

# The Generator

Issue 504  
September 2023



**Palmerston Model Engineering Club**  
[www.pnmecc.net.nz](http://www.pnmecc.net.nz) - [pnmecc@trains.net.nz](mailto:pnmecc@trains.net.nz)

Managers of the Marriner Reserve Railway - Marriner Street - Palmerston North  
C/- 119 Ruapehu Drive - Palmerston North 4410

## **The Palmerston North Model Engineering Club** **Upcoming Club Events**

Club Nights typically start at 7.30pm and are usually held at the  
Hearing Association Hall, 435 Church Street, Palmerston North.

### **Thursday 28 September**

Club Night

Buy, sell, swap or give away.

### **Thursday 26 October**

Club Night

Health and Safety

## **Marriner Reserve Railway**

### **Sunday 1 October & Sunday 15 October**

Railway operations at the Marriner Reserve

Trains in operation from 1pm to 4pm

Weather permitting (Richard Lockett 06 323 0948)

### **Thursdays**

Railway operations for club members

Subject to ongoing track maintenance and weather

Contact track manager (Richard Lockett 06 323 0948)

## Club Notices

### **Subscriptions are now overdue.**

If you have not yet paid your subscription please do so as it is a time consuming task for the Treasurer to have to chase you up with a phone call!

Membership subscriptions of \$40.00 as set at the Annual General Meeting are now due.

Please pay Club Treasurer Lawrence Brooshooft at a club night or preferable pay direct into the clubs bank account via internet banking. **Account number 06-0996-0831663-00**

**Please remember to use your name as the reference.**

### **End of year gathering.**

#### **Saturday 25th November**

This year we have arranged a visit to a large private collection in Whanganui of vintage radio's along side Meccano and other vintage toy's/models. This collection comes highly recommended by those who have previously visited. Lunch to follow at the local RSA club and then perhaps visits to some of our Whanganui based members workshops. Details in October Generator.

### **Purchase of Welsh Steam Coal.**

The PNMEC has recently purchased 500kg of Welsh steam coal for use in our members steam locomotives at the Marriner Reserve Railway. This coal comes at great expense and maybe the last that the club are able to purchase due to supply and importation difficulties. There is plenty of NZ coal available to burn but is not suitable to burn in our locomotives due to the amount of smoke produced along with clinker, waste product left behind in the ashpan and tar in the fire tubes.

The Welsh coal produces no smoke and if using the right sort of grate leaves little waste although it takes a while to come to grips with it as it is slow burning having little if any volatiles "ie" it doesn't release methane gas when heated because it doesn't have any. This means that if the locomotive is not moving and producing a draft through the fire then the fire will go out and quickly! As we all know methane and oxygen mixed makes for a good fire.

On a similar vein I have just received an article from a archaeology magazine which my UK based brother subscribes to discussing the problems for heritage railways in the UK with the shutting down of all Welsh coal mines. Heritage Rail is a 600 million pound tourist industry and is at risk due to the 30,000 tonnes of coal it burns each year, equivalent to one week of fuel for a coal fired power station (none left in the UK) and they point out that importing poorer quality coals from the other side of the world would increase the amount of CO<sup>2</sup> that the industry producers and that it makes more sense to mine local Welsh coal to keep the industry alive and with the lowest possible CO<sup>2</sup> emissions.

As the builder of another model steam locomotive in 7.25 inch gauge I often question myself as to why I am building it as by the time I finish it we properly will not be able to buy coal of any sort let alone burn the stuff! Why because I like building them. There again burning coal in a miniature Steam locomotive is properly no worst than cooking a sausage on your barbeque, trouble is barbeque fuel is no good for burning in our locomotives. We know we've all tied it!



Beaver Lumber Company locomotive Tasha with Alex Mudgeway on the footplate.

