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# INTERSECTIONS: OFFICE FURNITURE DESIGN - TECHNOLOGIES – AESTHETICS

TERRENCE L. UBER

COLLEGE OF ARCHITECTURE AND ENVIRONMENTAL DESIGN  
KENT STATE UNIVERSITY

Dr. Terrence L. Uber  
 College of Architecture and Environmental Design  
 Kent State University

## **INTERSECTIONS: Office Furniture Design - Technologies – Aesthetics**

This paper will investigate the intersections of design, manufacturing technologies and aesthetics in the emerging commercial office furniture industry in the United States, 1875 - 1925. The commercial office furniture industry developed in the United States in the late nineteenth century in response to the changing nature and needs of conducting business. This study deals primarily with furniture which would be used in offices of clerical staff and managers.

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This paper will investigate the intersections of design, manufacturing technologies and aesthetics in the emerging commercial office furniture industry in the United States, 1875 - 1925.

Sources are drawn from two major sources: 1) furniture trade catalogs primarily in the collections of the Museum of American History, Smithsonian Institution; and the Hagley Museum and Library, Wilmington, DE; and 2) business journals of the period (ex. *Systems*).

The commercial office furniture industry developed in the United States in the late nineteenth century in response to the changing nature and needs of conducting business. This study deals primarily with furniture which would be used in offices of clerical staff and managers. In most instances, it does not include the furniture found in top-level executive and owner offices.

To provide the proper context for this discussion, a brief overview of the development of the commercial office with subsequent developments in the furniture industry is in order.

#### The Office

Overview. With the expansion of business in the United States in the second half of the nineteenth century, the office experienced drastic changes. The most obvious of these changes

was the increase in office personnel to handle the increased volume of orders, internal and external correspondence, bookkeeping and filing. The United States census data for the years 1880 – 1920 illustrated the rapid growth in clerical employees which occurred during this period:

Growth in the Number of Clerical Employees, 1880 – 1920<sup>1</sup>

<u>Year</u>	<u>Total</u>
1880	172,575
1890	801,455
1900	1,068,993
1910	1,631,626
1920	2,951,008

The increased population of clerical workers, along with increased specialization of work, facilitated the development of hierarchical structures in large business concerns to manage and control the work within the office. Greater numbers of supervisory and management personnel were necessary to oversee the various departments within the office. Supervisory personnel were put in charge of workers performing specific functions—i.e. typing, filing, bookkeeping, order entry, etc. (See Fig. 1). Supervisors reported to middle management personnel, often called managers, who reported to executive personnel, vice-presidents/president/owners. The larger the business concern, the more layers the hierarchy contained.

The Furniture Industry

As a corollary to the expansion of business in the latter part of the 19<sup>th</sup> century, the furniture industry also experienced significant growth. Furniture manufacturing began in the United States in the workshops of colonial craftsmen where work was exclusively done by hand, but in the nineteenth century it evolved into larger firms which produced goods in large quantities – “batch production” – and developed machinery which could replace the basic work of many craftsmen.

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<sup>1</sup> As presented in Leffingwell, *Office Management*, 1926, 4-5. Clerical employees included bookkeepers and accountants in banks and stores; cashiers in stores; clerks in railroad companies, express offices, insurance offices, government offices, hotels and restaurants; all other clerks, “not otherwise included,” except those in stores, by which term is meant salespersons.

The Globe-Wernicke Co.

Cincinnati



*A n office of the nineteen showing confusion and lack of proper filing equipment.*



*A Small Modern Office with a Central Filing System.*

**Figure 1**  
**“Finding and Filing Paper, 1920”**  
 Globe-Wernicke Company                      Cincinnati, OH

While machine tools and technological advancements enabled manufacturers to produce furniture on a large scale, the handcrafted production methods of previous generations were still employed to produce furniture for a segment of the market. But even in firms employing batch production methods, a certain amount of hand-finishing was normally included, so the mechanized and hand production methods were not mutually exclusive.

In general, the furniture industry, encompassing both residential and commercial furniture, experienced similar types of growth and change as other business concerns during the late nineteenth and early twentieth centuries. The increasing number of people working for wages in offices and factories created a middle-class with discretionary income to spend. And the changes in industrial production and improved transportation networks made it possible for furniture to be produced and delivered at affordable prices, moving beyond the world of high-style and custom-made furniture which had been available to only a small segment of the population. In a response similar to the increasing diversity and specialization that occurred in many businesses during this period, the furniture industry expanded and specialty-manufacturing firms were established which were capable of producing large quantities of specialized furniture forms. Many small firms continued to produce goods much as they had done in the past, but the industry came to be dominated by larger, more specialized firms in the early twentieth century.

As the furniture industry developed, certain geographic areas became centers of production for general furniture manufacturing (See Fig. 2). Originating along the eastern seaboard in numerous small factories and workshops, the industry gradually moved westward as the country expanded.

