19th Century Iron Lenticular Truss Bridges from the Berlin Iron Bridge Company
(and Other Historic Bridges of Western Ma.)

Dr. A. Lutenegger
Professor of Civil & Environmental Engineering
University of Massachusetts
Amherst, Ma

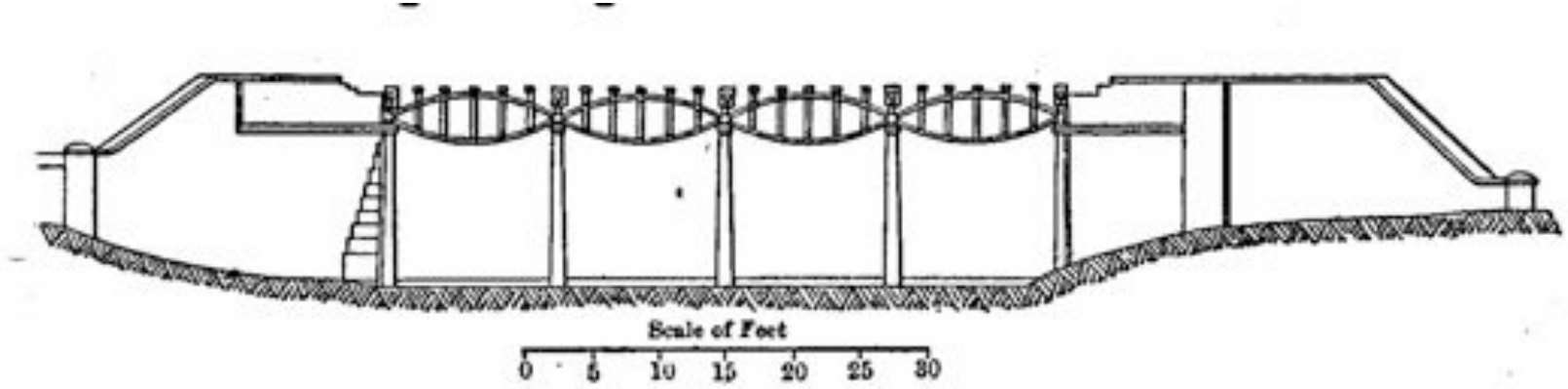

8. 16. 2002


8 17 2002

Pre-1878
Iron Lenticular Bridges

- G. Stephenson – 1824 Gaunless Bridge
- R. Stephenson – 1838 Kilsby Bridge
- Von Pauli – 1857 Isar Bridge
- Brunel – 1859 Saltash Bridge
- Gerber – 1860 Mainz Bridge
- Lohse – 1868 Hamburg Bridge

