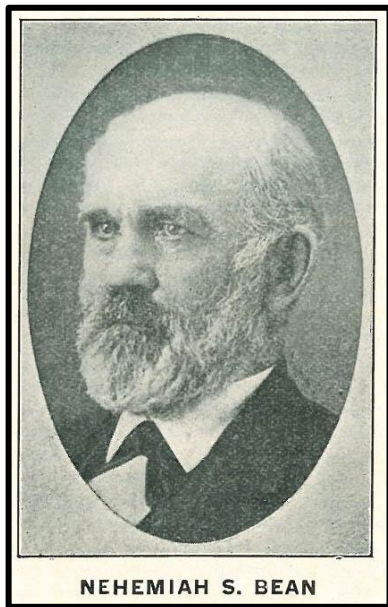


Nehemiah Bean and the Amoskeag Steam Fire Engine

By Aurore Eaton, Executive Director, Manchester Historic Association

The Amoskeag Manufacturing Company's Machine Shop in Manchester, New Hampshire rolled out its first steam locomotive engine on March 1, 1849, and after a successful run in this business ceased locomotive production in February 1858. In July Ezekiel Straw was put in charge of the operations. This made him the top administrator for the entire company, as he was already managing the real estate, the water power system, and textile manufacturing. Straw, a civil engineer, was always looking for innovative ways to increase the company's reach and profitability, especially if it involved technological innovation. Under his leadership, the Machine Shop would next take on the exciting challenge of manufacturing steam fire engines.



One man would prove critical to the success of this venture.

*Nehemiah S. Bean was born in 1818 in Gilmanton, New Hampshire. As his father had died, Bean's family sent him off at a young age to apprentice with the Shakers in Canterbury, New Hampshire. He stayed in this religious community for several years where, according to an 1896 article, he "obtained some very valuable lessons in thrift, industry and frugality."

Bean left the Shakers when he was a young man to learn the wheelwright's trade, and later worked in a machine shop in Lowell, Massachusetts where he gained mechanical skills. He then went to Lawrence, Massachusetts to work as a carpenter. His diverse abilities were recognized in 1847, when he was hired by the Amoskeag Manufacturing Company to oversee the pattern room at the Machine Shop. He was put in charge of the locomotive department in 1850. Four years later he left for a similar position with the Essex Manufacturing Company in

Lawrence, Massachusetts. While in Lawrence, Bean was also a fire fighter. He was a member of a hand engine company, which spurred his interest in finding better ways to put out fires.

During the international financial panic in the fall of 1857 locomotive production was stopped in Lawrence. During the winter and spring, Bean and a local mechanic, Thomas Scott, took advantage of their time off to build a steam fire engine. This was remarkable, because neither Bean nor Scott had ever seen such a machine. They tested their 4-ton engine in Lawrence at the end of June 1858. They gradually increased the steam and water pressure to see what the engine could do. After a few burst fire hoses, the machine was finally able to shoot water vertically an impressive 198 feet through 135 feet of hose.

The steam fire engine trade was just beginning to blossom in the United States, and demand for new and better engines was high. Competitions were set up to pit one manufacturer against another, and these events became popular entertainments. Scott and Bean brought their engine to Boston for a series of public trials on August 31 and September 1, 1858. There were three other machines in the running, including one from Philadelphia, and two from Boston.

A tall flag pole on Boston Common near Beacon Street was used to measure the height of the water streams. On the second day of the competition the Bean & Scott engine shot water to a height of 155 feet, wetting the flag at the top of the pole. The competition also involved a time trial, where the horse-pulled engines were run around Boston Common at top speed. The Bean &

Scott engine performed well enough for the partners to win the \$300 second prize. The first prize of \$500 went to the Philadelphia company of Reanie & Neafie.

The City of Boston bought the Bean & Scott engine for \$3,500, and named it the “Lawrence No. 7.” This was the first and last Bean & Scott machine, as Bean was soon hired by a locomotive manufacturing firm in Boston. However, before the end of 1858 he was back in Manchester and working for the Amoskeag Machine Shop. This time, his job was to improve the design for the Lawrence engine, so that the Amoskeag could begin producing the best engine in New England, if not in the United States. In August 1859 the Amoskeag Machine Shop completed its first fire engine, built according to Bean’s specifications. The “Amoskeag No. 1,” made for the City of Manchester, was demonstrated to much fanfare at the city’s famous firemen’s muster of 1859.

