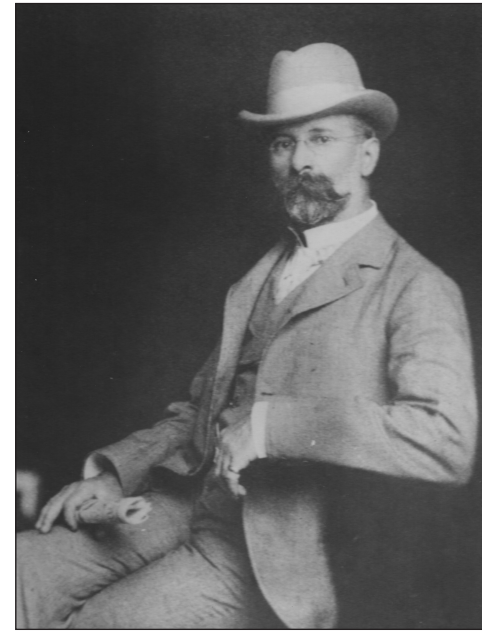


Simon W. Wardwell

Inventor, Visionary, Entrepreneur



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Thank You

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A computer, a keyboard, and the mouse that connects them all receive electronic commands from cables using the technology patented for a Wardwell braiding machine. If you are wearing fine shoelaces, ironing clothes, using a cellphone, or sport stitches from a recent surgery, a Wardwell Machine may have braided those laces, the ironing cord, the tiny cellphone wire, and likely, the stitches.

The basic design of the Wardwell Braiding Machine has hardly changed since its co-inventors, Simon W. Wardwell Jr. and Edward F. Parks, filed their first patents in April, 1905. Wardwell owned the company that brought their invention to market, and people have called it a “Wardwell Braiding Machine” ever since. A century-old technology that still shapes crucial material culture of the modern world begs the question: Who was its primary inventor?

“I’ve had glimpses of what type of person [Wardwell] might have been,” said John Tomaz, a vice-president at Wardwell Braiding Company, located in Central Falls, Rhode Island since its inception. “You hear that he was a brilliant man, you hear that he was very difficult to get along with, that he had a bunch of women, he has no children that he ever acknowledged — all kinds of things. All I know is that he made one heck of a great machine and we’re still making a living from it today. There wasn’t another braiding machine like it, not even close.”

Wardwell’s surviving personal and business correspondence reveals the comically fractious, grandiose personality of a man who was indeed difficult to get along with; he loved six-toed cats, lived apart from his wife, Mary, (though she thought highly of him), wrote flirtatiously to

other women, and his unusual will, which today endows the well-endowed Wardwell Foundation, made no reference to any children of his own.

The Wardwell Foundation recently donated the inventor's papers to the Rhode Island Historical Society, making public for the first time a fascinating archive that offers keen insight into the process of invention — from an idea to a machine to a marketing plan. The archive also offers rare glimpses of American life in the early twentieth-century, including an eyewitness account of an early Wright Brothers test flight; letters written to Elbert Hubbard, a controversial founder of the American Art & Crafts Movement who died on the Titanic; and a hilariously scathing critique of the Pullman Car.

Like many inventors, Wardwell possessed a restless, febrile mind that at times tormented him, as if his soul and his mind were mismatched. He had the soul of a poet but the practical mind of a mechanic. He began writing poetry at 18 and never stopped, turning out reams of self-published verse that displayed a good vocabulary, extensive reading, but little talent. In one poem he wrote that he would swap his “talent for invention” to be a poet, though invention “has done me service in my time;/Helpt me with my billets-doux when I was younger;/Has brought me an amatory rime;/When starving, something to appease my hunger.”

Wardwell registered his first patent at age 22, and his last one came posthumously, more than 50 years later. The exact number of his U.S. patents is difficult to pin down, somewhere between 150 and 170. Some of them are multiple patents for constructing a single machine; many of them were of dubious value: a cylindrical toy whistle; a collapsible canoe; an eggcup; a type of fishing reel. In his mid-30s he invented ingenious ways of winding thread, yarn, and wire on his Universal Winding Machine, which brought him enough money to live comfortably. At age 55, he made his mark as an inventor of historical importance, registering, with Parks, the first of 17 patents for a braiding machine so advanced that no one has significantly improved upon its mechanics in more than a century.

In 1937, 16 years after Wardwell's death, one of his nieces expressed an interest in writing a novel based on her mysterious, inventive Uncle Simon. The niece, who became an accomplished opera composer named Adelina Carola Appleton, wrote to one of Wardwell's business contemporaries: “I would like to know a lot more about him. ... Aunt Hanna [one of ten Wardwell sisters] has told me some things. I'd like to really do this — just as soon as this very busy season wanes a bit. But I would like to collect data soon. If I could come to Providence later on could you assist in the ‘telling me?’ Is anyone doing this?”

The business partner, Edwin C. Smith, discouraged Appleton from trying to learn more about her ingenious, eccentric uncle. “You see,” he wrote, “none of us had any intimate knowledge of Mr. Wardwell — only such knowledge as came to us from our daily relations. We were of his staff if you want to put it that way. [W]e were not really business associates or business intimates. Between our sphere in his world and the sphere of his personal affairs there was a barrier. Only once in my years of working for him have I entered his house. There was a standing rule that no calls or visits be made except at his instance.” Smith violated this rule one time, when an urgent business matter came up.

“So, believing that I was serving his interests I essayed to get the message to Mr. Wardwell. He met me at the door of his home. Not a word was uttered but he made it very clear to me that my best course was to go back which I did. He overlooked my indiscretion but he made it clear that there was to be no reoccurrence. That little incident may perhaps help you understand why it is difficult to relate the facts of Mr. Wardwell's life.” Difficult, perhaps, but given the rich archives of business and personal correspondence he kept locked in a vault, not impossible; and, given the importance of his and Parks' invention, worthwhile.

In 1849, Matilda Ann Wardwell delivered Simon Wardwell Jr., the third of her 13 children, in the Alleghany Mountain of western Maryland. Her husband worked as an agent for a lumber company that supplied wood to Baltimore's shipbuilders. Her oldest child, Ernest Wardwell, described the family's hometown of antebellum Grantsville as a “primal village (in which) I learned to ‘read, write, and cipher,’ shoot squirrels, and catch ‘mountain trout’” Simon's formal education was likely similar to his older brother's, the equivalent of a “common school” education that taught the basics of reading, writing, and arithmetic.

In his ninth year, 1858, Simon's family, now numbering 12 children, moved to an even more remote location in the mountains of Maryland, where, in his brother's words, “there was neither village or school.” The family moved there in order to be closer to the mill that sawed trees into boards, a move that likely ended Simon's formal education at the age of 9. One year after that, in 1859, Matilda Ann Wardwell died, during or shortly after the birth of her 13th child.

“Our household was completely disrupted by the death of our mother,” Ernest Wardwell recalled in a 33-page memoir, “and myself brothers and sisters separated, never to be united again as one family.” The father packed Ernest off to Baltimore to resume his education at the Adams School for boys; Simon and a younger brother stayed with the father in the rural reaches of the Alleghenies, while all the girls went to the father’s ancestral home in the Merrimack Valley of Massachusetts to board with uncles and aunts.

At the outbreak of the Civil War, Ernest won a small measure of fame in Baltimore, and it is good that he did, for without it, there would be precious little information about Simon’s early years. As a high school student, Ernest bore witness to the Baltimore Riot of 1861, in which a mob of Confederate sympathizers attacked a regiment of Massachusetts soldiers passing through Maryland en route to Washington, D.C. to protect the capital after the bombing of Fort Sumter. At first Ernest, then 17, aligned with the bloodthirsty mob; but when he saw soldiers in blue enduring a punishing rain of cobblestones, coal, bottles, pitchers and dishes crashing down upon their heads from the city streets and windows above, he empathized with the soldiers. One soldier knocked unconscious dropped his rifle when he fell; Ernest picked it up, handed it to a Union soldier, and fell in with the regiment, where he came under fire for the first of many times.

The 6th Massachusetts Volunteer Infantry adopted the teenage Ernest as a kind of mascot. He never returned to school, choosing instead to go north with the regiment to their home in Massachusetts, where, at 18, he formally enlisted with the 26th Massachusetts. His quick transformation from a southern schoolboy to a Union soldier earned some news coverage and prompted him to write about his experiences, offering the only insight into Simon Wardwell’s early years.

