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The NAWCC, Inc. is the world's largest museum, research library, educational institution, and international community of horological professionals and enthusiasts dedicated to clocks, watches, time, and timekeeping.

We are committed to being the world leader, educator, and advocate for horology and for everyone who is interested in timepieces and horological issues.

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NAWCC School of Horology

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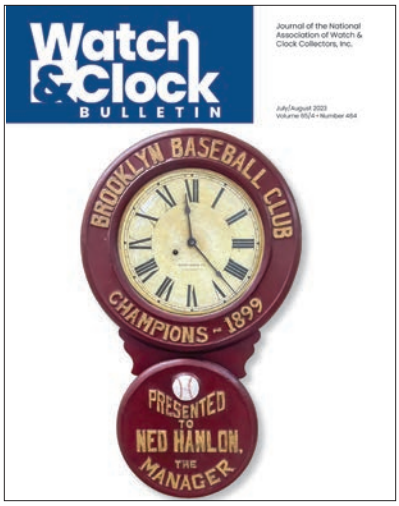

About the Front Cover

On page 222, Jerry Maltz shares his latest advertising clock finds and recalls the mysterious Brooklyn Baseball Club clock that got away. Though the Baird Clock Co. was dissolved in 1896, the clock shown on the front cover has the inscription "Champions – 1899". Evidence of a clairvoyant clockmaker?

About the Back Cover

Geoff Cox and Stephen Barasi trace the restoration process for an early 17th-century lantern clock made by Richard Quelch of Oxford. Turn to page 233 for their detailed account of the reconversion of the long pendulum clock to its original balance wheel mechanism.

Letter from the Editor

Inundated as we are today with noisy digital advertising, it was refreshing to learn more about the advertisers who used clocks as their promotional platform, specifically the Baird clocks that Jerry Maltz discusses in this issue. Clocks with a brand or store name and a simple slogan—Best Goods! Leading Jeweler! No Poisonous Drugs! (my exclamation points, for gusto)—they said it all and showed the time to boot. The Museum has a Baird clock on display that proclaims, in impressive but rather obtuse lingo, that molliscorium (an oil for softening leather) and embrocation (liniment) are available from Vanner and Prest.

A ca. 1895 Baird advertising clock on display in the National Watch & Clock Museum.

Sidney Advertising Clock Co., ca. 1890, Sidney, NY. Connected to the movement, the drums rotated every five minutes to show different ads.

Near the Museum's Baird clock is a Sidney advertising clock with ads covering drums that ingeniously rotated every 5 minutes. Moving into the next galleries, you'll see novelty clocks and watches that promoted pop culture characters of the time (a Shmoo clock and James Bond watches, for example).

There will be several wonderful new exhibits in the Museum this summer, including skeleton clocks, carriage clocks, vintage wristwatches, and clocks of John B. McLemore. Make the trip to Columbia, PA, and see for yourself how special a place the Museum is, filled with horological delights.

Laura Taylor
Managing Editor
editor@nawcc.org

Regular Annual Meeting of the NAWCC

Saturday, July 15, 2023

8:00 – 9:00 a.m.

Lancaster Convention Center

25 S. Queen Street

Lancaster, PA

Message from the Board Chair

I would like to thank our members who took the time to vote for Directors and Nominating & Elections Committee (NEC) representatives for the 2023–2027 term. I am excited to welcome new Board members Eliel Garcia, Jarett Harkness, Geoffrey Parker, and Jeff Zuspan. They will all be seated at their first Board meeting, which will take place prior to this year's National Convention in Lancaster, PA. I would also like to thank Tom Compton, Jay Dutton, Rich Newman, and Ralph Pokluda, who have all completed their terms as Directors. The last few years have been challenging, not only for the NAWCC but for all organizations. The leadership from these individuals has been key to the Association's ability to not only weather the storm but also ensure a bright forecast for our future success. I look forward to working closely with the 2023–2027 Board to keep the momentum going.

In addition to the new Directors, I would also like to congratulate our newest NEC members, Jay Dutton and Richard Newman, who will be taking on their new roles in July. The NEC is critical in overseeing our elections and identifying potential future candidates for the Board. Jay and Rich will be replacing Jerry Thornsberry and Carroll Wolfe, who are completing their respective terms on the Committee. My thanks to both Jerry and Carroll for all they have done and will undoubtedly continue to do for the NAWCC.

As I write this message, members and staff are busily preparing for this year's National Convention in Lancaster, PA, celebrating the NAWCC's 80th year. The National Convention is always a wonderful event, but this year promises to be something extra special. It all starts on Thursday, July 13 with an open house at our campus in Columbia. The open house will feature exhibits on carriage clocks from around the world and vintage wristwatches, the newly launched *S-Town* clock exhibit, and many other updates that the Museum, School, Library, and headquarters staff have been working on. From Friday, July 14 through Sunday, July 16, Convention activities will take place at the Lancaster County Convention Center in downtown Lancaster. We have a varied and exciting schedule that includes lectures, the crafts competition, a live auction, a large mart, the annual members' meeting, and a reimagined banquet that will include a presentation on the conservation of the Westminster clock by Keith Scobie-Youngs. For more information and a detailed schedule, consult your May/June *Mart & Highlights* or *Bulletin*, or go to www.natcon.nawcc.org.

Immediately following the National Convention, we will be hosting the Ward Francillon Time Symposium—Lancaster Legacy at the Hamilton Club—on July 16–17. Day 1 will feature lectures, drinks, and dinner at the historic Hamilton Club, just a short walk from the Lancaster Marriott at Penn Square. Moving to our Museum in Columbia on Day 2, we'll enjoy lectures, a luncheon, and several behind-the-scenes sessions and tours with exclusive access to Symposium attendees only.

I look forward to meeting with you, sharing our passion for horology and all the NAWCC has to offer. See you all in Lancaster!

Rhett Lucke
NAWCC Chairman of the Board
rlucke@nawcc.org

Message from the Executive Director

Our Association's 80th anniversary celebration has been a principal focus of our attention here at HQ as we prepare to welcome you to Lancaster County for what promises to be a memorable National Convention. In addition to this, we have a new and unexpected piece of good news that has added a major project to our schedule.

Over the years, the NAWCC has evolved from being a collectors' community and information exchange to being a keeper of artifacts, knowledge, and reference material. This evolution has deep roots in an unlikely location for such a premiere horological resource. The fact that the Museum and Research Center are not in a prime city location has long been a bone of contention for many within the Association.

However, Lancaster County is now a major US tourist destination, and Columbia is experiencing a significant renaissance.

River trails (both wet and dry) are extending, and new hotels, restaurants, and businesses are moving into the area. The Museum is recognized as an important asset to the local Borough and the Commonwealth of Pennsylvania.

Our world-class horological artifacts are made from just about every conceivable degradable material (paper, metals, wood, plastics, etc.), and their preservation requires careful control of the building's environmental conditions. Our aging systems have caused us to look at every possible option. With no rainy-day fund in place, the Board and I had to contemplate and prepare for worst-case scenarios that might have even required relocation of the collection to protect it from the inevitable decline of our current HVAC systems.

Thanks to the grant-writing initiatives of the Oversight and Advancement Committee, which oversaw the Association's management during the pandemic, we received notification that our application for the Local Share Account was successful. This funding will get us well underway with overhauling the HVAC systems, potentially securing the home of the NAWCC collection for another quarter of a century and beyond. Further to this, we have been allocated a line item in Pennsylvania's state budget for further funding that we will need to apply for in order to complete the HVAC project. At present, this state money is notional. The competition is fierce, and so we will be planning careful and strategical applications over the next few years.

The HVAC improvement project is a major investment and will likely cost several million dollars. The Association will not see a penny of the grant money; all funds will be managed by the Borough of Columbia, who will work with my team to ensure that the project is carried out with complete transparency and in compliance with the strict rules of the Commonwealth of Pennsylvania. It is our job to guarantee that the grant and this investment delivers equipment that is practical for the needs of the collection and that the new system is efficient and long-lasting.

On another front, we have developed new ways of communicating over the last year and are delighted by the positive feedback received from our monthly e-newsletter, for example. If you would like to receive these updates, please drop either Laura (ltaylor@nawcc.org) or me a line and we will add you to the mailing list. By developing a stronger digital presence for both the NAWCC and the Museum, we will succeed in sharing our passion that will, in turn, inspire others' passion.

I could not be happier with the way our team has jumped at the chance to learn more about the subject of horology. Very often, you will find staff learning about different types of watches and clocks or taking part in collections management, curation, and even conservation. I am hopeful that this enthusiasm will continue to grow and help us to shape and adapt the Association for the changing world of collecting watches and clocks.

Talking of such things, we have been blessed with several generous donations to the Museum from longtime NAWCC members. Hal and Maida Cherry donated a fabulous collection of some of the finest 19th-century skeleton clocks, totaling 35 items. It is difficult to choose highlights from such a wonderful collection, but for this communication, I would like to share the magnificent quarter-striking skeleton clock by James Condliffe of Liverpool (Figure 1).

Figure 1. Quarter-striking skeleton clock by James Condliffe donated by Hal and Maida Cherry.

Figure 2. (left to right) Sonny McClain, two excellent fellows from the moving service, Janelle Soash, Michael Schwartz, Alex Simpkins (and several other staffers not seen here) helped unload new donations, including a 3-train with posted frame donated by Don Saff.

Recently, we had a truckload of tower clocks arrive at the Museum and all of our available team were keen to assist with getting the clocks safely into the Museum (Figure 2). These were donated by renowned artist, art historian, and horological author Don Saff and included an important piece of Pennsylvania's electrical horology by Daniel Drawbaugh, which now hangs alongside the original patent model for the design; a 3-train with posted frame; and two English tower clock movements.

Another welcome addition to our Public Time collection was donated by horological artist Randall Cleaver. It is one of two known Pennsylvania tower clock movements that were designed by Elmer Dungan, better known for his *Hickory Dickory Clocks*.

In this slightly longer than usual message, I hope you will agree that as we approach the NAWCC's 80-year anniversary, there is plenty to look forward to!

Rory McEvoy
NAWCC Executive Director
rmcevoy@nawcc.org

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Christmas in July

Special Two Week Online Only Auction

July 6-20, 2023

Rolex GMT Master ref 6542, no crown guards
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Jules Jürgensen five-minute repeater heavy 18K HC
$4,000-$6,000

Edward Howard, 23 sapphire jewels, 18K, w/original box
$8,000-$12,000

Rolex two tone Datejust w/factory diamond dial
$3,400-$5,000

Hamilton Grade 951 pendant-set, extremely rare
$6,000-$10,000

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Watch & Clock BULLETIN

Columns

My Ongoing Obsession with Baird Advertising Clocks

BY JERRY MALTZ, NAWCC FELLOW (NY)

Introduction

I have been a passionate collector of advertising clocks for many years (Figure 1). It has been 25 years since my book *Baird Advertising Clocks* was published.[1] The book contains photos and descriptions of more than 70 different clocks. In August 2008, an addendum of 17 different Baird advertising clocks was published in the *Bulletin*.[2] Since that time I have found several more Baird clocks, all described here.

Edward Payson Baird

Edward Payson Baird was born in Philadelphia, PA, on January 26, 1860. At the age of 15 he left school and went to work for William Torrey and Co., which was owned by his mother's relative. The company produced packing boxes. More than likely this company produced wooden packing boxes for the Seth Thomas Clock Co. It was there that Baird encountered Seth Thomas Jr., the son of Seth Thomas, the clockmaker. Baird then worked for the Seth Thomas Clock Co. from 1879 to 1887. Subsequently, he became the general manager of the Electro-Mechanical Clock Co., Ltd., in Montreal, Canada.

In 1887, the Baird Clock Mfg. Co. was formed in Montreal. He established a sales office in New York City as well. Baird made wooden cases and doors for advertising clocks. He used clock movements made exclusively by the Seth Thomas Co. and advertised as such to ensure the quality of his clocks and guarantee larger sales. In later years he used other companies' clock movements as well.

Business grew, and in July 1890, Baird moved from Montreal to Plattsburgh, NY. In addition to being the proprietor of his company, Baird was also the salesman and traveled throughout the US, England, and Ireland to promote his product. After his company was sold at public auction in 1896, Baird established the Baird Manufacturing Co. of Chicago in 1897. He produced the same kind of wooden case but changed to stamping and embossing the advertisement on tin (similar to a license plate) instead of using papier-mâché. These clocks did not sell well and few were produced, bringing an end to Baird's clockmaking enterprise after only one year in Chicago. He died on October 23, 1929, at the age of 69.

All of the standard Baird clocks pictured here are 30 ½" long and have an 18 ½" wide top door, 12" wide

Figure 1. (left) A clock-filled wall in the Maltz home in 2007 and (right) the same wall in 2023. AUTHOR'S PHOTOS.

bottom door, and a 12" dial. All other clocks have their own statistics listed. The papier-mâché clocks were made between 1891 and 1895. The clocks made in Chicago were produced in 1896. The iron time clock was made in the early 1900s.

Brooklyn Baseball

I remember that night like it was yesterday. It was a rainy night and my wife, Millie, and I drove 45 minutes from our home in New Rochelle to New York City, to Leland's Auction House to bid on the Brooklyn clock (Figure 2). The auction room was full, perhaps 200 sports fans anxiously awaiting the clock to come up. The clock was placed in a glass case, and I asked the attendant to open the door so I could examine it. It took me all of 10 seconds to know the clock was original: great paint, full label, correct pendulum, and a fine dial. The baseball protruded about 2" from the flat surface of the bottom door. Twenty minutes later, my dream of owning the clock was gone. I never got the chance to bid. The opening bid was much higher than I wanted to spend. The bidding continued until the hammer was brought down at $15,000, which did not include the auction commission.

Now, this is a mystery. In January 1896 the Baird Clock Co.'s assets were sold at auction; was Edward P. Baird a clairvoyant? Did his middle initial stand for Prognosticator? Could he predict that the Brooklyn baseball team would become champions three years later? Of course not.

This is my theory. Someone, most likely an old employee who still had access to the machinery and was a great baseball fan, made the clock. Possibly he was a friend or relative of the club's manager, Ned Hanlon, who later was voted into baseball's hall of fame in Cooperstown, NY.

Today, the clock resides in the Sports Museum of Los Angeles, commonly called "Cooperstown West."

Figure 2. Brooklyn Baseball Club clock. AUTHOR'S PHOTO.

Clock & Eagle

I have dubbed this clock the "Dwarf Baird" (Figure 3). It measures just 18" tall, 9" wide, with a 5" dial. There is only a 9" drop from the arbor to the center of the pendulum. It is pictured alongside an elongated 35" tall Baird with the same advertising. There are no other "Dwarf Bairds" known to exist.

Figure 3. The "Dwarf Baird" clock. PHOTO BY PHIL LARIVIERE.

Hudson Clothier

Figure 4 shows an advertisement from the *Plattsburgh [NY] Directory* from 1891. The clock measures 18 ½" in diameter.

J. L. Hudson Clothier was founded by Joseph Lowthian Hudson in 1881 as an upscale department store. Hudson was born in 1846 in Newcastle upon Tyne, UK. The store was located on Woodward Avenue in downtown Detroit. It was the tallest department store in the world at the time, consisting of 25 stories, four basements, and 59 elevators. In 1909, Hudson invested in a start-up automobile company that was named Hudson in his honor. He passed away in 1912.

In addition to the clothing advertising clocks shown in this article, many other clothing stores used Baird clocks to advertise their merchandise:

Montreal Clocks: J. P. Becker's Department Bazaar

Plattsburg Clocks: Baltimore Clothiers (Harrisburg, PA); Carwalho Clothiers (Keokuk, IA); Gusky's (Pittsburgh, PA); Marshall & Ball (Newark, NJ); McAdams & Berry's (Richmond, VA); New York Clothing House (Baltimore, MD); Simpson Bros. (Chattanooga, TN & Birmingham, AL); J. Stern & Sons (Quincy, IL); Strauss Bros. (Chicago, IL); Woolf (Chicago, IL); Wootten, Hayes & Harris (Denison, TX); Ead's Neal (Macon, GA); Houseman, Donnally & Jones (Grand Rapids, MI); McGregor & Co. (Newark, NJ); Saks & Co. (Washington, DC)[3]

F. W. Humphrey & Co.

Frank Waterman Humphrey was born in 1853 and died in 1909. He was a lifelong member of the Elks Lodge. F. W. Humphrey Clothiers operated from the mid-1880s to 1903 on the northeast corner of Broadway and Pine Street in St. Louis, MO.

The Humphrey clock advertisement in Figure 5 is from the journal *Printer's Ink* (March 30, 1892). It proudly proclaims that Baird Clock Co. had "fourteen leading Clothing Houses among our customers."

Mammoth Shoe and Clothing Co.

Mammoth Shoe and Clothing Co. was run by partners Horace Kleinhans (1852–1903) and De Calvus Simonson (1851–1934). The store was located at 424-434 West Market Street in Louisville, KY (Figure 6). Their advertisement in the *Louisville Courier Journal* (March 26, 1893) proclaims, "For $8 and $10 you can buy a really lovely overcoat. For $12 and $15 you have pick of hundreds of the finest overcoats ever seen in the city."

In 1898 the three-story building was devoured by fire. Kleinhans and Simonson were insured for the business, which never opened again. The building was rebuilt and leased to H. Giershoper, who opened a new clothing store, the Louisville Clothing Store.

Figure 4. An 1891 ad for Baird clocks, showing a Hudson Clothier clock, printed in the *Plattsburgh Directory*.

Figure 5. F. W. Humphrey & Co. clock ad in *Printer's Ink* (March 30, 1892).

Adolph Newsalt Jeweler

Adolph Newsalt was born in Prussia in 1848 and died in 1921.

After his father died when Newsalt was nine, he and his mother moved to New York City. He later began his apprenticeship as a jeweler in Lacrosse, WI, in 1860. In 1864 he moved to Dayton, OH, and worked for two years in other jewelers' stores before taking his $300 in savings and starting his own business on Fifth Street in Dayton (Figure 7). In time Newsalt's business flourished and he opened a second store at Main and Fourth Streets. This second store was considered the "most complete and best designed in the country."[4] The business outlived its founder and closed in 1928.

Figure 6. Mammoth Shoe & Clothing Co. clock. COURTESY OF THE CLOCK BROTHERS.

Figure 7. Adolph Newsalt clock. AUTHOR'S PHOTO.

Figure 8. Palace Clothing Co. clock. PHOTO BY JOHN KELCHNER.

Palace Clothing Co.

The clock claims that Palace Clothing Co. is the "Largest and Best Store" (Figure 8). The store opened in 1889, and was operated by the manager Maurice I. Rothchild. It was located at 43 Washington Avenue N., Minneapolis. A second location was opened in 1893 at 315-323 Nicolett Avenue. In 1949 it merged with the Young Quinlan Co., which had been established in 1926. The store ceased operations in April 1945.

Sanitary Cigars

B. C. Horn operated Sanitary Cigars, located on the corner of Front and Clay Streets in San Francisco. Horn was elected to the San Francisco City Council and was also the president of the Alameda Railroad.

An advertisement from the *Daily British Columbia Newspaper* of July 3, 1867, reads "500,000 Cigars @ $5.00 Per Thousand." Another ad states, "The Facilities For Importing From Virginia and Havana Can Not Be Excelled By Any Establishment On The Pacific Coast."

Some names of the cigars Horn sold were Forest Rose, Liberty Boy, Sunnyside, Nature's Bounty, and Atlantic Cable. The Sanitary Cigar clock (Figure 9) promotes cigars with "No Flavoring" and "No Poisonous Drugs."

Shonfield & Friedrich

The original Shonfield advertisement clock was made with a flaw (Figure 10). The word "Clothiers" on the top door was missing the letter "s." Shonfield took possession of the clock and had an artist print the missing letter onto the flat surface of the door.

The Shonfield clock was purchased from Baird in 1894, and a year or two later a partner was added to the firm. The new clock advertised Shonfield & Friedrich (Figure 11). This time "Clothiers" was correctly spelled.

J. H. Sielcken & Co. Teas, Coffees, Spices

John Herman Sielcken was born in Germany in 1847 and died while vacationing there in 1922. His occupation was accounting, and presumably he saw the potential profits to be made from running his own coffee business, which was located in San Francisco in the early 1890s (Figure 12).

In later years his business partner was George W. Crossman. The firm Crossman and Sielcken operated out of New York City.

Streissguth Clothing Co.

Otto Streissguth was born in 1854 in New Glarus, WI, and died in Milwaukee in 1930. He opened his first store in April 1891 on the northeast corner of State and Third in Milwaukee. In 1895, the company moved to a larger store at Grand Avenue and Second Street (Figure 13).

Three ads for the company were printed in the *Milwaukee Journal*.[5] One ad from May 3, 1901, proclaimed that the name "Streissguth" was pronounced "Stricegooth." Another advertisement from May 3, 1901, announced that free tickets to all

home games of the Milwaukee Brewers would be given away with a purchase of $3.00 or more. Then in January 1903, the newspaper released a statement announcing the closing of the Streissguth store and the sale of the remaining merchandise by the company Stumpf & Langhoff.

Figure 9. Sanitary Cigar clock. PHOTO BY JOHN KELCHNER.

Figure 10. Shonfield Clothiers clock. AUTHOR'S PHOTO.

Figure 11. Shonfield & Friedrich Clothiers clock. PHOTO BY JOEL ZAREMSKY.

Thurber Whyland

Figure 14 shows an extremely rare time-and-strike movement stamped by the F. Kroeber Clock Co. of New York. The only other Baird advertising clock with this same movement is the *Pittsburg Times* clock pictured in the *Bulletin*.[6] The style of the case is a short drop schoolhouse design measuring 27 ¾" tall and 18 ½" wide, and it has a 12" wide bottom door with a 2 ½" window to view the pendulum.

Horace Kingsley Thurber was born in Delhi, NY, in 1828 and passed away in 1899. He became involved in the food business in 1857. In the early 1870s, Thurber paid $19,000 for a triangular block of property on West Broadway and Reade Street in New York City, where he built a warehouse for his wholesale grocery business. The red brick neo-Grecian building, at the corner of 16 Hudson Street, was completed in 1874. On the third floor, a round-faced clock was built into the masonry.

In 1874, Thurber partnered with Whyland, and the new company of Thurber Whyland & Co. was formed with branch offices in France and England. Thurber diversified in 1886 to invest in coal mines in west Texas. The town of Thurber, TX, was named after him.

In 1918, long after Thurber's death, Thurber Whyland marketed tobacco by having boys collect cigar bands and offering free cigars and cash as an incentive to promote their product.

In 1984, the original New York City company building was converted into luxury apartments.

Welch's Magic Tea

The company was founded in Vineland, NJ, in 1869 by Thomas Branwell Welch and his son, Charles Welch, who was a practicing dentist.

Vineland was founded in 1861 by Philadelphia land developer Charles K. Landis to create his own alcohol-free utopian society. He offered Italian grape growers 20 acres of land to be cleared and used to grow grapes. The clock in Figure 15 promotes Welch's Magic Tea as the cure for headaches, malaria, and constipation as well as for problematic complexions!

The company's product changed to Welch's grape juice in 1893. In 1956, the company was sold to the National Grape Cooperative.

Winchester Repeating Arms Co.

The founder of the company was Oliver Winchester, who was born in 1810 and died in 1880. His business experience began with making men's shirts, but he

Figure 12. J. H. Sielcken & Co. clock.
PHOTO BY PHIL LARIVIERE.

Figure 13. Streissguth Clothing Co. clock.
PHOTO BY PHIL LARIVIERE.

Figure 14. Thurber Whyland Co. clock. PHOTO BY OLIVIA MALTZ.

later became the largest stockholder of the New Haven Arms Co. of Bridgeport, CT. In 1857, Winchester bought a controlling interest in the Volcanic Repeating Arms Co. from Horace Smith and Daniel B. Wesson. On May 22, 1866, the Winchester Repeating Arms Co. was established and produced the first reliable lever-action repeating rifle (Figure 16). The first gun to bear the name Winchester was called Yellow Boy.

The company moved to New Haven, CT, in 1871. In 1873, the model 1873 was produced and sales exceeded 700,000; it was known as "The Gun That Won the West." In 1939, the company produced 47,000 Browning Automatic Rifles, commonly called the BAR. Every combat infantry squad had two BAR men. In 1939, the company began manufacturing the M1 Garand. By the end of World War II, over 6 million rifles had been produced, and the company employed more than 60,000 workers. In 1960, the company manufactured 1.3 million M14 rifles for the military. In 1989, however, the company went bankrupt and was acquired by the Belgian arms maker Fabrique National Herstal.

Chicago Clocks

Buffos Cigar

Sam Woodside, whose name appears on the clock (Figure 17), was a wholesaler of tobacco and cigars. He was born in Ireland in 1833 and died in 1901. He served as a Union soldier in the Civil War.

Figure 15. Welch's Magic Tea clock.
COURTESY OF DELANEY ANTIQUE CLOCKS.

This is a very rare, double-sided bracket hanging clock made in Chicago in 1896, hung from a custom wrought-iron sconce. The case measures 44 ½" tall and 19" wide, with a depth of 7". The Seth Thomas No. 86, 30-day movement has a custom arbor and wheels to accommodate the second pair of hands. It is stamped "Made for the Baird Clock Co".

The advertisements, like all of Baird's Chicago clocks, were made with embossed tin. The front and rear ads on the clock are identical.

The front dial has two winding holes and has "Leased from the Baird Clock Co" printed on it. The second dial has the same message.

Rather than purchase the clock, Sam Woodside Co. distributors could get the clock without charge. Included in the arrangement was an agreement that the clock would be serviced by a local jeweler. In return, Woodside would pay a monthly fee to the Baird Clock Co.

The name "E. Seidenberg Stiefel & Co" appears on the advertisement; no information could be found related to that name.

Figure 17. Buffos Cigar clock. Author's clock featured in Fontaine's Auction Gallery catalog.

Figure 16. Winchester clock. AUTHOR'S PHOTO.

Figure 18. Daily News window clock.

