

FORSYTHE BRIDGE
Spanning Big Flat Rock Creek, CR 650S
Moscow vicinity
Rush County
Indiana

HAER IN-106
IN-106

PHOTOGRAPHS

PAPER COPIES OF COLOR TRANSPARENCIES

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240-0001

HISTORIC AMERICAN ENGINEERING RECORD

FORSYTHE BRIDGE

HAER No. IN-106

LOCATION: County Road 650S, spanning Big Flat Rock River, 2 1/2 miles northeast of Moscow, in Orange Township, Rush County, Indiana.
UTM: 16.626309E/4375225N, Manilla, IN Quad

STRUCTURAL TYPE: Wooden covered bridge, Burr arch-truss

DATE OF CONSTRUCTION: 1888

BUILDERS: Emmett L. Kennedy, Rushville, IN (superstructure)
Smith Bussell, Greensburg, IN (substructure)

PRESENT OWNER: Rush County, Indiana

PREVIOUS USE: Rural vehicular and pedestrian bridge

PRESENT USE: Rural vehicular bridge, load limit set at 3 tons¹

SIGNIFICANCE: Local bridge contractor Emmett L. Kennedy built the Forsythe Bridge in 1888. The Kennedy family of Rushville built nearly sixty covered bridges, which are distinguished primarily by the scrollwork and cornice brackets at the arched portal, horizontal wood siding, and whitewashed exterior. Nearly all, including the Forsythe, use the Burr arch-truss. The well-crafted Forsythe Bridge illustrates the Kennedy's accomplishments in bridge building.

HISTORIAN: Sarah Maria Rose Dangelas, summer 2002

PROJECT INFORMATION: The National Covered Bridges Recording Project is part of the Historic American Engineering Record (HAER), a long-range program to document historically significant engineering and industrial works in the United States. HAER is part of the Historic American Buildings Survey/Historic American Engineering Record, a division of the

¹ This should change to 10 tons after the bridge is restored.

National Park Service, U.S. Department of the Interior. The Federal Highway Administration funded the project.

Chronology

- 1848 July 5, Emmett Loren Kennedy born to Archibald McMichaels Kennedy (1818-1897) and Henrietta Langston Kennedy (1820-1883).
- 1858 Big Flat Rock Church built near the future site of the Forsythe Bridge.
- 1864 The Kennedys buy a 247-acre farm and move to Rush County. Arch establishes his construction business in Rushville.
- 1870 Arch Kennedy, with help from Emmett, builds his first bridge in Dunlapville, Indiana. He then names his business "A.M. Kennedy & Sons."
September 14, Emmett Kennedy marries Martha Ann Freeman (born December 18, 1850, Union County); they will have ten children, six who live to adulthood.
- 1874 A.M. Kennedy listed in the local business directory as farmer and bridge builder.
- 1883 Brothers Charles and Emmett take over the business, which becomes "Kennedy Brothers." Arch goes into politics full-time.
- 1886 Charles leaves the business in Emmett's hand as he becomes a full-time lawyer.
- 1888 "E.L. Kennedy" builds the Forsythe Bridge.
May 24, contracts are let.
August 15, completion of substructure is recorded.
October 6, completion of superstructure is recorded.
- 1890s Emmett retires from bridge building.
- 1913 March 25, the Big Flat Rock River floods, damaging Forsythe Covered Bridge.
- 1918 The Kennedy family builds their last bridge.
- 1937 January 26, Big Flat Rock River floods.
- 1938 December 13, Emmett dies at age 90 in Rushville.²
- 1980-84 Forsythe Bridge is closed to traffic and threatened with demolition.
- 1983 Seven Kennedy-built structures, including Forsythe Bridge, are listed together on the National Register of Historic Places as "A.M. Kennedy House and Covered Bridges of Rush County."
- 1984 Restoration of Forsythe Covered Bridge completed and it reopens to traffic.
- 2002-04 J.A. Barker Engineering, Inc., planned restoration of Forsythe Covered Bridge.

² Obituary of Emmett L. Kennedy, *Rushville Republican*, 13 December 1938.

Introduction

Local bridge-builder Emmett L. Kennedy and his company built the Forsythe Bridge in 1888. The Kennedy family of Rushville, Indiana built nearly sixty covered bridges in their home state. Kennedy bridges are distinguished primarily by their housing--scrollwork and cornice brackets at the portals, horizontal wood siding, and whitewashed exteriors. Nearly all, including the Forsythe Bridge, use the Burr arch-truss system. At 186' long, the Forsythe Bridge is the longest single span bridge the family constructed and is an excellent example of the Kennedy family's accomplishments in bridge building. The Forsythe Bridge carries County Road 650S across Big Flat Rock River, 2 1/2 miles northeast of Moscow, Orange Township, Rush County, Indiana.³ Still open to traffic and set for restoration in 2002, the Forsythe Bridge is a noteworthy example of the enduring strength and charm of wooden covered bridges.

Description

The Forsythe Bridge is composed of a 186' single-span wooden Burr arch and a twenty-two panel multiple kingpost truss (see Appendix B, Illustrations 1 and 2). The bridge is immediately surrounded by woods, but beyond that, residences and farms stretch out in all directions. It is a quiet location and not heavily traveled, even though there is no easier alternate route. The Big Flat Rock River travels below the bridge in a southerly direction. The bridge is supported at the riverbanks by carefully pointed cut stone abutments.⁴ The stepped wing walls that lead from the roadway at each corner of the bridge down to the riverbanks are an unusual feature (see Appendix B, Illustration 3).⁵

The multiple kingpost design arranges strong, vertical posts at 8'-3" intervals, connected to a top and bottom chord that run the length of the truss. Diagonal braces connect the posts to each other from bottom to top toward the center of the truss. A set of arches is then imposed upon the truss on either side of the posts and braces for added strength.

