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Main Line

National Model Railroad Association Inc.

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Australasian Region

April, May, June 1997

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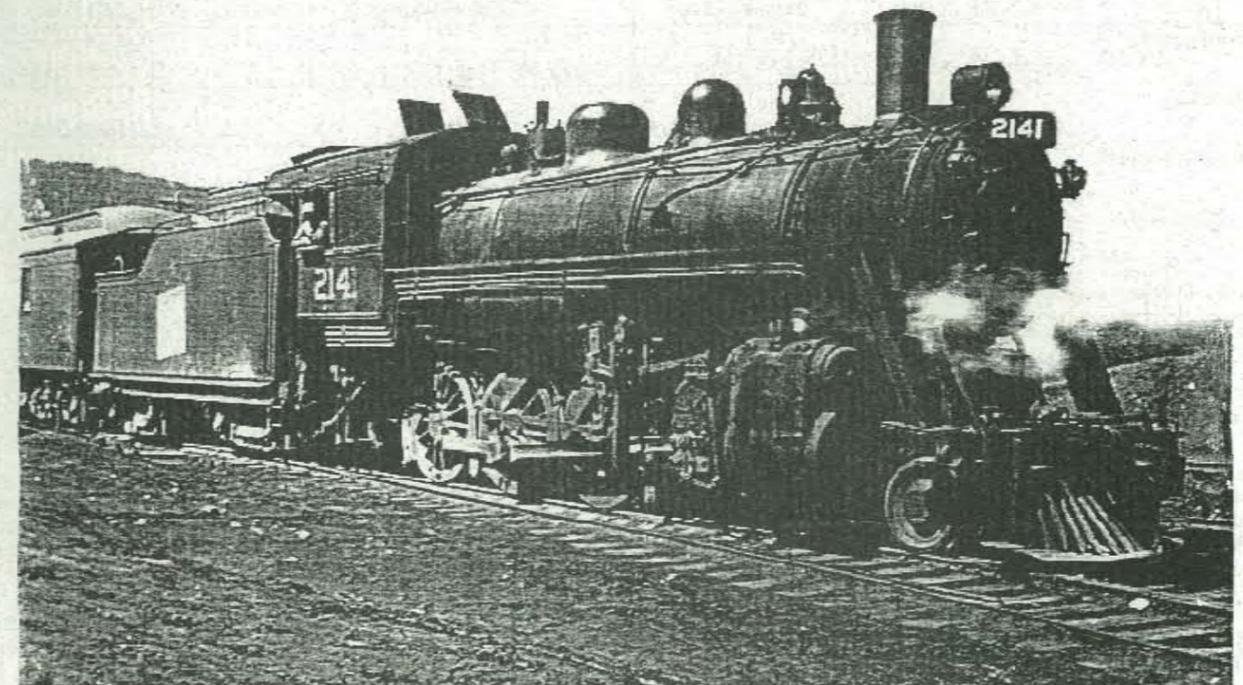
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Australasian Region Convention '97

7th 8th 9th June

Have You Registered Yet?



Canadian National Railways 2-8-0 2141, Train 381, at Leyland on the Alberta Coal Branch, 14 May 1838
Credit: Rev C D (Dwight) Powell, A C Lynn Zelmer collection.

Australasian Region Directory
 NMRA Inc. P.O. Box 714, Willoughby NSW 2068
<http://www.iinet.net.au/~espee/ar.html>

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Main Line is the official journal of the Australasian Region of the National Model Railroad Association Incorporated. It is published four times per year in approximately February, May, August, and November. Articles, letters, member's classified advertisements and club notices are solicited from the membership and are considered to be donated free for the benefit of the hobby. They should be mailed to:- THE EDITOR, Main Line, 7 Booralie Road, TERREY HILLS, N.S.W. 2084. Articles can be submitted on a computer disk 3.5" or 5.25". Most WP packages can be read at this time.

This magazine is prepared on a 486DX4(100) computer (1.6gb HD) running under Windows 95 and prepared on a Lanier 1110 MFD using Office '97; True Type Fonts. Articles can also be sent to my Email address as shown above. Paid advertising is welcomed. Current rates for four issues are \$130 for a full page, \$70 for a half page, \$40 for a quarter page and \$150 for the back cover. All enquires regarding advertising should be directed to the Editor.

REGIONAL SCHEDULE

17 th May Ian Henderson 2.00pm	Mosman NSW 7 Mitchell Road (02) 9969 2815
17 th May Graeme Hodgson 2.00pm	Queanbeyan NSW 15-11McKeahnie St
18 th May (Sunday) Peter MacDonald 2.00pm	Bachus March Vic 4 Boyd Street (03) 5367 3601
24 th May Family BBQ 2.00pm	Mudgeeraba QLD 25 Berrigan Road

7th - 9th June Marayong NSW
ALL weekend
John Paul High School
AUSTRALASIAN REGION
Convention

13 th July (Sunday) Don Davis 2.00pm	King's Park 5 Wake Street (02) 9671 4351 Park in Madagascar Drive
20 th July (Sunday) Gavin Hince 2.00pm	Hopper Crossing Vic 16 The Glades (03)9749 6974
17 th August (Sun) Graham Meyer 2.00pm	Emerald Vic 2 Elizabeth Court (03)
21 st Sept (Sunday) Laurie Green MMR 2.00pm	Sunbury Vic 20 Nambour Drive (03) 9744 5188

EASTER 1998
Narrow Gauge Convention
Black Heath NSW

WAY BILL

Platform 3 Presidents Report	Fred Gill MMR
Division 2 Reports	John Gilles
Platform 4 Division 4 Reports	Geoff Truman
Sydney Reports	A. N. Other
Platform 5 Next Regional Trustee	Phil Knife MMR
Platform 6 Trustee Nomination Form	Phil Knife MMR
Platform 7 Big Time Railroding, Pilbara Style	Phil Knife MMR
Platform 10 Baldwin Locomotive Works	Laurie McLean

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There is still time
for you to register
for the
1997 Convention
in Sydney.

From The Presidents Desk

Well, it's almost here, the 1997 Australasian Region's Convention in Sydney. This is the first time in our Regional Convention history that two well-known and respected USA Model Railroad Authors will be presented together on our Convention Program. To date there has only ever been one USA visitor at our Sydney conventions and we feel proud that both Bob Hayden and Dave Frary accepted our invitation. To us narrow gaugers it is especially good news as we will be able to chinwag over our particular narrow gauge views on the hobby. Please don't miss out on this great opportunity to meet these guys in June.

You may remember that the Australasian Region was presented with a plaque for 'The Best Performing Region in the Achievement Program for 1995-1996' at our December meeting in Sydney last year. I currently don't know how our region is progressing for 1996-1997 as the period is from July 96 to the end of June 97. But the region has achieved a record in its own right. For the first time ever we have had three members reach MMR status in the past year. They are Roger Hoad (NSW), Gavin Hince (Vic) and Ken Scale (NSW). Congratulations go out to these AP participants for reaching their goal. Thank you Gentlemen, I'm proud of you all. This now gives the region a total of nine MMR's since the AP was introduced in our region.

