Sydney Live Steam Locomotive Society

Anthony Road, West Ryde, N.S.W.

'Newsletter'

Volume 51. No. 2.
May 2023

Arthur Hurst and his rebuilt 3503, originally built by past member Ron Larkin seen on the occasion of its first passenger hauling service at the grounds. It ran well all day. The story of this loco is on page 8.

February Running Day.

The day was rather unpleasant, hot and humid, but it was our last running day for our summer season! Martin D was working on #7 signal getting it ready for the afternoon's operation. Bernie C was observed watering down the leaves and the stub points for the carriage siding to counter any expansion that may hinder the operation later in the day. John L organised an esky with ice and cold water for the elevated crew as the afternoon wore on. The B10, now back with David T was having a boiler test with Andrew A. The hydro was OK but the steam test was not completed due to a faulty blower valve spindle.

Running on the outer main we had the Allison C3609 driven by Andrew running in front of David L's Commonwealth Railways GM's. They were hauling the green set with Jo Anne T as guard. The interesting feature of this train was the distance between the two drivers due to the length of the double diesel locomotives. The second train, the blue set was hauled by Arthur H with the Hurst Mountain 4-8-2 and Greg C as guard. Eddie was on the station.

The inner main had the Wolgan Valley Shay hauling the Pullman set with Scott M at the regulator. John H was guard. The second train was the Central West car set with Graeme K and 4-6-2 2401 train engine being led by Garry B and C3807. There were some low loadings at times but otherwise all ran well for the afternoon.

Simon and Gazelle leads David C and Nigel Gresley with John L as guard on 4 cars on the February running day.

On the elevated our four car train, the blue set, was hauled by Simon C with 4-6-0 B1 Gazelle leading David C and 2 -8-0 Nigel Gresley as train engine. John L was guard. Brian K coupled his 45 class diesel outline locomotive up to three cars and ran with Bernie C as guard. Paul T steamed his Hunslet with one car. David T was seen driving a few laps during the afternoon. Wayne F was station master for the elevated.

The signal box was attended to by Martin D, James P and Warwick A. Peter W sold the ride tickets and the gate was taken care of by John S. The kiosk was looked after by Joy E and Elizabeth T. Mick M was track superintendent and Neal B was about assisting where needed.

Following the running on the elevated Warwick A, Arthur H and John L were at work with angle grinders cutting sections of the old track and tip rails in preparation for the next section of elevated track replacement that was to start the following day.
It had been a rather exhausting day but we just managed to have a successful afternoon.

A behind the scenes view as Brian and the 45 come around the back of the signal box in February.

March Running Day

It was a bit hard to come to terms with the fact that our first autumn running day had weather that reminded us more of mid-summer. With the temperature close to the mid thirties we were fortunate that the humidity was not as high as it had been for the previous running day. Setting up and tidying the grounds involved a lot of leaf raking and blowing but by the time the gates were opened all looked well.

The GL carriages were checked and prepared by Chris D, David L, Ross B and Evan L. Mick M and David L inspected the new section of the elevated track and certified it for the afternoon's running. John L trimmed some of the vegetation around the perimeter of the elevated and Bill P, John S and Mike D raked and cleared the leaves. Young Cameron Murray assisted with the leaf cleaning as well.

On the elevated we had one four car train and two two car trains thus only needing one guard. Brian K coupled up his 45 class diesel outline loco to the blue set and Simon C ran his 4-6-0 B1 Gazelle as pilot loco. Behind the guards van Brian coupled one of the new elevated passenger vans for a test run. John L was guard with Neal B taking over to allow John to get some photos of the afternoon's run. For our first revenue run Neal B rode on the new carriage, with a special seat for one and reported that

45 Class
On the inner GL we had the two larger locomotives. Mick M ran the Wolgan Valley Shay with Tony E as guard while Ross B steamed his 0-6-2 Fowler with John H occupying the guards position. With reduced patronage both trains were stabled in the head shunt for a period of time. While on guard duty John H was noted recording the trains progress with a Go-Pro, or similar device. John was checking to see if this

Above: Graeme and 2401 as train engine are led by Garry and 3807 at the inner main station on the February running day.
Right: Arthur and the 4-8-2 on the outer on the February running day.

it rode well with some variation at the transition from the old to new elevated track. From the guards van John L noted that the B1 rode this transition well while the 45 did show a slight side to side roll. The rest of the new track provided a ride as smooth as we could wish for!

Bernie ran his 0-4-0 Blowfly with two cars very well till a bit after 3.00pm. Paul T ran 0-4-0 Hunslet with two cars having a break in the loop mid way through the afternoon and was the last train on the elevated track. The station was looked after by Bill P with Cameron M assisting with ticket collecting. David J had some time driving the

Editorial

In July this year we will celebrate the75th Anniversary of the SLSLS. We can look proudly on what has been achieved at our grounds over the last three quarters of a century and recognise the design skills of our members as well as the hard work that has been provided by the members to achieve all of this. Add to this we have been able to admire the results of the skilful construction and care that our members have taken in constructing the miniature locomotives that we have to run on our tracks. The quality and detail and performance of some of these would match the best examples of model engineering anywhere in the world. The same goes for examples of steam road and agriculture vehicles and stationary steam plants. Our infrastructure has tried to recreate a true railway atmosphere to add to the appeal. We have a real lever frame operating real signals on the elevated and the stub points have been a feature for many years. The elevated track replacement is progressing well and is of a rather unique design. The ground level track is of great quality, kept that way by continuous and careful maintenance. The signal box with its miniature lever system keeps trains running safely and soon we will have automated signalling protecting the lower end of the track.

While all this has happened we have had good management planning the direction of the Society, looking after our finances and the operation of the "paper work" and compliance matters that are becoming much more a part of present day life. We have been fortunate!

