

## A DENTIST'S CHAIR AS A PROFESSIONAL CLAIM

Olivia Armandroff



Fig. 1. Ira Allen Salmon, Miniature Dentist's Chair. From Winterthur Museum, 1956.0517.

At first glance, this approximately thirteen-inch-high reclining chair, complete with a carved walnut frame, brass base, and emerald green, thickly fringed, velvet upholstery, seems to be an object of curiosity like other miniatures, demanding attention given its aesthetic rather than utilitarian merits (Fig. 1).<sup>1</sup> While it became a part of Henry F. du Pont's significant collection of miniature antiques in 1935, subsequent scholarship connected the chair model to a patent Boston dentist Ira Salmon acquired on June 5, 1866. The patent inspires a new appreciation of this miniature distinct from its novelty; it had a professional purpose. While the diminutive chair was once housed in the Miniature Stair Hall, it is now set in the museum's End Shop, a part of the museum devoted to the theme of business.

Through history, dentists have occupied many office spaces. In the Middle Ages, demand for light forced most dentists to work outdoors, in village marketplaces and at fairs.<sup>2</sup> While some early operations were performed standing, by 1717, the German surgeon Ludwig Cron found the most convenient position for extracting patients' teeth was while they were seated on the floor, and from this point, dentists' chairs have evolved.<sup>3</sup> At this time, itinerant practitioners were most common, but some dentists established themselves in their homes, using domestic furniture as shown in the 1530 *Artzneybuch*, a German medical book with an entire illustrated chapter dedicated to dentistry. In America, dentists continued to locate their offices in their homes even after the Civil War,

and many dentists' chairs were adaptations of common domestic wares, such as the earliest surviving American example in which Boston dentist John Flagg augmented his 1790 Windsor chair with a horsehair and leather headrest and instrument drawer (Fig. 2).<sup>4</sup> Other dentists adapted rocking chair, transforming them into reclined dentist's chairs by strategically placing a log beneath their rockers to limit motion. While these dentists' inventions were likely driven by a practical interest, their selection of Windsor and rocking chairs—two forms associated with leisure and comfort—may have been motivated by their desires to put their patients at ease.

In the mid-1800s, dentistry was professionalized with the formation of journals including the *American Journal of Dental Science* in 1839, educational institutions, the first of which was the Baltimore College of Dental Surgery in 1840, and trade organizations such as the American Society of Dental Surgeons in 1840 followed by the American Dental Association in 1859.<sup>5</sup> Dentists announced these advances in public forums such as the



Fig. 2. Josiah Flagg, Dentist's Chair, c. 1790. From the Kornberg School of Dentistry, Temple University, 1954.5.

1867 Paris Universal Exposition and the 1876 Philadelphia Centennial Exhibition.<sup>6</sup> In his 1922 history of dentistry, which is still an authoritative text, James Anderson Taylor acknowledged the two dentists responsible for launching America's first dental college, and leading the industry's transformation in the 1840s. He noted that "dentistry under the potent influence of Hayden and Harris ceased to be desultory trade or calling and attained the dignity of a recognized profession."<sup>7</sup>

Beginning in urban areas, dentists shifted their workplaces from private domestic settings to public, professional offices. Contemporaneously, their makeshift chairs evolved into purpose-built ones and their portable cases of tools became regulated cabinetry displays. In 1833, John D. Chevalier opened the first dental supply house in New York City and countless vendors would follow his precedent.<sup>8</sup> By the end of the century, dental schools' curricula included acquainting students with the stock chairs and cabinets. Now readily accessible and easily recognizable, dentists increasingly found standardized equipment had become a necessity in order to demonstrate professional training and competency.

Ira Salmon became a dentist at the moment when the profession was maturing. Born in 1830, Salmon initially followed a more traditional path, training with his uncle in Maine and beginning a practice in Boston in 1854.<sup>9</sup> His desire to transition from mechanical dentistry, which entailed work with artificial teeth and dentures, to the emergent field of operative dentistry likely precipitated Salmon's return to school.<sup>10</sup> The latter involved procedures to manage cavities and deterioration in live teeth, and the professional expectations that would have accompanied them. In 1867, he graduated from the Pennsylvania College of Dental Surgery. And in 1868, he began to lecture at Harvard Dental School in addition to his daily operative practice. Finally, in 1869, he established new offices, relocating from Boylston Street to 670 Tremont. This move situated him in a key commercial thoroughfare and an area that was the heart of the city's dental business; twenty-one of the one hundred and nineteen dentists listed in the 1869 Boston City Directory were located on Tremont Street along with the Boston Dental College and several dental supply houses.<sup>11</sup> Salmon's patent for a dentist's chair, submitted in 1866, and two subsequent 1867 patents for a Dentist's Tool Rack and a Dental Instrument, an automatic mallet, were made at the same time as these other life changes. In a span of only three years, Salmon had acquired a degree, an affiliation with Harvard Dental School, new office space, and patents—all of which would have similarly announced his professional maturity, establishing him as an authority on dental surgery.<sup>12</sup>