The upper and lower chords are each made up of two parallel timbers that function as a single chord (see Appendix B, Illustration 4). The diagonal braces fit into the vertical posts via double-step joints at both ends (see Appendix B, Illustration 4). The chords at both top and bottom sandwich the posts. The arches are bolted to the posts and, through that, to each other with a pair of threaded metal bolts. A small number of timber segments are connected with a

³ The river's name is concurrently written "Flat Rock" and "Flatrock" in both historical and contemporary documents.

⁴ The face of the masonry was "pointed up" as a finishing detail in 1888.

⁵ Although Forsythe is the only extant Kennedy bridge with stepped wing walls, the Kennedys incorporated this feature in some of their "village" style bridges. See images in Richard Sanders Allen, *Covered Bridges of the Middle West* (Brattleboro, VT: Stephen Greene Press, 1970), 66-67.

lap joint to create each arch. These segments are joined at the posts, where the arch is notched into the verticals (see Appendix B, Illustration 5). The arches sandwich the lower chords on their way to the footing at the abutment and rest directly on skewbacks at the abutments.

Overhead tie beams sit on the top chords beside each post (see Appendix B, Illustration 6). Diagonal braces form X's in the overhead panels and are joined at their ends to the tie beams with mortise and tenon framing and an adjustable wooden wedge. These wooden wedges in the joints of the bracing allow for added tension as the bridge has changed with age and exposure (see Appendix B, Illustrations 6 and 7). The roof is sheet metal covered with shingles. The eaves extend about 1' from the siding. There is a window on either side near the center of the bridge.

Heavy lateral beams, spaced regularly beside the vertical posts and on top of the lower chords, make up the floor system (see Appendix B, Illustration 7). Diagonal braces form X's to connect the lower chords to add lateral support. On top of the beams, irregularly spaced stringers run longitudinally across the bridge. The deck is composed of a layer of longitudinal wooden planks on top of lateral planks that in turn rest on the stringers. A guardrail runs the length of the deck and is attached to the truss.

Larry Stout, the President of Rush County Heritage, gave the author a tour of Forsythe Bridge in June 2002. He pointed out the scant remains of what appears to be an advertisement for a livestock auction, dated 1889, inside the east portal, on the south side at eye-level. It was common for merchants to advertise their products and services with postings on the insides and portals of covered bridges.⁶

The portal opening is 15'-9" wide, with a vertical clearance of about 13'-8" (see Appendix B, Illustration 8). Horizontal clapboard sheathing protects the sides of the bridge, while the portal faces are of vertical planks. There is no space between the top of the sheathing and the eaves, making the bridge dark and still.⁷ The entire bridge is painted white. The details on the portal are distinctive Kennedy touches. Wooden scrollwork, now painted dark green, decorates the face of the portal on either side of the rounded arched opening. There are five pairs of decorative brackets in the gable's cornice. In the tympanum, dark green stenciling reads "Built by E.L. Kennedy 1881."

⁶ For more on this practice, see Richard Sanders Allen, *Covered Bridges of the Northeast* (Brattleboro, VT: Stephen Greene Press, 1957), 3.

⁷ Often with covered bridges, a space is left under the eaves to allow transverse winds to pass through and to allow light into the bridge. The Kennedy bridges do not typically have this feature.

Covered Bridges in Indiana

In the early nineteenth century, several important patent designs had proved the strength and resourcefulness of covered wooden trusses. Timber bridges quickly became more popular than stone bridges since they were less expensive to construct, called for materials that were easy to come by, could span greater widths, and required skills that local builders and carpenters already possessed. The addition of roofs and siding protected the wooden truss members and joints from the elements, thereby considerably increasing their life spans. The height of the covered wooden bridge era was the 1870s.

Between 1820 and 1922, at least 600 covered wooden bridges were built in Indiana. A handful of bridge-building companies and individuals were responsible for a bulk of the covered bridges in Indiana. J.J. Daniels and J.A. Britton were each prolific builders in and around Parke County, west of Indianapolis. On the other side of the capital, three generations of the Kennedy family reigned in this industry. Daniels, Britton, and the Kennedys built at least 158 bridges in Indiana.⁸ Another company involved in Indiana covered bridge construction was Ohioan Robert W. Smith and his Smith Bridge Company, who worked out of Toledo, but built several bridges in neighboring Indiana.

In 1930 the Covered Timber Bridge Committee was organized under the auspices of the Indiana Historical Society and the direction of state highway engineer and covered bridge enthusiast Robert B. Yule. At that time, the committee members gathered statistics, took documentary photographs, collected news clippings, and corresponded with bridge builders' families and local historians to create an archive on the covered bridges in the state. The result of this project is "The Covered Bridge Collection" in the Indiana Historical Society Library, which is divided into two sets of folders, one for photographs and the other for documents.⁹ Their effort left an important archive of Indiana's bridges at mid-century, particularly since many of these bridges have disappeared.

Although various organizations around the state have been active in preserving the bridges, most have been lost to replacement metal spans, floods, arson, and/or neglect. In 1998 there were only ninety-three covered wooden bridges left in the state.¹⁰ In 2002, Indiana's Historic Bridges (including concrete, metal, and wooden spans) made the National Trust for Historic Preservation's "Eleven Most Endangered Structures" list.

⁸ *Indiana History Bulletin* 69, no. 1 (March 1998), 1.

⁹ There is no finding aid for these files, since they are uncatalogued, but the folders are readily available when requested as "The Covered Bridge Collection" and subsequently by county. Unfortunately the files were not kept up-to-date and primarily contain clippings, etc., only from the late 1930s to the early 1950s. The bulk of the photographs the author examined were taken ca. 1940 and are small format. Some negatives and postcards are present as well.

¹⁰ *Indiana History Bulletin*, 1. The author believes the tally in 2002 to be ninety.