Figure 2  
Significant US Office Furniture Manufacturers in the US –  
1<sup>st</sup> Quarter of the 20<sup>th</sup> Century

- Globe-Wernicke, Cincinnati, founded in 1882;
- Art Metal Construction Company, Jamestown, NY, founded in 1899;
- Yawman and Erbe, Rochester, NY, founded in 1899;
- Shaw-Walker, Muskegon, MI, founded in 1899;
- General Fireproofing (GF), Youngstown, OH, founded in 1902,
- and Allsteel, GF's Metal Furniture line, founded in 1912;
- Metal Office Furniture Co., Grand Rapids, MI, founded in 1912.<sup>2</sup>

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<sup>2</sup> For 'short' histories of these companies, see: Hensch, Thomas J. *An "Evolutionary History" of the Office Systems Furniture Industry and the Nature of Strategic Change: Evolution,*

With factory locations being determined in part by the availability of raw materials and transportation, in the mid-to-late 19<sup>th</sup> century major furniture manufacturing centers developed in and around Cincinnati, OH; Jamestown, NY; southern Indiana; and Grand Rapids, MI. The growth of the furniture industry in Michigan proved to be particularly important for the development of the metal office furniture industry. While the initial reason for location of furniture manufacturing in this area appeared to be the availability of raw materials (wood) and water and rail transportation, the proximity to the fledgling automobile industry in the Detroit area of eastern Michigan provided opportunities for the transfer of technologies between the industries.

By the last quarter of the nineteenth century, the demand for office furniture was large enough to support furniture manufacturing firms which specialized in commercial types of furniture including furnishings for the office.

As illustrated in an advertising flyer from the T. B. Wigfall Co. – a retail supplier of office furniture made by various manufacturers (See Fig. 3), there was a wide range of types and styles of desks available for the various types of work required by modern business. The forms illustrated here would have been constructed of wood with design details which mimicked the details of residential furniture of the era.

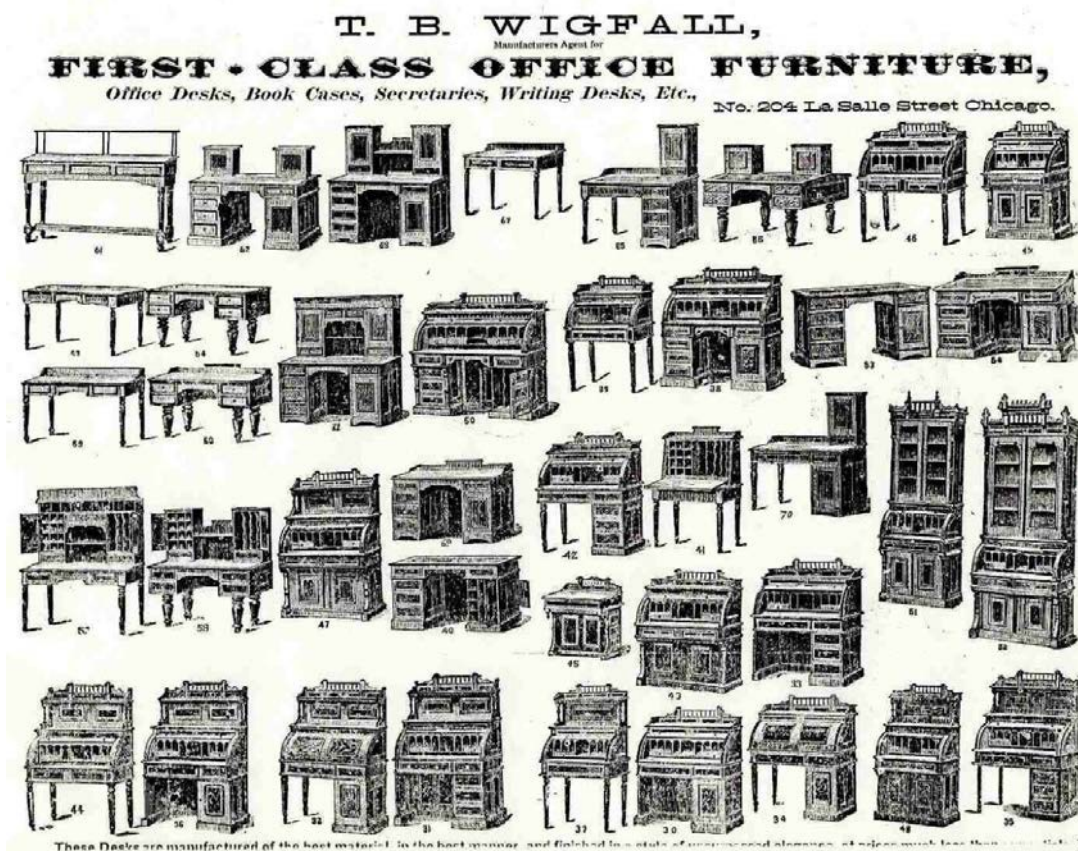


Figure 3

As the volume and size of business increased, there was a need for more and better organized storage of business paperwork—first, through changes in the design of the desk, and second, through the development of new furniture forms. Two events in 1876 were significant in the development of the office furniture industry and consequently important in the design of office furniture.

