Incidental Notes on Antebellum Pianos

LAURENCE LIBIN

INDUSTRIAL PIANO PRODUCTION WAS ALREADY well established in the United States by the time Steinway & Sons formed their iconic partnership in 1853. Leading firms such as Chickering in Boston, Loud & Bros. in Philadelphia, and Nunns & Clark in New York had each been producing hundreds of high-quality pianos annually during the 1840s, if not earlier, and scores of lesser makers competed in the crowded American marketplace. To gain attention and market share, manufacturers differentiated their pianos (overwhelmingly "square" models) from competitors' by claiming novelty and superiority, just as car makers do today. These claims often touted patents, which in the midst of the Industrial Revolution proliferated madly for all kinds of musical instruments and related accessories. Many of these products employed metals in new ways arising from rapid advances in metallurgy and metal-working technology; hence "metallic," like "patented," connoted modernity.

Among the best-known pre-Steinway American piano patents are those of the engineer John Isaac Hawkins (granted February 12, 1800) for a "portable grand," a short upright with strings of uniform length extending nearly to the floor, screw tuners, and "metallic elastic" strings, among other features (Hawkins's British patent, issued to his father, November 28, 1800, does not mention metal framing—the American patent record is lost—but his three extant portable grands have iron reinforcement); Alpheus Babcock (December 17, 1825) for a cast metal frame incorporating a hitchpin plate, for square pianos; Jonas Chickering (October 8, 1840, patent no. 1802) for a cast-iron frame including an integral nut and damper wire guide, and (September 1, 1843, no. 3228) for a cast-iron frame for grands, with longitudinal struts and a perforated nut, or agraffe bar, through which strings pass to the tuning pins; and Frederick Mathushek (October 28, 1851, no. 8470) for cross-stringing in a fanned arrangement on a suitably

shaped metal frame. Step by step, these advances moved piano making beyond the competence of woodworkers alone.[1]

Dozens of other American patents, more than 70 by 1852, were granted for less noteworthy piano-related inventions, many of which, like Hawkins's, originated outside the mainstream of professional piano making. These efforts by hopeful inventors were stimulated by the potential for considerable profit in commercial instrument manufacturing generally, tied as it was to increasing middle-class prosperity and leisure time—the same conditions that also promoted music publishing, which was likewise aimed at a mainly amateur market and fueled by technological advances. Several antebellum music publishers, such as Firth, Hall & Pond in New York, also produced fine pianos and other instruments.

The 1836 Patent Office fire destroyed many records pertaining to earlier patents, making their reconstruction problematic when no example of an invention survives. Moreover, numerous experimental instruments and components seem not to have been patented, or their patents have not been traced. Anonymous examples include a finely engineered, partially quadruple-strung upright piano combined with a free-reed organ, apparently of pre-1840 German-influenced Pennsylvania origin,[2] and an iron-framed, down-striking grand piano with looped screw tuners, built before 1850.[3] Such complicated, one-of-a-kind instruments exemplify the wide diversity of eccentric models that for one reason or another failed to gain even limited acceptance.

More tenacious, but still a dead end, were Alpheus Babcock's unpatented, ribbon-wound bass strings, on which a flat, annealed iron strip, instead of normal round wire, spirals around an iron wire core (the term "ribbon" is used here to distinguish this strip from ordinary wire). Babcock, an inventor and manufacturer of high-quality square pianos, consistently wound his bass strings with soft iron ribbon in graduated sizes from about .7 to 1.25 mm wide and .18 to .55 mm thick, but no other maker is known to have employed this material and it seems to have been used for no other purpose, though it might have been an offshoot of some similar product such as thin brass striping used for furniture inlay (Figure 1).

Babcock most likely obtained his ribbon from a nearby source if it wasn't

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[1] The transitional state of piano making in 1835 can be gauged from *The New-York Book of Prices, for Manufacturing Piano-Fortes*, issued by the Society of Journeymen Piano-forte Makers (repr., Malden, MA: American Musical Instrument Society, 2009).

[2] Laurence Libin, "A Unique Organized Piano from Pennsylvania," *Organ Yearbook* 18 (1987): 95–108.

[3] Laurence Libin, "19th-Century Keyboards Suffer in New Jersey," *Newsletter of the American Musical Instrument Society* 20, no. 1 (Feb. 1993): 1, 5–6.

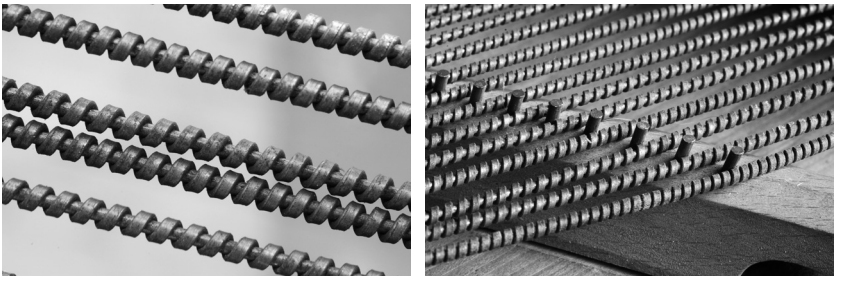

Figure 1 *Two details of the flat iron bass-string winding on an 1828 Babcock piano, courtesy of John Watson, Colonial Williamsburg Foundation.*

made in his own workshop, in Boston. (Babcock's pianos, supposedly made in Philadelphia for the distributor John George Klemm, seem rather to have been sent there from Boston.[4]) Wire manufacturing in New England was driven at first by the cost and uncertain supply of imported wire and by political sentiment.[5] The Boston non-importation agreement of August 1, 1768 exempted card wire, indispensable for carding wool, from its list of prohibited British imports, but by 1809 card wire was being drawn by hand in Leicester, Massachusetts.[6] The scarcity of wire of every kind during the War of 1812 spurred its production at several Massachusetts manufactories by 1815.

