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# Mechanic Geniuses and Duckies Redux: Nail Makers and Their Machines

MAUREEN K. PHILLIPS

**In the late eighteenth and early nineteenth centuries, inventive nail makers plied their trade amid the rough-and-tumble intrigue of an emerging high-stakes industry.**

## Introduction

The little squabbles of these mechanic geniuses and duckies are as curious as between our itinerant Baptist and Methodist preachers.<sup>1</sup>

Rev. Bentley, Nov. 4, 1797

In a previous article, this author proposed a revision to then currently held theories concerning when machine-cut and -headed nails were first used in the New England area by analyzing nail factories, nail machines, and nail samples.<sup>2</sup> But in focusing on the inanimate, an important part of the story hovered off-stage. The creativity, competition, camaraderie, deception, ambition, greed, and generosity that flowed among the “mechanic geniuses” characterize the cut-nail industry in the late eighteenth and early nineteenth centuries as much as statistics and dates. The Rev. Bentley may have seen their activities as “little squabbles,” but the emotions ran deep, and the stakes were high for anyone involved in the beginning of the Industrial Revolution in the United States. Here, then, is an attempt to flesh out the specters from the nineteenth century.

## The First Volley

Five hundred balls per minute shot,  
Our foes in fight must kick the beam;  
Let Perkins only boil his pot,  
And he'll destroy them all by steam.<sup>3</sup>

This little refrain refers to exhibitions held in 1825 in England by Jacob Perkins (Fig. 1), of the United States of America. Perkins was demon-

strating his “steam artillery,” an invention that would “shatter targets to atoms” from a considerable distance and with considerable speed. The exhibitions, held before gatherings of British and French aristocrats and engineers that counted the Duke of Wellington and Prince Polignac, of France, among its observers, excited much general interest, even though the esteemed onlookers could not think of a practical use for the invention.

Perkins's starring role at this royal demonstration came at the apex of a long and multi-faceted career that began in more humble circumstances in his native Newburyport, Massachusetts, during the heady decades after the end of the Revolutionary War. It ended with his death in London in 1849 at the age of 83, when he was eulogized in both America and in England as “The American Inventor.” A true mechanical Renaissance man, Perkins developed major improvements in navigational equipment and gunnery, devised new applications of steam power, created a process for engraving non-counterfeitable bank notes that was used by the Bank of Philadelphia and the Bank of England, and was in the forefront of the rapidly developing machine-made nail industry. Although entirely self-educated, he published articles in respected scientific periodicals such as the *Franklin Institute Journal* and received awards from such revered institutions as the London Society of Arts.<sup>4</sup>

But in the early 1790s, Jacob Perkins was a struggling young gold-

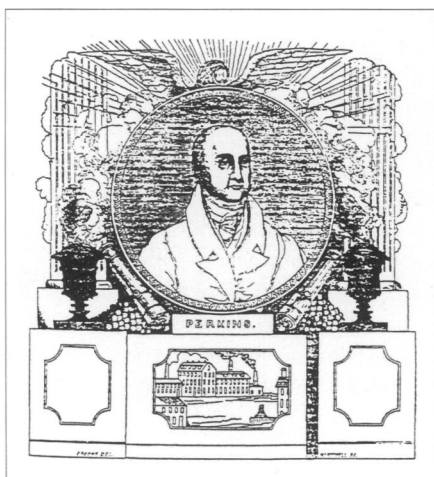


Fig. 1. Jacob Perkins. From Perley, “The Manufacture of Nails in Essex County,” *The Essex Institute Historical Collection*.

smith who had attained a modicum of success gold-plating beads and shoe buckles for fashionable ladies and designing dies for the Massachusetts mint. Perkins invented his first nail-cutting machine sometime between 1790 and 1792. It is not known why he became interested in nail manufacturing, except that he certainly would have been aware of the huge market for cheap nails that was waiting to be milked. In 1794 Perkins rented a barn near the newly established Newburyport Woolen Manufactory, located on the Parker River at Byfield, a few miles south of Newburyport (Fig. 2). There he set up his prototype nail machine, using the waterwheels from the woolen mill for power. The prototype actually had two operational components, one for cutting and one for heading nails. By December 1794, he had improved the design sufficiently to apply for his first patent, which was awarded on January 16, 1795. His was only the fourth patent for a nail machine in the United States and the first awarded to a New Englander.<sup>5</sup>

Perkins began selling his nails on a small scale in the Newburyport area in early 1795, helped along by family connections.<sup>6</sup> Soon, two principal promoters in the woolen mill — Samuel Guppy and John Armstrong, both of Bristol, England — offered to provide Perkins with financial backing, and the enterprise of Jacob Perkins Inventor, Guppy and Armstrong Proprietors was created.<sup>7</sup>

The fledgling enterprise placed its first advertisement in the November 24, 1795, edition of a Newburyport newspaper, *The Impartial Herald*, under the heading “Newburyport Patent Nails.” The item announced that the business had “begun making Brads and will have a considerable number for all, in 14 or 20 days from this date” and invited interested parties to “see the operation of

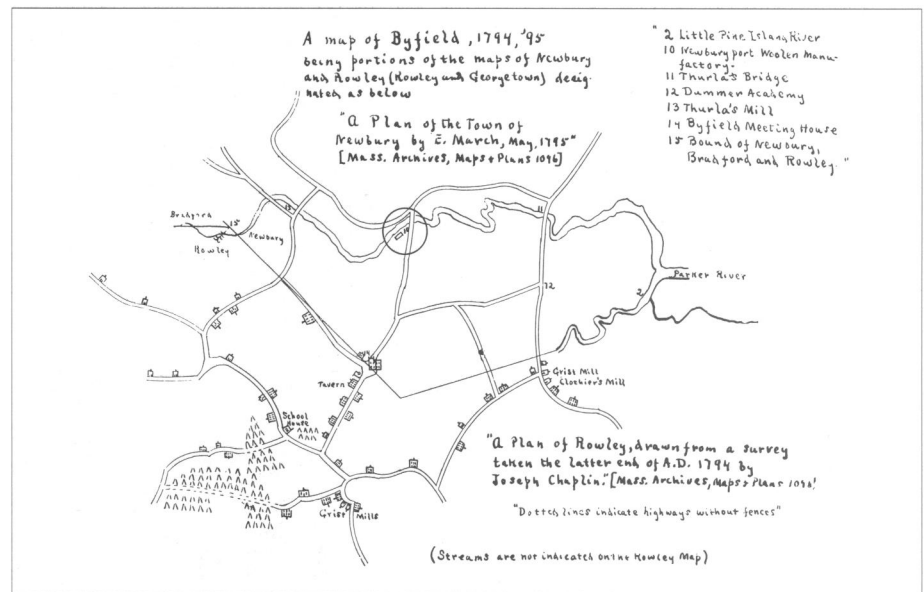


Fig. 2. Map of Byfield, Massachusetts, 1794-95, showing the Newburyport Woolen Factory. From Ewell, *The Story of Byfield*.

