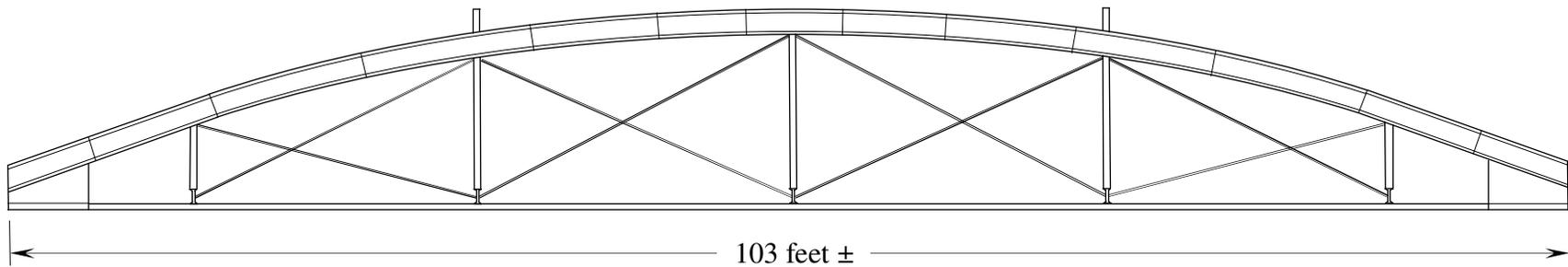
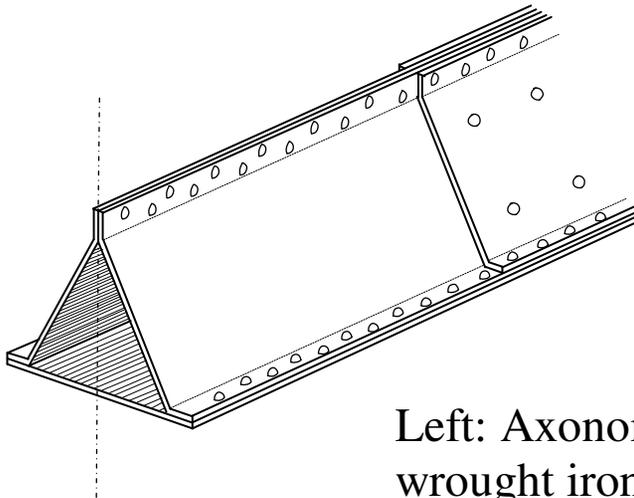


Moseley Wrought Iron Tubular Bowstring Bridge

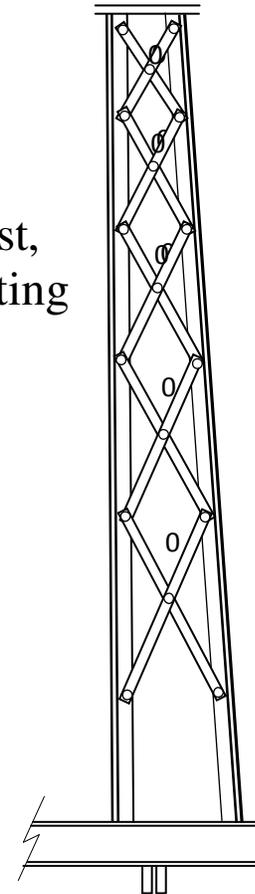


Elevation of the Bridge
(Not to scale)



Left: Axonometric section of the
wrought iron tubular arch,
showing a splice in the plates
(Not to scale)

Right: Elevation of a post,
showing lacing and riveting
(Not to scale)



Moseley Wrought Iron Tubular Bowstring Bridge (1870)

Claremont, New Hampshire

This bridge is one of three Moseley Patent tubular bowstring arch bridges to survive in the United States, and is the only example standing on its original site. Inventor Thomas W. H. Moseley (1813-1880) is credited with introducing the concept of the bowstring bridge into the United States. This example was fabricated in 1870 by the Moseley Iron Building Works near Boston.

The tied arch or bowstring bridge was a highly popular form of metal bridge during the early-to-mid nineteenth century. In such bridges, the arch carries the dead and live loads of the bridge, being connected to the floor of the bridge by vertical posts (as here), or by metal rods. The compression in the arch creates outward pressure at the feet of the arch. This pressure is resisted by horizontal tension members or “ties” that connect the ends or feet of the arch. The resemblance of this structural system to an archer’s bow gives this form of bridge the popular name of “bowstring.”

In February 1857, Thomas W. H. Moseley, then living near Cincinnati, became the first American to patent a tubular bowstring bridge. After initial experiments, Moseley settled upon the general form of riveted tubular arch illustrated on the other side of this page. Moseley’s arch was fabricated from wrought iron boiler plate, the toughest metal in common used during the mid-1800s. Creation of the curved arch required the development of rolling machinery that was capable of bending the iron plates to create flanges for riveting, while simultaneously giving the plates the curve required for arches of various radiuses. Moseley developed and patented “peculiar machinery” for this process, initially establishing his rolling mill and bridge fabricating shop in Cincinnati. Moseley also utilized riveting machinery that was in common use for boiler making to connect most of the curved plates of the arch in the shop, leaving a limited amount of riveting to be completed by hand in the field.

In 1861, near the outbreak of the Civil War, a group of Boston investors urged Moseley to relocate his fabricating shop to their city. Moseley established the Moseley Iron Building Works near Boston, manufacturing tubular arch bridges, several other bridge designs, and iron building and roofing frames.

The Claremont tubular bowstring bridge was constructed in 1870 to provide a crossing over the Sugar River for workers at Monadnock Mills, and probably also to carry pipes for illuminating gas from the adjacent gas plant to the mill buildings. As shown on the other side of this page, the Monadnock Mills bridge is fabricated from iron plates that are overlapped and riveted, with staggered joints. The two halves of each arch appear to have been fabricated in the shop; the only obvious field joint is seen in the plates that join the two halves at the apex. The arch sections would have been transported from Boston to Claremont by railroad.

The Monadnock Mills tubular bowstring bridge is the earliest surviving metal bridge in New Hampshire and one of the earliest metal bridges in New England. Unlike its two surviving counterparts—one relocated from Lawrence, Massachusetts to Andover, and the second lying in ruins in Bennington, Vermont—the Claremont bridge stands in its original location, adjacent to a park, inviting a clear understanding of its intended use and a full appreciation of its status as an American engineering landmark.