

**United States Department of the Interior
Heritage Conservation and Recreation Service**

**National Register of Historic Places
Inventory—Nomination Form**

See instructions in *How to Complete National Register Forms*
Type all entries—complete applicable sections

1. Name West Virginia Covered Bridges Thematic Resources

historic Covered Bridges of West Virginia

and/or common

2. Location

street & number _____ not for publication _____

city, town _____ vicinity of _____ congressional district _____

state _____ code 54 county _____ code _____

3. Classification

Category	Ownership	Status	Present Use
☐ district	☒ public	☐ occupied	☐ agriculture
☐ building(s)	☐ private	☐ unoccupied	☐ commercial
☐ structure	☒ both	☐ work in progress	☐ educational
☐ site	Public Acquisition	Accessible	☐ entertainment
☐ object	☐ in process	☐ yes: restricted	☐ government
	☐ being considered	☒ yes: unrestricted	☐ industrial
		☐ no	☒ transportation
			☐ other:

Thematic Group

4. Owner of Property

name Multiple Ownership

street & number _____

city, town _____ vicinity of _____ state _____

5. Location of Legal Description

courthouse, registry of deeds, etc. _____

street & number _____

city, town _____ state _____

6. Representation in Existing Surveys

title Covered Bridges Inventory has this property been determined eligible? ☐ yes ☐ no

date August 1979 by E.L. Kemp ☐ federal ☒ state ☐ county ☐ local

depository for survey records Historic Preservation Unit, WV Dept. of Culture and History

city, town Charleston state West Virginia

7. Description

Condition		Check one	Check one
☐ excellent	☐ deteriorated	☐ unaltered	☐ original site
☐ good	☐ ruins	☐ altered	☐ moved date _____
☐ fair	☐ unexposed		

Describe the present and original (if known) physical appearance

Covered Bridges in West Virginia

The covered bridge builders in West Virginia employed relatively few types, none of which originated in the Virginias. For short spans, up to about fifty feet, the traditional kingpost and queenpost trusses were used and are illustrated in Fig. 1. For intermediate spans, up to about eighty feet, the multiple kingpost truss was the most popular and is shown in the insert in Fig. 2. The Long truss was also used and closely resembled the Howe truss, differing only in that wood verticals were used instead of iron rods. The Staats Mill bridge is an outstanding example of this type. Both the Warren and Lattice trusses were used for spans up to about 150 feet. A Lattice truss, see Fig. 3, was used to cross the C. & O. Canal at Cumberland, Md., near the West Virginia border, but no Lattice truss bridges are known to have been built in the Mountain State. The Warren truss was patented in England and was very popular for iron bridges, but very little used in timber bridges. It was a simple form of alternating tension and compression diagonals, without vertical members, which produced an elegant repeating "W" pattern. At least two examples of the Warren truss were built in West Virginia, namely the notable twin span bridge at Renick, which has been razed, and a handsome example, which continues to serve local traffic, across Locust Creek in Pocahontas County.

For long span bridges the Burr truss was favored and in the hands of Lemuel Chenoweth, the Mountain State's pioneer bridge builder, it reached a peak of excellence and beauty unmatched anywhere in the nation. The bridges at Philippi and Barrackville stand as silent witnesses to his genius. By adding arches to a basic multiple kingpost truss the deflections of a bridge could be markedly reduced. This permitted much longer spans to be built, the record was Burr's McCall's Ferry bridge of 345 feet clear span built in Pennsylvania. Details of the Burr system are shown in Fig. 2.

Although literally dozens of systems were developed and patented, the above list represents all the known types built in West Virginia.

