In the mid-19th century, the American Watch Company of Waltham, Massachusetts (called "Waltham," for short) led the transformation of the worldwide watchmaking craft into a modern mass manufacturing industry. Never before had any industrial product as complicated as a watch, requiring such fine precision in its intermeshing parts, been mass produced by machine. Automation and interchangeable parts manufacture made reliable timekeepers affordable for the average citizen.

Of the 14 million watches Waltham produced by its revolutionary methods between 1859 and 1905, only a tiny fraction, fewer than 0.1%, represented the company's foremost expressions of technical know-how and craftsmanship. These special watches—the signature "American Watch Company" grade—showcased the company's best and boldest ideas and most elegant finishes.

Surviving "American Watch Company" grade examples of nine Waltham watch models serve as testaments to the ingenuity and drive of watch industry pioneers like Charles Vander Woerd, Charles W. Fogg, and Duane H. Church, whose achievements propelled Waltham's rise. Beginning in the late 1870s, Waltham lavished exquisite and diverse decorative efforts on this flagship grade, creating some of the most beautiful watches ever made.

For this book, two scientists—both longtime watch collectors and devoted horologists—explore the intriguing history of these storied Waltham artifacts, detailing their diverse varieties and technical and decorative attributes.

Shown above is one of the earliest "American Watch Company" grade movements ever made, and possibly the most extraordinary. This pre-Nashua Waltham creation has an 18-size, 17-jewel movement marked as serial number 28,711. It bristles with rare, experimental, and groundbreaking features: a free-sprung helical hairspring, an unusual two-headed cock carrying the pallet arbor and escape wheel, Dennison's patented scalloped-tooth escape wheel, and possibly the earliest known American double-sunk dial.

Geller and Treiman follow the story of Waltham's "American Watch Co." grade from this early beginning through the 1876 Centennial, when Waltham's flagship watches won international recognition and shocked the Swiss industry out of its complacency, to the flamboyant cosmetics of the 1880s, to the more restrained elegance of Waltham's turn-of-the-20th-century bridge models. The authors explain the evolving technical and decorative features of these watches—the brilliant innovations, the audacious gambles, and the noble failures—all revealing the motivations and personalities of their creators.

Collectors interested in gaining a more nuanced appreciation of their "American Watch Company" grade watches, and in understanding the many varieties there are to collect, will turn to this book again and again.

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Waltham's "American Watch Co." Grade, 1859–1905

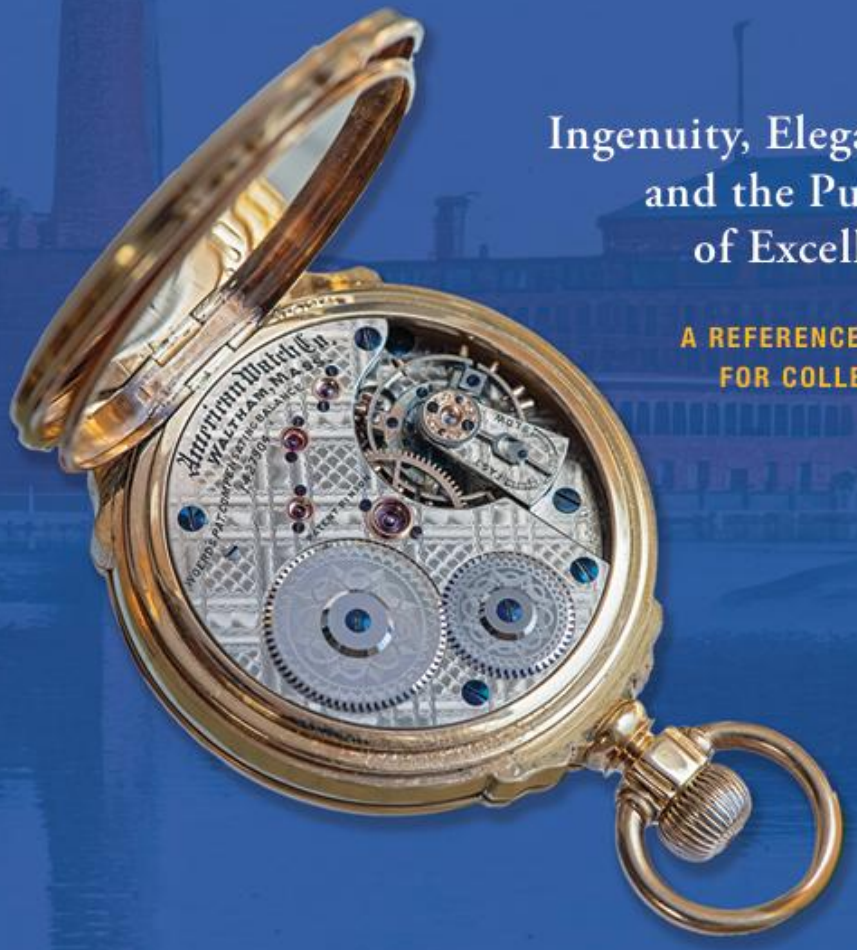
Clint Geller • Jerry Treiman

NAWCC

Waltham's "American Watch Co." Grade, 1859–1905

Ingenuity, Elegance, and the Pursuit of Excellence

A REFERENCE GUIDE FOR COLLECTORS



Clint Geller • Jerry Treiman

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Organization of this Presentation

This presentation is divided into four parts:

Part 1: Introduction & Historical Background: Origin of the AWCo Grade

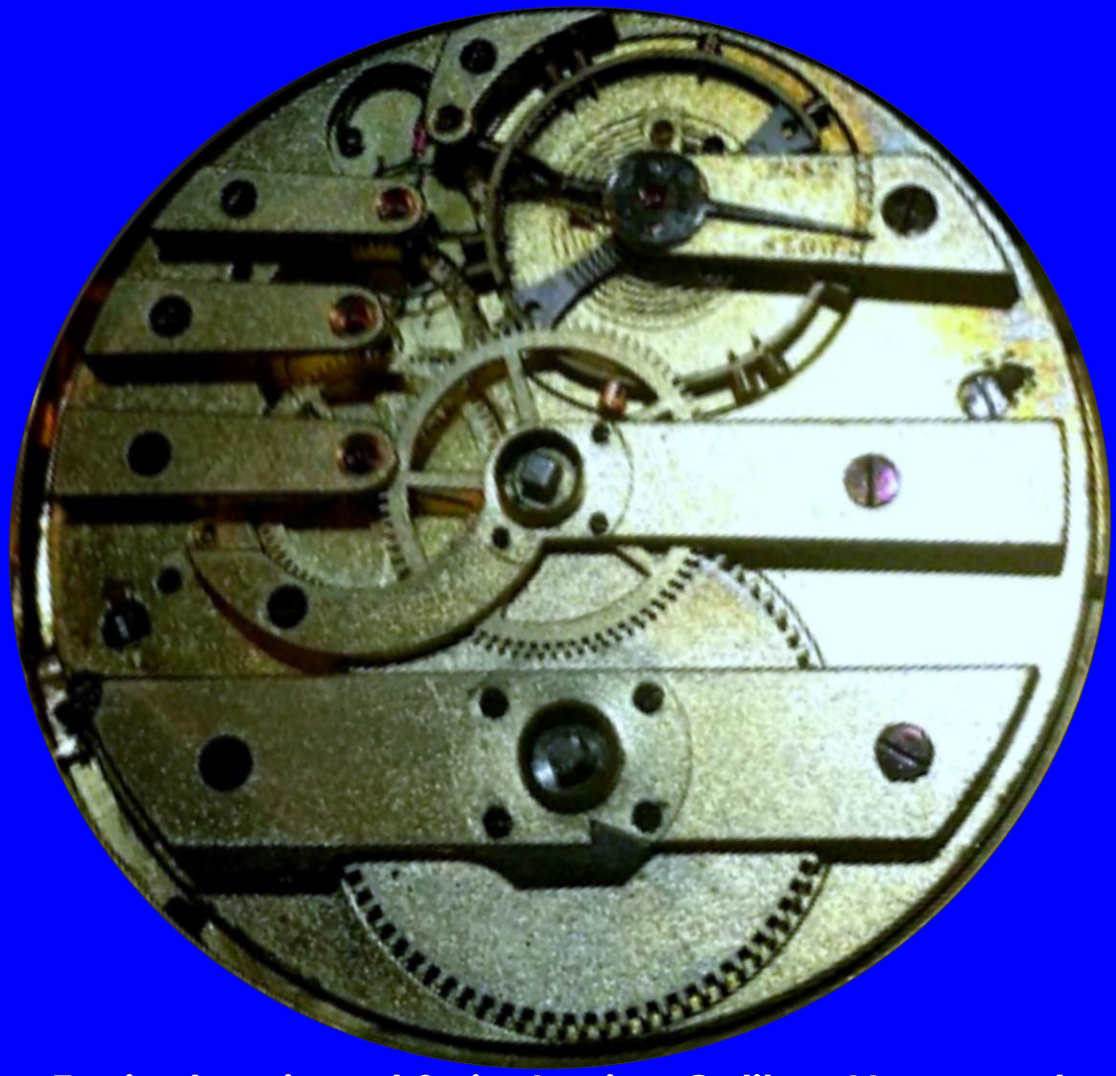
Part 2: The Key Wound and Set 1859, KW20, & KW16 Models

Part 3: The Stem Wound and Lever Set 1868 and 1872 Models

Part 4: The Post-Nashua Dept. Era Pendant Set 1888, 1891, and 1894 Bridge & 1899 Bridge Models

Part I: Preceding Historical Developments

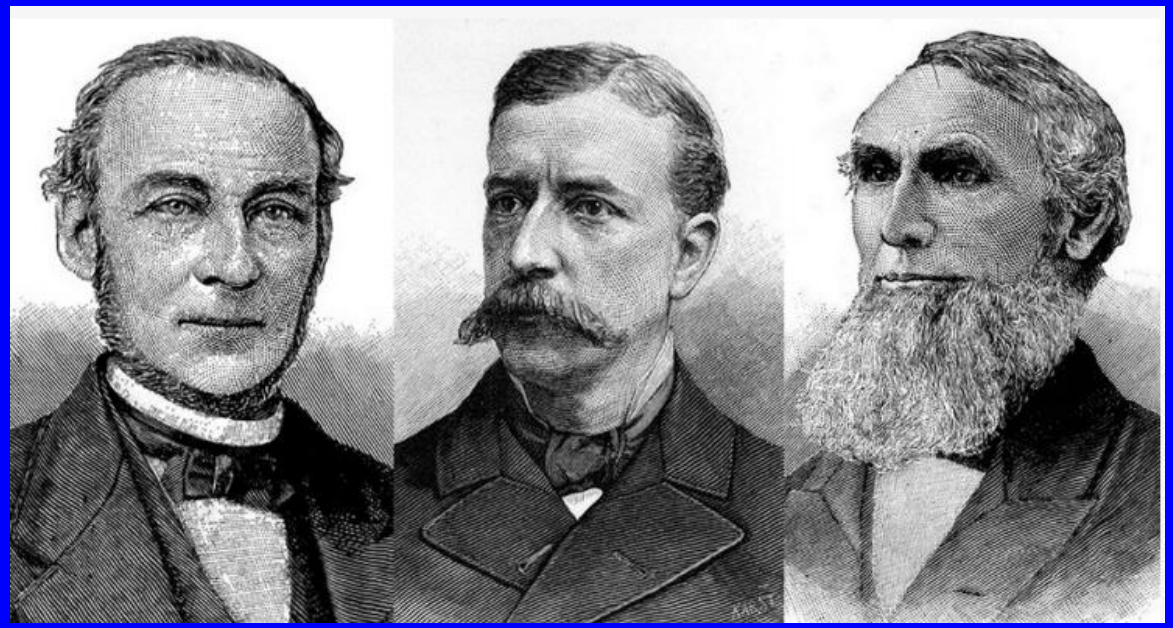
- Before 1850, there were no American watch manufacturers. Nearly all watches were made in Europe.
- European watchmaking was a dispersed craft industry.
- In Europe, numerous small shops made the many individual parts of a watch using manual machinery continuously attended by skilled or semiskilled operators.
- There was little standardization or inter-changeability of parts.



Typical unsigned Swiss Lepine Calibre Movement
Exported to the US in the hundreds of thousands c. 1850-70

The Dawn of American Watch Manufacturing

In 1851, an ambitious Boston entrepreneur Edward Howard, who owned a prosperous and prestigious clock company, and Aaron L. Dennison, a visionary watch designer, combined with financial backer D. P. Davis to form the American Horologe Company with a vision to make watches on automated machinery to interchangeable parts standards in a single, integrated production facility.



Howard Davis Dennison

"Howard, Davis & Dennison" SN #3, made by the American Horologe Co., the earliest direct ancestor of the AWCo, in 1851.
A novel 22/23 size 8-day watch with tandem mainsprings.

By 1853 the partnership was doing business as the Boston Watch Company (BWCo). The BWCo had made great strides in streamlining and standardizing the watchmaking process, but it had insufficient capital reserves to stay the course long enough to realize profits.

Dennison, Howard & Davis “1857 Model” Movement SN 3,330, circa 1855-56

In 1857, the assets of the BWCo were sold at auction. A group of investors led by Royal E. Robbins bought most of the assets. His group came to be known as "Appleton, Tracy & Co."

However, Edward Howard and his partner Charles Rice came away with about 500 movements in progress. Most of these were finished and sold under the name of "Howard & Rice." Both companies initially finished and/or manufactured movements similar to the original BWCo design, which AT&Co named the "1857 Model."