From 1836, when patent laws had been revised, a complete patent application included a model of one-foot square in addition to the invention's drawings and written description.<sup>13</sup> Most importantly, patent law required proof of an advance upon prior designs. Until the Patent Office began to distribute a publication describing its patents in the early 1870s, innovators were expected to have guaranteed their design's novelty by visiting the gallery of previously submitted models in the Washington, D.C. Patent Office.<sup>14</sup> This practice encouraged the submission of patent applications only by those intimately acquainted with the most current innovations. In the mid-nineteenth century, following the Industrial Revolution and in the era

of great exhibitions, the popularity of pursuing patents grew and the patent application process became increasingly professionalized. Beginning in the 1860s, furniture patents were commonly claimed in association with furniture companies.<sup>15</sup> As a dentist, Salmon deviated from the average furniture patent applicant. An outsider of the patent business, Salmon likely would have relied on professionals when submitting his application, including a draftsman to render his drawing, an attorney to draft its description, and a model maker to produce the chair's model.<sup>16</sup> Salmon's attorney, listed as R. H. Eddy, had taken out a prominent advertisement in the 1856 Boston Directory offering to prepare "Caveats, Specifications, Assignments, and all Papers and Drawings necessary to procural of patents."<sup>17</sup> According to Salmon's 1866 patent for "Improvement in Dentists' Chairs," the chair's key innovation departed from prior models by connecting its body to the foot-stand with gimbals, bars, and bolts instead of a ball-and-socket joint. Unlike previous models which had failed to hold the body securely in a single position, Salmon's new mechanism promised a secure seat with the ultimate purpose of ensuring the safety of the patient. Because operative dentistry entailed the use of sharpened tools, unexpected motion could endanger a patient's life, making fixed support essential.

Salmon was working at the forefront of modern dental chair design in 1866; only nine patents for dentists' chairs preceded his own.<sup>18</sup> He built on his predecessors' designs by focusing his contributions on adjusting the underbody mechanism of the 1855 "Perkins's Patent Ball

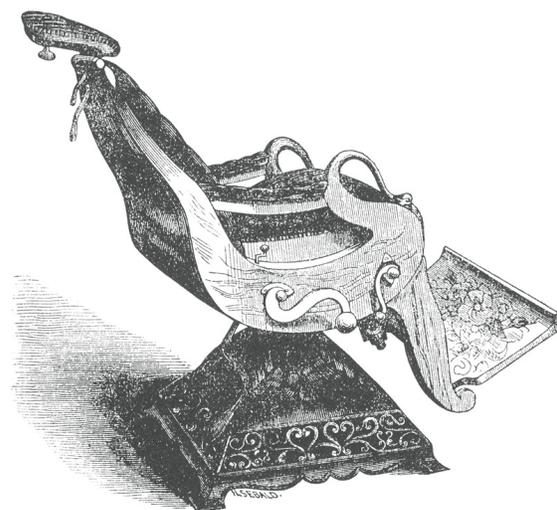


Fig. 3. D. W. Perkins, *Perkins's Ball and Socket Chair*, 1855. From the Virtual Dental Museum, University of the Pacific.



Fig. 4. American Chair Co. of Troy, New York, Centripetal Armchair, 1850–58. From Winterthur Museum, 2015.0018.

and Socket Chair” (Fig. 3).<sup>19</sup> Salmon not only improved the joint, but also added a scroll-wheel to the rack that allowed the seat to be raised and lowered. Subsequent patent applications show that other inventors were grappling with the same questions as Salmon: how to facilitate the chair’s movement so that a dentist could work in either a standing and sitting position, and with varying degrees of inclination. After Salmon’s patent, significant innovations to the underbody included a hydraulic-pump base in 1877 and in 1893 a disk-shaped base that prevented a dentist from tripping over chair legs.<sup>20</sup> Dentists’ manuals often include directions for complex procedures that specify the arrangement of the chair, meaning an adjustable seat was necessary for a dentist to effectively perform the full range of operations expected in the era.