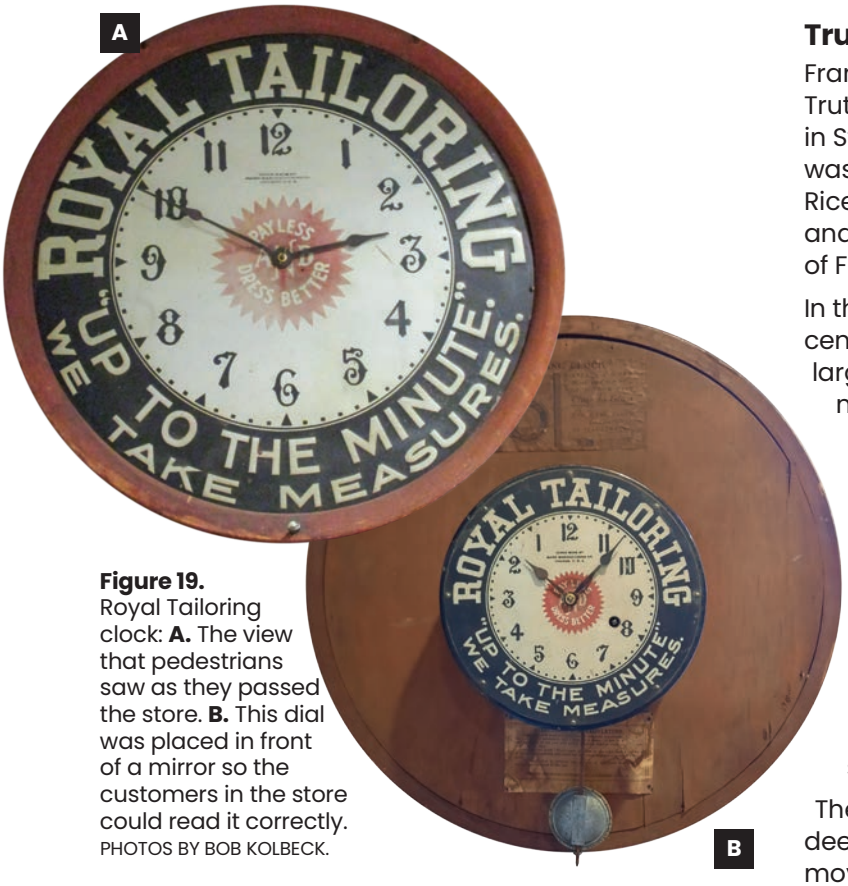


Figure 19. Royal Tailoring clock: **A.** The view that pedestrians saw as they passed the store. **B.** This dial was placed in front of a mirror so the customers in the store could read it correctly. PHOTOS BY BOB KOLBECK.

Daily News

The image in Figure 18 is from the *Chicago Daily News*. Melville Elijah Stone (1848–1929) founded the newspaper, which was published from 1876 to 1978.

This *Daily News* clock is the identical type of Chicago tin window clock as the Royal Tailoring clock shown here.

Royal Tailoring

A double-sided tin advertising clock produced in Chicago in 1897 promoted Royal Tailoring (Figure 19). The Royal Tailoring Clothing Co. was located in New York City and Chicago. This clock was designed to be hung in a store window to attract passing pedestrians.

The embossed dial measured 19 ½" in diameter. The reverse-side dial with the numbers placed in reverse was only 5 ½" in diameter, with a winding hole at the number 8. The clock was placed in front of a mirror so the customers inside the store could read it correctly. This dial was not embossed.

Three posts were drilled into the bezel at the numbers 11, 1, and 6. A wire was attached to the posts and then attached to nail heads on the ceiling and on a base below. This prevented the clock from moving side to side while the pendulum was in motion.

Truth Cigars

Figure 20. Truth Cigar clock.

Frank R. Rice was the owner of Truth Cigars at 305 N. 4th Street in St. Louis, MO, until 1932. He was born in Michigan in 1843. Rice served in the Union Army and lost a leg during the Battle of Fredericksburg.

In the latter part of the 19th century, St. Louis was the largest tobacco and cigar manufacturer in the United States. The company known as F. R. Rice Tobacco was established in 1892. The price of a Rice cigar called the Mercantile was 10 cents. Another cigar called the 305, named for his address, sold for 5 cents.

The two-sided clock with a flat bottom and top was placed on a counter to be seen by customers walking in and around a store (Figure 20). This clock may have been leased in the same way as the Buffos cigar clock (see above).

The clock measured 38" tall, 19" wide, and 7" deep. The clock most likely had a Seth Thomas movement, but I believe it was only the 8-day type unlike the Buffos cigar 30-day clock that had to be wound while standing on a ladder.

Rice also made fancy glass humidors to keep his cigars fresh. They are very collectible today.

Figure 21. Baird chronograph, next to eyeglasses and some good beer for size comparison. AUTHOR'S PHOTO.

Baird Time Clock

In the early 1900s, businesses were growing and factories employed hundreds of workers. Time clocks to track workers' hours were needed. The Baird time clocks (Figure 21) were made of iron, weighed 16 ½ pounds, and measured 8 ½" high, 7 ½" deep, and 6 ½" wide. Baird's time stamp was patented on December 25, 1894 (no. US531297A). The clock in Figure 21 is serial number 3567; this high number was most likely meant to impress potential customers. Baird's time clock venture was unsuccessful and very few of these clocks were produced.

Novelty Clocks

Crystal Palace

Figure 22. Crystal Palace clock ad (1893).

This is a glass paperweight mantel clock featured in an 1893 English newspaper ad (Figure 22). Baird used the London address 181 Victoria Street while promoting sales in England. The ad describes the clock as being 3 ½" tall, containing a Seth Thomas movement, and available with or without advertising. This particular clock advertised "Moral - Accidents Will Happen, Insure In The Travelers."

The Monitor

This clock (Figure 23) was featured in an advertisement from *Printers Ink* (November 17, 1897), displaying a combination desk, memo, calendar, and pencil rack. The clock is 7 ½" square. The ad says that Baird can print any advertisement on a clock's dial and label or on the memo pad if the customer purchases a large number. A single clock cost $1.25. Baird's address is listed as 140 Clinton Street in Chicago. A 1907 *Printers Ink* ad lists the company's address as 30 Michigan Street, Chicago.

Figure 23. Monitor clock ad from *Printers Ink* (November 17, 1897).

Conclusion

It has been nearly 50 years since I bought my first Baird advertising clock. Earlier this year I purchased another Baird clock. The excitement is still the same, and the best feeling is when I find a Baird clock that I never knew existed. While writing this article, I found five of these rare clocks. Hopefully more will be located in the future and an addendum will be needed in the *Bulletin*!

Acknowledgment

Many thanks are due to Millie, my wonderful wife of 62 years, who greatly assisted with the preparation of this article.

Notes and References

1. Jerry Maltz, *Baird Advertising Clocks* (self-pub., Jostens, 1998).
2. Jerry Maltz, "Baird Clock Co.: The Clocks and the Companies That Advertised," *NAWCC Bulletin* 50, no. 375 (August 2008): 418–24.
3. See Maltz, *Baird Advertising Clocks* and "Baird Clock Co."
4. Frank Conover, ed., *Centennial Portrait and Biographical Record of the City of Dayton and of Montgomery County, Ohio* (Logansport, IN: A. W. Bowen & Co., 1897), 312–15, www.daytonhistorybooks.com/page/page/1606711.htm.
5. Streissguth Clothing Co. ads were located by Daniel Lee, local historian, Milwaukee Public Library.
6. Maltz, "Baird Clock Co.," 423. The "h" in today's spelling of *Pittsburgh* was left off the newspaper's title and the clock.

About the Author

Jerry Maltz is a US Army veteran and an infantry BAR man. He was formerly the proprietor of a trucking business and then an employee of a Fortune 500 company. Now retired, Jerry shares his passion for clock collecting with his wife, Millie. He is a member of three NAWCC Chapters and a former president of New York Chapter 2. He has attended every NAWCC National Convention since 1983 and is the author of *Baird Advertising Clocks*. In 2018, Jerry became an NAWCC Fellow.

Changing Times

The New Generation of Watch Enthusiasts

BY BRENT LUCKE (NE)

Horology can be, at times, exclusionary—not by the intention of its passionate devotees but as a consequence of it being of little immediate utility and inherently expensive. This is good for luxury brands in a commercial sense, particularly those targeting the market in which inaccessibility is easily conflated with authenticity. Exclusion is not, in and of itself, a deadly sin for something as frankly inconsequential for our tech-focused society as the dedicated timekeeping of wristwatches. Exclusion does, however, present clear risks for the future of the passion, especially to enthusiasts and organizations such as the NAWCC, who need young makers and collectors to keep the pursuit alive.

The NAWCC isn't entirely devoid of young faces and accessible collections. I grew up attending watch shows with my dad on our family vacations. Funny how ideal road trip locations always sit near a Regional, right? During the summer and fall of 2020, like most of us, I found myself with a lot of free time and an excess of boredom. It started with a few YouTube videos about a Shinola I'd been gifted for Christmas in 2017, and down the rabbit hole I went. Nearly three years on, I'm in desperate need of a watch box to organize the accumulation of new and vintage watches taking over my dresser top. Stories of past feats of man over the natural world, the pursuit of new technologies, and the plain old cool factor of watches keep me wanting "just a few more" (Figure 1).

Despite my upbringing and enduring obsession with watches, like many enthusiasts under 30 I still feel a bit out of place in legacy organizations like the NAWCC. Not for lack of kindness, enthusiasm, and general interest in saying hi to a new face, but largely because the primary focus of the organization seems to be the trade shows. Don't get me wrong, they aren't purely business events. Presentations are given, dinners are had, and restoration services are offered by skilled artisans. However, the primary attraction is the mart sales floor. This, I'd argue, is a missed opportunity for the Association as, while nobody hates a good deal on

Figure 1. A little past due for a watch box it seems.
AUTHOR'S PHOTO.

Figure 2. The Seiko Diver (left) and Omega C-Case (right)—vintage or reissue, it's more about the story than the deal.
AUTHOR'S PHOTO.

a piece they've been looking for, trading watches isn't the best draw for the experience-over-stuff mindset of Generation Z.

Hodinkee, despite recent criticisms of its commercialization and staff changes, forged the Millennial and Gen Z watch nerds. Stories, large or small, are core to our interest in watches. My fledgling collection, I feel, reflects this, whether it's my fascination with Gérald Genta's work and iconoclastic approach to watch design or my surprise in learning about the popularity of Seiko divers (Figure 2) sold at Cold War-era exchanges (military-run shops selling goods to GIs).

From a young designer appreciating the perfect balance of her Omega Seamaster to a young adventurer nodding to Jacques Cousteau with his orange DOXA 300, the stories of human trials and achievement are what draw many a young collector to a passion for watches (Figure 3).

The NAWCC and similar organizations would be well served to adapt to this desire for storytelling. Whether it's through greater leverage of the Museum as a source of social media content, greater collaboration with brands or large collectors to provide in-depth displays of horological stories at Regional events, or the creation of more written materials by the Association, the younger generation will be captured more by the sharing of knowledge and experiences than opportunities to build up a private collection of their own. Frankly, that area is all but dominated by online retailers and trading platforms. A larger digital footprint (the foundations of which seem to be under development) and a larger emphasis on education both online and in person at events would set us down a better path toward recruiting and engaging the interest of a younger generation.

To help inspire and encourage the interests of budding Gen Z collectors, it will also take the efforts of those who are already passionate, sharing that enthusiasm with others while appreciating different perspectives. This article, in addition to being a reflection, is also the start of work I hope to write on this goal of building a greater narrative of Gen Z's journey as collectors. While many aspects of the passion will remain the same for all generations, the trends, focus, and entry points into the hobby are always changing.

Figure 3. Sometimes it's just too hard to pick only one: (top left) vintage Omega Ladymatic; (bottom left) Omega Ladies Seamaster; (top right) quartz Seiko Chrono; (bottom right) faux-gold quartz Seiko. AUTHOR'S PHOTO.

About the Author

Recently graduated from the University of Nebraska-Lincoln's Business School, Brent Lucke works as a marketing coordinator for a real estate company and as the community manager of a coworking space in downtown Lincoln. Watches have been a big part of his life, having grown up in a home with a collection of antique pocket watches and vintage advertisements. Many of Brent's childhood summers included trips to NAWCC Conventions across the country and time spent watching his dad browse eBay for deals. These experiences instilled a deep appreciation for the watch industry's history and modern developments.

Phase 2 of the Quelch Lantern Clock Restoration: A Perilous Journey

The Reinstatement of a Balance Verge in an Early 17th-Century Oxford Lantern Clock

BY GEOFF COX (UK) AND STEPHEN BARASI (UK)

This article complements an earlier one describing both the history and movement of an early 17th-century lantern clock made by Richard Quelch of Oxford (Figure 1).[1] This account covers the *reconversion*, a term used by White,[2] of the long pendulum clock to its original balance wheel (balance verge) mechanism.

This brief introduction will consider the development of balance wheel clocks in the early years of the 17th century up to the point when the first pendulum clocks began to replace them.

Figure 1A. The finished Quelch clock awaiting the second phase: the crown wheel balance reinstatement. PHOTO BY GEOFF COX.

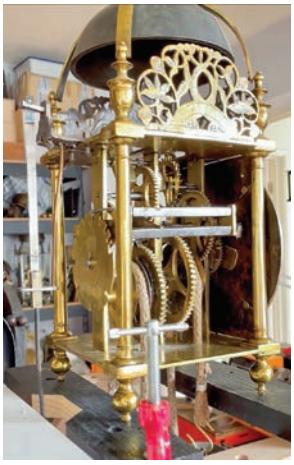


Figure 1B. A view of the hammer spring and counter showing a chamfer on the latter, typical of second-period work. Note that the original stepped potence remains, supporting the escape wheel originally to clear the balance arbor. PHOTO BY GEOFF COX.

First-Period Lantern Clocks (1580–1640)[3]

A Very Close Relative of the Gothic Clock or a Distinct English Variant?

There has been considerable debate among horologists regarding the origins of the English (London-made) lantern clocks. Robey[4] has described the development of Continental Gothic lantern clocks over a period of at least a century before London-made lantern clock production started. Both German and Flemish clocks can be identified with clear stylistic and mechanical differences between the two forms. However, both types were made largely from steel parts with very elaborate and ornate designs and typically (among other characteristics) the balance wheel was suspended by a cord.[5]

Figure 1C. The top plate from above, including a number of unfilled holes originally used to carry the balance wheel mechanism, possible fly cover, and the two rear side holes for top hinge pins before the rear pillars. PHOTO BY GEOFF COX.

Figure 1D. Set of modern two-handed gearing parts removed from the updated clock, replaced in phase 1 of this project. PHOTO BY GEOFF COX.

Following the religious persecution of Dutch Huguenots by the Spanish, many arrived in London in the last decades of the 16th century. Some settled in the Blackfriars area of London just north of the River Thames.[6] Their arrival coincided with waves of the bubonic plague, mainly between 1563 and 1603. Records reveal that 670 members of the Dutch community in London died from the plague, including the Dutch clockmakers John Vallin and Francis Nowe.[7] Both these makers had produced clocks dated 1598 and 1588, respectively, although in very small numbers.

Weight-driven mechanical clocks had been made in England since the 13th century mostly for cathedrals, monasteries, and the ancient universities. A clock made for St. Albans Abbey with an elaborate astronomical movement had an early form of verge escapement with a foliot controller (a swinging arm that was a precursor of the balance wheel[8]). In contrast to these church-associated clocks, the only ones found in domestic settings were those in royal households in the early 16th century.[9]

Thus early 17th-century London clockmakers were likely to have been influenced by the recently introduced Continental lantern clock tradition as well as long-established English clockmaking skills. Until about 30 years ago, many horologists suggested that the London form of the lantern clock was a direct development from Gothic clocks, thereby challenging the idea of the development of a distinct English form. However, White argued very strongly that "the old theory that only London weight driven clocks of the late Elizabethan and early Jacobean period were made to a bastard Gothic or 'transitional' design can be rejected out of hand."[10]

It is now accepted that London makers such as Harvey, Stevens, and Bowyer drew on both Continental sources and traditional English turret clockmaking to develop a clearly distinct lantern clock form. This London style of lantern clock differed from the Continental form in that most of the components were brass and the balance wheel was suspended from a top balance cock. These and many other differences relating to construction details have been extensively noted by Robey.[11] The less ornate style of London-made lantern clocks compared to the Gothic form may reflect the Renaissance classical style becoming established in England. These influences are also found in both English furniture and architecture of this period.[12]

Balance wheels were fitted to all English lantern clocks until the introduction of the short pendulum in 1657. Probably one of the first clocks to be fitted with a crown wheel pendulum was one made by Peter Closon circa 1660, an illustration of which is shown in White's seminal work.[13]

The pendulum (initially a short form then a longer version with anchor escapements) was considerably more accurate and often ran for a full day. However, balance wheel clocks continued to be made as late as 1696.[14] This is partly due to them being cheaper to make than the pendulum form and possibly the natural conservativeness of some makers. It was also the case that makers, even in the very early years of London clockmaking, would buy large quantities of clock parts from suppliers and expect to use up the stock before embarking on newer designs.

How Many Balance Wheel Lantern Clocks Are Now Considered Original?

There has been a great deal of confusion and controversy relating to the originality of existing balance clocks. While some authors claim that there are unlikely to be any such truly original clocks,[15] others have suggested there are a limited number that may be original. Robey[16] has reviewed the evidence for the existence of original balance wheel clocks in detail and has identified 10 criteria to be met before a clock can be regarded as original. Applying this comprehensive list, he concludes that seven clocks are largely original and a further seven are original but have had significant parts replaced.

Interestingly, Loomes[17] has described a clock by John Quelch (the son of Richard Quelch) that, at auction, appeared in a very grubby and completely unrestored state. Although incomplete, the clock has a balance wheel that Loomes concludes is original, suggesting that Robey's list of original balance wheel clocks may grow over time.

Whether clocks originally fitted with a balance wheel and converted to pendulum escapement should be returned to a balance wheel is open to debate. It has been performed less often in recent years; however, the unusual design and origin of the present lantern clock supported the decision to reconvert to a balance wheel.

The following account records the process of the reconversion by Geoff and may represent one of the very few detailed descriptions of a balance verge reinstatement, including many technical aspects of the problems encountered and overcome.

The Castings and Making the Parts

The parts required to reinstate a balance verge (Figure 2) comprise:

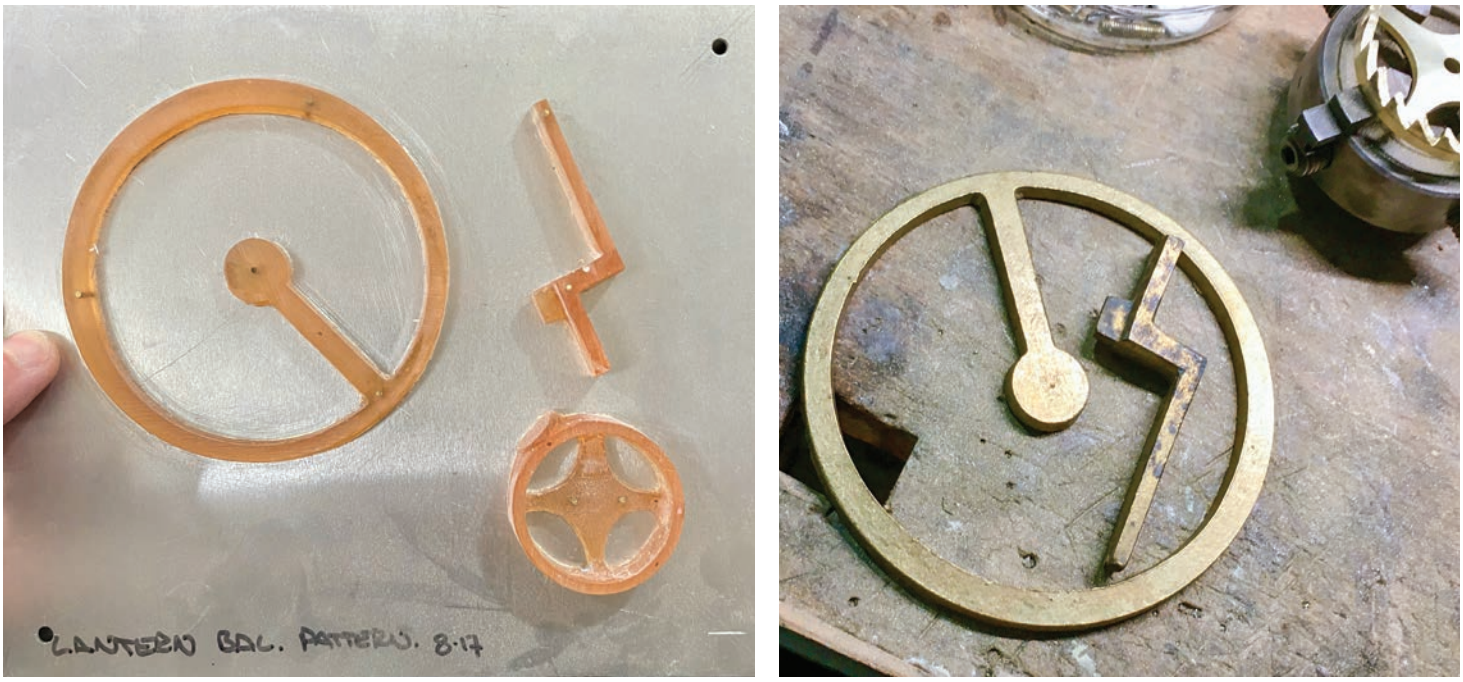


Figure 2. (left) Resin pattern detail and (right) the casting. PHOTOS BY GEOFF COX.

- Balance casting (machined, filed, and fitted) in yellow brass
- Crown-wheel casting (machined, filed, and fitted) in yellow brass
- Top plate mounting upper balance arbor verge potence casting (machined, filed, and fitted) in yellow brass
- Lower potence block (machined, filed, and fitted) in yellow brass
- Bespoke single piece steel balance verge arbor (with the two impulse pallets)

In rare cases, past pendulum conversions to early lantern clocks have allowed the original crown-wheel potence to be used (through which the balance verge arbor runs). Such is the case with this Richard Quelch clock. If this component does not remain, a suitable casting or machined component is required.

The castings can either be sand cast in yellow brass from patterns or cast models in wax for finer resolution investment castings. If the restorer is lucky, he can cast what is required from scrapped period clockmaking brass compo material.

Machining, Filing, and Fabrication

The crown wheel always has an odd number of teeth to allow the escapement of movement. It is consequently not typically possible to use a dividing plate to equally locate the teeth. It was necessary to plot a line of paper tape exactly the length of the circumference of the machined crown wheel blank and carefully divided into 19 equidistant lines at right angles to the length horizontally. The tape is carefully stuck around the outer diameter of the blank, and the marked lines used to locate the vertical slots on a small mill using a rotary table. These become the impulse pallets of the crown wheel (each at a ~15 degree slant to allow for less recoil). The radii were handwritten, filed, and cut (Figure 3).

The Going Train of a Balance Verge: Current Constraints

Geoff has now had the experience of successfully reinstating six 17th-century lantern clocks, all by noted makers. Each case is an unknown due to the needs and styles of that example. Each is a different engineering adventure in its own right, beyond getting the escapement correct. This lantern clock has presented more challenges and limitations than most.

It's well documented that balance verge lantern clocks have a reputation for very poor timekeeping. Despite having conventional wheel-and-pinion tooth counts from known examples (including counts published in the 18th century as well as modern essays), Geoff has personal experience with varying performance from those he's reinstated together with those that have crossed his bench.

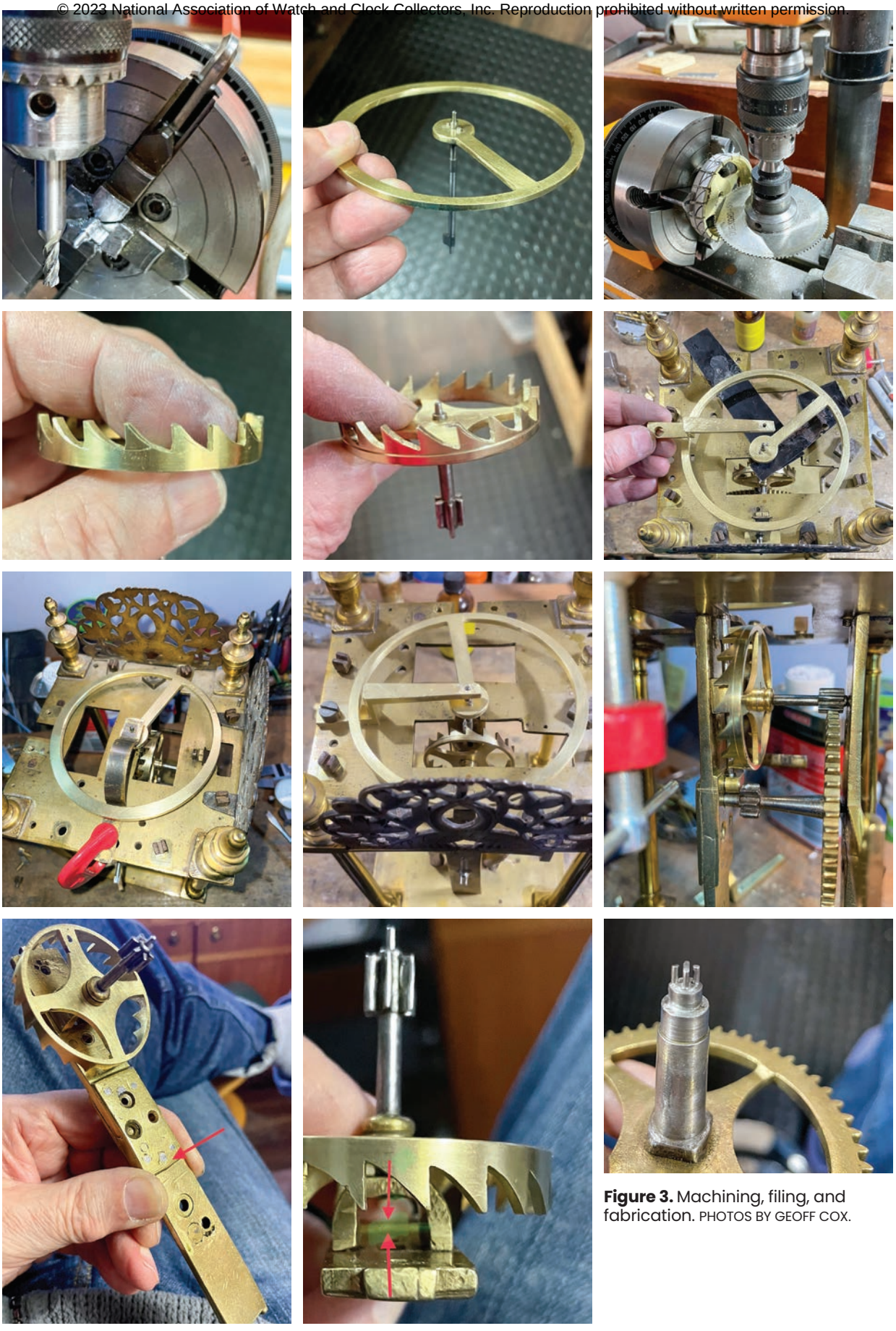


Figure 3. Machining, filing, and fabrication. PHOTOS BY GEOFF COX.

Timekeeping accuracy ranges from minutes to hours per day. Brian Loomes has more than likely had the opportunity to study hundreds or more 17th-century English lantern clocks, probably more than anyone else. He has written that the Edward Norris 1660 lantern clock that Geoff had reinstated for him "performed better than 1 minute per day in a constant temperature [environment]"[18] after optimizing its timing with small drive weight adjustments. Of course, the error is subject to considerable change with changes in temperature!