the engines at Byfield, six miles from Newburyport.” The ad also promised that “headed nails we shall also begin to make soon,” and within the year the heading machines were up and running.<sup>8</sup>

In late 1796 the rapidly expanding business moved its operations to the town of Amesbury, a few miles west of Newburyport, and set up the nail-making machinery in a former grist mill that Perkins had bought from the Newburyport Woolen Manufactory the prior year.<sup>9</sup> The new site was located on the Powow River, which would provide more water power than the smaller Parker River in Byfield, and in a major port town on the Merrimack River, which at the time was navigable past Newburyport to the shipping lanes of the Atlantic. The Amesbury factory was the first major cut-nail operation in New England and possibly in the United States.<sup>10</sup> For the first time in America, nails could be produced quickly, cheaply, and in large quantities.

The factory was also situated next to a rolling mill that had been sup-

plying iron rod and plate to the business in Byfield, but Armstrong and Perkins were not satisfied with the quality of iron produced at Amesbury. Even before the move, Armstrong had been negotiating with an iron works in the Schuylkill Valley of Pennsylvania to purchase a superior-grade iron for the Amesbury plant. Not one to miss an opportunity, he also solicited orders for Perkins Patent Cut Nails, as well as the Perkins cut-nail machines (Fig. 3).

By 1798 Samuel Guppy had returned to England, and the business's name had been changed to “Armstrong and Perkins.” Immersed as he was in contriving adjustments and improvements to his invention, Perkins seemed to have been unaware of this not-so-subtle change in Armstrong's status. Perkins was particularly concerned with the design of the heading apparatus, which operated at a much slower rate than the cutting machine. He soon had a design for a second nail machine that calibrated the cutting and heading mechanisms, thus cutting and heading nails in one operation and at the

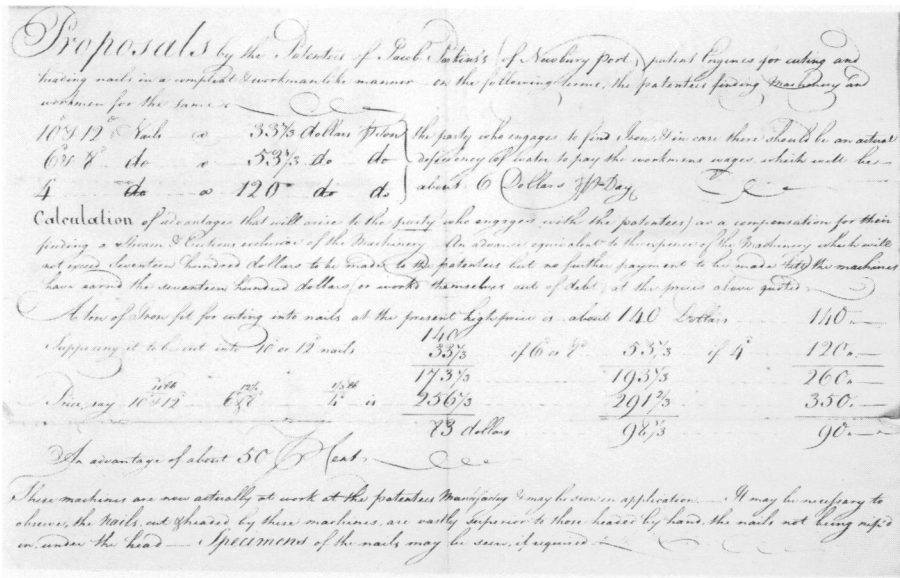


Fig. 3. Schedule of nail prices enclosed with John Armstrong’s letter to Robert E. Hobart of Pottstown, Pennsylvania, 1796. Courtesy of the Peabody Essex Museum.

same rate. He applied for a second patent in April 1798.<sup>11</sup>

Perkins’s new “one-operation” nail machine was not an immediate success — nails would stick to the heading mechanism and jam the apparatus. In the summer of 1798 Perkins instructed David Mooers, a machinist at the factory, to disassemble the machine and to set aside a critical component for Perkins to work on. But before he could return to his machine, Perkins had been maneuvered out of the business. He had given a mortgage to Armstrong on the Amesbury property and on his rights in both nail machine patents (the second was awarded in 1799) in return for a loan, presumably to fund his continuing experiments. When Armstrong called in the loan, Perkins was unable to pay and was forced to assign his rights in the two patents and in the factory to his former partner. He left the factory, but not before gaining some measure of revenge by instructing Mooers to throw away the part of the machine that had been set aside.<sup>12</sup>

Armstrong’s actions against Perkins proved to be premature. Armstrong now owned the rights in the 1799 patent, but the machine prototype sat disassembled under a workbench at the factory with a critical component missing. The factory operated without the 1799 machine, becoming a major concern that employed 165 workers. Armstrong, finding himself financially overextended with several investments, sold the nail factory in 1801 to Samuel Putnam.<sup>13</sup> The sale included “a very valuable Machine for cutting and heading Nails at one operation, with the Patent Right for the exclusive use thereof, which was originally granted to JACOB PERKINS.”

**Consolidating Territory**

Samuel Putnam quickly resold the Amesbury factory (Fig. 4) in 1802 to what was probably its chief competitor on the north shore. The group of investors that bought the factory also owned the Salem Iron Works, which produced nails using a machine invented by one of its founders, Nathan Read.

