

Enduring Furniture at an Affordable Price:
Reconstructing Nineteenth-Century Business Models

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Submitted in partial fulfillment of the
requirements for the degree
Master of Arts in the History of the Decorative Arts and Design

MA Program in the History of the Decorative Arts and Design
Cooper Hewitt, National Design Museum, Smithsonian Institution;
and Parsons The New School for Design
2012

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Preface

Durable, mid-priced furniture has dwindled in the American market in the last thirty years, replaced by cheap, disposable furniture. The result has been a rise in consumption and waste that has detrimental social and environmental impacts. In the middle and late nineteenth century in America, well-made, desirable furniture was widely available to, and affordable for the burgeoning middle class. Much of the furniture that was made over a century ago remains sturdy and desirable enough to be treasured as heirlooms in homes, antique shops, and museums. The business strategies of early industrial furniture makers offer models for the revitalization of mid-priced furniture manufacturing.

This paper proposes a methodology for reconstructing the business strategies of these makers from a material culture perspective, through the deconstruction of their furniture, and the interpretation of business records including account books, trade catalogs, government data, patents, and magazine descriptions of operations. Nineteenth-century industries such as firearms, agricultural equipment, textiles, and shoes, rapidly – and almost uniformly – moved on a path to fully mechanized factory production. But unlike these industries, the furniture buyer demanded a diversity of form and appearance in furniture that could not entirely be met by machine production.

Instead of full mechanization, furniture makers combined some industrial processes with flexible hand-craft finishing techniques. The result was higher volume production with a great degree of flexibility in style, form, and selling price. Long before mechanization, David Alling's furniture production employed industrial practices including the outsourcing of labor and parts, in-house division of labor, use of standardized parts, and wholesaling. Three elaborately stenciled and turned chairs,

several account books, and a painting of his workshop are all that survive. The construction methods and business strategy, however, are deduced by combining the furniture analysis with invoices, shipping records, and an inventory of shop equipment. Alling's strategy included a focused product line (chairs), and low-cost production with flexibility in appearance and price. A similar methodology is applied to understand the business models of other early industrial furniture makers. The strategies used to make early factory furniture are case studies for production using the advanced tools of modern manufacturing to make furniture that is both affordable to a mid-priced consumer and durable enough to last for generations.

Text

There are only two ways of lowering the price of commodities. The first is to discover some better, shorter, and more ingenious method of producing them: the second is to manufacture a larger quantity of goods, nearly similar, but of less value. Among a democratic population, all the intellectual faculties of the workman are directed to these two objects: he strives to invent methods which may enable him not only to work better, but quicker and cheaper; or, if he cannot succeed in that, to diminish the intrinsic qualities of the thing he makes, without rendering it wholly unfit for the use for which it is intended. -Alex de Tocqueville, Democracy in America, 1835¹

In 1835 Alexis de Tocqueville identified the fundamental strategy used by American manufacturers to lower the production cost of furniture for the growing consumer market: ingenious methods for the production of large quantities of similar goods. This essay charts the development of those "ingenious methods" and their impact on furniture design in the nineteenth century. The business practices and furniture of a representative group of makers are analyzed and presented to illustrate the interrelated economic and social factors that accompanied the significant changes that occurred.

At the start of the nineteenth century there were primarily two tiers to the market for furniture: wealthy merchants and land owners that purchased expensive, hand crafted, historicist furniture; and workers and farmers making do with home-made or locally-made furniture, often in traditional English style. Both types of furniture were produced using traditional hand techniques. This essay refers to furniture produced from start to finish by individual journeymen, using primarily hand-techniques, as "traditionally made" furniture. The growth in employment from industrialization created both supply and demand for lower priced consumer goods, especially among what Stuart Blumin

¹ Alexis De Tocqueville, *Democracy in America: Volume II*, trans. Henry Reeve (New York: D. Appleton and Company, 1899), <http://books.google.com/books?id=N-sJAAAAIAAJ>, 532-533.

refers to as the "middling classes" - middle income, non manual workers. These managers and clerks tended to live in the peripheral areas of cities, and had their own homes rather than the tenements of laborers. The additional living space needed to be furnished with additional quantities and types of furniture at lower costs.²

Throughout the nineteenth century furniture makers experimented with business strategies that incorporated new production techniques to profitably produce furniture for this developing segment of the market.³ By the end of the century the furniture manufacturing industry was significantly more diverse. More than 4,000 small shops of three to four employees existed, but a much wider range of shop sizes had developed. Over 1800 furniture factories, with an average of 38 workers, produced furniture at a wide range of volume and pricing.⁴ To minimize costs and thereby maximize profits, factory production processes were organized differently from the traditional hand-craft processes of the small shops.⁵ Philip Scranton explains that as opposed to the rigidly mechanized production of staple products, furniture and other goods subject to stylistic change were produced through flexible means, by the investment in "general-purpose technologies" that could be adjusted easily.⁶

² Stuart M. Blumin, *The Emergence of the Middle Class*. (New York: Cambridge University Press, 1989), 140-149.

³ *Ibid.*, 11.

⁴ Department of the Interior, *Report on Manufacturing Industries in The United States at the Eleventh Census, 1890, Part I. Totals for states and Industries*, 38-39.

⁵ An 1880 description of the M & H Schrenkeisen Company in New York City describes their serial process that integrated machine and hand methods. The full description appears on page 143.

⁶ Philip Scranton, *Endless Novelty: Specialty Production and American Industrialization, 1865-1925*. (Princeton, NJ: Princeton University Press, 1977), 17.

As de Tocqueville discussed, the capitalist economy was fundamental to American democracy. In a capitalist economy the production of furniture, especially in high volume, was almost always subject to the motivation to increase profit and to avoid losses. Furniture was subject to the basic economic law of supply and demand that governed the manufacture of other consumer durable goods.⁷ When furniture was produced in small scale for local markets, the main factors affecting the cost of furniture production were material selection, investment in real estate, and labor. When furniture manufacturing changed from a local shop of a few craftsmen with an apprentice system to a larger company the furniture design changed. Joinery techniques, the profiles of parts, and the overall forms were adjusted to make the most use of the new methods. The goal was lowering the cost of manufacturing at high volume, often for distant markets. Additional financial factors indirectly influenced the furniture design, including the amount of capital invested in machinery, the organization of labor, marketing and transportation systems.⁸ Furniture historians have struggled with interpreting furniture within this complex web of economic and technological factors.

The market for furniture fluctuated greatly in the nineteenth century.⁹ To begin with, sales were suppressed by the Embargo Act of 1807 and the British blockade during the War of 1812. Frequent economic recessions, some of them severe, occurred almost every five years. The 1837 recession put an early cooperative of journeymen craftsman

⁷ Michael J. Ettema, "Technological Innovation and Design Economics in Furniture Manufacture," *Winterthur Portfolio* 16, no. 2/3 (Summer - Autumn, 1981), 197-223, <http://www.jstor.org/stable/1180774>, 198.

⁸ Ibid.

⁹ Terrence Witkowski, "Marketing Thought in American Decorative Arts," *Journal of the Academy of Marketing Science* 18, no. 4 (1990): 367, doi:10.1007/BF02723922.

in Philadelphia into trusteeship when they could not sell the large quantity of furniture they had in their wareroom.¹⁰ Borrowing from banks was usually not an option since most banks were hesitant to extend credit to artisans in favor of large sums to more financially secure merchants, for land purchase and for infrastructure improvements.¹¹ During economic downturns furniture businesses often suffered to the point of financial collapse because they could not maintain the overhead costs for shops, equipment and employees.¹²

Historiography

It is amazing, too, to find the great number of variations in form and ornamental detail that we constantly encounter. Furniture was then made not by machines but by men: and man when he works individually is invariably possessed by the itch to create, to develop his own idea, to express himself, and not literally to copy.- E. S. Holloway, 1928¹³

This quotation from E. S. Holloway's book on American colonial furniture typifies the early 20th century historian's idealization of the pre-industrialized American cabinetmaker and the machine as the agent of destruction of creativity in furniture. According to two other early writers, Thomas Ormsbee and Ethel Berjkoe, the machine "became the dominant factor in the American economy" as "the factories of America were speedily replacing the individual craftsman with mass-produced furniture" to meet

¹⁰ Kathleen M. Catalano, "Cabinetmaking in Philadelphia 1820-1840: Transition from Craft to Industry," *Winterthur Portfolio* 13, (1979):, <http://www.jstor.org/stable/1180603>, 89.

¹¹ Howard B. Rock, *The New York City Artisan 1789-1825: A Documentary History* (Albany, NY: State University of New York Press, 1989, 137.

¹² Ibid.

¹³ E. S. Holloway, *American Furniture and Decoration Colonial and Federal*, (New York, NY: Lippincott Company, 1928), 8-9.

the needs of the growing population."¹⁴ The catalog for the 1970 exhibition "Nineteenth Century American Furniture" at the Metropolitan Museum of Art states: "By 1840, with a rapidly expanding market, there had been a definite change from individual assembly of furniture to the mass production of parts, which were shaped with the aid of lathes and scroll saws powered by steam-driven machines."¹⁵ The prevalent role of the machine in these descriptions masks the interdependence of design with business methods as well as mechanization.

By 1973 the role of the agency of the machine was re-examined, not only as a force in changing production methods, but also in contributing to stylistic change. In that year The Winterthur Museum held a seminal conference, *Technological Innovation and the Decorative Arts*, to begin to address the "close relationship between technological innovation during the eighteenth and nineteenth centuries and the development of home furnishings."¹⁶ The organizers of the conference concluded that in spite of the new materials and techniques developed during industrialization, "the general tendency was to repeat old forms."¹⁷ The "most profound effect of technology on the decorative arts was to make them available to a mass audience."¹⁸ In one essay from the conference, Polly

¹⁴ Ethel Hall Bjercoe, *The Cabinetmakers of America* (Garden City, NY: Doubleday, 1957), 16.
Thomas Hamilton Ormsbee, *The Story of American Furniture* (New York, NY: Pyramid Books, 1966), 57.

¹⁵ Berry B. Tracy, "Introduction," in *19th-Century America: Furniture and Other Decorative Arts*, eds. Suzanne Boorsch, Marvin D. Schwartz and Marilyn Johnson (New York: Metropolitan Museum of Art, 1970), xiv.

¹⁶ Ian M. G. Quimby and Polly Anne Earl, "Introduction," in *Technological Innovation and the Decorative Arts*, eds. Ian M. G. Quimby and Polly Anne Earl (Charlottesville, NC: Henry Francis du Pont Winterthur Museum, 1974), vii.

¹⁷ *Ibid.*, xi.

¹⁸ *Ibid.*

Anne Earl examined the timing and scale of machines in furniture production. She concluded that mechanized production was not a driver of stylistic change, but she supported the theory that cheaper, machine-produced furniture contributed to highly ornamental forms introduced into mid- and low-priced furniture.¹⁹

In the 1980s, Michael Ettema refuted assertion of earlier writers who believed that the highly ornamental styles of the late nineteenth century were a direct result of industrial production. "The willingness of historians to emphasize the efficacy of machinery reflected a lingering confusion between the impact of technological innovations and broader changes effected by the industrial revolution."²⁰ Ettema disagreed with Earle's assertion that machine production led to ornamental low-priced furniture. According to Ettema, nineteenth century woodworking machines could not inexpensively produce copies of expensive ornamentation. Ettema concluded that the "maximum use of labor-saving machinery produced low-end furniture for the exploding middle- and working-class sectors" and that "proliferation, not elaboration, was the legacy of technological innovation in the nineteenth-century furniture industry."²¹

The application of water- and steam-powered woodworking machines increased the volume of furniture produced and reduced the cost of making basic furniture carcasses and frames by increasing worker productivity. The reorganization of labor processes further lowered costs by reducing the need for skilled workers. The production savings were a method of manipulating the profit margin on the furniture to different

¹⁹ Polly Anne Earl, "Craftsmen and Machines: The Nineteenth-Century Furniture Industry," in *Technological Innovation and the Decorative Arts*, eds. Ian M. G. Quimby and Polly Anne Earl (Charlottesville, NC: Henry Francis du Pont Winterthur Museum, 1974), 307-330.

²⁰ Ettema, "Technological Innovation and Design Economics in Furniture Manufacture, 198.

²¹ *Ibid.*, 198.

degrees to suit the business strategy of the company. Some nineteenth century furniture manufacturers leveraged production savings by:

- maintain the selling price as equivalent to traditionally made furniture, thereby increasing the profit margin per piece. The profit could be used to reimburse the significant investment in acquisition and upkeep of tooling.
- lower the selling price, thereby reducing the profit per piece, but making the furniture more competitive with the goal of increased profit by greater volume of sales.²²
- increase the selling price, by offsetting the cost of strategically adding more expensive hand finishing and ornamentation to the furniture.

Although this strategy did not necessarily increase the margin of profit, it was a way of making the furniture distinctive in an increasingly competitive market²³

By combining the strategies above in a variety of ways, factory producers in the late nineteenth century fashioned a plethora of business practices in the furniture industry that influenced design, including the production of ornate furniture.

The flexibility of ornamentation and style was an important requirement in factory made furniture that affected the degree of mechanization. For standardized goods such as canned food, soap, and tobacco, aesthetic variety in the product was less critical and full mechanization was possible. The cost of investment in machines in these

²² Polly Anne Earle, *Craftsmen and Machines*, 310.

²³ Jan Seidler, "Transitions in New England's Nineteenth-Century Furniture Industry, Technology and Style, 1820-1880," in *Tools and Technologies: America's Wooden Age* (Burlington, VT: University of Vermont, 1979), 75.

industries was worthwhile, because demand for an item remained consistent over long periods of time, and the investment could be spread over many units.²⁴ In comparison, the furniture industry did not develop full mechanization, because the demand for any one design fluctuated with changes in fashion. The investment in equipment to produce a single piece of furniture usually could not be spread over sufficient units to recoup the cost, regardless of the labor savings involved. Furniture making equipment needed to remain generalized so the resources could be switched to alternative uses as styles and price points changed..²⁵ As an alternative to a fully-automated process, the furniture industry developed a deep knowledge of efficient, adaptable, batch-production techniques that used adjustable machine processes to create basic forms that were then varied with ornamentation..²⁶

The adoption of factory production techniques by American furniture companies was slow and uneven when compared to other industries such as textiles, shoes, clocks, printing, and firearms.²⁷ Considering woodworkers made up twenty percent of the male population not engaged in agricultural production in 1850, its surprising that the widespread knowledge of transforming wood into useful products did not lead to the

²⁴ Clive Edwards, *Victorian Furniture : Technology and Design* (New York, NY: Manchester University Press, 1993), 24.

²⁵ Michael J. Piore and Charles F. Sabel, *The Second Industrial Divide: Possibilities for Prosperity* (New York, NY: Basic Books, 1984), 22.

²⁶ Scranton, *Endless Novelty*, 10.

²⁷ David A Hounshell, *From the American System to Mass Production, 1800-1932 : The Development of Manufacturing Technology in the United States* (Baltimore, MD: Johns Hopkins University Press, 1984). Hounshell compares and contrasts the process of industrialization of several American industries.

rapid development of new techniques beyond the preparation of stock.²⁸

There were several structural reasons for the slow pace of a change that influenced the selection of manufacturers investigated. The first reason was the fractured nature of the woodworking trades in the nineteenth century.²⁹ Carpenters, coopers, cabinetmakers, shipwrights, wheelwrights, and carriage makers had the means and the methods to build machines themselves rather than rely on specialists as did other industries. As a result they applied mechanization in unique ways to suit their individual production that limited the development of innovative techniques through more generally applicable machines. Because they did not rely on machinists as did industries such as textiles and fire arms, the knowledge that was developed tended to stay within each trade, for example a shipwrights invention for a new method of wood bending was unlikely to be widely transferred to the furniture industry. The second reason is that the furniture industry was more geographically diffused, inhibiting the informal sharing of knowledge among workers that moved between establishments in more centrally located industries such as the concentrated textile and firearms industries of New England.³⁰ A third reason

²⁸ Ross Thomson, *Structures of Change in the Mechanical Age : Technological Innovation in the United States, 1790-1865* (Baltimore: Johns Hopkins University Press, 2009), 51. Thomson cites the *Census of the United States (1820), Digest of Accounts of Manufacturing Establishments*, US Department of State.

²⁹ Thomson, *Structures of Change*, 51-54.

³⁰ Hounshell, *From the American System to Mass Production*, 131-132. Hounshell discusses the importance of mechanics and location in the transfer of innovative techniques from clock making and armory practice into molded plywood sewing machine covers made by Wheeler and Wilson.

J. Richards, *A Treatise on the Construction and Operation of Wood-Working Machines: Including a History of the Origin and Progress of the Manufacture of Wood-Working Machinery* (New York: E. & F.N. Spon, 1872)<http://books.google.com/books?id=3sIOAAAAYAAJ>, 38-39. Richards explains the geographic and other fundamental inhibitions to the wide scale adoption of woodworking machines in comparison with other industries.

for the slow adoption of mechanization was the lack of a single overarching organization such as the professional machinist and engineering societies. Societies of woodworkers were numerous but locally oriented so knowledge tended to stay within a limited geography.³¹ Since the development of new practices happened at individual companies and not through umbrella organizations, and since the changes were geographically oriented, I examined in detail the business strategies of individual makers in regions that exhibited significant change, including the mid-Atlantic, New England, and the mid-West.

Changes in furniture design also occurred across the economic scale so it was necessary to examine furniture produced at different prices. Catherine Hoover Voorsanger identified a "hierarchy of production" that occurred in the furniture industry by the middle of the nineteenth-century.³² She defined the hierarch by quality, volume, specialty, and pay scale. The highest tier referred to themselves as cabinetmakers. They paid high wages and created expensive, luxury products. John Hewitt and John Henry Belter are cabinetmakers from this upper tier that were selected for their use of new methods of production and labor organization. The next tier was composed of makers who used the words "furniture" or "furnishings" to describe themselves and created an identity as *manufacturers* of affordable mid-priced furniture. Of these second tier manufacturers David Alling and Lambert Hitchcock were selected for their introduction of industrial practices combined with continued use of hand-crafted techniques. Later in

³¹ Thomson, *Structures of Change in the Mechanical Age*, 51-54.

³² Catherine Hoover Voorsanger, "The Herter Brothers and the New York Furniture Trade" in *Herter Brothers : Furniture and Interiors for a Gilded Age*, ed. Katherine S. Howe (New York, NY: Harry N. Abrams, 1994), 57.

the century manufacturers in the mid-West, including Mitchell & Rammelsberg and Berkey & Gay, blurred the distinctions between the upper and middle tier makers. These makers were selected because they combined, in one company, hand-craft practices associated with expensive cabinetmakers and the factory practices of middle tier producers. The result was good quality products at a range of prices from affordable mid-level furniture to expensive luxury furniture. The lowest tier that Voorsanger identified was small-scale "slaughter" shops that used new methods to produce less-expensive, but low-quality furniture. Many of these makers were forced out of business in the second half of the nineteenth century when machine-made furniture of better quality at a similar price was introduced.³³ Unfortunately too few account records and attributed pieces of furniture from these makers could be identified for an in depth study of developments in that tier.

To understand the baseline for change in the nineteenth century it is necessary to briefly look at the later years of the eighteenth century. Before the development of new business practices, furniture makers were of two different professional levels. On one level were the producers for the small, but lucrative, luxury market. These makers operated under the journeyman system in which each craftsman passed through a period of apprenticeship to become a journeyman, responsible for all aspects of furniture production from dressing the raw materials through construction and finishing. Leaders of this tier of workshops were both master-cabinetmakers and merchants who employed

³³ Joel Lefever, "They make Furniture With Machinery" in *Grand Rapids Furniture: The Story of America's Furniture City*, (Grand Rapids, MI: The Public Museum of Grand Rapids, 1998), 35.

one or two journeymen and apprentices.³⁴ They sold their product in one of two ways; either custom ordered or through retail shops. The craftsman had direct control over the price of his furniture.³⁵ At the same time there existed many local furniture-makers that were part-time or seasonal, including many farmers. This tier of makers produced custom furniture, repaired furniture, created picture frames, mended tools, and worked as carpenters and painters.³⁶

New Business Strategies

As the furniture industry matured in the early years of the republic the two tiers broke down into a multiplicity of business strategies that included new practices: wholesale shipment to distant ports, production on speculation, specialization in furniture type, new methods of marketing and retailing, and new furniture forms.³⁷

Speculation: John Hewitt, New York

Industrialization involved not only the introduction of machines, but also novel ways of organizing labor and distributing product that supported an increase in the scale of production.³⁸ John Hewitt is an example of the first generation of American cabinetmakers to build a practice using new patterns of production and distribution during the nineteenth century.. Hewitt was one of a number of cabinetmakers who took

³⁴ J. L. Oliver, *The Development and Structure of the Furniture Industry* (New York, NY: Pergamon Press, 1966), 19.

³⁵ Sharon Darling, *Chicago Furniture, 1833-1983 : Art, Craft Industry* (New York, N.Y.: W.W. Norton, 9-10).

³⁶ Alfred D. Chandler, *The Visible Hand: The Managerial Revolution in American Business*, (Cambridge, MA: Belknap Press, 1977), 51.

³⁷ Margaretta M. Lovell, "Such furniture as Will be Most Profitable: The Business of Cabinetmaking in Eighteenth Century Newport," *Winterthur Portfolio* 26, (1991), 60-61
Oliver, *The Development and Structure of the Furniture Industry*, 19.

³⁸ Chandler, *The Visible Hand: The Managerial Revolution in American Business*, 14.

advantage of the expansion of transportation through canals and steamships to sell wholesale furniture on speculation at distant markets.³⁹ Similar to other cabinetmakers of the early nineteenth century, Hewitt expanded his output for these markets not by mechanization, but by hiring more workers, and purchasing the work of other cabinetmakers.⁴⁰ An examination of his account book and correspondence provides a window into the organization of his business.⁴¹ He used traditional craft techniques to make furniture in the popular neoclassical or Greek styles of the late eighteenth and early nineteenth century targeted for the luxury southern market (Figures 1 & 2).



Figure 1 Chair, 1820-1825

Cooper Hewitt, National Design Museum, Number: 1931-70-53



Figure 2 Hewitt (attrib.), Card Table (one of a pair)

New York, 1800-181. Mahogany and satinwood; H 29 1/2", W. 38". (Present owner unknown: photo, Taylor & Dull, Inc.) in Marilyn Johnson, "John Hewitt, Cabinetmaker," 202

³⁹ Catalano, "Cabinetmaking in Philadelphia," 87.

⁴⁰ John Hewitt, *Account Book*, Manuscript Group 84, John Hewitt Cabinetmaker Records, the New Jersey Historical Society.

⁴¹ John Hewitt, *Account Book*; John Hewitt, *Correspondence*, Cooper Union Library, New York, NY.

Hewitt's early life prepared him for the flexibility and daring that he displayed throughout his career. Hewitt was born in 1777 in Staffordshire, England, and followed the traditional career path of a cabinetmaker. He learned woodworking skills from his father, but unlike prior generations, Hewitt left his father's trade to become a machinist at the revolutionary engineering firm of Boulton & Watts in Soho, London. His interest in new technology and new opportunities led him to immigrate to the United States in 1796 to work at the Roosevelt foundry along the Passaic River in Belleville, New Jersey.⁴² Roosevelt was a significant early manufacturer and inventor who worked with Livingston and Fulton to develop the engines and mechanisms of steam powered boats. At the Roosevelt foundry, Hewitt worked on the second steamboat in America and sailed on its trial run.⁴³ After immersing himself in the novel industrial methods of these important companies, Hewitt established a business in New Jersey as a furniture maker and a dealer in cotton, lumber and hardware. By 1805 he had focused his business on furniture making, and had a shop at 191 Water Street, New York among the fashionable furniture makers of the city, with a satellite office in Savannah, Georgia.⁴⁴

⁴² John Hewitt, *Account Book*,

⁴³"Nicholas Roosevelt" in *Appleton's Cyclopaedia of American Biography, Volume 5*, eds. James Grant Wilson and John Fisk (New York, NY: D. Appleton and company, 1888), 317-318.

⁴⁴ Marilyn A. Johnson, "John Hewitt, Cabinetmaker," *Winterthur Portfolio* 4 (1968): <http://www.jstor.org/stable/1180495>, 188.

<u>Quantity</u>	<u>Description</u>
1	Bureau
6	cases for clocks and guns, etc.
1	chest
2	coffins
1	desk
5	sideboards
2	stands
5	Breakfast tables (tops only)
7	Card tables
8	Dining tables (tops only)
1	Dining table
39	Total pieces of furniture
	Miscellaneous other work
	Doors, Tools, patterns & models, table legs, chair & tool repairs

Figure 3 Summary of approximately one year of services of journeyman Thomas Constantine, 1812-1813, John Hewitt, *Account Book*, Manuscript Group 84, John Hewitt Cabinetmaker Records, the New Jersey Historical Society

Hewitt employed the service of at least 16 cabinetmakers, both in-house and subcontracted, and paid them either by the piece or by the hour.⁴⁵ One year of the services of a cabinetmaker in Hewitt's accounts shows that a single craftsman could be used flexibly to make several furniture forms (Figure 3). In-house production of whole pieces of furniture was much less expensive than outsourced work. In 1801 Hewitt purchased breakfast tables from Matthew Bruen for between \$16.00 and \$22.00 each (depending on the level of inlay, carving etc). In comparison he paid \$12.50 to an in-house cabinetmaker for a similar table more than ten years later in 1812.⁴⁶

⁴⁵ Ibid., 200.

⁴⁶ A full transcription including the price paid by Hewitt for each service appears in page 105.

"Plan of a pillar and claw breakfast table. Lenth [sic] 3 feet, Bed(?) 2 feet, leaves 1 foot, block 2 inches thick, 46 ½ wide, rail 4 ½ deep and framed out to blocks. Drawers cock beaded and bead over and nail with break, blocks carved, pillar 1 ft 4 long and 4 1.2 square for claw

Pillar 4 ½ square to be turned all up and to have a Snose(?) Plate, sweep of leave 6 ½. Grain end and double elliptic, plan of claw 1 ¼ square at bottom, 2 in thick at top 2 ¾ across the claw at top, claw to rise 10 ½ and project 13 ½ x 4 ½ the wood(?), plan of pillar to be under(?)"

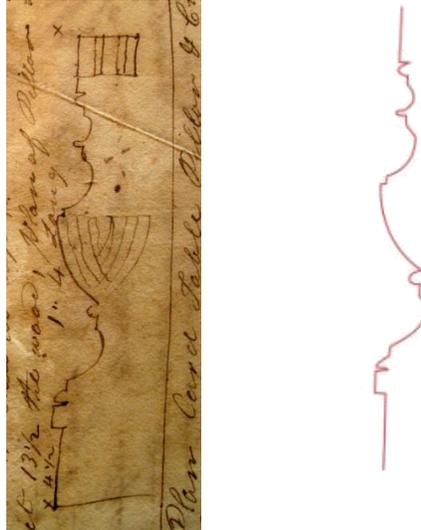


Figure 4 Description and plan for a pillar and claw breakfast table pillar, John Hewitt, *Account Book*, Manuscript Group 84, John Hewitt Cabinetmaker Records, the New Jersey Historical Society, red-line is author's drawing showing profile



Figure 5 Attributed to Duncan Phyfe, Pembroke table, Metropolitan Museum of Art, The Sylmaris Collection, Gift of George Coe Graves, 31.44.151931 with Hewitt profile in red

Hewitt represents a new type of cabinetmaker in the early 1800s, one who was willing to take the risk of sales to customers at great distances where he had little control over price, or ability to collect on debts.⁴⁷ His furniture was sold on speculation; delays in payment were considerable when the furniture was slow to sell, and as a result he was often short on cash.⁴⁸ He sold furniture in plain, inlaid, carved, and gilded versions. The furniture was similar in style to the neo-classical furniture of Duncan Phyfe: at least one entry in the account book specifically mentions a "French Sideboard like Phyfe's." It's likely they were using similar source books for their designs, but the entry in the account book demonstrates that Hewitt imitated Phyfe furniture. A plan drawn for the pillar of a breakfast table sketched in Hewitt's account book is almost identical in profile to the pillar and claw table attributed to Phyfe in the collection of the Metropolitan Museum of Art (Figures 4 & 5). As his trade grew, he shipped his furniture to ports in Virginia, South Carolina, Georgia, Connecticut, and Massachusetts, as well as in Cuba, England, Curaçao, and Spain.⁴⁹

Hewitt's fortunes swung wildly from comfortable wealth to financial ruin. His successes can be attributed to his flexibility and innovative character, but his difficulties illustrate the challenges in the production of a high volumes of furniture made with traditional techniques and in traditional designs. The British embargo of the War of 1812 reduced shipping and effectively shut down his access to Southern and foreign markets that had become the mainstay of his business. Although he tried to establish a local New

⁴⁷ Witkowski, "Marketing Thought," 367.

⁴⁸ Hewitt, *Account Book*.

⁴⁹ A typical shipment for nine pieces of furniture to a Virginia dealer appears in Figure 74 on page 106.

England market, the slow payment of customers during and after the war was a significant financial strain. Extending credit without being able to obtain it himself was a gamble that did not end well for Hewitt. When a fire destroyed his shop in 1816, he had no financial means to rebuild and by 1819 he was out of business.

Hewitt used his machinist skills to reestablish himself. He made wheels and cotton gin parts, and eventually shipped furniture to the south, again on speculative terms. The refusal of payment for a \$4,000 order shipped to Savannah strained his finances to the breaking point a second time and his business collapsed. Once again Hewitt leveraged his machinist skills and was back in New York by 1827 . He opened a shop to produce his patented "folding bedstead with superior spring and such tight joints as to exclude insects or bedbugs."⁵⁰

In 1830 he had returned to making furniture for distant markets and entered into business with his eldest son, Francis. Hewitt's letters show that he continued to pursue the debts from his earlier years including the \$4,000 debt from ten years earlier. He complains bitterly that he is "now very poor" due to the recalcitrance of his debtors, that his "family is large and my means small," and that "men like this taking advantage of an unfortunate man will not be justified in the eyes of an all seeing God..."⁵¹ Regardless of these financial difficulties, once back in business, he again shipped volumes of furniture on speculation, but he may have lowered the quality of his furniture. He had to refund one large order. In his response to the buyer Hewitt complains that "I can give you more than a dozen of names in New York that has[sic] paid me the same prices that I have

⁵⁰ A. Nevins, *Abram S. Hewitt: With some Account of Peter Cooper*, New York, NY: Octagon Books, 1967), 15.

⁵¹ Hewitt, *Correspondence*, Cooper Union Library.

charg[ed] you for the same kind of bedsteeds[sic]." He received other letters of complaint including a letter from Montgomery complaining that "the cradle you sent me is a poor concern; every time the weather is damp it will not work. The tables are poor, coarse, common wood." Hewitt refunded part of the order.⁵² By 1846 Hewitt had turned over the business to his sons and retired to New Jersey.⁵³

Hewitt's financial difficulties were due to a combination of factors: sales technique; design of his furniture; and, the traditional production techniques. The norm for American furniture makers through the 1820s was to produce specific orders for local consumers based on established credit terms, not to produce furniture for speculative sale.⁵⁴ Because Hewitt's furniture relied on expensive materials and high-cost labor, he invested a large amount of capital upfront in each piece of furniture and had to wait an unknown amount of time for reimbursement. The outlay of capital was compounded when the furniture was shipped in large orders. Even when orders were pre-arranged, craftsmen such as Hewitt commonly extended credit, and their often well to-do customers were not always conscientious in prompt payment. Refusal to accept credit risked losing the sale.⁵⁵ Because his production was labor intensive, and bank credit was hard to

⁵² Ibid.

