Modelling in Gauge 1

Sample Page

Book 2 : John van Riemsdijk's Contribution

Front Cover pictures :
John in his workshop
John's Barry 0-8-0, axle pump under tender - see 163/19

This page: JvR assembling his signal box

(Photos by Graham Colover)

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On this page from top left and clockwise:
Hertfordshire L.N.E.R. 256 - see 131/17
Aster/Fulgurex German 4-6-4T, BR62 - see 170/53
A locomotive test bed - see 131/2
Clockwork - see 164/31

(Photos by Graham Colover)

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The Gauge 1 Model Railway Association’s principle objectives are to promote railway modelling in a scale which will involve a rail gauge of approximately 1.75 inches or 45 millimetres, and to bring together persons interested in the construction of Gauge One models, tools and apparatus of all kinds.

Information on G1MRA can be obtained from their web site at www.gaugeone.org or by writing to
Mick Mumford, Membership Secretary, PO BOX 581, Earls Barton, NORTHAMPTON, NN6 0YW, UK

Other books available from G1MRA in the **MODELLING IN GAUGE 1 series** are:-

Book 1 : Electric Propulsion Articles from G1MRA Newsletters on Electric Propulsion topics, including motors & gears, track, controls and construction of engines & trains. 110 Pages.

Book 3 : Freight Stock. Articles from G1MRA Newsletters on Freight Stock topics, including wagons, vans, components and techniques. 98 Pages.

Book 3 : Coaching Stock. Articles from G1MRA Newsletters on Coaching Stock, including coaches, components and techniques. 102 pages

Also available from G1MRA are:-

PROJECT BOOK Written by Bob Hines & Ron Poulter. Illustrated by over 40 photographs. 84 pages including full drawings and constructional descriptions to build a G1 model live steam single cylinder LMS 4F 0-6-0 tender engine. This engine is known as the ‘Project’, hence the book’s title. Includes pictures of a selection of variants built to the basic design.

DEE BOOK Written by Dick Moger & Barry Applegate. The sequel to the Project book. 96 pages including full drawings and constructional descriptions to build a G1 model live steam SR ‘D’ class twin inside cylinder tender engine.

Dee Metric Drawings Converts for metric stock, material & tools. Complements DEE book, not alternative.

A Pictorial History of G1MRA 1947 to 2007. The story of G1MRA over 60 years told in pictures with accompanying commentary. 98 pages.

Printed and bound in Great Britain by CPI Antony Rowe, Chippenham and Eastbourne

Articles in this book

Sample page

INTRODUCTION TO MODELLING IN GAUGE 1
by Robert Houghton – President of G1MRA 1963 - 2008

Some 80 years ago I used to look forward to the next monthly issue of the then Model Railway News. Now, in my 94th year, I still have that same anticipation, but for the next issue of the Gauge One Newsletter and Journal, which never fails to come up to expectations. Could this be my second childhood? Not a bit of it; I just had the good fortune all those years ago to become interested in the Gauge One Model Railway hobby, and it has remained with me for the rest of my long life, with the added incentive of being able to share it with my two sons, both of whom have garden railways of their own. Age does not come into it. For the younger generations it is a hobby which provides a constructive and positive alternative to the TV and computer screens, whilst for those in retirement I can recommend it as an aid to keeping an active mind; and you can always borrow a magnifying glass! Gauge One is such a wide-ranging hobby, for young or old, steam or electric, indoors or out in the garden, skilled or unskilled, and above all as a means of meeting all manner of interesting and friendly people you would otherwise never have heard of.

Since the earliest days of our Association, in 1948, the Newsletter has been a central feature. Regularly produced and edited by volunteers, it has contained above all a wealth of contributions by the more skilled, erudite and experienced Members for the benefit of the rest of us. There is always something new to be learnt, and encouragement to be obtained from the descriptions of other people's ideas and accomplishments. Typical of the spirit of G1MRA, Geoffrey Hammond and his team of helpers have voluntarily delved into the 200 editions of the Newsletter, and undertaken the laborious process of compiling and publishing this series of booklets. Our sincere thanks go to them for this further contribution to our enjoyable and fascinating Gauge One hobby.