In *Lantern Clocks and Their Makers* by Loomes, John Robey provides information on the Samuel Stretch clock (Figure 4):

> The crownwheel is pivoted between the front bar and a bridge riveted to the centre bar to clear the vertical pallet arbor. The lower pallet pivot sits in a block riveted to the centre bar. Note the relatively large gap (not present on pendulum clocks) between the going greatwheel and the centre bar. This is usually necessary to give space for the lower support block, but here the pallet arbor is shorter than usual, the block higher and the gap not really necessary.[19]

The following are usual going train specs (also citing the Samuel Stretch example with an original balance having a crown wheel with 21 teeth):

> Crown wheel: 19 teeth usual but 21 typical/ pinion of 6
>
> Second wheel: 54/7
>
> Great wheel: 56
>
> Pinion of report: 4
>
> Hour wheel: 48

The Richard Quelch lantern clock has the same original train and is fitted with a replacement 19-tooth crown wheel, but it needed the hour wheel count changed from 48 to 64. It's interesting to note that the original Samuel Stretch balance train with a short balance arbor and block is very similar to the resulting layout of the current Richard Quelch lantern clock!

Though crown wheels with 19 or 21 teeth seem to be preferred, examples with up to 25 are known. The balance verge beats at 59-60 per minute, typical of the examples.

Crown wheel balance verge trains typically need less mass to drive them compared to an anchor train, as timing the clock is achieved by adding or subtracting small amounts of drive weight. There is more friction on a verge balance than on an anchor train. The operational shortcoming of an anchor train due to wear can be overcome by adding more weight within reason, and such was the case with this clock. Adding weight has its limits, as the timing depends on running with adequate drive weight to overcome the friction of the train and run slowly enough to accurately reflect the time (with a light enough drive weight). It may be possible to slow it a minute or two an hour by adding two small timing weights to the balance. This was not uncommon, as shown in an example from Robey's article on original balances.[20]

The center post from this approximately 400-year-old clock has seen better days (Figure 5). At some stage it was broken in two and repaired/conserved with overlapping splints. This raised splint interferes

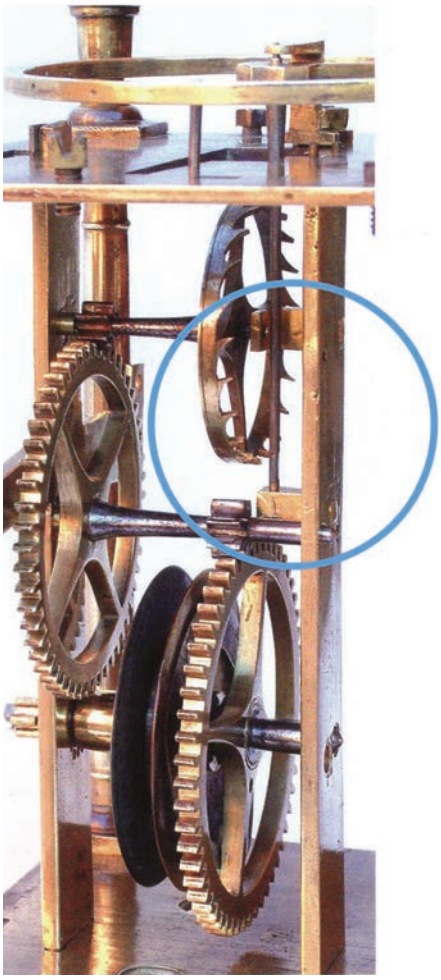


Figure 4. Samuel Stretch original short block potence that is very similar to the Quelch. PHOTO BY JOHN ROBEY AND USED WITH PERMISSION.

Figure 5. Center post. PHOTO BY GEOFF COX.

with the spacing where the lower balance verge arbor block needs to go. Due to the nature of fitting the anchor escape wheel and anchor, it was not necessary to line up and locate the crown wheel pinion in the center of the center post potence, which the balance arbor passes through and needs to line up with. There is very significant pinion leaf wear in this clock (Figure 6), suggesting that it may have run over the centuries with too heavy a drive weight. It's clearly evident that this clock has run for centuries with a variety of escapements.

When the clock was converted to an anchor train for improved timekeeping in the late 18th century (known by style of the work), the clock had the escape wheel arbor lined up with the second wheel arbor, which is usually offset to have space for the length of balance verge arbor and to access the lower block. This means a wheel arbor may need to be moved or offset, otherwise the balance arbor bangs into it, obstructed by the second wheel arbor pinion. It's a very narrow margin; it was just possible to gain enough clearance by cutting back the teeth less than 1 mm. It had to be done twice, gaining roughly 1.5 mm. In each case the sharp teeth were turned down and repointed by hand. Just enough clearance was gained while allowing suitable verge pallet contact location impulse and then clearance to pass. A tidier job on the crown wheel resulted and freed up the required clearance space.

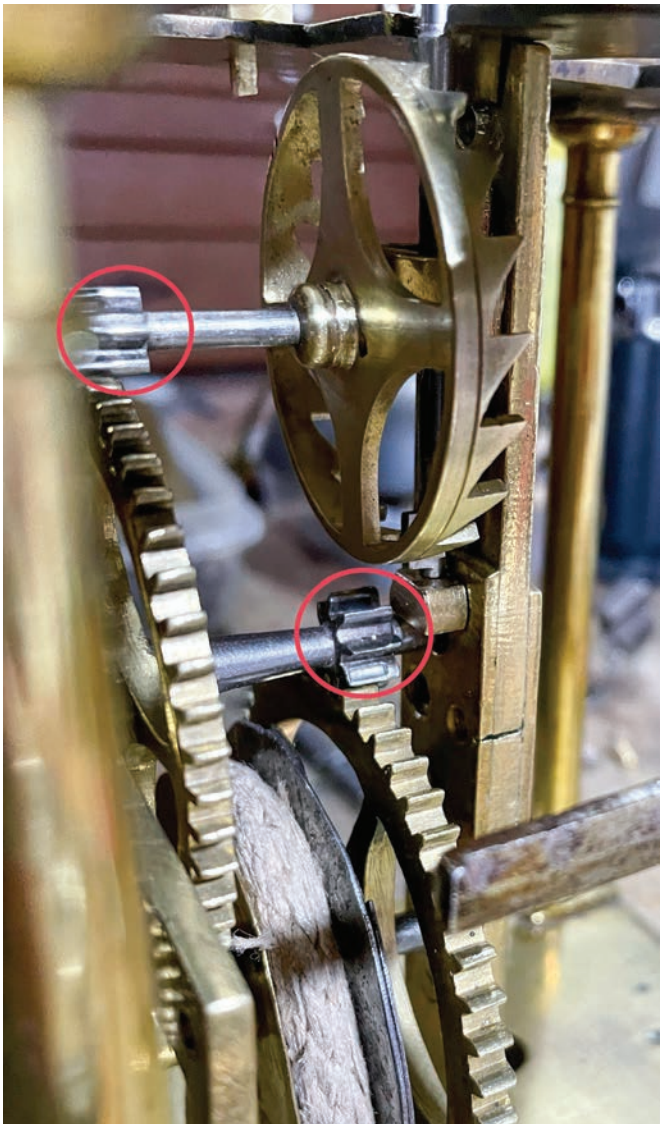


Figure 6. Pinion wear detail. PHOTO BY GEOFF COX.

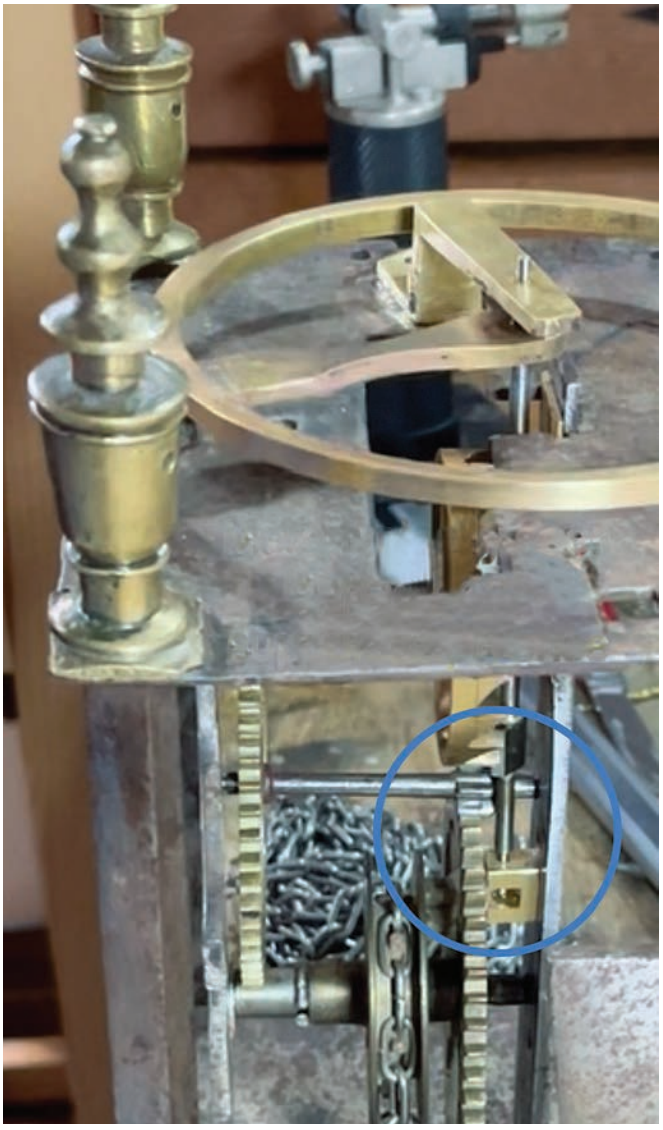


Figure 7. A typical longer verge arbor lower potence block with bottom supported pivot. PHOTO BY GEOFF COX.

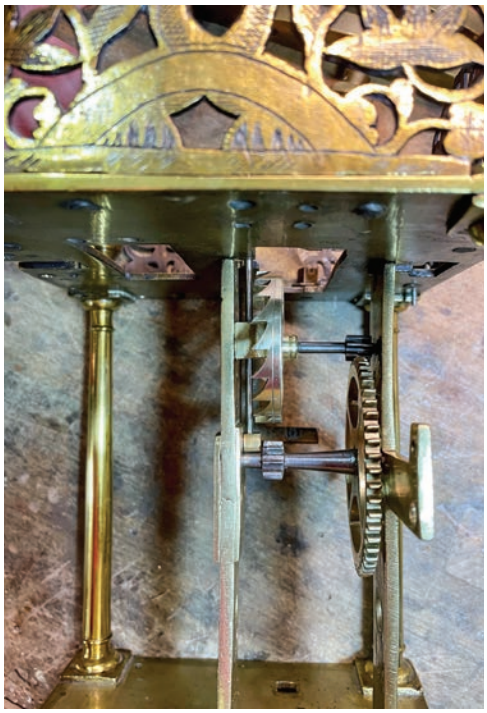
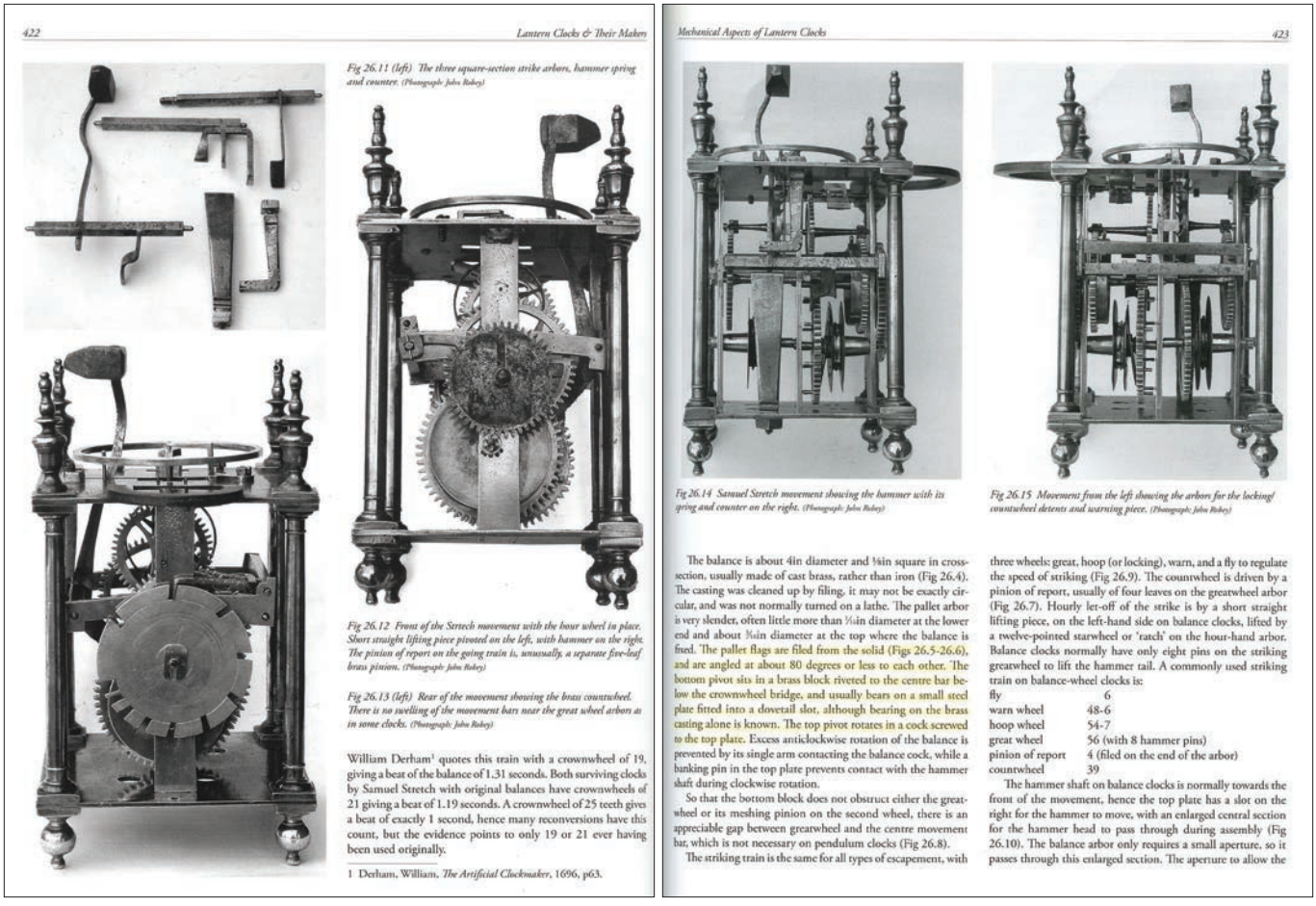


Figure 8. The short bottom verge arbor potence. PHOTO BY GEOFF COX.

Geoff didn't know if a short bottom verge arbor potence would suit. Typically, they are quite long and therefore potentially more stable (Figure 7). In this case it's not possible without moving a wheel or two over. A short version was made and just barely fit (Figure 8), but without the benefit of a bottom pivot support (less friction). Though a short distance from the bottom pallet to the bottom pivot, the bottom potence block managed to clear the second wheel arbor pinion in its current position.

Making It Work: The Adventure Continues

With the replacement balance verge fitted and adjusted properly, the clock runs happily but 1/3 too fast! The single hand indicates 1 hour in 40 minutes of running—bad news. Where then did the gearing count go wrong? The clock retained its original gearing ratio. The pinion and wheel tooth count are 100% typical of a balance lantern layout according to several observed examples and Derham's *The Artificial Clockmaker*[21] (Figure 9):



422 Lantern Clocks & Their Makers

Fig 26.11 (left) The three square-section strike arbors, hammer spring and counter. (Photograph: John Robey)

Fig 26.12 Front of the Stretch movement with the hour wheel in place. Short straight lifting piece pivoted on the left, with hammer on the right. The pinion of report on the going train is, unusually, a separate five-leaf brass pinion. (Photograph: John Robey)

Fig 26.13 (left) Rear of the movement showing the brass countwheel. There is no swelling of the movement bars near the great wheel arbors as in some clocks. (Photograph: John Robey)

William Derham[1] quotes this train with a crownwheel of 19, giving a beat of the balance of 1.31 seconds. Both surviving clocks by Samuel Stretch with original balances have crownwheels of 21 giving a beat of 1.19 seconds. A crownwheel of 25 teeth gives a beat of exactly 1 second, hence many reconversions have this count, but the evidence points to only 19 or 21 ever having been used originally.

1 Derham, William, *The Artificial Clockmaker*, 1696, p63.

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Fig 26.14 Samuel Stretch movement showing the hammer with its spring and counter on the right. (Photograph: John Robey)

Fig 26.15 Movement from the left showing the arbors for the locking/countwheel detents and warning piece. (Photograph: John Robey)

The balance is about 4in diameter and ¼in square in cross-section, usually made of cast brass, rather than iron (Fig 26.4). The casting was cleaned up by filing, it may not be exactly circular, and was not normally turned on a lathe. The pallet arbor is very slender, often little more than ⅛in diameter at the lower end and about ⅜in diameter at the top where the balance is fixed. The pallet flags are filed from the solid (Figs 26.5-26.6), and are angled at about 80 degrees or less to each other. The bottom pivot sits in a brass block riveted to the centre bar below the crownwheel bridge, and usually bears on a small steel plate fitted into a dovetail slot, although bearing on the brass casting alone is known. The top pivot rotates in a cock screwed to the top plate. Excess anticlockwise rotation of the balance is prevented by its single arm contacting the balance cock, while a banking pin in the top plate prevents contact with the hammer shaft during clockwise rotation.

So that the bottom block does not obstruct either the great-wheel or its meshing pinion on the second wheel, there is an appreciable gap between greatwheel and the centre movement bar, which is not necessary on pendulum clocks (Fig 26.8).

The striking train is the same for all types of escapement, with three wheels: great, hoop (or locking), warn, and a fly to regulate the speed of striking (Fig 26.9). The countwheel is driven by a pinion of report, usually of four leaves on the greatwheel arbor (Fig 26.7). Hourly let-off of the strike is by a short straight lifting piece, on the left-hand side on balance clocks, lifted by a twelve-pointed starwheel or 'ratch' on the hour-hand arbor. Balance clocks normally have only eight pins on the striking greatwheel to lift the hammer tail. A commonly used striking train on balance-wheel clocks is:

fly	6
warn wheel	48-6
hoop wheel	54-7
great wheel	56 (with 8 hammer pins)
pinion of report	4 (filed on the end of the arbor)
countwheel	39

The hammer shaft on balance clocks is normally towards the front of the movement, hence the top plate has a slot on the right for the hammer to move, with an enlarged central section for the hammer head to pass through during assembly (Fig 26.10). The balance arbor only requires a small aperture, so it passes through this enlarged section. The aperture to allow the

Figure 9. The pinion and wheel tooth count of the Quelch clock are 100% typical of a balance lantern layout according to examples and Derham's *The Artificial Clockmaker.* PHOTOS OF THE SAMUEL STRETCH CLOCK BY JOHN ROBEY, PAGE IMAGES USED WITH PERMISSION OF MAYFIELD BOOKS.

> William Derham quotes this train with a crownwheel of 19, giving a beat of the balance of 1.31 seconds. Both surviving clocks by Samuel Stretch with original balances have crownwheels of 21 giving a beat of 1.19 seconds. A crownwheel of 25 teeth gives a beat of exactly 1 second, hence many reconversions have this count, but the evidence points to only 19 or 21 ever having been used originally.[22]

With the exception of the new crown wheel, the time train and the gearing/pinions are original and match those used in the period, including the reuse of the original crown wheel arbor when converted to anchor. The correct gearing existed, giving Geoff a green light for the balance reinstatement without the need to calculate any new gearing. It was down to having chosen to use the typical 19-tooth crown wheel count *and* its smaller-diameter crown wheel needing to fit the limited space from the inconveniently relocated second wheel obstruction. Assuming that a 19-tooth was ideal would prove to be wrong.

The options were to either fit 33% more teeth in either the hour wheel/pinion of report or for Geoff to cut a 25- or 27-tooth crown wheel (which would be bigger and require the train complication to move to the second wheel). Geoff didn't think it would be possible to cram in an unconventional hour wheel of 64 much smaller teeth driven by a "correct" 4-tooth pinion of report.

The least destructive, most effective solution was to make a second replacement hour wheel, increasing the tooth count 1/3 to 64 from the typical 48 (Figure 10). This would be driven by a new pinion of report reduced in size to accommodate smaller teeth for the largest diameter wheel. A plastic model was machined, which confirmed that the fit and functionality were possible within the space limitations (as the hour wheel was replaced during the initial anchor pendulum clock restoration). The higher-count hour wheel solution keeps the original train/pinion arbors and is not readily visible. It was hoped the 64 smaller teeth could be scaled within the hour wheel diameter to be driven from the smallest possible scaled-down 4-tooth pinion of report fitted to the great wheel arbor. If this was not feasible, a new pinion with additional leaves would need to be fitted to the original tapered arbor (or a new pinion arbor made!) and the corresponding wheel/arbor moved over. This would result in more complication, modification, and less conservation.

With fit and function now confirmed possible, a new hour-wheel and suitable pinion of report was machined and cut (Figures 11 and 12). As the nearest modern wheel cutter was chosen, it was necessary to carefully hand-file the hour wheel tooth width, profile, and length. Since the hour wheel hand shaft position and great wheel arbor location were fixed

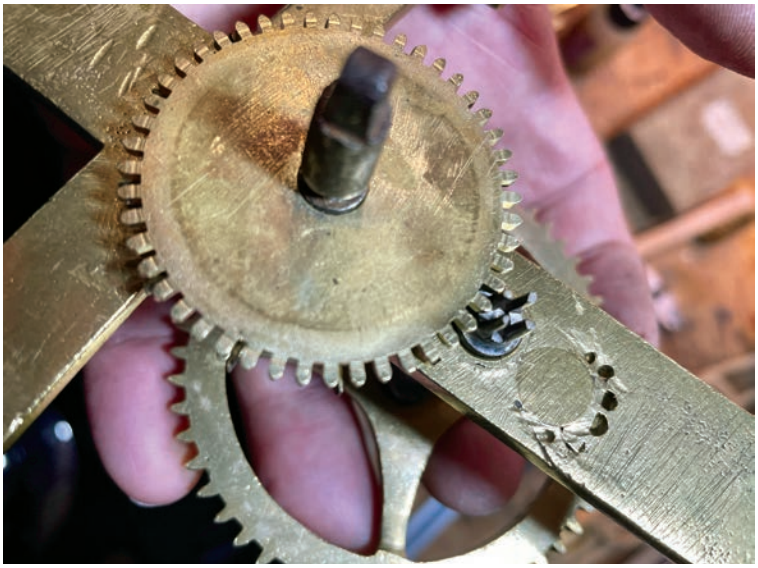

Figure 10. Space constraints of the 48-tooth hour wheel. PHOTO BY GEOFF COX.

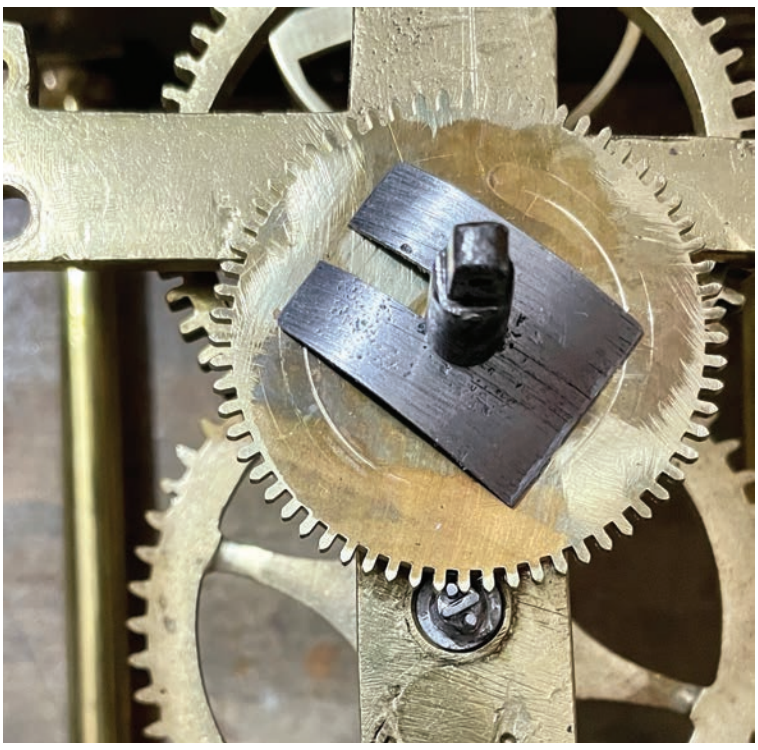

Figure 11. New 64-tooth hour wheel. PHOTO BY GEOFF COX.

distances, component diameters were very critical, with no margin for error. Many relatively short work sessions proved a success, and is usually the safest way forward on such adventures. The conversion work is sympathetic, nice and tidy, presents well, and it mechanically operates with optimal swing.

Months have passed and more than 80 work hours later, the reinstated escapement has been optimized to the extent possible in its current situation, including retaining worn but original pinion arbors. The bottom balance arbor has to be supported on the pivot shoulder without the benefit of less friction contact from the pivot bottom than is typical (via the center point) and so it is against a hardened steel support face. This, together with the accumulation of alignment errors from almost 400 years of repairs, replacements, and conversions, resulted in reliable running without incident, only ~45 minutes a day fast using a 2,160 g drive weight (143 g counterweight = 2,017 g net). It may be possible to remove (or add to the counterweight) a few grams more via flat lead shims, supplied to the owner to experimentally apply. A 2,050 g drive weight reduction (80 g counterweight = 1,970 g net) to slow down timing stops the clock on occasion from the inability to overcome friction, pinion wear, etc.

Figure 12. The 64-tooth hour wheel cutting. PHOTO BY GEOFF COX.

The following steps for future consideration to improve performance are listed in order of priority:

1. It may be possible to slow it a minute or two an hour by adding two small timing weights to the balance (as noted by Robey[23]).
2. Somehow fit a steel bottom balance arbor pinion support despite space limitations.
3. Replace the two pinion arbors. Unfortunately, there's not enough remaining material on the original pinion leaves (50% loss) to redress the worn mating surfaces and maintain tooth geometry and required thickness.
4. Replace one of the pinion arbors with extra leaves (to be determined), allowing the gearing to time properly. This would necessitate moving the second wheel/pinion and allowing additional space for a conventional bottom cock, supporting the arbor pinion from the bottom.

The rope length/hanging height of 6" runs the clock for ~4 hours. Typically, balance verge lantern clocks have independent drive ropes/weights and run ~6 hours per winding. The run time can be doubled by fitting a longer rope on a single pulley, with the end anchored to the bottom plate to the side or the wall bracket running twice the weight. Very often there are telltale holes on the bottom of such lantern clocks, indicating this had been done.