Ernest fought in battles around New Orleans and Baton Rouge where he twice suffered wounds. In 1864, while stationed in New Bern, North Carolina, he went on furlough to western Maryland, where he took 15-year-old Simon from their father’s care and brought him back to the Union garrison at New Bern. “It was at great expense to me that I fitted him out with clothes and paid all of his board,” Ernest wrote, an arrangement that lasted into 1866, when 17-year-old Simon left New Bern and struck out on his own, eventually for the west.

“He left home and went to St. Louis, Missouri, where he invented a sewing machine, and was also much interested in flying machines,” Ernest recalled. Simon’s name emerges as a St. Louis resident in 1871, when the

U.S. Patent Office issued him his first patent, for a sewing machine table. That leaves a gap between the time he left his brother’s care in 1865, and his emergence in St. Louis in 1871. Simon makes an oblique reference to this period in a 1902 letter addressed to “Kind Woman,” in which he writes of “the summer of 1869, in the wilds of North Missouri, traveling in the capacity of a tramp ... nourished on hard corn and snow-balls with liquid air dessert.” It is possible that Simon Wardwell Jr. struck out for the west and rode the rails as a tramp until he settled in St. Louis at 19, perhaps for no other reason than that’s where the freight trains brought him.

At 22, he earned a patent for a sewing machine table that he claimed could attach to any make of sewing machine. Its chief benefit was that it swiveled so a machine operator could rotate the table instead of moving the fabric when sewing, of little benefit given the light weight of fabrics. The two men who witnessed his patent application spearheaded a group of local investors to finance their inventive prodigy as he attempted, with further patents, to bring a sewing machine to market. The group incorporated as the Wardwell Sewing Machine Company in 1874, with 24-year-old Simon listed as a stockholder.

The machine that Wardwell eventually produced appears to be heavily influenced by the design of the Willcox & Gibbs sewing machine, patented in the late 1850s by an Appalachian mountaineer named James A.E. Gibbs. Both machines laid down a lock stitch in lieu of the far more common chain stitch. Gibbs lived in the mountains in what became West Virginia, north of Roanoke; Wardwell grew up in the mountains southwest of Cumberland, Maryland, on the border of West Virginia, a distance of less than 200 miles between them. Gibbs’s story was a classic rags-to-riches tale. Through sewing machine patents he filed in the late 1850s, Gibbs transformed from living as a poor mountaineer to being a wealthy man of influence, a story that might have resonated with a nearby, mechanically minded boy harboring a dream to invent flying machines. The connection is just informed speculation, one possible explanation of why Wardwell mostly applied his inventive talents to textile machines rather than saw mills, machine tools, steam engines, or aviation.

The earliest extant photograph of Simon W. Wardwell Jr. is a small, oval portrait stamped into a passbook that allowed him daily admittance to the Philadelphia fairgrounds of the Centennial Exposition of 1876. In the

photograph, Wardwell cultivates facial hair known as a Van Dyke beard. His mustache bends into a frown, with a thin goatee. He is 26, fair-skinned, and parts his hair to the left with an upsweep to his bangs. He dresses in a collar and tie.

The passbook granted Wardwell admittance to the Philadelphia fairgrounds as an attendant of an exhibition presented by the Wardwell Sewing Machine Company of St. Louis, Missouri. The company exhibited its model of a lock stitch sewing machine. Wardwell did not develop a working model of the machine until years after the fair closed, but that did not deter him from exhibiting a static, non-working machine. Fair judges awarded the exhibit a “medal and diploma on its merits,” an honor touted by Wardwell’s company out of all proportion to its worth. Judges at nineteenth-century expositions were very free in their awarding of medals and diplomas; a gold or silver medal indicated real merit, but general medals and diplomas were the 1800s equivalent of participation trophies. As early as 1867, James Gibbs’s sewing machine company, Willcox & Gibbs, advertised that it would no longer even compete for medals as their machine had earned so many that the firm found them superfluous.

Wardwell Manufacturing’s name surfaced in the Dun Credit Reporting Bureau’s St. Louis office in February 1877, and reports from Dun agents were not encouraging: “prominent wealthy citizens who were stockholders have sold out and there are but few responsible parties connected with it now. Have not commenced manufacturing machinery and the capital which was originally paid in has been consumed by salaries and current expenses.” In addition, a director was suing the company for expenses incurred at the Centennial Exposition,

“They have an excellent machine,” the Dun agent wrote, “but their long delay in getting it properly to work has caused a great deal of distrust ... The firm is under a cloud at present.”¹

In April 1877, the company told Dun agents that Wardwell Manufacturing’s president, George W. Shaw, “went East” to Hartford in order to negotiate a contract with the Colt Fire Arms Company to build the sewing machines. By January 1878, Dun reported, the Wardwell Company had still built no sewing machines. The Dun agent predicted that even if Wardwell Manufacturing produced machines, the firm would face “an endless amount of litigation” for patent infringements.

Despite Dun’s gloomy pronouncements, the Wardwell Manufacturing Company pressed on; by May 1878, Colt produced 15 sewing machines per day. Wardwell’s extant writings are often feverishly

hyperbolic, and around this time he issued an advertising brochure for his sewing machine that hailed in boldfaced type a “New Era and Revolution in Sewing Machines, As much as the discovery of Columbus in the Geography of the new world.” He claimed the machine was “The Leading Invention of the Nineteenth Century in its Class,” a preposterous claim. Wardwell accompanied one of his machines for exhibit at the Paris Exhibition of 1878, where, like many U.S. exhibitors, Wardwell Manufacturing earned a medal for its two-spooled, lock stitch machine. Shortly after the Paris Exhibition, the company fell apart. A lender sued Wardwell Manufacturing for payment in August 1879, and that December the company assigned the tools used in making the machine to its debtors. By early 1879, Wardwell and his St. Louis-born wife, Mary Shea, had already skipped out of Missouri, moving to Providence, Rhode Island, to employ his skills as a sewing machine designer with the Hautin Sewing Machine Company of nearby Woonsocket. That April, Wardwell sold to Hautin his patent for efficiently coating thread with shoemakers wax. Waxed threads offered less friction than standard threads and shoe manufactures used them in sewing together stiff leather pieces.

In moving to Providence, Wardwell followed the same path trod by inventors such as George Corliss and James Gibbs decades earlier. Corliss had come to Providence seeking funding for his sewing machine patent, the third such patent issued in the United States; his invention stitched together leather soles to shoe tops. Corliss never did find funding for his sewing machine, but while working in Providence as a draftsman he invented a system of valves to more efficiently harvest the power generated by steam engines, revolutionizing their construction.

Gibbs’ patent lawyer, James Willcox, had come to Providence seeking a manufacturer for their single-spool, lock stitch sewing machine, eventually contracting with Brown & Sharpe to build the machines with interchangeable parts, one of the first non-weapons projects to use the Armory System of manufacturing. For much of the nineteenth-century, Providence was what economic historian Nathan Rosenberg has called a place of “technological convergence,” where investors, inventors, and manufacturers formed a synergistic culture that drove technological innovation that solved manufacturing challenges and created new possibilities.

Wardwell did not accept failure well. Developing a successful sewing machine became an obsession for him, a Great White Whale. His first attempt to bring his own sewing machine to market had failed, so in 1887 bought out his Woonsocket employer, the Hautin Sewing Machine Company, and again incorporated as Wardwell Sewing Machine Company. By the 1880s, the barriers of entry to the sewing machine market were formidably high. Through ingenious marketing and customer financing schemes, Singer's dominance of the sewing machine market was so complete that many smaller manufacturers dropped their sewing machine lines and converted into making other goods such as guns and bicycles.

Inventing machines cost money, and Wardwell did not have a lot. His ingenious ideas helped him draw investors for his inventions, though at times his extravagant claims and acerbic personality drove them away. Wardwell pulled together a consortium of investors in Woonsocket to help him advance the design of his sewing machine, much as he had in St. Louis. His Woonsocket investors included Joseph Banigan, an Irish immigrant who struck it rich through his Woonsocket Rubber Company, mostly making rubber boots and shoes. They bought out the Hautin Sewing Machine Company, and in 1887 incorporated as Wardwell Sewing Machine Company. Sales data for that company does not exist, and it is unclear whether the second version of Wardwell Sewing ever brought a machine to market. If the machine ever did come to market, it likely did not sell well; in 1889, Wardwell took work as a selling agent for L.S. Scott, a Woonsocket manufacturer of lath-sheeting for horsehair plastering. Within a decade of Wardwell Sewing's inception, the partners sold its assets to the Taft-Pierce Company of Woonsocket. Taft-Pierce diversified into things like typewriters, eventually went into receivership in 1905, and was taken over by a syndicate that made gages and other measuring devices (but no sewing machines) into the 1980s.