Gaunless Bridge

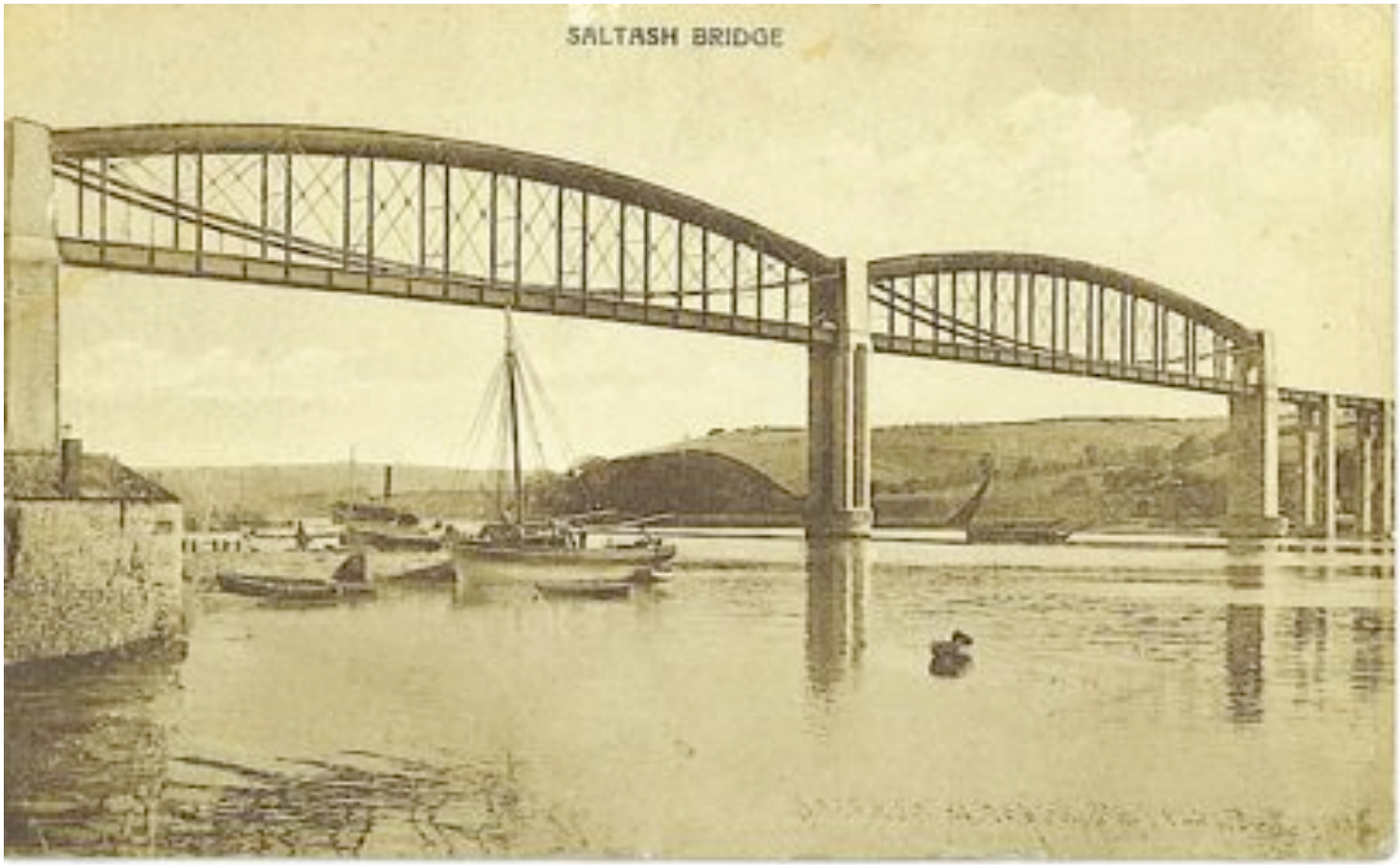


Gaunless Bridge

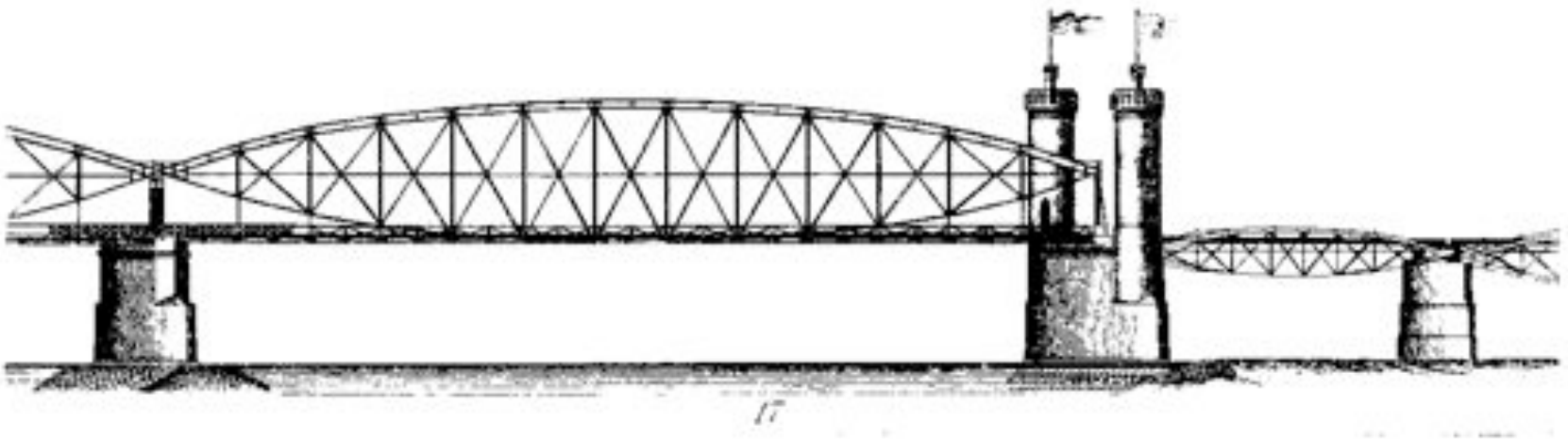
Gaunless Bridge

Brunel's Saltash Bridge

Brunel's Saltash Bridge

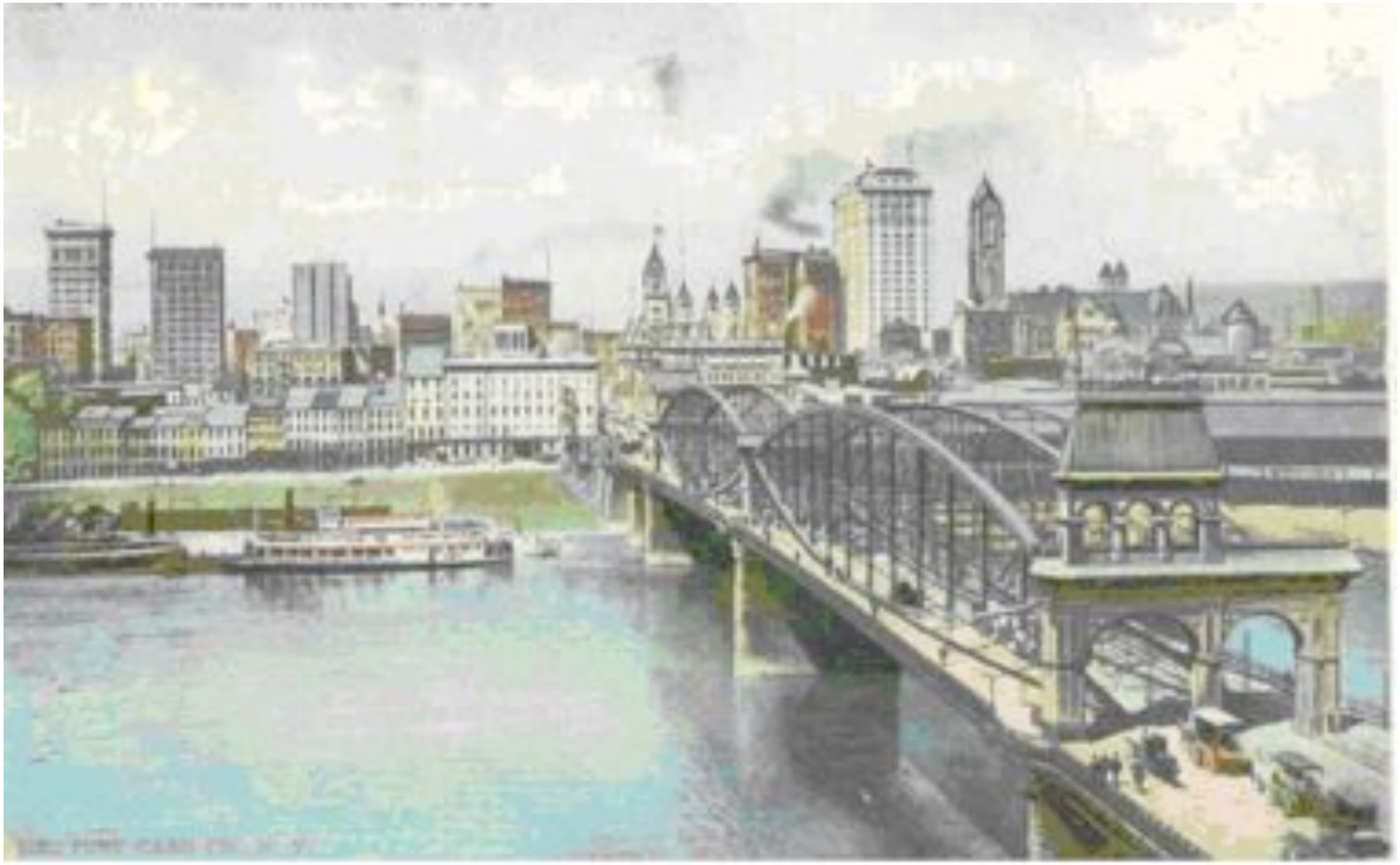


Mainz Bridge

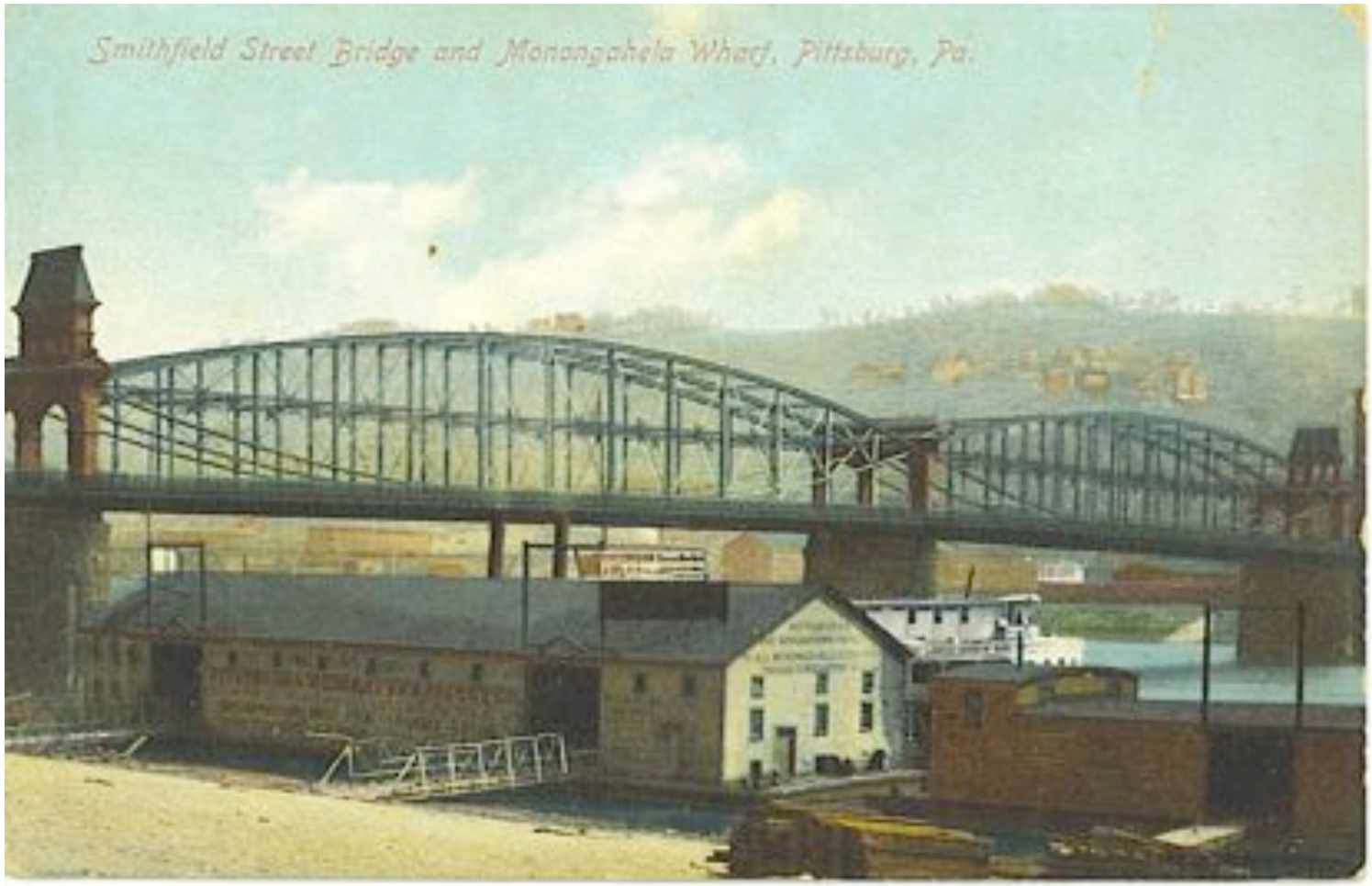


Hamburg Bridge

Lindenthal's Monongahela Bridge



Monongahela Bridge



Patents Prior to 1878

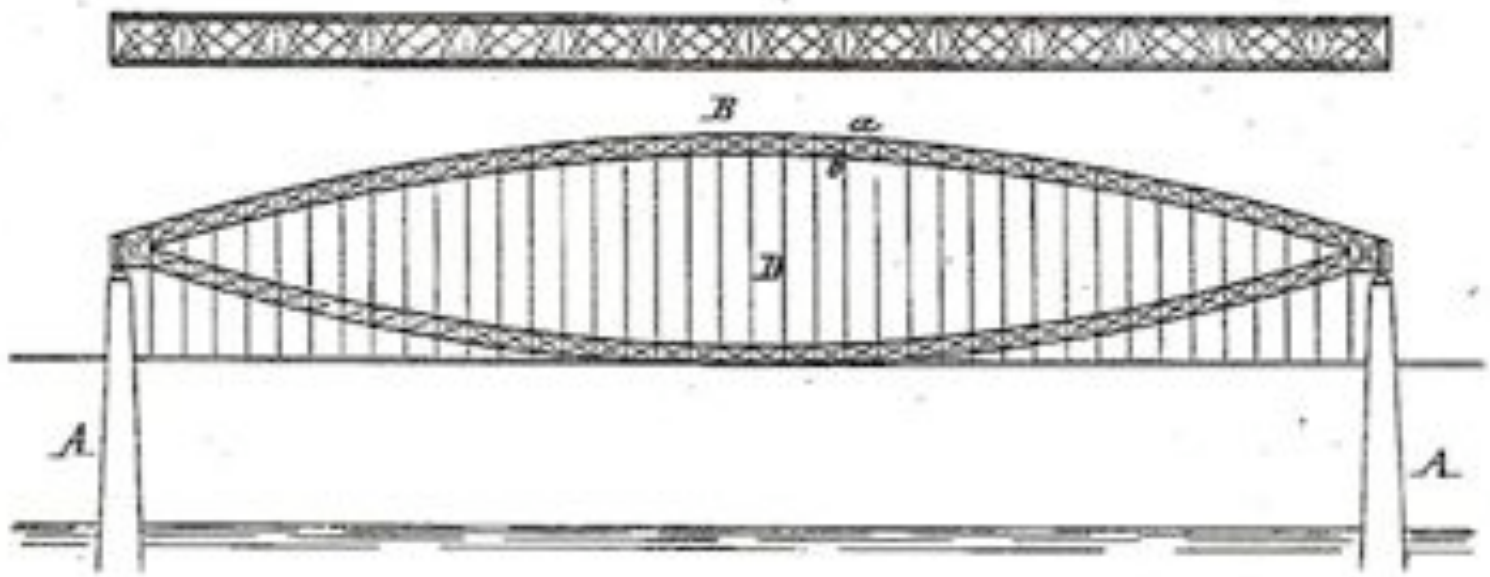
- Barnes – 6,230 – 1849
- Stanley – 8,337 – 1851
- Hervey & Osborne – 13,461 – 1855
- Dieckmann – 113,030 – 1871
- Harding – 132,398 – 1972
- Eads – 142,381 – 1873

G. E. HARDING.

Improvement in Bridges.

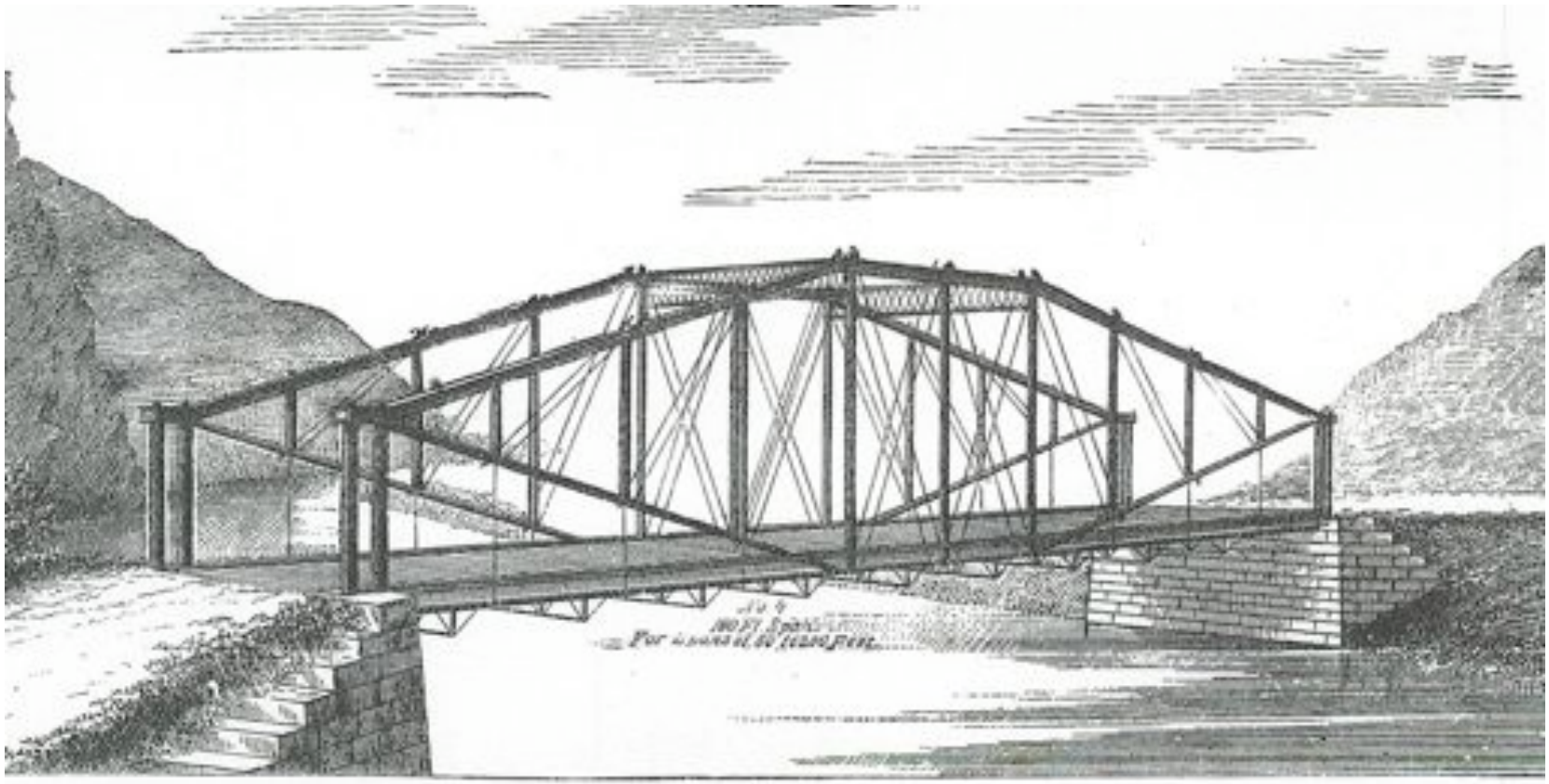
No. 132,398. Patented Oct. 22, 1872.

Fig. 1.



ELEVATION AND PLAN

Douglas 1877



DESIGN FOR AN ELLIPTICAL TRUSS BRIDGE.

Douglas 1878 Patent

3 sheets—Sheet 1

W. O. DOUGLAS.
Truss-Bridge.

No. 202,526. Patented April 16, 1878.

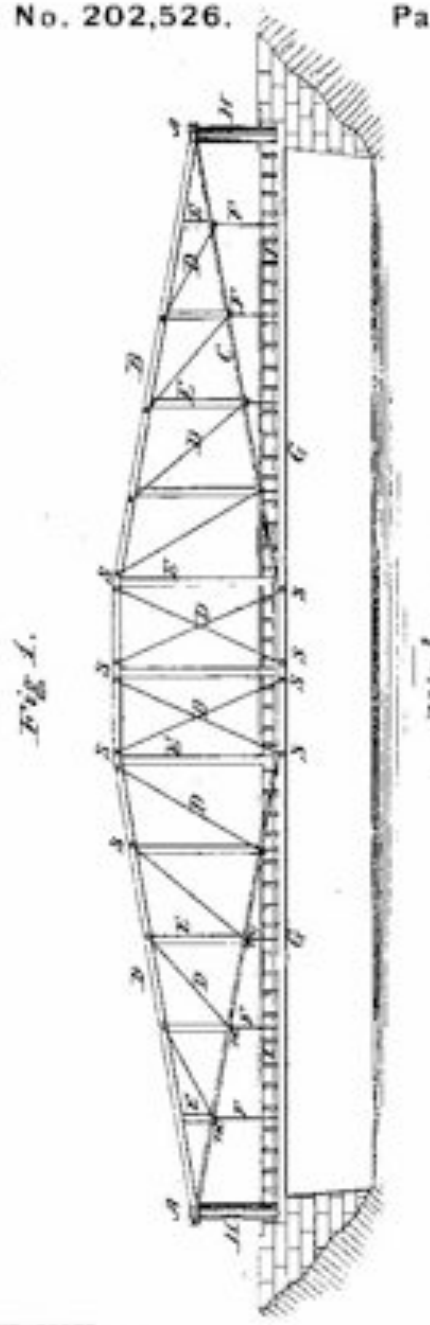


Fig. 1.

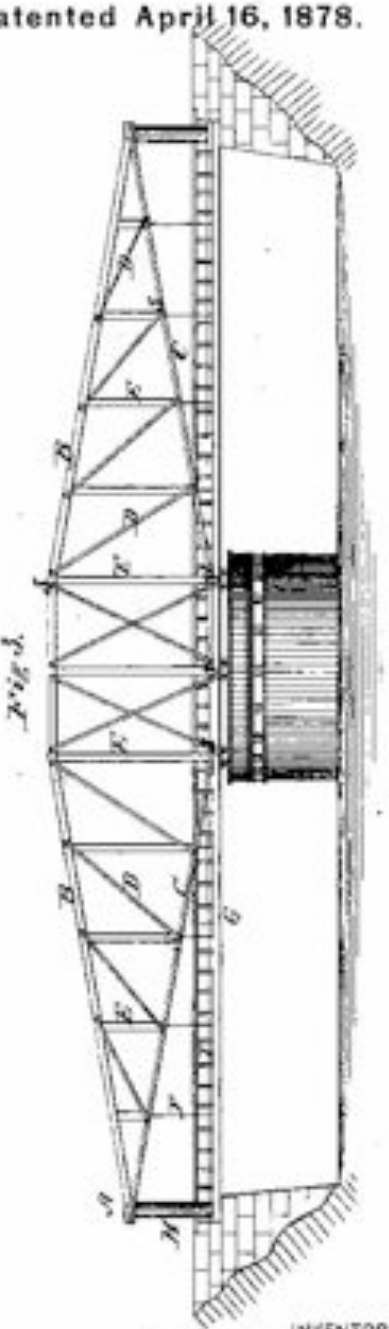


Fig. 2.

WITNESSES

Harry Smith
Wm Blackstock

INVENTOR

Wm. O. Douglas
By Hill McDonald
Their ATTORNEYS

Douglas 1878 Patent

3 Sheets—Sheet 2

W. O. DOUGLAS.
Truss-Bridge.

No. 202,526. Patented April 16, 1878.

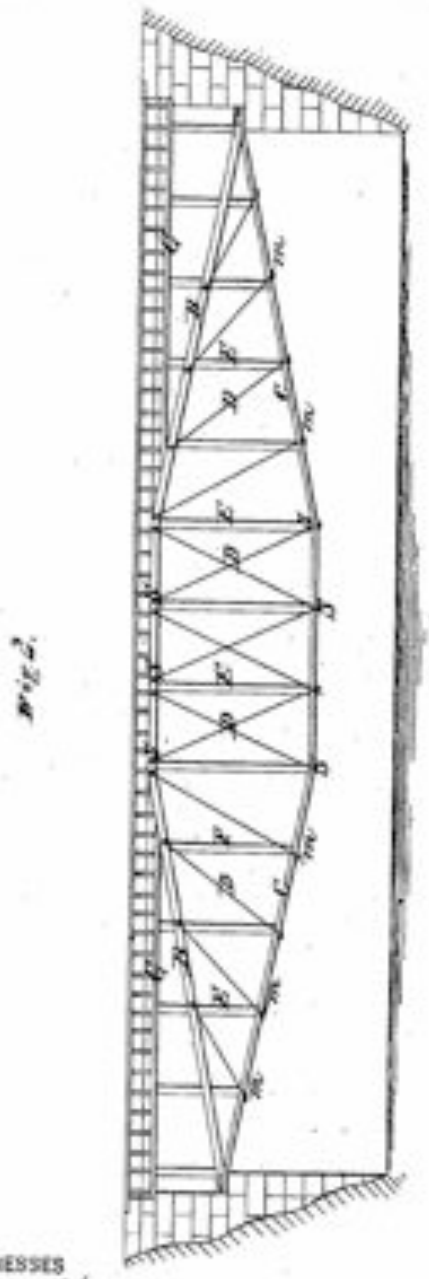


Fig. 2.

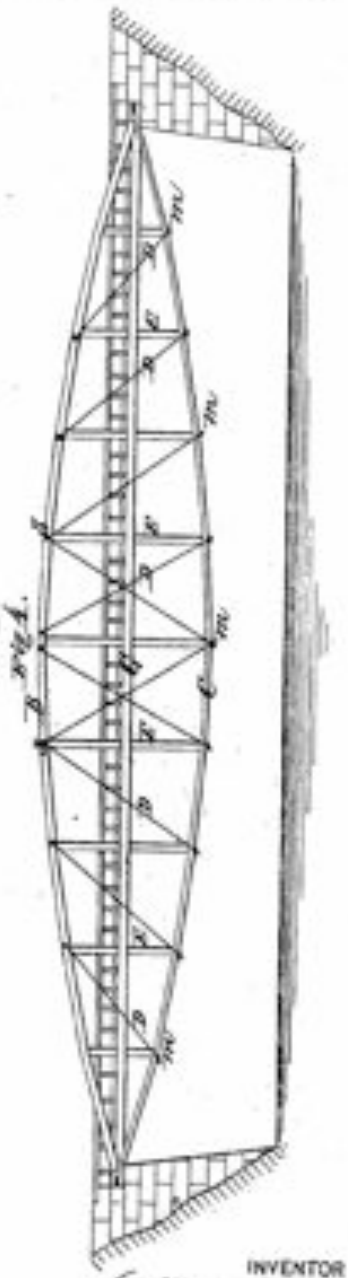


Fig. 1.

WITNESSES

Harry King
Wm Glasgow Jr.

INVENTOR

Wm O. Douglas
By Hill Brothers
His ATTORNEYS.

A TREATISE

ON THE

STRENGTH

OF

BRIDGES AND ROOFS,

WITH

PRACTICAL APPLICATIONS AND EXAMPLES,

FOR THE USE OF

ENGINEERS AND STUDENTS.

BY

SAMUEL H. SHREVE, A. M., Civ. Eng.

NEW YORK:
D. VAN NOSTRAND, PUBLISHER,
23 Murray St. and 27 Warren St.
1873.

CHAPTER X.

LENTICULAR TRUSSES.