Ribbon of sufficient length for winding bass strings could have been formed by running sheet iron of appropriate thickness through a slitting mill, or by drawing stock through rectangular holes in a draw-plate, or by rolling regular iron wire flat. This last method is unlikely in Babcock's case because the sides of his ribbon are more or less squared, not bulging, and the exposed width often has slightly raised edges, a form more consistent with slitting than with drawing. Ascertaining the manufacturing process might help reveal the source of the ribbon and Babcock's reason for adopting it, since each method would presumably impart different mechanical properties to the material. In any case, modern experiments by the piano restorers Lucy Coad and Tim Hamilton indicate that the sharp-edged rectangular ribbon was not easy to wind accurately by hand on

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[4] Darcy Kuronen, "Early Piano Making in Boston: 1790–1830" (unpublished manuscript). I am grateful to Mr. Kuronen for sharing his unpublished data.

[5] Reluctance to "buy British" may have motivated the spinet maker John Harris to advertise in the *Boston Gazette* of September 18, 1769 "a very curious Spinnet, being the first ever made in America," a false claim.

[6] Duane Hamilton Hurd, ed., *History of Worcester County, Massachusetts: With Biographical Sketches of its Pioneers and Prominent Men* (Philadelphia: J. W. Lewis, 1889), 2:1625.

the core wire (evident from Babcock's sometimes unevenly angled and irregularly spaced open coils), though no doubt experience would have brought facility.

Several speculative explanations have been proposed for Babcock's use of open-wound iron ribbon in preference to normal wire winding: the ribbon's greater area in contact with the core presumably resists slippage and loosening, and distributes mass more evenly along the core while retaining flexibility. The smoother profile of flat-wound string might reduce binding on the bridge and bridge pin (though the sharp edges could scrape their surfaces), and its smaller diameter for a given pitch allows a smaller pilot hole in the tuning pin, making the pin less likely to break, and slightly lessens the chance that closely adjacent strings will buzz against each other.[7] Use of iron throughout the compass avoids the use of brass strings in the bass, thus maintaining more even tension across the string band and improving tuning stability. Babcock might simply have preferred the sound of his ribbon-wound strings or used them just because they were different. Probably they were not cheap. Still, his purpose remains uncertain, and his scaling and stringing principles remain to be elucidated. Whatever his reasoning, if ribbon winding had been economically advantageous it would surely have been adopted by other makers.

A possible, if not probable, source for Babcock's ribbon was Ichabod Washburn (1798–1868), whose firm grew to become a major American wire supplier by the 1860s. About 1814, Washburn was apprenticed to a blacksmith in Leicester, but after a few years he moved to Millbury where he began making agricultural tools. He moved in 1819 to Worcester, where, briefly in partnership with the loom builder William H. Howard, he set up a workshop for lead pipe and wool-processing machinery. From 1822 to 1835, the period of most extant Babcock pianos, he partnered with the machinist Benjamin Goddard. Washburn said that he and Goddard began producing iron wire in Northville, a section of Worcester, in 1831,[8] but Washburn is said to have experimented along this line earlier in Millbury.[9] According to a biographical sketch accompanying the Ichabod Washburn papers (MS26) at the Worcester Polytechnic Institute, Washburn began making card wire in Northville in 1824.

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[7] Pilot holes in tuning pins were becoming commonplace in Boston pianos in the 1820s, first, it seems, for bass strings. Spreading use of pilot holes coincided with introduction of stiffer wire and tougher steel drills.

[8] Henry T. Cheever, ed., *Autobiography and Memorials of Ichabod Washburn* (Boston: D. Lothrop & Co., 1878), 46.

[9] Robert W. Dunbar, ed., *Centennial History of the Town of Millbury…* (Millbury, MA: Town of Millbury, 1915), 279–80. Goddard married in Millbury in 1822.

Whether or not Washburn ever made iron ribbon, late in life he recalled that about 1850 Jonas Chickering, who had worked for and later employed Babcock, encouraged him "to try my hand at making steel wire for the strings to his instruments. Until then, that business had been entirely in the hands of [Joseph] Webster, of England, for eighty years. This undertaking . . . was the greatest success of my mechanical life."[10] Washburn began water-tempering piano wire in his home in 1856.[11] On February 5, 1861 he patented (no. 31,361) a system for tempering steel wire longitudinally. By that time, Washburn's wire was "used in all the best pianos made in this country."[12] Much of it probably survives on contemporary, unrestored American pianos. Washburn also reportedly made plated wire for winding bass strings of other instruments.[13] Whether iron ribbon would have been considered "wire" in Babcock's day is an open question.

A machine undoubtedly useful for mass-producing pianos was Rudolph Kreter's hammer-covering apparatus (patented January 4, 1853, no. 9526), the rights to which were assigned to Nunns & Clark, who reportedly had been using Kreter's complicated device as early as 1850.[14] By covering a whole set of hammer heads with two or three layers of felt in one operation, it speeded output and improved consistency. Kreter, who (as "Randolph" Kreter, apparently a misnomer) had patented a piano action on September 9, 1851 (no. 8350), later patented improvements to the Erard action (1873) and a new piano music rack (1881, assigned to George Steck, a piano manufacturer in New York since 1858); he also patented folding baby carriages (1875, 1878). Intriguingly, Kreter was for a time the treasurer of a New York union of (predominantly German) skilled craftsmen, the Workingmen's League (*Deutscher Arbeiterbund*).[15] No doubt he

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[10] Cheever, *Autobiography*, 49.

[11] Hurd, *History of Worcester County*, 2:1627.

[12] John Leander Bishop, *A History of American Manufactures from 1608 to 1860* (Philadelphia: E. Young, 1861), 2:697.

[13] Nowadays flat but close-wound strings are common on string basses and guitars, but plain iron is unsuitable for this application because it tends to rust and corrode when handled.

