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WPI SAVE OUR TREASURES IQP: THE HIGGINS ARMORY MUSEUM

An Interactive Qualifying Project

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Abstract

The Higgins Armory Museum, designed by Joseph D. Leland, was founded in 1931 by John Woodman Higgins on the site of the Worcester Pressed Steel Company. Through the construction of the museum, Higgins's thoughts on modern pressed steel products as craft were brought to life through their pairing with the metalworking used to create the medieval armor found Higgins's collection. In addition to the pairing of armor and modern machine made produced as exemplars of the "craft" used in Gothic and modern metalworking, the museum is housed inside a modern steel and glass structure. This building utilizes components made in the factories of "Presteel" and traditional Beaux-Arts principles employed by Leland, to create a unique and valuable structure in American architectural history. This paper aims to place the Higgins Armory Museum in context with other significant works of American architecture, while also providing a detailed history of the museum, its founder, and architect. It is a continuation of a previous work written for Professor David Samson in the Department of Humanities and Arts at Worcester Polytechnic Institute.

Introduction

In the nineteenth century Worcester, Massachusetts became one of New England's most industrialized cities. Many historians term this period of rapid industrial growth the "mechanical era" or "machine age"¹. The beginning of this era led not only to the production of unique machine made consumer products, but it also allowed for the development of a new architectural style applicable to industrial buildings. In Europe, Peter Behrens and Walter Gropius pioneered the development of mechanically produced consumer goods as art. Gropius, who was also an architect, furthered his views on design in the "mechanical era" through the construction of The Fagus Shoe Works, which many historians consider the impetus for the modern industrial building as a work of architectural significance (Image 1).² For American architects the search for a style appropriate for an industrial building that mirrored the mass production and use of artificial materials housed inside required a shift in vision and materials utilized to create such a structure by the designer. This search also required both the architect and client to embrace the culture, products, and design for a new era in American history: "the machine age".

In Worcester, John Woodman Higgins, a pioneer in manufacturing and President of the Worcester Pressed Steel Company believed in designing for a new era, and embraced it through architectural endeavors. Higgins explained in a 1933 essay that "the time will come when we will see new masterpieces... obtained through the manufacturing of steel parts..."

¹ John Woodman Higgins, "Design for Mass Production," *American Magazine of Art*, September 1933 1933.

² Walter Gropius, *The New Architecture and the Bauhaus*, trans. P. Morton Shand (Cambridge, MA: MIT Press, 1965).

used in the design of practical structures”.³ The result of Higgins’s passion surrounding the use of modern materials and techniques in architecture was the building he commissioned to house “Presteels” new executive offices, and his dream of having a museum of metal objects. The structure that Higgins commissioned is now known as the Higgins Armory Museum, and stands as an exemplar of American industrial architecture during the 1930’s. In particular, the techniques utilized in the design of the exterior represent a turning point in both American culture and architectural design. This landmark therefore necessitates the careful restoration needed to keep this structure as an example of American architecture for the “machine age”. In addition to representing American design for the “machine age”, the Higgins Armory Museum also merits preservation as an attempt by it’s architect, Joseph Leland (under the supervision of Higgins), to incorporate the eclectic architectural elements found in more traditional American structures into a style appropriate for a new era and archetype.

This work analyzes the 1931 addition to the Worcester Pressed Steel Company as an example of the development of industrial architecture in Worcester and America. This building functioned not only in the realm of industry, but also served as a cultural center in the form of a museum for the people of Worcester. The creation of this hybrid, combining museum and manufacturing center, was inspired by the ideas and ideals of John Woodman Higgins himself. Higgins’ rationale for this building encouraged its architect, Joseph D. Leland, to leave behind his classical training in the Beaux-Arts for a more “modern” architectural style, utilizing glass and steel rather than brick or stone to address the multiple functions of the building. However, Leland’s Beaux-Arts training can be seen in the overall execution of the building combining the eclectic styles found in American architecture,

³ Carter and Bradley C Higgins, *Craftsmanship in Steel* (Worcester, MA: The Newcomen Society in North America, 1956).

including Art Deco, in his design. Higgins choice of a strict glass and steel structure combined with restrained embellishments paved the way for “modern” construction in Worcester during the early twentieth century.

This paper will utilize the Crystal Palace, Singer Loft, Hallidie, Necco, and Chrysler Buildings as examples of progressive architecture throughout Europe and America. Each of these structures demonstrates architectural trends that led up to the conception and construction of the Higgins Armory Museum as a significant and unique glass and steel structure in the US.

John Woodman Higgins: A Medieval or Modernist Man?

John Woodman Higgins was born on September 1, 1874 in Worcester. As a young child Higgins could be seen as an innovator. He crafted devices to reduce his household chores such as installing electric communication bells in his parent’s home, constructing furniture, and other novel devices. “He was inspired by tools, and as he walked to school past the village blacksmith, he decided he would be a mechanic rather than a policeman, locomotive engineer, or poet.”⁴ The metalwork crafted by the village blacksmith was the impetus for Higgins’s interest in steel and metal craft. While a youngster, Higgins’s grandfather also told him stories of crusaders clad from head to toe in steel, and Higgins acquired a love for armor. As a high school student, Higgins traveled to Europe where he purchased his first suit of armor, albeit a reproduction. His trips to Europe continued throughout his life with the determination to purchase genuine suits of armor. In 1896 Higgins graduated from Worcester Polytechnic Institute (WPI) where he studied electrical

⁴Ibid.

engineering. While at WPI, Higgins's love for steel and its properties were further developed. Higgins once said that "if silver is like the diamond, steel is like the pearl"⁵.

Upon graduation Higgins went to work with his father, Milton Price Higgins, at one of his four companies, the Worcester Plunger Elevator Company. There he became the general superintendent, but in 1902 the company was sold to the Otis Elevator Company. John continued at Otis, where he became interested in the new technology of rolled and pressed steel. This interest inspired Higgins to invest in this new technology, and in 1904 Higgins purchased the Worcester Ferrule and Manufacturing Company, a manufacturer of pressed steel parts for \$65,000, and left Otis. Higgins soon became president of Worcester Ferrule and Manufacturing Company beginning in 1910. After Higgins took office, the name and logo of the company were immediately changed to the Worcester Pressed Steel Company, and the company adopted a Gothic suit of armor as its logo.

The selection of a suit of armor for the new company logo was not accidental on the part of Higgins, and went beyond his obsession with Gothic armor. Higgins believed that armor "signifies the ultimate combination of the beautiful with the form best suited for a particular need. The members of the early Armorers Guilds made pots and pans and cups and chandeliers and tools as well as arms for the fighting man. They had no modern uniform steel, not even an analysis beyond knowing where the ore came from. Yet, the work they did inspired us with admiration."⁶ The embrace of craftsman as "artisan" is exactly what Higgins believed in. Higgins himself wanted to inspire the workers at the Worcester Pressed Steel Company. Although they too probably did not know where the ore they were working with came from, or any of its attributes, they did not need to. The workers at the Worcester Pressed Steel Company were working during the "Mechanical

⁵Ibid.

⁶Higgins, "Design for Mass Production."

Era”, and were seen as laborers by many. They produced common products much like the members of the Armorers Guild. They simply operated a machine that produced a product. They themselves did not produce anything. However, Higgins did not believe this. He, much like Peter Behrens or even William Morris, felt that even machine operators working in a factory were craftsmen. Higgins frequently told his employees, “A craftsman... becomes an artist. Every artisan who strives to become an artist will become a better craftsman, and oh, how this world needs better craftsmen to raise the standard of living in this Man Age of Mass Production! Your highest goal is skill...”⁷. These beliefs were an integral component of the foundation for what Higgins would eventually do at the Worcester Pressed Steel Company.

In 1904 Higgins married Clara Louise Carter in St. Louis, Missouri while on a sales trip selling stampings at the World’s Fair. The 1904 World’s fair held exhibitions in many large structures whose designs utilized the grandeur of classical Beaux-Arts architecture, while displaying the latest innovations. In addition to the substantial stone used to construct these Beaux-Arts Halls, steel had made its way into the fair as an architectural material in the form of glass and steel greenhouses, and a glass and steel birdcage crafted by architect Frank Baker.⁸ This was only the beginning of Higgins’s exposure to architecture, particularly with the new uses of steel in design and construction. One can imagine that Higgins was fascinated with the steel used in the creation of these structures. They utilized the “art” of architecture, combined with the modern industrial material of steel, to create a structure that was unique, and intrinsically looked into the future much like the “mechanical era”.

⁷ Higgins, *Craftsmanship in Steel*.

⁸ *The 1904 World's Fair Society* (2006 [cited 2 January 2006]); available from <http://www.1904worldsfairsociety.org/>.

The Worcester Pressed steel company continued to produce goods though many low periods in the presteel market between 1906 and 1927 (including the end of World War I which left "Presteel" with a huge unsellable inventory). In 1927 Higgins took his family to Europe and visited the great armory collections of the world. Higgins and his family visited the Royal Armory of Madrid, The Vienna Collection, the Tower and Wallace Collections in London, and the Gothic suits located in Castle Churburg in the Austrian Tyrol. Higgins continued to collect while in Europe. His home soon became full of armor, and it began to overflow into the "Presteel" office quarters.⁹

It was at this point that Higgins began to dream of housing his collection in an office building belonging to a steel company which also housed a museum containing both modern and ancient products. "For fifteen years Higgins had felt that the steel and glass sash used in his (original) factory buildings could be applied to an office as well."¹⁰ One can imagine that Higgins's dream to combine a museum with the products produced in an industrial factory was novel for Worcester. Many, including "Presteel" employees, felt that this idea would make the company a laughing stock. However, for Higgins this was an ideal way to demonstrate that the work of his factory "craftsmen" could be considered "art" both to fellow factory owners and the citizens of Worcester through its pairing with Gothic armor. He hoped that "such a collection in such a building, open to the general public, and related to modern shops... would inspire sympathetic understanding"¹¹ in his critics.

