October 2004
No 295

THE GENERATOR

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.**

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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.

Sender:-
PNMEC
22b Haydon St,

Place stamp here

Coming Events

Coming Events: October Monthly Meeting. This will be held at the Hearing Association Rooms, Church Street, Palmerston North on the 28th October at 7. 30 pm. **SHARP.**
See further details on page 2.

Mid Week Run at Marriner Reserve Railway:

26th October		between 10.00 am and 2 pm.
23rd November		between 10.00 am and 2 pm

Please contact Doug Chambers beforehand.

Track running at Marriner Reserve Railway:

7th	November	1 – 4 pm
21st	November	1 – 4 pm

OPEN WEEKENDS

Havelock Live Steamers	23rd – 25th October
New Plymouth Model Engineers	23rd – 25th October
Nelson Model Engineers	23rd – 25th October - Ground level track Opening
Tauranga Model Engineers	12th – 14th November 25th Anniversary
	Murray Bold has registration forms and a copy of the program for the weekend.
Whangarei Model Engineers	14th – 17th January 2005
Locomotion 2005	5th – 6th March

The closing date for the next issue of The Generator is Friday 12th November

REPORT of the SEPTEMBER MEETING

A windy, blustery evening did not deter a large number of members turning out for the evening.
Richard Lockett continued with his series of talks on workshop practice. This time he covered taps and dies, but sadly not the extraction of broken taps in blind holes.!!!

Once again there was a wide variety of 'Bits and Pieces' on the table being displayed by the following members.
Brian Leslie displayed the spanner issued to him when he started with NZR. It was for tightening the smokebox door clamps. The previous month's speaker had talked about smokebox draughting and that had jolted Brian's memory and he recalled the need for the smokebox door to be perfectly sealed.
Jim Curtis displayed a broken fitting from his 'workshop Electrolux' and appealed for another. (the editor was able to supply one) Jim explained that he had been doing a lot of woodwork lately and cleaning up the floor was a bit difficult without the appropriate 'power tool'.
Ian McLellan displayed the chassis for his 'Maisie' which is now progressing rapidly. He also had a tool he had made for rounding the end of studs.
Bruce Geange had two 0 –4 –0 Gauge 0 saddle tank locomotives that he is building. Electric motor powered and incorporating a lot of rivet detail. The rivet detail produced on a machine especially made for the job by Bruce. The rivet machine was demonstrated as well.
Chris Rogers displayed headlights and small detailing parts for his 'Adams Radial tank'.
Richard Lockett showed some of the boiler fittings that he has been making for his NZR W.
Mike Barnes and Doug Chambers displayed the firebox and outer shell assembly for the 7" 'Phantom 'boiler they are making for Mike's cousin Ted Barnes of Inglewood.

Richard Lockett spoke of progress on the new station building. He explained that as there is not a lot of room where it is being constructed the workforce is of necessity a small one, although later more members may be invited for specific tasks.

OCTOBER MEETING.

The format for the evening is for members to bring their favourite book and be prepared to explain just why it is your favourite. We have had "Your favourite tool" "Your favourite picture" and these evenings involved a lot of discussion and laughter, and I anticipate more of the same during this meeting.!!!

END OF YEAR FUNCTION

See page 7 & 8 for details and RSVP form

FOR SALE

Hunslet NZR Dsa 71/4" gauge. 4 hp Briggs and Stratton engine driving an Eaton Hydrastatic Transmission.
Complete package includes 'Dsa' locomotive, La riding trolley, 12 volt battery and a sturdy workshop stand on castors.
The locomotive is modelled on the NZR Dsa Hunslet that was in service at Invercargill during the mid 1950s. The Makers no 4700, being one of fourteen imported at that time, from Hunslet in England.