See you all at the Convention

Fred Gill MMR

Division 2 Reports

By John Gillies

25 January

Summer and a long weekend usually means that a large number of Canberra region residents head off to the South Coast for some sun, surf and sand. When given the choice of the Coast or the first NMRA meeting for the year, especially if the legendary hospitality of Peter Weller-Lewis is an added incentive, the choice is easy. Most of the active Canberra region members turned up along with Reid McNaught who was visiting his old stomping ground while in Australia for a short period. Old and newer members alike caught up with Reid's Northern Pacific modeling activities in New Zealand (I was surprised to find later that Reid and myself constitute 40% of the Australasian membership of the Northern Pacific Railway Historical Association).

After an operating session on the Buffalo Creek and Gauley and discussing the dismantling of the

remainder of Elk Run, Peter gave a run down on the plans for his new Chesapeake and Ohio layout which he shared with *Main Line* readers in the January-March 1997 issue. We all look forward to Peter's future labour of love as he recreates his beloved C&O in the transition period of late steam and early diesel. We then adjourned for a BBQ and afternoon tea along with more discussions of rail related activities. A most pleasant afternoon was completed with videos in the lounge.

Thanks again to Peter and Jenice.

22 February

On a very hot and windy afternoon we gathered at Tony Payne's and witnessed the considerable progress Tony has made in adding additional rock castings and ground covers to the Mid Atlantic. Tony has accomplished a tremendous amount in the last few months, which has resulted in some major changes to the lower level with the incorporation of a large radius helix to connect the two levels. After a little cleaning of the helix tracks, a successful operating session was held until we retired to the air-conditioned comfort of the lounge room.

Bob Kollwyn graciously scheduled a visit to his sister's over the same weekend so that he could bring the "how to" books and videos and inform Division 2 members on the workings of the NMRA library. This was greatly appreciated by those present and he left with a lighter load. Around a dozen videos and a couple of books are doing the rounds in the Canberra region at the present time as we increase our knowledge and skills thanks to Bob's generosity. Perusal of Bob's offerings, afternoon tea, wide ranging discussions and a further operating session concluded a convivial meeting at the Payne's.

Thanks again to Tony and June.

15-17 March

Over the Canberra Day long weekend the NMRA manned an exhibit at the annual National Model Railway Exhibition Group organized exhibition. Our exhibit consisted of two display cases containing samples of the handiwork from Division 2 members.

A brisk trade was done informing the public about our models, the NMRA and its benefits and getting in a few plugs for the upcoming Sydney convention. At least one new member was recruited and Gerry Hopkins MMR won the best layout award.

Congratulations to Gerry and thanks to Rob, Mal, Stephen, Stewart, Charles, Tony and Peter for generously donating their time and models.

22 March

We journeyed South to John Prattis' Lithgow Zig Zag layout and were suitably impressed by the further expansion of scenery and completion of layout wiring. This enabled a lengthy operating session where everyone got the opportunity to run a train or two around the layout, usually with one operating in each direction with skillfully managed use of the passing sidings. The Zig Zag performed flawlessly as operators accustomed themselves to the layout and several used the meeting as an opportunity to exercise recent trackage rights agreements for their equipment. A couple of Spectrum doodlebugs were observed successfully climbing the 1 in 40 grades of the Zig Zag in search of passengers.

A session using John's Timesaver module provided entertainment prior afternoon tea during which a number of topics were discussed, including the Sydney convention at which point those who hadn't registered were convinced to do so in the near future! A number of the NMRA library videos were exchanged before we returned to the layout for a further operating session.

Thanks to John and Julie for their hospitality.

19 April

Ken Macleay welcomed members, including newcomer Grant Cooper, to the C&O Big Sandy River Division for an entertaining afternoon of operation and camaraderie. Ken had added some further rock work and scenery on his lower level and begun adding colour and texture to the hillsides.

A new coal mining facility was also visible above the helix on the upper level. New trackage had appeared since our last visit and Ken described recent and planned activities, including details of his construction techniques.

A number of C&O trains, both freight and passenger, toured the layout under the controls of eager volunteers. Ken operated a couple of trains behind his new C&O Pacifics - as usual everything worked like clockwork. A number of budding dispatchers controlled the routing of the trains as we further increased our familiarity with Ken's excellent handiwork.

Breaks for afternoon tea enabled members to peruse a range of magazines and books on hand, exchange the NMRA library videos, and discuss a wide range of topics such as C&O scenery, N gauge tram gearboxes and trials re-motoring Con-Cor SD35s. A final operating session took place before it was time to leave.

Thanks again to Ken and Carol for their hospitality.

Division 3 Report

Our November meeting, and the last for the year, was hosted by Graham Meyers at Emerald. Just down the road and across the lake is Lakeside - the terminus of Puffing Billy. Graham put on such a large spread that the walk to the Wright Trestle was a must. It was a very pleasant walk taking us about an hour and a half. We heard the whistle of a diesel being used to haul a works train. By the time we arrived it had departed and it returned after we had left. Volunteers were clearing the scrub back to the tree line.

The trestle was rebuilt to last with colourbond cappings on the timber and steel stirrups set in concrete holding the trestle bents. Graham said they drove concrete trucks to the site to pour the bridge foundations.

When we had returned to the level crossing at Lakeside, Graham told us the volunteer crew were prisoners doing community work for Puffing Billy.

During the afternoon members showed a few of their latest projects.

- Ken Morecroft brought along a selection of his maintenance of way vehicles that had been designed to clean the track.
- Laurie Green MMR showed his latest purchases from Caboose Hobbies.
- Peter MacDonald produced the engine shed he is building for the Sunbury MRC's layout.
- Steve Cullen had a finished timber wagon based on his key steel chassis.
- Graham was finishing off a vertical boilered steam engine.

Thanks to Graham and family for their hospitality.

Geoff Truman

Sydney Meeting Reports

WHO WILL BE OUR REGION TRUSTEE?

Phil Knife MMR

When I was a youngster, I used to think that a "trustee" was a jail prisoner who could be trusted with special privileges. Our present Region Trustee, John Saxon, perhaps feels a bit that way, as he has been in that role since our Region was first formed in 1984 - almost like a prisoner to the role! Maybe so, but I'm sure that John would admit to having enjoyed his role, and a sense of pride in representing Australasia in the NMRA halls of power in the USA. For his services to the Region and the NMRA at large, he has been awarded Honorary Life Membership. But John insists that he will be stepping down at the end of his present term. I mention all this, because the time has come for us to prepare to elect our Trustee to take office in March next year. I have been given responsibility once again for conducting the election in this Region.

Let me begin by spelling out briefly what the duties of the Region Trustee are, and some thoughts on qualifications needed. Obviously we need the right person in this role if it is to be carried out properly. Perhaps you are that person, or you are aware of someone who might be. Anyway, here is what is involved:

- The Trustee must be a current, active, committed member of the NMRA.
- The Trustee is the representative of the Australasian Region on the NMRA Board of Trustees (BOT), which is the executive, or governing, body of the Association.
- The Trustee is expected to attend the half-yearly BOT meetings (invariably in the USA) in February and July (in conjunction with the National convention).
- The Trustee is responsible to the parent NMRA for the oversight of operation of the Region.
- The Trustee is a member of the Board of Directors (BOD) of the Region.

