

ON INDUSTRIAL WOOD CARVING IN AMERICA, 1780 - 1980; AND THE
DEVELOPMENT OF THE SALSTROM WOOD CARVING MACHINE

by

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1980, Revised ©2005

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–preface–

Little if anything has been written to date on the use of wood carving machines. The purpose of this paper was to research and then write about the development and contribution of the Salstrom wood carving machine to the carving and furniture industry in America.

Information for this paper was compiled from various written accounts of wood carving in America. Taped interviews were conducted with the late David N. Salstrom of the Salstrom Carving Machine Company while it was still located in Chicago and with Philip Salstrom, Sr., owner of both the Salstrom Carving Machine Company from 1985 and of the Rockwood Carvers, Oregon, Illinois until his death. The letter books of Cass Gilbert pertaining to the building of the U.S. Supreme Court building in reference to the carving contracts were researched at the New York Historical Society. Reference slides and photographs of the first Salstrom carving machine, and some carvings are included here. The allegorical figures and Corinthian column capitols are being compiled and will be available for future reference.

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Carving wood is one of the oldest forms of the designer of furniture as well as the sculptor. In Egypt, Greece and Rome and later the nation-states of Europe, a rich history of styles of figures, chairs, tables and other furniture are known to us through wood carvings. With the advent of the machine age, the tradition of carving began to disappear. Wood and other materials took on a new and mechanically emphasized shape in the 20th Century as a result of Bauhaus and other modernist ideologies. In Europe and America, the shine of polished chrome, glass, and then plastic became the sign of modernity and represented the rapid, sleek movement into the future with the burst of growth and energy that accompanied the modern age. Though many of us not only accept but welcome the spare and abstract qualities of modern design, who cannot help but admire the worlds of imagination and human endeavor represented through the styles of various cultures, which are known to us through carved designs? Nature woven into design, becomes apparent in carved spiral scrolls based on shells; leaf designs; and animal legs of dogs, horses and lions; bird claws and wings. The enchanting milieu which carved furniture may provide invites contemplation and an investigation into the history of the wood carving industry in America.

America, during the presidency of George Washington, 1789-1799, had already begun to establish a wood carving industry. Certain qualities apparent in the furniture industry today, such as a sophisticated approach to organization based on the contribution of combined efforts of designer, cabinet-maker and carver were already present. Samuel McIntire (1757-1811), for instance, was both an architect and a craftsman; he was often praised as the most skillful hand carver of his day. In addition to carved furniture, he carved portrait busts, eagles and ship ornaments which were popular subjects from the earliest established American tradition. Though he was not a cabinet-maker, McIntire carved, for various furniture makers in Salem, Mass., many pieces of furniture which rank among the most beautiful in America. Often the designs of his chairs were based on those of English designers such as George Hepplewhite and Thomas Chippendale whose designs were well known in England and America as well. Thomas Chippendale was the son of John Chippendale whose life work had been as a wood carver. In 1754, The Gentleman and Cabinet Maker's Directory, which contained 160 Chippendale furniture designs, was published and therefore available for use by furniture makers. After the death of George Hepplewhite, a book of Hepplewhite furniture designs was published in 1788.

The beginnings of the furniture industry in America in the day of Samuel McIntire is especially evident in two particular instances. The first of these is the significance of a signed "Frothingham" chair;¹ the second is the discovery of a bill from McIntire to a Salem furniture company. Benjamin Frothingham, a personal friend of George Washington, who had been a major in the Revolutionary War, became a cabinet-maker after the war. Frothingham commissioned the esteemed Samuel McIntire to carve chairs for him in the Hepplewhite style

and initiated the practice of signing the seat frame so that his chair, once carved, would not be returned to the wrong company. The significance of a signed chair of the quality of the Frothingham chair is that it establishes the practice of furniture being made by one craftsman and being sent to a master carver to be completed.¹ Among several Salem furniture makers, McIntire carved for the company of Elijah and Jacob Sanderson and Josiah Austin. An 1807 bill from McIntire to this company establishes an early record of prices and billing for piece work which is similar to the practice of Today's industrial carving companies:²

1807 Bill:

12 Leaves for window cornice – \$3.00

Reeding and Carving 4 legs for worktable – \$3.00

Carving and Fluting 18 chairs – \$18.00

Pr. of arms – \$.75

Each area of work and planning that went into the making of a chair was very carefully executed by he who was highly qualified in a given area; the results being a work of superior craftsmanship and design achieved through combined talents. This may be compared to the individual who sets out to handle all areas to the best of his ability despite his lack of qualifications in one area or more. Lewis Mumford believed that in order for man to make a machine that he first had to become the machine. It may follow then, that the advanced organization present in the furniture industry of the late 18th Century became the age of machine-made furniture during the Industrial Revolution.