214.—The form of this peculiar truss, known also as the Pauli System, is shown in the following figure:

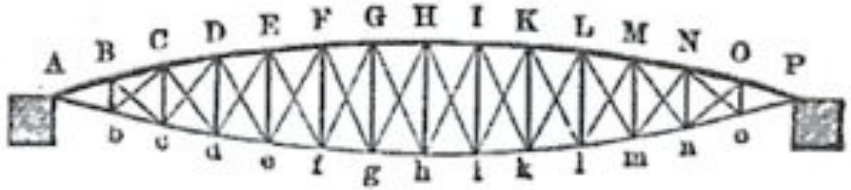
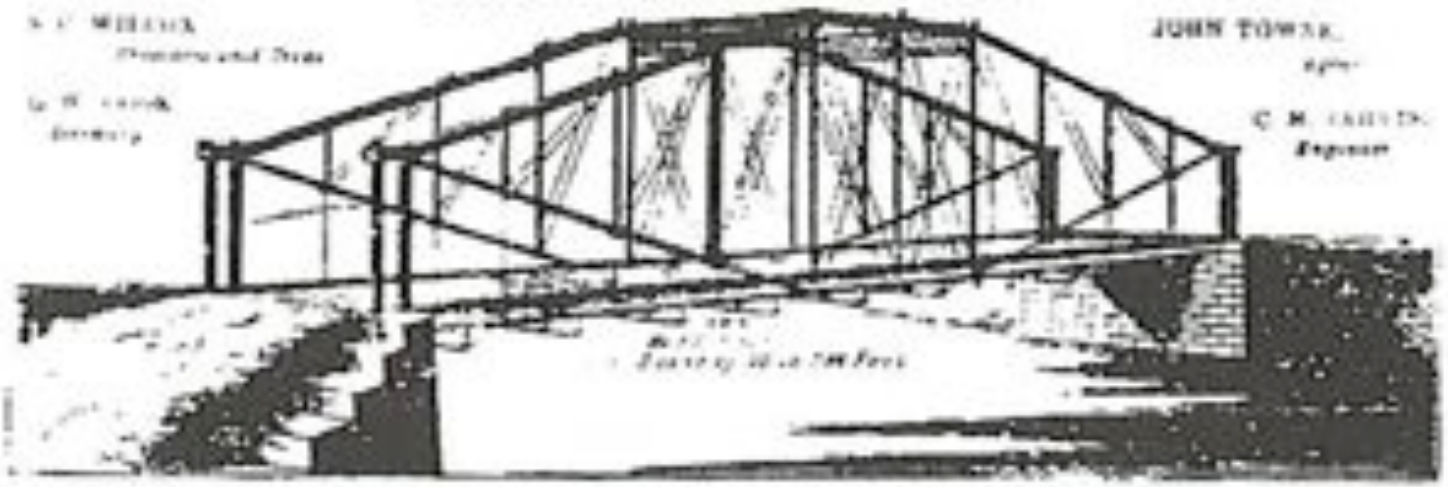


Fig. 81.

It is composed of two equal parabolic arcs for chords meeting at the ends, and braced with vertical and inclined braces. It is not capable of supporting any greater weight than a Bow String Truss of equal depth and length, and practically possesses many disadvantages.

THE CORRUGATED METAL CO.,

EAST BERLIN, CONN.



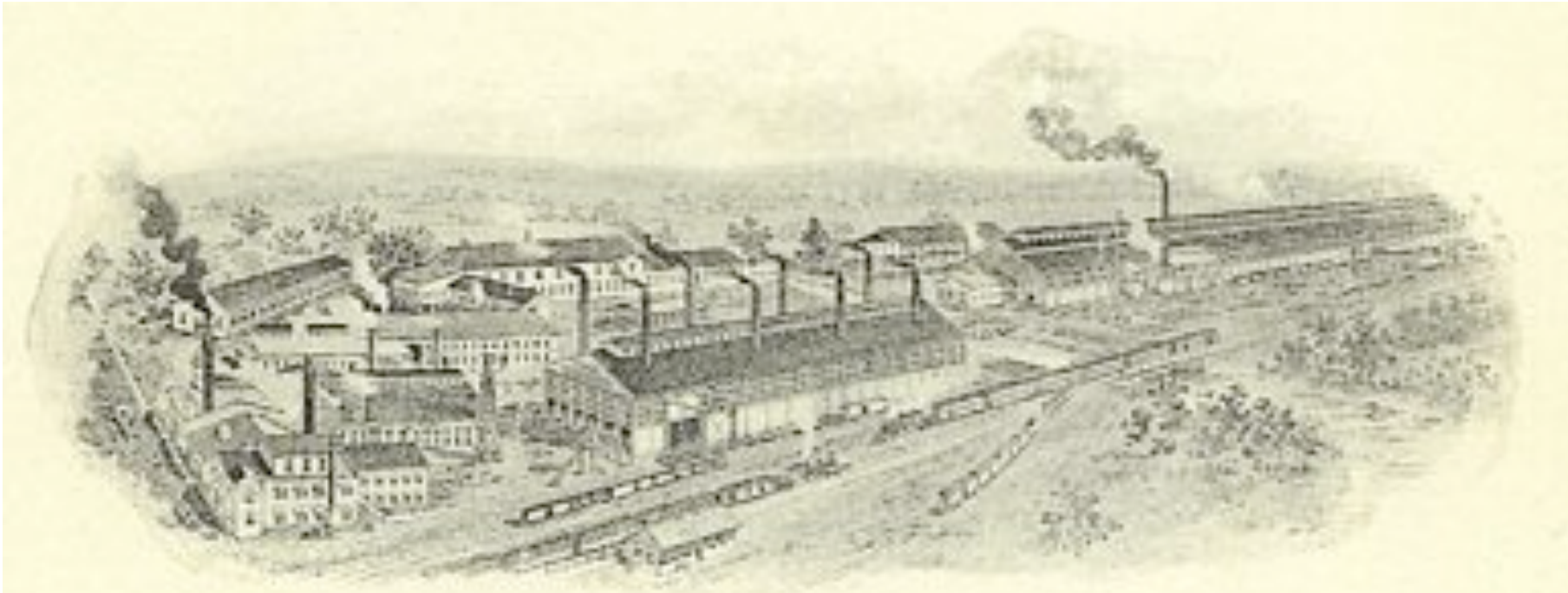
IRON BUILDERS.

Engineers and Contractors for Douglas Patent Wrought Iron Bridge.

ROOF TRUSSES, CORRUGATED IRON SHUTTERS, ROOFING, CEILING, SIDING,

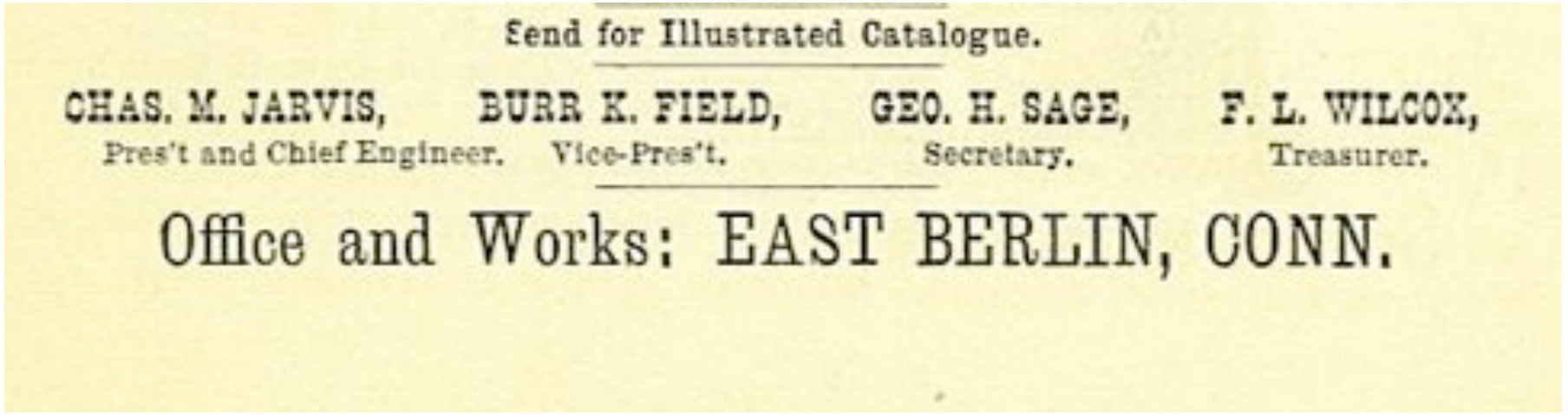
And General Iron Construction.

WORKS OF THE BERLIN IRON BRIDGE COMPANY, 1878.



WORKS OF THE BERLIN IRON BRIDGE COMPANY, 1900.

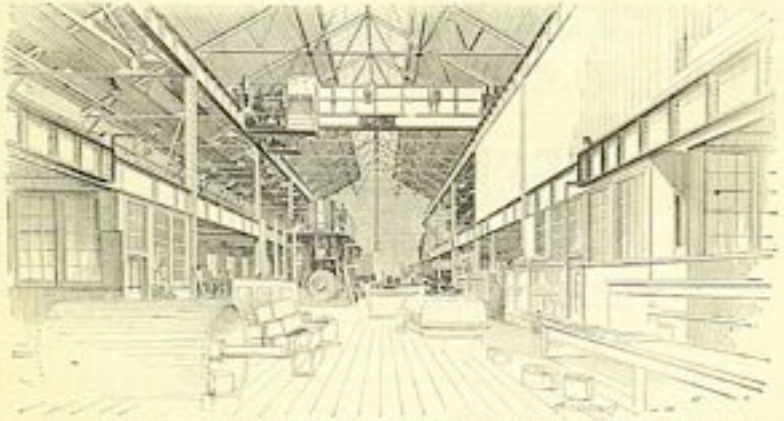
The Driving Force



THE BERLIN IRON BRIDGE CO.

Engineers, Architects and Builders of Iron and Steel Bridges, Roofs and Buildings.

The above illustration, taken direct from a photograph, shows a Double Track Railroad Bridge designed and built by us at Cos Cob, Conn., on the N. Y. N. H. & H. R. R.



The above illustration is taken direct from a photograph and shows the interior of a Forge Shop designed and built by us for Wm. Cramp & Sons Ship and Engine Building Co., at Philadelphia, Pa. The Forge Shop is 50 ft in width and 50 ft. in length, the adjacent Boiler Shop (shown on the right) being 55 ft. in width and 300 ft. in length. The Smith Shop is controlled by a Traveling Crane as shown. The building is covered with Corrugated Iron.

Send for Illustrated Catalogue.

CHAS. M. JARVIS,	BURR K. FIELD,	GEO. H. SAGE,	F. L. WILCOX,
Pres't and Chief Engineer.	Vice-Pres't.	Secretary.	Treasurer.

Office and Works: EAST BERLIN, CONN.

THE BERLIN IRON BRIDGE CO.,

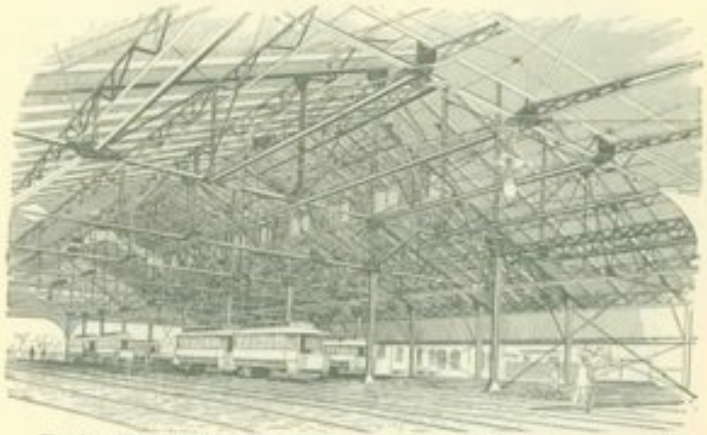
BRIDGE AT JAMESTOWN, CHAUTAUQUA COUNTY, N. Y.
Span, 70 feet. Roadway, 16 feet wide.

East Berlin, Conn.

Binghamton, N. Y.

THE BERLIN IRON BRIDGE CO.

Engineers, Architects and Builders of Iron and Steel Bridges, Roofs and Buildings.



The above illustration is taken direct from a photograph, and shows the interior of Car Shed designed and built by us for the New Orleans and Carrollton Railroad Co., at New Orleans, La. The building is constructed entirely of steel and covered with corrugated steel. It is 30 ft. wide and 300 ft. long. The sides are left open for a distance of 10 ft. from the surface of the ground, and the ends are left open entirely from the tie beam to the ground.

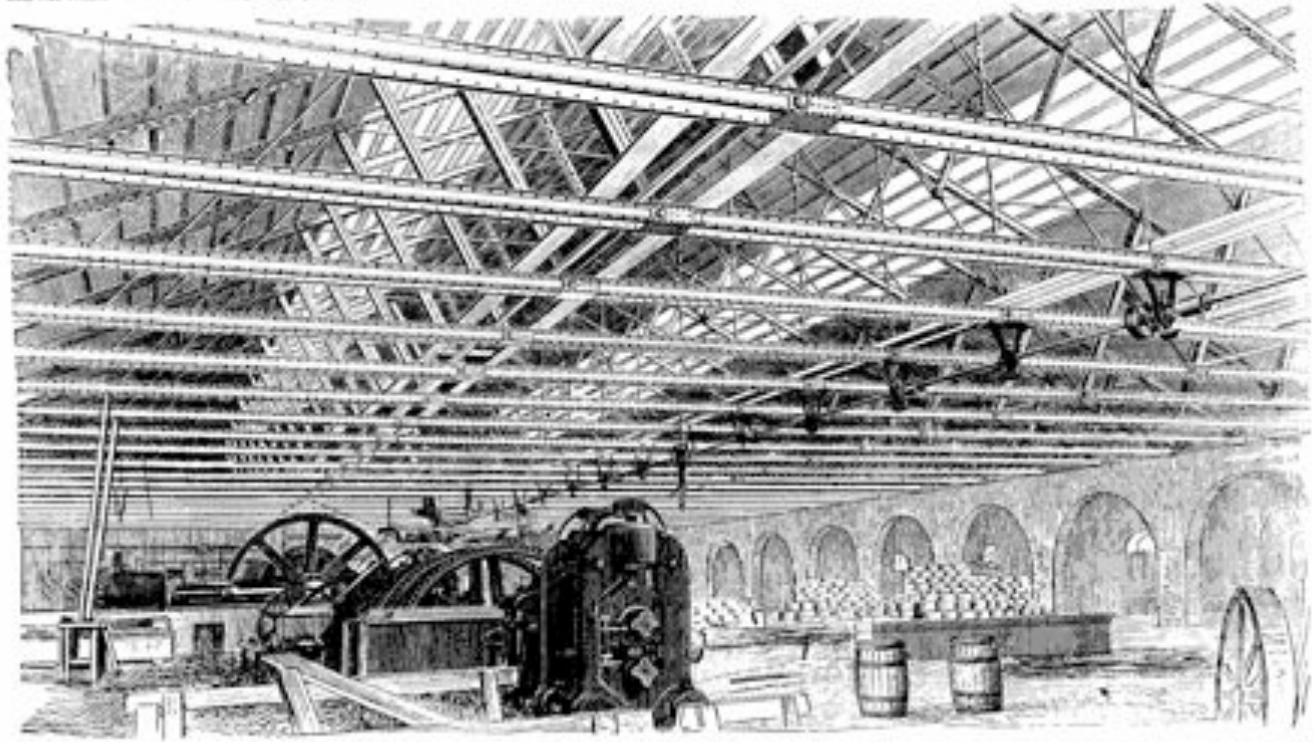
The above illustration shows a Parabolic Truss Bridge, designed and built by us at Danielsonville, Conn. The bridge consists of one span of 140 ft. with a roadway 20 ft. wide in the clear, and two sidewalks each 3 ft. wide in the clear.

CHAS. M. JARVIS, Pres't and Chief Engineer. BURR K. FIELD, Vice-Pres't. GEO. H. SAGE, Secretary. F. L. WILCOX, Treasurer.