It made me think, well, how many more milestone celebrations will the SLSLS have. We simply have to do the mathematics, to get to 90 we have to add 15 years to our present ages, the scores do not for many of us look very pretty! Let's settle for getting to 80.

Overall we need new members and any we get need to be made feel welcome and be happy to be involved with what work is required to keep us going. It should be the case that we take time to explain what has to be done, why and how to do it. They may not have the vast knowledge of railway or engineering matters as we do, or, think we do and their practical skills may need developing with our help but hopefully they will bring their own skills set that can benefit the Society.

I feel it is a matter of everyone doing what they can to advance the cause of the SLSLS and be happy to have our facilities to make use of. We need to be involved members, doing whatever we can to assist in the overall advancement of the Society. I can remember some years back a former member stated "I don't cut my grass at home why should cut it here". At the time I did not answer, if I had of I would have said "because you belong to the SLSLS!"

John Lyons - Fill in Editor

David Thomas has relieved Paul on Hunslet for some laps on the elevated in March.

system could be utilized by some societies that are unable to have a CCTV system as we have to provide a record of their train operations. The station was looked after by Ian T.

On the outer main we had some interesting combinations. On one set Craig D ran the TGR 4-6-2 R class as train engine with Evan and the heritage Mikado 2-8-2 running pilot. They ran very well all afternoon till Evan returned the Mikado to loco and was replaced by John T and the 2-8-0 J class till the end of running. Greg C was guard. The second train had a very South Australian flavour as David L's CR GM's were coupled to the car set and David T's SAR 620 class ran pilot. The 620 was returned to loco for a short time but returned to finish the afternoon. Paul B was guard on this train. David T noted that we had a visitor From SA so he hoped that the visitor was suitably impressed at seeing the South Australian locomotive combination in operation. On the station we had Peter D and Chris D.

John S and Mike D looked after entry procedures and the signal box was attended to by Martin D and James P having a busy but successful afternoon. In the kiosk Liz and Joy provided a good service and Neal B was track superintendent. Eddie and David J also assisted with the day's operation and Peter W sold the ride tickets in the ticket office. With a lot of regular members playing trains at a country venue or involved in grand children duties we did well to manage the afternoon. It would be really nice to have an excess of members available! There was one very big party group set up at the bottom of the grounds and all the shady parts of the grounds were well patronized. Fortunately our visitors headed for home, or cooler places, not long after 4.00pm giving us a chance to start packing things away.

April Running Day.

We were fortunate to have a good day, clear blue skies and bright sunshine but not too hot. A welcome change to what we had experienced for our previous two running days. Ross B had the Fowler ploughing engine on his trailer adjacent to the elevated station for testing. David T officiated with the engine passing both hydro and steam tests and is now set for four years of operation. With much of the setting up completed John L was assisting Mike D with some work on the lathe turning components for Mike's riding truck. The piers that were poured the previous week were released from the moulds by Bill P. Bill took one of the mould sections home to carry out some running repairs.
There were lots of locomotives; in fact, Warwick's C3609 was not unloaded!

On the inner ground level Scott M was once again in charge of the Wolgan Valley Shay running one of the car sets with Tony E as guard. The second train had Craig D and the TGR R class 4-6-2 as train engine and Ken B and Simplex coupled in front. Late in the afternoon the Simplex suffered from steaming problems and retired to loco. The Mule was taken out, turned and coupled on to the train as attached banker. The main switch breaker tripped but was reset and continued well. Neal B was guard for this train. Ian T was station master for the inner station.

The outer main saw the green set hauled by Graeme K with 2401 train engine and Arthur H with C3503 4-6-0 coupled at the head of the train. This was the first run for the rebuilt

Preparation for the February running day in loco saw 3609 being lead attached to the Commonwealth GMs while 3807 watches on.

Left: Simon and Gazelle lead Brian's 45 with David J driving on the March running day.
Above: Ross' Toneya takes a break in the inner main siding in March.

C35 in revenue service. The combination ran well all afternoon with Wayne F acting as guard. The second train, the blue set, was under the care of David L with the Commonwealth Railways double GM diesels. Jo Ann T was guard for this train and the station was attended to by Paul B and Peter D.

One train had Garry B with B1 Impala 4-6-0 coupled in front of David C's Nigel Gresley 2-8-0 with four cars and a van. Garry's B1 was fresh from hydro and steam testing. Geoff H was guard. The second four car train was powered by Brian K and his 45 class diesel outline loco as train engine with Bernie C and his 0-4-0 blowfly running in front. John L was guard for this train. Paul T and his Hunslet took two cars and David T ran his B10 with one car. The B10 did not run long as a problem developed. Eventually John T arrived and when he steamed the 2-8-0 J class he ran two cars on the elevated as well.

Attending the station were Jim M, David J and David T. Running the canteen we had Eliz T and Joy E. The signal box was crewed by Martin D, James P and Mike D and Warwick. Track superintendent was Mick M assisted by Chris D. The gate was controlled by John S with help from John H and Mike D. Tickets were sold by Peter W. Looking at the figures for rides given for the afternoon the total score was 1570 with the break down inner 525, outer 456 and elevated 589. Who would have thought! They must be doing something right up on the elevated! In all a successful afternoon so much more pleasant than our two previous ones.

Carers Run.

The Society had been approached by the Department of Communities and Justice, who look after foster carers with the view of having a run for the carers and the children they foster. This was fitted in on Saturday 6th May taking up the time 12 noon to 3.00pm. They provided a lunch for our members. It was a nice easy affair with one train on each of the ground level tracks as well as some action on the elevated. The inner ground level saw Mick M run the Shay with Chris D as guard and the second train had Craig D steaming his TGR R Class 4-6-2 and ran with Paul B as guard. Dennis O'B was assisting.
On the elevated Warwick A steamed 3½" gauge Britannia, very appropriate considering it was Coronation day!

