



**Newsletter of THE PALMERSTON NORTH MODEL
ENGINEERING CLUB INC**

Managers of the "MARRINER RESERVE RAILWAY"
Please address all correspondence to :- 22b Haydon St, Palmerston North.

PRESIDENT
Chris Rogers
(06) 356-1759

SECRETARY
Murray Bold
(06) 355-7000

TRACK CONVENOR
Richard Lockett
(06) 323-0948

EDITOR
Doug Chambers
(06) 354-9379

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No 302**

PNMEC Home Page www.pnmeec.org.nz
Email:- pnmeec@clear.net.nz

TRACK RUNNING

This is held on the FIRST and THIRD Sunday of each month, from 1 pm to 4 pm Summer and 1 pm to 3 pm during the Winter. All club members are welcome to attend and help out with loco coaling, watering and passenger marshalling - none of the tasks being at all onerous.

Visiting club members too, are always welcome at the track, at the monthly meeting, or if just visiting and wishing to make contact with members, please phone one of the above office bearers.

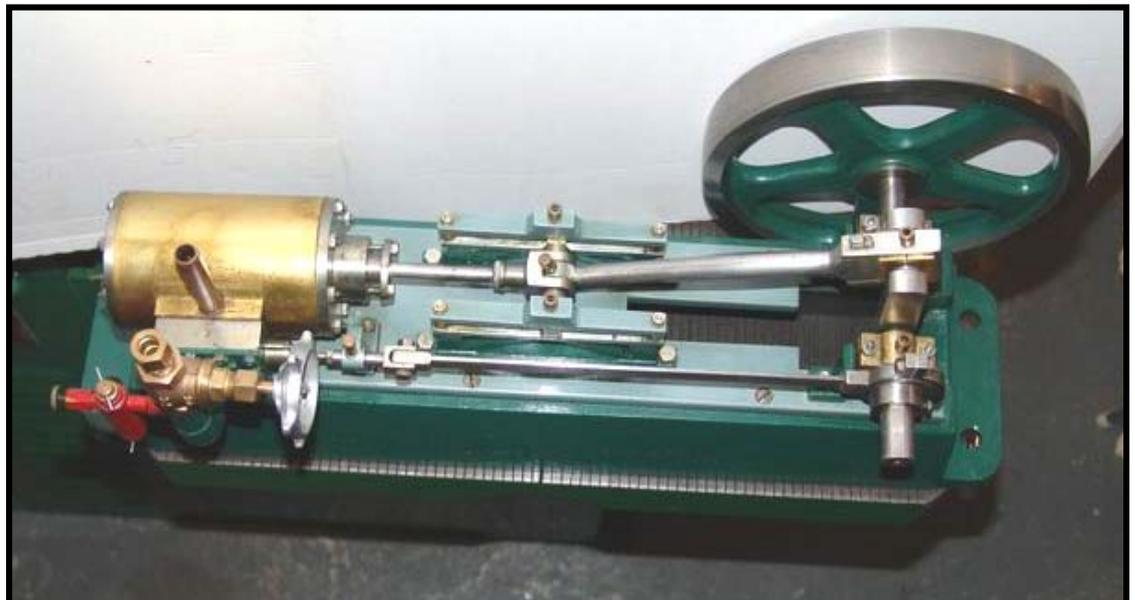
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Palmerston North

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This Months Featured Model



**MAY MEETING
VISIT to MANAWATU HYDRAULICS**

The May meeting was a visit to Manawatu Hydraulics. We were shown through the workshop by the owner Paul Burr and one of his staff. Paul was quick to tell us that although the company's name implied that they were hydraulic engineers, that in fact the majority of their business was in general engineering.

There were the usual lathes, mills and machinery that you expect to see, but also a very big lathe, a Webster Bennett vertical lathe, a computerised lathe, a McDonnell Douglas 4 axis machining centre and a Kearns horizontal boring machine. There was a computerised wire cutting EDM and a crankshaft grinder.

The computerised lathe was demonstrated to us. A very interesting workplace to see through.



SUBSCRIPTIONS NOW DUE

Subscriptions remain at \$28 for members. Juniors and Country members \$14.

You can send your sub to 'The Treasurer' C/o 22B Haydon Street, Palmerston North or hand it to Barry Parker at the next meeting.

JUNE MEETING

This will be held on the 23rd of June in the Hearing Association Rooms, Church Street, Palmerston North at 7.30pm **SHARP**.

The subject for the evening will be **MODERN IMPLANT TECHNOLOGY**.

Dr. Paul Morris will give a talk / slideshow on the latest methods of completely implanting a new set of teeth. This is a new medical phenomena. A highly interesting and informative 45 minutes, plus question time.

