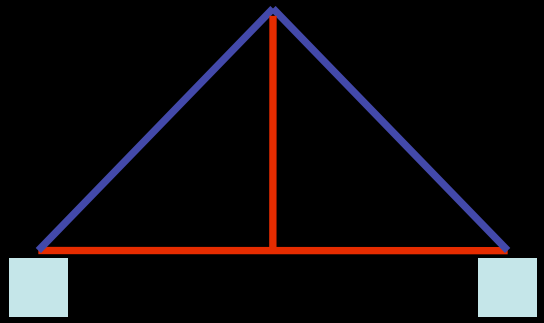
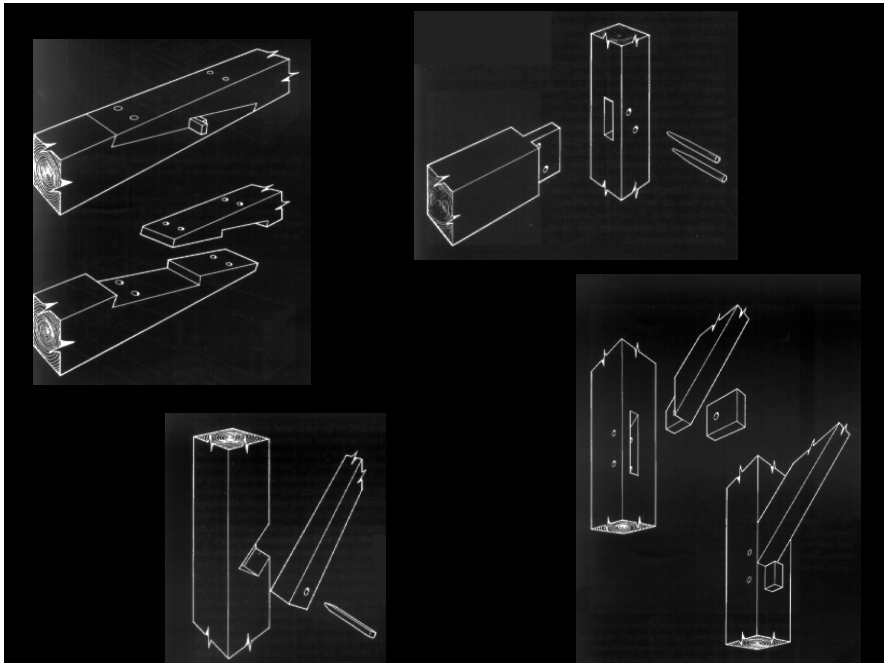
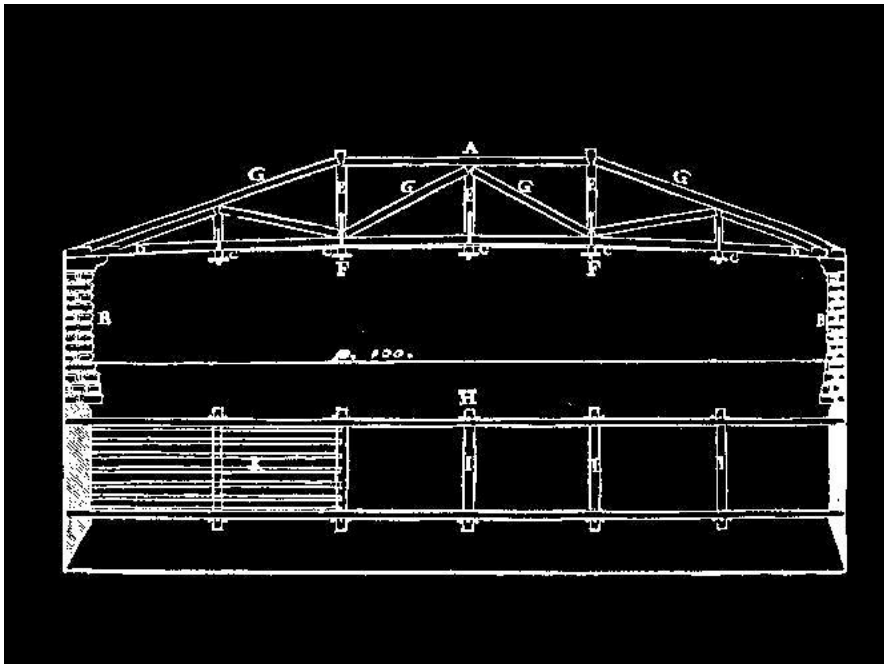
Covered Wooden Bridges

History of the wooden truss
Burr -> Town -> Long -> Howe
Evolution towards constructibility
Restoration and rehabilitation

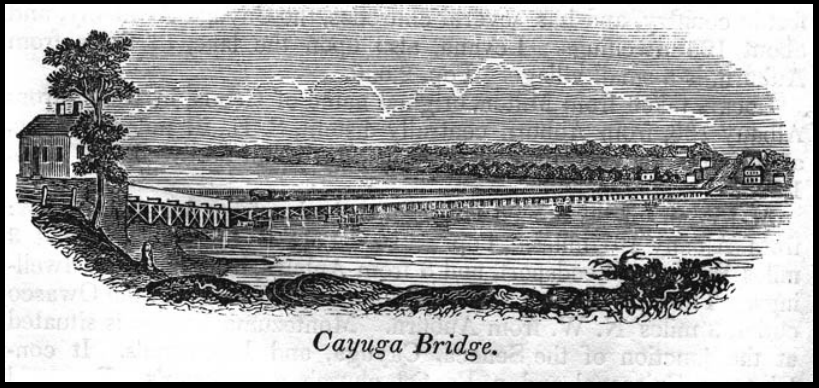


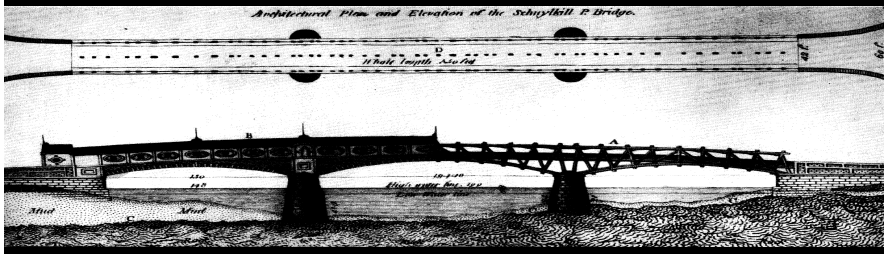


European Truss Bridges
(1570 - 1756)