Robbins

AT&Co grade Model 1857 Movement SN 5,026

Legacy BWCo material finished by AT&Co Circa 1858

Howard & Rice Model 1857 Movement SN 6,149

Legacy BWCo Material finished by EH&Co Circa 1858

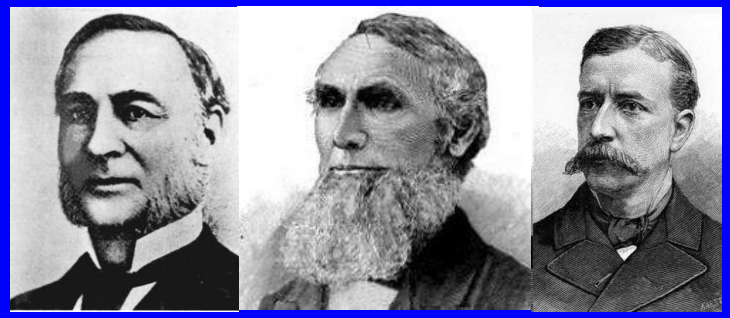
Historical Background, continued

- In 1859, AT&Co merged with the Waltham Improvement Company and reorganized as the American Watch Company (AWCo) as it prepared to meet its first domestic competition from E. Howard & Co., which had just begun production of a new more advanced watch model.
- To meet the moment, the AWCo inaugurated a new, thinner 3/4 plate watch model, the 1859 Model, and a new flagship grade, dubbed "American Watch Company," with 19 jewels and their own patented safety mechanism to protect against escapement damage due to mainspring failures.
- On Waltham's new premier grade, the movement engraving completely spelled out the word "American" in the AWCo name.

Waltham Watch Factory

THE AMERICAN WATCH COMPANY GRADE IN HISTORICAL CONTEXT

Partnership of Edward Howard, Aaron L. Dennison, and D. P. Davis ⟶

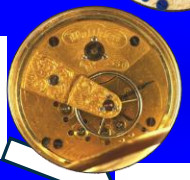


Howard Dennison Davis

American Horologe Co.
Roxbury[a], MA (6 mo.s in 1851)

Warren Manufacturing Co.
Roxbury, MA (1851-1853)

Boston Watch Co.
Roxbury, MA (1853 -1857)



Beginning of the American Mass Production Watch Industry

a: Roxbury was annexed by Boston in 1868

Enter Royal E. Robbins

Tracy, Baker & Co.
Waltham, MA (May-June,1857)

← Dennison & Howard → part ways

Howard & Rice
Roxbury, MA (1857-1858)

Finished pre-existing BWCo "1857 Model" material (last few marked "EH&Co")

Output based on BWCo "1857 Model" design

Appleton, Tracy & Co.
Waltham, MA (1857-1859[b])

b: In 1859 AT&Co. merged with the Waltham Improvement Co. to become the American Watch Co.

E. Howard & Co.
Roxbury, MA (1858-1861)

1st output based on BWCo DH&D SN 5,000 divided plate prototype

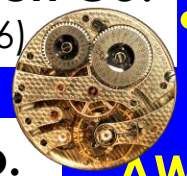
Nashua Dept.[c] created, 1862

American Watch Co.
Waltham, MA (1859-1885)

Nashua Watch Co.
Nashua, NH (1860-1862)

E. Howard Clock & Watch Co.
Roxbury, MA (1861-1863)

American Waltham Watch Co.
Waltham, MA (1885-1906)



E. Howard Watch & Clock Co.
Roxbury/Boston, MA (1863-1902)

Waltham Watch Co.
Waltham, MA (1906-1957[d])

AWCo Grade Production Period (1859 to ~1905)

Howard Watch Co. …
Waltham, MA (1903 to 1910)

The history between 1902 and 1903 is complex

c: The Nashua Dept. existed as a separate department within the AWCo for 15 to 20 years.

d: Except Waltham Watch & Clock Co. (1923-25)

The Historical Significance of the AWCo Grade

For nearly half a century, American watchmaking defined the state of the art in machine manufacturing worldwide. It was precisely during this heyday of American watchmaking when the "American Watch Co" Grade of Waltham watch movements created an international reputation for American watchmaking. In what became universally known as the "American system of manufactures," the AWCo and its immediate predecessors pioneered the mass production of watches on the interchangeable parts basis in a single integrated factory facility, beginning with interchangeable cases, movements, dials, screws, wheels, and large brass movement components, and eventually progressing to every part of a watch. Nothing like this had ever been attempted before with any product nearly as complicated as a watch, nor with as demanding a set of fine manufacturing tolerances. Numerous other industries, including automobile manufacturing, ultimately adopted these same methods.

Throughout this most formative and historically impactful period of American watchmaking, the American Watch Company Grade, comprising fewer than 10,000 of the over 14 million watches Waltham made in that period, symbolized most of the best in the US industry. Presented here are numerous outstanding examples of all nine AWCo Grade production models, including several rare varieties of special interest to technological historians and advanced collectors.

Royal Elisha Robbins

Founder, Principal Owner, & Treasurer of both AT&Co and the AWCo

Principal partner in Robbins & Appleton, Principal Sales Agents For the AWCo

American Watch Co Grade Models - Key Features and Production Data

Model	Size	Description/Key Features (some variable)	Total #	Last/First SNs
1859	18	Gilt ¾ Pl – KWr/KSr – 19J[a] – FRP – DSD – HH very rare	143	28,701 – 40,170
KW20[b]	20	Gilt ¾ Pl – KWr/KSr – 19 to 21J – SB or FCP – some with FVHS – SSD	343[e]	50,001 – 250,470
KW16[b]	16	Gilt or Nickel ¾ Pl – KWr/KSr – 19 or 20J – SB, FCP or FVHS – SSD	402-430[e,f,g]	50,301 – 501,600
1868	16	Nickel ¾ Pl – SW/LS – 18J – GE SSD – HC only	~120	410,401 – 501,520
1872	16	Nickel ¾ Pl – SW/(Pin, Nail, or LS) – 18 to 21J – Some w. various WPs[c] – GE Dials[d]	~1,750[m]	670,001 – 3,349,100
1888	16	Nickel ¾ Pl – SW/PS – 19 or 21J[h] – Safety Barrel – GE Dials[d]	~1,958	3,574,001 – 6,506,470
1891[i]	00	Nickel ¾ Pl – SW/PS – 16J – Only Lady's Model	~1,050	4,242,001 – 5,512,000
1894	12	Nickel center Bridge – SW/PS – 21 or 23J – Hull Style GE DS Dials	~1,360	8,774,001 - 14,000,000
1899	16	Nickel center Bridge – SW/PS – 21 or 23J[j] – Hull Style GE DS[k] Dials	2,830[l]	9,503,501 – 14,144,200

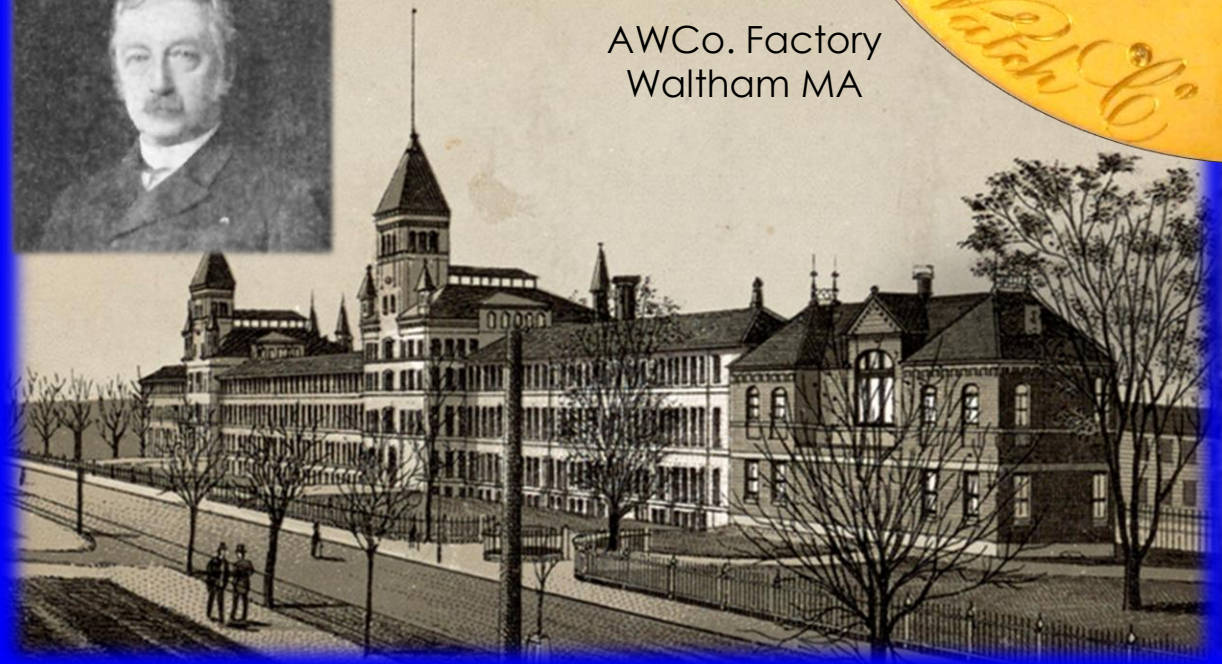
KWr: Key Wind fr. Rear **KSf**: Key Set fr. Front **KSr**: Key Set fr. Rear **SSD**: single sunk dial **DSD**: Double Sunk Dial **GE**: Glass Enamel **DS:** Double Sunk **FP**: Full Plate **¾ Pl**: ¾ Plate **J:** Jewels **FRP**: Fitts's Reversing Center Pinion **HH**: Helical Hairspring **SB**: Stratton's Barrel **FCP**: Fogg's Center Pinion **FVHS**: Fogg's Vibrating Hairspring Stud **WPs**: Chas. V. Woerd's Patents **HC**: Hunting Case **SW/PS**: Stem Wind/Pendant Set **Hull**: Edger L. Hull (Waltham Dial Room Foreman) **SN**: Serial Number

a: A very few very early M59s may have had only 17 J **b**: introduced in 1862 **c**: Woerd's patent sawtooth balance (about 10 known) is by far the rarest of Woerd's many patents **d**: scarce DS GE "AWCo" dials also are seen **e**: < 100 with FVHS **f**: 79 Were Nickel **g**: a few with GE Dials **h**: One 17 J AWCo Grade Model 1888 movement seen **i**: also called "Old Model." **j:** not counting EH&Co and EHWCo private labels, some of which had only 17 jewels **k:** some later examples had single sunk dials **l:** includes ~1,280 made for EHWCo **m:** assumes Run 9 included only 20 AWCo Grade movements

Part 2: The Key Wound and Set 1859, KW20, & KW16 Models

Royal E. Robbins
AWCo. Founder

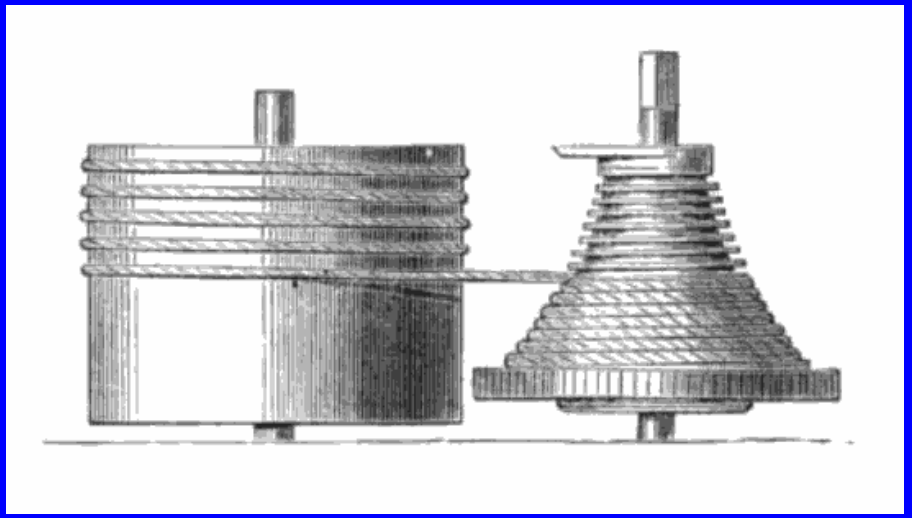
AWCo. Factory
Waltham MA



Chas. V. Woerd
Factory Supt. &
Chief Designer

Early AWCo Safety Mechanisms

- In the mid-1800s the best European watches incorporated fusees, which both improved isochronism* and protected wheel trains in the event of brittle mainspring failures.
- American watch manufacturers eschewed fusees as an economy measure and to make watches thinner.
- They then needed to develop other means to protect wheel trains and preserve isochronism. These innovative approaches are reviewed on the succeeding slides.



Fusee and Barrel with Chain
(not used in American watches)

* Uniformity of timekeeping accuracy, or "rate," over the running period.

