

FROM HAND TOOLS TO POWER TOOLS

ADVANCEMENTS IN WOODWORKING TECHNOLOGY



HAKEEM HASWORTH | MFG-109 | 8 OCTOBER 2017

TABLE OF CONTENTS

Introduction	3
The Medieval Era	3
Woodworking Tools in the Seventeen and Eighteenth Century	4
Woodworking Tools in the Nineteenth Century	5
Development of Power Woodworking Machinery	5
Chronology of Woodworking Breakthroughs.....	6
Timeline for Woodworker's Tools	7
The Future of Working Wood	7
Works Cited	8

INTRODUCTION

Imagine that regular nail sitting in your tool box and think about how much it has evolved over the last few hundred years. In the 1600s the wooden peg became a wooden nail, then in the late nineteenth century a square-metal head replaced the wooden nail, and by the early 1900s the familiar rounded nail was invented. Tools evolved over time to make more detailed, sturdier and faster wood-working projects. Hammers, mallets, saws, planers, calibers, squares and even nails are tools that have been around for many years and used to build homes, ships and furniture.

THE MEDIEVAL ERA



Figure 1 Image adapted from a larger Pieter Brueghel painting

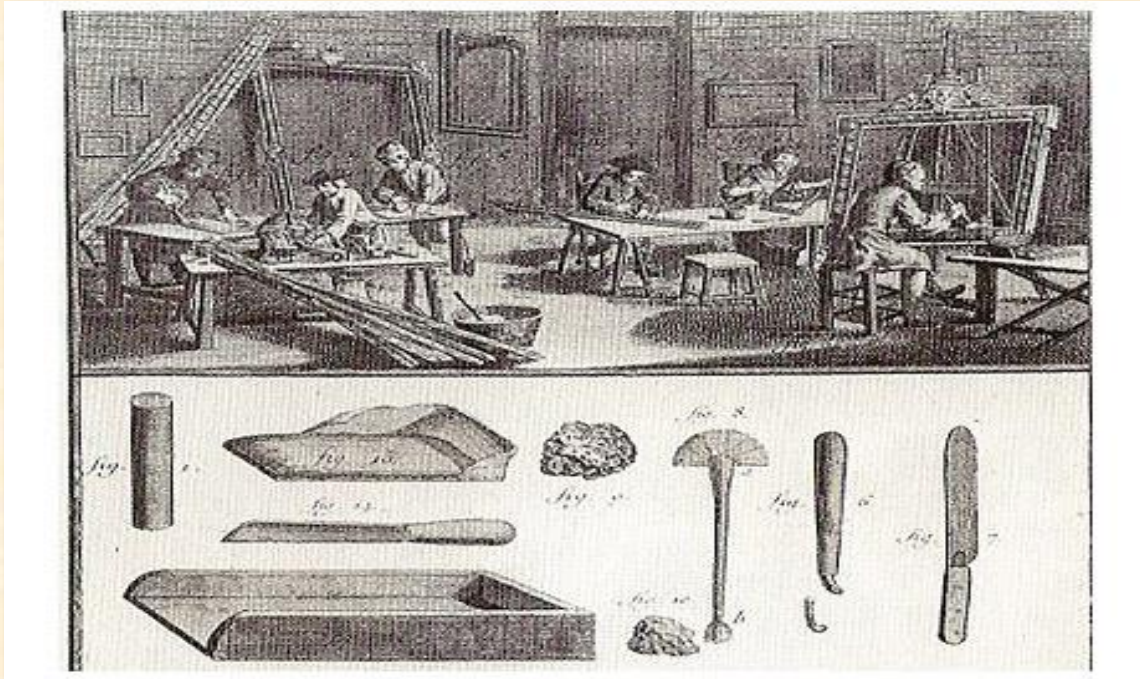
introduced into Britain, ornamenting furniture with carvings follows. Furniture production becomes more elaborate, the craft evolves -- from the hands of carpenters the trade passes to more specialized workmen, the first the joiners, then cabinetmakers. The 18th-century stands as the zenith of individuality in the art of furniture making. See the contributions of Daniel Marot and Jacques-Andre Roubo.