Duncan Phyfe (1768-1854) who was born in Scotland, came to America at age 15 and began work as an apprentice to a cabinet-maker in Albany, New York. Phyfe opened a furniture shop in 1792 in New York City and employed various craftsmen to carve, turn and assemble in a manner similar to factory production in his workshop on Partition Street.³ Phyfe's designs were based at first on those of the English designer, Sheraton, and later in combination with an interpretation of design elements based on the English Regency and Empire styles. Since his interpretations were so individual, he is recognized as having developed the Empire Style in America.

The production of hand carved furniture was greatly reduced because of economic conditions which were a result of the impact of the Industrial Revolution. The Industrial Revolution, which began in England in 1760, greatly influenced the movement from manual to machine techniques of production. In the U.S., these machine techniques began to influence furniture design by 1850-1900. The English Empire Style which was established by Thomas Hope in 1807 was well suited to machine production methods which were then coming increasingly into use. The style consisted of large plain surfaces and straight lengths of timber not requiring to be elaborately carved or shaped by hand. Though there were some carved features such as carved claw feet, in comparison with earlier styles, very little carving was incorporated into the design. Instead of relying on carving for embellishment, the massive Empire Style furniture was decorated with applied metal ornaments such as honeysuckle or palmette, lotus or acanthus leaves, and sphinxes and chimeras.

Industrialization in America (1850-1900) caused an enormous increase in productivity as well as an increase in population. As new cities were forming and the standard of living in America was rising, furniture stores and furniture factories were growing in number to meet the increased demand for furniture products. Machines from the beginning could help with the process of cutting and shaping wood and those techniques were suitable for Empire Style designs. The process of carving by machine seemed too complex to be possible. The result of this was to produce less furniture with carving because when carving was incorporated into the design, the furniture became enormously expensive by comparison to furniture that did not require so much hand labor.

A demand for styles of furniture and architectural interiors which were embellished with carving, both in Europe and America, encouraged the development of machine carving techniques. From 1888 until 1924, many attempts were made to produce a carving machine.⁴ Of particular significance is the carving machine designed in 1924 by David Salstrom, Chicago, Illinois, which greatly enhanced the possible quality of machine carved furniture parts as well as the use of ornamental sculpture and carving in interiors. One must consider the very complicated design procedure involved in producing an efficient machine for wood carving.

Gustavus Adolphus Salstrom, the father of David B. Salstrom, came to America from Sweden in 1854 when he was 12 years old. In 1865, when he opened the Union Grocery Store, he was one of the founders of the city of Rockford, Illinois. By grubstaking immigrant Swedes who later repaid him with stocks in the companies that they formed, he was instrumental in the forming of the Central Furniture Company in 1879.⁵ The Central Furniture Company was one of the first furniture companies in Rockford which sold carved furniture. It was a natural outcome that several of his sons chose the carving and furniture trade. Even from the earliest days of industrialization, Swedes brought knowledge of wood and wood working skills to America. The Swedish idea of the collaboration of art, craft and industry does not exclude, but welcomes the challenge of machine made items which may offer a very high level of design and craftsmanship. The reasoning may be because mass production of the highest quality often demands greater manual skill and design efforts than does handi-craft.

David B. Salstrom, who was at the impressionable age of 16 in 1888, took his first job in The Excelsior Furniture Company in Rockford, IL. The experience of those first few months were to prove to be the seed of his life's work. It was then that a man named Seaman who had formed the Milwaukee Carving Company, 1888, in Wisconsin, came into the factory with the first rudimentary 2-spindle carver which he had made to reproduce carvings. International Woodcarver, March, 1908, 2, confirms that "The woodcarving machine was improved by Seaman some twenty odd years ago and placed on the market at that time." Seaman had ingeniously expanded the idea of the 2-dimensional pantograph used for making copies of drawings and wood engravings to incorporate the three dimensions necessary for wood carving. By using one stationary tracing spindle to follow the form and lines of the original 3-d carving (or pattern made in another material) it was possible to use a second spindle with a rotating carving tool to make a copy from the original pattern out of a wood block. Seaman swore that

even a 16-year-old could operate his machine and Dave was selected to demonstrate. As young Dave operated the spindle carver, he began to think how this principle of duplicating a carving could be further improved. He also realized that if it could be done that it might once again make carved styles profitable for manufacturing.⁶