FOR SALE

Myford ML 7 lathe complete with 3 and 4 jaw chucks and steady.
Contact Bruce Manning Phone (06)323-2111

WANTED

We need to beg borrow or steal a MIG welder for a month or two, so we can build the new station. If you can help call Richard 323-0948

COMING EVENTS

**Mid Week Run at
Marriner Reserve Railway:**
28th June between 10.00 am and 2.00 pm
Please contact Doug Chambers beforehand.

**Track running at
Marriner Reserve Railway:**

3rd July 1 - 3 pm
17th July 1 - 3 pm

OPEN WEEKENDS

Hawkes Bay Model Engineers
July 2nd and 3rd

The closing date for the next issue of The Generator is Friday 15 July

AIRLINE DOORS and SEATING

Cynthia handed this in and I have added a little to it.

Question

On a recent flight it struck me that I have always boarded airliners from the left, never the right. How did this practice begin and is there any reason why? Also the Captain of an airliner always sits in the left-hand seat in the cockpit with the co-pilot to the right. How did this universal practice arise and does it serve any useful purpose other than filling a convention?

Answer

At the beginning of World War 1 the rotary engine was the most common design for fighter and observation aircraft. In a rotary engine the cylinders are arranged radially around the crankshaft. The crankshaft is fixed to the airframe and therefore remains stationary while the crankcase and cylinders on which is mounted the propeller, rotates. The momentum of the spinning engine kept the engine turning even if it misfired, giving a chance of recovery when misfiring occurred.

This type of engine suffered several problems. Getting a fuel mixture into the spinning cylinders was one.

The engines would only run at half to full throttle. They would not idle and the method used to reduce power for landing was to turn off the ignition switch and then turn it on again before the engine stopped spinning. Thus the engine sounded Burrup – burrup ---- burrup. If the ignition was left off too long, the engine would cease to spin and fail to restart.

The attempt to land then sounded like this Burrup --- burrup ----- and a crash short of the airfield complete with the sound of snapping wooden spars, tearing fabric and twanging wires.

The second problem with these engines was that they were lubricated with Caster oil, note Caster oil not Castrol. Much of this oil found its way into the cockpit either as raw oil leaking from the engine, or in the fumes of the exhaust. It didn't really matter where it came

from but it had the same effect as the teaspoon of castor oil administered by Doctor, nurse or mother. The scarves the pilots wore were not just for show, but to help avoid the unpleasant effect of the oil.

The third problem was in fact a mixed one, the rotation of the crankcase and cylinders, nearly always clockwise, (viewed from the cockpit) meant that left-hand turns were easier to make than right-hand because of the torque reaction. Pilots of aircraft fitted with rotary engines were able to use this ability to turn quickly to the left when avoiding attacking aircraft. However, care had to be taken as if the turn was too quick or too tight then the aircraft would stall and spin. For the first eighteen months of the war it was not known how to extract an aircraft from a spin, so the spinning aircraft returned to earth with fatal results for the pilot.

Pilots of rotary-engined aircraft found it easier to make left-hand circuits of their airfields before landing and airfields where there is no radio traffic control, and a right-hand circuit is used, must display a special visual signal.

Later in the War bombers with side by side seating for the two pilots came into use and the aircraft captain sat in the left-hand seat as this afforded him a better view as he made a left-hand circuit around the airfield.

The pilot of the early airliners still in the left-hand seat had to position his aircraft as close as possible to the terminal building, usually on unmarked grass. As he could only see the left-hand wing tip that was the side he placed near the terminal.

The pilot would not park facing away from the terminal, as then the prop wash would blow over the waiting passengers and spectators. So the aircraft was always parked with the left-hand side to the terminal and the door in the fuselage was put in that side.

The rotary engines used in World War 1 were mostly nine cylindered, and made by Bentley, Le Rhone, Clerget or Oberursel. They varied in horsepower from 85 to 130 and rpm at take off was around 1200.

HORIZONTAL or MILL STEAM ENGINES

By Doug Chambers

Most of us are familiar with the Stuart Turner horizontal steam engine. Many of us 'cut our model engineering teeth' on a casting set for this type of engine.

Unless you are able to visit the Tokomaru Steam Museum or other like museums overseas there is little chance of seeing a full-size horizontal steam engine running.

In New Zealand through from 1910 – 60 horizontal steam engines could be found in knitting mills, flax mills, sawmills, dairy factories, and large industrial production factories. They were used to power the line shafting that ran below the ceiling above the individual knitting, sewing, or lathes and mills, which were all driven by flat belts off the line shafting pulleys.

In the dairy factories the engines drove vacuum pumps and in some cases these were arranged in tandem with the steam cylinder and operated by an extension of the piston rod. Midhurst Dairy Factory, just north of Stratford had two such engines, one of which is now at the Tokomaru Steam Museum.