Videos showing the clock in operation are available at https://earlyclocks.uk/rquelch-balance-recon. Figure 13 features photos of the completed Quelch clock.

Notes and References

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3. White, *English Lantern Clocks*, 42.
4. J. A. Robey, "The Origin of the English Lantern Clock, Part 1: Comparison with European Gothic clocks," *Antiquarian Horology* 37, no. 4 (December 2016): 511–21.
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6. White, *English Lantern Clocks*, 46.
7. B. Loomes, *Lantern Clocks and Their Makers* (Mayfield, England: Mayfield Books, 2008), 7; see also White, *English Lantern Clocks*, 46.
8. P. G. Dawson, C. B. Drover, and D. W. Parkes, *Early English Clocks* (Suffolk, England: Suffolk Antique Collectors Club, 1982), 15.
9. Dawson et al., *Early English Clocks*, 14.
10. White, *English Lantern Clocks*, 55.
11. Robey, "The Origin of the English Lantern Clock, Part 1."
12. White, *English Lantern Clocks*, 55.
13. White, *English Lantern Clocks*, 175.
14. Loomes, *Lantern Clocks and Their Makers,* 126.
15. White, *English Lantern Clocks*, 105.
16. J. A. Robey, "English Lantern Clocks with an Original Balance," *Antiquarian Horology* 41, no. 2 (June 2020): 177–96.
17. B. Loomes, "John Quelch of Oxford," *Clocks Magazine* (October 2010): 11–14.
18. Personal communication between Geoff Cox and Brian Loomes, 2018.
19. Loomes, *Lantern Clocks and Their Makers*, 420–21.
20. Robey, "English Lantern Clocks with an Original Balance."
21. W. Derham, *The Artificial Clockmaker: A Treatise of Watch, and Clock-Work: Wherein the Art of Calculating Numbers for Most Sorts of Movements Is Explained to the Capacity of the Unlearned* (1696). This is the most famous of the early English-language books on horology.
22. Loomes, *Lantern Clocks and Their Makers*, 422.
23. Robey, in Loomes, *Lantern Clocks and Their Makers*.

About the Authors

Stephen Barasi trained as a physiologist in London then for a higher degree in neuroscience in Edinburgh. He worked as an academic researching in the field of sensory neuroscience and teaching medical and science students. After retirement he became interested initially in 18th-century long case clocks then in English lantern clocks. He is particularly interested in linking early lantern clocks to the history of early and mid-17th-century London.

Geoff Cox has been interested and involved in early clocks since he was a student roaming museum collections and NAWCC events during summer holidays. Completing an education at Michigan State University, the work travel that followed allowed the opportunity to network with important collectors such as Norman Langmaid and others who were enthusiastic in sharing their collections and vast experience with early English clocks. After retiring from a commercial scientific career spanning the US and UK, he shares decades of restoration experience and knowledge with others though Earlyclocks.uk.

Figure 13. The finished Quelch clock. PHOTOS BY GEOFF COX.

The Atlantic Clock Works of Birmingham, England, Revealed

Part 4: "Tempus Raptor" Movements

BY PETER GOSNELL (UK)

As will be shown, the first "Tempus Raptor" ("T.R.") movements directly follow on from the last "Square Nut" striking 6-spoke escape wheel ("S.N.s.6") movements (previously investigated at the end of Part 3[1]). Improvements found on "T.R." movements suggest their production could have commenced circa 1878 when (as stated in key point 20 in Part 1[2]) "the factory had been re-organised with skilled practical men, new machinery and a one-third price cut." The "Tempus Raptor" (approximate translation: "time is a thief") logo, which gives these movements their name, was now punched on the middle of the front plate (Figure 1A) and consists of an escape wheel within which was the legend "TEMPUS RAPTOR" with a sandglass in the middle (Figure 1B). Flanking this motif on the left side is "TRADE" and on the right side, "MARK". Extensive searches of the Trademark Index at the British Library found that this so-called trademark was never registered in Great Britain, suggesting it was used merely as a form of embellishment, probably with the intention to impress potential customers who happened to see it.

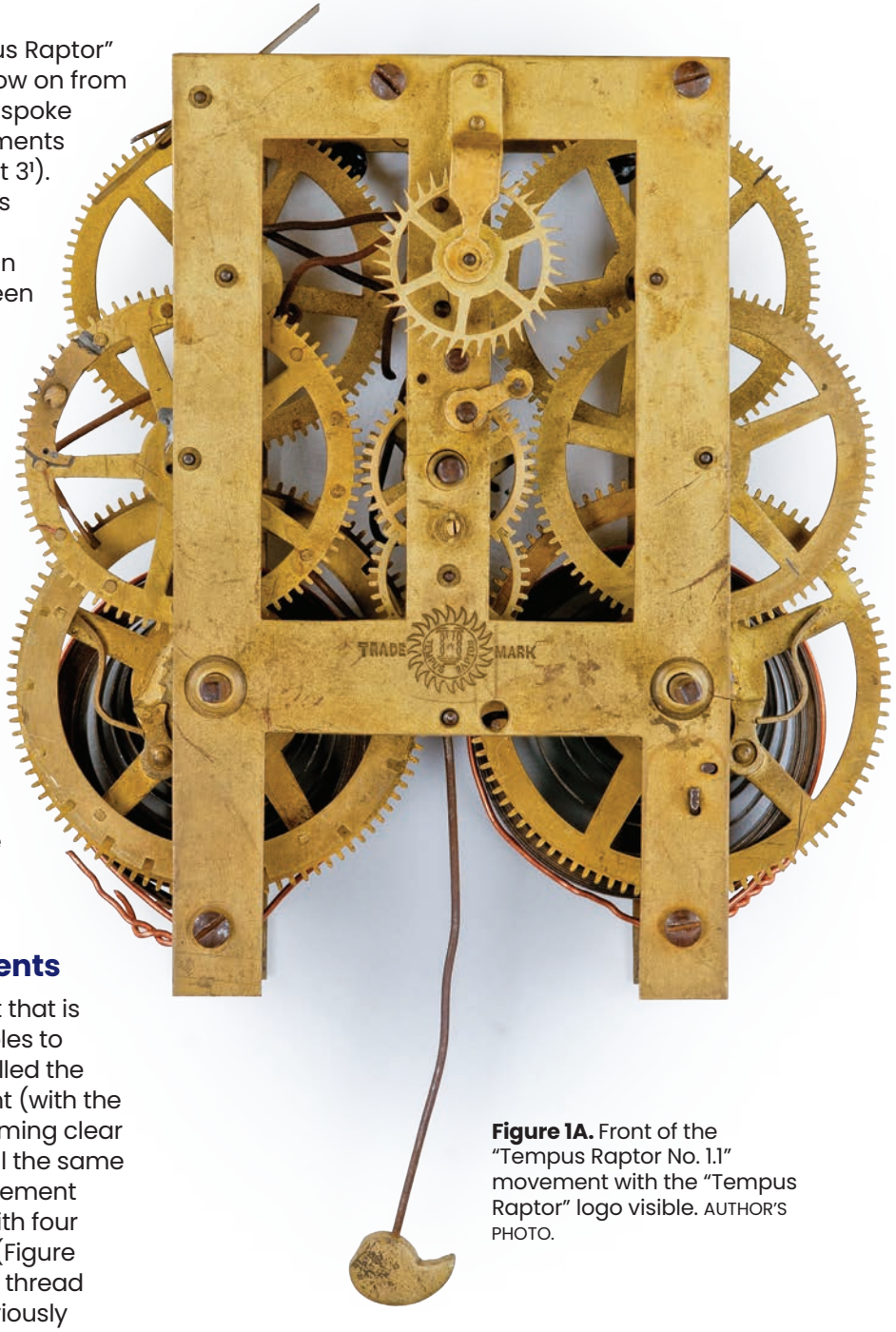

Figure 1A. Front of the "Tempus Raptor No. 1.1" movement with the "Tempus Raptor" logo visible. AUTHOR'S PHOTO.

"Tempus Raptor No. 1.1" Movements

Figures 1A and 1C show a loose movement that is now considered one of the earliest examples to use the "Tempus Raptor" logo; it will be called the "Tempus Raptor No. 1.1" ("T.R.1.1") movement (with the full significance of the "1.1" used here becoming clear later). This early "T.R.1.1" movement used all the same components as the previous "S.N.s.6" movement except the front plate was now secured with four more robust blued steel machine screws (Figure 1A). These screws appear to use the same thread specification as "Small Square Nuts" (previously

Figure 1B. Detail of the "Tempus Raptor" logo from the movement in Figure 1A. AUTHOR'S PHOTO.

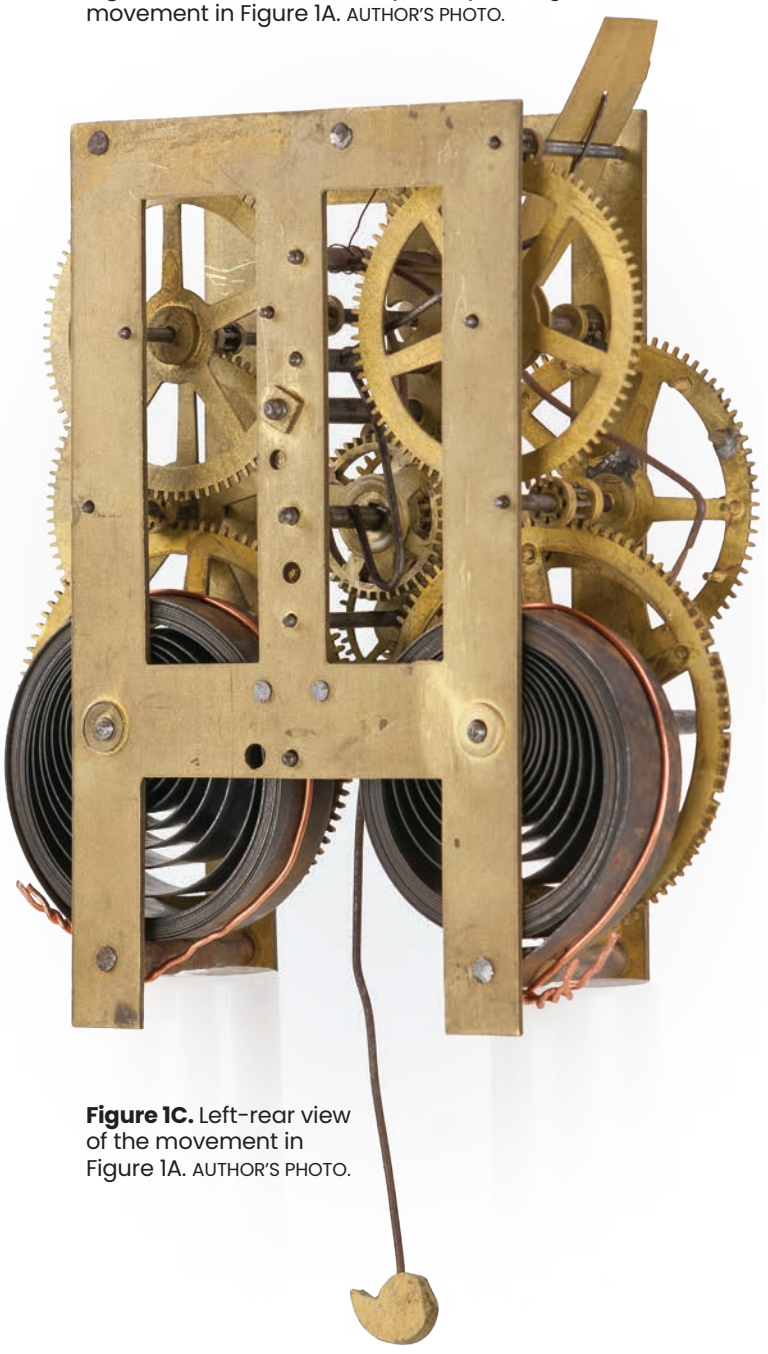

Figure 1C. Left-rear view of the movement in Figure 1A. AUTHOR'S PHOTO.

detailed in Part 3[3]), while the middle rear-facing pillar (Figure 1C), which would normally be hidden, still used a "Large Square Nut" (again detailed in Part 3[4]), perhaps initially to finish up old stock left over from earlier "Square Nut" production. This "T.R.1.1" example again has a small "8" punched on the bottom front left plate leg and has a 38-tooth escape wheel punched with another "8" and would require a 10" pendulum. Three additional views of this same movement were presented in a past *Bulletin* issue.[5] Only one other "T.R.1.1" movement has been seen but only from less-than-adequate photographs.

"Tempus Raptor No. 1.2" Movements

Next come what have been called "Tempus Raptor No. 1.2" ("T.R.1.2") movements, with Figures 2A and 2B showing two views of one example; another six images of this same movement appear in a previous *Bulletin*.[6] Notice from Figure 2A how this "T.R.1.2" movement now has new unidirectional great wheel clicks and conventional wire return springs instead of the old Sperry & Bryant-styled arrangement that from observations could have suffered from a moderately high failure rate. This "T.R.1.2" example again still uses four blued steel machine screws to secure the front plate (Figure 2A), a "Large Square Nut" to fix its middle rear-facing pillar (Figure 2B) and has a new mark at the very foot of the front left plate leg in the form of a small bullet-shaped indentation (Figure 2C). This movement has a 38-tooth escape wheel punched with an "8" and a 10" pendulum.

So far five wall cases with "T.R.1.2" movements have been found. Three "T.R.1.2" movements were all located within 12" drop dial cases with rosewood veneer and pewter inlay; this is the exact same case design previously seen with a "Square Nut" striking, 4-spoke escape wheel ("S.N.s.4") movement in Part 3.[7] Figure 2D shows one example with the dial removed and trunk door propped open to show the "T.R.1.2" movement (the same movement presented in Figures 2A–2C). Figure 2D also shows the "Superior No. 3" ("S.3") label that has been found only once before, again with the previous "S.N.s.6" movement model, presented in Part 3.[8] Different images of the same case and label have been published before in the *Bulletin*.[9] The case in Figure 2D has Significant Details A, B, and C as previously defined in Part 3:

A. A nailed-in, bent wire hanger is used instead of the usual hanging plate.

B. If the case has a wooden dial surround, then it is fixed permanently to the case with screws rather than pegs.

C. If the case design permits the use of a visible label through a full-width trunk door, then this label will have a pseudo-Royal Coat of Arms of the United Kingdom at the top and the word "Superior" below the coat of arms image.[10]

Two further "T.R.1.2" movements were found within "PRIZE-MEDAL REGULATOR" ("P-M.R.") cases. Notice that both these cases with "Superior" labels, seen in Figures 3A–3B and Figures 4A–4C, now have an upgraded molded circular edge on their dial surround and lower trunk door, whereas the previous two "P-M.R." examples shown in Part 3 just had plain chamfered edges.[11] The first "P-M.R." case example, seen in Figures 3A and 3B, has the same "Superior No. 2" ("S.2") label that has been illustrated twice before in Part 3.[12] Notice once more how the lower edge of the label has been designed to fit closely to the curve of the case (Figure 3B). The second "P-M.R." case example (Figures 4A–4C) now has an "S.3" label that has been adapted for the curved case somewhat crudely (Figure 4B); perhaps the factory had run out of "S.2" labels when this second case was assembled and so this "S.3" label was adapted to serve. Noteworthy from Figure 4C is the genuine "PRIZE-MEDAL REGULATOR" tablet from which the name for this style of case first originated. These two "P-M.R." examples both have Significant Details A, B, and C, and both have been presented before in the *Bulletin*.[13]

To date, no example of a "T.R.1.2" movement within a headless wall clock case has yet been found.

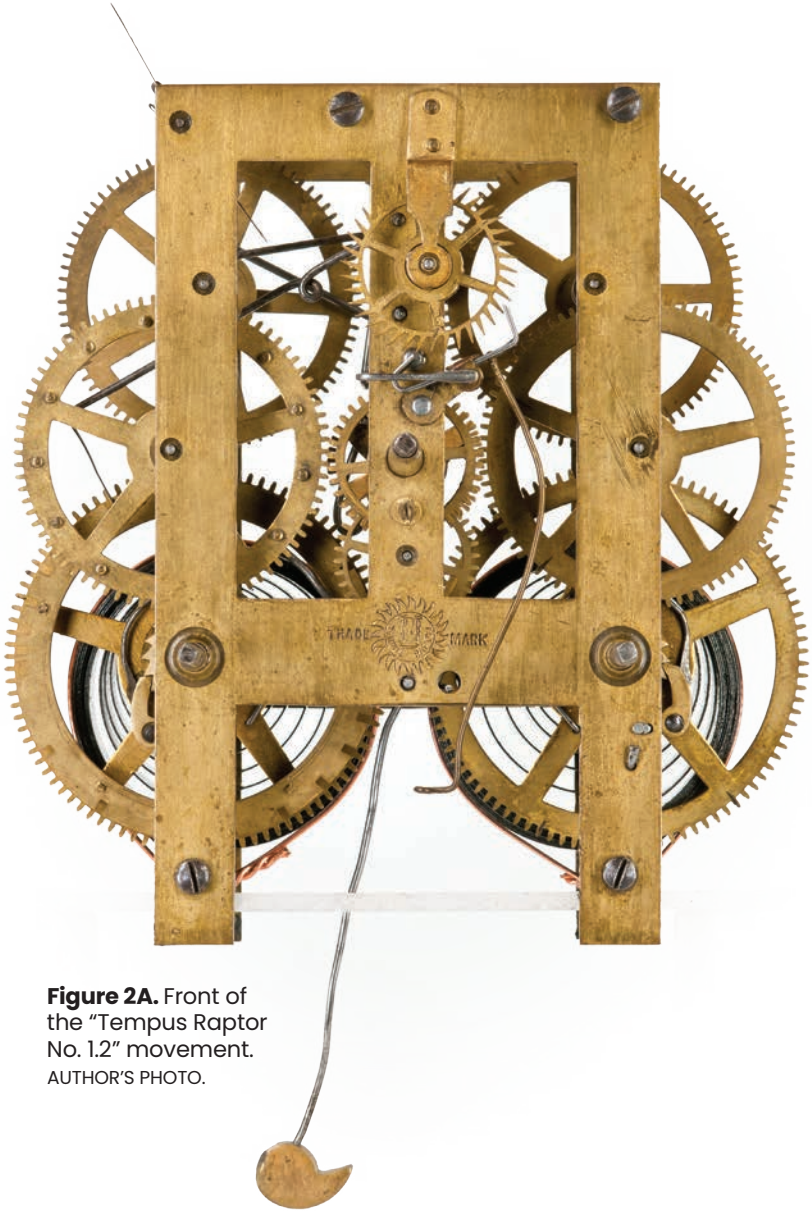

Figure 2A. Front of the "Tempus Raptor No. 1.2" movement. AUTHOR'S PHOTO.

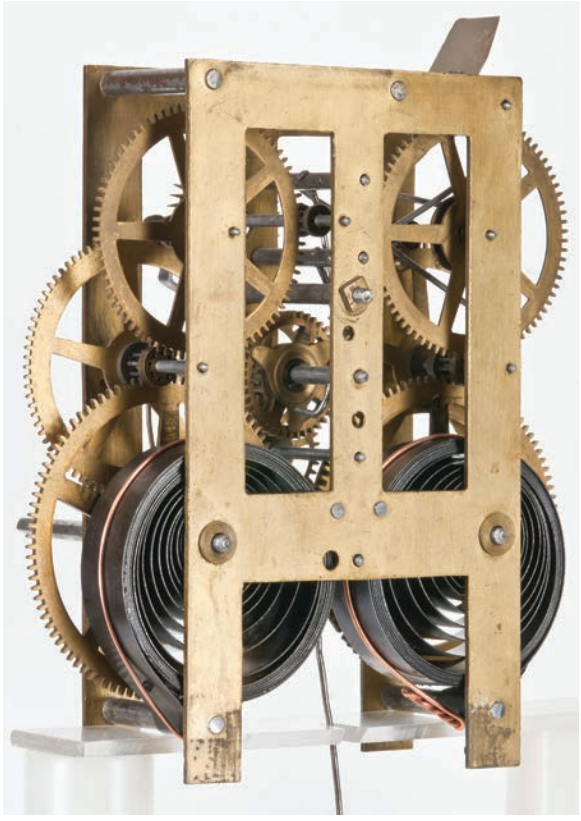

Figure 2B.▲ Right-rear view of the movement in Figure 2A. AUTHOR'S PHOTO.

Figure 2C.▸ Bullet-shaped indentation at the foot of the front left-plate leg found on the movement in Figure 2A. Notice the blued machine screw. AUTHOR'S PHOTO.

Production of "T.R.1.2" movements ceased when the 24-hour count wheel disc, riveted to the striking great wheel, was updated to a 12-hour count wheel located in front of the striking train's second wheel arbor. This modification and how it appears to have copied the same improvement that had taken place at the E.N. Welch factory in Forestville, CT, was explained and illustrated in the 2014 *Bulletin* article.[14] Unfortunately, it has not been possible to date when these changes took place at the E.N. Welch factory and the believed Cartwright factory. To identify these two different types of count wheel systems found only on "Tempus Raptor" movements, earlier movements with a 24-hour count wheel disc riveted to the striking train's great wheel have already been called "Tempus Raptor No. 1.1" ("T.R.1.1") and "Tempus

Figure 2D. A 12" drop dial case with the dial removed to show the "Tempus Raptor No. 1.2" movement in Figure 2A and the trunk door propped open to reveal the "Superior No. 3" label. AUTHOR'S PHOTO.

Figure 3A. "Prize-Medal Regulator" case containing another "Tempus Raptor No. 1.2" movement. IMAGE COURTESY OF KEYS FINE ART AUCTIONEERS.

Figure 3B. "Superior No. 2" label belonging to the case in Figure 3A. IMAGE COURTESY OF KEYS FINE ART AUCTIONEERS.

Figure 4A. "Prize-Medal Regulator" case with the dial removed to show a "Tempus Raptor No. 1.2" movement and the trunk door open to reveal a "Superior No. 3" label. IMAGE COURTESY OF KEN ROBINSON.

Figure 4B. Trimmed "Superior No. 3" label belonging to the case in Figure 4A. IMAGE COURTESY OF KEN ROBINSON.

Raptor No. 1.2" ("T.R.1.2") models. All "Tempus Raptor" movements that follow and have an improved 12-hour count wheel located in front of the striking train's second wheel will now be called "Tempus Raptor No. 2" ("T.R.2") movements.

"Tempus Raptor No. 2" Movements

In December 1978 Bill Matthews illustrated what we now call a "T.R.2" movement.[15] At that time, it was thought that "Tempus Raptor" movements were an E.N. Welch product with a curious trademark added presumably by an English importer. Although the clocks' labels now indicate their British origins, none of them say either "Atlantic Clock Works" or "Cartwright," raising two questions: Who made the movements and/or complete clocks? Why didn't the clocks' maker(s) apparently not want to be identified? This second question will be addressed in the concluding article in this series. Hopefully, these articles now being presented will convince the reader that "Tempus Raptor" movements were

Figure 4C. "Prize-Medal Regulator" tablet belonging to the case in Figure 4A. IMAGE COURTESY OF KEN ROBINSON.

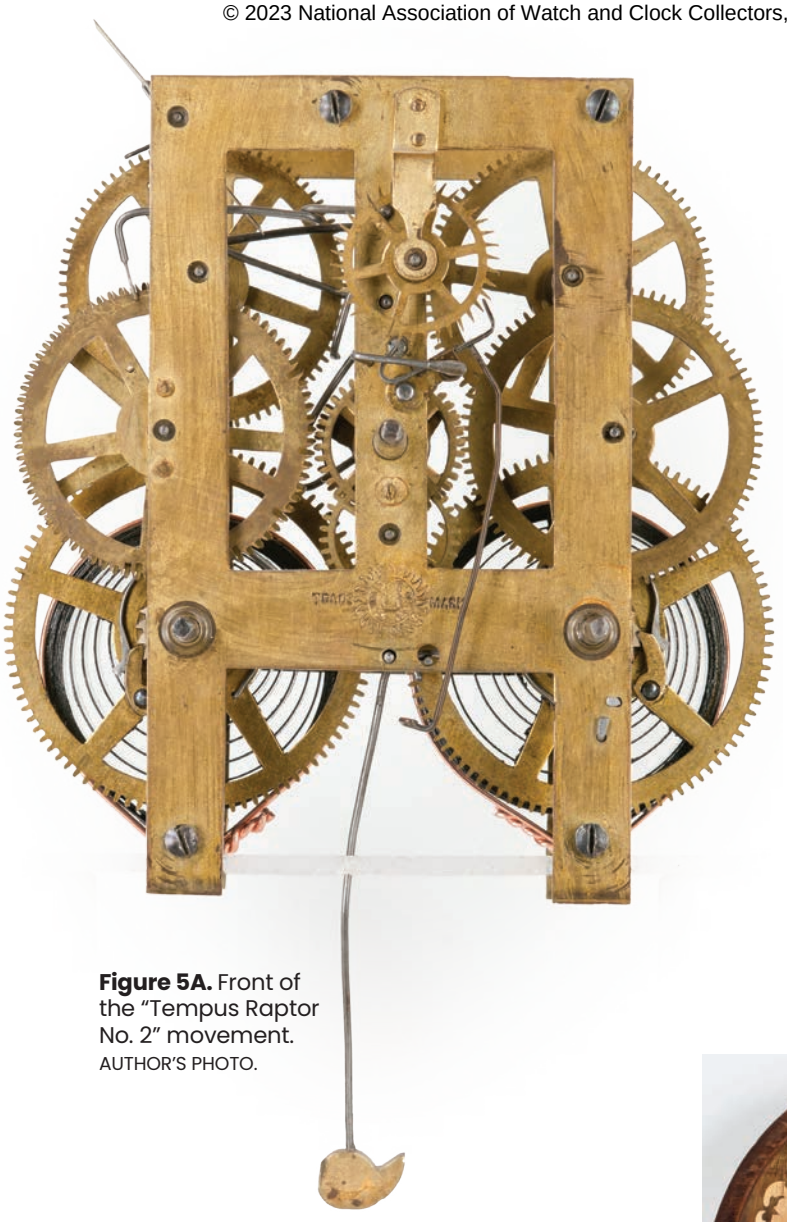

Figure 5A. Front of the "Tempus Raptor No. 2" movement. AUTHOR'S PHOTO.

