



1 Live Steam Models

1.1 Early Developments

There are several ways of enjoying Gauge 0 model railways. Some people build, some buy, some collect - while others concentrate on running. A particularly fascinating aspect is the steam locomotive; here again some get their pleasure from building, others build to run while others, whose interest only lies in running, will buy. Whatever they choose, it does seem that once the steam bug has bitten it never goes away.

The earliest Gauge 0 steam engines were mostly of German manufacture. Their appearance was often bizarre and the only example that ever came my

way was better at distributing water and fire than it was at running. Between the wars improved models appeared, often with piston valve cylinders in place of the earlier oscillators.

In this period Bassett-Lowke produced their Mogul, Super Enterprise and Enterprise designs in large numbers and also made other engines to special order. This activity continued on a reducing scale until the firm moved out of the model railway business. As an example of the special orders, I was recently shown a rather nice looking BR 9F 2-10-0 which was based, as far as possible, on the standard Mogul design.



Photo 1.1 A very early Maerklin 0-4-0. The original tender is missing and has been replaced by an early Hornby one. This was a Christmas present to its owner in 1911. (Photo R. Fielding).

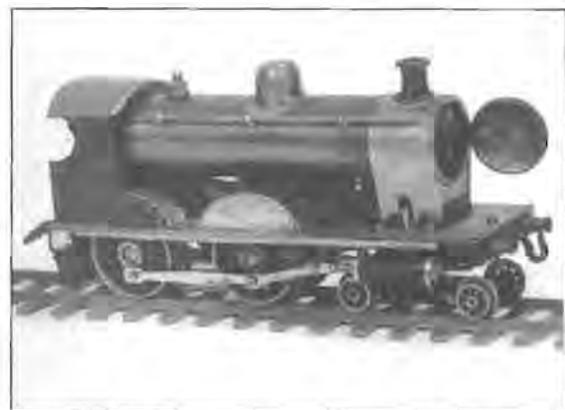


Photo 1.2 A Bing 4-4-0 purchased in 1926. The oil lubricator is located in the smokebox. Piston valves supply steam to the cylinders and reversal is achieved by operating a cab lever which controls a steam/exhaust change-over block located between the frames. Spirit fired. (Photo M. Goodwin).



Photo 1.3 Maerklin 4-6-2 express locomotive for O Gauge but hopelessly out of scale; nearer Gauge 1. Piston valves driven by eccentrics located on the centre drivers. Purchased in Gamages (London) in 1930. Spirit fired. (Photo M. Goodwin).

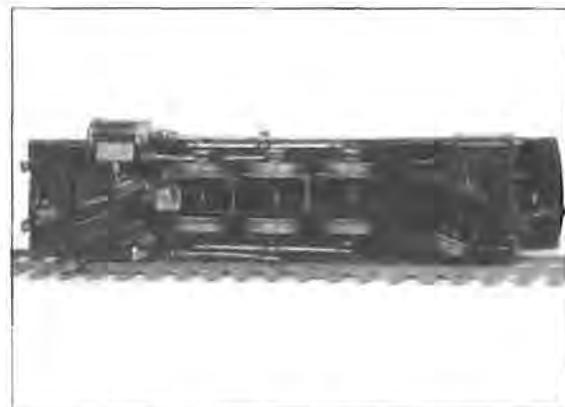
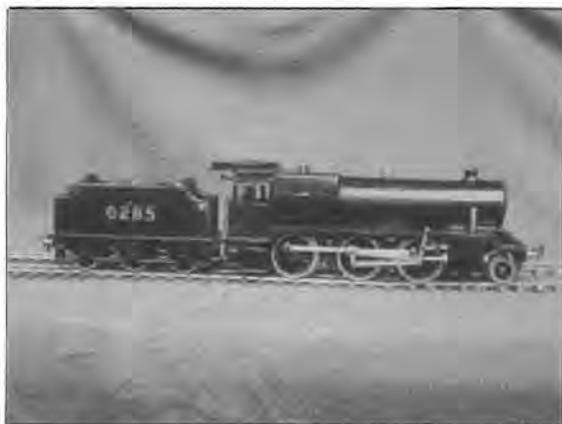


Photo 1.4 Underside of the Maerklin 4-6-2 express locomotive showing the centre flue boiler and circular burner locating ring. The loco is fitted with a regulator and reverse that can be actuated by a cab lever or a trackside lever. (Photo M. Goodwin).



Photos 1.5, 1.6, 1.7, These show the three standard products of Bassett-Lowke; a 4-4-0 Enterprise; a 4-6-0 Super Enterprise and the later Mogul. (Photos R. Fielding).

