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MARCH 2012

NEWSLETTER

THE OO LIVE STEAM CLUB

SPRING EDITION

FOR COLLECTORS AND ENTHUSIASTS OF HORNBY
OO LIVE STEAM MODEL RAILWAY SYSTEMS

DONCASTER ALEXANDRA PALACE WARLEY
PETERBOROUGH LIANGOLLEN



THE CLUB CARRIES A SELECTION OF DVDS.....SHOW PRICE.....£5

WE ALSO CARRY A LIMITED SELECTION OF OOLS ITEMS FOR SALE



EDITORIAL

General Information

The OO Live Steam Club is devoted to the collecting and operating of Hornby 00 Gauge Live Steam trains.

The name Hornby and the use of the Hornby Live Steam Logo is with the kind permission of HORNBY.

All opinions expressed are those of the contributors. The OO L.S.C cannot be held legally responsible for any errors.

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to whom all articles, contributions and comments for inclusion in the OO L.S.C. Newsletter should be sent.. See contact details below

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Eric Fenwick

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Welcome to second edition of the OOLSC Newsletter which with a smiggen of luck and much burning of the midnight oil, should coincide with the 2012 March exhibitions at the Alexandra Palace and the Garden Railway exhibition, Peterborough.

What a wonderful opportunity to meet up with many of our members and fellow OOLive Steam enthusiasts from across the country, all of whom will receive a very warm welcome at the club stand. It is incredible to think that in the short space of time since the official launch of the OOLSC at Peterborough in November 2011 we have over 300 members. However, equally notable is the fact that many of those enthusiasts are new to the world of OO Live Steam. At every exhibition we are increasingly invited to attend!.. astonished, mesmerized and often perplexed model railway enthusiasts of every generation discover the magic and allure of the unmistakable fragrance of heated steam oil filling the surrounding air! Sublime perceptions that are increasingly the preserve of those ever so lucky members of the OO Live Steam Club!..See you soon..Ed



CONTENTS

All the latest club news including our ongoing-technical projects!

The invention of OOLive Steam. Part one!

Richard Hallam's fantastic journey following his invention of the first commercial OOLive Steam Locomotive. To be published over the next four issues.

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Yours truly working at Butlins, "Summer of '69"

CHAIRMAN'S COLUMN

STOP PRESS Members may be aware of an offer to the Club of a railway layout. Sadly it proved to be unsuitable for our use and we declined the offer. I will try and report more details next time.



Kingfisher and Silver Fox passing each other on the prototype-spaced double track of the new OOLSC Roadshow layout



Special thanks to Chris and Richard for 1000 miles worth of visits to Binbrook and much midnight oil to help build the new layout.



A detail photo of how 2 joining 'blocks' fit together, locate track and pass power between modules

It really is a joy to me that the club is growing so well with such commitment from what is now quite a big group of enthusiastic individuals with a diverse range of skills.

My personal aim in all this is to see the brand re-launched in some way. The best way to do this is to get all those Mallard sets gathering dust on shelves out and in use and the owners now demanding more. The best way to reach them face to face is at Model Railway shows. The best way to get them to have another go is to SHOW them through practical 'hands-on' display that it's easy and fun and to hold their hands through the inevitable maintenance issues.

But there are far more shows than the Club can do on its own so we need to make it easy for individual members to run a display at their local show, even organise their own local display at a receptive venue (Garden Centres would be a good location).

That's where the modular roadshow layout design that we are working on comes in. if any members are planning to build a layout, please talk to us about making it compatible with our roadshow. The principle is to use a standardised 'wood block' that holds the track in a consistent way so baseboard modules, whoever makes them, always join together.



Roadshow at Alexandra Palace last year

Adrian Campbell

Back in the year 2000 Richard Hallam wrote a series of articles about his new invention for the "British Railway Modelling magazine." Twelve years later the OOLSC was formed, primarily as a direct result of his amazing technical and innovative skills; manifest in the superb Hornby OOLive Steam Locos which are today the veritable "Prima Donna's" of our magnificent hobby. We are extremely fortunate to have Richard as our lifetime Club President and extend our grateful thanks to the Editor of B.R.M....Mr John Emerson. For allowing us to re-print the articles commencing with

...PART ONE. Below!