Evan & the heritage 2-8-2 lead Craig and the R on the outer main on the March day.

Arthur H ran the C35 with two cars till trouble with the injectors forced him to retire the locomotive. Mike D was intending to run the 3½" Derby 4F but trouble with the axle pump caused an early end to that, very disappointing.
The entrance was attended to by John S, John H and one of the carer's helpers. Track super was David L assisted by Ken B and in the signal box we had Martin D and James P. In all it was a successful afternoon, there were lots of happy faces!

Works.

(See photos Page 15)

The continuing elevated track replacement has taken another step forward between the Sunday after the February running day and the March running day. With some angle grinder work at the completion of the February running day the Sunday work was off to a good start. The beams were removed quickly by Andrew, transported to the top of the grounds and with the aid of John H'S tractor were lifted into Brian K's trailer and dispatched to Mudgee in very quick time. There was some week day work and the new track was ready to go with a week to spare. Involved were Chris D, Mike D, John T, Andrew A, Warwick A, Bill P, John L, John S, Arthur H and John H. Sorry for anyone forgotten. The track was back in service for the March running day and some minor adjustments were made the following Saturday. Work is now preparing for the next section of work. Piers have been poured and await sealing and fitting of rubber cushion strips.

Ross had the ploughing engine out for a boiler ticket on the April running day. David T officiated.

Ground level track work has started again now that cooler weather has arrived. The siding behind the ticket office has been lifted and a set of points removed.

A general clean up of the grounds has begun. John H took a load of timber to the waste disposal depot, 900 odd kgs. About one third of the load would have comprised of the old signal post and another redundant fence corner post, all old hard wood. The anti tip rail that is to be recycled has been removed to the bank behind the workshop leaving the area in front of the coal storage shed free of obstacles, much safer!

The mains electricity connection for the disabled toilets is

April Running Day: Left: Scott and the Shay with a good load on the inner main. Right Top: David L and the GMs on the outer main, while Right Beloe: Ken's Simplex leads Craig up the inner main with a good load.

Left: Garry B and B1 Impala leads David C and Nigel Gresley down the elevated in April.

Below: The action on the special day for Carers.

Top: Mick and the Shay while below that is Craig and the R.
Lower scenes are on the elevated with (left) Arthur and the 35s brief appearance on the track and (right) Warwick with the 3½ inch gauge Britannia on Coronation Day!

closer to being completed with the trenching completed, conduit laid and wiring in place and the lot refilled. The connections at either end will be completed soon. Warwick A, Mike D, David L and Chris D and others have been involved.

David L and others have continued work on the automatic signalling for the lower end of the ground level track with attention now turning to the outer main..

Restoration of 3503 Arthur Hurst

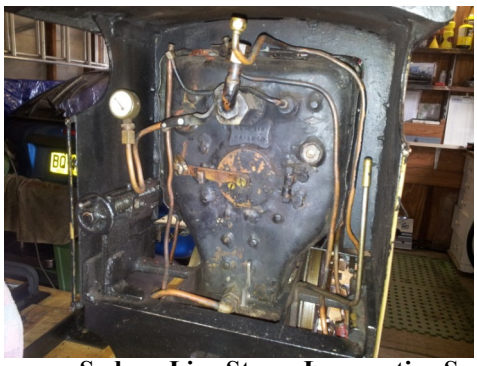
Ten years ago, I was contacted by Barry Tulloch, advising me that under his house was an old 35 class loco that he had been storing for about 15 years. He wanted to find a new home for it as he needed the space. The locomotive, 3503, was constructed by the late Ron Larkin, had seen extensive use at West Ryde, and was in need of major restoration. It was suggested if I were to contact the Larkin family I might be able to buy 3503 in its current state and start on the restoration process.

The Larkin family agreed to the sale and on one Saturday afternoon Barry supervised John T and me getting under the house and bring 3503 out to the awaiting marking-out table. Barry, John and Elizabeth pointed out a few major issues with the locomotive and tender and then assisted me in loading up the engine so I could take the locomotive home and eagerly start on the restoration process.

Never in my mind did I imagine that this process would take almost 10 years and with a lot of assistance from others as my knowledge was limited in the restoration process.
Under close inspection with my brother John, it was discovered that the motion gear, cylinders, plumbing, lubricator etc was worn out – to be expected considering that the locomotive was used by Ron almost every running day at Ryde on the elevated track for many years. Both Barry Tulloch and my brother thought that the boiler was in reasonable condition but needed work to bring it back to an operational level.
Over the first few years, restoration seemed to be at a snail's pace what with family issues and the like and just trying to sort out which way to proceed with the restoration. It was all a bit daunting because everything except for the boiler, including the tender, needed rebuilding. John Tulloch and I went out to government records near Penrith to see if there was any availability to get some 35 class drawings which would give me an idea of where to start, first on the tender modifications and then move to the locomotive.
It just so happened that Ray Lee was cleaning out his workshop one day when under the bench he also had a Larkin built 35 class rolling chassis which he had been storing. He suggested to me to ask the Larkin family if they would be interested and willing to sell me this chassis as the parts may be of use with the restoration of 3503, to which the Larkin family agreed, so after the purchase was made, I went to Ray's place at Engadine and picked up the rolling chassis and bought it home to Dapto.

While this chassis needed work too, it was in much better condition than the original one. A decision was made to cease work on the original chassis and to finish this chassis including adapting it to suit the original boiler. This process took quite some time as family issues took precedence! I sought advice from a number of people including my brother John, Barry Potter, John Tulloch, Ray Lee, Ben de

Pictures of the loco before restoration. Left the cab view, cab sides and boiler.