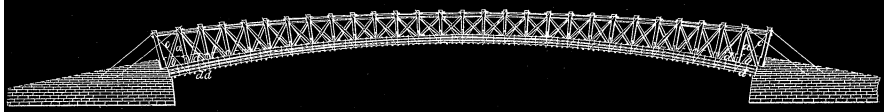


Early American Bridges

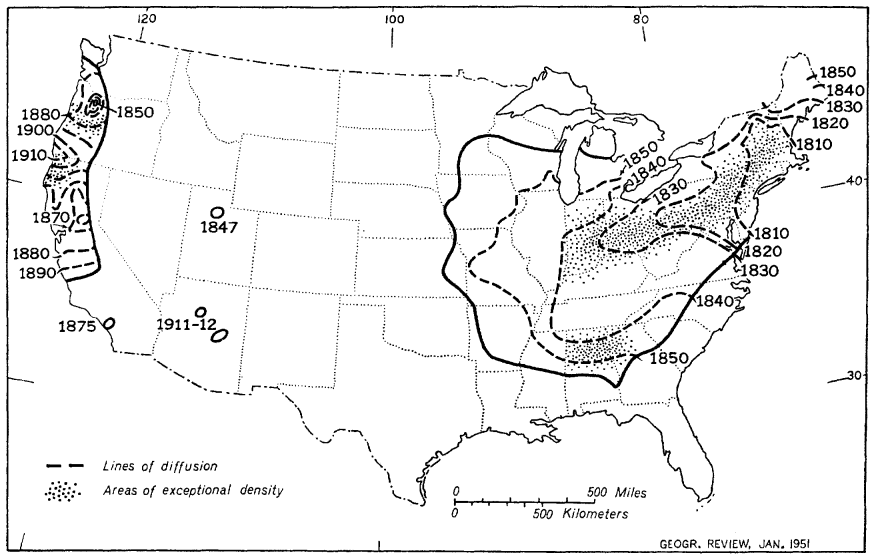




Permanent Bridge (1806)
Timothy Palmer



“The Colossus (1812)
Lewis Wernwag



Theodore Burr and the Burr Arch-Truss

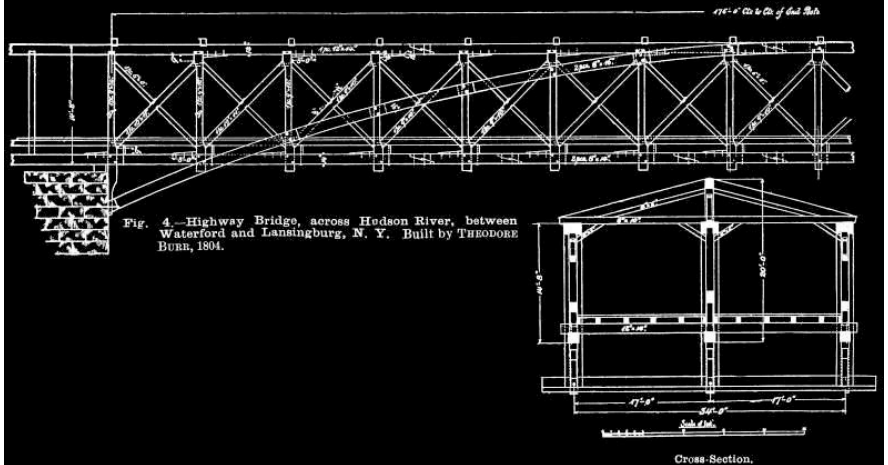


Fig. 4.—Highway Bridge, across Hudson River, between Waterford and Lansingburg, N. Y. Built by THEODORE BURR, 1804.

Cross-Section.

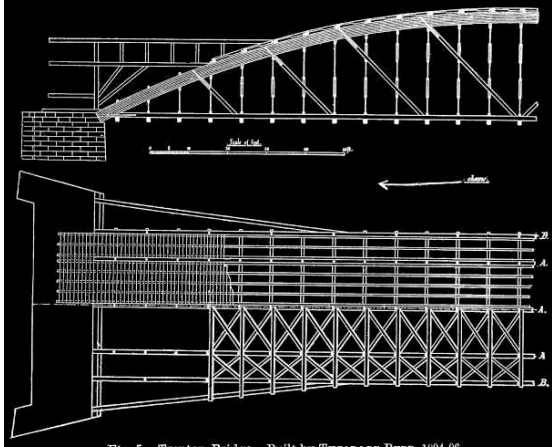


Fig. 5.—Trenton Bridge. Built by THEODORE BURR, 1804-06.

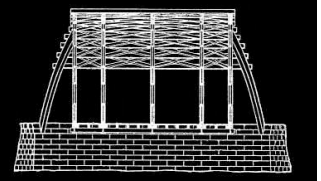


Fig. 6.—Trenton Bridge; Cross Section.

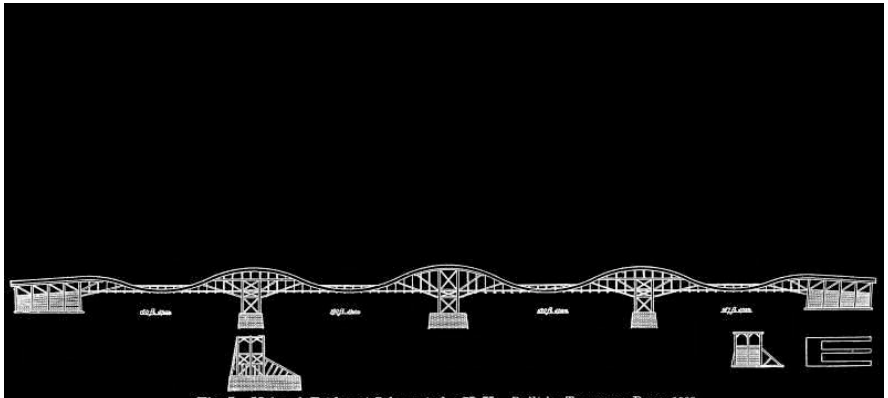
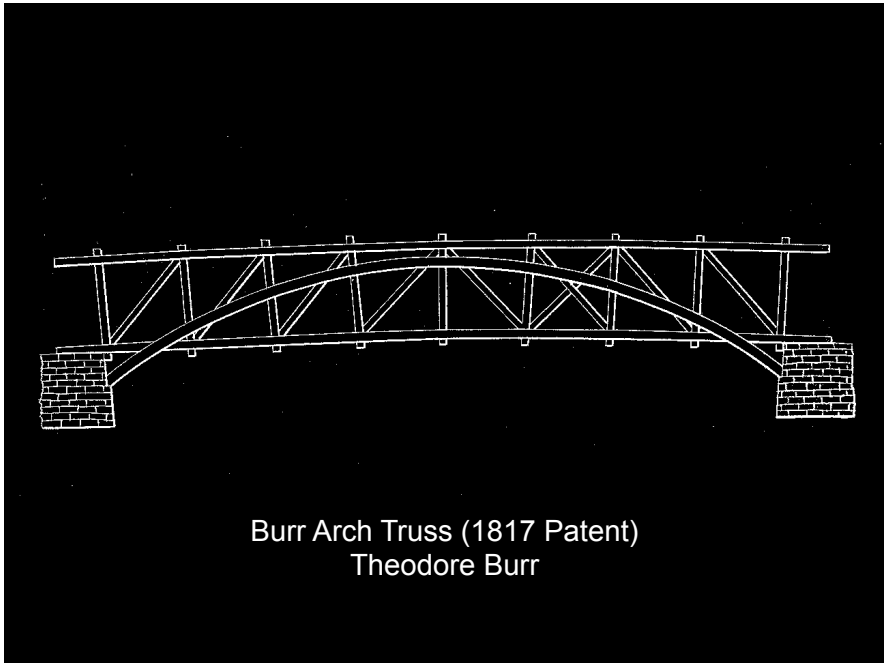
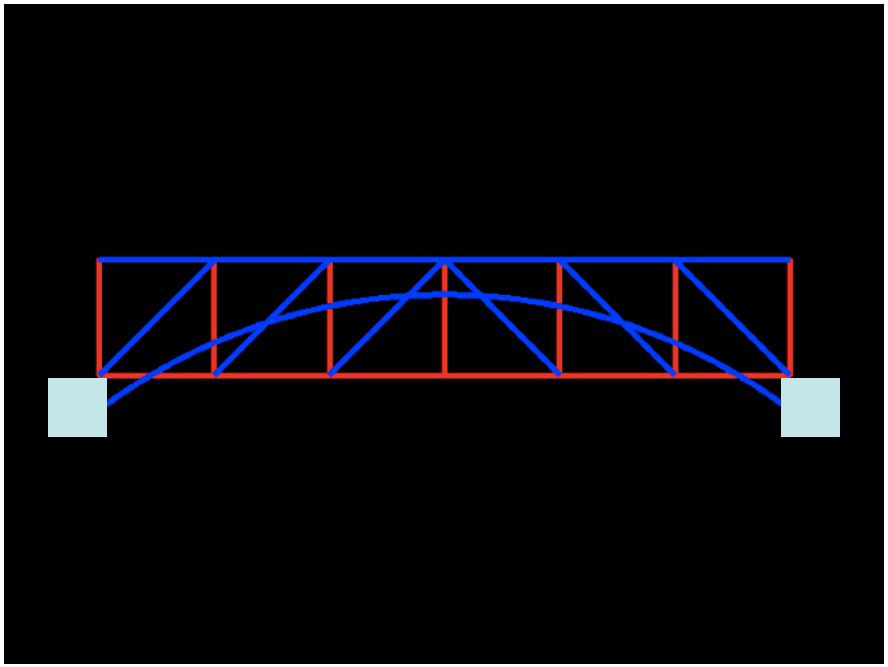
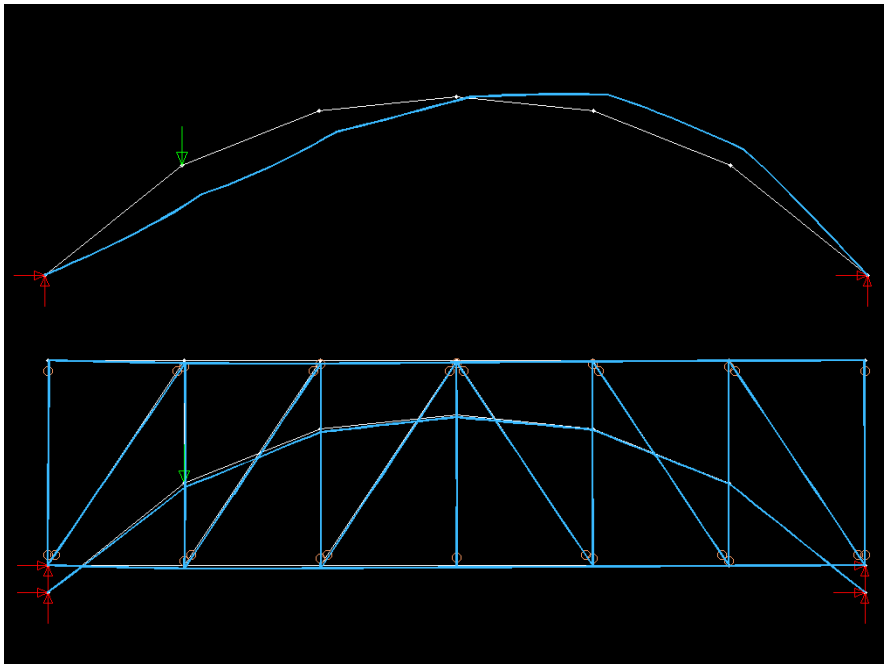


