

Did You Know...

...That Bailey Bridges, a type of modular bridges, have their own nomenclature?

Donald Bailey invented this bridge type while working in the British War Office in 1940-1941, the realization of an idea he had dating back to 1936. These bridges became very important during World War II because they could be transported easily, and could be quickly erected over a river with relatively little effort and manpower. In the United States, Donald Bailey was granted a patent on May 15, 1945, for his Bailey bridge design. Additionally, the United States Army made extensive use of Bailey bridges, and even published a complete guide to Bailey bridges, *Army Field Manual FM 5-277*. While Bailey bridges are a type of truss bridge, the proper names used to identify a Bailey truss and its parts differ from the terms used with other types of truss bridges. The parts of Bailey trusses were given specific names in the U.S. Army field manual. For example, floor beams are called “transoms” on Bailey trusses. Additionally, some parts are unique to Bailey bridges and not found on traditional truss bridges. For example, hand operable “transom clamps” hold the transoms in place.

Bailey trusses are composed of identical truss panels that can be combined in a variety of ways to meet the loading and span length requirements of the crossing. Bailey bridges are given classifications that reflect the placement of these panels. If on either side of the roadway a single row of panels is present, the bridge is a single truss, single story truss bridge. A stronger truss can be produced by placing additional truss panels side-by-side next to each other. As such, if on either side of the roadway, there is a pair of truss panels placed side-by-side, the truss is a double-truss, single story truss. It is also possible to stack panels vertically for even more capacity, adding additional “stories” to the truss. As such, a bridge with each side of the roadway having two side-by-side truss panels sitting on top of two more side-by-side truss panels is a double-truss double-story truss bridge. These processes can be expanded even further to produce triple trusses, and triple stories.

Bailey truss panels can also be used to construct suspension bridges, with the truss panels forming both suspension bridge towers and the stiffening truss for the deck. Bailey truss panels can also be used to built temporary vertical lift bridges, with the truss panels not only forming the lift truss, but the lift towers as well. Lastly, another use of the Bailey panels is in the construction of the bents (piers), which support the bridge.

While originally used as wartime structures, Bailey bridges have continued to be used in peacetime to the present day. While the most popular use today is for temporary bridges during bridge construction projects, they also are a quick way to reopen crossings where bridges have collapsed in floods. They also are used in Canada as permanent bridges, often in remote locations where the Bailey trusses are easier to transport and erect in such locations. Commercial providers of Bailey bridges, such as Acrow Corporation, have altered and adapted the original Bailey design to meet their needs. For example, a temporary vertical lift bridge provided by Acrow during the rehabilitation of the Bridge of Lions in Florida used Bailey style panels. However, the size of the vertical lift tower panels was far larger than the traditional Bailey truss panels used in wartime.

For bridge historians, it is worth noting that after World War II, many wartime Bailey bridges were sold as surplus and installed as permanent crossings in the United States and Canada. Surviving Bailey bridges that are war surplus stand out as historic in comparison to modern Bailey bridges. Many of the Bailey bridges were manufactured using British steel, so the names of various British steel mills may be

found rolled into the steel members of these bridges, aiding in identifying potentially historic examples of Bailey bridges.