Above and below: Views into the revamped cab. Bottom: The nice lines of the tender.

Gabriel and Jason Schmidt and a number of others in order to get the best information so I could undertake the restoration. My goal was to carry out the restoration process by myself to the best of my ability!

I was able to get the replacement chassis to run on air after doing modifications, watching the motion gear going forward and in reverse for the first time was very pleasing which also spurred me on with increased enthusiasm.

One of the first major jobs was to make new cladding for the boiler, along with enhancing or replacing other platework. Long term storage had taken its toll. Once this project was complete, fitting it into the 2nd frame this took quite some time to achieve. Among other tasks, this included new running boards, a better functioning regulator, a new lubricator system, a completely new steam manifold with new steam valves, a new gauge glass setup, make and fit a new reverser, fit new injectors and establish a new vacuum brake setup, all new plumbing was needed as well!

While the engine steamed well, its valve events were not very good. Brother John & I tried to improve them by adjusting the valve setting. This was not successful because an eccentric came loose. Close inspection while dismantling to fix the eccentric indicated a number of issues that added together, meant that while it would definitely work, a 'bit of fiddling' would make it better! We didn't replace a single component – just fine-tuned them. This is a summary of what we did:

- Reposition the motion bracket so that it was at the same angle as the valve rods.
- Change the length of the lifting arms so suit the repositioned motion bracket.
- Make all four eccentric rods the same length.
- Use Allan Wallace's valve simulator to find the best eccentric angle to optimise valve events.
- Set eccentrics, alter the two valve's lengths & position them to provide correct inlet opening – just cracked at top & bottom dead centres.
- With correct inlet timing, calculate the valve land width to give correct exhaust port timing, and machine the slide valves to suit. (Exhaust beats can only be evenly spaced if the cylinders open to exhaust at the same position in their stroke.)

In hindsight, this fine tuning would have been much easier before the engine was re-assembled and painted! I have learned a lot doing this and the final product is very rewarding – Ron's partially completed chassis together with much of his original engine now has another life at the club where he used it extensively.

No it's not Arthur! 3503 being test driven by brother John.

A Westinghouse Pump

For 5” Gauge

Simon Collier

Westinghouse style pumps are a familiar sight on many 5” gauge engines, adapted to be steam operated water feed pumps. Warwick Sandberg has sold 1” scale pumps and larger for many years. Loco builders often fit dummy pumps but a few have built their own working pumps, including Ray Lee and James Sanders in our club.

There are plans hand drawn by Ray, and also drafted plans derived from these by someone with slight modifications. When I first got a copy of the plans, I studied them for three days before I fully understood what was going on. These pumps are incredibly complicated! I thought I might have a go one day and filed the plans.

Recently James Sanders completed his second pump for his 27 Class build, and much like injectors, James’s success was the impetus I needed to cut metal. I had bought a foot of 1-3/8” LG2 from Ben at the Hot Pot for the job so material was on hand. The pump head is a nightmarish fabrication and houses both the pilot valve vertically, and shuttle valve horizontally. My approach to projects is to try to make the most difficult part first, and if successful, it’s all downhill from there.

The pump head after silver soldering, is shown in Photo 1. The bores were undersize at 6 mm, to be drilled and reamed out to 1/4” after the valve port and connecting holes were drilled. You definitely want new, quality 1/16" drills so you have some chance of maintaining spacing when drilling across the bores. Drilling the connecting holes at 90° to each other is heart-in-mouth stuff, requiring careful measurement and concentration.

Spare shuttles and valves were made.

The first step. The five piece head was silver soldered.

The little slide valves carried by the trip rod and the shuttle valve were easier than expected but still are small and fiddly. The shuttle piston valve was made easier with the digital readout on the lathe. It reminded me of injector making, but injectors are vastly easier and quicker that these pumps. I had been warned that O-rings and packing needed to have minimal squeeze as friction would prevent the pump from working. Similarly, a high degree of concentricity is essential, for the cylinders, trunk section and glands. This means working to the greatest accuracy possible, with lots of clocking components to run true, and ideally, screw-cutting threads rather than using dies. Collets were used where necessary. You can’t afford to take a lazy option at any stage.

The trip rod, with pilot valve cradle and trip button nut and lock

The little 1/32” thick discs on the trip rod which retain the pilot valve caused some head scratching. The solution was to make a little dumbbell with a 1/16” hole through it and silver solder it to the stainless trip rod. I used monel as I had a little, and thought brass might melt. Once brazed on, the middle could be filed down so the slot in the pilot valve would fit over it. The piston rod was made from 5 mm stainless, as my 3/16 stock was well under nominal size. The end for the water piston was turned down to 3/16 and screw-cut 3/16 x 40. The steam piston was silvered on. It transpired that later on, I realised that there was a mistake in the plans, with 2-1/8" needing to be 2-5/16", so I made a new piston and rod, but this time, I stepped the rod and Loctited on the new steam piston. I may come to regret this, but cleaning up the silver solder on the first rod without marking the rod itself was stressful. The steam cylinder was straightforward. I find that insert boring bars always cut tapered bores, so final cuts were made with a sharp HSS bar. It was a matter of guesstimating what bore would give just a light squeeze on the Viton O-ring. The ring groove depth also can be used to control the degree of squeeze.

Boring for the glands after silver soldering on the trunk ends, after clocking to run true.