⁵³ Johnson, John Hewitt, Cabinetmaker, 194.

⁵⁴ Sean Wilentz, *Chants Democratic New York City and the Rise of the American Working Class, 1788-1850* (New York : Oxford University Press, 2004), 28.

⁵⁵ Rock, *The New York City Artisan*, 137.

One letter from Hewitt's agent confirms the loss of a sale by a New Jersey cabinetmaker to a dealer in Savannah because he insisted on payment when the furniture came on shore.

obtain, the delays in payment were devastating and Hewitt was unable to pay his workers or creditors.⁵⁶

Other American cabinetmakers who focused on the luxury market, including Phyfe and Lannuier, made limited shipments to the South. It was mid-level cabinetmakers such as Hewitt, John Oldershaw of New York, and Abraham Cross and David Alling in Newark who made large shipments of furniture that included both custom orders and significant amounts of furniture to be sold on speculation by agents.⁵⁷ Shipping furniture long distances, especially by water, risked serious damage to the furniture, from the physical stress of stowing and possible shifting during transport, and from the damage caused by weather changes. A clue to the difficulties is given in the following excerpt from a letter to Hewitt from his agent in Savannah dated January 1818:

The Remainder of the furniture was landed yesterday morning. I have opened a few of the Boxes today of the most elegant piece of mark to arouse attention. I am sorry to observe that it is all injurd, more or less by the dampness of the hold and the deck's leaking. One End of the Canted Corner Sideboard is very much injurd the rosewood banding and the veneer in the End Door has all started. The Back of the Grecian Sofa has got mildewed, and I am fearfull the Rest of the articles is not in much better state. I shall try and put it in the best state I can-Oldershaws furniture is as bad as mine-Capn Tilts informs me he had an un-common rough passage.⁵⁸

Hewitt's early successes and later difficulties illustrate the challenges of selling labor intensive, traditionally made furniture on speculation and at high volume. Hewitt initially succeeded through expansion of his capacity by hiring cabinetmakers and sub-

⁵⁶ Hewitt, *Correspondence*.

In an undated letter to Mr. G. W. Wallis written shortly after the 1816 fire in his shop Hewitt complains bitterly to one of his creditors of his troubles collecting on debts, and begs him to understand his situation in not being able to pay his debt.

⁵⁷ Johnson, John Hewitt, Cabinetmaker, 191.

⁵⁸ Hewitt, *Correspondence*.

Letter from his agent in the South, William Scott, to John Hewitt, January 1818

contracting work but his furniture was expensive and labor intensive. To profitably access distant wholesale markets, cabinetmakers either needed to have significant financial resources to overcome periodic interruptions in demand, or to lower the cost of production. Hewitt apparently attempted to make his furniture more economically not by changing the construction methods or type of furniture he produced, but by lowering the quality.

John Hewitt's career path demonstrated an entrepreneurial spirit, a willingness to embrace risk, and a global focus that were important characteristics of later high-volume furniture makers. Although his production techniques and the appearance of his furniture remained traditional, the organization of his practice underwent an important change with the hiring of additional cabinetmakers, and the farming out of work to sub-contractors. He represents several business practices that were used in factory production: "putting out" work and increasing the number of participants in the shop to increase the volume of production; increasing the market through geographic expansion; and, shipping furniture to wholesalers to be sold on speculation. These structural changes in his business practices were both key to his successful periods and the cause of his difficulties. He overcame financial difficulties to re-enter furniture practice by applying a variety of skills to produce new products such as his innovative bedsteads. His tenacity and versatility in overcoming financial difficulty were important traits of the men that would succeed in profitably developing factory made furniture in America.

*"...my advice to you is to come Back this Spring. For what purpos will it answer for you to stop when there is no likliwards of we coming to you for I think you may do Better in England than where you are. As for me I have plenty of Biseness and you may have constant work with me But I think ther is a good open for you to come and Settle ther."*⁵⁹

⁵⁹ Hewitt, *Correspondence*.

The above letter from John Hewitt's brother illustrates the contrast between the character of those who remained in the security of Europe and those innovators, such as John Hewitt, who willingly embraced the opportunity to try new methods in the United States. In another letter to Hewitt, his agent described how he had decided to wait the arrival of a steam ship that can draw four boats before he shipped the furniture to Augusta, since the steamship could make the trip in half the time. That Hewitt and his agent chose to ship via the new steamships, ships with engines that Hewitt helped develop, reveals something of their willingness to embrace innovation.

Specialization: David Alling, Newark

The business of furniture making was changing before the introduction of machines. Furniture making outside of urban areas in late eighteenth-century America was part of a varied business that included carpentry, and even the distribution of dry goods.⁶⁰ In the nineteenth century, woodworkers began to specialize to meet the rapid growth in demand for mid-priced furniture.⁶¹ Narrowly defined occupations, such as cabinetmaker, chair-maker, carpenter, coffin-maker, and carriage-maker became more commonplace as the industry reorganized to respond to growth, both in volume and geographic distribution. These makers limited the cost of tooling, increased production efficiency, and reduced material costs by focusing on a particular product.

According to historian Don Skemer, Alling's business was a successful model for the focused, high-volume production of furniture; a model that weathered economic difficulties for over 40 years. Alling success was a result of a business strategy that

⁶⁰ Edward S. Cooke, "The study of American Furniture from the Perspective of the Maker," in *Perspectives on American Furniture*, ed. Gerald W. R. Ward (Newark, DE: W.W. Norton, 1988), 13.

⁶¹ Oliver, *The Development and Structure of the Furniture Industry*, 19.

integrated design, the means of production, shipping, retailing and demands of the market.⁶²

David Alling inherited the business from his father Isaac who not only made furniture, but also sold lumber, building materials, and provided repair services.⁶³ Although David Alling continued to sell supplies to local manufacturers throughout his career, by 1830 he advertised himself specifically as a chair manufacturer. "*Chair Making, David Alling begs to inform the public that he continues the manufacture of Sitting Chairs.*"⁶⁴ Whereas Hewitt produced a range of traditionally made furniture forms, narrowed the focus of his father's business to the assembly of highly decorated painted chairs using new methods of organizing the work. His output consisted of tens of thousands of chairs annually.⁶⁵

Alling outsourced a number of the parts and the stenciled ornamentation of the furniture. His workshop was similar to John Hewitt's: both relied on a greater number of employees than traditional shops; but, Hewitt's labor was focused on the rapid assembly of chairs from pre-made parts rather than start-to-finish creation of furniture. The investment in labor and materials by Alling in any one chair was lower when compared

⁶² Don C. Skemer, "David Alling's Chair Manufactory: Craft Industrialization in Newark, New Jersey, 1801-1854," *Winterthur Portfolio* 22, no. 1 (Spring, 1987), 1-21, <http://www.jstor.org.libproxy.newschool.edu/stable/1181145>, 4.

Other New York high-volume makers of Windsor chairs included James Hallet Jr and John de Witt & Co.

⁶³ Skemer, "David Alling's Chair Manufactory," 4.

⁶⁴ Margaret E. White, *Early Furniture: Made in New Jersey 1690-1870 Catalog from an Exhibition October 10, 1958 - January 11, 1959* (Newark, NJ: The Newark Museum, 1958), 40. Quoted from *The Sentinel of Freedom*, October 26, 1830.

⁶⁵ A formal analysis of chairs made by Alling is limited since only two matching chairs have been located with clear enough provenance to support attribution, but the account books describe in detail the types of Windsor chairs he made and it can be assumed that they were akin to similarly named Windsor chairs made by others.

to the furniture of Hewitt, so he was better able to withstand the economic downturns that repeatedly brought Hewitt's business into crisis.

By the 1790s Alling was purchasing large supplies of furniture parts to make furniture for a market expanding in both volume and geographic location. During the first half of the nineteenth-century specialized furniture-makers, such as Alling, transitioned from serial, one-off methods of producing custom furniture, to batch production of furniture, shipped in bulk on speculation or consignment. Special orders for local customers remained an important part of his business, but as the nineteenth century progressed a greater percentage of his chairs was sold to markets in the southern United States and South America.⁶⁶

Outsourced production of parts and the division of tasks developed in advance of mechanization as ways of producing higher volumes of furniture at lower cost. Outsourcing shifted the economic burden of maintaining tools and employees from the furniture maker to the vendor and was particularly effective during periods of low demand, when a furniture maker could order fewer parts and avoid payments to maintain idle employees and equipment. The division of tasks reduced the need for highly skilled, expensive workers, since the worker did not need to be a master of all the production processes.⁶⁷

⁶⁶ David Alling and Isaac Alling, *Manuscript Group 309, David Alling (1773-1855), Chair Maker Records*, The New Jersey Historical Society, Newark, NJ, 1803-1857).

The Alling account books give a detailed, day-to-day accounting of his practice including payments to sub-contractors, journeyman and shipping and sales records.

⁶⁷ Benno M. Forman, *Delaware Valley "Crookt Foot" and Slat-Back Chairs: The Fussell-Savery Connection*, Winterthur Portfolio, 15, No. 1 (Spring, 1980), 41-64.

Alling was not the first cabinetmaker to use a combination of production by parts and outsourcing to produce chairs, although he was one of the first to combine the strategy with a high-volume export business. See Benno for a discussion of a mid-eighteenth century chair maker with a similar practice.

Outsourcing took on new significance when used as part of a high volume production strategy. A mistake in the 60 or so spindles outsourced for a set of eight Windsor chairs made in a traditional shop was costly, but not as costly as a mistake in an order for 2,000 or 5,000 spindles needed to make hundreds of chairs.⁶⁸ Chairs made in high volume from pre-made parts required especially careful forethought and planning or risked the wasted expense of thousands of parts that did not fit properly. Since the person making the parts was not the one assembling the chair, the dimensions of the parts had to be communicated accurately, usually through patterns. Once the pattern was made, the cabinetmaker could be confident that the part could be reproduced at a later date.

Alling's inventory indicates that he relied on the use of patterns, an entry is specifically made for a "lot of patterns on the floor."⁶⁹ Batch production included the stock piling of parts made through the use of patterns. The risk of mistakes associated with the outsourcing of parts for new designs may have encouraged a high volume producer such as Alling to continue to use the same parts over a greater period of time. Rather than expend the effort to make and refine new set of patterns, it was faster and less risky to re-combine parts from proven patterns to create new forms. Alling purchased seats, backs, and spokes by the thousands from local makers such as Linus Condit.⁷⁰ The parts of Alling's Windsor chairs included turned legs, rush or cane seats, flat or roll-backs (crest rails), stretchers, and a variety of flat or turned spindles and slats. The relative

⁶⁸ The orders for more than 8,500 parts over two months in 1801 to Linus Condit turner appear in the appendix on page 108.

⁶⁹ See line 78 of the inventory in the appendix on page 111.

⁷⁰ Alling, *Manuscript Group 309*,
See the orders for more than 8,500 parts over two months in 1801 to Linus Condit turner on page 112.

simplicity of the round mortise and tenon joint simplified the accurate making of the parts that were then combined to create variation within the Windsor-chair form.



Figure 6 Front, back and splat detail of chair attributed to David Alling, Newark Museum, 23.246

Alling subcontracted the ornamentation of his chairs to Moses Lyon, a local painter. Lyon specialized in painting stenciled ornamentation on furniture using bronze powders -- a cheap imitation of gilding (Figure 6).⁷¹ Lyon also used faux graining to imitate more expensive woods.⁷² By outsourcing the ornamentation to a local painter, Alling was able to ensure a dependable, controllable level of quality, without incurring the liability of an expensive, idle employee during downturns in demand.

Alling's shop contained benches dedicated to painting, assembly, spoke-shaving and turning. The inventory of his shop (taken upon his death) tabulates hundreds of chair

⁷¹ Nancy Goyne Evans, *Windsor-Chair Making in America: From Craft Shop to Consumer* (Hanover, MA: University Press of New England, 2006), 175.

Goyne gives an extensive discussion of the technique, including other metals such as pulverized tin to imitate silver and copper to create red tones.

⁷² Alling, *Manuscript Group 309*,

Lyon is paid for painting several chairs to look like satinwood. A transcription of his production appears in the appendix on page 114.

parts, including spindles, chair backs, seats, and arms.⁷³ The stockpiled parts and dedicated benches suggest that Alling divided the work in his shop into tasks. Although individual woodworkers could have constructed each Alling chair start to finish by moving serially among the different benches, it is more likely that they remained at one bench with their tools and focused on a particular task, such as part making, assembly, or finishing and ornamentation. If the woodworkers were engaged only in a particular stage of production, they may have been lower skilled, wage laborers paid by the hour,⁷⁴ Reorganizing production to facilitate hourly paid laborers was a way of reducing the cost of labor.⁷⁵

Easy access to a large market was a requirement for a high-volume business to avoid glutting the local market. The Alling shop in Newark had immediate access via ship along the Passaic River to the port of New York, and from there to Southern and foreign ports. Because the cost of transportation by ship was based on volume, with the

⁷³ Alling, *Manuscript Group 309*

The inventory records fourteen wood working stations, including only one specifically for shaving spokes and one for turning on the lathe. Turning and shaving were used to create spokes and slats; the highest volume of parts consumed in Windsor chair making. Having only one station in house for each activity limited the productivity for those parts. Alling chose to buy the majority of his spindles and seats rather than invest in the tools and space to create them in-house; a conclusion supported by his purchasing records. Of the remaining twelve woodworking benches, nine were probably dedicated to framing (assembly) of chairs: four are listed specifically as a "framing bench" and five as a bench with a vise. Two tables were dedicated for ornamental painting.

⁷⁴ Wilentz, *Chants Democratic New York City and the Rise of the American Working Class, 1788-1850*, 28. Wage labor in furniture was somewhat unusual in the United States. Artisanal trades in the New York area through the 1820s normally had about three employees, a master and one or two apprentices or journeyman and focused on made-to-order production.

⁷⁵ Gary J. Kornblith, "The Artisanal Response to Capitalist Transformation," *Journal of the Early Republic* 10, no. 3 (October 1990), 315-321, <http://www.jstor.org/stable/3123389>, 317; Wilentz, *Chants Democratic*, 28.

Wage laborers were somewhat unusual in the United States. Most apprentices went directly into small proprietorships. Artisanal trades in the New York area through the 1820s normally had about three employees, a master and one or two apprentices or journeyman and focused on made-to-order production. Increasing the number of workers and dividing their labor into tasks was one strategy for increasing the volume and speed of production at a low cost that was new to the United States.

risks of damage and loss born either by the maker or sometimes by the ship owner, high-volume chair makers modified their designs to reduce volume and damage.⁷⁶ Furniture was designed to pack efficiently and withstand the stresses of shipping that damaged the traditionally made furniture such as that made by John Hewitt.⁷⁷

Because Alling focused on the production of chairs he could ship them efficiently by inverting one chair on the seat of another, thereby reducing the overall volume. The box-like condensed forms were tightly wrapped with burlap and straw to minimize damage to their decorated surfaces (Figure 7).⁷⁸ The use of turning and painting eliminated the cost of repairing de-laminated veneers and damage to delicate carving that occurred with traditionally made furniture.⁷⁹



Figure 7 Glenister chair wagon, High Wycombe, Buckinghamshire, England, ca 1880-1915,
Collection of High Wycombe Library, High Wycombe England

In 1819 Alling shipped his first southern shipment to New Orleans “to sell on account of David Alling on Commission and to be account for.”⁸⁰ The order included chairs varying in price from \$50.00 per dozen for rosewood, gilded and bronzed to

⁷⁶ Oliver, *The Development and Structure of the Furniture Industry*, 17.

⁷⁷ Some high-volume chair makers modified the designs of their chairs to break down into parts that were assembled at their destination by specialized agents or the retailer.

⁷⁸ Evans, *Windsor-Chair Making in America*, 312.

⁷⁹ Hewitt, *Correspondence*, Letter from William Scott to John Hewitt, January 1818
Scott's letter to Hewitt cited above describes the de-lamination and other damage that required expensive repairs at the destination he recommends the shipping of spare parts.

⁸⁰ Alling, *Manuscript Group 309*.

\$27.00 per dozen for yellow colored with plain spindles. By 1803 he was selling chairs in batches of up to 170, and buying a large number of parts.

Although Alling's business used hand-techniques his was not a traditionally organized furniture shop. Although the word "factory" is often associated with powered machines, the 1855 inventory of Alling's shop gives no indication that he had adopted mechanization. What moved Alling's practice closer towards factory production from traditional craft was the focus on efficient production of a limited number of forms, the organization of his labor force into divided, serial tasks, and his use of outsourcing.

The sale of David Alling's chairs dropped precipitously during the recession of 1837, but unlike Hewitt, his business organization and construction methods were flexible enough for him to adjust his product line to include less ornamental fancy chairs made on speculation and more simply ornamented chairs and industrial and office chairs while continuing to make luxury custom orders.⁸¹ He did not need to lower the quality of his product as did Hewitt.⁸²

The focus on batch produced chairs from parts affected the design and appearance of the furniture. When an individual craftsman was responsible from start to finish, the result reflected his particular skill and interpretation of the design. Since each piece of furniture was made to order, variety could occur at any point in the process from the scale, to the choice of wood, to the number and arrangement of parts and the quantity and quality of ornamentation. Furniture such as Alling's, made in batches from pre-made parts, had less variation in form due to the limited number of possible variations in the

⁸¹ Skemer, "David Alling's Chair Manufactory," 12.

⁸² Catalano, "Cabinetmaking in Philadelphia," 89.

parts. To add the variety demanded by the marketplace, in ways that were cost effective, batch makers varied the combination of parts, painted finishes, and the stenciled designs. The same Alling Windsor chair form had the option of a variety of interchangeable spindles that varied on the economic and ornamental scale including plain, bamboo, flat, and organ spindles. Chairs could have simple scroll backs or more ornate curved flat backs or rockers. Ornamentation could consist of "striping" in imitation of more expensive wood such as rosewood or sandal wood, or include metallic painting, gilding or stenciled bronzing of a varying combinations of fruit and cornucopias.

Alling's early nineteenth-century business model for producing chairs in high volume included:

- A quick, efficient, reproducible means of production
- The purchase of large volumes of relatively inexpensive chair parts rather than investing in the capital and workforce that was required to produce them all in his own shop.
- The use of painting, stenciling, and graining for ornamentation instead of hand painting or costly veneers ill-suited to the rigors of shipment.
- A focused yet flexible product line – chairs made with a variety of ornamentation and forms.
- A production process that used task-based, lower-skilled, less costly labor

--- indeed every workman seems to be continually devising some new thing to assist him in his work, and there being a strong desire, both with masters and workman all through the New England States, to be "posted up" in every new improvement, they seem to be much better acquainted with each other all through the trade than is the case in England. - British Ordnance Committee on the Machinery of the United States of 1854⁸³

High-volume Mechanization: Lambert Hitchcock, Connecticut

Before the 1840s, manufacturers expanded output in three ways: traditional makers added more apprentices and journeymen to their work force; others, like Alling, used outsourcing and new labor practices; and finally, some manufacturers introduced simple water-powered machinery.⁸⁴ The challenges and ultimate success of Lambert Hitchcock's company serve as a model of the potential and the pitfalls in a business strategy that included a large investment in the infrastructure of mechanized production.

As was noted above, banks were hesitant to lend to high-risk craftsman.⁸⁵ In 1872, J. Richards, wrote a treatise on woodworking machinery in which he discussed the financial hurdles that impeded the wide spread adoption of machines by American woodworkers. As a manufacturer of woodworking machines sold in both England and America, he was well suited to observe the underlying causes for the differences between the adoption rates of machines in the two countries. Richards wrote:

*In England money is plentiful, seeks investment, and commands low rates of interest; in America money is scarce, hard to obtain for manufacturing investments, and commands high rates of interest.*⁸⁶

Hitchcock was able to use his family connections to raise and apply capital to create a mechanized shop that was geared toward high-volume production. The

⁸³ John E. Sawyer, "The Social Basis of the American System of Manufacturing," *The Journal of Economic History* 14, no. 4 (Autumn, 1954), <http://www.jstor.org.libproxy.newschool.edu/stable/2114247>, 377.

⁸⁴ Chandler, *The Visible Hand: The Managerial Revolution in American Business* 51.

⁸⁵ Rock, *The New York City Artisan*, 137.

⁸⁶ Richards, *A Treatise on the Construction and Operation of Wood-Working Machines*, 50.

willingness of his family to invest in a company used new methods may have been influenced by their location in Connecticut, an area that was becoming known as a center of manufacturing innovation, but it also shows the same willingness to embrace risk and novelty that was exhibited by the practices of Hewitt and Alling.

Hitchcock's journeyman years exposed him to innovative techniques of high-volume production in other industries. It was in Connecticut that Eli Whitney and Samuel Colt introduced the use of standardized parts, and Eli Terry harnessed water power to make clocks.⁸⁷ Hitchcock would have been aware of the clock maker's successful methods for producing higher-volumes of lower-cost products, and tapping the growing middle-class demand for an item that was once considered a luxury.

In 1818 Hitchcock chose the Farmington River Valley as the location for a new manufacturing facility to produce chair parts. The rocky hillsides of the valley provided an ideal landscape for the many saw mills that harnessed water power in the area.⁸⁸ He outsourced water power and raw material acquisition by partnering with the Benham & Doolittle saw mill. A shed was converted into a machine shop where all all-new power equipment was installed and linked by belts to the power generation equipment in the

⁸⁷ Hounshell, *From the American System to Mass Production*, 52.

By 1809 Terry had built a shop that employed water-powered tools to make clock parts. He produced the movements: precise, complicated arrangements of gears and other parts that regulated the hands of the clock. He contracted for the production of 4000 movements over three years, one of the earliest applications of water power for the mass production of parts. Terry designed and built his tools to produce the wooden parts of his clocks as did many of the first woodworkers who used water powered equipment. The patented movement for his shelf clock was produced inexpensively and for the first time the purchase price of a well-made clock was within the means of middle-class families. He also he took advantage of the town-to-town sales techniques of peddlers who sold clocks made on speculation. Soon, other manufacturers that applied mechanization and water power to clock making opened shops, some of them led by workers from the shop of Eli Terry.

⁸⁸ John Tarrant Kenney, *The Hitchcock Chair* (New York, NY: Clarkson N. Potter, Inc., 1971), 39.

mill.⁸⁹ The links to the existing mill reduced his overhead cost by eliminating the expense of transportation to get lumber to his shop, and the cost of maintaining the dam and power generating equipment.

Hitchcock's parts-based business was successful enough for him to purchase a separate property around 1820 to assemble and finish chairs, and in 1836 to custom build a mill suited to his construction process. Custom building an operation that integrated the acquisition of raw materials and furniture manufacturing into a single company was a cost effective and efficient way to produce high-volumes of furniture with machines. Eventually Hitchcock opened his own retail store in Hartford. The efficiency of integration, from the acquisition of raw materials to retail sales would be used by later factory furniture producers.⁹⁰

When he began to assemble whole chairs instead of just selling the parts, he needed to move beyond the town-to-town peddler system he had been using. The bulk transportation of his goods became a challenge. Unlike David Alling who had unimpeded access to the international shipping port of New York, the Farmington location was a hindrance to shipping finished chairs in bulk. The same steep geography that was ideal for water power was an obstacle that added a day or more of travel for the furniture to reach the ports at Hartford just thirty miles away. Improvements to the Albany-Hartford turnpike addressed the transportation problems somewhat, but it was the opening of

⁸⁹ Ibid., 43.

The initial production of his business was furniture parts that were not only well made, but easily bundled and transportable, an important consideration because Hitchcock used the same town-to-town peddlers as the machine-made clock industry to distribute his product. As the population grew and the country expanded westward, demand grew for chair parts for assembly and repair. Hitchcock chair parts were sold at general stores across the new nation and his business thrived

⁹⁰ Ibid., 43.

canals and the introduction of steam powered shipping in the 1820s that increased the potential market for his lower-priced chairs.⁹¹



Figure 8 Side chair Attributed to John Finlay,
Metropolitan Museum of Art, 65.167.6



Figure 9 Side Chair. Attributed to the Workshop of Duncan Phyfe & Son (1768–1854), Date: ca. 1815
Metropolitan Museum of art, 40.159.2



Figure 10 Hitchcock Chair, 1826-1829,
American Folk Art Museum, gift of the Historical Society of Early American Decoration, 58.29

⁹¹ Ibid., 45.



Figure 11 Hitchcock Chair ca. 1825,
General Artemas Ward House Museum, HU1508.1-5

The reliance on mechanized production in the Hitchcock business model had a direct effect on the appearance of his furniture. There were multiple entries in the 1852 Hitchcock inventory that listed machines and the parts of the belt and pulley system used to transfer power to his machinery.⁹² Among the power tools in the 1852 shop were a planer, seventeen saws, five lathes, a machine for mortises and one for tenons, two machines for creating butt joints for frames and drawers, a clamping machine and a powered grindstone. Water power was used to maximize the productivity of his workers by reducing the amount of time per-part.



Figure 12 Detail Pillow top crest rail,
The Hitchcock Chair, John Tarrant Kenney



Figure 13 Detail of work made with the whip-saw,
The Hitchcock Chair, John Tarrant Kenney

⁹² The full inventory begins on page 135.

The appearance of Hitchcock chairs was the result of machine-assisted production: primarily lathe turned elements combined with flat planar back splats and crests cut by powered saws. Hitchcock limited the three-dimensional ornamentation on legs and stretchers to motifs that could be produced by machines that reduced the skill and the time to create ornamental variety within the chair forms. Lathe turners created a wide variety of symmetrical, linear, profiles with incised decoration, including the popular imitation bamboo. Some parts were turned while the wood was still green and then steam bent to make the distinctive "pillow-top" crests (Figure 12). Workers used whip-saws, an early form of mechanized scroll-saw, to make the scrolls on the curved crests and back splats, and the scroll backs of tables and wash stands (Figure 13).

The design of Hitchcock chairs reflects competing economic forces: increase the perceived value of the chairs, and reduce the cost in production. A comparison with the contemporaneous luxury chairs of Finlay and Phyfe highlights the influence of large-scale production on the design of Hitchcock chairs (Figures 8 & 9). The posture of Hitchcock chairs is upright and square because the parts are attached with swiftly made, straight mortise-and-tenons. In comparison the legs, uprights, and feet of Finlay and Phyfe chairs were often curved with hand-carved elements that required complicated and time consuming angled mortise-and-tenon joinery. The curved joinery gives Finlay and Phyfe chairs a more sweeping, relaxed posture (Figures 8-10).

The first Hitchcock chairs were unornamented, but stenciled painting techniques similar to Alling's designs were soon applied as an inexpensive way of adding variety to the product line. The painters of Finlay chairs used pricked patterns for the scrolls, but most of the ornamentation was hand-painted, including mythological creatures on the

back of the chairs (Figure 14).⁹³ The very intricate pattern painted on the Phyfe chair likely used a similar combination of pricked pattern and handwork(Figure 15). In comparison, the painters of Hitchcock chairs employed re-usable stencils made of oiled paper or thin sheets of brass with very limited free-hand painting. The result was a distinctive ornamental style, with less intricate shapes having crisp edges and graduated shading that could be applied quickly using bronze powders (Figures 16 & 17). The difference style is evident in comparing Hitchcock's fruit basket motif with Phyfe's (Figures 15 & 16).



Figure 14 DETAIL, Side chair Attributed to John Finlay,
Metropolitan Museum of Art, 65.167.6



Figure 15 DETAIL, Side Chair. Attributed to the Workshop of Duncan Phyfe & Son (1768–1854), ca. 1815
Metropolitan Museum of art, 40.159.2

⁹³ Rian M. H Deurenberg, "Examination and Treatment of a Set of Klismos Chairs, Attr. to John and Hugh Finlay," *Journal of the American Institute of Conservation* 47 (2008): 106.



Figure 16 DETAIL, Hitchcock Chair, 1826-1829,
American Folk Art Museum, gift of the Historical Society of Early American Decoration, 58.29

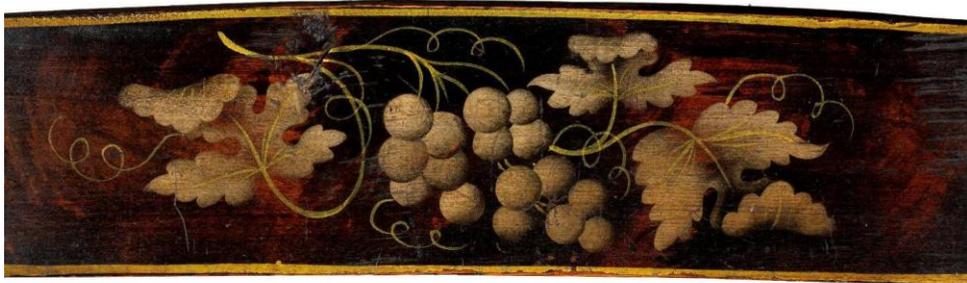


Figure 17 DETAIL, Hitchcock Chair ca. 1825,
General Artemas Ward House Museum, HU1508.1-.5

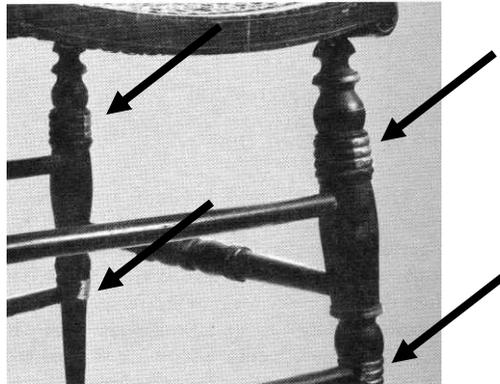


Figure 18 Gilded banding on Hitchcock chair,
Kenney, *The Hitchcock Chair* 89



Figure 19 Detail of Figure 6, the Alling chair, showing the gold banding fully encircling the rear leg above the seat,
Newark Museum, 23.246



Figure 20 Detail of Figure 6, the Alling chair showing the break in the gold banding at the rear of the front leg,
Newark Museum, 23.246

The ornamentation was not only less intricate, but also smaller in quantity than in the chairs of contemporary luxury makers. The ornamentation was limited to the front of the chairs, including the gold banding on the legs (Figure 18). The bronze or brass powders that were used to color metallic paints were mainly made in Germany and were expensive enough for Hitchcock to limit their use to the most visible areas of the chairs - especially in an operation with high-volume production where the savings per chair

would rapidly accumulate.⁹⁴ Fully painting the stripe on the legs under the seat and carrying the ornamentation around the back of the chair, as was done on similar furniture made by Phyfe and the Finlay brothers, would have increased the selling price of the chair.