Some of the larger engines were tandem compounds arranged in the same way with an extended piston rod driving the forward cylinder. Depending in the builder, the forward cylinder could be either the high pressure or the low pressure. There is a working example of a tandem compound at 'Sovereign Hill', the replica gold mine in Ballarat, Victoria. The engine was built in Ballarat about 1900.

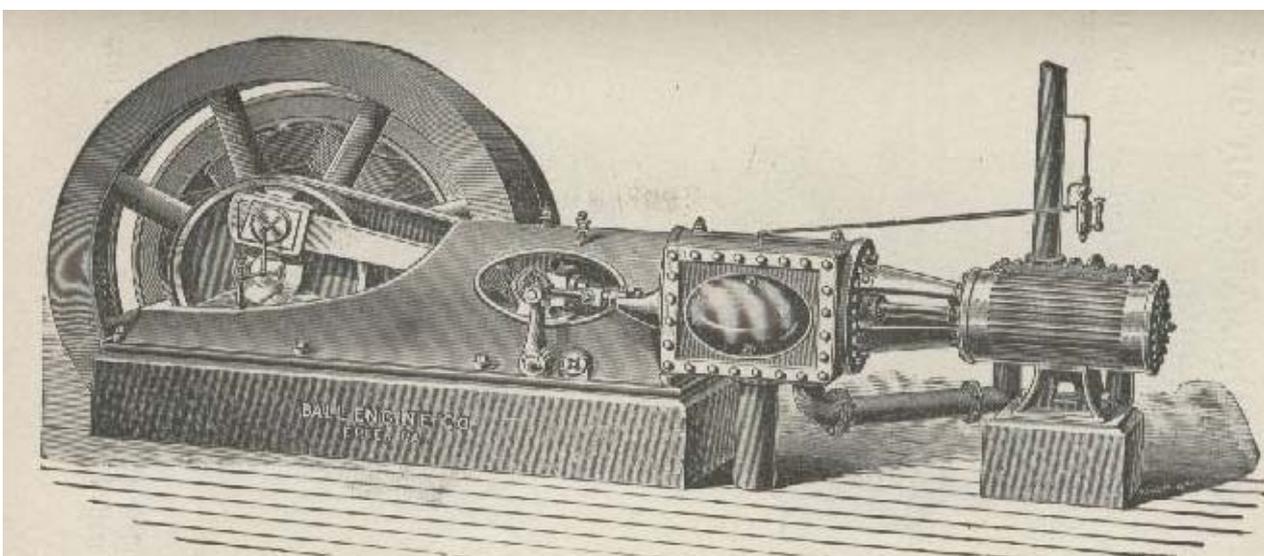
A common layout was the twin high pressure cylinder engine. This appeared to be two separate engines, joined with a common crankshaft with a split flywheel mounted in the centre of the crankshaft between the two engines. On bigger engines the flywheel might be

up to 8 metres or more in diameter and engines of this type were found where there was a requirement for high horsepower such as sawmills. There was one driving the winch at the Evan's Bay Patent Slip in Wellington where relatively large vessels were hauled out of the water for survey and repairs.

As few of the engines were required to run in either direction, they were mostly fitted with a simple eccentric driven valve gear. The boilers used to supply steam to the engines prior to 1900 were usually of the Cornish or Lancashire type with boiler pressure rarely exceeding 75 psi. This meant that the slide valve arrangement was best suited to the wet steam being supplied. After 1900 better boiler designs became available and pressures increased to 150 psi or more and often including a small degree of superheating. This meant that piston valves could be used and various manufacturers tried out different valve gear to increase the efficiency. Corliss valve gear probably gave the greatest efficiency of all and was used extensively in the large engines being made towards the end of horizontal steam engine production.

Once again there is an excellent example of a Corliss engine in the Tokomaru Steam museum. This particular engine was used in the Imlay Freezing Works in Wanganui where it was used to pump ammonia.

Some of these larger horizontal engines had long working lives. Where they powered knitting and cotton mills they received very good maintenance as if they broke down hundreds of factory staff would be out of a job until it was repaired. Even after 60 – 70 years of service they were still capable of giving reliable service, but were being replaced by more modern methods and individually electric powered machines.



The Generator

THE MODEL HORIZONTAL STEAM ENGINE

By John Couchman

During a portion of my early education we were instructed in how to make patterns through to machining castings.

A friend of mine owned a similar steam engine and I was able to run the imperial ruler over it and from these measurements drawings, patterns and castings were produced.

After school, Saturday mornings and school holidays I worked in a precision machine shop where I quickly graduated to lathe and milling work. The Second World War was on then and staff were in short supply. This fact worked to my advantage.