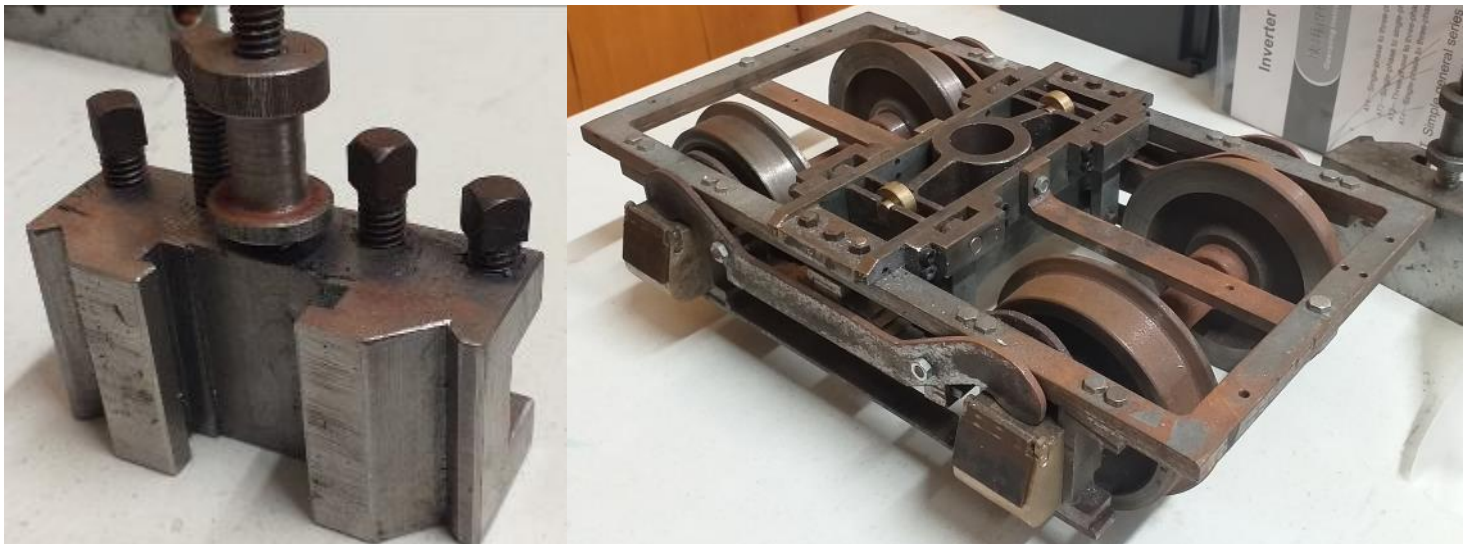
## Club Night Report

The programmed presentation on Robert and Margarets trip to the Antarctica in a large ship foundered because of a missing cable with would allowed the laptop to speak to the data projector but for some reason a large quantity of members projects turned up to be shown off, so we were keep occupied for the evening. Antarctica will be visited on another occasion next year!

Chris Bjerga and Graeme Hall made the trip over from Whanganui with Chris relishing getting back into his workshop after some ill health had manufactured some extra quick change tool holders for his lathe as well as getting back into the building of a Lucky Seven steam locomotive.

Graeme as usual had been busy knocking out another IC engine a gearless Hit and Miss governed by the opening of the exhaust valve and hence missing a beat!

Another busy man Bruce Geange had been working on a German MAN dump truck modelled in wood. No one present could explain what the MAN abbreviation meant so I have looked it up for you. Maschinenfabrik Augsburg & Nurnberg. New Club member Shane MacNee got back into his workshop during the covid lockdown and knocked out a Quayle kitset 20/20 steam engine. 20mm bore, 20 mm stroke. Merv George presented a fabrication jig for tacking round tube together. While Chris Morton brought along a very old model steam engine and boiler and enquired as to whose manufacture it was. The consensus of the room was a very old Bing model, from Germany.



Chris's Quick Change tool holder and rear bogie truck for the Lucky Seven locomotive.



Graeme's Gearless Hit and Miss Engine.



The Cab for Bruce's MAN dump truck Photo's Editor



Shane's very tidy Quayle 20/20 steam engine.

Chris's antique toy Bing steam plant and engine.

Fabrication jig from Merv

Photo's Editor



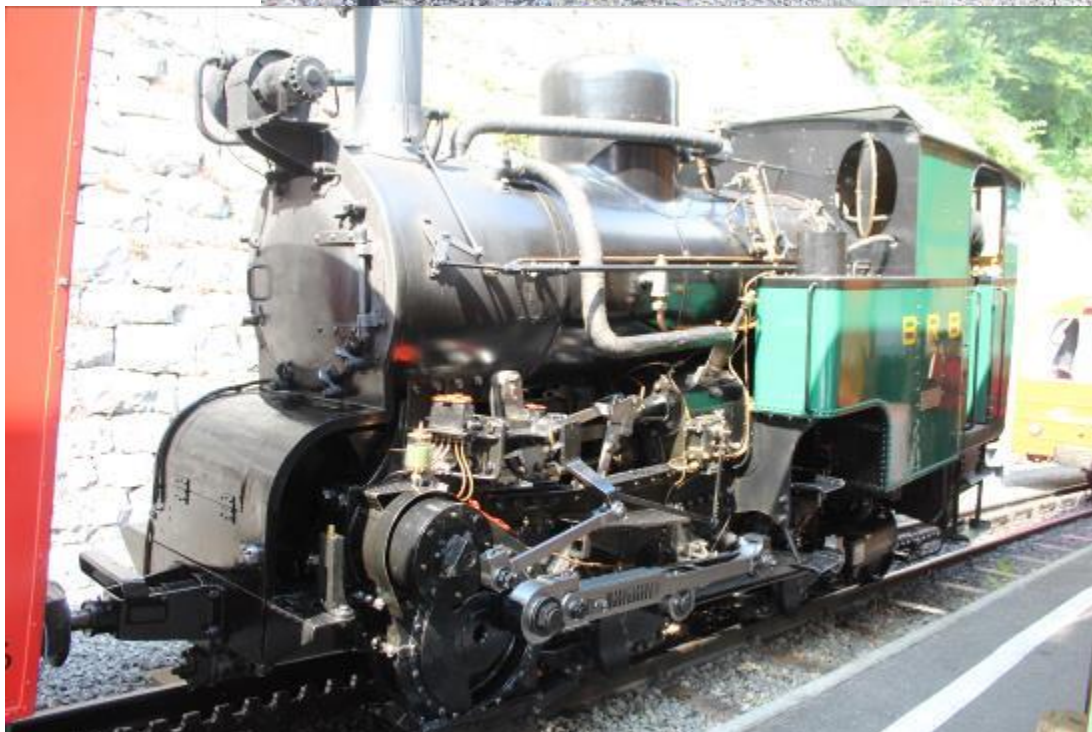
## [The locomotives of the Brienz Rothorn Railway](#)

