

**Historic STEM Women/Engineers:**

Tabitha Babbitt (circa 1779-1853)

A Shaker woman in the early 1800s used her engineering skills to invent the circular saw. While in the Massachusetts sawmill she owned with her husband, she analyzed the wasted energy of the push forward effort of the straight saw, with cutting accomplished only on the back pull. Her invention became the prototype of circular saws forever. It was used in sawmills then, and is now used in modern day industrial and home carpentry worldwide.

<http://science.howstuffworks.com/innovation/inventions/10-things-that-women-invented1.htm>

Emily Roebling (1843-1903)

Just three years into construction, when she became the civil engineer of the Brooklyn Bridge, she also became America's first female engineer. Daughter-in-law of John Roebling, deceased architect of the Brooklyn Bridge, and wife of his son Washington, heir to build the bridge, Emily was knowledgeable of and skilled in the technical issues of bridge construction. When decompression disease left Washington partially paralyzed, deaf, unable to speak, and confined to bed, Emily became the "man on the job." When challenges arose to replace him as chief engineer because of his limited abilities, Emily, the first woman to do so, addressed the American Society of Civil Engineers, and convinced them to keep the project in the family. She then continued her work for the next eleven years to completion of the bridge. As a woman, she didn't have the title, but rumor had it, Emily was the brains behind the civil engineering of the Brooklyn Bridge. Plaques in both bridge towers honor her skills.

<http://civilwarwomenblog.com/emily-warren-roebling/>

Julia Morgan (1872-1957)

With no architectural schools yet established on the West Coast, she enrolled in the all-male College of Engineering at the University of California, Berkeley. In 1894 she became the first female to graduate Berkeley with a civil engineering degree. She rebuilt the San Francisco 1906 earthquake-damaged Fairmont Hotel and established her own architect company. One-third of her clients were women or women's organizations. She designed twenty-eight buildings for the YWCA in California, Utah, and Hawaii. And, she designed and personally engineered construction of the Hearst Castle with 165 rooms, and its estate of 127 acres of gardens, terraces, indoor and outdoor pools. She designed the Neptune Pool to be hung by reinforced-concrete beams that a seismic movement would let it sway but not break. During her 45-year career, Morgan designed more than 700 homes, churches, hospitals, stores, office and educational buildings. She employed mostly women and encouraged them in this male-dominated profession.

<http://www.aia.org/practicing/awards/2014/gold-medal/julia-morgan/>

Margaret Knight (1838-1914)

Recognized as the “female Edison” she holds eighty-seven US patents. Born into a poor New England family, she worked in the cotton mills when nine. At age twelve, seeing a spindle spin off its moorings and horrifyingly injure a little girl, she invented a mechanical safety device. It automatically shut down machines to prevent injuries. It was installed on all looms in Manchester, New Hampshire and is in standard use today worldwide. The window frame and sash is one of her inventions, but her greatest invention that impacts all our lives is the machine that folds and glues paper into the square bottom paper bag. When her model to apply for a patent was copied by a man who was granted its patent, Knight became the first woman to appear before the commissioner of patents in Washington, DC to fight for her invention’s patent, the ruling came in her favor. Knight is one of 12 women honorably inducted into The National Inventors Hall of Fame that has honorably inducted 316 men.

<https://www.asme.org/engineering-topics/articles/diversity/margaret-knight>

Harriet Russell Strong (1844-1926)

To dam water was her thing. She was an enterprising female engineer who had patents for many different types of dams and water storage systems. She believed in water conservation and irrigation by natural water sources. Her inventions of new types of dams and water storage systems represented major breakthroughs in dry land irrigation and helped farmers during the early land settlement of Southern California and much of the southwest. They were widely adopted throughout the region and were credited with speeding the growth of Southern California's food-producing areas. Still, in 1917 the US government rejected her patent to dam the Colorado River and create a reservoir in the Grand Canyon. In 1922, the US government accepted a plan by a man to dam the Colorado River and create a reservoir in the Grand Canyon. In 1931 work began on the Hoover Dam.

[https://en.wikipedia.org/wiki/Harriet\\_Williams\\_Russell\\_Strong](https://en.wikipedia.org/wiki/Harriet_Williams_Russell_Strong)

Margaret Plunkett Colvin (1820-1894)

By 1875 over 2,000 patents had been issued in the United States for various washing machine devices. Not every invention worked. Margaret Plunkett Colvin of Battle Creek, Michigan patented her invention of a rotary washing machine that did work very well. When presented at the 1876 Philadelphia Centennial, her Triumph Rotary Washer was deemed to be the “successful result of years of experiment by a practical woman.” It also was presented at the Chicago’s World Colombian Exposition in 1893.

[https://books.google.com/books?id=uRJt7QqA7GEC&pg=PA301&lpg=PA301&dq=margaret+plunkett+colvin&source=bl&ots=l5zbJggpbl&sig=uhajPt9FjzHyDdWEAJbk-YJmZtg&hl=en&sa=X&ved=0ahUKEwiow\\_3BycvOAhXEpb4KHc64CsIQ6AEIMTAD#v=onepage&q=margaret%20plunkett%20colvin&f=false](https://books.google.com/books?id=uRJt7QqA7GEC&pg=PA301&lpg=PA301&dq=margaret+plunkett+colvin&source=bl&ots=l5zbJggpbl&sig=uhajPt9FjzHyDdWEAJbk-YJmZtg&hl=en&sa=X&ved=0ahUKEwiow_3BycvOAhXEpb4KHc64CsIQ6AEIMTAD#v=onepage&q=margaret%20plunkett%20colvin&f=false)

Josephine Garis Cochran (1839-1913)

Daughter of an engineer, and intolerant of servants breaking her fine china, she wanted a dishwasher in her own home. The first dishwasher patented by a man in 1850 wet but did not truly “wash” the dishes. Dismayed at the lack of progress developing such

a product, Cochran declared in disgust, "If nobody else is going to invent a dishwashing machine, I'll do it myself." And she did. She patented her dishwasher in 1866 and introduced it at Chicago's World Colombian Exposition where it won an award for "the best mechanical construction for durability and adaptation to its line of work." It was the Expo's top invention entry. Recognizing its product potential, Cochran founded the Crescent Washing Machine Company in the 1880s. After a number of acquisitions her company grew into what became the Kitchen Aid Manufacturing Company in 1924. Kitchen Aid featured Cochran's design as the first home dishwasher.

<http://learningabe.info/dishwasher.html>