This has a number of implications for potential Trustee candidates. The most obvious one is financial. Overseas travel twice a year becomes a limiting factor, but the NMRA does currently reimburse the airfare (at the cheapest excursion rate). Apart from paying the airfare up front to begin with, the normal

minimum stay in the USA is seven days, requiring hotel accommodation and meals. And there's the temptation to spend up big at local model shops! Trying to prise a ball-park figure out of John Saxon, the *minimum* outlay is about \$3000 per year (plus having the \$2000 or so air fare up front each time to begin with.) The second, and probably more important, implication is that the Trustee must be up to speed on our own Region activities, and have a good working knowledge of the NMRA as a whole. This will involve regular attendance at BOD meetings, which at present are held in Sydney.

Now there may well be someone out there who has the time and financial resources to attend both BOD and BOT meetings (and who does not necessarily live in Sydney - after all business and government people do this sort of thing all the time). Coupled with a genuine regard for the objects of the NMRA and a willingness to be involved in the running of a truly international organisation, this is a wonderful opportunity for the right person. In this issue of *Main Line* is a nomination form, which must be signed by the nominator, seconder and the candidate - and it goes without saying that all three must be members of the NMRA in good standing who live within the Region (although not necessarily members of AR). However, anyone who is interested in volunteering please contact me, and I will attempt to find nominators and seconders. Please read the notes accompanying the form.

Nominations close on 15 October 1997.

ooooOooooOoooo



ELECTION OF AUSTRALASIAN REGION TRUSTEE

Nominations are hereby called for the position of AUSTRALASIAN REGION TRUSTEE to take up office on 31 March 1998 for a term of two years. Details of this position are contained in the article *Who will be our Region Trustee?* elsewhere in this issue.

All nominations must be on the form below (or a photocopy), and must be signed by the nominator, seconder and candidate. All three of these persons must be members in good standing of the NMRA resident in the Australasian Region. Each candidate for nomination must submit the following Candidate Personal Information with the nomination form:

- A statement of qualification for the position of Trustee.
- A personal platform statement of no more than 250 words (which will be provided with ballot papers to all members, should a ballot be necessary).
- A photograph of the candidate.

Closing date for nominations

is 15 October 1997.

Nomination forms and Candidate Personal Information must be sent by this date to:

Phil Knife MMR
The Rectory
Samson Way
Karratha WA 6714
☎ (08) 9144-2594

NOMINATION FOR AUSTRALASIAN REGION TRUSTEE

I wish to nominate the following member of the National Model Railroad Association resident in the Australasian Region for the position of Region Trustee:

Please use block capitals.

NAME:
ADDRESS:
PHONE NUMBER:

NOMINATOR'S NAME:
NOMINATOR'S SIGNATURE

SECONDER'S NAME:
SECONDER'S SIGNATURE:

DECLARATION BY CANDIDATE:

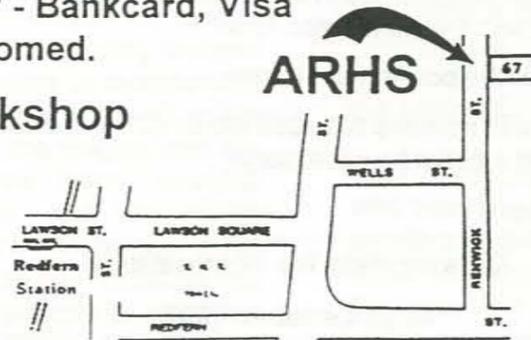
I, the above-mentioned candidate, agree to be nominated for the position of Region Trustee. My Personal Candidate Information is attached to this nomination form.

SIGNATURE: DATE:

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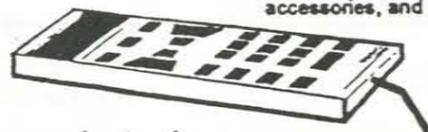
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ANTON'S TRAINS

For Scale Model Railways

"Put her in the first notch, then release the independent," he said. The engine note changed, and very, very slowly the two big Dash-9's started moving the two hundred and thirty iron ore empties. The End of Train device showed the brake pipe pressure at the last car to be the same as at the loco. "Up another notch!" he said, and we slowly moved into the sunshine. Our train was heading south, out of Seven Mile Yard, with a rake of empties for Tom Price. Seven Mile Yard is on a very slight gradient down towards Dampier in the north, so our south-bound train was sitting upgrade, nicely stretched out with all brakes off and held only by the independent brakes on the locos. "Another couple of notches," he said, as we approached the end of the yard. Up ahead the signal showed green, we gave her another notch, and moved out onto the double track main at about twenty kilometres an hour. Immediately we took the crossover for the right hand track, but both tracks are signalled for bi-directional running anyway. Once over the crossover he gave us the OK to push the throttle up to notch eight, and the big diesels really began to throb! In spite of the up-grade, we were soon accelerating towards our permitted speed for this journey of seventy kilometres per hour. The bright colourful displays in front of us showed that all was OK with our locos and train, so we sat looking ahead as we waited for the end of the double track at Broлга, about twenty kilometres ahead.

Was I really driving a train on Hamersley Iron's four hundred kilometre long railway in the Pilbara region of Western Australia? Yes - well almost! We were in the highly sophisticated locomotive simulator at Hamersley Iron's railway headquarters facility at Seven Mile, near Karratha. Richard, our friend and guide and Hamersley train driver, was showing a small group of us around the Seven Mile facility. There, as well as the railway headquarters and operations centre, is the company's main workshops. And nearby, at Dampier, are the huge iron ore ship loading facilities. There, the two hundred and twenty-six car trains of ore are unloaded two at a time in two rotary car dumpers. Each car carries one hundred tonnes of ore, so you can see how massive the whole operation is.

Until two years ago, Hamersley was a major user of Alco locomotive power. Although in more recent times the company had bought small fleets of EMD SD-50's and GE Dash-7's, the mainstay of the fleet has been the Alco Centuries since the railway began in the 1960's. Initially C-628's, then finally C-636's, the Alco's kept going and going. During the 1980's Hamersley rebuilt the majority of their C-636's with updated control equipment and new, roomy, air-conditioned cabs - known locally as the "Pilbara Cab", and not unlike the cabs on the NSW 82-class locos. Regrettably, all the Alco's are now lined up in a graveyard at Dampier awaiting a buyer. However, one has been preserved in working order at the Pilbara Railways Historical Society's museum at Dampier, and is used for fan trips. It even gets borrowed by Hamersley occasionally for a spot of yard shunting! But now, Hamersley runs only one class of locomotive, the twenty-nine General Electric C44-9W's imported from America two years ago. These are stock standard six-motor GE's, with only very minor modifications. The main visual difference between these locos and those running on American railroads is in the shape of the windshields. The Hamersley locos have a windshield more like those of the competing EMD SD-70's. Both Athearn and Kato produce models in HO of the C44-9W, and I believe that Hamersley decals are available.

