Society for Industrial Archeology · New England Chapters

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Visit the New England Chapters-SIA website: nec-sia.org

NNEC Treasurer's Report

Rick Coughlin

Bank balance on April 1, 2024: $3,415.57. Bank balance on April 1, 2023: $3,149.75. The bank balance has increased $265.82 in the past year. 2024 annual paid membership ($20/yr.) as of April 1, 2024: 21. Life members: estimated at 25.

The typical chapter expenses for the newsletter and the website (we share costs with the Southern New England Chapter) averages about $1,200 - $1,300 per year. To meet the typical annual expenses, we need at least 60 paid annual members at the current membership rate of $20/yr.

We no longer have the paid attendance for the conferences that we did in the past, when 30-50 people attended. The past two SIA conferences hosted by the NNEC-SIA averaged about 22 paid conference attendees.

Newsletter printing and mailing costs are increasing while membership and conference attendance is decreasing.

However, due to very generous member donations our bank balance has not declined compared to one year ago. So far this year two members have contributed $50, one contributed $100, one donated $270 towards the cost of the conference room and one extremely generous member contributed $1,000 for our printed newsletter expenses. We are very thankful for these donations that are keeping us going.

SNEC Treasurer's Report for 2023

Sara E. Wermiel

In 2023, SNEC had 122 members, about the same number as in 2022. Income from dues and donations in 2023 came to $816, not including dues of new members who signed up at the annual (2023) New England IA conference. Income from the conference (attendance fees, which included complimentary membership for non-members) came to $390. SNEC also had income from bank and certificate of deposit interest: $367.04. The sum of all income was $1,573.04.

Last year, SNEC hosted the annual New England Conference on Industrial Archeology – the 34th conference – which was held at Lawrence Heritage State Park Visitor Center in Lawrence, Mass. Costs, which exceeded receipts by $115.34, included a $100 donation to the Friends of Lawrence Heritage State Park, which allowed us to use their facilities.

In addition to the usual expenditures for printing and mailing the semi-annual newsletters, SNEC paid a biannual fee for website hosting for the NEC website and dues for membership in the national SIA for SNEC's two elected officers.

Although SNEC's bank account balance declined slightly last year, the chapter started 2024 with $11,109.71, of which $7,000 is invested in two certificates of deposit. Any member who would like to see the bank statement for SNEC should contact Sara Wermiel.

SNEC is currently led by the chapter's treasurer/registrar, Sara Wermiel. Leonard Henkin is the chapter's secretary. In addition, there is a management committee with six members: – Betsey Dyer, Ron Klodenski, Saul Tannenbaum and Robert Timmerman, in addition to Sara and Leonard. Former member Peter Stott retired from the committee. Betsey Dyer is the contact for tours: please contact her with your ideas for IA destinations and programs. Robert Timmerman edits the newsletter for the New England chapters. Contributions can be sent to him at any time, for the spring and fall editions. Former SNEC president Marc Belanger continues to manage the website and email distributions for the New England SIA chapters. Thanks to everyone for their help.

NNEC President's Report

David Dunning

The spring tour will be in July this year, in Windsor, VT. Details to follow. Since last fall's tour was virtual, there was no chapter business meeting; so, one will be held at lunch during the tour, at the Harpoon Brewery in Windsor. One topic to be discussed is virtual tours. The one last fall was because the plans for a tour in Pembroke, NH, fell through and there wasn't time to put together another one in December.

The virtual tour of the Concord Coach Company worked out well for the following reasons. Everyone in both chapters got to enjoy it. There was no weather problem. There was no gas or meal cost. There was no scheduling conflict; people could see it *whenever*. Members got to keep the pictures and all of those details to review another time. How many of our physical tours' specifics do we remember beyond 12 months?

Also, some members aren't as agile walking on rough terrain as they once were. At the July lunch meeting the chapter can vote on whether to have more virtual tours. One other reason in favor of them is that the chapter is about out of sites to tour. To work out, there needs to be 3-4 places near each other that we can see in one day. The Concord Coach virtual tour was from *IA, the Journal of the Society for Industrial Archeology* vol. 20, #1&2, published in 1994. David Starbuck, Denis Howe and others put it together. We have access to it electronically from SIA headquarters. Below are the other articles from this issue; think about which you would enjoy.

Title	Pages	Pictures
An Introduction to NH Archeology	12	19
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Documenting Laconia's Knitting Mills	16	20
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1st Polyphase Hydroelectric Station	19	35

Come prepared to discuss this at the July lunch meeting. Should we have one virtual tour and one boots-on-the ground tour/year for the next nine years?

NEC-SIA Winter Conference

David Coughlin

The winter conference, hosted this year by NNEC, took place at the McAuliffe-Shepard Discovery Center in Concord, NH, on Saturday, March 16th.

To start off the day, David Dunning showed a video of the implosion of the old Mary Hitchcock Memorial Hospital. The implosion was shown from different viewpoints as it came down in a matter of seconds. David talked about how it had to be done without damaging the nearby houses or Dartmouth College buildings.

David Moore presented on ironmaking in Bridgewater, MA. The New England chapters' newsletter of fall 2023 contained the first part of an article he wrote on this topic. David argues that Bridgewater is the oldest iron manufacturing town in the country where iron products are still produced. During his presentation, he went back to the late 1600's and discussed the different manufacturers that made iron from that point until today. Some of the products made were hollow cast cannons, cotton presses, boiler plates, components for Erickson's vessel "Monitor." and cotton gins. Look for part 2 on page 4 of this newsletter.