One was the Centennial Exposition at Philadelphia in 1876, where business decided that better housekeeping meant larger profits. [Office furniture was on exhibition from de Bock of Boston, Ransom of Buffalo and Wooten (sic) of Indianapolis.”]<sup>3</sup> “Better housekeeping” referred

<sup>3</sup> Wallen, 40-41.

to organization of the office and its contents. The display of office furniture at the exposition, particularly the Wooton desks, illustrated to business men how furniture could be utilized to help

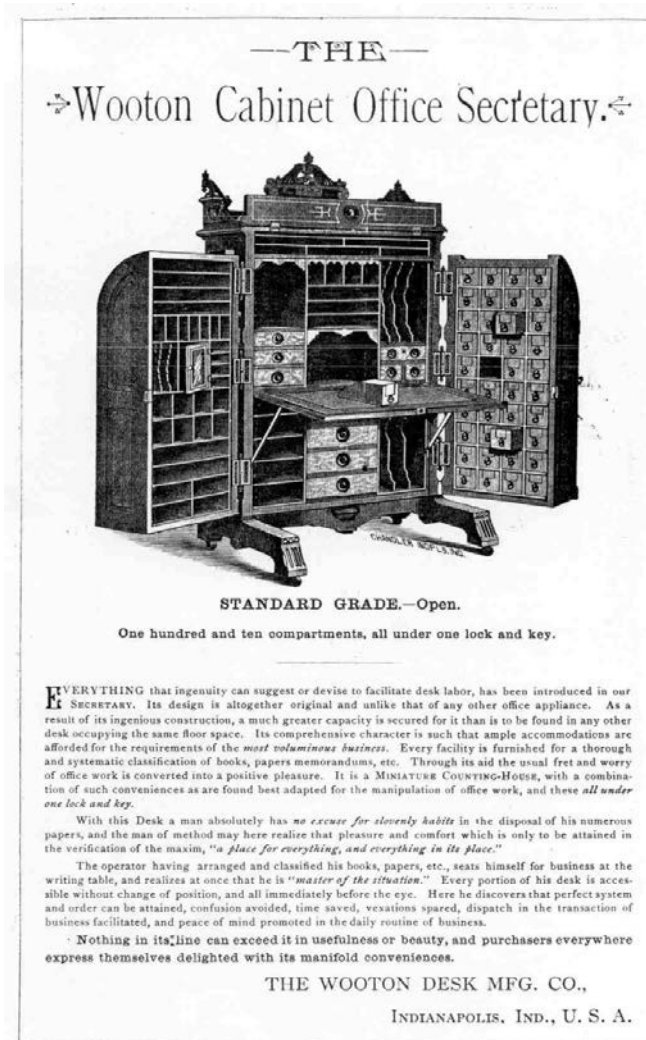


Figure 4

organize documents and maintain order in the office (See Fig. 4). These desks provided over 100 compartments to accommodate any and all types of correspondence and record keeping which a thriving business might need. This was a growing concern among businesses large and small as the volume of paperwork generated in the office increased dramatically. The Wooton desk provided over 100 compartments to accommodate any and all types of correspondence and record keeping which a thriving business might need. International exhibitions, like the

Philadelphia Centennial, drew large audiences of potential consumers and proved to be an efficient way for manufacturers to market new products to buyers and end users.

The second event that occurred the same year was the introduction of the Dewey Decimal System at The Library of Congress in Washington, D.C. While more subtle in their influences on office practices, layout and furniture design, the vertical card file indexes and the filing cabinets which had been designed for use in libraries were subsequently adopted by many business offices as a means to organize, reference and file documents and retrieve them upon demand. “The equipment for these card files was provided through the Library Bureau<sup>4</sup>, an organization that Melvin Dewey founded in the same year to sell supplies and promote the decimal system for libraries. Card indexes and card files gradually came to be used in business both for indexing numerically organized flat files and for compactly recording and storing various types of business information (sales office records, for example).”<sup>5</sup> This concept of card filing would lead to a revolution in the storage of office documents in the 1890s.

The Chicago Columbian Exposition of 1893 was also extremely significant for office business practices and office furniture. During the exposition, the Library Bureau introduced the concept of vertical filing for business documents. This concept was based on the Dewey Decimal System of card filing which had been introduced in 1876. To implement the vertical document filing system, the Library Bureau designed and manufactured filing cabinets to accommodate the system, similar to the Allsteel GF cabinets in Figure 5.

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<sup>4</sup> The Library Bureau eventually became a division of Remington Rand Corporation.

<sup>5</sup> Yates, 56-57.



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**Figure 5** Allsteel Filing Equipment, 1916

## **Form and Design**

The display of office furniture at the Paris Exposition in 1900 was an indication of the progress which had been made in its design and manufacturing in the previous decade in the United States.

The roll-top desk, which had its origins in the cylinder desks of previous eras, was becoming a symbol of American business, and with its “functional” arrangement of various compartments signified the changes which office procedures had undergone to organize and control the increasing volume of paperwork generated by the prospering businesses (See Fig. 6).

