STEAM LINES

NORTHERN DISTRICTS MODEL ENGINEERING SOCIETY (PERTH) INC.

November—December 2014

Slight 'changing of the guard' at AGM

NDMES' AGM on October 10 saw a slight changing of the guard, with Paul James having to step down after reaching the mandatory three years as president.

He was succeeded by Tom Winterbourn, but Paul will continue to serve the society as a committee member.

Phil Gibbons was re-elected vice-president, but John Turney did not seek re-election as treasurer due to a forthcoming overseas work commitment.

Damian Outram offered to fill the vacant position from the floor of the meeting and was duly elected. Paul Costall remains as secretary and party booking co-ordinator. With Ed Brown and Andrew Manning not seeking re-election as committee members, Steve Reeves, Geoff Wilkinson, Gilbert Ness and Paul James were elected to fill the four positions.

The AGM returning officer was John Shugg.

The new president Tom Winterbourn thanked Paul for his leadership over the past three years, during which there has been much progress, with the completion of the new 5" carriage storage shed, the 7¼" carriage shed/ workshop, the upgrade of the electrical system (overseen by Andrew Manning), the re-flooring of the gazebo, installation of new fencing at the western end of the site, the upgrade of the steaming-up shed and other associated works.

In particular, Tom mentioned the impending installation of the new track and the removal of the points near the new workshop (beginning after the Christmas party in early December). This work has mostly being undertaken by Ken Cooper, Andy Davis and Ian Huxtable. When this work has been completed (the track is already in situ), the workshop head-shunt track will be fabricated and laid, with access being provided up the back straight.

Some familiar faces, including Jeff Clifton from Bunbury, enjoy lunch in perfect weather at our inaugural Invitation Run on September 13. More pictures and a report, pages 6 and 7...

Other society positions filled included:

Boiler inspectors: Phil Gibbons and Steve Reeves, with Noel Outram to be added when approval is received from AMBSC president Barry Potter.

Librarian: John Martin.

Driver training: Jim Crawford and Steve Reeves.

Safety officer: David Naeser.

Competent persons: Andrew Manning and David Naeser.

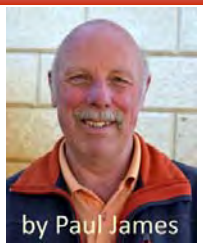
Newsletter: Tom Winterbourn and Jim Clark.

During the general meeting which followed the AGM, concern was raised by several members about the possible loss of access to Vasto Reserve through the double gate at the western end of our site. The council is proposing to extend the adjacent Men's Shed operation to the back fence-line, despite requests from NDMES to stop short of the fence to allow us continuing access to the reserve for use by traction engines.

The society will now make further representations to the council, and to seek the support of the local elected councillors and the Federal MP, as the funding for the Men's Shed extensions are believed to come from the Federal Government.

Inside this issue:

T'was a very good year!



RETIRING president's report as presented at the AGM on October 10, 2014:

It is pleasing to note that the past year has concluded with excellent membership participation in various club activities and events and with the further development of our grounds and facilities.

While membership numbers have been maintained at a healthy fifty eight, it appears this will soon increase after several recent requests for membership application forms.

January saw the completion and commissioning of the raised track riding car storage shed, traverser and bendy track. This has proven to be a real success with no more physical handling of cars on and off the track and the freeing up of track for easy access through the previous tunnel storage area.

Following the preparation of the selected area, the large 7¼" carriage storage and workshop shed was erected at the rear of our site in late March. Access track has since been made and concreted flush with the floor surface. While the concrete contractor was on site we also gutted the old wooden gazebo floor and replaced it with concrete. The gazebo seats have since been lowered and it has had a paint job.

To provide access to the new storage area Ken, Andy and Ian are now in the process of manufacturing track and suitable points so that the current track can be modified and realigned. It is anticipated this work will be completed after our Christmas run in early December.

This year also saw the often talked-about club invitation run take place in early September. This involved significant preparation, including the provision of additional steaming bay track and a huge clean-up of the area, as well as increasing water and blower access points. I would like to thank everyone who helped Tom and Dennis sort and clean this area up.

In order to run traction engines, the road vehicle track was given a clean up and a new fence installed to separate our site from that of the BMX. I might add that the site presented very well on a perfect spring day, thanks to all involved.

Other progress has been the fitting of an air conditioner, a white board and projector screen to our meeting area, electrical work, container roofing and, of course, the general maintenance of grounds and facilities. I would like to acknowledge the work of the Tuesday and Saturday work parties, for without them, none of this would be possible. The Tuesday group has, for a considerable time, been well-supported, averaging around 12 members.