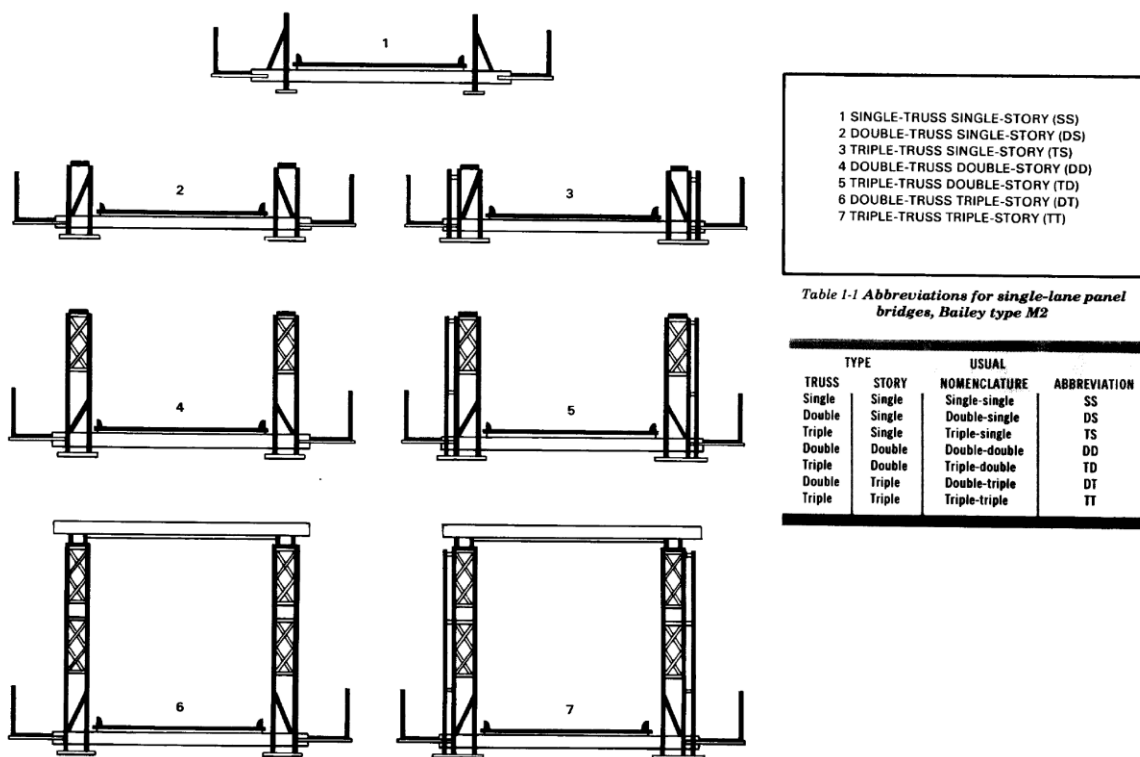
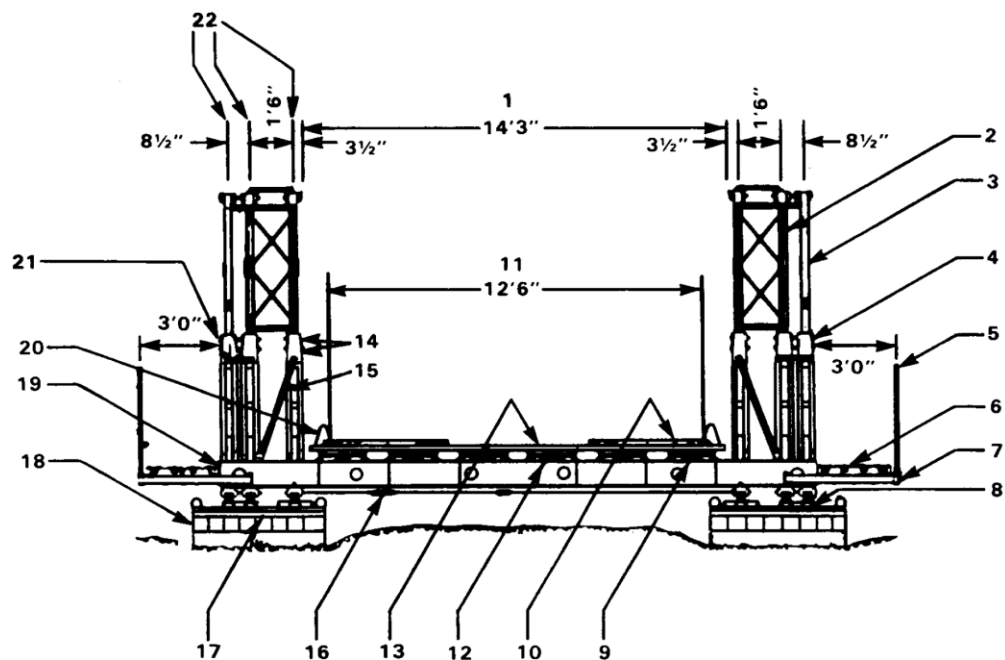