LMS STANIER "CORONATION PACIFIC" 46238 CITY OF CARLISLE

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OOLSC.*

It couldn't be done they told *Richard Hallam*, but he proved them wrong with this live steam powered model of *City of Nottingham*. Photographs by *Tony Wright*.



City of Nottingham heads up the final incline to the summit of the layout, some 25 scale feet above the lower circuit.

The idea manifested itself as long ago as the early 1960s. I was confined to bed with a bout of 'flu and whilst looking for something with which to pass the time, stumbled upon my father's collection of railway magazines spanning the period 1947 to 1962 which he had frugally purchased over the years from the local library for a few (old) pence per copy as and when they became date expired.

Up to that point in time, apart from having enjoyed trackside pursuits as a train spotter in my youth, railways had not impinged too heavily on my conscience. However, the transformation was swift and I remember hungrily devouring copy upon copy, and being enthralled by the articles on 'Practice and Performance' by those eminent commentators the late Cecil J Allen and O S Nock. Particularly, I found their descriptions of the exploits of steam over Shap and Beattock quite fascinating, even inspiring.

Faced with the imminent demise of steam, schoolboy memories of lineside activity at Tamworth and Grantham came flooding back with the realisation that I had been totally oblivious to the second 'Golden Age' of steam in the late 1950s. Of all the many aspects of railways it was the drama of the steam locomotive, both in its physical presence and in the activity taking place on the footplate, that I found captivating. This led me to ponder the possibility of recreating in miniature live steam locos hauling scale length trains through a railway landscape. The scale would have to be small, no bigger than 4mm to the foot, in order to practically represent a

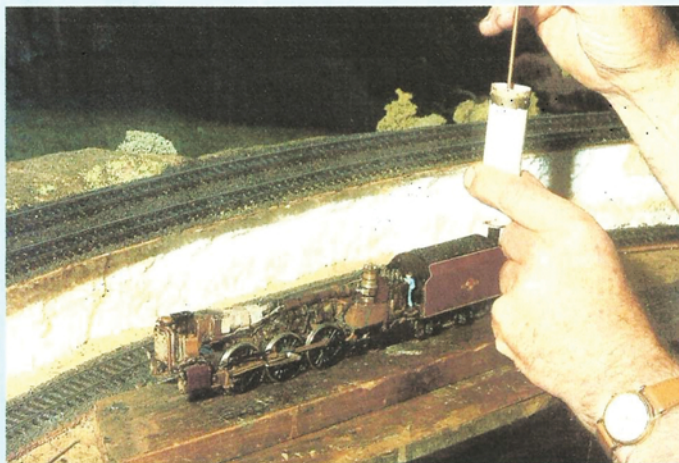
reasonable track mileage. The brief was as follows: The loco should appear authentic and perform convincingly, entailing the production of live steam to drive double acting cylinders (no great virtue could be envisaged in reproducing the four cylinders of the 'Duchess' prototype chosen, as the observer would be none the wiser if presented with just the two visible ones). Control would be achieved remotely and in addition to manipulation of the regulator, should provide a reversing function

and also operate a steam whistle - albeit only with the regulator closed. The whole system was to be robust, practical and reliable. 'Can't be done' was the chorus.

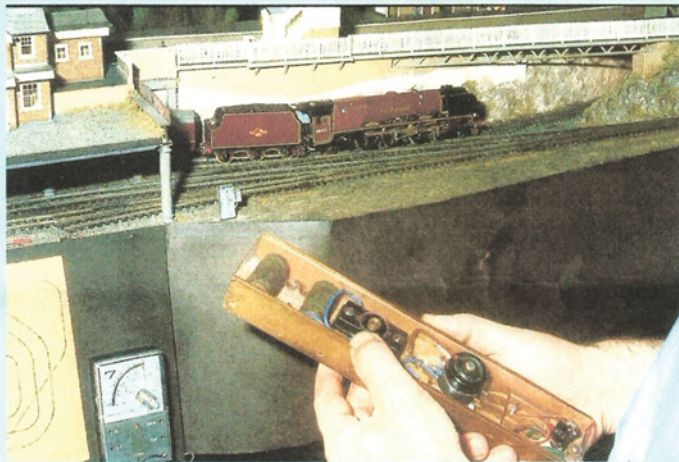
Obstinacy and a perverse desire to prove people wrong must have some value in the order of things, as after more years than I care to admit, including lengthy periods in which the project lay dormant, the scheme has eventually come to fruition to a degree that I frankly would not have thought



46251 levels out for some steady running on the lower circuit offering welcome respite for the operator.