Office and Works: EAST BERLIN, Conn.

THE BERLIN IRON BRIDGE CO.,

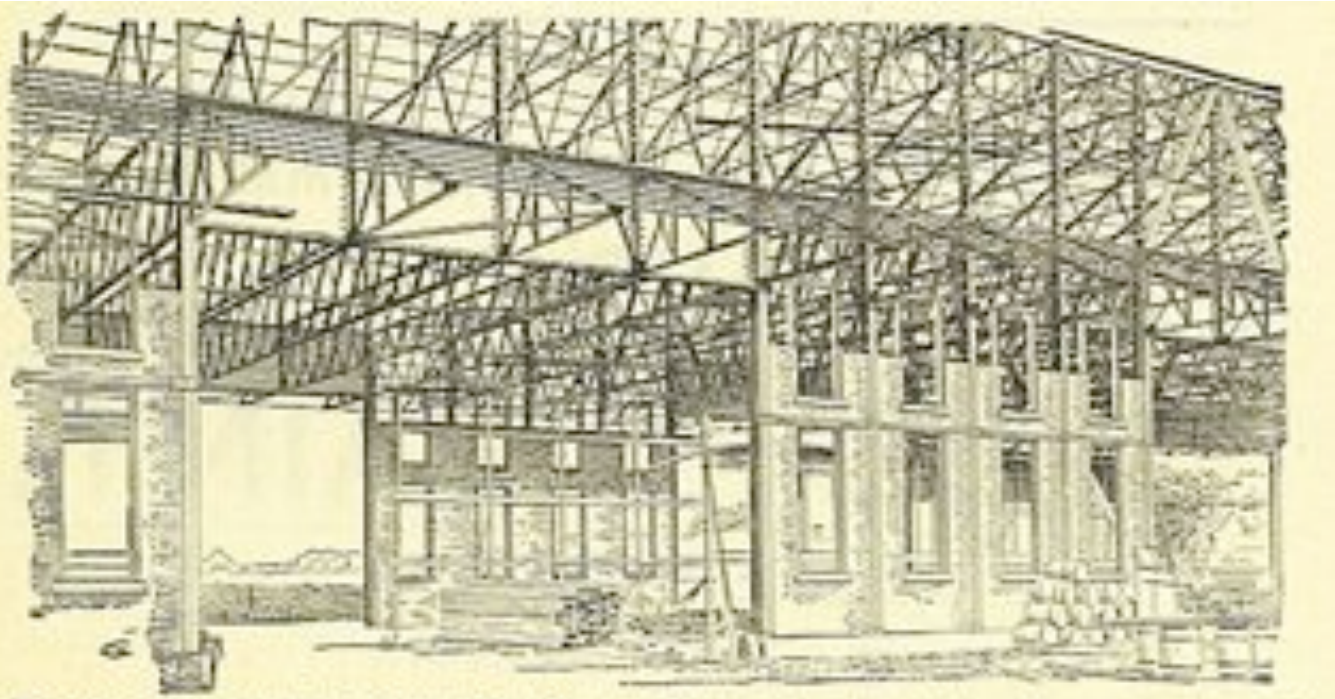
Engineers, Architects and Builders of Iron and Steel Bridges, Roofs and Buildings.



The above illustration is taken direct from a photograph, and shows the construction of an Iron Truss Roof, designed and built by us for The Coe Brass Mfg. Co., at Torrington, Conn. The roof is over their Rolling Mill, which is a building 118 feet in width and 233 feet in length. The line of brick arches, shown on the right, connects with an adjoining Muffle Room, which is also covered with an iron truss roof, designed and built by us.

Send for Illustrated Catalogue.

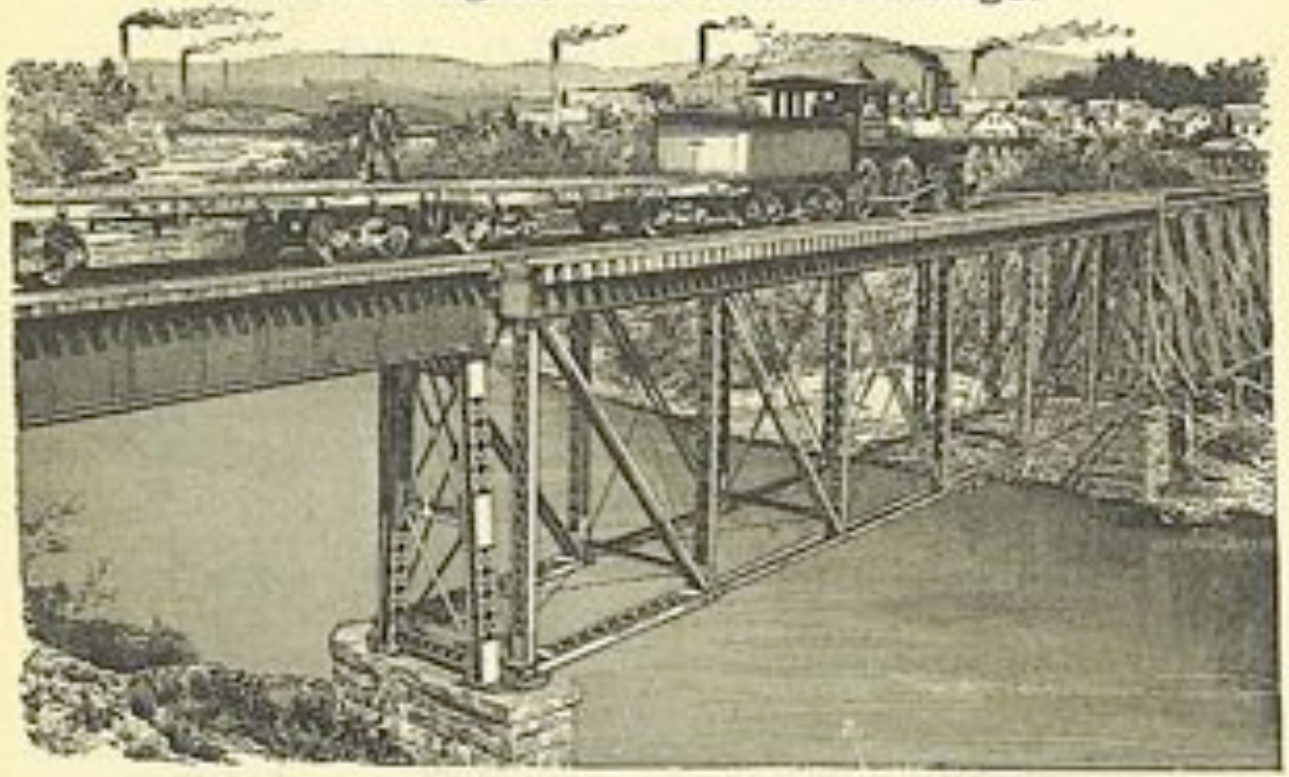
Office and Works, EAST BERLIN, CONN.



The above illustration is taken direct from a photograph made during the construction and shows the details of an Iron Building designed and built by us for the Newport News Ship-Building and Dry Dock Company, at Newport News, Va. The building is 60 ft. in width by 320 ft. in length, and is two stories high—the lower floor being used for a Ship Shed for punching, bending, riveting, etc., the upper floor being used as a Mold Loft. Outside of the building, extending entirely around it on all four sides, is an overhang 12 ft. wide, thus affording additional shop room outside of the building, where raw material may be stored and still protected from the weather. Wide openings are placed every 40 ft., so that raw material may be taken in, and finished product moved out, cheaply and quickly. The supporting frame is all iron throughout, and between the iron posts on the sides is a light brick wall.

THE BERLIN IRON BRIDGE CO.

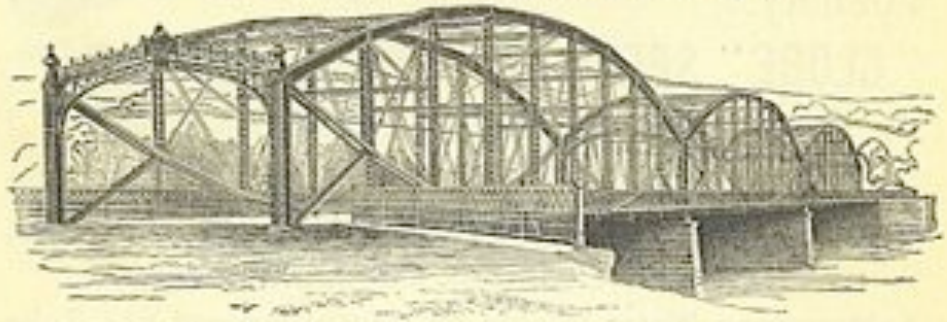
Engineers, Architects and Builders of Iron and Steel Bridges, Roofs and Buildings.



The above illustration is taken direct from a photograph of an Iron Truss and Plate Girder Bridge designed and built by us to carry the M. W. & C. R. R over the Naugatuck River at Waterbury, Conn.

THE BERLIN IRON BRIDGE CO.

Engineers, Architects and Builders of Iron and Steel Bridges, Roofs and Buildings.



PARABOLIC TRUSS BRIDGE, AT BINGHAMTON, N. Y.

FOUNDRY BUILDING, FOR FARRELL FOUNDRY AND MACHINE CO., AT ANSONIA, CONN.

Layout of BIBCO Plant

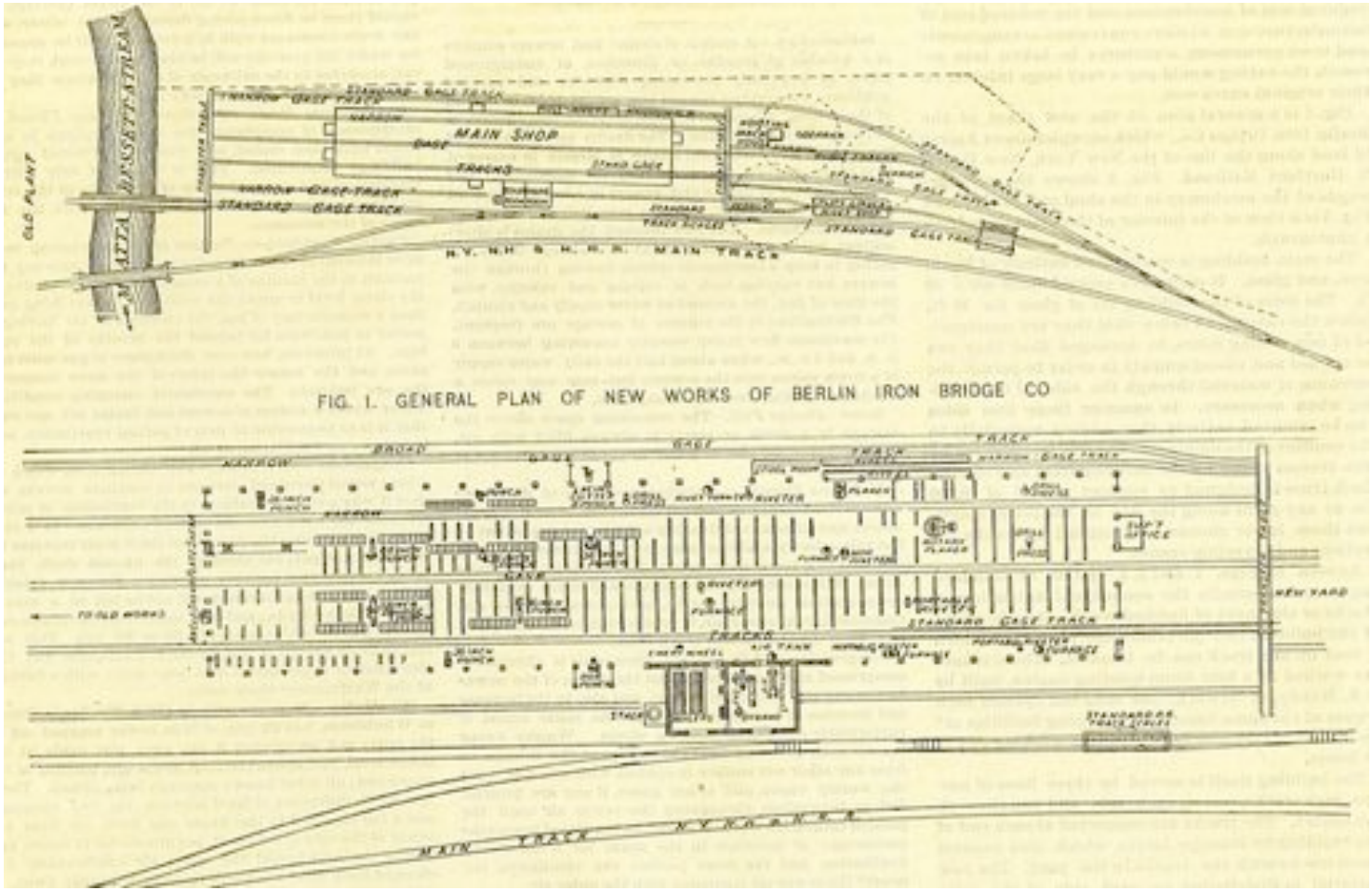


FIG. 1. GENERAL PLAN OF NEW WORKS OF BERLIN IRON BRIDGE CO

Inside BIBCO Plant

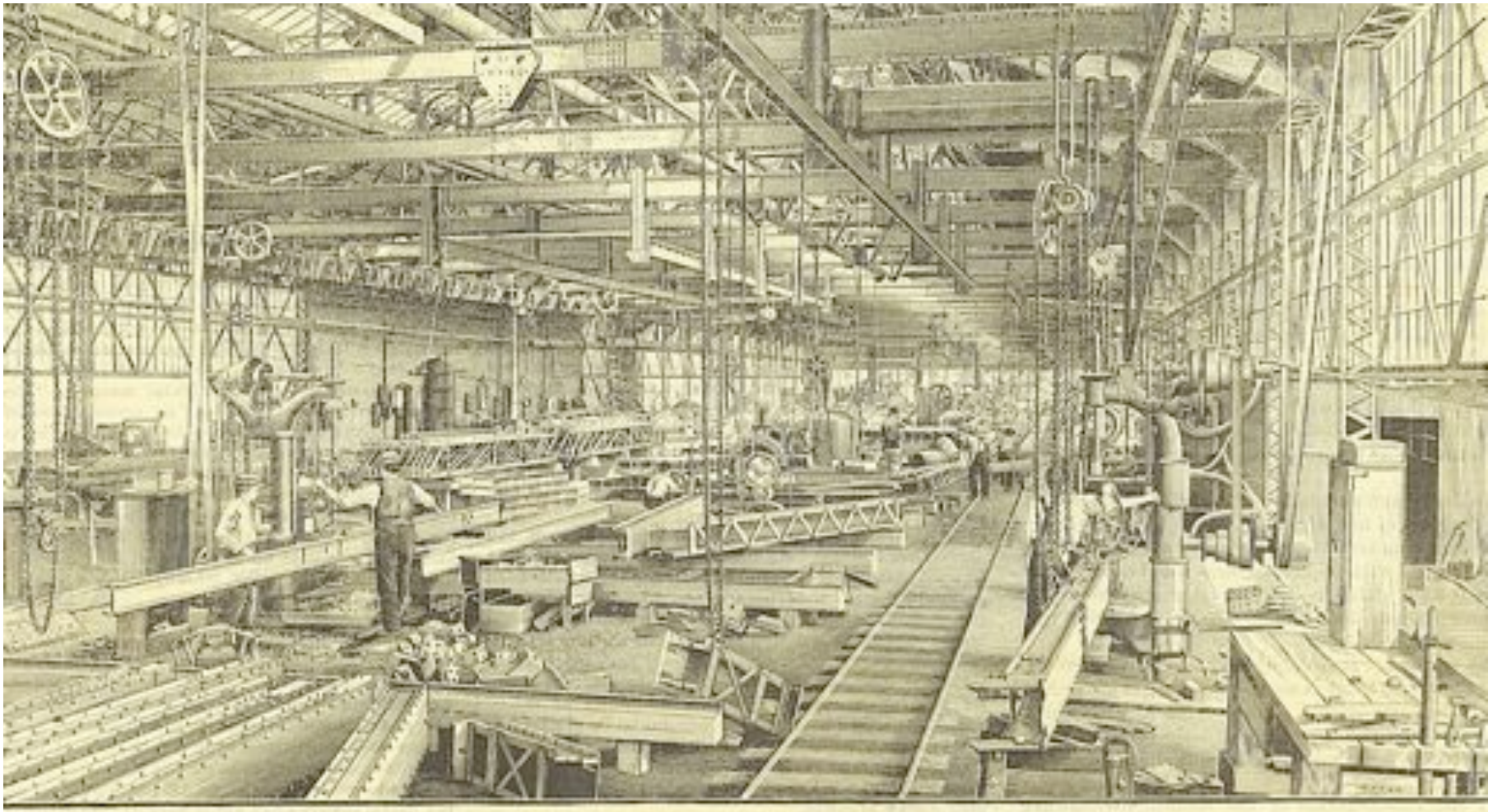
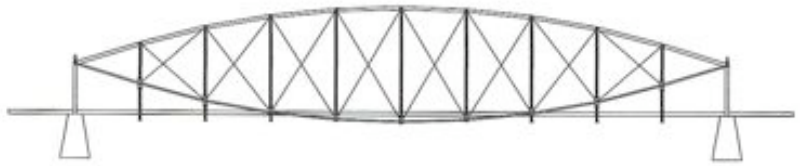


