

Nails – holding buildings together

When Captain James Cook arrived in the Pacific, he found buildings that were woven, lashed or pegged together as there was no iron. He brought with him nails and the opportunity for new construction techniques.

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Early European settlers imported large quantities of nails. The New Zealand Company ship *Glenbervie* included in its 1840 voyage at least 20 kegs of nails. Reportedly, in 1843 the first house built on the Canterbury Plains was constructed without iron nails as these had been left in Wellington by mistake. 'Ranzau', a house at Hope near Nelson, was built around 1844. Its handmade nails came from Europe, and range from 6 to 30 cm in length.

New Zealand imports of nails were so important in the 1800s that they were listed separately in the statistics. In 1873, nail imports were just over 4 shillings per person and represented 0.9% of all imports. Even in the 1890s nails were 0.5% of total imports, showing their critical importance to a country undertaking many building developments.

From hand-forged to square nails

The first nails were forged by blacksmiths. The revolution in nail manufacture came in 1790 when Englishman Thomas Clifford invented the first nail-making machine. This converted a flat sheet of iron into a string of square-shaped 'plate' or 'cut' nails. These were then snipped off and the nail head finished by hand until 1815. The technology for this process was only possible because of the industrial revolution, which made available the iron and steel for the nails and machinery, and the steam power to work it.

Wire nails enter the scene

The technology for round wire nails, like those we use today, apparently started in France in the early 1800s but took some



Figure 1: Ladies nail hammering competition at a picnic in Tututawa in 1910. (From the James McAllister Collection, Ref. G-12821-1/1, Alexander Turnbull Library, Wellington, NZ.)

time to dominate the market. In the USA, for example, it was not until the 1890s that more steel wire nails were made than cut nails.

Today, the manufacture of wire nails has not changed greatly from the original process. Coils of steel wire rod are hard drawn to the appropriate wire size. This is then fed into a nail-making machine, which makes the nail in a three-step process. First, the head is formed by a hammer hitting against a die while the wire is gripped tightly (forming the 'cording' on the shaft); then the wire is pushed out of the die; and finally, cutters form the sharp tip of the nail. The nail head shape is determined by the die and the point shape by the cutters.

The nail is then tumbled with sawdust, removing oil, rough edges and any nibs. These 'bright steel' nails can be weighed and packed in suitable sizes bags or boxes, or taken onto a further process to be galvanised, spiral rolled, annular grooved, have a washer added, or painted. If the nail is to be used in a machine nailer, it is collated onto a paper or plastic strip.

Brass, copper, silicon bronze and stainless steel nails are produced by a similar process.

NZ-made lead-headed nails

When the first nails were made in New Zealand is unclear. Early settlers undoubtedly used blacksmiths to hand-forge nails but the

first factories made lead-headed nails. This process involved skill to ensure the lead cap sat properly on the nail, sealed tightly onto a roof and would not be damaged by the hammer blows of roofers.

Numerous patents were taken out for lead-headed nails, but this did not stop local plumbers producing their own versions. Many early 'nail manufacturers' were probably plumbers making lead-head roofing nails, although it is impossible to determine whether they were manufacturing the nail itself, or only the (added) lead-head.

In 1928, the Lino Roofing Nail Company of Dunedin (started around 1916) was complaining to factory inspectors that local

plumbers were providing unfair competition. The plumber would use left-over scrap lead (which had already been paid for by a client) and an apprentice's spare time to make their own lead-headed nails, undercutting prices changed by 'legitimate' manufacturers.

Local nail manufacturers

William Stokes of Christchurch first appears in Wisers directory for 1887, continuing in business until at least 1896. In 1890, Wellington had Ballinger Brothers and George McCaul, both manufacturers of corrugated iron and spouting, and also roofing nails. In George McCaul's case his works claimed their 'composition metal flange head roofing

nails' were 'acknowledged by architects and builders to be the best roofing nail ever manufactured in the southern hemisphere'.

P.H. Venables Limited was started by Joseph Venables, a plumber, in Christchurch about 1900. From 1903, Venables was the only New Zealand nail manufacturer listed in *Wises New Zealand Post Office Directory* until 1908, when they were joined by the Crown Nail Company of Dunedin.

In Auckland, Alfred Jonathon Kemp's first entry in a commercial directory was as a plumber in Line St, Ponsonby, Auckland in 1903. By 1911, he had become a builder and in 1912 started the Auto Machine Company, to become in 1918 The Auto Machine Manufacturing Company Limited. Their Wellington factory opened in 1922.

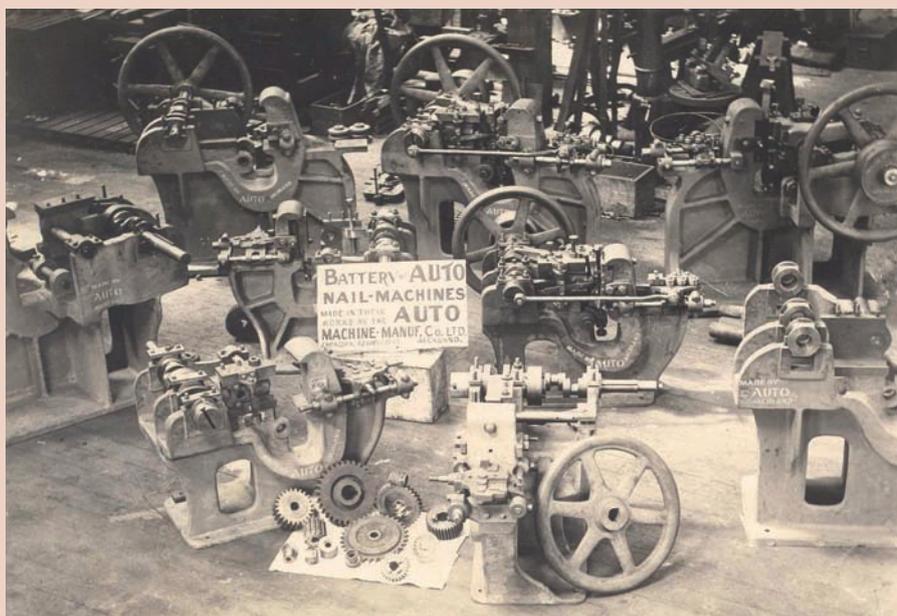
Pearson, Knowles & Rylands Brothers N.Z. Ltd (PKR) had been suppliers of nails to New Zealand for many years from their British head office, but in 1938 started negotiations to build a New Zealand plant.

P.H. Venables continued until 1941, when it was merged with the Auto Machine Manufacturing Company. After various amalgamations, including a merger with PKR, these companies finally closed in 1994.

Nails still made in New Zealand

Although many nails are now imported, there are still at least three New Zealand manufacturers – NZ Nail Industries Ltd (Auckland), Wireplus (Auckland) and Hurricane Wire Products Ltd (Christchurch).

Surprisingly, there is no New Zealand Standard for nails. ❖



Inside the Auto Machine Manufacturing Company Ltd factory in Nelson Street, Auckland about 1920. (From the Fletcher Challenge Archives, Ref. 0255P/3.)