Within the next 22 years, two companies had designed improvements upon that first 2-spindle design. The Lockman Company designed a vertical wall carving machine which could carve 4 pieces from an original pattern while the carver stood and guided a tracer over the pattern. Another company designed the first horizontal machine which could carve 8 pieces while the carver guided a tracer over the pattern. The basic problem with all of these early machines was that there was an incredible amount of vibration, probably due to the fact that they were belt driven, which resulted in a very crude carving.

In 1910, David Salstrom designed his first carving machine and became partners with E. Kopriwa Furniture Company in Chicago which then had exclusive rights to the use of his machine. Emanuel Kopriwa, a Chicago woodcarver, designer and modeler "Made a specialty of high class work for furniture, pianos, organs and interior finish." Essentially, Salstrom had improved upon the earlier machines by adding greater weight which proved to reduce the amount of vibrations to a degree. The vibrations in these belt-driven machines from the belt passing over the drive-rollers caused imperfect cutting. At the same time, he expanded the number of spindles to 18 which doubled the amount of production possible. In 1914, the first 24-spindle Salstrom carving machines were made solely for carving violin necks since the war had cut off the supply of violin necks from Germany.⁷

It was not until 1924, after Dave Salstrom had decided to break his partnership with E. Kopriwa and formed the Salstrom Carving Machine Company in Chicago, that he achieved his most important design innovations. Though many careful details were incorporated into the functions of his machine, there were two major technical advancements over all the earlier machines. The first of these had to do with solving the problem of vibrations which had been a great drawback of machine carving. This was accomplished by the design of a horizontal motor which could be placed onto the machine. 3 highly balanced squirrel-cage 3/4 horse motors were placed onto the horizontal 18-spindle machine at equal intervals. Because of this, the long belts and pulleys of the steam-driven machines were no longer necessary thereby eliminating vibrations to such a degree that they were no longer a problem. For the 24-cutter machine, 4 motors were equally spaced, thus making the quality of carving from the 24-cutter machine equal to the quality of carving possible with the smaller number of 18 spindles. The second important technical innovation had to do with the facility of the machine carver to guide the cutting action as he moved the tracer over the pattern. All other carving machines employed a somewhat cumbersome spindle frame which was controlled by rollers located at the ends. The side-to-side movement was the easiest movement for these machines to make which in most cases would result in the action of cutting across the grain of the wood whereas the best cuts to make in carving wood are with the grain rather than against it. Dave Salstrom realized that it would be possible to make the easiest movement result in the action of cutting with the grain of the wood

when he designed a spindle frame that was suspended and balanced so that the whole frame moved like a pendulum with the easiest movement from forward to backward (see illustration). To this day (1980), the Salstrom carving machine is unique in America in that it is the only carving machine that has an over-head balancing system. The pendulum action causes the spindle frame to constantly want to move back towards center; and this action results in a finer quality in detail than any of the other carving machines. The carving machine developed and patented by David Salstrom made America the first country to have a superior carving machine. In more recent times, there are carving machine companies in Italy, Germany and Japan in addition to several other carving machine companies in America. Most other carving machines are lighter in weight than the Salstrom carving machine and some allow for faster carving; but none equal its capability for precision and quality of detail.

In addition to the carving machine Dave Salstrom also designed the carving tools necessary to go from start to finish. In 1928 he applied for a patent granted in 1929 for an improved cutter now known as the removable-lip smoother-rougher. Philip Salstrom, Sr. (1812-1992) stated that the “smoother-rougher” has never been surpassed and remains standard in American-made carving machines. (see illustration of carving tools).