These mechanistic underbodies recall features seen on rocking, revolving, and tilting chairs which were being reimaged at the same time. Gretchen Townsend’s research on the centripetal armchair produced between 1850 and 1858 by the American Chair Co. of Troy, New York, demonstrated how beneath the chair’s upholstered cushion, springs and a cast iron base enabled it to swivel, flex, and recline in any direction. The firm developed these innovations based on experience with its signature line of reclining railway seats (Fig. 4).<sup>21</sup> Such developments were experiments with a more comfortable chair design.

Townsend argues that while these features failed to endure in parlor settings, they were embraced by manufacturers of ergonomic office furniture who captured the market for chairs that facilitated movement and support.

Following dentist William Morton’s successful use of anesthesia in 1846, dentists foresaw a need for chairs with reclining backs. An 1859 treatise by Sir John Ternes on dental surgery noted that while easy chairs had previously been tolerated, improvements to professional chairs permitted operative dentists to position their patients’ heads in lines both conducive to the operation and that offered better support.<sup>22</sup> Chapin Aaron Harris in his 1866 publication, *The Principles and Practice of Dental Surgery*, recommended the administration of anesthetic agents to a patient in a reclined position—requiring a dentist to own an operating chair with a moveable back.<sup>23</sup> A reclining feature was essential in supporting the patient’s body when he or she lost consciousness. Salmon’s chair boasted a reclining back. In 1867, the year after Salmon applied for a patent, a reclining back would have been a supplemental feature, given that a dental trade catalog’s standard operating chair did not recline.<sup>24</sup> But by 1876, such a feature was considered essential and the same company’s catalog from that year exclusively offered reclining designs.<sup>25</sup>

Because patent law required that innovations be “new,” inventors and their agents emphasized mechanical improvements in different parts of a chair. Merging the best innovations into a single chair quickly became complicated by various trade-offs as the chair with the most innovative headrest may not have had an equally well-designed underbody mechanism. Distributors compensated for this unevenness by selling chairs with patent-protected options, as when the S.S. White Dental Manufacturing Company offered Perkins’ Dental Chair with “Whitcomb’s Head-rest substituted” for thirty extra dollars in 1867.<sup>26</sup> For this reason, while Salmon announced his central innovation was in his chair’s underbody, his patent text also claimed other features. In this description, he differentiated his headrest from a previously-patented one that permitted only a few positions. Instead, he used an improved joint that allowed the headrest to be positioned at any angle within its range of movement. In Salmon’s era, advances in dental surgery made patent designs for headrests on dentists’ chairs increasingly important.

While Salmon perfected D. W. Perkins’s chair’s underbody mechanism, he preserved its other features including its plush seat and mahogany wooden armrests, carved with swan-head terminals.<sup>27</sup> These design features recall late Neo-Classical sitting room furniture such as John Finlay’s 1832 sofa for Hampton’s Drawing Room (Fig. 5).<sup>28</sup> In keeping with Salmon’s interest in establishing



Fig. 5. John Finlay, Sofa, 1832. From Hampton National Historic Site.



Fig. 6. George W. Archer, Dentist's Chair, 1874. From the Kornberg School of Dentistry, Temple University, 1940.2.

a patient's comfort with the underbody, the upper part of the chair also would have guaranteed a patient's ease. Here, the chair's aesthetic design retained associations with the domestic sphere and would have made the dental office a less-intimidating, and even familiar environment. Trade manuals such as *The Dental Office and Laboratory* encouraged dentists to take their patients' comfort into account. They advised professionals on the duration for keeping patients in a chair and even suggested remedies to mask procedural smells such as placing pastills with the pleasant odors of myrrh and nutmeg at the base of operating chairs.<sup>29</sup>

While the chair's metal base incorporated modern engineering, its upper section was likely intentionally anachronistic and traditional. And because patent designers were focusing their exacting modifications on the underbody mechanisms and preserving the style of the top of the chair, swan-carved armrests continued to appear in patented dentists' chairs through 1874 in a design by George W. Archer intended

for both dentists' and barbers' shops (Fig. 6). Like dentists, barbers in 1874 were using sharp devices such as razors and scissors, making the comfort and safety of their clients as important as that of dental patients.