The advantage of not fully ornamenting all sides of the chairs was not only a savings in the amount of metallic paint, but also a reduction in the production time. But carrying the brush stroke for painting fully around the legs, if done before assembly, would not have taken significantly more time than just painting the front of the leg. There must have been a secondary factor in the production process that made fully applying the ornamentation unprofitable.



Figure 21 William Buttre trade card, new York, ca. 1813.

Winterthur Library, Evans, Windsor-Chair Making in America: From Craft Shop to Consumer

The factor that may have tipped the balance toward unprofitability was the timing of ornamentation in the construction process. Hitchcock and Alling chairs legs were likely to have been ornamented after assembly. Because Hitchcock made a limited number of chair bodies from large numbers of pre-made parts, it would have been much

⁹⁴ Paul Collins, "Henry's Little Pot of Gold," *New Scientist* (October 25, 2003), <http://www.lexisnexus.com>, accessed January 1, 2015, 50.

In the mid 1840s Henry Bessemer introduced less expensive gold paints using an industrial process for flaking brass. After their introduction Bessemer maintained tight control over the patented process for the next 40 years

more difficult to manage the inventory of parts if they were painted prior to assembly. They would also be subject to damage in storage. It was more efficient for Hitchcock to assemble the chairs, and then apply ornamentation as needed to fill orders. Applying the gold banding to the legs was a hand process. To accurately apply the painted stripe to the back of the legs under the seat after assembly required contorting the brush hand, and likely required that the chair and the worker be reoriented several times. An illustration of the bench and set-up for a furniture painter of the period gives an idea of the set-up and possible difficulties in reorientation (Figure 21).

The cost in labor to fully ornament all sides of a chair, as was done by luxury chair makers, must have outweighed the benefit of increased price. The seemingly small detail of limited ornamentation is further evidence of how the increased value through ornamentation competed with the need to minimize the cost of construction.

Investment in the machines and the land and buildings to house them sped up production of the chair parts, but to recoup the investment the entire production cycle had to be considered.⁹⁵ The time for ornamentation and assembly had to be sped up as well or Hitchcock would have faced a bottle neck in his production that would reduce or eliminate the savings in time from the production of parts. The result was that Hitchcock furniture was designed to be slightly less ornamental when compared to the expensive furniture made by Phyfe and Finlay. The reduced ornamentation was part of the business structure and suited the less expensive selling price of Hitchcock chairs, illustrating the connection between business structure, design and marketing.

⁹⁵ E. Rothbarth, "Causes of the Superior Efficiency of U.S.A. Industry as Compared with British Industry," *The Economic Journal* 56, no. 223 (September, 1946), <http://www.jstor.org.libproxy.newschool.edu/stable/2226046>, 388

In later years Hitchcock used mahogany and other veneers for the drawer fronts of his bureaus and for the panels of his case goods, but the base finishing of the majority of Hitchcock furniture was painting either in opaque colors including black and yellow, or wood graining to imitate expensive woods. Rather than hand-carved decoration, the chairs combined machine made ornamentation with metallic painted striping and stenciling primarily to the front of the furniture. The finishing of Finlay furniture was likely also done through stenciling but hand-painted decoration in a variety of colors was applied on all sides of the pieces.⁹⁶ The differences in appearance are a direct result of the pressures of time in a volume based factory practice using a division of labor and less skilled workers, versus the highly-skilled custom furniture businesses of the luxury makers.

Hitchcock's dependence on machine production required continual high-volume sales and higher profit margins per piece to cover his overhead costs.⁹⁷ A downturn in the economy after the 1828 election of Andrew Jackson reduced sales of furniture at a time when Hitchcock had over 100 employees, and had the capacity to turn out 15,000 chairs per year.⁹⁸ The company continued to produce furniture; with little or no cash reserves. With the ongoing difficulty in obtaining credit, it was the only way to pay creditors and maintain the considerable investment in the infrastructure of the business..⁹⁹ The company produced so much furniture that he glutted his retailers, who were forced to sell

⁹⁶ Deurenberg, "Examination and Treatment of a Set of Klismos Chairs," 100.

⁹⁷ Rothbarth, "Causes of the Superior Efficiency of U.S.A.," 388

⁹⁸ Kenney, *The Hitchcock Chair*, 96.

⁹⁹ Kenney, *The Hitchcock Char*, 117-118

the furniture at a discount. The company was shut down in 1829 because its liabilities significantly exceeded its assets.

Hitchcock increased the profit margin on his chairs when he reopened a year later. He increased the wholesale price by up to twenty-five cents: a significant amount considering the previous cost of his chairs ranged from twenty-five cents to a dollar and seventy-five cents. He also introduced higher-profit cabinet furniture made using outsourced table tops and drawer fronts. The higher profit margins and diversification of the product line successfully supported the company's bottom line for the next 20 years.¹⁰⁰

The 1852 inventory taken when Hitchcock died hints at the diversity the product line had achieved and the relative value of the chairs compared to the other forms of furniture (Figure 22).

Item	Inventory	Percentage of Inventory	Value	Percentage of value
Stand	650	47.5%	\$957	35.3%
Bureau	214	15.7%	722	26.6%
Table	202	14.8%	443	16.3%
Chairs	179	13.1%	109	4.0%
Crib	54	4.0%	176	6.5%
Looking Glass	32	2.3%	5	0.2%
Secretary	28	2.0%	280	10.3%
Bedstead	8	0.6%	20	0.8%
Totals	1,367		\$2,713	

Figure 22 Summary of assembled furniture in the shop of Hitchcock, 1852, Kenney, *The Hitchcock Chair*, 117-118

¹⁰⁰ Ibid, 114.

As with John Hewitt, a willingness to take risks was an important aspect of the success of the Hitchcock Company. At its start in 1818, Hitchcock set up a wholly new manufacturing shop utilizing water power in novel ways for furniture production..¹⁰¹

Aspects of the organization and production of both Alling and Hitchcock prefigure later companies that produced furniture on a large scale. Both Alling and Hitchcock strove to save costs in the organization of production, Alling through the use of outsourced parts and ornamentation, and Hitchcock through the labor saved with the use of machines and later through outsourcing some parts. They offered product lines that focused on a limited product form, chairs, made by the application of their non-traditional production methods. They reserved hand-methods for ornamentation, painting, to add variety to the product line and move it up the economic scale to suit demand. They economized on costly materials and labor involved with hand-painting by ornamenting only the most highly visible areas of the chairs and by the application of re-usable stencils to create the most elaborate painted ornament.

Hitchcock's mid-nineteenth-century business model for producing lower-priced chairs in high volume included:

- Strategic placement and limited use of ornamentation
- Low cost ornamentation techniques suited to the rigors of shipping - Stenciling, and graining instead of freehand painting, carving and veneers
- A focused yet flexible product line – chairs made with a variety of ornamentation and forms that could be made to sell at a variety of price points.

¹⁰¹ Ibid, 93.

- A custom built shop that used powered woodworking machines to increase worker productivity
- Designs made up of parts that maximized the efficient use of machines for making and joining parts
- A production process that used task-based, lower-skilled, less costly labor
- Outsourcing of the production of specialty parts

Low-volume Mechanization: John Henry Belter, New York

Although most businesses applying new production methods such as Alling and Hitchcock were focused on meeting the need for mid-priced furniture, new methods were also being applied by at least one upper-tier cabinetmaker. John Henry Belter created elaborate Rococo-revival furniture through the innovative use of molds. Although he made some bureaus and tables, he focused on Rococo-revival seating and beds made using his innovative technique. He reserved hand methods for ornamental hand carving to add variety and to move his furniture up the economic scale as needed. He economized on costly materials through the use of veneers and through a patented method of reducing the labor and skill in creating the open-work for carving.

The production of laminated Rococo -revival furniture in the United States in the second half of the nineteenth century has been attributed to Alexander Roux, Prudent Mallard and Francois Signoret of New Orleans, Lutz and George J. Henkels in Philadelphia and Charles Baudouine, J. W. Meeks and John Henry Belter in New York. Belter's carving was more intricate than his competitors and he was seen as the leader in the field for the quality of the carving and the piercing of his expensive work.

As early as 1847, Belter was producing both furniture using his lamination technique.¹⁰² There is significant scholarship describing Belter's practices partly because his furniture was luxurious, expensive, and well known but also because he patented several of his techniques. The patents record the details and some of the motivations for his materials and construction techniques.

In two of Belter's patents he specifically stated that part of the rationale for applying his laminating method was the financial savings from economizing on materials.¹⁰³ He recommends the efficient use of expensive "highly-prized veneers," on external portions of the furniture and using "cheap wood" for the internal veneers.¹⁰⁴ Although he was aware of the cost savings of his technique, he did not use it as a strategy to sell lower-priced furniture. Belter chose instead to use the financial savings to offset the cost of the additional labor need to make the elaborate, yet refined ornamentation that made his Rococo furniture distinctive in the market place. Belter's competitors including J. W. Meeks and Alexander Roux made not only Rococo Revival but also Gothic, Elizabethan, and Renaissance Revival furniture using traditional techniques¹⁰⁵. Less concerned with quality, other makers of laminated furniture did choose to use the molding technique to create lower priced furniture.¹⁰⁶ Rather than try to compete with

¹⁰² Marvin D. Schwartz, Edward Stanek and Douglas K. True, *The Furniture of John Henry Belter and the Rococo Revival*, 1st ed. (New York, NY: E.P. Dutton, 1980), 10.

¹⁰³ John H. Belter, *Improvement in the Method of Manufacturing Furniture*, US Patent No. 19,405, February 23, 1858, <http://www.google.com/patents> (accessed October 12, 2011), 1

¹⁰⁴ John H. Belter, *Bedstead*, US Patent No. 15,552, August 19, 1856, <http://www.google.com/patents> (accessed October 12, 2011), lines 94-99; Belter, *Improvement in the Method of Manufacturing Furniture*, 2.

¹⁰⁵ *Ibid.*, 2.

¹⁰⁶ Schwartz, Stanek and True, *The Furniture of John Henry Belter and the Rococo Revival*, 7.

Belter, these makers used the cost-saving manufacturing-technique to create similar furniture forms at lower prices to meet market demand.¹⁰⁷

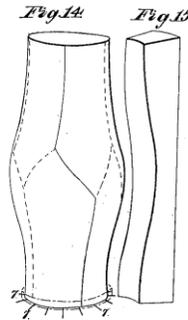


Figure 23 Detail of caul (mold) for making chair backs,
John H. Belter, *Patent No. 19,405 Improvement in the Method of Manufacturing Furniture*

In his patents Belter described the process of building furniture with cauls (Figure 23). He was able to press eight chair backs in twenty-four hours using his method. In Belter's furniture, the lamination technique was critical to the durability of the delicate, lacy, pierced carving. In solid wood the thin cross sections that resulted from the open work would have significantly reduced the structural integrity to the point of breakage.¹⁰⁸

As he states in his patent description:

*This work is more graceful in appearance and better adapted in form to its intended use than ordinary pressed work, and is much stronger and stiffer. My work is capable of resisting with great power transverse strains applied in any direction and tending to break it along any line.*¹⁰⁹

¹⁰⁷ Ibid., 2.

The Dun reports indicate that Belter was considered credit worthy; however, one statement indicates that the cost of production made the business less profitable than his competitors.

¹⁰⁸ Ibid., 7.

¹⁰⁹ Belter, *Improvement in the Method of Manufacturing Furniture*, 2.



Figure 24 Slipper Chair, ca 1855,
Metropolitan Museum of Art New York, 51.79.9



Figure 25 Sofa, 1850-1860,
Metropolitan Museum of Art New York, 1999.396



Figure 26 Side Chair, attributed to John Henry Belter,
Brooklyn Museum, 64.153.2, gift of Mrs. Charles S. Jenney.

The arrows on the back detail indicate where open work would have resulted in short grain weakness if made in solid wood



Figure 27 Side Chair, attributed to Bembe & Kimble, ca 1855,
Brooklyn Museum, 1992.42 Alfred T. and Caroline S. Zoebisch Fund. Showing variety of arrangements and joinery required to avoid short grain sections. Arrows indicate repairs after breakage due to short grain in the hard wood.

There would be almost no way to avoid short-grain sections (Figure 26). Short-grain occurs where the wood grain is oriented across a narrow profile and are hard to avoid in tightly curved hard wood profiles. The short grain sections easily break from physical stress or wood movement due to humidity fluctuations.¹¹⁰ Woodworkers mitigate short grain problems in hardwood construction by joining several pieces of wood together and orienting the grain in anticipation of the final form. A chair attributed to Bembe & Kimble chair attempts to achieve the sweeping Rococo curves through the orienting and joining of several sections of wood to attempt to avoid short-grain sections(Figure 27). The arrows indicate areas of short-grain that broke and were repaired despite the best efforts of the cabinet maker to avoid the problem. The labor involved in joining hardwood to prepare the curved forms was eliminated by the lamination technique.

¹¹⁰ Schwartz, Stanek and True, *The Furniture of John Henry Belter and the Rococo Revival*, 9.

Laminated wood is made from several sheets of veneers glued together. The grain of the veneer is rotated from layer to layer before gluing, effectively eliminating short-grain sections. Once laminated, the design for the piercing could be freely arranged without worry about short-grain weaknesses. The strength of the lamination technique was critical to the successful execution and the durability of the very delicate chair and sofa backs (Figures 24 & 25). To prepare the chair back for carving in solid wood would have taken an enormous amount of time and skill to arrange and join dozens of small pieces of wood in the correct orientation. The use of lamination reduced the level of skill and time for preparing the backs for piercing and carving.

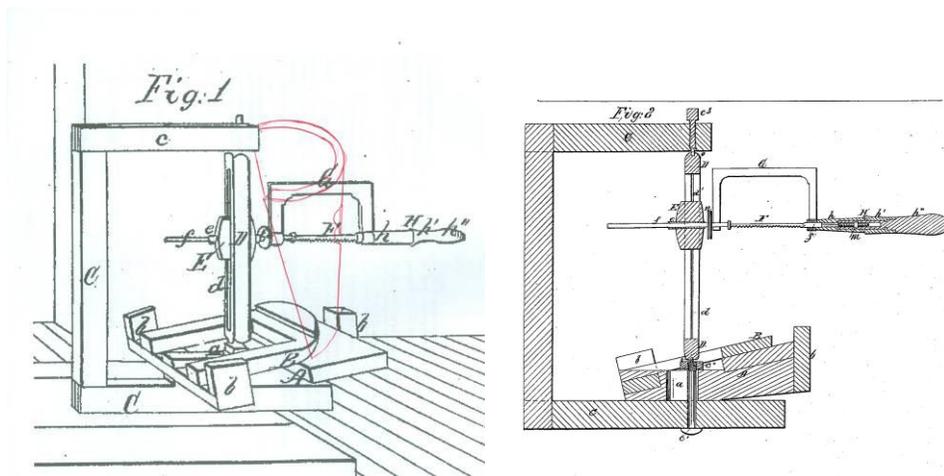


Figure 28 Belter Patent, , Machinery for Sawing Arabesque Chairs
John Henry Belter, US Patent No. 5,208, July 31, 1847. illustration Chair back indicated by the author,

Belter also patented a method of reducing the amount of skill needed to create the pierced parts of his furniture. A frame was used to hold the curved pieces steady and restrict the fret-saw to a consistent, perpendicular angle (Figure 28). Once the pattern for the back was drawn on the chair, the actual sawing of the open work would have been much easier than free-hand sawing or attempting to saw the curved backs on a band saw. The technique would have saved considerable time in cutting the filigreed forms (Figure 24).

Part of the efficiency in Belter's process came from the use of cauls to create multiple pieces of furniture from the same form, "with progressively more complex carving added to distinguish one pattern from the next."¹¹¹ Stanek and True analyzed the similarities and differences between the chairs and concluded that the backs were made with the same caul because they all share the same angle within their tulip-shape (Figures 29-31). The most basic form of the chair has simple carvings and no arms (Figure 29), a more ornamental chair has some carved elements on the crest rail plus carved arms (Figure 30), and the most elaborate has both scrolled arms and piercing (Figure 31).



Figure 29 Belter Side Chair,
Schwartz, *The Furniture of John Henry Belter and the Rococo Revival*

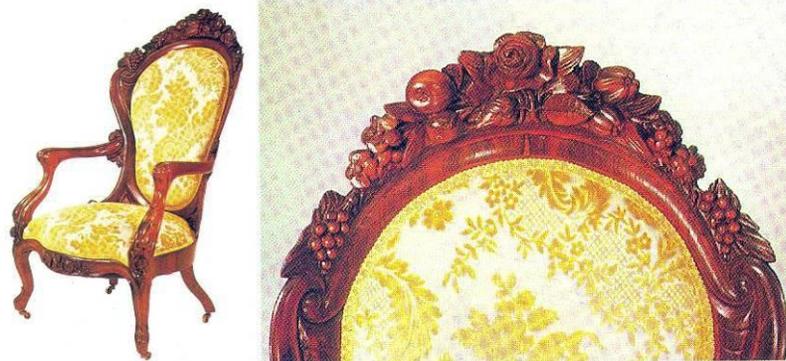


Figure 30 Belter Armchair,
Schwartz, *The Furniture of John Henry Belter and the Rococo Revival*

¹¹¹ Ibid., 10.

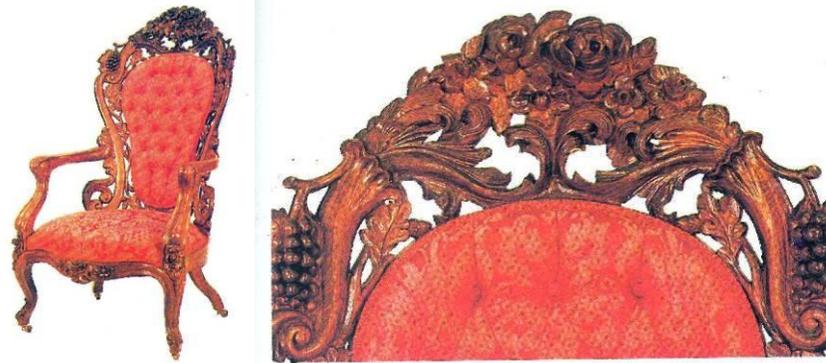


Figure 31 Belter arm chair,
Schwartz, *The Furniture of John Henry Belter and the Rococo Revival*



Figure 32 Belter Side Chair,
Schwartz, *The Furniture of John Henry Belter and the Rococo Revival*

Modifying the carving on the chair backs was an efficient method of creating variety within the tulip-backed slipper-chair form. According to Belter's 1847 patent, the chair backs were made and carved separately, suggesting that he may have constructed and stored them for later combination into a variety of forms as needed.¹¹² A similar strategy was probably used to create the crest rails. Applied solid wood crest share a similar curvature and could have been made in numbers and applied as needed to chairs to add variety (Figures 34 & 35). On some chairs the crest piece was not separate but carved from an extension of the fully laminated back (Figure 37).

¹¹² John H. Belter, *Machinery for Sawing Arabesque Chairs*, <http://www.google.com/patents> (accessed October 12, 2011), lines 11-15.



Figure 33 Belter Suite,
Schwartz, *The Furniture of John Henry Belter and the Rococo Revival*

The ability to vary the amount of ornamentation may have been used by other makers to market less expensive versions of Rococo furniture, but for Belter, the spectrum of ornamentation within a form was a method of creating suites of furniture. Parlor side chairs and arm chairs were coordinated through the curvature of their backs and further coordinated with sofas, tables, and étagères that had similar or matching ornamental carvings. Beds and bureaux were also made in suites coordinated through similar carved ornaments (Figure 33)¹¹³



Figure 34 Belter Chair with applied crest,
Schwartz, *The Furniture of John Henry Belter and the Rococo Revival*

¹¹³ Ed Polk Douglas, "Rococo Revival: John Henry Belter" in *Nineteenth Century Furniture: Innovation, Revival and Reform*, eds. Marsha Melnick and Susan E. Meyer (New York, NY: Billboard Publications, Inc., 1982), 33.

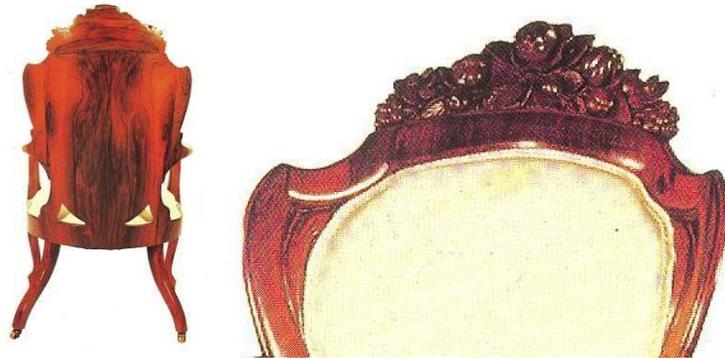


Figure 35 Belter chair with applied crest 2,
Schwartz, *The Furniture of John Henry Belter and the Rococo Revival*

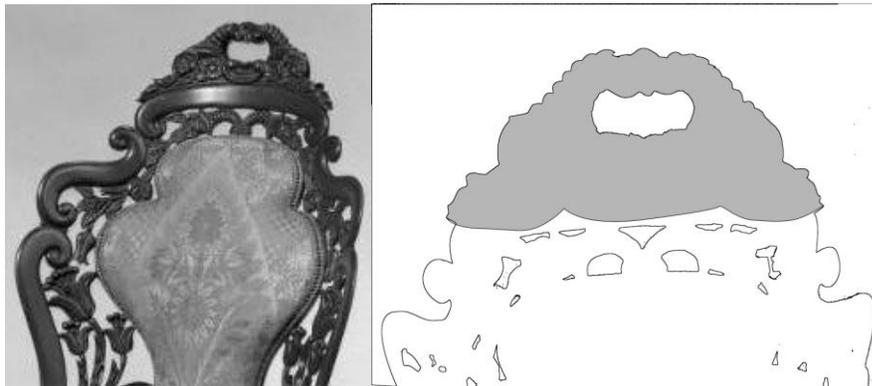


Figure 36 Side Chair, attributed to John Henry Belter,
Brooklyn Museum, 64.153.2, gift of Mrs. Charles S. Jenney.
The gray area on the right shows the applied crest rail from the back



Figure 37 Belter chair with fully laminated crest, Schwartz, *The Furniture of John Henry Belter and the Rococo Revival*

Some of Belter's designs remained in production for at least 10 years, suggesting not only a continuing popularity, but also that he was maximizing the return on his investment in the cauls and specialized equipment needed to produce his laminated

furniture.¹¹⁴ Laminated furniture made multiple pieces with identical bodies and varied ornamentation. Hounshell discusses the role played by the demand for stylistic novelty in delaying the adoption of mass-production techniques in furniture.¹¹⁵ Makers were hesitant to invest in expensive new machines that limited the variety of the furniture that could be produced. Cabinetmakers that produced low volumes of furniture by hand could cost effectively produce a variety of same furniture form, a bureau for example, and include multiple versions with different forms and levels of elaboration in the ornamentation in the carved and inlaid decoration. But if each of Belter's cauls could only produce exact duplicates, unless the chair was extremely and continually popular, the return on the investment in the cauls for that chair was limited. The balance between the investment in specialized equipment for production, the cost savings associated with the production process, and the flexibility to adjust the final appearance to extend the lifetime of the investment was important as volumes of furniture production increased.

As in the turned and stenciled chairs of Alling and Hitchcock, production of furniture by lamination combined the use of a labor saving machines to create the basic form with the flexible use of hand techniques to create variety. Flexibility in the production process was critical to reduce the risk of over producing one piece of furniture that might have fallen out of fashion. In Belter's furniture flexibility was maintained through the interchangeability of the basic forms and the use of varying patterns of hand carved ornamentation.¹¹⁶

¹¹⁴ Schwartz, Stanek and True, *The Furniture of John Henry Belter and the Rococo Revival*, 10.

¹¹⁵ Hounshell, *From the American System to Mass Production*, 151.

¹¹⁶ Schwartz, Stanek and True, *The Furniture of John Henry Belter and the Rococo Revival*, 35.

As with the furniture of Alling and Hitchcock, Belter's was tailored not only to new production methods, but also to the market and price point. Alling and Hitchcock used new production methods to produce lower-priced chairs for a widely distributed and growing middle-class market. Belter was one of the few furniture makers of the mid nineteenth century who used new methods of furniture production to supply the luxury market.¹¹⁷ Rather than apply the material and labor savings of his innovative technique to lowering the price of his furniture Belter applied the financial savings from the use of his methods to off-set the labor needed to increase the quality and quantity of hand-carved ornamentation.¹¹⁸



Figure 38 Settee, 1870-1900
Metropolitan Museum of Art, 69.90.1

Belter's furniture demonstrates the interrelationship of production method, demands of the marketplace and the willingness on the part of both makers and consumers to embrace new ideas. Belter's furniture expresses an exuberance in its elaborate ornamentation that was not seen in earlier Rococo and Rococo-revival furniture made through labor intensive carving. He seems to have reveled in the new process, pushed it to its ornamental limits; but, always with an eye to profitability by keeping the

¹¹⁷ Ibid., 1.

¹¹⁸ Ibid., 35.

basic forms in production for extended periods of time. It is reminiscent of the elaborate cast iron furniture, another form of mold made furniture that became prevalent in the nineteenth century (Figure 38). As with Belter, cast iron furniture seemed to exude a confidence in its hyper-ornamentation that may have been based in the novelty of its production method and material.

Belter may have initially limited his production to Rococo Revival because he had invested significant capital in the physical plant and trained personnel needed to produce furniture with the curves associated with Rococo. Sweeping curves are less prevalent or non-existent in the other styles so he could not apply the investment in cauls and other equipment to produce other styles of furniture. Since some of the furniture made by Belter included pieces made using only traditional methods the skill did exist in his shop to make other styles of furniture.

Belter's mid-nineteenth-century business model for producing higher-priced chairs included:

- Focused production - Rococo Revival chairs
- Exploitation of a niche within the market and development of a brand identity.
- Using the labor savings in the production of the basic form to offset the cost of highly ornamental, elaborate techniques that could only be done by hand.
- The disguising of new techniques within historical ornamentation.



Figure 39 *Side Chairs, Austria 1815-1820*,
Metropolitan Museum of Art, 1996.417.1 & 2003.448.3

Belter may have been inspired to work with veneers when he was learning his trade in Germany. The Biedermeier furniture popular during the time of his training often employed veneers. The furniture was made up of broad, unornamented surfaces. Some of the delicate parts such as fretwork and brackets used laminated veneers for strength (Figure 39).¹¹⁹ Michael Thonet was another innovative furniture maker from the same area of Germany that was also inspired by Biedermeier furniture in his use of bent wood.¹²⁰ Although outside the focus of this study on developments in the American furniture industry, Thonet had an important influence on the American market not only for his ingenious construction process, but also for his methods of marketing and distribution.¹²¹ His organization and methods embodied all of the principles of factory made furniture that would develop in the United States. His factory was perhaps the first that was custom built to suit techniques dedicated to the high volume production. His product line included a mix of prices from affordable to luxury models and was geared both to the commercial and the domestic consumer. His furniture was designed to knock-

¹¹⁹ Schwartz, Stanek and True, *The Furniture of John Henry Belter and the Rococo Revival*, 26.

¹²⁰ Christopher Wilk, *Thonet : 150 Years of Furniture*, (Woodbury, NY: Barron's, 1980), 11.

¹²¹ Barry R. Harwood, *The Furniture of George Hunzinger : Invention and Innovation in Nineteenth-Century America* (Brooklyn, NY: Brooklyn Museum of Art, 1997), 23.

down to ship efficiently and marketed to a wide geographic distribution. The furniture was produced in a wide variety of forms from standardized parts.¹²²

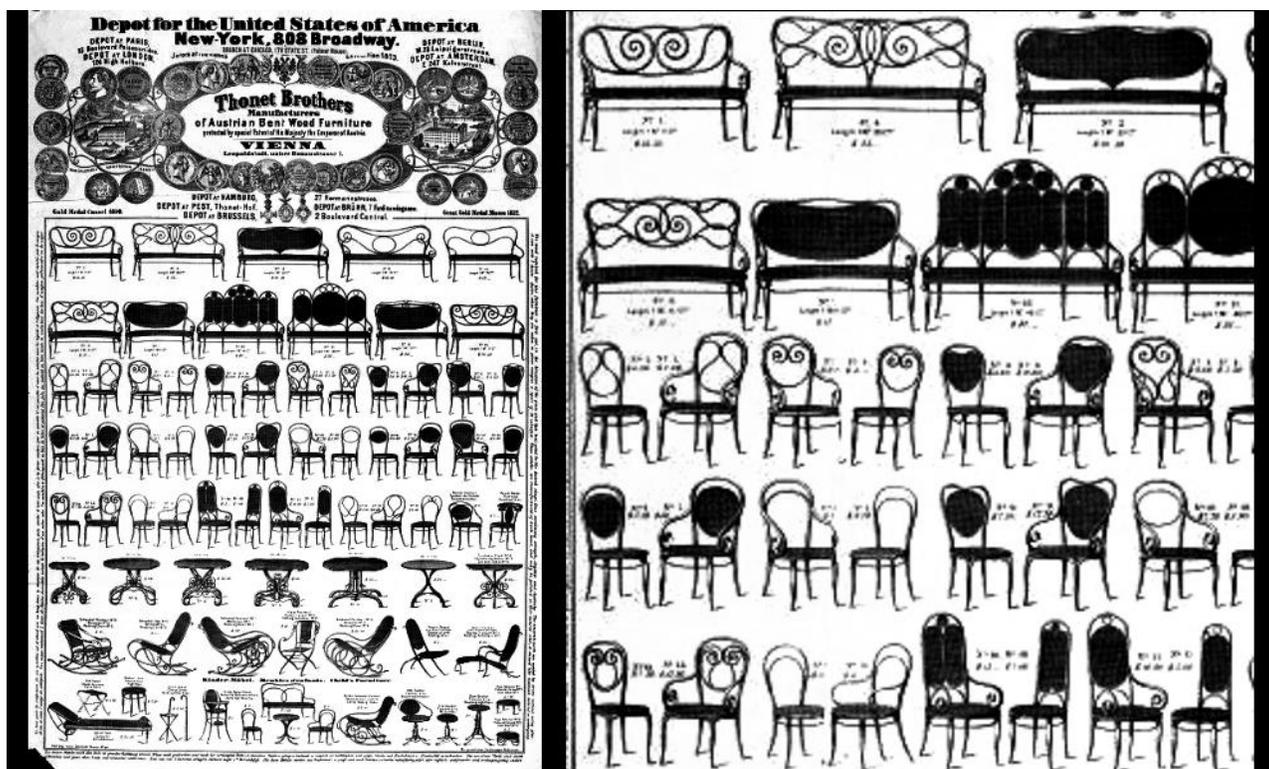


Figure 40 Thonet New York Broadside, 1873 with seating detail, V&A, E.2314-1997

Thonet furniture was available in the American market by the 1860s and he opened his first retail store in New York in 1873.¹²³ What is most remarkable about his chairs is the use of standardized parts to create the widest variety of chairs from the fewest number of parts.¹²⁴ Most of his chairs consist of fewer than 10 parts yet could be combined in dozens of styles (Figure 40). The furniture of Thonet definitely inspired at least one imitator in the United States. The Thonet patent on bent wood furniture had expired in 1869 and Henry Seymour of Troy, New York patented a design (Patent no.