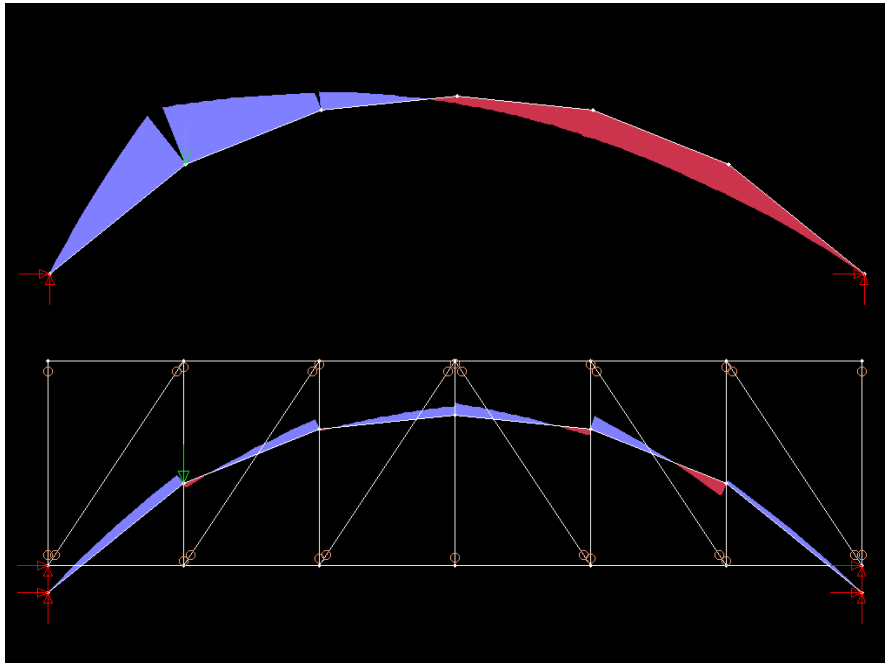
Fig. 7.—Mohawk Bridge at Schenectady, N. Y. Built by Theodore Burr, 1808.



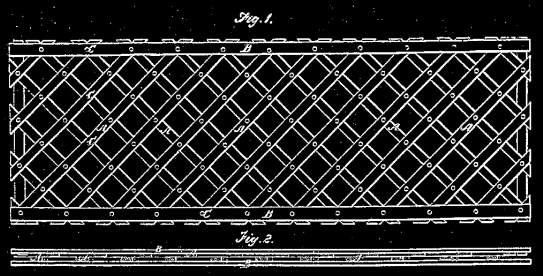
Burr Arch Truss (1817 Patent)
Theodore Burr