While he tinkered with sewing machines with his investors' money in the 1890s, Wardwell also drafted plans for a machine that could more efficiently wind thread onto spools and bobbins. As anyone who has ever tried to rewind a garden hose or a kite string knows, evenly winding strands of loose fabric is a challenge. Thread and yarn resist even distribution across the face of a cylinder. In textile mills, various kinds of machines — drawing machines, spinning machines, and looms, sprouted empty bobbins that needed to pick up thread from a large skein, and wind it around the smaller jack spools to the shuttle bobbins so they could twist, spin, or weave the thread or yarn into fabric. In any textile mill, thousands of bobbins of different shapes, sizes, and materials spun at different speeds, and

getting them to evenly wind thread, wire, or yarn presented a challenge that Wardwell sought to solve.

To fund development of his ideas for a winding machine, Wardwell turned to Joseph Leeson, an English-born linen merchant with offices in Boston. In 1892, Wardwell agreed to assign to Leeson his future patents for \$100 and a large share of the new Universal Winding Company's stock. The company initially rented factory space in Attleboro, Mass., where Wardwell went to work testing his ideas.

His wife, Mary, fondly recalled those early, hopeful years of their marriage, when they lived in Boston and her husband was trying out new ideas in Attleboro. Wardwell "appreciated the help he had financially in the invention of the winding machines," Mary wrote, "but Mr. Leeson gave him no other help. All Mr. W's inventions," she wrote of her husband, "show his extreme ability in Mechanism — a 'Wizard' really in that line." Ironically, one of Wardwell's paternal ancestors, also named Simon, had been hanged on Salem's Witch Hill in 1692, accused of being "a wizard."

Carl Christensen, who began a long career drafting the blueprints for Wardwell's inventions in the 1890s, recalled that he and Wardwell "expended considerable time and worry" in the Attleboro factory before the Universal Winding Machine "actually performed." Wardwell's methods for winding were complex, ingenious, and produced skeins of thread that are recognizable to this day. He developed ways to incrementally nudge thread back and forth as it wound around a cylinder, adjusting as the movements as the skein of thread grew larger. He pioneered, perhaps outright invented, layering thread at angles, like you might see in a skein of kite string, and "cone winding," in which a skein tapers toward the top, like a skein of baker's twine.

When Wardwell's "Universal Winding Machine" hit the market in the mid-1890s, it performed so well that at least one competitor, the Williamantic Linen Co, copied it, leading to nearly seven years of litigation that suppressed Universal's value until the case was decided. The suit commanded the industry's attention because, as the Boston Transcript put it, "this style of winding is fast superseding the older methods and holds fair to control the delivery of every description of yarn and thread, for all purposes, through the agency of looms, knitting frames, sewing machines, braiders, electric wire insulating machines, etc."

One U.S. District Court in Connecticut ruled that the Wardwell method showed "no patentable novelty," while another ruled that

Williamantic's winding machines were "such an improvement ... of the art at the date of the invention" that they infringed on no existing patent. Finally the U.S. Circuit in Boston ruled in 1900 that the patents Wardwell assigned to Universal Winding in 1894 were "good and valid" and that Williamantic had infringed on his improvements, opening a wide and prosperous field in winding machines for Wardwell and his company. Wardwell and Leeson enjoyed a few prosperous years after their company won its patent case, but then the volatile cotton industry plummeted into a min-recession, reducing the demand for machinery. Meanwhile, Wardwell continued to cast about for financing to bring to fruition the many inventions that constantly burned in his mind: an adjustable wrench made from stamped metal pieces instead of cast iron, to lower its cost of production; the cylindrical toy whistle, collapsible canoes, an improved method of dyeing yarns without unwinding them.

Wardwell found financing for his stamped-metal wrench through a partnership with Fredrick Mossberg and Walter Ballou, the latter a director of First National Bank and executive of the National India Rubber Company. They founded the Mossberg Wrench Company in Attleboro, which made the wrench, the whistle, and branched out into nickel plating and making light machine parts. Wardwell continued to make improvements in winding for Leeson and the Universal Winding Company, and he acted as the superintendent of the firm's new plant at 99 Stewart St. in Providence; but he also continued to pursue his own interests with Mossberg Wrench, eventually building a large plant of his own in Central Falls in 1902.

In the early 1900s, Wardwell also incorporated the Woonsocket Publishing Company, a holding company that began to publish his voluminous output of poetry under the nom de plume "Simon Durst." Durst means Thirst in German, symbolic of Wardwell's "thirst" for life. The Woonsocket Publishing Company, which Wardwell referred to as his "Playhouse," likely owned just a little equipment for light binding. Wardwell wrote that he would have liked to learn the printing trade, but there's no evidence that he ever did; he once forbid the illustrator of his poems from visiting the Publishing Company's Woonsocket office, possibly because there was not much to see.

To bind his poems between quality covers, Wardwell hired the Roycroft Press, owned by Elbert Hubbard, a controversial philosopher and businessman whom Wardwell admired. Wardwell once heard Hubbard speak in a Providence church, and Hubbard's remarks moved Wardwell to what he called "'smile-tears,' squeezed out of the lachrymal ducts by an

excess of conflicting, but all pleasuring emotions." Hubbard built a Utopian community of craftsmen and artists on his Roycroft campus in East Aurora, New York. When Wardwell contracted with him to publish his poetry in the early 1900s, Hubbard was on the cusp of a publicly scandalous divorce, after fathering and openly raising a daughter with the community's schoolteacher. The Roycroft community was part of the American Arts and Crafts Movement, which adapted as its creed this motto from English philosopher John Ruskin: "A belief in working with the head, hand and heart and mixing enough play with the work so that every task is pleasurable and makes for health and happiness."

It might seem ironic that Wardwell, a man who devoted his life to inventing machines for automating and speeding up factory work, would embrace a movement that stressed the pleasure of craft and encouraged workers to unite the "head, heart, and hands" to fashion artisanal objects in a healthy, happy environment. For its founder, William Morris, a socialist Englishman, the Arts and Crafts movement was not all about aesthetics, it was equally about principles, a philosophy to lead the Industrial Revolution's refugees by showing them how to turn their backs on industrialization by hand-crafting objects both useful and beautiful. But the Arts & Crafts movement's largest, most successful practitioners in the United States, Gustav Stickley and Elbert Hubbard, married the movement's values with the technology of machine production, an American phenomenon sometimes called the "democratization" of the Arts and Crafts movement. This allowed common laborers to hold in their hands aesthetically pleasing furniture, pottery, and books that, without machine production, would have remained beyond their means. It also allowed Stickley and Hubbard, devout capitalists, to make good money.

Wardwell paid homage to Hubbard in his first hardcover book, *Bub and Sis*, nearly 25,000 lines of rhyming couplets telling a love story that begins in fictional "Hubton" before rollicking off to pastoral Apple Meadows Farm. The poem is essentially an adolescent fantasy in which the main character, Bub, hooks a beautiful trout. As he reels it in, he calls the fish by the name of the girl he has a crush on, Jane, who overhears him as he says to the hooked fish:

There Missy, I have hooked you! Now we'll see
Whose Jane You are. My beauty! Come to me –
There, that's the way – right in my little net;
Oh, don't be frightened – I won't hurt you pet."

Jane overhears him comparing her to a trout, is happily shocked to hear how much he adores her, so “convulsed with bliss” he “pressed upon her lips love’s first kiss.” He signed one copy of the book, now in the Wardwell archives: “To Louise Rivers – Wishing her Jane’s happy fate. Simon Durst.” Wardwell’s addiction to inventing, the strain of yoking together business partnerships, running businesses, and maniacally writing poetry drove him to madness. By the early 1900s, he and his wife were permanently living apart. He took rooms on Greene Street in Providence, near the Public Library, where he lived with several six-toed cats, which he sometimes gave as gifts to friends. His lease included a clause allowing him to tint the windows so no one could see into the “experimental factory” that he kept on the first floor.