I learnt my 'workshop prayers', there was one recited when one suffered bodily injury, another for mistakes in machining, and a further one when an item is dropped on the floor and it mysteriously disappears.

The above experience enabled me to carry out work of a more advanced nature, which eventually gave birth to this horizontal steam engine with its 2" diameter and 3 1/2" stroke.

A friend of mine built me a steel vertical boiler about 20" in diameter and 40" high.

A lovely boiler to operate and to heat my small workshop in the cold winter nights in Invercargill. At that particular time we were having power cuts for up to 1 1/2 hours each night, usually at about 6pm and sometimes later. A small generator was coupled to the engine via a flat leather belt. I ran a pair of cables from the detached workshop to our kitchen and connected a car headlight bulb. I had a similar arrangement in the workshop where I spent many an hour firing the boiler, maintaining the water level and keeping up the lubrication.

This little engine performed like a champion reminding me of the 'Singer' sewing machine.

To keep the water level up in the boiler, I used the town supply, which had a pressure of about 80 psi. A back-up manual pump was

also in the circuit coupled to a water supply tank. The exhaust from the engine passed through this tank so warm water was available to pump into the boiler in an emergency. However the pump was never used and the warm water was used in the basin for washing my hands !!!!

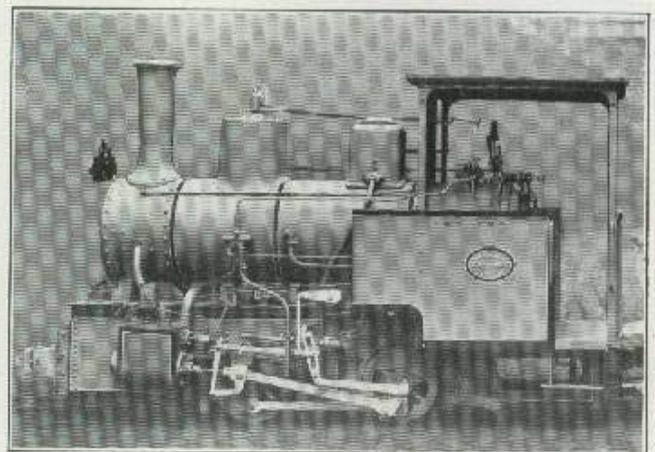
Footnote: During the Second World War the NZ Government took over a lot of privately owned lathes. Several were installed in the machine shop where women were machining mortar bombs. Each bomb was checked after machining by inspectors with a set of gauges. Surprisingly there were only a very small number of rejects.

There were no breaks for morning or afternoon teas in those days but in Summer time when the temperature was high the Company would supply all the staff with a large ice cream each.

During my time in that shop there were no accidents. People were well aware of the fact that if off work, no pay.

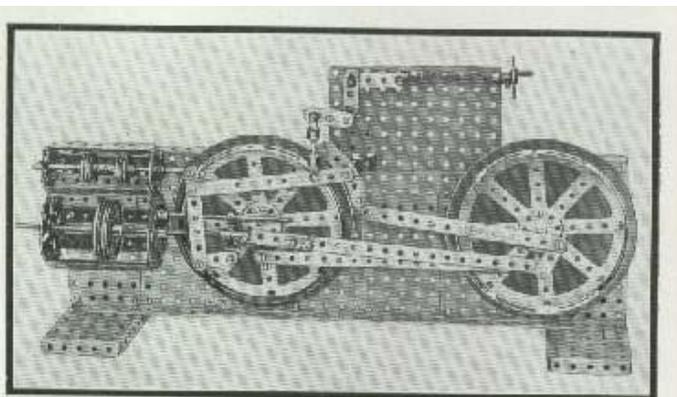
OF INTEREST

The following two photos may be of interest. One shows a locomotive built by Fowlers of Leeds. It would be an interesting example to model with its outside Walschaert's valve gear.



The Generator

The second picture shows a Meccano model of a Walschaert valve gear. Interestingly, although the valve represented is obviously a piston type the radius rod is fitted incorrectly to the combination lever. Assuming the valve is inside admission then the radius rod should be above the valve spindle.



However this is an excellent way of understanding the operation of valve gear, similar set ups made of wood or metal have been used by model engineers to test valve events before making the necessary parts and then finding a fault with the design.

Thames Open Weekend May 21 & 22

Richard, Ken and Joyce, Murray and Janice, Chris and Paulette all went to the Thames open weekend last month. We had with us “Mr Sandman” and “Netta”. Grant Alexander (ex PNMEC) had “Nutkin” in steam all weekend.

There was the usual crowd from Auckland, Hamilton and Rotorua. We had a great time. The weather was kind. A few of us went on a guided tour of some of the gold mines and stamping battery. Thanks to all concerned for a neat weekend.



The Generator