Bowman also produced their range of locomotives during this period; these all had oscillating cylinders and were non-reversing. All these models had spirit fired pot boilers and all were made to generous dimensions, especially the Bowmans which were virtually Gauge 1 engines on Gauge 0 frames.

For those readers unfamiliar with the design of oscillating cylinder engines; examples of this type appear in Photos 1.1, 1.9, 1.10 and 1.11. The cylinder is mounted on a central pivot and is held against the steam distribution plate by a spring. The piston, piston rod and connecting rod form one solid unit and, as the crankshaft rotates, they cause the cylinder to oscillate about its pivot and alternately align its steam port with the steam and exhaust openings in the distribution plate. Photos 1.2 to 1.7 show the more conventional piston or slide valve engines where the operating cylinder is fixed and steam distribution is by a separate moving valve unit.

A surprising number of these various models have survived and many Guild members and others enjoy restoring and running them. Some have undergone small but significant improvements and I have seen

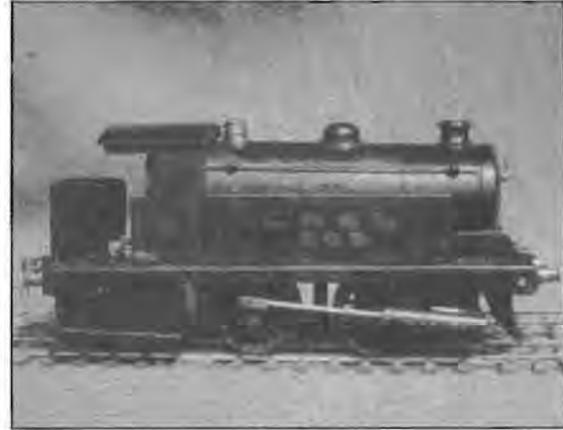
one or two whose performance would surprise the original makers.

In the *Model Engineer*, LBSC commenced his weekly articles in the 1920s and continued for most of the next 40 years. He is much better known for his 2 1/2 in and 3 1/2 in gauge designs of which many examples are still running; indeed some are still being built. Undoubtedly, LBSC did more than anyone else to lay the foundations for successful miniature steam locomotives.

Occasionally he put forward a design for a Gauge 0 engine, e.g. *Bat* and *Sir Morris de Cowley*, and I understand that they were good performers. However, they were somewhat oversize with boilers 1 3/4" and even 2" in diameter which, with oversize cylinders,



Photo 1.8 A NYC Hudson based on LBSC'S design 'Josie', which was described in the *Model Engineer* in 1933. (Photo R. Fielding).



Photos 1.9, 1.10, 1.11 Three products from Bowman; a small 0-4-0T, a large 0-4-0T and a 4-4-0 tender engine No. 453. These are roughly contemporary with the early Bassett-Lowke designs but use simple oscillating cylinders for their drive. (Photos R. Fielding).

necessitated undersize wheels and extended bogie wheelbases, all with disastrous effect on the scale appearance.

In the last 30 years or so considerable progress has been made in Gauge 0 steam. For years the experts of the day had laid down rules and guidelines. Would-be builders were warned that closely scaling down the real thing was quite impracticable and that for success boilers, cylinders, etc. had to be made larger than scale. I also remember reading that fine scale wheels were no good as the spokes would be ripped out under the power of well made cylinders!



Photo 1.12 This model of a 9F 2-10-0 is an example of a Bassett-Lowke order built for the late Sir Alec Issigonis, the designer of the Austin Mini and Morris Minor cars. (Photo R. Fielding).



While many people are quite happy to have a locomotive that will run well and are not unduly concerned about the appearance, there are others who try to produce close to scale models. One or two of these modellers began to question the old 'rules'. After trying out various ideas it was often found that the 'rules' were unfounded and, after some years of trials and experiment, one can now see steam locomotives which equal some of the best of their electric counterparts in appearance. There are now accurate models of small Victorian engines which will run with proportionally heavier loads than their prototypes did.

Other important developments include radio control, gas firing as an alternative to methylated spirit and, of course, 'O' rings for sealing pistons and glands.

Any normal prototype layout of mechanical parts has been reproduced including 4 cylinders, 3 cylinders and inside cylinders with full valvework.