¹²² Ibid, 18, 42-43.

¹²³ Ibid., 78, note 74.

¹²⁴ Ibid., 16.

103,786, May 31, 1870) for a chair in direct imitation of Thonet.¹²⁵ The chair backs were almost identical (Figures 41 & 42).



Figure 41 (LEFT) Bentwood Side Chair, 1870-1878, Inscribed Henry I Seymour,
Metropolitan Museum of Art, 1984.448.2

Figure 42 (RIGHT) Chair, late 19th-early 20th century, Thonet Brothers,
Cooper Hewitt Museum, 1982-55-1

“The manufacture of furniture is carried on to a great extent in nearly all the large cities and towns of the United States. In the former, extensive establishments exist for the production of decorative furniture, the constructive portions being for the most part prepared by machinery, by which labour is greatly economized, as well as perfect accuracy of fit in the same article of furniture.”¹²⁶

American furniture manufacturing businesses that developed at mid-century in the mid-West developed models that were similar to Thonet in producing high volumes of furniture, from a fixed set of parts, using machine assistance. These businesses built on the experience of the Hitchcock Company, not simply adopting mechanical production into a traditional woodworking business, but building completely new types of businesses that affected the appearance of furniture throughout the remainder of the century.

The creation of new businesses that built on the successes of others, as Hitchcock did with the Connecticut clock-makers, was a more significant influence on changing

¹²⁵ Barry R. Harwood, "Two Early Thonet Imitators in the United States: The Henry I. Seymour Chair Manufactory and the American Chair-Seat Company," *Studies in the Decorative Arts* 2.1 (1994): 95-96.

¹²⁶ George Wallis, "Special Report on the New York Industrial Exhibition" in *Parliamentary Papers*, (London: Harrison and Son, 1854), <http://books.google.com/books?id=iaQSAAAAYAAJ>, 60.

methods of furniture production than gradual changes within existing companies. As Kenneth Ames states " the furniture trade flourished in Grand Rapids because it profited from the painful transition from craft to industry that had taken place at considerable human cost in other, generally eastern parts of the country. The new was able to build at the cost of the old."¹²⁷

Between 1850 and 1870 the American population grew from about 23 million to more than 38 million people, a growth of sixty five percent. The immense increase coupled with cheap land drove rapid westward expansion.¹²⁸ As people moved west they converted their bulky household items to cash that was much easier to transport over the eastern mountains.¹²⁹ Upon arrival in the west they purchased replacement furniture. This new pattern of consumption, coupled with population growth, significantly increased demand.¹³⁰ In his book on the development of the furniture industry J. L. Oliver writes that technical progress resulted in the relocation of the textile and iron industries in a way that did not happen for the furniture industry.¹³¹ Mainly traditional furniture making continued in New York, Boston, and Philadelphia; the evolution in the methods of furniture production occurred mainly in mid-Western cities. Easy access to wood supported the development of large-scale manufacturing in Cincinnati and Grand Rapids,

¹²⁷ Kenneth Ames, "Good Timing and a Flair for Leadership" in *Grand Rapids Furniture: The Story of America's Furniture City*, ed. Karen McCarthy (Grand Rapids, MI: The Public Museum of Grand Rapids, 1998), 16.

¹²⁸ *Ibid.*, 7.

¹²⁹ Jennifer Howe and John Bigelow Taylor, *Cincinnati Art-Carved Furniture and Interiors* (Cincinnati, OH: Ohio University Press, 2003), 6.

¹³⁰ Christian G. Carron, *Grand Rapids Furniture: The Story of America's Furniture City* (Grand Rapids, MI: The Public Museum of Grand Rapids, 1998), 22.

¹³¹ Oliver, *The Development and Structure of the Furniture Industry* 23.

whereas in New England, a lot of the hardwood forests had been harvested and the land converted to new uses.¹³² With easy water access to the interior of the county, Cincinnati was ideally situated for distribution of large volumes of factory-produced furniture at the start of the westward migration.¹³³ By 1829 there were already ninety-six cabinetmakers and twenty-seven chair makers listed in the city directory.¹³⁴

High Volume and a Diverse Product Line: Mitchell & Rammelsberg,

The furniture and business practices of the Cincinnati firm of Mitchell & Rammelsberg (hereafter M&R) illustrate another model for the factory production of furniture; the production of a wide variety of furniture and styles by a single maker at a range of price-points. Although production of good-quality, mid-priced furniture in high volume occurred at the Lambert Hitchcock Company, David Alling's furniture business, and other firms prior to 1850, most factory production was used to create furniture at the low end of the market. As discussed, many firms that made better furniture in high volume were successful because they focused on a particular form, such as chairs. The narrow product focus limited the choice for middle-market consumers. After 1850 the stylistic choices and forms grew rapidly, as more firms adopted practices that allowed them to produce multiple forms in the same factory.¹³⁵

Kenneth Ames dates the beginning of the "Golden Age of Furniture Consumption" to 1850, when an increasing number of American consumers began to

¹³² Carron, *Grand Rapids Furniture*, 26.

¹³³ Polly Anne Earl, "Craftsmen and Machines," 307-330.

¹³⁴ Howe and Taylor, *Cincinnati Art-Carved Furniture and Interiors*, 6.

¹³⁵ Evans, *Windsor-Chair Making in America*, 107.

define their place in society through the objects they owned, including furniture.¹³⁶ Until the early nineteenth century most of the non-wealthy population lived in communal, multi-generational space, but by mid-century a middle-class individual was expected to have, and could afford, his or her own bedroom.¹³⁷ New notions of comfort included larger living spaces, and the separation of occupational and domestic environments.¹³⁸ Additional rooms such as parlors and dining rooms with dedicated furniture also became more common among the middle classes.¹³⁹ In referring to the success of a factory furniture maker, M & H Schrenkeisen in New York, *Scientific American* described how "almost every well-to-do mechanic has his parlor or 'best room,' furnished in a way which is almost unknown among the same classes in other parts of the world."¹⁴⁰ According to Ames, the creation of specialized forms of furniture for these rooms contributed to demand for choice in the forms of mid-priced furniture. Forms such as hall stands and parlor tables became signifiers of gentility that separated nineteenth century Americans by class.¹⁴¹ M&R capitalized on the demand for stylish furniture, at a range of price

¹³⁶ Ames, "Good Timing and a Flair for Leadership," 8.

¹³⁷ *Ibid.*, 11.

¹³⁸ Blumin, *Emergence of the Middle Class*, 155.

¹³⁹ Katherine Grier, "Imagining the Parlor, 1830-1880" in *Perspectives on American Furniture*, ed. Gerald W. R. Ward (New York: W.W. Norton & Company, 1988), 205-240. Grier's essay explores the role of commercial parlors in photographers studios and hotels as enticements for middle-class consumption in the nineteenth century that pre-dated the influence of department stores and exhibitions; Karen Halttunen, *Confidence Men and Painted Women: A Study of Middle-class Culture in America, 1830-1870* (New Haven, CT: Yale University Press, 1982), 60.

¹⁴⁰ American Industries, No. 37. "The Manufacture of Parlor Furniture", *Scientific American*, October 9, 1880, 229.

¹⁴¹ Ames, "Good Timing and a Flair for Leadership," 12.

points.¹⁴²

The partnership of cabinetmakers Robert Mitchell and Frederick Rammelsberg began in 1847. By the 1840s the success of Hitchcock's method of producing furniture using machines was well known in the mid-West.¹⁴³ Lambert Hitchcock had to build a new, state-of-the-art factory when he lost access to the nearby saw mill.¹⁴⁴ Similarly the burning of the M&R factory in 1848 ironically contributed to their success. Forced to start anew, they opened a modern factory in 1849 that was able to produce "furniture at lower prices than has ever been offered in the West."¹⁴⁵ The new facility used steam-powered equipment and employed 150 workers, fifty percent larger than Lambert Hitchcock's highest number of employees.

M&R kept all production processes in-house for speed and efficiency.¹⁴⁶ They custom built a factory in 1849 that produced "furniture at lower prices than has ever been offered in the West."¹⁴⁷ The new facility used steam-powered equipment and employed 150 workers, a workforce fifty percent larger than Lambert Hitchcock. The company increased profits through integrated retail and wholesale operations that retained the retail

¹⁴² Lefever, "They make Furniture With Machinery," 33.

¹⁴³ Darling, *Chicago Furniture*, 9-10.

¹⁴⁴ Kenney, *The Hitchcock Chair*, 55

Benham & Doolittle rough milled parts of the chairs for Hitchcock until the 1836 death of Benham forced him to seek a new arrangement.

¹⁴⁵ Donald C. Peirce, "Mitchell & Rammelsberg: Cincinnati Furniture Manufacturers 1847-1881," *Winterthur Portfolio* 13 (1979), <http://www.jstor.org/stable/1180608>, 211 note 6. Pierce cites the *Cincinnati Gazette*, October 4, 1849

¹⁴⁶ As with Hitchcock's operation, rough-hewn lumber was shaped on the lower floors and moved upwards through stages of assembly, dressing and finishing on the upper floors.

¹⁴⁷ *Cincinnati Gazette*, October 4, 1849

mark-up for the company ¹⁴⁸ After ten years the company divided its production facility into separate eight-story buildings outfitted with the latest steam powered equipment for construction and finishing. ¹⁴⁹ The following diagram from 1859 shows the arrangement and large inventory of equipment in the construction building. ¹⁵⁰

Eighth Story	Storage	
Seventh Story	Assembly workers	
Sixth Story	Assembly workers	
Fifth Story	Assembly workers	36 men working on carving
Fourth	Assembly	
Third Story	1 Daniels planer 2 tenoning machines 2 friezing machines (a special shaper used to create the edge details the frames of paneled construction) 3 scroll saws 1 molding machine	1 mitre saw Three fine rip saws Three fine cross cut saws One grooving machine Four boring machines Four jointing machines
Second Story	5 planing machines (3 Daniels' and 2 Woodworth's) 2 mortising machines 1 grooving machine	4 rip saws 3 cross-cut saws 3 scroll saws
Basement	2 steam engines 1 tin punching machine 3 Bettgemen's patented dovetailing machines	1 Wright's machine for turning bed spring disks A large blacksmith and machine shop

¹⁴⁸ Voorsanger, *The Herter Brothers*, 63.

¹⁴⁹ The two buildings were connected by bridges over an alleyway designed to mitigate the ever-present woodworking threat of a disastrous fire. The building was equipped with innovative steam-powered elevators to move furniture between floors and to the roof for drying, steam-heated glue ovens and steam heat piped through the building. Using steam heat for both the building and the ovens eliminated the need for open flames, a crucial safety element of the new building. Also maintaining stable temperatures was critical to preventing the wood from warping and changing dimension during construction. In addition to the elevators, all of the woodworking machinery was steam-powered, drawing power from two steam engines located in the basement.

Also on the property was 75,000 square feet for storage of lumber, stacked to a height of 20 feet including poplar, black walnut, cherry, oak, pine, ash, maple, solid mahogany, and solid rosewood. The firm consumed an amazing several million feet of lumber annually. The cost of buying lumber in bulk was likely cheaper and afforded them flexibility in their product line to respond to demand.

¹⁵⁰ Charles Cist, *Sketches and Statistics of Cincinnati in 1859*, Unknown publisher, 1859), <http://books.google.com/books?id=py0WAAAAYAAJ>, 293-295.

Although the factory was highly mechanized, M&R designed their furniture to be made using both traditional hand-techniques and machines. The amount of machine and hand ornamentation determined the selling price of the piece and provided a high degree of flexibility in the price of the furniture. For example, an 1863 inventory included poplar beds at \$3.25, elaborate "French" beds for \$150.00, and *étagères* from \$14 to \$250.00. The firm produced kitchen tables in a range of sizes, painted chairs at \$4.50 per dozen and commercial furniture, including saloon tables, office tables and office chairs.¹⁵¹

The wide variety of offerings was leveraged by retail spaces located in urban shopping areas of Cincinnati and St. Louis. The stores had large open spaces for customers to see the variety of furniture available at a glance. The multi-story retail buildings presaged the emergence of department stores: model interiors into which the customer could imagine themselves, and that increased the likelihood that they would find an appealing item to purchase.¹⁵²

In 1859 the firm was selling \$500,000 annually, but had yet to achieve full capacity.¹⁵³ To increase sales, M&R began to market furniture to organizations including "churches, lodges, hotels, halls," and "offices": apt markets for large orders of identical-looking furniture.¹⁵⁴ The sales to commercial clients echoed David Alling's sales of industrial and office chairs to support his finances two decades earlier.

¹⁵¹ Peirce, "Mitchell & Rammelsberg", 213.

¹⁵² Grier, "Imagining the Parlor, 1830-1880", 208.

¹⁵³ {{795 Cist, Charles 1859;}} 293-295.

¹⁵⁴ Mitchell & Rammelsberg Furniture Co., *Illustrated Catalogue* (Cincinnati: 1880), "To the public". The catalog, in the collection of the Rutherford B. Hayes Presidential Center, www.rbhayes.org, lists a number of suites as inexpensive and ideal for use in hotels.



Figure 43 Secretary / bureau, stamped Mitchell & Rammelsberg, mahogany,
Cowan's Auction, "Cowan's Auction, Decorative Arts, January 12th, 2008, Lot 140



Figure 44 Grain Painted Secretary/bureau,
Mitchell & Rammelsberg Grain Painted Chest," <http://www.diggerslist.com/sale/furniture/%F4%80%82%AB/34059/>
(accessed November 9th, 2011).

The furniture was basically an assemblage of flat boards with ornamentation added by veneers, faux graining techniques, and the application of carved and turned elements made using mechanical shapers and lathes. The parts for the case goods and bedsteads of M&R were made using planers and band saws. Many of the parts were interchangeable, including the elements used to build up ornamentation that created a variety of styles.¹⁵⁵ The furniture could be efficiently and cheaply shipped in knocked

¹⁵⁵ *Twelfth Annual Report of the Indiana State Board of Agriculture* (Indianapolis, IN: Alexander Conner, 1870), <http://books.google.com/books?id=GuFMAAAAYAAJ>, 168-170.

M&R furniture was stylish enough to win several prizes at the 1869 Indiana State fair for their bureaus, bedsteads, extension tables, sofas, chair sets, center tables, writing desks, parlor suites, office furniture, and cabinets.

down form by railroad and canals.¹⁵⁶ Veneers were an efficient method of using costly woods.¹⁵⁷ Expensive hand-carving was reserved for details to raise the furniture on the economic scale.

A simple bureau illustrates the strategy for adding variety in the product line while maintaining the selling price constant (Figure 43). Mahogany veneer adds visual interest to the otherwise simple box of drawers. Square profiled band-sawn legs are the primary form of three-dimensional ornamentation. The legs are not integrated into the form, but are simply attached to the box. Another version of the same chest shows how visual variety was created (Figure 44). The legs, still square in profile, have a different, but similar curvature. Whereas one chest in has a veneer of flamed mahogany and carved beading around the drop front (Figure 43), the other is painted to resemble figured mahogany and lacks beading (Figure 44). The chests would have been comparable in price. The amount of time and degree of skill for production of each would have been similar - the veneering and beading taking up a similar amount of effort as the painting. The adjustments in ornamentation and form primarily created consumer choice.

¹⁵⁶ Darling, *Chicago Furniture*, 19.

¹⁵⁷ Ibid., 11. Veneers had become less expensive as steam technology not only speeded up the process but also reduced the thickness of the veneer



Figure 45 Walnut Dresser, Ca 1860

Neal Auction Company, "Important La. Purchase 2 Day Auction - Lot 434 Mitchell & Rammelsberg Walnut Bedroom Suite", November 4, 2011.



Figure 46 Chest | Bureaur, Mitchell and Rammelsberg. 186 - 1870,
Newark Museum, 26.2737A-Q, Gift of Miss Grace Trusdell



Figure 47 Detail of the drawer fronts on Figure 46



Figure 48 Crest detail Figure 46



Figure 49 Side panel detail Figure 46

A comparison of two dressers also illustrates the distinction between higher and lower price points for the same furniture type (Figures 45 & 46). Both dressers are elaborately ornamented, but the ornamentation and form of Figure 45 shows evidence of machine production while the dresser in Figure 46 displays much more hand work. On Figure 45 the carcass is square with simple band-sawn and routed plaques applied to the

drawer fronts for ornamentation. The bow front carcass and drawers sh required more hand work and were much more complicated to fit (Figure 47).

Most of the carved elements in the crest and on the side panels of Figure 45 are flat and narrow enough to have been made primarily with a shaper otherwise known as a moulder or friezer.¹⁵⁸ The finials and corner mounts are simple turnings. The elaborate pulls are probably the only elements that were hand carved. The crest and side panels, show much more delicate hand work, including scrolling acanthus leave and complicated florettes (Figures 48 & 49). The compound curves of the side panels make it unlikely to have been worked on machines primarily geared to linear and flat surfaces.



Figure 50 Signed Canterbury,

John Werry, "*Mitchell & Rammelsberg Music/Map Rack*", <http://rarevictorian.com/2008/12/mitchell-rammelsberg-musicmap-rack.html>, November 09, 2011).



Figure 51 Work stand, ca 1863, Mahogany, stamped Mithcell & Rammelsberg

John Werry, "*Mitchell & Rammelsberg Ladies Workstand ~ 1863*", <http://rarevictorian.com/2008/06/mitchell-rammelsberg-ladies-workstand-1863.html>.

¹⁵⁸ An 1880 illustration of a friezer in-use appears in the upper right-hand corner of Figure 77 on page 144.

The virtuosity of M & R machine ornamentation is displayed in a canterbury (Figure 50). The piece is made up of flat panels that have been scroll sawn and then routed to give a modified trefoil design, and the uprights and dividing posts consist of turned elements. The lack of hand carving and overall flatness of this piece may indicate that it was among their less expensive offerings. The work stand was probably a mid-priced offering (Figure 51). Although the legs were probably made using a pattern and a mechanical shaper, the feet are delicately carved. The carvings on the knees of the legs and apron were made separately and applied. The body itself is a simple box, its top given visual interest by the figured veneer and the machine-shaped cove and routed edge detail.



Figure 52 five-piece rosewood Victorian bedroom suite, signed Mitchell & Rammelsberg, circa 1860,
WorthPoint Staff, "Mitchell & Rammelsberg Bedroom Suite, Highlights Katherine Creamer Estate Sale,"
<http://www.worthpoint.com/worth-points/mitchell-rammelsberg-bedroom>, June 30, 2009 (accessed November 4th,



Figure 53 An American walnut Renaissance revival bed and dresser with a drop marble top is signed Mitchell & Rammelsberg,
Frances McQueeney-Jones Mascolo, "Lanceray Bronzes Command Top Money at Grand View",
http://antiquesandthearts.com/Antiques/AuctionWatch/2007-05-01_10-22-36.html, (accessed November 4, 2011).



Figure 54 Walnut Bed, Ca 1860,

Neal Auction Company, *Important La. Purchase 2 Day Auction - Lot 434 Mitchell & Rammelsberg Walnut Bedroom Suite.*



Figure 55 Signed high-back bed, rosewood,

WorthPoint Staff, "*Stevens Auction Co. to Host Pair of Estate Sales with a Southern Flair*", www.worthpoint.com/worth-points/stevens-auction-southern-estate-sales November 09, 2011)

Surviving beds and dressers of M&R illustrate the strategy for creating a range of selling prices that could be produced by varying the amount of ornamentation within the same form (Figures 52-55).¹⁵⁹ The 1880 catalog shows the correlation between the selling price and the ornamentation (Figures 56-60). As the sets increase in price the surface changes, from unornamented walnut and ash, to veneered and engraved ornamentation, marble tops, and pierced hand-carving. The beds illustrated are just a few examples drawn from the 32 sets M&R offered, all having the same basic form, with varying degrees of ornamentation and values evenly distributed between \$25 and \$375.

¹⁵⁹ Mitchell & Rammelsberg Furniture Co., *Illustrated Catalogue.*

Although the images here are from the 1880 catalog, the same strategy likely was used in their earlier offerings.

It is not possible to determine exactly what price range was most successful for M&R without sales figures, but their catalog offerings provide some clues to the distribution of their sales. The greatest variety in the M&R catalog was in the low to middle-range. For example, the 1880 catalog offered 24 chamber sets between \$25 and \$106, but only nine sets from \$150 to \$375. Sets costing less than \$100 did not include any hand ornamentation; almost all of the sets over \$100 included some form of hand ornamentation, whether it was carving, inlay or gilding. It is likely M&R included hand work to attract a luxury consumer who could afford a high-end bedstead from a more prestigious maker still associated with hand-made furniture. Considering the small variety in the high-end furniture, it is likely the company's sales were in the middle to low end of the market.

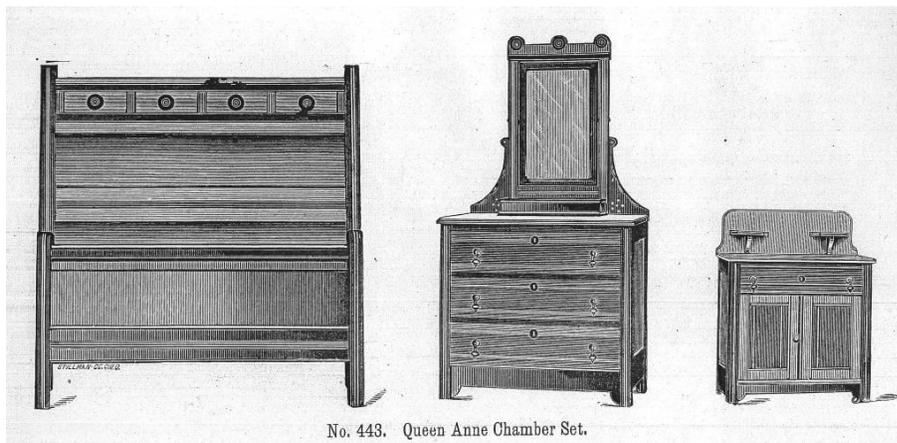
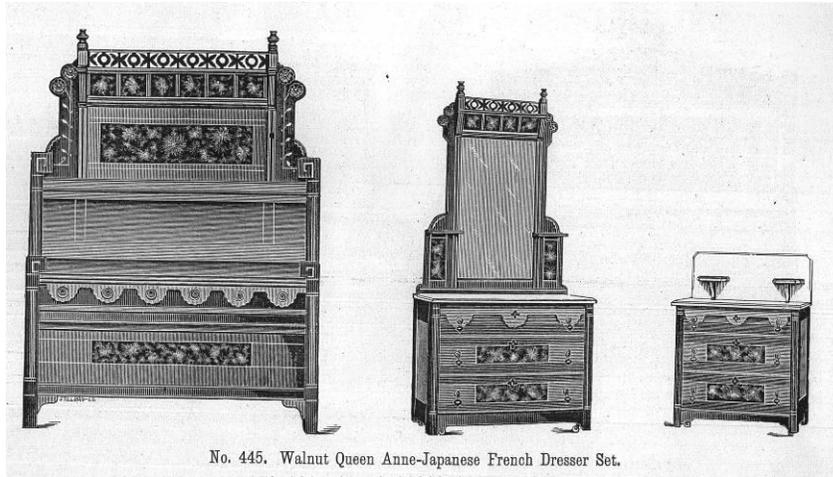
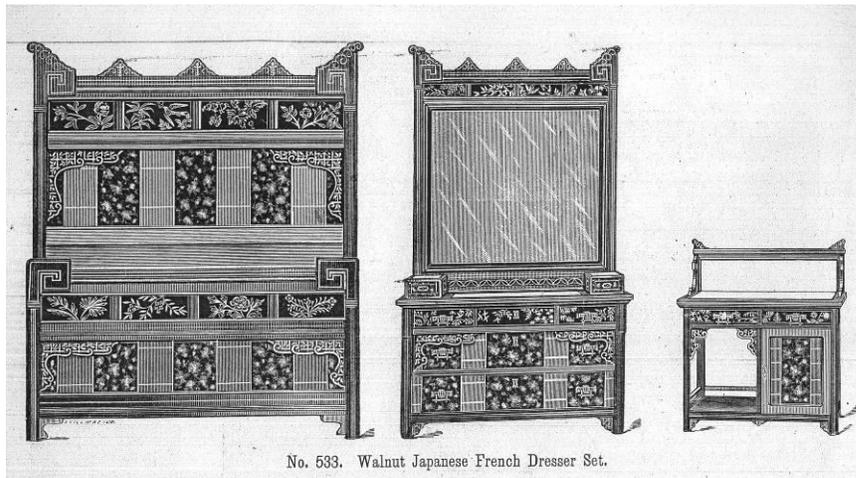


Figure 56 Mitchell & Rammelsberg 1880 Catalog No. 443 Queen Anne Chamber Set, Mitchell & Rammelsberg Furniture Co., *Illustrated Catalogue* (Cincinnati: 1880). The catalog is in the collection of the Rutherford B. Hayes Presidential Center, www.rbhayes.org.



No. 445. Walnut Queen Anne-Japanese French Dresser Set.

Figure 57 Mitchell & Rammelsberg 1880 Catalog No. 445 Walnut Queen Anne-Japanese French Dresser Set, Mitchell & Rammelsberg Furniture Co., *Illustrated Catalogue* (Cincinnati: 1880). The catalog is in the collection of the Rutherford B. Hayes Presidential Center, www.rbhayes.org.



No. 533. Walnut Japanese French Dresser Set.

Figure 58 Mitchell & Rammelsberg 1880 Catalog No. 533 Walnut Japanese French Dresser Set, Mitchell & Rammelsberg Furniture Co., *Illustrated Catalogue* (Cincinnati: 1880). The catalog is in the collection of the Rutherford B. Hayes Presidential Center, www.rbhayes.org.

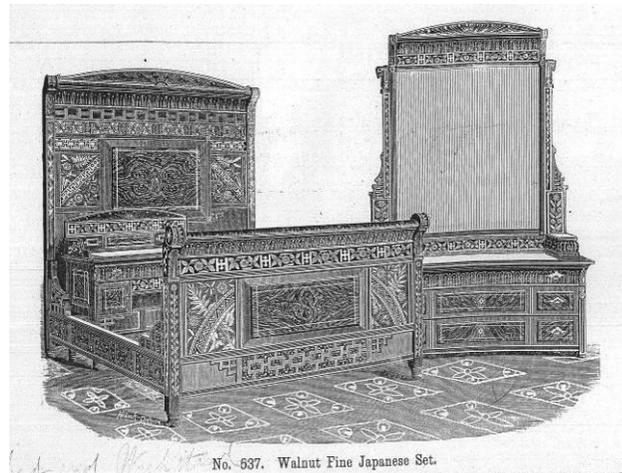


Figure 59 Mitchell & Rammelsberg 1880 Catalog No. 537 Walnut Fine Japanese Set, Mitchell & Rammelsberg Furniture Co., *Illustrated Catalogue* (Cincinnati: 1880). The catalog is in the collection of the Rutherford B. Hayes Presidential Center, www.rbhayes.org.

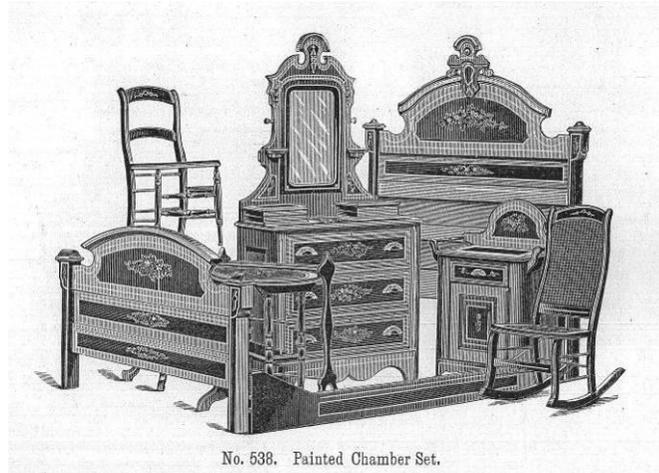


Figure 60 Mitchell & Rammelsberg 1880 Catalog No. 538 Painted Chamber Set, Mitchell & Rammelsberg Furniture Co., *Illustrated Catalogue* (Cincinnati: 1880). The catalog is in the collection of the Rutherford B. Hayes Presidential Center, www.rbhayes.org.

M & R was among a number of firms in Cincinnati to build a new type of business practice. In 1851 Charles Cist wrote about the difficulty in categorizing the diversity of furniture producers that had developed just within the previous decade: “these establishments are so various in their fabrics, some confining themselves to one or two prominent articles, others making every possible variety, and others again, blending

the chair business with what is called cabinetware that such classifications becomes imperfect and unsatisfactory."¹⁶⁰

The focused business models for high-volume production of Alling and Hitchcock were now joined by more multi-faceted business models like M&R. Cist attributed the new diversity of business models in furniture production directly to the application of steam power and machinery, crediting the changes with increasing sales. The increased sales also increased employment and wages, and according to Cist freed workmen from arduous rough tasks while employing their skills in "delicate operations."¹⁶¹

High-volume Luxury Mechanization: Berkey & Gay, Grand Rapids

Just as the furniture manufacturers of Cincinnati learned from the experience of Eastern manufacturers such as Hitchcock, the furniture businesses in Grand Rapids, Michigan were built on techniques developed from 1840 through 1860 on the east coast and in Cincinnati. Manufacturers in Grand Rapids invested in the latest infrastructure, tooling, and organizational methods suited to factory production.

Grand Rapids was an ideal location for the high-volume production of furniture: the city had access to water power and raw materials, and, as observed in the models of Alling, Hitchcock, and M & R, ready access to transportation. While not as central as Cincinnati, the city had the advantage of straddling a steep drop in the Grand River, an ideal location for water-powered facilities and transportation. As settlers arrived in Michigan and cleared the land, a canal system was built to provide water power to saw mills set up along the Grand River. The city and river were adjacent to large areas of

¹⁶⁰ Cist, *Sketches and Statistics of Cincinnati in 1859*, 200.

¹⁶¹ *Ibid.*, 200-205.

forests that could be harvested and the logs transported by water to the mills. The line between soft woods to the north and old growth hardwoods to the south passed near the city so the early manufacturers had easy access to both types of wood.¹⁶² Finished products were initially shipped via the river to the Great Lakes and to distribution points across the nation, although winter freezes limited transportation until the Detroit and Milwaukee Railway lines reached Grand Rapids in July of 1858.

The ready supply of material and the ease of transportation significantly lowered these two major cost factors affecting production. Another factor, the cost of machinery, was lowered by the founding of woodworking machine manufacturers, some of which were partially owned by the furniture manufacturers. In later years the Charles Buss Company and the King Carving Company were located in Grand Rapids and established the city as a center of woodworking machine expertise.¹⁶³

Finally the cost of labor was low due to the millions of immigrants who settled in the mid-West after the Civil War. Many were peasant farmers from the Netherlands, Poland, and Germany as well as freed slaves. Because these immigrants were unskilled, and too poor to purchase land to become farmers, they readily took jobs as factory

¹⁶² Bert Hudgins, *Michigan: Geographic Backgrounds in the Development of the Commonwealth*, (Detroit: 1953), 60.