The Salstrom carving machine links superb craftsmanship with versatility. Though standard 18- and 24-cutters are most useful in the furniture industry, special Salstrom carving machines have been made for the purpose of achieving larger or more unusually shaped carvings. For instance, in the 1930's, a lot of architectural carving was done for interiors; A combination of machine carving (60–70%) and hand carving (30–40%) was used to complete the work. When Cass Gilbert, architect, was building the U.S. Supreme Court Building in Washington, D.C., a specially made Salstrom carving machine was made for carving life-size allegorical figures for the spandrels of the main reading room; these were carved from plaster originals designed by Joseph T. Mohn and executed in plaster by John Donnelly under Cass Gilbert's supervision. 3' Corinthian column capitals, carved out of Indiana white oak, were also carved by machine and finished by hand for the library. An important letter documents the subletting of the wood carving by Matthews Brothers Manufacturing to the hand carvers Herman Gansch and Joseph Dux of Chicago.⁸ (see copy of letter herein from Cass Gilbert's letter books, NY Historical Society, Letter #479, dated March 20, 1933 which documents the subletting of the wood carving to Herman Gansch and Joseph Dux, hand carving companies of Chicago, Illinois). Philip Salstrom, Sr. and David N. Salstrom who both worked on the project recalled the special machines that were formed to do the work for Gansch and Dux. The Salstrom Carving Machine Company did 60–70% of the preliminary carving for these hand carving companies who then completed the work.

In addition to the practical uses for carved furniture parts, Salstrom carving machines have been adapted for a variety of special carving projects. Harp columns were carved for Lyon and Healy, Chicago. Carved female pelvic bones were made for Clay Adams to be used in the study of obstetrics. At one time, Dolphins were carved for Karges Furniture Company and then finished by hand carvers when they returned to Karges. A machine was designed and adapted to

carve intricate doors for Saudi Arabia. Maiden figures for the prows of boats were carved at Rockwood Carvers. Large ornamental heads of King and Queen (see illustration) were carved for fireplace mantels in a Chicago restaurant interior.

Dave Salstrom's strongest desire was to be able to reproduce any kind of carving. Swedish hand carvers were whittlers as he knew them coming nowhere near to the fine carving of McIntire or German and Italian hand carving. It was not however, Salstrom's intention to replace the hand carver. The very impact of the costs of industrially made furniture as compared to hand-carved furniture costs had already made hand-carved furniture unaffordable by most people and impractical for the furniture manufacturer to produce. It was his goal to produce a superb quality of machine carving which could meet the costs of furniture manufacturers.

The technological advancements of the Salstrom carving machine made it possible to do more intricate and detailed work and made superb craftsmanship possible through machine carving techniques. With the improvements made, the limitations as compared to the craft of manual carving were reduced to two elements: the machine could not do sharp square corners because tools rotate and therefore even a square tool would make a round mark in a corner; and it could not do very fine lines because of the width caused by rotation. Hand carving was used to square corners and to finish lines and details. It was usually necessary for an original pattern to be carved by hand from drawings of designs before it could be reproduced; this could only be done by hand carving. Another important function of the hand carver was in the work of architectural carving. Ornamental carving for the interiors of homes in Chicago, Rockford, New York and other cities was often begun by machine carving (60-70%) and then a considerable amount of hand carving (30-40%) was done to complete the work. The E. Kopriwa Company and later the Salstrom Carving Machine Company collaborated with hand carving companies such as the Joseph Dux Company and Herman Gansch of Chicago. The advantage of doing a great bulk of the work by machine helped to cut the total cost therefore increasing the possibility of using carving in interiors. The mechanical nature of the carving machine based on the pantograph insured accurate measurements to the original pattern.

In 1924 when the Salstrom Carving Machine Company was formed in Chicago, three companies bought machines. The largest of these, Zangarle and Peterson, bought 11 machines. The immediate impact on furniture design was an increased use of ornate and intricate carving. Zangarle and Peterson, however, never carved more than 24 pieces from one pattern. The superior quality of work achieved by these three companies reaped tremendous profits. The quality of carving possible made it feasibly and economically possible to copy and improvise upon all the traditional styles such as Queen Anne, Chippendale, Hepplewhite, Rococo, etc.

Though a quality carving machine is an asset to the furniture trade and enhances the speed of the carving process, the wood carving machine requires a much more skilled operator than does the operation of a lathe or wood-embossing machine. The lathe produces wood turnings as an operator loads and unloads blocks of wood. The process is accomplished in a matter of seconds. The wood embossing machine which produces shallow designs in a surface of wood is similar in its dependence on an operator to a lathe. The wood carving process takes

anywhere from 3 hours to 2 days time to produce one set of from 12 to 24 items (or less if the size is larger than the distance which 2 spindles would allow for). The ideal wood carving machine operator should have the eye of a craftsman as well as mechanical knowledge of carving tools. Just as the hand carver uses a series of tools to move from the early roughing of a carving to the later detail of lines, so does the machine carver have a choice of 12 different tools that he may use to move from the early roughing of a carving to the later detail of lines. Depending on the complexity of the carving, a selection of from 2 to 6 tools are used for a particular carving. The machine carver must be aware of the appropriate sharpness and selection of tools in addition to how much of the total process may be done best by each tool that he chooses. An excellent machine carver may require the experience of approximately two years. Although the skills of the machine carver are not the same as those of the hand carver, machine carving is comparatively closer to the skilled craftsmanship of hand work than the operations of the lathe or embossing machines. The Salstrom carving machine is entirely dependent on the guidance of the machine operator.