⁹ John Nelson, "Ancient and Modern Metal Work in Glass and Steel Building," *The Iron Age* 126, no. 25 (1930).

¹⁰ Higgins, *Craftsmanship in Steel*.

¹¹ *Ibid.*

However, the concept of a museum dedicated to demonstrating “the application of arts to manufacture and practical life”¹² was not new to America during the period when the Higgins Armory was conceived of. Higgins’s vision for the museum followed a model established by the Newark City Museum, another growing industrial center, (and later Richard F. Bach at the Metropolitan Museum) which “exhibited manufacturing processes and local industrial products— not only to instill Newark’s citizens with pride but also to improve their taste by exposing them to selected examples of good design”¹³. John Cotton Dana of the Newark City Museum (director starting in 1909) “led an industrial art museum movement that supported mass production design without completely rejecting the conservatism of art schools.”¹⁴ The visions of Dana and Bach were the foundation on which Higgins based his thoughts for a museum of industrial design. Higgins would expand upon the idea of a museum of industrial products through the pairing of industrial products with the craftsmanship seen in the construction of armor. This would allow visitors to experience the development of metalwork from medieval to modern times.

However, the question quickly arose of what building would Higgins carry out this vision in? The Worcester Pressed Steel Company buildings were filled to capacity, and Higgins’s armor began to overwhelm that space as well. So, in 1928, the Worcester Telegram announced, “the city was to have a free public museum and laboratory of metalwork.” The museum “would comprise a historical library and a collection of objects

¹² Jeffrey L. Meikle, *Twentieth Century Limited: Industrial Design in America, 1925-1939* (Philadelphia: Temple University Press, 1979).

¹³ Ibid.

¹⁴ Ibid.

illustrating the progress of the art of metal working from its earliest beginning to the present time”¹⁵, and issued a call for an architect for the building.

Joseph D. Leland: Beaux-Arts Architect for the Industrial Era

In 1928 John Woodman Higgins hired architect Joseph D. Leland of Boston to execute his vision of an office-museum that would house his collection of armor, display modern products constructed of steel, and also serve as office space for the Worcester Pressed Steel Company. Leland was born on June 16, 1885 and died in 1968 in Milton, MA at the age of 82. Leland graduated from Harvard University in 1909 and received additional architectural training at the Ecole des Beaux Arts in Paris. Leland was named a fellow of the American Institute of Architects (AIA) in 1943. His firm, Leland and Larsen, had offices in Boston, Worcester, and New York, constructing buildings throughout New England and in New York City.¹⁶ Leland and Larsen constructed or remodeled countless buildings utilizing traditional Beaux-Arts styling learned during Leland’s education in Paris (see appendix for a complete list of works and strict biography of Leland).

A typical construction project for Leland was the Whitinsville Middle School Gymnasium (1924). Here, Leland’s Beaux-Arts training is particularly prominent. It utilizes red brick (traditional for educational buildings), a symmetrical design scheme, with a grand entranceway, accented with classical embellishments, and classical technique of elevating the structure atop a conspicuous base (Image 2).

Leland’s buildings utilized his classical training in Beaux-Arts design through and though despite the fact that many were constructed in a period when this style of

¹⁵ "City to Have Free Public Museum of Metal Work," *Worcester Daily Telegram*, February 10, 1928 1928.

¹⁶ "Joseph Leland, 82, Retired Architect," *New York Times*, 16 April 1968 1968.

architecture was not looking forward to a new style of American architecture. One can imagine that Leland strongly believed that a strict Beaux-Arts design philosophy was applicable to architecture for cultural institutions, particularly in a city like Worcester, still searching for its place in society and looking to elevate its status through the construction of prominent cultural centers (such as museums). Of particular interest to this paper is Leland's work on the American Art Galleries in New York City in 1923. To my knowledge, this is the only other work on an exhibition complex Leland completed, making it particularly significant.¹⁷

The American Art Galleries was instituted in 1880, and its headquarters were altered by Leland in 1923 (Image 3). This building housed a significant collection of art, and was one of the premier galleries in New York City. The plain red brick building served as a clean slate for Beaux-Arts style architecture, and Leland successfully altered the building using the techniques in which he was trained. The building consists of three distinct levels including a distinct base, short second story probably housing offices, prominent piano nobile housing the gallery space, and classical dentilated crown all set upon a rectangular base. Each level is distinctly identified through the implementation of moldings and uniquely sized windows. The features of the structure are also in perfect symmetry on each side of the building. The most notable example of this symmetry is the application of the building name "American Art Galleries Instituted 1880" appearing twice on either side of the central balcony and entranceway solely for effect. The balcony and each window is accentuated with moldings, and topped with an oval shaped decoration.

Although the building is constructed of brick, the base of the building features what appears to be a glass and steel foundation supporting the upper levels. This glass and steel

¹⁷ "American Art Galleries, New York: Second Prize, Altered Building Class, Fifth Avenue Assn., Annual Medal Award, Joseph D. Leland & Co., Architect," *Architecture* 1923 47 (1923).

base is not left unembellished. The header features adornment where each vertical support meets the horizontal beam. Additionally, decorative glass is placed between the header and the doorways to shops located below the offices. This component is the first instance that the pairing of glass and steel appears in Leland's works prior to the construction of the new addition to the Worcester Pressed Steel Company.

Despite the fact that John Woodman Higgins would have disliked the decorative execution (because it was fake and meaningless) of the Beaux-Arts styling, he would have appreciated what the style of architecture stood for: knowledge and education, structure, proportions, and symmetry. Higgins needed Leland's expertise as an architect, trained in the most respected academies, to successfully execute his new building. However, this is where the influence of Leland took a back seat to the ideas of John Woodman Higgins himself. It was Higgins who believed that steel and glass construction was the appropriate direction for the new building to take. The idea that engineering and industry could create something that was both functional and beautiful in the form of architecture was at the core of Higgins' philosophy. Higgins insisted that the building be constructed solely out of glass and steel. There was to be no brick, stone, wood, or cement utilized in the structure of the building. Higgins also wanted to utilize products made in his own factory to construct his new building. This allowed Higgins to create his own type of steel having unique construction and sizes, while also allowing all of the workers at "Presteel" to see how their products were works of art in the form of a new building. Having combined the knowledge of a well trained Beaux-Arts architect, and that of an engineer and industrial pioneer, the concept for the addition to the Worcester Pressed Steel Company was born.¹⁸

The 1931 Addition: A Movement towards Modernism

¹⁸ Higgins, *Craftsmanship in Steel*.

Prior to beginning construction on the permanent structure, Higgins and Leland first needed to quell safety concerns surrounding glass and steel construction. At the time, many felt that a pure glass and steel building would fall apart due to the expansion and contraction of steel during the extreme temperature fluxations experienced in New England. To test this rumor, Higgins and Leland constructed a one-story replica of the new building on the top of the Higgins' garage. Higgins and Leland monitored the prototype for one year. It proved that a structure comprised solely of glass and steel was able to successfully withstand the expansion and contraction of steel through large temperature changes. Immediately thereafter in 1929, construction on the new museum/office space began at the present location on 100 Barber Avenue.¹⁹

The site of the Higgins Armory Museum sits atop a large promontory looking down upon the city of Worcester, and is located next to the original Worcester Pressed Steel site on the corner of Barber Ave and Randolph Road. Many of the buildings on the Presteel campus were interconnected, as is the case with the new office/museum structure. This allowed the new structure to become an integral part of the factory floor, and directly connected the factory workers with the armory. It is also sited so that the maximum amount of light is able to flood the interior spaces through the vast expanses of glass. Although the addition sits amongst other factory buildings, the addition appears as a unique structure. From a distance it resembles a castle looking over the city, and a constant reminder to the citizens of Worcester of its presence and of the ideas held by Higgins himself concerning industry, manufacturing, and craftsmanship.

Overall, the building takes on the shape of a large "V" or opened hinge. The entrance to the building sits at the point of the "V", and serves as the focal point for the

¹⁹ Ibid.

building. It marks the center of the building, and like all Beaux-Arts architecture defines the central point of symmetry. Attention to the entrance is increased through its placement inside a semicircular cutout made in the structure of the building. Each side of the building is significantly longer than it is wide, typical of structures (particularly churches) designed in a naïve-basilica typology. The entire building is symmetrical around the entranceway. The doorway sits under a heavily crested marquee of steel and wrought iron. The doors themselves are plate glass in stainless steel frames, with protective grills of polished art-forged steel. The doorways are the most intricate and embellished component of the entire building, and a prime example of metal craft as an art form during the early part of the twentieth century (Image 4).²⁰

Each of these elements are indicative of Beaux-Arts design, and this is one place where Leland's training in Beaux-Arts design can be seen. His ability to organize the overall structure in this manner provides the building with a sense of order and clarity while not utilizing a typical square or rectangular shape found in many Beaux-Arts buildings. In a way, this marks Leland's first departure from classical Beaux-Arts design to something more contemporary for the late 1920's.