History of the Bridge Site

The Forsythe Bridge spans Big Flat Rock Creek and carries County Road 650S, in Orange Township, Rush County, Indiana. Although Indiana became a state in 1816, the first permanent European American residents did not settle in Rush County until 1819.¹¹ The county became a farming and milling community, with the first gristmill opening in 1821. The county government was established in 1822 in Rushville, about 12 miles north of the future location of Forsythe Bridge.¹²

The first gravel and plank roads in Rush County were toll roads, built by stock road companies or local residents to replace dirt trails that were insufficient for bringing farm products and milled goods to regional trading centers. Although the railroad stopped in Rushville at least as early as 1852, without secure and lasting wagon roads, Rushville and Rush County at large were in danger of being bypassed by more efficient travel and trade routes stopping in other areas.¹³ In the 1870s, the county government began constructing a network of free gravel roads as part of a statewide movement toward internal improvements.¹⁴ A profusion of wooden bridges were constructed in this era. However, by the close of the century, heavier loads and increased traffic encouraged the county to construct metal bridges, since they were thought to be more formidable and were fireproof.¹⁵

Within Rush County, the small Orange Township is notable for its rugged terrain and abundance of streams and creeks.¹⁶ While no major roads or railways make their way through this township, Big Flat Rock River cuts from the northeast and runs south through the eastern half of the township. The nearest village to Forsythe Bridge is Moscow, which lies 2 1/2 miles to the southwest, downstream from the river.¹⁷

¹¹ Among these families was the Arnold Family, whose descendents are still living on the farm their forbears purchased and cultivated near Rushville. The author had occasion to visit with Eleanor Arnold, a noted local historian and vice president of the preservation group Rush County Heritage, who lives with her husband in the 1853 Arnold House. Mrs. Arnold's passion for local history has been a tremendous advantage for the county's and state's memorial record.

¹² Rushville is the county seat. It is also the nearest incorporated town to Forsythe Bridge.

¹³ S. D. King, "Map of the State of Indiana" (New York: S. D. King, 1852).

¹⁴ By the 1890s, taxes were levied in various townships to build new roads or to purchase existing toll roads.

¹⁵ For the history of transportation in Rush County see *History of Rush County, Indiana* (Chicago: Brant & Fuller, 1888; reprint, Knightstown, IN: Eastern Indiana Pub. Co., 1966); A.L. Gary and E.B. Thomas, eds., *Centennial History of Rush County, Indiana* (Indianapolis: Historical Publishing Co., 1921), 92-100; Allen, *Covered Bridges of the Middle West*.

¹⁶ Gary and Thomas.

¹⁷ There is a restored Kennedy bridge at Moscow that, since 1986, has inspired the annual "Moscow Covered Bridge Festival." It was built in 1886, most recently restored in 1990, and is still open to vehicular traffic.

A map of Orange Township shows a continuous road spanning the river at this location before the 1888 construction of the Forsythe Bridge.¹⁸ Documentation of a previous bridge at this site could not be found. It is likely that what looks like a crossing on the map is actually a ford. Furthermore, the Commissioners Records refer, on at least two occasions, to the present bridge's construction "at Forsythes Ford across Big Flat Rock River."¹⁹

The name Forsythe references the grist mill that Asa Forsythe operated from 1870-1884. In 1870, Forsythe purchased the Hungerford Mill, which sat on the east bank of the river adjacent to the bridge. According to covered bridge historian Bryan Ketcham, Forsythe abandoned the mill in 1884.²⁰

In 1912 the Roth Round Barn was erected within sight of the bridge on the east shore of the river. This picturesque structure became as much a tourist attraction as the bridge. The barn fell into disrepair and either collapsed or burned in the early 1980s.

On the other side of the river, in the nearby hamlet of Gowdy, Flat Rock Christian Church, was built in the 1850s. In 1984 the pastor joined in the effort to preserve Forsythe Bridge since it is a major byway for the congregation.²¹ In 1888, the bridge most likely would have served a similar function for this church, being more convenient than a ford.²²

Construction of the Bridge²³

In nineteenth century Indiana, the county commissioners let bridge contracts. A similar three member Board of Commissioners still governs the county. In the nineteenth century, the life of a bridge often began many months before its construction. A petition might be circulated and presented to the commissioners who would then agree to apportion county monies to the cause and subsequently order specifications from a local builder, an engineer, or a county employee. A call for bids would appear in the local newspaper, and often the Indianapolis newspaper, at least twice.²⁴ The call would ask for proposals for bridges that followed the

¹⁸ "Orange Township," *Atlas of Rush County, Indiana* (Chicago: J. H. Beers & Co., 1879), 55.

¹⁹ Rush County Commissioners, "Record Book 14" (Rushville, IN: Rush County Court House), 234, 373.

²⁰ Bryan E. Ketcham, *Covered Bridges of the Byways of Indiana* (Oxford, OH: Oxford Printing Company, 1949), 55.

²¹ Randy McNutt, "County to Accept Bids," *The Cincinnati Enquirer*, 9 September 1984, B2.

²² The author could not locate an initial petition to bridge the river at this location, but it is probable that the church's congregation would have desired its erection.

²³ For more on calling for proposals, determining specifications, and awarding contracts, see Wayne M. Weber, *Covered Bridges in Indiana* (Midland, MI: Northwood Institute, 1977), 11-13.

²⁴ James Cooper described this process in a personal communication, June 2002.

specifications available in the auditor's office. At the arranged date, the county commissioners would convene a special meeting to open the bids and let the contract. Contractors and builders were sometimes present at these meetings.

On May 23, 1888, the Rush County Commissioners "proceeded to receive sealed bids for the construction of a Bridge across Flat Rock at Forsythe."²⁵ The records of the commissioners include a list of each proposal for both the superstructure and for the substructure. Twenty-three bids from fourteen different contractors were submitted for the superstructure, including one bid from the Smith Bridge Company and four separate proposals from Emmett L. Kennedy.²⁶ The Columbus Company submitted the highest bid at \$5,782.80, while the lowest (\$3,392), came from the Wisconsin Bridge Company. At this meeting, the board accepted "the proposition of E.L. Kennedy to construct said bridge according to Plan 3 for the sum of \$3700.00."²⁷ Emmett Kennedy's alternate proposals, all for wooden bridges, were \$4,205, \$4,000, and \$3,500. There is no hint in this record as to the differences between the four proposals. The *Rushville Republican* noted the following day that the "court was well attended by bridge builders."²⁸

At the May 23 meeting, bids were opened and awarded for a second bridge, this one across Mud Creek, also in Orange Township. E.L. Kennedy submitted three bids for this structure but lost to the Variety Bridge Company.²⁹ This bridge must have been substantially smaller since the bids for the superstructure ranged only from \$500 to \$1,264.20.