The Rockwood Carvers and the Salstrom Carving Machine Company are now located 17 miles southwest of Rockford along the Rock River. Both companies are now owned and managed by Philip Salstrom, Jr. In 1985, his father, Philip Salstrom, Sr., purchased the Salstrom Carving Machine Company following the death of his cousin, David N. Salstrom. In business for over 50 years now, Rockwood Carvers in Oregon, Illinois, has produced and still does produce quality carving for furniture manufacturers nationwide. In the shop of Philip Salstrom, Sr. large production orders were filled for companies such as Kroehler Manufacturing, Mersman Brothers and RCA and others. As was the tradition of the Salstrom Carving Machine Company, a selection of small carvings of dogs, horses and birds were also made and sold in gift shops as seen in pictures here with Philip Salstrom, Sr. in the early '60's. Originally having shared in the experience of making carving machines in Chicago as well as learning the machine-carving trade from his uncle, Phil Salstrom, Sr. brought unique experience to the carving industry.

In addition to traditional carved parts for furniture, his son Philip Salstrom, Jr. prefers smaller, custom jobs and will adapt the Salstrom carving machines to carve unusual sizes and shapes. One of his favorite projects just before the 9/11, 2001 attack on the World Trade Center in New York, was carving harp columns for Lyon and Healy, Chicago, for which he had especially adapted a Salstrom carving machine. He also carves architectural carvings such as large cornices. Today, Philip Salstrom, Jr., who owns and manages the Salstrom Carving Machine Company and Rockwood Carvers in Oregon, Illinois, continues to combine knowledge of the wood carving craft and machinery, as he services carving machines by providing carving tools and necessary parts as well as occasionally rebuilding a machine. He improvises and adapts tools and equipment to enhance the quality of carving production necessary for specific orders.

NOTES

- 1- Sack, Albert, Fine Points of Furniture: Early American. (New York, 1979) pg. 54 and 55.
- 2- Kimball, Sidney Fiske, Samuel McIntire, Carver Architect of Salem, (PA, 1940), pg. ____.
- 3- Hayward, Helena, ed. World Furniture, (NJ, 1977) pg. 247.
- 4- Salstrom, David, Jr., taped interview with Mary S. Porter, 1981.
- 5- _____, Portrait and Biographical Record of Winnebago and Boone Counties: Gustavus Adolphus Salstrom, (IL, 1892), pg. 742 and 743.
- 6- Salstrom, David, Jr., taped interview with Mary S. Porter, 1981.
- 7- Ibid.
- 8- Gilbert, Cass, letterbooks pertaining to the building of the U.S. Supreme Court Building, (New York Historical Society: March 20, 1933), letter #479:

March 20, 1933

Subject: U.S. Supreme Court Building
Contract for Wood Carving

Hon. David Lynn,
Architect of the Capitol
Washington D.C.

Dear Sir:

Receipt is acknowledged of copy of George A. Fuller Co.'s letter to you of March 6th, signed by Mr. Distler which reads as follows:

"Matthews Brothers Manufacturing Company have advised us that they have sub-let the wood carving for the United States Supreme Court to:

Herman Gansch, Chicago, Illinois

Joseph Dux, Chicago, Illinois

Klise Mfg. Co., Grand Rapids, Michigan

"This is for your information."

We approve the letting of the wood carving to the parties mentioned in the above quoted letter.

As a matter of record, we have been assured by Matthews Brothers Mfg. Co. that the carving will be executed strictly in accordance with the models and with an approved character.

Yours very truly,

Cass Gilbert, Cass Gilbert Jr.
and John R. Rockart, Arch.

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Salstrom, David, Jr., taped interview with Mary S. Porter, 1981.

Salstrom, Philip, Sr., interviews with Mary S. Porter, 1980-84.