FIG. 3. VIEW OF INTERIOR OF NEW SHOP

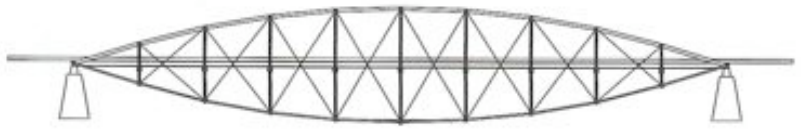

THE BERLIN IRON BRIDGE CO

Styles of Lenticular Bridges

Suspended Deck



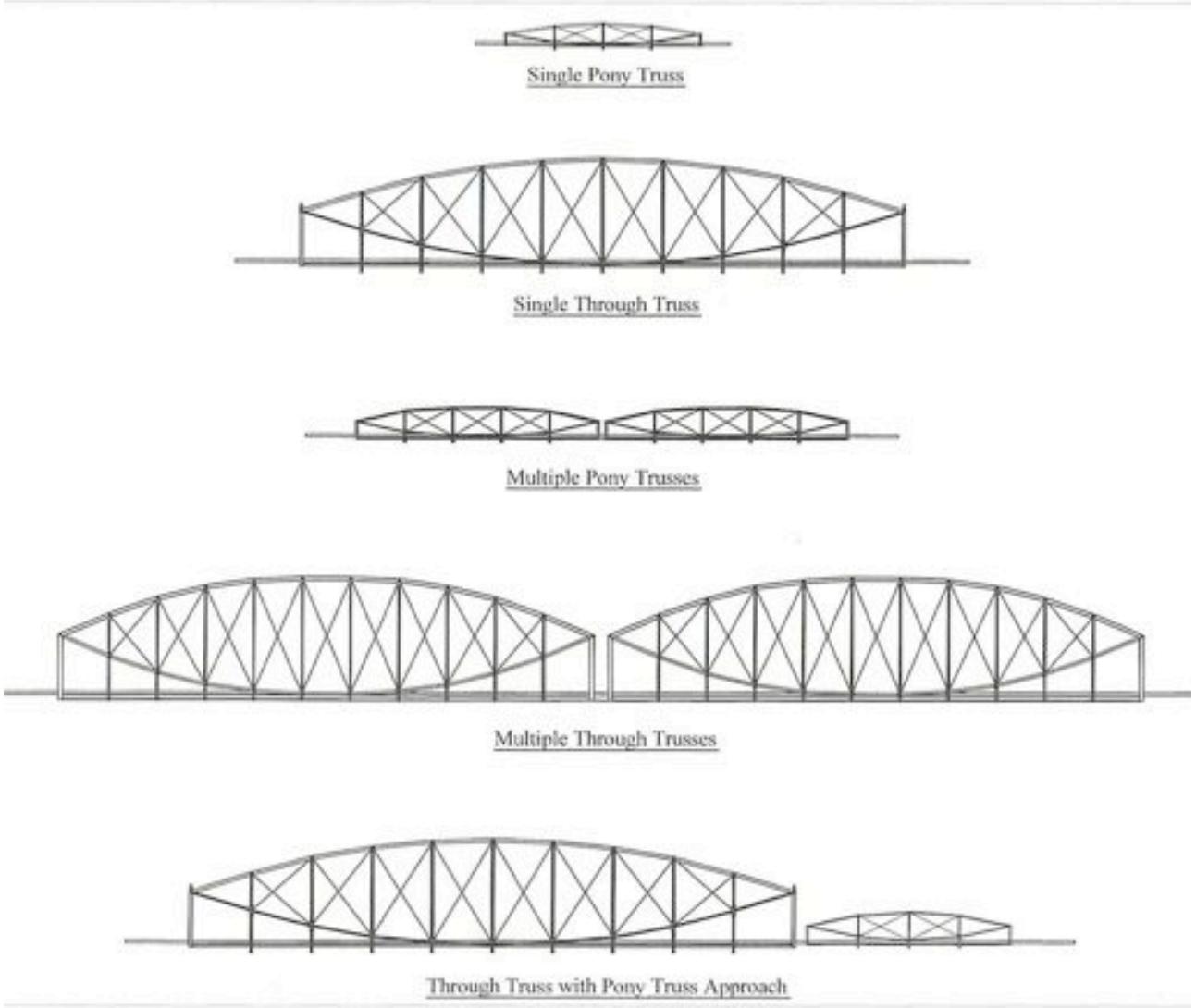
Suspended Deck



Mid Deck

Under Deck

Configurations of Bridges

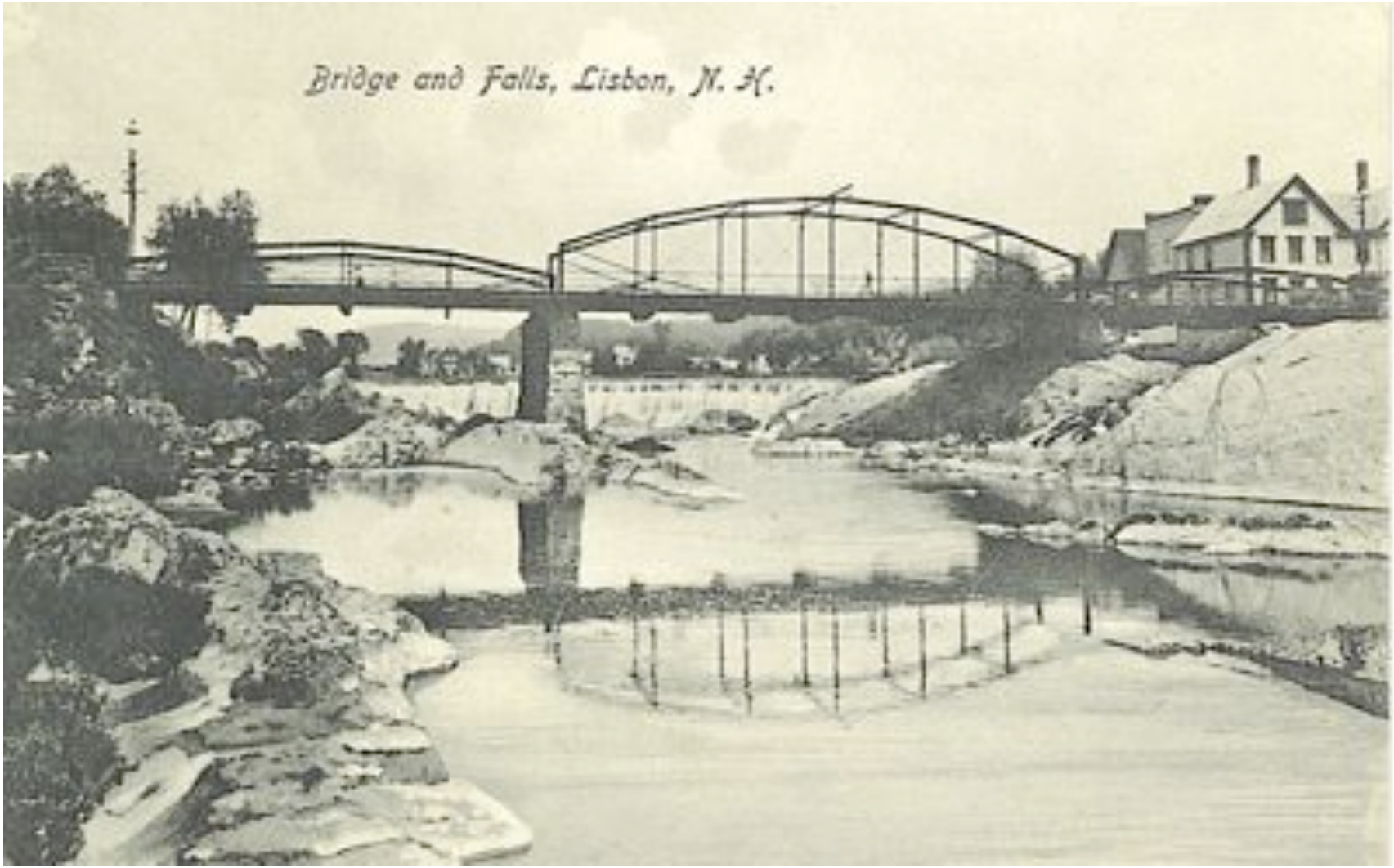


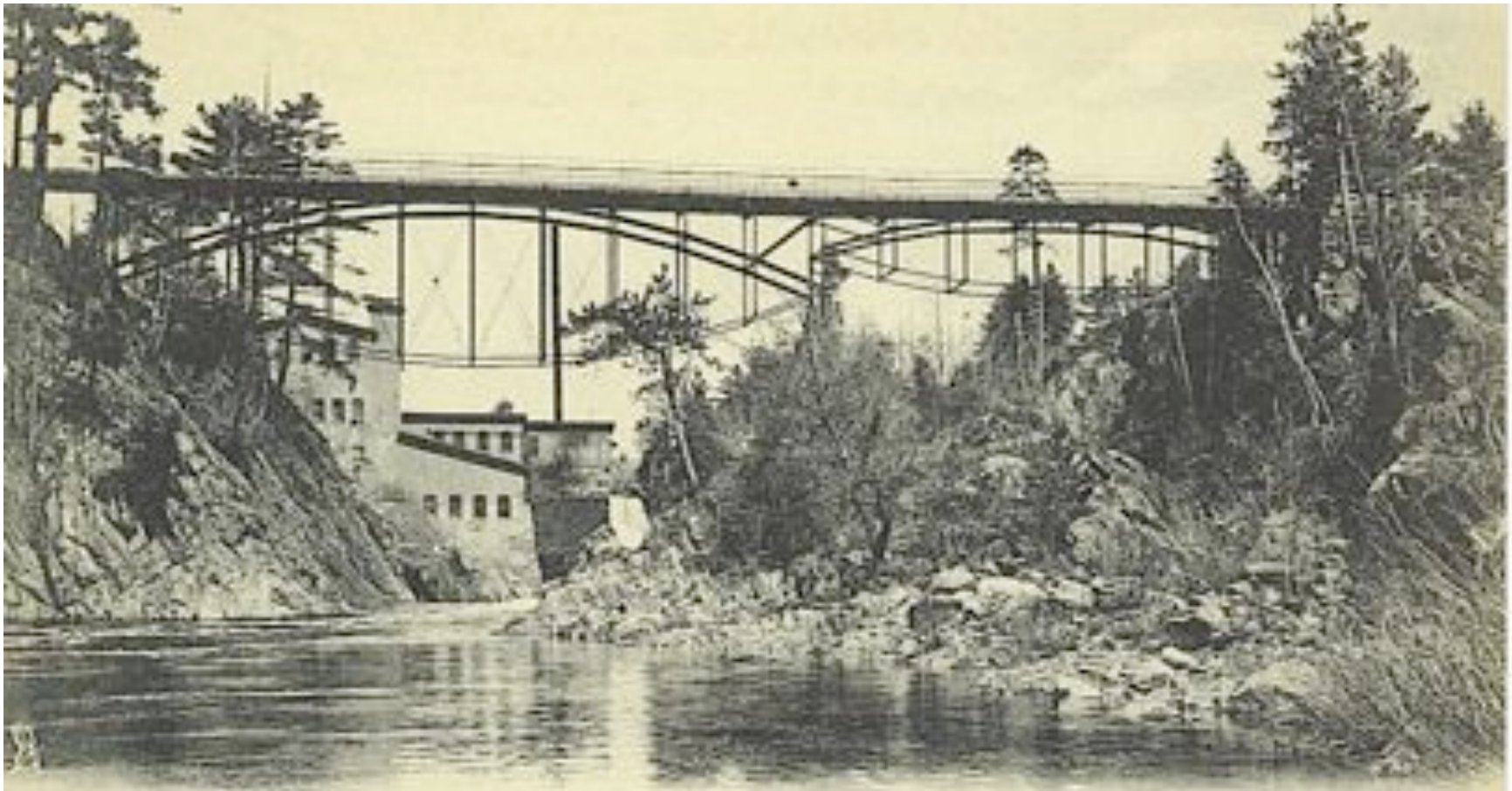
ONEONTA, N. Y.

Main Street Bridge.

No. 1531

Thanks for card. This is a nice sightly place. I am having a delightful vacation. Yours.


Bridge and Falls, Lisbon, N. H.

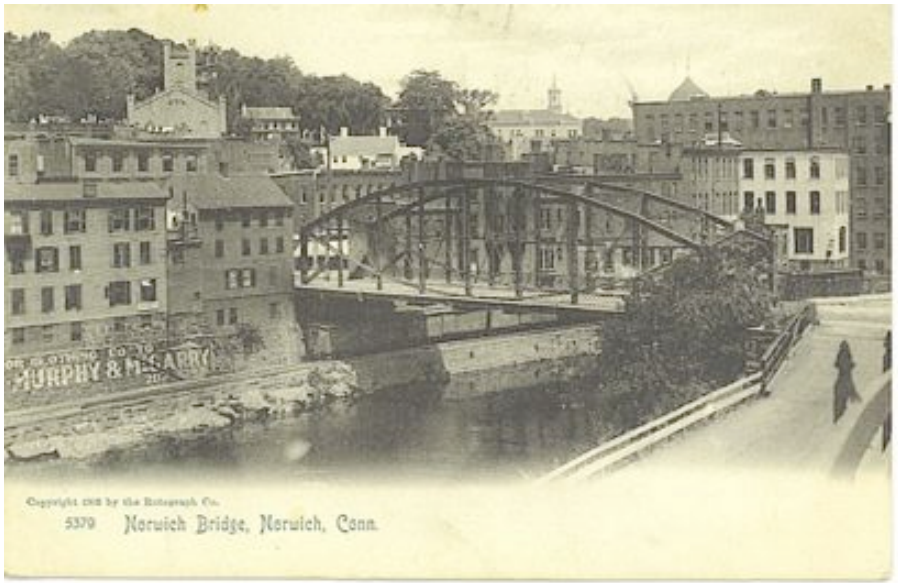


PLYMOUTH, N. H. LIVERMORE BRIDGE.

