - Ghosts of Aberglaslyn - and he has provided us with the following review.



Copies can be purchased via the website;

<http://welshhighlandheritage.co.uk/sales>

Or from;

**Welsh Highland Heritage Sales,
c/o Adrian Gray,
25 The Pound,
Syresham,
BRACKLEY
NN13 5HG.**

Your present reviewer has known and loved southern Snowdonia and its railways for more than seventy years, and so the prospect of a book devoted to that enigmatic railway, the PBSSR, was most exciting. 'Ghosts of Aberglaslyn' does not disappoint.

John Manners, a design engineer with Parsons Peebles, in collaboration with Michael Bishop, has produced a thoroughly researched and very readable account of the long drawn out attempts to connect Portmadoc and Beddgelert with Carnarvon by way of a connection between the Croesor Tramway and the North Wales Narrow Gauge Railway.

The scheme to connect these railways commenced in 1900 with the NWNGR obtaining a Light Railway Order, and the following year the Portmadoc, Beddgelert & South Snowdon Railway (PBSSR) Act was passed for an electric railway from Portmadoc to Rhyd Ddu. The NWNGR was to be electrified and extended to Carnarvon.

The newly fledged North Wales Power & Traction Company in collaboration with Bruce Peebles of Edinburgh planned a hydro power station at Cwm Dyli in Nant Gwynant which would not only supply power to the slate quarries and surrounding towns but which would provide the traction for the railway. It was to be the first hydro station in Britain.

As originally planned passenger services would be worked by motor cars similar to the Manx Electric Railway, but this was later changed to electric locos hauling conventional carriages. In fact, six machines were constructed but remained in Edinburgh, only to be finally sold for scrap during WW1. A lovely portrait of a PBSSR passenger train approaching

Beddgelert by Edward Paget-Tomlinson graces the front cover of the book.

Considerable construction work took place between the Croesor Tramway (later Croesor Junction) and Rhyd Ddu during the years 1904 – 1906 which included the famous bridge to nowhere in Beddgelert and the now waterlogged cuttings we see today from the WHR train north of that station.

The power scheme ran over budget and it quickly became apparent that the railway was unlikely to produce a satisfactory financial return. The contract was cancelled in July 1907 and Bruce Peebles went into voluntary liquidation but the NWNGR did benefit from this cancellation. Two new passenger brake compos were obtained from Pickering's and two new locomotives from Hunslet to enable this impoverished concern to continue operating their steam trains.

The book includes excellent Appendices detailing other electric railways of the period, Minute Books relating to the NWP&T Co, a bibliography, and a very detailed index.

This fascinating story is further enlivened by the characters involved. From St Helens both Windle William Pilkington (glass) and Joseph Beecham (pills) were directors and other well-known names include James Cholmeley Russell and Gowrie Aitchison.

This very readable and well researched book sets new standards for our Heritage Group publications.

Thoroughly recommended.

AMD

From the Editor

First, an apology!

The normally smooth running of the Editorial Offices faltered as our previous issue was being distributed with the consequence that Membership Renewal reminders that should have been included with *WHH73* were omitted. Despite this, a number of members have nevertheless renewed for 2017 - thank you to those who have done so! Meanwhile, reminder forms are enclosed with this Issue for those Members who have not so far renewed and who do not pay by Standing Order.

As noted elsewhere in this Journal, it is now possible to renew membership subscriptions via the Group's website.

You will note that on the Reminder Form there is a request for your e-mail addresses - we are attempting to generate as complete a list of these as possible to ease our communication with members, however we currently have this information for only about 30% of our members. Your assistance with the completion of these records would be much appreciated.

Of course, the request for e-mail addresses is directed at all members and not just those who are receiving the renewal reminders - Dick Lystor and/or Mike Hadley would be only too happy to add your e-mail addresses to our register.