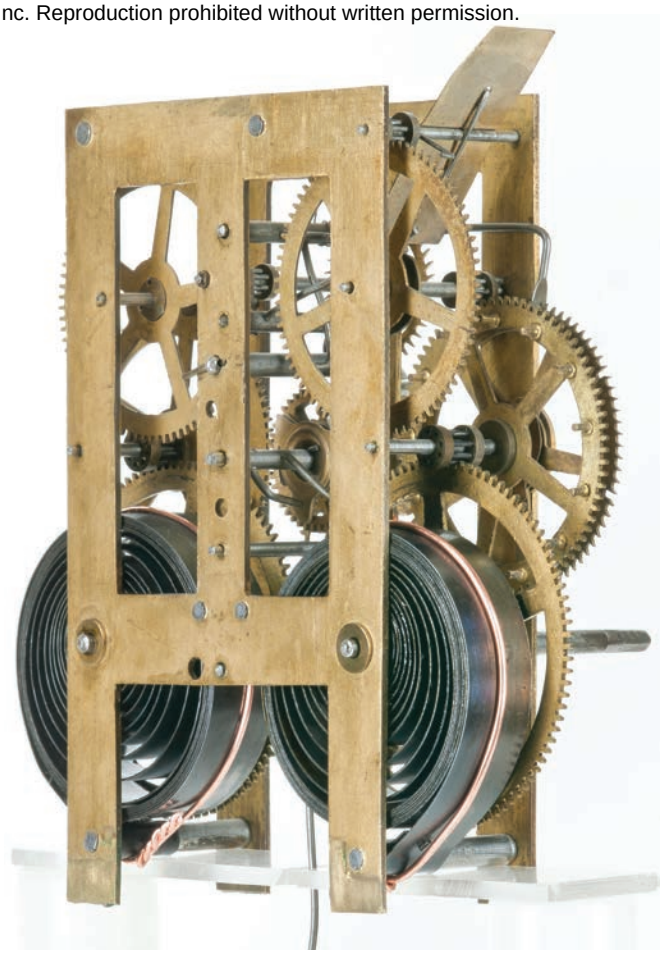

Figure 5B. Left-rear view of the "Tempus Raptor No. 2" movement in Figure 5A. AUTHOR'S PHOTO.

Figure 5C. "Z" (or "N") punched on the front left-plate leg of the movement in Figure 5A. Note the blued machine screw. AUTHOR'S PHOTO.

Figure 5D. A 12" drop dial case with a "VANDYKE REGULATOR" tablet and with the dial removed to show the "Tempus Raptor No. 2" movement in Figure 5A. AUTHOR'S PHOTO.

one of a series of different models produced by C. & H. Cartwright at the Atlantic Works, Birmingham, England.

Figures 5A and 5B show two views of a "T.R.2" movement example with the new 12-hour count wheel clearly visible. Figure 5B also confirms this movement now uses a pin rather than a "Large Square Nut" to fix its rear-facing middle pillar. Another six views of this same movement previously appeared in the *Bulletin*.[16] This movement has a small "Z" (or "N") on the bottom front left plate leg (Figure 5C) and has a 38-tooth escape wheel punched with an "8" and a 10" pendulum.

Six "T.R.2" movements were found in 12" drop dial cases, and all had the now familiar "S.3" label (Figure 6A). Four of these six cases will now be presented; an additional example was illustrated previously in a past *Bulletin* issue.[17]

Figure 5D shows the first example that contains the "T.R.2" movement pictured in Figures 5A–5C. This 12" drop dial case, now with incorrect replacement ears, has the hands and dial removed. This case is decorated with floral interlocking rosewood and sycamore veneers with a galloping horse depicted on the lower trunk curve. This case has Significant Details A, B, and C, and notice from Figure 5D it now has a tablet that states it is a "VANDYKE REGULATOR". Different images of both this case and its "S.3" label appeared previously in the *Bulletin*.[18]

An almost identical second case example, now with its ears missing, is shown in Figure 6B. Notice how the orientation of the rosewood and sycamore veneers on this example have been reversed when compared to the case seen in Figure 5D, suggesting these two different varieties of interlocking wood veneer (rosewood and sycamore) may well have been produced by a process whereby many matching pieces could have been punch-cut in a single operation. Also notice from Figure 6B that the "VANDYKE REGULATOR" tablet has a different blue background to that seen previously in Figure 5D. Based on photographic evidence, Significant Details B and C are confirmed; A may or may not be present.

A third example was found with the same orientation of rosewood and sycamore veneers as the case seen in Figure 6B but with a pair of racing greyhounds instead of the galloping horse on the

Figure 6A. "Superior No. 3" label belonging to the case in Figure 6B. IMAGE COURTESY OF DELANEY ANTIQUE CLOCKS.

Figure 6B. Similar 12" drop dial case to that in Figure 5D but with the orientation of the interlocking veneers reversed. Note the different colored "VANDYKE REGULATOR" tablet. IMAGE COURTESY OF DELANEY ANTIQUE CLOCKS.

lower trunk curve and a "VANDYKE REGULATOR" tablet with another slightly different design and color scheme (Figure 7).

A fourth case example with a "T.R.2" movement has a now familiar 12" drop dial case with rosewood veneer and pewter inlay, but this case has an added ring of decorative inlay around each pewter disc (Figures 8A and 8B) and a tablet that states this clock is now a "CHAMPION REGULATOR". The clock's dial has been reported as having been repainted with the central decorative motif faithfully copied from what remained of the original (Figure 8A). It was confirmed that this case has Significant Details A, B, and C.

Figures 9A and 9B show a "T.R.2" movement within a now incomplete headless wall clock case with the dial, pendulum, and bell all missing and the mirror now broken. This headless wall clock case has Significant Detail A, a simple rectangular door with inlay, frets cut from a thin, plain piece of mahogany, a double curved base with inlaid strips, and Gothic cross roundels, with a decorative roll at the bottom. This new case design almost certainly would have been cheaper to produce when compared to the earlier headless wall clock case with the "S.N.s.4" movement, previously presented in Part 3.[19] Another complete and seemingly identical headless wall clock case again with a "T.R.2" movement was posted on the NAWCC Forums by "Blindraccoon" on June 6, 2014.[20] Both of these two "T.R.2" movements within headless wall clock cases have a small "w" punched on the bottom of the front left plate leg and now a 40-tooth escape wheel punched with a "7" and from calculations would require a shorter 9 ¼" pendulum, with the imitation mercury pendulum on the "Blindraccoon" example still intact and illustrated in the Forums posting.

Figure 7. Trunk detail of another 12" drop dial case with interlocking veneers and a pair of racing greyhounds depicted on the lower curve. Note the different "VANDYKE REGULATOR" tablet. IMAGE COURTESY OF DAVID PETERS.

All except what could be the earliest of these believed C.& H. Cartwright "T.R.1.2" movements have been found within cases with a variety of new decorative elements, with all cases also conforming closely to those reported as produced from 1878 to 1880 (as described in key point 17 in Part1): "Two European patterns of wooden cased wall clocks for shops, offices and dining rooms were produced: large dials [dials would have meant drop dials too] with marquetry or inlay, and Vienna Regulator styled cases with mirror-backed pendulum box and imitation mercury pendulum."[21]

To date no "T.R.2" movement has yet been found within a "P-M.R." case.

In Part 5 "The Caledonian Registered" movements will be investigated.

Notes and References

1. Peter Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 3: 'Square Nut' Movements," *Watch & Clock Bulletin* 65, no. 463 (May/June 2023): 169, Figure 12A.
2. Peter Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 1: Charles Cartwright & Sons," *Watch & Clock Bulletin* 65, no. 461 (January/February 2023): 42.
3. Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 3: 'Square Nut' Movements," 163.
4. Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 3: 'Square Nut' Movements," 164.
5. "Research Activities and News," *Watch & Clock Bulletin* 56, no. 407 (January/February 2014): 104, Figures 5A–5C.
6. "Research Activities and News," *Watch & Clock Bulletin* 56, no. 407, 105–6, Figures 6C–6H.

7. Peter Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 3: 'Square Nut' Movements," 163, Figures 3E–3G.
8. Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 3: 'Square Nut' Movements," 169, Figures 12B–12C.
9. "Research Activities and News," *Watch & Clock Bulletin* 56, no. 407, 105, Figures 6A–6B.
10. Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 3: 'Square Nut' Movements," 164.
11. Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 3; 'Square Nut' Movements," 164, Figure 4A and 165, Figure 5A.
12. Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 3: 'Square Nut' Movements," 165, Figures 4B and 5B.
13. "Research Activities and News," *Watch & Clock Bulletin* 57, no. 417 (September/October 2015): 411, Figures 7A–7D, and *NAWCC Bulletin* 50, no. 377 (December 2008): 729, Figures 16A–16D.
14. "Research Activities and News," *Watch & Clock Bulletin* 56, no. 407, 105–6.
15. Bill Matthews, "Anglo-American Clocks," *Clocks Magazine* (December 1978), reprinted in "Research Activities and News," *NAWCC Bulletin* 44, no. 337 (April 2002): 229–32.
16. "Research Activities and News," *Watch & Clock Bulletin* 56, no. 407, 107–8, Figures 8E–8J.
17. "Research Activities and News," *NAWCC Bulletin* 50, no. 377, 729, Figures 17A–17C.
18. "Research Activities and News," *Watch & Clock Bulletin* 56, no. 407, 106–7, Figures 8A–8D.

Figure 8A. Another 12" drop dial case with a "CHAMPION REGULATOR" tablet and additional rings around each pewter disc. IMAGE COURTESY OF THE LATE PETER STEWART.

Figure 8B. "CHAMPION REGULATOR" tablet belonging to the case in Figure 8A. IMAGE COURTESY OF THE LATE PETER STEWART.

19. Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 3: 'Square Nut' Movements," 166, Figure 6.

20. NAWCC Forums, Clocks>General Clock Discussions, https://mb.nawcc.org/forums/general-clock-discussions.9/.

21. Gosnell, "The Atlantic Clock Works of Birmingham, England, Revealed: Part 1: Charles Cartwright & Sons," 42.

About the Author

Peter Gosnell joined the NAWCC in 1997 and between 2001 and 2008 made yearly visits to the US to study the development of the Connecticut brass clock movement with the guidance of the late Dr. Snowden Taylor. Subsequently, Peter's research has focused on early industrialized clockmaking in England, with a number of articles on the subject published in the *Bulletin*.

Figure 9A. Now incomplete headless wall case containing a "Tempus Raptor No. 2" movement. IMAGE COURTESY OF THE LATE JOHN TAYLOR (DERBY).

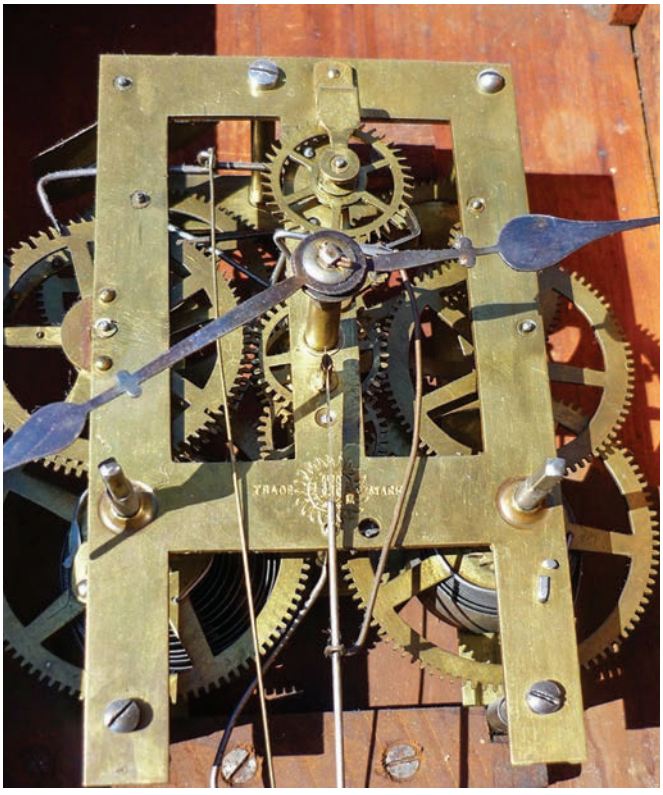

Figure 9B. "Tempus Raptor No. 2" movement belonging to the case in Figure 9A. IMAGE COURTESY OF THE LATE JOHN TAYLOR (DERBY).

The Genesis and Development of the Model 1862N E. Howard & Co. Pocket Watch Movement: Part 2

BY ALAN MYERS (IRE) AND CLINT GELLER, NAWCC SILVER STAR FELLOW (PA)

Introduction

In Part 1 of this article,[1] we provided an overview of the events surrounding the development of the Howard Model 1862N three-quarter plate movement design. We proposed a new hypothesis concerning the possible involvement of Daniel Bucklin Fitts in the design's creation. We also argued that the "thin" version of the Model 1862N movement design, with the later wheel train arrangement, was foreseen from the beginning. Part 2 describes several successive structural and cosmetic design evolutions involving the escapement, pallet bridge, and balance cock of Model 1862N movements, as well as evolutions in the plate finish, steelwork, and engraving. The current work extends that of Geller,[2] especially with respect to the successive structural design changes that transpired during Model 1862N production.

Model 1862N Production

Overview

An initial run of 100 Model 1862N movements was completed between December 1862 and January 1863 and was assigned serial numbers 3,301 to 3,400. This was followed by a run of 100 Model 1863 ladies' movements, which was assigned the consecutive serial number block from 3,401 to 3,500. The I-size movement design was based on that of the Model 1862N, but it carried the upper lever pivot in the train plate, so it incorporated the stability advantage that a bridge offers over a cock, while obviating the need for a separate bridge. For reasons unknown, no further manufacture of the I-size ladies' movements occurred, but production of Model 1862N movements recommenced at No. 3,501. Production of this model continued uninterrupted, or nearly so, until at least No. 26,770, and sporadically thereafter until at least No. 27,580, in 1871. Ultimately, between 23,000 and 24,000 Model 1862N movements were finished for sale.

Production Timeline

An approximate production timeline for the Model 1862N is provided in Table 1, which lists completion dates for a representative selection of Model 1862N movement 10-lots. Table 1 and other tables as noted are available online at www.nawcc.org/publications/watch-clock-bulletins/bulletin-addenda. The surviving factory records generally list only one completion date for each 10-lot, even though some movements may have lagged behind their consecutively numbered siblings for any number of reasons.

It is important to emphasize that while the various ébauche types have a chronological order to them, they do not necessarily correspond to tightly defined serial number ranges.

Sufficient granularity is provided in Table 1 to reflect some of the nonsequential nature of Howard watch movement production, with some 10-lots appearing with earlier completion dates than some other 10-lots with much lower serial numbers. Nevertheless, except for those serial numbers falling within the gap in the surviving records, completion dates of movements whose serial numbers do not appear in the table may reasonably be interpolated from those of the closest 10-lots listed above and below it in the table. Completion dates interpolated in this way are very likely accurate to within a few months or better, though fully adjusted movements are more likely than others to lag behind less highly adjusted movements with nearby serial numbers.

Table 2. Measurements of Type 1 and Type 2 movements.

Movement	Dial Plate	Train Plate	Total	Total + Dial
Type 1	3.5 mm	3.7 mm	7.2 mm	8.2 mm
Type 2	2.5 mm	4.2–4.3 mm	6.7–6.8 mm	7.7–7.8 mm

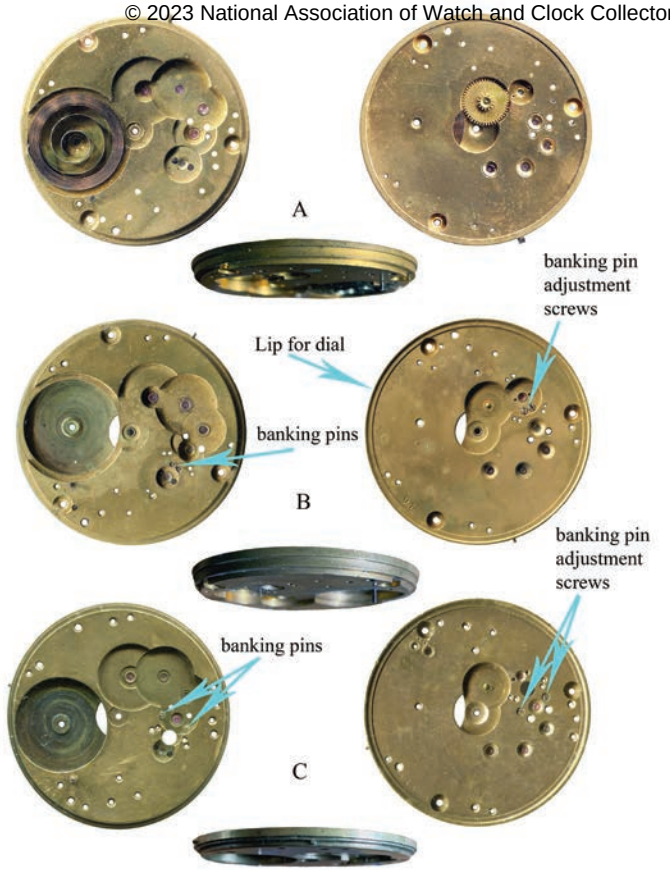

Figure 1. Dial plates of E.H. & Co. movements: **A.** No. 4,601; **B.** No. 7,197; **C.** No. 21,802. PHOTOS BY ALAN MYERS.

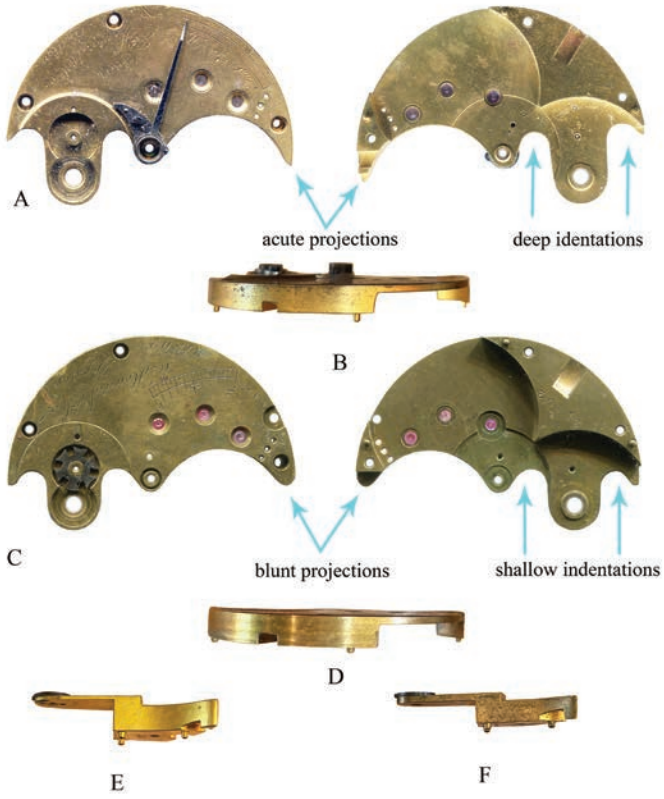

Figure 2. Train plates and balance cocks of E.H. & Co. movements: **A.**, **B.**, **E.** Thick plate movements; **C.**, **D.**, **F.** Thin plate movements. PHOTOS BY ALAN MYERS.

Movement Details and Variations

Model 1862N movements have dial plates with integral sidewalls (hereafter more simply referred to as integral dial plates). The early, low serial number Model 1862N movements were relatively heavy (54–55 g without dial) and thick (Table 2) compared with later 1862N movements, which were both lighter (46–47 g without dial or dust ring) and thinner (Table 2), as further discussed in this article. The weight reduction in the later movements was accomplished by reducing the thickness of the dial plate upon which the movements are built (Table 2, Figure 1) from 3.5 mm to 2.5 mm, but it was perhaps the change in aspect ratio, enabling flatter cases, that was the real objective. The new thinner dial plates could not be milled as deeply as those of the earlier thick movements, so the top plates were made thicker to accommodate the mainspring and train wheels (Figure 2D). The portion of the three-quarter top plate carrying the stopwork and the main wheel were made even thicker than the rest of the plate. The small increase in the weight of the thicker top plate notwithstanding, the new design nevertheless enabled an overall movement weight and thickness reduction (Tables 2 and 3). The cantilevered section of the balance cock was made thicker in the thin movements, perhaps for added stability (Figure 2F).

Significantly, the dial plates of the thick movements are deeply milled (Figure 1) in order to accommodate retaining pins through the dial feet, as these feet are otherwise too short to extend sufficiently above

Table 3. Weights of some 1862N movements (complete with dial and hands).

Type	Weight (grams)	Main Features Affecting Weight	Serial Number
1B	66.7	Thick dial plate, with balance over center	4,605
1B	64.5	Thick dial plate, with balance over center	5,690
1C	67.9	Thick dial plate, with balance over center	7,107
2A	57.5	Thin dial plate, balance under center, no dust ring	9,009
2B	56.6	Thin dial plate, balance under center, no dust ring	18,817
2B	58.3	Thin dial plate, balance under center, with dust ring	20,624
2B	62.2	Thin dial plate, balance under center, with dust ring	24,576

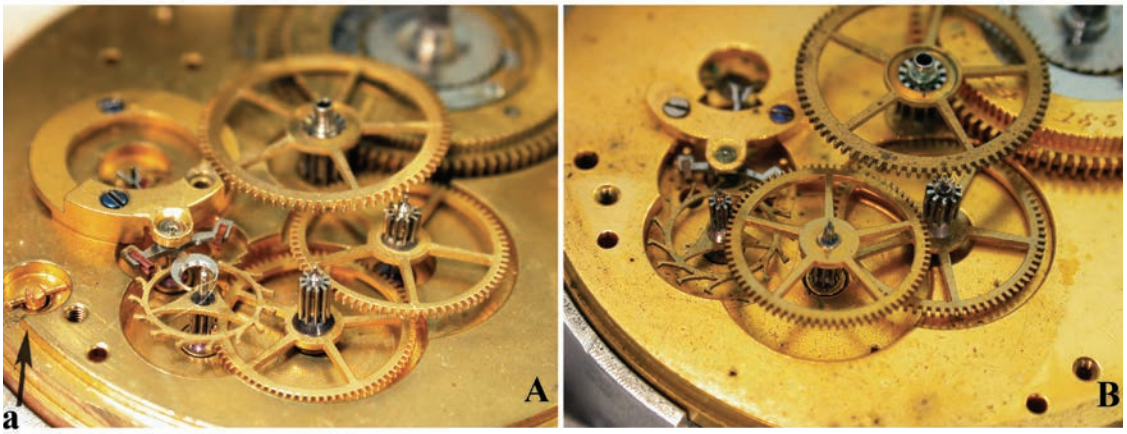

Figure 3. Arrangement of train wheels of E.H. & Co. Model 1862N movement: **A.** Thick plate movement, with **(a)** showing the countersinking of the dial pin, necessitated by the thicker plate; **B.** Thin plate movement. PHOTOS BY JOHN WILSON.

the top of the dial plate to be secured by a pin. This design feature may indicate that dials were prepared in anticipation of being used with the thinner dial plates of the later movement design, even while the thick model movements were being manufactured. Indeed, the patent application for George P. Reed's protective mainspring assembly states that it allows one to situate the exposed stopwork gears in "sunken recesses," in the bridge above the barrel, and that this fact enables the stopwork to be made "so thick and strong as to prevent all liability of derangement," while yet enabling "the watch be made thinner . . . comparatively speaking." Under the circumstances, one may surmise that Reed, who was the chief watch designer and factory superintendent at E.H. & Co. at the time the Model 1862N design was gestating, would have been especially keen to manufacture a watch that realized the full potential he claimed for his invention. This claim prominently included reduced movement thickness.

The arrangement of the wheel train differs between the thick and thin variants of the Howard Model 1862N, here termed Type 1 and Type 2, respectively. In the thick Type 1 movements, the second wheel lies above the third wheel, which in turn lies above the fourth wheel, and the escape wheel lies above the fourth wheel (Figure 3A). In the thin Type 2 movements, the third wheel lies beneath both the second and fourth wheels, and the fourth wheel lies above the escape wheel (Figure 3B).

Following is a more detailed discussion of the many variable functional and cosmetic finishing details of Model 1862N movements. The first and last observed or recorded occurrences of the various movement features to be discussed are given in Table 4.[3]

Type 1 Movements

Type 1 movements are most quickly recognizable by the scythe-shaped escutcheon (Figures 4 and 5), together with the position of the balance wheel above the center wheel. In earlier works by Clint Geller,[4] the earliest style of escutcheon is described as a crescent, but here this term is used for the earliest style of lever cock.

Train jewels are either spun into the top plate or are in settings (chatons, in Swiss parlance), which were sometimes spun-in and sometimes screwed-down.

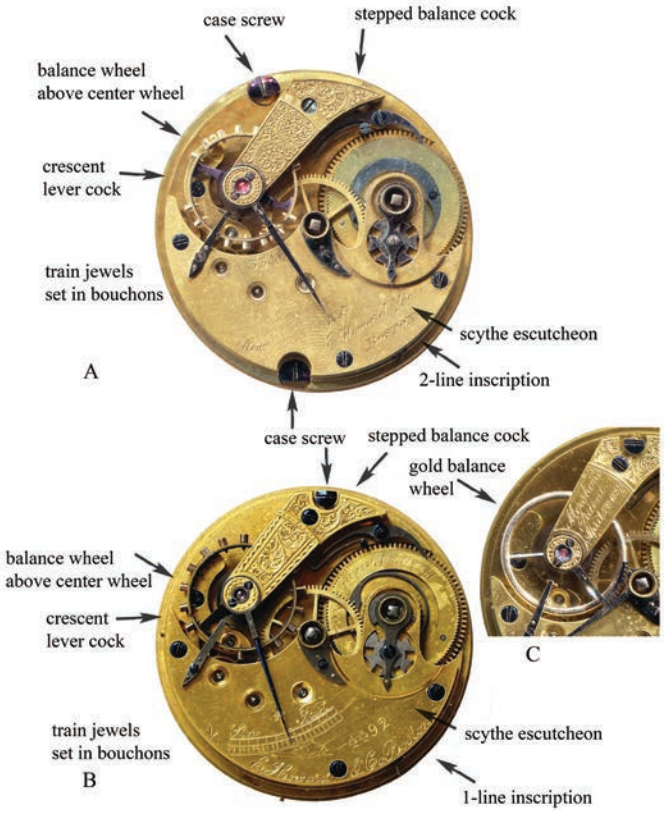

Figure 4. E.H. & Co. 1862N movements: **A.** Model 1A, thick plate, No. 3,646, note the balance wheel above the center wheel, flat balance cock, crescent lever cock and two case screws on the pillar plate; **B.** Model 1B, thick plate, No. 4,492, note the balance wheel above the center wheel, stepped balance cock, crescent lever bridge and single case screw on the balance cock; **C.** Gold balance wheel of No. 4,520. PHOTOS BY ALAN MYERS.

Most balance wheels in Type 1 movements are bimetallic with two independent arms, but some early ones are uncut and solid gold (Figure 4C, Table 5[5]).