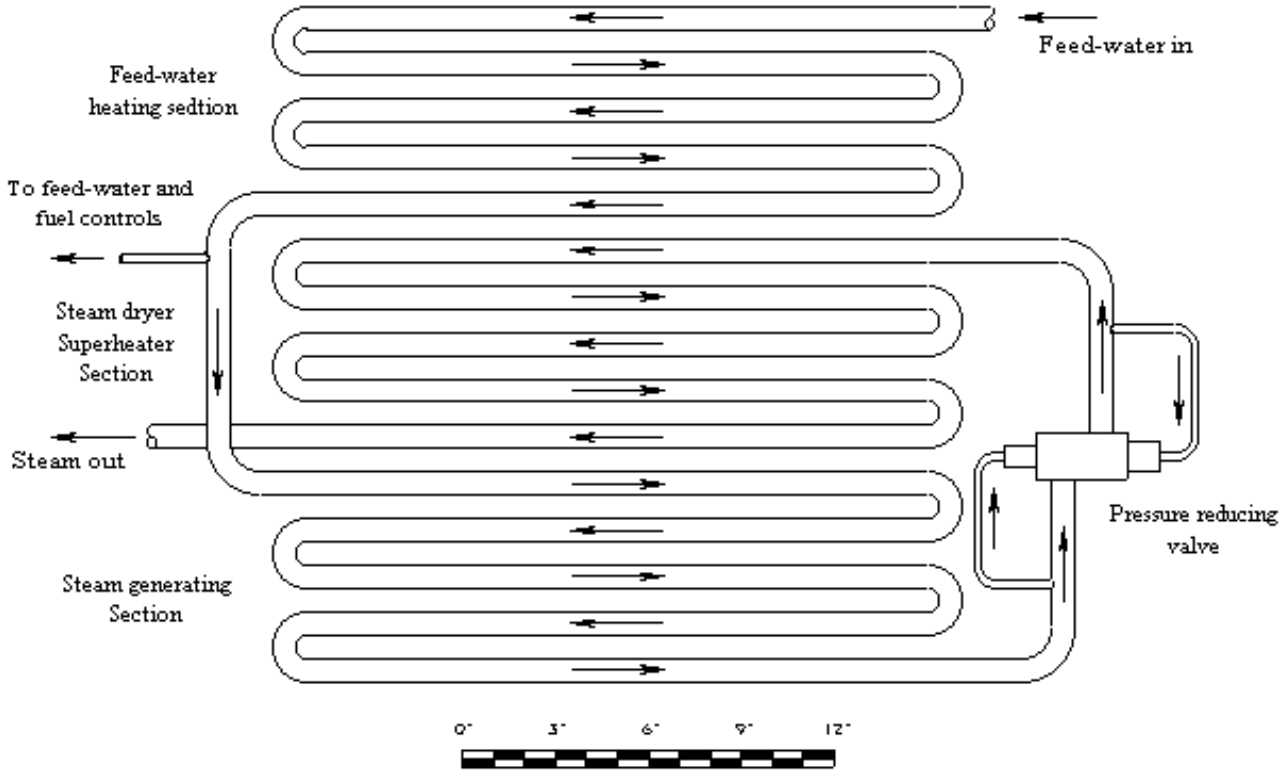
Price POA from Jim Curtis, phone 06 374 7151

CAMBREY DUAL PRESSURE STEAM GENERATOR

By Bren Campbell

Light industrial and automotive flash steam generators generally consist of stacks of twelve to fifteen series connected zigzag grids or flat spiral coils formed from ½" to ¾" steel tube. The furnaces can be above or below depending upon the type of installation and the choice of fuel, solid, liquid or gas. Whether top fired or bottom fired the feed-water is introduced into the elements furthest from the furnace and the steam drawn off from the elements adjacent to the furnace. In this contra-flow system the combustion gases progressively give up heat and the working fluid, water and steam, progressively take up heat. The stack of elements is seen as consisting of three series connected groups each about a third of the whole. The furthest group from the furnace is regarded as the feed-water heater. The middle group is the actual steam generator and the group adjacent to the furnace is the steam dryer/super-heater. Because there is continuous passage right through the boiler considerable overlap in the progression of water to steam occurs. Large amounts of energy transformation must take place within very small volumetric spaces in time measures of seconds thus tending to create excessive turbulence within the circuit.