I am delighted to have this opportunity to express my personal thanks for the help I have obtained from the Newsletters over the years. These new booklets, I am sure, are going to be a source of encouragement and enjoyment, particularly to newcomers to our hobby. In the words of one of our more illustrious Members, the late Freddie Wrighton: "have a go at it". You may be pleasantly surprised by what you can achieve.

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FOREWORD *by Geoff Hammond*

Welcome to the first reprint of the 2nd book in the series "Modelling in Gauge 1" which draws on the many articles and letters that have been published over more than a 50 years period of the Association from over 200 Newsletters.

There won't be a member of G1MRA who has not heard of the initials JvR and his work is legendary. John van Riemsdijk joined the Association in 1947 and was been an active member until his death in 2008. Not many of today's members will remember his spell on the committee but we will all have seen his contribution to the Newsletter over the years along with the many Aster locomotives running throughout the world. John's contribution has been to publish in excess of 90 articles and letters in the G1MRA Newsletter, right up to his final years, the majority of which are reprinted here as "John van Riemsdijk Contribution ". This reprint adds those final articles and his obituary.

When considering the subjects for these books various topics were considered and every one includes articles from the pen of JvR. It became immediately apparent that these articles were interlinked as the designs of his own productions were developed. John, through his association with Count Antonio Giansanti-Coluzzi and his Fulgurex "organisation", continued with the development of his designs and produced many different prototypes for the Aster Marque. Aster has been a major producer of steam locomotives since 1975, and John was involved in the design of 19 different Aster locomotives. His work on boilers led him to the classification of Type A, Type B and Type C boilers – indeed it is common to refer to the JvR Type C boiler, which was introduced by John as a strong boiler that was easy for Aster to mass produce. His work on compounding continued, as shown by the article 206/24.

The first article overleaf is a profile of JvR written by Tony Hall-Patch which serves as an introduction (for further details you should read John's own memories contained in this book). All the other articles are by JvR except where they give the other side of the conversation as a reply to one of his articles, and the last which was written by Graham Colover in memory of JvR.

Unfortunately in 2002 John's home suffered from severe flooding when the adjacent mill stream burst its banks forcing John and his wife Jocelyn to retreat to the top of a wardrobe on the first floor. All his locos and rolling stock suffered water damage and his complete collection of books and photographs were waterlogged and could not be saved. Consequently we have lost access to many of the photographs used to illustrate the original articles. In some cases we have used alternative photos and in some case copies from the original newsletters, so we must apologise for any loss in quality of these but feel that the character of the original article will not be lost.

We must thank Peter Trinder, Graham Colover and Mike McDonald for supplying many of the photographs and Martin Hulse for production editing, including scanning, layout and typesetting.

Articles are published in this book in their original Newsletter issue order, with the oldest first. Each article shows in its heading the title, author if not JvR, year originally published, issue number, and page number within that issue. The contents section on the preceeding pages lists these headings, together with the page number within this book where they appear. So for example:-

New gauge one commercial high pressure loco Mar 1973 84/14

appeared on page 14 of Newsletter Issue 84 which was published originally in March 1973. The index at the back of this book shows where selected topics appear.

These books hopefully will stimulate their own debate and development so if you feel you can add to this please submit your article to the current Newsletter Editor, assuming you are a G1MRA member, since the G1MRA Newsletter has always been for members only. If you are not a G1MRA member and would like more of the type of articles in this book then join G1MRA and you will receive the Newsletter once a quarter, packed with contributions on a wide variety of Gauge 1 topics, and will also be able to contribute your own views and experiences.

We must offer thanks for the contribution that JvR has given to the Association and the world of Gauge 1 over the years, which this book allows us to enjoy. As you read it remember how much we owe him.

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Sample

John was indoctrinated into railways by his father who took him on many continental rail trips in his youth. He has had a lifelong interest in railways ever since.

I met him in the early days of the Association when he, as Secretary, persuaded me to join the Committee. It was only a move to Scotland and then much further afield which resulted in a relatively short term in office for me.

It was in the mid fifties, whilst attending a meeting at Keen House, that John asked me to go with him to Paddington. Surprise, surprise, it was not to see a last gasp from Swindon with a super King, but to meet Jocelyn who was shortly to become his wife and has remained so ever since. Their Silver Wedding was something to remember, if only hazily!