Three subtypes of the Type 1 movement variant have been seen. Subtypes 1A and 1B have a crescent-shaped lever cock. (This part is often termed a bridge, but in this particular design variation, it is supported on only one end and is therefore more correctly called a cock; Figure 6A). In contrast, a Subtype 1C movement has a circle-shaped lever bridge (fixed to the dial plate on either side of the lever arbor; Figure 6B). In Subtype 1A there are two case screws that are both situated on the dial plate, one of which is accessed through a hole in the train plate (Figure 4A), whereas in Subtypes 1B and 1C, a single case screw is situated at the base of the balance cock (Figure 4B). The differences between subtypes 1A, 1B, and 1C are summarized in Table 6.[6]

Helical Hairspring Variant

A small number of Type 1 movements were adapted to use helical hairsprings. To accommodate the increased vertical length of a helical hairspring, the balance wheel was pivoted below the center wheel on these movements, and the arm of the balance cock was raised above a heightened step. Model 1862N examples are known of both the Type 1B variant with a crescent lever cock, and the Type C variant with a circular lever bridge (Figure 5B).

One probably unique helical hairspring-movement, No. 6,859, has a Cole's resilient banking escapement and a winding reserve indicator. Movement No. 6,859 is the only known example of a Howard movement with or without a helical hairspring featuring either this complication or any other. The terse factory records suggest that the entire 10-lot of movements from Nos. 6,851 to 6,860 was finished on April 26, 1865, and no special notes accompany any of the movements in this 10-lot, which are all listed as basic gilt movements with chronometer balances, top-plate train jewels without screwed-down settings, simple regulators, and adjusted only to isochronism. However, given the obviously very special handling that movement No. 6,859 received, the supposed finishing date of this movement cited in the records is not likely to be any more accurate than the description of its features. Indeed, very few Model 1862N examples with a Cole's escapement are known with serial numbers below 23,000, though No. 6,859 is evidently a very early example. The records also indicate that this 10-lot was finished by George P. Reed, who was Edward Howard's chief movement designer and nominal factory superintendent in 1865, and Reed's personal association with movement No. 6,859 is likely to be accurate. During his tenure, Reed seems to have picked some movements from the Howard production stream at random for his experiments, and movement No. 6,859 was probably one of them.

Quite a few Howard ébauches are known that were also extensively modified by Reed and carry his name. Reed left Edward Howard's employ, apparently on good terms, sometime around 1865, but a less formal business relationship between them evidently continued. It is possible that Reed may have completed movement No. 6,859 even after he had set out to make watches on his own.

Type 2 Movements

A Type 2 movement can most readily be identified by its trefoil-shaped escutcheon (Figure 7) around the center wheel pinion and the position

Table 6A. Main changes in the movement design of Howard 1862N types.

Type	Date	Dial Plate	Pallet Bridge	Escutcheon	Balance Position	Case Screw Position	Balance Cock	Train Jewels	First Known Serial
1A	1862	Thick	crescent	scythe	above	dial plate	stepped	pressed-in	3,302
1B	1863	Thick	crescent	scythe	above *	balance cock	stepped	pressed-in or screwed	3,689
1C	1865	Thick	circular	scythe	above *	balance cock	stepped	pressed-in or screwed	6,341
2A	1865	Thin	yoke	trefoil	below	balance cock	stepped	spun-in or 3rd or all screwed	8,237
2B	1868	Thin	yoke	Trefoil or none	below	train plate	Stepped or planar	spun-in or 3rd or all screwed	18,643

* Below in helical balance spring movements

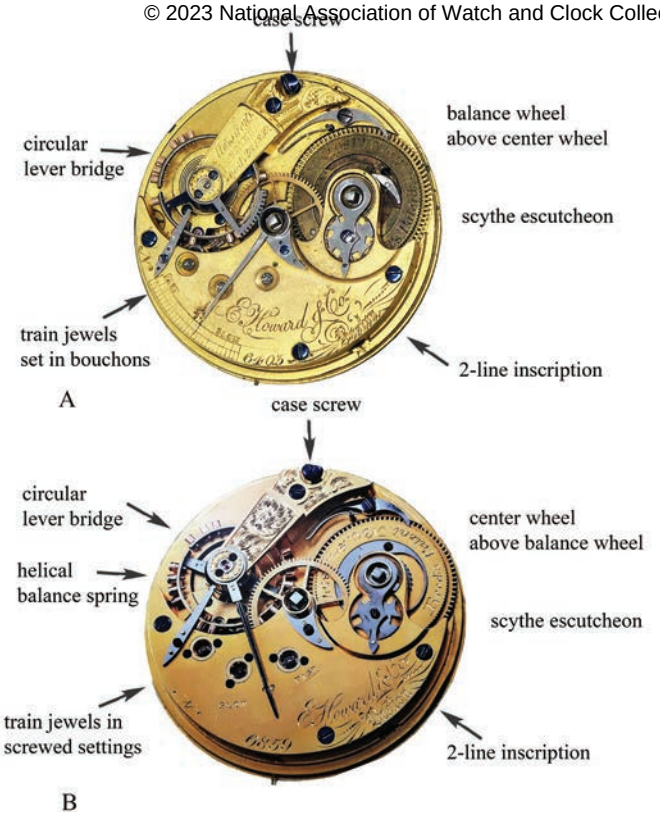

Figure 5. E.H. & Co. 1862N movements: **A.** Model 1C, thick plate No. 7,197, note the balance wheel above the center wheel, stepped balance cock, circular lever bridge and single case screw on the balance cock; **B.** Model 1C, thick plate, helical hairspring, No. 6,859. PHOTOS BY ALAN MYERS.

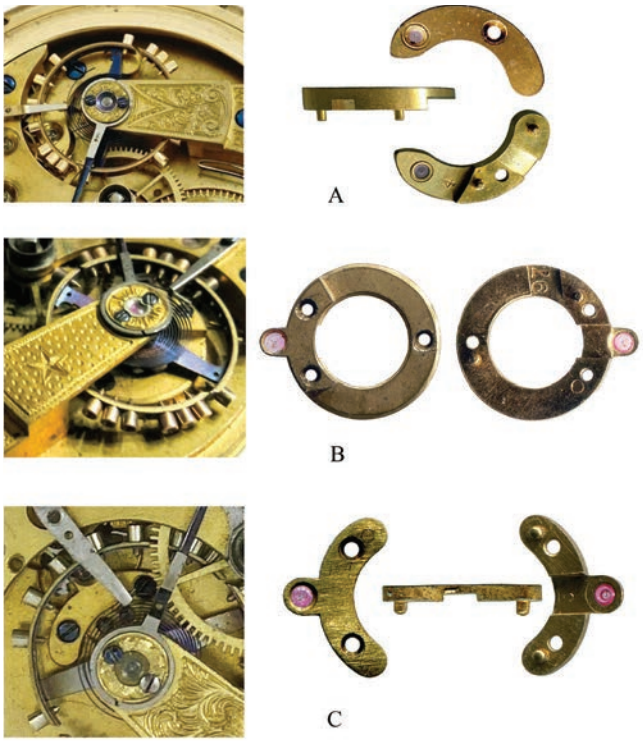

Figure 6. Lever cocks and lever bridges used in Howard 1862N movements: **A.** Crescent lever cock; **B.** Circular lever bridge; **C.** Yoke lever bridge. PHOTOS BY ALAN MYERS.

of the balance wheel below the center wheel. The extension of the bridge around the balance wheel is shorter and less tapered (Figure 2B). Top-plate train jewels are either spun-in or have all the train jewels or just the third-wheel-hole jewel in screwed-down settings. Dial plate train jewels are spun-in. A full set of screwed-down top-plate jewel settings cost an additional $5 in 1870.[7] On Type 2 1862N movements the lever bridge is always of the yoke style (Figure 6C). Balance wheels on Type 2 movements are always bimetallic. There are two subtypes of Type 2 movement (Table 6). In Subtype 2A, the case screw is situated at the base of the balance cock as in the earlier Type 1 movements. In Subtype 2B movements, the case screw, with a shortened shank, is on the train plate.

The balance cock of a Type 2 movement may be either stepped or planar, and if the latter, it most often but not always carries Reed's patented whip spring regulator (described below), though this particular patent is never marked on E.H. & Co. watches. Edward Howard's uncharacteristic reticence concerning marking Reed's regulator patent may be explained by the legal settlement Howard reached with an Albany, NY, watchmaker, Charles Fassoldt, in a patent infringement suit concerning two similar inventions. In 1870, Reed's patent regulator raised the wholesale price of a Model 1862N movement by $6.[8] After about No. 24,000, short, simple regulators with index scales on the balance cock, which are seen on very early Model 1862N movements as well, make a sporadic reappearance.

Some very late Subtype 2B movements lack an escutcheon around the center wheel pinion (Figure 8B). More significantly, dust rings were introduced on Model 1862N movements somewhere between No. 11,690 and No. 15,701.[9] Many of these dust rings have been lost or discarded over the years by indifferent or insouciant watchmakers. This fact is important to remember, because a movement with a missing dust ring will show a small gap between the movement edge and the lip of an original case, and such a gap has caused many an inexperienced collector to needlessly doubt the authenticity of a likely original watch case housing a Model 1862N movement with a missing dust ring.

Regulators

While the E.H. & Co. factory production records distinguish between plain and patent regulators,

plain being the default type where no other type is noted, the two distinct types of patent regulator were never differentiated therein. Nevertheless, based on observations of a large number of surviving movements, one can determine that up to No. 18,096, the notation "P.R." invariably referred to Mershon's patented rack-and-pin Type 1 regulator, whereas beyond No. 18,096, this notation could refer to either Mershon's (nearly always the Type 2 T-style) rack-and-pin regulator or to Reed's patented whip spring regulator. The only known exception to this rule is the 10-lot at Nos. 21,521 to 21,530, both known examples from which have scythe-style Mershon's Type 1 regulators.

Each basic type of regulator—plain, Mershon's, and Reed's—came in two styles or subtypes. Plain regulators consisted of a straight index arm rotating around an axis concentric with that of the balance staff. The arm extended from a frame attached to curb pins that, when the index arm was turned, changed the effective length of the hairspring and hence the rate of the watch. Model 1862N movements with plain regulators were made concurrently with movements with patent regulators. The short style of plain regulator, seen on some movements before No. 3,600 and other movements beyond No. 24,000, reads to an index scale on the balance cock (Figure 9C). The long style of plain regulator, which was made throughout nearly the entire Model 1862N production period, reads to an index scale on the train plate (Figure 9D).

Mershon's patented compound rack-and-pin regulator was designed to reduce the length of arc travelled by the curb pins for a given displacement of the regulator index arm. In principle, this gearing advantage enabled finer rate adjustment. In the earlier movements with Mershon's regulator, the part of the regulator carrying the curb pins resembles a scythe with a toothed blade (Type 1) that meshes with an index arm turning on an axis concentric with the center arbor, as in Figure 9A. Beyond No. 8,310, the spoke of the Mershon's

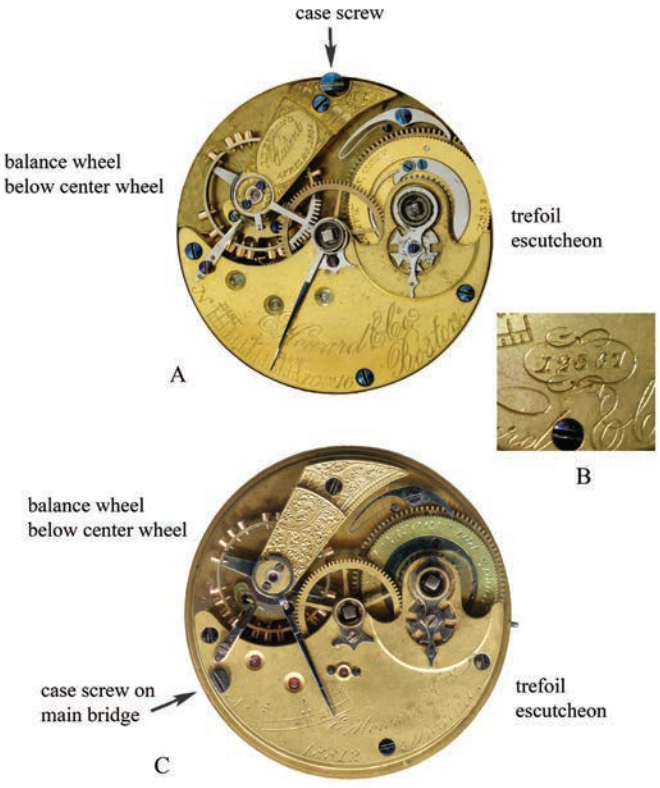

Figure 7. E.H. & Co. 1862N movements: **A.** Model 2A, thin plate, No. 9,656, note the trefoil escutcheon, balance below the center wheel, and yoke lever bridge; **B.** No. 12,367 enclosed in ornate scrolls; **C.** Model 2B No. 18,812, note the trefoil escutcheon, balance below the center wheel, yoke lever bridge, stepped balance cock, and case screw on the train plate. PHOTOS BY ALAN MYERS.

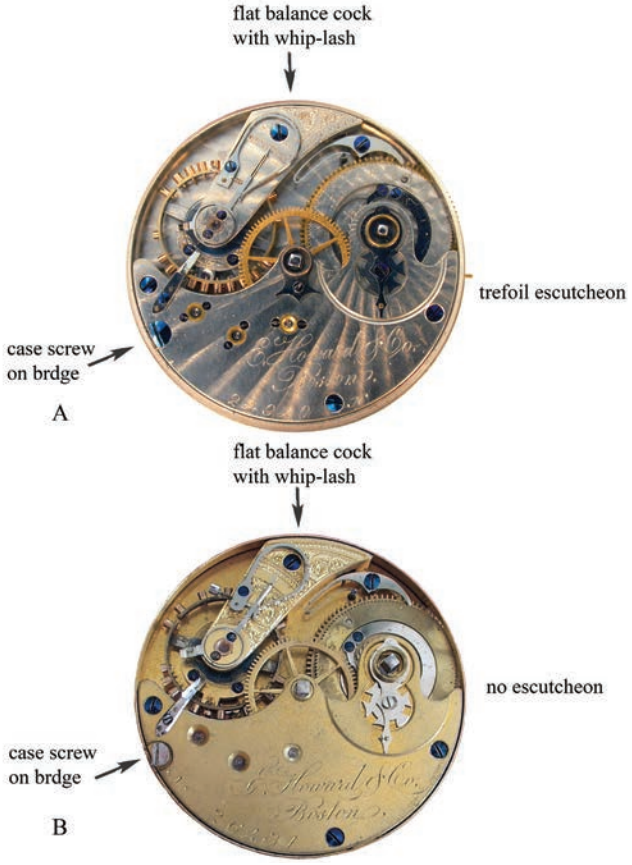

Figure 8. E.H. & Co. 1862N movements: **A.** Model 2C, nickel thin plate No. 24,940, note the trefoil escutcheon, balance below the center wheel, yoke lever bridge, flat balance cock with Reed's whip spring regulator, and case screw on the train plate; **B.** Model 2C thin plate No. 26,431 with no center wheel escutcheon. PHOTOS BY ALAN MYERS.

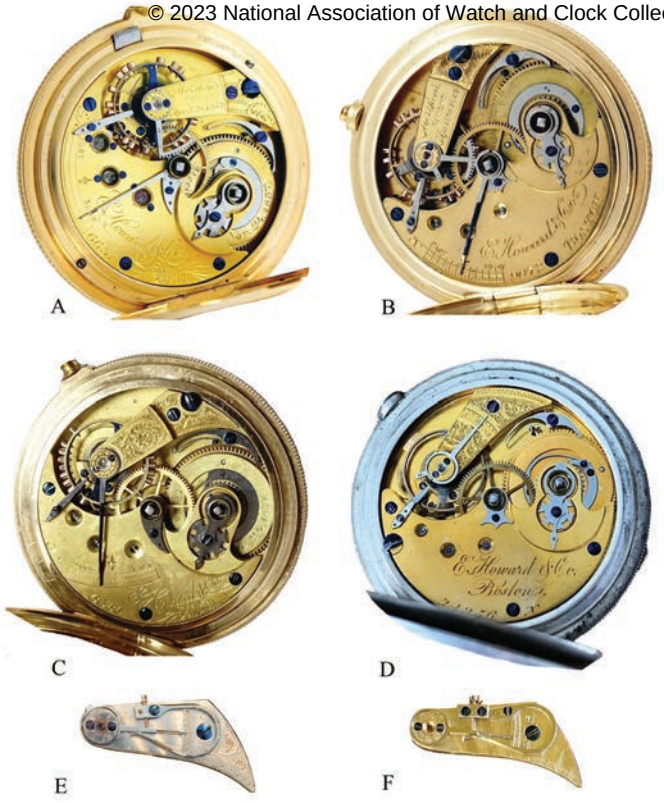

Figure 9. E.H. & Co. 1862N regulators: **A.** Mershon's Type 1 regulator with long index arm; **B.** Mershon's Type 2 regulator; **C.** Short simple regulator with index scale on balance cock; **D.** Long, simple regulator with index scale on train plate; **E.** Reed's whip spring regulator; **F.** Reed's whip spring regulator scarcer "collar piece" variant with the regulator screw passing through a separately mounted steel collar, which is fastened below the base of a shortened whip spring. PHOTOS BY ALAN MYERS.

regulator emerging from the balance cock attaches in the middle of the toothed rack (Figure 9B). This part of the latter mechanism design therefore resembles a letter T with a curved top, rather than a scythe. In both cases, the regulator index arm reads to an expanded index scale parallel to the train plate perimeter.

The idea behind Reed's whip spring regulator, also called a "swan neck" regulator in English parlance, was to enable more precise movements of the regulator index arm. This goal is accomplished by situating the index arm between a fine-pitched screw and an opposing spring, free of any possible backlash in a gearing assembly. The single-piece style of Reed's regulator, in which the regulator screw passes through the thickened base of the whip spring, is the variety most often seen (Figure 9E). The scarcer variant is the collar-piece style, in which the regulator screw passes through a separately mounted steel collar, which is fastened below the base of a shortened whip spring (Figure 9F). The index arm of a Reed's regulator is necessarily short, as it is enclosed by the whip spring, and the index scale lies atop the balance cock.

Reed's regulators generally make their appearance after No. 22,401. However, one fully adjusted, nickel-plated, and uniquely damaskeened movement with No. 18,097 is the lowest numbered Model 1862N movement, if not necessarily the earliest movement, seen with Reed's regulator. The factory records list no inventory price for this one movement, which has several features chronologically inconsistent with its serial number. A movement out of the same 10-lot with a consecutive serial number, 18,098, also has been recorded. It is a common $76 gilt movement with a Mershon's curved T-style regulator and adjustments to isochronism and temperature but not to positions. The entire 10-lot at No. 18,091 is listed as having been finished on March 10, 1869, but this date is almost certainly incorrect as regards No. 18,097. Beyond No. 22,401, movements with Reed's and Mershon's Type 2 regulators were manufactured concurrently.

Escapements

Perhaps the most significant evolutions that took place in the Model 1862N design were in the escapement. In thick plate movements, the pillar plate milling for single-pin banking differs from that for two-pin banking (Figure 1). In thin plate movements, all of which have two-pin banking, escapement changes did not necessarily occur concurrently with changes in ébauches. Each product of the manufacturing process began as a rough movement, or ébauche, that consisted of plates, bridges and cocks, and the gear train, but with no escapement parts. Batches of these ébauches then were drawn from stock for finishing, at which time the escapements were added. However, ébauches may not always have been taken from stock for finishing in the same chronological order in which they were assembled, so ébauches originally assembled earlier may have been given the same type of escapement as ébauches assembled later. Therefore, we cannot be precise about the timing of escapement design changes based on movement serial number information. We can only describe the general progression of the escapement design from one type to the next.

The two most significant aspects of E.H. & Co. Model 1862N escapement evolution were in the division of lift between the pallets and the escape wheel teeth, and in the manner of banking of the lever. Early on, the shape of escape wheel teeth on E.H. & Co. watch movements evolved more or less in parallel with that on contemporaneous A.W. Co. watches. However, Edward Howard very much blazed his

own path concerning banking of the lever, and it is this story, which reveals something of the eccentric nature of Edward Howard and his company, that we will address first.

Lever Banking Approaches

Edward Howard had a singular aversion to banking pins, especially to banking pins that were fixed in the dial plate. This attitude may have been a consequence of the necessarily wider manufacturing tolerances of the day, which could not avoid the frequent need to deliberately bend fixed banking pins once they were planted in the dial plate, in order to optimize escapement action. Bent banking pins, in turn, could lead to increased variations in the dial-up versus dial-down rate, and inasmuch as Howard was adjusting some of his watches to positions quite early on, this was a complication he would have sought to avoid. Consequently, the earliest E.H. & Co. Model 1858 divided-plate movements had two adjustable banking pins mounted eccentrically on the ends of screws in the dial plate (Figure 1), even though this represented an added expense relative to simple, fixed pins. It is notable that the first Waltham movements to incorporate this same design feature were the advanced, Nashua-derived 20- and 16-size three-quarter plate key-wind models manufactured after 1862. Nonetheless, Howard evidently came to regard adjustable banking pins as, at best, a problematic advantage, as he experimented with more than one way to eliminate banking pins altogether before he found a lasting solution. If nothing else, banking pins in the dial plate, whether fixed or adjustable, had to be removed before gilding and then reinstalled, which must have been a nuisance.

Before the end of Model 1858 production, and on into the Model 1862N period, Howard therefore decided to embrace an escapement design, used by Adolph Lange and some other German Glashutte watchmakers as well as a few English makers, in which a single pin hung down from one arm of the lever and banked off the edges of a circular hole in the dial plate (Figure 10A). Howard kept with this basic escapement design for several thousand movements until he abandoned this solution for unknown reasons and returned for a long while to using two adjustable banking pins.

Ever dissatisfied with this arrangement, Howard eventually decided to experiment with an English idea that had been little used, even by the English: the resilient banking escapement (Figures 11A and 11B), provisionally patented in 1858 by James Ferguson

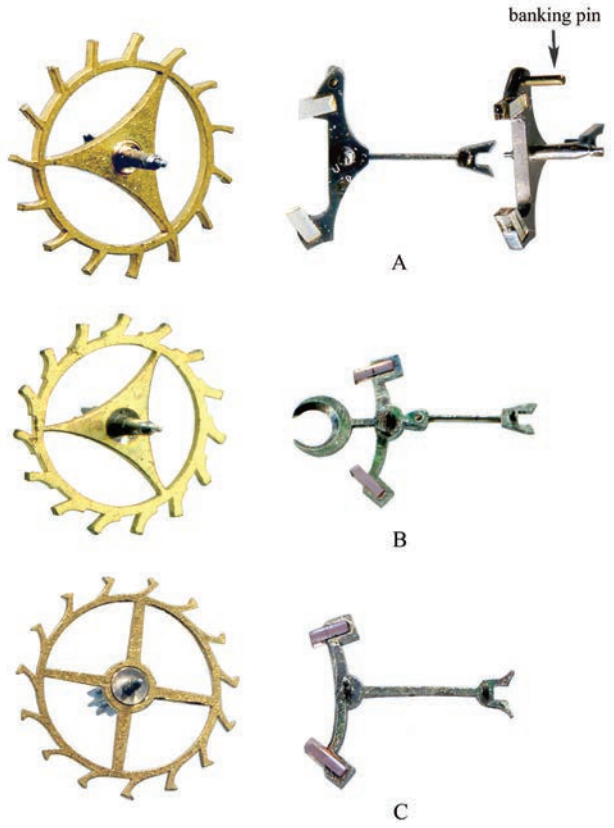

Figure 10. E.H. & Co. 1862N escapements: **A.** Escape wheel with three spokes, blunt teeth, no counterpoise, and pronounced asymmetrical lever (No. 4,604); **B.** Escape wheel with three spokes, toe-ended teeth, and a weakly asymmetrical lever with an open crescent counterpoise (No. 7,197); **C.** Escape wheel with four spokes, pronounced club foot teeth, and a weakly asymmetrical lever with no counterpoise (No. 21,802). PHOTOS BY ALAN MYERS.

Cole (1799–1880) in patent application No. 443. Cole did not apparently follow through with a full patent application. Cole's invention not only altogether resolved one of Howard's pet peeves, banking pins, but it also prevented the possibility that the fork of the lever could be jolted outside of the roller jewel—a condition known as being "overbanked"—thus jamming the escapement and stopping the watch.

At a time when bounding about on horseback was a common means of conveyance, stoppages due to shocks were much on the minds of more than a few watchmakers. For this reason, the prominent English maker Charles Frodsham advised customers in Spain, where equestrianism was especially prevalent, to choose his lever watches in preference to his pocket chronometers, which were even more prone than lever watches to "set" when jolted.[10] One enterprising, independent American maker patented an odd lever movement design with two balance wheels that was intended to prevent stoppages due to shock.

This unwieldy arrangement appeared on a few movements engraved "Horseback Precision."[11] And circa 1900, the A.W. Co. even made one special Cole's escapement movement with No. 12,000,000 that was reported by one source to have been presented to the original "Rough Rider," President Theodore Roosevelt.[12]

The introduction of Cole's escapement is where the banking pin story and the escape wheel tooth evolution story converge. For here, the pallets bank off the back sides of the redesigned escape wheel teeth. As such, in the event of a sudden shock of the sort that might cause a conventional lever escapement to overbank, a resilient escapement would quickly recover and continue operating without interruption. In order to allow the escapement to function resiliently, the now superfluous banking pins and the horns of the pallet lever were eliminated. But if Cole's escapement eliminated one problem—overbanking—it may have created another. Banking pins were used to fine-tune escapement action, so without them it was entirely up to the precision of the manufacturing process to consistently reproduce escapement parts with sufficient accuracy for good performance. By his own admission, Howard's manufacturing capabilities were not up to this task without recourse to costly hand finishing, or at least batch matching. In a letter to William H. Keith, who had served as president of the A.W. Co. from 1861 to 1866, Howard conceded:

> The interchangeability of parts, however, was found not to be practicable in the finer parts. It never has been to this day, *and never will be* [authors' emphasis], as the fine pivots, jewels and parts of the escapement have to be selected and properly matched. It was found impossible to make the fine parts near enough alike to dispense with selecting and matching.[13]

The Howard factory records make no mention of movements having Cole's escapements, so precise production figures for Cole's escapement movements are not available. The absence of any reference in the factory records to Cole's escapement perhaps tells us that Howard may have been somewhat ambivalent about committing to this design or that he may have regarded Cole's invention as much as a cost-reduction measure as an added quality feature. It apparently did not affect the assessed inventory value. An alternate possible explanation for this omission in the records is that Cole's escapement was an English invention for which no use agreement was negotiated, so Howard may not have wished to clearly identify its use in the written records. In any case, Cole's escapement movements were not well received in the trade, for which reason only about 500 Model 1862N movements were made with this feature,[14] and many that were made later were converted back to the standard banked-lever form. Many others merely had banking pins added. The reason for their rejection by the trade is not known, though potential difficulties in tuning escapement action without banking pins may have been a factor. Some extant examples are known to keep excellent time, however, so Cole's escapement movements may have been poorly received simply because they were different and repairmen weren't comfortable maintaining them. Model 1862N movements known to have Cole's escapements are given in Table 7,[15] although some of these may have banking pins added. Removal of these banking pins, a reversable operation, enables such a movement to function resiliently, as originally designed.