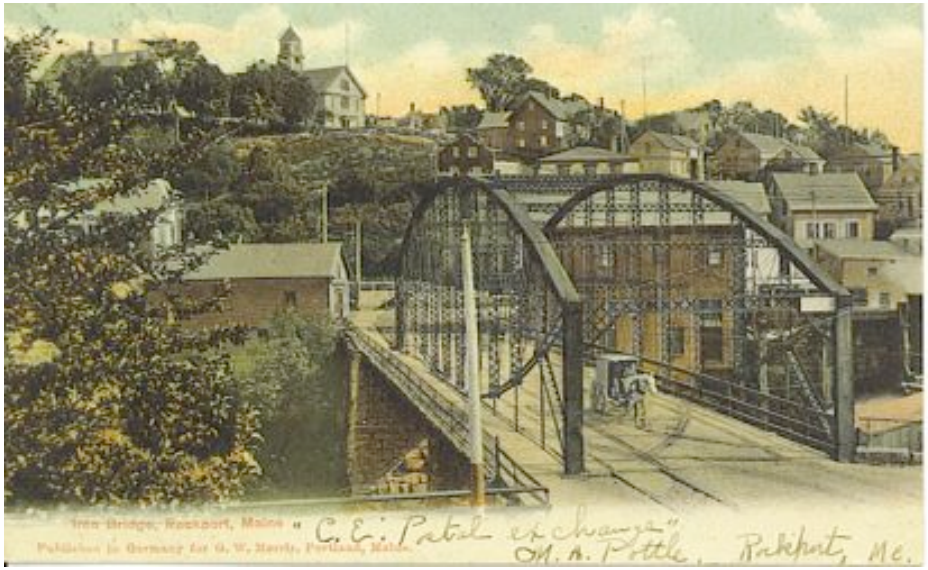
Fred W. Brown, Druggist.


Bridge over the Wallkill, Montgomery, N. Y.

- Through Truss Bridges
- Pony Truss Bridges

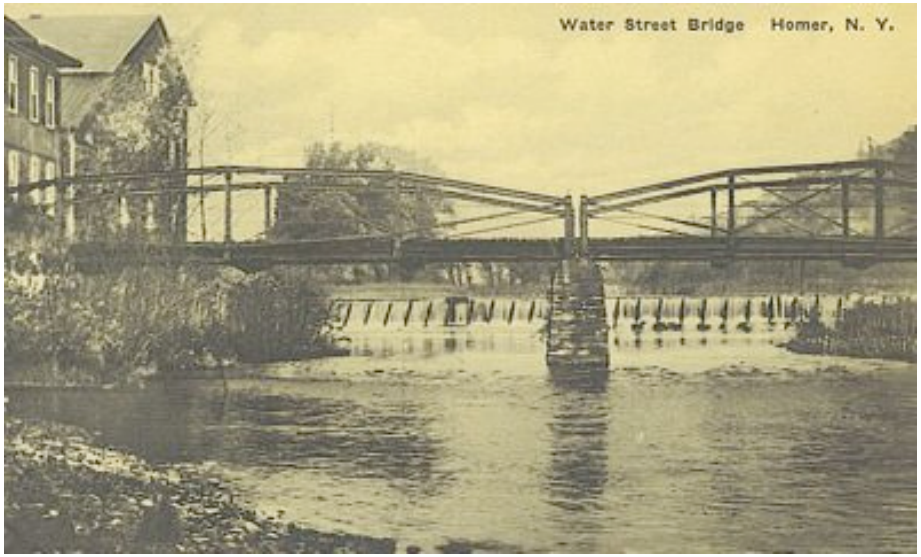


Copyright 1908 by the Rotograph Co.
5379 Norwich Bridge, Norwich, Conn.



Iron Bridge, Rockport, Maine
Published in Germany for O. W. Norris, Portland, Maine

C. E. Patch exchange
M. A. Pottle, Rockport, Me.


Water Street Bridge Homer, N. Y.


2837
Bridge over Ice Mill Brook,
Hamilton Pond, Waterbury, Conn.

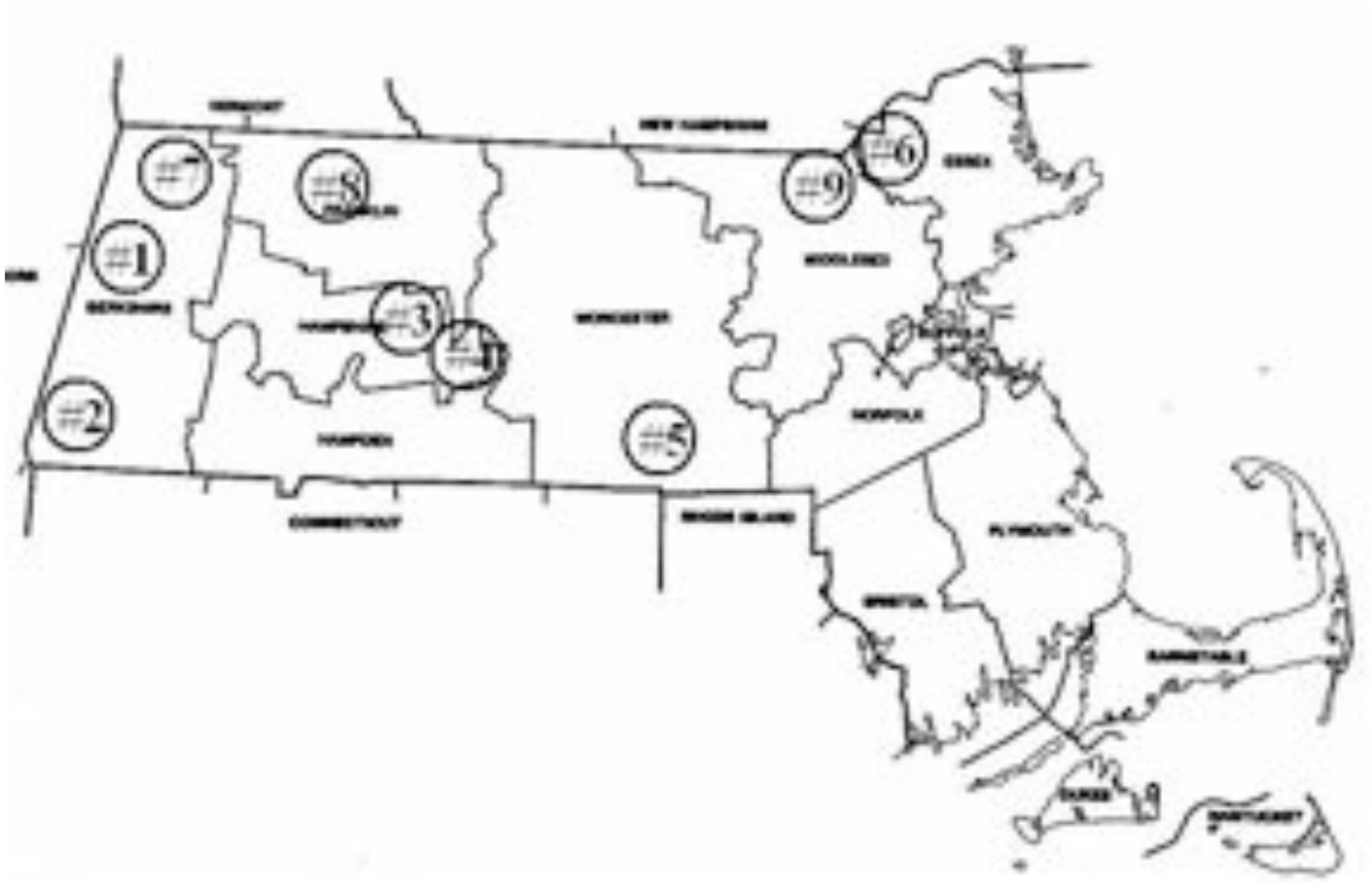

Bridge over Housatonic River. Lee, Mass.

The Success of BIBCO Bridges

- From 1879 to 1900 over 600 Lenticular Bridge Structures Built
- Aggressive Marketing
- Modular Design & Construction
- Mass Production of Components
- Rapid Construction Schedule

About 55 Extant Bridges

- Massachusetts
- Connecticut
- New Hampshire
- Vermont
- Rhode Island
- New York
- Pennsylvania
- New Jersey
- Texas


#1
#2
#3
#4
#5
#6
#7
#8
#9


5 4 2003


WEIGHT
LIMIT
5T
8T
13T

What's the Current Status of BIBCO Lenticular Brides?

1. Some bridges have been refurbished.
2. Some bridges are waiting for refurbishment.
3. Some bridges are waiting for discovery.

Bardwell's Ferry Bridge, Shelburne, Ma.


4. 16. 2004

Rhule Road. Malta, N.Y.

Depot Rd. Bridge, Colchester, N.H.

Sheffield St. Waterbury, Ct.

Candor, N.Y.

Melrose Rd. E. Windsor, Ct.


4.17.2004

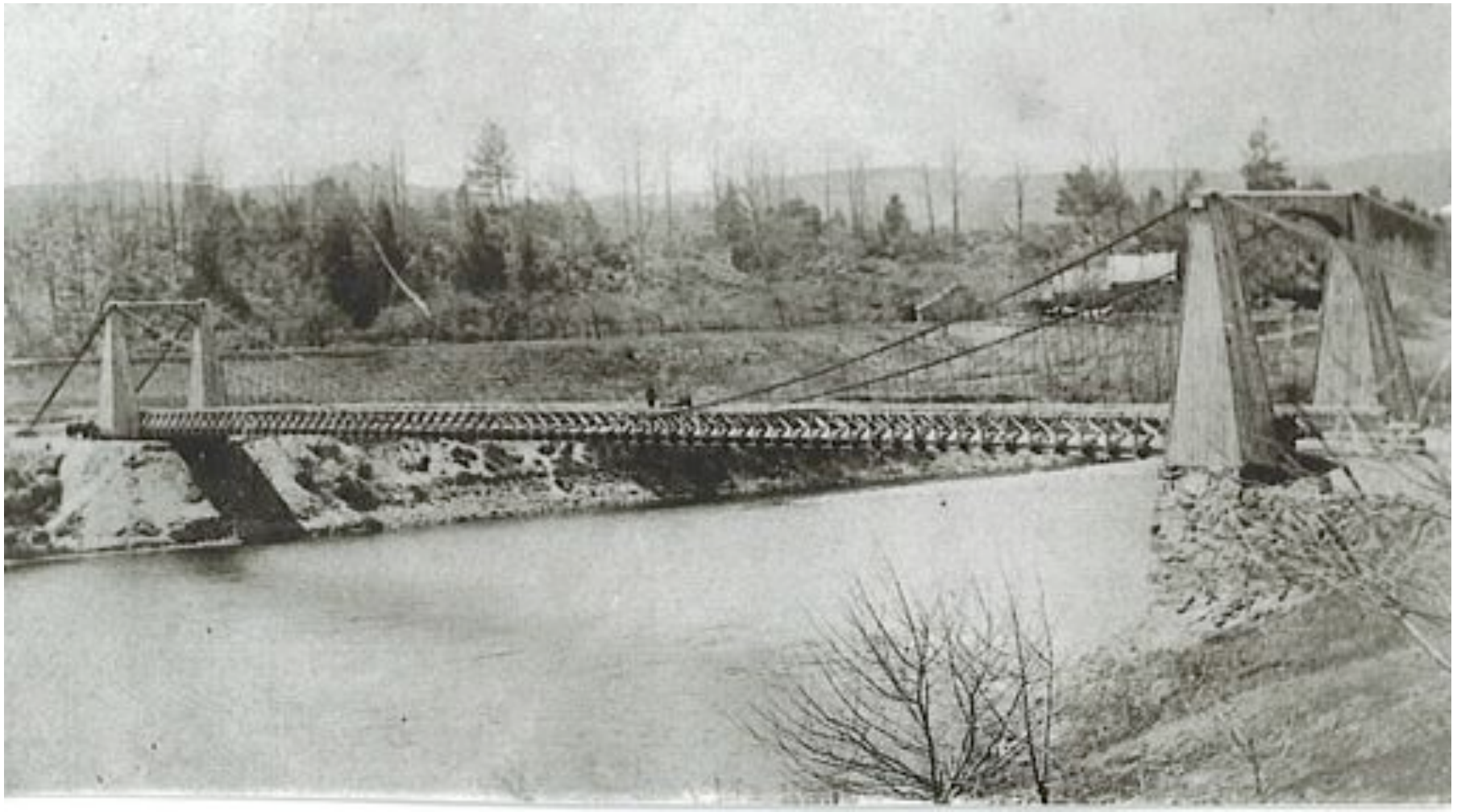

5.17.2004

2007 Lenticular Truss Bridge

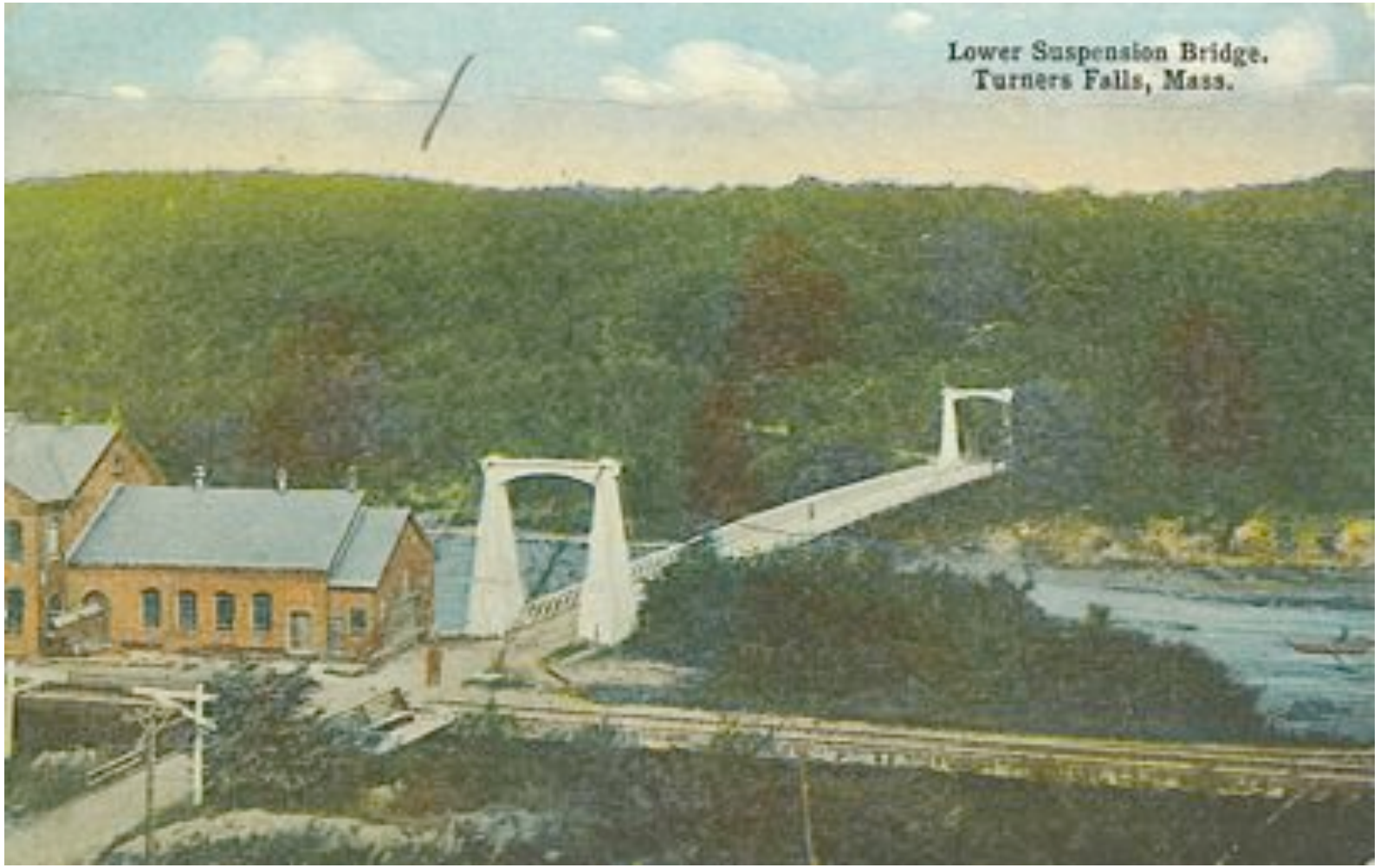
Other Historic Bridges of Western Ma.