For anyone who is prepared to spend the time and not be disheartened by an occasional failure, the

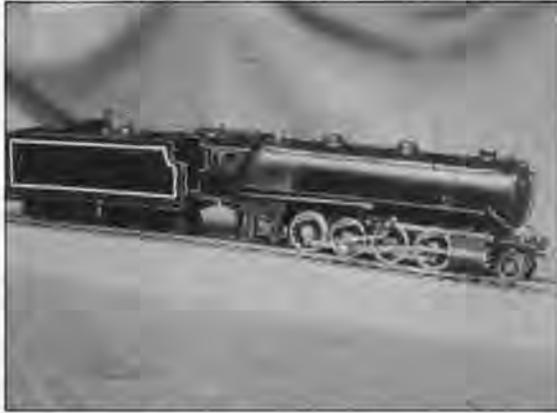


Photo 1.13 This 2-8-0 is listed by its present owner as a freelance design, maker unknown. However, there is a strong resemblance to a 2-8-2 built by Mr. R.H. Cox for the late Sir Alec Issigonis and described in the Model Engineer for 3 November 1960. This could be that model built to allow for modified burners. (Photo R. Fielding).

development and refining of Gauge 0 steam has much to offer.

1.2 Level of Skill Required

Steam locomotives undoubtedly have a wide attraction and it appears that many people would like to own such an engine. However, they would not consider building one for themselves as they imagine it is a job for the highly skilled engineer. The fact is most of the people who build successful engines have had no formal engineering training at all. Magazines such as *Model Engineer* will give one an idea of the procedures involved and this, coupled with the



Photo 1.14 A Flying Scotsman by A.W. Mills of Cheltenham. This is internally fired with meths burners and has been overhauled by Clarry Edwards. (Photo R. Fielding).

desire to own a working steam locomotive, often provides the incentive to have a go.

The first efforts may not come up to expectations but one of the beauties of the steam engine is that, provided the boiler produces steam, it will usually run, even if not very efficiently. Seeing the wheels go round for the first time is a most rewarding experience and will invariably arouse enthusiasm to press on and do better.

When building an engine the use of a lathe is very desirable but not absolutely essential. It is possible to buy finished wheels and also cylinders, e.g. Talisman supplies slide valve cylinders, Tom Cooper has his 'Osmotor' and DJB have a multi-cylinderec oscillating engine designed by Peter McCabe. Additionally, some builders have constructed excellent slide valve cylinders using brass tube and rod without the use of a lathe.

However, the cost of buying parts, and certainly the cost of a complete engine, would go a long way towards the price of a small lathe. After that any number of models can be built for little more than the cost of the wheel castings. Scrap metal can often be used and a friendly plumber could supply odd bits of copper tube for use in boilers.

1.3 First Steps

Obviously a first attempt should not be too ambitious. In future publications two types of engine will be described, the first being simple and the second a little more complicated. These will given as examples but you do not have to copy them blindly. It is more than likely that you have a different prototype in mind. Wheel sizes and their spacing can be altered; the connecting rods and eccentric rods can be made longer or shorter to suit.

Cylinder bores can be a little larger or smaller, although in the oscillating engine it would be as well to keep to the stroke specified as this is designed to suit the port layout. In the slide valve engine the stroke could be varied if required. If increased, the cylinders can be made that much longer, while if reduced, the easiest way is to make the cylinders as shown but make the piston correspondingly longer. I would, however, strongly recommend making the ports, valves and eccentrics exactly as shown. Most of the boiler dimensions could also be varied by modest amounts but it would be as well not to reduce the diameter of the flue.

As for firing, both gas and methylated spirit will be mentioned. Both are capable of giving good results and it seems there is little to choose between them. It is largely a matter of personal preference. Both



fuels are perfectly safe if used properly and handled with due care and attention. Safe methods of operating are described in Chapter 2 and should be observed at all times.

The old pot boilered engines of years ago were noted for leaving a trail of water and oil in their wake and this was sometimes augmented with pools of burning spirit. This gave steam a bad name and unfortunately several people still think that this behaviour is a necessary accompaniment to steam operation, in spite of developments in the last 25 years or so. Every effort should be made to dispel this myth, and when running one should always have a cloth handy (full size drivers always did!) and any water or oil that might be spilled should be mopped up at once. When filling the spirit tank a check should always be made to see that there is no overflow or spillage, and if there is it should be wiped up immediately before attempting to light up. In this way fires will be avoided, everything kept clean and there should

be no complaints about the state of the track. In any event, after running on a test track, or in fact anyone else's track, it is a matter of courtesy to ensure that no mess of any sort remains.

If you have read this far and feel that you would like to build an engine, you should first read the following pages very carefully, and anything else that you can find on the subject. A list of books and articles, by no means exhaustive, is given in Appendix A. A check at your local reference library may well produce others. As suggested earlier, you do not have to stick rigidly to what is offered although for a first attempt it would be advisable not to deviate too far. Nevertheless, if different ideas are tried and are failures the amount of material wasted is negligible; only time is lost. On the other hand, if some variation on the theme is successful this could provide one of the answers that has eluded the rest of us.

Get busy and good steaming.