Although Nathan Read and Jacob Perkins shared an interest in nail machines, and Read lived but a short sail down the coast from Perkins’s hometown, the two men occupied very different worlds. In contrast to Perkins, Read (Fig. 5) enjoyed the privileges of a middle-class background. He was born in 1759 in central Massachusetts of impeccable patriotic lineage — his father was an officer in the Revolution and his mother was first cousin to Maj. Gen. Nathaniel Green, second in command to General Washington. Nathan enjoyed a year of preparatory education before attending Harvard College, from which he graduated as valedictorian in 1781. After teaching at Harvard for several years, Read studied medicine and set up an apothecary in Salem. He was soon married and involved in local politics.<sup>14</sup>

By 1790 Read had prospered sufficiently to build himself a mansion in Salem and indulge his interest in the mechanical arts. Read’s first known venture focused on the potential uses of steam power for transportation. His experiments

TO BE SOLD,  
(If applied for in thirty days.)

**The Nail Manufactory**

At AMESBURY in the County of Essex,—con-  
sisting of

**THE Mills, Water-Couric, and**  
Buildings with the land under and adjoining,  
and the Utensils and Machinery thereto be-  
longing.

ALSO,

A very valuable Machine for cut-  
ting and heading Nails at one operation, with the  
Patent Right for the exclusive use thereof, which  
was originally granted to JACOB PERKINS.—  
The Premises being the same which lately be-  
longed to JOHN WARREN ARMSTRONG,  
and which he conveyed to the subscriber.

The Mills are situate upon **Powow**  
River, near where it empties into the Merrimack,  
about five miles above Newburyport.—The Prem-  
ises are in excellent repair, and for the Capital ne-  
cessary to be employed, may be rendered as pro-  
ductive as any Manufactory in the State.

For terms apply to **Mr. ROBERT**  
**FOSTER** a residing at the Mills, or to the Subscrib-  
er at Salem.

**SAMUEL PUTNAM.**  
Salem, 22d July, 1801.

Fig. 4. Samuel Putnam’s advertisement in *The Newburyport Herald*, July 22, 1801, selling the Amesbury Nail Factory.



with steam did not involve the spectacular display of “atoms shattering at 30 yards,” as would Perkins’s steam artillery, but Read attained some attention in 1789 when he navigated a steam-powered paddle boat across Salem Bay before a number of prominent observers, including Governor John Hancock.<sup>15</sup>

In 1796 Read and several Salem associates established the Salem Iron Factory in Danversport on the edge of the Waters River, which ran through farmland that Read owned.<sup>16</sup> The factory manufactured chains, cables, anchors, and other iron products for ships, catering to the booming ship-building industry across the bay in Salem, but the principals were soon considering expansion. In April of 1797 Read was working on a model of a “cutting machine for nails to head them at the same time.” The machine was already being used at the Salem factory in 1797 when Read applied for a patent, which was awarded January 8, 1798.<sup>17</sup>

To Read belongs the distinction of being the first to patent a one-operation nail machine. Theoretically, his invention should have supplanted Jacob Perkins’s two-operation machine immediately, but in practice the heading apparatus on Read’s machine proved to have the same jamming problem as Perkins’s 1799 machine would.<sup>18</sup> The factory, however, was able to operate the nail machine sans the heading mechanism, and although the Salem factory was three years behind Perkins and Armstrong, it found a ready local market. With the factory’s success, Read’s interest in nail machines and in the iron business was replaced by his involvement in politics. In 1800 he was elected to the U.S. House of Representatives, and in 1802 Congressman Read became Judge Read when he was appointed Justice of the Court of Common Pleas for the County of Essex. By that time Read was no longer actively involved in the factory.<sup>19</sup>



Fig. 5. Nathan Read. From Bradlee, “The Salem Iron Factory,” *Essex Institute Historical Collections*.

The Salem factory lost its creative impetus with the departure of Read, but the business he left behind was a well-run, well-financed corporate personality intent on expansion. Early in 1802 the Salem cadre acquired the Amesbury factory, adding a second major nail-manufacturing plant on the north Atlantic coast, access to the superior Perkins machines, and rights to the 1799 Perkins patent. By 1805, under the Salem group’s management, the Amesbury Nail Factory was reportedly the largest operation of its kind in Massachusetts.<sup>20</sup>

However, competition in the nail industry was intensifying. In a move calculated to widen the lead over the competition, the management at the Amesbury factory resurrected Perkins’s 1799 machine prototype from under a factory workbench and engaged a Bridgewater nail maker, Briggs R. Reed, to reassemble the machine and put it into operation. Briggs Reed soon had the reassembled machine working, but the factory and all its contents were destroyed by a fire on December 24, 1805.<sup>21</sup> By the time it was rebuilt, the Amesbury Nail Factory had acquired formidable competition from a concern to the south.

### Bridgewater’s Last Stand

Every nail driven in any building in the world around speaks eloquently of Colonel Jesse Reed’s wonderful ingenuity.<sup>22</sup>

In 1802, as the Amesbury Nail Factory and the Salem Iron Works began operating under the co-ownership of the Salem investors, a young Bridgewater joiner by the name of Jesse Reed was teaming up with Thomas Odiorne, a prosperous Boston merchant, to become the first to patent and put into production a workable one-operation nail machine. Much of the activity was concentrated south of Boston around the town of Bridgewater, which for decades had been the major center of wrought-nail manufacturing in Massachusetts and which was well known for the skill of its smithies. A Bridgewater nailmaker, Ezekiel Reed, had invented one of the earliest hand-operated nail-cutting machines in the 1780s; in 1795, the year that Jacob Perkins’s machines were set up in Byfield, John Armstrong called on Bridgewater inventor Samuel Rogers to observe Rogers’s own cut-nail machines in action; the Salem Iron Factory had employed a smith from Bridgewater to help set up its iron works in 1796; and in 1805 the Amesbury Nail Factory would import Bridgewater nailmaker Briggs Reed to reassemble Perkins’s machine.<sup>23</sup> It was inevitable that the challenge presented by a one-operation nail machine would engage the mechanical talent gathered in Bridgewater.

