Stevens was the engineer who built the Great Northern Railway in the United States and was chief engineer on the Panama Canal between 1906 and 1908.

In 1886, Stevens was in charge of building a rail line from Duluth across the Upper Peninsula of Michigan, and three years later he was hired by the Great Northern Railway. He was the first European American to discover the Marias Pass over the Continental Divide; Stevens Pass in the Cascade Range was named for him. During his time at Great Northern, Stevens built over a thousand miles of railroad, including the original Cascade Tunnel.

In 1905, he was hired by Theodore Roosevelt as chief engineer on the Panama Canal. Stevens’ primary achievement in Panama was in building the infrastructure needed to complete the canal. He rebuilt the Panama Railway and devised a system for disposing of soil from the excavations by rail. Stevens argued the case against a sea level canal like the French had tried to build. He successfully convinced Roosevelt of the necessity of a high-level canal built with dams and locks.

To Roosevelt’s great annoyance, Stevens resigned suddenly from the Canal project in 1907 as the work turned to construction of the canal itself. Stevens had little expertise in building locks and dams, and probably realized he was no longer the best person for the remainder of the job. The true reasons for his resignation have never been known.

Following the collapse of Imperial Russia in 1917, leaders of the provisional government appealed to Woodrow Wilson for help with their transportation systems. Stevens headed a group of U.S. railroad experts sent to manage the Trans-Siberian Railway. After the overthrow of the provisional government, Stevens remained in Allied-occupied Manchuria and in 1919 headed the group charged with the administration and operation of the Chinese Eastern and Siberian railways. He returned to the U.S. in 1923 and retired to North Carolina.