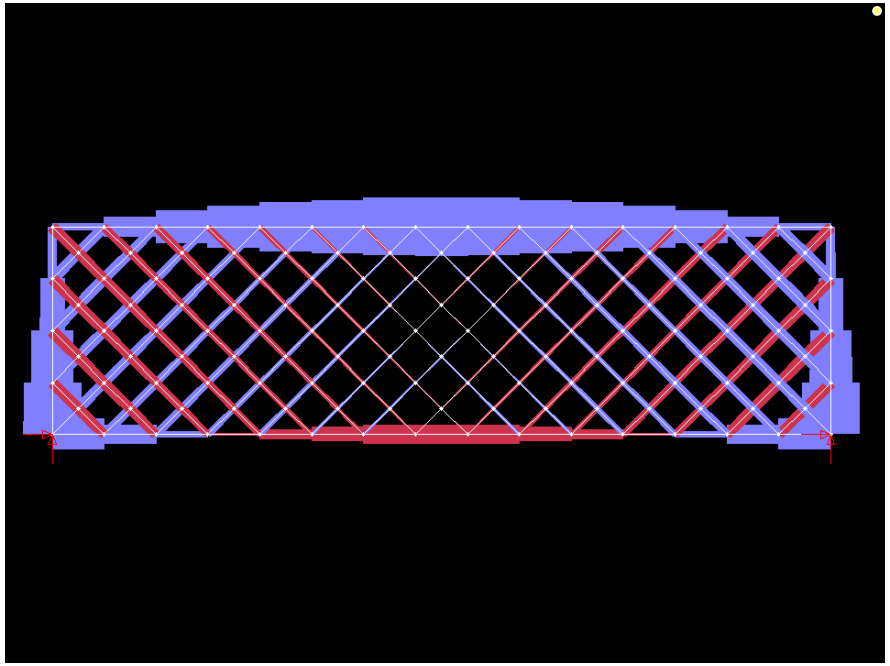


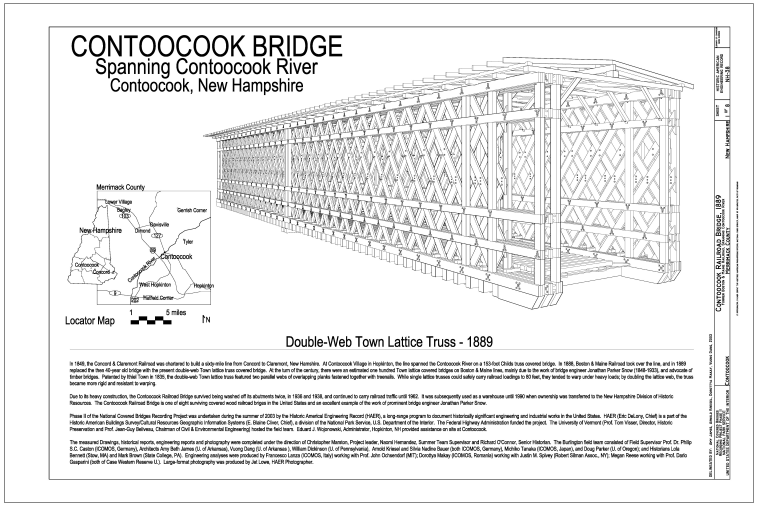




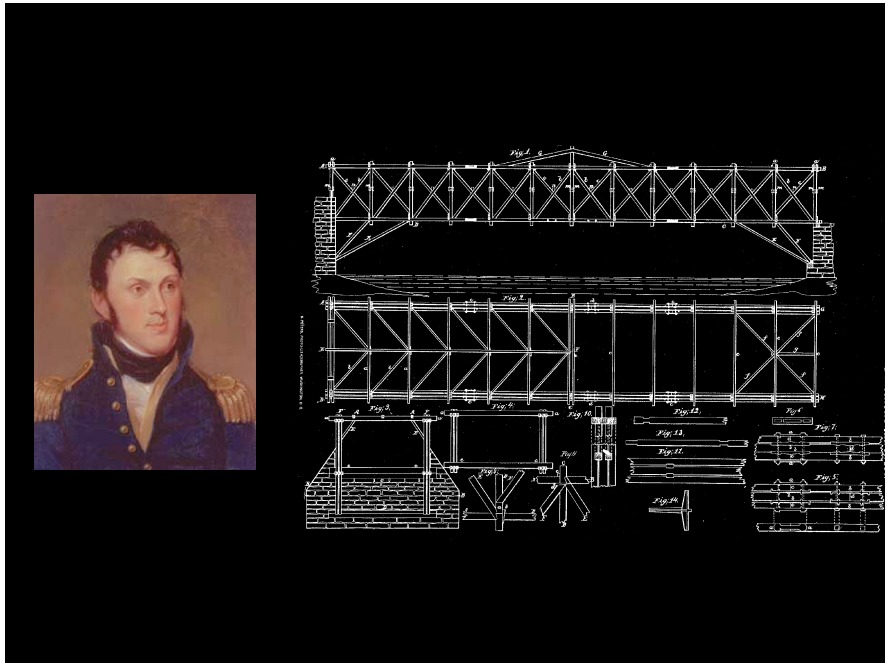
Ithiel Town and Town Lattice Truss

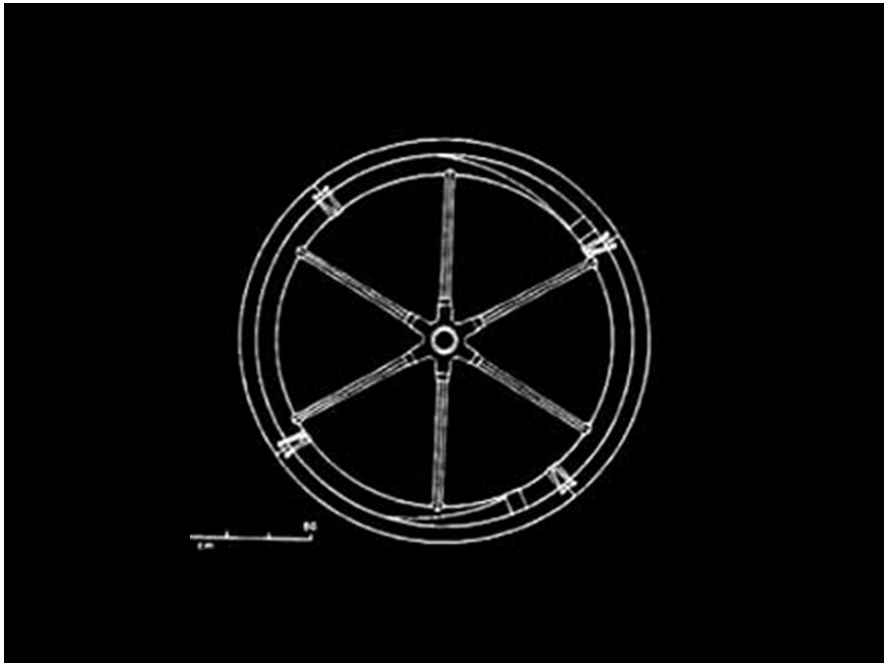


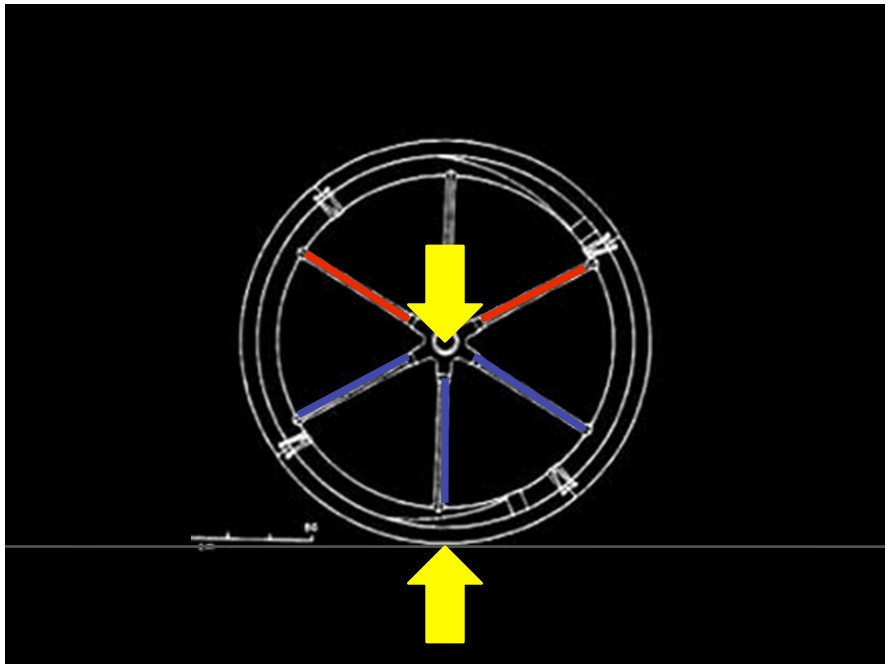