Hamersley is a very professionally-run railway, and their maintenance standards for both stock and track is of the highest order. This year their target is to ship fifty-four million tons of iron ore through Dampier, and indications are that they will exceed that target. The railway runs over three hundred kilometres from Dampier, the port, to Tom Price, with three major branches to other mine sites. This requires crossing the Hamersley Range in both directions, and loaded trains from Paraburdoo are banked from the mine up to the main line junction. Trains are standard length and require two Dash-9's for each. Single manning is now the rule, so there is only one person on each train. The locos, of course, have an operator alert device which has to be cancelled every few minutes, otherwise the train stops. Train control is by

CTC from Seven Mile, with colour light signals and radio despatching. Next year the plan is to change over to in-cab signalling to replace the lineside signals (and those who maintain them). All people work a twelve-hour shift, four days on and four days off, as this is a round-the-clock operation.

At Seven Mile every train is inspected before departure, and "bad order" cars replaced. This requires a lot of shunting, usually done by a pair of Dash-9's. However, a small pool of SD-50's and Dash-7's is kept on standby, and they see occasional use in lashups of three. Out on the road, there are hot-box detectors at regular intervals, and these automatically report the condition of each train as it passes by radio to the driver. If a hot box is detected, the train is stopped and the driver walks back to inspect it. If it happens to be the last car, he has a 2.3 kilometre walk each way! Bad order cars are left in a siding for collection later - and note that, with single manning, the driver does all his own shunting and uncoupling! Mind you, on a well-maintained railway like

Hamersley, such occurrences are not commonplace.

For those who may be visiting this part of Western Australia, the Pilbara Railways Historical Society museum at Six Mile, between Karratha and Dampier, is well worth a visit. They have a collection of locos from all four Pilbara iron ore railways, with such gems as Alco C-415, C-628, C-636, S2 and RSC3 (ex-NSWGR 4002), EMD F7A, English Electric Bo-Bo and, of course, the ex-GWR 4-6-0 "Pendennis Castle". Also, the Society runs a number of trips on the Hamersley Iron railway, using ex-NSW passenger cars and two of the museum locos. The best trip is in late August, with an overnight return run to Tom Price.

Both Kathy and I have joined the Historical Society, and it makes a change to be working on 12 inches to the foot models! If anyone is planning a visit to this area, please let me know by a letter, or by e-mail to pknife@ozemail.com.au, or you can phone me on (08)9144-2594.

Phil Knife

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CMA Track Stop - \$11-95
Rix Maxwell Ave. Series - \$19-75
Rix 150' H'way Overpass - \$62-50

Good stock Walthers Cornerstone and Micro Engineering Kits.

'N' Thrall Well Cars MDC - 12 pack \$155-50
'HO' Stewart 70 tonne Hoppers - 6 pack \$114-50 Santa Fe , Southern Pacific [T.N.&O.]
Accurail 40' Boxcars - 3 pack \$48-00
Southern Pacific Silver Overnight
Burlington Northern Green.

Its Tool Time

Mascot Binoculars 2 1/2 X Magnifier - \$35-00
Mascot Swivel Head Pin Vise - \$12-60
Scaleways Work Cradle - \$12-50
Kadee Spring Pin - \$3-60
Hodgkinson Kadee Trip Pin Adjuster - \$28-00
Xuron Rail Nippers - \$23-75
K-Tool Grade Gauge - \$23-75
Tamiya Straight Tweezers - \$7-95
Tamiya Cutting Pad - \$10-75
CTT Scale Rules O/S/HO/N - \$5-60
NWSL Sanding Stick 120/240/320/400/600 grit \$6-30 ea. - Replacement Strips - \$1-90 ea.
NWSL Chopper - \$49-00
NWSL True Sander - \$56-00
NWSL Dupli-Cut - \$42-00
X-Acto No! Knife - \$4-90
#11 & # 17 blades - \$3-95
X-Acto Deluxe Saw/Knife Set - \$31-50
X-Acto Mitre Box - \$16-80
Razor Saw Set - Handle + #239 Saw - \$14-70
X-Acto Vacuum Vise - \$18-50
Badger #200 Air Brush & Accessories - \$149-00

Kits - HO

IHC Water Tower - \$20-75
IHC Crossover/Signal Bridge - \$18-50
IHC Freight Station - \$30-75
IHC Arlee Depot - \$22-50
IHC Interlocking Tower - \$31-50
IHC Country Barn - \$14-70
IHC School House - \$12-95
IHC Water Bridge - \$12-95
IHC Old Time Gas Station - \$22-50
IHC Sand & Fuel Depot - \$24-50
IHC Rico Station - \$32-50
ConCor Yardmasters Office - \$12-75
ConCor Engine Crew Shanty - \$12-75
2 Stall Engine House - \$31-50
ConCor Weekly Herald - \$31-50
Summer Stock Theater - \$31-50
ConCor Sandhouse/Diesel Fuel Facility - \$31-50
ConCor Island Creek Coal Company - \$33-60
ConCor Hillsborough Gravel Company - \$42-00
America Classic Euston Mill - \$72-00
America Classic Deer Creek Way Sta. - \$19-95
Bachman Plus Coal & Sanding Facility - \$42-00
Bachman Plus Lyric Theater - \$32-50
Bachman Plus Texaco Gas Station - \$34-50
Bachman Plus Frankford Junction - \$39-95
Bachman Plus Diesel Sanding Facility - \$42-00
Bachman Plus Diesel Fueling Facility - \$42-00

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**NARROW GAUGE LOCOMOTIVES
OF THE BALDWIN LOCOMOTIVE WORKS
BURNHAM, PARRY, WILLIAMS & CO.**

1877

BY LAURIE McLEAN.

In the many books & publications we as modelers read, we sometimes come across old & historic information that appears strange however we don't fully stop to think about such material.

As modelers we pride ourselves about a basic knowledge of Locomotives, their class, wheel configuration, dimensions, weight & tractive power. This becomes the common talking point of many of our discussions so that we can communicate to each other & provide our listener with a clear picture of what we are explaining.

The origin & history of classifying early Baldwin Locomotives was learnt whilst researching one of my old books of last century which explained the way Locomotive manufacturers expressed their products to potential purchasers. It made for interesting reading & provided invaluable accurate information of the time. This information was in the form of letters sent to Burnham, Parry, Williams & Company from railways that purchased their locomotives & provided feedback on the performances of their engines. Not only do these letters provide operation, but they also include the freight & passenger traffic, loads & car types, grades & much more that may interest many early railroad enthusiast & modellers.

I have extracted much of this information so that it may well assist some of you and if further details are required then please write care of the editor.

It must be understood that in the 1870's an enormous push west was occurring in the United States of America & boom times & mineral wealth was there for those who could reach the rich areas.

Men formed companies to mine the minerals & many needed to use rail transport to get ores to mills & smelters. The period was very aware of time & money & acted with great speed so as to provide quick returns to investors & profits on their outlay.

