Eli Whitney and the Cotton Gin

Eli Whitney was born in 1765 and grew up on a Massachusetts farm. During the Revolutionary War he manufactured nails to fill the demand caused by British embargos. It was his genius to observe what people needed, and to provide it.

After working his way through college at Yale, Whitney moved to South Carolina. There he saw how hard it was to separate the seeds from short-staple cotton. In just a few days in 1793, he invented a machine that could do the task ten times faster than a slave doing the work by hand. The cotton gin revolutionized agriculture. It also made possible the cotton economy of the American South, perpetuating and increasing the practice of slavery upon which the agricultural system depended.

After the invention of the cotton gin, the yield of raw cotton doubled each decade after 1800. 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.

However, 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 fifteen, with approximately one in three Southerners working as a slave.

Design

The design was not elaborate and did not address any complex aspects of cotton cleaning. This simple design only separated the cotton fiber from the seeds quicker than it was done by hand and made the cleaned fiber available to fabric-manufacturers across Europe.

1. The design comprised a wire screen, with numerous, small hooks made from wire. The hooks served the purpose of pulling the cotton into the machine, while the integrated brushes quickly cleared the loose lint.

2. Cotton lint is cleaned within a wooden cylinder. The cylinder has rows of spikes that form a grid and function like a comb.

3. When the open cotton pods pass through the bars of the grid, the close-knit design does not allow the seeds to pass through.

4. The cleaned cotton fibers, minus the seeds, are then extracted through the wire teeth of the grid-like comb and sorted in a pan on the other side.