The trunk section is a soldered fabrication, again needing to be concentric so it was bored for the glands after brazing up. The glands were Loctited into the respective ends with the piston rod in place to help align the glands in the trunk ends. I also had the gland nuts with Teflon tape packing in place, as I could see no way of packing the glands after the fact through the hole in the cylindrical part of the trunk. The water cylinder was a horrible contraption, with no fewer than four ball check valves, and angled holes to connect passage ways. I had made the decision early on when the stock was still in the lathe, to cut fins in the cylinder to look more prototypical. Talk about making a rod for your own back. This made brazing in the

Mistake on mistake. Wells inserted to remake the ball seats.

Plugs of 8 and 9 BA were made by Loctiting in a few turns of thread and later Dremeling off flush, and reusing the threaded rod end in the next session.

Diary

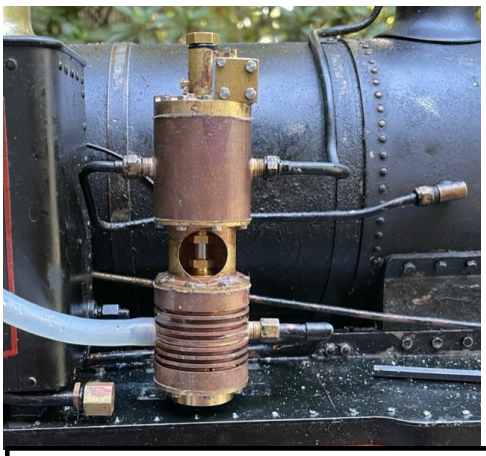
3 June	Presidents Breakfast and AGM
10-12 June	Hot Pot Run
17 June	Public Running Day
4 July	Directors meeting
15 July	Public Running Day
22 July	Members 75th Birthday Luncheon
29-30 July	SLSLS 75th Birthday Weekend
5 August	Members Meeting
19 August	Public Running Day & Next Newsletter
5 September	Directors Meeting

Upcoming Special Events

11-13 August	QSMEE Track n Tent
4-5 November	Small Gauge Festival

threaded inlet and outlet more difficult, the connecting hole at a shallow angle to the cylinder half way down was horrendous. I should have cut the fins very shallow, say 0.5 mm which still would have had the look without making things very difficult.

The plans did not give accurate, angular locations of the check valves and so I made a mistake here. I had to silver solder in a brass plug, but lack of penetration deep down manifested later on compressed air test. I therefore drilled the 6 mm holes out to 1/4, and Loctited in deeper wells of brass. These were later slot drilled 6 mm to the 7/32 depth, and reamed through 1/8 at the bottom. This went anything but smoothly but I think I got away with it as there was no leak on the next test. There is a nasty little 1/4 O.D. gland to make a press fit in the bottom of the pilot valve chest bore. I fitted a 1/16 I.D. Viton O-ring in here retained by a 3/16 x 40 screw. As the ring is in a threaded bore, I relied on a touch of end squeeze to seal the trip rod. A guess, like many others.



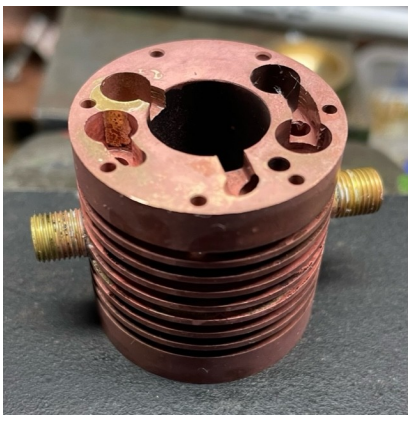
On steam test there were many leaks and immediate failure of the 0-ring under the cap.

With the gland and also the little slide valves, I turned them from 5/16 stock so I could arrive at a truely round result and bring them exactly to the diameter I wanted. The sections of the pump are held together by 8 BA screws. The bottoms of the two cylinders were easy as the eight screws were spaced at 45°. The top of the steam cylinder however had a huge more than 100° arc with no screws possible because of the shuttle chest. Warwick Sandberg's pumps have this chest elevated, and so screws can be fitted under it. The top of the water cylinder requires irregular spacing to miss the valve holes.

Six gaskets need to be made for the pump including the shuttle chest covers. There is very little distance from the check valve bores and the cylinder outside so a lot is asked of the gaskets. I first used ordinary paper, keen to test the pump on air. I also used O-rings of uncertain parentage for the top cap and also the shuttle valve. The latter happened to have an O.D. of 6.35 mm, 1/4. In the reamed 1/4 bore it had just a little resistance: perfect. I am unlikely to find Viton rings that size. I could use Teflon tape when the rings fail at steam temperatures. The first air test had the pump springing to life at about 10 psi. I couldn't quite believe it actually worked. When fully assembled, it pumped water convincingly, once I fixed the leak mentioned above.

Air with no resistance is easy. Steam was the true test. I removed the Sandberg pump from my Simplex and replaced it with mine. Steam was raised, and with heart in mouth I opened the valve. Much issuing of steam from everywhere resulted but that was all. In my haste, I had connected the pump the wrong way around! I connected it properly getting well deserved burnt fingers, but still no pumping.

By this time, the dodgy O-ring sealing the top cap self destructed into three pieces, so that was the end of that. Printer paper did not cut it as gasket material either. So I will go back and properly attend to everything I did in haste to test it. As satisfying as it was to have the pump work on a whiff of air, I can't say I enjoyed making the pump. It was too much difficult, very demanding work that dominated two months. I think I'll make some 12 oz injectors for a little R&R!



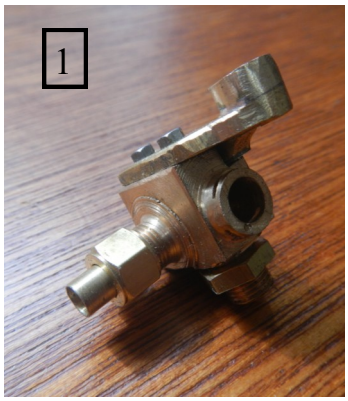
Water cylinder and steam cylinder are double acting. This shows four ball check valves. Inlet top and bottom, and deliver top and bottom. Silicon nitride 3/16 balls were used with 1/8 seats.