[14] The oft-repeated but mistaken claim that Kreter and Frederick Mathushek both patented hammer-covering machines in 1850 stems from Alfred Dolge, *Pianos and Their Makers* (Covina, CA: Covina Publishing Co., 1911), 99.

[15] Hans-Arthur Marsiske, *Eine Republik der Arbeiter ist möglich: der Beitrag Wilhelm Weitlings zur Arbeiterbewegung in den Vereinigten Staaten von Amerika, 1846 - 1856* (PhD diss., University of Hamburg, 1988), 157. Weitling, who organized the League in 1850, was a prominent socialist agitator.

was the Rudolf [*sic*] Kreter who purchased the historic Jayne Tavern and surrounding acreage in Setauket, Long Island, on April 1, 1865.[16]

From at least 1858 the Nunns & Clark factory was located in Setauket, a thriving industrial center and harbor, where Robert Nunns had lived from 1845 or earlier.[17] Bryant Coleman Hawkins, a native of South Setauket who had worked for Nunns & Clark, was the assignee when Robert Nunns petitioned for bankruptcy on August 31, 1867.[18] The Setauket-born painter, musician, and violin inventor William Sidney Mount was likely related to Bryant Hawkins through the family of Mount's mother, Julia Ann née Hawkins, and uncle, the noted musician Micah Hawkins. Mount remarked, "As regards my violins at the [New York Crystal] palace. . . they were put together under my own direction by Piano makers. . ." who were possibly connected with Nunns & Clark.[19] William Clark, son of Nunns's partner John Clark, died in Setauket in 1907, terminating that community's connection to piano manufacture.[20]

Of the many versions of cast-iron frame introduced before the Civil War, one type, not patented or previously described, appears in an 1858 William Hall & Son overstrung square piano, recently renovated under Miguel Zenker's direction in Mexico City. An iron strut extends diagonally from the elaborately painted hitchpin plate at the right, parallel to and in front of the lowest strings, to the left side block. Remarkably, the strut is held up at both ends by a flexible joint comprising a bulbous pin enclosed by face-to-face sockets: at the left side a socket in the end of the strut facing another in a massive cast-iron bracket bolted down through the bottom; at the right, a socket in the end of the strut facing another in a raised flange on the plate. The joints, secured by string tension, could allow the case to twist slightly without cracking the plate, but whether gaining this flexibility was the maker's aim is uncertain. Casting the long strut

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[16] Susan Carter White Pieroth, "Jayne Tavern," Rootsweb.com, accessed May 20, 2014, http://www.rootsweb.ancestry.com/~scwhite/kennedy/jayne-tavern.html.

[17] Frank Turano et al., *The Setaukets, Old Field, and Poquott* (Charleston, SC: Arcadia Publishing, for the Three Village Historical Society, 2005) shows photos of Nunns's house on p. 40, and the large factory building on p. 38.

[18] *The Internal Revenue Record and Customs Journal* 6, no. 24 (December 14, 1867): 208. No relationship has been traced between Bryant Coleman Hawkins and either John Isaac Hawkins or Obed Mitchell Coleman (see below).

[19] Laurence Libin, "Instrument Innovation and William Sidney Mount's 'Cradle of Harmony,'" in J. G. Armstrong, ed., *Catching the Tune: Music and William Sidney Mount* (Stony Brook, NY: The Museums at Stony Brook, 1984), 66n2.

[20] Extensive information about the Nunns family and their relationship to the Ennever piano firm in London appears at http://www.ennever.com/histories/history129.php (accessed May 25, 2014).

and its supporting bracket separately from the plate allowed for some inaccuracy in alignment, and the three-piece assembly might have been less liable to break than a brittle one-piece casting.

Not many nineteenth-century American piano patents proved of enduring value; most were for impractical gimmicks, many of them never widely produced if at all, despite extravagant claims made for them. For example, Horatio Worcester's hinged hitchpin plate for square pianos (June 3, 1862, no. 35,484), inspired by the tailpiece of the violin, was said to prolong the piano's tone, stabilize its tuning, double its volume, and impart to it "a singing quality which has been much admired by the most eminent musicians of the city [New York]."[21] Like most such ambitious "improvements," Worcester's proved ephemeral, and no example is known.

Another highly endorsed but short-lived novelty was Edward Lesley Walker and George W. Cherry's "Harmonic attachment," patented January 16, 1845 (no. 3888; patented also in England, October 10, 1845). Comprising a row of buckskin- or rubber-tipped curved metal weights held by a hinged bar or frame over the strings and lowered onto them at their midpoints, the pedal-operated device produced octave harmonics from the struck strings. Walker, a composer, pianist, professor of music at Dickinson College, and music publisher from Carlisle, Pennsylvania, and later Philadelphia, toured with a Chickering "Patent Harmonic Grand Pianoforte" custom-fitted with the attachment, on which he performed works of his own to promote the instrument. William Vincent Wallace dedicated to Walker a Grand Nocturne (*Nocturne dramatique*, op. 32) on the air "Scenes that are the brightest" from Wallace's popular opera *Maritana*, an arrangement "expressly composed to elicit some of the effects of Mr. Walker's patent Harmonic Pedal [*sic*]."[22]

A New York newspaper remarked that "One of Chickering's inimitable instruments, furnished with a Harmonic Attachment, may be seen at Firth, Hall and Pond's . . . The Harmonic tones are those exquisite, bell-like vibrations for which Ole Bull is so celebrated on the Violin. Produced on the Piano they have a fine effect."[23] The Boston critic John S. Dwight characterized the attachment as "very effective where any transition into a new sphere, or dream-world, was intended

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[21] *Scientific American*, n.s., 7, no. 1 (July 5, 1862): 8.

[22] *New-York Evening Post*, April 3, 1847, 2. Wallace later lost money in the failure of the Wallace Piano-forte Co.; see fn. 29, below.