Examples of Carving Detail Possible



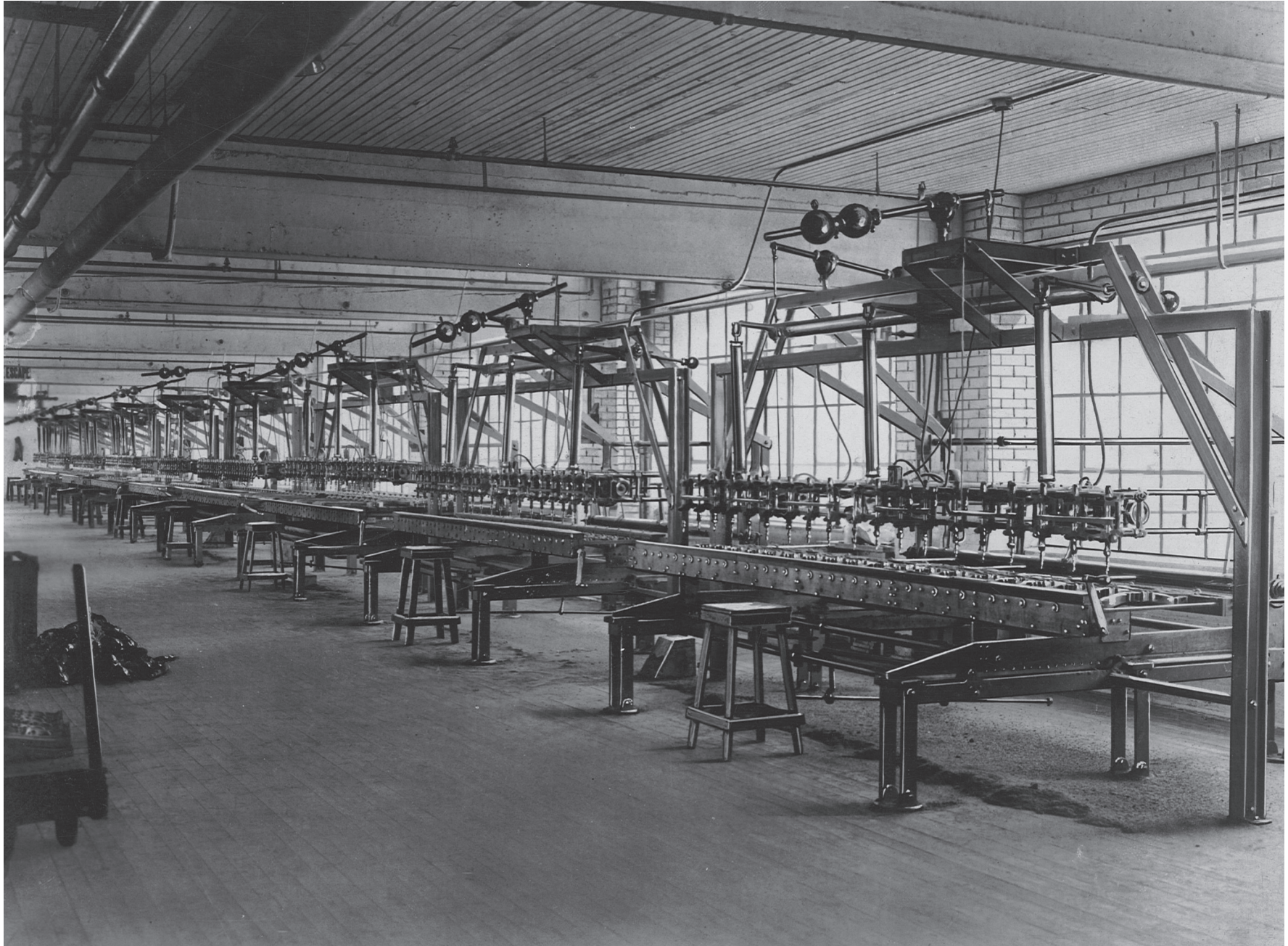
SALSTROM

CARVING
MACHINE COMPANY

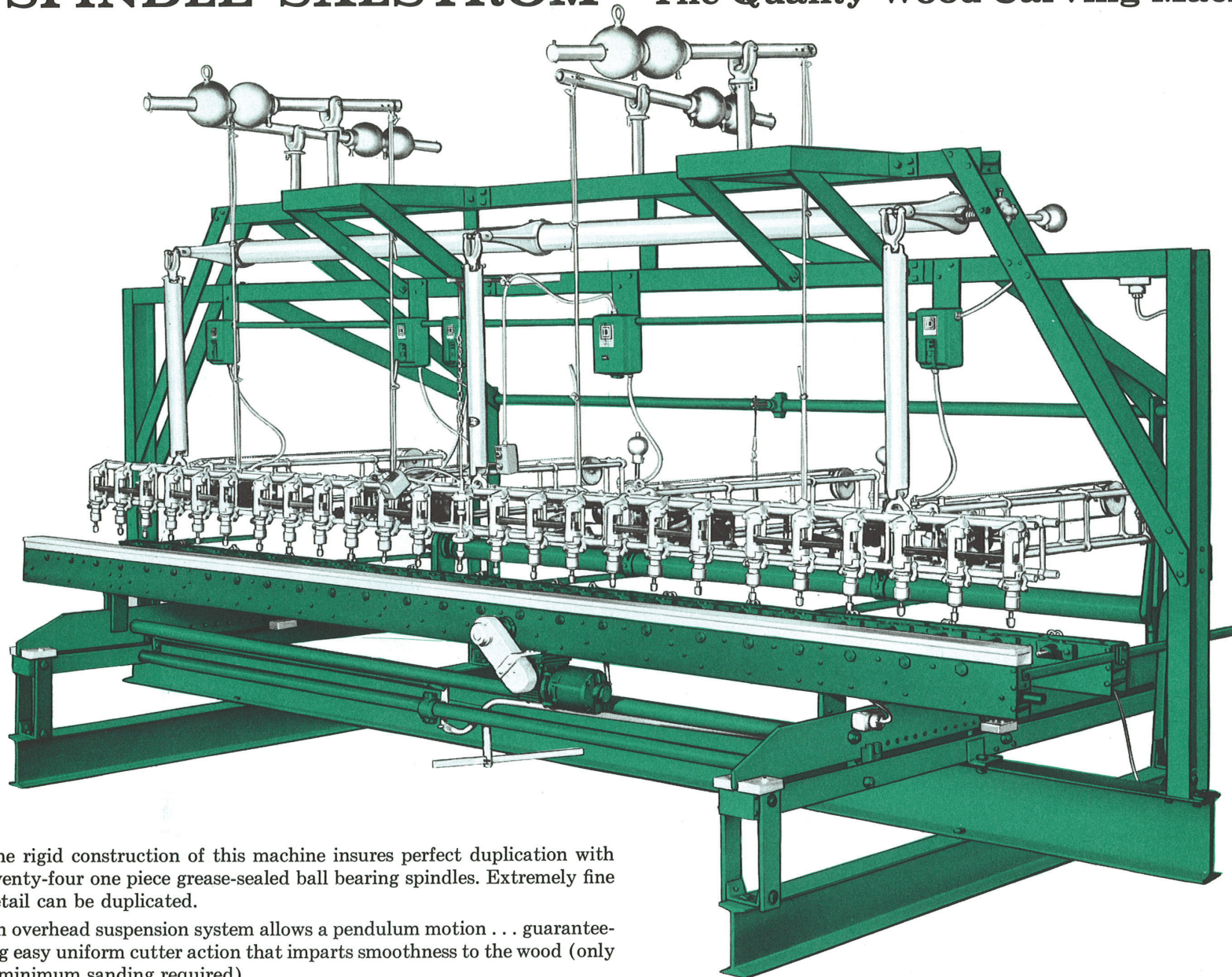
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CHICAGO 24, ILLINOIS

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24 SPINDLE SALSTROM The Quality Wood Carving Machine



The rigid construction of this machine insures perfect duplication with twenty-four one piece grease-sealed ball bearing spindles. Extremely fine detail can be duplicated.

An overhead suspension system allows a pendulum motion . . . guaranteeing easy uniform cutter action that imparts smoothness to the wood (only a minimum sanding required).

Capacity—up to 8" diameter and 60" long in centers. Flat tables are available for moulding and panel work. We also build smaller machines.