Bruce's Bits

Part 6c – Bruce's Boiler Bits – Regulator et al

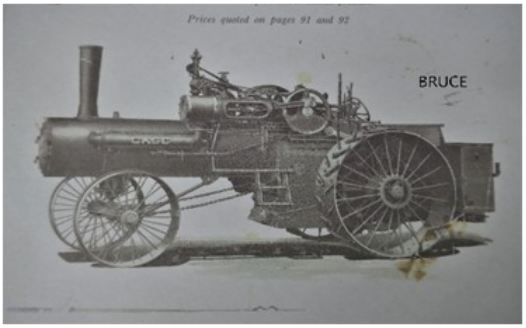
Chris Denton

The regulator for a traction engine is not the same as that for a locomotive. It serves the same function but also need to incorporate a governing device for speed regulation for when the unit is used in a stationary application, e.g. running a thrasher, water pump or any of the other myriad devices traction engines (and tractors) were used to power. As many governors used spinning weights to adjust the regulator, the whole control unit is located outside the boiler. In Bruce's case it would be located on the steam valve chest. So far so good.



It was at this point that a decision had to be made re what type of regulator best suited the installation. It had to be operated by a quadrant from the driver's position, frictionless as far as possible and be able to interface with a rotating weight governor. That was the theory anyway. A screw-in/out or a disc type regulator (as used in LBSC designs) could have been adapted. However, in my inimitable style I concocted a much more complicated arrangement! It consisted of a SS shaft made to a close fit in a brass case. The shaft was hollow for half its length and had two holes drilled a 90° to each other about 5mm apart, perpendicular to the axis of the shaft. These holes intersected the hollow section of the shaft and lined up with holes in the brass body, one being the steam inlet and the other being the outlet to the valve chest. In the closed position the holes in the body and shaft did not line up so the steam was shut off. When the shaft was rotated the holes lined up such that the steam entered the inlet hole in the shaft, went along the shaft and out through the exit into the valve chest. Why the complication of two offset ports and not just one? Not an easy question to answer but it had something to do with the fit of the shaft in the body. If it leaked a bit the "leak" had a much more tortured path to travel and would be thus reduced. Also, having more than one throttling port may give better control. That's the best I can offer. The solid part of the shaft protruded through the body so it could be connected to the governor with a simple linkage, when and if required.

Because of scale restrictions, I decided to make the governor non-functional in the sense that it COULD rotate and COULD be coupled with the quadrant control but was not required to do so from the start. If I have the time and inclination to get my head around the interaction of the number of weights, size of the weights, length of the arms, speed of rotation, stiffness of the spring and whatever I have not yet identified that impacts on the design/ construction of the unit, then I will go down that path, after all the other demands of getting the whole tractor functioning are met. Don't hold your breath waiting.



Uncharacteristically, the machining of the unit went relatively smoothly. The body was machined from a generous piece of square section brass bar with integral inlet (pipe fitting) and delivery (screwed stub) connections. Refer Photo 1. It also incorporated a slotted boss which will be fitted with a "C" clip to retain the shaft in place The mount for the governor was made from a bit of scrap brass bar with a support boss silver soldered in place and was bolted to the top of the body.

The shaft was machined from SS. Refer Photo 2. It has been drilled out for about half its length and incorporates the ports, "O" ring groove and groove for the "C" clip. The smaller diameter end of the shaft has been reduced to accommodate a linkage for the governor and the drilled hole in the larger diameter end still needs to be sealed – any suggestions welcomed.

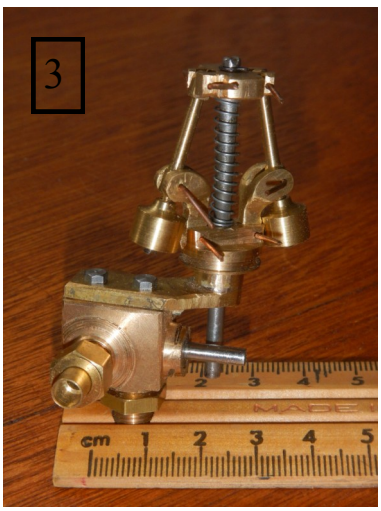
The governor components were a bit more fiddly. I went for two weights rather than three or more for ease of construction and to preserve my mental wellbeing. The weights were made cylindrical for ease (drilling accurate holes in spheres was a little too daunting). Two of the links were turned with much trepidation and filed to suit. The other two were painstakingly filed, a couple of times! The upper and lower mounts were turned and filed and the lower mount incorporates a thin pulley should the impulse to fit a (very small) drive belt get the better of me. Copper wire has been used to temporarily hold the lot together and will be replaced with 1mm pins eventually (see there is a use for all those broken 1mm drill bits!). Bunnings came to the party with the spring.

The fully assemble unit in shown in Photo 3.

In hindsight I wonder if I should have offset the ports on the shaft at less than 90° so the two ports opened progressively and not simultaneously. You may have thoughts on the matter.

Overall, the units looks the goods and with a bit of luck it will actually function OK. Whether the governor will ever be fully functioning is up for grabs, but not likely.

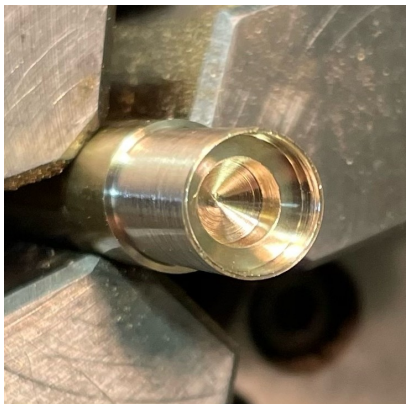
Lesson learnt – why do things simply when a more complicated way is possible.