¹⁶³ Frank Edward Ransom, *The City Built on Wood a History of the Furniture Industry in Grand Rapids, Michigan, 1850-1950* (Ann Arbor, MI: Edwards Bros, 1955), <http://catalog.hathitrust.org/api/volumes/oclc/3460580.html>, 8. Ransom gives a thorough analysis of the elements that came together to make the city a center of industrial furniture production.

The Grand Rapids Iron Works made equipment for mills including saw mills. The firm constructed its first sawmill engine in 1854 and was taken over by Byron D. Ball brother of Ebenezer Ball, an owner of Powers and Ball a Grand Rapids factory furniture producer. The Michigan Iron works was owned by W. T. Powers and Son and manufactured mill machinery and specialized in veneer cutting machines. William T. Powers was the other owner of Powers and Ball. Other early woodworking machine makers included the Valley City Iron works started in 1862 that made steam engines and veneer cutting machinery and the West Side Iron works started in 1860 that made band saws.

workers. The continual supply of unskilled labor permitted factory owners to keep wages low, hours long, and discourage labor organization.¹⁶⁴

Some immigrants brought with them a high degree of woodworking skill and included carvers from Glasgow that "learned their business in the shipyards on the Clyde, carving figure-heads, stem and stern adornments and cabin decorations," and for whom "there is no style of carving too intricate for their deft chisels."¹⁶⁵ As was done in the strategy of M&R, the labor of the carvers was used carefully to adjust the price of the basic forms of the factory made furniture. Berkey & Gay, one of the largest and most successful of the factory companies, experimented with artificial-wood drawer pulls and ornaments from O. A. Nathusius & Company for a period in the 1870s but switched back to hand-carved ornamentation in their own factory.¹⁶⁶ Its likely that the pressed glue and sawdust ornaments of Nathusius were not convincing enough to impress the shopper looking for true hand-carving.

As with the model of John Hewitt and Lambert Hitchcock, the challenges inherent in the high-volume production of furniture were illustrated by the impact of economic recession on furniture makers in Grand Rapids. The Grand Rapids Chair Company began operation in 1872 and was founded with the intention of being a large volume manufacturer focused on chair making. Building a workforce and physical plant suited to machine production led to initial success, but within months the recession of 1873

¹⁶⁴ Ibid., 40.

¹⁶⁵ Albert Baxter, *History of the City of Grand Rapids, Michigan* (New York, NY: Munsell & Company, 1891), <http://books.google.com/books?id=DWN5AAAAMAAJ>, quoted from the *Detroit Free Press*, November 1887, 462.

¹⁶⁶ Lefever, "They make Furniture With Machinery," 38.

depressed sales and the company experienced financial difficulties for eight years.¹⁶⁷ As with Hitchcock, the significant investment in capital equipment forced them to stay in business: their 1876 *Stock Book* noted:

*It was the general expression that it was better to continue business than to shut down entirely for the reason that in case of shutting down and discontinuance of manufacturing, that a loss would be sustained by natural decay of buildings and machinery - and by the withdrawal of our goods from the market, the company would materially suffer.*¹⁶⁸

The inflexibility of their product line forced them to keep producing to keep their business solvent, and also similar to Hitchcock's response, forced them to expand their offerings. Their success came after they began offering suites of furniture in 1880.¹⁶⁹

Labor continued to be a significant cost factor in the production of furniture. The Grand Rapids Chair company used prison labor, a form of outsourcing, as a method of lowering costs.¹⁷⁰ The use of prison-labor, especially during difficult financial times, continued throughout the nineteenth century giving some makers an unfair competitive edge that could depress prices.¹⁷¹ In 1886 the "National Anti-Convict-Contract Association" of manufacturers forwarded a resolution to congress suggesting that the sale of goods that were the product of convict labor be prohibited outside of the state in which they were manufactured. Among the signatories were George Berkey, the president of the large Grand Rapids furniture company of Berkey & Gay as well as other leaders of

¹⁶⁷ Ransom, *The City Built on Wood*, 16.

¹⁶⁸ Ibid., Quoted from the Grand Rapids Chair Co., *Stock Book*, January 18, 1876.

¹⁶⁹ Carron, *Grand Rapids Furniture*, 154; Ransom, *The City Built on Wood*, 16.

¹⁷⁰ Nancy Goyne Evans, *Windsor-Chair Making in America*, 36.

¹⁷¹ Ransom, *The City Built on Wood*, 16.

furniture companies.¹⁷² Evidently the practice was not sufficiently curtailed for *The Wood-Worker*, a journal for machine woodworkers, printed an editorial in 1895 that warned against the wide-spread and growing use of convict labor for making furniture, especially in the building of chairs.¹⁷³

Even as the manufacturers increased production to thousands of units, most furniture production still included a significant amount of hand work. Labor was divided into those that operated machines, those that assembled furniture, those that ornamented, and those that finished.¹⁷⁴ The need to maintain flexibility in the product line and the imperfect success in producing carving machines, limited the use of machines to the preparation of stock. Workers with traditional hand-skills were maintained to respond to fluctuations in demand both in terms of style and price.¹⁷⁵ During times of low demand companies with flexible production such as Mitchell & Rammelsberg and Berkey & Gay could to benefit from their investment in machinery by changing their production to more plainly ornamented furniture for lower priced consumption by consumers and institutions.

¹⁷² *Convict Labor, 2nd Annual Report of the Commissioner of Labor 1886*, Government Printing Office: Washington, DC, 1887, 368.

¹⁷³ "Convict-made furniture," *The Wood-Worker*, Vol XIV, No. 1, S. H. Smith: Indianapolis, IN March 1895,

¹⁷⁴ Lefever, "They make Furniture With Machinery," 37.

¹⁷⁵ *Ibid.*, 36.

Lefever describes how Phoenix was able to "redirect" their manufacturing efforts to supply a particular demand by creating a "special orders" department.



Figure 61 Berkey Table ca. 1870,
Carron, *Grand Rapids Furniture: The Story of America's Furniture* p. 28

Berkey & Gay belied the assumption in the trade that fine furniture had to be made by-hand in the East.¹⁷⁶ Established by Julius Berkey in 1859 , the company initially made window sashes, doors, and blinds. In 1861 Berkey began making a popular scalloped walnut “Berkey Table” at the sash and blind mill (Figure 61) . The table legs were flat, band-sawn elements arranged around a lathe-turned pillar with a scalloped apron molding. Some of the tables had plywood legs and tops.¹⁷⁷ All of the parts were adapted to the shapers and bandsaws used in his sash and door factory. At the start Berkey & Gay made and marketed occasional and sewing tables in cherry or walnut (Figure 62). The tables were also built up in layers of machine-made parts (Figure 63).¹⁷⁸ The Berkey & Gay catalog offered selections of ornamental parts for application to their furniture (Figure 64).

¹⁷⁶ Ibid., 33.

Other high-volume producers of expensive furniture in Grand Rapids included Nelson Matter & Company and Phoenix Furniture Company

¹⁷⁷ Carron, *Grand Rapids Furniture*, 133.

¹⁷⁸ Ibid.



Figure 62 Occasional Table, Berkey & Gay Furniture Co., 1870-1888,
Grand Rapids Public Museum, 1960-08-03

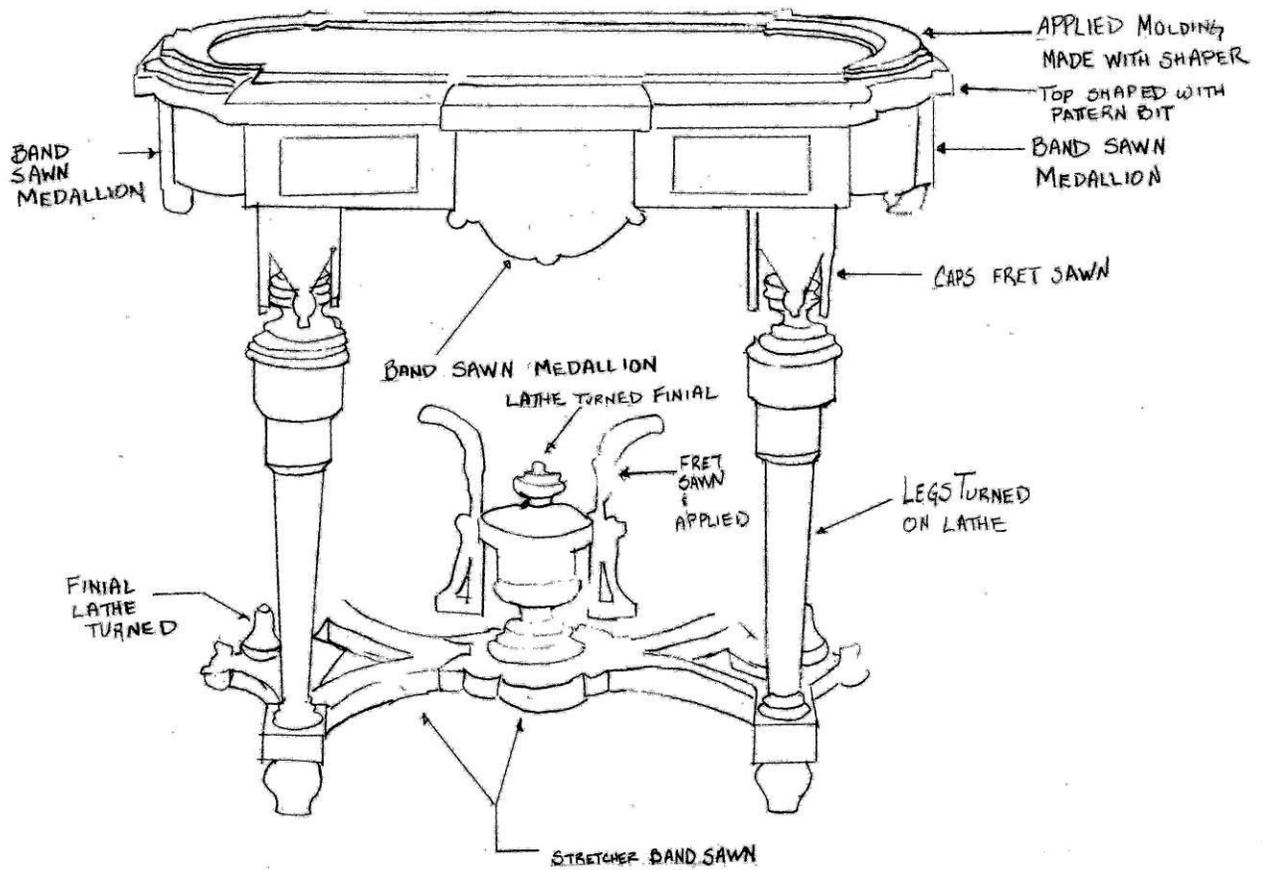


Figure 63 Diagram of Figure 81 proposing tooling used for the elements of the table,
author's drawing

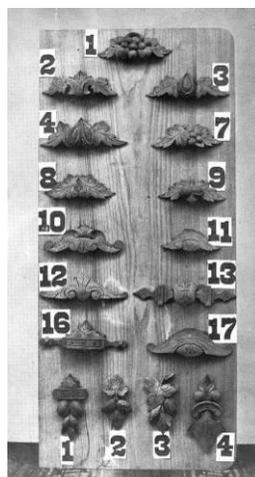


Figure 64 Selection of ornamental metal elements shown in the Berkey & Gay Catalog,
Witherell, Late 19th Century Furniture by Berkey & Gay

Even after mechanical carving was put in place it was only used for roughing out work; hand carvers remained in demand throughout the nineteenth century. Some general conclusions can be made from a survey of Berkey & Gay employees published in 1889 by the Bureau of Labor.¹⁷⁹ The largest group of employees was the sixty cabinetmakers, followed by forty-nine finishers, thirty-seven carvers and thirty-eight machine operators. The relative proportions of these occupations likely reflected the balance between hand-work and machine production.¹⁸⁰ The hourly wage of carvers, was almost twice the hourly cost of machine operators, meant hand-carving was used judiciously.

The origins of the tradesmen show the reliance on immigrant labor. Almost all were immigrants or the children of immigrants from Northern Europe. Germans made up almost half of the cabinet makers and carvers, but the Dutch made up the majority of the finishers. As was the case with Mitchell & Rammelsberg, the more expensive furniture of

¹⁷⁹ *Seventh Annual Report of the Bureau of Labor and Industrial Statistics*, February 1, 1890

A summary of the survey appears on page 145. The strategy for selecting the 238 employees of the total 375 employees was not given but it is assumed was closely representative of the workforce.

¹⁸⁰ *Ibid.*,

Of the workers surveyed carvers were the paid the highest amount, with an average weekly wage of \$15.75, followed by cabinetmakers at \$9.67, machine operators at \$7.94 and finishers at \$7.62.

Berkey & Gay relied on highly skilled carvers; the president of Berkey and Gay had to make at least one trip to Europe to entice immigrants to come to work for him.¹⁸¹

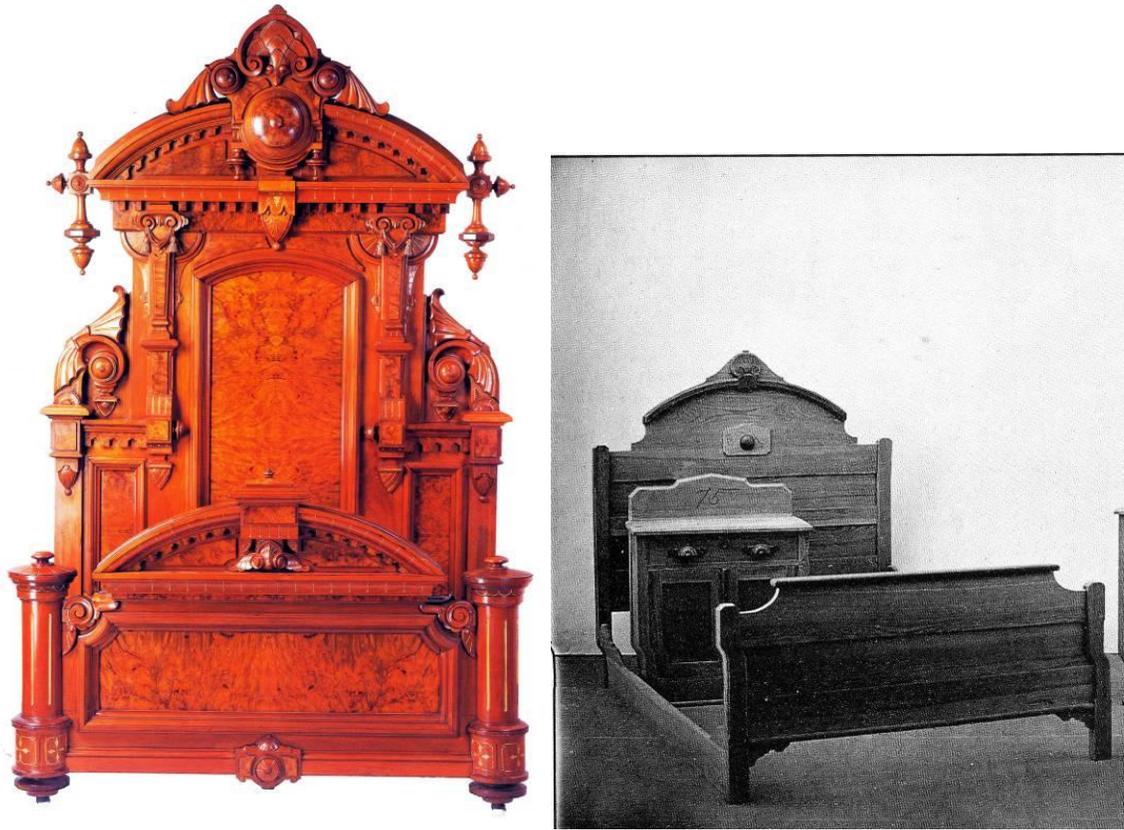


Figure 65 Berkey & Gay Beds, ca 1880

LEFT - Carron, *Grand Rapids Furniture: The story of America's Furniture City*

RIGHT - Witherell, *Late 19th Century Furniture by Berkey & Gay*

The bed made for the 1876 Centennial Exposition is one of the more elaborate pieces of Berkey & Gay furniture (Figure 65 left). Kenneth Ames refers to the bed as "a marvel of purposeful elaboration."¹⁸² The bed typifies the luxury end of their furniture line, encrusted with an array of ornamental elements made both by machine and hand, to increase its selling price. A Berkey & Gay bed with the same basic structure appears in the catalog, its head and footboard stripped of almost all ornamentation (Figure 65

¹⁸¹ Ransom, *The City Built on Wood*, 34.

¹⁸² Ames, "Good Timing and a Flair for Leadership," 13.

right).¹⁸³ An examination of their late nineteenth century catalogs shows that they offered a wide range of ornamentation (Figures 66 & 67). The bedroom suites are made up of a limited number of basic forms, 5-7 headboards and 5-7 footboards with varying degrees of curvature and 3-4 dressing tables varying in the number of drawers. Berkey & Gay applied the same strategy of tiered ornamentation to tables, dressers and sideboards (Figures 68-69).



¹⁸³ Brian L. Witherell, *Late 19th Century Furniture by Berkey & Gay* (Schiffer Publishing Ltd: Atglen, PA, 1998), 116.

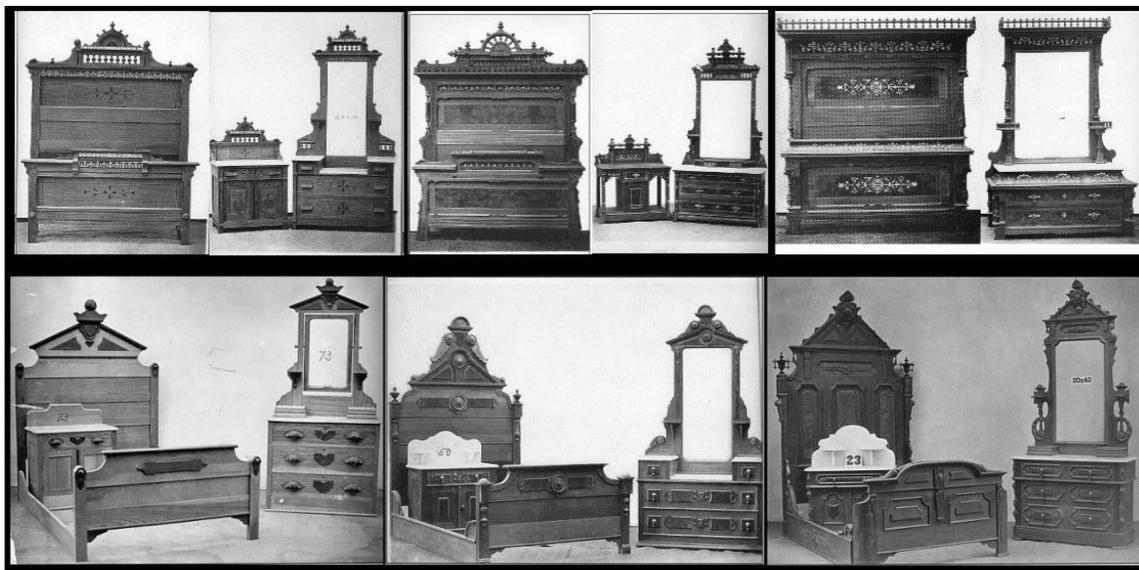


Figure 66 Berkey & Gay Bedroom Suites arranged by headboard and mirror style, ca. 1880 ,
Witherell, *Late 19th Century Furniture by Berkey & Gay*

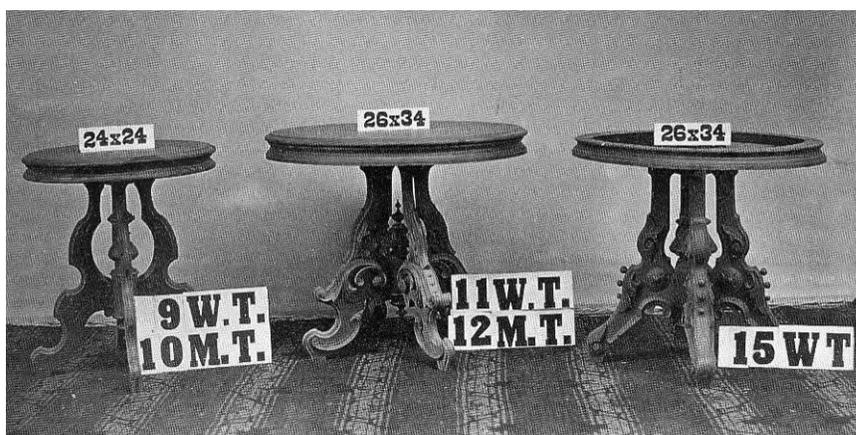


Figure 67 Berkey & Gay Tables from ca. 1880,
Witherell, *Late 19th Century Furniture by Berkey & Gay*



Figure 68 Berkey & Gay Bureaus from ca. 1880
Witherell, *Late 19th Century Furniture by Berkey & Gay*



Figure 69 Berkey & Gay Sideboards from ca. 1880
 Witherell, *Late 19th Century Furniture by Berkey & Gay*

"From its very first machine made, scalloped, walnut and cherry "Berkey Tables," the company's products were made for wholesale shipment and sale to the masses.¹⁸⁴ As with other furniture manufacturers instituting a new scale of production, their factory was purpose-built to use "the latest and most improved wood working machinery...as a model for their use."¹⁸⁵ In 1882 the factory was powered by two water wheels and a steam engine and employed 500 men divided into specialists that shaped wood using machines, assembled the furniture, caned the seats, applied the finish, cut marquetry, applied decoration, applied veneer, and carved ornamentation.¹⁸⁶ As did Mitchell & Rammelsberg, Berkey & Gay capitalized on the public's interest in furniture suites, which included everything needed for bedrooms and parlors. Pieces were also manufactured for the hall and office. Much of the company's early production was shipped unfinished, to be finished by the retailer upon arrival to avoid scratches, and to

¹⁸⁴ Baxter, *History of the City of Grand Rapids, Michigan*, 465.

¹⁸⁵ *Ibid.*

¹⁸⁶ Lefever, "They make Furniture With Machinery," 37.

shift the burden of hand work to the retailer.¹⁸⁷ Some pieces, however, were given painted faux burl panels at the factory. As with Thonet, the scale of production encouraged the firm to seek out commercial orders, including large contracts for bedroom suites that were supplied to hotels in Washington and New York at Coney Island and Manhattan Beach.¹⁸⁸



Figure 70 Berkey & Gay showroom from "The History of Berkey & Gay Furniture Company", *Stereoscope: The Journal of Historical Society of the United States District Court for the Western District of Michigan*, Summer 2011, p 5.

The large open display of the Berkey & Gay space, akin to the space of Mitchell & Rammelsberg, displayed the variety and flexibility of their furniture (Figure 70). Production on the scale of Berkey & Gay required access to a large number of retail and commercial customers. The company led the effort to introduce the wholesale trade

¹⁸⁷ Ransom, *The City Built on Wood*, 33.

¹⁸⁸ Carron, *Grand Rapids Furniture*, 132.

show, another development in the furniture industry that coincided with high-volume production. In 1870s they targeted advertising to dealers across the country announcing a show of their furniture in Grand Rapids. Other makers that also showed their furniture included Nelson & Matter and the Phoenix Furniture company.¹⁸⁹ The Furniture Mart, as it became known, reversed the flow of information in the marketing of furniture. Rather than supporting the expense of sending agents with samples out to broadcast offerings, the dealers came to Grand Rapids, bringing with them the desires of customers and institutions. The companies were able to gauge the desire of the country through advanced orders and in so doing strategically modify their production in advance. It was a re-introduction of the custom order method that continued in hand-made furniture from the eighteenth century, albeit on a grander scale. The ability to gauge demand in advance significantly reduced the risk of overproduction that earlier wholesale cabinetmakers Hitchcock and Hewitt struggled to overcome when producing on speculation. The flexibility to adjust their product line through changes in ornamentation was an important aspect of the continued success of these very large-scale producers, especially as trade shows increased the rate of change in furniture style towards a seasonal industry.

M&R and Berkey & Gay shared similar business models for the high volume production of a diverse product line that included:

- The use of powered woodworking machines to increase worker productivity
- A production process that used task-based, lower-skilled, less costly labor

¹⁸⁹ Carron, *Grand Rapids Furniture*, 71.

- Diversity in the price and product line – the addition of some higher profit furniture, but a focus on mid- to low-priced furniture
- Diversity in the style of furniture produced.
- Designs made up of parts that maximized the efficient use of machines for making and joining parts
- The strategic use of hand ornamentation techniques to change the price-point of the furniture

Innovation and furniture design

This study has primarily focused on the direct effect of new methods of production and new business organizations on furniture design. An interesting corollary was the indirect effect of mechanization on furniture design. As the impact of mechanization permeated the culture of late nineteenth century America, the machine became an aesthetic fetish, a symbol of progress, popularized by grand exhibitions such as the Centennial Exhibition in Philadelphia, and various mechanic fairs in New York and other cities.¹⁹⁰ Decorative arts objects including everything from silver to lighting and furniture adopted the machine aesthetic, whether manufactured by hand or by machine. Furniture was made with many layers of crisp ornamentation including turnings reminiscent of shafts and gears and geometric elements that resembled the intertwined parts of a machine. The action of the machine became an obsession as well. John Hewitt created "Press Beds" for clients, a pre-cursor to Murphy beds that folded up into furniture.

¹⁹⁰ John F. Kasson, *Civilizing the machine: Technology and republican values in America, 1776-1900*. (New York, NY: Grossman Publishers, 1976), 137-180.

Innovation in production techniques and business methods was an important characteristic of almost all of the furniture companies discussed. The prevalent use of patents is an indicator of the innovative character of the leaders of these organizations. John Hewitt, John Henry Belter, Henry Seymour, and Michael Thonet secured patents for their furniture. Eli Terry also patented his clocks. There was a spike in the number of patents for convertible and mechanical furniture at mid-century.¹⁹¹ Many of the patentees introduced utility and stylistic change through their patented furniture. The furniture of George Hunzinger, for example, embraced the idea of interchangeable parts; its form can arguably be said to have been inspired by the cogs and gears of the machine.¹⁹²

Hunzinger was among the makers that used patents as a marketing tool. Patents are by definition innovations and his application of patent markings in prevalent places on his furniture implies that at least some of the consumers in the nineteenth century, while still looking backwards in terms of revivalist styles, were beginning to seek novelty in their furniture.¹⁹³

It is intriguing to see Hunzinger chairs in the foreground of the image of Berkey & Gay's show room (Figure 70 on page 89). The inclusion of the chairs suggests Berkey & Gay were both manufacturers and distributors, and that the company believed the aesthetic of Hunzinger furniture complimented their own complex, multi-layered furniture. Julius Berkey's own innovative nature is evidenced by his several patents for furniture hardware including braces, hinges and locking mechanisms, as well as patents

¹⁹¹ Giedion, Sigfried, *Mechanization Takes Command : A Contribution to Anonymous History* (New York, NY: Norton, 1975), 394.

¹⁹² Harwood, *The Furniture of George Hunzinger*, 97.

¹⁹³ *Ibid.*, 27.

for making wooden bicycle wheels and a parlor game.¹⁹⁴ The willingness to innovate was a character trait of these makers that influenced the style of the furniture they produced.



Figure 71 Belter Suite,
Schwartz, *The Furniture of John Henry Belter and the Rococo Revival*



Figure 72 (Left) Settee, George Hunzinger, 1876
The Metropolitan Museum of Art, New York 1992.269
(Center) Side chair, George Hunzinger, 1876
The Chrysler Museum, 71.2292a
(Right) Armchair, George Hunzinger, 1876
The Chrysler Museum, 71.229d

Hunzinger produced a suite of furniture from interchangeable parts shown in using the same strategy as Belter's suite of furniture (Figure 71 & 72). Hunzinger's set included a settee, armchair, and side chair where the central section of the settee is

¹⁹⁴ Julius Berkey, *Bolt*. US Patent No. 442,941, December 16, 1890.
Julius Berkey, *Friction-Hinge*. US Patent No. 413,891, October 29, 1889.
Julius Berkey, *Brace or Stay for Furniture*. US Patent No. 454,705, June 23, 1891.
Julius Berkey, *Design for a Hook*. US Patent No. 24,539, August 13, 1895.
Julius Berkey, *Caster*. US Patent No. 524,977, October 29, 1895.
Julius Berkey, *Wooden Rim for Wheels*. US Patent No. 558,470, April 21, 1896.
Julius Berkey, *Game*. US Patent No. 675,807, June 4, 1901.

repeated alone as the side chair, and with arms to create an armchair.¹⁹⁵ Hunzinger was likely inspired by the interchangeable parts of a fellow German cabinetmaker, Thonet, who had opened a retail store in New York, as well as the molded furniture strategy of John Henry Belter. Hunzinger also kept some of his pieces in production for extended periods of time, in his case to take advantage of his patent protections. Whereas Belter used carving to create variations within the furniture that kept it fresh in the marketplace, Hunzinger varied the details on the parts of his chairs, while keeping the overall form. He also offered his chairs in a variety of finishes and grades of upholstery to offer a range of price points to the customer.¹⁹⁶

Conclusions

There was money to be made in the increased demand for affordable goods driven by population growth, increased wealth, the availability of new markets, and the introduction of obsolescence in furniture style and form by catalogs and department stores.¹⁹⁷ Furniture makers that wanted to tap into the market had to sell more pieces, because profitability per piece on affordable furniture was much lower than luxury furniture. As shown by the financial difficulties of John Hewitt, the traditionally organized hand-technology shops of the late eighteenth and early nineteenth century

¹⁹⁵ Harwood, *The Furniture of George Hunzinger*, 100-101.

¹⁹⁶ *Ibid.*, 27, 51

¹⁹⁷ Wilson H. Faude, "They Don't make it any More" in *Victorian Furniture : Essays from a Victorian Society Autumn Symposium*, ed. Kenneth Ames (Philadelphia, PA: Victorian Society in America, 1983), 35-42.

Faude's essay explores the role of commercialism as a major factor in the development of all the decorative arts in the United States during the nineteenth century.
Katherine Grier, "Imagining the Parlor, 1830-1880," 207-210.

could not successfully increase the scale of their production using existing techniques and business organization.

However, innovative techniques alone were not enough. High volume furniture production required the integration of design with new production methods, ways of organizing labor, forms of retailing, and methods of marketing to a wide audience. Once an operation was in place the business and production methods needed to be flexible enough to produce furniture that could vary in appearance and price points to adjust to changing demand.

Factories accelerated the division of labor and created specialization among workers that included wood turners, ornamental painters, carvers, and joiners that assembled the furniture.¹⁹⁸ Factory made furniture was no longer made start-to-finish by one cabinetmaker, but increasingly assembled from pre-made, interchangeable parts by a series of specialized workers. Legs, rails, stretchers, spindles, table tops, and seats were stockpiled to efficiently and quickly assemble large orders. Unlike custom cabinetmakers, whose orders might take months to complete, these new manufacturers had in their showrooms a wide variety of furniture that could be assembled and shipped in large quantities in a matter of days.