On July 7, 1904, Wardwell wrote to Joseph Leeson, his partner in Universal Winding, with a progress report of a redesign for one model of the Universal Winding Machine, the No. 50. “Until a machine is absolutely done and tested, exhaustively, the cost and time of producing special tools cannot be estimated with any reasonable degree of certainty

“I desire, Sir, to give you a set of perfect machines at as early a day as possible. The time is drawing near when I must stop. I ought to stop now. I do not sleep, and have very distressing hallucinations while lying, wide-awake, in bed, and some of them persist even after getting on my feet – which is often necessary several times during the night. ‘My Doctor’ says that my brain must have an absolute rest for at least six months, or I shall be a mental wreck; so I have to choose between financial and mental wreck. I am debating the question every day, every hour, every minute.” Wardwell, nearly 55 years old, was on the cusp of a breakdown.

The summer of 1904 might have been the nadir of Wardwell’s adult life. He felt worn out, mentally and physically. The year before he had apologized to his psychiatrist for being “such a crazy patient,” and he suffered physically as well. A doctor would soon diagnose him as suffering from a “double hernia.” He spent 18 hours a day working on his various projects with the Universal Winding Company, Mossberg Wrench, and the Brindle-Steere company, for which he was trying to develop a new kind of power loom. In the few hours he spent in bed, he obsessively wrote poetry while sitting up; he continued to “skribble” poetry while sipping coffee at

breakfast, his mind unable to just idle. With his restlessness and insomnia, it was no wonder he was unable to live with Mary or anyone else.

Wardwell wrote to his sister, Alice, during that unhappy summer, “You have only to imagine a ship that has passed through a hurricane, with sails in rags, and masts in splinters, scudding under scraps of canvas and spars as remain after a storm, to understand my situation. I am not only powerless to help, but in need of help.”

Financial pressures also weighed heavily upon Wardwell. He had borrowed heavily to build his Mossberg Wrench factory in Central Falls, and he owed \$44,000 worth of five-year notes to four different banks. Mossberg Wrench was turning a profit on its stamped metal wrenches and toy whistles, but it was not yet paying dividends. Universal Winding had laid off 50 workers in March, and had temporarily ceased paying dividends to weather a mini-recession in the cotton industry, which dampened orders for new textile machines. A speculator named Daniel J. Sully, the “Cotton King” had attempted to buy up and hoard the cotton market, driving cotton prices high, spurring growers to grow too much, until the glut spilled out of Sully’s control, suddenly depressing prices, devaluing cotton purchased high and stored at mills nationwide. The glut shuttered mills that could not afford to produce cotton goods for less money than they had paid for the raw material. The chaotic forces Sully had unleashed on the market pushed him into receivership.

To boost Universal Winding’s balance sheet for the new fiscal year that July, Leeson asked Wardwell to forego \$7,000 in compensation. The winding company had paid good dividends for a few years, on the strength of Wardwell’s patents; he was accustomed to being able to help family members pay their bills – though he lived apart from his wife, Mary, he paid all of her expenses. He helped his sister, Alice, and he paid tuition and expenses for a niece, Nellie, to attend the New England Conservatory of Music, though Nellie tried his patience by running up small debts without telling him.

“Do not longer deceive yourself in the belief that you can in any way contribute to my happiness,” he wrote to Nellie after her graduation. “Even were I capable of that beatific state – and I am not – it would not consist of the elements which you could supply.”

In September 1904, two months after his psychiatrist prescribed a rest for his mind of “at least six months,” Wardwell struck up a conversation with Edward H. Parks, a 38-year-old foreman and model maker in one of his plants. In their conversation, Parks wondered whether Wardwell had ever considered working on the improvement of braiding machines.

As a matter of fact, he had. On a trip to Manchester England for the International Winding Company, Universal's foreign subsidiary, Wardwell had noticed the clumsy construction of braiders in factories in that city. Wardwell called them "jumping jennies" because of the way they shook and rattled as they spun bobbins round and round in a deafening racket. It seemed to him that braiding technology had hardly advanced since the first English patents issued in the mid-1700s.

Parks and Wardwell began an examination of braiding machines made at places such as New England Butt in Providence, and they found them woefully inefficient. Braiding machines consisted of a large metal disc that supported as many as two dozen spools or "packages" of tightly wound thread. Each package connected to three "horn gears," notched discs. When the notch in the first gear synched with the notch in the second, the second one snagged the package's dangling strand, and pulled the entire bobbin into its rotation. The second gear's notch then rotated to meet the third gear's notch, snagged the strand and passed the package onto another set of three gears. The gears tightly "rotated" the packages and "revolved" them in a big circle around the wide disc upon which they were mounted. A set of packages required multiple horn gears, noisily rotating, passing the bobbins back and forth in a serpentine, circular pattern.

Parks and Wardwell hit on a solution that removed all of those rotating gears. They fixed the packages to two, revolving discs, one set above the other. The bottom disc or "outer track plate" rotated in a clockwise direction, while the top disc ("inner track plate") rotated counter clockwise. The real genius of their machine was its method of raising and lowering strands unwinding from the thread packages. The bottom, or outer drive plate, manipulated taut strands of fabric with wicket-like "deflectors" that forced moving strands up and down, as they traveled up and along, then down a deflector.

The thread packages fixed to the inner drive plate revolved in a counter-clockwise axis, and also raised and lowered their unwinding threads. The inner drive plate manipulated the thread packages through use of a cam.

This method of revolving fixed packages in opposite directions while raising and lowering their strands promised to create a tighter, more consistent braid than conventional "jumping jennies" could produce. On the jumping jenny, each package rotated toward the center of the plate, then out toward the edges, a difference of a couple of inches that caused threads to slacken as each package moved toward the center of a plate, then tighten as it moved out toward the edge. On the Wardwell Machine, each pack-

age remained a fixed distance from the central braiding point while the strands passed over and under each other, creating a consistent, tighter braid.

On paper, the Wardwell-Parks design promised to be quieter, less cumbersome, and much faster than the manifold churning gears in the old "jumping jenny" technology. Using machine tools, toolmakers, and expert model makers available in their Mossberg shop, Wardwell and Parks built a small, prototype model in just a couple of months.

On November 12, 1904, a Saturday, Wardwell and Parks turned their small braider for the first time, braiding just 18 strands. Five days after that first test run, Wardwell was convinced that his braider could corner the market on candlewicks and shoelace manufacturing. "It is therefore our intention to sell the exclusive right to manufacture shoe-strings on our machine to some big concern here in Providence, which is the center of shoe-lace manufacturing, for \$250,000. We have figured the thing out, and this would be a small price for the 'exclusive,'" Wardwell wrote.

Parks and Wardwell worked methodically to develop their machine. First, they made the small, "four-strand candle wick braider." Wicks for candles and kerosene lanterns were ubiquitous in 1904, and Wardwell envisioned a huge market there. After braiding wicks, he planned to build a 48-strand braider to make shoelaces.

"We are making good progress in the development of the rapid braider, and expect before long to send another set of [patent] applications on it," Wardwell wrote, shortly after filing his first braider patents in April 1905. "There will be quite a number before we get through," as indeed there were – 17 successful patent applications issued to Wardwell and Parks over the next half-dozen years as they struggled to perfect their novel braiding machine.

Wardwell felt like he held a winning hand, but he and Parks still needed to play their cards right. There were so many variables in bringing a new machine to market, most importantly: What were the advantages of raising capital to manufacture the machine themselves, versus selling the patents for ready cash and letting someone else develop the expensive tooling to build them?

While they debated financing and other questions, they continued tinkering. To raise capital, Wardwell decided to sell his stock in the Brindle-Steere Company, hoping just to recoup the \$16,000 he had invested with them in developing a new kind of loom. He and Parks tore down the braiding machine "all to pieces" and laid out the parts to make "important changes" in reassembly.

“We have to take all the risk in when beginning an invention,” Wardwell groused in 1905 to a Philadelphia investor interested in the machine. “The inventor has to take the risk of not only making a success of the machine and of scouring patents, but of the possibilities of the machine being a success – all this warranted by prospects of large margins of profit over machines in use.”

The essential step was to make the machine a success, an invention that would run smoothly, efficiently, and perform functions better than anything on the market. Wardwell felt that he could deliver, that he was on the cusp of success. But, he observed in the spring of 1905, “While the grass grows, the horse starves.”

Wardwell and Parks decided to sell their patents rather than tooling up to make the machines on their own. In writing to a New York City investor in February 1907, Wardwell laid out his reasons for selling the patents:

“First, I am growing old. I am older than most men of my age [57] on account of the strenuous life I have led and am leading. I have got to stop it pretty soon, and therefore what I have to I must do soon or not at all, for if I delay these things I shall go stale on them, lose my verve, snap, enthusiasm, imagination, originality, etc. I must strike while the iron is hot, and it is very hot on three or four things now.