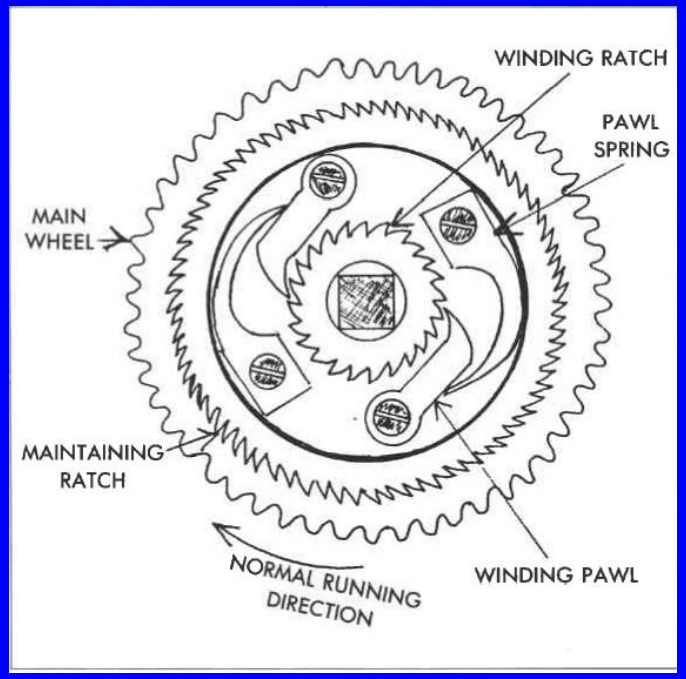
AWCo Innovations

Protecting the Escapement Against Mainspring Breakages

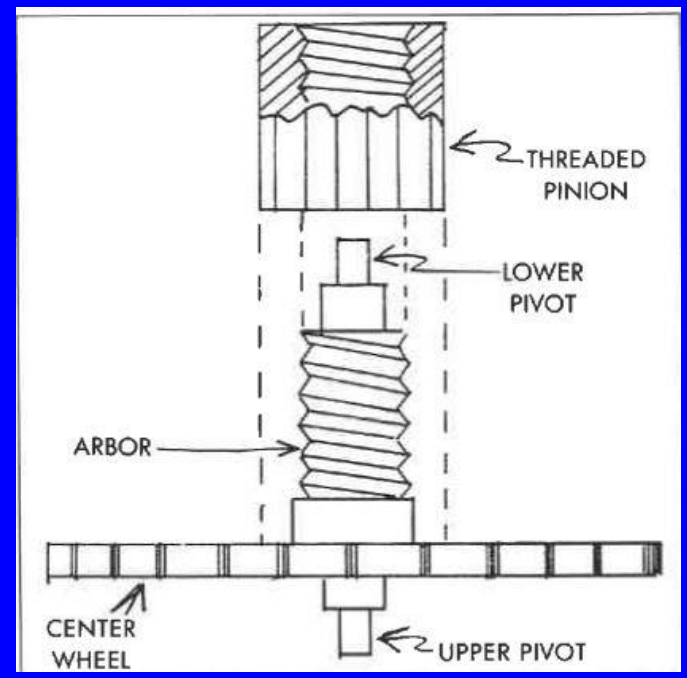
D. B. Fitts's Reversing Center Pinion

1859 Model SN 40,126

N. P. Stratton's Mainspring Barrel



C. W. Fogg's Center Pinion

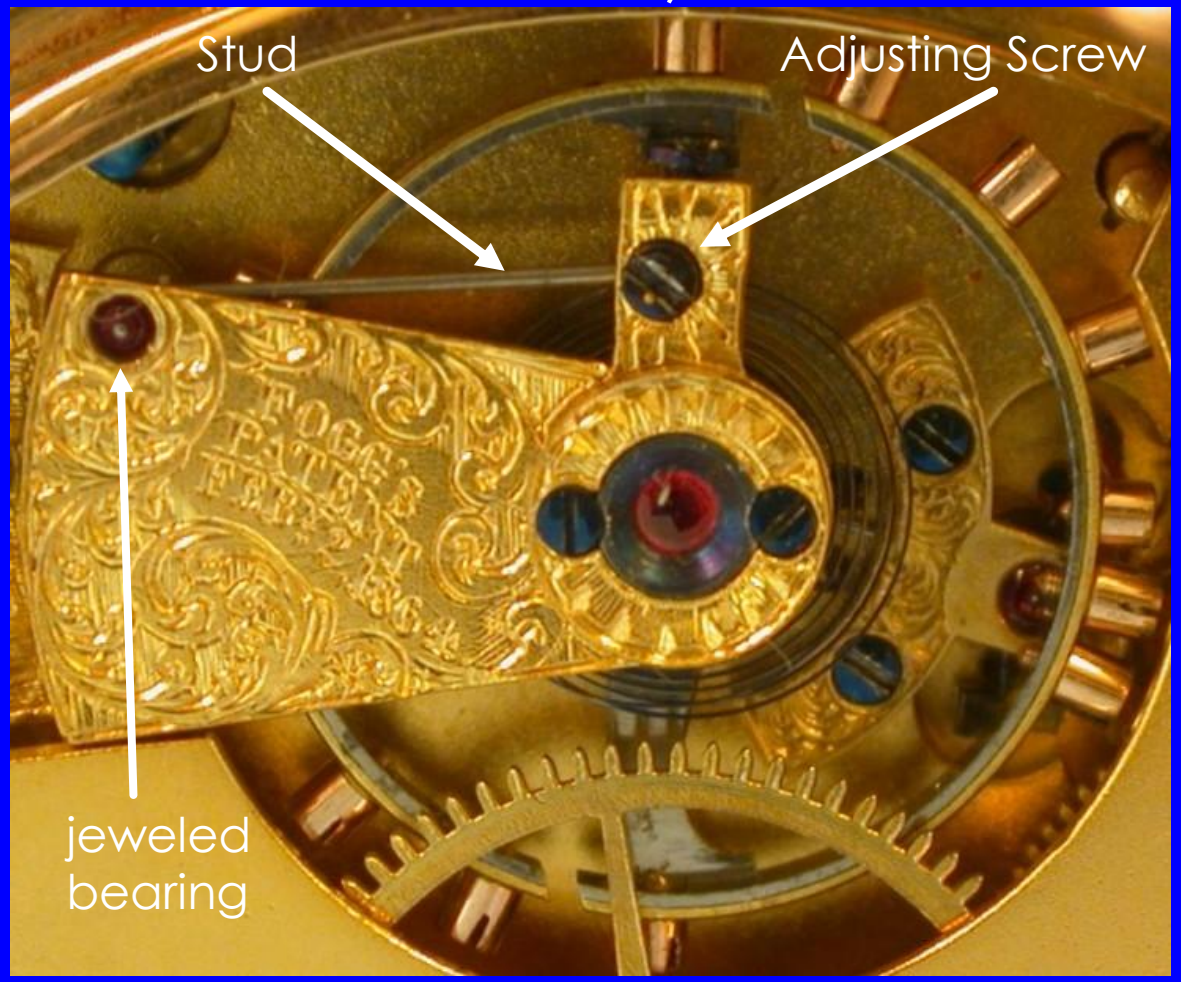


KW20 SN 150,024

1868 Model SN 501,503

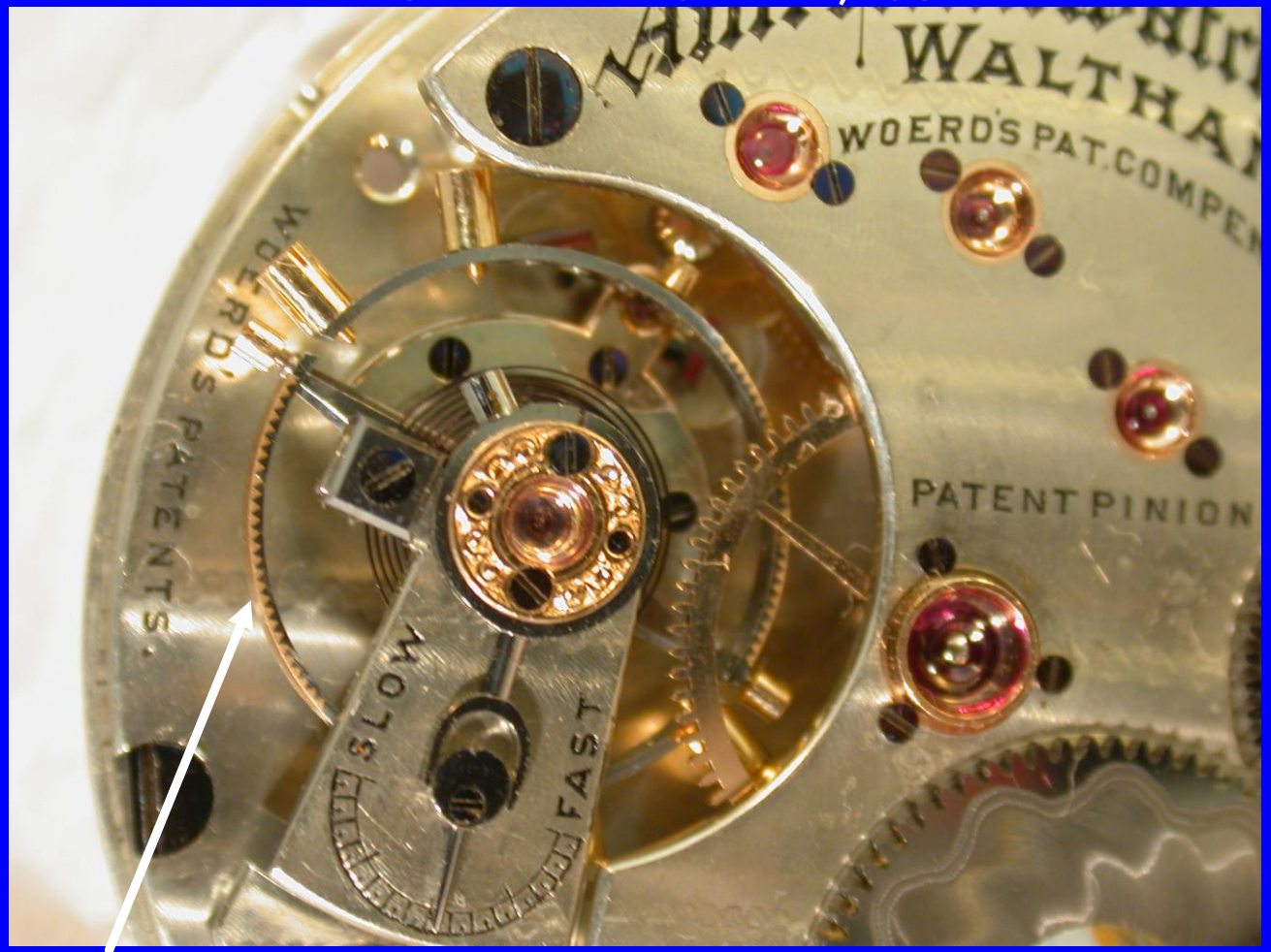
AWCo Innovations Aimed at Improved Timekeeping

KW20 SN 150,024



Fogg's Patent Vibrating Hairspring Stud
(Intended as an Isochronous Regulator)

1872 Model SN 999,960



Woerd's Patent Compensating Sawtooth Balance
(intended to reduce Middle Temperature Error)

AWCo Grade Watches Shown in Part 2

The Keywind/Key Set 1859, KW20 & KW16 Models				
SN	**Date**	**Size**	**Model**	**Movement Description**
28,711	7/1860	18	**1859**	19 jewels; Double Sunk Dial; **freesprung Helical Hairspring, Dennison's patent escape wheel, Two-headed pallet arbor and escape wheel pinion cock.**
36,381	11/1860	18	**1859**	19 jewels; Fitts's Reversing Center Pinion.; Double Sunk Dial; **Diamond endstone**
40,126	11/1860	18	**1859**	19 jewels; Fitts's Reversing Center Pinion.; Double Sunk Dial; **Diamond endstone**
1,090	1861/62	20	**KW20 Nashua**	19 jewels; Stratton's Barrel (marked only on pillar plate); **Signed "Nashua Watch Co.," Nashua assembly #: 190, winged escutcheon, unsigned dial**
50,037	1862/63	20	**KW20 1st Run**	19 jewels; Stratton's Barrel (not marked); **Double sunk dial!**
150,024	4/65 to 3/68	20	**KW20**	**21 jewels**; Stratton's Barrel; **Fogg's Vibrating Hairspring Stud Regulator**
250,456	1/68 to 10/79	20	**KW20**	19 jewels; Fogg's Safety Pinion; **Glass Enamel Dial, Gold Train, Large diam. balance; Superfine Pitch Hairspring, curb pin adjusting screw/plug**
50,376	12/63 to 2/64	16	**KW16**	19 jewels, Stratton's Barrel (Lowest numbered, but not first finished run)
125,412	8/64 to 7/66	16	**KW16**	**20 jewels**; Stratton's Barrel; **Fogg's Vibrating Hairspring Stud Regulator**
210,359	4/66 to 8/79	16	**KW16**	19 jewels; Fogg's Safety Pinion; **Gold Train**
501,586	4/70 to 4/71	16	**KW16 Nickel Plates**	19 jewels; Fogg's Safety Pinion; **Gold Train, Flat Hairspring**

Free-sprung helical hairspring

19 jewel movement

Craig Risch Collection

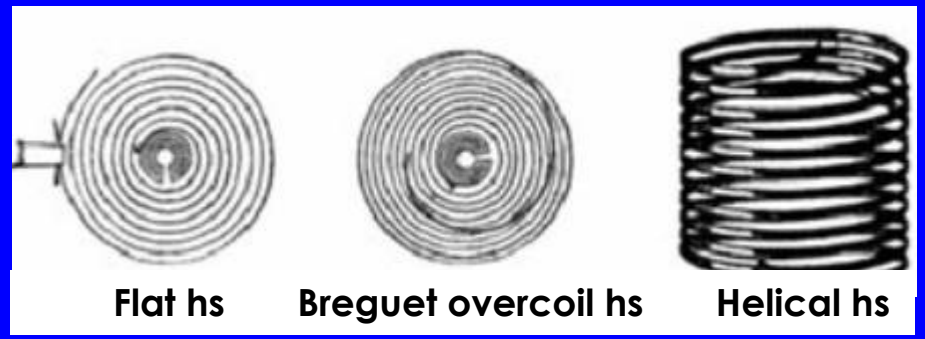
Dennison's Escape Wheel

Novel two-headed cock carrying the pallet arbor and Dennison's patented scalloped-tooth steel escape wheel

Early AWCo Design Experiments

In the 1859-61 period, both the AWCo and EH&Co conducted very limited experiments in plate design and hairspring configuration.