Figure 1-2 Single-, double-, and triple-truss assemblies

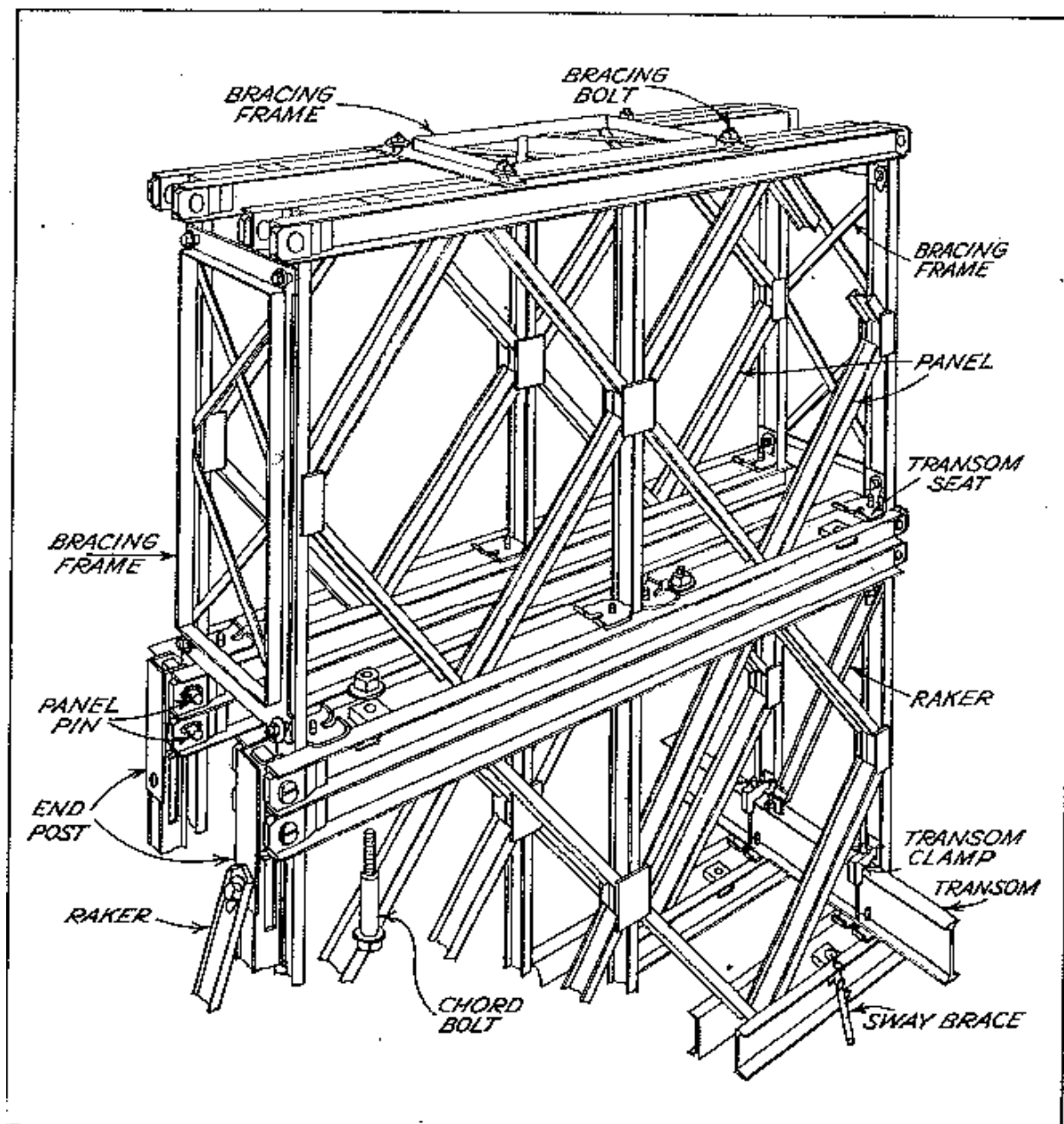
This diagram from the Army Field Manual shows the names of various layouts of a Bailey Bridge.