Approximately another 500 L-size Model 1869 Cole's escapement movements were made roughly contemporaneously with the Model 1862N Cole's movements. Of all these movements, of both N- and L-size, relatively few fully adjusted, higher-grade examples have been seen, which makes nickel-plated and damaskeened movement No. 23,469 (Figures 11C and 11D) especially unusual. It is one of only five documented examples of top grade $125 Model 1862N movements with Cole's escapements, all of which fall within two consecutive 10-lots and a serial number range of fewer than 20 numbers. This movement also exemplifies the scarcer "collar piece" style of Reed's patented regulator.

It must be noted that Cole's escapement was neither the last nor the most successful episode in Edward Howard's long quest to eschew banking pins. In the watch models following the Model 1862N that were introduced in 1869 (L-size), 1871 (N-size), and 1874 (G-size), Howard hit upon the idea of banking the pallet lever off the sides of the lever bridge itself. This idea still may have required some filing of lever bridge sides to tune escapement performance, but it nevertheless reduced parts and complexity and may have streamlined gilding operations while still allowing for escapement tuning. This banking approach was successful enough that the company continued using it until the end of its watchmaking history in 1903, long after Edward Howard withdrew from management in 1881.

Escape Wheel Design and Lift Division

The escape wheels seen on the early Model 1862N movements have three spokes (Figures 10A and 10B) and slender, toe-ended teeth. These wheels

give impulse to levers with broad pallet stones (0.9 mm diameter) and no counterpoises (Figure 10A). In these escapements, lift is therefore mainly on the pallets. Banking is achieved in these aforementioned Lange-style escapements by a long pin that hangs down from one pallet arm and banks against a circular hole in the pillar plate (Figure 10A). In later Model 1862N movements with two banking pins in the dial plate, the pallets are significantly narrower than those in the earlier single-pin escapements, whereas the escape wheel, which is otherwise similar, has broader teeth, resulting in more evenly divided lift (Figure 10B). The lever has a counterpoise that may be a complete circle or an open crescent (Figure 10B).

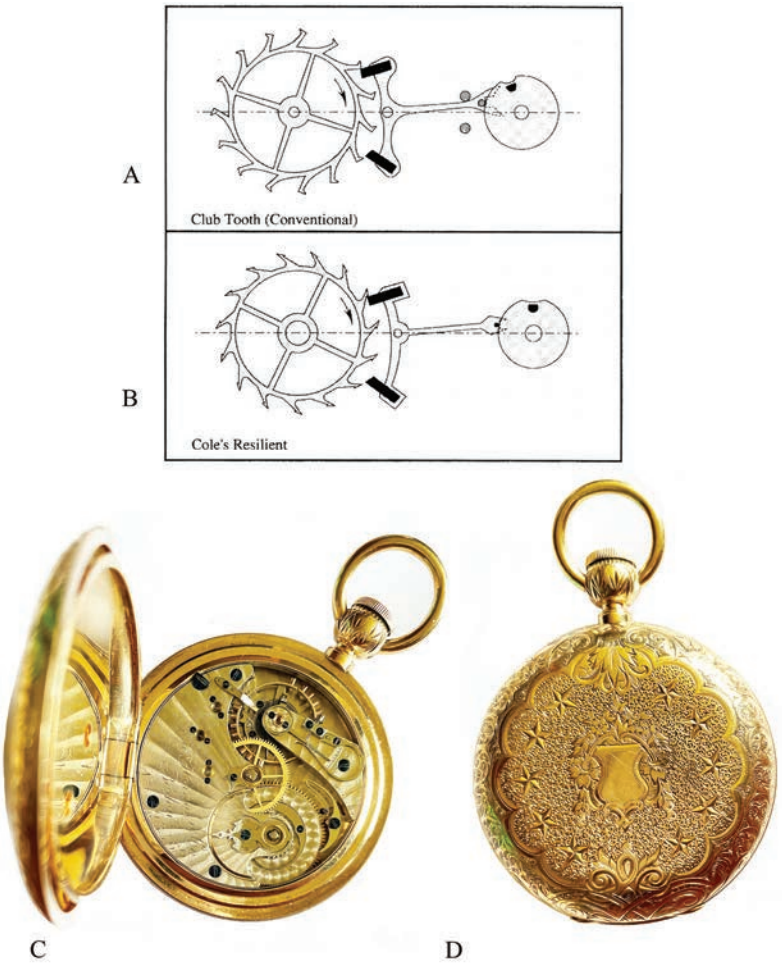

Figure 11. A. Line drawing of a conventional club-tooth escapement; **B.** Line drawing of Cole's resilient escapement. DRAWINGS IN 12A–12B BY STEPHAN HELFANT FROM CHAMBERLAIN; **C.–D.** Grade {4-3R-3} nickel-plated and damaskeened movement No. 23,469, fully adjusted to HCI6P with screwed-down top-plate jewel settings and Reed's Type 2 whip spring micrometer regulator, finished on May 5, 1870. PHOTOS IN 12C–12D BY ALAN MYERS. It is one of approximately 142 nickel-plated, damaskeened Model 1862N movements. The five confirmed nickel–Cole's examples range from serial numbers 23,464 to 23,476. The 4 oz. 18-kt. gold case with star-and-swirl pattern engraving carries the trademark of Levison Brothers, "L. B.," San Francisco retailers. This watch was exhibited at the 2002 NAWCC National Convention, "Boston: Cradle of Industrial Watchmaking," in Boxboro, MA.

In the last Model 1862N movements produced, the pallet stones are narrow (0.5 mm diameter). On these movements the escape wheel has four narrow, rectangular spokes (Figure 10C), and the teeth have fully developed club feet. Movements up to around No. 12,567 have a crescent-shaped counterpoise, but in later examples the counterpoise is absent.

Three Model 1862N movements, Nos. 3,342, 5,933, and 6,456, have been recorded as having levers with upright pallets.[16] We have neither illustrations nor detailed recorded descriptions of the escapements in these movements. We assume that these substitute escapements are from the previous Model 1858 divided-plate movements, as no other lever types with upright pallets are known. Fitting an upright pallet lever and escape wheel to a Model 1862N movement may not have been a straightforward operation. Although the early Model 1862N movements were already using some leftover Model 1858 parts such as the crescent lever cock, No. 6,456 likely has a circular lever bridge. The earliest thick Model 1862N movements have single-pin Lange-style banking, and such a movement would have required the addition of two banking pins in the dial plate. The reason or justification for these inorganic chimeras is unknown.

Other Finishing Details

Various Model 1862N finishing details possess both cosmetic and utilitarian attributes. For example, Model 1862N movement plates were gilded, "gold flashed," (Figure 12A) or nickel plated (Figure 12B). Both gilded and damaskeened plates were complemented by engraving on brass parts, and graceful polishing, blueing, and beveling on accompanying steel parts. Like gilding and flash plating, polishing, blueing, and beveling also tended to improve corrosion resistance. The earliest known gold-flashed and damaskeened Model 1862N movement is No. 3,622.[17] Like the later gold-flashed examples, that movement is also fully adjusted to isochronism, heat and cold, and six positions (HCI6P) and has screwed-down top-plate jewel settings. The latest example known to the authors is No. 24,509. The lowest numbered nickel-plated Model 1862N example known is No. 18,097, but the earliest example is likely No. 21,561. The latest example of which we are currently aware is No. 26,598.

Figure 12. A. Grade {3-3-3} gold-flashed and damaskeened movement No. 15,703, fully adjusted to HCI6P, with screwed-down top-plate jewel settings and Mershon's Type 2 rack-and-pin regulator, finished probably in 1866–67. This movement, which is one of approximately 300 gold-flashed and damaskeened Model 1862N movements, predates the introduction of nickel-plated finish; **B.** Grade {4-3R-3} nickel-plated and damaskeened movement No. 21,574, fully adjusted to HCI6P, with screwed-down top-plate jewel settings and Mershon's Type 2 "curved T" style, rack-and-pin regulator. Both watches shown here were exhibited at the 2002 NAWCC National Convention. PHOTOS BY CLINT GELLER.

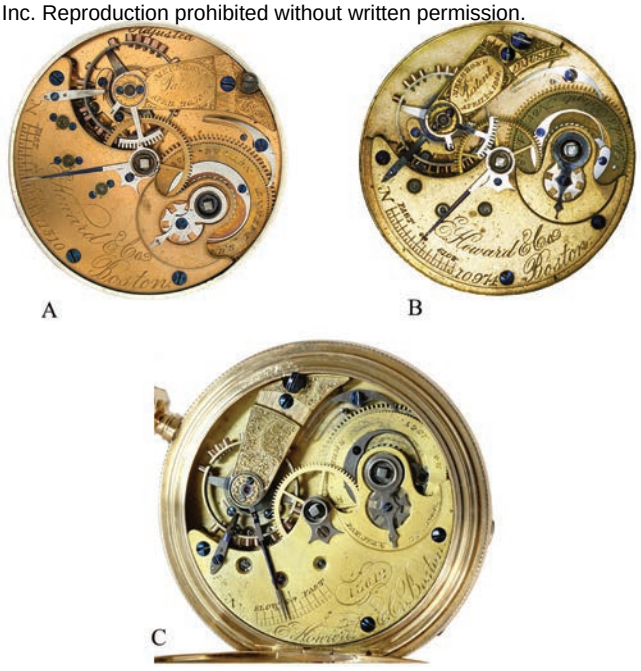

Figure 13. Adjustment inscriptions on E.H. & Co. 1862N movements: **A.** With "Adjusted" on the dial plate; **B.** With "Adjusted" on the balance cock; **C.** Edward Howard's July 24, 1866, plate design patent on No. 13,612. REPRODUCED COURTESY OF JONES & HORAN HOROLOGICAL AUCTIONS, JONES-HORAN.COM.

Brass surfaces were prepared for gilding by roughening with a wire brush. The gold damaskeened 1862N movements have a more reflective, specular appearance than conventionally gilded surfaces. This difference suggests that a physical vapor deposition process known colloquially as "gold flashing," without a preceding roughening step, was employed in their creation. Gold-flashed and nickel-plated brass surfaces were damaskeened prior to plating. The ray damaskeening pattern used on both the gold-flashed and the nickel-plated Model 1862N movements was centered asymmetrically on the barrel arbor rather than the center wheel, in order, as mentioned, to draw the eye to Reed's patented invention. Only the damaskeened Model 1862N movements—both the nickel-plated and the gold-flashed ones—have a groove milled in the top plate at the base of the raised section carrying the stopwork. This groove was cut in order to provide the damaskeening tool with a graceful edge on which to terminate the pattern.

Lever bridges are most often plain, but on nickel-plated movements the lever bridge is engraved, as in Figure 12A. Balance cock engraving varied most of all from movement to movement, often incorporating whirls, floral designs, or stars, as in Figure 4. Most nickel-plated movements in particular have an area of engraving at the base of the balance cock, but there are exceptions (Figure 8A). Adjustment markings, where present, whether "ADJUSTED" or "HEAT & COLD," nearly always appear on the balance cock, either along the base or on the edge facing the center wheel (Figure 13B), but very rarely may occur on the pillar plate (Figure 13A). Short, plain regulators and Reed's patented regulators also had their index scales on the balance cocks.

When present, Mershon's "April 29, 1859" patent marking usually is engraved on the balance cock in parallel straight lines, which sometimes are enclosed in an oval (Figure 14.2A), and which sometimes are not (Figure 14.1B). This patent marking began to disappear shortly after No. 16,500. When present, the date of George P. Reed's November 24, 1857, protective main wheel patent always appears on the main wheel of a Model 1862N movement, but this patent marking began to disappear shortly after No. 23,400. The third date seen on Model 1862N movements is for Edward Howard's July 24, 1866, plate design patent, which is engraved on the curved edge of the raised section of the top plate carrying the exposed stopwork (Figure 13C). This patent marking appears sporadically on movements with serial numbers between approximately 12,225 and 16,779, but it also turns up on movement No. 5,811, which clearly was finished out of sequence. Several movements in this serial number range with Mershon's regulator carry all three patent dates. Neither Reed's regulator patent nor James Ferguson Cole's resilient escapement provisional patent (an English one) were ever marked on Howard watches. Reed *did* mark his regulator patent on some of his own watches.

The company signature may appear engraved in two curved lines (Figures 7A and 7B), two straight lines (Figure 4A), or on a single line (Figure 4B) on the train plate. The most frequent signature position, whether engraved on one line or two, is near the outer edge of the train plate. The serial numbers on the earliest Type 1A movements are situated on the train plates adjacent to the balance wheels (Figure 4A). On later movements, the serial number is moved closer to the outer edge (Figure 5B) or above or below the company inscription (Figure 5A). The serial number usually is unadorned, but it also can be found illuminated within ornate scrolls (Figure 7B).

Dials

Dials were consistent throughout Model 1862N production in having three feet at 3.0, 21.5, and 42.5 minutes. Seconds bits of Model 1862N dials are relatively large, in the style of precision watches of the period, such as those on contemporaneous English pocket chronometers. The dials are fixed by pins that pass through holes in the feet under the pillar plates. Dial types and signature styles are shown in Table 8.[18] In the earliest Model 1862N movements, the dial inscription is in a one-line, script-style (Geller Type 3,[19] Figure 15A), changing to two lines either with both lines in print style (Type 4,[20] Figure 15B), or a script top line and a print-style "Boston" below it (Type 4,[21] Figure 15C). In later movements the E.H. & Co. signature is inscribed in a single-line, printed style (Type 5, Figures 15D–15F). The seconds track may be inscribed either within the seconds bit or around it on the main dial. Rare, personalized Model 1862N dials also are known, on which the hour numerals are replaced by the letters of the original retail customer's name.[22]

Figure 14. Balance cocks of various E.H. & Co. 1862N movements from thick type 1A to thin type 2C. PHOTOS BY ALAN MYERS.

Cases

The Howard firm never manufactured watch cases. Rather, cases for E.H. & Co. watch movements were supplied by numerous independent casemakers (Figure 16). Many, but by no means all, original cases for Model 1862N movements were incused "E. H. & Co." This marking was placed in watch cases, probably by several different suppliers, at the request of the Howard sales offices in New York City and Boston. Some cases even carry both the "E. H. & Co." marking and the casemaker's mark. Other original Model 1862N cases carry no trademarks

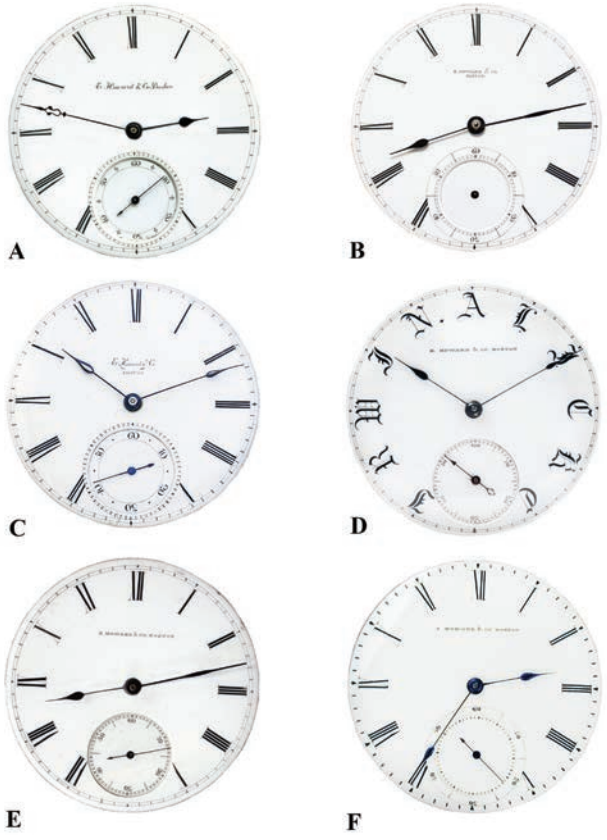

Figure 15. E.H. & Co. 1862N dials: **A.** No. 3,346, one-line script, Roman numerals, minute marks; **B.** No. 5,792, two-line print, Roman numerals, minute marks; **C.** No. 18,812, top line script, bottom print, Roman numerals, minute marks; **D.** No. 17,347, custom personalized dial with one-line print Howard signature and Old English characters at the hour positions; **E.** No. 4,492, one-line print with minute marks; **F.** No. 24,940 one-line print without a separate, sunk seconds dial. PHOTOS BY ALAN MYERS.

at all. Some Model 1862N watches have matching movement and case serial numbers, indicating that some Model 1862N watch cases were made to order for specific watch movements.

Case markings may be those of actual casemakers, or of wholesale or retail jewelry firms. Prominent or otherwise noteworthy markings on Model 1862N watch cases include but are not limited to:

Cooper & Fellows ("C. & F.")

Fellows & Co. ("F. & Co.")

Palmers and Batchelder ("P. & B.," Boston, sometimes erroneously attributed to Peters & Boss)

John M. Harper ("J. M. H.")

Charles E. Hale & Co. ("C. E. H. & Co.," New York City, sometimes erroneously conflated with E. Howard & Co.)

Eliashib Tracy & Co. ("E. T. & Co.," Philadelphia)

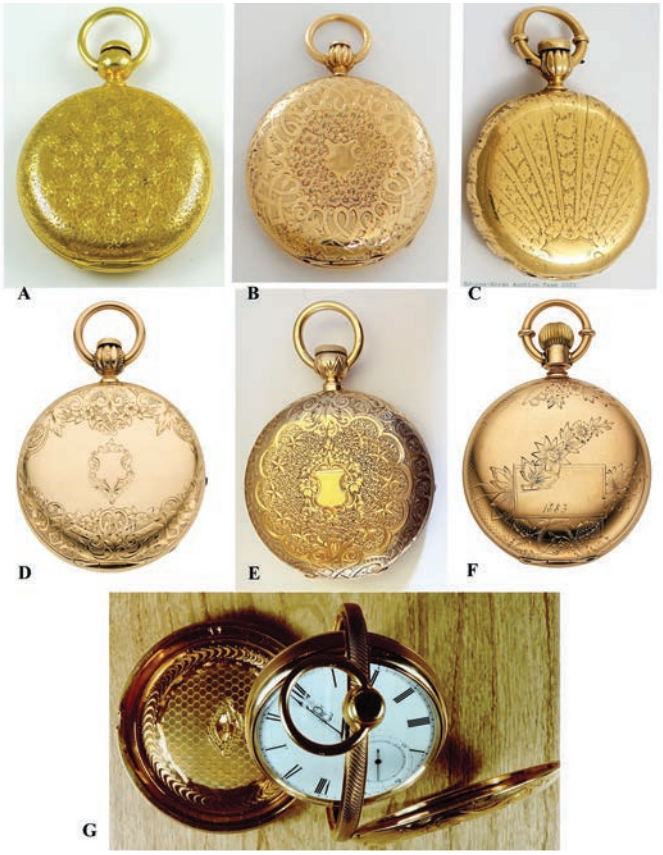

Figure 16. E.H. & Co. 18-kt. hunter cases for the following Model 1862N movements: **A.** No. 19,945; **B.** No. 20,599; **C.** No. 22,486; **D.** No. 15,968; **E.** No. 23,469; **F.** No. 21,840. PHOTOS IN 17A–17F COURTESY OF HERITAGE AUCTIONS, HA.COM; **G.** Reversible case, No. 21,572. PHOTO IN 17G BY CLINT GELLER.

Brooklyn Watch Case Company ("B. W. C. Co.," Brooklyn [separate from New York City until 1898], not to be confused with the defunct Boston Watch Co., which signed its cases "B. W. Co.")

Wheeler, Parsons & Co. ("W. P. & Co.," New York City, after 1867, often appearing together with "B. W. C. F." in small letters on the inside of the dust cover, likely standing for "Brooklyn Watch Case Factory")

Warren & Spadone ("W. & S.," New York City); D. T. Warren & Co. ("D. T. W. & Co.," New York City)

Margot Brothers ("M. B.," Boston)

Celestine Jacot & Brother ("C. J. & Bro.," Philadelphia)

C. & A. Pequignot ("C. & A. P.," Philadelphia)

Baldwin & Co., Newark, NJ (spelled out inside of a circle with a horse's head in profile; makers famous for their hunting-to-open-face reversible cases)

Levison Brothers ("L. B.", a San Francisco retailer)

P. A. Giannini, ("P. A. GI.," San Francisco, a possibly unique, contemporaneous West Coast casemaker with a small but highly prized output)

The particular size, shape, winding/setting, and case screw configurations of E.H. & Co. Model 1862N movements causes cases not specifically made for them to usually fit poorly and/or to require various functional modifications to the case and/or the movement. Signs of an incorrect watch case for a Howard movement include:

- Extra holes in the dust cover
- An extra locating pin hole in the case or a moved or missing pin on the movement
- Removal of the movement dust ring and/or the dust cups
- A spacing washer underneath the case screw(s)
- Milling down of the dial diameter
- Reaming out of the case interior (the most extreme measure)

Most E.H. & Co. Model 1862N movements originally were cased in 18-kt. gold, which wears quickly in regular use unless extreme care is taken. Surviving Model 1862N movements today consequently outnumber surviving original cases by several

to one. Owing to their various special casing requirements, it is often quite easy to tell when an E.H. & Co. movement is in a case made for another manufacturer's movement. However, many Model 1862N movements have been transferred into cases that originally housed other N-size Howard key-wind movements. In fact, interchanges between Howard movements and the contemporaneous cases that were made for them were designed to be undetectable. As a result, except in special instances such as when movement and case serial numbers occasionally match, it is usually impossible to say more than that a particular case was made for some Howard movement of the same model and age as the one it holds. This subject is explored in greater depth in a previous *Bulletin* article by Geller.[23]

Conclusions

The Model 1862N was one of the most successful movements produced by E.H. & Co. Over a period of 10 years, more than 23,000 of these movements were manufactured. The Model 1862N movements can be viewed conveniently as consisting of two types that we call Type 1 and Type 2. These types are most easily recognized by the position of the balance wheel. In Type 1 movements the balance wheel lies above the center wheel, whereas in Type 2 movements it lies below the center wheel. In addition, the Type 1 movements have a scythe-shaped escutcheon, whereas the Type 2 movements have a trefoil-shaped escutcheon or in late models have no escutcheon. Types 1 and 2 each have a number of subtypes, and these are enumerated on page 256 and page 257, respectively.

This innovative three-quarter plate design enabled reduced movement thicknesses without sacrificing reliability. Many Model 1862N movements were fully adjusted to temperature, isochronism, and six positions, making them the only fully adjusted American watch movements of their time, except perhaps for a relatively very small number of contemporaneous top-grade Waltham movements. Reed's whip spring micrometer regulator was debuted on this model, and damaskeened finishes, both gold-flashed and nickel-plated, found their way into regular Howard movement production. Notable escapement variations, unique in the American industry, appeared and disappeared during Model 1862N production, underscoring Howard's penchant for experimentation and his restless quest for excellence.

We have highlighted the key structural evolutions as distinct movement "types," which we hope may serve as a richer basis for future communication among collectors. In Part 1 we presented possible evidence and accompanying reasoning to support the contention that Daniel Bucklin Fitts may have been involved with the development of the Model 1862N design. The Model 1862N was the only Howard watch model whose plate design was patented, and this could have been why Howard took this step. Furthermore, the important change from thick to thinner plates that took place during the Model 1862N production period was probably planned before the first thick Model 1862N movement was completed, but certain details of the succeeding thin-plate variant were finalized later.

Acknowledgments

The authors are grateful for the invaluable insights offered by watchmaker John Wilson, and by the extensive access graciously offered to his collection by Don Barrett. We also thank the NAWCC Managing Editor, Laura Taylor, and the publications team for their fine editorial work in the production of this article.

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Dr. Alan Myers is Professor Emeritus of zoology at the National University of Ireland. He has studied E.H. & Co. pocket watches for a number of years and has published several articles on them. He is the author of two books for IWC Schaffhausen on their early pocket watches as well as several articles on Swiss 19th-century pocket watches. He has also written articles on English Bonniksen karrusel pocket watches. Dr. Myers can be contacted via the *Bulletin* editor.

Dr. Clint Geller is a materials physicist living and working in Pittsburgh, PA, as a Senior Advisor Scientist for Materials Design, Inc. He is the author of two NAWCC books and 15 previous *Bulletin* articles. He chaired two NAWCC national seminars, and he guest-curated a special exhibit on Civil War timepieces at the National Watch & Clock Museum. Dr. Geller was made an NAWCC Fellow in 2003 and a Silver Star Fellow in 2022, and he received the NAWCC's James W. Gibbs Literary Award for excellence in horological literature in 2009. He can be contacted either through the NAWCC Forums (mb.nawcc.org) or through his blog, ClintGeller.com.

Research Activities & News

Private Label Watches: Documented or Not

BY THOMAS L. DE FAZIO, NAWCC FELLOW (MA)

Introduction

Private label watches have long fascinated me. With few interesting exceptions, they have not been qualified as standard watches by North American railroads. Also with few interesting exceptions, and similar to most American factory-made watches, they were seldom of the highest grade and generally not adjusted for positions, temperature, or isochronism. Some of the finer Swiss run-of-the-factory watches, including some of those of Patek Philippe, Vacheron Constantin, or C. H. Meylan, made before World War I, went unrecognized in flea markets and in NAWCC meeting marts. So, while a collector may be hunting markets for finer things, like examples of unusual but well-recognized detached escapement watches, or well-recognized standard railroad watches, that collector might find pieces of interest or even of quality, at low prices, among private label watches. And examples from Patek Philippe, Vacheron Constantin, and C. H. Meylan? Generally, finer Swiss factory watches have one or more distinguishing features, such as bridge patterns, small trademarks, or other "tells." Once these are known from experience, one can more confidently spot such sleepers.

One can read about private label watches in two commonly found, commonly used but out-of-print references that contain much information about private label watches: *American Pocket Watches* by Ehrhardt and Meggers[1] and *Complete Price Guide to Watches* by Gilbert et al.[2] *American Pocket Watches* addresses American-made watches exclusively, though it does something that *Complete Price Guide to Watches* does not do. *American Pocket Watches* lists individually all of the very many private label watches that had come to the authors' attention by the book's publication date. Additionally, Richard Meggers was an enthusiastic collector of pocket watches of the Illinois Watch Co., which produced many private label watches. So, the book is an excellent reference for any collector specifically interested in American private label pocket watches. While *Complete Price Guide to Watches* addresses Swiss, English, German, French, and other foreign-made watches, it has no mention of the many Agassiz, Lange, Grossmann, Patek Philippe, Meylan, Vacheron & Constantin, and A. P. Walsh or other English makers' products marked for American, Canadian, or South American houses.