The earliest AWCo Grade 1859 Model movements were ½ plate movements made like SN 28,711. Their top plates were cut back to reveal Dennison's patented escape wheel, and a novel double-headed cock carrying both the lever and escape wheel pinions, but *without* Fitts's reversing pinion on the center wheel.



1859 MODEL SN 36,381

(Fitts's patent reversing center pinion, 19 ruby jewels, **Rare diamond balance endstone**)

Very early double sunk dial

18K Celestine Jacot & Brother Hunting Case of AWCo Grade Movement 36,381

37 DWT total weight

18K Celestine Jacot & Brother Hunting Case of AWCo Grade Movement 36,381

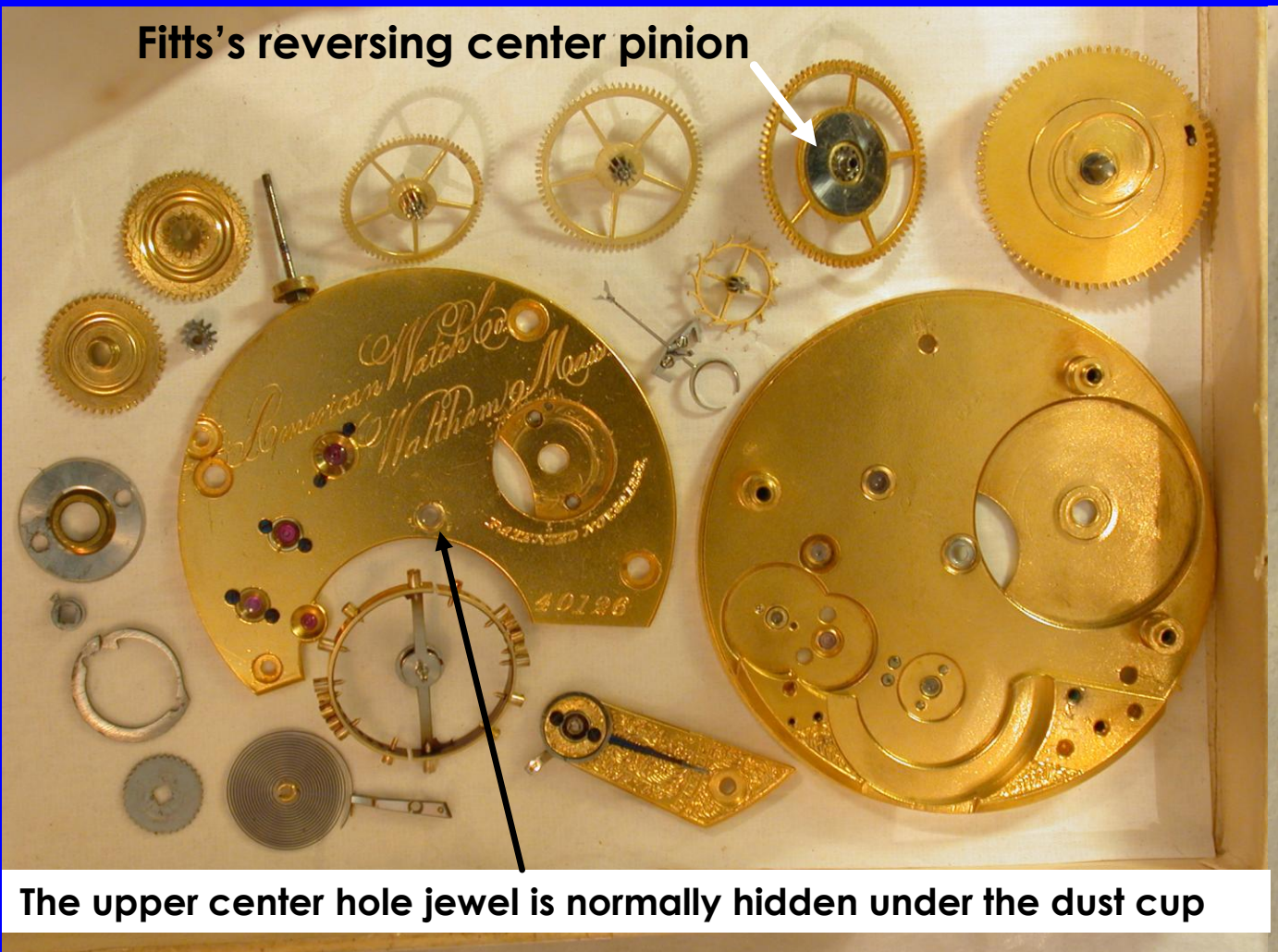
This slim, sleek case exemplifies the style that Waltham was emphasizing with their 1859 Model watches for gentlemen

1859 MODEL SN 40,126

(Fitts's patent reversing center pinion, 19 ruby jewels, **Rare diamond balance endstone**)

Very early double sunk dial

Movement SN 40,126 Details



Straight Line Lever Escapement

Pictures, courtesy of John Wilson

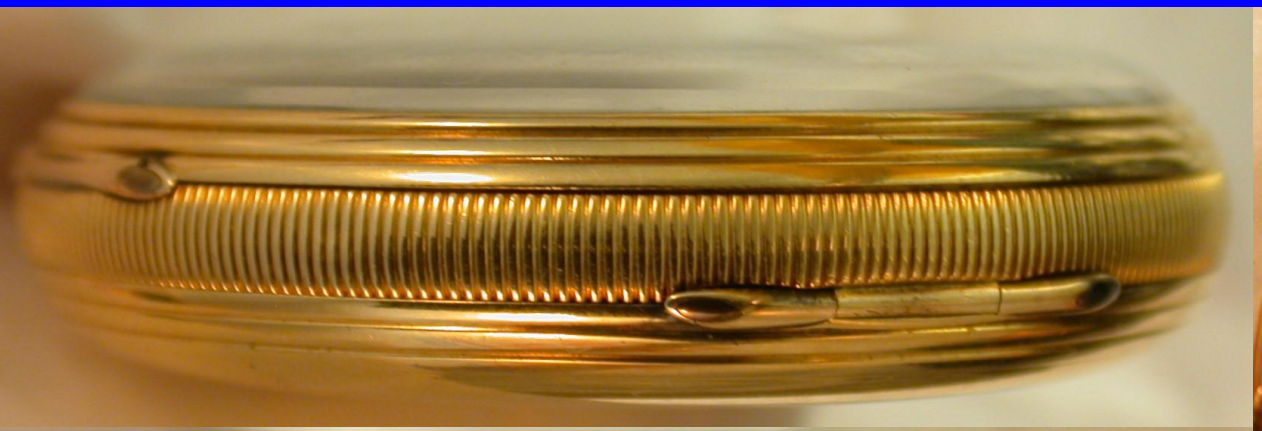
1859 MODEL SN 40,126 18K "R. & A." OPEN FACE CASE

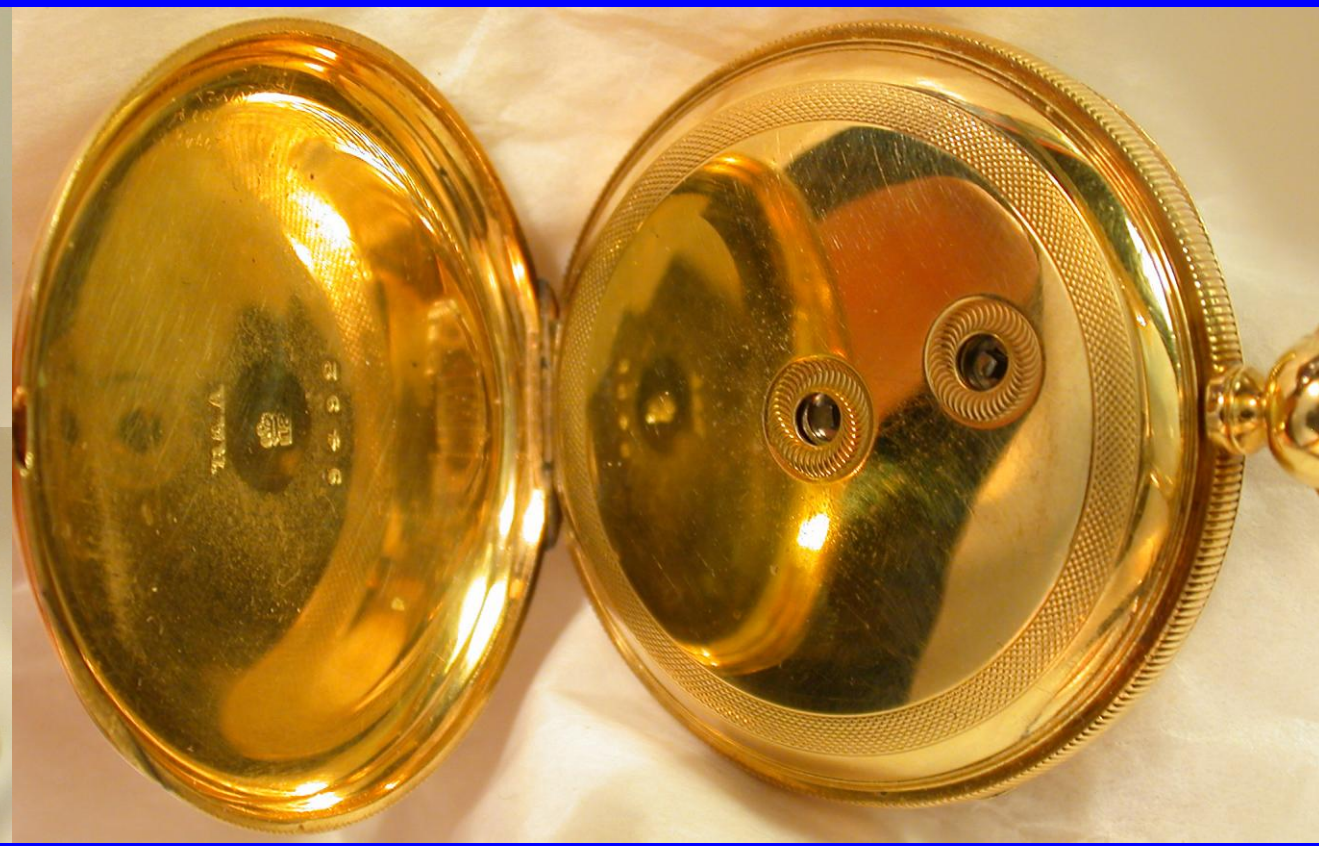
1859 Model movements came in both hunting and open face cases.

Most 1859 Model cases have a distinctly flatter profile than cases for full plate movements, reflecting the “thin model” theme emphasized in the company’s advertising for this model. In keeping with prevailing casing standards of the time, many 1859 Model cases, especially the gold ones, also are relatively light.

Only about 140 to 150 AWCo grade 1859 Model movements actually were made* and gold 1859 Model cases are almost as rare.

(*The Waltham factory records list 3 additional AWCo grade runs that don’t seem to have been made.)



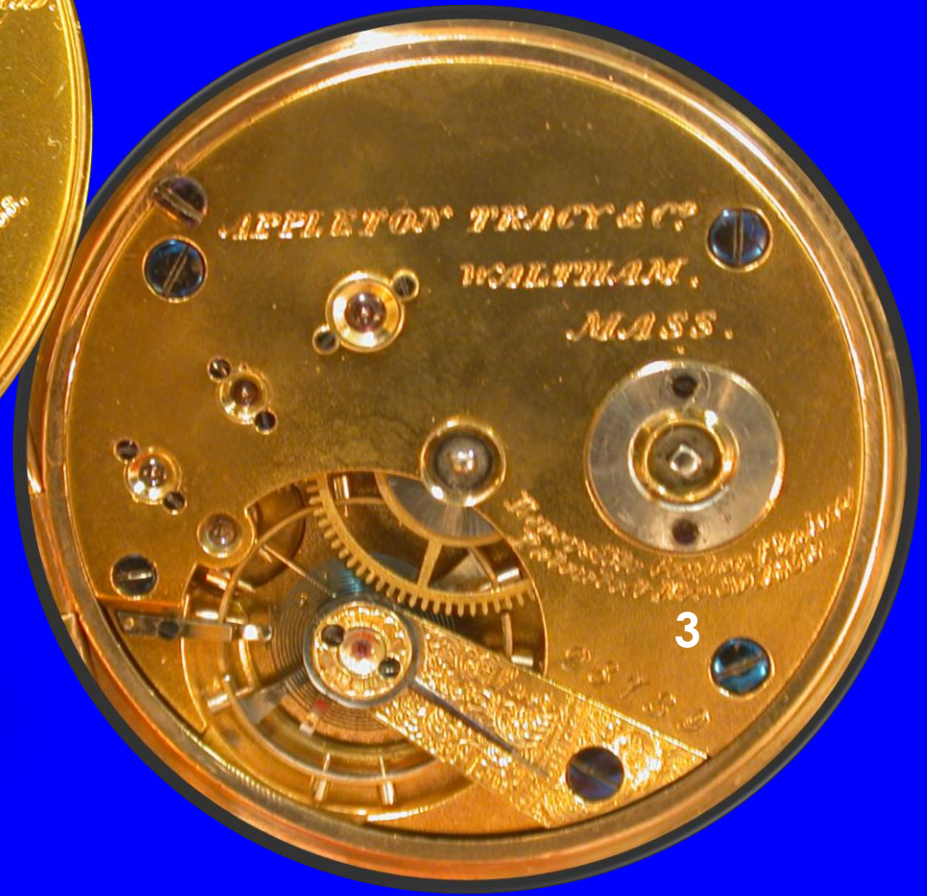


Fitts's Pinion Marking Variations

AWCo Grade Movement
SN 36,381

AWCo Grade Movement
SN 40,126

AT&Co Grade Movement
SN 28,739



AWCo Grade Marking Variations on 1859 Model Movements

SN 28,711 Signed
“American Watch Company”

SN 36,381 Signed
“American Watch Compʸ”

SN 40,126 Signed
“American Watch Co.”