8. Significance

Period	Areas of Significance—Check and justify below			
— prehistoric	— archeology-prehistoric	— community planning	— landscape architecture	— religion
— 1400-1499	— archeology-historic	— conservation	— law	— science
— 1500-1599	— agriculture	— economics	— literature	— sculpture
— 1600-1699	— architecture	— education	— military	— social/
— 1700-1799	— art	— ☒ engineering	— music	— humanitarian
— ☒ 1800-1899	— commerce	— exploration/settlement	— philosophy	— theater
— ☒ 1900-	— communications	— industry	— politics/government	— ☒ transportation
		— invention		— other (specify)

Specific dates

Builder/Architect

Statement of Significance (in one paragraph)

Introduction:

Much has been written about the once ubiquitous covered timber bridge. Although its origins can be traced to Roman usage, it can be said to be a unique American development. In the popular mind such bridges have a strong romantic appeal as part of our bucolic 19th century past. The large number of covered bridge societies concerned with the history and preservation of the genre testify to its popularity. No other bridge type has captured the interest and affection of the public like the covered bridge. Despite an army of devotees, there has never been a systematic effort to preserve West Virginia's few remaining bridges.

Historic Significance:

In the 19th century American civil engineers made three major contributions to the art and science of structural engineering, which brought this country international recognition for its pioneering efforts in developing the long span wire suspension bridge, the skeletal frame skyscraper and the all metal truss. The all metal truss is the offspring of the patented timber truss systems used in covered bridges. Thus, these quaint rustic structures stand as tangible evidence of American engineering skills and of an important era in the evolution of structural engineering.

With little capital and an acute transportation problem facing the new Republic, timber bridges were widely used, and numerous patented systems were developed from the time of the first large timber bridge by Enoch Hale in 1785 until the time of the Civil War. Stevenson (1) gives an interesting insight into American civil engineering practice at the height of the covered bridge era:

The zeal with which the Americans undertake, and the rapidity with which they carry out every enterprise, which has the enlargement of their trade for its object, cannot fail to strike all who visit the United States as a characteristic of the nation. English and American engineers are guided by the same principles in designing their works, but the different nature of the materials employed in their construction, and the climate and circumstances of the two countries naturally produce a considerable dissimilarity in the practice of civil engineers in England and America. At first view one is struck with the temporary and apparently unfinished state of many of the American works and is very apt, before inquiry into the subject, to impute to want of ability, what turns out, on investigation, to be a judicious and ingenious arrangement to suit the circumstances of a new country, of what the climate is severe—a country where stone is scarce and wood is plentiful and where manual labor is very expensive. It is vain to look to the American works for the finish which characterizes those of France, or the stability for which those of Britain are famed.

A notable treatise on American railroad bridges was published by Theodore Cooper in 1889 (2) in which detailed information on a number of timber bridges was presented. This was followed in 1934 by Fletcher and Snow's paper which was published together with two dozen discussions (3). Writing at the end of the 19th century, William Burr (4)

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salutes the accomplishments of the leading first generation timber bridge builders when he says:

The names of Palmer, Burr and Wernag were connected with an era of admirable engineering works, but with bridge analysis practically unknown, and the simplest and crudest materials at their disposal, their resources were largely constituted of an intuitive engineering judgment of high quality and remarkable force in the execution of their works never excelled in American Engineering. The works they constructed form a series of precedents which have made themselves felt in the entire development of American bridge building.

Literally dozens of systems were patented in the first half of the 19th century. The Howe truss was the last important type to be patented and is illustrated in Fig. 4. With iron rods for the tension verticals it represented the transition from the all timber covered bridge to the later all iron truss. Whipple's classic work on bridge design was published in 1847, followed by Haupt's influential text entitled Bridge Construction, in 1851(5,6). These were the first references available to American engineers on truss analysis and appeared after all of the principal truss systems had been developed and patented. Thus, the transition from timber to iron also represented the transition from craftsmen builders, one might say bridgewrights, to bridge engineers trained to use analytical design methods during the period from 1840 to 1860. These patented truss systems are not just antique curios but represent one of 19th century America's greatest contributions to structural engineering. The history of covered timber bridges is well documented in a general way(7). Allen's recent series of books (8,9) provides an excellent introduction to the subject, complete with references, notes and appendices.