While such Neo-Classical furniture features were emblematic of tradition, their materials also meant they were associated with luxury. Through the nineteenth century, advertisements emphasized chairs' costly materials, as in the turn-of-the-century Harvard Chair, upholstered in seal skin, which was marketed as "one of the most . . . beautiful . . . dental chairs made."<sup>30</sup> Likewise, other dental objects were designed to express luxury and status. Utilitarian objects such as gasometers, used to store and administer nitrous oxide during dental procedures, were sold with either nickled or japanned ornamental bases. In their design, stands for the engine bits of dentists' drills recalled cake dishes and jelly molds with a series of concentrically layered trays, all capped by a round finial. Surviving photographs from the late-nineteenth century, such as one showing the Boise City office of Dr. Pyle, capture how the decorative impulse of the Victorian era influenced dentist office design, resulting in draped, fringed curtains, flowers, and a fanciful elephant statue (Fig. 7).<sup>31</sup>

These nineteenth-century dentists' investments in ornament conformed with a long tradition of lavish dental devices: itinerant dentists kept ivory-handled tools in shagreen cases, and the first practical dental instrument case, manufactured in New York City in 1840 by John D. Chevalier, was made in rosewood, walnut, mahogany, or leather, embellished with heavy brass or German silver mountings and silk velvet lining, and held mother-of-pearl handled, bejeweled instruments.<sup>32</sup> The valuable materials used in dentists' instruments would have been especially meaningful to patients at a time before sepsis when



Fig. 7. "Interior, American Dental Parlors, Boise City, Probably ca 1890. C.F. Stamper Photo, Boise City, Patient: Dick Williams, Left: Mrs. Williams, Dentist: "Dr. Pyle." From the Idaho State Archives, 2084.

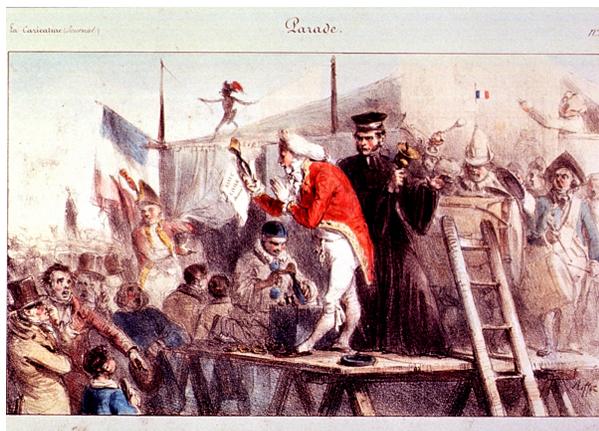


Fig. 8. Denis Auguste Marie Raffet, *Parade*, 1831. From U.S. National Library of Medicine, Bethesda, A021996.

commissions for gold fillings and ivory and porcelain teeth demanded that dentists have access to professional quality equipment that was reusable. An 1867 dental trade catalog demonstrated the significant price differential between the cheapest standard model of dentist's chair, unadorned beyond a stain used to imitate elegant woods, for \$85, and the most costly design by J. O. Whicomb which featured an upholstered tilt seat and footrest and carved rosewood feet and arms.<sup>33</sup> Likewise, the velvet and carved walnut in Salmon's chair made claims of professionalism by suggesting its owner's commercial success; a dentist using a Salmon chair was one who could afford to elegantly outfit his dental office.

Historically, dentists have made their claims of authority in public spaces through spectacle, as dentists at fairs often worked on an elevated stage. In some cases, these stages included wings and were explicitly intended for entertainment purposes; jugglers, clowns, and conjurers drew attention prior to dental surgeries.<sup>34</sup> Engravings from France and Britain in the eighteenth and nineteenth centuries show how this carnivalesque practice endured (Fig. 8). Itinerant dentists were also a trope in depictions of nineteenth-century, rural life, and scenes emphasized locals' fascination following a practitioner's arrival. Even when dentists' offices evolved, space constraints originally precluded separate waiting and operating rooms, and a gallery of spectators, awaiting their own treatment, was frequently depicted in both caricatured and realistic scenes of dentists' offices. In these public settings, a dentist became as much a showman as a trade practitioner and his chair as much a stage as a professional tool. Ultimately, spectators served as sureties, giving patients confidence that their dentists were being watched and held accountable in performing honest work.