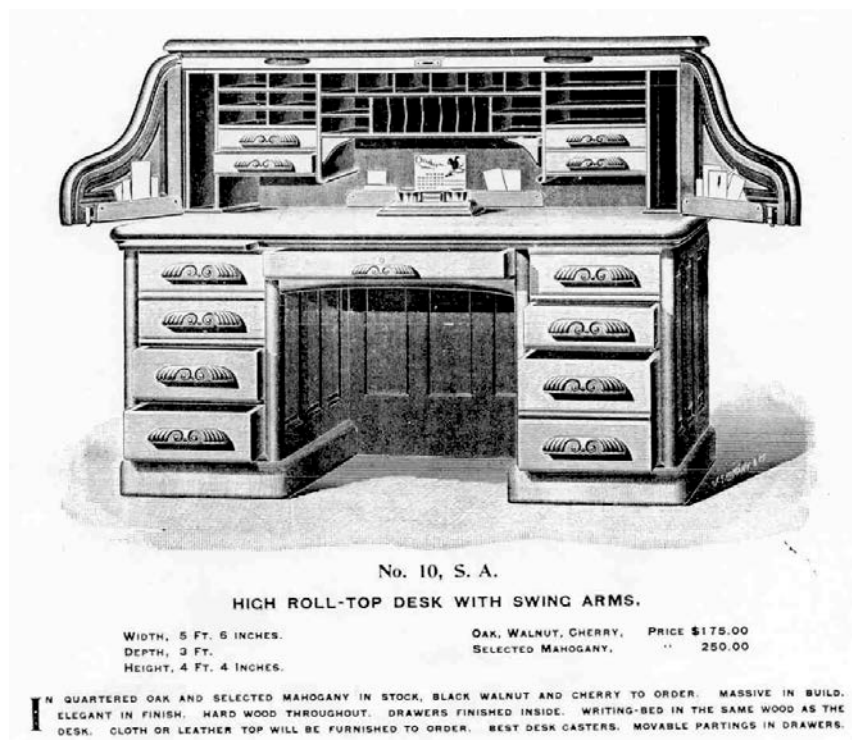


Figure 6 Derby and Kilmer Roll-Top Desk, 1880

The roll-top desk form which the Derby & Kilmer Co. of Boston had advertised as “the standard business desk of the country” in 1880,<sup>6</sup> continued as a popular desk form into the first quarter of the twentieth century. The Wm. O. Olsen Co. of Chicago advertised “Our Roll Top Desk No. 41” in the September, 1901, issue of *System*. Made out of well seasoned and kiln-dried white oak, the desk contained pigeon-holes (18), shelves for copy and order books and letterhead, drawers, a compartment for books, and arm rests.<sup>7</sup> But several factors which had roots in the late nineteenth century influenced desk design in the early 1900s and decreased the popularity and use of the roll-top desk. As businesses grew and office practices were developed to process the increased flow of paperwork, work assignments within the office became more specialized with

<sup>6</sup> Derby & Kilmer Desk Co. *Sixteenth Illustrated Catalogue of the Derby Roll-Top Desks and office Furniture*. Boston, MA: Derby & Kilmer Desk Co., ca. 1880, np.

<sup>7</sup> The armrests, also called pull-out slides, were shelves which recessed into the desk body at the top of the drawer pedestals.

the result that specialized furniture forms were developed to facilitate specific types of work. The use of the typewriter in the office on a large scale prompted the development of numerous desk forms to accommodate the machine (See Fig. 7).

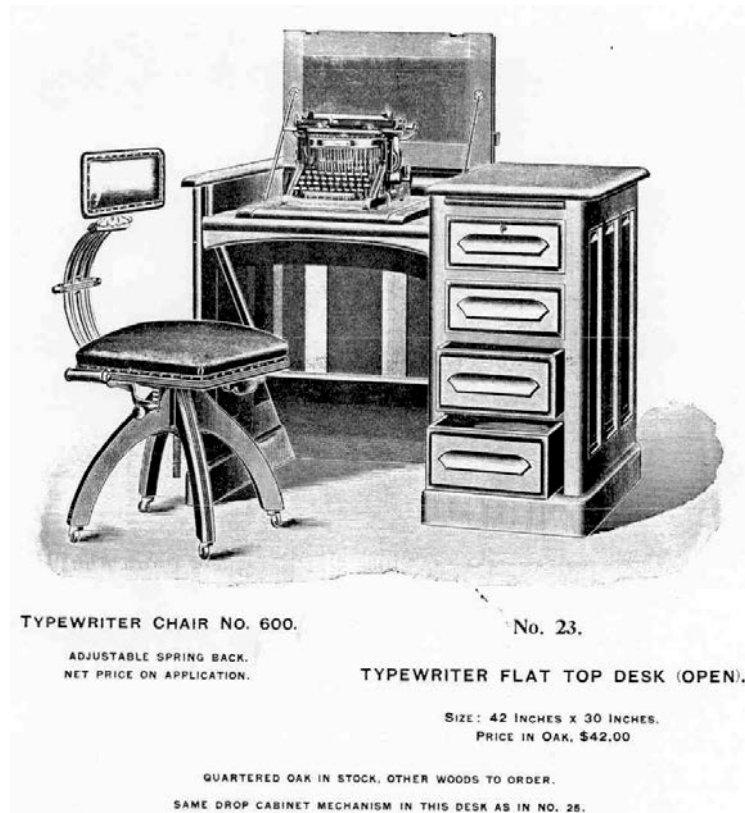


Figure 7 Typewriter Desk  
Derby and Kilmer Co., 1880

Relating back to the Dewey Decimal System and the introduction of the card file for libraries, Desks specifically designed to accommodate the use large numbers of index cards for record keeping were also developed. One desk manufactured by the Shaw-Walker Company (See Fig. 8) could hold up to 80,000 file cards!