The addition also demonstrates a more functional type of architecture than Leland would have typically constructed. Higgins needed two separate wings to the building to house his two collections: armor and industrially produced goods. Rather than put them on two separate floors, Leland adapted the structure of the building such that the visitor could seamlessly transition from medieval to contemporary craft without changing floors.

The execution of the exterior of the building takes on a classical form of three distinct sections consisting of a base, piano nobile, and crown. Each of these stories is

²⁰ Nelson, "Ancient and Modern Metal Work in Glass and Steel Building."

accentuated through the use of pressed steel embellishments that surround the building. The base of the building was designed to house office space for the company. Its rows of ribbonlike windows are dwarfed by the piano nobile above. Each pane of glass is outlined through the use of steel mullions emphasizing the rectangular shapes utilized in the design of the building. The oversized piano nobile is significantly larger than the lower base to allow for the construction of vaulted ceilings on the interior. This large expanse of glass provides a sense of power, strength, and mass despite the fact that it is completely transparent. This sense of mass was achieved in Beaux-Arts architecture through the use of large stones, something Leland would have mastered while studying at the Ecole des Beaux Arts.

The large piano nobile is crowned with a series of pressed steel rosettes. These stampings were scaled down replicas of the large stained glass rosettes found on either end of the armory, and serve along with another ribbon of pressed decoration to crown the building. Each of the vertical steel members extends through the roof and protrudes upwards, and gives the building the appearance of being almost castle-like. Each of the embellishments on the buildings “serve to exemplify the various methods of working and joining metals by rolling, casting, stamping, punching, forming, and forging”.²¹ Each of these elements was placed on the building to distinguish the classic components of a structure. They exemplify how industrial products could be used in the creation of art. This is one aspect of the design where Higgins’s vision of utilizing products created in “Presteel” factories is elegantly executed by Leland (Images 5 and 6).

The entire façade of the building is comprised only of steel and glass, and each steel member is highlighted through the use of purposefully oversized rivets. The construction of

²¹ Ibid.

the building exemplifies the strength and versatility of steel and glass. The steel components of the structure are painted with numerous coats of heavy aluminum bronze paint for protection against rust. The workings of the interior of the building can be seen from the outside.²² The façade also exposes each of the stairwells in the building located on the ends and center of the building much like the Gropius' Fagus Shoe Factory (Figure 7). The façade of the building lacks any other adornment outside of the pressed steel used to accentuate the three levels of the structure and embellished entranceway hidden in the front of the building. Although the structure appears to be finished with the highest degree of quality, the building is considered to be of "mill quality construction"²³ utilizing only structural steel. The overall verticality utilized in the design stems from the modern skyscraper, pioneered by the Chicago School Architects, reaching upwards with immense size and strength.

This seemingly modern exterior is a foil for the contents and design of the armory housed inside. This masking of the interior contents with a modern exterior is a switch in the way architects traditionally design a building. Typically, architects created traditional exteriors which open up into modern interiors such as the Reagan Building by J. Freed in Washington, D.C., or The Oxford Museum of Natural History. The exterior façade of the natural history museum at Oxford exists as a mask for the glass and cast iron courtyard, and scientific artifacts housed inside. This foil functions much like the glass and steel curtain walls employed by Leland mask the gothic armor and castle-like spaces inside.²⁴

The interior of the building exists as two species. The first level served as expanded office space for "Presteel". More notably, the second and third floor housed the armory

²² Leland and Larson, "Office Building and Museum for the Worcester Pressed Steel Company," *The Architectural Forum* 54 (1931).

²³ Nelson, "Ancient and Modern Metal Work in Glass and Steel Building."

²⁴ Higgins, *Craftsmanship in Steel*.

containing Higgins' collection of arms and armor, and a wing of modern industrial pressed steel products produced by "Presteel". In Leland's description of the building, he says that "for the display of armor and mediaeval steel work, the architectural treatment of the room (two upper wings) should be reminiscent of the architecture of the times, and therefore the room is vaulted in a Gothic manner."²⁵ Faux Caen stone is used to create the effect of Gothic styling, and covers the entire two wings of the armory. This application of imitation stone to a large open wing allowed for the construction of many niches and alcoves much like a castle. Higgins modeled the interior of the armory after the Castle Chursberg located in the Austrian Tyrol where he purchased a significant amount of armor on his 1927 trip to Europe.²⁶ Although the armory itself is executed in a Gothic style, the stone lacks almost any embellishment. It is very pure and straightforward. The only embellishments exist on the doorways.²⁷

Armor lined the walls of the armory punctuated by smaller "windows" allowing an immense amount of light into the armory. These windows also exposed the glass and steel construction utilized on the exterior of the building, and allowed the visitor to see outward and look at the other wings of the building. The exposure of the modern exterior inside the gothic interior exists as a reminder that one is inside a large modern factory building and not a Gothic castle. This exposure of the steel and glass skeleton would have been most appropriate in the modern wing of the structure. There modern products of manufacturing would have been seen inside a modern building. However, like the mediaeval wing, it too was cast in faux Caen stone in Gothic styling. Leland himself questioned the effectiveness of the interior styling for the modern wing wondering if it would "be possible to exhibit

²⁵ Larson, "Office Building and Museum for the Worcester Pressed Steel Company."

²⁶ "All Steel and Glass Building Is a Symbol of the Age," *Metalcraft* 6 (1930).

²⁷ Nelson, "Ancient and Modern Metal Work in Glass and Steel Building."

these things (armor and manufactured products) with equal effectiveness in a room very simply designed in flat steel which would be consistent with the modern use of steel and glass in the exterior.”²⁸ It was Higgins who wished to remind visitors of the “culture” of modern products by continuing the feeling of a Gothic castle into the modern products wing.

In many ways the new addition to the Worcester Pressed Steel Company exists as a hybrid between modern architecture and classical design which some may categorize as Art Deco. It utilizes classical Beaux-Arts design with a minimum amount of embellishments on the exterior combined with the use of modern materials in the form of steel and glass. In traditional Beaux-Arts architecture, these stylistic elements would carry little meaning in their forms. However, in the case of the addition to Pressteel, these elements exemplify the use of new industrial manufacturing techniques to produce something that would appear as if were a crafted and artful decoration. These embellishments also go beyond those used in Art Deco design in that they are more meaningful than colorful veneers or fancy inlays because they demonstrate the making of a product. They exist to remind the factory workers and citizens of Worcester that industrial products can be beautiful. These decorative elements along with the decorative placement of the steel support structure suggest that something more than manufacturing is housed inside.

If the pressed steel embellishments were removed from the building, many would consider this building truly modern. The pure glass and steel structure would exist as an engineering form, something Alfred Barr Jr. suggested was the path towards modern architecture. In a 1928 essay on the Necco Factory of Cambridgeport, MA, Barr states that “the engineer and chief designer achieved architecture positively ... through the use of

²⁸ Larson, "Office Building and Museum for the Worcester Pressed Steel Company."

economy in decorative motive...".²⁹ However, the concept of a hybrid between factory, engineering form, Beaux-Art design, and modern glass and steel construction did not suddenly emerge. Its design stems from a lineage of glass and steel structures that led up to the design for the addition to the Worcester Pressed Steel Company.

Chronology of Architecture Leading to Presteel

During the 1840's and 1850's the introduction of metal into the construction of buildings, and its use as an architectural element, came into the spotlight with the English architect, engineer, and horticulturist Joseph Paxton. Paxton's utilization of iron in his design for "The Crystal Palace" would make a significant impact on the materials utilized in future architectural design. The realization of the sheer strength of iron allowed Paxton to create large unsupported spans which contemporary building materials would not allow him to do.

In 1850-1 Paxton won the competition to design and construct the "Crystal Palace" for The Great Exposition. Through the construction of the Crystal Palace, Paxton demonstrated how architecture could embrace a new era of machinery in manufacturing while housing expositions of hand-made artistic products. Much like Higgins, Paxton believed in the "craft" of produced products through the use of the machine.

However, where did the concept for Paxton's design come from? The answer lies in the emerging technology of the period: railroads. Years after the Crystal Palace was completed, Walter Benjamin commented on the emergence of iron from railroads into a construction material stating, "with iron, an artificial building material appeared for the first time in the history of architecture. The rail was the first unit of construction, the forerunner of the girder."³⁰

²⁹ Alfred H. Barr, "The Necco Factory," *The Arts* 13 (1928).

³⁰ John McKean, *Crystal Palace: Joseph Paxton and Charles Fox* (London, England: Phaidon Press, 1994).

In addition to being involved with engineering and architecture, Paxton himself was involved for 20 years with the railroads. He partnered with Thomas Brassey, a large railroad contractor, in many railroad development projects. It was then that Paxton realized the ultimate strength and versatility of iron as the tracks they constructed guided large trains throughout England.

Paxton himself was fascinated with the power of iron, and much like Higgins, his contemporaries claimed that “his life was an exhibition of industry”.³¹ Iron provided Paxton with the materials to construct the Crystal Palace, however, the architectural forms that were manipulated into his work for the 1850-1 Great Exposition came from the gardens where he spent much of his time.

While speculating on railroad construction projects, Paxton was also designing greenhouses for the gardens that he worked in. He designed numerous structures, many of which were of unprecedented size for the time. Paxton designed these greenhouses from wood, glass, and iron, and his designs were regarded as the premier structures in the late 1800's.