When the dental office became a private setting in the mid-1800s, the dentist's audience disappeared and the onus fell upon the patient to mind the dentist's work. The lavish decoration seen in Victorian-era dentists' offices may be a palimpsest of the industry's performative

tradition, endowing patients with the power of spectator and encouraging them to be the ultimate appraisers of their dentists' work. Footstools sold in an 1867 dental trade catalog emphasized the chair's height, making it reminiscent of a stage in a medieval market.<sup>35</sup> The dentist used levers and pulls to set the chair in motion, becoming a stage master. An 1867 trade catalog listed pearl handled mirrors among its standard products, essential devices in allowing patients to watch their dentists' work.<sup>36</sup> These features glorified spectatorship, making a dentist's operation a practice of wonder rather than fear.

Much scholarly discussion of Thomas Eakins's *The Gross Clinic* and *The Agnew Clinic* has focused on the performative nature of the medical profession. Like Gross and Agnew, Salmon was a university lecturer, and he was employed to captivate an audience of students in the lecture halls of Massachusetts General Hospital. For Salmon and his students, dental operations were affairs to be studied. He may have had theatrical design in mind when he endowed his chair with swan armrests and velvet upholstery. These dramatic features subtly invoked the relationship of the performer and spectator for the dentist and patient, further guaranteeing a patient's comfort by associating the dental procedure with a spectacle to be anticipated and observed rather than a dreaded operation to be feared.

This paper has argued that Salmon's patent model was intended to establish his professional reputation in the industry by demonstrating his keen awareness of the needs of the dentist and the patient. In the same year as he submitted his patent model, a report about the twelfth annual American Dental Convention in the November 1866 issue of the periodical, *The Dental Cosmos*, describes how "Dr. Salmon exhibited a dental chair capable of being inclined backward, laterally or obliquely, at an angle of 40 to 70 degrees."<sup>37</sup> In addition, Salmon demonstrated for his peers how his automatic mallet (Fig. 9), used to condense gold when filling a cavity, was designed so that "a greater variety of blows . . . can be obtained . . . with little noise" and presented his instrument rack.<sup>38</sup> The next year, *The Dental Cosmos's* careful coverage of professional advances included endorsements of Salmon's mallet.<sup>39</sup> Salmon's mallet was so popularly received, it would be manufactured and distributed by dental equipment companies into the end of the century, allowing Salmon to reissue his patent in 1870 and 1873.<sup>40</sup> While many patent designs were never realized, either being rejected or, after being patented, failing to receive financial support, several advertisements between 1881 and 1884 for second-hand chairs in New



Fig. 9. "Salmon's New Automatic Mallet." From S.S. White Dental Manufacturing Company, *Catalogue of Dental Materials, Furniture, Instruments, Etc*, page 139.

York and Boston Depots listed Salmon Chairs, proving Salmon successfully marketed and sold his chair's design.<sup>41</sup>

In the long tradition of dentists fashioning their own seats, from the medieval dentist depicted in the *Arzneibuch* to Josiah Flagg, Salmon may be one of the final dentists to achieve this success. He was working at a time when the production of dental equipment was becoming increasingly monopolized by a small number of firms. Although his inventions were positively received by his peers, by 1870, only four years after Salmon had first introduced his designs to his professional cohort, when the American Dental Association brought the subject of new dental innovations to the floor, an amendment to the society's Constitution was proposed that "No person shall be a member of this association who holds a dental patent, or is or shall be interested in one."<sup>42</sup> Although the amendment was rejected in 1870, when the 1871 session of the American Dental Association opened, amidst roll calls and a fixing of hours, "Dr. Cushing moved that Drs. Salmon and Morrison be . . . discharged from service on the Committee on Instruments and Appliances, both having appliances of their own."<sup>43</sup> These trade association announcements forecast an impending divide between practicing dentists and the designers and manufacturers of dental equipment. While Salmon never gave up his interest in innovation, and he continued to submit patent applications for designs such as improvements to car heaters, a type-writing machine, and an autoharp until the end of his life, none of subsequent patents were dedicated to dental instruments. Instead, again conforming to the professional expectations of operative dentistry, he opted to pursue his dental practice over a career in the world of dental instrument innovation.<sup>44</sup>