While the contract for the bridge superstructure was not in the Commissioners Records, completion of the superstructure was recorded on October 6, 1888. A payment of \$3,800 was allowed at that date to Emmett Kennedy.³⁰ The *Rushville Republican* noted that "the approaches are to be built by the people of the neighborhood, without expense to the county, unless the cost exceeds \$600."³¹

²⁵ Rush County Commissioners, "Record Book 14" (Rushville, IN: Rush County Court House), 229.

²⁶ The Smith Bridge Company built many covered bridges in Indiana. The business was based in Toledo, Ohio and led by Robert W. Smith, who patented his own designs for wooden trusses. See, for example, Cataract Falls Covered Bridge (HAER No. IN-104).

²⁷ Rush County Commissioners, "Record Book 14," 230.

²⁸ *Rushville Republican*, 24 May 1888, 1.

²⁹ Rush County Commissioners, "Record Book 14," 230. The *Rushville Republican* fills in details left out of the commissioner's record. It reported on May 31, 1888 that "The Mud Creek bridge is to be of iron, and the contract was let to the Variety Iron Works Co., of Cleveland, Ohio, at \$865.50." The Commissioners Records note that Kennedy's proposals were for wooden bridges.

³⁰ Rush County Commissioners, "Record Book 14," 373. An additional \$100 was added to the contract price for "extras ordered."

³¹ *Rushville Republican*, 31 May 1888, 1.

The masonry structures that supported the wooden trusses were often built under a separate contract. This part, called the substructure, required different skills, materials, and experts. Although sometimes the superstructure contractor was in charge, often a separate bid and contract were allowed. For example J.J. Daniels in Parke County drafted abutments, piers, and pilings, and referred to these features in his bridge proposal specifications.³² However, while the Kennedys may have supervised or visited the site during construction of the abutments, the contract was actually awarded separately at Forsythe.³³

Bids for the Forsythe Bridge substructure (abutments) were also opened at the May 23 meeting. Four proposals were submitted. The commissioners awarded the contract to Smith Bussell, “his being the lowest & best bid” at \$7.34 per yard for the masonry, \$15.00 per thousand for the timber, 34 cents per cubic yard for the wet excavation, and 10 cents per yard for the dry excavation.³⁴ On May 24, 1888, a contract with Smith Bussell for the substructure of the bridge was recorded. Bussell completed the work on or before August 14, at which time the commissioners allowed him the remainder of his pay. In total, Bussell received \$2,697.20 for the Forsythe Bridge substructure.

On October 6, 1888, after the bridge was complete, James Keating became superintendent of the building of the approaches.³⁵ In total, then, building the Forsythe Bridge cost the county at least \$6,497.20.

The Kennedys

The story of the Kennedy family is told in several places and still makes the rounds in local oral history.³⁶ Descendants have been involved in contributing to the lore and archives, although personal papers and photographs are scant. Much of the written information on the Kennedys and their bridges appears to come from family tradition.³⁷ The story usually begins

³² See HAER No. IN-105, West Union Bridge.

³³ A nineteenth-century photograph of the construction of the abutments for an unidentified Kennedy bridge shows Emmett (with his characteristic long white beard and dark suit) taking a break to pose alongside the masons. Collection of Bill Gulde.

³⁴ Smith Bussell [sometimes written Bussel] resided in Greensburg, in Decatur County, which borders Rush County to the south. Rush County Commissioners, “Record Book 14,” 231.

³⁵ Rush County Commissioners, “Record Book 14,” 373.

³⁶ For example, Eugene R. Bock published a history of the Kennedys and their bridges in 1947. Mildred McMillan Benson later published a short history in the Rush County Sesquicentennial book. It appears that Benson (Emmett’s granddaughter) relied heavily on Bock’s article, as several paragraphs are borrowed nearly word-for-word. Neither author gives references for their information, though the details may have come from Karl Kennedy, among printed sources.

³⁷ For example, Karl Kennedy, Emmett’s son and business partner at the beginning of the twentieth century, spoke to covered bridge enthusiasts and others about his father and their work processes. At a 1964 meeting of the Indiana Covered Bridge Society, Karl “told many interesting stories about the bridges and their construction.” George Gould, “Some Notes on

with patriarch Archibald McMichaels Kennedy, who brought his family to Rush County to live in 1864.

Archibald (“Arch”) Kennedy was a self-taught man who worked as a carpenter from 1841-53. Starting in 1853, his granddaughter writes, he “supplemented his carpenter work with small bridge construction.”³⁸ In 1870, with help from his 22 year-old son Emmett, Arch began his career as a bridge-builder with a contract in Union County for the Dunlapville Bridge. By 1874, “A.M. Kennedy” was listed in the county directory as both “farmer and bridge-builder.”³⁹ Emmett took over the family’s bridge building business when his father entered local politics in the mid-1880s. In 1888, the year he constructed Forsythe Bridge, Emmett is listed in the county directory as a bridge builder.⁴⁰

The peak building period for the family was between 1881 and 1884, when they built at least twenty-four bridges.⁴¹ In total, the family built nearly sixty bridges in Indiana (and one in Butler County, Ohio, 1871). Nearly all were Burr arch trusses.⁴² Tradition holds that Arch secured the contract (being an able orator and skilled politician), Emmett supervised the construction, and a second son, Charles, was for a short time in charge of supplies and specifications.⁴³ The actual construction process is detailed in several sources.⁴⁴

The Kennedy business was headquartered in Rushville, where they maintained a lumberyard. Here, the bridge trusses were cut and, “in most cases completely prepared for framing, even to the boring of bolt holes, before being reshipped to the bridge site for assembly.”⁴⁵ The builders at the lumberyard became so skilled at bridge construction that the process worked as

the Kennedy Family,” *Indiana Covered Bridge Society Newsletter* 1, no. 4 (July 1964): 1. Emmett’s daughter, Nellie Kennedy McMillan, and granddaughter Mildred McMillan Benson, also contributed to the materials extant on the family.