In the 1850s attending a firemen’s muster was a popular pastime in America. There was a great spirit of competitiveness among the many volunteer fire companies that served large cities and small towns alike. In 1855 a Manchester company, with its hand-pumped engine “Torrent No. 5,” won a muster in Worcester, Massachusetts by shooting a stream of water 150 feet in the air. In 1859 Manchester’s seven fire companies got together and organized a muster to take place on Merrimack Common (now Veterans Park). The park contained a large fire pond that would provide ample water for the competing engines. The Manchester fire companies raised \$900 for prize money then set the date of the event for September 15, 1859. Fifty-two volunteer fire brigades from around New England traveled to Manchester to participate.

This was the end of an era. The man-powered “handtubs” would eventually be replaced by the powerful steam fire engines that were just making their debut. The Amoskeag Manufacturing Company’s first steamer, the “Amoskeag No. 1,” designed by Nehemiah Bean, was put on trial on July 4, 1859. Within seven minutes it easily shot two streams of water to a vertical height of 203 feet. No handtub could compete. The city bought the engine, and established Steam Fire Engine Company No. 1 on July 6, 1859.

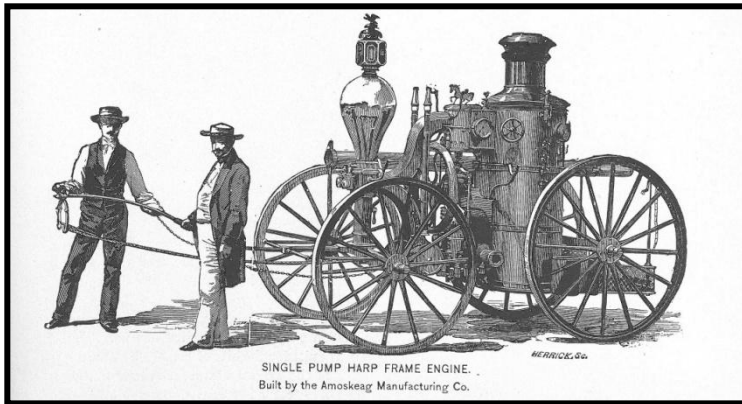
When “Amoskeag No. 1” was demonstrated at the firemen’s muster on Merrimack Common on September 15, 1859 many in the assembled crowd were impressed with its spectacular efficiency – but it is unlikely that any of the volunteer firemen were pleased. They took great pride in beating down fires through the sheer force of their physical prowess combined with spirited teamwork. The looming prospect that a machine would change the nature of their thrilling avocation must have rattled the nerves.

With talented inventor Nehemiah S. Bean supervising design and production, within a short time the manufacture of steam fire engines and hose carriages became the major focus of the Machine Shop of the Amoskeag Manufacturing Company. Mechanics were hired to meet increasing demand, and soon an engine could be built within two months of the receipt of an order.

The company became known for its personal service. According to historian George Waldo Browne, “Every engine sent out was warranted to be of the best material and workmanship, and a competent engineer was sent to put the machine in complete running order.”



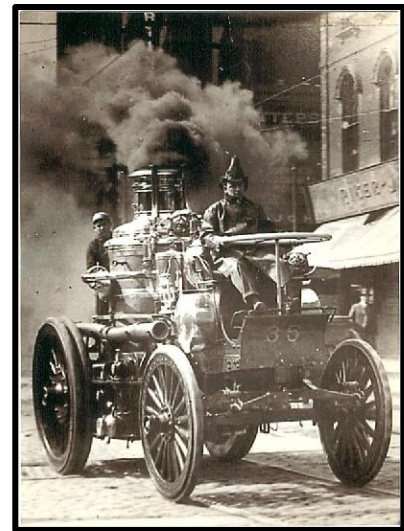
Amoskeag No. 1



The Machine Shop built a variety of fire engines. The biggest demand was for the double pump “harp” type. On these, the hexagonal cast brass frame was bolted to the pump and steam cylinder, which made it look like the frame of a harp. The first-class harp engine weighed 6,000 pounds when loaded with fuel (wood or coal) and water, and was pulled by three horses. According to Browne, this engine “...was often

put to severe test at firemen’s musters and parades, and won many prizes, becoming a general favorite.” The second-class harp engine weighed 5,300 pounds when fully equipped, and could be pulled either by two horses or by men. The company also made a compact 4,000 pound single pump engine used by small towns that could be pulled by either by one horse or by men.