From Colonial times until the Civil War the settlement of western Virginia can be traced by the roads which were laboriously extended from the settled parts of Virginia through very mountainous country until they reached the Ohio. At first these were mere traces of trails, but the situation changed noticeably with the establishment of the Board of Public Works in 1816 and the institution of the turnpike company, modeled on the English system. With the inducement of state matching money from the B.P.W., turnpike companies were formed by the score on a tide of public enthusiasm which swept into nearly every valley. Many of these companies were ill conceived and were never incorporated, others struggled to make a return on the money invested and a few were successful financially. In any case these turnpikes played a remarkable role in the development of western Virginia. As a result of the terrain, scores of timber bridges were built on all of the turnpikes, usually under separate contracts from the B.P.W. Several important examples survive.

The maneuvering of opposing forces in the Civil War took place in West Virginia on the turnpikes. In fact the conflict cannot be understood without a knowledge of the turnpike roads. Covered bridges were key links in the road system and were fought over in skirmishes at Philippi, Bulltown and Gauley Bridge. Both armies attempted to

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disrupt transportation along the turnpikes by destroying each others bridges.

Following the Civil War the turnpike system was disbanded and replaced by a county road system. The majority of the extant covered bridges were built during this period from funds provided by the county courts. By the end of the century, metal truss bridges and later concrete arch bridges were steadily replacing timber bridges and by 1900 the death knell for the timber bridge was sounded.

Throughout the entire 19th century the covered timber bridge was an essential part of the transportation system in West Virginia. The total number of bridges constructed is unknown, but there must have been hundreds built. In the early 1950s there were more than eighty of these handsome structures left, but by the end of 1979 the number had been reduced to nineteen. Many of these survivors are in poor condition and will be lost if preventative measures are not taken immediately. Listing them on the National Register of Historic Places is an essential first step in developing a comprehensive preservation plan. Therefore, all of the extant covered bridges in West Virginia are presented in this theme nomination.

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Colonel Stephen Long (1784-1864) patented his famous wooden truss system in 1830 marking a new era in bridge building in the United States and in a larger sense he was a pioneer in transforming the art of building, which was practised by craftsmen, into a professional activity firmly guided by trained civil engineers. He was a man of wide interests who succeeded in making substantial contributions to nearly all of the recognized fields of civil engineering in his day.

While working with the Baltimore and Ohio Railroad, Long built his first bridge, the Jackson Bridge near Baltimore, which carried the Washington Pike over the B & O. Before this bridge, the B & O was committed to monumental masonry structures following traditional British and European practice. This bridge ushered in the use of timber trusses for railway use.

The Long truss was not common in the Virginias but in Jackson County at least four were built and two survive. There are no other Long trusses in West Virginia. The Staats Mill Bridge was specified by the County Court to be based upon the Bridge at Hardesty's Mill over Tug Fork, whereas the design of the Sarvis Fork Bridge was to be based upon the Angerona Bridge. The inspiration for building covered bridges using the Long patent is not known. The two extant bridges are excellent examples of this type, whose notable features are the repeating "X" braced panels, the details of the counter braces, the use of a horizontal lattice bracing system in the roof and joggles used in the chord splices. Both bridges are of nearly identical span and possess all of the structural details of the Long system. The distinguishing feature of the Sarvis Fork Bridge is the polygonal arch installed on the inside of the trusses. The arches were not "let into" the truss members with notched joints so typical of other arch-truss systems. Thus, it appears most likely these arches were added when the bridge was moved in 1924.

The Sarvis Fork Bridge is a good example and rare survivor of an important patented covered bridge system. It is an important landmark in Jackson County and it is one of seventeen surviving covered bridges in West Virginia.

9. Major Bibliographical References

1. Stevenson, D., Sketch of the Civil Engineering of North America, Weale, London, England, 1838.
2. Cooper, T., "American Railroad Bridges," Transactions, ASCE, Vol. XXI, Paper No. 418, July, 1889.