On the events front, we have seen a steady increase in patronage on our public run days, to the point where we

(Continued on page 3)

Know your Society

President	Tom Winterbourn	0415 682 931	twinterbourn@ozemail.com.au
Vice President	Phil Gibbons	9390 4390	pa.vb.gibbons@bigpond.com
Secretary	Paul Costall	9572 1385	costall.paul@gmail.com
Treasurer	Damien Outram	9256 2056	damienoutram@yahoo.com.au
Committee Members	Paul James	9457 7175	pkjames47@hotmail.com
	Gilbert Ness	9295 3006	gilbert_ness@talk21.com
	Steve Reeves	9354 1395	spreeves@bigpond.com
	Geoff Wilkinson	9305 4133	geoff.wilkinson@obliquewa.com
Boiler Inspectors	Phil Gibbons	9390 4390	
	Steve Reeves	9354 1395	
Librarian	John Martin	9300 2180	
Birthday Bookings	Paul Costall	9572 1385	
Driver Training	Jim Crawford	9276 5464	
Safety Officer	David Naeser	9276 8709	
Newsletter Editor	Tom Winterbourn	0415 682 931	
Newsletter Production	Jim Clark	0407 988 746	
Website	Laurie Morgan		www.ndmes.net

Society On-site Phone Number	9349 0693
Society Grounds and Track Site	Vasto Place (off Balcatta Road), Balcatta
Postal Address	NDMES, PO Box 681, Balcatta 6914, Western Australia

Presidential Report (cont...)

broke attendance records in June. Although we do not advertise, it seems "word of mouth" and Facebook publicity by patrons may have much to do with the increased patronage. These run days are always well-attended by members and are a real social event.

General meeting nights are also well-attended and we managed a couple of guest speakers. Perhaps this concept could be further promoted with the appointment of a volunteer to oversee the organising of guest speakers, activities or a visual presentation.

The September invitation run saw around 40 members attend, many staying all day and a similar number of guests from kindred clubs. The weather was perfect, as was the camaraderie, food supply and refreshments. I wish to thank Tom for taking care of much of the organisation and he and Jenny for organising the catering. Thanks also to members who helped out on the day to make it the success it truly was.

Other events this year included the AMRA exhibition and Hare and Forbes sausage sizzle. While these take some organising, they seem worthwhile and not only provide us with publicity but also a financial and social reward.

Finally, I acknowledge the efforts of Tom and Jim in reinstating our newsletter.

Overall, the society is financially secure with increased income from public run days and extra activities. Although our future is in the hands of the membership, we need to consider the development of new long term plans with the completion of the original plan.

Finally, I wish to acknowledge and thank Jean and Cathy for taking care of the canteen; also the outgoing committee members, particularly vice-president Phil Gibbons, secretary Paul Costall and treasurer John Turney; I wish the incoming committee every success for the coming year and thank our membership for its support in making the society the friendly and successful society it undoubtedly is.

Paul James

Sizzlers wanted

THE bi-annual Hare and Forbes sausage sizzle is almost upon us again and we're looking for willing sizzlers to go on the roster.

The dates to put in your diary are Thursday, Friday and Saturday, November 20-22.

This is always a fun event, allowing members to socialise without having to look after trains, browse through the sale stock and, if interested, get an additional 10 per cent off the already discounted price.

Then there's also the "remuneration" to help swell the society's coffers and the valuable publicity generated.

Shortly, an email will go out asking for volunteers to go on the roster, so please give some thought to spending a morning or afternoon helping out.

Indulge in some Christmas spirit

Another date to put in your diary is Sunday, December 7, when we will be "playing trains" and indulging in some Christmas spirit.

Gates will open at about 8.30am to allow those with locos to get on to the track. As in previous years, it will be a "bring your own" lunch affair with the BBQs available for use. The society will provide cool drinks.

At about 2pm, there will be a small adjournment for a quick general meeting in the air-conditioned clubrooms.

With this function over, Ken, Andy, Ian and others will swing into action removing the points linking the circuit to the back straight and commissioning the new re-aligned ground level track approaching the tunnel overpass. This will provide space for the headshunt for the new 7¼" storage shed, with carriages accessing the shed via the back straight.

This work should be completed in time for the January run (no general public run in December).

Calendar of Forthcoming Events

Sandgropers Bunbury	Sat/Sunday	November 8-9	All weekend	At SWMEA Bunbury
General Meeting	Friday	November 14	8:00 pm	
Club Run Day	Sunday	November 16	9:00 am — 2:00 pm	
Public Run Day	Sunday	November 30	10:00 am — 2:00 pm	
Christmas Get-Together	Sunday	December 7	8:30 am onwards	(see article above)
General Meeting	Sunday	December 7	2:00 pm	During the Christmas Party

Who's building what

Steam Lines is compiling an up-to-date register on who's building what and the state of progress. The register will be updated on a regular basis as projects advance and new ones are started.