In 1881, a merger between two major firms established S.S. White Dental Manufacturing Company as the leading producer of dentists' chairs for the remainder of the nineteenth century.<sup>45</sup> A photo-booklet "Souvenir" designed for branch house managers after their 1898 visit to the S.S. White factory in Staten Island includes images of the firm's extensive operations. The facility included rooms where designing and drafting occurred and machine shops where chairs were manufactured (Figs. 10 and 11).<sup>46</sup> Amidst both the draftsmen designers and factory workers, there was no place in the expansive factory for a dentist like Salmon. At the same time as S.S. White was producing chairs on a mass scale, the design of dental chairs and cabinets again underwent important changes. Chairs were designed in new types of materials that were cheaper and could be readily cleaned. At this time, dentists substituted lab coats for their street clothes. As a better understanding of the germ theory in the 1900s, the opulence of the Victorian dentists' office was abandoned in favor of a sterile, white space. And John L. Naughton's reclining dental chair of 1958 established the prototype for the style

of dentist chairs that remain in use today.<sup>47</sup> In contrast to S.S. White's industrial-era production of over a thousand chairs each year, Salmon's process of innovation and self-promotion was more akin to the work of a craftsman and traveling salesman. While his patent application described the model chair's essential contribution as its innovative mechanism, today it is valuable as an emblem of an era when dentists designed professional tools based upon their personal experiences, responding to their patients' demands for comfort in a rapidly modernizing world.

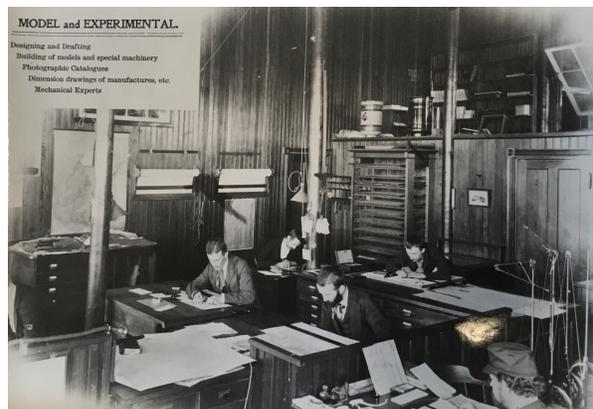


Fig. 10. "Models and Experimental." From "S.S. White Dental Manufacturing Company Souvenir: Visit of Branch House Managers June 28<sup>th</sup> 1898," 1898, Box 5, S.S. White Staten Island plant, S.S. White Dental Manufacturing Company photograph collection, Hagley Museum and Library, Wilmington, DE.

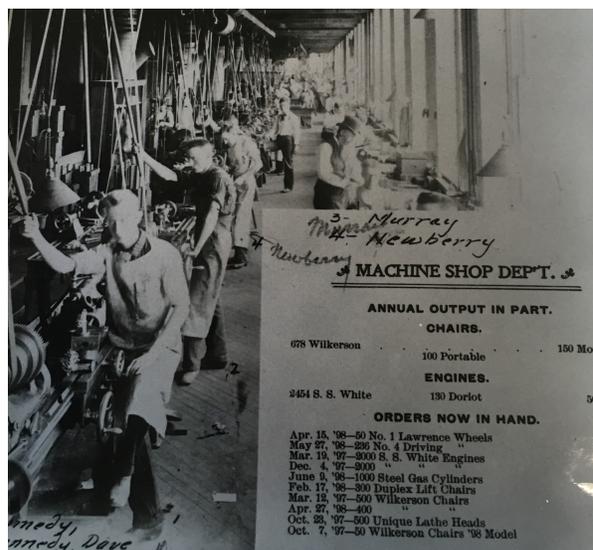


Fig. 11. "Machine Shop Dept." From "S.S. White Dental Manufacturing Company Souvenir: Visit of Branch House Managers June 28<sup>th</sup> 1898," 1898, Box 5, S.S. White Staten Island plant, S.S. White Dental Manufacturing Company photograph collection, Hagley Museum and Library, Wilmington, DE.

