

Model Boilers and Boiler Making

By K.N.Harris

A Hard backed book of 180 pages approx A5, published in 1967

Boilers have been the death of many models. Very little detailed accounts on the subject have been published since the late E.L Pierce book Model Boilermaking. This book uses the contents of that publication as the basis for this book with many updates to permit the building of safe functional boilers, the emphasis is being on functionality rather than scale detail.

The book walks you through the whole process, starting with the decision stage, giving general principles of functionality, evaporation, efficiency and notes on scale and the effect it has to the finished boiler. Suitable materials for construction with their physical properties with calculations to determine pressures and material thickness.

Boilers are needed for static and mobile engines, the author has given the design details of a comprehensive range of boilers, showing water, fire grate and flue gas circulation.

You are walked through the construction process, giving the reader details of how to plan make templates and formers, then cut out the parts, how much allowances and how to form, flanges and the various ways to join the parts. Methods of riveting, the range of rivets, setting tools are well explained. The importance of stays and the options available for each type of boiler, and the best way to fit are covered. Simple things like 'man-holes', domes, fire-holes and foundations that are often left to the ingenuity of the builder, are explained in some detail with various suggestions and illustrations to help the builder.

The options for firing a boiler are varied, we tend to be blinkered towards the uses we are familiar with, i.e. coal and pressurised Kerosene for 3.5" and larger locomotives, spirit and gas for smaller gauge locos, and stationary engines. The specifications for each type and sub type are given, allowing the builder to make an informed choice. The design and construction of burners is well covered, along with controls gear including 'automatic' devices. One thing I noted is that the 'Arch', a vital part of a full-sized Locomotive boiler, is described with scale suggestions on how to include one.

Mounting a boiler along with safe operation is essential. Nothing is missed, safety valve design and construction. Sight glass options, design and construction. Regulator options, designs and construction. Blowdown valves, Domes, clacks, etc, a tremendous amount of information is given to the builder.

Logically once built the boiler needs to be tested, and again a full explanation of how to test is given, with suggestions for calibration of gauges, using temperature as an alternate measure of pressure.

Further reading leads on to more technical design considerations, tube proportions, spacings, superheaters and feedwater heaters with formulae and data for you to follow. More specifics on Model Locomotive boilers follows to keep them true to full size originals.

Finally, the Appendix covers specific design criteria for 16 types of boilers along with huge amounts of data. If you are planning on making a boiler, this is a must read, even if you are just a tyre kicker you will learn and understand the topic to a much greater depth.

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Tony Ashgrove, October 2025