Fortunately, first-hand accounts of this tumultuous period in the cut-nail industry in early nineteenth-century Bridgewater have been discovered in surviving court records of two patent infringement lawsuits filed in 1814 and in 1819. Both lawsuits centered around the issue of the primacy of the Perkins 1799 one-operation machine versus one that was a product of Bridgewater in-

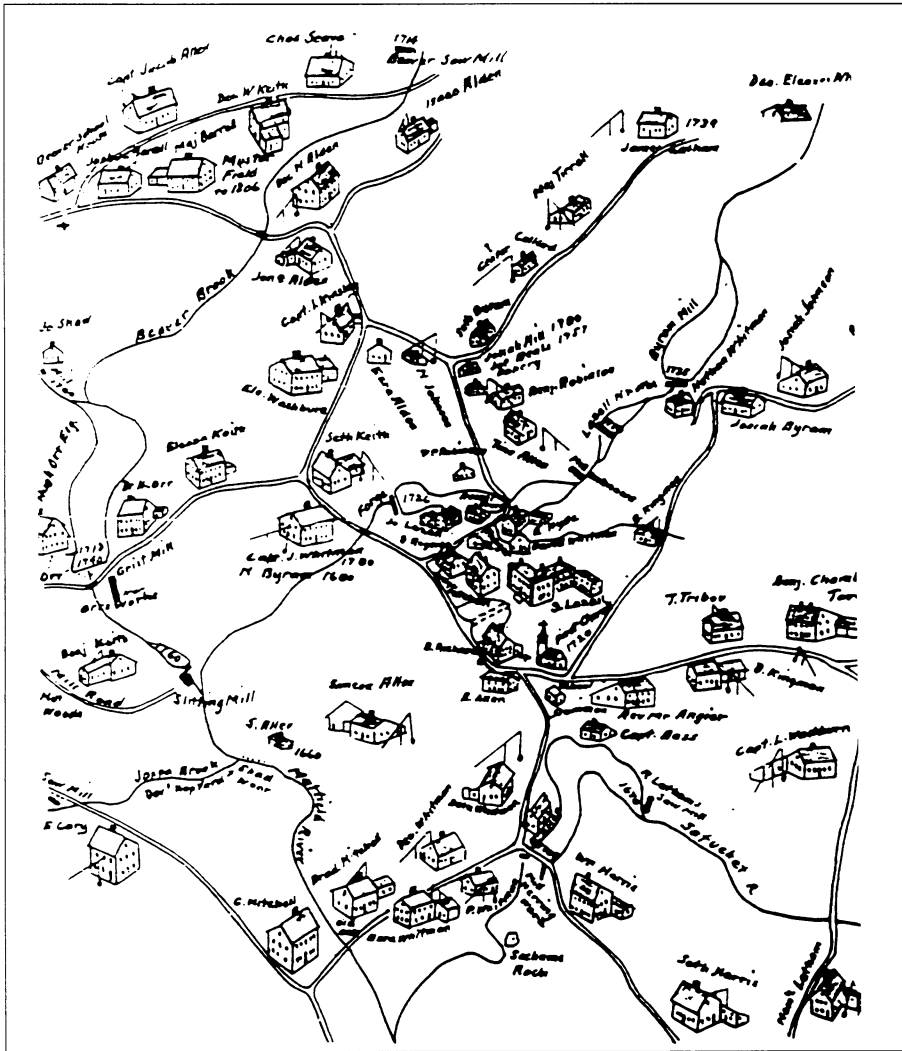


Fig. 6. Map of East Bridgewater made by Samuel Rogers in 1798. House identifications and dates were added by Percival Churchill in 1939. Melville Otis worked at Orr's Mill (Orr's Works, middle-left). Down the river is Keith's Mill (Slitting Mill), where Jesse and Briggs R. Reed worked. Courtesy of the East Bridgewater Public Library.

genuity. Depositions taken in connection with the lawsuits contain remarkably detailed descriptions of the design of critical components used in contemporary nail machines and recount the friendships and competition among Bridgewater-area machinist-inventors.

One such Bridgewater genius was Samuel Rogers (the inventor Armstrong had visited in 1795), who had been designing nail-cutting machines and heading devices since 1792. Rogers (1766-1838) was a watchmaker from nearby Marshfield, who

first became intrigued with the concept of nail machines while watching his uncle, Adam Rogers, use a hand-operated nail-cutting machine in the late 1780s. Melville Otis (1778-1852) was a close friend and associate of Rogers and one of the most respected of the local nail machinists. Otis worked at Orr's Mill (Fig. 6), a major nail works in Bridgewater owned by the family of Otis's mother, and was forever tinkering with the components of the nail machines then in operation.<sup>24</sup>

Rogers and Otis were also friendly with Jesse Reed, another local boy intent on inventing a one-operation machine.<sup>25</sup> Reed and Otis lived for a time at the same boarding house while Reed worked down the river at Keith's Mill, the other major iron works in Bridgewater. Although not trained as a professional nail maker, Jesse Reed (Fig. 7) came by his nail-making credentials honestly. Born in Bridgewater in 1778, Reed was the seventh child of Ezekiel Reed, the inventor of the hand-operated nail-shearing machine. Reed, who had no formal education, worked as a joiner before he teamed up with Thomas Odiorne. It is not clear just how Reed and Odiorne met, but it is probable that Odiorne had sought out the son of Ezekiel Reed after hearing of Jesse's inventiveness from Odiorne's brother Ebenezer, himself a mechanic.<sup>26</sup>

Reed's initial attempts to develop a one-operation machine were not successful, and by 1803 he and Odiorne had parted company. Reed left Bridgewater to work as a joiner in the surrounding towns but was back within the year. He was soon dropping in on Rogers and Otis, comparing notes on the design problems that plagued the model one-operation nail machines.<sup>27</sup> Otis, "of a confiding nature, who opened his



Fig. 7. Jesse Reed in 1852. From Barry, *A Historical Sketch of the Town of Hanover, Massachusetts*.

heart too fully to less scrupulous people," was quite open with Reed. Rogers was more reticent but found Reed resourceful in obtaining information about Rogers's machines.<sup>28</sup>