³⁸ Mildred McMillan Benson, “The Bridge Building Kennedys,” in *Rush County Sesquicentennial*, 32.

³⁹ *Atlas of Rush County*, directory, 1874.

⁴⁰ *History of Rush County, Indiana*, 656.

⁴¹ George E. Gould, “Indiana’s Covered Bridges Built by Inventive and Skillful Craftsmen,” *Outdoor Indiana* (February 1978), 7.

⁴² One of the two Howe trusses was in Greene Co. It was called “Old Nellie” and spanned 600’. The Kennedys also constructed a multiple Kingpost bridge in Homer, Indiana.

⁴³ Allen, *Covered Bridges of the Middle West*, 65. Charles left the family business to Emmett when he moved on to become a lawyer.

⁴⁴ All of these are mid-twentieth century and appear to rely upon a single account, probably that of Emmett’s son Karl, who worked alongside his father in the company’s later years. The most comprehensive report found is Eugene R. Bock, “The Kennedys--Bridge Builders,” *Covered Bridge Topics: Indiana Edition* 11, no. 2 (1947): 1, 3-7.

⁴⁵ Bock, 5. Evidence of this assembly can be seen in the way the arch rings are notched into the truss posts (see Appendix B, Illustration 5). This connection indicates that the arch was bolted to the truss *before* the construction falsework (temporary support system) was removed, and therefore possibly before the truss was set into place.

a “veritable ‘production line.’”⁴⁶ Most sources note the employment of local carpenters under the direction of Emmett and “three or four ‘key’ men” to assemble the bridge on site.⁴⁷

After the bridge was let down to bear its own weight, the arch and truss settled. According to Karl Kennedy’s description, “wooden wedges were [then] driven in along the ends of the lateral braces between upper beams and between floor beams. Thus if the bridge was out of alignment, the proper wedges could be driven in to straighten the structure” (see Appendix B, Illustrations 4 and 6).⁴⁸ After the bridge’s covering was finished, the entire exterior was whitewashed. Karl Kennedy remembered that the paint was “prepared at the bridge site by stirring white lead and linseed oil in an old wooden tub.”⁴⁹

The trademark Kennedy decoration is a significant part of the story of the Forsythe Bridge. Other builders were certainly concerned with how their bridges would look. For example, J.J. Daniels noted in his specifications for a bridge in western Indiana, “The ends must have a neat plain finish with no projections to catch water or invite decay. They must be covered with three coats of white paint and lettered as the Board of Commissioners shall direct.”⁵⁰ The Kennedys went further.⁵¹ Their work is easily identifiable by its portal details as described above, and the Forsythe Bridge is no exception. Built just after the Kennedy’s peak construction period, it employs the paired cornice brackets, painted signature and date, and white finish that characterize five of the six remaining Kennedy bridges.

Although their last bridge contract was in 1918, the Forsythe Bridge was one of the firm’s last bridges. Only five bridges were erected after 1888. Competition with those who built metal bridges (which were fireproof and required less regular maintenance than wooden bridges), persuaded the Kennedys to concentrate on the more profitable avenue of general contracting and cement work, as well as on repairing bridges in the area. Emmett also pursued natural gas deposits on his land.⁵² E.L. Kennedy and Sons built the last Kennedy bridge in 1918 in Wayne County. Only six Kennedy bridges are still standing.

⁴⁶ Bock, 5.

⁴⁷ Bock, 5.

⁴⁸ In George Gould, “Some Notes on the Kennedy Family,” *Indiana Covered Bridge Society Newsletter* 1, no. 4 (July 1964): 4.

⁴⁹ Gould, “Some Notes on the Kennedy Family,” 4.

⁵⁰ Joseph J. Daniels, “Collection of Papers and Drawings of J. J. Daniels, ca. 1880-1898,” in Indiana Historical Society Library, Indianapolis.

⁵¹ The Kennedys also built five covered bridges with arcaded sidewalks. Some had enclosed overhead bracing above the roadway and the walkways, revealing the Kennedys’ celebration of their craftsmanship. These novelties, called “village-type” bridges, have all regrettably disappeared from the landscape. In 1934 the Historic American Buildings Survey (HABS) documented one of these, see “Kennedy Covered Bridge,” HABS No. IN-24-1. It was built in 1881 and replaced with a concrete bridge in 1940.

⁵² Eugene R. Bock, “The Bridge-Building Kennedys,” essay draft (Anderson, IN: 1945), 17.

Bridge Design

Theodore Burr (1771-1822) patented his first bridge design in 1806 and a second on April 3, 1817.⁵³ The 1817 patent drawing shows a multiple kingpost truss resting on stone abutments, superimposed with an arch whose ends are anchored to the abutment faces below the lower chords (see Appendix B, Illustration 9).⁵⁴ In Burr's design, the posts are in tension while the diagonal braces are in compression. The diagonals meet the posts with little need for mortise and tenon.

Although Burr built dozens of bridges, he is remembered more for the practicable design he patented and promoted. No doubt, much of its success was due to its expediency. Burr wanted to reduce the need for complex carpentry/joinery. He "advocated merely butting suitably mitered ends to save much of the carpentry effort and expense."⁵⁵ The design also allowed for variation at the connections, in the proportions, and with the materials. The design's widespread repute and proven durability helped provincial carpenters successfully bid for and build economical, lasting bridges more or less in their own backyards.⁵⁶ The Burr arch-truss became one of the most popular vernacular designs for wooden bridges in the United States, its product varying slightly from builder to builder.⁵⁷ In some cases, as with the Kennedy family, builders could master the Burr arch-truss to the degree that they could successfully earn a living almost entirely by constructing bridges in their regions. The Burr truss was used extensively in Indiana.⁵⁸ Historians generally attribute this to its being the favorite design of the state's most prominent bridge builders, Emmett and Archibald Kennedy, J.J. Daniels, and J.A. Britton.⁵⁹

⁵³ J. G. James, "The Evolution of Wooden Bridge Trusses to 1850 (Continued)," *Journal of the Institute of Wood Science* 9, no. 52 (1982): 169-193. The patents were lost in the US Patent Office fire of 1836.