Boiler filling in progress. This normally takes place with the engine on the track immediately after a run in order to harness the vacuum that will form in the boiler after the power is switched off.



The decidedly 'steam age' control handset. From the top: resistances to reduce voltage to 9volts; combined contact breaker and voltage variation button; current reverser; overload trip.

Scale wheels are used running on Peco finescale track. Contrary to prediction, no problems have been experienced with sparking, arcing, electrical resistance or discontinuity of current. The circuit is protected by a 5amp circuit breaker. The track itself, however, constitutes a marked electrical resistance requiring feeder points every 6' or so fed from suitably heavy duty wiring in order to avoid current drop.

Returning to the early experiments, the next stage was to link up the boiler to a simple cylinder and piston mock-up incorporating, I remember, a safety valve borrowed from a Mamod steam engine. Using conventional soft packing in a $\frac{1}{4}$ " diameter piston, I was quite surprised at the effort imparted to the piston. Things were looking promising!

The safety valve on the present model is set to blow at 25psi and is equipped with four nozzles to represent the four valves of the prototype.

The next item to be considered was the means of steam distribution to the cylinders, not forgetting that the ability to reverse was to be a necessary function. The complication and fragility of scale

working valve gear was obviously going to be far too daunting, and so a far simpler means of steam distribution needed to be concocted. As the pursuit of maximum efficiency was not high on the agenda a fixed cut-off would be quite adequate. 70% has been found to be about the right compromise allowing for satisfactory starting and the fact that slight valve timing discrepancies were bound to occur working to this scale. In addition it ensures a satisfying chatter from the exhaust especially when lacking the sort of inclines suited to this cut-off.

Unfortunately for model makers, the laws of inertia cannot be scaled down, although we strive to make it appear that they can. However in terms of the events within the cylinder of a miniature steam engine, admission and exhaust at the sort of piston speeds required are virtually instantaneous requiring no advance valve events as in full size practice.

Taking these factors into consideration a simple rotating slide valve was devised which enables any number of double (or single) acting cylinders to be employed in any desired sequence of operation.

Admission and exhaust are designed to occur at forward and backward dead centres, still allowing 30% of the piston stroke to operate expansively. Drive for the valve is effected by 4:1 gearing from the driving axle housed between the frames. Having the valve so geared has the dual advantages of decreasing the effort required to drive the valve and facilitating the means of reversal as outlined shortly. The drawback is that eight ports in the valve itself are required instead of just two. However, using a suitable jig, these have been incorporated in a $\frac{1}{4}$ " diameter valve requiring deft use of the mini-drills. Four ports are required in the port face for two and four cylinder arrangements and six for a three cylinder arrangement.

Reversing is achieved by the 'rotating valve' equivalent of the slip eccentric principle: a certain free movement is allowed in the valve drive chain so that, to accomplish a change of direction, the valve is advanced through this free movement, while the engine is stationary, in order to engage the correct port openings. Because of the 4:1 drive ratio, it is only necessary to advance the valve by one eighth of a revolution. To effect control of the regulator valve, reverse mechanism and steam whistle an on-board electric motor protected by a relay is utilised. To operate the motor, current is reduced from 12volts to 9volts, de-activating the relay and allowing current to flow to the motor. Current reversal has no effect other than to control the direction of rotation of the motor.

The regulator is activated through reduction gearing having a ratio of 1,352:1 which also activates a pawl designed to engage a serrated wheel on the valve shaft drive to effect reversing. Until recently the regulator consisted of a lever operating a rotating slide valve in a steam chest having ports arranged so that, momentarily before steam is admitted to the main steam chest, a port opens to admit steam to the whistle. This proved useful in monitoring the position of the regulator as well as heralding the imminent progress of the loco.