In the usual flash boiler configuration the location of the feed-water heater is considered ideal. There are differences of opinion over the placing of the steam-generating group in the central location. The steam drying/superheating group without some kind of heat modification generally delivers steam that is grossly overheated for the end use. .



Cambrey Dual Pressure Steam Generator Diagram

These generators function satisfactorily where the duties are uniform and constant such as supplying steam for steam cleaning nozzles, train coach heating, battery charging and water pumping plants and launch displacement hull propulsion. In these working conditions manual control of fuel and feed-water can maintain any desired steam temperature and pressure. A simple automatic device is required to shut down the burner in the event of feed-water failure.

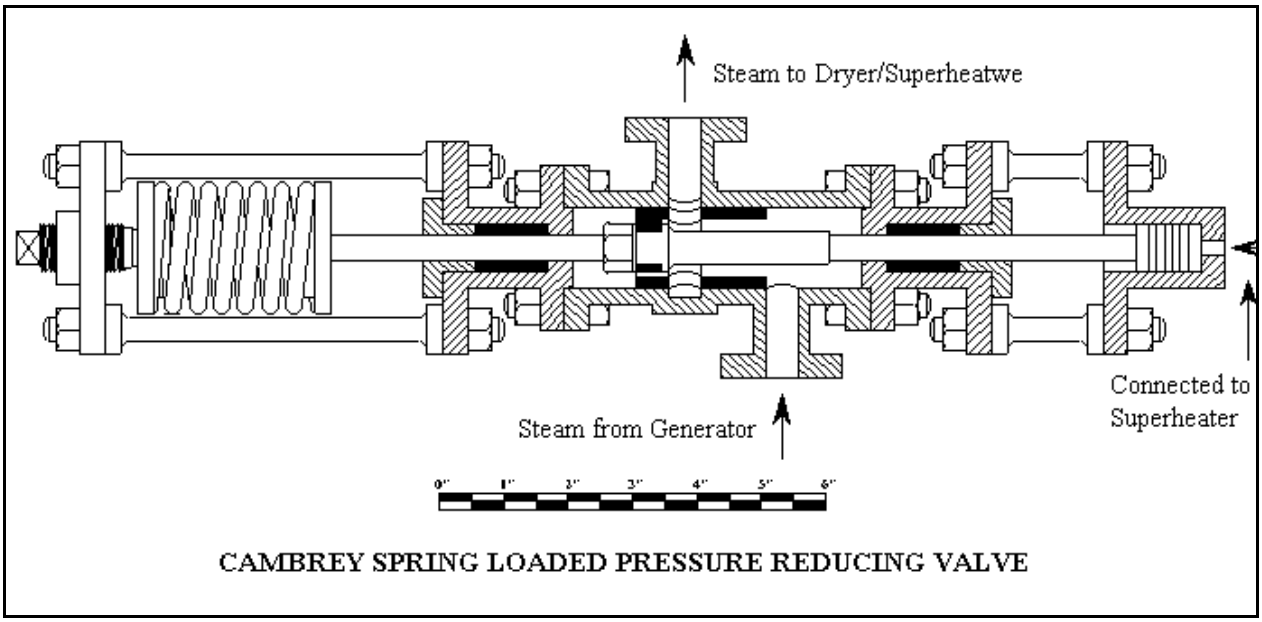
Manual control cannot be sustained in conditions of varying loads such as those encountered in steam propelled road and rail vehicles. Therefore, temperature and pressure response devices are essential to enable the generators to maintain stability of performance. These are heat sensors located at various points in the circuits that trigger adjustments to the fuel input at the furnace and feed-water injections at the beginning and apparent hot spots in the circuits. Steam pressure is also linked to the feed-water

and fuel controls. Such control devices are automatic and rely upon installed or external power.