After the war, when John served in SOE, he set up manufacturing clockwork mechanisms from 00 to Gauge 1. Many were marketed under the 'Walker-Riemsdijk' label and quite a few are still in service. When a member bought a 'distressed' spring-driven tank engine last year, he asked John if he could recommend any improvements and was met with the rejoinder "Oh yes, I built that one for So-and-So; it has an extra gear to give maximum power though at the expense of a longer run". That was more than fifty years ago!

JvR (left) with Tony Hall-Patch

JvR, as he is often known, joined the staff of the Science Museum after his spring drives had got involved with early parking meters, and he worked his way up to become Keeper of Civil and Mechanical Engineering. He was responsible for the curatorial setup of the National Railway Museum at York where he was joined by member David Jenkinson, who took up a permanent post on the staff at York later.

John's involvement with Fulgurex/Aster is probably his best known contribution to Gauge 1. He provided the technical designs for most of the Continental and UK locomotives, his last input being for the 'Stirling Single'. He is known at Aster as 'Mr. Performance' – he always strove to get the best out of their products, sometimes modifying them to be nearer his own concepts where they had strayed.

He and Jocelyn set up home in Hertford and the double track main line he built was full of character and encouraged the best out of visiting locos. He held the first 'Aster Day' when anyone with an Aster – mainly Schools, if I remember rightly – was welcome. These were 'surgeries' when any poor performers were given the once over.

Although his involvement with Fulgurex/Aster was time-consuming, he always had scratch-built locos and stock in hand. His first was a model of a Dutch 4-4-0 (he called it 'all the sevens' – 7/16 inch bore, 7/8 inch stroke and 7 foot drivers). He has about 30 steamers, all serviceable, with more on the stocks.

John has always been generous to a fault with help, advice and ideas. Many members have benefited from these as well as enjoying his friendship over the years

John was made a Vice-President of G1MRA about ten years ago, when he and Jocelyn moved, lock, stock and barrel, to the South of France. Alongside a great deal of work on the Mill, Millhouse and Dower House, he managed to get a new track up and running very quickly and, as several members have found out, it is an enjoyable track to run on. Being a figure of eight, a train appears and reappears from opposite directions on each circuit rather than what can become boring with a circular layout.

His boiler designs, Types A, B and C, are an example of his research and constant development, the introduction of compounding to Gauge 1 another. One wonders what he will come up with next?

He is my longest standing friend and I wish him and the family many years to come in the sunny South of France.

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I have never built a Gauge "1" steam locomotive. This is my main qualification for writing about them. If I had, pride would so distort my outlook that my opinions would be far more suspect. I am building one at the moment, so I must write this before I finish it.

However, there is no part of a steam loco, "except the pressure gauge", which I have not made in the course of much rebuilding and repairing, and I did once build a Gauge "0" steam loco in its entirety. One advantage of rebuilding other people's work is that you learn from their mistakes. Another is that you discover that there is no single ideal system of design, and engines built on entirely different principles function equally satisfactorily. The reason for this is perhaps that no single model can fulfil all our requirements at once, so different principles of design can cope with different requirements. For example, we require realism and efficiency (by efficiency I mean power and economy) but the two are incompatible. Realism depends on a clearly visible white exhaust, and, in a model, this is a sign of inefficiency. I have two engines whose main purpose is to show a white exhaust. They are of the pot boilered low pressure type, very little altered, and both pull a reasonable train, at a heavy cost in methylated spirit. It is best to retain the pot boiler because once you mix flue gasses with the exhaust steam, the latter does not condense in the atmosphere and you see nothing.

The formula for efficiency is pretty well known, thanks to "L. B.S.C.". I have a loco which he rebuilt, and though I had to do considerable repairs, and alter the chicken feed arrangements, I preserved his "system" in this engine and it is the most efficient I have, being very powerful and very economical – I can leave it for 30 minutes at a time, and though it has no axle pump it uses very little water while pulling ten heavy coaches. But it shows no exhaust and is more or less silent in operation. Very useful when you have friends to tea. So, if you want that, follow "L.B.S.C.'s" published instructions – except for one thing, do not make the outer shell of a Smithies boiler of steel, because it will rust through.