However, the fact that the whistle could not be sounded on the move was irritating and caused me to think that there must be a feasible solution. Eventually, after rejecting most ideas as over complicated, I hit on the idea of incorporating another rotating slide valve on top of the existing regulator valve, connecting this to the regulator lever and allowing this new valve limited free movement before it in turn activated the main regulator valve. Within the limits of the free movement a tiny steam port would be activated, admitting steam to the whistle regardless of the position of the main regulator valve. As this new valve would be smaller than the main valve and possess less friction, it would always move first subject to the designed free movement. This has proved to be the case, provided no foreign matter such as oil is allowed to foul the sliding surfaces. For instance, special care has to be taken to ensure that the regulator is properly shut before boiler filling, as explained later, is embarked upon otherwise oil is likely to be sucked back from the valve chest.

**Richard Hallam's
fascinating articles will
be continued in our next
OOLSC Newsletter**

ossible during the earlier stages of development, the original brief has largely been accomplished, resulting in a loco that will run for an hour on one oiler filling and is capable of hauling 16 or so coaches up a winding 1 in 90 incline, or maintain scale speed of 75mph or thereabouts on the level with the same fuel. Interestingly, the scale distance between water stops is roughly equivalent to the 12" to the foot ratio!

The running is very smooth and together with the light, sound and smell of live steam, gives that sense of something 'living', even in this small scale. The manner in which the loco reacts to the regulator is uncannily similar to the real thing. In fact the constant temptation to have a 'steam up' as resulted in querying looks from my local filling station attendant at the copious amounts of distilled water frequently purchased, instigating remarks such as 'A lot of ironing tonight have we?'

Things were not always so. There was a time when the loco could scarcely move light engine, steaming duration was limited to 15 minutes and operation was decidedly jerky and unpredictable. One of the things I have learned is that provided an idea is sound in theory, it will tend to work in practice. If it doesn't it is usually because something overlooked is preventing it from working. The difficulty is in diagnosing what that something

is. All rather obvious, but the tendency is to dismiss an idea if it doesn't produce results immediately.

Steam engines are often regarded as temperamental and unpredictable performers, but they are only obeying the laws of thermodynamics and physics in general and any claimed 'mystery' has to be due to one's inability to understand what is happening in that department.

Another lesson rapidly learned was the value of superheating. It can make the difference between zero performance and the production of copious amounts of smooth flowing power. Sufficient superheating in a model is essential due to the high rate of heat loss, but too much will lead to overheating problems and consequent oil carbonisation. In addition to the latter, if the steam is too hot, the exhaust becomes totally invisible and virtually silent which rather defeats the object.