This register is in no way meant to be a comprehensive compendium. Specific projects will be featured on a regular basis in future editions of Steam Lines. The "thumbnails" provided by members to date are listed in surname alphabetical order.

Stan Armstrong: Building a Bolton No. 7 horizontal mill engine.

Ed Brown: This is my project so far—it is 80% finished, it's just the boiler at 70%. The loco is a 5" gauge WAGR Es 308 4-6-2. It is a model of 1902 vintage. I have been 8 years so far and counting.

Ed Brown's 1902 WAGR Es 308.

Jim Clark: 3" scale Allchin traction engine "Royal Chester", 100% complete. Has just undergone its final steam test. Also 5" gauge BR Britannia locomotive "Oliver Cromwell", 80% complete.

Ron Collins: Completing a 4" scale Fowler traction engine and a 5" Speedy (started in 1974-75 after reading in a magazine article the owner had taken 33 years to build. I thought 'silly old fart taking that long to build a locomotive' – that was about 40 years ago!). Started a 7¼" Crampton 4-2-0.

Paul Costall: After about 12 years, just completed 4" Fowler Showman's traction engine. Prior to AMRA, it was steamed up twice and roof fitted. Also has a NSW C38 5" built by George Palmer, but currently on back-burner for a rebuild. Also owns Firefly, built by Ron Date, bought by Ian Huxtable on Ron's death and then bought by Paul to keep in the club as Ian wanted to concentrate on other projects.

Andy Davies: 5" Simplex. Have bought boiler (ex-Bob Brown) and frame through Steve Reeves. Recently received some castings from Reeves (UK), courtesy of brother-in-law Mike. Am currently building the smokebox.

Phil Gibbons: Building four locos at once, 7¼" gauge: an 0-4-0 Juliet with baker valve gear; 0-4-0 Pug British rail shunter with inside Stephenson valve gear; Mallet 0-4-0+0-4-0; and a single-cylinder stationary engine 3.5" bore and 4" stroke half completed. Hope to finish one a year.

Peter Harding: Building a Northumbrian, as serialised in Model Engineer, July 2009 onwards. A simplified model of an early 0-2-2 locomotive. Chassis is built and runs on air. Currently building the boiler—all plates flanged and bushes made and just started silver soldering.

Les Harris: Has 5" Somerset and Dorset Southern 2-8-0 steam loco (built by a real craftsman in Canberra) and some rolling stock. New shed with pit and crane finalised. Have 300m of track and pallet loads of sleepers for track laying, with grandkids laying the first track any time now. Started project when wife organised my NDMES membership seven years ago.

Les Harris' 5" Somerset and Dorset Southern 2-8-0T.

Ian Huxtable: Heisler V-twin 5" American logging loco, almost at rolling chassis stage. 60% complete. Yet to start on centrally-mounted boiler.

Paul James: Building 3½" Hielan Lassie 3-cylinder Pacific. Started about 6 years ago and now nearing completion. Has tender to complete (about half done).

Marcus Jones: Have completed Gauge 1 live steam loco, "Fyvie Castle", as far as I wish to at this stage. Also

An HO gauge Britannia under construction by Marcus Jones.

Who's building what (cont...)

has OO gauge butane-fired Britannia, 75% built and 2" scale Gold Medal Burrell Steam Tractor about 70% complete (as acquired). Also aspiring to build a 5" Britannia or Duchess Pacific.

Dennis Lord: Completed 1 gauge Evening Star; completed 2½" WA N class loco, completed 5" 4-4-0 (yet to be steamed) and 85% completed a 3½" Evening Star (rolling chassis stage, working on boiler).

Andrew Manning: Have done little model engineering for months and now looking forward to several part-complete projects: Complete Titch, needs lagging, a practical oil pump and braked riding car. Loco steams and runs well; Simplex, 80% complete, plumbing, oil pump, lagging painting, driving car; Foden needs a new boiler feed pump, but may shorten to tractor format as a bit big to get into and out of workshop; have a Caradoc engine complete (has run on air) and have the copper to build an 8" vertical boiler; also partly complete 3½" Titch and a traction engine needing little to complete.

Laurie Morgan: Building model boats – nice, quick and restful in comparison to building locos. One has a small 3-cylinder simple steam engine (30 years old and made by Aster) and the other has a 2.5kW brushless motor.

Gilbert Ness: Has built up a loco shed and has six 5" locos in various stages of completion plus two which are operational. These include a Glasgow and South Western 4-6-2 Baltic, a 4-4-0 old time American loco (marketed by Reeves as "Washington"), Stanier LMS "Duchess" Pacific, British Railways 2-10-0 9F (being built from a CNC kit), an LNER A4 4-6-2 streamliner Sir Nigel Gresley (part built from a CNC kit), an East African Railways 4-8-2 + 2-8-4 Beyer Garratt, a German class 64 2-6-2 tank loco. Also has a UK outline class 66 diesel (which has been run at Balcatta). The priority is to get the 9F completed.