In the medieval era, because the furniture is crude and very simple, this system makes more sense than it would today: plain benches and stools, tables, chests, and beds are perhaps the only furniture, even in the homes of the nobles. Those are the days when bathtubs are unknown -- remember even soap has to wait until the 18th-century! When floors are covered with rushes; when all the scraps from a meal at the table are thrown to the dogs under the table. In peasants' homes -- crude "huts" -- manners are even cruder and pieces of furniture fewer than in the homes of the aristocracy.

In time, carpenters began, more and more, to add embellishments to their work.

In the thirteenth century, when Gothic architecture is

WOODWORKING TOOLS IN THE SEVENTEEN AND EIGHTEENTH CENTURY



A carpenter in the seventeenth century would have several valuable tools that he carried with him everywhere. The most basic woodworking tool was the mallet that worked like a hammer to fit wood screw vices into place. Calipers were also a simple but very important tool for measuring the thickness of wood. Chisels had a sharp metal edge that when used alone or with a file could shape and add designs to wood. The saw had been around for thousands of years, but it wasn't until 1650 that it improved greatly with the invention of the steel hand saw. Boring tools were used to create holes in the wood like a drill and during the 1600s metal braces popularity replaced wooden pegs. Planes were used to smooth surfaces and add decorative finishes.

Figure 2 Woodworking tools were basic, powerless tools until the Industrial Revolution that started in 1760. This revolution sparked the circular saw, plane devices, and moldings machines. (McLaughlan)

WOODWORKING TOOLS IN THE NINETEENTH CENTURY

With the boom of the Industrial Revolution, the 19th century brought about a great change in woodworking tools. The gimlet-pointed auger was a drill-like tool that made it possible to put holes in wood easily with a steady twist. Bench planes were different from the traditional plane because its adjustable use made it possible to smooth curved, flat and different shaped surfaces. No longer made with wood, ratchet braces made great improvements on holding wood together faster and stronger. Lathes shaped wood, circular saws cut the wood more smoothly, and the spring measuring tape made measuring easier and quicker.

DEVELOPMENT OF POWER WOODWORKING MACHINERY

It is no stretch to consider that the history of woodworking machinery from earliest times until today opens when a pre-historic man first uses a block of wood for a seat. As shown by authorities such as W L Goodman and R A Salaman, its path is long and tortuous.

Woodworking skills and hand tool technology developed steadily through the Middle Ages and the Renaissance, and -- in the 18th-century -- with the cabinetmakers of Europe and America, these skills reached a peak of perfection.

Woodworking skill and technology develops steadily through the Middle Ages, and finally -- as the Industrial Revolution takes off -- for power woodworking machinery -- achieves a stunning start with the Bentham planer and the Woodworth bandsaw. The upshot, modern industrial woodworking, with its pantheon of power machinery and mass production - is about to travel through still another phase, with the promise today of laser technology applied to the

production of wood objects.

The highest efforts of the British cabinetmaking trade are concentrated in a few large establishments in London and the great cities, which have their own cabinet makers, carvers, upholsterers, etc., on their premises. In some instances, one piece of furniture may pass through the hands of several branches of the manufacture. **The larger of these establishments are supplied with steam machinery, and all the work that can possibly be executed by mechanical agency is prepared by these engines, leaving only the most costly operations to be executed by hand.** (McLaughlan)

For example, page 177 of J H Pollen's 1876 "Furniture and Woodwork" section -- over 40 pages -- of the G Phillips Bevan's British Manufacturing Industries London, E. Stanford, 1876-77. page 177