Locomotive manufacturers needed to publish catalogues & books with their products to mail to interested parties so they could determine which type of Locomotive would provide the motive requirements for their particular situation. It must be remembered that the majority of these potential customers were spread over the many new states & territories & indeed countries.

The Baldwin Locomotive Works was in Philadelphia Pa. with six men controlling the works in 1877.

They were; George Burnham, Charles T. Parry, Edward H. Williams,
William P. Henszey, Edward Longstreth & John H. Converse.

The following information is taken from the *original Locomotive Publication of 1877* which I have in my library. The book is hard bound with gold leaf printing on the cover & has original photographs of the Locomotives as built, & pasted onto pages at each class description.

This may help in understanding the way early Locomotives were designated.

CIRCULAR.

We present herewith photographs and figures showing the patterns, dimensions, and tractive power of various classes of locomotives for narrow-gauge railways.

All the classes of locomotives specified can be built for the United States standard narrow gauge of three feet, the South American standard narrow gauge of one metre, the Canadian standard of three and one-half feet, or for any intermediate or wider gauge.

All work is accurately fitted to gauges and templets, which are made from a system of standards kept exclusively for the purpose. Like parts will, therefore, fit accurately in all locomotives of the same class.

This system of manufacture is a distinctive feature of these Works. Its value and importance to the *users of locomotives* cannot be overestimated. By its means the expense of maintenance and repairs is reduced to a minimum. A company whose railroad is equipped with our locomotives may save, almost wholly, all outlays for shops, machinery, drawings, and patterns for their repairs. The necessity of maintaining for the same purpose an organization of skilled workmen at a constant expense is also obviated. Every important part of the locomotive being accurately made to the same templet, we can at any time supply a duplicate part, made to the same templet, which is sure to fit in the place of the original. The large number of locomotives at all times in progress, and embracing the principal classes, insures unusual and especial facilities for filling at once, or with the least possible delay, orders for such duplicate parts.

It will also be apparent that a company procuring its equipment of motive power at these Works, can, at the same time, supply itself with a limited stock of duplicate parts sufficient for all repairs likely to be required. An expenditure of a *few hundred dollars* in this manner will provide more fully and perfectly for all ordinary contingencies than would a large investment of capital in shops, machinery, and organization designed for the same purposes.

The important saving possible by this method will manifest itself in two directions:

1. The first cost of the necessary parts for repairs will be from 25 to 50 *per cent.* less than if made in the company's shop. We are constantly producing such parts by workmen trained by long experience in each specialty, and hence with the greatest economy in expenditure both of labor and material.
2. The services of the engine are lost for the shortest possible time while undergoing repairs. Having already on hand the necessary part, the master mechanic can at once apply it.

Otherwise a force of workmen must be maintained at a constant and large expense in order to be in readiness to manufacture the required parts when the occasion arises; and when the demand comes, time while perhaps drawings or patterns are made, and from them the proper parts constructed and fitted in place.

The *loads* given under each class are invariably in gross tons of 2240 pounds, and include both cars and lading. All the locomotives described are sold with the guarantee that they will haul the loads stated on a straight track in good condition, assuming the resistance of the cars is not to exceed ten pounds per ton of 2240 pounds of their weight.

Designs and estimates for any other required patterns of locomotives will be submitted on application. The delivery of locomotives at any point which can be reached by rail or vessel will be included in contracts if desired.

EXPLANATION OF CLASS DESIGNATIONS.

Each class of locomotive is designated by two figures, or set of figures, separated by a hyphen, and combined with the letter C, D, or E. The figure before the hyphen indicates the whole number of wheels under the locomotive; the figure after the hyphen, the diameter of the cylinders, thus :

The figures	10. 1/2	are used to designate the cylinders 8 inches in diam.
"	11 & 12	" " " " 9 " "
"	14	" " " " 10 " "
"	16	" " " " 11 " "
"	18	" " " " 12 " "
"	20	" " " " 13 " "
"	22	" " " " 14 " "
"	24	" " " " 15 " "

(The fraction 1/4 added to any of these figures indicates that the locomotive has a truck at each end, making it a "Double-Ender." The fraction 1/2 indicates a special class.)

- The letter C indicates that 4 wheels are connected as driving-wheels.
- The letter D indicates that 6 wheels are connected as driving-wheels.
- The letter E indicates that 8 wheels are connected as driving-wheels.

Thus, 8-14 C means an 8-wheeled locomotive having cylinders 10 inches in diameter and 4 driving-wheels ; 8-16 D , an 8-wheeled locomotive having cylinders 11 inches in diameter and 6 driving-wheels and 10-22 E , a 10-wheeled locomotive having cylinders 14 inches in diameter and 8 driving-wheels.

The book now commences to list the classes.

NARROW-GAUGE PASSENGER LOCOMOTIVE.

CLASS 8-14 C.

(General design illustration by photograph of the "No. 2," on opposite page)

CYLINDERS	10 inches diameter , 16 inches stroke.
DRIVING-WHEELS	38 to 42 inches diameter.
TRUCK-WHEELS	24 inches diameter , with centre-bearing swinging or sliding bolster.
WHEEL BASE, TOTAL	18 feet.
" RIGID	(distance between driving-wheel centres) 6 feet 9 inches.
TENDER, FOUR-WHEELED	tank capacity, 700 gallons.
" EIGHT-WHEELED	" " 1000 "

WEIGHT OF ENGINE IN WORKING ORDER.

On drivers	22,000 pounds.
On truck	11,000 "
Total weight of engine	33,000 "

LOAD

In gross tons of cars and lading.

On a level	525 gross tons.
" 20 feet grade	245 " "
" 40 " "	150 " "
" 60 " "	105 " "
" 80 " "	80 " "
" 100 " "	65 " "

*(The above Locomotive is a 4-4-0 American as we know it today)

*(Without reproducing the whole list, I will list the remaining Classes as they appear:)

NARROW GAUGE PASSENGER LOCOMOTIVE.	CLASS 8-16 C 36,000 POUNDS.
" " " "	8-18 C 40,000 "
" " " "	8-20 C 45,000 "

REMARKS

The four preceding classes of locomotives are designed especially for passenger service, and can be run at speeds of from 25 to 40 miles per hour.

Classes 8-14 C and 8-16 C are adapted for service on light rails weighing 30 to 35 pounds per yard. For service on tracks laid with heavier rails, Classes 8-18 C and 8-20 C are recommended. It may be noted, however, that the locomotive "Schuylkill" (photograph on page 10), Class 8-18 C , was run on 35 pound rails on the narrow-gauge passenger railway in the Centennial Exhibition grounds, from May to November 1876.

On the Nevada Country (3 feet gauge) Railroad, of California, on which the maximum grade is 116 feet per mile, a locomotive of Class 8-16 C hauls six loaded eight-wheeled cars. Weight of each loaded car, 9 gross tons. Total weight of train, 54 gross tons.

On the Camden, Gloucester and Mount Ephraim Railway, 3 feet gauge (laid with 30 and 35 pound rails), a locomotive of the same class has hauled five loaded eight-wheeled freight cars and two loaded passenger cars up a grade of 110 feet per mile. The usual is two passenger cars, with which the is made from Gloucester to Camden, two miles, in eight minutes, making one intermediate stop, and running slow into the city of Camden. One curve of only 120 feet radius occurs on entering Camden.