It was around this time (1805) that the Amesbury Nail Factory employed Briggs Rogers Reed to re-assemble Jacob Perkins's 1799 one-operation machine. Briggs (1784-1835) was also from Bridgewater, had worked at Keith's Mill, and was in fact Jesse Reed's younger brother.<sup>29</sup> It may be entirely coincidental, but the following year found brother Jesse back in collaboration with Odiorne in neighboring Kingston, putting the finishing touches on the invention that was to revolutionize the nail industry, an invention that to many contemporary observers was not at all like the models Jesse Reed had been working on in 1802 and 1804, and which was remarkably similar to the Perkins 1799 invention that Reed's brother had just reassembled. And according to Rogers and Otis, the major difference between the Reed and Perkins machines, a "forcing slide" or "clearer" that pushed the nail from the cutting die down into the heading apparatus (thereby eliminating the sticking and jamming problems), was designed on the same principle as the clearer that they had been discussing with Reed back in 1804.<sup>30</sup> But whether Reed stole the other machinists' ideas or was only inspired by them, he possessed a genius for assembling the various singular advances into one efficient model. For the first time, a one-operation machine was made commercially feasible, and Thomas Odiorne and his brothers took full advantage of it.

Thomas Odiorne (1769-1851), of Exeter, New Hampshire, and Boston and a graduate of Dartmouth College, was the unlikely combination of merchant, poet, and inventor. After Jesse Reed's successful experiments in Kingston, Odiorne bought a mill seat a few miles north of



Fig. 8. C. 1810 map of Boston (lower left) showing the Odiornes' Nail Factory (circle, middle-left). Courtesy of the Society for the Preservation of New England Antiquities.

Boston in Malden (Fig. 8) and in 1807 paid Jesse Reed \$42,000 for the patent rights to Reed's one-operation machine.<sup>31</sup> With his brothers, Ebenezer the mechanic, and George, a Boston banker and lawyer, Thomas Odiorne established a nail factory at the mill seat in Malden. Within a year the Malden factory was profitable enough for the Odiornes to use their "maize of cousinships and marriages" in the Schuylkill Valley to acquire forges on the Chester and French creeks, the same area in which Armstrong had sold Perkins's machine ten years before. There in 1808 they established the Old Sable Forge Works and set thirty of Jesse Reed's machines into operation. The Reed and Perkins machines were now competing head-to-head in large-scale operations in at least two industrial regions of the United States.<sup>32</sup>

With the beginning of operations in Malden in 1807, there were now at least three major nail factories north of Boston, and the competition escalated to cut-throat levels. By

1810 the Salem Iron Factory had expanded again and now operated a third nail factory in Beverly, across the river from its Danvers operation. Jacob Perkins reappeared, building and selling an 1810 version of his 1799 one-operation machine in Dedham, Massachusetts. Ironically, while Jesse Reed was accused of basing his 1807 invention on Perkins's 1799 design, Jacob Perkins had reportedly "borrowed" Reed's 1807 clearer design for his 1810 machine.<sup>33</sup>

In 1810 and again in 1814, the Odiornes bought from Reed patent rights in improvements to Reed's 1807 machine.<sup>34</sup> With the rights to the 1807 invention and to the 1810-14 improvements in hand, the Odiornes began to fight the competition in the courts. In 1814 Thomas Odiorne, with George acting as plaintiff's attorney, filed a patent infringement lawsuit against Enoch Winkley, owner of a Portsmouth, New Hampshire, nail factory that was producing cut nails using Perkins's 1810 machines (Fig. 9). In the manner of most lawsuits, Odiorne accused Winkley of a plethora of violations against the Reed patents, but the main issue revolved around the use of the clearer in the Perkins machine that the Odiornes claimed was Reed's invention. Although Jacob Perkins was not directly involved in the court proceedings, his presence was keenly felt. The Odiornes produced as a witness Michael Morrison, a mechanic who had worked with Perkins at Amesbury on the 1799 invention, had visited Jacob Perkins at his Dedham factory, and at the time of the lawsuit owned and operated three of Jesse Reed's machines. Morrison deposed that Perkins had "frequently acknowledged that he considered Jesse Reed to be the inventor of the device" but that Perkins had used the clearer because "he thought that Reed had adopted his principle of cutting and heading nails at one



**PATENT**  
*Cut Nail & Brad Manufactory*  
 At Amesbury,  
 Or Newburyport, or  
 Portsmouth.

**E**NOCH WINKLEY respectfully informs his Friends and the Public that he keeps constantly for sale, at his Shop in Congress-street, by wholesale or retail, a large assortment of *Perkins' newest Patent cut Nails*, 3d. 4d. 6d. 8d. 10d. and 20d. — Likewise Shoathing, Drawing, Wrought and Barrack Nails and Brads, 1d. 2d. 3d. 4d. 5d. 6d. 8d. 10d. 20d. all of the first quality. All Persons wishing to purchase any of the above articles are requested to call and see them. They may be assured of meeting with as good terms as at any other place in the country. *Portsmouth, May 11, 1811.*

Fig. 9. Enoch Winkley's advertisement in the *Portsmouth Oracle* dated May 25, 1811, for "Perkins' newest Patent cut Nails."

operation in his machine." In dramatic fashion, Mr. Morrison exclaimed:

[K]nowing the abilities of Mr. Perkins as an inventor, I was induced to observe to him that "had it been my case I would have fasted forty days and forty nights before I would have taken Reed's forcing slide and have applied it to my machine."<sup>35</sup>

Winkley's primary defense was the counter-charge that Jesse Reed had stolen the design principles for a one-operation machine from Perkins. He countered Morrison's testimony with the deposition of David Johnston, a millwright at Amesbury in 1804, who remembered seeing Perkins's 1799 machine with "the parts of the machine ... lying about ... and not put together" and later in 1805 seeing the same machine re-assembled by Briggs Reed. When he saw Reed's 1807 invention in operation, Johnston was convinced that Reed's machine was "constructed on the principles of said Perkins's machine."<sup>36</sup>

The sentiment of the patent court appears to have been with the Perkins machines, for it not only rejected the Odiornes' claim of infringement but also invalidated Reed's 1807 patent, finding that it

had been modeled on Perkins's 1799 patent. Undeterred, the Odiornes continued to manufacture nails, and in 1819 they finally sued their major Boston-area competitor, the Amesbury Nail Factory, this time for infringement of Reed's 1814 patent. Why they waited so many years to directly challenge Amesbury is puzzling, unless it is an indication of just how heated the competition was becoming (the Odiornes were also suing competitors of their Sable Forge Works in Pennsylvania at this time).