In 1867 the company began producing “self-propellers.” These “horseless carriages” used steam power for locomotion as well as for pumping water. They worked quite well in some cities, but there were some difficulties to overcome. The machines could reach a speed of 10-12 miles per hour, but could only travel easily over flat surfaces. They functioned poorly on snow and ice, and they were so loud they terrified any horses in the vicinity. These machines are recorded in the annals of motor vehicle history as being some of the first vehicles to use a modern differential gear. This allowed the four wheels to move at different speeds, which made turning sharp corners possible. This improvement was first tried in 1873 on an engine destined for Detroit, Michigan, the “Lafayette 1.”

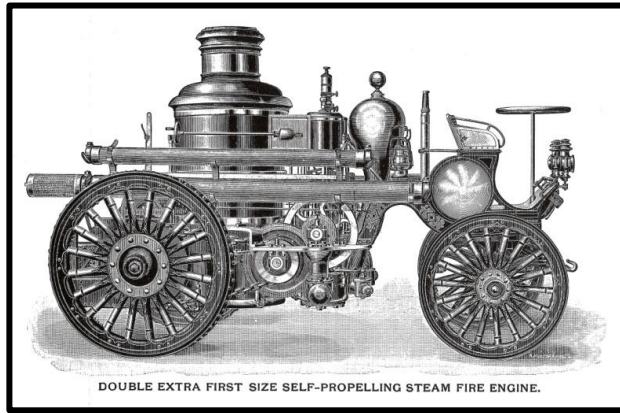


An Amoskeag “self-propeller” in Boston, Massachusetts

How good were the Amoskeag fire engines? The record for the longest distance ever recorded for a steam fire engine to throw a stream of water horizontally was reportedly set when a newly built Amoskeag steamer, Engine Six of Cambridge, Massachusetts, was tested at Fresh Pond in that city in March 1891. The astounding record was 381 feet, 4 ½ inches.

By 1876 the Amoskeag’s Agent, Ezekiel Straw, had grown disenchanted with the steam fire engine business. The Amoskeag had built 550 engines since 1859, all under the intelligent direction of Nehemiah S. Bean. These sold well, but the division was not as profitable as Straw would have liked it to be. Its main purpose seemed to be to spread the fame of the Amoskeag Manufacturing Company rather than to make money. Straw decided to sell the patents to the Manchester Locomotive Works, and at age 58 Bean willingly took the opportunity to retire. The Locomotive Works continued to manufacture the Amoskeag steamers for several more decades. This company was bought by the American Locomotive Company in 1901, and the last Amoskeag engines were produced in 1907 or 1908.

The famous Amoskeag steam fire engines were known for their effectiveness in fighting fires, and were also appreciated for their beauty. Small towns from Maine to Oregon bought the machines, as well as large cities including New York, Boston, New Orleans, Pittsburgh, Philadelphia, Detroit, Albany and San Francisco. The Amoskeag engines were a significant factor in saving lives and property at the Great Boston Fire of November 1872 and the San



Francisco earthquake and fire of April 1906. Many were acquired by the U.S. Government to be used at Navy yards and at arsenals. They were sold around the world including in Canada, Russia, China, Australia, Peru and Chile. The city of London bought two, which were named “Queen Victoria” and “Princess Alexandra.” Today Amoskeag engines can be seen in museums across the United States, and many are held in private collections.

An Amoskeag steam fire engine.

Note: This article is a compilation of material published in the New Hampshire Union Leader newspaper on May 8, May 15 and May 22, 2012 in the “Looking Back” column written by Aurore Eaton. Additional information, photographs and archival records are available through the Manchester Historic Association in Manchester, New Hampshire USA www.manchestehistoric.org.

*Nehemiah S. Bean was the father of Norwin S. Bean.

**“Torrent No. 5” was made in Boston in 1844. It is on permanent display in the Millyard Museum in Manchester, New Hampshire.



N. S. Bean #4 horse drawn Amoskeag steam fire engine and horse wagon at the Vine Street (Central) Fire House in Manchester, New Hampshire.