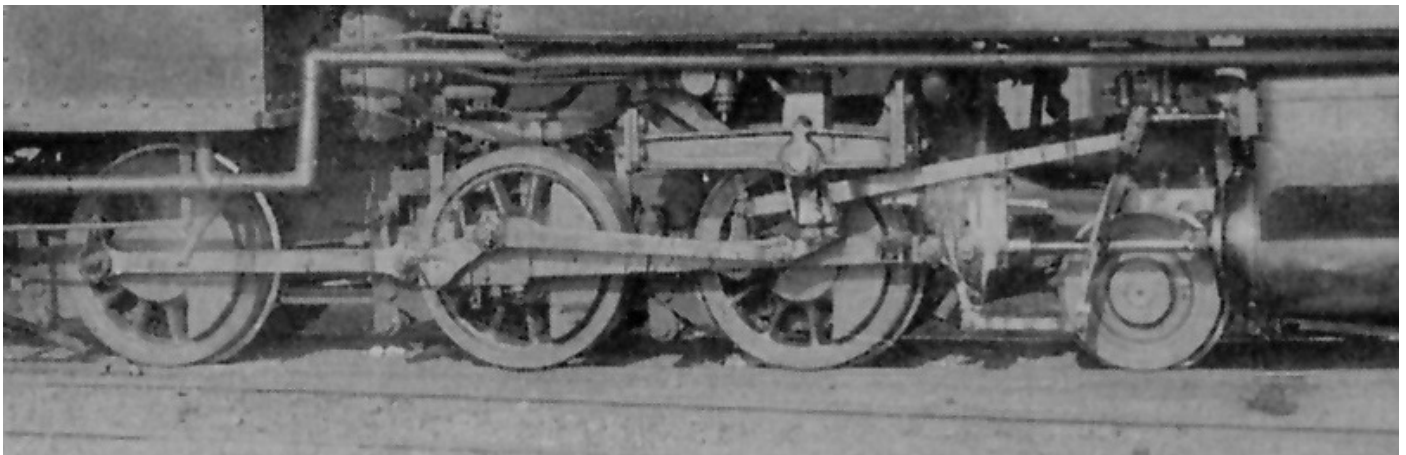
On the subject of electronic communication, some time ago now I noted the option available to members to receive their

copies of *WHH* by this means, thereby reducing our distribution costs and freeing money for other applications. There has been a gradual increase in the number of members who have opted for this option but the proportion is still relatively low.

As a reminder, our print process requires that I generate each Issue as a PDF file so an electronic copy of each Issue, suitably configured for distributing via e-mail, is readily available anyway. There is no additional effort required to generate these electronic issues but there is significant effort to be saved if distribution could be in this form rather than as paper via 'snail-mail'. I would ask any members who wish to consider this option to contact me (contact details at the bottom of page 12) with any queries they might have or, better yet, to request a switch to this form of distribution.

As well as Membership Renewal reminders, you will also find enclosed a copy of the Minutes of the 2016 AGM together with the Calling Notice for the 2017 AGM. Where relevant, I also include Membership Cards for 2017.

Finally, as with all of our *NWNGR* goods stock articles, I hope that the notes published here will prompt discussions that contribute to our better understanding this regrettably obscure subject. The response to the notes on Covered Goods Vans presented in *WHH* 64, 70 and 71 proved most useful - hopefully we might yet clarify the Slate Stock story.



Detail from a photo by A W Croughton taken at Dinas Junction in 1924 (photo WHR 216)

(Continued from page 12)

We need to exercise care when making judgements such as these precisely because we have to ensure that we understand the relationship between the main and eccentric cranks. This is especially so with the Welsh Highland as there were two locomotives with Walschaerts gear, both fitted with outside admission valves. However whereas, as we have seen here, *Russell* was fitted with eccentric cranks that 'followed' the rotation of the main cranks in forward motion, the reverse was true in the case of the *Baldwin*. As we can see in the photograph above, in all essential respects the valve gear fitted to the *Baldwin* was the same as that fitted to *Russell* except

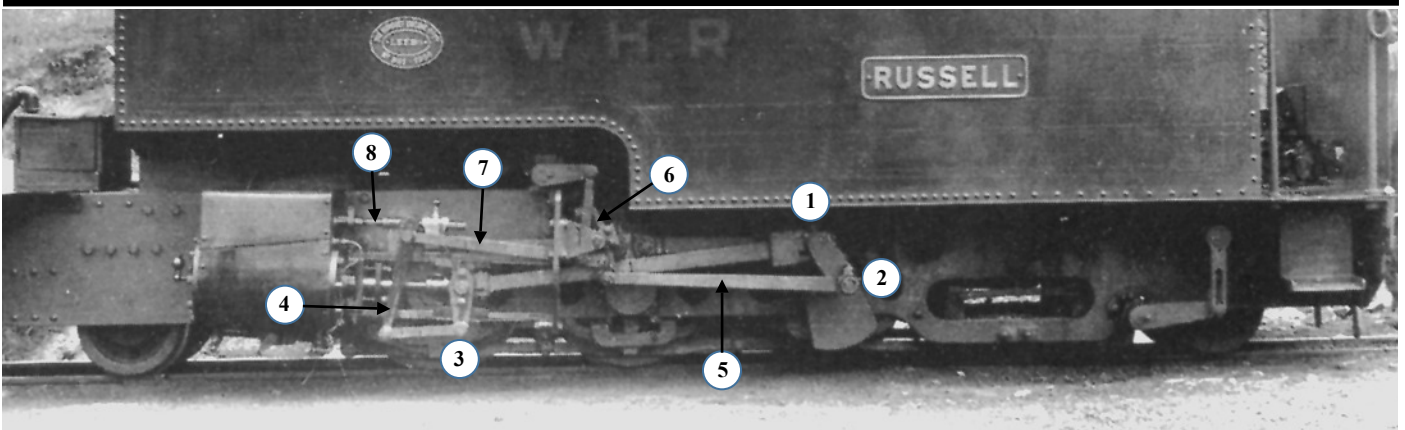
that in forward motion the eccentric cranks 'led' the main cranks.