⁵⁴ Reconstruction drawing as the original was lost in the US Patent Office fire of 1836.

⁵⁵ James, "The Evolution of Wooden Bridge Trusses to 1850 (Continued)," 171.

⁵⁶ One of the most popular anecdotes of the Kennedy family's dynamism relates to their showmanship at county commissioners' meetings as they attempted to persuade the officials to award them the contract at hand. The story begins with Emmett Kennedy, laid up at home with an ailment and idle time in 1872. He took to the task of building a 42" scale model of a Burr arch-truss. After recovering, he and his father used the model at the commissioners' meeting to sell their product to the officials, who otherwise might not grasp the sophistication of bridge-building. Emmett would use the model to illustrate his argument. At some point, Archibald, reportedly a man of some magnitude, would set the model on makeshift abutments and stand on top of the truss, proving the strength inherent in the design. This tactic apparently worked well. The model is now in the collection of the Rush County Historical Society. For one version of the story, see George E. Gould, "Indiana's Covered Bridges Built by Inventive and Skillful Craftsmen," 7.

⁵⁷ For example, the Kennedys created a particularly heavy truss by doubling the top chord and using larger members than other builders did for the transverse roof beams. They did not incorporate metal as some later Burr arch-truss users did, except in bolting the members together at key joints.

⁵⁸ George Gould, *Indiana Covered Bridges thru the Years* (Indianapolis: Indiana Covered Bridge Society, 1977). Gould calculates that about 63 percent of Indiana's covered bridges were Burr arch-trusses.

⁵⁹ E.g., Robert S. Yule, *The Covered Bridge in Indiana* (Indianapolis: Indiana State Highway Commission, 1971).

The Kennedy family almost exclusively used this design for their bridges. As discussed, the decision to keep to a single design helped the family and their employees become expert and expedient bridge builders. However, their loyalty to this design and to all-wooden structures in general steered them away from bridge-building activities in the 1910s, as competition from iron truss builders intensified.

Materials

According to all reports, by 1888, all of the structural members in Kennedy bridges would have been of white pine.⁶⁰ Bock and others tell us that the family imported white pine via railroad from Michigan. Once the bridge-building business was firmly established, the Kennedys operated a lumberyard in Rockville. Emmett's son Karl remembered it as roughly one block square, east of the intersection of Rushville's two railroad lines.⁶¹ Beers' 1879 map of Rockville illustrates an unnamed "lumber yard" in that area that might be the Kennedys' yard.

Relative to the abutments, several sources make note of the good, useable limestone located just south of the area. For example, the writers of the 1874 *Atlas of Rush County* reported "at Moscow and below, the limestone crops out, affording some fine building-stone."⁶² The 1879 map labels the "Good Limestone" along the western shore of Big Flat Rock River just south of Forsythe's Mill. In 1921, county historians identified the existence of "Limestone of a good quality for building crops out in the vicinity of Moscow," recalling that "quarries have been profitably worked in the past."⁶³ It is likely that stone for the abutments of Forsythe Bridge would have been quarried locally and that it was limestone.⁶⁴

Subsequent History of the Bridge

Currently, the county highway department owns and manages the bridge, but its primary stewards are the locals.⁶⁵ Rush County, in particular, has actively worked to protect and

⁶⁰ E.g., Bock, "The Kennedys—Bridge Builders," 5; Gould, "Some Notes on the Kennedy Family," 4, and John Sechrist, "More on Kennedy Bridges," *Indiana Covered Bridge Society Newsletter* 24, no. 1 (January 1987): 4. Sechrist wrote that a group of "experts say that most of the [Kennedy] bridges standing today were framed with white pine."

⁶¹ Bock, "The Kennedys—Bridge Builders," 5.

⁶² *Atlas of Rush County*, (1874), 2.

⁶³ Gary and Thomas, 231.

⁶⁴ Karl Kennedy's description of the family's bridges noted that the "stone for the abutments and piers was from local sources" (in Gould, "Some Notes on the Kennedy Family," 4).

⁶⁵ Forsythe Bridge is County Bridge number 146.

promote the preservation and appreciation of their bridges at least since the 1980s, a time of uncertainty for covered bridges.⁶⁶ After the near-loss of many of the bridges, those most active in the fight to save them formed Rush County Heritage, a small non-profit organization, in 1986.⁶⁷

Several sources indicate that the Kennedy bridges have a history of being simultaneously appreciated by some in the community and neglected by others. In 1973, the county commissioned a bridge inventory and inspection.⁶⁸ At that time, the independent contractor recommended replacing the bridge by 1978 with a two-lane highway. The county highway department closed the bridge from about 1980 to 1984, when the county entered into a serious debate about tearing down and replacing the remaining Kennedy covered bridges. This led several Rush County residents to form the Rush County Heritage to fight the demolition. In the end, the preservation-minded group succeeded and Rush County Commissioners allotted \$50,000 in June 1984 to repair the Forsythe Bridge.⁶⁹ Later that year, the bridge reopened to traffic after significant restoration.

In 1983, just before this civic struggle raged, the Forsythe Bridge was listed on the National Register of Historic Places as part of a theme study of Kennedy family structures in Rush County.⁷⁰ The study included all six extant covered bridges in Rush County and the house Archibald Kennedy built on his Rushville farm in the 1860s and lived in until his death in 1897.⁷¹

The efforts by the Rush County Heritage are to be commended. Their insistence that the bridge be kept in use has succeeded in saving this historic and distinguished structure.⁷² Although the bridge was showing signs of wear at the time of the author's visit, it is slated for restoration by J.A. Barker Engineering, Inc., 2002-2003.

⁶⁶ In addition to local residents, several of Emmett's descendants have shown an interest over the years. See for example, Wendy Mickle, "Letter to [her cousin] Mildred Benson," (1984) in the Collection of Bill Gulde.