“Second, I need cash now – quite a bushel – for, though my International and Universal Companies are both earning money ... they are not and will not pay me dividends for some time to come, for I propose to keep the money in the treasury to build a factory for [Universal Winding, which leased its factory space.] I am tired of doing business in other people’s houses, especially when the other people are bankers and brokers, as are the owners of this [Stuart Street] property, for bankers and brokers are the stupidest – meanest people in the world, and I shrink from stupid, mean people.

“There are other reasons why I desire cash which I cannot very well put on paper, and cannot very well state verbally to anyone but a man of my own type of supreme cerebral convolutions.”

Wardwell wanted cash, but his candid, at times caustic, personality made him a difficult negotiator. Besides selling rights to the Wardwell-Parks

Braider, he wanted to sell his patents for a “magnet winder” that drew on magnetic power to wind electrical coil onto giant spools. He developed the magnet winder for the Universal Winding Company, while simultaneously perfecting his braider, working on new types of looms for Brindle-Steere before selling that stock, managing Mossberg Tool’s line of wrenches and whistles, publishing his poetry, and still tinkering with a new household sewing machine that he hoped to bring to market. He never did quit on his goal of marketing a sewing machine, and had a falling out with one of his investor friends who suggested that he drop the idea.

General Electric installed the magnet winders in its Lynn, Massachusetts factory, and early returns looked promising. The company wanted Universal Winding to make larger magnet coiling wires, and Wardwell saw a competition brewing between GE and Westinghouse for the machines. Wardwell held interest in the Universal and International Winding Companies with Joseph Leeson, and he wanted those companies to spin off another company to build the magnet winding machines, capitalized with a large stock purchase by GE, Westinghouse, or Western Electric. Wardwell felt, however, that Leeson and his management team were not capable of pulling off the deal, exposing a rift that had been growing between Universal’s “Boston Office” and its “Factory Office” in Providence.

“Now, I am, I believe personally capable of engineering this arrangement through,” Wardwell wrote to an agent in March 1907, “but I am so preoccupied with more important matters in the invention line as to render it inexpedient for me to take on the labor of it; and I will say to you, in strictest confidence, that I very seriously fear that if the Company is organized by our Directorate, or a committee of the Directorate, other than myself, the arrangement would not be satisfactory to me ...

“Now, I advise that you get one or two real men – not mere financial shells, but men – comprehensive thinkers – incidentally possessed of money enough to come here and see me about this thing; or, if you can get them ready, I will come to New York and bring some magnet samples; but please emphatically understand once for all, that I am, as Mark Twain says, ‘very old and very wise’ and can see through a good many holes in the skimmer, and have no time to quibble with mere money grubbers, quibblers, or smart Alecks of lawyers. If you run me up against anything but men, I will make my little bow and withdraw in a minute.”

Wardwell pitched the braider patents to the Draper Corporation, just across the Rhode Island border in Hopedale, Mass., the world's largest producer of power looms. In one 1906 letter to George Draper, Wardwell joked: "I think it would be well for us to meet soon, and talk about things over a bit, with a view to an acquaintanceship. 'It is possible' that cooperating, we might make a hundred thousand millions or so, and take charge of all earthly things generally – religious, social, commercial, and financial. I am you see, a modest person. My speculations and ambitions do not extend to Mars. Heaven and Hell, however, being within these purlieus, why I must include them, of course."

In a subsequent, serious proposal to Draper, Wardwell promised in his typically hyperbolic prose: "We are able to deliver the absolute monopoly of the braiding business for the world." Wardwell felt sure that his new-style braider would quickly make all existing braiders obsolete, which was not the case. The braiders he dismissively referred to as "jumping jennies" were and are better at producing products of large dimensions. Wardwell's machine braided quickly, tightly, and precisely, but never would be able to braid products of a large diameter; the centrifugal forces of wider plates would put too much tension on the packages. Wardwell's braider was revolutionary, but there would always be uses for the "jumping jenny" machine.

The Wardwell-Parks braider did dramatically improve braiding for cable used to transmit electronic signals. Irregularities in loosely braided cable scatter signals, reducing the "signal power" of the cable, a problem since the first telegraph cables began transmitting in the 1830s. The new machine's tighter, more consistent weave reduced the "structural return loss" of a signal, vastly improving efficiency for all sorts of uses, the telegraph, telephone, electric motors. The Wardwell-Parks machine was also faster and more precise for the most common braiding products.

Wardwell's boastful, caustic personality and often, extravagant claims made it difficult for investors to evaluate his inventions. His winding machine patents had indeed spawned prosperous domestic and international companies, but it was hard to tell whether his braider was another home run, like the Universal Winding Machine, or another whiff, like his long-suffering lockstitch sewing machine. Compounding problems with negotiating patents for the braiding machine was Wardwell's reluctance to let them go. According to his correspondence, he and Parks entertained several offers to sell the combined patents for a net of \$200,000 to split between them. But, like the artist who becomes enamored of a favorite work, Wardwell grew reluctant to let it go. In the meantime, he

continued to tinker, setting it up, breaking it down, experimenting with different diameters for the drive plates.

An eyewitness to aviation history wrote to Wardwell in September 1908: "Knowing of your intense interest in the subject of areal flight, I am taking the liberty, to write you from my own observation, hoping I am not over-stepping any bounds of friendship." The letter writer, Herbert F. Clark, witnessed a few of Orville Wright's record-breaking flights over Fort Myer, an Army base next to Arlington National Cemetery.

Clark offered technical observations of the plane's construction, then shared his feelings about witnessing "the dream of ages" as Orville rose in controlled flight. "It really gave me the most thrilling sensation the first time I saw him rise . . . The next feeling after wonderment that seems to press you is a desire to laugh at the extreme ease with which it seems to be done. . . .

"It strikes the female order peculiarly also, one girl after watching him for some time turned around and said, 'Why, he's got on tan shoes' another said 'I should think he'd wear knee pants the wind blows up his trousers.' Even the men make the most foolish remarks for to tell the truth every body is thrown off their mental balance I believe when they first witness a flight. . . . The life of the horse must be full of trouble," Clark observed on September 11, 1908, "first he had to get used to the bicycle then the automobile and now the flying machine is destined to add still further nerve-wracking tests."

Clark told Wardwell: "I know that you would be pleased to see him fly[.] Also that you could improve on certain features. The whole affair outside of the engine is not expensive[,] could not cost over \$600 or \$700 to duplicate them in quantities." Wardwell's confidential secretary at that time, Daniel McNiven, wrote on the outside of the letter's envelope: "Wardwell's personal reply promised" but he was too busy to reply at the moment. He had set aside his lifelong dream of developing a flying machine in order to pursue his Wardwell Rapid Braider, a machine so perfect in its inception that it has hardly changed in a hundred-plus years.

In that time, aviation evolved from the Wright Brothers' first sustained flight to putting a Rover on Mars, a remote controlled vehicle packed with wire braided on a Wardwell machine.

A crew of workmen lugged a 341-pound machine up the stairs at the Mossberg Wrench factory, and mounted it to a bench. Wardwell set up the braiding machine with cylindrical spools, or "packages," tightly wound with size 14 Code wire. On March 16, 1909, nearly five years after filing his first braider patents, Wardwell turned the machine by hand.

"The machine turned easily smoothly noiselessly," wrote his assistant and confidante, Daniel McNiven, who kept a detailed notebook of the braiding machine's development in 1909, the year Wardwell sold his first batch of 10 machines. McNiven felt that the braider "performed its function very satisfactorily," but ever the perfectionist, Wardwell had found some of its movements to be "inexact." Wardwell called for a dinner break at Cameron's Restaurant, then a visit to "the Globe picture show," before parting with McNiven at 11 p.m., resolving to "rectify the timing discrepancy tomorrow forenoon." Summing up his thoughts for the day, McNiven wrote, in a neat, cursive hand, "The machine is a handsome and to use Mr. Wardwell's term, a 'dignified' mechanism. And promises to be in all respects the wonderfully efficient machine it was intended to be."

After 16 days of tinkering with the latest iteration of his machine, Wardwell felt ready to show it to Fred Dunbar, an executive from the National India Rubber Company in Bristol, Rhode Island. On a Friday afternoon in early spring, Wardwell ran the machine for Dunbar at 53 revolutions per minute, about twice the speed of an old-style braider. "Mr. Dunbar appeared well pleased with the machine and its work," McNiven noted. "He noticed the small size of the braided product, as compared with that of the "Textile" machine and explained the advantage of that feature in putting wires into a conduit" to create insulated cable.