As was shown in the catalog of Mitchell and Rammelsberg, the more ornate and expensive the furniture became, the more hand-work was incorporated into the production. In 1872 the British and American wood working machine maker J. Richards acknowledged that most carving in both England and America continued to be done by

¹⁹⁸ Darling, *Chicago Furniture*, 10.

hand and that carving machines gave "no great promise of a gain in the future."¹⁹⁹

Although a mechanical carving machine was used by Schrenkeisen in New York, *Scientific American* commented in 1880 that they "found it more economical in practice to do a large proportion of the carving by hand, rather than fit up the knives and patterns for the machine for all the new and elaborate designs in carving which are always being introduced."²⁰⁰ The Schrenkeisen operation retained thirty to forty "expert" hands regularly employed to produce original designs. The high degree of flexibility in the skill of these carvers was important to maintain as part of factory production.

John Henry Belter used new methods of production to offset the strategic application of costly hand-ornamentation. Belter's production methods freed him to provide highly ornamental furniture that otherwise would have been extremely expensive to make using traditional solid-wood techniques. It can be argued that Hitchcock and Alling added more ornamental painting to their chairs to create more expensive versions of their basic forms.

An analysis of the appearance and construction methods of the furniture produced by these makers shows the relationship between design and business organization. To add variety to the basic forms, furniture was designed with less-expensive veneers in place of solid wood, and the limited use of expensive hand-ornamentation.. The strategic application of veneer and hand-ornamentation was typically used to adjust the selling price of the furniture and to create the variety needed to appeal to a wide market of

¹⁹⁹ Richards, *A Treatise on the Construction and Operation of Wood-Working Machines*, 44.

²⁰⁰ American Industries, No. 37. "The Manufacture of Parlor Furniture", *Scientific American*, October 9, 1880, 229.

A full description of their operation appears in the Appendix on page 143.

commercial and retail customers. The application of a vocabulary of ornamentation to a limited number of furniture forms became a hallmark of factory methods in furniture production. Whether done through stenciling, carving -- or later through the assembly of pre-made ornamental elements -- ornamentation became more independent of form in furniture design.

The design of factory-produced furniture changed in conjunction with the new forms of business and labor organization. The visual composition of the furniture was often fractured because it was built up of layers of ornamentation that were not as integrated into the whole as they were in hand-crafted furniture. Although curvaceous ornamentation continued in factory-made furniture, overall, the appearance of this furniture began to reflect the capability of the machines to produce more planar and geometric forms that relied on surface ornamentation for its style rather than the underlying form of the furniture.

Contemporary historians have called for a multi-disciplinary context for understanding developments in nineteenth century furniture design that considers business structure, construction, function, costs, and technology.²⁰¹ This investigation shows that mechanized production had both a direct and indirect influence on furniture design, but was only one of several interrelated organizational and production practices that developed in the furniture industry during the nineteenth-century. Design, production techniques, retailing, and transportation were all elements that were used by

²⁰¹ Ettema, "Technological Innovation and Design Economics in Furniture Manufacture," 198; Jonathan Prown and Katherine Hemple Prown, "The Quiet Canon: Tradition and Exclusion in American Furniture Scholarship," *American Furniture 2002* (2002), 209; Cooke, "The study of American Furniture," 113-120.

manufacturers to transform a large sector of the furniture trade during this period from eighteenth-century craft to nineteenth-century industry.²⁰²

To say there was a path from hand techniques to machine production would imply an overly deterministic, and narrow view of technological change.²⁰³ There was a flowering of multiple business models and scales of production that at the root retained elements of hand-techniques and skills, but combined them with cost-savings techniques to produce furniture that could be sold at a wide distribution of price points.

Small furniture-making firms continue to respond to changes in demand by maintaining flexible production methods that can produce different furniture designs.²⁰⁴ Although the technology of furniture making has continued to evolve, on the whole, the distribution of shop sizes and shop organization in the industry remains remarkably similar in the twenty-first century to its predecessors around 1880. In 2009 more than eighty percent of shops had fewer than twenty employees, but these small shops only employed twenty percent of all furniture manufacturing employees. Most combine machine assisted production with hand techniques.²⁰⁵

The Thonet Company may have been the only company to mass produce furniture in the nineteenth century. The fluctuation in demand created by stylistic change and the insistence of variety by the consumer delayed the mass-production of furniture until the

²⁰² Catalano, "Cabinetmaking in Philadelphia," 91.

²⁰³ Scranton, *Endless Novelty*, 7.

²⁰⁴ Piore and Sabel, *The Second Industrial Divide: Possibilities for Prosperity*, 27.

²⁰⁵ See charts based on the 2009 Furniture Industry Data on page 148-149 and the 1889 Personnel Survey of Berkey & Gay on page 145-146

late twentieth-century.²⁰⁶ The combination of profit motive, as well as the sacrifice of individuality to low price furniture, finally led to mass-production in the product lines of global producers. The result has been low-cost furniture of good, if not durable, quality. The furniture is designed for the plain, flat surfaces of machine production and minimizes ornamentation. Because consumers cannot develop and sustain an emotional attachment with this mass-produced, low-quality furniture much of it quickly ends up in landfills. The environmental impact compounded by the needless consumption of energy and natural resources to replace it.²⁰⁷

Americans still form lasting relationships with furniture that speaks to them, whether new or old, passed down through the family or bought at a thrift store, made by machine or made by hand, valuable or inexpensive. Our relationship with this furniture is maintained by the individuality of its ornamentation and the ability of the furniture to patina in attractive ways. We trace our memories in the bumps and curves of ornament, the dents and scratches of use. A relationship, whether to another person, or to an object, requires reciprocation. The mass produced furniture in production holds none of our stories, it has nothing to give back and so it is painless to let it go when it becomes broken or inconvenient to keep. An understanding of the methods of the high-volume furniture makers of the nineteenth century: their ability to produce durable furniture, at a variety of costs, that remained desirable as decorative object; and, a signifier of status has important implications for the continued globalization of the consumer economy.

²⁰⁶ Hounshell, *From the American System to Mass Production*, 12.

²⁰⁷ Jonathan Chapman, *Emotionally Durable Design*. (Sterling, VA: Earthscan, 2005), 62.

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Appendices

Cashbook of John Hewitt

Transcription of cashbook entry for roughly one year's work done by journeyman Thomas Constantine in John Hewitt's shop.

1812-1813 entries for work done by Thomas Constantine		
14-Feb	Making 2 pair card tables solid ?	38.8950
19-Feb	Making a 4 foot dining table	3.7400
20-Mar	making coffin for Mr. Laclan	2.0000
20-Mar	making a sideboard of elliptic center and card draws	35.9150
17-Apr	Making 1 french sideboard	40.0000
1-May	Making 1 pair breakfast tables needed legs	12.5800
16-		
May	Making 1 coffin for Mr. Dealing	2.0000
30-		
May	Making 1 french sideboard	40.0000
18-Jun	Making 1 french sideboard	40.0000
1-Jul	Work at ? Chest	0.6250
7-Jul	making 1 pair card tables	21.1350
20-Jul	making 1 pair card tables	21.1350
20-Aug	making 2 clock cases	26.2000
	1 small glass case for Mr. Desston	0.3125
2-Sep	2 hours work for Mr. Nandle	0.2500
15-Sep	Making of Moddals? For Mr. Quinney	3.0000
	Making 2 pair card tables- 1 Drolling? Table \$19.44 and 1	
29-Sep	Devincer? \$21.135	40.5750
	Making 1 D? case	2.5000
7-Oct	Making a gun case	3.0000
24-Oct	Making a secretary bureau for J. Cornell	10.0000
3-Nov	Making 1 pair card tables solid top	19.4400
5-Nov	Making a stand for wine bank	1.5000
12-Nov	making 2.3 ft breakfast tables needed legs	12.5800
17-Nov	making a torch? for M. Henerson	2.5000
17-Nov	repairing for sep? R. Henerson	1.0000
	repairing a brush	
	making a tray stand	1.0000
5-Dec	making 2 Breakfast tables needed legs	12.5800
17-Dec	making 1 set of 4 ft 6 dining tables legs	17.4250
18-Dec	making 1 counting house desk and boxes	29.7300
20-Dec	Making 1 pair glass doors for Higgins	4.2000
10-Feb	making 6 3 ft 6 dining tables	19.2500

18-Feb	making a protractor for Mr. Bundle	0.3750
19-Feb	Making 1 sett 4 ft dinign tables need legs	15.2900
11-		
Mar?	repairing mahogany chair for Bruen	0.5000
	make a case for watch	1.2500
17-		
Mar?	making 2 patters for Mr. Boyase	0.7500
18-		
Mar?	Making 20 pieces for Mr. bliant	0.5000
24-		
Mar?	Making a french sideboard	46.3400
3-Apr	making a sett 4 ft dining tables plaing	12.0000
		541.8925

Figure 73 Manuscript Group 84, John Hewitt Cabinetmaker Records, The New Jersey Historical Society

For M. John King	
Richmond, Virginia	
1	Sideboard with bottle drawer and back board 75
	Sett 4 ft dining table and legs to be need and to have
1	casters 50
1	Pillar and claw breakfast table 35
1	pair card tables 43
1	Candle stand 5
1	Square bason stand 4
1	Secretary and bookcase (Like L) \$87.50
	to have door No 12. (extra charge)
1	field bedstead 13

high post bedstead all the parts maho'y and between joints carved with drapery and to have cornice to be gilt and light blue ? This bill to be extra and to be ready by the first Nov'r or if ready before to drop Mr. John King a line to Richmand Virginia. For cash ? 2

1	1/4 percent for an acceptance 1 per cent.	33
		258
		95
		353

Figure 74 Order for Richmond Virginia, Manuscript Group 84, John Hewitt Cabinetmaker Records

Size of wardrobe French

6 feet between doors 4 ft 7 wide outside 2 ft end, deep, 7 inches

Inside and pediment 7 feet turned part 2 ½ stiles

Plan of a pillar and claw breakfast table. Lenth [sic] 3 feet, Bed? 2 feet, leaves 1 foot, block 2 inches thick, 46 ½ wide, rail 4 ½ deep and framed out to blocks. Drawers cock beaded and bead over and nail with break, blocks carved, pillar 1 ft 4 long and 4 1.2 square for claw

Pillar 4 ½ square to be turned all up and to have a Snose? Plate, sweep of leave 6 ½. Grain end and double elliptic, plan of claw 1 ¼ square at bottom, 2 in thick at top 2 ¾ across the claw at top, claw to rise 10 ½ and project 13 ½ x 4 ½ the wooo?, plan of pillar to be under?

[below is drawing of profile]

Plan card table pillar and claw

Pillar 19 ½ long & 4 in Square, clasws the same as breakft table, join nail as under 3 pieces 4 inches thick and 2 skew braces and 1 on top. Joint nail 3 ½ deep and formed as under.

[followed by drawing.]

A sideboard for Dr.? Clark 6 ft 4

3 ft 9 high 2 ft 4 wide on top to have bedstead on centre 3 ft 4 wide and 1 ft 4 from floor? To top of bedstead. Feet of sideboard 8 inches high to framing. To have sides in each end for bason on stand.

[followed by elevation of sideboard, and plan and elevation of bason stand, crossed out possibly to indicate delivery]

A counting house counting desk for Mr Marquand

6 ft long 4 ft 9 wide 1 ft 10 over

The falls 3 ft 5 high frame, inside as customary – look at Bacions? Desk for falls, from Mapple? With leaves. Falls 2 ft ½ wide.

[annotated drawing follows]

2 Sideboards for Mr. Stannard? Of the Firm of Yeley and Stannard No 103 Trant St city?

4 ft 2 ½ long on top

21 ½ wide on frame

To have a back board to suit

To have nob handles

To be done as son as possible say 3 wwkes from June 10th 1811

Price \$40 each or about.

[followed by plan drawing]

Inventory of a shipmen t to mr. John King of Richmand Virginia. Image in camera

Inventory of logs sent to be sqwn by Joseph Meeks into veneer, image in camera

Second inventory of logs sent to Mr. Dean's mill at Springfield. 13 logs mahogany May 7th 1812

Order with Linus Condit, Turner

Manuscript Group 309, David Alling (1773-1855), Chair Maker Records, The New Jersey Historical Society, Newark, NJ, 1803-1857).

1801 aug 6			
08/06/1801	200	sets posts	10.0.0
29-Aug	400	sets posts	20.0.0
29-Aug	1200	arm chair cum & square & oval spindles	7.4.0
8-Sep	1850	plain rounds	6.9.0
30-Sep	2900	plain rounds	10.6.6
30-Sep	800	pround benders	3.4.0
30-Sep	1200	flat benders	9.12.0
		total	66.16.0

Inventory of Isaac Alling's property on his death in 1855

Manuscript Group 309, David Alling (1773-1855), Chair Maker Records, The New Jersey Historical Society, Newark, NJ, 1803-1857).

Line	Description	Value
1	doz oak office chairs with 3 coats of varnish	23.00
2	1 doz do do do	23.00
3	2 7/12 doz do do do	62.00
4	1 doz do do do	23.00
5	1/2 doz office walnut finished at \$21/doz	10.50
6	1 1/12 doz Oak office weavery backs 27/doz	29.25
7	11/12 doz office walnut chairs 28/doz	25.67
8	2 doz Bannister Backs cane seat 23/doz	46.00
9	3 1/2 doz common cottage rosewood 13/doz	45.50
10	1 doz light wlanut in the wood	22.00
11	1 doz light single corrk in the wood	21.00
12	1 doz maple light in the sood	16.00
13	1 doz oak office in the wood	22.00
14	2 doz maple in the wood	38.00
15	1 doz oak light single corrk in the wood	18.00
16	1 doz do do without seats	9.00
17	2 large rocking chairs	5.00
18	3 large stools	1.88

Line	Description	Value
19	2 2/12 doz medium rise do	13.00
20	4 smal do do	1.50
21	36 sticking Horses for Sadlers use	90.00
22	1 1/3 doz oak office chairs	36.00
23	10/12 doz double top rosewood	20.00
24	3 doz common cottage rosewood	45.00
25	1 doz rosewood bannister backs	23.00
26	1 doz oak doo do	23.00
27	2 doz do do do	46.00
28	1 1/3 doz rosewood cane seat	30.00
29	1 doz bannister backs	23.00
30	1 doz oak cane seats	24.00
	Subtotal page 1	815.30
31	4 oak cane seat sewing chairs	7.66
32	3 rosewood do do	5.75
33	10/12 doz rosewood cottage rush seat	20.00
34	8/12 doz walnut rush seat	16.00
35	2/12 doz rosewood tea chairs	4.00
36	2 large rockign chairs #3.25	6.50
37	2 smal do do 18	4.50
38	11/12 doz assorted cottage chairs 12/	16.50
39	4/12 doz walnut grecian	6.50
40	1/3 doz office chairs assorted to 16	8.00
41	1 doz walnut grecian on the beam	10.00
42	11/12 doz windsor chairs in the wood 4 each	5.50
43	1 settee bedstead in the wood	4.00
44	1/2 doz windsor chairs in the wood 5 each	3.75
45	7 doz oak office chairs in the wood 23/doz	161.00
1	lot of demijohns and varnish in the house garret	3.00
2	lot of sundries on the beam in do	1.00
3	lot of sundries do do	2.00
4	1 carboy for holding aquafortis	1.00
5	lot of demijohns for varnish and kets	4.00
6	lot of spindles assorted	0.50
7	lot of stuff	0.75
8	lot of posts	1.50
9	lot of backs	0.75
10	lot of posts	0.75
11	lot o backs	0.50
12	lot of stuff for charis	3.00

Line	Description	Value
13	lot of pots	1.50
14	lot of short pots	0.38
15	lot of pots	2.00
16	lot of posts	1.25
17	lot of posts	0.50
18	lot of mat pieces	0.40
	Total	1119.74
19	Lot of front posts and rounds	1.75
20	lot of backs	1.75
21	lot of back post and front posts and spindles	4.50
22	lot of long post	0.88
23	lot of posts and back post assorted	1.00
24	lot of mouldings	1.00
25	lot of rockers and scrolls	0.75
26	lot of spindles in 2 boxes in garrett	0.50
27	lot of oak stuff spindles and post	6.00
28	lot of spindles in barrel	0.75
29	lot of post assorted	1.25
30	lot of rounds for chairs	1.00
31	lot of post assorted	1.25
32	lot of stuff	1.00
33	lot of stuff	1.50
34	lot of long and short post	1.75
35	lot of short post in rack	0.50
36	lot of backs in rack	1.50
37	lot of do do	0.75
38	lot of front post	0.50
39	lot of do do	0.50
40	lot of post	0.50
41	lot of do do	0.50
42	lot of small back post	0.50
43	lot of do do	0.50
44	lot of do do	0.50
45	lot of do do	0.50
46	lot of tops	0.50
47	lot of do do	0.25
48	lot of long post	5.00
49	lot of short post in rack	2.00
50	lot of mat pieces for chairs	1.00
51	Lot of scrolls for chairs	0.50

Line	Description	Value
	[Subtotal page 3]	1162.37
52	Lot of arms for chairs	0.50
53	lot of arms sawed stuff	0.75
54	lot of short post	0.50
55	lot of front rounds	1.00
56	lot of short post	1.00
57	lot of scrolls	3.00
58	lot of mat pieces	0.50
59	lot of long square post	0.50
60	2 tables in ornamental room	1.00
61	lot varnish cans in paint shop	1.50
62	lot paint cups on the shelves	1.00
63	1 keg of belleville white lead	2.12
64	contents on the bench	3.00
65	paint brushes and kegs under bench	0.75
66	closets and contents	1.00
67	1 large wheel for lathe	2.00
68	2 benches and contents	0.75
69	lot of old chairs that have been repaired in front shop	50.00
70	12 old chairs to be repaired in past	3.00
71	7 chairs	3.50
72	24 old chairs belonging to estate	9.00
73	7 chairs assorted	5.25
74	1 cilender stove and pipe and drum complete	5.00
75	1 writing desk in shop	1.00
76	lot augers and planers and wedges on bench	2.50
77	vice bench and drawe3rs	1.25
78	lot of patterns on floor	1.00
79	1 high candle stand	0.38
80	1 broad ax for chopping block	1.00
81	3 saws	1.00
82	Lot of drawing knives	0.75
83	2 adse for cutting out the seats for windsor chairs	1.50
84	Lot of sundries	1.00
	[Subtotal page 4]	1270.37
85	Brace and beril	1.50
86	Bitts sundries	1.75
87	glue pot	0.50
88	3 flammers	1.00
89	19 cane seats for chairs new	5.25

Line	Description	Value
90	lot of seats assorted	2.50
91	lot of slats and tops for chairs	0.50
92	lot of spindles	1.50
93	lot of rounds for chairs	0.75
94	1 sett of black walnut stuff and seats included for chairs	7.50
95	lot of spindles for chairs	2.00
96	lathe and chucks and bands	11.00
97	1 bench with wooden vice	7.00
98	1 do do do do	6.00
99	1 do do do do	5.00
100	1 long bench were lathe stands	2.00
101	10 barrels in cellar 4 each	5.00
102	lot of old chairs	1.00
103	1 barrel of whiting in cellar	1.00
104	1 carboy for holding aquafortis	1.00
105	1 large stove	0.75
106	balance of stuff inc ellar	1.00
107	lot of wooden screws in back shop	3.50
108	1 large screw in do do	1.00
109	1 drawing shaving horse	0.75
110	4 framing benches at 6	3.00
111	1 bench with vice	1.50
112	lot of seats with without cane	1.00
113	sundries in back shop	0.50
114	73 old chairs in back shop at 3 each	27.38
115	lot of screws & arms & legs	1.00
116	lot of backs upstairs in back shop	3.25
117	70 walnut tops at 3 each	2.10
	[subtotal page 5]	1380.85
118	Lot of cane seats	3.50
119	96 oak tops for chairs at 3 cts each	2.88
120	33 office tops for chairs at 7 each	2.31
121	lot of rails for chairs	1.00
122	lot of stuff assorted	0.50
123	lot of spindles including post	3.25
124	lot of old post	0.75
125	lot of spindles including post	1.00
126	lot of backs and front post odd stuff	1.00
127	140 walnut tops at 4 cts	5.60
128	55 cottage tops at 3 cts	1.65

Line	Description	Value
129	330 walnut & maple post	1.75
130	45 office tops at 3 cts	1.35
131	58 good and 19 poor banisters	0.75
132	lot of spindles	1.50
133	lot of tops for rocking chairs	0.40
134	100 walnut arms	1.50
135	52 do do	0.75
136	lot of maple arms	0.60
137	45 oak tops at 3 cts	1.35
138	lot of oak tops for children's chairs	1.00
139	lot of arms	0.75
140	lot of backs	0.25
141	lot of slats and tops for chairs	1.00
142	lot of spindles and legs	0.50
143	lot of post	3.00
144	lot of spindles	1.50
145	145 oak tops at 7 cts in back shop upstairs	10.15
146	1 varnish can	2.00
147	1 grindstone under shed	1.50
148	lot of pin plank under shed	4.00
149	lot of walnut and maple in barn at 2 1/2 cts per foot	
150	lot of maple in barn at 2 1/2 per foot	
	[Subtotal page 6]	1440.09
151	1 bench in barn	2.00
152	180 bundles of flagg at 4 per bundle	90.00
153	1 cutting box in barn	1.00
154	lot of loose boards in barn	2.00
155	1 cord of wood in yard	5.50
156	1 common spring waggon	20.00
157	1 light one seat carriage	15.00
158	lot of manure in yard	4.00
159	1 framing bench in shed	0.50
160	1 lot of veneers? Veneers? In shed for chairs	25.00
161	1 maple plank	1.25
162	lot of black walnut plant at 5 cts per foot	30.25
163	lot do do do at 4 1/2 cts per foot	14.71
164	lot of hickory timber in shed	7.00
165	lot of stuff in pieces in wood house walnut and maple	3.00
166	lot of stuff on shelves in wood house	1.50
167	lot of oak plank 4 cts per foot in do	38.56

Line	Description	Value
168	lot of maple plank 2 1/2 cts per foot do	
169	lot of cherry plank 2 1/2 cts per foot do	
170	lot of curled maple 2 1/2 cts per foot do	
171	lot of whitewood plank 2 cts upstairs in wood house	21.35
172	lot of maple do 2 1/2 cts do do	
173	lot of black walnut at 4 cts do do	11.56
174	lot of maple do 2 cts do	4.00
175	lot of birds eye veneers 1 1/2 cts per foot	5.38
176	1.2 seat top carriage in waggon house	4.00
177	lott of doors and window frames in carriage house	5.00
178	lot of curb stones in alley	5.00
	stock lumber tools etc.	1793.65

From the account books at the New Jersey Historical Society, MG 109

Summary of work stations in the 1855 inventory

Manuscript Group 309, David Alling (1773-1855), Chair Maker Records, The New Jersey Historical Society, Newark, NJ, 1803-1857).

Line	Description	Quantity	Assumed use
68	2 benches and contents	2	General use
77	vice bench and drawe3rs	1	Framing
97	1 bench with wooden vice	1	Framing
98	1 do do do do	1	Framing
99	1 do do do do	1	Framing
100	1 long bench were lathe stands	1	Turning
109	1 drawing shaving horse	1	Carving slats
110	4 framing benches at 6	4	Framing
111	1 bench with vice	1	Framing
151	1 bench in barn	1	Dressing lumber
	Total	14	
60	2 tables in ornamental room	2	Ornamenting
75	1 writing desk in shop	1	Account keeping
159	1 framing bench in shed	1	Inactive / in storage

Entries in Alling's daybook to Moses Lyon, ornamental painter

Manuscript Group 309, David Alling (1773-1855), Chair Maker Records, The New Jersey Historical Society, Newark, NJ, 1803-1857).

Moses Lyon
with David Alling since April 1. 1815

1815		Rate	\$
April- 11	By Gilding and Bronzing 14 Ball backs (2 stools gratis)	10	17.5
April- 11	" gild 2 Cornius (Mrs Gobbler)	12	3
	" gild 2 D/o D/o	2	0.5
	" Ornamenting 14 Brn Plain spindles	1	1.75
April- 11	" D/o 26 Cane Col d/o	1	3.25
April- 11	" 14 drab orjan spindles	1/6	2.625
May- 11	" 8 Brown d/o	6-Jan	1.5
"	" 2 small coquelico Chg	2	0.5
"	" 8 table feet (Cross)	2	2
May- 11	" 12 Ball back bamboo	2	3
May- 11	" 3 Pine Apples (I. Allen)	6	2.25
May- 11	" 12 Ball back bamboo	2	3
June- 11	" 12 Bronzed ball backs	10	15
	" Gilding spear for (Cross)	2	0.25
	" Silvering d/o (Cross)	2	0.25
	" Sett of Green Bed Cornius (I allen) for ?		2
	" D/o D/o (Oak Wreaths) (I allen)		3
	" 2 Pine Apples (I allen)	6	1.5
	" 12 Bamboo	1	1.5
	" 8 common Broad tops	1	1
	" 2 d/o d/o arms	1	0.25
			65.625

Figure 75 Payments to Moses Lyon for gilding and painting of furniture and furniture parts

David Alling, Ledger, 1803-1851, selected entries to Jotham

Manuscript Group 309, David Alling (1773-1855), Chair Maker Records, The New Jersey Historical Society, Newark, NJ, 1803-1857).

[Selected payments to Jotham from the ledger 1803-1851]		
Date	Year	Jotham Ds [debits]

[Selected payments to Jotham from the ledger 1803-1851]					
Date	Year	Jotham Ds [debits]			
10-Feb	1803	Due on Settlement	0	3	2
22-Jun		painting and varnishing a chair body	1	2	0
26-Jun		one & three quarters of a day painting	0	14	11
5-Jul		one day painting @ half a day 4/3	0	12	9
9-Jul		2 lb white lead 2/10 p 30 painting portico	0	0	10
9-Jul		painting blinds for vive Windsors green 12/	3	40	0
10-Jan	1804	turning 2 pillars for chimney piece	0	5	0
20-Mar		painting a case to put hats in for Mr. Halsey	0	10	0
20-Mar		100 nails for fence	3	6	8
25-Mar		turning a pillar for sign 4/ cash by I clark	0	16	6
24-May		one day painting # one day Do	0	15	0
25-May		three quarter Do three 5/3 three quarter do 6/	0	11	3
4-Jun		two days Do 15/ two days Do 15/	1	10	0
6-Jun		one day Do 8/ two days Do 15/	1	3	0
9-Jun		two days Do 15/ two days Do 15/	1	10	0
9-Jun		half a day Do 4/ black Jappan 5/	0	9	0
9-Jun		black & Nutman Marveling 5/	0	5	0
10-Jun		one day Do /20 to painting two large windsor blinds for church 20/	2	8	0
3-Jul		painting blinds for two windsors	1	4	0
		to painting pieces for Milk room	0	5	0
30-Jan	1805	To turning a clay roler	0	1	6
10-Feb		turning a clay roler	0	1	6
13-Mar		turning two sets field beadstead posts	1	0	0
10-May		one set long posts Do	0	12	0
		turning pieces for Same	0	1	6
20-May		turning three piazza posts for Green	0	18	0
20-Jun		Turning 4 chisel handles	0	2	0
25-Jun		turning 4 columns for parsonage	2	8	0
4-Jul		turning 4 piazza posts	1	12	0
5-Aug		turning 10 flair posts	1	5	0
5-Aug		turning a set long beadstead posts	0	12	0
15-Sep		turning one set field posts	0	10	0
15-Sep		Do two columns for chimney piece for Pennington	0	8	0
10-Nov		4 rollers for trundle bed	0	2	0
12-Dec		3 sets short beadstead posts	0	9	0
	1806	gilding a large frame for Doctor Hays	0	16	0
10-Jan		turning two clay rollers	0	3	0

[Selected payments to Jotham from the ledger 1803-1851]					
Date	Year	Jotham Ds [debits]			
12-Feb		turning two clay rollers	0	3	0
20-Feb		turning two wheel barrow shafts	0	2	0
25-Feb		turning roller for clay by I alling	0	1	6
15-Mar		turning a set field bedstead posts	0	10	0
20-Mar		turning a set rollers for trundle	0	2	0
10-Apr		turning two columns for chimney piece for J. Pennington	0	8	0
25-Apr		turning 1 1/2 dozen buttons for W. Wallace	0	2	0
20-Sep		turning three sets cone bedstead posts by Barney	0	9	0
5-Oct		to turning 3 sets field bedstead posts by Barny @ 10	1	10	0
		[page total]	34	16	1
5-Oct	1806	turning two pillars & balls for runnels sign	0	12	0
5-Oct		turning two pillars and bolls for woodruff sign	0	12	0
10-Oct		turning a set rollers for trundle	0	2	0
6-Jan	1807	turning 3 sets low bedstead posts	0	9	0
20-Jan		turning two clay rollers posts	0	3	0
25-Apr		turning four sets short bedstead	0	12	0
25-Apr		turning a set field posts for J Gill	0	10	0
25-Apr		turning two sets chimney piece pillars for I. Woodruff	0	16	0
6-Aug		turning sign Bolls and Gilding for Woodruff	2	8	0
18-Sep		three days painting	0	18	0
10-Sep		one bottle spirits turpentine	0	1	6
15-Sep		one pint and a half pints do by John King	0	1	2
18-Sep		one quart do	0	1	6
15-Oct		set filed beadstead posts by Isaac Tichenor	0	10	0
22-Dec		turning two bolls for I. Johnson & gilding	0	8	0
		an order given me on you by I Williams	2	8	0
15-Jan	1808	one pint oil	0	1	3
23-Feb		a note given for sixty days for 60 dollars for discount days	24	0	0
10-Apr		to cash on s of note given for 60	0	12	0
20-Jun		to cash paid for putting up the yard fence	12	0	0
18-Jul		to one quart spirits turpentine	0	2	0
6-Feb	1809	to one pint oil	0	1	3
		to one pint spirits turpentine	0	1	6
			44	13	8
		to amount from the other side	34	16	1

[Selected payments to Jotham from the ledger 1803-1851]						
Date	Year	Jotham Ds [debits]				
			79	9	9	
11-Jan	1812	by balance due at sett this day E. Excepted	18	0	11	
			£			
			97	10	8	

Figure 76 Transcription of payments to Jotham from David Alling's Ledger at the New Jersey Historical Society, MG 309

David Alling's shipping book, selected entries

Manuscript Group 309, David Alling (1773-1855), Chair Maker Records, The New Jersey Historical Society, Newark, NJ, 1803-1857).

1826

September 23rd

To the following chairs shipped on board the Schooner Agenord. M Beell Cpt. Bound for Norfolk as per bill of lading to be sold to net the prices annexed to each. Freight as per bill of lading 25 cent per bundle

1 dozen wide slat square seat rosewood no ball ft ports at 42.00

1 dozen " with ball feet 42.00

1 doze large

Etc.

10/7th savannah

Emperor

Includes 6 small chairs at \$1.00 and 1 dozen large Horn fret rosewood to be delivered to Mr. Dearing of Augusta who bought them here at \$3.00 he paying expenses. [image in camera]

10/19

America for New Orleans

59 bundles at 50 cents per bundle,

(over 100 chairs)

10/31

Lafayette for New Orleans this time to receive 5 percent commission

Moses Lyon complete account with David Alling, 1815-1817

Manuscript Group 309, David Alling (1773-1855), Chair Maker Records, The New Jersey Historical Society, Newark, NJ, 1803-1857).

