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THE CORNISH BOILER.

R. Shambrook.

The simplest and at the same time, one of the most common forms of land boiler for small powers, was the Cornish boiler. Used extensively throughout the 19th and early 20th centuries in Cornish, and mines throughout the world, it was ideally suited for its use, and was unsurpassed for reliability.

What later became known as the 'Lancashire boiler' on account of its having first adopted in mills in that county, was a modification of the Cornish boiler, where it was found that when greater power was required from any one boiler, that boiler if of the 'Cornish' type, would require to have an excessively large furnace flue, in order to give sufficient grate surface. The length of the grate could not be increased beyond that which could be conveniently worked by the fireman, and moreover a flue of large diameter was found too weak to resist collapse, unless made of very thick plates, which was undesirable; therefore when great horsepower was required, the construction of the boiler was modified, and two flues of moderate size were fitted instead of one.

In the Lancashire boiler the furnaces were fired alternately, so that whilst one was giving off smoke and unburnt hydrocarbon gases, the other was burning briskly, with its greatest heating effect. In this arrangement, when the gases from both furnaces mixed in the external flues, the unburnt gases given off by the green fire (due to want of air and too low a temperature) were burnt by the excess of air which had passed through the other furnace, being raised to the point of ignition by the great heat of the gases from the bright fire.

Water Tubes

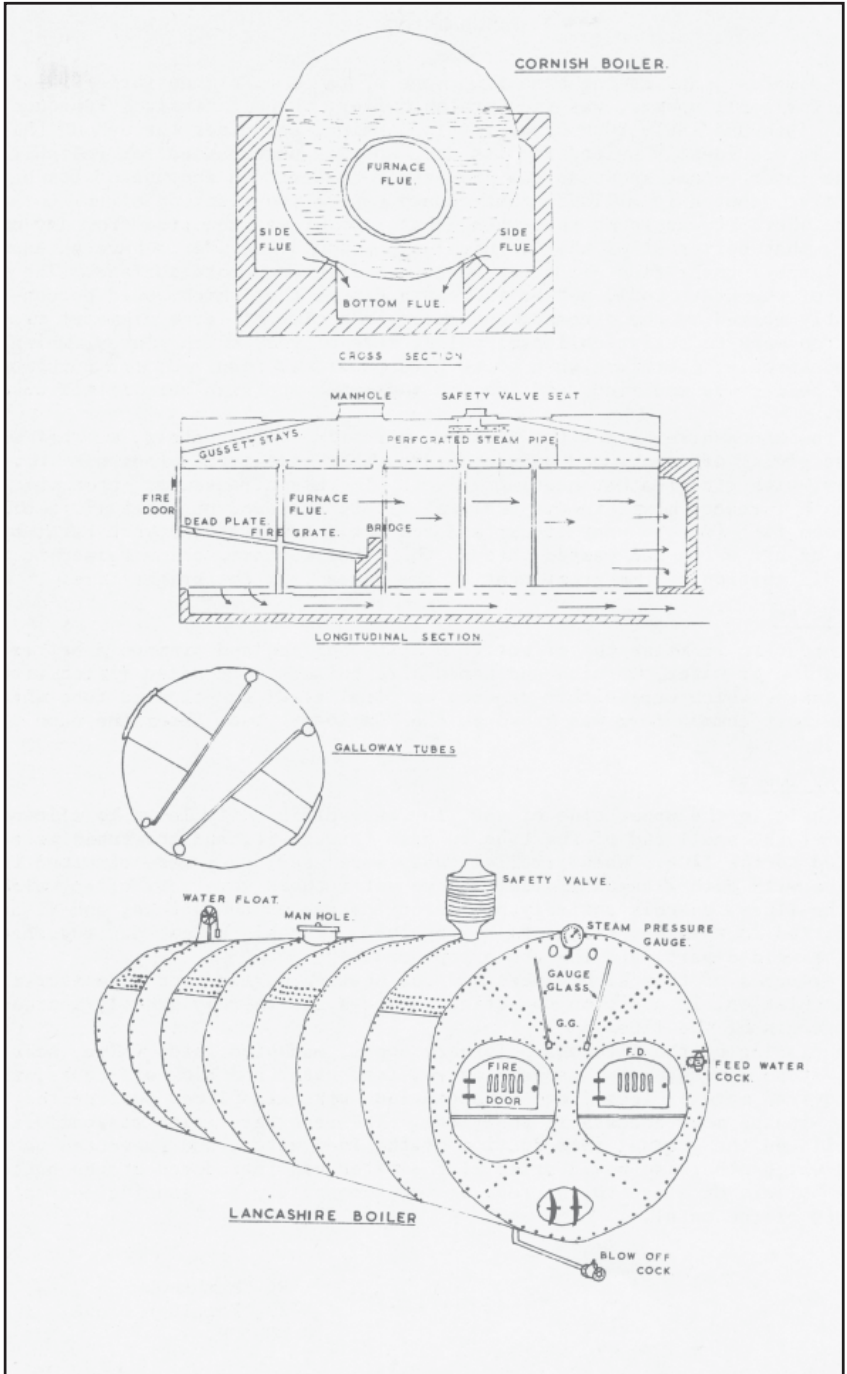
In order to increase the effective heating surface and promote a better circulation of water, Cornish and Lancashire boilers were often fitted with water tubes, which were either tapered or paralleled; the tapered tube which was the most common form was known as the "Galloway" tube after the name of its inventor.

Galloway Tubes

The hole in the upper side of the flue was sufficiently large to allow the flange of the small end of the tube to pass through it, and the tubes were riveted to the flue. When parallel tubes were used, they were riveted to the flue with both flanges inside. These water tubes were very often welded into the flues, as this entirely prevented leakage at the joints, and if any tube fitted in this way needed to be replaced, it could be cut out together with the welded part, and the whole replaced.

Water tubes of this kind, increased the heating surface and also increased the circulation, in addition to acting as stays and thereby greatly increasing the strength of the flues.

THE CORNISH BOILER



The placing of the fittings – furnace doors, manholes, stop valve, safety valve, steam gauges, water gauge glasses, feed water and blow off cocks, which all required more or less frequent attention, were all placed outside the boiler, in the most accessible positions. The feed water pipe was perforated, this allowed the gradual introduction of the feed water, and prevented the stress which otherwise would arise if the water was introduced at the bottom of the boiler, or close to the tops of the furnace flues – causing contraction in parts of the metal.

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