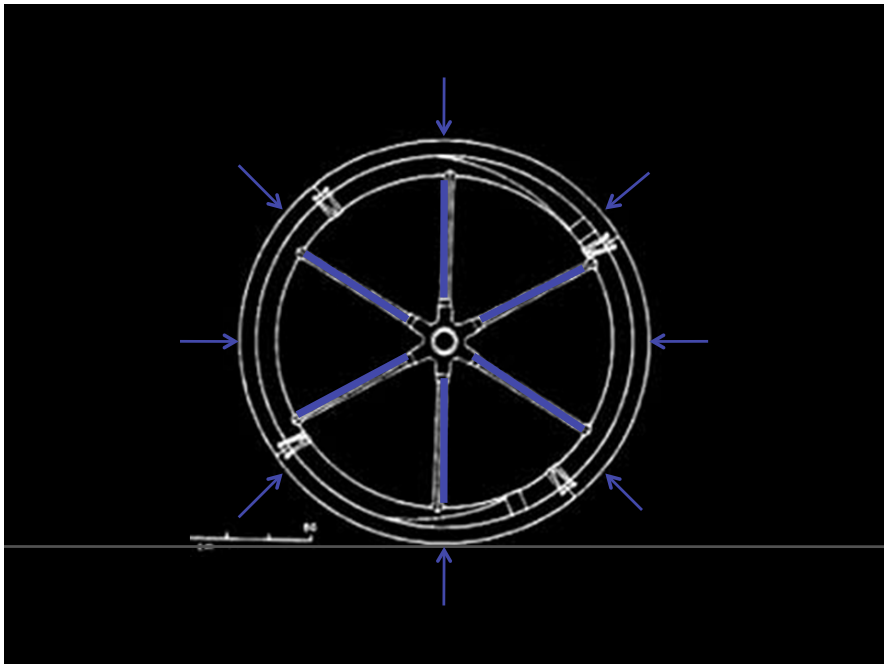


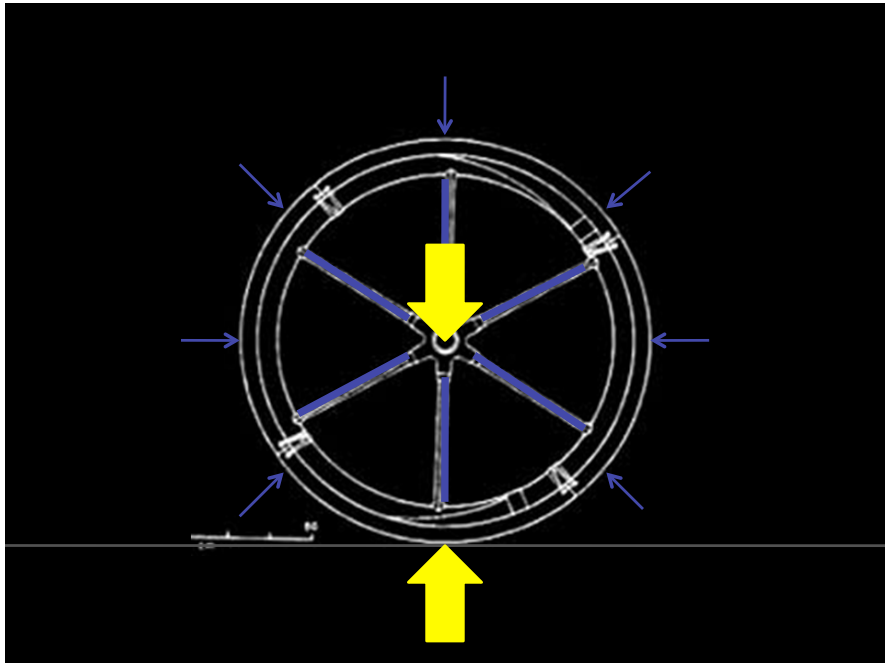
Stephen H. Long and the Long Truss

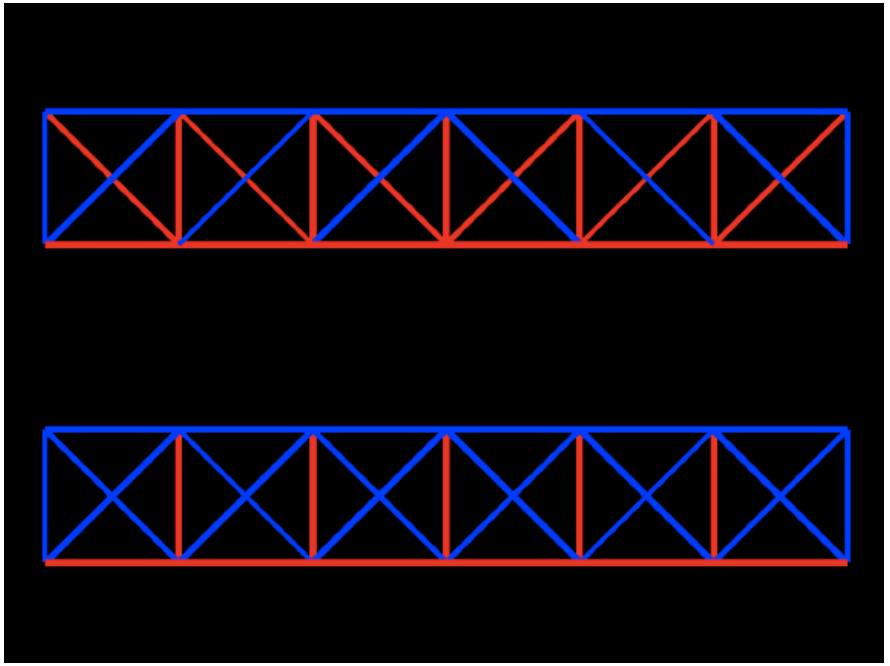


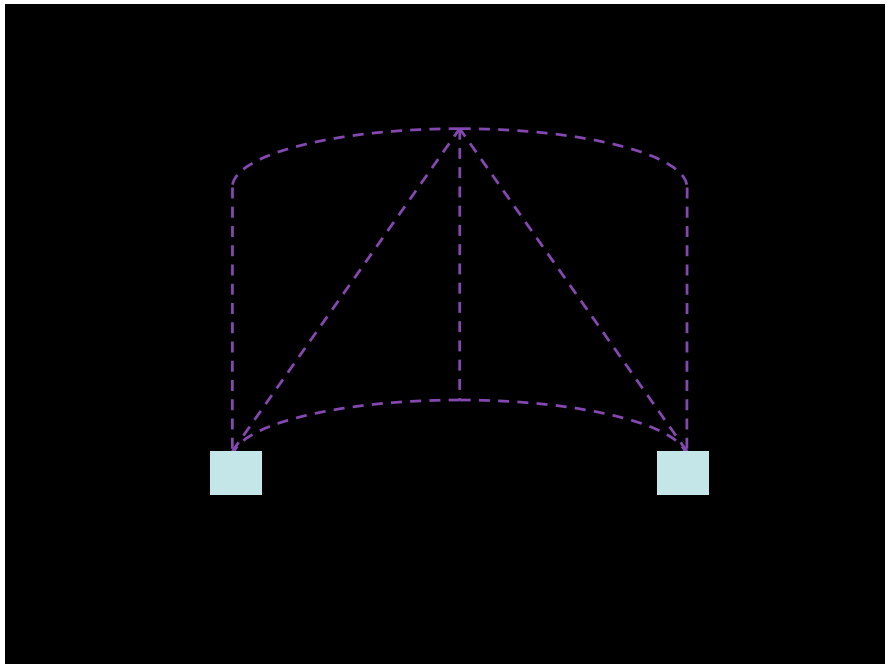


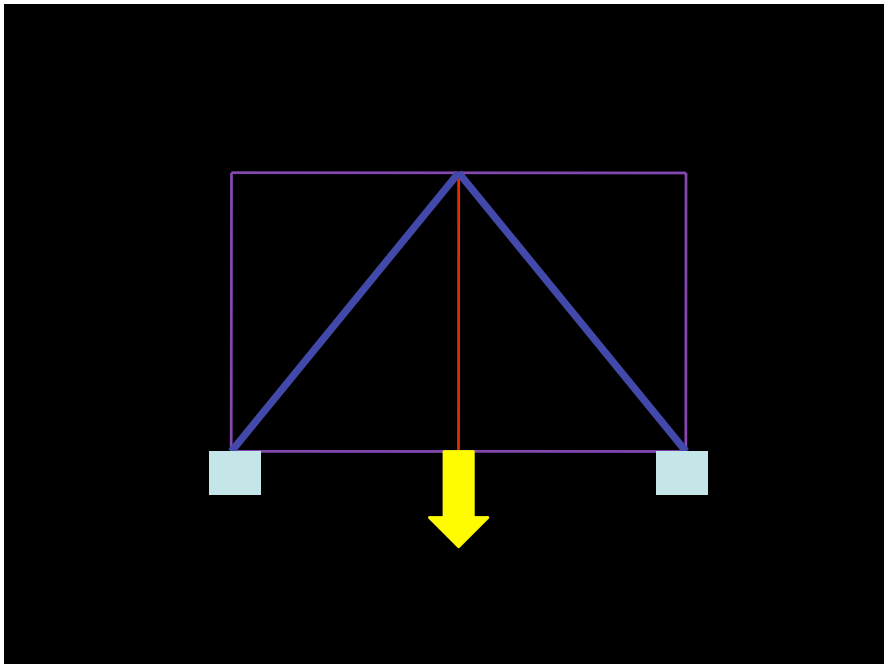