Steve Reeves: GR20 Garratt loco, 7¼" gauge 4in to 1ft scale. Design based on two Beyer-Peacock tramway Garratts built for Brazil Railway in 1912. About 50% complete. Completion date unknown – perhaps five to seven years.

Milton Smith: Building a greatly modified 5" Simplex as a 2-6-0 tender loco. Named Andrew G Trigg. 99.9 per cent complete. Hope to have it running at NDMES in September, 2015.

Geoff Wilkinson: 5" LBSC Maid of Kent. Now finishing off the valve gear for the second time! Tender rolling chassis is complete. Plenty of re-work on the motion to do. Ready now to start work on the boiler.

The cake queen unmasked!

FOR the past two years, Susan Armstrong has cooked cakes, scones, muffins or whatever for the Tuesday morning work crew and which have been dutifully brought in by husband Stanley.

Now its time to unmask this cake-making angel. Susan (don't call me Margaret!) took over the role from Clive Chapman, whose hand-made muffins were also highly valued.

With an 8am start, the Tuesday morning crew look forward to morning tea (or coffee) about 10am, but definitely not before Stanley arrives with his box of goodies.

Susan either cooks the cakes on Monday nights or Tuesday mornings. The only times the crew misses out is when the courier (Stanley) is unable to get to Balcatta for whatever reason.

Susan said her cake-making is no chore. "If it's cooked in an oven, I'll cook it," she says. Susan raised two children before resuming secretarial work for about 25 years, retiring a couple of years ago.

Meanwhile Stanley's day job was Clerk of Courts, organising and attending court sittings anywhere between Esperance and Broome. He later became an industrial registrar, running Industrial Court sittings, retiring 27 years ago, in August, 1987.

In his spare time, Stanley is building a Bolton horizontal mill engine.

Stan Armstrong is about to get his hand smacked by wife Susan as he tries to steal a cookie being taken out of the oven. Susan cooks muffins, cakes etc every week for the Tuesday morning work crew and they are conveyed to the club by Stan, whose arrival coincides with the start of "smoko" at 10am.

Invitation run day success

OUR September 13 invitation run was a great success in several ways.

Firstly, the weather could not be faulted; we had plenty of visitors from other clubs (mainly Castledare and Bunbury); camaraderie was much in evidence with a good exchange of knowledge; and the food was top-rate and much appreciated. It made all the effort in preparing for the day well worthwhile.

We had many early "arrivers" to help get set up and members willingly took on the various duties allocated to them. All visitors were met at the gate and welcomed and given a name badge.

In probably his last official duty as president (he stepped down at the AGM on October 10 after the mandatory three years in the chair), Paul James welcomed the visitors, giving a brief history of the society and its more recent successfully completed projects.

Morning and afternoon muffins and cookies were graciously provided by Agnes James and Susan Armstrong and there were plenty of willing helpers manning the BBQs for lunch (we fed just short of 100 people). Evening meals were provided by Agnes and Paul James, Phil Gibbons, Clive Chapman and Jenny De Gouw.

We had a number of visiting locos and the three steam traction engines of Ken Austin, Paul Costall and Bunbury visitor Graham Palethorpe were able to "stretch their legs" on Vasto Reserve.

During the evening meal in the clubrooms, attended by about 30 people, thanks for a very enjoyable day were expressed by Ken Belcher (CMR) and Jeff Clifton (SWMEA).

Then the truly enthusiastic ran into the night on various locomotives.

In all, an excellent day and one which we have been encouraged by several visitors to make an annual event.

*Following is a random selection of pics taken on the day, mostly when everyone was on the picnic grounds for lunch. *All photos: Tom Winterbourn*

There has to be one in every crowd! Paul Costall hams it up for the camera watched by Damien and Noel Outram.

Invitation run day success (cont...)

A little bit of hot air

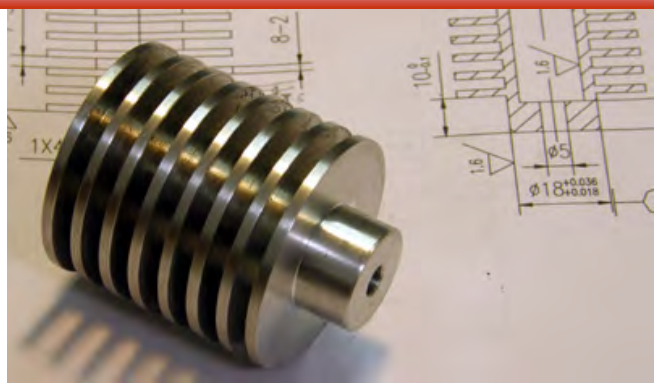
by Jim Clark

Continued from previous issue...