A Myford Oiler

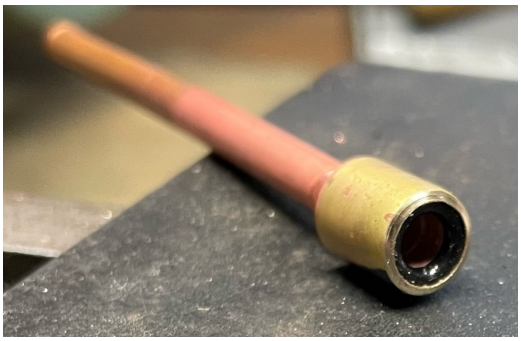
Simon Collier

Some years ago I came upon an ML-7 lathe, and as it was very cheap, I bought it as a second lathe. I was aware that Myfords needed a special oil gun. These were very expensive and not readily available. I therefore set about modifying a cheap oiling can from Supercheap Auto or similar outlet. The idea was to select an O-ring that was a firm fit over the 3/16 oil nipples and arrange for it to be retained in a fabricated nozzle by a thin brass ring a bit smaller than the O.D. of the 0-ring, so it won't pull out when withdrawn from the oil nipple. The nozzle was silver soldered to a suitable length of 3/16 copper tube. At the other end of the tube, the adaptor made to fit the oil can's outlet thread was silver soldered on.



Recently, Eddie generously gave an ML-7 to David Judex. I am helping David to become familiar with the lathe, fit new belts etc, and of course, he will need an oiler. Frustratingly, I could not repeat my earlier success, scrapping several nozzles. The 0-ring had to be tight on the O.D. so oil under pressure could not bypass on the outside. I was making a two piece nozzle silver soldered together, then turned down and faced to leave a thin retaining ring. A mistake enlightened me to a much simpler method.

Chuck a bit of 3/8 brass, turn down to 8.5 mm for about 14 mm. Drill 5 mm for about 6 mm, then drill 19/64 for only about 1.6 to 1.8 mm. Bore to 7.8 mm for 2.3 mm, facing the internal step in the bore to ensure a known depth. Reverse in the chuck and drill through 11/64 or 5/32. Then drill 3/16 for about 5 mm for the copper pipe. The internal step is to inhibit silver solder from running through into the O-ring recess. Chuck the now annealed nozzle with pipe. You will only be safely able to have a little protruding from the jaws. Insert 5/16 O.D. O-ring, pushing home. Now use any blunt tool or device to form the 0.5 mm sticking out in excess of the O-ring thickness of about 1.8 mm. Form it inwards to retain the O-ring. It doesn't take much of a turnover to retain the O-ring.



I have found the thread for the nozzle tube on cheap cans to be 8 mm, 8 mm fine, and 6 mm fine. The can I made for David was the latter, so I drilled it out to 5/16 and tapped it 9/32 x 32 ME. It was extremely hard to hold the oil can lid to drill. I then made a suitable brass hex piece, screwed 9/32 ME, for the can end of the copper tube, silver soldered it onto the tube, and screwed it onto the oil can. This can now pops over the Myford nipples with satisfying resistance, and positively oils. It can reach and clear the angled nipple on the back gear, the most inaccessible one on the lathe.

Not much of the above is critical but I think the 7.8 mm bore is important as 7.9 mm doesn't feel convincing as it pushes onto the nipple a bit too easily. I used a very small HSS boring bar I ground up years ago from a 3/16 tool blank for this. Otherwise a D-bit could be made, or a 7.8 mm end-mill purchased if you are really averse to making tools. The O.D. of the nozzle needs clear access to the back gear nipple and 8.5 mm will allow this. □□□

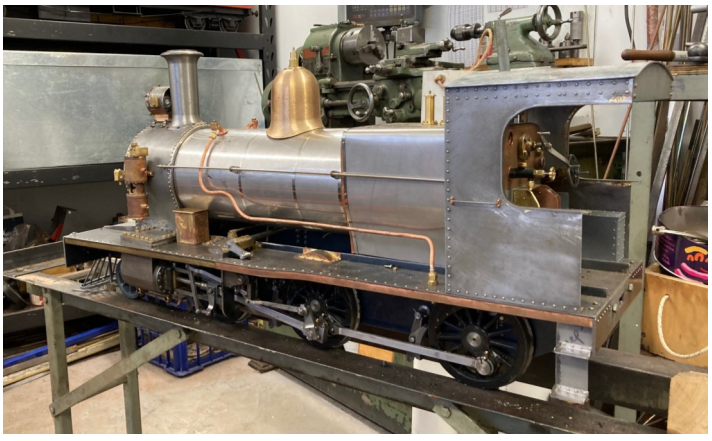
President Mike is supervised by Industrial Arts Teacher extraordinaire John Lyons as he uses the clubs lathe to manufacture parts for his new riding car.