Moses Lyon account with David Alling				
Date	Description/Contra	Rate	Credits	Debits
4/01/1815	With David Alling Since April 1 1815			

Moses Lyon account with David Alling				
Date	Description/Contra	Rate	Credits	Debits
4/01/1815	By Gilding and Bronzing 14 Ball backs (2 stools gratis)	10	17.5	
4/06/1815	" gild 2 Cornius (Cornucopias?)(Mrs Gobbler)	12	3	
4/06/1815	" gild 2 D/o D/o	2	0.5	
4/06/1815	" Ornamenting 14 Brn Plain spindles	1	1.75	
4/10/1815	" D/o 26 Cane Col d/o	1	3.25	
4/11/1815	" 14 drab organ spindles	1/6	2.625	
5/6/1815	" 8 Brown d/o	6-Jan	1.5	
5/6/1815	" 2 small coquelico Chg	2	0.5	
5/6/1815	" 8 table feet (Cross)	2	2	
5/16/1815	" 12 Ball back bamboo	2	3	
5/20/1815	" 3 Pine Apples (I. Allen)	6	2.25	
5/26/1815	" 12 Ball back bamboo	2	3	
6/3/1815	" 12 Bronzed ball backs	10	15	
6/3/1815	" Gilding spear for (Cross)	2	0.25	
6/3/1815	" Silvering d/o (Cross)	2	0.25	
6/3/1815	" Sett of Green Bed Cornius (I allen) for ?		2	
6/3/1815	" D/o D/o (Oak Wreaths) (I allen)		3	
6/3/1815	" 2 Pine Apples (I allen)	6	1.5	
6/3/1815	" 12 Bamboo	1	1.5	
6/3/1815	" 8 common Broad tops	1	1	
6/3/1815	" 2 d/o d/o arms	1	0.25	
6/3/1815	carried over		65.625	
04/15/1815	To cash seventeent 50/100 dollars			17.5
5/20/1815	to cash twelve dollars			12
5/26/1815	to cash seventeen dollars			17
6/3/1815	to cash twenty dollars			20
6/5/1815	to cash ten dollars			10
6/26/1815	to cash ten dollars			10
7/1/1815	to cash ten dollars			10
7/3/1815	to cash fifteen dollars			15
7/4/1815	to cash two dollars			2
7/14/1815	to cash eighteen dollars			18
7/14/1815	to painting lees chrs gold and bornze for do 11 at.91			12.375
7/14/1815	paintign 3 trunkds			0.875
7/14/1815	3 1/2 to paint at 2/3			0.98
7/14/1815	painting and fremans sign and water pan			0.375

Moses Lyon account with David Alling				
Date	Description/Contra	Rate	Credits	Debits
08/16/1815	cast ten 87/100 dollars			10.87
08/16/1815	cash three dollars			3
08/27/1815	cash fifteen dollars			15
08/27/1815				174.975
06/02/1815	2 satin wood sewing chairs		0.16	
06/02/1815	3 window cornices d.alling		1.125	
06/02/1815	4 bamboo		0.5	
06/02/1815	4 bamboo		0.5	
06/02/1815	pitcher and bowl for Doctor Lee		1	
06/02/1815	Green pitcher wishart		0.18	
06/02/1815	12 bamboo		1.5	
06/02/1815	12 satin wood flat backs		1	
06/02/1815	5 bamboo		0.63	
06/25/1815	10 bamboo		1.25	
	amount of work done for Jacob Allien from Sep			
06/25/1815	1813 to April 1 at 1815 to bill			16
	Amount of work done for A. Cross from Sep 1813			
06/25/1815	to A[pril 1 1815 to bill			8
06/30/1815	24 bamboo			3
07/03/1815	4 organ spindles drab		0.75	
07/05/1815	6 bamboo		0.75	
07/07/1815	13 bamboo		1.625	
07/08/1815	2 slat backs (grapes Nat col)		0.75	
7/08/1815	12 Bamboo		1.5	
7/10/1815	14 organs pindles		2.625	
7/14/1815	2 window cornices (I allen)		4	
7/14/1815	3 bed cornices (Ii allen)		4.5	
7/14/1815	gilding water fount, pitcher and bason dr. lee			1
7/14/1815				117.97
08/01/1815	Tipping 8 pl spindles			1
08/01/1815	Gilding 12 Nankeen slat backs			4.5
08/01/1815	Striping 12 satin wood			1
8/25/1815	2 ball backs bronzed			2.5
8/25/1815	2 window cornices (I allen)			4
8/25/1815	3 Bed Cornices (do)			4.5
9/1/1815	14 Cane col slat backs			3.5
9/1/1815	24 bamboo			3
9/7/1815	12 plain spindles			1.5

Moses Lyon account with David Alling				
Date	Description/Contra	Rate	Credits	Debits
9/7/1815	8 do drab		1	
9/7/1815	6 bamboo		0.75	
9/15/1815	24 bamboo		3	
9/15/1815	19 bamboo (gales)		2.375	
9/30/1815	12 plain spindles		1.5	
9/30/1815	8 slat backs bronzed (sanford)		5	
9/30/1815	6 do striped (do)		0.5	
10/1/1815	Setting Luer's sign		0.5	
10/1/1815	2 slat backs bronzed		1.25	
10/1/1815	2 pine apples gilt (I allen)		1	
10/1/1815	4 table feet bronzed (I allen)		1	
10/10/1815	2 rocking chairs gilt		0.75	
10/10/1815	4 do colours		1	
10/10/1815			163.095	
9/27/1815	To cash thirty five dollars			35
12/5/1815	To cash five dollars			5
12/5/1815	to cash ten dollars			10
12/5/1815	3 chairs common			3
12/5/1815	4 ball backs painting			1.5
12/5/1815	paint for rochnmans spind garnder and sanford so bowls			1
12/12/1815	6 books gold leaf			4.31
12/14/1815	cash ten dollars			10
12/20/1815	paid for wood 20			2.5
12/26/1815	cash two dollars			2
12/26/1815	2 chairs for chilton			4.25
12/26/1815	2 bamboo			4.25
12/26/1815				257.785
10/25/1815	2 tables striping (Cross)		0.5	
10/25/1815	2 wash stands do do		0.5	
10/29/1815	24 nankeen slats bronzed		15	
11/3/1815	16 plain sp: cane col		2	
11/3/1815	16 organ sp. Green		3	
11/3/1815	16 do brown		3	
11/12/1815	2 plain spindles		0.25	
11/12/1815	10 do		1.25	
11/18/1815	12 nankeen org spindles		2.25	
11/18/1815	8 cane col do		1.5	
11/25/1815	12 bronzed double corss (decatur)		9	

Moses Lyon account with David Alling				
Date	Description/Contra	Rate	Credits	Debits
11/25/1815	2 sofas bronzed do		8	
12/1/1815	8 green pl spindels		1	
12/1/1815	8 brown do		1	
12/1/1815	0 satin wood bronzed		5	
12/9/1815	16 organ spindles		3	
12/14/1815	24 plain spindles		3	
1/02/1816	16 plain spindles		2	
1/02/1816			224.345	
01/03/1816	By balance of old account in full		33.44	
01/03/1816	Balanced jan 3 1816		257.785	257.785
1/20/1816	To cash one dollar			1
1/30/1816	2 book gold leaf			15
1/30/1816	Cash fifteen dollars			1.625
2/3/1816	cash five dollars			5
2/8/1816	Twine			0.31
2/8/1816	1/2 pint turpentine			0.06
3/2/1816	cash ten dollars			10
3/16/1816	cash ten dollars			10
3/19/1816	3 Whtie lead			0.66
3/19/1816	1/2 pint linseed oil			0.08
3/27/1816	cash sixty dollars			60
4/4/1816	1 putty			0.15
4/4/1816	1/2 pint turpentine			0.06
4/4/1816	note at sixty days for seventy eight 16/100 dollars			78.16
4/6/1816	Cash two dollars			2
4/8/1816	cash two dollars			2
4/10/1816	cash fifteen dollars			15
4/11/1816	cash fifteen dollars			15
4/20/1816	25 1/2 lb lead colour paint			5.58
4/20/1816	cash 50/100 for correction of error			0.5
4/20/1816	Carried forward			222.185
1/8/1816	Ornamenting 15 plain spindles		2	
1/9/1816	" 8 plain spindles		1	
1/10/1816	" 6 plain spindles		0.75	
1/11/1816	" 16 Organ spindles		3	
1/12/1816	" 12 Bamaboo		1.5	
1/12/1816	" 12 Bamboo		1.5	
1/15/1816	" 12 Rocking Chairs		3	

Moses Lyon account with David Alling				
Date	Description/Contra	Rate	Credits	Debits
1/15/1816	" 6 Common seat piece		0.375	
1/16/1816	" Striping 1 slat back Sweg. Ch.		0.08	
1/17/1816	" gilding 3 Rocking Chairs		1.125	
1/19/1816	" Ornamenting 16 Windsors (Plain spindles)		2	
1/20/1816	"24 Windsors Pl sp.		3	
1/20/1816	" 6 Black commons		0.375	
1/20/1816	" 16 Windsors Pl Sp		2	
1/24/1816	" 8 Windsors Pl Sp		1	
1/29/1816	" gilding 8 green Cross Backs		3	
1/30/1816	" Ornamenting 24 Drab windsors		3	
1/31/1816	" 8 Drab windsors		1	
2/1/1816	" 8 Drab Windsors		1	
2/1/1816	" 6 Cane Colour Windsors		0.75	
2/1/1816	" 6 Windsors Bamaboo		0.75	
2/1/1816	" Bronzing 12 Slat Backs Green		7.5	
2/1/1816			39.705	
2/2/1816	Amount brot. Forward			222.185
2/2/1816	Amoutn brot forward		39.705	
2/2/1816	by tipping 24 Bamboo Ch		3	
2/3/1816	by tipping 24 Bamboo Ch		3	
2/5/1816	gilding 12 Green slat bakcs		4.5	
2/8/1816	tipping 12 high bamboo		1.5	
2/9/1816	bronzing 12 Nankeen stal backs		7.5	
2/9/1816	tippin 13 small bamboo		1.375	
2/10/1816	bronzing 12 satin wood slat backs		7.5	
2/10/1816	By caleb Durand Seven Dollars		7	
2/13/1816	Tipping 6 high windsors		0.75	
2/13/1816	" 5 windsor sewing ch		0.625	
2/14/1816	" 22 small windsors		1.375	
2/15/1816	bronzing 12 nankeen ball backs		13.5	
2/15/1816	tipping 8 drab windsors Fl: Sp:		1.5	
2/16/1816	lettering and Ornamenting Rommels Sign		2	
2/17/1816	tipping 8 drab windsors Fl: Sp:		1.5	
2/17/1816	" 24 Low windsors		2	
2/19/1816	" 8 Green Windsors O Sp.		1	
2/19/1816	" 8 Green Windsors O Sp.		1.5	
2/24/1816	" 12 Common seat pieces		0.75	
2/24/1816	" Bronzing 12 Nankeen Ball Backs		12	
2/24/1816	tipping 12 Green Org. Spindles		2.25	

Moses Lyon account with David Alling				
Date	Description/Contra	Rate	Credits	Debits
2/28/1816	8 Brown Windsor Fl. Sp.		1.5	
2/28/1816	[Page total]		117.33	
3/5/1816	Amt Brot. Forw			222.185
3/5/1816	Amount brouth up		117.33	
3/5/1816	bronzing 12 Green Ball Backs		13.5	
3/6/1816	Tipping 16 Drab organ spindles		3	
3/6/1816	" 6 Cane Rocking chs Stripe		0.75	
3/6/1816	" 3 Rocking Ch / Colours		0.75	
3/8/1816	" tipping 16 windosrs Fl Sp Grn		3	
3/8/1816	" 8 Organ Spindles (Rush)		1.5	
3/12/1816	" gilding 8 green Cross Backs		3	
3/12/1816	" Striping 10 Satin Wood Sewg Chrs		0.08	
3/13/1816	Lettering Mrs. Hedden's Sign		0.25	
3/15/1816	Tipping 8 Plain spindles Camelot		1	
3/15/1816	" plain spindels (Drab)		2	
3/19/1816	" 1 Settee Organ Spindles		1.125	
3/19/1816	" 12 Bamboo		1.5	
3/22/1816	" 12 Bamboo		1.5	
3/23/1816	Bronzing 1 Ball Back sofa		6.75	
3/28/1816	Tipping 12 High Bamboo		1.5	
3/28/1816	" 12 Small Bamboo		1.25	
3/30/1816	" 12 Bamboo		1.5	
4/2/1816	Bronzing 12 Slat Bakcs (Laylock Cane Seats)		6.75	
4/2/1816	tipping 12 Brn? Organ spindles		1.5	
4/2/1816	"" 12 Bamboo (Yello)		1.5	
4/2/1816	" 6 Commons (Black)		0.375	
4/3/1816	Striping 2 Satin Wood (Sewg Chr)		0.16	
4/3/1816	[Page total]		171.57	
4/3/1816	Amount brot forward			222.185
4/3/1816	Amount brought up		171.57	
4/3/1816	Tipping 3 Sewg. Chs. Colours		0.56	
4/3/1816	" 1 Do Small Chair		0.06	
4/6/1816	Bronzing 12 nankeen ball Backs		12.75	
4/10/1816	" 12 nankeen Slat bakcs		9	
4/11/1816	" 24 Green slat Backs		15	
4/11/1816	Tipping 16 Organ Spindles (I Clark)		3	
4/16/1816	" 8 commons		0.5	
4/16/1816	" 16 Plain spindles		2	
4/17/1816	" 12 Organ Spindles		2.25	

Moses Lyon account with David Alling				
Date	Description/Contra	Rate	Credits	Debits
4/18/1816	" 16 Brown Palin Spindles		2	
4/18/1816	" 8 Green Plain sindles		1	
4/19/1816	" 16 Green Plain Spindles		2	
4/19/1816	" 12 Bamboo (done 23 Mar. ommitted)		1.5	
4/25/1816	" 6 common cane col		0.375	
4/25/1816	" 7 commons black		0.44	
4/30/1816	" 12 bamboo		1.5	
5/1/1816	"12 Bamboo		1.5	
5/1/1816	Bronzng. 24 Breen Slat Backs		15	
5/1/1816	Tipping 8 Brown Windsors		0.33	
5/6/1816	" 2 Plain spindles		0.25	
5/6/1816	" 4 Plain spindles (Sunflower)		0.5	
5/9/1816	" 1 Sewing Chair		0.1875	
5/10/1816	" 2 Bamboo Arm Chairs		0.25	
5/11/1816	Bronzing 22 Satin wood & Stripes		4.5	
5/11/1816	[Page total]		248.0225	
5/23/1816	Amount Brought forward			222.185
5/23/1816	Cash five dollars & 06/100			5.06
5/23/1816	Cash eleven dollars			11
5/23/1816	1 book gold leaf			0.75
5/23/1816	1 1/4 lb lead colour			0.28
6/1/1816	cash thirty dollars			30
6/29/1816	cash twenty five dollars			25
7/3/1816	cash twenty dollars			20
7/18/1816	cash twenty five dollars			25
8/20/1816	cash twenty dollars			20
9/26/1816	cash twenty dollars			20
9/26/1816	cash one shilling			0.125
9/28/1816	cash twenty dollars			20
10/24/1816	cash fifty dollars			50
11/12/1816	cash seven 50/100 dollars			7.5
11/12/1816	3 books gold leaf			1.78
11/22/1816	Cash twenty five dollars			25
12/13/1816	cash fifty dollars			50
12/21/1816	cash ten dollars			10
12/28/1816	cahs half a dollar			0.5
1/15/1817	A cot of jacob allen			4.5
1/15/1817	Amt carried forward			548.68
5/11/1816	amount brot over		248.0225	

Moses Lyon account with David Alling				
Date	Description/Contra	Rate	Credits	Debits
5/11/1816	gilding 1 looking glass Thomas		1.5	
5/16/1816	" 16 Organ Spind (I. Clark)		5	
5/17/1816	Bronzing 12 Sating wood slat bks		7.5	
5/18/1816	" 12 nankeen Slat backs		7.5	
5/18/1816	Tipping 12 Bamboo		1.5	
5/21/1816	" 1 Bamboo sewing chr		0.125	
5/21/1816	Bronzing 12 Green Slat Backs		7.5	
5/21/1816	Striping 12 Satin Wood		1	
5/22/1816	Tipping 16 Windosr Org Sp:		2	
5/23/1816	" 16 Windosrs Flat Sp		3	
5/23/1816	Striping 12 nankeen Slat Backs		1	
5/27/1816	Tipping 12 Bamboo		1.5	
5/28/1816	Bronzing 8 Slat Backs (to match)		5	
5/28/1816	Tipping 10 Bamboo		1.25	
5/31/1816	" 20 Windosrs		2.5	
5/31/1816	gilding 10 Organ spindles		3.125	
5/31/1816	Tipping 6 commons		0.375	
5/31/1816	" 6 Blk windosrs		0.375	
6/3/1816	gilding 8 Brown Org Spindles		2.5	
6/3/1816	Tipping 16 Windsors Or Sp		2	
6/7/1816	" 20 Flat Spindle windsors		3.75	
6/7/1816	" 12 Plain spindles		1.5	
6/7/1816	Carried forward		309.5225	
6/10/1816	Brot Forward			548.68
6/10/1816	Amount Brought forward		309.5225	
6/10/1816	Tipping 2 bamboo		0.25	
6/12/1816	" 8 commons		0.5	
6/15/1816	" 12 Windosrs		1.5	
6/15/1816	" 12 plain spindles		1.5	
6/22/1816	" 12 bamboo		1.5	
6/22/1816	" 12 Plain spindles		1.5	
7/1/1816	"12 Bamboo		1.5	
7/1/1816	" 1 windsor Fl. Sp. Swg. Ch.		0.1875	
7/1/1816	" 12 bamboo		1.5	
7/1/1816	" 12 bamboo		1.5	
7/1/1816	" 4 Organ spindles to match		0.75	
7/1/1816	" 12 Bamboo		1.5	
7/8/1816	" 12 windsor flat spindles		2.25	
7/9/1816	" 12 windsor fl: sp:		2.25	

Moses Lyon account with David Alling				
Date	Description/Contra	Rate	Credits	Debits
7/10/1816	" 12 Windsor Fl: sp:		2.25	
7/11/1816	" 12 windsor Organ Sp		1.5	
7/12/1816	" 12 Bamboo		1.5	
7/16/1816	" 8 bamboo		1	
7/16/1816	" 1 Rocking Chr Stripes		0.08	
7/16/1816	" 2 Bamboo		0.25	
7/17/1816	Bronzing 10 Green Slat Backs		6.25	
7/17/1816	" 1 Green sofa		3.75	
7/18/1816	Tiping 4 Brown Plain spindles		0.5	
7/18/1816	" 12 cane Col Commons		0.75	
7/23/1816	"24 Bamboo		3	
7/24/1816	" 12 bamboo		1.5	
7/25/1816	" 12 bamboo		1.5	
7/25/1816	Carried forward		351.54	
7/27/1816	Carried forward			548.68
7/27/1816	amount brot over		351.54	
7/27/1816	striping 8 satin wood slat bks		0.66	
7/29/1816	tipping 24 cane col windosrs		3	
7/30/1816	" 12 green windosrs (org sp)		1.5	
7/30/1816	" 8 green windsors flat sp		1.5	
7/31/1816	" 16 brown windosrs (fl: sp:)		3	
8/1/1816	" 8 cane col windosrs (fl: sp:)		1.5	
8/1/1816	" 12 commons		0.75	
8/5/1816	" 12 bamboo		1.5	
8/6/1816	" 2 green plain spindles		0.25	
8/6/1816	gilding 1 brown org sp to match		0.3125	
8/6/1816	" 2 white cross bakcs (clevelands)		0.75	
8/8/1816	tipping 10 windsors (org sp)		1.25	
8/9/1816	" 12 windosrs		1.5	
8/10/1816	" 12 bamboo		1.5	
8/12/1816	" 12 bamboo		1.5	
8/13/1816	" 26 bamboo		3.25	
8/15/1816	" 12 bamboo (cane seats Dr. Clark)		1.5	
8/16/1816	" 8 windosrs (org spindles)		1	
8/16/1816	" 2 bamboo Arm chs.		0.25	
8/20/1816	Bronzing 12 green slat bks (grapes)		7.5	
8/24/1816	" 2 nankeen to match		1.25	
8/24/1816	tipping 10 organ spindles		1.875	
8/26/1816	" 12 bamboo		1.5	

Moses Lyon account with David Alling				
Date	Description/Contra	Rate	Credits	Debits
8/27/1816	" bronzing 12 white slat backs		7.5	
8/27/1816	tipping 12 bamboo		1.5	
8/28/1816	" 12 bamboo		1.5	
8/28/1816	Bronzing 12 slat bakcs (green)		7.5	
8/28/1816	Carried forward		408.1375	
8/28/1816	Brot Forward			548.68
8/28/1816	amount brot over		408.1375	
8/28/1816	tipping 4 plain spindels		0.5	
8/30/1816	" 12 bamboo		1.5	
8/31/1816	Bronzing 12 ball backs (Cane seats)		12	
8/31/1816	tipping 6 windsors		0.75	
8/31/1816	" 2 organ spindles		0.375	
9/5/1816	" 17 bamboo		2.125	
9/6/1816	gilding 12 green slat backs		4.5	
9/7/1816	tipping 2 small chairs		0.125	
9/7/1816	gilding condits sign		0.75	
9/7/1816	" tea board		0.5	
9/7/1816	tipping 3 small chairs		0.1875	
9/11/1816	" 8 Organ Spindles (Rush)		1.5	
9/11/1816	bronzing 12 ball backds (green)		12	
9/12/1816	" 1 ball back sofa		6	
9/13/1816	gilding 12 organ spindels (cane col)		3.75	
9/14/1816	" 12 organ spindles (brown)		3.75	
9/16/1816	tipping 12 windsors (org spindles)		1.5	
9/16/1816	" 12 windosr (flat sp)		2.25	
9/17/1816	" 12 bamboo		1.5	
9/18/1816	" 8 windosrs flat sp.		1.5	
9/19/1816	" 4 bamboo		0.5	
9/19/1816	" 1 small chair (broad pattern)		0.09	
9/19/1816	" 12 windosrs org sp		1.5	
9/20/1816	" 12 windsors		1.5	
9/21/1816	" 24 windosrs		3	
9/21/1816	" 1 bamboo settee		0.75	
9/21/1816	Carried forward		472.54	
9/23/1816	Brot forward			548.68
9/23/1816	amount brot forward		472.54	
9/23/1816	tipping 8 windosrs org sp		1	
9/23/1816	" 8 plain spindles		1	
9/24/1816	" 2 bamboo settees		1.5	

Moses Lyon account with David Alling				
Date	Description/Contra	Rate	Credits	Debits
9/25/1816	bronzing 12 wide top ball backs		27	
9/25/1816	tipping 56 bamboo		7	
9/27/1816	" 8 windosrs org sp.		1	
9/27/1816	" 6 plain spindlesw		0.75	
9/27/1816	bronzing 12 slat backs (grapes)		7.5	
9/28/1816	Tipping 16 windsors green		2	
9/28/1816	" 8 windosrs cane col		1	
10/1/1816	" 12 bamboo		1.5	
10/2/1816	bronzing 12 slat backs (Lilley)		7.5	
10/2/1816	tipping 12 high bamboo		1.5	
10/2/1816	" 3 bamboo sewg chrs		0.375	
10/3/1816	gilding 4 single cross backs		1.5	
10/5/1816	tipping 12 bamboo		1.5	
10/7/1816	" 4 bamboo		0.5	
10/8/1816	bronzing 12 slat backs		7.5	
10/9/1816	" 12 slat backs (grapes)		7.5	
10/9/1816	tipping 16 bamboo windosrs		2	
10/9/1816	" 6 bamboo sewg chr		0.75	
10/10/1816	" 12 sewg chrs organ spindles		2.25	
10/11/1816	" 12 high chair org spindles		1.5	
10/11/1816	" 8 windosrs organ spindles		1	
10/11/1816	Carried forward		559.165	
10/12/1816	Brot Forward			548.68
10/12/1816	amoutn brot over		559.165	
10/12/1816	tipping 12 organ spindles		2.25	
10/12/1816	striping 12 rocking chiars		1	
10/14/1816	tipping 12 rocking chairs		3	
10/15/1816	gilding 12 slat backs		4.5	
10/16/1816	gilding 12 slat backs		4.5	
10/17/1816	striping 2 sewing chiars		0.16	
10/17/1816	tipping 4 bamboo		0.5	
10/17/1816	" 24 windsor slat backs		4.5	
10/17/1816	" 12 bamboo windsors		1.5	
10/19/1816	bronzing 12 satin wood slat bks		7.5	
10/21/1816	tipping 4 bamboo		0.5	
10/21/1816	" 6 organ spindles		1.125	
10/22/1816	" 12 bamboo		1.5	
10/22/1816	bronzing 12 slat bcks (Rose wood)		7.5	
10/23/1816	" 10 slat backs (Nankeen)		6.25	

Moses Lyon account with David Alling				
Date	Description/Contra	Rate	Credits	Debits
10/23/1816	tipping 16 windosrs green		2	
10/23/1816	" 16 windsors cane col		2	
10/23/1816	" 16 windsors drab		2	
10/24/1816	" 12 small chairs (since some time)		0.5	
10/24/1816	" 8 common slat backs		1.5	
10/24/1816	" 12 gorgan spindles		2.25	
10/25/1816	" 12 bamboo		1.5	
10/25/1816	" 12 bamboo		1.5	
10/26/1816	" 20 bamboo windsors		2.5	
10/26/1816	Amt carried forward		621.2	
10/28/1816	Brot forward			548.68
10/28/1816	Amount brot over		621.2	
10/28/1816	tipping 10 oval spindles		1.25	
10/29/1816	" 12 bamboo organ spindles		1.5	
10/30/1816	" 12 bamboo		1.5	
10/31/1816	" 15 windosrs org sp		1.875	
11/5/1816	" 8 Organ Spindles (Rush)		1.5	
11/5/1816	" 8 windsors org sp.		1	
11/5/1816	" 19 windsors bamboo		2.375	
11/5/1816	gilding picture fram (Hay's)		0.5	
11/7/1816	tipping 16 windosrs flat spind		3	
11/11/1816	" 8 windsors org sp.		1	
11/12/1816	gilding 12 slat backs		4.5	
11/12/1816	tipping 6 windsors org sp		0.75	
11/13/1816	" 16 plain spindles		2	
11/16/1816	" 8 windosrs flat sp.		1.5	
11/18/1816	bronzing 12 slat backs		7.5	
11/19/1816	tipping 8 commons		0.5	
11/21/1816	" 12 widnsors flat sp		2.25	
11/23/1816	" 20 commons		1.25	
11/23/1816	" 8 windsors flat sp		1.5	
11/25/1816	bronzing 12 ball backs (grn cane seats)		12	
11/28/1816	" 12 green ball backs		9	
11/29/1816	tipping 4 bamboo		0.5	
11/29/1816	Carried over		679.95	
11/30/1816	Brot forward			548.68
11/30/1816	Amoutn brot up		679.95	
11/30/1816	striping 6 slat backs		0.5	
11/30/1816	tipping 2 organ spindles		0.375	

Moses Lyon account with David Alling				
Date	Description/Contra	Rate	Credits	Debits
12/4/1816	tipping 6 plain spindles		0.75	
12/11/1816	" 8 plain spindles		1	
12/11/1816	" 8 windsor bamboo		1	
12/11/1816	bronzing 12 slat backs		7.5	
12/11/1816	tipping 8 commons		0.5	
12/16/1816	" 12 small bamboo		0.75	
12/17/1816	" 12 bamboo		1.5	
12/18/1816	" 12 bamboo		1.5	
12/19/1816	" 12 bamboo		1.5	
12/19/1816	bronzing 12 wide tops rose wood		18	
12/21/1816	tipping 12 flat spindles windsors		2.25	
12/21/1816	" 7 sewing chairs		1.3125	
12/21/1816	bronzing 3 grn slat backs		1.875	
12/21/1816	tipping 9 small chairs		0.56	
12/23/1816	" 8 Organ Spindles		1.5	
12/24/1816	bronzing 12 slat backs (rosewood)		6	
12/24/1816	tipping 12 organ spindles		2.25	
12/26/1816	" 16 windsors org sp.		2	
12/27/1816	striping 1 single cross chair		0.08	
12/27/1816	tipping 8 windsors org sp.		1	
12/27/1816	gilding 3 cornices (H. Parkhurst)		1	
12/27/1816	gilding 2 cornices (woodbridge)		1	
12/27/1816	caried forward		735.6525	
2/7/1817	amount brot forward			548.68
2/7/1817	cash five dollars			5
2/11/1817	paid william ward			5.25
2/11/1817	order to mrs. Johnson			20
2/11/1817	ten dollars			10
2/22/1817	ten dollars			10
2/25/1817	twenty five dollars			25
3/12/1817	ten dollars			10
3/25/1817	paid james a campfield (order			7.25
3/25/1817	balck paint by Mm Ward			0.25
3/25/1817	1 book gold leaf			0.625
3/25/1817	cash thirty dollars			30
4/2/1817	cash fifty dollars			50
4/16/1817	paid john lee (order) forty three 12 1/2 / 100 dollars			43.125
5/7/1817	cash three dollars			3

Moses Lyon account with David Alling				
Date	Description/Contra	Rate	Credits	Debits
5/29/1817	do two dollars			2
2/29/1817	cash five dollars			5
6/20/1817	Carried forward			775.18
12/28/1816	Amount brot forward		735.6525	
12/28/1816	tipping 2 small charis		0.125	
12/28/1816	" 16 windsors		2	
12/28/1816	" 12 Plain spindles		1.5	
12/28/1816	" 8 organ spindles		1.5	
1/7/1817	" 8 windsor org spindels		1	
1/8/1817	" 8 windsor org spindels		1	
1/9/1817	bronzing 12 slat backs rose wood		6	
1/14/1817	" 2 cornices (A. Brack)		3	
1/14/1817	" 12 ball backs (fruit)		12	
1/14/1817	" 1 sofa to match		6	
1/16/1817	striping 1 slat back sewg ch		0.08	
1/16/1817	tipping 1 small chiar		0.06	
1/16/1817	" 8 plain spindles		1	
1/17/1817	" 8 plain spindles		1	
1/18/1817	" 12 bamboo		1.5	
1/20/1817	" 8 plain spindles		1	
1/21/1817	" 8 plain spindles		1	
1/22/1817	" 12 organ spindles windsor		1.5	
1/23/1817	" 12 bamboo		1.5	
1/24/1817	" 4 bamboo		0.5	
1/24/1817	" 1 small bamboo		0.69	
1/28/1817	" 8 flat spindle windsors		1.5	
2/3/1817	" 18 slat backs windsors		3.375	
2/3/1817	[Page total]		784.4825	
7/5/1817	amount brot over			775.18
7/5/1817	cash fifteen dollars			15
7/5/1817	mrs. Johnson your order on me accepted for forty four dollars			44
8/23/1817	cash ten dollars some time since			10
8/23/1817	abner campbell			3.625
8/23/1817	cash 1 dollar			1
8/25/1817	cash 5 dollars			5
9/4/1817	cash seven dollars			7
9/4/1817	cash one dollar			1
9/4/1817	order to Mrs. Johnson thirty dollars			30