On the Denver and Rio Grande Railway, passenger locomotives of Class 8-16 C take the regular passenger trains of three cars at a speed of 20 miles per hour on all grades, the maximum being 75 feet per mile. For full particulars of their performance on this line, see letter of W.W.Borst, Superintendent, on pages 25 and 26.

On the Eureka and Palisade Railroad (3 feet gauge) , of Nevada, a locomotive of Class 8-18 C , with one passenger coach attached, made the run from Palisade to Eureka, 90 miles, in two hours and thirty-eight minutes, nearly all the distance being up grade, viz.: 52 feet per mile for 35 miles, 75 feet per mile for 8 miles, and 105 feet per mile for 3 miles. Average speed, 34.17 miles per hour.

We subjoin copy of a statement by the General Manager of the Centennial Narrow-Gauge Railway, showing the performance of a passenger locomotive of Class 8-18 C , and of a freight locomotive of Class 8-18 D , on the Narrow-Gauge Railway in the Centennial Exhibition grounds from May to November, 1876:

*WEST END PASSENGER RAILWAY CO.,
Philadelphia. November 30, 1876.
Messrs. Burnham, Parry, Williams & Co.,
Baldwin Locomotive Works, Philadelphia.*

Gentlemen:

During the Centennial Exhibition we have had in use on our three-foot gauge railroad two of your locomotives, one being Class 8-16 C, and one Class 8-18 D, both of which have given entire satisfaction under such circumstances as locomotives are seldom made to perform.

These engines came under my daily supervision and did their full share in transporting over four millions of passengers on this now famous little railway.

The gauge of the line was three feet , with double track three and a half miles long, or seven miles in all. For its length it was probably the most crooked road in the world, being made up almost wholly of curves, in order to run near all the principal buildings on the Exhibition grounds. Many of these curves were on our heaviest grades, some having a radius of 215, 230, and 250 feet on grades of 140 and 155 feet per mile. These are unusually heavy grades and curves, and when combined as we had them, with only a 35 pound iron rail, made the task for our engines exceedingly difficult.

Your locomotive "Schuylkill", Class 8-18 C, began service May 13, and made 156 days to the close of the Exhibition. The locomotive "Delaware", Class 8-18 D, came into service June 9, and made 131 days to the close of the Exhibition. The usual load of each engine was five eight-wheeled

passenger cars, frequently carrying over 100 passengers per car. On special occasions as many as six and seven loaded having been drawn by one of these engines.

Each engine averaged fully sixteen trips daily, equal to fifty-six miles, and, as the stations were but a short distance apart, the Westinghouse air-brake was applied in making 160 daily stops, or a total of 25,000 for each engine. Neither was out of service an hour unless from accidents for which they were in no way responsible.

Very respectfully,

(signed) R.W.FLOWER, Jr.,
General Manager.

(Note.- Average weight of each loaded car, about 12 gross, tons.)

NARROW-GAUGE FREIGHT LOCOMOTIVE.	CLASS 8-16 D. 35,000 POUNDS
" " " "	8-18 D. 39,000 "
" " " "	8-20 D. 44,000 "
" " " "	8-22 D. 48,000 "

REMARKS.

The four preceding classes are designed especially for freight service, and can be adapted to the use of either wood or coal as fuel.

Classes 8-16 D and 8-18 D, having a weight on each driving-axle of from 10,000 to 11,000 pounds, are recommended for service on light rails weighing from 30 to 35 pounds per yard. Classes 8-20 D and 8-22 D, with a weight of from 12,000 to 14,000 pounds on each driving-axle, would require heavier rails.

The construction of these engines is such that they will readily pass over short curves, the pony-truck having a swing bolster and radius bar, and the middle pair of driving-wheels having tires without flanges.

The Bell's Gap Railroad (of Pennsylvania), which is laid with 35 pound rails, and has a maximum grade of 158.4 feet per mile, combined with curves of 204 feet radius, is worked by two locomotives of Class 8-16 D. Thirty-three to thirty-five empty coal cars (weight of each car 2150 to 2200 pounds) can be taken by one engine up the grade and around the curves named.

On the Centennial Narrow-Gauge Railway a locomotive of Class 8-18 D, with a rigid wheel-base of 11 feet 8 inches, worked with entire success on curves of 215, 230, and 250 feet radius, combined with grades of 140 and 155 feet per mile. Over this track the regular load (as will be seen from the official statement printed on page 15) was five eight-wheeled passenger cars, each car frequently containing 100 passengers. No test was ever made, however, to show the maximum capacity of the engine in tractive power.

The Lake Tahoe (3 feet gauge) Railway, which has curves of 318 feet radius, is worked with three locomotives of Class 8-20 D. The rigid wheel-base of two of the engines is 12 feet 9 inches, and the third, 12 feet.

We subjoin a letter giving particulars of the performance of freight locomotives (Class 8-18 D) and passenger locomotives (Class 8-16 C) on the Denver and Rio Grande Railway. The maximum grades on this line between Denver and Colorado Springs are 75 feet per mile, and the track is laid with 30 pound iron rails.

DENVER AND RIO GRANDE RAILWAY.
Office of Superintendent,
Denver, Colorado, February 13, 1877.
General Wm. J. Palmer,
President D. and R. G. Railway Co.

Dear Sir :

In reply to letter of Burnham, Parry, Williams & Co., in reference to the performance of our last engines, I have to say :

1. Freight engines Nos. 13, 14, 15, and 19 (Class 8-18 D). The average train for these engines is twelve loaded box or thirteen loaded coal cars and caboose ; each load 8 tons (coal cars 3 1/2 tons, box cars 4 tons), or 150 tons of cars and lading, at a speed of 8 to 10 miles per hour.

Our average freight train time on present card is 10 miles per hour between Denver and Pueblo. On heavy grades the speed is reduced to 8 miles, and on slightly descending grades and levels the speed is increased to 12 miles.

We have, when rail and cars in perfect condition, hauled 15 loaded cars at about 6 miles per hour.

2. Passenger engines Nos. 16, 17, 18 (Class 8-16 C). These engines are used on our regular passenger trains, consisting of one baggage car and two coaches, at speed of 20 miles per hour on all grades. We have never had occasion to test either speed or the power of these engines in passenger train service.

On the 29th of August, 1876, engine 16 took one baggage car, five coaches, and one excursion car from Denver to Colorado Springs. Time, including stops, 4 hours ; actual running time about 3 1/2 hours. She did her work with ease, making 20 miles per hour on the heaviest grades. I am satisfied that either of the four-wheeled-connected passenger engines will haul seven coaches and one baggage car over our 75 feet grades at from 18 to 20 miles per hour.

These engines are as heavy as should be run over a 30 pound iron rail, although I do not see that they injure the iron more than our lighter engines.

When the road bed is soft these engines knock the track out of line more than our first engines.

Respectfully yours,

(signed) W.W.Borst,
Superintendent.