A NSWGR 27 Class

James Sanders

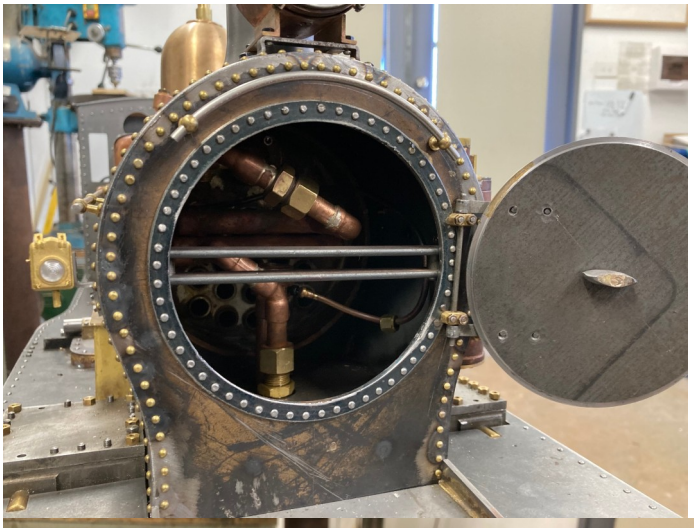
Here are some pictures of recent progress on the 5" gauge 27 that I am building. I started it about 3.5/4 years ago? We have since moved house twice, have two little girls and now live in Dubbo. There have been projects in between but in the last few months I have made greater progress. The cylinders were the impetus for the project in the very first place,

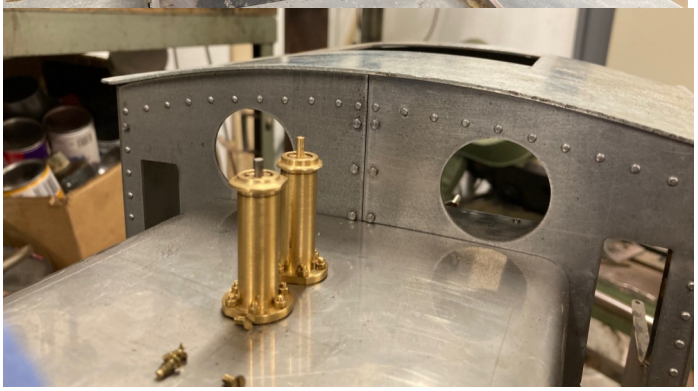
Roger Kershaw of Orange gave me some Martin Evan's Simplex cylinders fully machined probably 4 years ago and I didn't want to make a Simplex so I got to drawing up the 27 from original Hunslet drawings. The wheels were drawn up in cad and water cut by Wayne Fletcher, the returned bits being machined and fabricated into wheels of correct spoke



and profile, better than the simplex wheel castings I had. No tyres required either as they are steel! I got it running on compressed air late in 2022, which was a pleasing moment. As I wanted it to be in rebuilt form I have referred greatly to photographs because I am not aware of any drawings existing of the rebuilt version. I made a working Westinghouse pump for it, using Ray Lee's drawing. The process was made simpler as this was my second one. Stainless steel was used for boiler cladding, the boiler being done a couple of years ago, it is a proper belpaire rated at 100psi. Extensive use of bronze brazing was used in construction. 1 and 1.6mm copper was flanged for the cladding joints where stainless wasn't suitable.

The tender has been my recent focus, drilling and riveting. A lot of work and time consuming. A modified ball valve was used as a regulator and smokebox steam connections are done Ray Lee style. Dummy clacks are mounted on the boiler, with in line vertical clacks back further along the line. On previous engines I have made the top feed clacks operable, but decided it would be simpler to have vertical clacks. It took two goes to get the chimney right, I machined the first one and it just wasn't right. Further investigation of drawings and greater reference to photos and the second one came out much better. It is machined from cast iron round bar.
Handrails are attached to the cladding with 10ba screws tapped into the stainless sheet. They are surprisingly secure. Stainless 3/16" cable ties are used for boiler cladding straps. A bit more detail to go, but it is getting there.









Major Works Around the Grounds

Left & Above: The fourth stage of elevated track rebuild was done after the February running day. Andrew, Chris, Arthur Mike and John. Lunch was provided by Jo!
Below: Trench digging for the toilet power supply.
Far Below Left: Robert W and John L pouring more elevated piers. Bill P is also regularly involved in this job. Middle: Mike, Chris and John demonstrate their prowess at gate installing. Right: The never ending job of track maintenance.






Duty Roster.

June:	David Thomas, Bernard Courtenay, Greg Croudace, Stuart Larkin, Shaun Sorensen, David Lee, Geoff Hague, Martin Dewhurst, Ken Baker, David Coulshed.
July:	John Hurst, John Lyons, Matthew Lee, Jim Mulholland, Martin Yule, Warwick Allison, Tony Kidson, Nigel Woolley, Bill Perrin, Eddie Jones.
August:	Ross Bishop/Neal Bates, Tony Eyre, Jo-Anne Topp, Ray Lee, Peter Wagner, Paul Taffa, John Tulloch, John Simpson, David Judex.
September:	Mick Murray, Andrew Allison, Wayne Fletcher, Graeme Kirkby, John Noller, Ian Tomlinson, Glen Scott, Chris Denton, Warwick Reinhardt, David Chenery.
October:	Evan Lister, Simon Collier, Garry Buttel, Scott Murray, Graham Tindale, Paul Brotchie, Mike Dumble, Deven Shirke, Craig Deacon, James Pritchard.

Gate Roster and Track Superintendents: To be advised.

Above: An unusual view from the signal box during the April running day. The elevated station is just visible to the right. Three trains are present with Arthur and 3503 waiting for loading on the outer main platform.
Below: Arthur and 3503 leads Graeme and 2401 uphill on the April running day.

'Newsletter' is Published by: **Sydney Live Steam Locomotive Society Co-op Ltd.**
Track location is Anthony Rd, West Ryde adjacent to Betts St, behind West Ryde shops. 33° 48' 15.99" S; 151° 05' 12.78" E
Telephone: (02) 9874 8696. **Postal Address:** The Secretary, PO Box 453, West Ryde, NSW, 1685
Web Page Address: ***https://www.slsls.asn.au***
Public Running Day is the **THIRD** Saturday in each month from 1.30pm. Entry is $6 adults, $3 children. Rides are $2.50 each.
To ride on the trains, enclosed footwear must be worn.