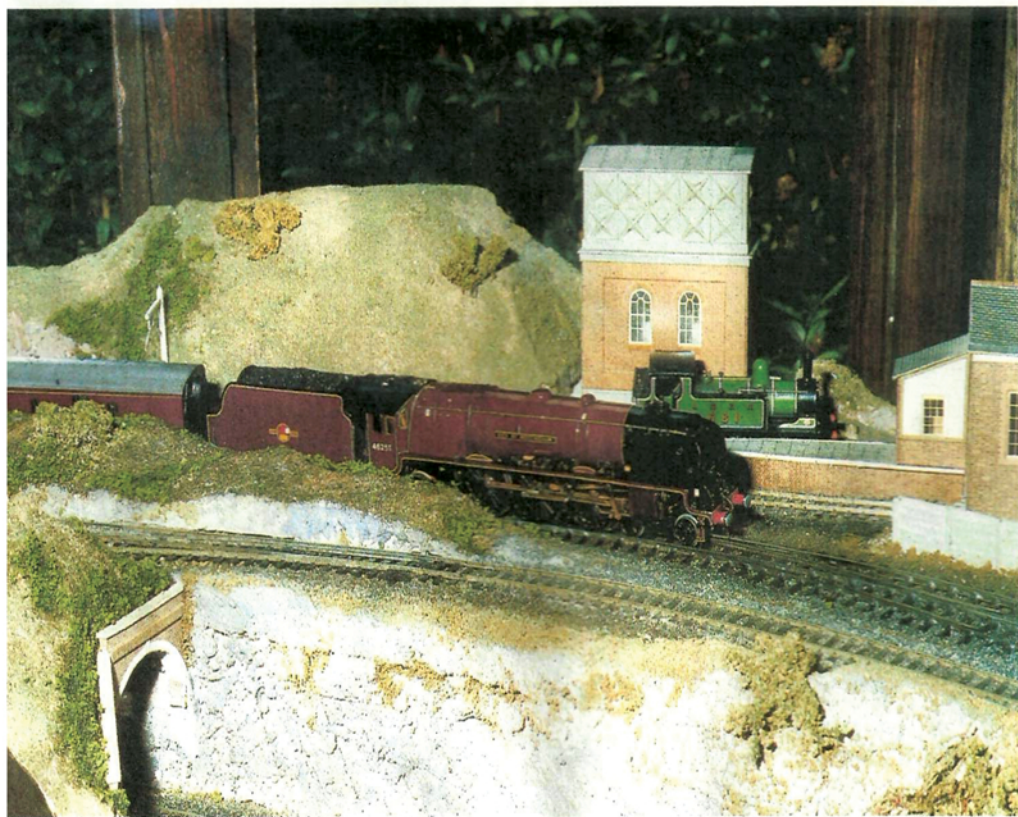
Whilst the design brief required visual and audible authenticity I decided, in the interest of practicality and my own sanity, that ingenuity would be the name of the game in terms of simplifying the mode of operation, provided nothing outwardly was affected. The two main areas concerned were the raising of steam and the distribution of steam.

Producing steam by combustion in 4mm scale seemed decidedly tricky. It seemed to me that a

simpler and more controllable method would be to heat the water by means of an electric immersion heater in the base of the boiler fed by current picked up from the track in the conventional manner, but using more substantial pick-ups. The question was would this be feasible? A mock-up was built to find out how much current would be required to produce a suitable boiling rate from a 30cc capacity boiler. One immersion heating tube was utilised containing a heating element fashioned from a portion of 750 watt electric fire element. A 12volt current from a car battery caused the water to boil quite merrily. At this stage however, I had no idea what steaming rate would be required.

Next, the boiler was mounted on a tender chassis utilising three split-axles (for 2-rail operation) with substantial steel pick-ups doubling as springing for the axles. Soft solder, a material which I have found to be a quite satisfactory substitute for white metal, was applied to the steel pick-ups to act as electrical contacts as well as bearings for the axles. The pick-ups were bolted to electrically independent brass frames having vertical slots acting as guides for the axles.

The present loco has two such elements in parallel; one in the boiler and one acting as a superheater consuming in all 12volts at about 3.5 amps and retains the same pick-up arrangement.



Well into the climb as City of Nottingham rounds the curve past the goods yard, throttling back for the level section through the station.

00 Live Steam Project

Build your own live steam locomotive.

The Club has an ongoing project to develop the 00 Live Steam System. We are currently looking into producing Locomotive Body and Tender shells, by using 3D printing, to fit on a prototype 00 Live Steam Chassis to produce alternative 4-6-2 Pacific Locomotives. Design work is progressing on the 3D art work for an LMS Duchess and we have a sample drawing for a GWR Class 6000 King 4-6-0. These drawing are being produced by one of our American members and you can look at the King 3D drawings on our website.

Another member is working on a locomotive preheating controller and switch box, so that we can operate locomotives on our exhibition layouts. We will be able to move locomotives to an isolated siding or loop, where the boiler will be refilled and the water preheated, before driving it on to the main-line tracks to pick up a rake of coaches. The switching box will permit us to select the power source, either the main-line controller or the preheating controller, and enable us to control the relevant locomotive on the siding or loop.

The design work on the preheating controller is now complete and assembly of the prototype is in hand. This controller will permit us to preheat two locomotives simultaneously and each DC circuit can be switched to one of two sections of track.

The preheating controller is the first step towards developing a revised compact locomotive controller, which will incorporate the preheating circuit and offer greater control over the locomotive.