The following letter from Charles E. Holland, Esq, President of the Mineral Range Railroad Co., of Michigan, is especially interesting as furnishing valuable data respecting the performance of 3 feet gauge "Mogul" locomotives on exceptionally heavy grades, and in contending with deep and long continued snows.

The three locomotives referred to, and with which this line is worked, are of the following classes :

The Portage Lake, Class 8-16 D, page 17 ; cylinders, 11 x 16 ; drivers, 36 inches diameter ; weight, 35,000 pounds.

The J.C.Sharpless, Class 8-18 D, page 18 ; cylinders, 12 x 16 ; drivers 36 inches diameter ; weight, 38,250 pounds.

The Keweenaw, and Sharpless are both of same class, but the former has a boiler 2 inches larger in diameter, and driving-wheels 4 inches larger in diameter.

MINERAL RANGE RAILROAD CO.,
Hancock, Mich., February 19, 1877.
Messrs. Burnham, Parry, Williams & Co.,
Philadelphia.

GENTLEMEN :

In reply to your inquiry relative to the working of the last engine furnished us, we would say that we use the " Sharpless " for freight service, the " Portage Lake " for passenger service, and

the "Keweenaw" as a spare engine. I will give you the service of the "Sharpless," from which we can judge of the "Keweenaw" by comparison.

Our road is 12.1/2 miles long. We leave the station at Hancock on a grade of 211 feet to the mile, which continues for a distance of about 1200 feet. We pass from this 211 feet to one of 146 feet to the mile, which latter grade continues for a distance of about 2 miles; after which the maximum grade is 60 feet to the mile, reaching an altitude at Calumet, the other end of the road, of 630 feet above the starting point. The curve of 410 feet radius occurs upon the 146 feet grade.

The snow commences falling in November usually, and continues to fall steadily until January or February, with occasional heavy storms after that time, with high winds and heavy drifts. Sleighing comes with the first fall of snow, and continues until April, and sometimes until the early part of May. By 1st January we have from 1.1/2 to 3 feet of snow, and it is not an unusual thing to find 3.1/2 to 4 feet of snow in the woods on 1st April. This is our average winter. The present is the mildest we have experienced since 1857 and '8.

During the winter of 1875, with very heavy snows, high winds, and the mercury ranging from 0 to 35 below for over 40 days, we were only delayed, all told, about 3 days; that is, the Smelting Works and Stamp (Crushing) Mills, to which we brought their daily supplies of material, were stopped, on account of our inability to get trains through, only about 3 days.

In exposed places on the 146 feet grade the snow often drifts to the depth of 3.1/2 to 5 feet on the track, and becomes so hard that one could walk upon it easily as upon a floor. With the "Sharpless" provided with a small iron plow, we have often worked up grade, clearing the road of these drifts, and to good effect. She would go into them for a distance of 200 to 500 feet each run, before the snow would stop her by getting under the drivers and causing the engine to slip.

With this explanation of the difficulties we are called upon to surmount in operating our road, you will be able to judge intelligently of the service of the engines. We are now hauling about 90,000 tons of freight per annum, or at that rate, say 12,000 tons from Hancock up grade, and 70,000 tons of copper rock, and 8,000 tons of copper down grade. The copper is transported upon 8-wheeled freight cars, and the rock in 8-wheeled hopper cars, the cars weighing each 6.1/4 tons empty, and 18.3/4 tons loaded.

The "Sharpless" (12 x 16 cylinders, 36" drivers) will draw up the 211 feet grade 10 empty hopper cars. Total weight, 62.1/2 tons. On the 146 grade, which includes the curve of 410 feet radius, with a good rail, the same engine draws regularly 12 empty hopper cars. Total weight, 75 tons.

Its usual load on the 60 feet grade is 12 empty rock cars and 6 loaded freight cars. Weight, about 150 tons "going up." The usual down freight train consists of 12 loaded rock cars, and from 6 to 8 cars of copper. Weight of cars and lading, say for 18 cars, 305 tons; 20 cars, 332 tons.

This is our regular work, unless the rail is unusually bad by reason of snow or frost.

The capacity of the "Keweenaw" (12 x 16 cylinders, 40 in. drivers), on the 211 and 146 feet grades, is about 6 to 12 tons less, as near as we can judge. For freight service we consider the "Sharpless" the best; for passenger service the "Keweenaw" excels; the larger boiler causes her to steam easily, and her greater weight to run very steadily.

The "Portage Lake" (11 x 16 cylinders, 36 in. drivers), draws 2 coaches, weight 15 tons, and 1 freight car, weight, say, 12 to 14 tons, and makes the trip to Hancock to Calumet in 50 minutes. Deducting stops, this would make running time about 40 to 45 minutes. We use this engine in passenger service, as the other engines, being larger, are more desirable for heavy work.

We consider that with the "Sharpless" we can transport in one year, making 2 round trips over the road per day, 100,000 tons of freight down grade, and 30,000 tons up grade, the work all to be done between 7 a.m. and 6 p.m., and by the "Sharpless" alone. By adding one more trip, time required 4 hours, the service would be increased 33 to 50 per cent.

Our rail weighs 35 pounds per yard, which we consider heavy enough for the engines. When we renew we shall use a heavier rail, and increase the weight of freight engines purchased in future.

To sum up, your engines have given perfect satisfaction, and we do not see in what manner they could be improved. Our service, with the grades, snow, and ice, is very hard, but the engines

have never failed. I have written at length that you might fully understand what we were doing, and will be very glad to answer any further inquiries you may be pleased to make.

Very truly yours,
(signed)

CHARLES E. HOLLAND.

NARROW-GAUGE FREIGHT LOCOMOTIVE.

CLASS 10-22 E.

Illustrated by photograph of the "No. 3," on page 33.

CYLINDERS	14 inches diameter, 16 inches stroke.
DRIVING-WHEELS	36 inches diameter.
TRUCK-WHEELS	24 inches diameter, with sliding or swinging bolster and radius bar.
WHEEL-BASE, total	18 feet 2 inches.
" rigid	(distance between centres of first and fourth pairs of driving-wheels) 12 feet.
TENDER, eight-wheeled	tank capacity, 12,000 to 14,000 gallons.

WEIGHT OF ENGINE IN WORKING ORDER.

On drivers	44,000 pounds.
On truck	8,000 "
Total weight of engine	52,000 "

LOAD.

In gross tons of cars and lading.

On a level	1060	gross tons.
" 20 feet grade	490	" "
" 40 " "	310	" "
" 60 " "	220	" "
" 80 " "	175	" "
" 100 " "	140	" "

*(These locos are what we know as "Consolidations", 2-8-0's)

*(Without reproducing the whole list, I will list the remaining Class as it appeared.)

NARROW-GAUGE FREIGHT LOCOMOTIVE.

CLASS 10-24 E.

58,000 POUNDS

REMARKS.

The preceding classes of engines, known as the "Consolidation" pattern, are especially adapted to heavy freight service and to working to steep gradients, as by utilising the adhesion of four pairs of driving-wheels very great tractive power is obtained.