- Suspension Bridges
- Iron Truss Bridges
- Steel Arch Bridges
- Concrete Arch Bridges

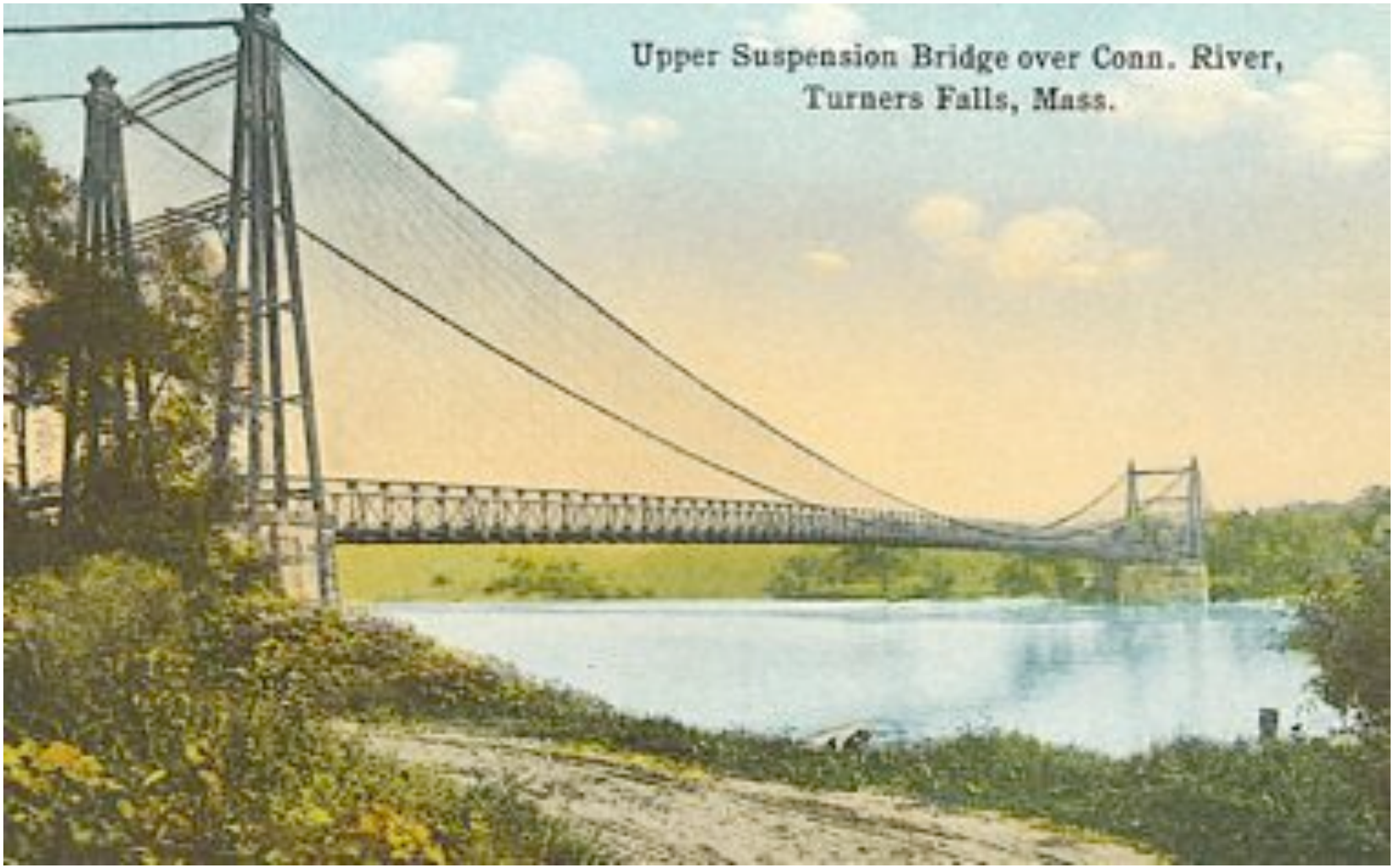
Stillwater Bridge – Deerfield 1870

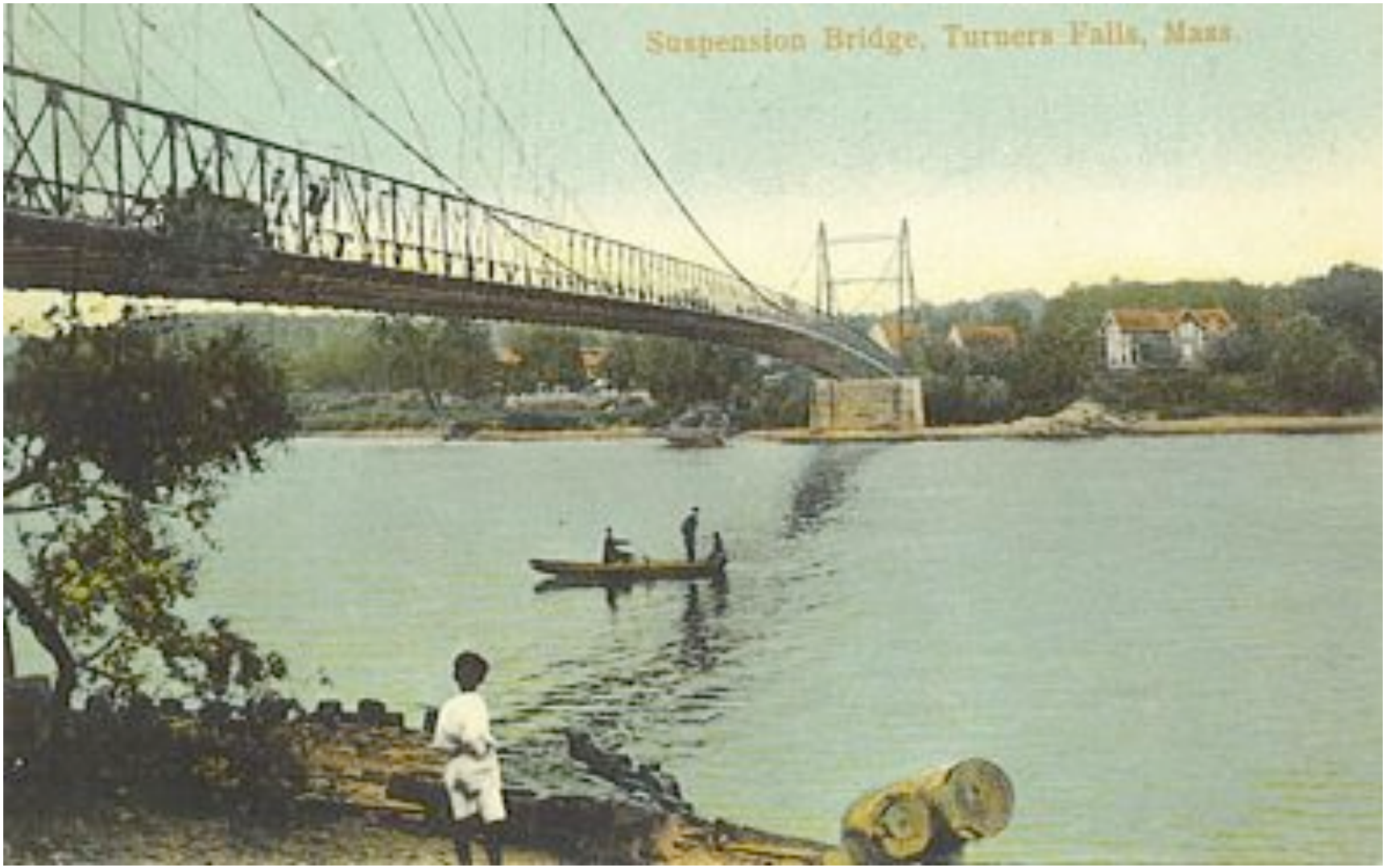


Lower Bridge – Turner's Falls 1872



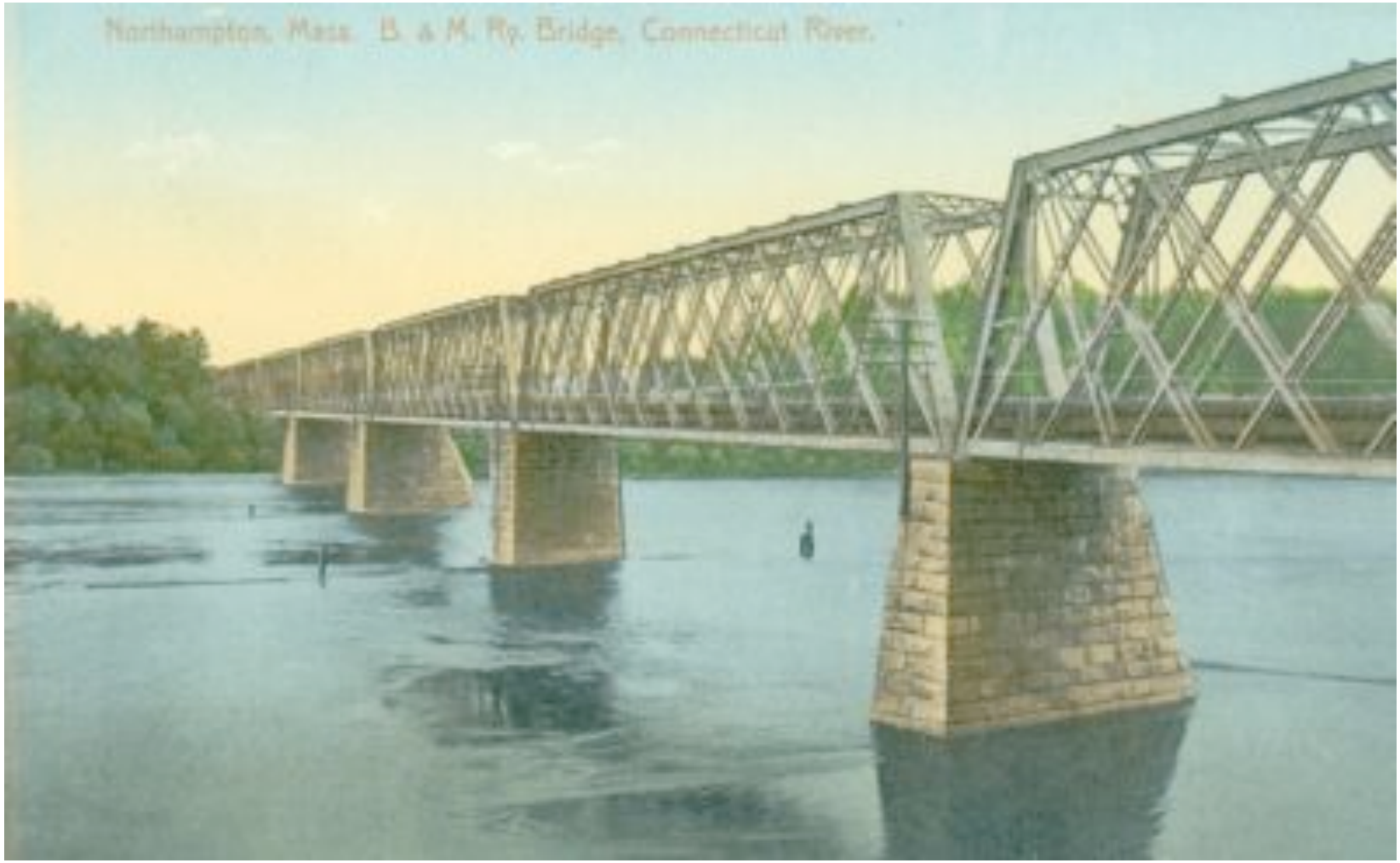
Upper Bridge – Turner's Falls - 1878




Suspension Bridge, Turners Falls, Mass.


32.