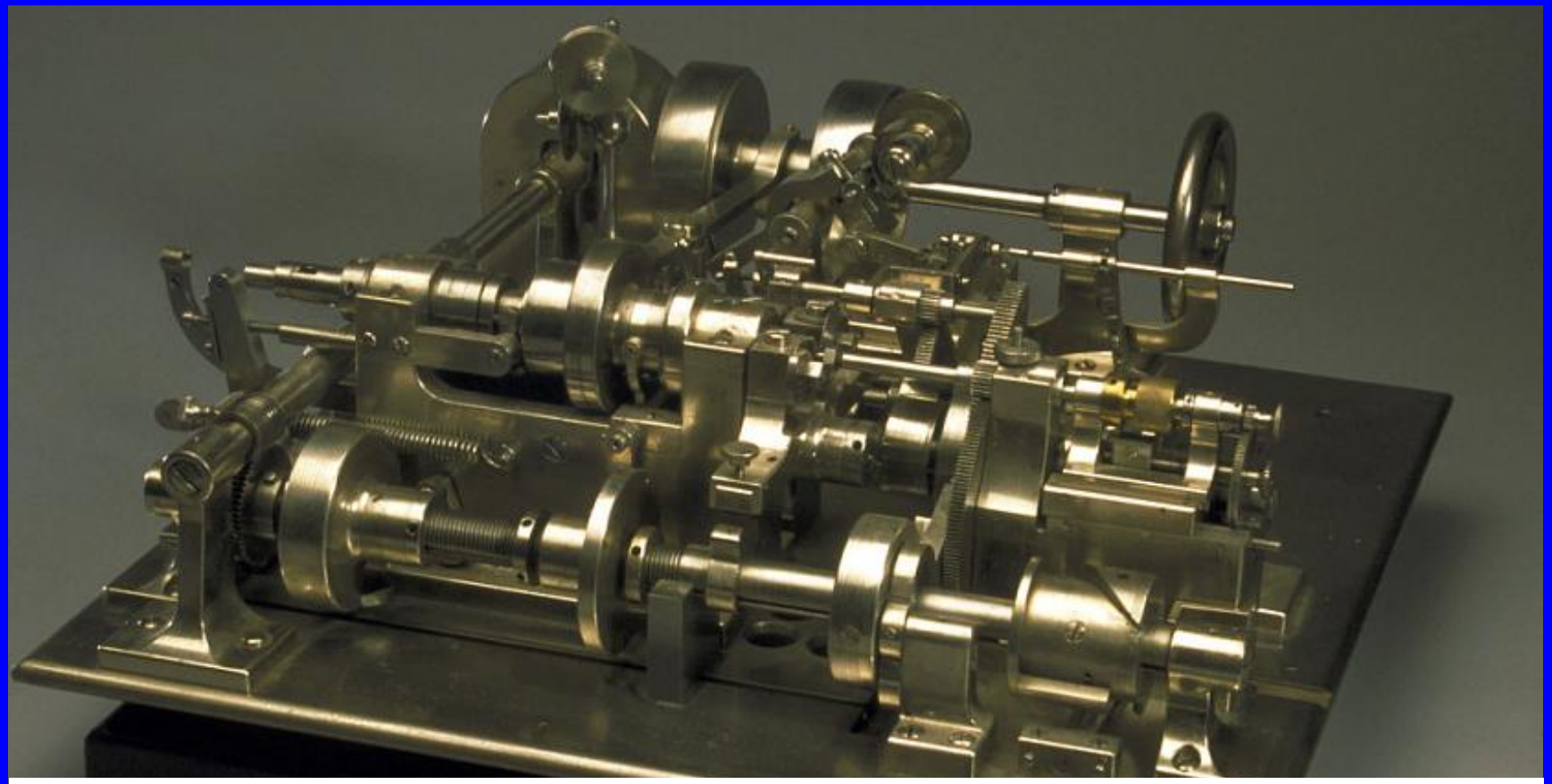
The Nashua Watch Co. & the Nashua Department (ND)

- In 1860 a group of Waltham's key machine and watch designers joined with investor B. D. Bingham to found the Nashua Watch Co. (NWCo) in Nashua NH.
- In its short history, the NWCo invented the capsule method for making bimetallic balance wheels, and a machine for accurately and reproducibly cutting friction-minimizing epicycloidal gear teeth.
- Parts were made for hundreds or more of 20 size and 16 size movements, but probably only about 25 of the 20 size movements and no 16 size movements were completed under the Nashua name. This watch design became the basis of the AWCo's KW20 and KW16 models after 1862.
- In 1862 the economic crisis caused by secession and Civil War and the resulting scarcity of skilled manpower forced the undercapitalized NWCo's owners to sell the company back to the AWCo, before the NWCo could realize profits.

Old Washington House
Site of the NWCo Factory

The Nashua Watch Co. & the ND, continued.

Royal E. Robbins, the AWCo's Treasurer and principal owner, installed the former Nashua employees in a separate wing of the factory known as the "Nashua Department." For over two decades, the Nashua Department was a semiautonomous organization within the AWCo from which the company's most important innovations in automated machinery and watch design sprang. The ND's director, Charles vander Woerd, rose through AWCo management to become General Superintendent in 1876. The last vestiges of the ND's former separate existence came to an end with Charles vander Woerd's departure in 1883.

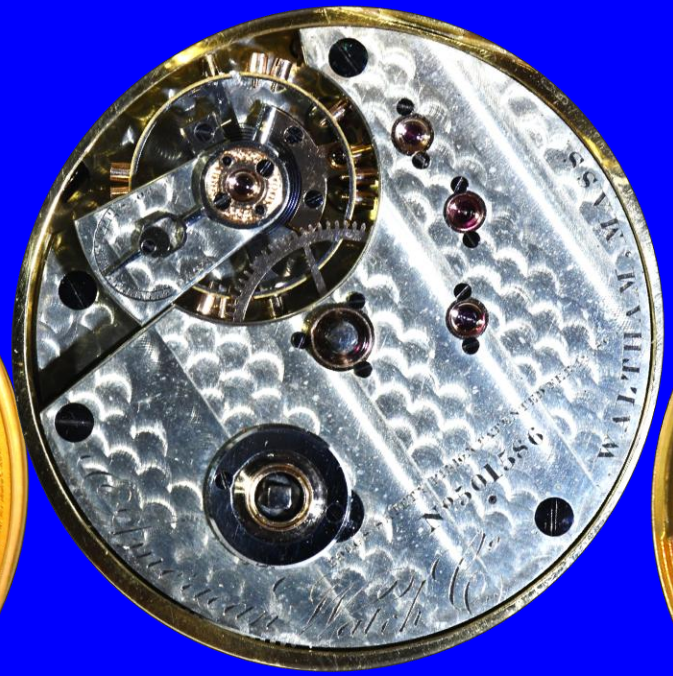


C. V. Woerd's revolutionary automatic screw-making machine, invented in 1871

Nashua Department Watch Models

- The ND finished up 20 size and 16 size movements based on the design inherited from Nashua.
- These had exposed stopworks and straight line lever escapements with adjustable banking pins.
- There were two grades: AWCo with 19 or more jewels, and Appleton, Tracy & Co. with 15 jewels. Most AWCo Grade movements had Breguet overcoil hairsprings, and a few late 16 size Awco grade keywinds had nickel plates. All stemwind model AWCo grade movements had nickel plates.
- The Nashua Department also designed two new stemwound and lever set ¾ plate watch models, the 1868 and 1872, as well as the company's most sophisticated full plate, the 18 size Cresecnt St. grade 1870 Model (not shown).

