

learner's place in a machine shop where cotton-spinning machinery was made and repaired.

In 1837, when a financial panic hit the country, Howe lost his job. He then decided to go to Boston, and this marked a turning point in his career. In Boston he met Ari Davis, a maker of mariners' instruments and scientific apparatus. Howe began to work in Davis' shop, a place to which inventors often came to ask advice about their ideas. Davis sometimes helped them, but just as often he shouted at them in anger—he is said to have been one of the noisiest men in Boston. One day Howe overheard his employer bellowing at a man who had brought a knitting machine to the shop to seek Davis' advice. "Why are you wasting your time over a knitting machine?" said Davis, "Take my advice, try something that will pay. Make a sewing machine." "It can't be done," was the reply. "Can't be done?" shouted Davis, "Don't tell me that. Why—I can make a sewing machine myself." "If you do," interrupted the capitalist, "I can make an independent fortune for you." Davis, like most men of many words, often talked of more than he planned to do. He never attempted to invent a sewing machine.

But the loud voices interested Howe, who, it is said, determined then that he would produce a sewing machine and win the fortune that the prosperous-looking man had asserted was waiting for such a deed. A kind of lameness since birth had made physical tasks painful for Howe, and he perhaps felt that this would offer an opportunity to become independent of hard physical work.

After marrying on a journeyman machinist's pay of \$9 a week, Howe's health worsened and by 1843 was so bad that he had to stop work for days at a time. His wife was forced to take in sewing to maintain the family. It was the sight of his wife toiling at her stitches together with the pressure of poverty that recalled to Howe his earlier interest in a machine to sew. He decided to make an earnest attempt to invent one. Watching his wife for hours at a time, he tried to visualize a machine that would duplicate the motions of the arm. After many trials, he conceived the idea of using an eye-pointed needle in combination with a shuttle to form a stitch. It is possible that, as some authors state, the solution appeared to him in a dream, a manifestation of the subconscious at work. Others have suggested that he may have learned of Hunt's machine. There is a general similarity in the two, not only in the combination of eye-pointed needle and shuttle but in the overhanging arm and vertical cloth suspension.

After conceiving the idea, whatever his inspiration, Howe determined to devote all of his time to producing a working model of his machine. Elias' father, who had then started a factory for splitting palm leaves in Cambridge, gave him permission to set up a lathe and



Figure 217.—ELIAS HOWE, JR., 1819–1867. From an oil painting in the Smithsonian Institution presented by the inventor's grandson, Elias Howe Stockwell. (Smithsonian photo 622.)

a few tools in the garret of the factory. Elias moved his family to Cambridge. Soon after his arrival, unfortunately, the building burned down, and Howe despaired of finding a place to work. He had a friend, however, in George Fisher, who had just come into a small inheritance, and Howe persuaded him to enter into partnership with him for the development of the machine. Fisher agreed to board Howe and his family, which now included two children, while Howe completed the model. Fisher also agreed to supply \$500 for material and tools in exchange for a half interest in a patent if one was obtained.

At long last Howe was able to spend his full time and concentration on building his machine. His family was being fed and had a roof over its head. Within a few months Howe had completed a model and by May 1845 had sewed his first seam (see fig. 14). In July of that year he sewed all the principal seams of two suits of wool clothes, one for George Fisher and one for himself.

Several efforts were made to solicit public interest in the new machine. One was installed in a public hall in Boston, and a tailor was employed to operate it at three times the regular wage. The reception was similar to that of Thimonnier's: crowds came to see the "contraption," but, when Howe tried to interest large clothing