For the benefit of members, here is a list of the earlier "L.B.S.C." articles in the "Model Engineer":-

G.E.R. 0-6-0 T single cylinder	1944 Jan 20 & 27
L.S.W.R. 0-4-4 T single cylinder	1934 Jun 7, 14 & 21
Freelance 4-6-2 "Diana"	1950 Mar 16,Apr 13 & May 11
American Pacific	1925 July to 1926 Jun
G.W.R. 0-6-0	1942 Sep to 1943 May
G.W.R. 4-6-0 "King"	1932 Apr to 1933 May

Another loco, of almost equal efficiency, is entirely different in its internal economy. This surprising machine is also very economical, only marginally less powerful, and in some ways more realistic. It is the last version of the Märklin Reichsbahn Pacific. It is, I think, my favourite loco, and pulls 10 coaches if required, though its usual load is eight. It too, can be forgotten for long periods.

The modifications to this engine have not affected the boiler or the cylinders – they have conserved water, spirit and oil. It is therefore worth giving particulars of the arrangement as evolved by Märklin.

The cylinders are 5/8 inch bore x ¾ inch stroke, thin walled and lagged. Piston valves, about ¼ inch diameter, have fairly large ports, but no appreciable lap and no advance, because this engine still has a reversing block to switch steam and exhaust pipes. The effects of the long and tortuous exhaust path are felt in a maximum speed around a scale 70 m.p.h. (with a load). The steam pipes have a great length outside the boiler, and might perhaps act as a condenser, but for the effects of two superheater coils in the firebox.

The boiler is 2 ½ inch diameter and around 14 inches long. It has a large dent in the underside at the rear end, from which a sloping flue, 1" diameter, rises to the base of the chimney. Apart from this, the boiler is full of water from backhead to smokebox door, the firebox end is cased and lagged, and the fire consists of two small spirit vapourizers about 7/8 inch diameter. The exhaust is turned up the chimney, but does not draw the fire, This boiler steams very well, and the loco builds up pressure while running. Safety valves blow at 30 lbs/sq. inch.

This engine has two advantages over the "L.B.S.C." type. One, it starts from cold without any preliminary clearing of water from the cylinders. When the gauge reads around 251b I simply open the regulator and she creeps away majestically, running hydraulically for about 10 feet, so it's as well to have metal roofed coaches at the front of the train. When the cylinders clear she starts to puff loudly but this dies away as she accelerates. The loud puff is her second advantage – it sounds magnificent when she starts from a brief stop – and I think it is caused partly by the acoustics of the boiler and partly by droplets of water in that long exhaust line.

Why is this theoretically unsatisfactory machine so efficient? The deplorable valve events (which give easy starting and perhaps the heavy blast) are offset by the size of the cylinders (the bigger they are, the hotter they keep and, the less they leak – relatively), the thin wall and the lagging. The boiler is outstandingly good in design, but the "dent" makes it unsuitable for high pressures, unless stayed. The cylinders, incidentally, are so attached that they communicate very little heat to the framing. The lubricator is a horizontal drum under the footplate towards the rear of the engine on the starboard side. It has a plug cock which I can flick open as the engine passes on her second lap. I always let her warm up first, to avoid wasting oil during hydraulic working.

The foregoing shows that the "L.B.S.C." system is not the only one which results in an efficient loco. With this in mind we might consider the possibilities of simplifying construction and even improving realism which other systems offer. The low pressure loco – commercial type – can be highly satisfactory if the cylinders are kept warm – which means superheat and lagging – and tight (pack the pistons and glands if worn), and properly lubricated *(* see instructions for H.P. locos.) The boiler too must be kept hot. Side tanks are a help here. Of course, you can fit an internally fired boiler, but you lose sight of the exhaust.