- |                             |                         |
|-----------------------------|-------------------------|
| 1 CLEARANCE BETWEEN TRUSSES | 12 PLAIN STRINGER       |
| 2 BRACING FRAMES            | 13 CHES                 |
| 3 PANEL                     | 14 PANEL PINS           |
| 4 END POST                  | 15 RAKER                |
| 5 FOOTWALK POST             | 16 SWAY BRACE           |
| 6 FOOTWALK                  | 17 BASE PLATE           |
| 7 FOOTWALK BEARER           | 18 GRILLAGE             |
| 8 BEARING                   | 19 TRANSOM              |
| 9 BUTTON STRINGER           | 20 STEEL RIBBAND        |
| 10 WEAR TREAD               | 21 SHORT PANEL PINS     |
| 11 ROADWAY                  | 22 CENTERLINE OF PANELS |

*Figure 1-1 Panel bridge, Bailey type M2*

This diagram from the Army Field Manual shows the names of various parts of a Bailey Bridge.



**Figure 6. Bailey Panels in End Bays of Double-double Bridge**

This isometric diagram appeared in a 1947 article written by John A. Thierry, Captain, Corps of Engineers, and it shows the names of various parts of a Bailey Bridge.



The Royal Military College of Canada in Kingston, Ontario features an exhibit of a Bailey bridge, along with interpretive signage, that illustrates the wartime use of this bridge type. The exhibited Bailey truss was fabricated from British steel sourced from several different mills.



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May 15, 1945.

D. C. BAILEY

2,376,023

CONSTRUCTION OF BRIDGES AND OTHER METAL FRAME STRUCTURES

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Fig. 4.

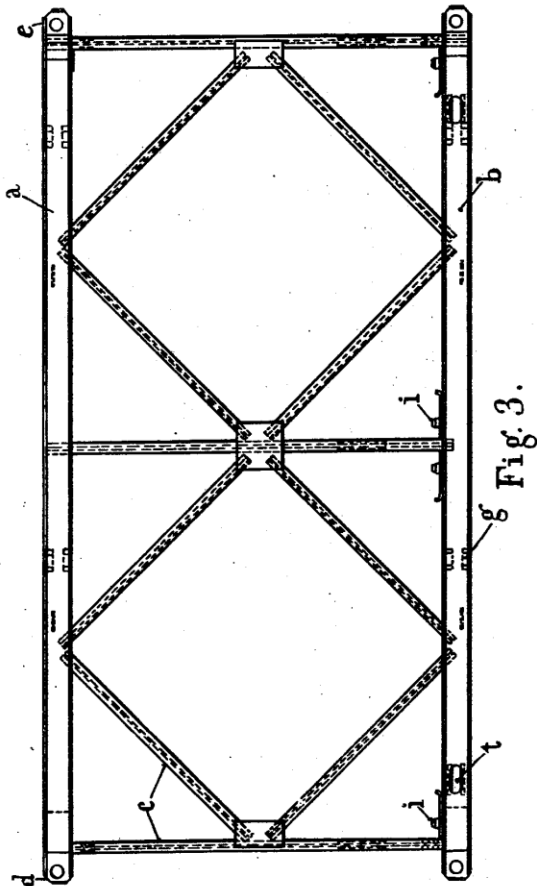


Fig. 5.

Inventor  
D. C. Bailey  
By *Glasgow Downing & Co.*  
Attys

A drawing of a Bailey truss panel as it appeared in the 1945 US Patent application.





Bearings and jacking step visible just above on the end post.





Bottom chord connections with raker.



Bracing frame.





Stringers and chases.



Transom and stringers.





Transom clamp.