The fourteen year construction took the lives on many men, killed the architect, and crippled his son.  It was construction on a scale that had never been done before, and without some of the modern conveniences that we now take for granted.

Because of the scale of the bridge, suspending over one of the largest and busiest waterways in the country, the plans for it were a work of true vision.  The creator, famous bridge designer John A. Roebling, was perhaps one of the few people who could have even dreamed of the practical possibility at the time, and it was his invention of the wire rope that even made it possible.

Building a bridge across the East River had been talked about since the early 1800s, but had never been attempted because of the difficulty.  But in just three months in 1867, Roebling created the entire plan for the bridge, down to the exact specifications.  These plans were soon accepted and funded by the New York Bridge Company, run by a group of prominent leaders dedicated to erecting the bridge.

"The contemplated work, when constructed in accordance with my design, will not only be the greatest bridge in existence, but it will be the great engineering work of the continent and of the age.  Its most conspicuous feature - the great towers - will serve as landmarks to the adjoining cities, and they will be entitled to be ranked as national monuments.  As a great work of art, and a successful specimen of advanced bridge engineering, the structure will forever testify to the energy, enterprise, and wealth of that community which shall secure its erection."  
    - "Report" to the New York Bridge Company, September 1, 1867 by John A. Roebling.

A month after his plans were accepted, while examining locations for the Brooklyn tower site, Roebling's foot was crushed on a pier by a ferry.  Roebling died 17 days later from tetanus.

Suddenly, Roebling's 32 year old son Washington, also a bridge builder, was in charge of one of the toughest engineering projects in history.  The plans had been created, but they had never been tested on a project with close to the same magnitude.

"Here I was 32 years old, suddenly in charge of the most stupendous engineering structure of the age, with only preparatory plans, nothing fixed or decided.  The prop on which I hitherto leaned had fallen.  Henceforth, I must rely on myself."  
      - Washington Roebling.

**The Caissons**

Soon after ground was broken, problems became immediately apparent with the two 3,000 ton caissons (airtight cylinders sunk to the riverbed that allowed workers to build a foundation for the towers into the bedrock).  Caissons of this magnitude had never before been created, and work in them was miserable and deadly.

"Inside the caisson everything wore an unreal, weird appearance.  There was a confused sensation in the head, like the rush of many waters.  The pulse was at first accelerated, then sometimes fell below the normal rate.  The voice sounded faint, unnatural, and it became a great effort to speak.  What with the flaming lights, the deep shadows, the confusing noise of hammers, drills and chains, the half-naked forms flitting about, if of a poetic temperament, get a realizing sense of Dante's inferno.  One thing to me was noticeable, time passed quickly in the caisson."  
           - E.F. Farrington, master mechanic for Washington Roebling.

Construction of the Brooklyn caisson hit bedrock after around 44 feet and was filled with concrete to create the base.  The Manhattan caisson was much more dangerous.  The plan was originally to lower it 106 feet to hit the bedrock, but as they got lower and lower, and the dangers became more apparent, Washington Roebling made probably the riskiest decision of the entire construction.  By taking soil samples he discovered that the soil hadn't shifted in millions of years, and so he decided that it was stable enough itself to hold the bridge.  To this day one tower of the Brooklyn Bridge rests on bedrock, while the other rests on sand.

In the caissons, fires, explosions and the bends (caisson disease) took the lives of 20 men. A case of the bends nearly killed Roebling himself.  He survived, but became crippled, confined to his house for the remainder of his life.

Unable to oversee the construction in person, besides from his window view of the bridge from his Brooklyn Heights home, Roebling relied on his wife Emily to be his eyes and ears for the project.  Under his assistance, Emily Roebling studied higher mathematics and bridge engineering, and soon became very fluent in the construction of bridges.

**The Stone Towers**

Finally in 1873, construction began of something that was visible to the public, the towers.  The 276-foot neo-Gothic towers were built of granite and featured two arched portals.  These towers were of both fundamental and psychological importance to the bridge.  First, they were taller than any other building in the city, except for the very top of the Trinity Church.  Second, they were to hold the weight of the cables that were to be strung, as well as the roadways so that the bridge would not interfere with traffic on the Hudson.

 The towers had to be as tall as they were, to allow the bridge to give enough clearance for ships.  And all of this would have never been possible without John Roebling's invention of the steel rope.

**The Cables and Roadways**

By the time the cables were to be strung, major doubts began to encircle the project.  There had always been doubters of the project, but when William 'Boss' Tweed was convicted of stealing between $40 million and $200 million from New York tax payers, the public began to look upon all public works, and particularly the construction of the bridge with more scrutiny.

To create the 4 main suspension cables, wires were pulled, strand by strand by a traveller rope from one tower to the next.  Each cable held 6,289 of these wires, 331 wires to a strand and 19 stands to a cable.

While the cables were being strung, a major problem was discovered.  The J. Lloyd Haigh company that was responsible for providing wire for the cables, was found to have given faulty wires.  It was virtually impossible at the time to redo the wires, and so the story was kept as quiet as possible and 150 extra wires were added to each cable to strengthen them.  The owner of the company, J. Lloyd Haigh was eventually put in jail.

The near final straw occurred at the 10 year mark, when the cables were completed and the roadways were beginning to be put down.  Because of extreme delays from the companies providing the materials to create the roadways, the public began to become severely impatient.  This, coupled with the fact that Washington Roebling hadn't actually set foot on the bridge in nearly 10 years due to his disability, made him a convenient scapegoat.

Despite the fact that the bridge engineers testified to the importance of Washington Roebling to the completion of the bridge, enough of the bridge trustees got together to vote on his removal.  After a very tight vote, they were narrowly defeated.

**Completion**

The Bridge was completed in 1883, to a huge celebration.  Emily Roebling became the Bridge's first passenger, riding in an open carriage and carrying a rooster, a symbol of victory.

The site of the completed bridge took away most of the anger towards the delays and costs and all of the businesses in the city closed for its opening.  President Chester A. Arthur attended and crossed the bridge with New York Mayor Franklin Edson to meet Brooklyn Mayor Seth Low.  14 tons of fireworks were used in the celebration.

 On the first day of its opening, a total of 1,800 vehicles and 150,300 people crossed the bridge.  But the opening week was not without controversy, as a week later, a rumor that the bridge was going to collapse caused a stampede that killed 12 people.  Soon after, to publicize his famous circus, P.T. Barnum led 21 elephants across the bridge and calmed any doubts about its stability.

The bridge itself is just above 6,000 feet long and 270 feet tall and was designed by John Roebling to be six times stronger than it needed to be.  Because of this, the bridge is still standing today, although it is only about four times stronger than it needed to be, due to the inferior wire supplied by J. Lloyd Haigh.