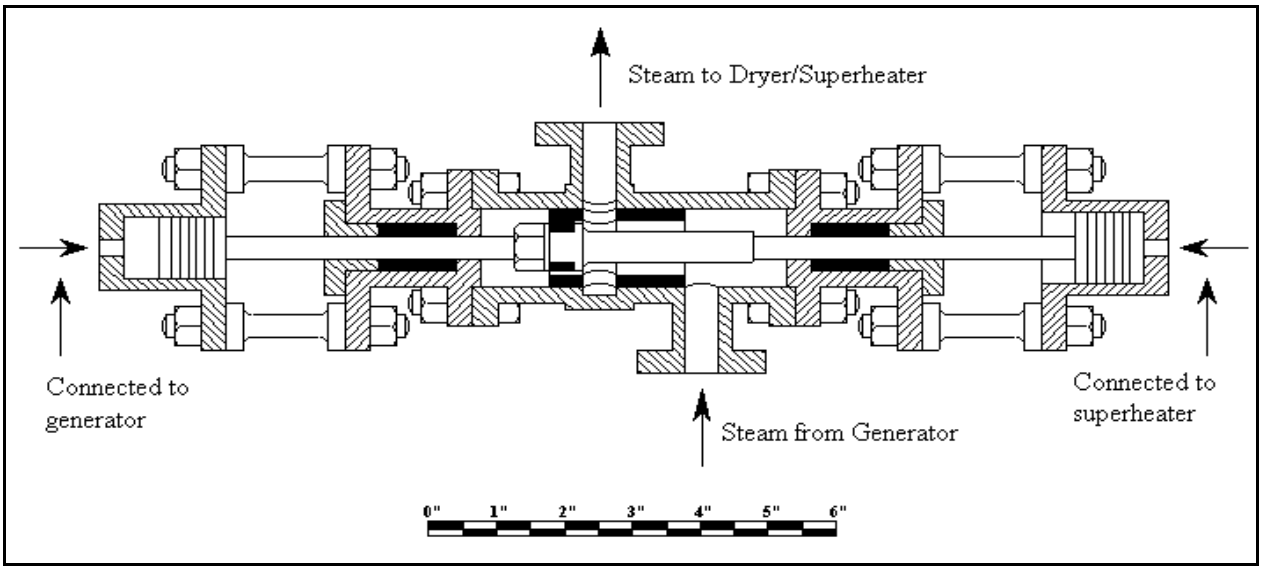
This essay puts forward a proposition that should (a) produce a more temperate superheat and (b) provide self induced stability in the internal workings. The first calls for a relocation of the steam dryer/ super heater to the middle position in the assembly, and the steam generating section placed adjacent to the furnace. The feed-water heating section will remain in its original position. The second part of the proposal is to operate the super heater at a lower working pressure than that in the steam generator in accordance with the principle that any moisture carried with the steam will be vaporized when released from a high-pressure chamber into one operating at a lower pressure. This will be realized by installing a pressure-reducing valve or governor in the pipe connecting the steam generating section to the steam dryer/ super heater. Like the reconfiguration of the generator sections or groups, steam pressure reducing valves are not new, but combining them as essential to the functioning of flash steam generators is the point of this proposition. The governor will arrest pressure surges from the steam generator. Wire drawing of steam/vapour through the valve will create some rarefying. Further, the reduced dryer pressure plus the modified superheat will complete the process.

The steam generator diagram shown represents an under-fired example. The feed-water heating section is at the top. The steam generating section is located at the bottom of the assembly and the middle space accommodates the steam dryer/super heater A steam pressure-reducing valve is installed in the connection between the steam generating and superheating sections

Two choices in design of the reducing or pressure governing valves are shown. One is held open by the pressure in the generator and partially or completely closed by the pressure in the dryer. The other is held open by spring pressure independent of the generator. The dryer pressure as in the first type initiates the closing. The steam pressure in the generating section controls the fuel and water inputs. This also includes burner shutdown in the event of feed-water failure. Should solid fuels be used draught control is also executed from that source.