Surviving court papers are voluminous but appear to contain only the testimony and depositions of witnesses for the Amesbury Nail Factory. These witnesses, however, included millrights who had lived and worked with Melville Otis; David Mooers, who had thrown away the mysterious missing piece to Perkins's 1799 machine; and Samuel Rogers and Melville Otis themselves, who (if their memories served correctly) had not only invented one-operation machines before Perkins and Reed but had together unwittingly supplied Jesse Reed with the design for the forcing slide that was so crucial to the success of Reed's machine.

The court found that Reed's 1814 patent was invalid because it was only a restatement of the 1810 patent, but it also rejected the Amesbury Nail Factory's claim that Reed's 1810 patent was patterned after Perkins's 1799 design. Thus, the status quo was maintained.

It appears that the Odiornes initially planned to either appeal the decision or to re-file the lawsuit under the 1810 patent. Depositions were taken in connection with the case in June and July 1819, a month after the verdict had been entered. However, the Odiornes apparently lost interest in pursuing the matter. David Mooers's deposition, the last one recorded, was not attended by any Odiorne representative.

## Epilogue

The end of the lawsuit signaled the last volley of the early cut-nail industry. By the time of the trial in 1819, the center of the industry had already begun to move inexorably toward the rich iron-ore deposits in western Pennsylvania and eastern Ohio. In the end, the Odiornes' operations outlasted the North Shore collective. The Salem Iron Factory ceased manufacturing nails in 1819; the Amesbury Nail Factory struggled on until 1825, when it sold out to the Salisbury Woolen Mill. The Sable Forge Works in Eastern Pennsylvania closed its doors in 1832, while the Odiornes' Malden Nail Factory continued operating until 1838.<sup>37</sup>

The principal players in this drama for the most part followed widely divergent paths. Nathan Read had already distanced himself from the the cut-nail industry well before the major battles had begun. In 1807 he moved to Belfast, Maine, where he became chief justice of Hancock County. There he purchased a large farm and spent most of his time in agricultural pursuits, "the most natural, healthy, and honorable occupation of man." The "mechanical interests" that had so occupied Judge Read's early years were translated into pioneering public education and in working to bring the railroad to Belfast. Read died in Belfast in 1849 "in the full possession of his intellectual powers and universally respected by everyone."<sup>38</sup>

As for the Odiornes, Ebenezer (the machinist who had introduced Thomas to Jesse Reed) died in 1817 of a skull fracture suffered in a fall at the Malden factory. Attorney-banker George rose from a bank cashier to president of the American Bank and climbed the Massachusetts political ladder from Boston alderman to state senator. He died in 1846, having in his later years earned a reputation as an ardent abolitionist.



Thomas Odiorne, the energy behind Jesse Reed and the Odiorne's nail-making empire, remained closely involved with the nail business. Having worked with Reed on the infamous 1807 invention and later versions of the machine, Odiorne patented his own inventions for improvements to the nail machinery. He continued to write poetic odes to the perfectibility of mankind until his death in 1851.<sup>39</sup>

Jesse Reed's 1807 invention and later improvements became the most well-known and widely used nail-cutting machines of the first quarter of the nineteenth century. Reed never moved far from his home base nor from the occupation at which he had been so successful. He used the princely sum of \$42,000 that he had received from Thomas Odiorne for his 1807 invention to finance a series of his own nail-manufacturing operations, first in Kingston from 1807 to 1812, then in Hanover from 1812 to 1819. Reed's business acumen never quite matched his knowledge of machinery, and he was forced on more than one occasion to sell his home to pay his business debts. His association with Thomas Odiorne continued for years, with Reed selling Odiorne the patent rights for each successive improvement to the nail machine he churned out, and Odiorne bailing Reed out when things looked bleakest. Jesse Reed died sometime after the birth of his thirteenth child in 1857.<sup>40</sup>

Between 1799, when he was ousted from the Amesbury Nail Factory, and 1810, when he established his factory in Dedham, Jacob Perkins directed much of his efforts to other enterprises. His re-emergence into the nail business in 1810 was probably goaded by the success of Reed's one-operation machine, which Perkins considered to be of his own design,<sup>41</sup> but by that time he had turned his attention to marketing his cut-nail machines in England, having found another backer in the person

of Joseph Chessborough Dyer, a wealthy American industrialist and entrepreneur. In 1810 Dyer patented Perkins's 1810 machine in England (Fig. 9), and within a few years had established a major nail factory in Birmingham, England, using Perkins's machines.<sup>42</sup>

Perkins's reputation as a mechanical genius had by this time triggered potentially lucrative offers.<sup>43</sup> In 1816 he was lured away from Newburyport to Philadelphia, where he worked for an engraving firm and then journeyed to London to sell his process for engraving bank notes to the Bank of England. By this time, Perkins had sold out of the Birmingham nail factory, but the engraving venture was eventually successful, and Perkins remained in London to establish an engraving concern that operated until World War II. Perkins never returned to the United States. He lived in London until his death in 1849, applying his inventiveness to concerns of steam power and navigation, and earning the title "the American Inventor."

MAUREEN K. PHILLIPS is an architectural conservator for the Building Conservation Branch/Northeast Cultural Resources Center of the National Park Service in Lowell, Massachusetts.

## Notes

1. *The Diary of William Bentley, D.D.*, vol. 2 (1905; reprint Salem: Essex Institute, 1962), 239.
2. Maureen K. Phillips, "Mechanic Geniuses and Duckies," A Revision of New England's Cut-Nail Chronology before 1820," *APT Bulletin* 25, no. 3-4 (Fall 1994): 4.
3. "Steam, A Poem," *London Mirror*, Feb. 1825, quoted in J. Leander Bishop, *A History of American Manufactures from 1608 to 1860*, vol. 2 (1868; reprint N.Y.: Johnson Reprint Corporation, 1967), 305.