CHRONOLOGY OF WOODWORKING BREAKTHROUGHS

1. **1776**—James Watt invented the separate-condenser steam engine, which powered early overhead-belt woodworking plants.
2. **1790**—Sir Samuel Bentham, engineer, English naval architect, invented rotary cutting.
3. **1800**—Planing machine and circular veneer cutting saw patented in England.
4. **1814**—Large circular saws introduced in U.S.A.
5. **1840**—First lathe-type veneer cutting machine patented by John Dresser.
6. **1849**—California gold rush stimulated development of special machines to build wagon wheels.
7. **1860**—Circular saw in general use.
8. **1866**—First double end tenoner patented by H. B. Smith Machine Co.
9. **1869**—Completion of first transcontinental railroad and expansion of rail system led to development of railway cutoff saws, multiple-spindle borers, and hollow-chisel mortisers for car building.
10. **1869**—First practical large log band mill built.
11. **1875**—First veneer slicer operating in U.S.A.
12. **1881**—Double surfacer with endless-bed in feed and power-driven top and bottom outfeed rolls patented in U.S.A.
13. **1885**—Band mill with 9-ft. wheels put into service.
14. **1890**—Silicone carbide abrasives first produced experimentally.
15. **1896**—First band mill driven by electricity. It had a 14-in. saw, 9-ft. wheels, and a 100-h.p. electric motor.
16. **1900**—Endless-bed, triple-drum sander patented. 1906—DC motors begin to replace belted drives.
17. **1907**—George Stetson and Harry Ross market their planer-matcher.
18. **1908**—Ball bearings used in woodworking machines.
19. **1909**—Thin high-speed steel knives in round heads replace thick knives in square cutterheads.
20. **1910**—Heyday of wooden automobile frames, using special glue joints and specialized machinery.
21. **1919**—Alternating current motor comes into use.
22. **1924**—William H. Mason forgets to turn off the press heat at lunch time—discovers hardboard.
23. **1926**—Strauss' patent rights on tungsten carbide cutting tools acquired by Krupp Works of Germany.
24. **1930**—V-belts begin replacing flat belts, permitting more compact designs.
25. **1930**—Laminating industry begins to develop wide market for board products.
26. **1949**—Lee Sherrill and Raymond Pendergast, who founded Timesavers, develop the widebelt sander.
27. **1950**—Nicholson and Soderhamn invent the ring debarker separately and almost simultaneously.
28. **1962**—Slicing and rotary cutting of thick (+1/4") veneer developed by the Forest Products Laboratory.
29. **1963**—Demonstrations that lasers and water jets can cut wood.
30. **1963**—Feasibility of chipping head rig demonstrated by Peter Koch of the Southern Forest Experiment Station. First commercial model in use a year later.
31. **1963**—Shaping lathe headrig developed by Peter Koch.
32. **1966**—Introduction of tape controlled routing and shaping machine by Ekstrom Carlson.
33. **1976**—First commercial use of Peter Koch's shaping lathe headrig on hardwoods.

Source: Adapted from Anonymous, "200 Years of Woodworking", *Wood and Wood Products* 1976

TIMELINE FOR WOODWORKER'S TOOLS

TOOL	STONE AGE	BRONZE AGE	DARK AGES	MIDDLE AGES	MODERN ERA
Axe	✓	✓	✓	✓	✓
Chisel	✓	✓	✓	✓	✓
Auger	✓	✓	✓	✓	✓
Handsaw	—	✓	✓	✓	✓
Crosscut saw		✓	✓	✓	✓
Drawknife		✓	✓	✓	✓
Bow drill		✓	✓	✓	✓
Plane, plough		—	✓	✓	✓
jack			✓	✓	✓
moulding			✓	✓	✓
T-Axe			✓	✓	✓
Rule			✓	✓	✓
Plane, try			—	✓	✓
Saw, fret				✓	✓
tenon				✓	✓
Marking gauge				✓	✓
Screwdriver				—	✓
Twist bits					✓
All metal plane					✓
Powered mills					✓

THE FUTURE OF WORKING WOOD

¹The history of woodworking machinery from earliest times until today opens when the pre-historic man uses a block of wood for a seat. Its path is long and tortuous.

Woodworking skill and technology developed steadily through the Middle Ages, and finally -- as the Industrial Revolution takes off -- for power woodworking machinery -- achieves a stunning start with the Bentham planer and the Woodworth bandsaw. The upshot, modern industrial woodworking, with its pantheon of power machinery and mass production - is about to travel through still another phase, with the promise today of laser technology applied to the production of wood objects.

¹ Adapted from *History of Woodworking Tools* (Goodman, 1962)

WORKS CITED

Anonymous. (1976). 200 Years of Woodworking. In *Wood and Wood Products*.

Goodman. (1962). *History of Woodworking Tools*.

http://www.woodworkinghistory.com/glossary_woodworking_tools.htm. (n.d.). Retrieved from Glossary Woodworking Tools.

McLaughlan, K. (n.d.). *A Timeline of Tools*.

Pollen, J. H. (1876). Furniture and Woodwork. In G. P. Bevan, *British Manufacturing Industries* (pp. 177-212). London: Stanford.