A somewhat different but most interesting talk was given by Ron Romano concerning billboard monuments of New England. Doing cemetery research, he began to come across long horizontal grave markers held up by two upright posts. Now called "billboard monuments," these markers would often have 3-5 names and information on the deceased, rather than individual gravestones. Ron was the first person to document these "unknown" monuments, erected mainly between 1840-1880, and has written two books on the subject.

Eric Peterson started off the afternoon session by telling us about Industrial History New England (IHNE), a website which lists industrial history sites all through New England. It was inspired by a 2018 gathering of industrial history enthusiasts in Amesbury, MA. In addition to the larger museums, IHNE lists many smaller museums we may not know about on their website: https://industrialhistorynewengland.org.

John Mayer, who recently joined the board of directors of the Society for Industrial Archeology, led a discussion on topics related to our national organization. Most chapter members know very little about the national organization and have not attended the twice-yearly tours, usually in large cities. John gave us information about what's happening on the national level and fielded many questions about this topic.

The last speaker was Pat Malone, who presented on the topic of "Material Evidence for the Re-creation of a Waterpower System," which he worked on with Charles Parrott. Beginning in 1970, the Old Slater Mill Association studied the 1810 Wilkerson Mill with the explicit goal of recreating its early waterpower system. Pat discussed how a new waterwheel was built and supplied power for a shop exhibit in the same first floor space used by David Wilkerson more than 200 years ago.

Finally, there were two significant changes from two years ago at this location. The first was that the cafe had reopened, and the majority of attendees had a nice lunch at an affordable price right on site. Second, the IA used books table was very popular among attendees and many found excellent bargains on IA related books. We were encouraged to continue this for the next conference. It's a three-way winner. You eliminate books no longer needed, raise money for the chapter and provide IA related books to the attendees at prices below $5.

Iron Manufacturing in Bridgewater, Mass. (South Parish) Part 2

David R. Moore, Chairman
Bridgewater Historical Commission

{*Editor's note: Part 1 of this article, in the fall 2023 newsletter, ended with a description of a two large shafts, 28 inches in diameter by 34 feet 4 inches long, weighing about 25 tons each. See Editor's comments on iron as a material and manufacturing at the end of this article.*}

One of the many projects of the Bridgewater Iron Company (BIC) plant after the Civil War was documented in *Scientific American* in 1866: "At Lazell, Perkins & Co.'s works, at Bridgewater, Mass., a mold is being made for casting a monster sea water condenser for one of the Boston and Liverpool packets now being built at Newburyport. It will require twenty tons of iron, and will be the heaviest single casting ever turned out by these works."[4]

By 1875, the firm ranked as the largest iron concern in New England covering over 70 acres, including worker housing and other support buildings. The principal plant, covering about 15 acres, housed two rolling mills, the largest 244 by 132 feet; two machine shops, of which the largest was 251 feet in length; two forges, one being 130 by 100 feet; an iron foundry, 130 by 90 feet; a brass foundry; and numerous other support buildings, totaling 28 in all. Five steam engines and eleven water wheels powered the works, which annually consumed 15,000 tons of coal and 48,000 bushels of charcoal.[5]

The company's forge department was distinctive, having facilities for producing heavy forgings that could be done at very few other places in the country. An example of the products was the wrought iron forgings for John Ericsson's USS Monitor [6] along with the anchors for the old USS Constitution. There may have been a connection between the plant superintendent James Ferguson and Ericsson. Ferguson, a Scotchman, had learned his trade in England and was managing the production facilities at other plants in Fall River and Taunton along with Bridgewater. John Ericsson, of Sweden, also had spent over 10 years in England developing his skills in designing and constructing iron implements of war. BIC was contracted to produce many forgings for the Navy before, during and after the Civil War. Among these were components for Ericsson's monitors, his forged cannon and his bombproof battery.

There has always been a controversy as to whether BIC actually produced iron plating for the USS Monitor. James T. deKay, a noted historian on the Monitor, states that the design called for two layers of 4-inch boiler plate to cover the turret. He also reports that the Abbot Company in Baltimore, Maryland, supplied most, and I emphasize that the word most is used, of the plate for the job.[7] They did not have the equipment needed to form or roll the 4-inch-thick plate to the desired curves, so Ericsson substituted 8 riveted layers of 1-inch plate instead. BIC did manufacture 1-inch plate and first-hand accounts state that they did produce certain iron "timbers" to support the turret and numerous parts for many other Monitor class ships.

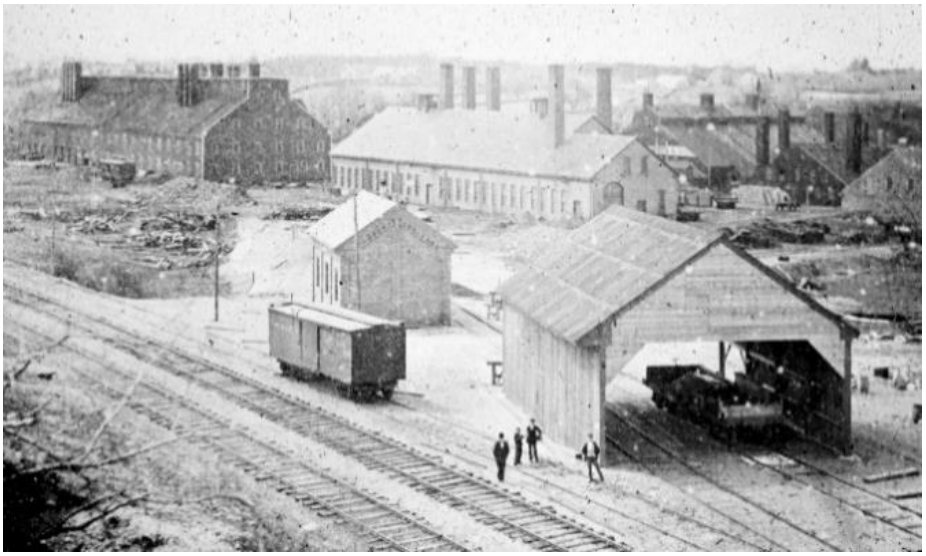
Research of the records of the American Swedish Historical Society in Philadelphia has produced two important letters. Although their catalog lists them as correspondence with the Henry Penkins Company, they actually are