CAMBREY SPRING LOADED PRESSURE REDUCING VALVE



The reducing valves illustrated are balanced piston types. In the twin servo piston version the cylinder fed from the generator is smaller in cross sectional area than that fed from the steam dryer. The difference for the sake of this discussion is 25%, thus, if the generator is worked at 800 psi the steam dryer will work at 600 psi. A pressure difference of 25% would always be the result at whatever pressures the steam generator worked.

The spring version of the valve would replace the high-pressure servo piston with a compression spring that would hold the governor valve open until the dryer pressure overcame the resistance of the spring. This would work very well but would not come into effect until the dryer pressure had built up to 600psi plus. The steam generating section could operate at any pressure in excess of that without affecting the pressure in the dryer.

Note that the servo piston cylinders are connected to their respective boiler sections by small-bore tubing that is shown direct in the generator diagram but in practice would include cooling coils so that only condensate would act upon the servo pistons.

The chart below is for a spring-loaded pressure reducing valve and shows ten stages in the results projected following light up and the initial steam pressure raised to 100 PSI.
A selection of three generator maximum pressures is shown for a dryer pressure of 600 psi at which the pressure-reducing valve causes the system to operate in the intended dual pressure mode.

Stages in steam raising	Generator Max. PSI 700	Generator Max. PSI 800	Generator Max. psi 1000	Steam dryer PSI	Feed-water rate %	Burner fuel rate %
1	100	100	100	100	100	100
2	200	200	200	200	100	100
3	300	300	300	300	100	100
4	400	400	400	400	100	100
5	500	500	500	500	100	100
6	600	600	600	600	100	100
7	**625**	**650**	**700**	**600**	**100**	**100**
8	**650**	**700**	**800**	**600**	**75**	**75**
9	**675**	**750**	**900**	**600**	**50**	**50**
10	**700**	**800**	**1000**	**600**	**25**	**25**

LETTER FROM ENGLAND

By Stan Compton

Because IMLEC this year was only one hours drive away, I was able to take one of our Hereford members with me. A retired doctor who always had a wish to get his hands onto the tools to build things with, sadly he never seems to get started. He is good company though and we arrived at the site to find the proceedings were well under way and although the aluminium rail was wet, a competitor was belting round with a hefty load at 10 mph. How the drivers cope with firing at that speed I don't know. It is a fast track at Kinver with one section of 1 : 110, the rest is almost level.

Getting started with those massive loads on wet rail is the problem, the station area has a permanent cover so the rails never get a good wash from the rain. Add the oil that is always present and you can guess what the problem is. Sanding was done to help but this can be a mixed blessing.

Heavy showers were the rule for most of the day so we went to see the model display. Always plenty to see in the fine Community Hall. A rare "Halton Tank", the same as the one I tested that had a riveted boiler some time ago, was in lovely condition. A "Stirling Single" built by a retired lawyer was a credit to someone without a mechanical background, he was well on with a LSWR 4 – 4 – 2 tank and making a good job of it, Victorian engines look attractive but can be a 'devil' to build.

Incidentally, I got my "Caledonian 2 – 4 – 0 out recently, the first time for ten years, gave it a boiler test

and passed it on to Richard Donovan our president, who spent the rest of the afternoon enjoying himself.!!!

Among the exhibits and traders Kinver members had set up stalls with items donated by past members widows, all at ridiculously low prices. Tools, castings etc. A box of castings to build a "Juliet" was priced at NZ $180. Ideal for a beginner, far better than a "Tich". Peter our retired doctor kept looking at these. "Forget it" I said, "You have a "Sweet Pea" at home to complete besides the player piano you've just bought and stripped for overhaul".
I wasted my breath, the castings had not sold and he contacted the club next week and proudly brought them round for me to see with the drawings and frames.
How a "Sweet Pea" came second at IMLEC intrigues me, maybe it had the modified boiler designed in South Africa and published in "Engineering in Miniature" May 1995?
You will no doubt read the full report in "Model Engineer" but the engine that appealed to me was the 0 – 6 – 0 "Lancashire and Yorkshire Railway" belting round with six adults at the lower speed of 8 mph. I have a set of drawings for this loco that were sent to me but time is not on my side with a 5" Hunslet Quarry tank to build as well.