During the conception of the Crystal Palace, Paxton, much like Higgins, wanted to emphasize the cultural trend in 1850 of industry, manufacturing, and innovative technology. Although Higgins and Leland utilized industrially produced standardized components for Presteel some 80 years after the Crystal Palace, mass production of such items was quite visible in late 19th century England, and was a significant component to the overall vision of the Great Exposition in 1851. The Crystal Palace, utilizing Paxton's mechanically produced gutter system, exemplified how mechanically produced units could be combined to produce something beautiful without clothing the structure in medieval turrets or enclosing the

³¹ Ibid.

structure with brick; neither of which would move architecture in a new direction. Paxton exposed each component of the system of parts that made up the whole structure. In many ways the Crystal Palace was just like a machine to house exhibits, requiring each individual component to work together to create a functioning whole (Figure 8).

Paxton also had a limited period of time to construct the Crystal Palace, and therefore took advantage of the speed of mechanically produced components in his design. Without mechanically produced products, the Crystal Palace would not have been possible. In an article published in *The Morning Chronicle* on the day the Crystal Palace opened it was suggested that: "It is probable that no other people in the world could have achieved such a marvel of constructive skill within so brief a period. It is to our wonderful industrial discipline – our consummately arranged organization of toil, and our habit of division of labour – that we owe all the triumph."³²

Another design element that allowed for rapid construction of The Crystal Palace was the use of standardized repetitive pre fabricated units created and assembled utilizing machinery developed by Paxton. Higgins and Leland took a similar approach to Paxton in the design for "Presteel" casting the majority of the steel elements in Higgins's own factory. Additionally many components to "Presteel" utilized multiple iterations of the same component allowing for rapid construction and lower cost. All of this in addition to demonstrating the beauty of mechanically produced products to the craftsman and public.

In many ways the Crystal Palace served as a model for architects utilizing iron as a material to create structures of immense size. The use of standardized mass produced components as a building material set the standard for the amount of time needed to complete a large construction project. However, in 1851 the impact the Crystal Palace will

³² Ibid.

have on future architectural endeavors both in Europe and America is unknown. It is now clear that the use of innovative construction methods and materials paved the road for many architects to advance architecture, and allowed them to adapt new styles and construction tactics appropriate for the era in which they were working. Some 50 years later in the United States, iron is being utilized to create a new style of architecture in the form of a façade for a brick building in Ernest Flagg's Singer Loft Building of 1902-4.

In the period between the construction of the Crystal Palace and Flagg's Singer Loft building, the commercial skyscraper came into the spotlight in America. Most notably, the Chicago School architect Louis Sullivan pioneered the creation of the skyscraper in America. However, American architects were plagued with creating a style of architecture that was truly American and appropriate for this new type of building. Many of the designs for these new structures required the use of iron to support their immense size, and debate arose about how best to treat it in the overall aesthetic of the building. The issues of what style does American architecture adopt and what was the best way to treat iron as an architectural element provided the impetus for Flagg's design for the Singer Loft Building. The design of the loft is largely a demonstration of Flagg's opinion on these issues, much like the Higgins Armory Museum does for Higgins and Leleand.

In February of 1902, Ernest Flagg was commissioned by the Singer Manufacturing Company to design an office and loft building for a site located south of Houston Street in New York City. This particular area in New York was the site of numerous cast-iron buildings, which allowed The Singer Loft Building to blend in with its neighbors most notably Louis Sullivans Bayard (Condict) Building of 1897-8. However, Flagg's Singer Building took an approach to its cast iron frame that was different from other buildings in the area. Instead of seamlessly joining iron elements together to disguise them as a material

other than metal, Flagg explored the “decorative possibilities of iron”³³ in his design. Flagg utilized French commercial architecture for the overall design of the building and incorporated French classic decorative elements crafted of iron to emphasize the major components of the building. Although each of the iron beams found on the façade of the building are encased by terra cotta (required by a New York law passed in 1899), Flagg explicitly depicts where each column exists through the use of decorative iron, glass, and terra cotta elements much like Leland does in the “Presteel” addition through the use of oversized rivets (Image 9).

Flagg, much like Joseph Paxton, also needed to devise a construction strategy to create a structure that contained intricate steel elements and also took advantage of an odd “L-shaped” lot. The answer to this problem once again lay in the use of prefabricated parts which could be quickly assembled and tested in the factory where they were made. In an essay by what many historians call the pioneer of iron as an architectural element and building material, Viollet-le-Duc spoke about the advantages of prefabricated iron (not steel which was used in the construction of the Higgins Armory Museum), which Flagg (and Higgins also) strongly believed in. Viollet-le-Duc said, “They would be quite finished in builders’ yards, the factories and workshops before being put up, and consequently they would be erected very quickly, without mishaps, obstruction, or great annoyance to the neighbourhood.”³⁴

The result of this experimental use of iron construction resulted in mixed results from critics writing during the period. Many claimed that the Singer Loft Building was an attempt to replicate Sullivan’s Bayard (Condict) building, however, some disagreed. Harry

³³ Mardges Bacon, *Ernest Flagg: Beaux-Arts Architect and Urban Reformer* (Cambridge, MA: MIT Press, 1986).

³⁴ Ibid.

Desmond of the *Architectural Record* called Flagg's creation "A Rational Skyscraper". Desmond went on to also say that Flagg relied "directly on logical instead of traditional lines, relying rather upon the 'principles' inculcated at the Ecole than upon any established set of patterns."³⁵ A similar sense of style can be seen in Leland's design for the Worcester Pressed Steel Company. Although Leland's overall style is Federal while Flagg's is Baroque, Leland looks at the desired function of the building and incorporates that into the overall composition of the structure. He, much like Flagg, take the essence of the components which make up a building which he also learned at the Ecole, and creates a structure that is both functional, logical, and has pure "structural expression" while using ornament that "should soften, add interest, beauty, refinement, and grace to the thing ornamented."³⁶

It should also be noted that the Singer Loft Building, like the Presteel addition, was multi-functional. The structure not only served as an office building but also as a showroom of every Singer sewing machine produced. In her text on Flagg, Mardges Bacon writes that the Singer Loft Building is a "promotional brochure of the period which urged 'public exposition' of the Singer machines in operation 'for here is undoubtedly the most extensive and complete installation to be found'".³⁷

Overall, the Singer Loft Building exemplifies the homogenization of an American structural system, the iron curtain wall, with ornamentation taken from classic French design and the essence of classical architectural design. Flagg utilizes each of these components to create a structure where "decoration could approximate construction" resulting in "modern architecture" not "archaeology" according to Bacon.³⁸

³⁵ Ibid.

³⁶ Ibid.

³⁷ Ibid.

³⁸ Ibid.

Although the Singer Loft Building utilized iron and glass to create a new type of façade that some considered to be “modern”, the significant use of steel muted the effect of glass used in the design. 10 years later, the architect Willis Polk set out to design a glass and steel curtain wall structure whose large expanse of glass would be considered the major design element. Polk executed this vision through the construction of his Hallidie Building of 1918 in San Francisco, CA (Image 10).

The Hallidie Building, constructed for the regents of the University of California as an investment property, utilized what many consider to be the “first true example of the curtain-wall applied to a large urban structure”.³⁹ Much like the Fagus Shoe Factory designed by Walter Gropius served as a model building for Higgins and Leland, it too existed as a precursor to Polk’s design. Polk also looked at the work of Joseph Paxton prior to designing the Hallidie Building, and called an early study for the building “The ‘Crystal Palace’”.⁴⁰ However, Polk expanded on the idea of the immense glass curtain wall utilized by other architects by eliminating any supporting elements in the plane of the façade. The front of the Hallidie building is as close as structurally possible to being a continuous glass surface.⁴¹ The entire façade and remainder of the building is supported by and constructed of a system of reinforced concrete cantilevers. These cantilevers project outward to create a 3” sill to support the immense weight of the glass façade of Polk’s design.

Much like Leland uses the rivets necessary to construct the Higgins Armory Museum as a decorative element, Polk utilizes features, such as fire escapes placed within the plane of glass, to provide “interest” to the building. Each of the fire escapes is utilized to create “an artistic composition” in the design, while also providing symmetry and three-dimensionality

³⁹ Keith W. Dills, "The Hallidie Building," *Journal of the Society of Architectural Historians* 30, no. 1 (1971).

⁴¹ Dills, "The Hallidie Building."

to the glass façade of the building. Polk also utilizes four bands of cast iron ornament designed in a Gothic style to accent the components of the structure. These bands are inscribed with birds and other organic patterns found in Art Nouveau decoration that Polk discovered in the Paris Metro stations of Hector Guimard.⁴² Although the Higgins utilizes gothic rosettas to accentuate the crown of the building similar to Polk's Art Nouveau accents, Polk's embellishments lack the restraint and simplicity found in Leland and Higgins's design.

The issue still remains in America of what is an appropriate style for pure industrial architecture. Although many of the structures that have been analyzed to this point have included some component of "industry" in them, none have had the sole function of being an industrial building. This issue is a key component to Leland's design for the Higgins Armory Museum. The new office/museum needed to fit in amongst the other buildings on the "Presteel" site while respecting the executives and museum housed inside. The only other major industrial work of architecture in America is that of Albert Kahn in his design for the Ford Glass Plant of 1922. Closer to Massachusetts, a major contributor to industrial architecture in the early 20th century was the Necco Factory built in 1928, which pioneered a new industrial architectural style for the "machine age".