- <sup>1</sup> Object File, Conservation Department, Winterthur Museum, 1956.0517.
- <sup>2</sup> Richard A. Glenner, "Dental Chairs," in *The Dental Office: A Pictorial History* (Pictorial Histories Publishing Company, Incorporated, 1984), 1.
- <sup>3</sup> *Ibid.*, 23.
- <sup>4</sup> *Ibid.*, 2, 23.
- <sup>5</sup> "History of Dentistry Timeline," American Dental Association.
- <sup>6</sup> "History of Dentistry," The American Dental Education Association, accessed September 10, 2018, [https://www.adea.org/GoDental/Health\\_Professions\\_Advisors/Histor\\_y\\_of\\_Dentistry.aspx](https://www.adea.org/GoDental/Health_Professions_Advisors/Histor_y_of_Dentistry.aspx).
- <sup>7</sup> William Phipps Blake, *Reports of the United States Commissioners to the Paris Universal Exposition, 1867* (Washington D.C.: U.S. Government Printing Office, 1870), 16.
- United States Centennial Commission, *International Exhibition, 1876: Reports and Awards. Groups I-XXXVI and Collective Exhibits*. Ed. by Francis A. Walker (Washington D.C.: U.S. Government Printing Office, 1880), 247–48.
- <sup>8</sup> James Anderson Taylor, *History of Dentistry: a Practical Treatise for the Use of Dental Students and Practitioners* (Philadelphia and New York, Lea & Febiger, 1922), 84.
- <sup>9</sup> Glenner, *The Dental Office*, 35.
- <sup>10</sup> "Obituary: Dr. Ira Salmon," *The Dental Cosmos: A Monthly Record Of Dental Science* 38, no. 12 (December 1896): 1040–41.
- <sup>11</sup> Charles F. Cox, Shiro Suzuki, Naotake Akimoto, John D. Ruby, Yasuko Momoi, and Nobuko Maeda, "Operative Dentistry's Beginnings & Its Rapid but Steady Continuum," *Dental, Oral and Craniofacial Research* 2, no. 4 (2016), <https://doi.org/10.15761/DOCR.1000166>.
- <sup>12</sup> "Boston, Massachusetts, City Directory, 1869," *Ancestry.com* (accessed September 18, 2018), 732.
- <sup>13</sup> Ira A. Salmon, "Dentist's Tool Rack. United States USRE62368E, issued February 26, 1867," *Ancestry.com*, accessed September 24, 2018.
- Ira A. Salmon, "Dental Instrument. United States USRE62504E, issued February 26, 1867," *Ancestry.com*, accessed September 24, 2018.
- <sup>14</sup> *American Enterprise: Nineteenth-Century Patent Models* (New York: Cooper-Hewitt Museum, 1984), 18.
- <sup>15</sup> *Ibid.*, 12.
- <sup>16</sup> Gretchen Townsend, "Working Chairs for Working People: A History of the Nineteenth Century Office Chair," (Unpub. M.A. Thesis, University of Delaware, 1987), 30.
- <sup>17</sup> Barbara Suit Janssen, *Icons of Invention: American Patent Models* (Washington D.C.: Smithsonian Institution, National Museum of American History, 1990), 12.
- <sup>18</sup> Ira A. Salmon, "Dentists' Chair. United States USRE55368E, issued June 5, 1866," in Object File, Registration Department, 1956.0517. *The Boston Directory* (Boston: George Adams, 1856), 21.
- <sup>19</sup> United States Patent Office, *Subject-Matter Index of Patents for Inventions Issued by the United States Patent Office from 1790 to 1873: Inclusive* (Washington D.C.: U.S. Government Printing Office, 1874), 430; Glenner, "The Dental Office," 23–34; See also Charles Rudolph Edward Koch, "The Operating Chair," *History of Dental Surgery: History of the Development of Dentistry, Operative Dentistry, Prosthetic Dentistry, Orthodontia, Oral Surgery, Dental Literature, Dental Journalism, Dental Education and Dental Colleges.* - v. 2. *Dental Laws and Legislation, Dental Societies and Dental Jurisprudence.* - v. 3. *Biographies of Pioneer American Dentists and Their Successors* by B. L. Thorpe (n.p.: National Art Publishing Company, 1909), 237–43.
- <sup>20</sup> George Kubler has described this progression from what he terms an artifactual idea. Gretchen Townsend makes this argument about office chairs in her thesis, "Working Chairs for Working People: A History of the Nineteenth Century Office Chair," 2.
- <sup>21</sup> Glenner, *The Dental Office*, 26.
- <sup>22</sup> Townsend, "Working Chairs for Working People," 1.