letters to the Lazell, Perkins & Co, from John Ericsson. The first, dated December 17, 1862, during the actual construction of the USS Monitor, was an order for production of iron blocks described as, "10 wrought iron blocks to the enclosed drawing and forward the same to the Delamat[e]r Company in this city with all dispatch. It may be well to state that these blocks will form the two sides of an iron log cabin, the pilot house of my impregnable battery." The second letter, dated June 30, 1863, was for beams made of 1" plate. Ericsson's records also talk of his work on the monitor "Dictator," which is also mentioned in newspaper accounts of work at the plant. All of the ironwork for the fleet of the Pacific Mail Steamship Company was also produced here.

One cannot emphasize enough the size of the machinery that was required to produce these gigantic wares. The lathe had a faceplate of between 15 to 20 feet in diameter, could turn a shaft of 40' in length. The thud of the 10-ton Willard steam forging press could be heard in the center of town, but could be controlled with such accuracy that it could crack a walnut without damaging the meat. Other hammers or forging presses weighing more than 11 tons could exert a force of over 35 tons with the use of steam pressure. The massive planer could peel off pieces of iron one- and one-half inches wide and a quarter of an inch thick with each pass. The shear, weighing over forty tons, could cut bars of iron 5 inches square. Pieces of iron 20 to 30 tons could be moved around by one hand on cranes with relative ease, to position them before the various machines. The largest crane was reported to have a capacity of 75 tons.[8] Shafts were produced that would take up four railroad flat cars to move about, with an assembled weight of over 65 tons.

Another article from the *Scientific American* in 1863 spoke of the machinery at the plant. "A large steam hammer in the works of Messrs. Lazell, Perkins & Co., Bridgewater, Mass., weighs upwards of eleven tons, and has ten feet stroke; the full force of the blow being 135 tons. The large lathe in the same establishment will bore and face 30 feet diameter, and turn 87 feet long."[9]

The rolling mill was powered by 2500 HP steam condensing engines with a 150,000-pound fly wheel to maintain momentum.[10] Six-thousand-pound pieces of iron or steel would be run between rolls and reduced to plate or thinner stock to make smaller steel stock. The rolls weighing 5,000 pounds each, also made at the plant, had to be replaced every few months and refinished in the machine shop every few days.



Undated photo of the ironworks

Bridgewater Iron Company continued to operate right up until the time when it could no longer compete with the great iron and steel centers springing up in Pennsylvania, West Virginia and Ohio. The invention of the Bessemer Converter by Henry Bessemer dropped steel prices by 80%. This eliminated the antiquated methods of building up larger items by forging, which had been the specialty of BIC. The demands of the Industrial

Revolution also emphasized the importance of production facilities closer to the sources of raw materials and transportation. The exact same factors, on a larger scale, that had made Bridgewater the industrial giant that it was 50 years before, would now bring its demise.