19J KW20 SN 50,024
NWCo assy no. 163



19J KW16 SN 501,586
Final run, w. nickel plates

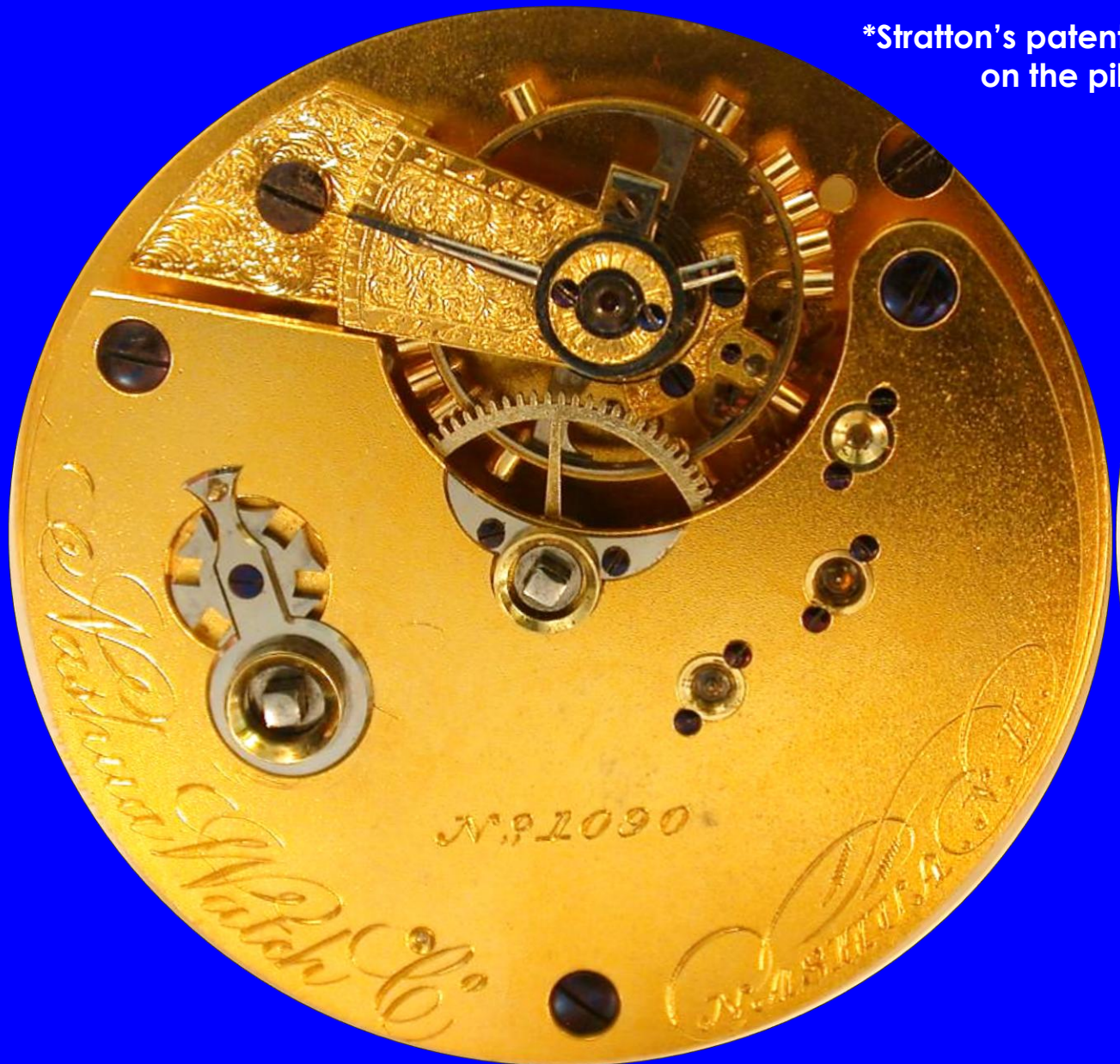
18J SW/LS Model 1868
SN 501,503

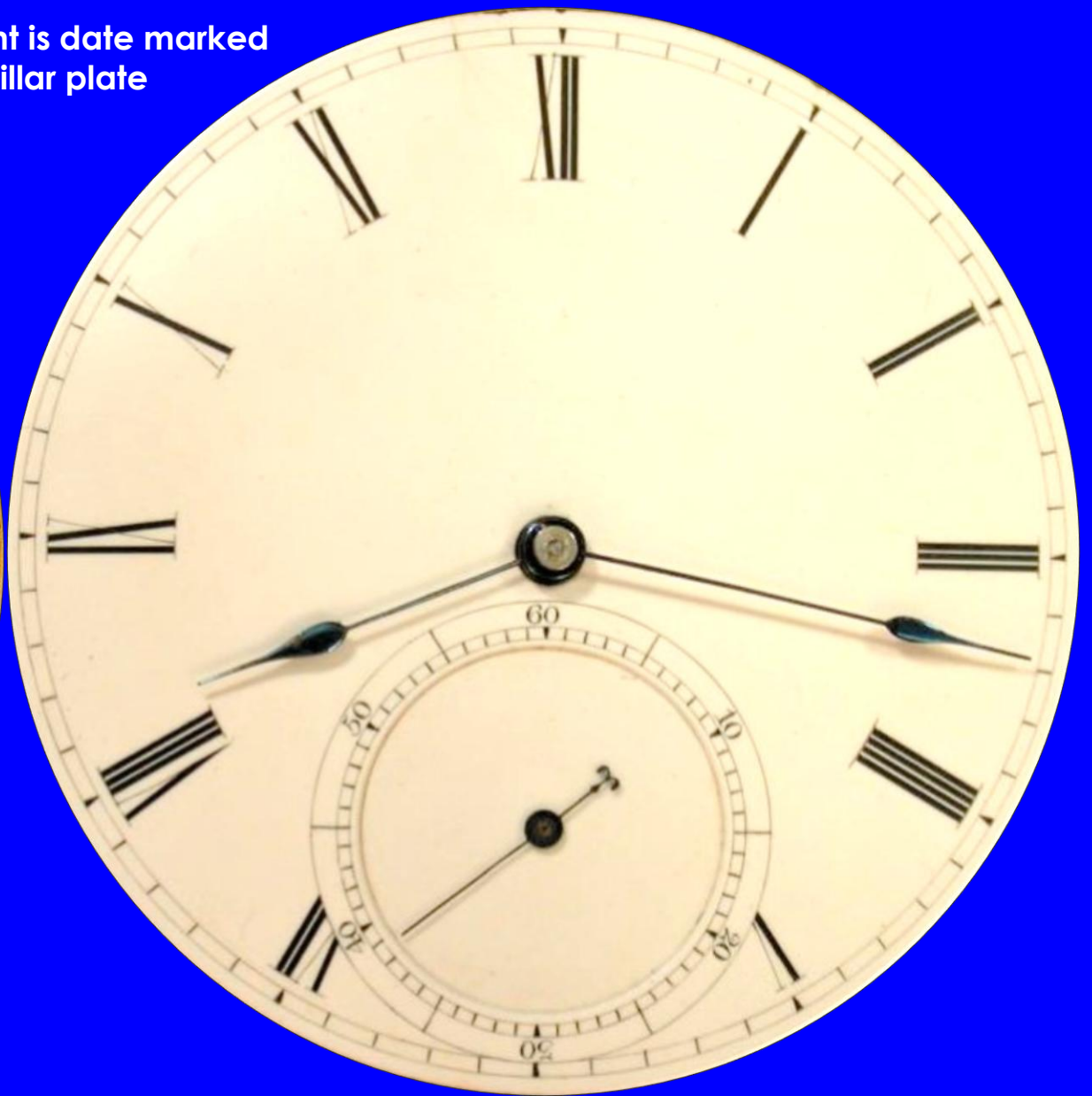
21J SW/LS Model 1872
SN 2,747,953 Non-Magnetic

Nashua Watch Co. Movement SN 1,090

(20 Size, 19 jewels, exposed stopwork, Stratton's patent barrel*, adjustable banking pins, bimetallic balance)

*Stratton's patent is date marked on the pillar plate





Picture Courtesy of
John Wilson

Undersides of plates of Nashua SN 1,090

Subsidiary train plate

Stratton's 1860 barrel patent

Assembly # 190

Escape wheel & lever with counterpoise

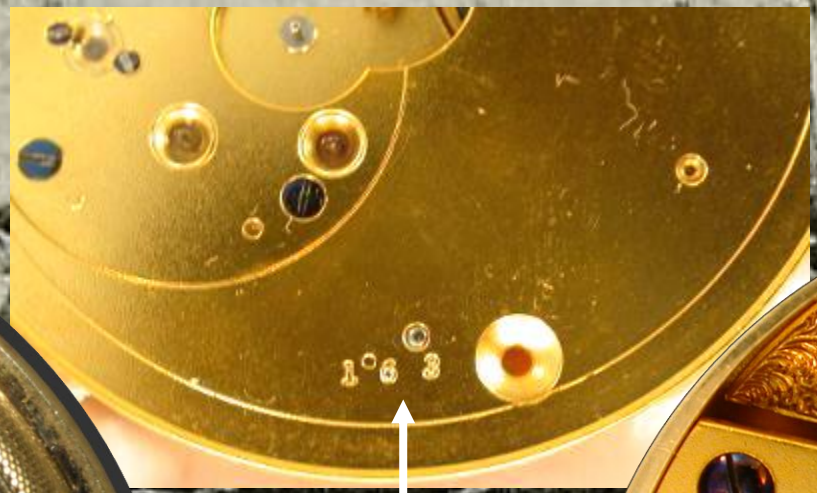
C.E.H.&Co. Gold Case of Nashua Movement SN 1,090

50 DWT, 2.5 oz., ~16K Gold

1st Run AWCo Grade KW20 SN 50,042, Nashua #163

(19 ruby jewels, exposed stopwork, Stratton's patent barrel [not marked], flat hairspring)

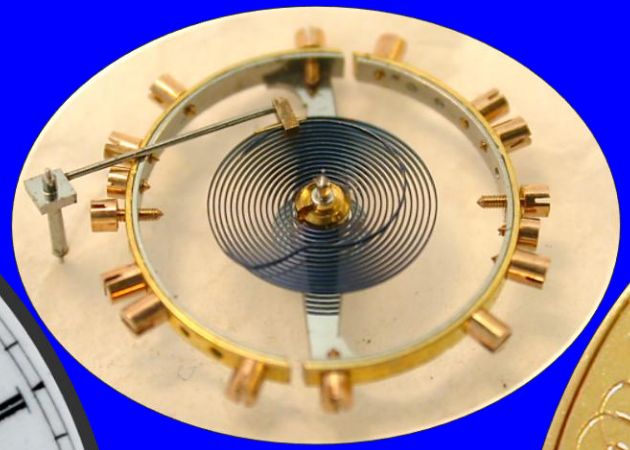
16th MA Infantry, c. 1862



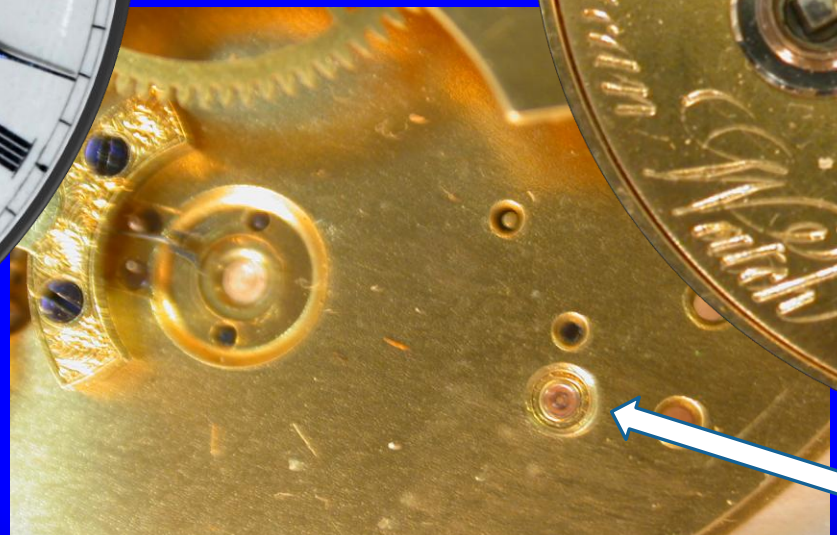
Nashua assembly
on pillar plate,
The 63rd Nashua ebauche

MODEL KW20 SN 150,024

(**Fogg's vibrating Breguet hairspring stud regulator**, Stratton's pat. barrel, exposed stopwork, **21 ruby jewels!**)



"Fogg's Pat., Feb. 2, 1864"



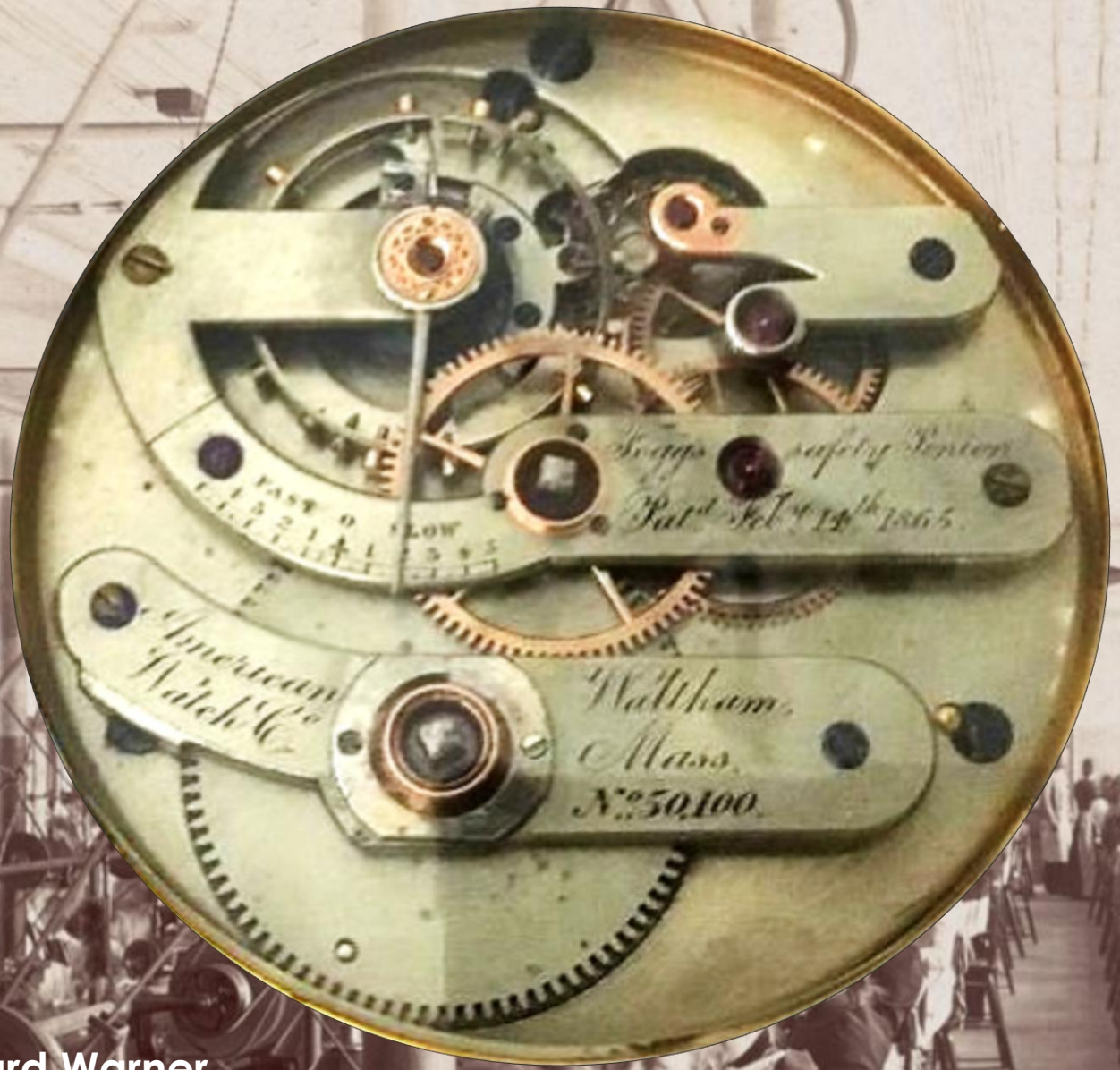
21st jewel in lower plate

Final Run AWCo Grade KW20 SN 250,456,18K AWCo HC

(19 ruby jewels, Fogg's Cam Regulator & Safety Pinion– Glass Enamel Dial – Gold Train – Large Diameter Balance Wheel)
(Superfine Pitch 20-Turn Breguet Overcoil Hairspring – Curb Pin Adjustment Screw)

Unique Nickel, Bridge Style KW20, SN 50,100

Waltham ¾ Plate Dept.