Figure 8      Card Filing Desk      Shaw-Walker Company

**Metal Furniture Manufacturing - Overview.** Metal office furniture in the late nineteenth century benefited from technological developments in the steel industry. The use of sheet metal, as seen in the bicycle industry and early automobile industry, was adapted to the production of metal furniture as early as 1887. The development of the pickling process to clean the metal surfaces before finishing resulted in more durable and better-appearing painted finishes for the furniture. Metal furniture manufacturers stressed the use of this process on cold-rolled steel as a selling point for their furniture, as seen in descriptions from the General Fireproofing Company:

- ***Cold-drawing of steel*** is the method whereby strips of cold steel are formed into mouldings and any desired shape by pulling the steel, without the application of heat, through polished, idle rolls. The metal is pressed into a homogenous mass without setting up strains or changing the nature of the steel by heating.
- ***Electric welding*** is the act of fusing two or more pieces of metal together. It is accomplished by causing the passage of a heavy current of electricity through the parts. the resistance of the steel pieces creates a very high temperature which fuses the metals perfectly. The union is as complete as if the pieces were one.

- **Acetylene, sometimes called Autogenous welding**, is the means used in closing joints in metal work, or of uniting several pieces of metal by fusing the adjacent edges together. Heat for the fusion is supplied by an oxy-acetylene torch. Additional metal is fused into joints if required.

Cold-Drawing of Steel, Electric Welding and Acetylene Welding.  
GF Allsteel – Housing of Records. Youngstown, Ohio. 1916.

While a few firms were producing metal office furniture in the 1890s, the number of firms increased in the first two decades of the twentieth century as new companies were started and existing wood furniture manufacturers expanded into metal production, either by starting their own metal facilities or by purchasing existing metal manufacturers and adapting the production to office furniture.<sup>8</sup> This period also witnessed improvements in the construction of office furniture which originated with the automotive and building industries. Most important of these technological advancements were the developments in welding which joined the steel parts together.<sup>9</sup> Early metal furniture components were connected using a variety of nuts, bolts, screws and/or rivets. In all cases, the fasteners could work loose over time, causing the frame to become wobbly and unstable. The development of electric arc welding and oxyacetylene welding techniques permitted manufacturers to construct monolithic cases for files and desks which eliminated the nuts, bolts, etc. The construction technology of the skyscraper office

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<sup>8</sup> The mid-teens, 1913 – 1917, appeared to be the time period when the most changes were taking place in the metal office furniture industry. Wood manufacturers Globe-Wernicke and Shaw-Walker added steel furniture to their product offerings, while new metal companies were formed Berger Manufacturing – A Division of Republic Steel in Canton, OH.

<sup>9</sup> Greenwood, Richard N. *The Five Heywood Brothers (1821-1951): A Brief History of the Heywood-Wakefield Company during 125 Years*. New York: The Newcomen Society in North America, 1951. In this address to the Newcomen Society of England at Gardner, MA, in 1951, Greenwood made reference to the invention by Marshall Lloyd, and his assistant, Lewis Larsen, of Lloyd Manufacturing of an oxyacetylene tube welding process which they developed and patented in 1910. Lloyd Manufacturing specialized in baby carriages and fabric for furniture, but after the development of this process, “At one time, Lloyd supplied all the tubing required for the windshield frames of Henry Ford’s early Model T’s.”(21) Lloyd Manufacturing became a wholly-owned subsidiary of Heywood-Wakefield Company in 1921.

building also served as a prototype for the development of new construction techniques for metal office furniture.