[23] *The Tribune* (New York), August 7, 1845.

to be expressed. With all its delicacy, and sweetness, it also gave out a wealth of tone that filled the room."[24]

George W. Cherry, a practical inventor from Alexandria, D.C., also patented a ventilating hat in 1845; however, neither he nor his promoter Walker was a manufacturer, and their Harmonic attachment was not taken up by the trade. But Walker's Chickering was not unique: a Gothic-style carved rosewood Chickering square piano made for "one of our millionaires of Union Square" at a cost of $1,000, "has Walker's Harmonic attachment, which is by many considered superior to Coleman's."[25]

Likewise now obscure is the "Linguine" attachment invented by Spencer Bartholomew Driggs of Detroit. Driggs's invention, patented January 24, 1854 (no. 10,446) and possibly prefigured in the piano he exhibited in 1853 at New York's Crystal Palace, consisted of a series of small steel or other metal tongues (*linguine*) or flat springs mounted above a piano's strings and struck simultaneously with them by a separate set of hammers. Less apt to go out of tune than strings, the tongues eased the piano tuner's job by acting like tuning forks, one for each note, to which the strings could be tuned. More importantly, the Linguine imparted a sweet aura to the instrument's tone, demonstrated in Charles Wels's song *An Echo From the Lakes*, "descriptive of the Linguine melody," performed in New York in July, 1855.[26]

Unusual in coming from the West (Driggs moved in 1856 to New York, where he died in 1883), Driggs was well known for several piano patents, most notably his plan (December 18, 1855, no. 13,942, also patented in England, November 1, 1855) for securing a convex soundboard in an open metal frame connected by metal ribs to a cast-iron base-frame beneath. This arrangement did away with heavy wooden supports and incorporated a resonant, arched bottom-board linked to the soundboard by a soundpost under the bridge, an idea, like Worcester's, derived from the violin. Further, the patent calls for metal "saddles" (later developed as clamps) astride the bridge, over which the strings pass in a straight line, allowing the bridge to be made narrower than usual and

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[24] John S. Dwight, *The Harbinger, Devoted to Social and Political Progress* 4, no. 12 (Feb. 27, 1847): 188.

[25] *The Tribune* (New York), February 5, 1846. For Coleman, see below. A different "harmonic attachment" on some later reed organs was an octave coupler.

[26] Vera Brodsky Lawrence, *Strong on Music: The New York Music Scene in the Days of George Templeton Strong, 1836–1875*, vol. 2, *Reverberations 1850–1856* (Chicago and London: University of Chicago Press, 1995), 645. The music by Charles Wels was dedicated to the soprano Georgianna Stuart, and the Detroit poet W. H. Coyle dedicated the text to Driggs, who held the song's copyright.

communicating vibration more directly to the soundboard. Driggs wrote about acoustics,[27] and engaged Frederick Mathushek to implement his theories.

In the long run, Driggs's piano designs were unsuccessful. However, an obituary identifies him as the eponymous engineer from New Brunswick, New Jersey (where Driggs had a second piano factory), who patented improvements to railroad cars and, in 1869, a system of iron dikes for land reclamation.[28] Having invested heavily in real estate, but seeing his reclamation scheme fail, by 1874 he was deeply in debt, eventually leaving his widow, Anna (née Adrain), as defendant in a foreclosure suit over some 500 acres of New Jersey marshland, part of what is now known as the Meadowlands.[29]

More effective than most other attachments intended to expand the piano's tonal palette, the "Dolce Campana" installed on square pianos by Boardman & Gray of Albany was patented by James A. Gray, a former apprentice of Firth & Hall's, on March 27, 1849 (antedated September 27, 1848, no. 6223, and also patented in England, no. 12,609). The Dolce Campana ("sweet bells") typically consists of eight graduated cylindrical weights of brass-encased lead suspended over the bridge in a frame hinged to the hitchpin plate and held up by a spring. When lowered by means of the right-most pedal onto screws protruding upward from the bridge (or in another model, onto the soundboard), the weights lessen the soundboard's vibration, reportedly yielding a sweet bell-like tone. Harding says that the pressure lowers the piano's pitch.[30] Relieving the pressure while a chord sounds produces a moderate crescendo, and pumping the pedal while notes are sustained imparts a vibrato.

The virtuoso Louis Moreau Gottschalk is said to have admired these effects, as presumably did the composer Oliver J. Shaw, who dedicated his *Dolce Campana (Sweet Bells) Waltz* (Albany: Boardman & Gray, 1848) to James Gray. Shaw's sheet music gives directions for the attachment's use, preferably in soft, delicate, legato passages, sometimes in combination with the moderator and damper pedals. One wonders whether music such as this, intended to show off a particular

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[27] "The Mechanics and Mathematics of Musical Vibrations," *Scientific American*, n.s., 3, no. 10 (September 1, 1860): 146–47.

[28] *Scientific American*, n.s., 48, no. 8 (February 24, 1883), 121.

[29] *Real Estate Record and Builders' Guide* 13, no. 321 (May 9, 1874): 267. See also New Jersey Court of Chancery, Wolf v. Driggs, filed June 20, 1888. In the foreclosure suit, Robert Adrain, formerly a trustee along with Driggs, William V. Wallace, and others in the Wallace Piano-forte Co., founded in 1856, represented Driggs's widow (Robert Adrain's sister?) before the chancery court.