B & M Connecticut River Bridge - Hadley 1887

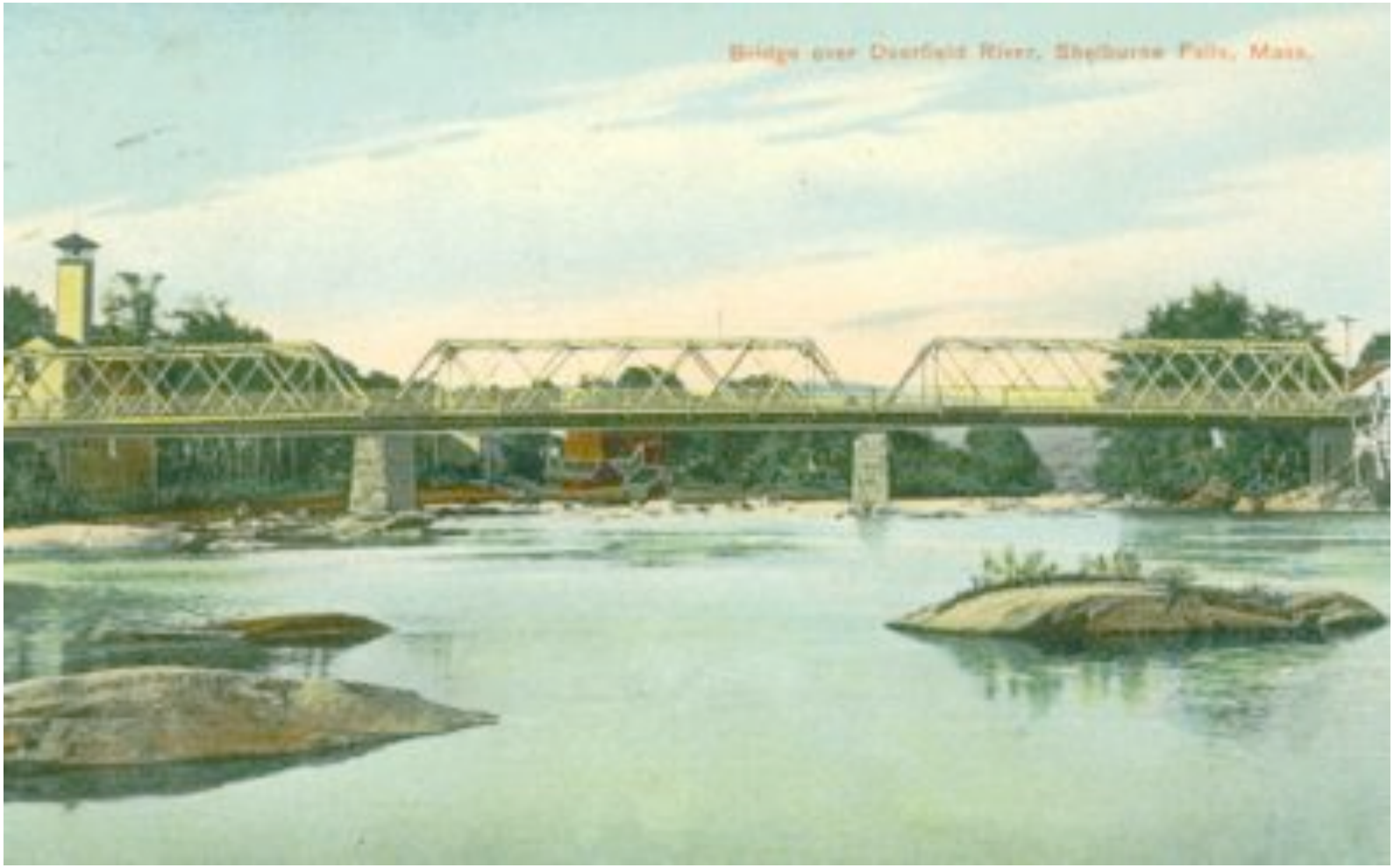


Clement Street Bridge – Northampton
1894

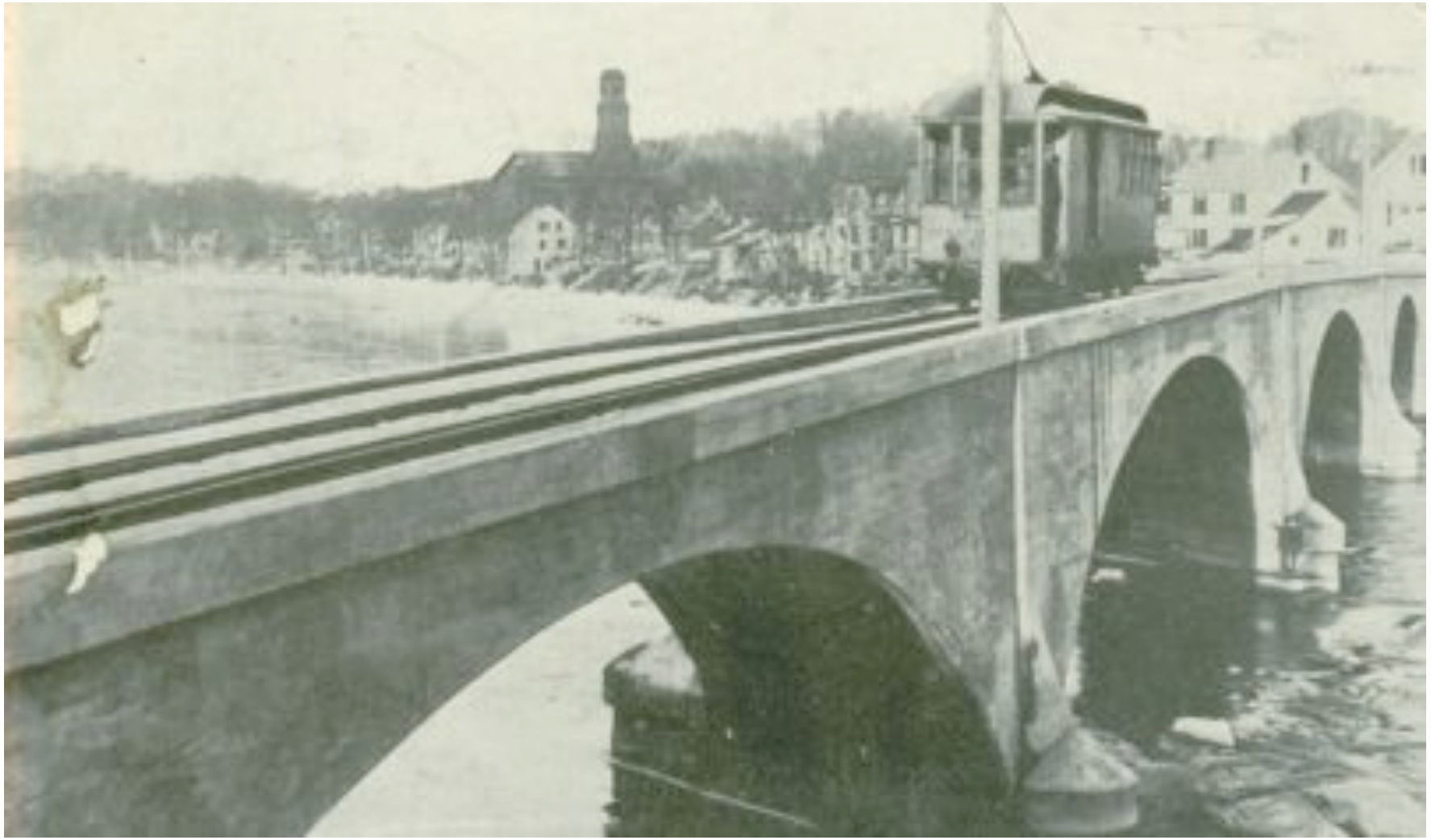
Hotel Street Bridge – Florence

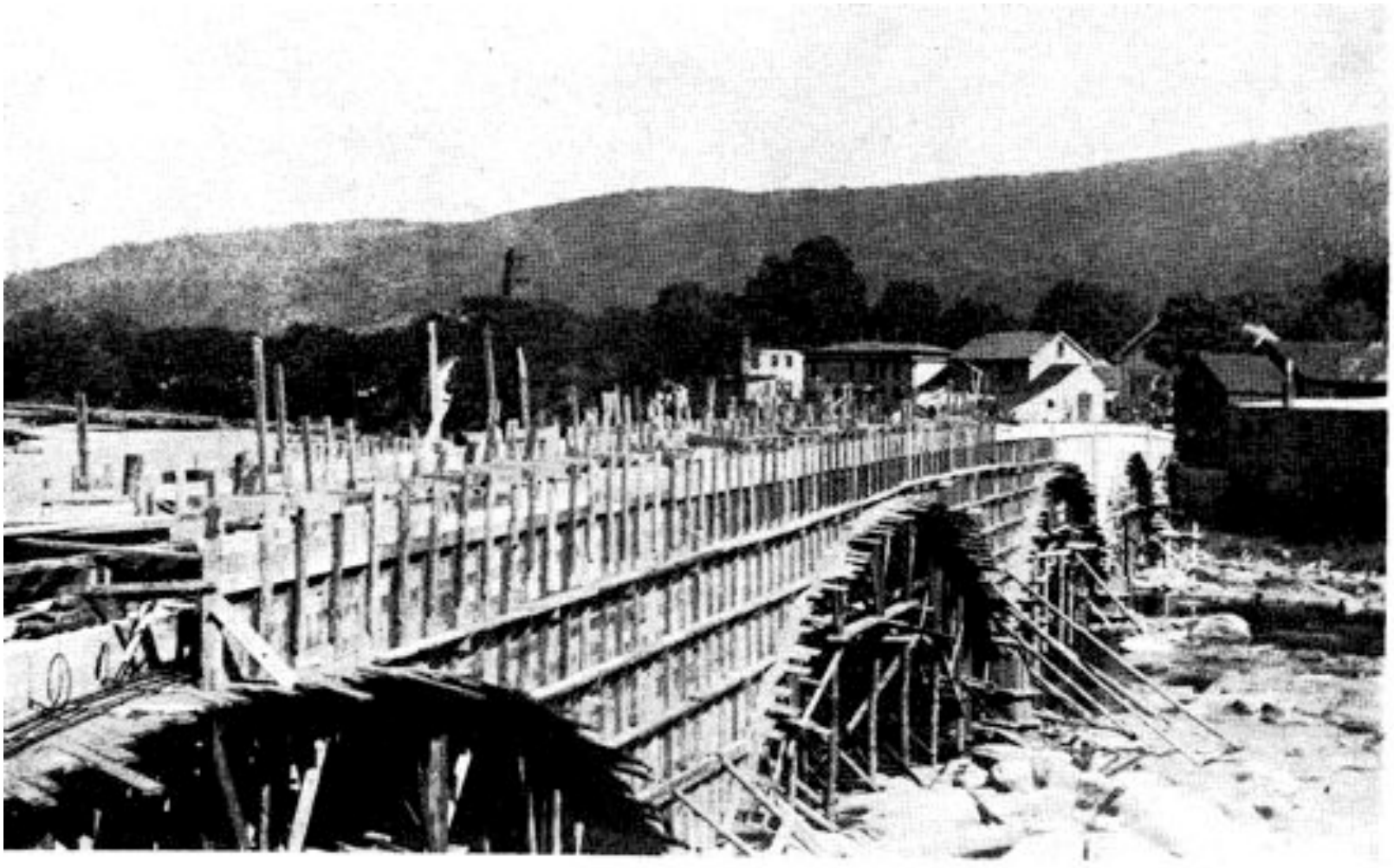
Bridge of Flowers and Main Street Bridges - Shelburne

Main Street Bridge



Bridge of Flowers





French King Bridge – Irving Steel Deck Arch Bridge 1932

Farley Rd. Bridge – Erving

(Phoenix Bridge Co.)


10. 21. 2003

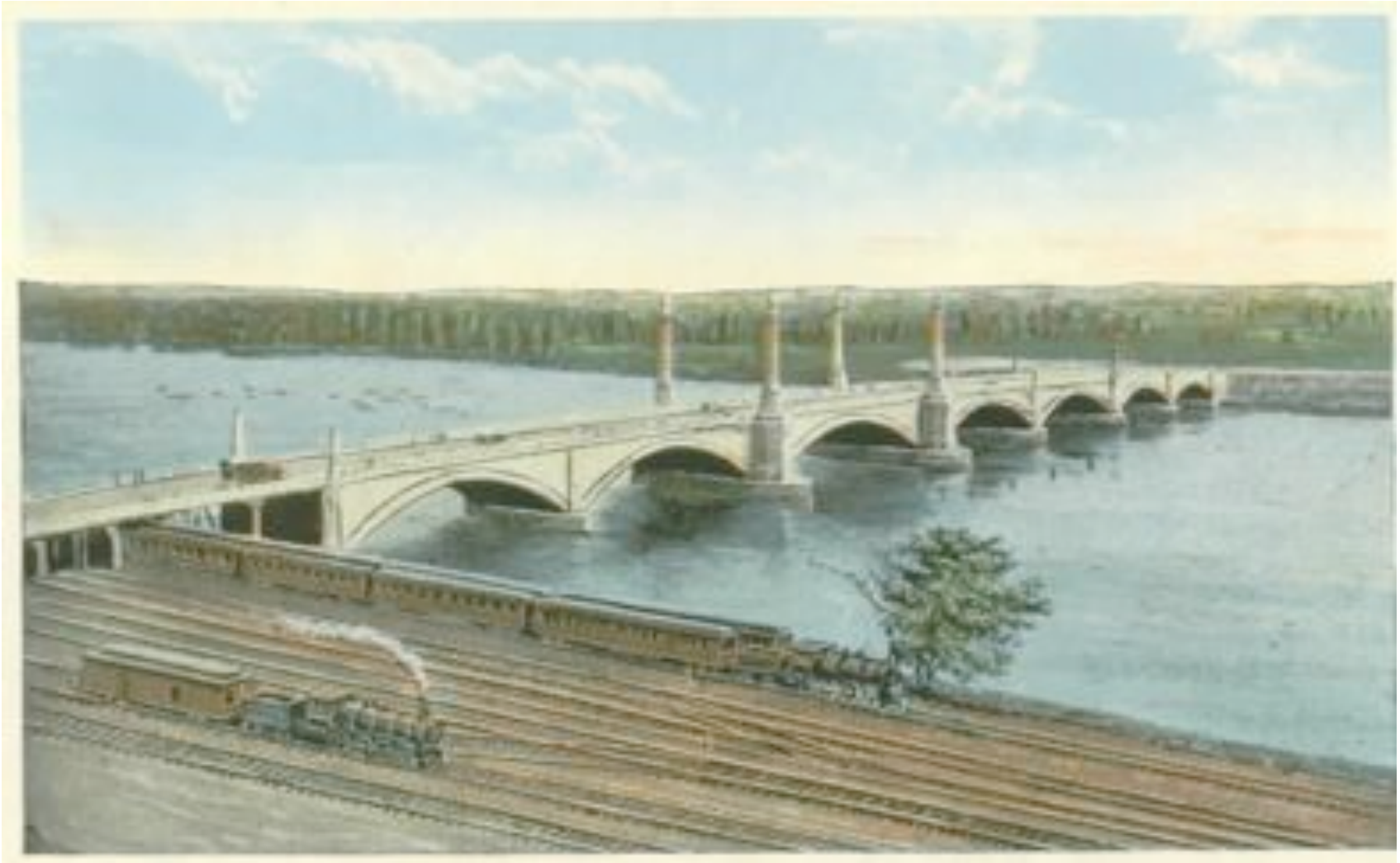
Shattuckville Rd. Bridge

East Mineral Road Bridge – Montague
1888

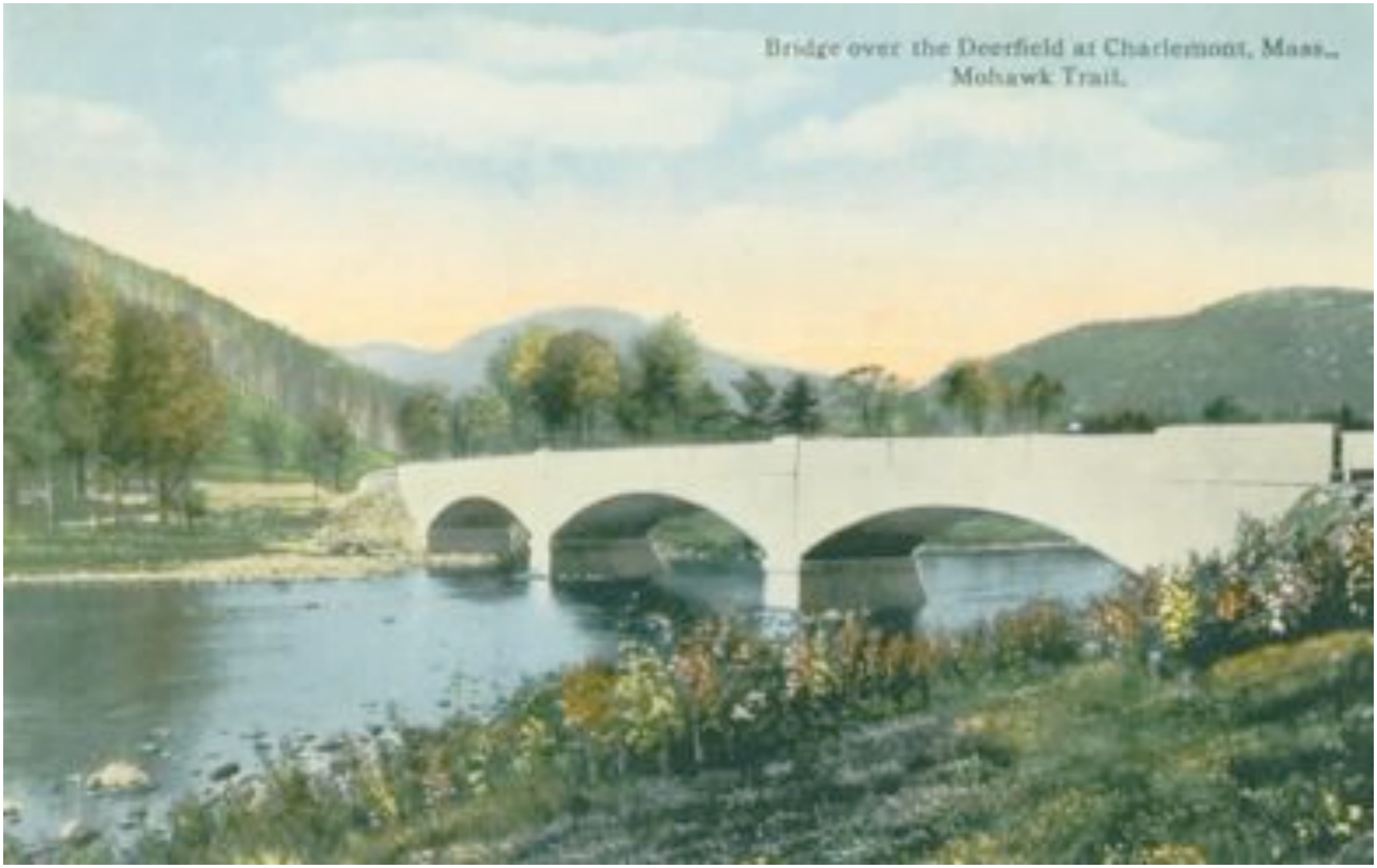
11th Street Bridge – Double Intersecting Warren Truss 1915

Adamsville Rd. Bridge - Colrain

Ct. River Bridge - Springfield



Rt. 2 Bridge - Zoar



1st Avenue Bridge – Turner's Falls

Ball Pipe Bridges

(No Model.)

C. H. BALL.

BRIDGE.

No. 502,165. Patented July 25, 1893.

Fig. 1.