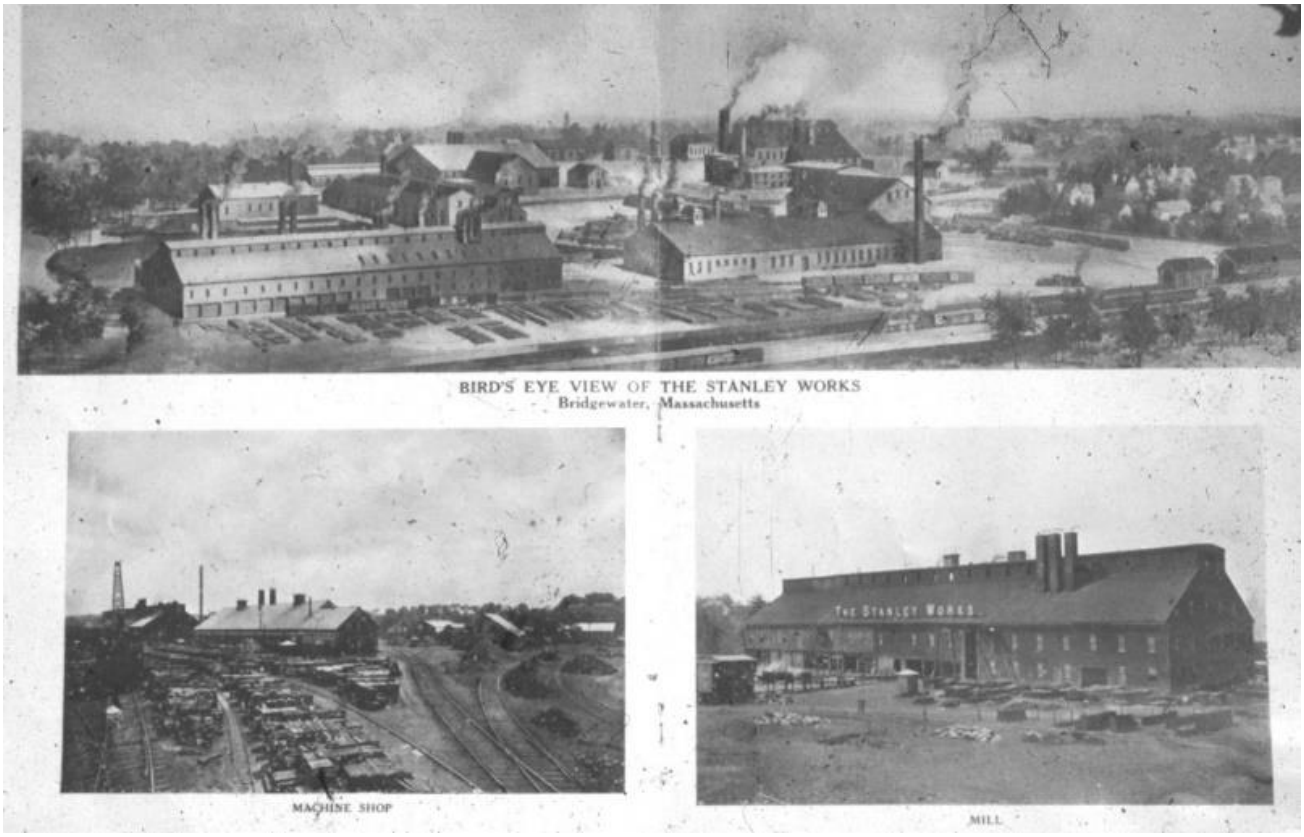
In 1899, the Stanley Works of New Britain, Conn., purchased the Bridgewater Iron Company. The Stanley Works was the sister company to the Stanley [Rule and Level] Company. *[Ed. note: The two firms were founded by cousins and eventually merged.]* The plant was used to produce machinery and plate for the manufacture of tools. It would continue until 1928 before moving the operation back to New Britain, leaving only their name for that section of town. There are a few billheads in existence that show a Bridgewater Foundry continuing to operate for a few years after 1899. The neighboring George O. Jenkins Co. purchased the plant, and many of the buildings were used for scrap paper storage, as they fell into disrepair.

The lapse of time and the devastation of the 1938 hurricane took a heavy toll on the complex. Two buildings re-opened in 1946 as the Bridgewater Foundry and continued until 1988, producing gray iron castings.

Today the site is owned by the town of Bridgewater and is under development as Ironworks Park at Stanley. It has been listed in the National Register of Historic Places and Massachusetts Register of Historic Places. The one remaining building, a 45 x 90-foot stone storehouse, is currently under restoration.

Iron manufacturing continues today under the name of the Henry Perkins Company, founded in 1848 and located about 1/3 of a mile down river from the BIC site, on Broad Street in Bridgewater.

The Henry Perkins Company was an offshoot of the cotton gin industry. Henry descended from the Perkins family that started the ironworks on High Street. He was born in Bridgewater in 1814 and learned his trade as a molder at the Lazell, Perkins & Company.



Brochure for sale of the works by Stanley

After a short period, he opened a foundry at the rear of the Bates and Hyde Company on Pearl Street. A fire destroyed the foundry section in 1848, and he seized the opportunity to open his own casting operation across the tracks on Broad Street. Men returning from the Civil War in 1865 were employed to construct a building that would serve until 1974 as the main furnace area for the plant. In 1852, Henry made his first shipment of piano back boards to the Chickering Piano Company. LeBaron Foundry of Brockton ran a casting operation out of Perkins Foundry for a few years until their section was destroyed by fire in 1910. The Perkins plant has continued for over 150 years in the same family, producing quality iron castings of all sorts, including nail machinery and piano backboards. An electric furnace would replace the ancient cupola furnace in 1972 for environmental reasons. Along with large production orders for United Shoe Machinery, Masoneilan, Pope Machine and Carver Cotton Gins, they were diverse enough to handle limited production of experimental engine blocks, boat parts, large gears and various other iron castings for national defense.

{*Editor's extended note on iron and steel: This history refers to a number of materials as iron. Strictly speaking, pig iron from the blast furnace contains 3.5% to 4.5% carbon [1] and has little tensile strength. Steel contains controlled amounts of carbon between 0.07% to 1.30% [1]. Engineering steel was first produced by the Bessemer Process, invented in England by Henry Bessemer. While Bessemer worked out the details of the process prior to 1860, he built his first mill in 1860. The first Bessemer plant in the US was built in 1867 [2]. However, the process to eliminate phosphorus was not developed until 1878, by Thomas and Gilchrist in England. Circumstantial evidence seems to show that Bessemer convertors were erected in Pennsylvania, but not necessarily in Bridgewater, Mass. The low carbon ferrous product used in Bridgewater was most likely wrought iron. This is made by reducing pig iron in a furnace, with considerable manipulation, and the use of iron oxide as an oxidizing agent for the carbon. After the carbon in the charge is reduced, the metal, which contains much slag, is sent to a forge, where the slag is squeezed out, hence the term "wrought iron." The nature of the process limits the size of each piece to about 500 pounds, so a large piece of metal had to be forge welded out of many smaller pieces. [3] So, the term "iron" in this article probably refers to both cast iron and wrought iron.*}

Endnotes

[1] J. M. Camp and C. B. Francis, *The Making, Shaping, and Treating of Steel*, 4th edition, Pittsburgh: Carnegie, Steel Company, pg. 256, table 34.