When the New England Confectionery Company set out to construct a new building they wished to create something that was beautiful and satisfied the company's industrial requirements for a new factory. This was accomplished through the hiring of Lockwood, Greene and Company who ended up not doing any of the design, but instead allowed their engineering department, in particular F. C. Lutze, to carry out the design and construction of the building. Some modernist architects at the time felt that this was the way towards

⁴² Ibid.

modernism in America. Some thought that farther the architect was from the engineer's desk, the more interesting the building would be.⁴³

In the case of the Necco Factory, the result of removing the architect from the design is a structure comprised of a concrete skeleton and yellow brick and limestone facades that lack any prominent decorative elements. Any adornment is crafted through the use of over- and under sized bricks, or, through the use of numerous window sizes, much like the Presteel addition utilizes oversized rivets and varying elevations of glazing to add interest to the exterior of the building. The overall design of the factory utilizes rectilinear forms to accommodate an odd site, and lacks any Gothic arches or Renaissance cornices popular in architectural projects (especially skyscrapers) during the period (Image 11).

In an essay on the Necco Factory by Alfred H. Barr Jr., founding director of The Museum of Modern Art in New York, Barr states that F. C. Lutzé “has achieved architecture positively by manipulation of proportions and masses, and by the restrained use of handsomer materials than were structurally necessary.” Barr also points out that Lutzé does not hide the necessary elements of a factory and the structure behind a false wall, but allows them to become part of the overall architecture and aesthetic of the building which Barr categorizes as “*Utilitas* and *Firmitas*” (utility and exquisite structural virtuosity). In the same essay Barr claims *Utilitas* and *Firmitas* as characteristics that are “genuinely modern” in a structure.⁴⁴

Countless elements of the Worcester Pressed Steel addition utilize the characteristics of “*Utilitas* and *Firmitas*” to successfully execute the vision of the structure. From the use of varying window sizes to distinguish the floors of the structure, to use of oversized rivets (a necessary element of construction), to the exposure of the stairwells, and the utility of

⁴³ Barr, "The Necco Factory."

⁴⁴ Ibid.

crafting the construction materials on site, each hint at characteristics moving in a modern direction. In his closing paragraph Barr states that the Necco Factory exists “for the new generation not merely as a document in the growth of a new style, but as one of the most living and beautiful buildings in New England.” One can imagine that Barr would have similar sentiments surround the Pressteel addition.⁴⁵

Although the Necco Factory can be seen as a step towards modern architecture in America, this was not the only architectural style being investigated in the United States. The trend of Art Deco design was being explored as a style of architecture that was appropriate for America in the early part of the 20th century. Art Deco would allow Beaux Arts trained Architects (such as Leland) to retain the “classical ideals of solidity and mass ... and axial, balanced, symmetrical plans and elevations ” and explore “more modern trends of “straight lines, geometric shapes, and cubic proportions.”⁴⁶ Each of these elements are crucial for the successful execution of the addition to the Worcester Pressed Steel Company.

In New York City, William Van Alen’s Chrysler Building was erected as one of the premier examples of Art Deco architecture in 1930’s America. In the case of the Chrysler Building Van Alen utilized “streamlined, rhythmic machine forms, ... vibrant colors, and shiny materials”⁴⁷ to construct a building that would set the tone for Art Deco architecture. The Chrysler Building utilized grey trimmed white brickwork to create its center section with a more modern than traditional horizontal shaft and ribbon windows that extend to each corner of the building. All of this is capped with a series of parabolic arches clad in highly polished steel. Countless other embellishments exist on the building such as “steel radiator

⁴⁵ Ibid.

⁴⁶ David Gebhard, *The National Trust Guide to Art Deco in America* (New York, NY: John Wiley and Sons Press, 1996).

⁴⁷ Marvin Trachtenberg and Isabelle Hyman, *Architecture: From Prehistory to Postmodernity* (Upper Saddle River, NJ: Prentice-Hall Inc, 2003).

cap gar-goyles and patterned brick wheels”⁴⁸ to accentuate the components of the building and emphasize the business house inside (Image 12).

Leland used many of these Art Deco features in the Presteel addition. His use of bright silvery paint, powerful vertical beams that extend upward through the whole structure, and geometric forms help set the tone for the building. Additionally, the multi-purpose pressed steel rosettes embellishments surrounding the attic story help to remind the visitor that antiquities are housed inside while also distinguishing that level of the building.

Although some consider yet another Art Deco structure, Rockefeller Center, to be the most ambitious of New York skyscraper projects, the work of Van Alen is one of the original. Kenneth Murchison in an essay on the Chrysler Building closes by stating that the Chrysler Building “teems with the spirit of modernism, it is the epitome of modern business life, it stands for progress in architecture and in modern building methods.”⁴⁹ I argue, that each of these qualities can also be seen in the addition to the Worcester Pressed Steel Company. Higgins strongly believed in modern technology for a modern business and in conjunction with Leland incorporated this into progressive architecture using modern building methods of pressed steel technology.

Conclusion

The search for an appropriate style for industrial architecture caused architects to rethink the vision and materials used in their designs. In Europe, Peter Behrens and Walter Gropius embraced the idea of mechanically produced consumer goods as art through the successful design and manufacture of these products. As an architect and industrial designer, Gropius took his beliefs surrounding art in the “mechanical era” and incorporated them into

⁴⁸ Carla Breeze, *American Art Deco* (New York: W. W. Norton and Company, 2003).

⁴⁹ Kenneth M. Murchison, "The Chrysler Building: As I See It," *The American Architect* 138, no. 2587 (1930).

his vision for industrial architecture through his design for the Fagus Shoe-Last Factory of 1913. This building served as a turning point for industrial architecture, demonstrating how a structure can embrace a new culture, design, and aesthetic for a new era.

Similarly in America, John Woodman Higgins had a vision of utilizing industrially produced products, crafted in his “Presteel” factories, with modern glass curtain wall technology utilized by Polk (in the Hallidie Building) to create a new industrial office space and museum. Although Higgins and Behrens both believed in the movement towards industrial production, Behrens embraced the pure engineering form while Higgins embraced the beautiful products that machines allowed him to produce for the masses. Higgins’s beliefs more closely followed that of Cotton Dana at the Newark City Museum whose vision “supported mass production design without completely rejecting the conservatism of art schools.”⁵⁰

With the help of architect Joseph D. Leland, Higgins and Leland redefined industrial architecture in America, while also incorporating the eclectic styles found in other architectural endeavors throughout the country. The unique materials and construction methods (solely glass and steel) utilized in the exterior construction of the building make it a particularly significant work of architecture and necessitate its preservation as a landmark of architecture in America.

Many works of architecture leading up to the construction of the Higgins attempted to depart from traditional uses of materials such as brick or stone to create unique and interesting structures. In particular, the works of Ernest Flagg’s Singer Loft Building, and Willis Polk’s Hallidie Building, utilized glass and metals in ways which diverge from previous applications of these materials. Flagg’s Singer Loft utilized cast iron, a new construction

⁵⁰ Meikle, *Twentieth Century Limited: Industrial Design in America, 1925-1939*.

material, interlaced with glass as both a decorative and structural element. Flagg's use of cast iron allowed him to emphasize the structural elements of the building while incorporating classical French design elements allowing for "decoration to approximate construction".⁵¹ Polk's Hallidie building took advantage of reinforced concrete to create a cantilever to support a complete glass curtain wall façade. This attempt by Polk is considered to be "The first application of a pure curtain wall to any building in America".⁵²

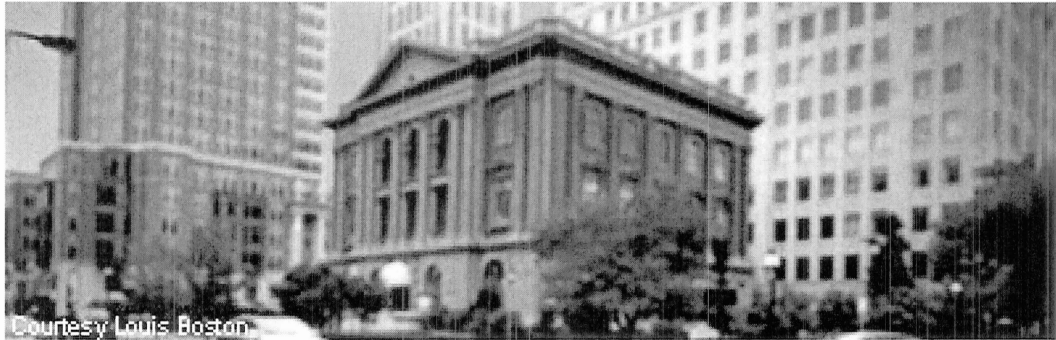
Each of the buildings discussed in this paper demonstrates a movement towards modern architecture in America through the use of the new materials, techniques, and styles appropriate for the "machine age". The Higgins Armory Museum takes advantage of each of these new architectural elements, metal as a decorative element from Flagg, and the glass curtain wall of Polk, and utilizes solely steel (not iron) and glass to create the first complete steel and glass structure in America. This structure is truly unique and exists as a landmark project in American architectural heritage.

⁵¹ Bacon, *Ernest Flagg: Beaux-Arts Architect and Urban Reformer*.

⁵² Kenneth Frampton, *Modern Architecture 1851-1945*.