After watching the machine braid wire, Wardwell and Dunbar slipped into an upstairs office, where Dunbar discussed an order for 10 machines. "These machines," McNiven noted, "[are] to embody certain changes which Mr. W. wishes to make before pronouncing the machine a complete and perfect embodiment of his latest ideas as to certain details (that relate chiefly to reducing unnecessary weight) in the interest of still greater speed and productivity."

LeBaron Colt II, general manager of the National India Rubber Company, stopped in to look at the machine as it braided wire at 100 revolutions a minute, one complete revolution in just six-tenths of a second. Impressed, Colt said, "We must have machines as quickly as possible, and we shall rely, Mr. Wardwell, upon your getting them to us at the earliest possible date."

"Give me a small order for say, 10 machines, and furnish the money to build to them, and I'll surprise you with the rapidity with which I shall furnish them," Wardwell said.

"I'll give you an order for 100 hundred machines Mr. Wardwell."

Wardwell balked at that, holding fast to an order of ten that could braid wire or yarn at 100 inches per minute. "Altogether the Exhibition was most successful, and the expressions indicated the desire of the Rubber Co. for immediate negotiation for control of the invention," McGiven wrote.

Colt invited Wardwell for a tour of the Rubber Company's expansive factory across the bay in Bristol, where he showed Wardwell a huge vertical braiding machine holding 72 packages, a slow, balky machine that the company used for special, large diameter projects. "Mr. Wardwell described the machine to me as a mechanical monstrosity," McNiven wrote, "the very sight of which produced in him a condition of physical collapse and mental stagnation."

On a Thursday afternoon in May 1909, Simon Wardwell "commandeered" McNiven to accompany him on a trip to New York, that night. Executives at the U.S. Rubber Company in Manhattan, the parent company for Colt's rubber works, wanted to see him the next day in order to buy 10 machines and the exclusive rights to use the Wardwell Braider in manufacturing insulated wire, a contract worth \$100,000.

McNiven quickly packed his bags. The two men left Providence on the 6:10 p.m. Shore Line train, arriving with a hiss of steam in Manhattan about five hours later. They checked into the new Hotel Belmont on Park Avenue, at 308 feet the world's tallest hotel. One architectural magazine described it as "a city in itself."

McNiven wrote: "After a midnight repast in the Subcellar Café, and special regalement on 35-cent cigars – a most sumptuous experience for me, my Customary after lunch indulgence being mostly limited to the

ordinary 5-cent stinker brands ... we spent the time till 2:30 a.m. preparing braider data for possible use on the morrow.”

At 5 p.m. the next day, after seven hours of negotiations, Wardwell, a man born in Appalachia, who once “traveled in the capacity of a tramp” before briefly alighting in St. Louis, signed a \$100,000 deal to manufacture ten machines of his own invention for an exclusive use of the National India Rubber Company.

Wardwell and McNiven caught the midnight train to Providence, but Wardwell refused to buy tickets for a Pullman sleeper on principle. “Mr. Wardwell justly abominates a Pullman sleeper,” McNiven wrote. “The least comfortable, the least efficient, the least ingenious, the least accommodating, the least successful in securing the end in view, of any invention of ancient or modern times is a Pullman Sleeping Car. It is a disgrace to civilization and a gross libel on American inventiveness and mechanical skill.” McNiven rented an upper sleeping berth, While Wardwell opted to sit up in a seat for the five-hour run through the darkness back to Providence.

Conflict between Wardwell and the Lesson family had been brewing for some time. As early as 1906, Wardwell promoted a sales agent to regional director of all southern business, but only if the agent did not tell the Leeson family of the promotion. “Be sure you’re your letter is not sent to the Boston Office. ‘Eternal vigilance is the price of liberty,’ which applied to this case, means: keep your eyes open and your mouth shut,” Wardwell wrote.

Wardwell felt that Joseph Lesson and his sons were mismanaging the Universal Winding Company. In his opinion, they let the factory’s landlord at 99 Stuart St. in Providence walk all over them. Wardwell wanted Universal Winding to build its own factory, because the central freight elevator on Stuart Street was often inoperable, and another tenant’s steam engine puffed clouds of steam into their factory space. He felt the Leeson family were not capable of spinning off a new company to handle the magnetic winding machine, and in January 1907, Wardwell had privately threatened to stage a coup to take over management of the company, writing: “indications are very clear that in a very short time ... I shall be in formal charge” of Universal Winding.

Shortly after Wardwell’s return from his successful New York negotiations, he discovered that someone had removed a direct telephone line from his Universal Winding office to the company’s headquarters in Boston. He suspected the Leeson family took it. The conflict came to a head on June 15, 1909, as Wardwell and McNiven waited for a trolley car at the corner of Stuart and Broad Streets in Providence. At their feet were a packet of 24 skeins wound on Universal Winding’s machines with yarn to run on the first braiding machine; Wardwell also carried a few volumes of his correspondence that he planned to squire away from Universal Winding to Mossberg Wrench.

Leeson’s son, J.R., and another Universal executive, “approached us from downtown, and were beside us before we even saw them,” McNiven wrote. Leeson picked up one of the packages at Wardwell’s feet. The younger Leeson stepped in front of Wardwell “with the evident intention of speaking,” McNiven observed.

Wardwell said, “I have no desire to speak to you.” He repeated the statement. “I have no desire to speak to you. There’s no use being a damned hypocrite about the matter.”

Leeson and his fellow executive, a Mr. Harvey, “hurried away without making any response,” McNiven wrote. The trolley car came along. “Mr. W. and I boarded it, exchanged for a Pawtucket car at Dorrance St.,” in front of City Hall, “and went to the Mossberg Wrench factory,” in Central Falls. “Mr. Wardwell explained his attitude towards Leeson as the natural and proper result of the treatment he had received at the hands of Leeson and his father, and the Universal Winding Company under their direction.” The Leeson family, according to McNiven’s notebook, questioned the propriety of Wardwell’s inventing textile machines for companies other than Universal Winding, while Wardwell was still stewing about \$7,000 that he felt the Leeson family still owed him from 1904.

Despite cash from the National India Rubber Company deal, and profits from Universal Winding and Mossberg Wrench, Wardwell still labored under financial pressure. “I have so many equally or more important inventions to bring out,” he had written in 1907, and I need cash now to exploit them.” He patented a perforated, steel bobbin to replace wooden bobbins on knitting machines, and in May 1908 capitalized yet another company to make them, Superior Knitting.

Wardwell negotiated with several large companies such as General Electric and Western Electric for sale of the braider patents; though many expressed an interest in buying braiding machines, none wanted to expand their core product lines by going into machine manufacturing. Two of the largest machine manufacturers – Universal Winding and Draper Manufacturing – were both out of the question. Wardwell had alienated his partners in Universal Winding, and after his early attempts to sell to Draper he concluded “I do not like the Drapers.”

After his public spat with the younger Leeson, there seemed to be but one course of action: resign from the Universal and International Winding Companies, and sell his stock back to the company. Though he complained about the price he received for his stock, Wardwell sold his Winding Machine Company holdings, and in March 1911 incorporated the Wardwell Braiding Machine Company to manufacture braiding machines in his Central Falls plant. Parks, his co-inventor in the braiding machine patents, was not part of the new company. Parks lived until 1952; perhaps Wardwell bought his interest in their invention, though there is no record of a sale in the Wardwell archives.

In January 1918, Arctic Air Flowed into Rhode Island, thickly freezing Narragansett Bay all the way from Providence down to Newport. Booming Coast Guard icebreakers worked round the clock in an attempt to bust a channel through the ice, but so much loose ice congealed in the channel that the coal companies would not risk sending barges through to deliver coal to the Providence wharves. Coal was so hard to come by, that schools closed for lack of heat. From his rooms near the Providence Public Library at 14 Greene St., Wardwell wrote a letter to the nearby Eastern Coal Company: “Deliver to my next-door neighbor any part of 2,000 pounds of household coal ... make the delivery in such a manner that my identity in the transaction is not made known to the recipient. This family is entirely without coal.”