Moses Lyon account with David Alling				
Date	Description/Contra	Rate	Credits	Debits
10/11/1817	cash two dollars			2
10/20/1817	cash one 25/100 dollars			1.25
10/20/1817	Mrs. Johnson (acct)			20.5
11/10/1818	cash in full			1.6775
11/10/1818	[Page total]			917.2325
2/3/1817	Amount brot over		784.4825	
2/3/1817	Graining 1 sofa (Burnet)		0.75	
2/3/1817	Bronzing 1 sofa (Burnet)		3	
3/4/1817	Bronzing 12 ball backs tops (Allaire)		6	
3/22/1817	" 12 slat bakcs do		3.75	
4/4/1817	" 12 slat backs do		3.75	
4/9/1817	" 12 ball backs (White fl)		4.5	
4/28/1817	"12 slat backs (gr)		3.75	
5/3/1817	" 12 slat backds "		3.75	
5/5/1817	" 12 slat backks "		3.75	
5/10/1817	" 12 ball backs (fruit)		6	
5/13/1817	" 12 slat backs (flower)		3.75	
5/14/1817	" 12 slat backs (Gr)		3.75	
5/16/1817	" 12 ball baks (cane seats and flat)		6	
5/16/1817	gilding & bronzing 12 ball baks (fruit)		12	
5/16/1817	Bronzing 1 sofa (Burnet)		1.5	
7/3/1817	Bronzing 11 slat backs		4.125	
7/12/1817	" 10 slat backs (Nankeen)		3.125	
7/15/1817	" 12 slat backs		3.75	
7/28/1817	" 12 slat backs		3.75	
7/29/1817	" 12 slat backs		3.75	
7/30/1817	" 2 slat back settees		3	
8/4/1817	" 12 slat backs		3.75	
8/6/1817	" 12 slat backs		3.75	
8/23/1817	" 12 cane seat ball backs		6	
8/23/1817			885.4825	
11/10/1818	Amount brought forward			917.2325
08/23/1817	Amount brot over		885.4825	
8/23/1817	Bronzing 4 slat bks (Buneacts?)		1.25	
9/27/1817	" 12 Ball backs (fruit)		6	
9/27/1817	gildg & bronzing 1 sofa nankeen col		5	
10/4/1817	bronzing 12 scroll backs (peaches)		4.5	
10/13/1817	" 12 wide tops scroll backs (cornucopia)		15	
10/13/1817	[account balanced]		917.2325	917.2325

Lambert Hitchcock, Inventory taken upon his death in 1852²⁰⁸

[Piece quantit y]	Unit	Inventory of Lambert Hitchcock, 1852 Description	[Gross Quantit y]	[Unit Value]	[Total Value]
INVENTORY of Stock in lower room in Factory					
51	Ps.	Chestnut, bureau back rails	55	0.01	\$ 0.55
95	"	Whitewood	294	0.025	7.35
46	"	Do	268	0.025	6.70
142	"	Stand Legs	320	0.025	8.00
16	"	Whitewood	25	0.025	0.63
85	Ft.	Refuse Cherry stuff			0.70
105	Ps.	Whitewood	187	0.025	4.68
60	Ft.	Stand back rails		0.025	1.50
128	"	Whitewood for table rails		0.025	3.20
142	"	Do stand rails			3.55
74	"	Do Do		0.025	1.85
1	Ps.	Wooden Clock			0.50
118	"	Table Legs		0.02	2.36
89	"	Whitewood table rails	155	0.025	3.88
177	"	Do stand rails	309	0.025	7.73
105	Ft.	Do Do Do	184	0.025	4.60
669	"	Chestnut table rails		0.01	6.69
159	Ps.	Whitewood	276	0.025	6.90
88	Ft.	Work stand back board		0.025	2.20
404	"	Cherry top rack		0.045	18.18
1,000	"	Sticks for Stand rolls			7.00
265		Veneer		0.05	13.25
4		Varnish Bbls.		0.5	2.00
2		Half bbls. Do		0.25	0.50
		About 8 Galls copal Varnish		1.5	12.00
2		Stoves and pipe			3.00
1		Spade & 1 old pail			0.25
2,067		Cherry board, not cut		0.0425	87.82
78		Whitewood Do		0.025	1.95
2,871		White pine board Do		0.025	71.77
		Labor on said stock by Burr & Beecher			7.42

²⁰⁸ John Tarrant Kenney, *The Hitchcock Chair*

[Piece quantit y]	Unit	Inventory of Lambert Hitchcock, 1852 Description	[Gross Quantit y]	[Unit Value]	[Total Value]
		Refuse stuff in the above room			10.00
					\$ 308.69
		INVENTORY in SHOP GARRET			
948	Ft.	Whitewood cut up		0.025	\$ 23.70
78	Ps.	Wash stand scrolls			2.75
61	Ft.	Lumber cut up		0.045	2.74
18		Bureau bars veneered			0.25
1,822		Chesnut table lopers 730 ft.	730 ft		7.30
1,696		Whitewood stand rolls			8.48
		About ½ bbl. gum shelac; poor article			0.50
1		Cast iron box stove and pipe			1.00
		Labor performed on the above by B. & Beecher			6.34
		Refuse stuff			1.00
					\$ 54.06
		NORTH ROOM, 2nd story; Factory			
505		Draw backs for wash stand			\$ 1.75
1,898		Pairs wash stand scrolls 413 ft.	413	0.025	10.32
435		Draw backs, for wash stands 79 "	79	0.025	1.97
		End table rails 18 "	18	0.025	0.45
34		Whitewood cut up		0.025	10.07
403	Ft.	Cherry lumber cut up		0.025	9.27
206	"	Stand drawers, veneered 145 ft.	145	0.07	10.15
403	Ps.	Bureau draw guides 389	389	0.025	9.72
3,206		Iron Vice, 1 wood vice & brush			4.00
1		Pr Shears for cutting wire			0.34
1		Wire			1.17
13½	Ft.	Labor on said stock by Burr & Beecher			17.22
					76.43
				Bring down	54.06
					130.49
		INVENTORY of WEST ROOM upstairs in the Factory			
1,682	Ft.	Whitewood cut up		0.025	42.05
1,668	"	Cherry lumber do		0.045	84.06
161	"	Blk walnut do		0.05	8.05
125	Ps.	Wash stand scrolls			0.67
1½		Bbls. Stand cleats			1.50

[Piece quantit y]	Unit	Inventory of Lambert Hitchcock, 1852 Description	[Gross Quantit y]	[Unit Value]	[Total Value]
1		Cherry stand damaged			0.50
1		Unfinished deep Bureau frame			1.00
1		Cast iron stove			0.50
		Labor done on this stock by Burr & Beecher			16.96
				Footing No.	
				1	\$ 155.29

EAST ROOM, Upstairs, Factory					
925	Ft	Pine lumber cut up		0.025	\$ 23.17
8,500	"	Whitewood do		0.25	212.50
784	"	Cherry lumber do		0.045	34.28
594	"	Bik Walnut do		0.05	29.70
12	"	112 ft. Mahogany Veneering		0.04	4.48
		Lot refuse stuff			4.00
100		Whitewood table frames			19.21
		Labor done on the above stock; B. & Beecher			41.56
					\$ 368.90

INVENTORY, Room over Basement					
490	Ft.	Whitewood cut up		0.025	\$ 12.25
15	"	Chesnut do			0.15
14	Sets	Cherry table tops 273	273 ft	0.045	12.28
23	"	Do do already hung 448	448		20.16
22	"	Do do finished			19.27
25		Cherry tables in the wood			29.25
25		Cherry tables do do			51.75
59		Do do frames			15.93
2,676		Maple table legs turned			100.35
18½	lbs	Glue		0.14	2.59
½	Bbl	Draw blocks			1.00
1,200		Whitewood legs, fitted—stand			34.97
39	Ft	Cherry lumber cut up		0.045	1.75
1,339	Ps.	Whitewood stand legs, turned			39.61
46		Cherry stands in the wood		0.075	34.50
100		Three drawer bureaus (Mahogany)			191.00
174	Lbs	Cut nails		0.03	5.22
		Refuse stuff			4.00
1		Old wood clock			0.75

[Piece quantit y]	Unit Rea	Inventory of Lambert Hitchcock, 1852 Description	[Gross Quantit y]	[Unit Value]	[Total Value]
1	m	Sand-paper			2.00
2		Small bunches wire			0.12
5	5/12	doz. 1/8 butts			1.35
6	Sets	brass butts			0.10
8		Bureau locks			0.34
	Gros				
33	s	1/2 in. Screws			3.30
7	„	1 1/2" do			1.12
15	“	1/2 “ do			1.50
5		Bureau locks			0.20
1	Box	Screw & key guard			0.25
1	Ps.	Rope			0.17
1	Pr.	Table planes			0.10
		Labor done on above, by B. & Beecher			279.36
					\$ 866.69
		INVENTORY, TOOLS & MACHINERY			
1		Old brace & bits & Iron vice			\$ 1.25
1		Iron Mandrel			2.50
1		mandrel for drilling, % bits			4.00
1		Double tenanting machine			100.00
1		1 1/2 in shaft, 3 pullies 7 iron hanger			10.00
1		Table butt machine			25.00
2		Old desks & a cupboard			1.00
1		Dove tailing machine			50.00
43		Ft 6: old belting			10.00
37		Ft 4" old belting			5.00
2		Circular saws, mandrels & frames hung			16.00
1		Squaring up mortising machine with cutters & mandrels			25.00
1		Double circular saw with frame & Mandrels			45.00
1		Cramping machine			2.50
7		Work brushes with vices			28.00
6		Old tables for laying stuff on			1.00
3		Glue kettles			1.25
2		Stoves & Pipes			8.00
1		Chair & Stool			0.25
48		Hand Vices			6.00
24		Feet White Wood Lumber			0.60

[Piece quantit y]	Unit	Inventory of Lambert Hitchcock, 1852 Description	[Gross Quantit y]	[Unit Value]	[Total Value]
1		Stone pitcher			0.12
1		Building used as a kiln dry & stove & pike & VARNISH BBL			8.00
2		Prs. Movable stairs			0.50
1		Tin funnel			0.06
1		Flat Iron			0.12
26		Cramps			2.60
12		Calls for laying veneers			1.50
41		Do Do Do			1.64
104		Ft belting 1 1/2 to 3 1/2 in wide			6.24
74		Calls for laying bureau draw fronts			2.22
23		Do Do secretary pannels			0.69
1		1 1/2 in shaft 10 ft long, 3 iron pullies and iron hangers			10.00
2		turning lathes			40.00
1		Circular saw, frame & Mandrel			14.00
1		Monkey Wench			1.00
7		Circular saws			10.00
1		8 feet shaft and drum			12.00
4		iron band strainers			15.00
1		Wood do do			2.50
1		Large drum and arms			25.00
1		1 3/4 in iron shaft 8 ft long with 2 iron pullies			7.00
1		2 in shaft 7 ft. long, 2 iron pullies			10.00
1		2 in do 2 iron and 1 wood do			14.00
1		Grind stone, shaft, & double iron do			3.00
1		2 in square shaft, 8 ft long, 2 wood pullies			5.00
1		2 in shaft 18 ft long, 2 iron and 2 wood pullies			25.00
1		Whip saw, frame, balance wheel, pully 7 shaft			5.00
1		2 in iron shaft, 2 iron, 1 wood pully			5.00
1		plaining machine			100.00
1		large splitting saw, frame & mandrel			35.00
2		saw horses and old table			0.10
1		2 in shaft, 5 ft long, 1 iron, 1 wood pully			5.00
4		circular saws and 1 cutter			8.00
3		cramping vices			1.00
77		feet belting, 2 to 3 in wide			4.62
212		" Do Do 3-6 Do Do			21.20

[Piece quantit y]	Unit	Inventory of Lambert Hitchcock, 1852 Description	[Gross Quantit y]	[Unit Value]	[Total Value]
84	"	Do Do 3-6 Do Do			13.44
					\$ 757.90
Inventory Promiscuous articles					
3		Turning lathes in Mr. Allens shop			20.00
1		Hollow mandrel do do do do			
		Mahogany in strips and in blocks			50.00
1		Stove & Pipe			0.34
3,004		Table legs in the rough			60.08
505		feet board measure square whitewood stuff cast of shop 2 1/2 c			12.62
1		furniture wagon, ropes and padding			25.00
		fuel in the yard			1.00
1		old double bob sleigh			2.50
1		wagon shed			10.00
250,000					
0		silk spools in allens barn			100.00
100,000					
0		do do at the depot			40.00
					\$ 301.54
STOCK in LOWER ROOM, Warehouse					
In general 25 pr ct off.					
24		4-Draw Mahog. Bureaus		168	\$ 126.00
10		Bureau Wash Stands		40	30.00
16		3-Draw Secrataries		160	120.00
11		Large 4 leg bik. Walnut Tables	4.5	59.5	44.63
23		Cheap stands	83	19.09	14.32
35		Dress. Tables	1.12½	39.37	29.53
43		Closed wash stands	2.5	107.5	80.63
12		Do Do Do Unfinished	87½	10.5	7.88
39		Blk. walnut Bkfst Tables	2.75	107.25	80.44
2		Cherry Do Do Do	2.75	5.5	4.12
6		Cheap tables	2	12	9.00
19		Fall leaf Stands	2.75	52.25	39.19
7		3-draw Bureau	5	35	26.25
15		4-draw " Whitewood	4	60	45.00
1		Crib		3.25	2.44
8		French bed steads		20.4	15.30
1		Broken stand		0.3	0.23

[Piece quantit y]	Unit	Inventory of Lambert Hitchcock, 1852 Description	[Gross Quantit y]	[Unit Value]	[Total Value]
33		Bureau cases	1.25	41.25	30.94
		Refuse lot of Knobs*		0.75	0.75
17		Cupboard catches*		0.34	0.34
48		Crib castors*	0.02	0.96	0.96
100		Boxes spool silk*		60	60.00
4		Looking glasses*		2.5	2.50
9		Do Do Small size*		1.5	1.50
15		Do Do Quite small*		1	1.00
		Shaving boxes	0.5	2	1.50
4		About 22 galls Varnish	1.5	33	24.75
145		Looking glass screws		0.5	0.38
156		Doz. 1¾ in. Knobs		3	2.25
30		Doz. Whitewood		0.06	0.05
28		Doz. 2 in. Knobs		0.5	0.37
16		Doz. Looking glass Do.		0.25	0.18
1		Measure & funnel		0.2	0.15
1		Old water pail		0.06	0.04
8		Ft Camwood		0.32	0.24
1		Dust brush		0.17	0.13
1		2-qt. Varnish jug		0.05	0.04
SECOND STORY					
35		Blk. Walnut Bkfst Tables	\$2.75	\$96.25	72.19
8		3-draw Mahogany Bureaus	7	56	42.00
93		Double wash stands	\$1.50	\$139.50	104.63
49		Cherry stands	1.12½	57.12	42.84
27		Do Do gummed over	0.092	24.84	18.63
1		Damaged Stand		0.1	0.07
1		Old cheap desk		1	0.75
1		Stove & pipe		1	1.00
1		Broken looking glass		0.06	0.06
2		Old chairs		0.25	0.15
7		Old Varnish pots		0.5	0.50
4		Varnish cans & Varnish		2	2.00
5		Do jugs and contents		1	1.00
1		Old small brass kettle		0.25	0.25
20		Old curtains		0.2	0.20

[Piece quantit y]	Unit	Inventory of Lambert Hitchcock, 1852 Description	[Gross Quantit y]	[Unit Value]	[Total Value]
		Bees wax & Paint		0.5	0.50
----- THIRD STORY -----					
48		Single wash stands	\$1.12½	\$54.00	40.50
85		Double Do Do	1.5	127.5	95.63
13		Grecian Maple Chairs	1	13	9.75
48		Plain Do Do	670	32.16	24.12
6		Grecian dark Do	1	6	4.50
8		Wood seat rocking Do	1.25	10	7.50
2		Cradle rocking Do	1.5	3	2.25
1		Cane seat Do Do	1.5	1.5	1.12
1		Do back Do Do	2	2	1.50
1		Do Seat Office Do	1.75	1.75	1.31
				\$1,679.80	1277.98
					\$
		Amount brot forward		\$ 1,679.80	1,277.98
1		Wood seat office chair		1	\$ 0.75
62		Do Do chairs	0.4	24.8	18.60
7		Miss Rocking chairs	0.4	2.8	2.10
8		Childrens office Do	0.5	4	3.00
18		Childrens chairs	0.34	6.12	4.09
2		Cane seat table Do	0.5	1	0.75
8		Do Do Crickets	0.37	2.96	2.22
2		Seraphim cases (damaged)		0.5	0.38
6		Old Varnish cans		0.5	0.50
3		Galls boiled oil		2.25	2.25
1		Box refuse screws & Pr table planes		2	2.00
3		Old looking glass frames		0.25	0.25
		Lot Brown cambrick		0.5	0.50
----- THINGS in WAGON SHOP -----					
53		Cribs	3.25	172.25	129.19
12		3-draw Secrataries	\$10.00	\$120.00	90.00
100		Cheap Stands	83	83	62.25
18		3-draw Mahog. bureaus	7	126	94.50
9		3 Do Do Do	5	45	33.78
14		Walnut tables	2.75	38.5	28.88
48		Close wash stands	2.5	120	90.00

[Piece quantit y]	Unit	Inventory of Lambert Hitchcock, 1852 Description	[Gross Quantit y]	[Unit Value]	[Total Value]
44		Fall leaf stands	2.75	121	90.75
					\$
				\$ 2,554.23	1,934.72

1880 Description of factory-made furniture

From *Scientific American*, the cover illustration referred to in the text appears on the next page.²⁰⁹

The first operation in the manufacture is represented by the view at top of first page where the log, as it comes to the factory, is taken by a large band saw and cut into the thicknesses and lengths required. This saw runs on a wheel about five feet in diameter. An adjoining view shows a smaller band saw, used to cut up plank and boards and further divide the lumber into the different sizes to fit it for the several pieces to be made. There are seven of these band saws and nine jig or scroll saws in constant operation. The wood having been cut to the required size, the first detail of the manufacture consists in the marking of the patterns thereon. This was formerly done with a pencil, but now stencil patterns are made in zinc, by which the pattern is so plainly shown on the wood that there is much less liability of error in cutting than was formerly the case.

Previous to the work on the jig saws, nearly all the pieces have to go to the boring machine, where holes of different sizes are put through such parts of the pattern as required to enable the workman to pass through the end of the saw in cutting out the design. These holes are usually bored in places where the curves are so small that it would be difficult to work them out with the saw, although some of the jig saws are less than an eighth of an inch wide. The workmen in this department, however, from long practice, are able to follow the intricate patterns with such firmness and facility that the most complicated designs are worked out with great rapidity, and apparently without the least pause or hesitation.

The friezer, or machine carver, shown in one of the views at the top of the page, takes up but little room, but the variety of work it will do is almost unlimited. There are several modifications of this machine, for different classes of work, but the essential principle in them is the revolution on a small axis, of different shaped knives, according to the design of the work, the wood being pressed against the knives in the line of guides and gauges adjusted to the particular pattern. In this way the machine may be adjusted to do almost any kind of carving desired, but it is found more economical in practice to do a large proportion of the carving by hand, rather than fit up the knives and patterns for the machine for all the new and elaborate designs in carving which are always being introduced.

The variety moulder, shown in one of the illustrations represents only one of several machines in operation for this department of the work, but it is one which will cut almost everything known to the trade in the way of mouldings. The planing and turning machines, which are also the subjects of separate views, are of several sizes, and of patterns entirely familiar to all wood workers, but the "jointer" is a machine less commonly known. It is to put a smooth edge or corner on pieces to be joined together, and it makes the edges and angles, either flat or any desired bevel, so smooth and even that when two pieces of wood of the same grain are glued together it is difficult to see where they join. The sand papering machine shown at the bottom simply represents arms covered with sand paper, which are made to rotate very rapidly while the workman passes the rough surfaces over them to smooth off the unevenness made by the saw or planer.

The carving by hand, of which a view is given in one of our illustrations, forms a very important part of the work done at this establishment, at which from thirty to forty expert hands are kept regularly employed. This work is all done by the piece, from original designs gotten up by the house, the firm being constantly engaged in contriving something new which is likely to please the artistic taste of the community. In this way they will get up a suit of parlor furniture, subject it to criticism, make possibly considerable alterations in it, decide on the different ways in which it will be upholstered, and then have from one to two hundred sets made of this particular style. No one outside of their immediate business.

²⁰⁹ American Industries, No. 37. The Manufacture of Parlor Furniture", *Scientific American*, October 9, 1880, 229

SCIENTIFIC AMERICAN

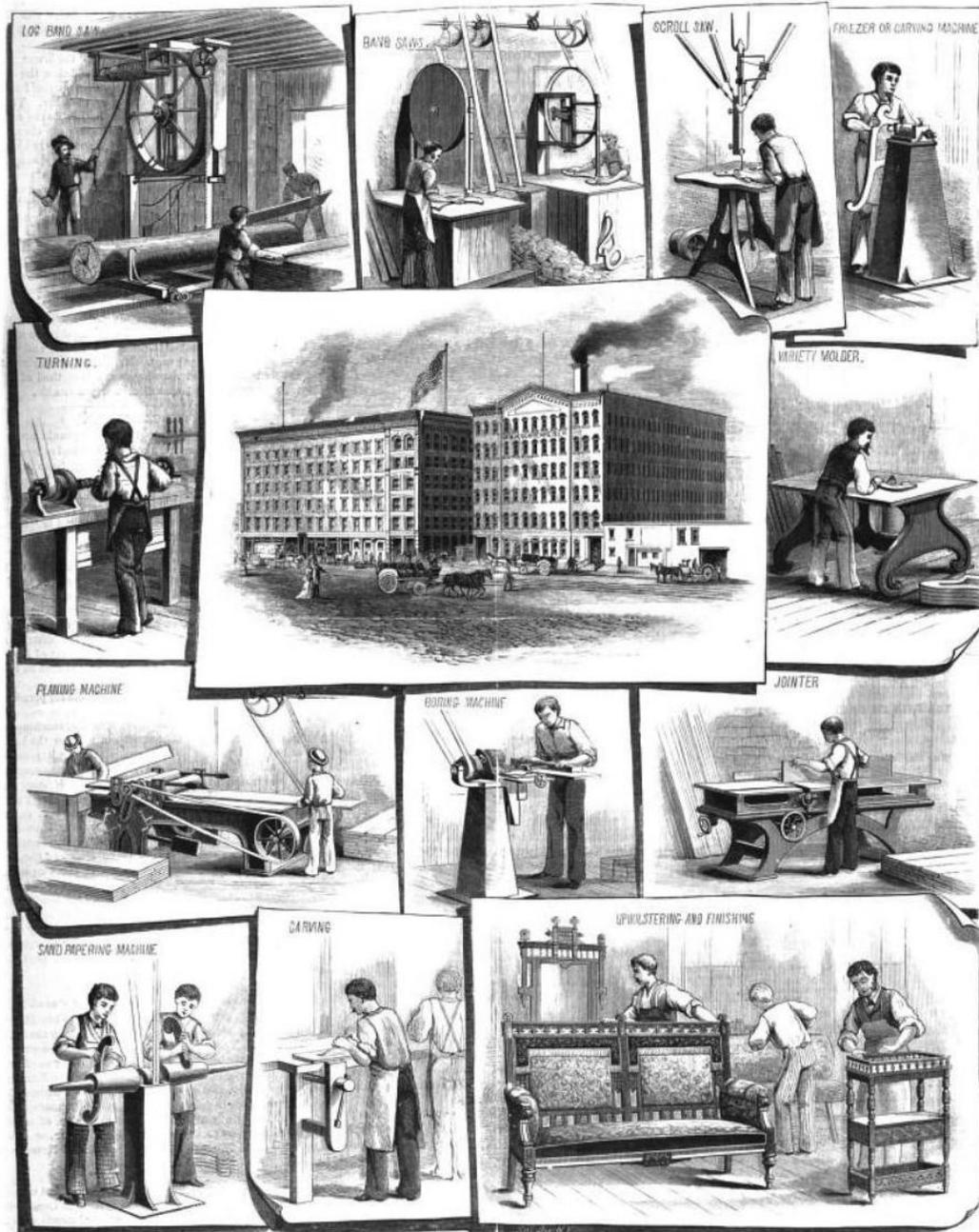
[Entered at the Post Office of New York, N. Y., as Second Class Matter.]

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES.

Vol. XLIII.—No. 15.
[NEW SERIES.]

NEW YORK, OCTOBER 9, 1880.

[\$3.20 per ANNUM.
[POSTAGE PREPAID.]



THE MANUFACTURE OF PARLOR FURNITURE.—FACTORY OF M. & H. SCHRENKEISEN, NEW YORK CITY.—[See page 292.]

Figure 77 M & H Schrenkeisen shop illustrated on the cover of *Scientific American*, October 9th, 1880

Berkey & Gay 1889 Personnel Survey

The 1890 surveyed 238 of their 375 employees. The employees worked 10 hour days.²¹⁰

Job Category	Average weekly wage	Number of employees
Carver	15.75	37
Mill wright	11.25	1
Cabinet Trimmer	10.00	2
Cabinet Maker	9.67	60
Trimmer	8.75	1
Glass Inspector	8.75	1
Machine Operator	7.94	38
Staff	7.71	36
Finisher	7.62	49
Varnisher	7.13	6
Turner	6.75	3
Veneering	6.50	3
Marker	5.00	1
Total		238

Figure 78 Berkey & Gay employees by job category and wage

²¹⁰ *Seventh Annual Report of the Bureau of Labor and Industrial Statistics, February 1, 1890*

Job Category	Place of origin	Total
Cabinet Maker	Germany	26
	Sweden	15
	Holland	7
	US	4
	England	2
	Norway	2
	Belgium	1
	Denmark	1
	Austria	1
	Prussia	1
	Cabinet Maker Total	60
Carver	Germany	15
	Canada	5
	Ireland	3
	US	3
	England	3
	Scotland	2
	Denmark	2
	Holland	2
	Norway	1
	Austria	1
	Carver Total	37
Finisher	Holland	36
	US	4
	Ireland	3
	Scotland	1
	Denmark	1
	Sweden	1
	France	1
	Canada	1
	Austria	1
	Finisher Total	49
Turner	Holland	2
	Germany	1
Turner Total	3	
Veneering	Denmark	1
	Holland	1
	Germany	1
Veneering Total	3	

Figure 79 Berkey & Gay employees by country of origin, 1889

Breakdown of the furniture industry in 1890

Industry	Number of establishments	Capital		Average Number of Employees.			Net Value of Product				Average annual earnings per employe. Excluding officers, firm members, and clerks
		Value	Average per establishment	Total	Average number per establishment		Total	Average per establishment	Average value per employe.		
					Including officers, firm members and clerks	Excluding officers, firm members, and clerks			Including officers, firm members and clerks	Excluding officers, firm members, and clerks	
Furniture, cabinetmaking, repairing and upholstering	4,054	12,861,208	3,172	14,721	4	3	14,127,192	3,485	960	1,318	536
Furniture chairs	340	14,387,075	42,315	13,837	41	38	10,294,059	30,277	744	788	385
Furniture factory product	1,579	66,393,864	42,048	63,946	40	38	56,080,251	35,516	877	938	502

Figure 80 1890 Report on Manufacturing Industries in The United States at the Eleventh Census, 1890, Part I. Totals for states and Industries

The amount of capital per employee shows that the chair and factory production was resource intensive, implying factory type operations, whereas the smaller furniture and cabinetmaking establishments did not require a lot of investment per employee implying more traditional means of making.

2009 Furniture Industry Data

Data excerpted from the 2009 Census of manufacturers²¹¹



Figure 81 2009 Regional Distribution of furniture manufacturers

²¹¹ U. S. Census Bureau, "Statistics of U. S. Businesses (SUSB) 2009, U.S. all Industries", <http://www.census.gov/econ/susb/> (accessed January 11, 2012).



Figure 82 2009 Distribution of Furniture manufacturers by size

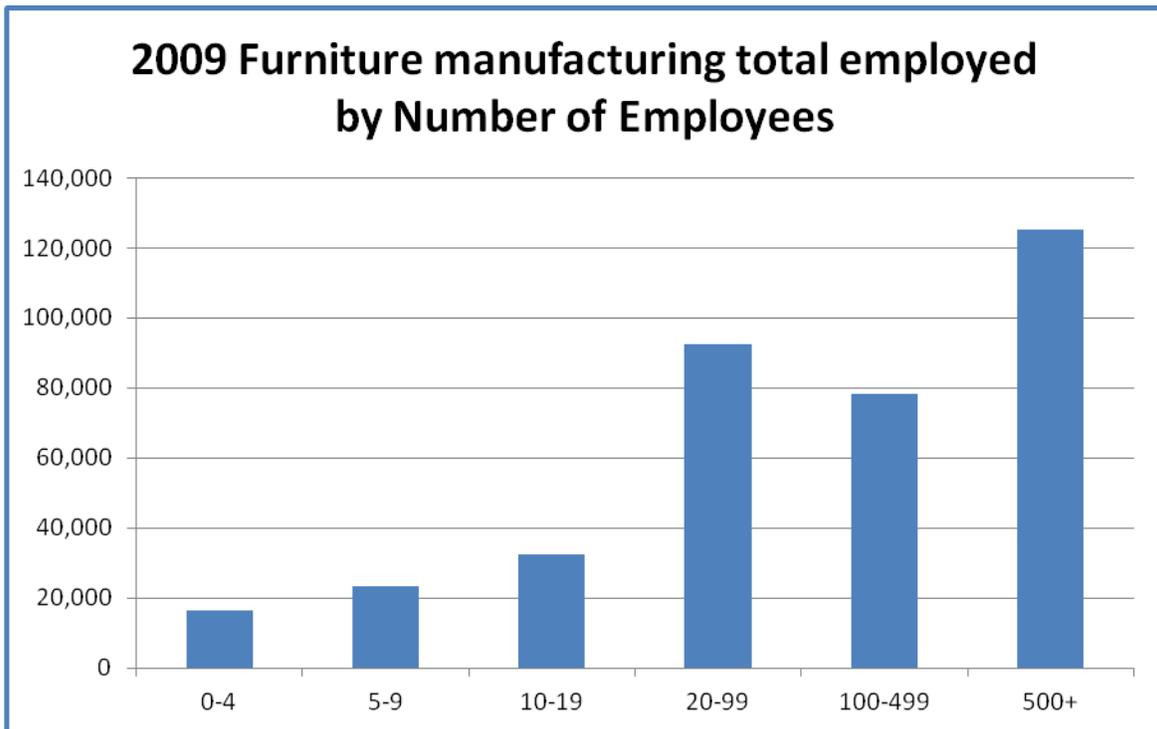


Figure 83 2009 Distribution of Furniture Manufacturers by size and total employment