[2] Camp and Francis, ibid., pg. 263.

[3] Camp and Francis, ibid., pg. 218-221.

[4] *Scientific American* vol. 15 n.s. issue 5, July 28, 1866: 64.

[5] Orra Stone, *History of Massachusetts Industries; Their Inception, Growth, and Success*, vol. II, 1930.

[6] Joshua Crane, "History of Bridgewater," unpublished m.s., 1872, at Bridgewater Library Historical Room, pg. 49.

[7] James T. deKay, *Monitor,* Ballantine Publishing Company, 1997, pg. 107.

[8] "Casting History," *Bridgewater Independent*, Nov 11, 1977.

[9] *Scientific American* vol. 9 n.s., issue 6, Aug. 8, 1863.

[10] "Bridgewater's Oldest Industry," *Bridgewater Independent*, Feb 10, 1910.

James S. Conant, Engraver on Wood

Rick Ashton

While researching the Ashton Valve Co., I have spent hours combing through old industrial era trade journals and catalogs for references to the company. One of the first things I noticed was how beautiful the advertisements were, and how incredibly detailed the art was, especially in the mid to late 1800s. I noticed the same thing in my Ashton Valve catalogs. I became very curious

as to how they could get such detailed results without using photography (which was still in its infancy). While looking at the Ashton Valve product catalog with a magnifying glass, I began to notice a name on many of the illustrations, and I thought it might be interesting to learn something about how the old Ashton catalogs and trade journals were put together.

The name I read was "James S. Conant Co. Boston, Mass." After finding some of his letterheads and journal advertisements, I saw they were often titled "James S. Conant – Engraver on Wood." Immediately I thought of wood cuts I have seen. The wood cut process goes back to 15th-century Europe. But wood engraving is different.

In the late 1700s, the Englishman Thomas Bewick, considered the founder of wood engraving, realized its potential for large illustrations. Bewick engraved harder woods than the types used in wood cuts. He used woods like oak, boxwood, maple and mahogany. He also used the end cuts of the wood as opposed to the side cuts used by wood cut printer. There were advantages to using the hardwoods. The hard and densely grained wood, when the end cuts (or cross sections) were used, offered the opportunity for engraved lines to be much finer than in the wood block method. The end cuts could also withstand hundreds of thousands of impressions in a printing press, far outlasting copper and steel. Wood engravers also used a number of specialized tools. Bewick used a "graver," a tool with a V-shaped cutting tip. This proved better when working with harder woods. Other tools included the "lozenge" graver, a steel tool with a lozenge shaped point that is very sharp. Various sizes of V-shaped gravers were used for "hatching," a process where parallel lines are used to create shady areas. There was also the "spit sticker" for creating fine undulating lines, the round scorper for curved textures and the flat scorper for clearing large areas. Smoother papers developed in the 1700s showed the detailed work better.

Alexander Anderson is credited with introducing the wood engraving process to America in the late 1700s. In England, *Punch* magazine and the *Illustrated London News* were early users of the wood engraving process. In the United States, *Harpers Weekly* used the engraving process in their periodical. James Conant worked for Harpers early in his career. Creating the wood engravings was a very time-consuming process, and Frank Leslie, a British engraver who emigrated to the United States in 1848, developed a way to divide the labor for making wood engravings. A design was divided into a grid, and each engraver worked on a square, which was then assembled into a single image.

After the Civil War, the industrial revolution in the United States created many new industries and many older ones expanded. This led to a class of wealthy industrialists, a prosperous middle class and a larger blue-collar class, all with money to spend. Montgomery Ward produced the first mail order catalog for the general public in 1872. On the industrial side, the explosion of manufacturing and the expansion of the railroads created a need for information and repair parts for the machines that drove these industries. Catalogs and trade journals became essential to maintaining these industries. All machines need repair parts to keep them running. The trade journals kept businesspeople up to date on the latest technologies, and the advertisements in them directed them to the companies selling the repair parts.

Some of the trade journals I used to research the Ashton Valve Company included the *Safety Valve, Railway Equipment Guide*, *Locomotive Engineering*, *Ice and Refrigeration*, *The Age of Steel*, *Marine Review*, *Electric Railway Journal*, *Scientific American* (still around), *Automobile Trade Journal*, *Plumbers Trade Journal*, *Fiber & Fabric*, *Power Plant Engineering*, *International Steam Engineer*, *Electricity*, *American Journal of Railway Appliances*, *Water & Gas Review*, *Cassier's Magazine*, *Wool and Cotton Reporter* and many others. Industrial-era trade journals are worthy of an article themselves.

There were hundreds of them, and they all needed to be printed. I have a list of over 100 that included Ashton Valve advertisements and articles. Many were printed using the wood engraving process.

Enter James S. Conant, the guy who this article is about. James was born in 1844 in East Bridgewater, Mass. He was born into a shoe-making family but even as a young man he dreamed about being a painter. During the Civil War, James followed his older brother into the 29th Company of Massachusetts Volunteers. After returning from the war, he went to Paris to study art. He tried to make a name for himself as a portrait painter. When that didn't pan out, he went to work as an illustrator. He developed a reputation for the fine drawings he produced on wood blocks for Boston engravers. His work would soon appear in *Gleason's Pictorial Drawing Room Companion, Ballou's Monthly* and *Harper's Weekly*.