Wardwell also sent life insurance certificates worth up to \$3,000 to all of his fulltime workers that month, with an attached letter reading: “We have the pleasure on presenting you with the Certificate of Life Insurance for your family,” a token, he wrote, of “our appreciation of the men and women who are upbuilding the business of the Company. ... The entire cost of this insurance is borne by us”

By January 1918, Wardwell could afford to be generous. His braiding machine company held back orders for \$175,000 worth of machines, and “assurances on the part of our largest customers respectively that as soon as their present orders are filled, they will place further orders, one concern

naming 1,000 additional machines as their next order.” Wardwell’s sister, Hanna, observed that he sometimes used generosity as a means of control. “We became separated in late years because I would not be dependent upon him,” she wrote, “and then when I inherited property I filled my big house with relatives and he avoided the place as if it were dangerous.”

Wardwell wrote that winter to Frances E. Young, a Boston oil executive. “You will recall that I set great store by the promise of the Braided Shoe Thread business and prophesied great things of it?” he wrote to Young. “Well, I have proved a ‘true prophet.’ One of our customers has now running on shoe threads 200 machines, and 400 more are on order”

Despite its success, Wardwell kept pushing for the machine to do more. In 1918, the company’s board of directors agreed to pay the rent for his rooms in Providence, because he frequently used the space with the specially tinted windows as an “experimental factory” to test out new ideas. That year he was trying to gear the machine to braid tire cords for the automobile industry, a large diameter product better made on the old-style braider; he was also developing an invention that he called the “Wonder Machine,” working from designs he had first sketched out for a household sewing machine in 1903. His lawyer, Edward A. Armington, “confidently believed” that the Wonder Machine would “reach a popularity equal to that attained by the Ford Automobile.”

Western Electric had purchased 400 Wardwell Braiding machines, and was negotiating for more. Yet, Wardwell wrote in 1918, he still hoped to sell the braiding machine patents so he could work less. “At 67, [he was actually almost 69] I am pretty tired and would be glad of relief from responsibilities, and am therefore open to a deal.” A deal to sell his braiding machine patents never came to fruition

The following year, in which he turned 70, Wardwell continued his efforts to push his poetry as well as his patents. He wrote a bizarre, heartfelt letter to the popular newspaper advice columnist Dorothy Dix, offering her \$1,000 in Wardwell Braiding stock if she would critique the poetry of his friend, Simon Durst, “an odd fellow of three-score and ten years. ... He has accumulated a large quantity of ‘copy’ ... He is aware, or course, that everyone of an established reputation for notable work in the literary world has, his own burden, the burden of many appeals for help from others, seeking recognition and place in the papers and magazines.”

For her advice, he offered Wardwell stock, in advance, “without regard as whether your verdict may be ‘innocent’ or ‘guilty as charged.’” In closing he referred to his friend as an “‘ancient mariner’ overboard and at his last gasp in the whorley gorley of life.

“P.S. ___ Lady-wise, do not disdain consideration of this appeal – do not withhold a straw from the drowning; even though it should” the letter ends abruptly. It is unclear whether Wardwell sent a typed copy of this handwritten letter to Dix, and there is no evidence that she ever replied.

On July 9, 1920, Wardwell drafted an unusual will, in which he stated his “distaste” for “commerce and finance” and “useless” sports. In September, he sold his stock in the Mossberg Wrench Company, and cashed in thousands of dollars of Liberty Bonds, clearly the work of a dying man, settling his estate.

In January 1921, Wardwell sought treatment at the Huntington Memorial Hospital in Boston, a Gothic building built less than a decade before to house the Harvard Medical School’s cancer research center. That July, a hospital social worker wrote to him “it is possible that further examination and treatment may be advisable.” By then he was five months dead. Wardwell died on February 19, 1921 in the J.W. Keefe Surgery building, a small, private hospital in an austere brick building still standing along Providence’s Blackstone Boulevard. The hospital’s owner, John W. Keefe, cut a cancer out of his colon, though it had already spread to his liver. Wardwell developed an infection from the colon surgery, and the infection killed him before the cancer did.

Wardwell left an estate valued at \$278,000, about the equivalent purchasing power of \$4.5 million in 2023. Most of his wealth came from his holdings in the Wardwell Braiding Machine Company (\$207,000 in stock, and \$50,000 for the factory real estate.) Had he kept his stock in Universal Winding, he also would have done well – in 1912, that company finally took his advice and bought its own plant, taking over the Maxwell Motor Company’s factory on Elmwood Avenue in nearby Cranston. Universal quickly doubled the factory’s size to 27 acres holding New England’s largest foundry; by the end of the 1920s, Universal was the largest textile winding machine company in the world, employing 1,200 people in Cranston alone, largely on the strength of machines – particularly the

No. 50 and the 90, with attachments – patented by Wardwell. In 1959, the company changed its name to Leeson, in honor of the Leeson family. It is still one of the largest textile machine manufacturers in the United States.

Wardwell’s will created a trust that would annually pay beneficiaries on a graduated scale, depending on how well Wardwell Braiding and his new Wonder Machine performed. He had completed a working model of the Wonder Machine in July 1920, seven months before he died, and he expressed high hopes for that machine.

Wardwell’s death spurred a flurry of correspondence between his family members and some of the four men overseeing the trust that his will created. Right away, his older brother, Ernest, now a 76-year-old man perpetually down on his luck, wrote to trustees in hopes of an immediate payment: “A few hundred dollars, just what I spent on him will be a God send to me now. I am 75 years old and so afflicted with neuritis as to barely write legibly, and I have a blind son to care for.”

From the time he ran off as a schoolboy and joined the Union Army, Ernest’s life had been even more picaresque, and far less profitable, than Simon’s. He worked as a newspaper correspondent, until ill health made that impossible. In the 1880s, the Massachusetts legislature granted Ernest a small, Civil War pension based on need; occasionally the Army called on him to perform some ceremonial function, such as acting as President-elect William McKinley’s aide during his inauguration. His wife died in 1900, leaving Ernest and their three adult daughters; six years later, at 63, he married a Baltimore woman in her mid-20s, Ella May Parker, though a local newspaper reported she “confirmed a report that [the wedding] was to take place after much hesitation and with evident reluctance.” Shortly thereafter, the January-May couple had a baby girl, followed by a son who was born blind and was prone to seizures. At the time he wrote to the trustees, Ernest was 76, with two minor children, a blind son and a daughter, to support.

“I do not believe that had he known I was living ... in absolute want, that he would have failed to assist me,” Ernest wrote. Simon did make provisions for Ernest and his four surviving sisters. The will directed that in years when Wardwell Braiding made a profit, the first \$6,000 would go to his wife; his five surviving siblings would split money between \$6,001 and \$16,000, with provisions for more if the company earned more

than \$30,000. Ernest received a little money before he died the following year. His young wife, Ella May, did not receive any more payments, but her daughter and three step-daughters annually split Ernest's share, as did their daughters. Simon structured the will so that all of nieces and then their daughters would receive payments until the last grandniece died, which turned out to be in 2020, 99 years after his death.

As family members died off, the remaining members of their "class" of survivors received a larger split of that class's shares; but as branches died off, their annual share went to the Simon W. Wardwell Foundation. Wardwell endowed the Foundation to fund some of his pet causes such as: "a model school for boys whose minds are more eager for useful knowledge than their bodies are for useless sports;" a "model hospital," a kindergarten, and a cottage community where elderly couples could live out their days with support. With the death of his last grandniece, the Foundation is now ready to disperse its funds.

Newspaper accounts referred to Wardwell's will as a "peculiar" document, but his final private secretary, Willard W. Bardsley, wrote: "Knowing Mr. Wardwell as we do, we cannot regard [the will] as peculiar, simply different, and out of the ordinary." Bardsley wrote that letter to the one niece that Wardwell refused to acknowledge, Lucile Wardwell Eliot. She had maintained a bizarre correspondence with Simon Durst, the poet; she knew Durst was her Uncle Simon Wardwell, but he never broke character, writing to her as a fan of his poetry while never acknowledging the relationship.

"[M]y Uncle and I never did meet personally," Eliot wrote to Bardsley. "I tried several times to do so, but he always made it very plain that he did not desire it, and I made no further attempts. I do think however that I understood many of his ideas and ideals of which he had many high and worthy ones. I may even say say [sic] that I was a sort of kindred spirit. I shall miss his letters much as they sort of took the place of a romance in my life, being a kind of mystery. He liked and understood me thru my letters, and often spoke of plans he had which he meant to have me carry thru for him. But that is all past now." In closing, Eliot asked Bardsley if he would write to her as her Uncle Simon?

Bardsley who was so enamored of Wardwell that he named his son Simon, declined to act as his late friend's surrogate, writing: "I would be

somewhat in the position of the writer who tried to complete *The Mystery of Edwin Drood* as left incomplete by Charles Dickens."