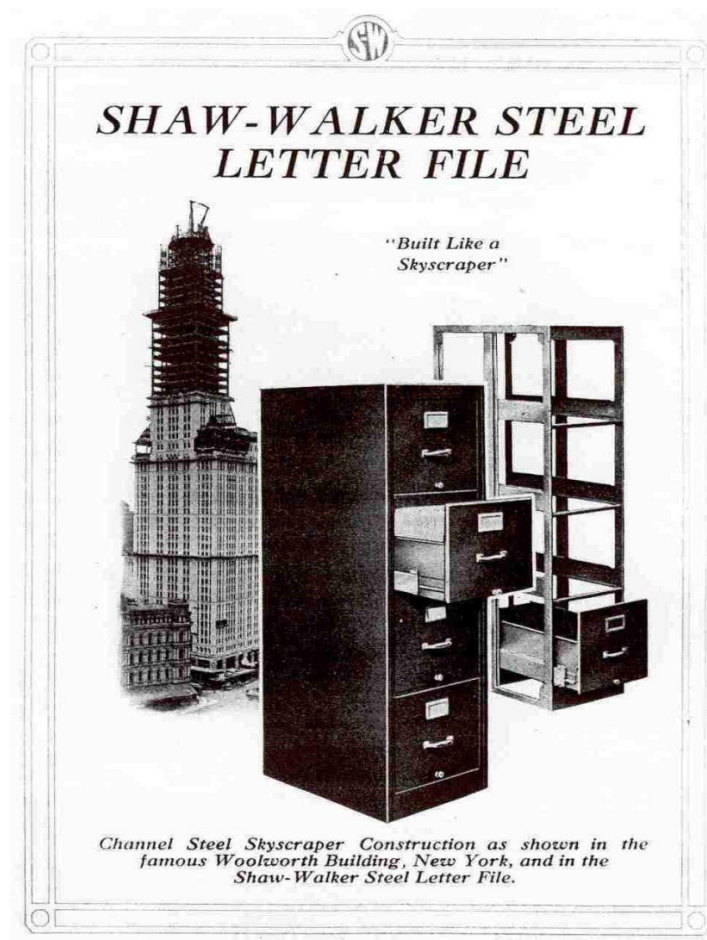


Figure 9

Using steel frame construction similar to that used in the skyscraper (See Fig. 9), furniture forms evolved which, while not differing significantly in appearance from earlier forms, were constructed to be more durable and function more efficiently. The advantages of metal over wood for office furnishings were repeatedly expressed in both trade catalogs and advertisements—resistance to fire; not susceptible to changes in humidity and temperature; ease of operation; and dust and varmit or vermin proof.

Another example of technology transferred among the auto and furniture industries was described by Richard Greenwood in his book *The Five Heywood Brothers (1821-1951): A Brief History of the Heywood-Wakefield Company during 125 Years*. (New York: The Newcomen Society in North America, 1951). In his address to the Newcomen Society of England at Gardner, MA, in 1951, Greenwood made reference to the invention by Marshall Lloyd, and his assistant, Lewis Larsen, of Lloyd Manufacturing of an oxyacetylene tube welding process which they developed and patented in 1910. Lloyd Manufacturing specialized in baby carriages and fabric for furniture, but after the development of this process, “At one time, Lloyd supplied all the tubing required for the windshield frames of Henry Ford’s early Model T’s.”(21) Lloyd Manufacturing became a wholly-owned subsidiary of Heywood-Wakefield Company in 1921. Heywood-Wakefield was a furniture firm which produced a variety of wood and metal framed furniture, primarily residential, in the first half of the 20<sup>th</sup> century.

### **Aesthetics**

The aesthetics of office furniture diverged into two distinct paths during the early part of the 20<sup>th</sup> century – partially dependent on the nature of the material used in production.

The early forms of office furniture, worked in wood, followed the design trends of the corresponding residential styles of the periods. Working through the revival styles of the second half of the 19<sup>th</sup> century – Gothic – Renaissance – Rococo – classical – and moving into the Arts and Crafts, office furniture could be found which displayed all of these design characteristics. Machine production reduced the quality of these design elements in most instances, but the historic references were still evident.

As the industry moved into metal furniture production, the nature of the metal restricted the implementation of many design elements which were possible with wood. The processes used in sheet metal production and construction severely limited the forms which could be reproduced. Although through the use of cast moldings and other production methods, applications of decorative detailing could be achieved to some extent (See Fig. 10).