I am spoilt for choice with three annual steam rallies within half hour drive, and this year I ended up at Much Marcle a village about 5 miles away. I did not put on a display in the model tent this year, neither did the two other members with plenty to display so Hereford efforts were very sparse. The "model wheelwrights" are always present and worth looking at. Some exhibitors put on a pathetic display of toy cars to save paying an entrance fee !!!!!!
Anne came with me and she enjoys looking over the nick-knacks on the stalls on the grounds. The junk that turns up year after year, old tractor and car parts that someone may be looking for, even the odd lathe or drill.
You would not believe the terrible condition a massive straw burning traction engine was in. It must have stood out on the pampas in Argentina for many years as a tree 150mm in diameter had grown up through the final drive. This had been sawn off above and below the axle so a section was still in place.!!! To even contemplate bringing such a wreck back to this country for restoration is amazing.!!!

A portable engine was belted up to a machine called a "scratter" locally, used for crushing apples, the resulting pulp was put into a traditional cider press. The very pleasant young girl belonging to the outfit found a used plastic beaker and gave us visitors a chance to taste the apple juice, unfermented of course, it was very nice. A pity she had nowhere to wash the beaker.!!!!!

You may recall I sold my 0 –6 – 0 loco based on "Bridget" to one of our Hereford members, a busy man who can spare little time to learn how to drive it properly. As usual operating the axle pump by-pass takes some grasping and he always ends up with the engine priming. Last thing I heard was that he had built a short length of track at home, raised steam, forgot to open the drain cocks, his wife got on behind him and when he opened the throttle she got showered with hot, oily water.!!!!!!
I have kept away in case I get blamed.!!!!!

One of the Hereford members has just completed one of the "Isle of Man" locomotives, the 0 –6 –0 called "Caledonia". With those massive cylinders

The Portable driving the "Scratter"

it pulls very well and makes plenty of steam, but it is very difficult to fire, Martin Evans specified such a small fire-hole door ring. It requires a long, thin shovel to get the coal up to the front of the grate.

This item came my way recently.
One day the pilot of A Piper 'Cherokee' was told by the air traffic control tower to hold short of the runway while a DC 8 landed. The DC 8 landed, turned around and taxied past the "Cherokee". One of the DC 8 crew got on the radio and said "What a cute little plane. Did you make it all by yourself ?"
The "Cherokee pilot not about to let the insult go by came back with, "I made it out of DC 8 parts and another landing like yours and I'll have enough parts for another one.!!!!

New PNMEC member Clive Walton, and the Hunslet "Maid Marion" running at Marriner Reserve on the club Running Day (4 October 2004) He recently purchased the engine from Trevor Kearns. The locomotive was built by Stan Compton and sold to Trevor shortly before Stan and Anne returned to England in 1988.

Don't forget Locomotion 2005 is coming
5th & 6th March

The Generator

I want to go to

"The PNMEC End Of Year Dinner"

See over for Details
RSVP to by 14 November

Bruce Geange 06 - 357 0566
or Chris Rogers 06 - 356 1759

Due to the success of the
2003 End of Year Dinner.
This year we will do it again.

It is to be held at the

Cloverlea Tavern,
301 Tremaine Ave,
Palmerston North
on Thursday 25th November 2004

Pre Dinner Drinks and Chat @ 6:30 pm
Sit down for Dinner @ 7:15 pm

Cost is $17.50 / head to be paid on the night

I / we wish to attend the 2004 End of Year dinner

Name	
Address	
Number Attending	
Contact Phone	

Please cut off this form and bring to next club night or
contact Bruce Geange or Chris Rogers with these details

The restaurant needs to know how many will be attending
so we need your details by 14 November