Conant was one of the first to use wood engravings in a commercial setting. In 1870, he co-founded the Bricher & Conant company with Henry Bricher, and for many years that company was the leading wood engraving company of its kind in the country. He went out on his own as the James S. Conant Company and was constantly experimenting with new methods of illustration. He soon was getting involved with the new field of photoengraving. He ran the company successfully for over 30 years. He retired in 1910 and the company merged with the Suffolk Engraving Co. Conant passed away December 18, 1922, at the age of 79.

The earliest mention I found of the James Conant Co. is in the 1875 ad for "Moose Skinner's Centennial Book." There was plenty of competition in his field, and the *1883 New England Business Directory* contains 88 listings for engravers, 15 for wood engravers. In 1890, Conant released an 18-page "catalog of shoe cuts and ornaments, designed for show advertisements." In 1900 he opened another engraving business in Portland, Maine, showing $10,000 in capital. The Boston Society of Printers featured a Conant wood engraving proof in their 1906 exhibition, "The Development of Printing as an Art."

From a 1919 *Fall River Line Journal*: "James S. Conant's illustration won in a contest to decide the header art for a new periodical, *The Fall River Journal*." It was celebrating the new steamer line from Boston to Fall River to New York. A paragraph from the first issue states: "It is fast becoming a universally recognized fact that Wood Engraving in America is originating a school of its own. The numerous new processes of Photo-Engravings, Heliotype, and all others in which chemicals are the active agent, only serve to more strikingly illustrate the vast superiority of Wood Engraving, and it is a matter of city pride that Boston possesses as good, if not the best engravers in the country. In our own case, we can state that among the many designs submitted for our headings, the one drawn by Mr. James S. Conant, 13 Franklin St., was selected as being the most artistic, he ranking among the best Designers and Wood Engravers of this country; and we point to it with pride as a specimen of elegant engraving."

A very detailed example of what Conant's firm could do. Note the address: 15 Franklin Street, corner of Washington Street, now part of the retail district.

What types of companies did he provide artwork for? We can start with the Ashton Valve catalogs. The earliest reference to the Conant company I could locate is an Ashton Valve catalog from 1895. The steam related drawings in the catalog are extremely detailed

and were used for years. The steam gage and safety valve designs were also used in trade journal advertisements. I also found samples of his work with companies like the Niles Tool Works and Joseph Breck seed catalogs, and in trade journals like the *Age of Steel* (1888), *Safety Valve* and *Wade's Fiber and Fabric* (1888). His work can be found in an illustrated book on Haverhill, Mass., and a Connecticut railroad report from 1890. An 1892 issue of *Greenfield Gazette* features a beautiful illustration of the Rodney Hunt Machine Company works. Advertising your factory building was a big thing in the 1800s, and there were companies that specialized in it. Many early Ashton Valve catalogs feature an illustration of the works. There are letterheads and envelopes that feature incredibly detailed design work. Conant even designed the label for a local rum drink in Boston called "Hub Punch." I managed to get hold of one of the bottles on eBay. Unfortunately, it is empty. But a Boston distiller has resurrected the drink and very loosely based the label design on Conant's.

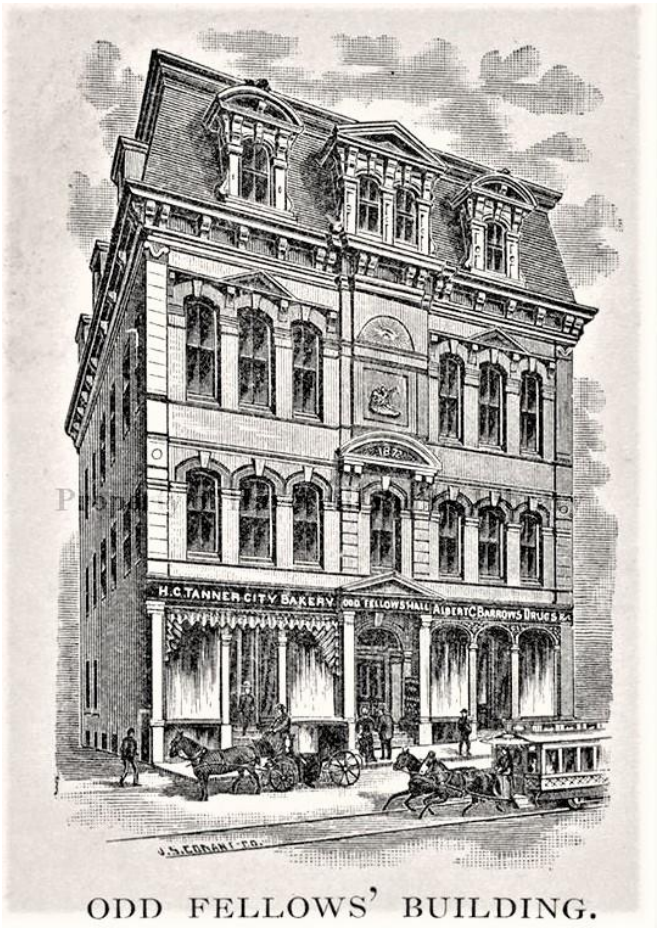
Commercial wood engraving for printing almost completely disappeared by the early 1900s. Advancements in photography and copy-making made the wood engraving process obsolete. However, it still exists today in the arts and crafts field, and there are a couple of societies that have been formed over the years to keep the craft alive. In the U.K., there is the Society of Wood Engravers, and the U.S. is home to the Wood Engravers Network.