The next item to tackle was the air supply cylinder. As this only has a 5mm hole through its end, a mandrel that could take the cutting forces was not practical. Fortunately, this piece is long enough to hold it in the chuck and do half of the slots, then flip it over and do the other half, holding it by the new fins (see photo).

I found that a few squirts of WD-40 helped to prevent the aluminium sticking to the tool and swarf from jamming in the slot as it got deeper.

The drawing calls for 7 fins 2mm wide with 3mm slots, but my parting tool is 3.5mm wide. Rather than make a special tool I changed the design to 6 fins with 3.5mm slots instead – I doubt that it will make any difference to its operation. There is enough of a finished boss at one end to catch it in the chuck and do a final very light skim over the outside of the fins to remove chuck marks.



If you don't work with machine shop drawings every day, you may need to refer back to a technical drawing reference or a book like "Fitting and Machining" to understand what the various tolerance and finish symbols on the drawings mean.

It's also necessary to pay close attention to the tolerances given for bores, shafts and spigots as it is intended that some items will be press fits into others. Being aluminium, it needs to fit just right as you can't apply too much force without marking or damaging it. I used a drop of Loctite with the press fitted parts to ensure the parts didn't move after pressing them together.

To be continued...

A Garratt by the end of the decade?

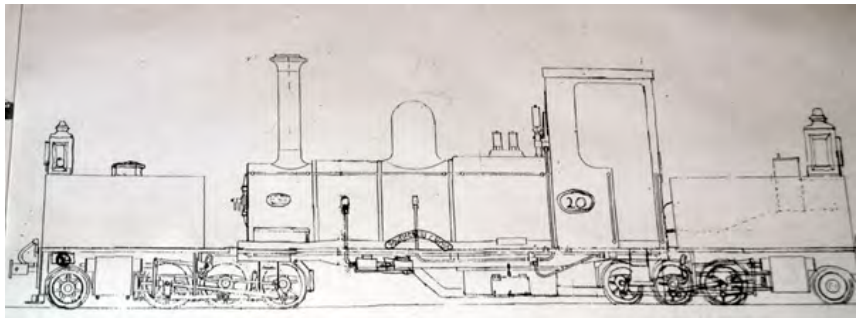
FOR a chap who's quite at home driving a little 5" battery loco or his 5" Blowfly at NDMES' monthly public running days, Steve Reeves is now getting ready to join the big boys.

He's well into a project to build a 7¼" 2-6-0+0-6-2 Garratt, Southern Cross No. Gr20. At 900kg, that's heavier than a Mitsubishi Mirage sedan!

Yes we know Steve has a 7¼" loco, Evyazel, but that is based at Bunbury. He plans to share the "big-un" between Bunbury and Balcatta.

It's a BIG loco! Steve stands behind the rolling chassis of his 2-6-0+0-6-2 Garratt, holding up one of the cab sides. The red "Southern Cross" nameplate is clearly visible in the centre.

Below: The working outline Steve is using for his Garratt project. All photos: Tom Winterbourn



The Garratt is based on two that were built by Beyer Peacock in Manchester in 1912 for the Buthidaung-Maungdaw Railway in Brazil, but Steve used a WAGR MSA outline drawing for the basic design.

Photographs from a Beyer Peacock book were used to get the proportions correct, such as cab, tanks etc, while Martin Evans Highlander (Black 5) plans were used for cylinders, valve gear and boiler sizes.

The boiler is a 10¾ inch diameter Belpaire-type with a grate area of 10in x 12in. It will be superheated and have a steam pump, oil headlights and vacuum brakes.

The loco will have cast iron piston valve cylinders with steam draincocks and ball bearing axle boxes.

Steve brought in most of the boiler fittings from the UK, plus two white and two red marker lights and oil lamps. He mostly used his own patterns and castings.

The components for two Jim Uwins twin ram mechanical lubricators with roller clutch drive.

He is currently making two twin-cylinder Jim Uwins mechanical lubricators.

"I guess I am about a quarter way through the project," Steve said.

"Construction started in December, 1989, with completion expected somewhere between five and seven years from now."

This 7¼" articulated giant **WILL** fit on to our hydraulic loader – just.

"At 9ft 7ins, that's 2.9210m, a mere 3" inside the 3m limit (sorry about mixing imperial and metric measurements). However, Steve confessed he hadn't checked whether the loco would fit on the unloader before starting construction, as the original plan was to run it at Castledare. But this plan has since changed and the loco will be run at NDMES and at SWMES in Bunbury.

"The length of the loco was determined by the size of the firebox, as I wanted to make sure the engine would steam OK on Collie coal," he said.

"If it had turned out to be too long for the unloader, I would have made a special ramp, but I'm glad it fits."

Steve said he spends about four hours a week on the project – most Fridays and Saturday mornings before going to work "on the buses".