Picture, Courtesy of Richard Warner

Some Outstanding KW20 Cases

50 DWT ~16K CEH&Co Case

60 DWT 18K CJ&Bro Case

Presidential Lifesaving 20 Size
Keywind, SN 50,037, 19 jewels

"The President of the United States
To
Capt Joseph Cook
for the rescue
of Crew and Passengers of
AM. SHIP FRANK A. BADGER
1863"

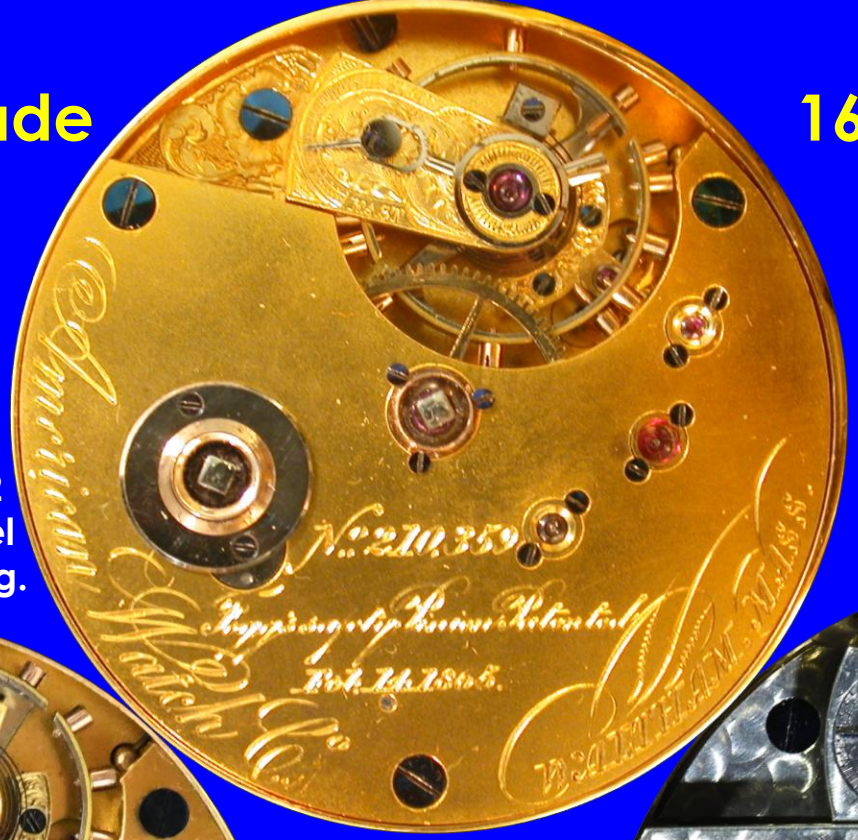
Courtesy Jeff Hess, hessfineart.com

AWCo Grade

16 Size Keywinds

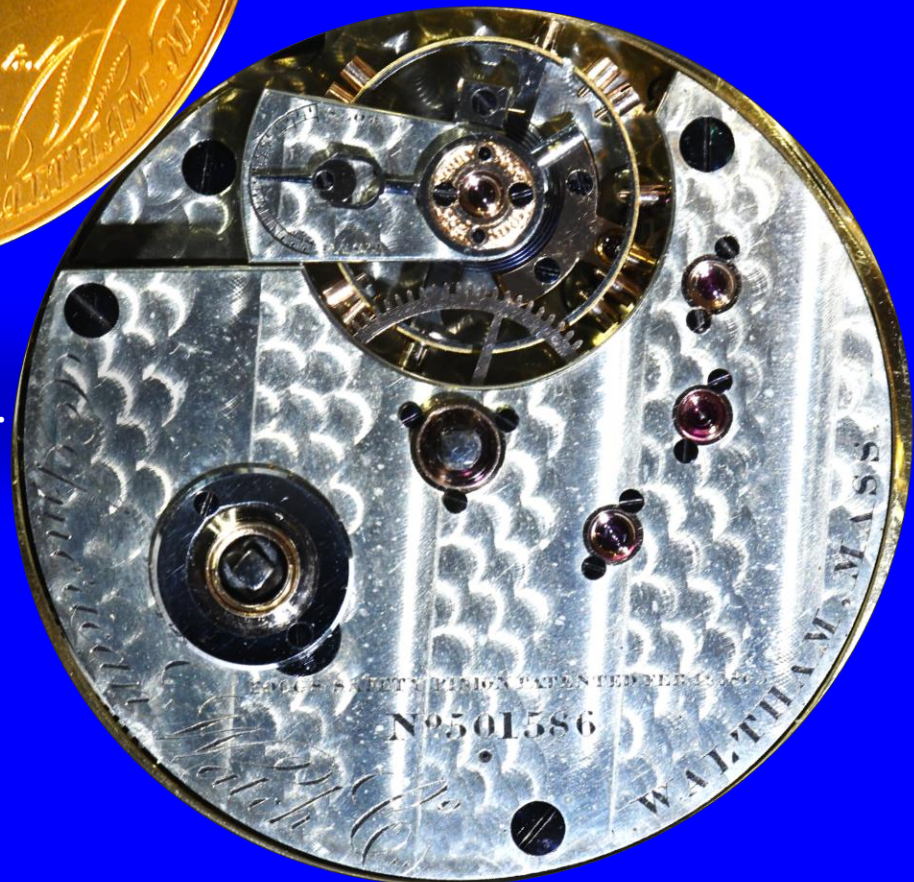
19J SN 50,385
Stratton's Barrel
Lowest numbered run

20J SN 125,412
Stratton's Barrel
Fogg's Vib. Reg.



19J SN 210,359
Fogg's Pinion
Fogg's Cam Reg.

19J SN 501,586
Final AWCo KW16 Run
Nickel Plates
Gold Train & Barrel Arbor Cup
5 Gold Jewel Settings



KW16 Model SN 50,385 in Silver “R. & A.” Case

(Stratton’s patent barrel, exposed stop work, 19 ruby jewels)

Silver Robbins & Appleton Hunting Case of KW16 Movement SN 50,385

Like the early KW20s, Movement SN 50,385, shown on the preceding slide, may have had some legacy Nashua Watch Company material in its construction, though not to the same extent as the KW20s. The very likely original silver hunting case of this movement bears the mark of Robbins & Appleton, Royal Robbins's jewelry house that was the AWCo's principal sales agency. "R & A" cases are especially prized by collectors.

Courtesy J&H

AWCo Grade KW16 SN 125,412

(20 Jewels, Stratton's patent barrel, Fogg's vibrating hairspring stud regulator, exposed stopwork)

(SN 125, 412, Fogg's patent vibrating stud, Stratton's patent barrel, exposed stop work, **20 ruby jewels**)

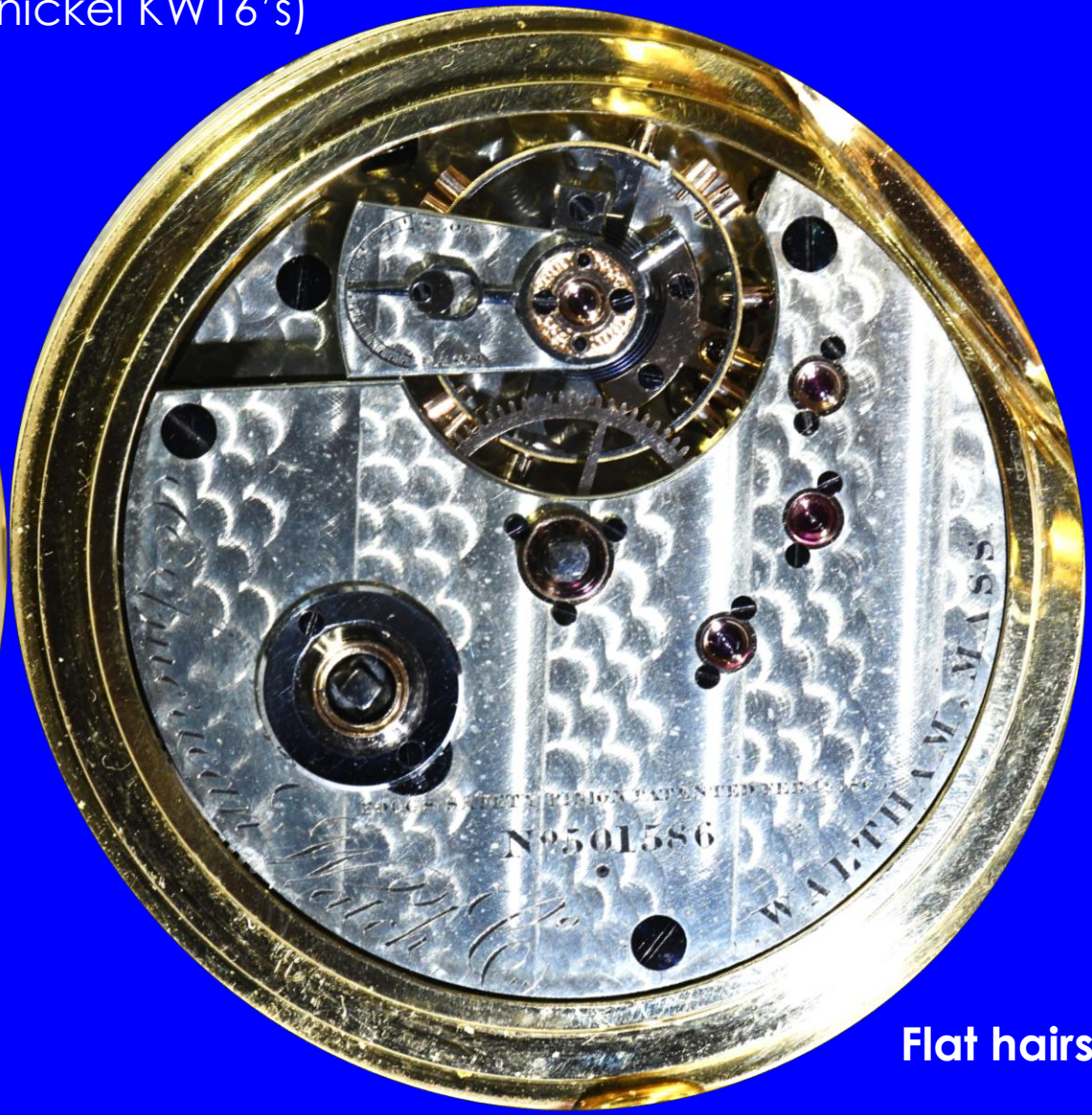
Model KW16 SN 125,412 18K “E. T.” Case

(18K Eliashib Tracy engine turned and engraved hunting case)

MODEL KW16 SN 501,586 NICKEL

(KW/KS, Fogg's patent safety pinion and cam regulator, 19 ruby jewels - 5 in gold settings, gold train)
(one of ≤80 nickel KW16's)