- <sup>23</sup> Sir John Tomes, *A System of Dental Surgery*, (London: Churchill, 1906), 436–37.
- <sup>24</sup> Chapin Aaron Harris, *The Principles and Practice of Dental Surgery* (Philadelphia, P. Blakiston, Son & Co., 1882), 382.
- "History of Dentistry Timeline," American Dental Association, accessed September 23, 2018, <https://www.ada.org/en/about-the-ada/ada-history-and-presidents-of-the-ada/ada-history-of-dentistry-timeline>.
- <sup>25</sup> S.S. White Dental Manufacturing Company, *Catalogue of dental materials, furniture, instruments, etc., for sale*. (Philadelphia: Lippincott's Press, 1867), 117.
- <sup>26</sup> S.S. White Dental Manufacturing Company, *Catalogue of Dental Materials, Furniture, Instruments, Etc.* (Philadelphia: White, 1876), 240.
- <sup>27</sup> S.S. White Dental Manufacturing Company, *Catalogue of Dental Materials*, 119.
- <sup>28</sup> Glenner, *The Dental Office*, 27.
- <sup>29</sup> Object File, Registration Department, 1956.0517.
- <sup>30</sup> *The Dental Office and Laboratory* 4, no. 1 (January 1890): 68. *The Dental Office and Laboratory* 11, no. 5 (September 1897): 143.
- <sup>31</sup> Glenner, *The Dental Office*, 26.
- <sup>32</sup> Arthur Hart, "'Old Tooth Puller' of Boise, Wild West Was as Much Character, Historian as Dentist," *Idaho Statesman*, accessed September 25, 2018, <https://www.idahostatesman.com/news/northwest/idaho/history/article204551314.html>.
- <sup>33</sup> *Ibid.*, 35.
- <sup>34</sup> S.S. White Dental Manufacturing Company, *Catalogue of Dental Materials, Furniture, Instruments, Etc* (Philadelphia: Lippincott's Press, 1867), 117, 121.
- <sup>35</sup> *Ibid.*, 1.
- <sup>36</sup> S.S. White Dental Manufacturing Company, *Catalogue of Dental Materials*, 124.
- <sup>37</sup> *Ibid.*, 108.
- <sup>38</sup> W. C. Horne, "Proceedings of Dental Societies," *The Dental Cosmos: A Monthly Record of Dental Science* 8, no. 4 (November 1866): 196.
- <sup>39</sup> *Ibid.*
- <sup>40</sup> Thos. Stellwagen, "Odonontographic Society of Pennsylvania," *The Dental Cosmos: A Monthly Record Of Dental Science* 8, no. 10 (May 1867): 535.
- <sup>41</sup> S.S. White Dental Manufacturing Company, *Catalogue of Dental Materials, Furniture, Instruments, Etc.* (Philadelphia: White, 1876), 135.
- <sup>42</sup> "Advertisements," *The Dental Cosmos: A Monthly Record Of Dental Science* 23 (1881): 728; at the New York Depot, either this chair or another is listed in the subsequent volume in 1882 as "1 Salmon Chair, Green Plush, good order" for \$45; in "Advertisements," *The Dental Cosmos: A Monthly Record Of Dental Science* 24 (1882): 722.
- <sup>43</sup> "Advertisements," *The Dental Cosmos: A Monthly Record Of Dental Science* 26 (1884): 818; an identically worded announcement is likely for the same chair, still available in Boston in 1885, in "Advertisements," *The Dental Cosmos: A Monthly Record Of Dental Science* 27 (1885): 817.
- <sup>44</sup> "American Dental Association," *The Dental Cosmos: A Monthly Record Of Dental Science* 12, no. 10 (October 1870): 525–26.
- <sup>45</sup> "American Dental Association," *The Dental Cosmos: A Monthly Record Of Dental Science* 13, no. 9 (September 1871): 462.
- <sup>46</sup> Ira A. Salmon, "Apparatus for heating cars. United States USRE10190E, issued August 29, 1882," Google Patents, accessed September 24, 2018; Ira A. Salmon, "Type Writing Machine. United States USRE406064E, issued July 2, 1889," *Ancestry.com*, accessed September 24, 2018; Ira A. Salmon, "Autoharp. United States USRE511970E, issued January 2, 1894," *Ancestry.com*, accessed September 24, 2018.
- <sup>47</sup> Glenner, *The Dental Office*, 25.
- <sup>48</sup> "S.S. White Dental Manufacturing Company Souvenir: Visit of Branch House Managers June 28<sup>th</sup> 1898," 1898, Box 5, S.S. White Staten Island plant, S.S. White Dental Manufacturing Company photograph collection, Hagley Museum and Library, Wilmington, DE.
- <sup>49</sup> Glenner, *The Dental Office*, 34.