[30] Rosamond E. M. Harding, *The Piano-Forte: Its History Traced to the Great Exhibition of 1851* (Cambridge: Cambridge Univ. Press, 1933; rev. 1978), 129.

novel effect, was born from the composer's own initiative or commissioned by the dedicatee and manufacturer (and publisher) as a promotional ploy. A piano with Dolce Campana advertised as having been specially made for the celebrated soprano Jenny Lind was exhibited in New York in 1850; it might have been the same one displayed by Boardman & Gray at the 1853 Crystal Palace exhibition in New York.[31]

Swell shutters, which affect tone as well as loudness, were occasionally applied to high-style pianos in Philadelphia by Charles Albrecht (square, ca. 1790, Vassar College) and Loud & Bros. (upright, 1831, Metropolitan Museum of Art). Albrecht's louvers, over the soundboard, are operated by a knee lever; Loud's, on the back of the vertical case, by a pedal. Ineligible for patenting because they were not new inventions, swell shutters had dubious value in pianos, where dynamics are already under the player's finger control, but presumably makers offered them as optional equipment to affluent buyers lured by expensive gadgetry. Composers and professional pianists were not taken in. Americans, like the British, also showed little enthusiasm for percussion attachments briefly popular for exotic effects in contemporary Viennese-type pianos.

A hitherto overlooked, patented tuning device survives in a square piano made about 1845 by R. Nunns & Clark (so engraved on its rectangular silver nameplate). The seven-octave (CC–c^5) piano, in a rosewood case with carved Gothic-revival tablet-front ornament, belongs to Vassar College in Poughkeepsie, New York. The instrument's provenance is obscure, but it might have been purchased second-hand by the college (founded in 1861, just after Nunns & Clark dissolved) or donated by an alumna. Instead of normal tuning pins the piano is equipped with geared tuners invented by Joseph Shaler Ives (b. 1811; d. Manhattan, October 15, 1887) of Bristol, Connecticut. No other example of this device, patented January 6, 1844 (no. 3403), is known (Figure 2).[32]

According to Ives's patent specification, his tuner employs

> with each string, a tuning pin which has a screw cut on it, intended to operate as an endless screw upon a wheel which turns on pivots in a proper metallic bearing. The worm wheel has a groove turned in it for the purpose of receiving the wire which

[31] Boardman & Gray's operation is extensively described and illustrated in *Godey's Magazine and Lady's Book* 48 (Jan. 1854): 5–13; (Feb. 1854): 101–7; and (Mar. 1854): 277.

[32] Also unknown is whether Ives knew of Frédéric Mahr's French patent of 1836 for a mechanical tuning pin using an "[e]ndless screw which operates a little wheel to which the strings are attached;" see Harding, *The Piano-Forte*, 372. Daniel Walker's patent for a screw tuner (June 19, 1838, no. 790) is of a different type.

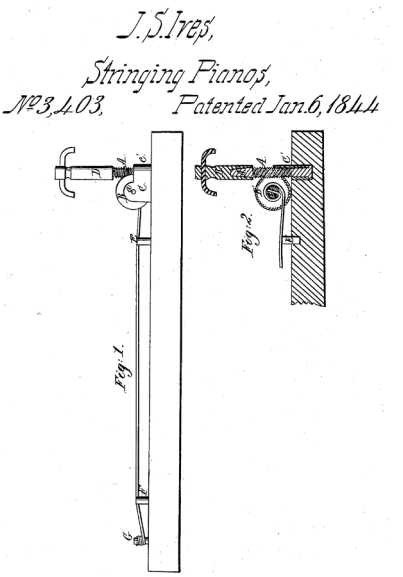

Figure 2 *Patent drawing for J. S. Ives's geared tuner, US Patent 3403. Source: http://www.googlecom/patents/US3403.*

> is to be strained thereon. The lower part of the tuning pin is inclosed by a metallic socket which is driven into the tuning pin block, where it is held permanently.

The accompanying drawing shows a T-shaped tuning key fitted to the squared top of the slender, threaded tuning pin. Each brass "worm wheel" (gear) is held vertically in its bent steel bearing and is circumferentially grooved like a yo-yo; the inner edges of the groove are triangularly toothed to engage the thread on the tuning pin, which is clasped by the bearing bracket just above the wrestplank. Within the groove, the axle of the worm wheel is drilled to accept the end of the string, which then wraps in the groove. "It will be seen, that by this arrangement the wire may be effectually tightened, that the strain may be given with the greatest exactness, and that the pin cannot be turned back by the tension of the string."

The tuners in Vassar's piano use worm wheels of about 9/16-, 5/8-, and 3/4-inch diameter for treble, mid-range, and bass strings respectively. The metalwork is accurate but the devices are impractical, in part due to the inconvenience of winding the strings in their grooves. Four of the tuners, presumably broken and too costly to repair, were replaced by normal tuning pins.

Ives was not a piano maker but, like many other patentees, a machinist and prolific inventor with musical interests. He also patented (May 9, 1846; no. 4499)

a screw slide for tuning free reeds of accordions, seraphines, and other reed organs.[33] The Patent Office records several patents under the appelations Joseph Ives, Joseph S. Ives, James S. Ives, Jos. Shaler Ives, J. Shaler Ives, and Shaler Ives (all the same person), including ones for clock springs and pinions, a grist mill, a method for cutting teeth of combs, and a spinning candlewick, as well as the piano and reed tuners.[34] By 1846, Ives was living in the vicinity of New York City, where directories identify him as an organette (reed) maker. A period lithograph shows property he owned in 1848 on Second Street near Washington Avenue in Morrisania, now known as the South Bronx. He is listed in 1860 at 429 East 164th Street, not far from the residence of the bandsman Thomas Dodworth.[35] Having prospered in business, Ives bequeathed $2000 to the Children's Aid Society of New York, and his estate paid $432.27 in collateral inheritance tax. One witness to his piano-tuner patent was the prominent Bristol banker Josiah T. Peck. How Ives's tuners came to the attention of Nunns & Clark, and whether that firm drew him to New York and paid him for the rights to his patent, are unknown.