*Steve is also share-building three 7¼" Juliet 0-4-0Ts, with Phil Gibbons and Robert Otway, with Steve building the three boilers. But that's a story for another day.

The long, long story of a power hacksaw by Laurie Morgan

A long time ago, in a galaxy far, far away … sorry, beginning of the wrong story.

Back in the '50s, when money was a lot harder to come by than it is now, and the Chinese weren't happily making cheap stuff for the rest of the world, people sometimes made their own machine tools.

Model Engineer back then published drawings and pictures of a power hacksaw designed by the 'Duplex' team, to be made in the home workshop (see below):

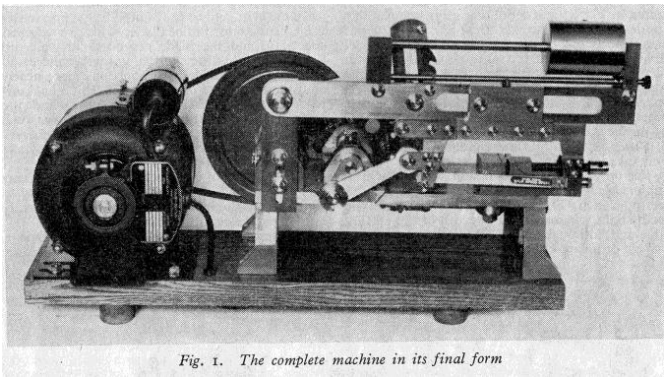


Fig. 1. The complete machine in its final form

This was no small project for someone who then might not be able to afford a lathe, or if they had one, did their milling with a vertical slide.

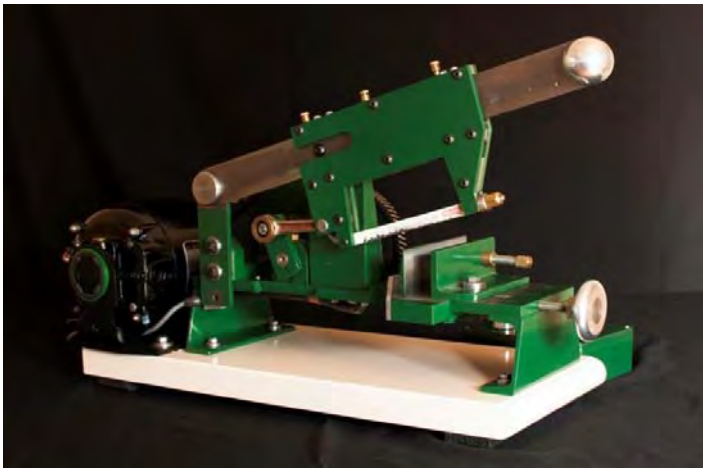
Anyway, fast forward to around 1980 and a young Ron Collins decided to make one in his Dad's shed in Cloverdale. He incorporated parts from broken motorcycles (no, not bikes he had broken, for at around that time he was riding a nice Suzuki water bottle, which got part-exchanged for a Suzuki Rotary RE5).

The project progressed so far, but got left behind in the rush to do bigger things and some long time ago it was passed on to me to complete.

Well me, being the lazy person I am, and in a hurry to build the roof trusses for my new workshop, I bought a Chinese bandsaw and Ron's half-finished project was left to languish in my roof space.

About 20 years ago I passed it on to Rodney Entwistle, another lecturer with whom I was working at the time at Curtin. Although I knew he was working on it slowly, it came as a surprise when he told me recently that it was finally finished – after a gestation period Ron reckons of about 30-35 years!

The pictures show what a good job he made of it.



One look at the name forged into the con rod (Yamaha) will confirm its motorcycle beginnings (I had thought it was a Honda, from a Postie bike, but my memory is not what it was…)

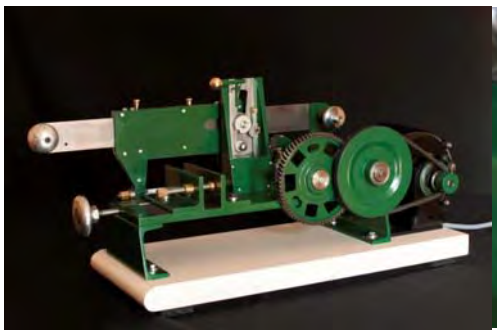
Rodney has listed the things he incorporated in this machine:

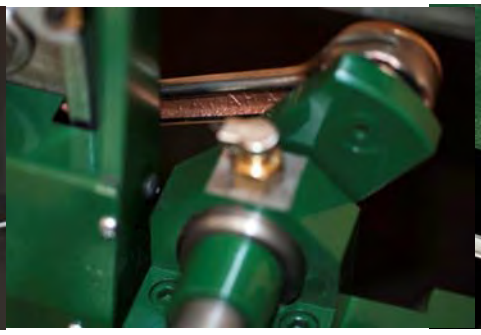
- An inbuilt vice with swivelling moving jaw and removable jacking screw. Underneath the base plate is a jaw support bar that is about 80mm long. It stops the jaw tilting. The "nut" for the jaw closing screw is tapped directly in the base plate.
- Auto cut-off by microswitch. The cam mechanism can be seen in the photo - the switch is enclosed by the cover at the base of the upright.
- Full relay start/stop control mounted in a free (or pendant) box.
- Removable outrigger support and stop for the work.
- The saw frame is oil-lubricated with channels milled into the saw frame side plates.
- The saw frame running clearance is adjusted with brass wear pads on its upper edge (roller bearings support the main load on the lower edge).

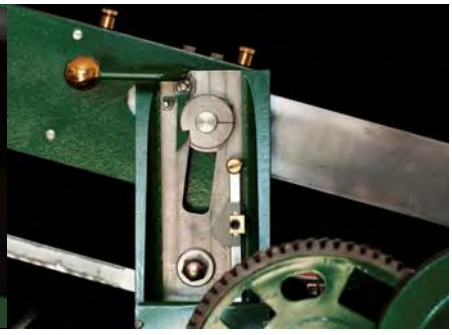
I'm not sure that I would want to cover it in swarf after all that!

Laurie Morgan

All photos: Cameron Entwistle







How I came to build a Britannia

by Jim Clark

As was mentioned in the May-June issue of Steamlines ("A tale of two Britannias"), I had always fancied building a large steam locomotive and in about 1997, I bought some parts and plans from Alan Marshall, a former NDMES member, who was returning to the UK. I bought the rest of the castings from Norman Spink, a model engineering supplier in the UK.

About the same time a company called Winson in the UK started to produce a ready machined, bolt-together kit for the Britannia, based on the same drawings I had, so I obtained a copy of its colour brochure and found that very useful in visualising how the various parts went together, especially in the early stages of the wheels and chassis assembly.

Winson subsequently went into receivership, but its legacy is a considerable number of kit-built Britannias in the UK and around the world.

Selecting which one of the class my model would represent was not difficult. The two popular ones are 70000 "Britannia" and 70013 "Oliver Cromwell", presumably because these are the two surviving locos in full size. These two have both recently been returned to main line steam after periods of neglect—search youtube and you will find several interesting videos.

My drawing set showed "Oliver Cromwell" and I had an etched set of nameplates, so 70013 "Oliver Cromwell" it became.

The drawing set consisted of 23 sheets, each covered with dozens of detailed scale drawings of the individual parts. They were scaled down and slightly simplified from the full size BR drawings.

I started with the loco main frames. I had the plates for these, along with other frame components, laser cut from steel sheet.. First I transcribed the frame drawings from the paper blueprints into CAD format using imperial dimensions and then produced the outlines to scale in metric units and provided files ready for the computer-based laser cutter.

The results were good, with a pair of highly accurate frame plates and all holes (down to $^1/_{16}$") either cut or accurately spotted by the laser. This meant that the frame started off square with all the axle box cut-outs properly aligned and at the correct spacing, essential to getting the rest of the engine to come together properly and run smoothly. Well worth the effort on the CAD.

I machined up the wheels to AALS standards and mounted them in sets, quartering the driving wheels.

I made up the front bogie assembly and the rear pony truck, each of which was fairly complicated. These were completely assembled, tested and painted as self-contained projects. I couldn't bear the thought of having to strip everything down at the end to paint it all and then re-assemble it again, so I completed each sub-assembly as a unit as I went along.

In another life and time (with more hair!) , the bogie and pony truck was complete and assembled on to the chassis. All photos: Jim Clark

Next came the motion work, including the cylinders, pistons, valve gear and all the complex interconnecting rods and levers.

I had some problems with porosity in the cylinder castings, which meant that there were small holes in the sides of the cylinder bore. Not good!

So I bored the castings oversize and made cylinder liners out of hollow gunmetal bar. These were pressed into the cast iron cylinder blocks and solved that problem.

Finally, the completed cylinder assemblies could be mounted on the chassis together with the driving wheel sets and rods.

At this point a couple of small but cumulative errors in the drawings become apparent, because the clearances between moving parts, even on the full size loco, are so tight that the slightest discrepancy causes moving parts to either not align properly or to hit each other. After some serious head-scratching and application of additional packing spacers under the cylinders and a little judicious filing, I finally had it all moving smoothly and the rolling chassis was complete.

Having invested so much time and effort, I needed a showcase so that Oliver Cromwell could be seen and appreciated and not just gather dust in the shed. So I built a specially strengthened, solid Jarrah cabinet with a swivel-out track base to allow it to be run in and out whenever necessary.