Works Cited

- The 1904 World's Fair Society. 2006. In, <http://www.1904worldsfairsociety.org/>. (accessed 2 January, 2006).
- "All Steel and Glass Building Is a Symbol of the Age." *Metalcraft* 6 (1930): 250-56.
- "American Art Galleries, New York: Second Prize, Altered Building Class, Fifth Avenue Assn., Annual Medal Award, Joseph D. Leland & Co., Architect." *Architecture* 1923 47 (1923): Plates 9-11.
- Bacon, Mardges. *Ernest Flagg: Beaux-Arts Architect and Urban Reformer*. Cambridge, MA: MIT Press, 1986.
- Barr, Alfred H. "The Necco Factory." *The Arts* 13 (1928): 292-95.
- Breeze, Carla. *American Art Deco*. New York: W. W. Norton and Company, 2003.
- "City to Have Free Public Museum of Metal Work." *Worcester Daily Telegram*, February 10, 1928 1928.
- Dills, Keith W. "The Hallidie Building." *Journal of the Society of Architectural Historians* 30, no. 1 (1971): 323-29.
- Frampton, Kenneth. *Modern Architecture 1851-1945*.
- Gebhard, David. *The National Trust Guide to Art Deco in America*. New York, NY: John Wiley and Sons Press, 1996.
- Gropius, Walter. *The New Architecture and the Bauhaus*. Translated by P. Morton Shand. Cambridge, MA: MIT Press, 1965.
- Higgins, Carter and Bradley C. *Craftsmanship in Steel*. Worcester, MA: The Newcomen Society in North America, 1956.
- Higgins, John Woodman. "Design for Mass Production." *American Magazine of Art*, September 1933 1933.
- Hyman, Marvin Trachtenberg and Isabelle. *Architecture: From Prehistory to Postmodernity*. Upper Saddle River, NJ: Prentice-Hall Inc, 2003.
- "Joseph Leland, 82, Retired Architect." *New York Times*, 16 April 1968 1968, 47.
- Larson, Leland and. "Office Building and Museum for the Worcester Pressed Steel Company." *The Architectural Forum* 54 (1931): 49-53.
- McKean, John. *Crystal Palace: Joseph Paxton and Charles Fox*. London, England: Phaidon Press, 1994.
- Meikle, Jeffrey L. *Twentieth Century Limited: Industrial Design in America, 1925-1939*. Philadelphia: Temple University Press, 1979.
- Murchison, Kenneth M. "The Chrysler Building: As I See It." *The American Architect* 138, no. 2587 (1930): 24-33, 78.
- Nelson, John. "Ancient and Modern Metal Work in Glass and Steel Building." *The Iron Age* 126, no. 25 (1930).