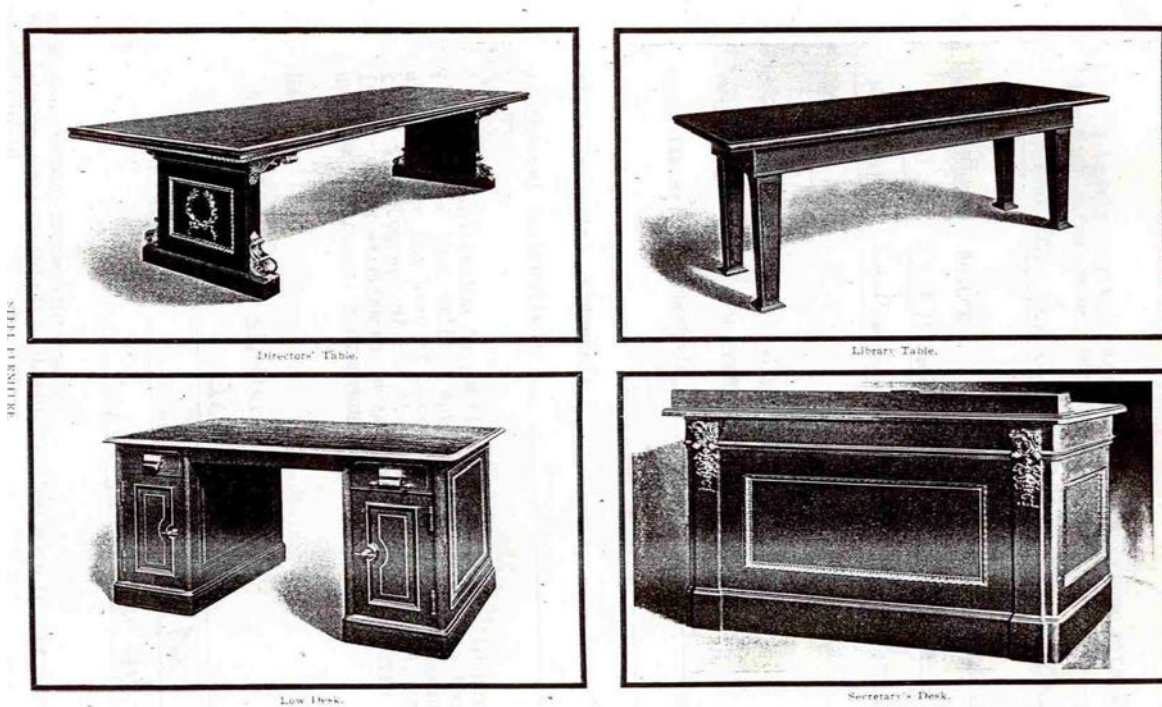


Figure 10      Art Metal Construction Company      Jamestown, NY

But most metal furniture produced during this period was extremely similar in appearance – rectangular forms designed to be functional and lacking most detail (See Fig. 11). This illustration for The Van Dorn Iron Works of Cleveland, OH, not only shows the relatively plain, flat surfaces of the office furniture, but also is an early example of the development of modularity in furniture, enabling customization for an office's specific filing and storage requirements.

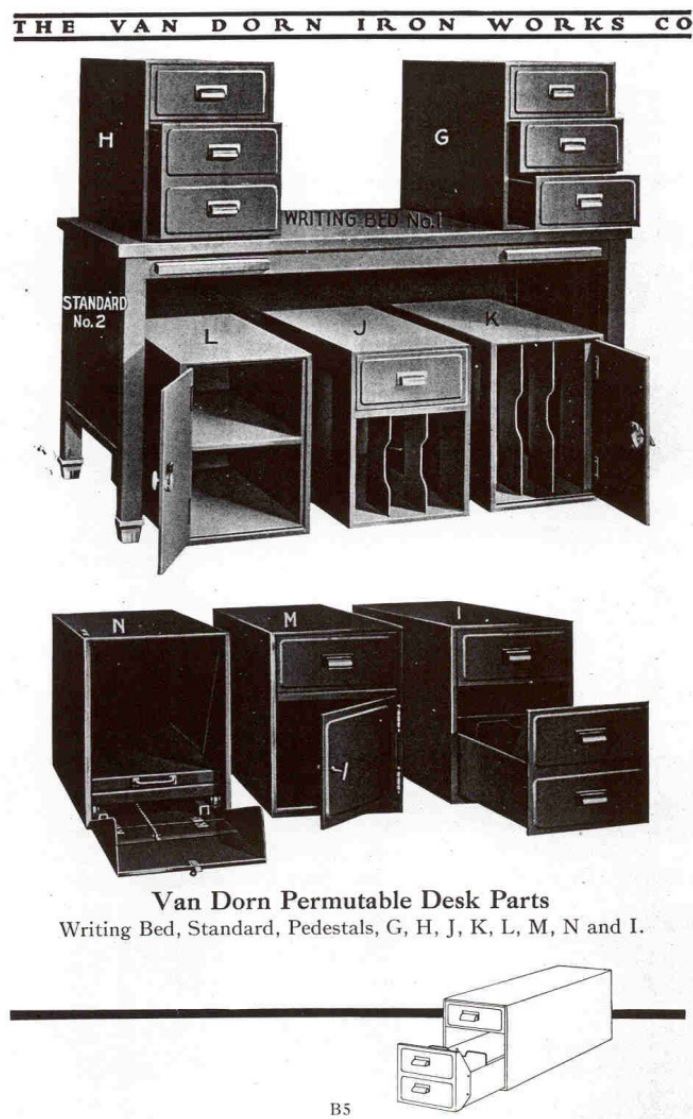


Figure 11

In what appears to be an effort to “compensate” for the lack of detail, and to make the cold, flat surfaces of steel more acceptable, painted finishes imitating wood graining were developed.