(See more illustrations, next two pages.)

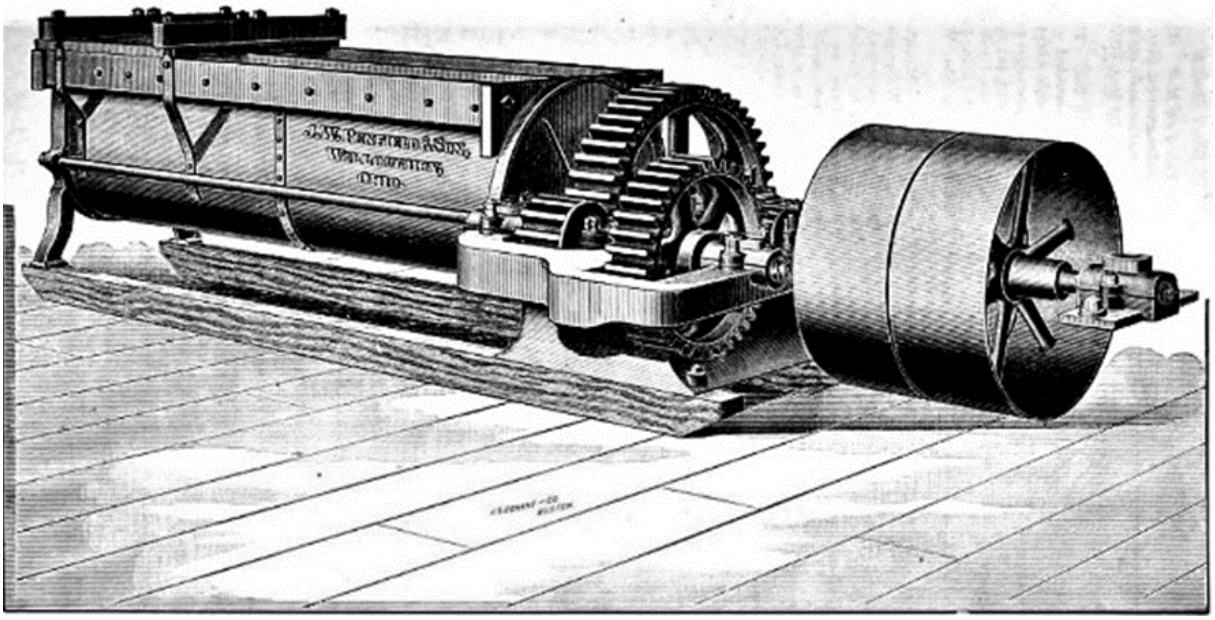
Sources: Wikipedia for almost all information on the wood engraving process and the 1923 *American Printer* magazine for Conant's obituary. Google Books for the journal references and examples of Conant's art.

1881 letterhead

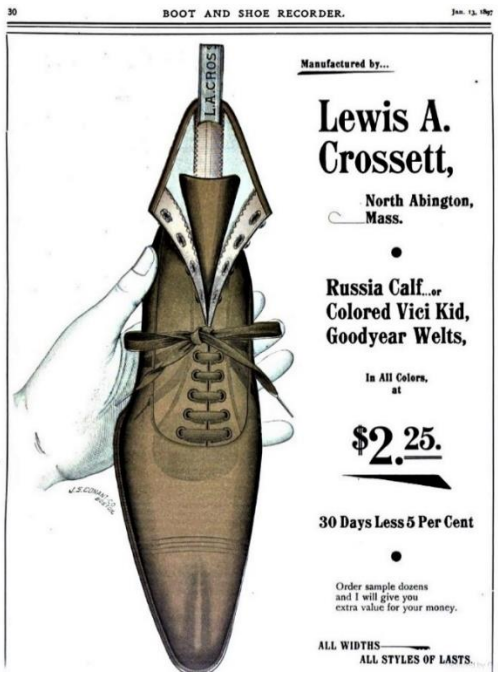
1882 letterhead

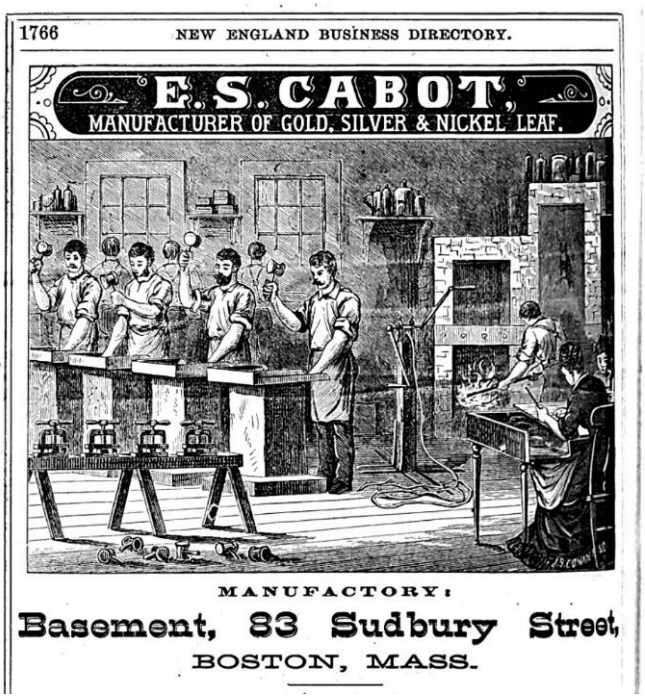


Odd Fellows Hall, Haverhill, Mass.