⁶⁷ Rush County Heritage has since gone on to rescue and promote the preservation of several other local structures. The current president is Larry Stout, who was of great research assistance. Rush County Heritage, Inc., 6352 W 650S, Rushville, IN, 46173.

⁶⁸ Reid, Quebe, Allison, Wilcox, and Associates, Inc., *Bridge Inventory and Safety Inspection: Rush County, IN* (Indianapolis: Board of County Commissioners, 1973).

⁶⁹ Randy McNutt, "County to Accept Bids," *The Cincinnati Enquirer*, 9 September 1984, B2. The bids were accepted on September 10, 1984.

⁷⁰ Adrian [preparer] Ellis, "A. M. Kennedy House and Covered Bridges of Rush County," National Register of Historic Places Inventory, 1983.

⁷¹ The house still stands (the author saw it in June 2002) and appeared from the outside to be in excellent condition. Despite being made of brick, and not wood, this Italianate house does contain such Kennedy trademarks as cornice brackets, arched openings along the porches, and arched window hoods.

⁷² Eleanor Arnold, Larry Stout, and Bill Gulde, founding members of the organization, each stressed to the author in personal communications that Rush County Heritage believed this was the best way to preserve the bridge.

APPENDIX A, Illustrations



Illustration 1. Truss. Field photograph courtesy of author.

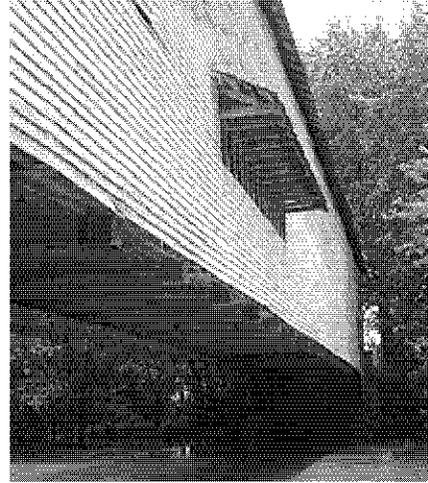


Illustration 2. South side. Field photograph courtesy of author.

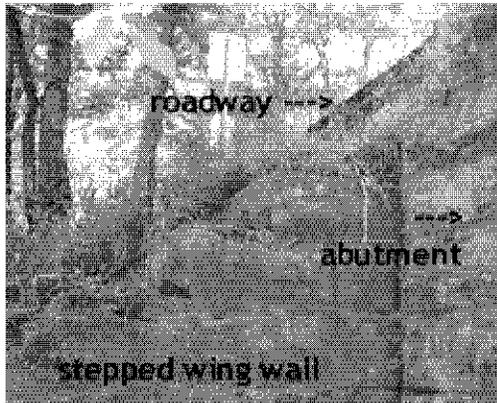


Illustration 3. Stepped wing wall. Field photograph courtesy of author.

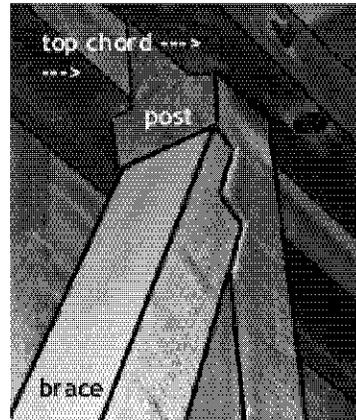


Illustration 4. Connections at the top chord. Field photograph courtesy of author.

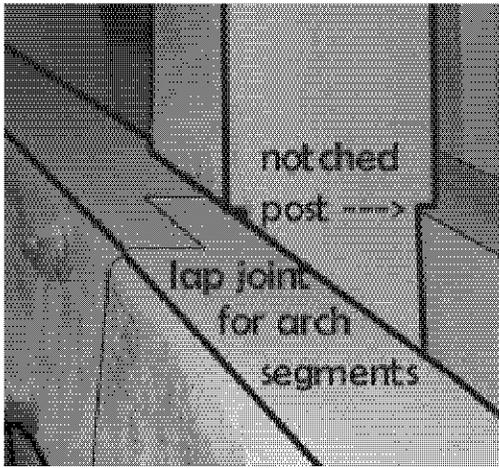


Illustration 5. Arch and post connections. Field photograph courtesy of author.

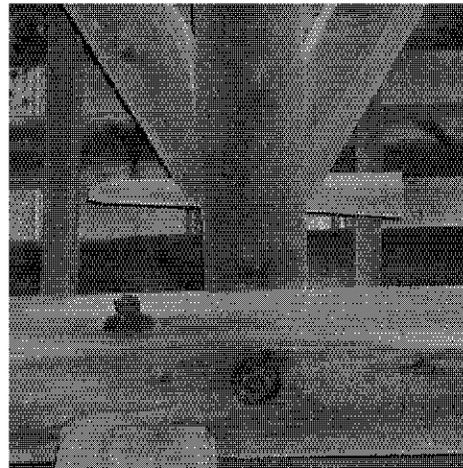


Illustration 6. Wedge at the tie beam. Field photograph courtesy of author.



Illustration 7. Floor system. Field photograph courtesy of author.

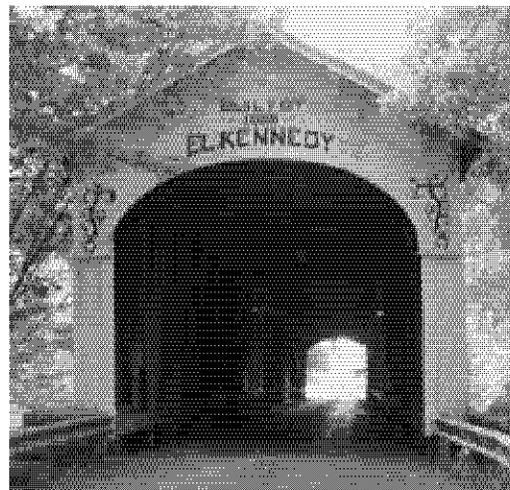


Illustration 8. West portal. Field photograph courtesy of author.