The Brienz Rothorn Railway is located in Switzerland, and runs from the Lake Brienz ferry terminal up a mountain side to a peak called Rothorn Kulm on mount Brienzer Rothorn. This 7.6 km rack and pinion railway climbs 1,678 meters (average gradient of 22% with a maximum gradient of 28%). At the summit passengers can visit a cafe or take a cable car to the other peaks surrounding Brienz. Jean and I made our way to this site in June of this year, joining steam enthusiasts from all over the world making their pilgrimage to view the operation of a steam powered rack and pinion railway constructed during the late 1890's. The society that operates this railway owns eleven steam and three diesel locomotives. Eight of the eleven steam locomotives were in working order and in regular service, one was undergoing heavy maintenance, and the remaining two are being cannibalised for spares. The workshop facilities are manned by permanent employees, but the operation of the railway is carried out by volunteers. During the summer months the railway operates 7 days a week carrying an average of 900 passengers per day to the top of the mountain. During the winter months the railway only operates on the weekends.

The society operates three generations of steam locomotives. The first generation locomotives are coal fired and entered service in 1891. These locomotives can push 40 patrons per trip to the top of the mountain requiring a crew of three (driver, stoker + 1 train attendant). They are rated at 225 hp, and during the 2 1/2 hour return trip will burn 300 kg of coal and consume 2,000 litres of water. The railway owns five generation locomotives, two of which were in regular use.

The second generation locomotives are also coal fired. These two locomotives entered service during the early 1930's and are rated at 295 hp and are still in regular service. They are capable of pushing a train loaded with 80 people to the top of the mountain using a crew of three. Unlike the first generation locomotives that were lever driven, these locomotives have a 3:1 ratio geared jackshaft mounted on the front of the locomotive connecting the steam engine to the coupling rods of the drive wheels. During the 2 1/2 hour return trip they will burn 350 kg of coal and consume 2,000 litres of water. The four third generation locomotives the society operates were specifically designed for this railway and entered service in the early 1990's. Outwardly they retain the appearance of a traditional rack and pinion steam locomotive, but internally they are very different. While all the major components of a traditional steam locomotive are still there, they were designed from the ground up using advanced materials, modern control technology, and are fully compliant with current regulations. These locomotives are oil fired and can transport 120 passengers up the mountain using a crew of two, with a return trip time of 2 hours. The introduction of computerised controls and the introduction of a dead man's handle means the locomotive can be operated by a single person. They are rated at 400 hp, and will burn 150 litres of fuel oil while consuming 2,800 litres of water per return trip. However, these impressive performance enhancements come at a cost.

1890 coal burner locomotive



1930 coal burning locomotive. Note 3:1 reduction gearbox

Photo's David Bell

When the society took delivery of their last two third generation locomotives in 1996 their purchase price was the equivalent of NZ\$3,980,000 each. (GST exclusive of course.)

The third generation locomotives look and smell like a conventional steam locomotive but that is where the similarities end. The technology used and the technical evolution that took place during their design and construction is quite staggering. I was fortunate to get an insight into this by a driver/maintenance engineer who recognised I had an engineering background, and was more than happy to explain in technical terms how these locomotives work. This story will have to be the subject of another generator article. David Bell



1996 oil burning Locomotive. Reduction gearbox located centre of driving frames.

Photo David bell

Date and Time			Activity
Thursday	28th September	7.30pm	Club Night Buy, Sell, Swap etc
Sunday	1st October	1pm to 4pm	Marriner Reserve Railway
Thursday	5th October	7.30pm	Committee Meeting
Sunday	15th October	1pm to 4pm	Marriner Reserve Railway
Thursday	26th October	7.30pm	Club Night Health and Safety
Thursday	2nd November	7.30 pm	Committee Meeting
Sunday	5th November	1pm to 4pm	Marriner Reserve Railway
Sunday	19th November	1pm to 4pm	Marriner Reserve Railway
Saturday	25th November	All day	End of Year Gathering

If you would like to be notified when this newsletter is published, send us an email with your **Name, Club** and **Email** address to [pnmec@trains.net.nz](mailto:pnmec@trains.net.nz) with "**Generator Please**" in the subject line.