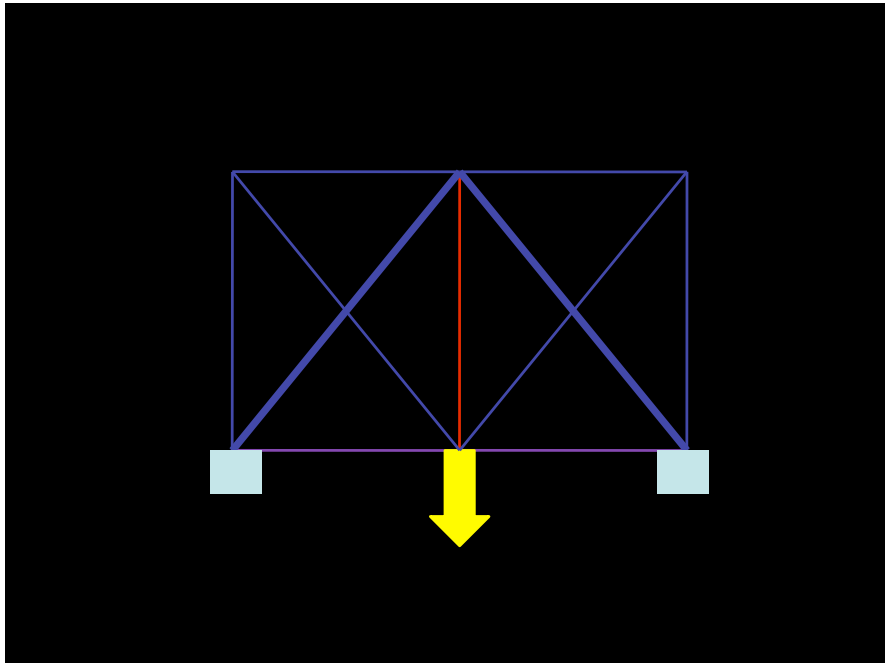


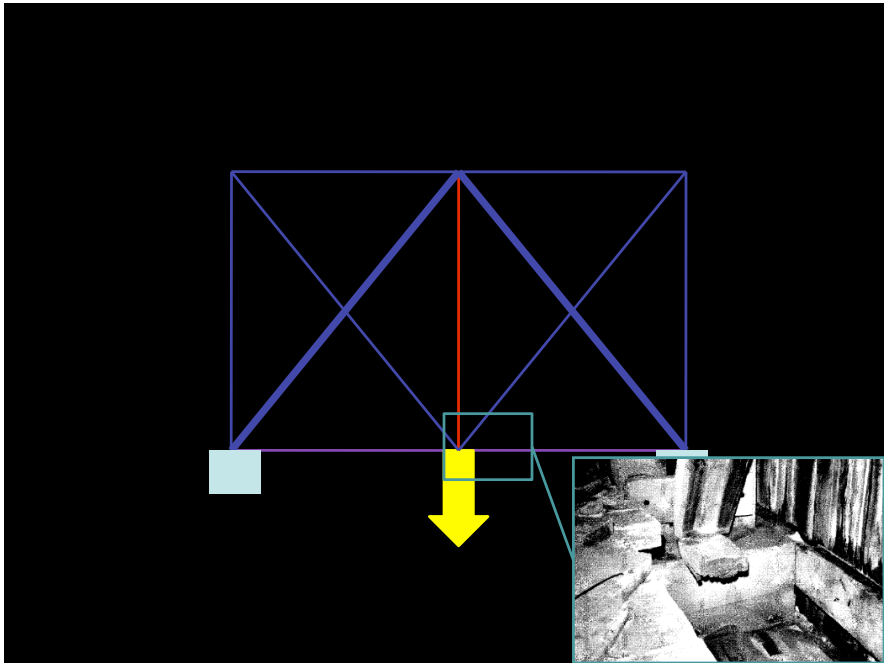


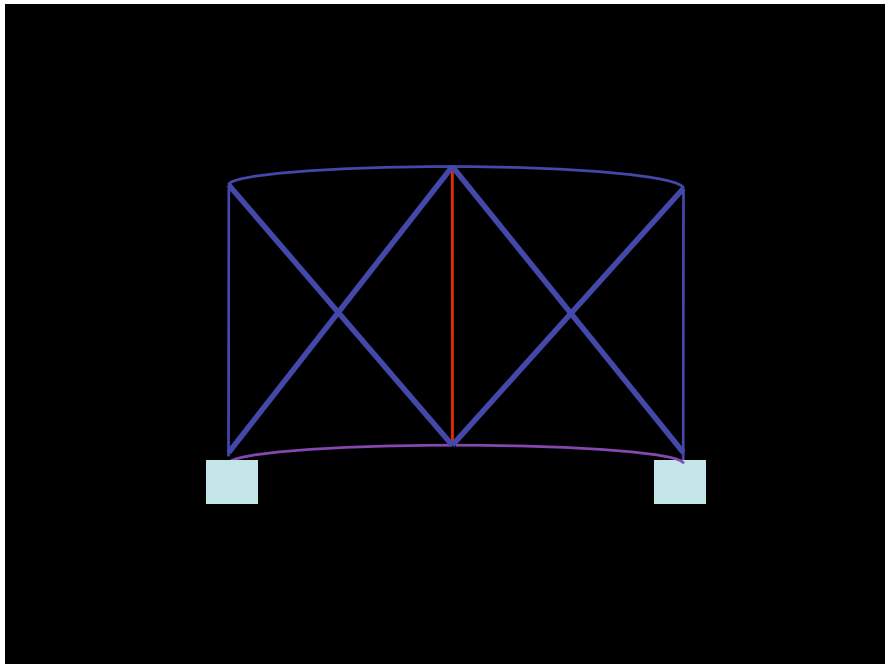






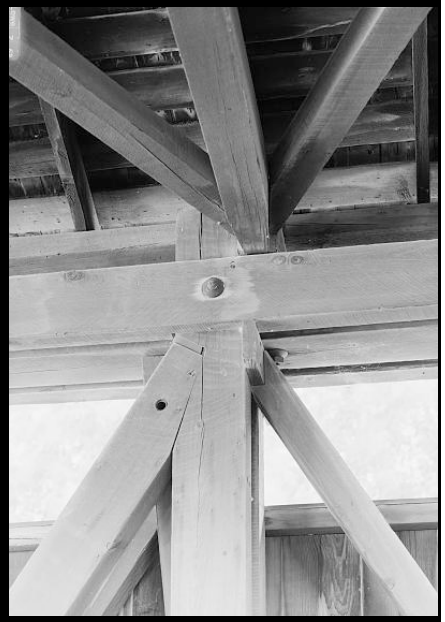






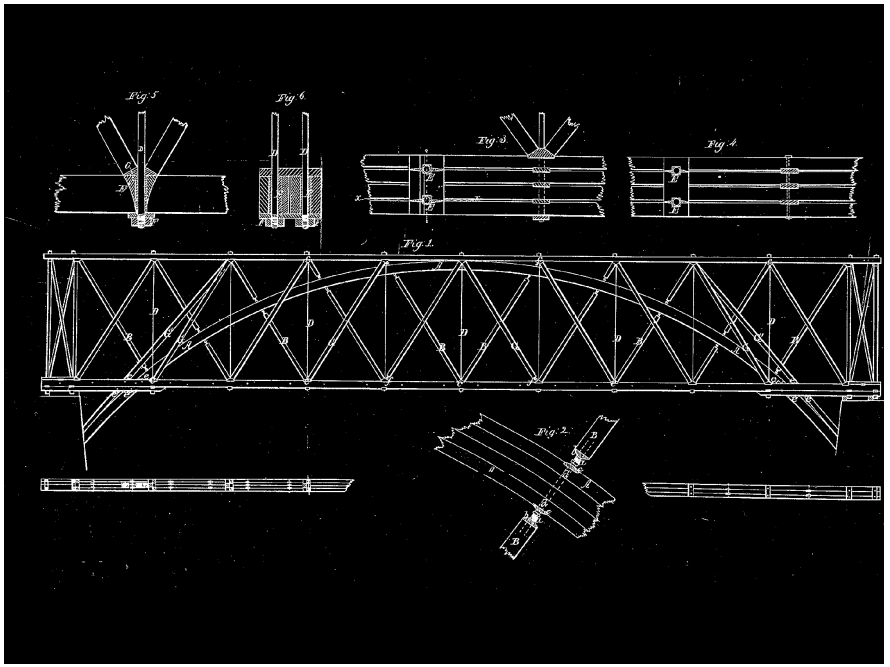

RAVENS 4-EVER!