4. *United States Commissioner of Patents Report* (Washington, D.C.: U.S. Patent Office, 1820, 1824, and 1849). *Franklin Institute Journal* 1 (1826): 77 and 3 (1829): 408; Bishop, vol. 2, 265, 288, 305.

5. Greville and Dorothy Bathe, *Jacob Perkins: His Inventions, His Times and His Contemporaries* (Philadelphia: Historical Society of Pennsylvania, 1943), 12-14, 20. Charles I. Pettingell, "Powow River Industries," *The Essex Institute Historical Collections* 82 (1946): 321. Sidney Perley, "The Manufacture of Nails in Essex County," *The Essex Antiquarian* 2 (May 1898): 69-70. *Early Unnumbered Patents 1790-1836: Index and Guide to the Microfilm Edition* (Woodbridge, Conn.: Research Publications, Inc., 1980), Reel 1S, No. 29.

6. Advertisements for Perkins's cut nails appeared in *The Impartial Herald* (later *The Newburyport Herald*) June 6, 1795 (for Wingate and Clark general store) and May 8, 1798, (for Abraham Perkins general store). Abraham Perkins was Jacob's brother; the *Herald* was the major newspaper in Newburyport and was owned by Perkins's brother-in-law and close friend, Angier March, after whom Perkins's second son was named.

7. Bathe and Bathe, 13.

8. *The Diary of William Bentley, D.D.*, vol. 2 (1905; reprint Salem: Essex Institute, 1962), 196, entry for Sept. 2, 1796. Reverend Bentley (1759-1819) was a Unitarian minister for East Church in Salem. Bentley travelled extensively in the Essex County area and kept meticulous diaries of his observations.

9. Bathe and Bathe, 14. Perley, 70-71. Perkins also brought with him a young machinist named Paul Moody, a Byfield native, who ran the Amesbury Nail Factory after Perkins's departure. When the Boston Manufacturing Company set up operations in Waltham in 1814, the owners first approached Perkins to become superintendent of its operations. Perkins declined but recommended Moody for the position. Moody was later pivotal in establishing what was to become the manufacturing colossus of Lowell, Mass., as chief machinist and as agent of the Lowell Machine Shop. George Sweet Gibbs, *The Saco-Lowell Shops: Textile Machinery Building in New England 1813-1849* (N.Y.: Russell and Russell, 1950; reissued 1969), 111-14.