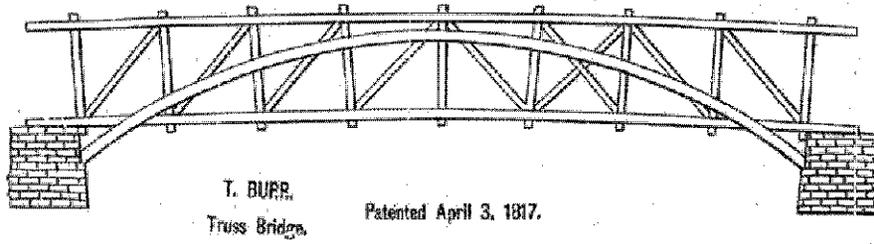


Illustration 9. Reconstruction of Burr's patent drawing.

BIBLIOGRAPHY

- Alexander, Mary M., and Capitola Guffin Dill. *Sketches of Rush County, Indiana*. Rushville, IN: Jacksonville Publishing, 1915.
- Allen, Richard Sanders. *Covered Bridges of the Northeast*. Brattleboro, VT: Stephen Greene Press, 1957.
- _____. *Covered Bridges of the Middle West*. Brattleboro, VT: Stephen Greene Press, 1970.
- Atlas of Rush County*, 1874.
- Atlas of Rush County, Indiana*. Chicago: J. H. Beers & Co., 1879.
- Benson, Mildred McMillan. "The Bridge Building Kennedys." *Rush County Sesquicentennial*.
- Bock, Eugene R. "The Bridge-Building Kennedys," draft of an essay. Anderson, IN, 1945.
- _____. "The Kennedys--Bridge Builders." *Covered Bridge Topics* 11, no. 2 (1947): 1, 3-7.
- _____. "The Covered Bridge and Indiana." *Indiana History Bulletin* 37, no. 5 (1960): 5-28.
- Chamberlin, Dann. "Covered Bridges of South-Central Indiana." *Covered Bridge Topics* 14, no 2 (1956): 1, 4, 6.
- Covered Timber Bridge Committee. *The Covered Bridge Collection*. Indianapolis: Indiana Historical Society, 1930-ca. 1955.
- Ellis, Adrian [preparer]. National Register of Historic Places Inventory, "A. M. Kennedy House and Covered Bridges of Rush County," 1983.
- Gary, A. L., and E. B. Thomas, eds. *Centennial History of Rush County, Indiana*. Indianapolis: Historical Publishing Co., 1921.
- Gould, George. "Some Notes on the Kennedy Family." *Indiana Covered Bridge Society Newsletter* 1, no. 4 (July 1964): 1, 4.
- _____. *Indiana Covered Bridges thru the Years*. Indianapolis: Indiana Covered Bridge Society, 1977.

- _____. "Indiana's Covered Bridges Built by Inventive and Skillful Craftsmen." *Outdoor Indiana*, (February 1978), 64.
- Hamner, Faith, ed. "Way Back When: Informal Essays of Rush County Oral History." Indianapolis: Indiana Junior Historical Society, 1974.
- History of Rush County, Indiana*. Chicago: Brant & Fuller, 1888. Reprint Knightstown, IN: Eastern Indiana Pub. Co., 1966.
- Indiana Historical Bureau. "Covered Bridges in Indiana." *Focus on Local History* (1998), i-viii.
- James, J. G. "The Evolution of Wooden Bridge Trusses to 1850 (Continued)." *Journal of the Institute of Wood Science* 9, no. 52 (1982): 169-193.
- Ketcham, Bryan E. *Covered Bridges of the Byways of Indiana*. Oxford, OH: Oxford Printing Company, 1949.
- King, S. D. "Map of the State of Indiana." New York: S. D. King, 1852.
- McMillin, William Robert. Letter to the author, 6 July 2002.
- McNutt, Randy. "County to Accept Bids." *The Cincinnati Enquirer*, 9 September 1984, B2.
- Mickle, Wendy. Letter to Mildred Benson, 1984. Collection of Bill Gulde.
- Obituary of Emmett L. Kennedy. *Rushville Republican*, 13 December 1938.
- "Pioneer Bridge Builder Dead at Rushville [obituary of Emmett L. Kennedy]." *Indianapolis News*, 13 December 1938.
- Reid, Quebe, Allison, Wilcox & Associates, Inc. "Bridge Inventory and Safety Inspection: Rush County, IN." Indianapolis: Board of County Commissioners, 1973.
- Rush County Commissioners. *Record Book 14*.
- Rushville Republican*, 24 May 1888, 1.
- Rushville Republican*, 31 May 1888, 1.
- Sechrist, John. "More on Kennedy Bridges." *Indiana Covered Bridge Society Newsletter* 24, no. 1 (January 1987): 4.
- Weber, Wayne M. *Covered Bridges in Indiana*. Midland, MI: Northwood Institute, 1977.

Yule, Robert S. *The Covered Bridge in Indiana*. Indianapolis: Indiana State Highway Commission, 1971.

Local Contacts

Eleanor Arnold, Rush County Historian and Vice President of Rush County Heritage, Inc.

J.A. Barker Engineering, Inc., Covered Bridge Restoration, <http://jabarker.com>

James L. Cooper, Professor Emeritus of History and Historic Bridge Consultant

Bill Gulde, Local Historian and Founding Member of Rush County Heritage, Inc.

Larry L. Stout, President of Rush County Heritage, Inc., 6352 W 650S, Rushville, IN, 46173

Identifying this bridge:

- World Guide # 14-70-04
- Rush County Bridge # 146
- IN Maps coordinates S4 T13N R9E

ADDENDUM TO:
FORSYTHE BRIDGE
National Covered Bridges Recording Project
Spanning Big Flat Rock Creek, CR 650S
Moscow vicinity
Rush County
Indiana

HAER IN-106
HAER IN-106

REDUCED COPIES OF MEASURED DRAWINGS

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240-0001