A braiding machine operator who had worked as for the National India Rubber Works, Mabel Allard, wrote to the trustees, making her case for a share of the will. Wardwell instructed that in any year his company earned more than \$50,000, people known by trustees "to have been loyal to me and my inventions during the hard, uphill struggle to establish my Wardwell Braiding Machine business" could split \$5,000.

"You will recall that I worked very faithfully for Mr. Wardwell during the trying period in which he endeavored to create a market for his braiders," Allard wrote to the trustees. Allard operated the first batch of 10 braiding machines that Wardwell sold to the Rubber Company. They broke down within a year, and for \$10 he sent another batch of 10 machines that Allard operated, working with Wardwell to perfect the beta version of the machines. "Mr. Wardwell often told me that the efficient way in which I operated his braiders had been of very great help to him in establishing them."

Trustees agreed that Allard qualified for an inheritance, but tempered her optimism for collecting. The end of World War I chilled the war-heated global economy in the early 1920s. Even Mary Shea Wardwell, the first beneficiary of payouts from company profits, suffered as the company failed to churn out profits. One year after Simon's death she wrote to Trustees from St. Louis:

"Rent – Light – Heat. Food. Dr.'s bills – mount up. I do not keep help (couldn't feed or pay their salaries here.) Have had no clothes, only the bare necessities. ... I thought of Mr. W. the 19th & I felt sad. When, I thought, of the agony he must have endured, during the last weeks of his life. I miss him as much as ever."

Ten months later, Mary shipped a Wardwell Sewing Machine, cash on delivery, from St. Louis to the factory in Central Falls, "Could not put it together so it has been no use to me," she wrote. "Just now, it is one more thing to have the care of & I fear to store it here as Mr. Wardwell was so careful of it and prized it." The machine arrived in Rhode Island with its packing case damaged, an ornamental star knocked off one of the legs, and its needle broken.

As the economy boomed in the “Roaring 20s,” the Wardwell Braiding Machine Company began paying all classes of its beneficiaries, none more handsomely than Mary Shea Wardwell. When she died at 83 in St. Louis in 1936, she left an estate worth \$100,079, the equivalent of more than \$2.1 million today. More than half of that was in cash. She was buried in her native St. Louis, far from her husband’s grave at Forest Hills Cemetery in Jamaica Plain, Massachusetts, the state of his ancestral roots.

When the estate started earning money, the Trustees found themselves in a quandary. Wardwell’s will directed them to develop and manufacture his WONDER Machine – his will referred to the machine several times, always in all capital letters. But he did not specify how they should fund the invention. As trustees for the heirs, his surviving sisters and their daughters and their daughters, they had a fiduciary responsibility to protect the trust’s funds, not to speculate with them on an unproven invention. And as managers of the Wardwell Braiding Machine Company, they had to act in the best interest of their stockholders – tooling up to build a machine outside of the company’s core interests struck them as out of bounds. Meanwhile, the model Wonder Machine stood idle in the factory.

Adelina Carola Appleton excitedly typed out a letter to the trustees administering Simon’s will. Her daughter and son-in-law, Carl and Carol Leo, had just returned from a tour of her late Uncle Simon’s factory. “Carol came home so filled with excitement about this ‘Wonder Machine’ that I was amazed, as I have never seen her so excited,” Appleton wrote.

Appleton’s music career was going well as she typed from rented rooms in New York City, with a fine view of the Hudson River. The year before, 1936, she had presented a version of her opera, *The Witches’ Well* in the Waldorf-Astoria, under the auspices of the National Opera Club of America. The opera dramatized the story of an ancestor, Simon Wardwell, hanged during the Salem Witch hysteria of the 1690s. The story so fascinated Appleton that, as a young girl, she wrote songs about witches and witchcraft. In speaking with a friend about her Uncle Simon’s “remarkable machine that would be a revelation if put on the market,” the friend said: “‘Are you quite sure this is so remarkable?’ And I replied that it truly was,” Appleton wrote.

Appleton’s unnamed friend was an officer in a start-up company that placed tiny, photographic negatives of documents on film, then used

a patented machine to project the documents to full size – microfilm. He claimed that his company, the International Filmbook Corporation, had a contract with the Library of Congress to miniaturize their documents on film. Filmbook, he said, received financing from “the man who owns Sears Roebuck: he has sixteen million dollars to invest in new machines for the advancement of mankind,” Appleton wrote, “and if I had any interest in this machine of my uncle’s invention that I should get in touch with those concerned. He said that this man he spoke of was a remarkable person who was much interested in humanity in general and a philanthropist”

At his law office in Pawtucket, RI, Edwin C. Smith looked over the letter that Appleton had sent him as a member of the Wardwell Trust. He forwarded it to fellow trustee, Willard W. Bardsley, with his own comments dripping with sarcasm: “The enclosed speaks for itself. The problem of financing the Wonder Machine is solved. Mr. Wardwell’s relatives are quick workers. How soon can you arrange to go to see this important individual?”

“Just the same it is an offering that cannot be ignored. It seems to me that the lead must be followed.”

To another trustee, Smith wrote: “My impression is that in her enthusiasm over her uncle’s invention, Mrs. Appleton may have led the other party to believe the invention has such import of human service as the telegraph, telephone or the radio. I may be pessimistic, but surmise that when it develops that it is just another sewing machine . . . it will not arouse in the prospective financier the same surge of enthusiasm as was aroused in the minds of ‘Carol and Carl.’”

The fact was, Wardwell’s WONDER MACHINE, as he referred to it in all caps in his will, was just a cheaply built sewing machine. In place of cast metal parts, it used stamped metal parts, similar to the business model that Wardwell used in making stamped metal wrenches for Mossberg Wrench. Wardwell felt that lighter, less expensive parts would give the Wonder Machine a market advantage because he could sell it for less than a Singer, and lighter materials made it more energy efficient.

Trustees discussed methods of financing the Wonder Machine’s start up into the 1950s, but nothing ever came of it. Until his final days, Wardwell fretted over his twin dreams of marketing a successful sewing machine, and becoming a famous poet, neither of which came to fruition. The Wardwell Sewing Machine Company that he started with rubber baron Joseph Banigan and others became part of the Taft-Pierce Company, a going concern into the 1980s. His winding patents created

the Universal Winding Company, today known as Leeson, and still one of the largest textile machine manufacturers on the United States. His Mossberg Tool Company eventually acquired the New England Butt Company, and made the old style “jumping jenny braiding machines; in the early 1980s, Rhode Island businessman Malcom “Kim” Chace sold Mossberg to the Wardwell Braiding Machine Company, returning the old company to its roots in Central Falls. The Wardwell Braiding Machine Company now makes large, horizontal braiding machines of the type that Wardwell once described as a “mechanical monstrosity.”

In 2009, the Wardwell Braiding Machine Company went into receivership. The Wilms Group, a German-based company, outbid one competitor at auction, and bought Wardwell Braiding. The Wilms Group continues to run the company in Central Falls under a subsidiary called Stolberger Inc. The company still makes the Wardwell Rapid Braider, essentially the same design patented in 1905 by Wardwell and Parks. At one point, general manager John Tomaz believes it was in the 1940s, engineers moved the thread deflectors from the bottom drive plate to the top, and switched the cam activated “shoe” to manipulate the threads on the bottom drive plate. And in the 1970s, engineers changed the “camber” of the thread packages, widening the angle of each package’s attitude toward its drive plate, so the packages better counter-balance each other, reducing centrifugal force; this allowed the machines to run a slightly higher speed.

Wardwell Braiding Machines now have some safety features – they turn inside of a box to prevent accidental entanglement, and they start, slow, and stop at the push of a button. The machine has resisted efforts to add numeric or computer numeric controls, because of the elegant simplicity of its mechanical engineering. “This machine today, is not all that different than what Simon Wardwell came up with,” said Tomaz.

Wardwell never invented a flying machine, wrote best-selling poetry, or successfully marketed a household sewing machine. Yet he revolutionized winding and braiding textiles and other materials. He was on the ground floor of four companies that succeeded well into the twentieth-century, including two, Leeson and Wardwell Braiding, that are still going strong. More than a century after its benefactor’s death, the Simon W. Wardwell Foundation now stands poised to make significant philanthropic contributions in Rhode Island.

Endnote

1. Rhode Island, Vol. 45, pg. 303, R.G. Dun & Co., Credit Report Volumes, Baker Library, Harvard Business School.