Many inside cylinder models have one cylinder only. Such engines, if built to "L.B.S.C." standards, will only run fast. As they are in the main small tanks this is rather absurd. Also, they only give two beats to a turn (and often rather loud ones at that). This system is really only suitable for two cylinder compound express engines, or Webb's 3 cylinder system, all of which produced two beats to a turn. As they only run fast, the "L.B.S.C." type of single inside cylinder engine is fine for one of Wordsell's lovely N.E.R. singles in its compound days. If you want a small tank, it is better to give it virtually no lap, and admission on just after dead centre, and reduce the blast pipe aperture. Then she will run slowly, with a less distinct beat, but she will still pull and steam, because though using more steam

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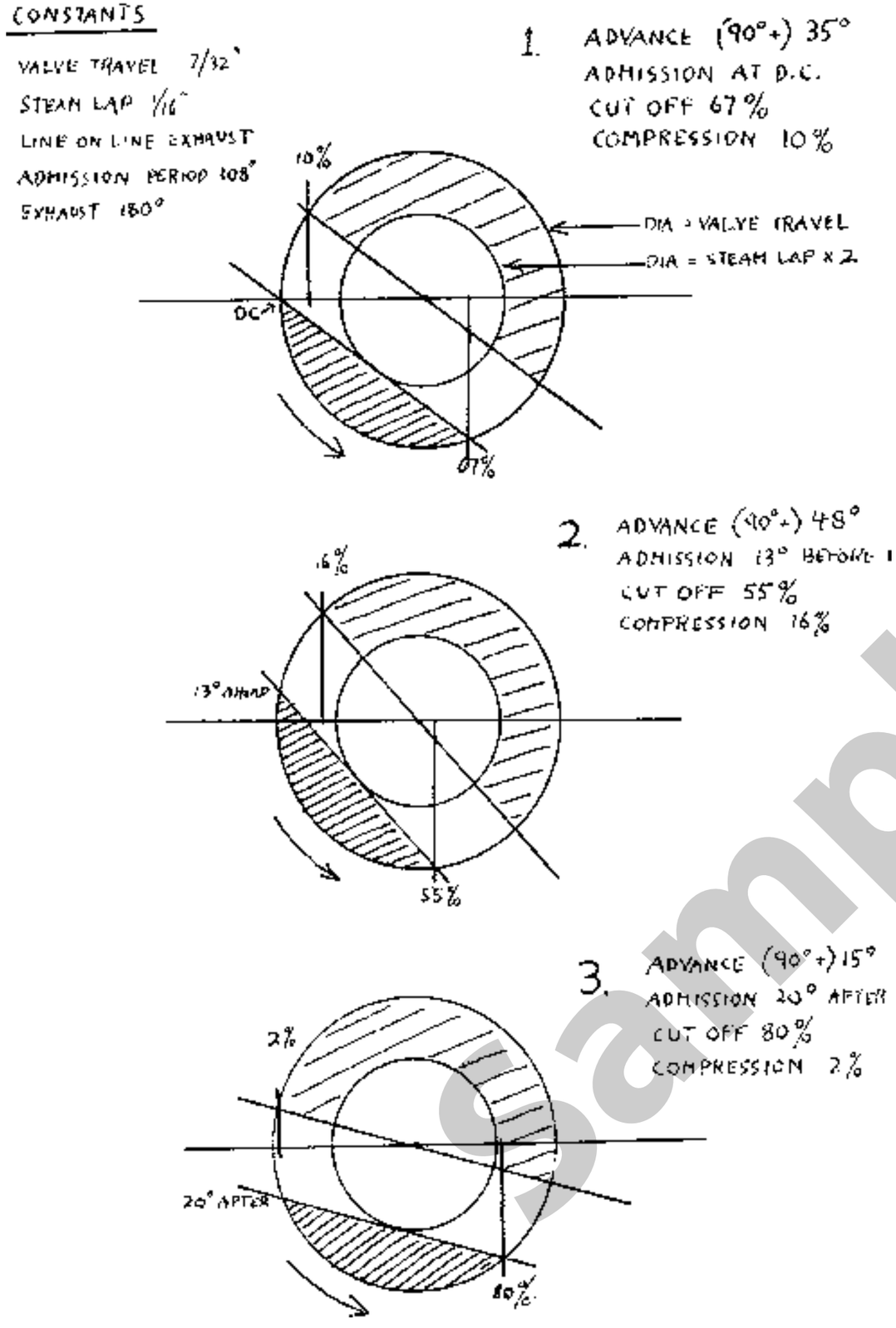
Sample



Sample

The type 'C' boiler

As boilers are very much under discussion at the moment, it seems the right time to introduce the type 'C' boiler. I first designed this for the Nord Super-Pacific which it was proposed that J. & M. Models would build for Fulgurex, the prototype of which has been seen and admired on many occasions. There is, of course, nothing particularly original in the concept which I am about to describe, in fact it is much the same as the first multi-tubular locomotive boiler which was fitted to a 0-4-0 locomotive by Marc Seguin in 1829. Very briefly, the essence of the design is that the boiler is a simple drum with a tube plate at each end, and the tubes (any number from two upwards) rise from the rear to the front at a very shallow angle, around 1 in 25. They could actually be horizontal but the rise gives better natural draughting, and also gives some warning of the boiler running dry as the wetted area of the tubes decreases lengthways as the water recedes from their undersides.