Vassar's piano also incorporates a full-compass rank of free reeds winded by a reservoir inflated by foot-pumped pressure bellows, all mounted beneath the bottom-board. Metal stickers beneath the key levers push open the reed valves. A sliding knob at the left end of the keyboard lifts and inactivates the piano's hammers to allow the reeds to sound alone; when the bellows are not pumped, the reeds remain silent and the piano sounds alone. When played together, the reeds amplify and sustain the notes of the piano's strings. This free-reed accessory represents Obed Mitchell Coleman's "Aeolian attachment," patented by him in the United States (April 17, 1844, no. 3548), England (October 10, 1844, no. 10,341), and France (no. 311). The Boston piano manufacturer Timothy Gilbert reportedly paid Coleman $25,000 for the rights to make and sell his Aeolian attachment within Massachusetts.[36] John Koster, following Daniel Spillane, dates Gilbert's

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[33] Charles Horst, a music store proprietor and music publisher in New Orleans, patented a similar tuner on September 27, 1845 (no. 4210), as well as a double iron frame for square pianos (April 17, 1849, no. 6342) and a combined rocking chair and fan. Harding, *The Piano-Forte,* 329, mistakes his names as "Hoist."

[34] Edmund Burke, commissioner, *List of Patents for Inventions and Designs, Issued by the United States, from 1790 to 1847* (Washington, D.C.: J. & G. S. Gideon, for the United States Patent Office, 1847), *passim*.

[35] Joan H. Geisman, *An Archaeological Assessment of the Morrisania Urban Renewal Project, Bronx, New York* (report prepared for TAMS Consultants, Jan. 1992), 24, 26, and 30.

[36] Charles Cist, *The Cincinnati Miscellany, Or, Antiquities of the West…* (Cincinnati: Caleb Clark, 1845), 1:98. *Dwight's Journal of Music* 4, no. 13 (December 31, 1853): 99–100, says $10,000; even this lesser amount is impressive.

purchase to 1846, but Coleman, born in Barnstaple, Massachusetts, on January 23, 1817, died prematurely in Saratoga Springs, New York, on April 5, 1845.[37]

A later New York newspaper advertisement states that another Boston firm, Hallet, Davis & Co., arranged to install Coleman's Aeolian attachment on their pianos, but maybe these were sold only outside Massachusetts or after Gilbert's exclusive rights had expired.[38] Hallet, Davis & Co. notwithstanding, Nunns & Clark purchased the rights for the rest of the United States excluding Massachusetts, reportedly paying Coleman another $25,000 plus up to $50,000 in royalties on sales of pianos equipped with the invention. A partisan of Nunns & Clark remarked, "As the invention came from the hands of Coleman, it bore about the same relation to what the professional taste and skill of Nunns and Clark moulded it into, as Fulton's first steamboat probably did to the last effort of Cincinnati boat building—the [steamboat] YORKTOWN."[39]

Contemporary writers regarded organized pianos like Vassar's and the "Euterpean" flue-pipe attachment patented by the brothers James and John McDonald of New York (October 5, 1852, no. 9304) as appropriate for playing on Sundays, when secular music was shunned. This assessment is supported by the title of Gustave Blessner's *12 Preludes and Voluntaries for the Organ, or Piano with Aeolian Attachment. To be used at Divine Service or for Private Study and dedicated with much respect to The Right Revd. L.S. Ives D.D. Bishop of North Carolina* (Boston: W. H. Oakes, 1846).[40] Pianos with Coleman's attachment were also used in recital, for instance at the 107th anniversary concert of the Royal Society of Musicians, in London in 1845, when a duet for two pianos, one so equipped, was performed by the eminent virtuosi Mrs. George Frederick Anderson (Queen Victoria's piano teacher) and William Sterndale Bennett; on that occasion Coleman donated ten guineas to the Society's charitable fund.[41] In Halifax, Nova Scotia, on August 5, 1846, Baron Rudolph de Fleur, "late pianist and Inspector General of Military Music to His Majesty the Emperor of Russia, Professor and Director of the Queen's Music Academy, Toronto," performed his own arrangement of Paganini's "Silver Bell" (*La Campanella*, the third movement of his second violin concerto)

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[37] John Koster, *Keyboard Musical Instruments in the Museum of Fine Arts, Boston* (Boston: Museum of Fine Arts, 1994), 297; Daniel Spillane, *History of the American Pianoforte; Its Technical Development, and the Trade* (New York: D. Spillane, 1890; repr., 1969), 92.

[38] *The Musical World and New-York Musical Times* 10, no. 12 (Nov. 18, 1854), 151.

[39] Cist, *The Cincinnati Miscellany*, 1:98.

[40] No relationship has been traced between Bishop Levi Silliman Ives and Joseph Shaler Ives.

[41] *The Musical World* 20 (London, 1845), 177.

as well as variations from Bellini's opera *Norma* on a Gilbert square piano with Aeolian attachment; de Fleur, together with an agent for Gilbert, brought the instrument to Halifax.[42]

In 1857 *Scientific American* reprinted a remarkable story concerning the reception of Coleman's device in London:[43]

> Thrilling Incident in the Life of an Inventor
>
> Aeolian Pianos – A correspondent in the National Intelligencer (D.C.) notices the efforts that were made some years ago by O.M. Coleman, the inventor of the Aeolian Attachment to direct attention to it, among the musical circles of London, and concludes with the following anecdote:
>
> 'After Coleman had obtained his European patents, and his invention had attained the highest point in the estimation of the public, he still found a "lion in the way." The celebrated [Sigismund] Thalberg, then and yet justly regarded as the first pianist in the world, who was then on the Continent, had not yet seen or heard the instrument. Many eminent musicians, and especially the piano manufacturers, stood aloof until Thalberg should give his opinion. Coleman felt that the fate of his invention hung upon the fiat of the dreaded Thalberg. It was – "Wait till Thalberg comes," and "If Thalberg says so and so, then," etc., until the very name of Thalberg became hateful. The great master arrived in London at last, and a day was appointed for his examination of the instrument. A large room was selected, into which were admitted a number of the first musical artists.
>
> '[The composer and pianist, Julius] Benedict sat down and played in his best style. Thalberg stood at a distance, with his arms folded and back turned. He listened for a time in that position, and then turned his face towards the instrument. He moved softly across the floor until he stood by the side of Benedict, where he again stopped and listened. An occasional nod of his head was all the emotion he betrayed. Suddenly, while Benedict was in the very midst of a splendid sonata, he laid his hand upon his arm, and, with a not very gentle push, said, "Get off that stool!" Seating himself, he dashed out in his inimitable style, and continued to play for some time without interruption, electrifying Coleman and the other auditors by an entirely new application of the invention. Suddenly he stopped, and turning to Benedict, requested him to get a certain piece of Beethoven's from the library. This was done, and Thalberg played it through. Then, striking his instrument with his hand and pointing to the music he said:-- "This is the very instrument Beethoven had in his mind when he wrote that piece. It has never been played before!"
>
> 'The next day Coleman sold his patent right for a sum that enabled him to take his place among millionaires.'