10. Cut nails were being produced in other parts of the country, but the size of the operations is thought to have been smaller than Amesbury. For example, in 1794 Josiah Pierson was selling cut nails produced by his own invention (patented in 1794) in New York City. Rita Susswein Gottesman, *The Arts and Crafts in New York 1777-1790* (New York: New-York Historical Society, 1954), 232.
11. Perkins's patent was awarded Feb. 14, 1799. *Digest of Patents Issued by the United States from 1790 to Jan. 1, 1839* (Washington, D.C., 1840). *Index of Patents Issued from the United States Patent Office from 1790-1873*, 3 vols. (Washington, D.C.: U.S. Patent Office, 1874). Guppy registered a patent on Perkins's 1795 nail machine in England on August 19, 1796. Bathe and Bathe, 15.
12. Bathe and Bathe, 15, 16, 19, 41. Deposition of David Mooers, July 27, 1819, taken in connection with Odiorne v. Amesbury Nail Factory, Essex County Registry, *Executions*, Book 3, Leaf 155. Deposition of Michael Morrison, May 21, 1814, taken in connection with *Odiorne v. Winkley*, Federal Circuit Court, Mass. District (Oct. term, 1814); Perley, 71-72.
13. Bathe and Bathe, 21. Perley, 73. Pettingell, 321. Deposition of David Johnston (n.d.) taken in connection with *Cutter v. Reed* (1810), filed with case papers for *Odiorne v. Winkley*.
14. *The Diary of William Bentley*, vol. 1, 141. Francis B.C. Bradlee, "The Salem Iron Factory," *Essex Institute Historical Collections* 54 (April 1918): 98. Jacob Whittemore Reed, *The Reed Family* (1861), 290-304. On Aug. 25, 1797, Rev. Bentley recorded: "Our grand Elec Day. The *Gazette & Register* had long excited the public mind. In the *Reg*, Read had been ridiculed and Crowninshield extolled.... [T]he Repts also had Tickets struck off w/ the English arms for Read and the Am. Eagle for Crow." Bentley, vol. 2, 380.
15. *The Diary of William Bentley*, vol. 1, 206. Bradlee, 99. Harriet Silvester Tapley, *Chronicles of Danvers: Old Salem Village* (Danvers: Danvers Historical Society, 1923), 97. Apparently the boat was not actually powered by any steam engine but by Read, who turned the paddle wheel shafts by himself.
16. Read had two houses built on his Danvers property (in 1793 and in 1804-05), both by noted wood carver and builder-architect Samuel McIntire. See Fiske Kimball, *Mr. Samuel McIntire, Carver-Architect of Salem* (Portland, Me.: The Southworth Anthoenson Press, for the Essex Institute, 1940).
17. Bradlee, 97, 111. *Early Unnumbered Patents. The Diary of William Bentley*, vol. 2, 219.
18. An entry in Rev. Bentley's diary dated Feb. 14, 1810, indicates that Read's heading apparatus had not been used "since the first experiments." Bentley, vol. 3, 497.
19. Bradlee, 99. Jacob Whittemore Reed, 292-293.
20. Bradlee, 112. Perley, 73. Pettingell, 321. Deposition of David Johnston. Albert Gallatin, *Report of the Secretary of the Treasury to the House of Representatives on American Manufactures* (April 17, 1810): "At Dover, Beverly, Amesbury, one each, all incorporated companies, owned, in part, I presume, by William Gray, Samuel Gray and Os-good."
21. Pettingell, 320-321. Deposition of David Mooers. Deposition of Michael Morrison. The owners of the Amesbury factory petitioned Congress for an extension of the patent rights for both the 1795 and the 1799 machines (to expire in 1809 and 1813, respectively) as an "inducement with them to commence the undertaking of rebuilding [the factory]." The petition was denied. See "Petition of George Dodge and Others of the Amesbury Nail Works for an Extension of their Patent Rights in 1806," 9th Congress, 1st Session, H.J. 126, reprinted in Bathe and Bathe, 174.
22. *Marshfield: The Autobiography of a Pilgrim Town* (Marshfield, Mass.: Marshfield Tercentenary Committee, 1940), 179.
23. "Description of Bridgewater," *Collections of the Massachusetts Historical Society* 7 (1818): 176. *The Diary of William Bentley*, vol. 2, 208 (entry for Dec. 9, 1796). Bishop, vol. 1, 388 and vol. 2, 485, 487-488, 496. William Allen, "The History of East Bridgewater Massachusetts," and Charles F. Meserve, "History of Abington Massachusetts," in *History of Plymouth County Massachusetts*, D. Hamilton Hurd, ed. (Philadelphia: J.W. Lewis and Co., 1884), 465, 852. Deposition of Samuel Rogers taken June 19, 1819, in connection with *Odiorne v. Amesbury Nail Factory*, *Executions*, Book 3, Leaf 150.
24. Deposition of Samuel Rogers. Nahum Mitchell, *History of the Early Settlement of Bridgewater in Plymouth County Massachusetts* (1840; reprint, 1897), 58, 263. Allen, p. 852. Rogers and Otis collaborated in inventing a machine for cutting and rolling iron, which they patented in 1803. See *Digest of Patents*.
25. Jesse Reed, of Bridgewater, was not related to Nathan Read of Salem, but the similarity of their names has created much confusion. Swank, Bishop, and Loveday all confuse Reed with Read, and/or Ezekiel Reed with Jesse Reed. Further confusion is found in the alternate spellings given the Read/Reed/Reade name in the genealogies for each family branch.
26. Reed received two patents before 1802, one for milling nails from heated rods and one for rolling iron, the application for which Ebenezer Odiorne had witnessed. Meserve, 465. *Early Unnumbered Patents, Reel 1*; John S. Barry, *A Historical Sketch of the Town of Hanover, Massachusetts* (Boston: Samuel G. Drake, 1853), 142.
27. Jesse Reed may have also been related to Rogers through Jesse's mother, Mary Rogers, of Marshfield. Elroy S. Thompson, *History of Plymouth, Norfolk, and Barnstable Counties*, vol. 3 (N.Y.: Lewis Historical Publishing Co., 1928), 36.
28. "Reminiscences," *East Bridgewater Gazette* (Feb. 24, 1894) 1. Allen, 55. Deposition of Samuel Rogers. Deposition of Melville Otis. *Odiorne v. Amesbury Nail Factory*, Leaf 139.
29. Mitchell, 294.
30. Deposition of Melville Otis, William Vinton, Timothy Allen, Odiorne v. Amesbury Nail Factory. Deposition of David Johnston, *Cutter v. Reed*.
31. Copies of two assignments of patent rights from Jesse Reed to Thomas Odiorne are among the case papers for *Odiorne v. Winkley*.
32. James C. Odiorne, *Genealogy of the Odiorne Family* (Boston: Rand-Avery, 1875), 74-76, 84-86. Anthony F. C. Wallace, *Rockdale: The Growth of an American Village in the Early Industrial Revolution* (New York: Knopf, 1978), 207-208. Curiously, it was the Old Sable Forge Works, and not the much closer Malden Nail Manufactory, that supplied the nails used in building the Boston Manufacturing Company

buildings in Waltham, Mass. (the predecessor of the great Lowell mill complex), in 1814. Boston Manufacturing Company Account Books, Baker Library at Harvard University Business School, Cambridge, Mass.

33. *Diary of William Bentley*, vol. 3, 497 (Feb. 14, 1810). Deposition of Michael Morrison, *Odiorne v. Winkley*.

34. Wallace, 208. William H. Winship, *Malden Industries and Manufacturers from about 1640 to 1951* (unpublished, 1954), 29. 1814 Patent Specifications filed with Case Papers for *Odiorne v. Amesbury Nail Factory*.

35. Deposition of Michael Morrison, *Odiorne v. Winkley*.

36. Johnston's deposition was taken in connection with an earlier case brought by William Francis Cutter against Jesse Reed in 1810 seeking to negate Reed's 1807 patent and was allowed into the

record for *Odiorne vs. Winkley*. No further information was found on the Cutter case.

37. Wallace, p. 209. "Historic Malden," *Malden Evening News*, May 5, 1936.

38. Bradlee, "The Salem Iron Factory," 99, 112. Jacob Whittemore Reed, *The Reed Family*, 293.

39. Winship, 30. Wallace, 208. *Odiorne*, 91. *Digest of Patents 1790 to 1839*.

40. Barry, 142-144. *Marshfield*, 177-179. John Ludovicus Reed, *The Reed Genealogy: The Descendants of William Reade of Weymouth, Mass., From 1635-1902* (1901), 161.

41. See "Petition of Jacob Perkins, of Newburyport in Essex County, State of Mass., for a Renewal of his Patent Right to a Nail Cutting Machine," Public Doc-

uments-1813, 13th Congress (June 15, 1813), Essex Institute, Salem, Mass. The Amesbury Nail Factory had reassigned the rights to the 1799 patent to Perkins in 1812, having been unsuccessful in its petition to extend its term and aware that the patent rights were about to expire (see note 20). Perkins was also unsuccessful in his petition.

42. Specifications and drawings entitled "Cutting and Heading Nails and Brads," English Patent No. 3365 dated July 26, 1810. Dyer would register two additional patents in England for Perkins-generated refinements to the machines: English Patent No. 3543 dated March 4, 1812, and No. 3798 dated April 1, 1814. Andrew Ure, "Nails, Manufacture of," in *Dictionary of Arts, Manufactures and Mines*, 11th ed. (New York: D. Appleton and Company, 1848), 883.

43. See note 8.

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