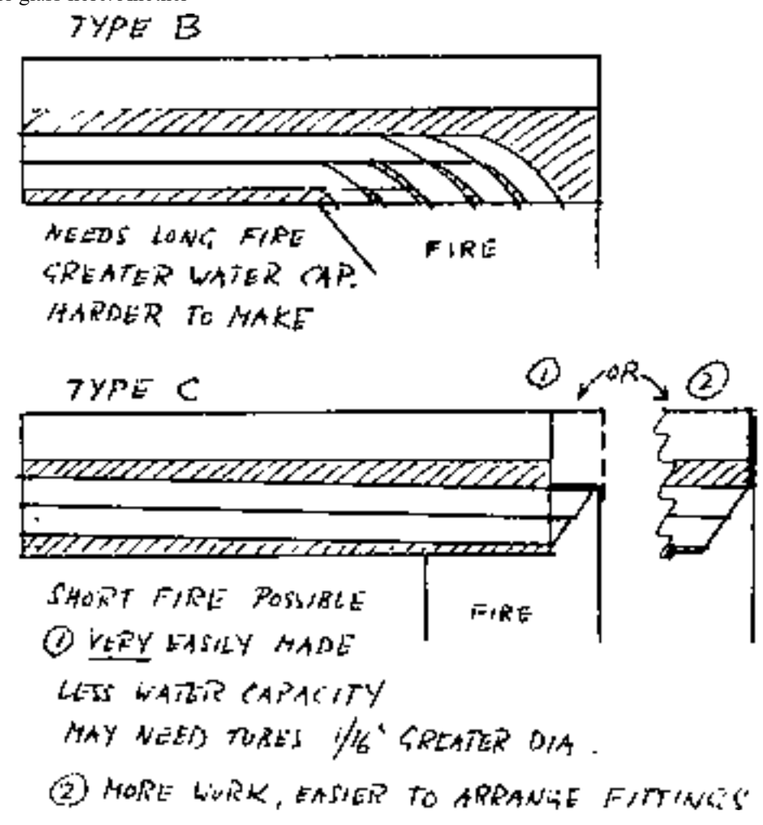
At the rear end of the boiler the fire is under the barrel in a dry firebox which may be made of copper and, if not too deep, may be silver soldered to the underside. A dry duct is provided at the back end to conduct the flames round into the rear of the boiler, so the flame flow starts off backwards and then goes forward through the tubes. This is also analogous to the Scotch marine boiler.

The reason for the design was to make the boiler very simple to manufacture in quantities: the tube holes are simply punched, the boiler ends are round blanks, and the dry firebox and duct can be cheaply produced by etching. A refinement is that the upper row of tubes may project from the rear tube plate and have their ends cut at 45°, their upper ends thereby extracting extra heat and providing support for the rear end duct, the back plate of which should be lined with asbestos or glass fibre. Another advantage of the type is that it makes it possible to arrange more heating surface and greater flue cross-section in some types of boiler, especially the shorter ones. Of course, as tube length is greater the tube diameter must be greater also, but this can be beneficial provided that the correct length to diameter ratio is observed. This, in practice, is that tube length should be around twenty times the internal diameter.

It may be thought that this ratio is very simple, too simple. However, the volume of gas flowing and therefore the volume of heat flowing varies as the square of the diameter. The capacity of the tube to absorb heat varies directly as the diameter and so the length of the tube available to absorb the heat from a given "slug" of hot gas passing along it should also vary directly as the diameter. To put it another way, the heating surface of the tube varies as diameter by length and if length varies as diameter then the heating surface will vary as the square of the diameter, which equates with the amount of heat flowing up a given tube.