Private Label Watches That May Have Had, or Did See, Railroad Use

The Pennsylvania Railroad commissioned some railroad-owned American Watch Co. (Waltham) and National Watch Co. (Elgin) full-plate watches of high grade that were loaned to locomotive engineers to use for timing their trains during the 1870s. While the experiment was less than successful, one could call the watches "privately labeled."[3] There was a later period, before ca. 1895–1900, when various railroads recognized a need for accurate, system-wide and train-borne timekeeping, to use their lines closer to capacity, and imposed various timekeeping systems to attain system-wide accurate time. Different railroads specified different requirements as to who must carry a watch and the specific makers, features, and grades of watches that needed to be carried. It is speculation to suggest that some private label watches of known make and grade would be approved by the watch inspectors of various railroads. An example is suggested by Figure 12 of De Fazio.[4] It shows a then-modern ca. 1895 private label Waltham model 1888 "Riverside" grade, adjusted, 17-jewel watch, sold by and marked for a Waycross, GA, watchmaker, George R. Youmans. At the time, Waycross was a small town of 4,000 to 5,000 people, but it was a rail junction for several railroads. While it is speculation, it seems likely that Youmans was a watch inspector for one or more railroads, and that one or more adjusted 18-size or 16-size and 15- or 17-jeweled watches with his name were used on one or more of the railroads that met at Waycross late in the 19th century: the Waycross Air Line Railroad, the Abbeville & Waycross Railroad, and even the Atlantic Coast Line Railroad. The sale of Waltham watches marked for George R. Youmans of Waycross, GA, offered fine watches to southeastern Georgian railroaders with casual

Figures 1A and 1B. An 18-size watch made by the Illinois Springfield Watch Co. ca. 1890–94. It is numbered 1,247,819, and is Model 6, Grade 99. With gold balance weights, patent regulator, and top plate train jewels in settings, it looks like a mid- to high-grade 15-jewel watch, but it is not. It has no dial-plate train jewels; it is merely an 11-jewel watch. It is shown as found. AUTHOR'S PHOTOS.

knowledge of watchmaking, without its buyer risking the opprobrium of owning an obviously Yankee-made watch.

Webb C. Ball may have done the most to codify criteria for standard watches for railroad use, one of the early standards being to ban private label watches. Ball was responsible for railroad timekeeping on all or part of six railroads prior to taking responsibility for setting standards for timekeeping on Vanderbilt's Cleveland, Cincinnati, Chicago and St. Louis Railway (CCC&StL Rwy), the "Big Four." Ball offered what were essentially private label watches, "Ball's Standard" railroad watches, produced by his friend John Dueber's Hampden Watch Co. of Canton, OH, as shown in a previous *Bulletin* article.[5] Many of Ball's first Hamilton-made 18-size, 17-jewel Grade 999 watches were also private label watches, carrying the names of Ball's qualified watch inspectors and sellers. Figures 15A, 15B, 16, and 17 in my September/October 2021 *Bulletin* article[6] bear witness. Some also would say that the reputed parts' interchangeability of Hamilton's 992-B and its derivative 999-B for Ball makes the Ball 999-B simply a private label Hamilton 992-B. Perhaps to assert so is a step too far for most collectors; perhaps it stretches their concept of a private label watch.

A Pair of Interesting Private Label American Watches

The first example was made by the Illinois Springfield Watch Co. ca. 1890–94. The movement is marked for "E. M. Beckwith" and the dial for "E. M. Beckwith, Torrington. Conn." (Figures 1A and 1B). Of 18-size, it is numbered 1,247,819, and is Model 6, Grade 99. A first impression is of a mid- to high-grade watch of 15 jewels with a whiplash regulator (micro-regulator) on a flat hairspring, all top-plate train jewels in a gold-like composite setting, and balance weights that appear to be of gold. But it is merely an 11-jewel watch. The top-plate jewels in settings are not matched by any train jewels in the dial plate. The Roman dial is single sunk, but it is lined in black to casually appear as a double-sunk dial. It has fine Swiss-style Breguet-type hands. Torrington at the time was a small industrial and mill town of about 10,000 people in northwest Connecticut. It was on the Naugatuck Railroad, which became a branch of the New York, New Haven, and Hartford Railroad (NYNH&H RR, the "New Haven") in 1887. Torrington was not a division point on the railroad, and the town's watchmaker (or watchmakers) was probably not a qualified railroad watch inspector. Beckwith's private label Illinois

Figure 2. E. M. Beckwith's Torrington, CT, store, ca. 1894 to as late as 1903.

watch, Grade 99, is a low-grade 11-jewel watch, but it is well turned out, giving the appearance to a casual viewer of a high-grade watch. Likely, Beckwith, or possibly the Illinois Watch Co., probably made that up-market appearance as a choice, allowing Beckwith to offer a good-looking and well-running American watch at a modest price. Its Bay State case seems in keeping with that philosophy; it is pressed-engraved, its thinly gold-filled case is inexpensive, its gold largely worn through. An image of the approximately 18" front of Beckwith's jewelry store was printed in *The Torrington Register: Souvenir Edition* of 1897 (Figure 2).[7]

E. M. Beckwith escaped notice by Ehrhardt and Meggers, suggesting that he may not have commissioned very many private label watches. According to Tom Brown,[8] Beckwith opened his Torrington store in 1894. By 1903, Beckwith operated in Niantic, CT, on the Long Island Sound coast;[9] one may infer that Beckwith's Torrington store no longer existed. A less than 10-year tenure in the small, industrial town of Torrington also suggests that Beckwith commissioned few private label watches.

3A

3B

Figures 3A and 3B. An 18-size movement made by John Dueber's Hampden Watch Co. ca. 1909. It is marked "Hampden" in a unique elongated and decorative fancy gilt script, and "Hampden Watch Co." on the double-sunk Arabic numeral railroad dial. Numbered 2,810,510, it is Model 3, Grade "No. 111," and is pendant-wound and -set. One's first impression is of a high-grade watch. However, it is an unadjusted movement of middle grade, finished as a top-grade watch. It is one of a mixed lot of 1,000 or fewer uniquely finished open-face and hunter movements exclusive to the W. J. Johnston Co. of Pittsburgh, PA. Not marked for Johnston, it may more properly be called a contract watch than a private label watch. AUTHOR'S PHOTOS.

The second example, a movement, is interesting too. It was in a box of odds and ends, uncovered and unprotected, seen at an NAWCC Chapter meeting. It is marked "Hampden" on the movement, and "Hampden Watch Co." on the double-sunk Arabic numeral railroad dial (Figures 3A and 3B). Of 18-size, it is numbered 2,810,510, made ca. 1909, and is Model 3, Grade "No. 111," pendant-wound and pendant-set. One's first impression is of a high-grade watch. It is marked for and has 17 jewels, with a Hampden patent regulator (micro-regulator) on a Breguet over-coil balance spring. All top-plate train jewels are of gold or a gold-like composite, and its balance weights are of gold. It has nickel plates, with a unique damascening pattern of centered wavy circles. The movement's engravings—"17 Jewels; Safety Pinion; 2810510"—are all gilt, and "Hampden" is in an elongated and decorative gilt fancy script not seen elsewhere. What is missing is "Adjusted." It is apparently an unadjusted movement, albeit finished like a near top-of-the-line railroad watch.

2,809,845	16	17	ON4P	U	No. 600
2,809,934	16	17	ON4P	U	No. 600
2,810,002	18	17	ON3P	U	[made for W.J. Johnston Co. No. 111]
2,810,226	18	17	ON3P	U	[made for W.J. Johnston Co. No. 111]
2,810,581	18	17	ON3P	U	[made for W.J. Johnston Co. No. 111]
2,810,939	18	17	HN4L	U	[made for W.J. Johnston Co. No. 111]
2,810,967	18	17	HN4L	U	[made for W.J. Johnston Co. No. 111]
2,810,984	18	17	HN4L	U	[made for W.J. Johnston Co. No. 111]
2,811,653	18	15	O	3P	

Figure 4. Excerpt of page 152 in Hernick and Arnold, *Hampden Watch Co.* It shows the 1,000 or fewer lot of mixed open-face and hunter movements for the W. J. Johnston Co.

I went to Hernick and Arnold[10] to learn what I could about the movement. Its serial number listing is interesting (Figure 4). The watch is one of a lot of 1,000 (or fewer) mixed open-face and hunter movements, all made for the W. J. Johnston Co. (WJJ). In *Hampden Watch Co.*, the table of contents has a subheading for WJJ under the heading for Hampden private label and contract watches, leading one to page 107 (Figure 5). The entire page is devoted to the watches of WJJ of Fourth Avenue and Wood Street in Pittsburgh, PA. Recourse to Google Maps shows that WJJ was located in downtown Pittsburgh, among large office buildings of the city, soon after the turn of the century (Figure 6). A quick internet search shows that WJJ published a large catalog of Hampden (and other) watches of all grades, railroad watches as well, pictured and priced. Page 107 of *Hampden Watch Co.* states that the damascening and the script "Hampden" on the watches for WJJ are "special" (meaning unique?).

Perhaps WJJ's watches are better called "contract watches" rather than "private label" watches; no dials or movements have been found that are marked for W. J. Johnston. Similar to a previously described private label Illinois Grade 99 watch marked for E. M. Beckwith, WJJ made finely finished, well-turned out but not adjusted Grade 111 Hampden watches. WJJ spent its money on the appearance of its contract watches but was not willing to spend its money for careful adjustment, since that work would involve the time of the most highly skilled watchmakers in the maker's employ. This methodology allowed the company to offer a fine-looking and well-running American watch at a modest price.

Conclusions

Some private label watches offer an interesting backstory for those with the time and interest to dig a bit. The internet offers one means for exploring for such stories. And for at least one particularly interesting movement, some of the surprising details were found in a quarter-century old NAWCC Special Order Supplement.

Notes and References

1. Roy Ehrhardt and William Meggers, *American Pocket Watches: Identification & Price Guide* (Kansas City, MO: Heart of America Press, 1987).
2. Richard M. Gilbert et al., *Complete Price Guide to Watches*, (Mount Pleasant, SC: Tinderbox Press, 2018).
3. Thomas L. De Fazio, "Pennsylvania Railroad Transportation Department Rules: Who Received the Early American Railroad-Owned (PRR) Railroad Watches? Who Was Required to Carry Time in ca. 1875?" *NAWCC Bulletin* 45, no. 343 (April 2003): 169–71.
4. Thomas L. De Fazio, "Webb C. Ball and Railroad Timekeeping," *Watch & Clock Bulletin*, 63, no. 453 (September/October 2021): 340-53.
5. De Fazio, "Webb C. Ball and Railroad Timekeeping," 344, Figures 5 and 6.

Figure 5. Page 107 of Hernick and Arnold's *Hampden Watch Co.* showing the catalog array of Hampden Watch Co.'s exclusively finished movements for W. J. Johnston Co.

107

The W.J. Johnston Company
Fourth Ave. and Wood Street, Pittsburgh, Pa.

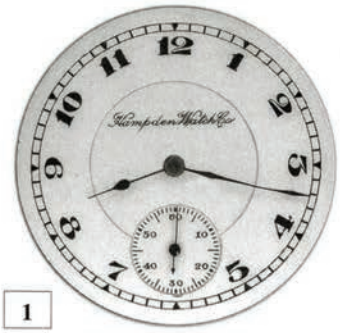
Information is taken from original W.J. Johnston advertising (circa 1911). Watches shown on this page have special damaskeening patterns and "Hampden" marked in script on the movement. They were made for and sold by The W.J. Johnston Company, Pittsburgh, Pa.. To date, none have been reported with "W.J. Johnston" marked dials or movements.

W.J. Johnston Co.
Advertising
(Circa. 1911)

18 Size
18S-17J-ON3L-U-[No. 181]
18S-17J-ON3S-U-[No. 111] (105-6)
18S-15J-ON3S-U-[No. 135] (105-7)

16 Size
16S-21J-ON4S-3P-[No. 260] (105-2)
16S-17J-ON4S-A-[No. 240] (105-9)
16S-15J-ON4S-U-[No. 220] (105-4)

The 1911 catalog states that 16 size movements were also available as hunting style, lever set.



1 **Hampden Watch Co.**
S/N 2770869

2 **16S-21J-ON3S-3P- [No. 260]**
S/N 2770869 - GJS
(made for W.J. Johnston & Co.)

Dials are assumed proper for movement.

3 **Hampden Watch Co.**
S/N 2775691

4 **16S-15J-ON3S-U- [No. 220]**
S/N 2775691
(made for W.J. Johnston & Co.)

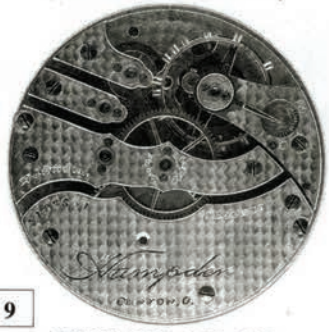
Private Label or Jeweler Contract in [brackets].

5 **Hampden Watch Co.**
S/N 2810226

6 **18S-17J-ON3S-U- [No. 111]**
S/N 2810226
(made for W.J. Johnston & Co.)

7 **18S-15J-ON3S-U- [No. 135]**
(no S/N - illustration taken from W.J. Johnston advertising)

8 **Hampden Watch Co.**
S/N 3129851



9 **16S-17J-ON3S-A- [No. 240]**
S/N 3129851 - (regulator parts missing)
(made for W.J. Johnston & Co.)

6. De Fazio, "Webb C. Ball and Railroad Timekeeping," 349–50.

7. *The Torrington Register: Souvenir Edition*, compiled by H. F. Donlan (Torrington, CT: Register Printing Co., 1897). A description of Beckwith's store appears on page 25 of this publication (https://books.google.com/books?id=vEBDAAAAYAAJ&newbks=0&printsec=frontcover&hl=en#v=onepage&q&f=false).

8. Tom Brown, "Hamilton Grade 938," Internet Horology Club 185, https://ihc185.infopop.cc/eve/forums/a/tpc/f/1086047761/m/451100313?csra=Y&f=1086047761&a=tpc&m=451100313&s=3206049661.

9. *The Jewelers' Circular and Horological Review* 46 (February 4, 1903), https://archive.org/stream/jewelerscircular00unse_44/jewelerscircular00unse_44_djvu.txt.

10. James L. Hernick and Robert F. Arnold, *Hampden Watch Co.*, NAWCC Special Order Supplement No. 1 (Columbia, PA: National Association of Watch & Clock Collectors, Inc., 1997).

About the Author

Thomas L. De Fazio is a retired mechanical engineer and occasional consultant. He holds an industrial arts diploma from South Philadelphia High School, and S.B., S.M., and Sc.D. degrees from the Massachusetts Institute of Technology. He taught engineering at the Florida Institute of Technology. He did design work or research in inertial navigation systems and sensors, geophysical instrumentation, industrial robotics, undersea systems, environmental issues, and complex product assembly issues at MIT, at the Charles Stark Draper Laboratory, and at Université Libre de Bruxelles. Most recently, he did innovative work in mobile robotics with iRobot Corp. His work is documented in papers, books, or patents. He is registered as an engineer in Massachusetts and Florida (retired status), and is a member of AGU and ASME. Avocationally, Tom is interested in American and British steam railroading, precision portable timekeepers, and issues in the history of mechanical technologies. He is a lapsed motorcyclist, and an occasional hiker, bird-watcher, bicyclist, and windsurfer.

Figure 6. An early 1900s postcard shows the part of downtown Pittsburgh where W. J. Johnston Co. was located. This image was made a few years before Hampden watch No. 2,810,510 was produced in Canton, OH.

Research Activities & News (RAN) is currently accepting submissions. RAN submissions should be approximately 2,500 words in length, plus images. Contributors may send information directly to Ed Fasanella, RAN Editor, at edwinfasanella@gmail.com.

Donor Recognition

April 2022 to March 2023

Members—and specifically members who give their time and treasure to our organization—are our lifeblood. It is time once again to recognize and thank our generous donors. The NAWCC is back to working at full capacity to bring the story of horology to our members and to the world. We could not begin to do what we do without your generosity.

It is great to be getting back to more-or-less normal activity at the NAWCC. I have been to four Regionals so far this year in Lexington, KY; San Diego, CA; St. Augustine, FL; and Wilmington, OH. Each of these events was bustling with activity, and attendees had smiles on their faces as they listened to the informative lectures and perused the mart tables full of goods. I have also had the privilege of seeing firsthand the progress and the improvements that Executive Director Rory McEvoy, his staff, and a great team of volunteers have made at our Museum, School, Research Library, and headquarters.

The much-touted and now largely complete public time gallery, which is primarily a product of donated clocks, funds, and labor, makes for a stunning and informative way to enter our Museum experience.

We have a newly renovated display that tells the story of Lancaster, PA, watchmaking. We have also received donations of several wonderful collections, among which is a reference group of skeleton clocks, which will soon be on display. Perhaps most importantly, we are beginning work on a new Hamilton Watch Co. gallery that will tell the story of this significant American watch company. All of this progress in telling horological stories is being shared not just with Museum visitors but online with video and audio stories the whole world can access. This work has been made possible through substantial corporate and individual donations.

There is a lot to celebrate, and there is a lot of value in supporting the NAWCC and its mission to be the leader in horological advocacy and education. Please take a few minutes to look over the following list of our donors as we thank them for making our mission and vision possible. We have had a good year, and I hope we will all work together to make this year even better.

—John Cote, NAWCC Fellow (IN)
Co-Chair, Development Committee

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National Association of WATCH & CLOCK Collectors, Inc.

Updated as of 5/8/23

† Denotes deceased.
FNAWCC denotes a recipient of the Fellow Award.
FNAWCC* denotes a recipient of the Silver Star Fellow Award.

National Association of
WATCH & CLOCK
Collectors, Inc.

Tempus Vitam Regit® Society

The Tempus Vitam Regit® Society is composed of members of the National Association of Watch & Clock Collectors, Inc., who recognize that the Association, together with its many resources, represents the pillar of horological preservation, research, and education worldwide.

Members of the Tempus Vitam Regit® Society demonstrate their confidence and encouragement of the varied programs and projects of the Association and realize that their commitment will help secure future services and benefits for all members and Chapters of the NAWCC.

Donations of $1,000 per year for three years are a prerequisite for membership in the Tempus Vitam Regit® Society. Through ongoing unrestriced philanthropic support, the Tempus Vitam Regit® Society strengthens current operations and programs and helps to provide a foundation for future endeavors.

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† Denotes deceased.
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The 1943 HERITAGE SOCIETY

The 1943 Heritage Society is made up of NAWCC members and friends who have given gifts or informed the NAWCC of their intent to give a gift through a will, bequest, or other planned gifts.

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National Association of WATCH & CLOCK Collectors, Inc.

Updated as of 5/8/23

† Denotes deceased.

Become an NAWCC Champion!

The NAWCC is looking for **Champions**: those who believe in the programs, exhibits, events, and services that our organization provides to its members and the public and who financially support these efforts toward building and growing our horological community as well as preserving and sharing the stories of time.

Those who pledge a 10-year financial commitment to the NAWCC are recognized as a **Champion** of the NAWCC and the NAWCC community. The **Champion** distinction is honorary; however, an NAWCC **Champion** is also entitled to:

1. Recognition as a **Champion** in the *Watch & Clock Bulletin*
2. Automatic enrollment in the NAWCC Tempus Vitam Regit Society
3. Ten years of regular membership (any contributory member will be recognized by the category Brass Champion, Gold Champion, etc.)
4. Ten years of free registration for the NAWCC National Convention
5. Special VIP invitations to every Museum exhibit opening event/reception
6. A 20% discount on all NAWCC Museum Store/Gift Shop purchases, including educational classes
7. Exclusive, behind-the-scenes tours of the Museum and Archives collection
8. Permanent recognition on a designated plaque in Columbia, PA

Payments may be made monthly, quarterly, bi-annually, or annually. Recognition may be requested to be anonymous.

To become a **Champion** of the NAWCC, or to learn more, please contact John Cote by email at jcote@comcast.net.

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Doug & Dorothy Cowan
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In Memoriam

John T. Hardy

John Hardy was born on October 30, 1938, and passed away on April 5, 2023.

He was a member of San Jacinto Chapter 139 (Houston area) and served as president from 2007 to 2009. John was an avid clock collector, and he was especially interested in those with wooden movements. His forte was collecting and restoring these movements as well as veneering and restoring original finishes on all clocks he encountered. John taught wooden clock restoration classes, and he was a professor emeritus of mathematics at the University of Houston and Associate Dean. He is survived by his wife, Ann.

—Darrah Artzner, NAWCC Fellow (TX)

Leaping into a Patek Frankenstein

Would I dare
At double almost triple
The most I'd ever spent
And for a franken not even gold
That most would ignore
I didn't sleep I brooded
Like a fiend I burned the web
And smothered experts I could find
Until finally
Knowledge was an empty shell
Then who knows why
Like Kierkegaard I took the leap
Not into faith like him
But into a beautiful
Nostalgic thing
Patek movement 1880s
Patek dial gothic design
Art deco no-name case
(Sterling cushion with onion crown)
So admirable upon my wrist
That I couldn't tell

Here is a poem that deals with the hesitancy and satisfaction of watch collecting. It will probably strike a chord or two with members who collect timepieces. Ray Comeau is a retired dean and director in Harvard's Division of Continuing Education, where he teaches courses dealing with the intersection of philosophy, literature, and management. He is a member of NAWCC Chapters 8 and 87 in his native Massachusetts.

In Memoriam

Phillip John Gale

It is my sad duty, but an honor and a privilege, to write the obituary for Phillip John Gale, who died peacefully, after a short illness, on February 21, 2023.

I was fortunate in that Phil took me under his wing while I studied the British Horological Institute's Distance Learning Course. Phil was always a great talker, and during that time I learned not only those aspects of horology and bench work that one never finds in books, but also of his life in snippets of anecdotes. Because his story came in snippets, I have not been able to assemble the full story in any authenticated chronological sequence; any errors are entirely my responsibility, for which I apologize.

Phil was born in Guildford on October 11, 1947. He became apprenticed at Stevens, the clockmakers in Guildford, in 1963 and attended Hackney College to study the BHI horology course on day release for the next four years. By his own account, homework was often done at the last minute on the train into London.

Phil worked for a number of years at the Royal Electrical and Mechanical Engineers (REME) workshops in Aldershot, where his experience extended from military-issue watches and office clocks to all manner of instruments, instrumentation, calibration, and optics that were in use by the armed forces. Phil married Sally in 1971 and while they were vacationing in Cornwall, Phil passed a factory in Bodmin advertising for instrument makers. He accepted a job there, and they moved to Bodmin in 1975 to work at Flann Microwave, where his work involved, among other things, precision gold soldering waveguides. He was also taking in clocks to repair in his spare time at home, and soon they bought a small property in Nanstallon and so began their long involvement in the Bodmin community. After 15 years with Flann, Phil became a self-employed clockmaker in 1990 to the prestigious clockmakers Galbraith's. Although self-employed, he was put in charge of overseeing the workshop. Some years later he left to work as an independent clockmaker in his own workshop at Criggan and never looked back.

Phil was always an active member of the BHI, becoming a fellow in 1994. He also joined the Antiquarian Horological Society and the NAWCC. He became a Freeman of the Worshipful Company of Clockmakers (WCC) in 1999, Freeman of the City of London in 2000, and Liveryman of the WCC by 2002, when I first met him among the membership of the South West branch of the BHI. I was in need of a career change and plucked up the courage to ask him if he would take me on as an apprentice. We hit it off, and he took me on as a sort of 9 to 5 Saturday apprentice.

Although I did quite well under his guidance, I would never in a lifetime be able to match, or even come close to, his absolute mastery of his craft. Often I would need to phone him with a problem I had. He had the phenomenal ability of describing over the phone, as a detailed, verbal, technical drawing, the part I was having trouble with and what I needed to do about it.

Phil had a lot of high-end clients, having worked on Quare's, Knibb's, Tompion's, and Mudge's. But he was never too proud to take on a 1970s German mass-produced clock for a neighbor, or a friend's neighbor. He was, I think, one of the very few people in the world who could overhaul singing bird boxes, including re-feathering the birds. They were skills he was happy to share and desperate to teach and pass on, and I for one shall be ever grateful for everything he taught me and for all his support and encouragement.

The main love of his life was his beloved wife, Sally, who predeceased him unexpectedly by just a few years. I think that broke his heart. He was my mentor and they were both my friends, and I shall miss them both.

—George Thomas (UK)

In Memory Of

We recognize here those individuals and Chapters whose gifts to the NAWCC were given in memory of fellow members.

James "Bud" Coleman given by P. Calvin Coble Jr.

James "Bud" Coleman given by Carolina Chapter 17

H. William Ellison given by Great Lakes Chapter 6

Billy Fortenberry given by Magnolia Chapter 41

George S. Hudson given by James R. Hudson

Ethel Kuhlmann given by San Diego County Chapter 59

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Mary Thatcher given by Jim & Renee Coulson

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Joe Wilkins given by Kentucky Bluegrass Chapter 35

Joe Wilkins given by Robert & Patricia Burton

Obituaries

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James E. "Bud" Coleman Jr.
119034 Burlington, NC

Ken Ewers
185992 McFarland, WI

Billy D. Fortenberry, FNAWCC
100993 Brandon, MS

Phillip John Gale
182822 Bodmin, Cornwall UK

Lynn Paul Gastinger
87663 San Antonio, TX

Charlie Hoff
184822 Flower Mound, TX

Philip Hrabar
167682 New Orleans, LA

M. Gordon Johnson
185225 Mechanicsville, VA

Ethel "Phyllis" V. Kuhlmann
186990 San Diego, CA

Virginia Norwood
107626 Topanga, CA

Paula Otto
83511 Haw River, NC

Leon Richmond, FNAWCC
13546 Leasburg, NC

Tim Rippon
158967 Palmyra, PA

Dean Rosener
172146 Pleasant Lake, IN

Mary Thatcher
14742 Wilmington, OH

In Memoriam articles for the *Watch & Clock Bulletin* are written to mark the passing of an NAWCC member. Submission guidelines are as follows:

- A maximum of 550 words submitted in a Word document (no PDFs). Including birth-death dates is recommended. Text will be edited for grammar, spelling, style, and word count.
- Images are optional, and there is typically a limit of one image. High-resolution images are preferred (a minimum of 300 dpi or 1,000 kb) and must be submitted as a separate JPG or TIF file. Do not embed the photo in the Word doc. Images of very low resolution/quality may be rejected.
- The author's name and state must be included.
- An In Memoriam will be printed in the next *Watch & Clock Bulletin*. Deadlines are the first of the month, 60 days prior to publication (e.g., the deadline for the March issue is January 1).
- Send Word docs and JPGs or TIFs to editor@nawcc.org.

FNAWCC denotes a recipient of the Fellow Award.

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NAWCC Dates to Remember

All Regional meetings must be scheduled through Convention Committee Coordinator John Koepke by emailing him at jskoepke@comcast.net, calling 510.236.2197, or mailing 2923 16th Street, San Pablo, CA 94806-2362.

For complete information about Regionals, the National Convention, and the NAWCC Ward Francillion Time Symposium, please see the *Mart & Highlights* or go to nawcc.org.

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