

FHS 2/15
10514

The Story of Augustine Taylor

The invention of the 2 x 4 is widely attributed to Augustine Taylor, a little-known builder who decided about 1833 that if mills could cut lumber to fixed dimensions (say 2 inches by 4 inches) it would be possible to build houses with hollow walls and more or less standardized shapes. The sawmill operator had few objections since it permitted him to get much more usable lumber out of a log. Dimensional lumber required more control of the milling trolley that holds the logs, but millwrights were early innovators of such technology, and Taylor seems to have had little trouble getting the mills to provide what he wanted.

Little is known of Augustine Taylor's personal life, and, of course, his invention would have been worthless if inexpensive nails had not become available by the early 1830s. Jacob Perkins invented a practical nail making machine in 1795, but it wasn't until the early 1830s that refinements to the original machine permitted cut nails to become widely available, and at attractive prices.

The "balloon" construction method that the 2 x 4 allowed began a whole new concept of house construction. The dead space between the walls actually insulated houses better than the solid timber frame construction methods that had been used previously. 2 x 4 construction methods made it possible to build a house faster, because adjustments for variations in thickness of each beam did not have to be calculated and accommodated. Furthermore, the house built with balloon construction methods could be built with fewer workmen since heavy beams were replaced by light-weight 2 x 4s that could be moved by a single man. Fewer construction accidents occurred, and a house worth of timber was lighter and easier to transport.

Ironically, balloon construction at first required a closer adherence to designed plans since the stress loads built into a house were easier to calculate on paper than on the site. Later on, balloon construction permitted mass building to a single plan, but at first new methods had to be discovered with time and practice. A heavy beam could carry a load either vertically or horizontally, but 2 x 4s required more care to see that individual pieces were not overloaded, in walls and floors especially.

According to some accounts, the initial houses that Taylor made by this method resulted in some awkward-looking structures. Overly optimistic projections of the load-bearing capacity of the 2 x 4 led to bowed floors or sagging walls. Methods had to be discovered that avoided putting shearing stresses on nails and thinner exterior walls. The truer dimensions that 2 x 4 construction permitted probably looked funny at first to those accustomed to the more solid feel of a thicker wall, but all these problems were resolved. Today, the 2 x 4 is so common that it is hard to conceive of anyone actually inventing it.

Chicago was rebuilt quickly after the 1871 fire due to the use of balloon construction. The use of 2 x 4s also caused the development of other 2 x boards (such as 2 x 6s, 2 x 8s) for studs, plates, joists, rafters, etc.

An alternate method of construction with dimensional lumber was called "plank construction." With this method one to two inch boards were stood up vertically around the exterior perimeter of the house without any frame. In this type of construction the sawmill operator did not have to worry about the width of the board, only the thickness. There are whole towns in Pennsylvania built with this type of construction.

Some people preferred to call the new building the "basket" frame method, because it described more accurately a house built of 2 x 4s. Inverting a woven ash basket, one can readily see that even light weight members properly bound together, could make a very sturdy structure indeed. The 2 x 4 gained relatively quick approval. It was efficient, inexpensive, and easy to use. Nowadays, we have a hard time even conceiving of house construction without it. ▲



Typical construction using 2x4s. Photo from the Forest History Society archives.

Inventors and Inventions

by Gary Paul Lehmann

This article is reprinted from Gary Paul Lehmann, "Inventors and Inventions: The 2 x 4," Chronicle, Early American Industries Association 47 (September 1994): 90-91.

2x4

**In 1833
it was
the newest
dimension
in house
construction**