Courtesy Louis Boston

Image 1: Bonwit Teller Department Store



Image 2: Beverly Farms Public Library



Image 3: Waltham Public Library



Image 4: Entrance to Higgins Armory Museum

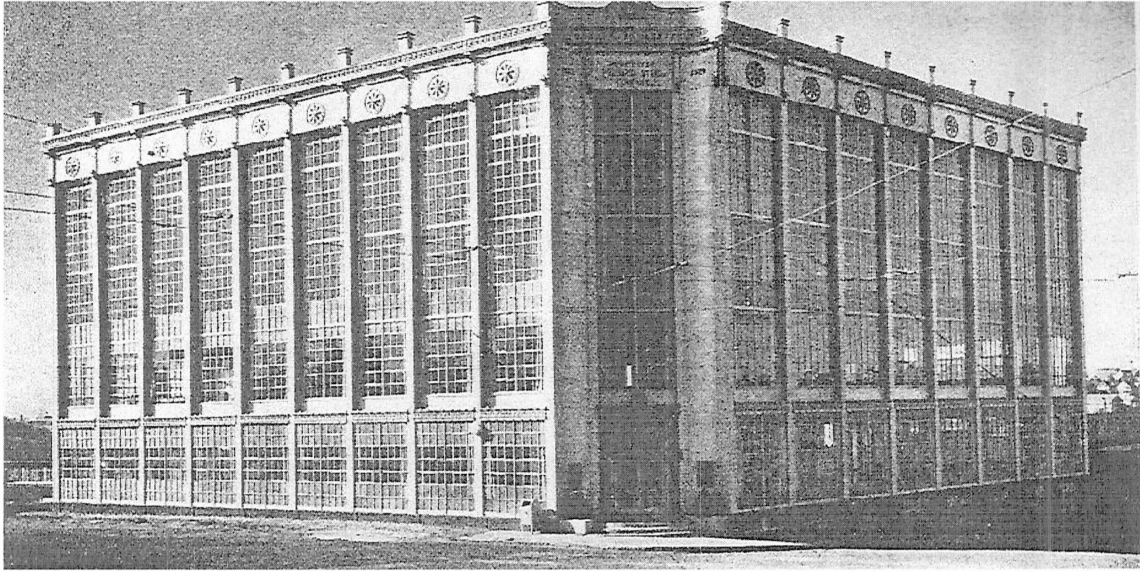


Image 5: Overall View of Worcester Pressed Steel Addition

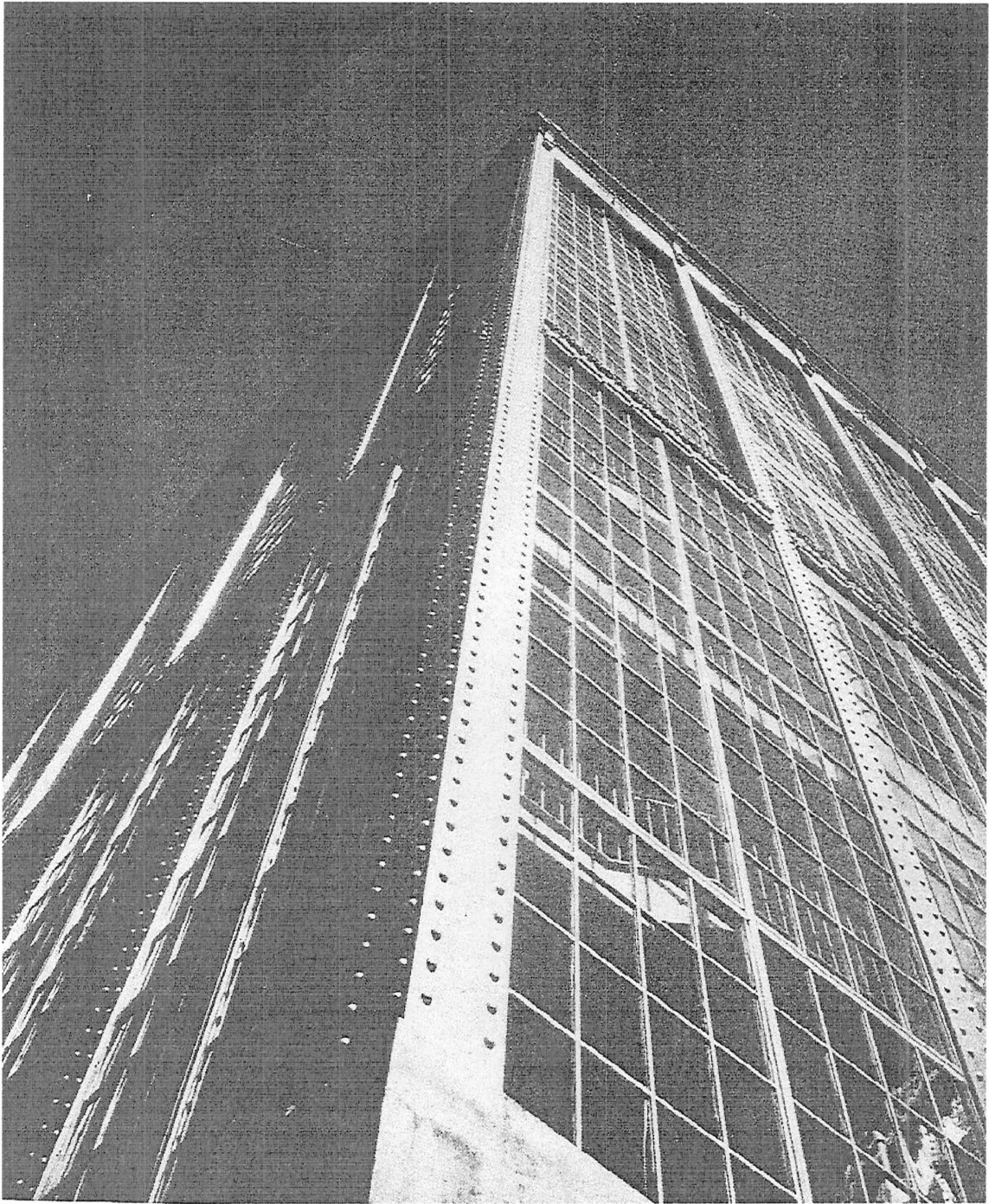


Figure 6: Display of Verticality at Worcester Pressed Steel Addition

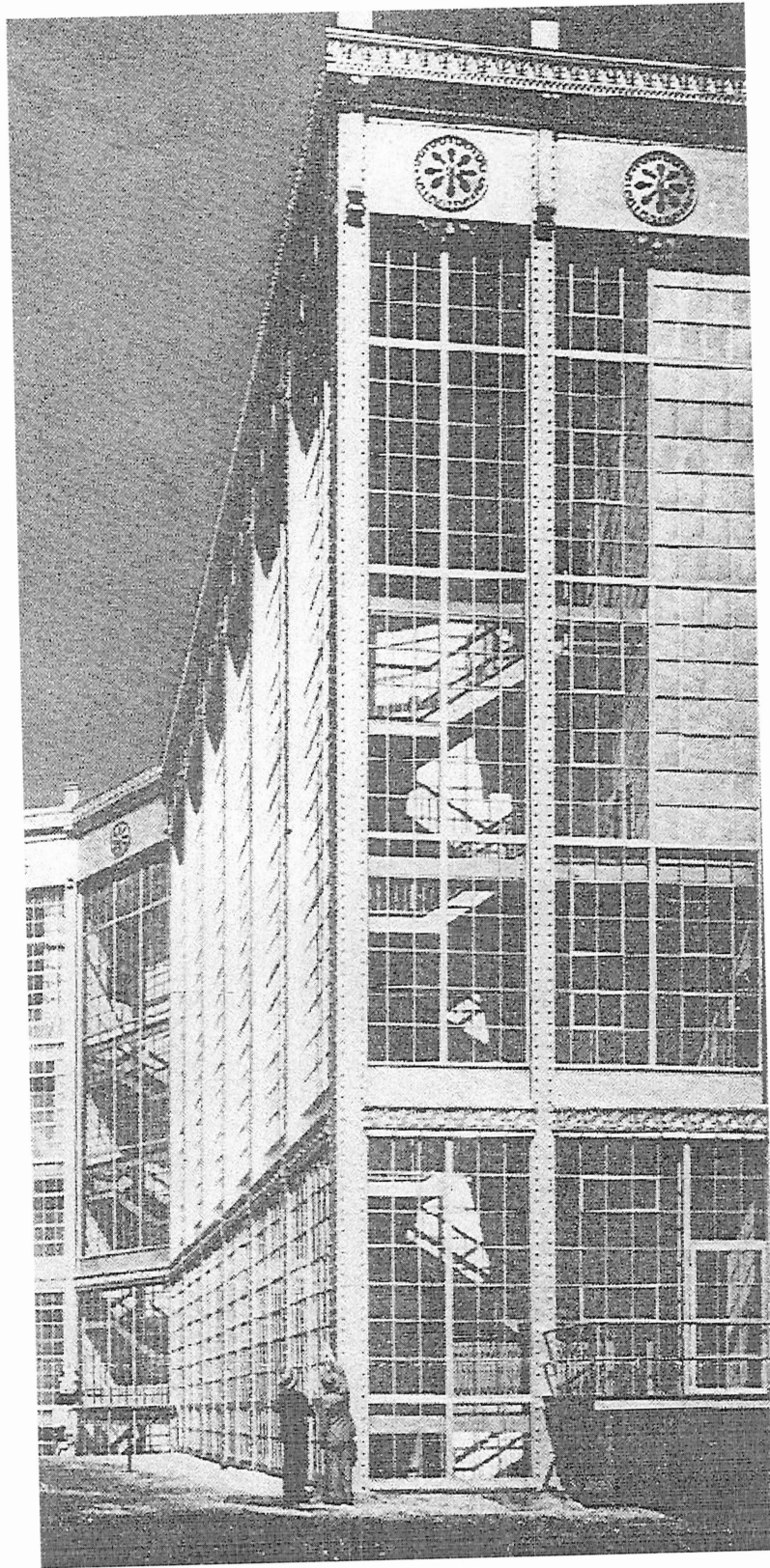


Figure 7: Display of Exposed Stairwell in Worcester Pressed Steel Addition

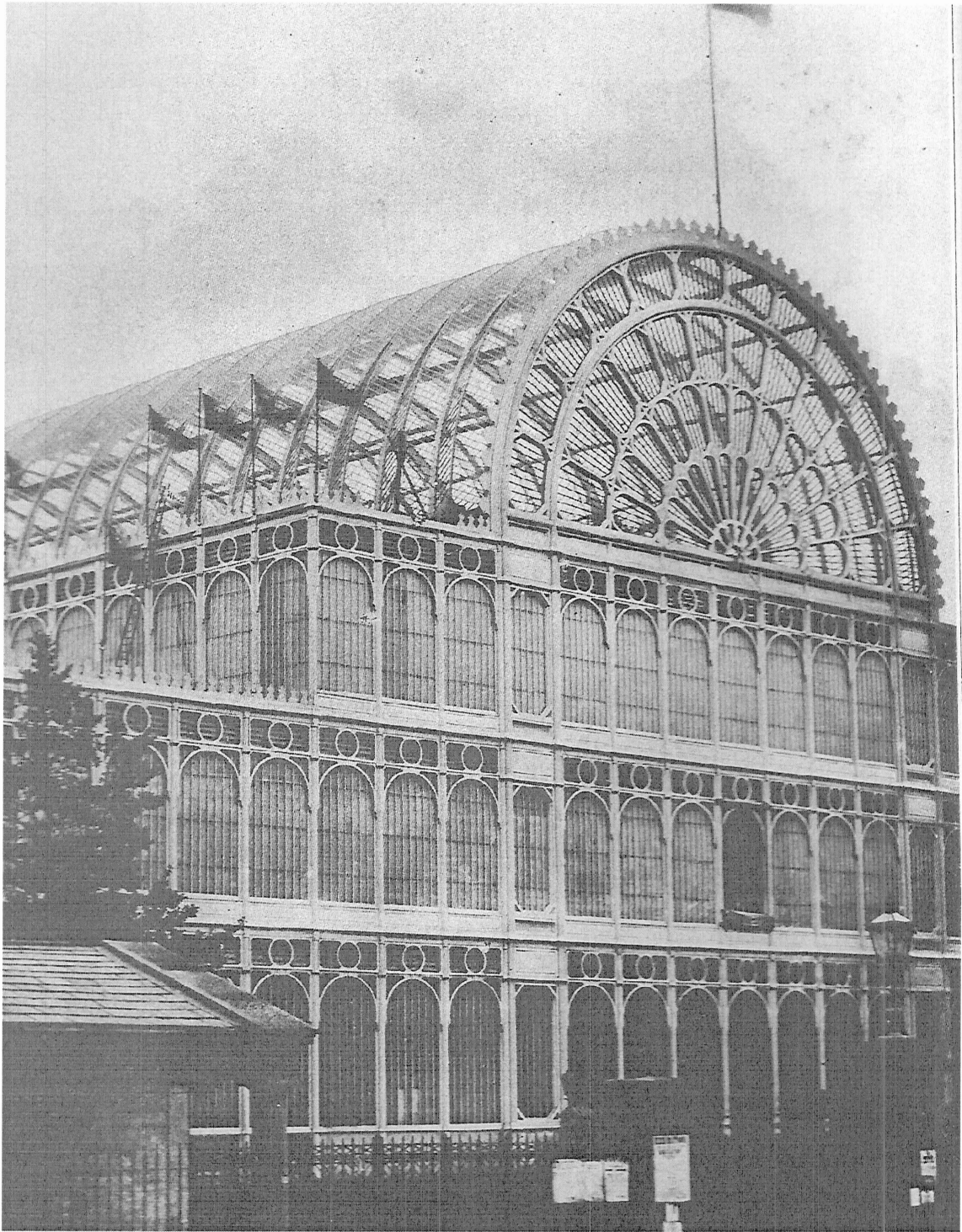


Image 8: Façade of Crystal Palace

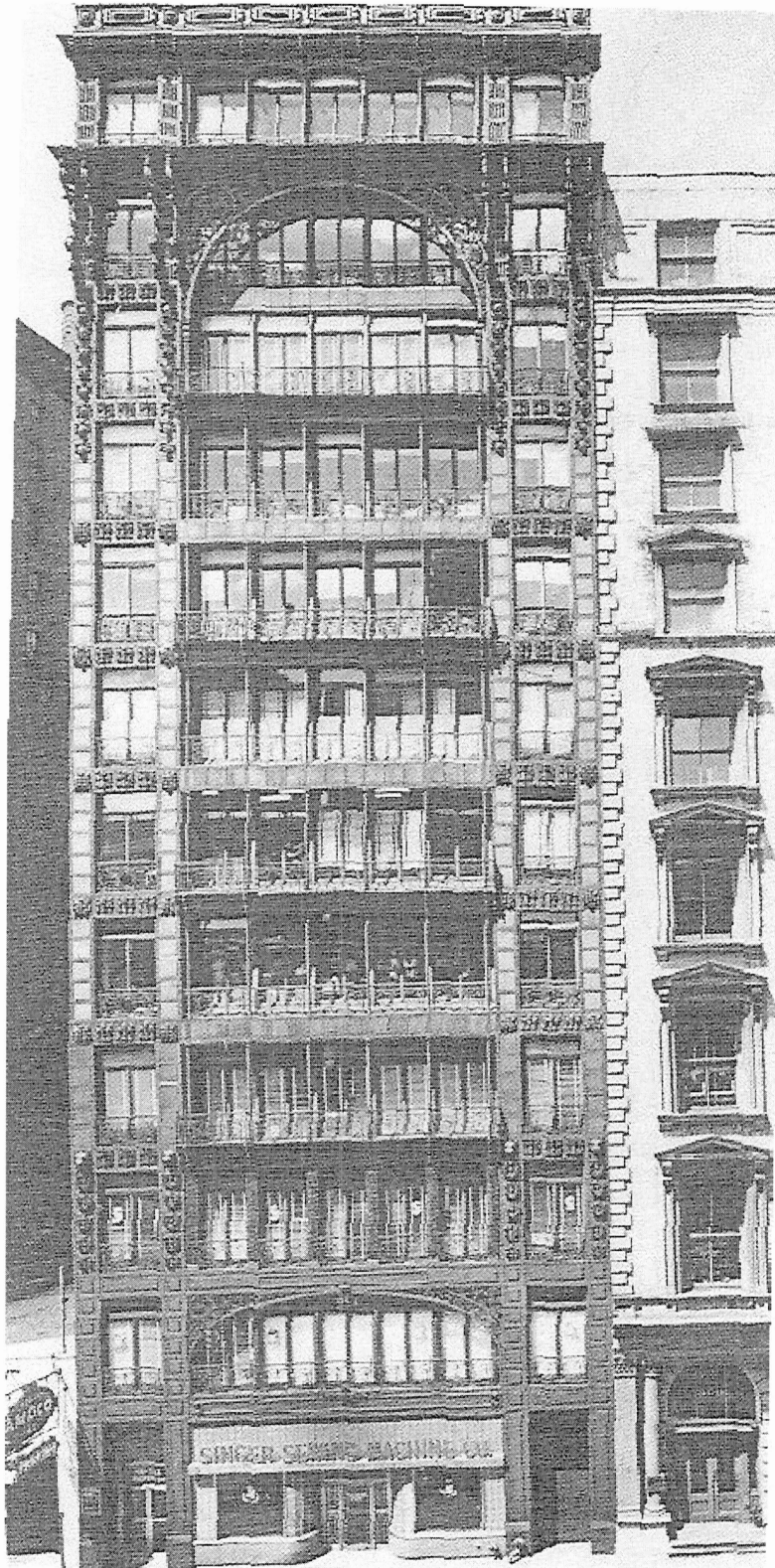


Image 9: Singer Loft Building

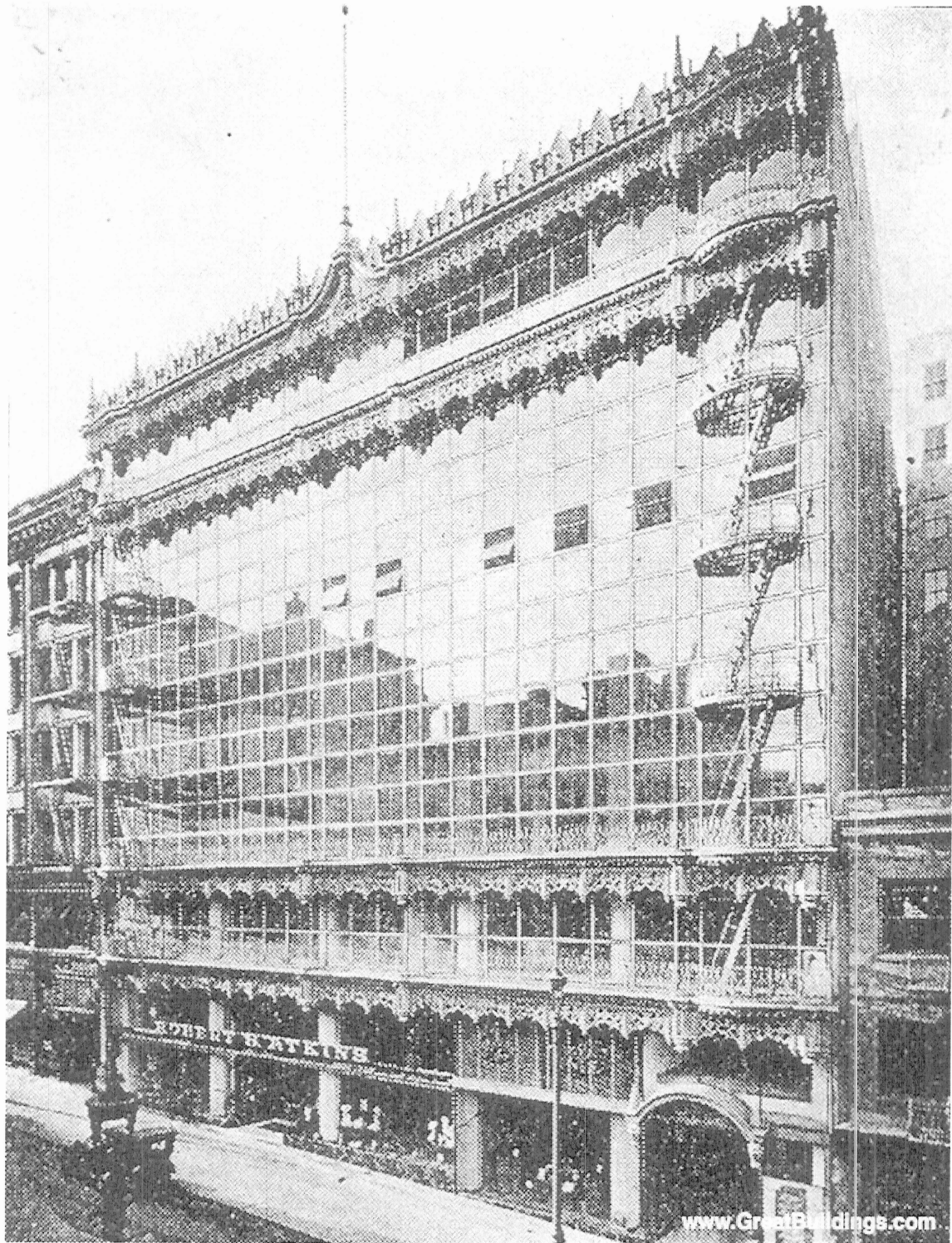


Image 10: Hallidie Building by Willis Polk

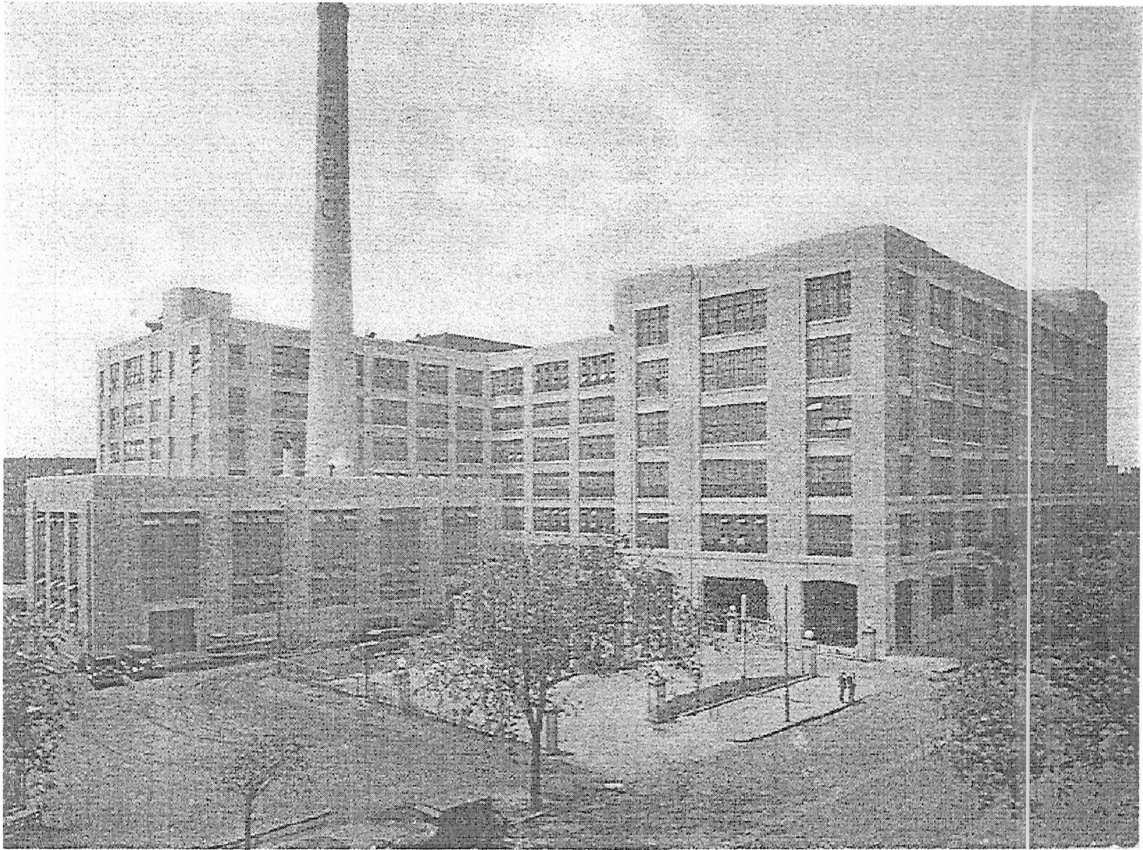


Image 11: Necco Factory



Image 12: Chrysler Building

Appendix I: Biography of Architect Joseph D. Leland

Joseph Daniels Leland III was born on June 16, 1985 and died on April 14, 1968 in Milton, MA at the age of 82. Survivors of Leland include a son S. Tudor Leland, sister Elizabeth Leland, and three grandchildren.

Leland graduated from Harvard University in 1909 and continued his education at the Ecole de Beaux Arts in Paris. Upon returning to the US, Leland joined the firm of Charles G. Loring (c. 1916) and remained as a senior partner in the firm Loring and Leland until 1919.

In 1921 Leland started his own architectural firm partnering with Niels H. Larsen. Leland and Larsen had offices in Boston, Worcester, and New York. Together they designed buildings in Pennsylvania, South Carolina, Maryland, New York, and throughout New England. The partnership between Leland and Larsen lasted until 1955 when two additional partners were added to the firm: John F. Bradley and Charles L. Hibbard. The firm then became Leland, Larsen, Bradley, and Hibbard. Leland retired from the firm in 1959 due to ailing health, but continues to consult with the firm. Leland, Larsen, Bradley, and Hibbard continued until 1973.

The firm, Leland and Larsen, designed the first public housing project in Boston, Old Harbor Village. Additionally Leland and Larsen converted the Boston Society of Natural History Museum to the Bonwit Teller Department Store, designed the Beverly Farms Public Library, and the Waltham Public Library (see images below).

Most of the designs created by Leland and Larsen utilized Beaux-Arts designs in their execution.