10. Geographical Data

UTM NOT VERIFIED

Acreage of nominated property _____

Quadrangle name _____

ACREAGE NOT VERIFIED

Quadrangle scale _____

UMT References

A

--	--	--	--	--	--	--	--	--	--

Zone Easting Northing

B

--	--	--	--	--	--	--	--	--	--

Zone Easting Northing

C

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D

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E

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F

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G

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H

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Verbal boundary description and justification

List all states and counties for properties overlapping state or county boundaries

state	code	county	code
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state	code	county	code
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11. Form Prepared By

name/title E. L. Kemp, Professor of History of Science & Technology, & of Civil Engineering

organization West Virginia University

date

street & number G14 Woodburn Hall, Town Campus

telephone (304)293-3867

city or town Morgantown

state West Virginia, 26506

12. State Historic Preservation Officer Certification

The evaluated significance of this property within the state is:

☐ national ☒ state ☐ local

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the Heritage Conservation and Recreation Service.

State Historic Preservation Officer signature

Charles Moran

title

date May 2, 1980

For HCRS use only

I hereby certify that this property is included in the National Register.

Keeper of the National Register

Attest: *Emma Jane Stice*

Chief of Registration

date 6-1-80

date 6-4-80

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3. Fletcher, R., and Snow, J. P., "A History of the Development of Wooden Bridges," Transactions, ASCE, Vol.99, Paper NO. 1864, 1934, pp. 314-408 .
4. Burr, W. H., Ancient and Modern Engineering and the Isthmian Canal, John Wiley and Sons, Inc., New York, N.Y. 1902.
5. Whipple, Squire, Bridge Building, 1847
- 6 . Haupt, H., General Theory of Bridge Construction, 1851.
7. "American Wooden Bridges," History and Heritage Committee, ASCE, 1974.
8. Allen, R. S., Covered Bridges of the Northeast, The Stephen Greene Press, Brattleboro, Vt., 1957.
9. Allen, R. S., Covered Bridges of the Middle Atlantic States, The Stephen Greene Press, Brattleboro, Vt., 1959.
10. Sloane, Eric, American Barns and Covered Bridges, Funk & Wagnalls, New York, N.Y., 1954. Figures 1-4 taken from this reference.

Multiple Resource Area
Thematic Group

dnr-11

Name West Virginia Covered Bridges Thematic Resources
State West Virginia

Nomination	Type of Review	Decision
1. Carrolton Covered Bridge	-	<i>All properties not previously listed</i> <u>Accept. E.J. Saxe 6-4-81</u>
2. Philippi Covered Bridge	-	<u>Accept. E.J. Saxe 6-4-81</u> Already listed
3. Mud River Covered Bridge	-	Already listed
4. Hens Mill Covered Bridge	-	<u>Accept. E.J. Saxe 6-4-81</u>
5. Hokes Mill Covered Bridge	-	<u>Accept. E.J. Saxe 6-4-81</u>
6. Fletcher Covered Bridge	-	<u>Accept. E.J. Saxe 6-4-81</u>
7. Simpson Creek Covered Bridge	-	<u>Accept. E.J. Saxe 6-4-81</u>
8. Sarvis Fork Covered Bridge	-	<u>Accept. E.J. Saxe 6-4-81</u>
9. Staats Mill Covered Bridge	-	Already listed
10. Walkersville Covered Bridge	-	<u>Accept. E.J. Saxe 6-4-81</u>
11. Barrackville Covered Bridge	-	Already listed
12. Laurel Creek Covered Bridge	-	<u>Accept. E.J. Saxe 6-4-81</u>
13. Indian Creek Covered Bridge	-	Already listed
14. Dents Run Covered Bridge	-	<u>Accept. E.J. Saxe 6-4-81</u>
15. Locust Creek Covered Bridge	-	<u>Accept. E.J. Saxe 6-4-81</u>
16. Fish Creek Covered Bridge	-	<u>Accept. E.J. Saxe 6-4-81</u>
17.	-	
18.	-	
19.	-	
20.	-	
21.	-	
22.	-	
23.	-	
24.	-	