RAVENS 4-EVER!




BRIDGE FASTER THAN A MILE

William Howe and the Howe Truss



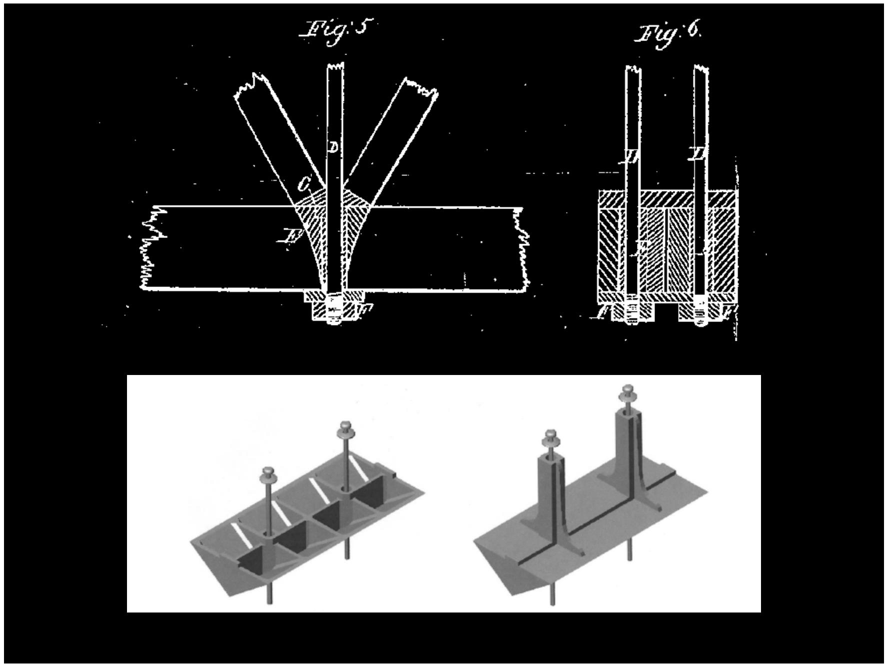
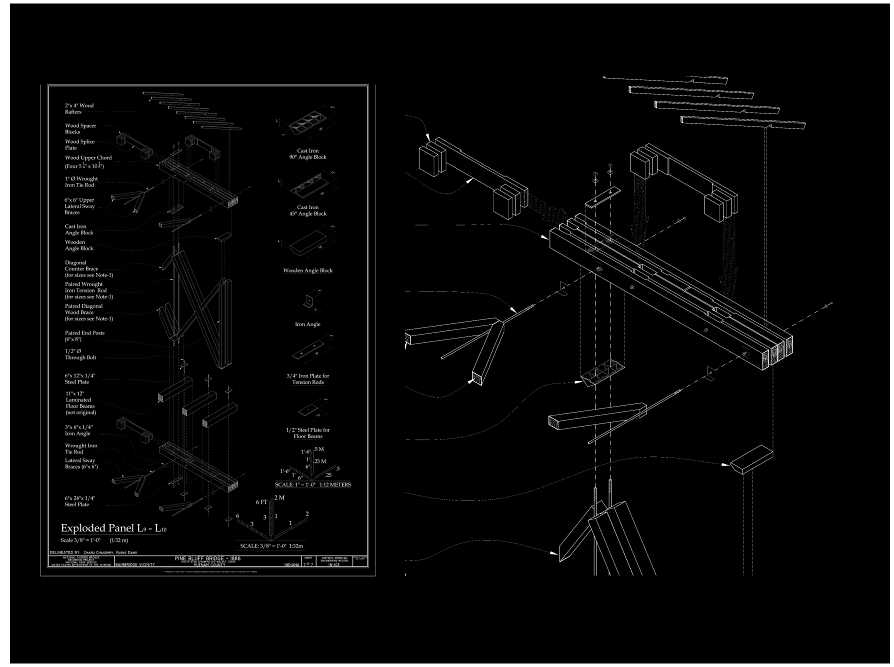
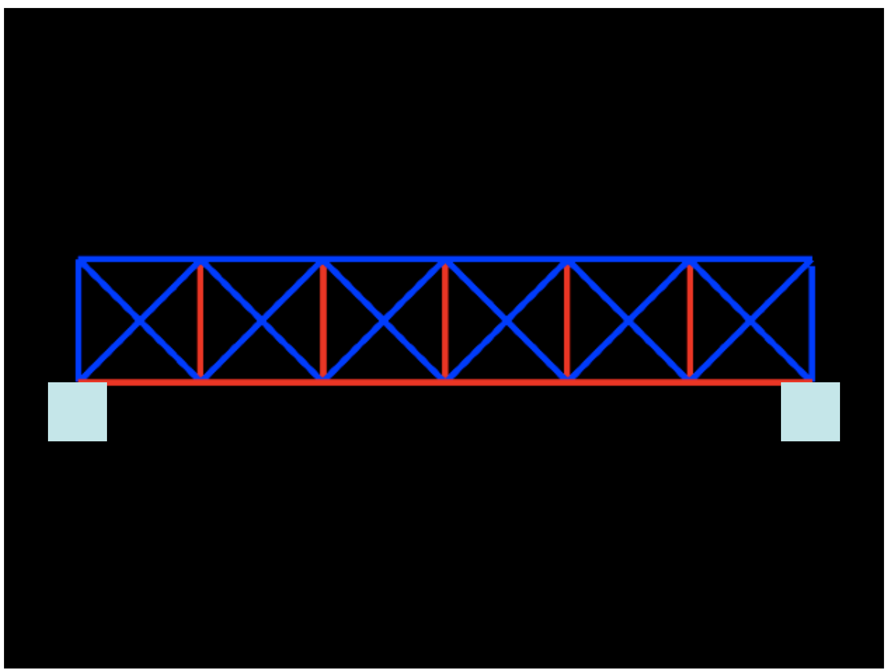
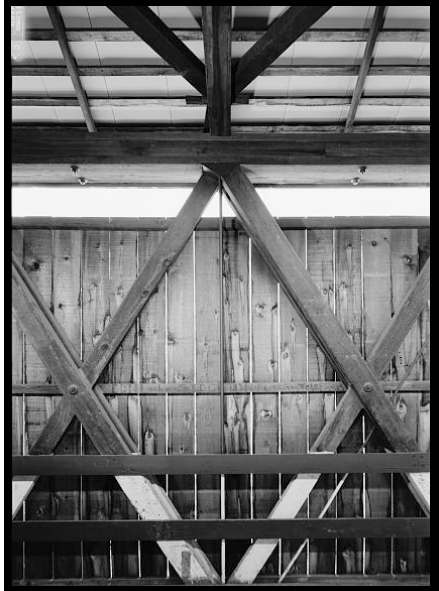