The pony-truck has a swing or sliding bolster, allowing it to move laterally under the engine, and only two of the four pairs of the drivers are flanged wheels. The engines will therefore readily pass short curves.

In Class 10-22 E, the distribution of weight on four pairs of drivers places only about 11,000 pounds on each driving-axle. An engine of this class may therefore be used on rails weighing 30 to 35 pounds per yard. For Class 10-24 E, the weight on each driving-axle being about 12,500 pounds, it is believed rails weighing 40m pounds per yard will be found sufficient.

We subjoin by permission the following letters, showing the performance of locomotives of the "Consolidation" pattern on narrow-gauge railways:

OFFICE EAST BROAD TOP R.R. AND COAL CO.

Orbisonia, August 6, 1875.

Burnam, Parry, Williams & Co.

Gentlemen:

Your favor of the 4th inst. is received with regard to the performance of our engines 3, 4, and 5 (Class 10-22 E, page 31).

Our maximum grade is 140 feet per mile, 3 miles in length. On this grade we have several curves 574' and 478' radius, one of 338', and several reverse curves of longer radius. The regular load of these engines, at speed of 12 miles per hour, is 15 coal dumps weighing 9500 pounds each, with passenger car of 18,000 pounds, making total load, exclusive of tender, of 81. 1/4 tons of 2000 pounds. The passenger car and 18 cars, loaded 10 tons each, or 274. 1/2 tons, we consider a load on adverse grades of 52. 8/10 feet per mile.

The above are not isolated cases, but is work actually done by the engines day after day, whenever the business of the road requires it.

As regards speed, I have run them on passenger trains at schedule time of 20 miles per hour with perfect ease and safety.

We have a curve of 240' radius on one of our branches, which these engines pass over easily.

Yours truly,

(signed)

A. W. Sims. Superintendent.

(The following refers to locomotives of about the same weight as Class 10-24 E, page 32, but with cylinders 16 x 20, and driving-wheels of 41 inches diameter.)

OFFICE TORONTO, GREY & BRUCE RAILWAY.

Toronto, August 11, 1875.

Messrs. Burnam, Parry, Williams & Co.

Dear Sirs:

In answer to your favor of the 4th inst., I trust the following information may be of service to you.

The maximum loads of the class you mention, Nos. 15 to 20, are 18 cars, giving a total load in gross tons of 270.

Our steepest grades are 88 feet per mile, having curves in combination of 10 and 13 degrees.

Yours faithfully,

(signed)

EDMUND WRAGGE.

NARROW-GAUGE FOUR-WHEELS-CONNECTED LOCOMOTIVES.

For switching or freight service.

CLASS	4-10. 1/2 C	8 X 12" CYL's	30" DRIVERS	14,000 POUNDS (WEIGHT)
"	4-11 C	9 X 12 "	30 "	17,000 "
"	4-12 C	9 X 16 "	36 "	20,000 "
"	4-14 C	10 X 16 "	36 "	23,000 "
"	4-16 C	11 X 16 "	36 "	28,000 "
"	4-18 C	12 X 16 "	36 "	33,000 "

*(The photo that accompanied this class showed a 0-4-0 locomotive named "Choctaw" with a 4 wheeled tender inscribed ? S & G R.R.) ?

NARROW-GAUGE SIX-WHEELS-CONNECTED LOCOMOTIVES.

For switching or freight service.

CLASS	6-11. D	9 X 12" CYL's	30" DRIVERS	19,000 POUNDS (WEIGHT)
"	6-12. D	9 X 16 "	36 "	22,000 "
"	6-14. D	10 X 16 "	36 "	25,000 "
"	6-16. D	11 X 16 "	36 "	31,000 "
"	6-18. D	12 X 16 "	36 "	36,000 "
"	6-20. D	13 X 16 "	36 "	40,000 "
"	6-22. D	14 X 16 "	36 "	44,000 "

*(Photo shows 0-6-0 locomotive the " B.G.R.R. " No.1)

NARROW-GAUGE FOUR-WHEELS-CONNECTED TANK LOCOMOTIVES.

For switching or freight service.

CLASS	4-10. 1/2 C	8 X 12" CYL's	30" DRIVERS	16,000 POUNDS (WEIGHT)
"	4-11 C	9 X 12 "	30 "	19,000 "
"	4-12 C	9 X 16 "	36 "	23,000 "
"	4-14 C	10 X 16 "	36 "	26,000 "
"	4-16 C	11 X 16 "	36 "	32,000 "
"	4-18 C	12 X 16 "	36 "	37,000 "

The weights given in the above table include water in tanks.

*(Photo shows 0-4-0 saddle tank locomotive the " ESPANA ")

NARROW-GAUGE SIX-WHEELS TANK LOCOMOTIVES.

For switching or freight service.

CLASS	6-11. D	9 X 12" CYL's	30" DRIVERS	21,000 POUNDS (WEIGHT)
"	6-12. D	9 X 16 "	36 "	25,000 "
"	6-14. D	10 X 16 "	36 "	28,000 "
"	6-16. D	11 X 16 "	36 "	35,000 "
"	6-18. D	12 X 16 "	36 "	40,000 "
"	6-20. D	13 X 16 "	36 "	44,000 "
"	6-22. D	14 X 16 "	36 "	48,000 "

The weights given in the above table include water in tanks.

*(Photo shows 0-6-0 saddle tank locomotive " MILLWOOD ", Millwood Coal & Coke Co.)

NARROW-GAUGE "DOUBLE-ENDER" TANK LOCOMOTIVES.

Designed to run either way without turning, and adapted to passenger service on short runs.

CLASS	8-10. 1/4	C	8 X 12" CYL's	36 to 40" DRIVERS	22,000 POUNDS TOTAL
"	8-12. 1/4	C	9 X 16 "	" " "	30,000 " "
"	8-14. 1/4	C	10 X 16 "	" " "	36,000 " "
"	8-16. 1/4	C	11 X 16 "	" " "	42,000 " "
"	8-18. 1/4	C	12 X 16 "	" " "	47,000 " "

Weights given above include weight of water in tank.

The leading and trailing wheels are arranged with swing-bolsters, so as to move laterally under the engine in passing curves. Engines of this class can therefore pass short curves without difficulty. One of class 8-10.1/4C is now working on a three-foot gauge road with some curves of only 100 feet radius.

*(Photo shows 2-4-2 saddle tank locomotive the "SABASTIAO", No 2.)

The interesting thing that comes to my mind when reading this information is how well advance this manufacturer was with a comprehensive range of classes of locomotives for the time, 1877. It can be assumed that earlier locomotives were far less powerful & that they were extremely basic. It also surprised me to find a locomotive makers catalogue book with photographs pasted onto the pages so that potential customers could see exactly what was on offer & it's strengths & requirements.

One can hardly imagine how some of these locomotives found their way to the remote frontier areas as described above. The effort & fortitude of the pioneers to extract the wealth from remote regions at that time is hard to comprehend.

This little book from which I have taken accurate information from both captures the feeling of how they did it & it is my wish to share the information so as to help unlock some of the secrets that are hidden in the last century. I hope it is of use to those of you building models so to provide physical dimensions.

Happy modelling !

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