It is possible to predict accurately the performance of any boiler design and I have sufficient data on hand, accumulated as a result of many experiments, to enable me to see on paper whether some boiler design will not work. In making boilers of different shapes and sizes one sometimes finds that one of the basic types just cannot be satisfactorily fitted into the particular shape one has to deal with: one can see that it will not allow sufficient heating surface or whatever. For this reason I think the type 'C' is a useful addition to the repertoire.

The first one actually to be steamed was in fact a conversion of the gas fired boiler of the Bavarian 4-4-4. This was a single flue with water tubes in the front half and the back half originally contained a soft flame, gas poker type of burner. I did not wish to alter the boiler itself so I contrived a firebox under the rear end and ducted the fire round to the rear end of the flue. The underside of the rear end of the barrel provides a small additional heating surface which is very valuable because it is subjected to flame at a high temperature. The result of the conversion has been entirely satisfactory. For the Super-Pacific I envisaged alternative methods of firing for the same type 'C' boiler and would anticipate no difficulty with a soft gas flame burner. Lastly, I designed a boiler of this type for the Midland Compound which is to be made in quantity by J. & M. Models. The first one of the type, which was made for testing purposes, was fitted to a "Schools" chassis and provided every bit as much steam as the original Smithies boiler, but with greater water capacity and within smaller overall dimensions. It only remains to add that the main steam pipe is taken from a regulator on the back head and runs across the duct and up one of the tubes of the smokebox, and this provides adequate superheat.



Where the layout passes the house; the girder bridge lifts out.

My railway has been in its present location for some twenty eight years, though parts of it have been realigned a little since it was first laid down, or propped up, or whatever. I thought it might be interesting to talk about how it has stood up to weather, tree roots, and the pounding by the trains; and how some of it was made.

Our aim, Jocelyn's and mine, was to create something which fitted into the garden as a real railway fits into the landscape, i.e. without spoiling it. The trains should run through the scenery as naturally as they do in real life, but there was to be no deliberate miniaturisation of the planting, it had to be more or less level, but the garden sloped a little, so earthworks, walls and a viaduct could not be avoided. But when trains were not running, the garden had to look like a garden, the planting of which also expressed a serious interest.

In addition to providing the spectacle of trains running, the railway had to be suitable for experimental running, the testing of ideas, so almost all the track had to be accessible. Eventually, there were no signals or stations, and the only features were civil engineering: a l2ft. tunnel, a 6ft. liftout through truss bridge, and a 22ft. arched viaduct. All these remain exactly as they were, but the track in between slewed somewhat, and its foundation has been changed, as much of it started on temporary wood planking covered with roofing felt.

The layout is very simple: a double track continuous circuit, 198ft. round, with virtually no straight lengths. There is a siding off the outer, which runs out of sight, and serves just as stabling for a train on busy afternoons. There is a junction near the summerhouse, at which a track comes off the inner, crosses the outer and then climbs round a six foot radius curve and runs about 30ft. behind the small courtyard at the rear of the house, into my workshop, where there are five storage tracks and shelving for the rest of the rolling stock. The only crossover between outer and inner is on the girder bridge, which lives inside when we are not running, and has been preserved from most of the weather. There are two lesser liftout bridges.

The track in the tunnel, on the viaduct, and on the bridges has never been relaid, but all the rest has been lifted at some time, a third of it this summer. The amazing thing is that only a few feet have ever needed replacement, yet this track was not new when laid down. It had been on a previous layout in Highgate, or on Victor Harrison's line at Bishops Stortford, or elsewhere – in fact it was almost all prewar, with brass rail, die cast chairs, and wood sleepers and battens.

When I took this last lot up, it was to level the formation, which was stone wall in part and a buried breeze block wall in part. Although our soil is on hard gravel over chalk, the large trees around the place manage to disturb things and a once level track had developed gradients as severe as 1 in 60 over some yards and even 1 in 28 over 6 feet, so something had to be done. All the track is ballasted, but quite a lot of the ballast was solid with moss. When I had cleaned the removed lengths I was very surprised to find that most of them could go straight back for reuse. I attribute this to two things: the ballast, which controls the moisture, so that the sun (remember what that is?) cannot dry the wood out too quickly and actually never gets to the battens, and the regular application of light mineral oil, once per year, dripped from a special tank wagon.