Thus we can develop another, rather more parochial, simple 'rule of thumb':

If the two locomotives were in forward gear, on *Russell* the die block would be 'up', but on the *Baldwin* it would be 'down'.

We can judge the position of the die block most reliably by looking at the radius bar and, if we have a clear view of the valve gear, and if we remember our 'rule of thumb', we can immediately determine which gear the crew had selected.

Peter Liddell's Photo Analysis



A detail from photo WHR 158 - LPC 1659 - taken at Beddgelert in 1928

In an earlier note in this series (*WHH* 63 p 12), I used the valve gear settings on the *Baldwin* to determine that the locomotive was actually reversing when the photograph under discussion was taken. Walschaerts valve gear can be useful when analysing photographs as it reveals so much information regarding the locomotive. However, care has to be exercised when doing this so this time I thought it would be useful to highlight a few technical essentials to aid analysis. I will try not to produce a detailed technical thesis!

First some basics. Steam inlet to, and exhaust from, locomotive cylinders is generally controlled by valves of either the inside or outside admission type. The former are often described simply as 'piston valves' and the latter as 'slide valves'. If a steam engine was only required to run in one direction at a constant steam cut-off then its valve could be driven by a fixed crank nominally set at right-angles to the driving crank. I say 'nominally' because it is normal practice to allow steam admission before the piston reaches the end of its exhaust stroke (lead) and the sealing faces of the valves are typically somewhat larger than the admission ports so some small valve movement is necessary before the admission/exhaust port is opened (lap). The crank driving the valve thus has to be set at an angle other than 90 degrees to achieve this additional 'lead/lap' motion requirement.

However, if the steam cut-off is to be varied then the amount of valve travel has to be adjusted, ideally without affecting the lead/lap provision discussed above. This requires that the length of the crank driving the valve would have to be adjustable within strict angular constraints.

Finally, for the engine to run in the reverse direction the crank would have to be positioned on the opposite side of the main crank.

Walschaerts solved this variable-crank problem by recognising that a 'virtual crank' could be generated by combining the motions of two real cranks set at 90 degrees to each other. In the photograph of *Russell* above, I have identified the main crank as (1) and the eccentric crank as (2). Note how the main crank is linked by the connecting rod to

the cross head (3) and from there by the union link to the bottom of the combination lever (4). The eccentric crank drives the eccentric rod (5) which is attached to the bottom of the curved expansion link (6). The expansion link is slotted and a die block is arranged to move up and down this slot under the control of the locomotive's reversing mechanism. This die block is connected to the radius bar (7) which is therefore moved by the actions of the eccentric rod. The degree and direction of this movement are determined by the position of the die block. The radius rod is connected to the combination lever (4). The valve spindle (8) is driven by the motion of the combination lever.

If the locomotive was fitted with inside admission (piston) valves, the radius rod would be attached to the combination lever above the valve spindle. With outside admission (slide) valves that link is below the valve spindle. Thus, at a glance, we can see which type of valve is fitted to the locomotive.

The key factor to be considered when determining forward and reverse gear settings is the relationship between the main and the eccentric cranks. We have already noted that there is an angle of 90 degrees between these cranks but individual designers can choose whether they wish their eccentric cranks to 'lead' or to 'follow' the main cranks as the wheels rotate. There are simple 'rules of thumb' which allow gear position to be recognised. With outside admission valves, if the eccentric 'leads' the main crank then in forward gear the die block would be in the lower half of the expansion link. If the eccentric 'follows' the main crank then in forward gear the die block would be in the upper half of the expansion link.

If we look at the photo of *Russell* above we can see that if the loco were to move forward, i.e. to the left, the eccentric would 'follow' the main crank as the wheels rotated. However, the die block is clearly in the lower half of the expansion link from which it follows that the loco was in reverse gear when the photo was taken. As the loco was waiting to depart to the right towards Dinas this is unsurprising.

(Continued on page 11)

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