(Continued on page 11)

How I came to build a Britannia (cont...)

by Jim Clark

I decided to take a break from the locomotive and start on the tender. This was tackled in a similar way to the loco, with the frames laser-cut and I machined up the wheel sets as before. As there was no motion work to worry about, I had a rolling tender chassis quite quickly. However, the body of the tender presented a few challenges of its own.

It is a complex design with a coal bunker sitting inside the water space. I decided to make it as two separate sub-assemblies so I could have some chance of reaching all the joints so as to rivet and solder them, as everything had to be watertight. The rivet patterns follow the full size tender.

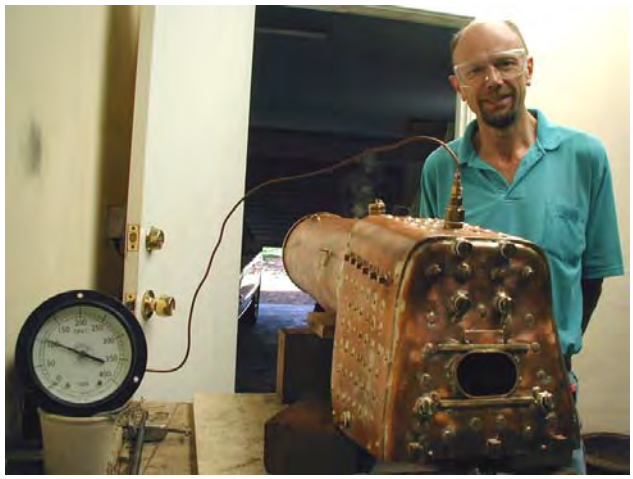
The finished tender, painted and lined.

The boiler was another challenge – the design in the original UK drawings was not suitable as it had to be designed to the AMBSC Code for use in Australia. I spent a long time making CAD drawings and studying the Code.

The main component parts of the boiler were laid out, showing the plates all flanged and the inner firebox and outer wrapper dry assembled using ordinary screws and nuts. This allowed everything to be checked for fit and adjusted as necessary prior to brazing.

Half way through the brazing stage, screws were replaced with copper rivets. The two sub-assemblies were first individually brazed up and then later brazed together. Following this, the copper rod stays in the firebox walls were fitted.

Now to the final stage of fitting the backhead and its stays. Lots of heat needed! There were a few leaks that had to be tracked down, then...a big smile – pressure tested at 100 psi and no leaks!



There is an array of four “Marty Burners” burners fitted into the Britannia ashpan. These are based on a US design published on the Internet and which has been used by several other club members for gas firing. These burners were easy to make and seem to work very well.

After the boiler had passed its hydrostatic test (at 200 psi) I couldn’t resist steaming it up. It steamed very freely using the gas burners.

The completed boiler has a brass cladding that was almost as difficult to make and fit as the boiler components themselves. There is a lot of tricky pipe work and many small fittings, all of which have to be made and fitted, then stripped off again so that the boiler can be finished and painted.

The cab is another complex shape, following the details shown in photos of the originals as far as possible. Finally, the cab, boiler and chassis could be temporarily united with the tender to get an idea of how the completed locomotive would look... and yes, that is a happy smile... it all fits together!

September/October General Meetings

Oops, I've got my finger stuck! Paul James is pictured giving a brief "show and Tell" update on his 5" Pacific project at the club general meeting on September 12.

Above centre: Jim Clark explains how his hot air engine works (as presently featured in the "Hot Air" construction series, page 7) at the October general meeting .

Above right: Also at the October meeting, Paul Costall with his authentic-looking lamp for his Fowler showman's steam traction engine.

Right: Ken Austin explains the operation of the swing arm bogie design for his 7¼" Baldwin locomotive, watched closely by immediate past president Paul James.

Railway builds four different new locos

IN the September-October issue of Steam Lines we reported on the extraordinary plans to build no fewer than 20 steam locomotives in England – because none of their class had been preserved.

Now, it is revealed that four of these locomotives are being built at the one location, the Llangollen Railway in Wales. They represent three of the four pre-nationalisation railway companies.

The September edition of The Railway Magazine states the latest addition to the new-build program at Llangollen is LNER B17 No. 61673 "Spirit of Sandringham". These Gresley-designed 4-6-0s, introduced in 1928 (with variants introduced as late as 1947), were known as Sandringhams, after the class pioneer of that name.

The three other locos being built at Llangollen are GWR Grange No. 6880 "Betton Grange", GWR Churchward 2-8-0 mixed traffic 4709 "Night Owl" and LMS un-rebuilt Patriot 45551 "The Unknown Warrior".

Northern Districts Model Engineering Society (Perth) Inc.

All correspondence to:-
PO Box 681
Balcatta
Western Australia 6914
www.ndmes.net

DISCLAIMER