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[42] Michelle Elizabeth Boyd, "Music and the Making of a Civilized Society: Musical Life in Pre-Confederation Nova Scotia, 1815–1867" (PhD diss., University of Toronto, 2011), 131 and 220.

[43] *Scientific American*, o.s., 12, no. 19 (Jan. 17, 1857): 145, extracted and much abbreviated from the anonymous *Memoirs and Auto-Biography of Some of the Wealthy Citizens of Philadelphia…* (Philadelphia: The Booksellers, 1846), 71–74.

Obed Coleman, brother of the inventor Ezra Coleman, was himself a precocious inventor and entrepreneur. Both men lived for some time in Philadelphia. *Appleton's Cyclopedia of American Biography* relates that Obed Coleman "was of German and English parentage, showed talent for music in infancy, and during a severe illness, in 1833, manifested wonderful inventive powers. About this time, when living in New Bedford, Massachusetts, he invented an 'Automaton Lady Minstrel and Singing-Bird,' consisting of the figure of a lady with a bird perched on her shoulder. The lady played several airs on an accordeon, while the bird warbled. Coleman sold this remarkable piece of mechanism for $800, thus relieving himself from extreme poverty. He removed to Saratoga in 1842, and invented improvements in the accordeon. He also began here to construct his AEolian attachment to the piano-forte, which gave him high rank among inventors. He sold his patent for $100,000 in this country, and for about $10,000 in England."[44]

John Moore's *Complete Encyclopaedia* offers a typically overblown encomium of the Aeolian attachment:

> This is the name which the ingenious inventor, Coleman, has affixed to one of those musical *desiderata*, which have been rather hoped for than expected. All pianists and manufacturers of the instrument have long felt that artistic skill and mechanical ingenuity had vainly essayed to banish that woodiness of sound, and want of sustained vibration, that attended the emission of its tone. The Aeolian Attachment not only removes the evils that are inherent in the piano-forte, but imparts to it a distinctive vibratory and sustaining power, combining the rich volume and swell of the organ with the passionate intensity and pathetic tenderness elicited from an Amati, or a Straduarius [sic], by a gifted violinist. By the aid of this invention, the dominant vibration may be sustained during the execution of the most difficult passages, and yet there is the most perfect assimilation of sound; indeed, not only is the necessary balance never destroyed, but the general quality of tone is improved. The power of the lower portion of the piano-forte may be increased to that of the lower double C of an organ pipe of thirty-two feet. But the principal advantage is gained in the middle region of the instrument ; and here the most delicate shades of feeling may be expressed : the white and black keys seem instinct with human passion, and all the various emotions which the most accomplished vocalist can feel and achieve are placed beneath the fingers and at the command of the performer. And yet the piano-forte is not bereft of its peculiar nature; all its usual re-sources remain undisturbed; and so perfect is the application of the invention, that it is adapted to every class of piano-forte, large or small, square or upright, thin and poor, powerful and brilliant. Like the soul of harmony, it lies concealed with-in, and its voice is alone evoked at the will of the performer. Its only external sign is

[44] *Appleton's Cyclopedia of American Biography* (New York: D. Appleton & Co., 1887–89), 217–18, paraphrasing a laudatory entry in John W. Moore's *Complete Encyclopaedia of Music, Elementary, Technical, Historical, Biographical, Vocal, and Instrumental* (Boston: Oliver Ditson, 1854), 26–27.

> an extra pedal, and the slightest pressure is ample to draw forth the vocal power. It is the invention of Mr. Coleman, an American gentleman, who has devoted many years to the labor which he has so triumphantly achieved.[45]

A less charitable opinion appears in *The Knickerbocker* magazine. Describing a visit to "The Saratoga Rural Cemetery," the anonymous writer remarks, "A little farther on is the monument to Coleman, (the inventor of the 'aeolian attachment' to pianos, a decided failure, by common consent of musicians and others,) of which, while it was yet in New-York, we gave a description in these pages."[46]

Equally disparaging, Erastus Wentworth, president of McKendree College (Methodist), described "Parlor Music" as a

> mode of producing, on the strings of the common piano, the rich effects and inimitable harmonies of the Harp of the Winds. Judge of our disappointment, when, with our head full of ideas of the real Eolian, 'Whose mingling chords so wild are flung, So soft their fitful murmurs ring, They thrill as if an angel sung, Or Ariel's finger touched the string,' we sat down to the veritable instrument with which the ill-starred Coleman is said to have drawn tears from the eyes of England's Queen, and, with the first pressure of the pedal and key-board, made the vexing discovery that the far-famed attachment was nothing other than the miserable reeds of the accordion twanging simultaneously with the vibrations of the smitten wires![47]

Coleman died soon after his promotional trip to England, and a monument supposedly shaped like a square piano was erected to him at the corner of Tenth Street and Broadway in Manhattan, very near Nunns & Clark's premises at 785 Broadway.[48] Old Greenridge Cemetery in Saratoga Springs features an imposing granite monument honoring Coleman; it is embellished with a wreathed square piano above an overlapped music scroll, lyre, and wind instrument, and is signed by the carver, "Michael Flannelly/Broadway & 10th St./N.Y."[49] The cemetery mistakenly identifies Coleman as "the concert pianist who [contracted his fatal illness] at sea while returning from a European tour."[50] The Greenridge

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[45] Moore, *Complete Encyclopaedia of Music*, 26–27.