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CHICAGO, ILLINOIS 60623

Examples of Carving Detail Possible



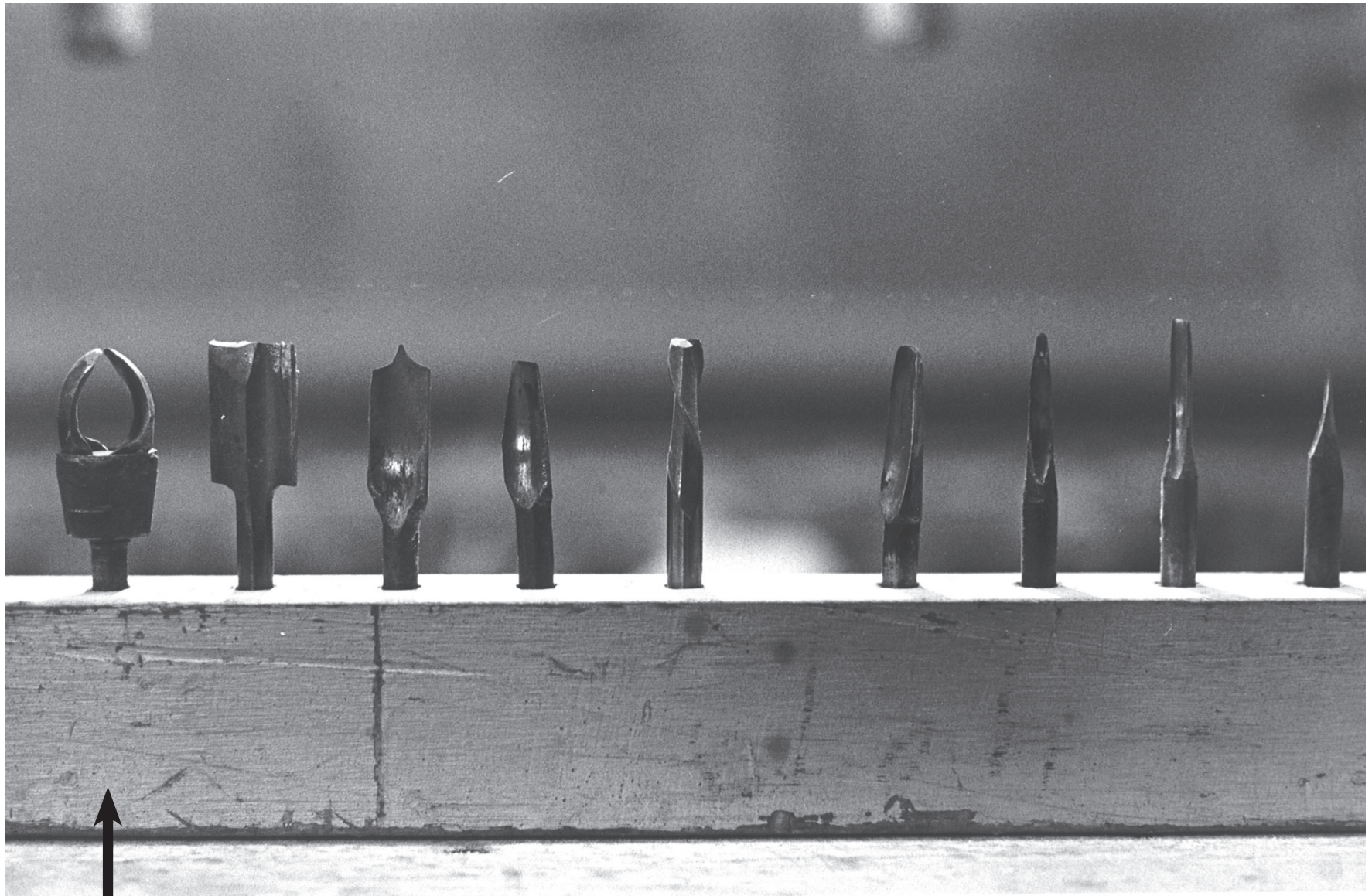
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Salstrom Carving Tools Used in Machine Carving
Photo taken at Rockwood Carvers, Oregon, Illinois



↑
smoother rougher

Manakin Carved on Salstrom Carving Machine Company, Chicago, IL.



Large ornamental heads of King and Queen were carved at Rockwood Carvers for fireplace mantels in an interior design for a restaurant in Chicago.

photo: courtesy of Lois Salstrom Chertow





Philip Salstrom, Sr.,
circa 1960, Rockwood Carvers,
Oregon, Illinois, displays dog and duck decorative carvings made at the
Salstrom Carving Machine Company, Chicago



Philip Salstrom, Sr.,
in the shop at Rockwood Carvers,
Oregon, Illinois, with dog and horse decorative carvings sold in gift shops.