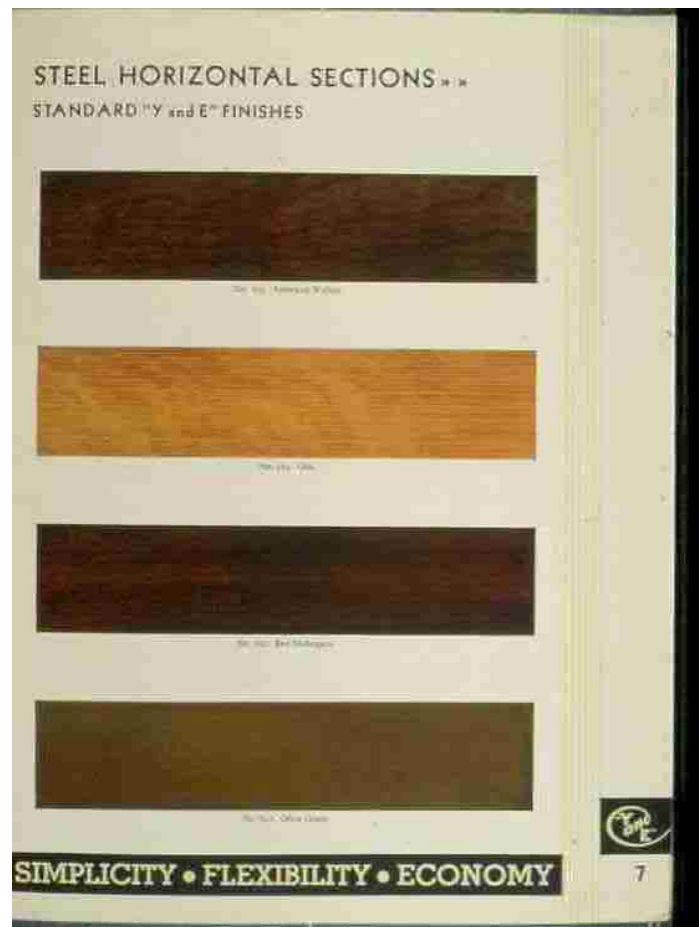


Figure 12      Yawman & Erbe

By the second decade of the 20<sup>th</sup> century, in an astonishing feat of standardization, almost the entire metal office furniture industry offered their goods in three wood-grain (painted) finishes—oak, walnut and mahogany; and one color—olive green (See Fig. 12).

The design of the furniture, while limited by the nature of steel construction, fits well with the emerging modernist traditions based on form and function. In addition, the streamlined form of Art Deco based on images of skyscrapers, transportation and sleek forms which evolved in the 1920s was evident in some forms.

While this research has concentrated on the design of office furniture in the United States, its design and manufacture were not limited to the United States.

In 1925, Le Corbusier wrote a series of critical essays translated as “The Decorative Art of Today” in which he examined the exhibits at the 1925 Paris Exposition of Decorative Arts. One chapter “Type Needs – Type Furniture” dealt with the design of office furniture. In this essay he decried the current use of ornament and excess in design – “Here we quit the anguished realms of fantasy and the incongruous, and resume a code with reassuring articles.” - and insisted that design should be based on human scale, the human function.

The illustrations (See Fig. 13) which accompanied Le Corbusier’s critique were very similar to the catalog items found in most US manufactures – an interesting conundrum of who designed what and when?

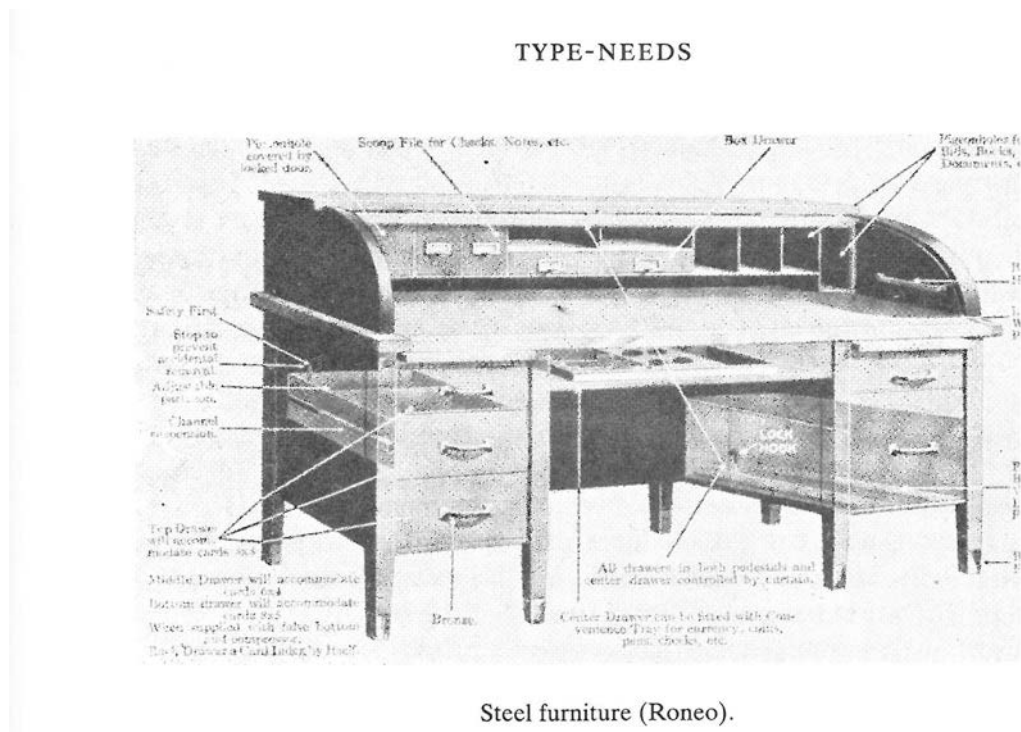


Figure 12

LeCorbusier

“The Decorative Art of Today”

Paris, 1925