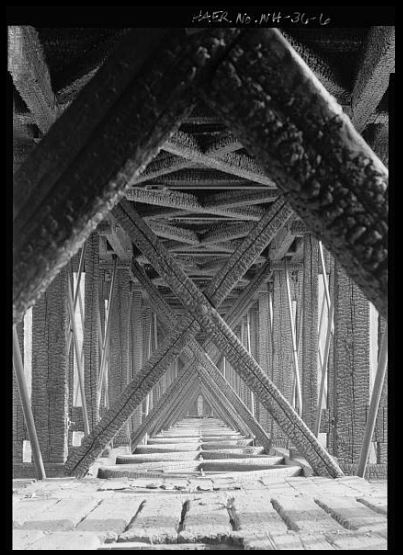
Fig. 5
Fig. 6

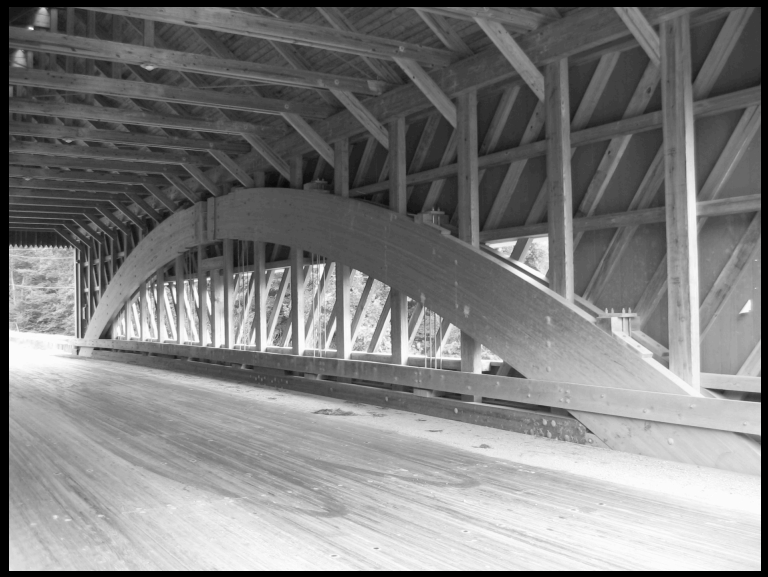

Exploded Panel L_9 - L_{10}





Future of Covered Wooden Bridges





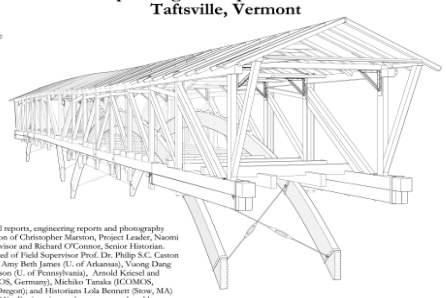
TAFTSVILLE BRIDGE
1836

Spanning Ottauquechee River
Taftsville, Vermont

Around 1793, Stephen Taft built a dam and tool factory near this site on the Ottauquechee River, and a small industrial Hamlet, later known as Taftsville, sprang up around it. The date of the first bridge at this location is not known, but there are records of at least three bridges existing here prior to 1836, when Solomon Emmons III built this structure at a cost of $1,800. The bridge underwent major flood repairs in 1869, laminated arches were added at an unknown date and steel plates installed as sway bracing in 1952, but the trusses themselves appear to be mostly original.

The Taftsville Bridge represents the early craftsman tradition of wood truss bridge construction and may be described as an elaborate multiple kingpost truss with a laminated wood arch. Most American builders favored simpler framing styles, but the Taftsville Bridge appears to show the influence of Swiss precedents. Above the basic multiple-kingpost brace, the bridge has a set of roughly-arranged arch-brace members, which form an alternate stress path. Solomon Emmons may have thought up his bridge design on his own, but it is possible that he was influenced by Swiss plans he had seen in contemporary literature. The Taftsville Bridge still carries vehicular traffic and is a rare surviving example of the early craftsman tradition of wood truss bridges.

Phase II of the National Covered Bridges Recording Project was undertaken during the summer of 2003 by the Historic American Engineering Record (HAER), a long-range program to document historically significant engineering and industrial works in the United States. HAER (Eric DeLony, Chief) is a part of the HABS/HAER/HALS/CRGIS (E. Blaine Cliver, Chief), a division of the National Park Service, U.S. Department of the Interior. The Federal Highway Administration funded the project. The University of Vermont (Prof. Tom Visser, Director, Historic Preservation and Prof. Jean-Guy Bellveau, Chairman of Civil & Environmental Engineering) hosted the field team. Woodstock town manager Phil Swanson, Charles Wilson - (owner of the Taftsville Country Store), Liza Wilson and Peter Fellows (Two River-Ottauquechee Regional Commission) provided assistance.



Modified Multiple Kingpost Truss
(with an added laminated wood arch)
Builder: Solomon Emmons III

LOCATION MAP UTM: 18.704271.4833988

The measured drawings, historical reports, engineering reports and photography were completed under the direction of Christopher Marston, Project Leader, Naomi Hernandez, Summer Team Supervisor and Richard O'Connor, Senior Historian. The Burlington field team consisted of Field Supervisor Prof. Dr. Philip S.C. Caston (ICOMOS, Germany), Architects Amy Beth James (U. of Arkansas), Yuong Dang (U. of Arkansas), William Dickinson (U. of Pennsylvania), Arnold Kriesel and Silvia Nadine Bauer (both ICOMOS, Germany), Michiko Tanaka (ICOMOS, Japan), and Doug Parker (U. of Oregon); and Historians Lola Bennett (Stow, MA) and Mark Brown (State College, PA). Engineering analyses were produced by Francesco Lanza (ICOMOS, Italy) working with Prof. John Ochsendorf (MIT); Doromya Makay (ICOMOS, Romania) working with Justin M. Spivey (Robert Silman Assoc., NY); Megan Reese working with Prof. Dario Gasparini (both of Case Western Reserve U.). Large-format photography was produced by Jet Lowe, HAER Photographer. Joseph Conwill wrote the HAER historical report.

TAFTSVILLE BRIDGE - 1836
Spanning Ottauquechee River
WINDSOR COUNTY
VERMONT
TAFTSVILLE
HAER NO. VT-38




Oakland Bay Bridge

-Read the article
-Identify issues of permanence, safety, economy, elegance, social, constructibility, efficiency regarding the bridge
-Sketch the form and consider how traffic loads move through the bridge

Oakland Bay Bridge

-Read the article
-Identify issues of permanence, safety, economy, elegance, social, constructibility, efficiency regarding the bridge
-Sketch the form and consider how traffic loads move through the bridge
-In groups of three, discuss issues of efficiency, economy and elegance
-Report to the class

Tappan Zee Bridge

-Read the article
-Identify issues of permanence, safety, economy, elegance, social, constructibility, efficiency regarding the bridge
-Sketch the form and consider how traffic loads move through the bridge
-In groups of three, discuss issues of efficiency, economy and elegance
-Report to the class