[46] *The Knickerbocker: Or, New-York Monthly Magazine* 34 (July 1849): 83.

[47] Erastus Wentworth, *The Ladies' Repository: a Monthly Periodical, Devoted to Literature, Arts, and Religion* 9, no. 5 (May 1849): 140.

[48] Vera Brodsky Lawrence, *Strong on Music: The New York Music Scene in the Days of George Templeton Strong, 1836–1875*, vol. 1, *Resonances 1836–1850* (New York and London: Oxford University Press, 1988), 287, 357–58.

[49] "Obed Coleman: Chief of Lyres," http://www.findagrave.com/cgi-bin/fg.cgi?page=gr&GRid=51615510, accessed January 12, 2016

[50] Greenridge Cemetery Association, http://www.greenridgecemetery.com/old-cemetery-poi.html,

monument noted in *The Knickerbocker* is surely the same as Flannelly's, moved from its original site.

Vassar's piano can be dated to about 1845 on the basis of its serial number, 5189, stamped on the wrestplank. Another Nunns & Clark piano (in The Metropolitan Museum of Art), serial number 8054, is dated 1853 under the soundboard. The 1855 New York census records that in that year the company produced 300 pianos worth $150,000, averaging $500 each, expensive for that time. Extrapolating that output annually back from 1853, serial number 5189 corresponds roughly to 1844, the year of Ives's and Coleman's patents. Further examination of Vassar's piano might reveal that it, too, is dated under the soundboard. Whether its reeds are equipped with Ives's screw tuning devices also remains to be learned, but a cross-strung square piano with Aeolian attachment that Nunns & Clark exhibited at London's Crystal Palace in 1851 reportedly did have "patent tunable reeds".[51] According to Robert F. Gellerman, the reeds used in Gilbert's pianos with Aeolian attachment were manufactured, at least in 1848, by the firm of Austin & Dearborn, melodeon makers in Concord, New Hampshire.[52] Whether they produced the reeds for Nunns & Clark is not yet known.

In any event, Vassar's instrument belies Daniel Spillane's assertion that Nunns & Clark "have never been identified with any reforms and innovations in piano structure or acoustics after 1840 [except for their employment of Kreter's novel hammer-covering machine] . . . They simply made average pianos after stereotyped principles first produced by other makers . . . ."[53] Incidentally, the iron frame in Vassar's piano incorporates a cylindrical strut across the front, analogous to the strut in the Hall & Son piano mentioned above but lacking the bulbous pin at each end.

While Coleman's Aeolian attachment attracted considerable attention (and apparent imitation in Moses Coburn's patent of February 1, 1847, no. 4948, where the reeds lie above the strings; Coburn, a music teacher in Savannah, Georgia, claimed that his invention predated Coleman's), Ives's two tuning mechanisms did not. Rather, like many other such devices, they seem to have been solutions in search of problems. Despite many attempts, nothing has been found preferable to a single simple tuning pin for a piano string, and brass free reeds (unlike

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accessed May 7, 2014.

[51] Koster, *Keyboard Musical Instruments* , 299n13.

[52] Robert F. Gellerman, *Gellerman's International Reed Organ Atlas,* 2nd ed. (Lanham, MD: Vestal Press, 1998), 8.

[53] Spillane, *History of the American Pianoforte,* 153.

a pipe organ's beating reeds) rarely need tuning once installed in a reed organ, where they are not readily accessible. In a piano with Coleman's attachment, it would normally be easier to tune the strings to the more stable reeds than vice versa. Furthermore, Ives's gadgets employ moving parts that increase cost and the likelihood of malfunction.

On the other hand, in connection with James Pirsson's Vis-à-vis double grand piano (the so-called American Mammoth Grand, introduced in New York in 1850 and displayed at London's 1851 Crystal Palace exhibition), *The London Journal of Arts, Sciences, and Manufactures* took notice of

> … a new contrivance for tuning, called the 'patent wheel tuning pin'. It is an application to the piano-forte of the plan of tuning adopted in the double bass and the guitar, the string being attached to a wheel moved by an endless screw. There is, however, an ingenious variation, which much simplifies the arrangement. In the guitar and double bass the string is wound round the axle of the wheel; but, as there would not be room for this in the piano-forte, where the strings lie closely side by side, a small groove is cut round the circumference of the wheel, in the middle of the teeth which engage in the screw; the wire is fixed round this groove, and thus no extension is required on either side of the wheel. This is the most complete and perfect substitute for the tuning-pins that we have seen, although probably the most expensive.[54]

It appears from this description that Nunns & Clark did not have exclusive rights to Ives's tuners, but that Pirsson (incidentally, a double-bass player) employed them at least in his monster piano. However, it may be that the anonymous writer was confused and that these tuners were actually in the Nunns & Clark piano described in the preceding paragraph of the *London Journal*.

Interestingly, the same journal remarks that "The large quantity of metal work now used in piano-fortes and other musical instruments, employs a separate class of artificers, called music smiths, who furnish to the piano-forte makers all the iron and brass work they require."[55] A later dictionary similarly defines "music-smith" as a "mechanic who makes the metal parts of pianofortes, etc."[56] The term, probably introduced in the 19th century, seems not to have been much used in the United States, but it could well describe whoever manufactured the devices Joseph Shaler Ives invented.

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[54] *The London Journal of Arts, Sciences, and Manufactures* 29 (London, 1851): 46.

[55] Ibid., 26.

[56] Robert Hunter, ed., *The Encyclopaedic Dictionary: A New, and Original Work of Reference…* (London: Cassell & Co., 1885), s.v. "music-smith."