

Eli Whitney and the cotton gin

Joan Brodsky Schur, "Teaching With Documents: Eli Whitney's Patent for the Cotton Gin (see <http://www.archives.gov/education/lessons/cotton-gin-patent/>)."

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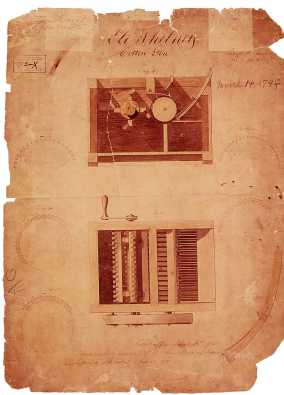


Figure 1. Eli Whitney's original drawings of the cotton gin, from his 1794 patent application.

As Eli Whitney left New England and headed South in 1792, he had no idea that within the next seven months he would invent a machine that would profoundly alter the course of American history. A recent graduate of Yale, Whitney had given some thought to becoming a lawyer. But, like many college graduates of today, he had debts to repay first and needed a job. Reluctantly, he left his native Massachusetts to assume the position of private tutor on a plantation in Georgia.

There Whitney quickly learned that Southern planters were in desperate need of a way to make the growing of cotton profitable. Long-staple cotton, which was easy to separate from its seeds, could be grown only along the coast. The one variety that grew inland had sticky green seeds that were time-consuming to pick out of the fluffy white cotton bolls. Whitney was encouraged to find a solution to this problem by his employer, Catherine Greene, whose support, both moral and financial were critical to this effort. At stake was the success of cotton planting throughout the South, especially important at a time when tobacco was declining in profit due to over-supply and soil exhaustion.

Whitney knew that if he could invent such a machine, he could apply to the federal government for a patent. If granted, he would have exclusive rights to his invention for 14 years (today it is 20 years), and he could hope to reap a handsome profit from it.

The Constitution and patent law

In Article I, Section 8, Clause 8, the Constitution empowers Congress "To promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries." Patent law must carefully balance the rights of the inventor to profit from his or her invention (through the grant of a temporary monopoly) against the needs of society at large to benefit from new ideas.

The patent bill of 1790 enabled the government to patent "any useful art, manufacture, engine, machine, or device, or any instrument thereon not before known or used." The patent act of 1793 gave the secretary of state the power to issue a patent to anyone who

presented working drawings, a written description, a model, and paid an application fee. Over time the requirements and procedures have changed. Today the U.S. Patent and Trademark Office is under the auspices of the Commerce Department.

Eli Whitney patents his cotton gin

In hopes of making a patentable machine, Whitney put aside his plans to study law and instead tinkered throughout the winter and spring in a secret workshop provided by Catherine Greene. Within months he created the cotton gin. A small gin could be hand-cranked; larger versions could be harnessed to a horse or driven by water power. “One man and a horse will do more than fifty men with the old machines,” wrote Whitney to his father. . . . “Tis generally said by those who know anything about it, that I shall make a Fortune by it.”

But patenting an invention and making a profit from it are two different things. After considering possible options, Whitney and his business partner, Phineas Miller, opted to produce as many gins as possible, install them throughout Georgia and the South, and charge farmers a fee for doing the ginning for them. Their charge was two-fifths of the profit — paid to them in cotton itself.

And here, all their troubles began. Farmers throughout Georgia resented having to go to Whitney’s gins where they had to pay what they regarded as an exorbitant tax. Instead planters began making their own versions of Whitney’s gin and claiming they were “new” inventions. Miller brought costly suits against the owners of these pirated versions but because of a loophole in the wording of the 1793 patent act, they were unable to win any suits until 1800, when the law was changed.

Struggling to make a profit and mired in legal battles, the partners finally agreed to license gins at a reasonable price. In 1802 South Carolina agreed to purchase Whitney’s patent right for \$50,000 but delayed in paying it. The partners also arranged to sell the patent rights to North Carolina and Tennessee. By the time even the Georgia courts recognized the wrongs done to Whitney, only one year of his patent remained. In 1808 and again in 1812 he humbly petitioned Congress for a renewal of his patent.

The effects of the cotton gin



Figure 2. This close-up of a cotton boll shows how deeply the seed is embedded in the fiber. Prior to Eli Whitney's invention, removing the seed had to be done by hand, which made the process time-consuming and labor-intensive.

After the invention of the cotton gin, the yield of raw cotton doubled each decade after 1800. Demand was fueled by other inventions of the Industrial Revolution, such as the machines to spin and weave it and the steamboat to transport it. By midcentury America was growing three-quarters of the world's supply of cotton, most of it shipped to England or New England where it was manufactured into cloth. During this time tobacco fell in value, rice exports at best stayed steady, and sugar began to thrive, but only in Louisiana. At midcentury the South provided three-fifths of America's exports — most of it in cotton.

However, like many inventors, Whitney (who died in 1825) could not have foreseen the ways in which his invention would change society for the worse. The most significant of these was the growth of slavery. While it was true that the cotton gin reduced the labor of removing seeds, it did not reduce the need for slaves to grow and pick the cotton. In fact, the opposite occurred. Cotton growing became so profitable for the planters that it greatly increased their demand for both land and slave labor. In 1790 there were six slave states; in 1860 there were 15. From 1790 until Congress banned the importation of slaves from Africa in 1808, Southerners imported 80,000 Africans. By 1860 approximately one in three Southerners was a slave.

Because of the cotton gin, slaves now labored on ever-larger plantations where work was more regimented and relentless. As large plantations spread into the Southwest, the price of slaves and land inhibited the growth of cities and industries. In the 1850s seven-eighths of all immigrants settled in the North, where they found 72% of the nation's manufacturing capacity. The growth of the "peculiar institution" was affecting many aspects of Southern life.

Epilogue

While Eli Whitney is best remembered as the inventor of the cotton gin, it is often forgotten that he was also the father of the mass production method. In 1798 he figured out how to manufacture muskets by machine so that the parts were interchangeable. It was as a manufacturer of muskets that Whitney finally became rich. If his genius led King Cotton to triumph in the South, it also created the technology with which the North won the Civil War.

From farm to factory

Whitney's cotton gin had an immediate impact. U.S. exports of cotton jumped from 1.4 million pounds in 1794, the year he applied for his patent, to 5 million pounds in 1795. At first, most cotton was exported or was spun into thread and woven at home, but soon cotton mills, or factories, were built to produce cloth on a large scale. North Carolina's first cotton mill opened in 1813, built by Michael Shenck near Lincolnton, and within a few years North Carolina's many mills were producing 7 million yards of cloth each year. But the state's poor transportation prevented its industry from growing much further.

On the web

Eli Whitney's Patent for the Cotton Gin

<http://www.archives.gov/education/lessons/cotton-gin-patent/activities.html>

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Figure 2 (page 3)

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