Ballast actually supports and holds the track in places, and this is very good for adjusting levels and aligning curves when you have a permanently unstable situation. In our case, such conditions occur close to a tall Sequoia, which was badly rocked by 100 mph winds some time back. In fact, it took a permanent list (though the top now grows vertically again) and though it was held by its tap root, the large surface roots broke up part of the railway that night, and high winds still disrupt things occasionally. The ballast, between walls and on a base of old wine bottles, can always be quickly rearranged to restore the damage.

Trees are in fact the main problem. A venerable cedar of Lebanon, with 30ft. horizontal branches, continues to grow underground, and was responsible for hoisting the buried breeze wall (which is faced, as it were, with a grassed embankment) about three inches in ten years. The viaduct passes close to a Blenheim Orange which is now 28 years older, and although the long spans avoid the main roots, the viaduct now leans slightly away from the tree, an effect concealed by the fact that it is built to a gentle curve. The line is really too close to all the trees, but there is only about 50 feet between the side of the house and the high hedge along the road, the trees are within this space and

we just could not avoid passing close to them.

The viaduct, part of which is shown above, was simply cast in concrete, using a mould which could be moved along to form each arch in turn. There are little arches at both ends, and a third little arch provides the support for the far end of the girder bridge. I got very fed up with mixing cement, so those large spandrels also contain old wine bottles. This structure has never given any trouble, the slight leaning away from the apple tree has simply produced vertical hairline cracks in the middle of the abutments, where the join comes between successive castings of the concrete. The track has never been lifted, but has been reballasted to remove moss. The loco in the picture is Victor Harrison's high pressure "Titley Court", still going strong but now with less obtrusive lubricators, (By the way, Bob, Victor's pneumatic speed control is alive and well and operating in Hertford and Englefield Green, both Tony Hall-Patch and I having locos thus fitted, and control coaches).

The upper picture was taken some years ago, the one below is recent and you can see that the tree leans away from the viaduct, too. On the far side, the line of the embankment containing the breeze wall can be made out, shaded by shrubs.

A buried breeze wall is a good idea, provided it is protected from frost (i.e. covered with felt or polythene) and clear of tree roots!

The girder bridge is assembled on a base of four $^{7}/_{8}$ x $^{7}/_{8}$ tee irons, inverted and 6ft. long along the bottom of the side girders, the right way up and shorter at the top. The sloping end members and the verticals are made of 20g aluminium angles, paired on each side of the tee webs. These were bent up and are about $^{7}/_{16}$ each way. The diagonal tension members are flat strip of the same material, about $^{7}/_{16}$ wide, and the lot is held together with 6 BA hexagon headed screws and nuts. The sides of the bridge are held together with paired angles, as the verticals, fixed under the lower tee irons and above the upper ones. These run across at right angles, so, to limit the possible twisting of the whole structure, there are crossed diagonal strips at the two ends of the top. The track rests on cross timbers which rest on the inside flange of the bottom tees. It was carefully designed but very quickly made. Final assembly took one evening only, under the astonished eyes of my then newly acquired in-laws. The thing is light enough to carry easily some 60 feet to my workshop.

One large tree which sweeps the lawn, about 20 feet in diameter, conceals the tunnel. The track is laid on a sounding board, between brick walls, and roofed, with sound holes above and below the board. It roars splendidly when a train goes fast through it. The sound holes are completely invisible within the tree, but you can get at the odd derailment that way if necessary. They do happen – I think squirrels and the like deposit bits of tree in there. The train in the picture above on right consists of a freelance but rather continental 0-6-2T, with a shrouded pot boiler and a geared oscillating cylinder, one of five such I have built (see Newsletter 74) varying from a "Terrier" to the prototype of the Aster Ouest loco. The coaches are Märklin 4 wheelers rebuilt on aluminium underframes, with bogies. The idea was Tony Hall-Patch's. The engine, if you can find it, in the picture above on left is my Barry 0-8-0, hauling a goods train.

I hope there are some ideas and experiences in this article which will be useful to those brave people starting a new layout. One last word of advice: get something running as soon as possible. You can make improvements later, and feel more like it once wheels are turning!

Sample