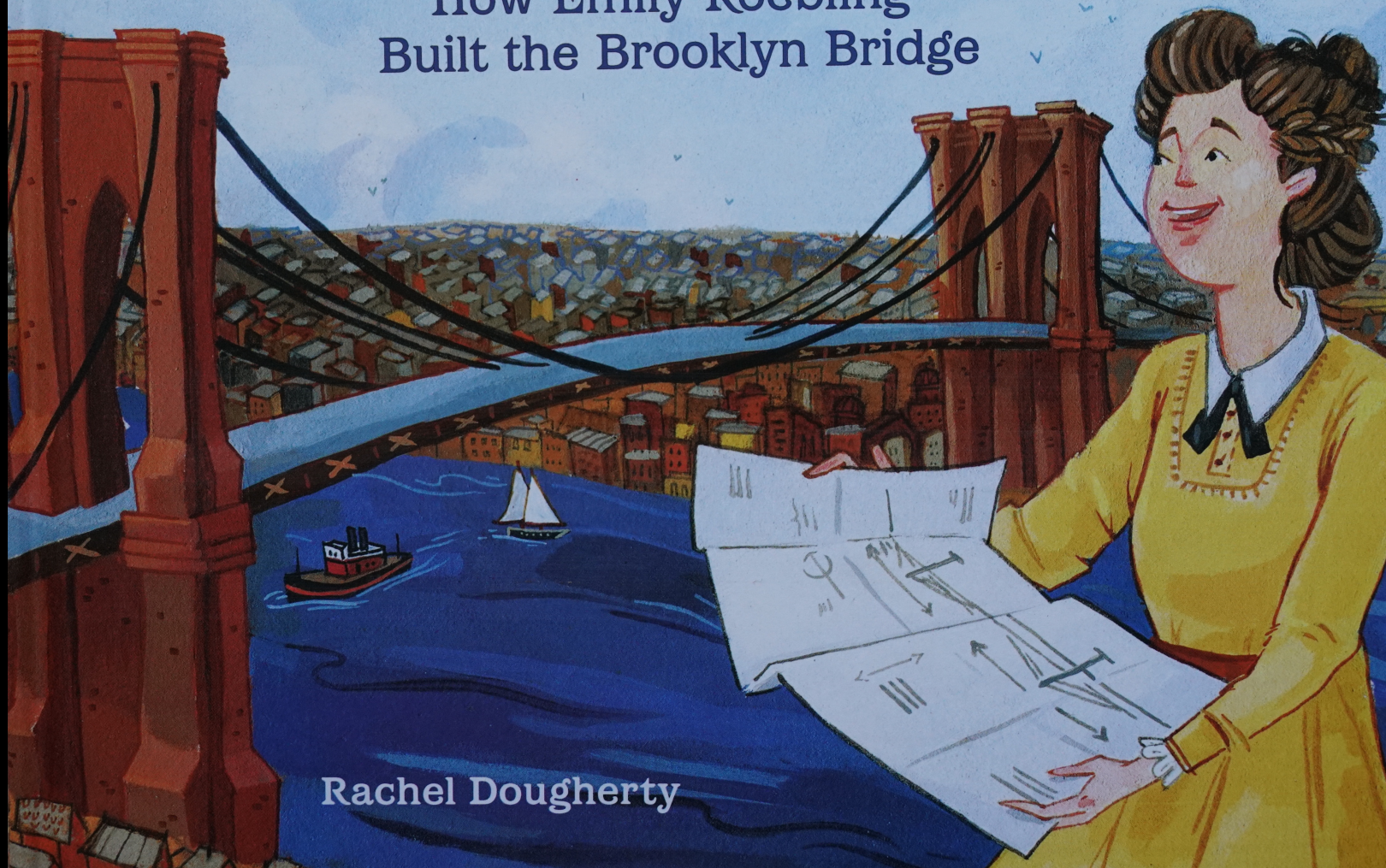


# SECRET ENGINEER

How Emily Roebling  
Built the Brooklyn Bridge



Rachel Dougherty



## AUTHOR'S NOTE

As a child, I was a stream of questions. Why do crabs walk sideways, how do kites stay up, who makes traffic lights? My parents filled my bookshelves with encyclopedias and biographies, and I fell in love with the real men and women of history who answered my questions. Some biographies began so impressively that I'd know right from the first page that the subject was special. But my favorites have always been the underdogs—the ones who have greatness dropped in their laps. That's how I came to love Emily Roebling.

## MORE ABOUT EMILY

Emily Warren was born on September 23, 1843, the second youngest of twelve children. Her brother Gouverneur Kemble Warren, thirteen years older than Emily, recognized her talents for science and arithmetic at an early age, and enrolled her in secondary school when she was fifteen. In the 1850s, girls rarely pursued education beyond what they learned from childhood governesses. But Emily attended a school offering courses in history and science, in addition to “traditional female pursuits.”

Gouverneur introduced Emily to Washington Roebling, with whom he had served during the Civil War. Shortly after Emily and Washington's wedding, Washington's father sent him to Ohio to work on a bridge. Thinking Emily would only visit occasionally, Washington made his living arrangements without her. But Emily insisted on joining him. Despite some opposition from his father, Washington yielded and brought her along.

Two years later, John Roebling took on the Brooklyn Bridge. Brooklyn was a separate city from New York at the time, and slow, crowded ferries were the only way to cross the East River. John asked Washington to travel to Europe to study pneumatic caissons, which could be pressurized with air and used underwater. Even though she was expecting a child, Emily refused to be left behind. Their only son was born in Germany and named John A. Roebling after his grandfather.

In 1869, while examining a construction site for the Brooklyn Bridge, the elder John A. Roebling injured his foot. Unfortunately, in this time before modern medicine, the injury became infected and proved fatal, leaving Washington to take over the building of the bridge.

After Washington became ill with caisson sickness in 1872, Emily kept the project afloat. When challenged by the trustees of the bridge, she fought to keep them from removing Washington from his post as chief engineer. When the steel manufacturers had questions, Emily advised them. When the public clamored about the safety of the bridge, Emily arranged lectures given by a master mechanic to calm their fears. It is now rumored that she even wrote his presentations.

Once the great bridge was completed, Emily and Washington lived in Troy, New York, for four years. Then they returned to their home in Trenton, New Jersey. Washington's health improved somewhat, and he continued operating the family wire business. But Emily did not stop learning. She went on to earn a law degree at New York University. Her final essay was entitled “A Wife's Disabilities,” and in it she pleaded for the law to treat men and women equally. She passed away in 1903 at the age of fifty-nine.

Though Emily was born at a time when women were not given much education or professional opportunity, when life asked more of her, she rose to the occasion. Her mind sharp and her hands steady, Emily proved that women could be as successful in science and engineering as any man.

## GLOSSARY

**anchorage block:** A massive masonry block heavy enough to offset the weight of the bridge. For the Brooklyn Bridge, each one weighs about 60,000 tons.

**cable:** Thick rope made of many metal wires wrapped together.

**caisson sickness:** An illness caused by nitrogen bubbles that form in the body when a person moves too quickly from an area with high pressure, such as deep underwater, to an area with lower pressure, such as the water's surface. Called decompression sickness or “the bends” today, it can affect scuba divers.

**catenary curve:** The natural curve of a hanging rope or chain when held at both ends.

**deck:** The roadway or walkway of a bridge.

**force:** An invisible push or pull on an object.

**stay:** A cable that runs diagonally between a tower and the deck of a bridge.

**suspender:** A cable that hangs vertically between the main suspension cables and the deck of a bridge.

**tower:** A structure that supports the cables and the deck of a bridge.

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