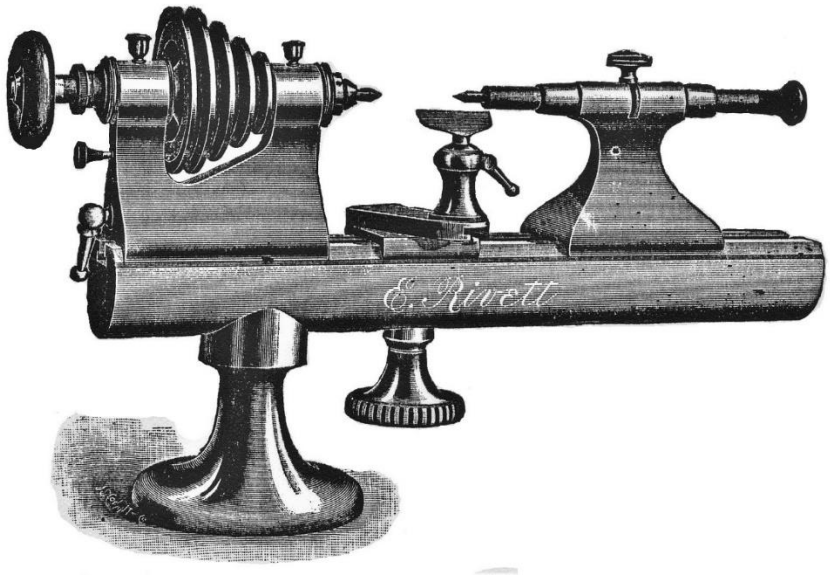
Pug mill for extruding clay to make bricks. [Note the two large flat belt drive pulleys. One is fixed to the drive shaft of the machine and is called the tight pulley. When the belt is on the tight pulley, the drive belt drives the machine. The other pulley is free to turn and is called the loose pulley. When the drive belt is on the loose pulley, the drive is disconnected from the machine.]



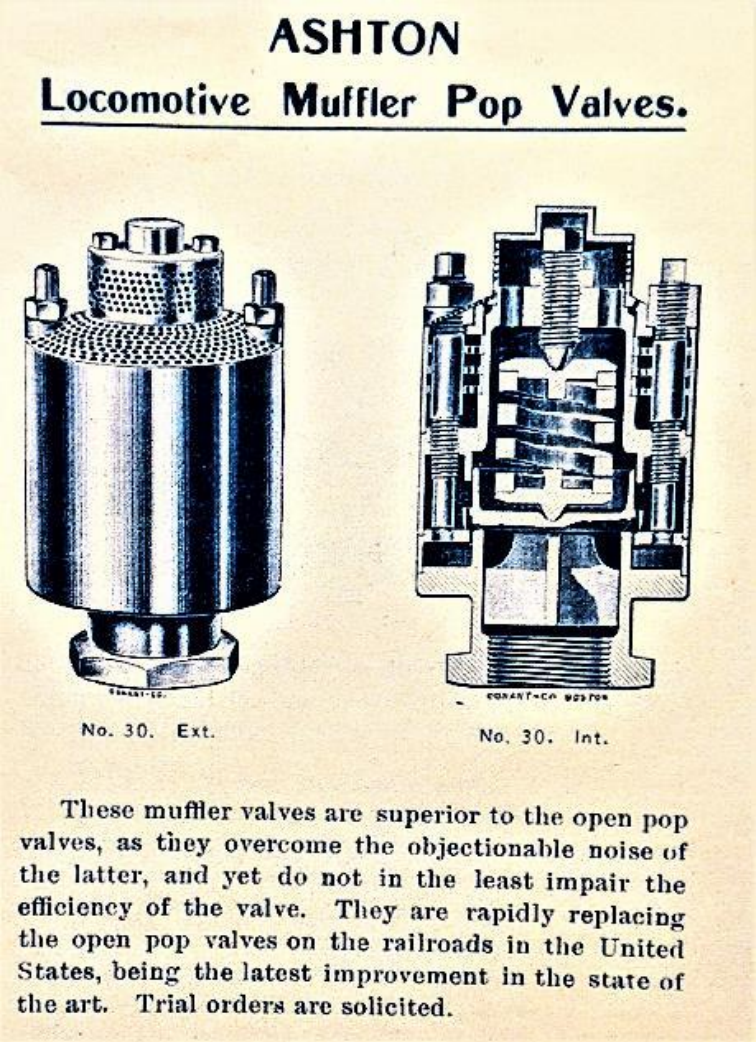


Advertisement from the Boot and Shoe Reporter, *July 13, 1897. Note 30 days less 5%.*

<Advertisement from the New England Business Directory.



Watchmaker's lathe, by the Faneuil Watch Tool Company. [Note the name on the lathe is Rivett. Rivett made lathes under his own name somewhat later.]



Muffled safety valve, from the 1895 Ashton Valve catalog.
[Ed. Note: This design was intended to reduce the racket made when locomotive safety valves opened, which they did frequently.]

Advice to Newsletter Contributors

Robert W. Timmerman, Editor

Thanks to all who contribute to the New England Chapters – SIA newsletter! Contributors can help streamline the newsletter production process by submitting materials in formats compatible with Microsoft Word, which I use to prepare this newsletter. For our guidelines on format for your contributions, visit nec-sia.org and click the tab Newsletter.

We appreciate your contributions to the newsletter and your cooperation!