Glass Enamel Dial

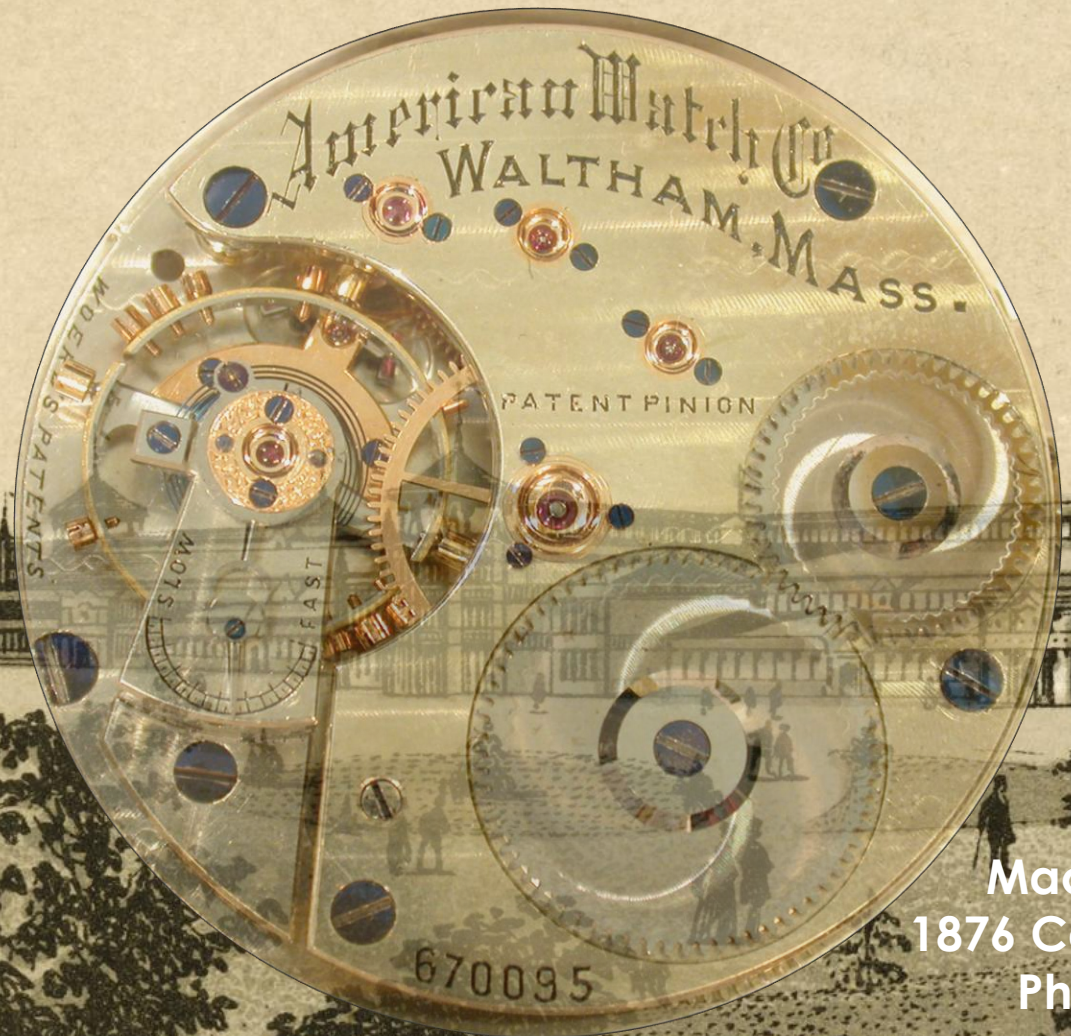


Flat hairspring

MODEL KW16 SN 501,586 18K AWCO CASE

44 DWT

PART 3: THE STEMWOUND/LEVER SET
MODELS 1868 AND 1872



Machinery Hall
1876 Centennial Expo
Philadelphia

Stemwind/Lever Set AWCo Grade Models 1868 & 1872

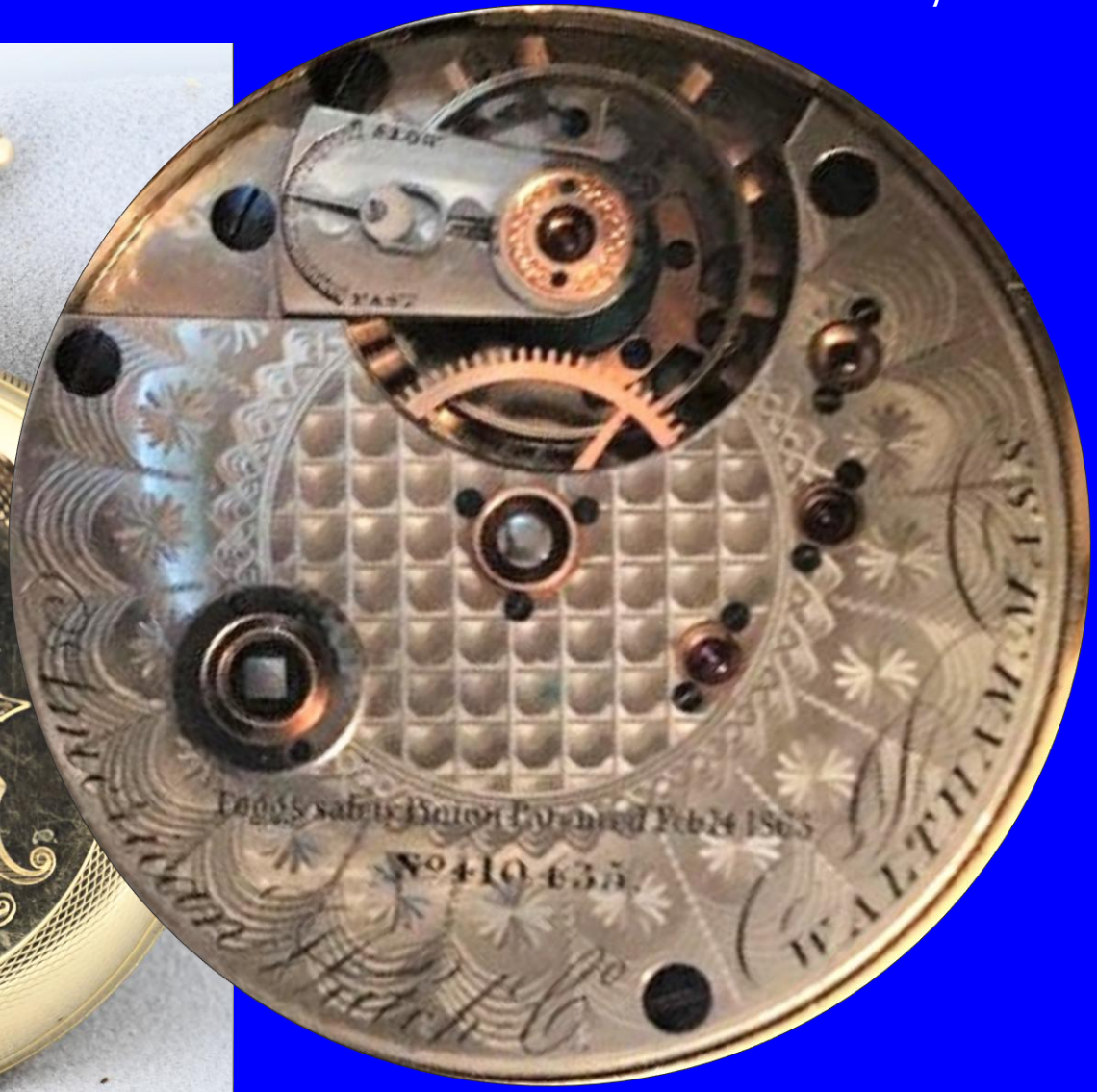
SN	Date	Size	Model	Movement Description
501,503	9/71 to 11/71	16	**1868**	18 jewels; Stemwind/ Lever Set; Fogg's Pinion; **Breguet Hairspring**; **Sidewinder, curb pin adjustment screw**
670,005	1/73 – 5/76*	16	**1872 1st Run**	**18 jewels; Stemwind/Nail Set; Breguet Hairspring, curb pin adjustment screw; 1868 Model style Spotting**
670,095	1/73 – 5/76*	16	**1872 1st Run**	**18 jewels; Stemwind/Nail Set; Breguet Hairspring, curb pin adjustment screw; 1 of Top 3 Performers in 1876 Centennial and Detroit Observatory Extended Trials**
871,101	1/77 – 3/88	16	**1872**	**18 jewels; SW/lever set;** Breguet Hairspring**; curb pin adjustment screw; 1st quick beat AWCo Grade movement, & 1st lever set AWCo Grade 1872 Model movement**
871,163	1/1879	16	**1872**	**21 jewels**; Stemwind/ Lever Set; **Gold Dome; gold jewel settings, Breguet Hairspring, curb pin adjustment screw, square roller jewel, 2nd 21 jewel AWCo Grade movement**
999,960	12/79 to 6/82	16	**1872**	21 jewels; Stemwind/ Lever Set; **Gold Dome**; **Woerd's Patent Compensating Balance!**
1,265,940	5/80 to 5/84	16	**1872**	21 jewels; Stemwind/ Lever Set; **Gold Dome; slow beat train**
1,265,944	5/80 to 5/84	16	**1872**	21 jewels; Stemwind/ Lever Set; **Gold Dome; slow beat train**
1,427,904	8/81 to 9/81	16	**1872**	21 jewels; Stemwind/ Lever Set; **Open Face, Gold Dome, Woerd's Patent Balace marking, bright nickel finish,** quick beat train, **4th Open Face AWCo Grade Stemwind Movement**
1,448,936	12/80 – 2/81	16	**1872**	21 jewels; Stemwind/ Lever Set; **Gold Dome; Breguet Hairspring**
1,719,004	11/86 – 5/87	16	**1872**	**21 jewels" Open Face, Stemwind/ Lever Set; Gold Dome, Breguet Hairspring, all top plate train jewel settings raised**
2,747,953	1886 – 1887	16	**1872**	21 jewels; Stemwind/ Lever Set; **unmarked non-magnetic single roiller esc.**, bright nickel, elaborate damaskeening**, open face**
2,788,058	1886 – 1887	16	**1872**	21 jewels; Stemwind/ Lever Set; bright nickel; ***marked* "NON-MAGNETIC," Double Roller**
2,788,104	1886 – 1887	16	**1872**	21 jewels; Stemwind/ Lever Set; bright nickel, elaborate damaskeening
3,349,025	9/1891	16	**1872**	21 jewels; Stemwind/ Lever Set; bright nickel; **great damskeening, Private Label, Double Sunk AWWCo dial**
No SN	"1875"	16	**1872**	**The Charles vander Woerd Watch with WP Balance & Chronograph Mech.**

MODEL 1868 SN 501,503 NICKEL

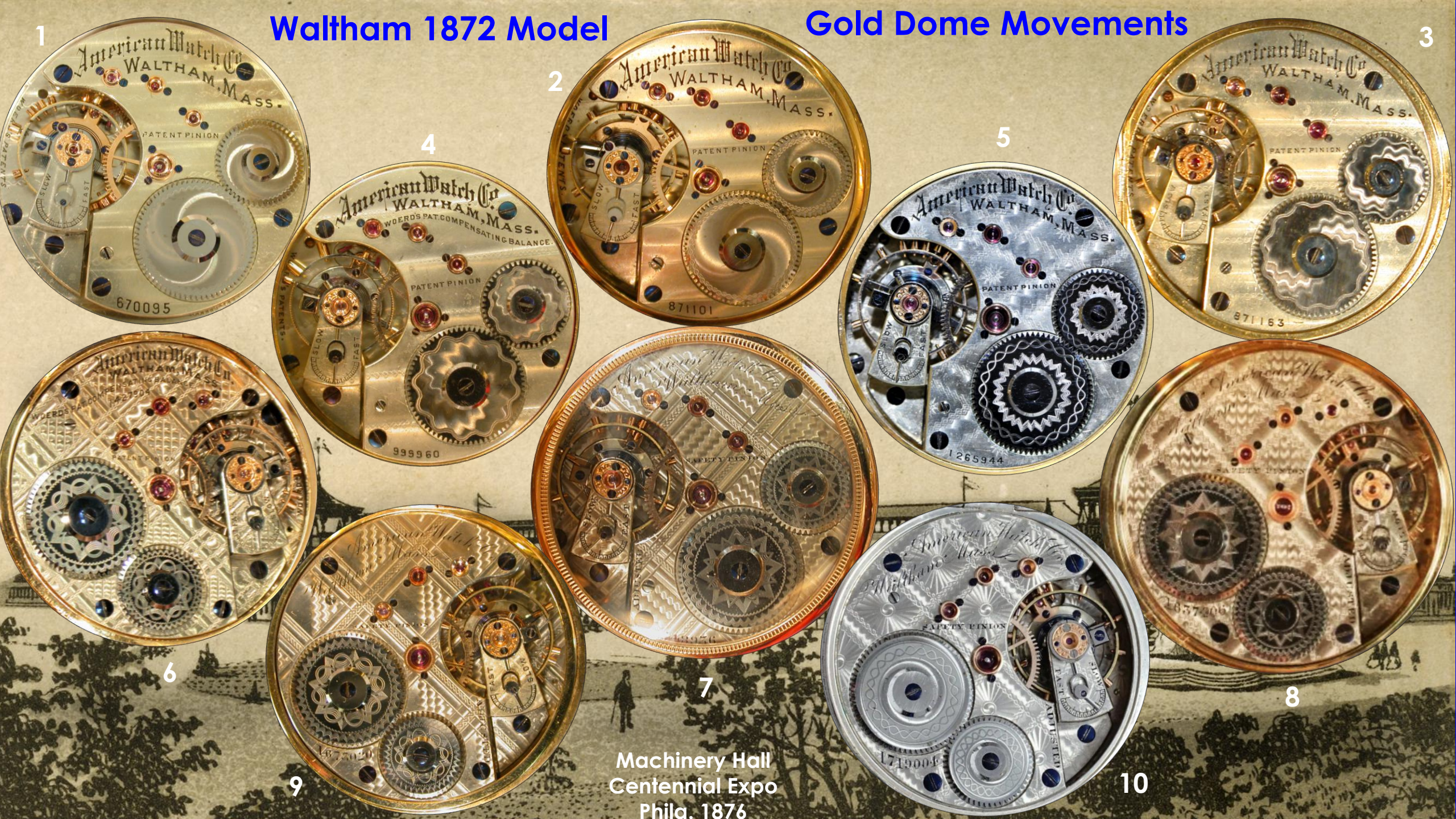
(SW/LS, Fogg's safety pinion & cam regulator, 18 jewels - 5 in gold settings, gold train and barrel arbor cup)
(Breguet overcoil hairspring, gold timing nuts, one of 121 AWCo Grade Model 1868 movements)

MODEL 1868 SN 501,503 NICKEL – LATER FINISH

(SW/LS, Fogg's safety pinion & cam regulator, 18 jewels - 5 in gold settings, gold train and barrel arbor cup)
(Breguet overcoil hairspring, gold timing nuts, one of 121 AWCo Grade Model 1868 movements)



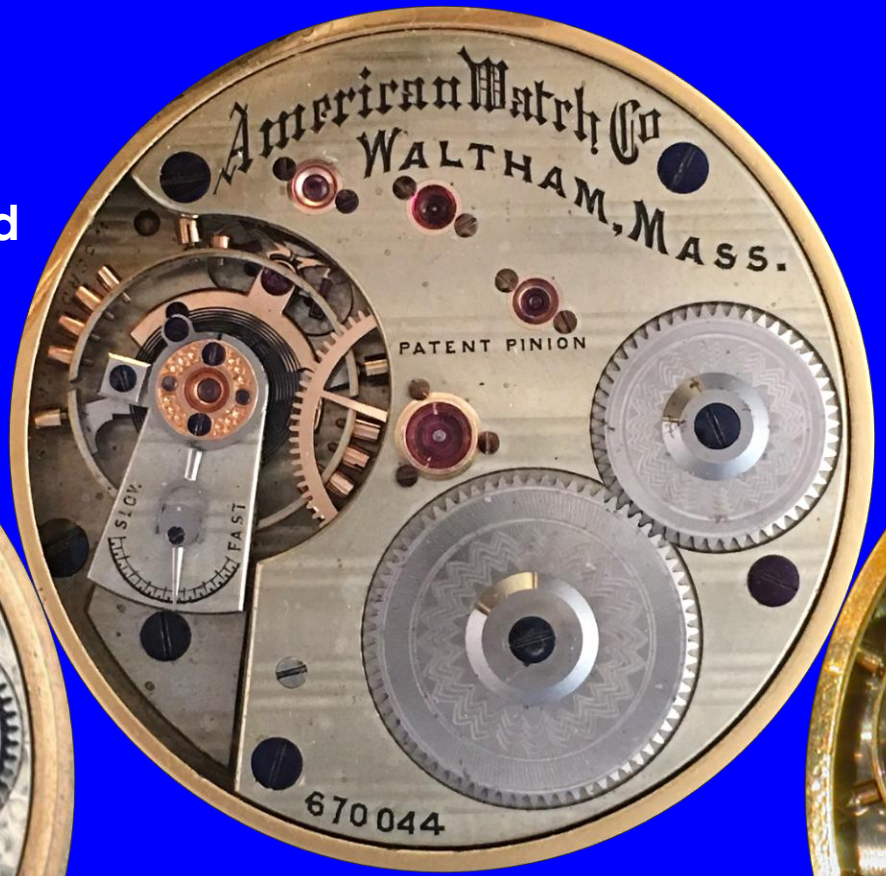
Waltham 1872 Model Gold Dome Movements



Machinery Hall
Centennial Expo
Phila. 1876

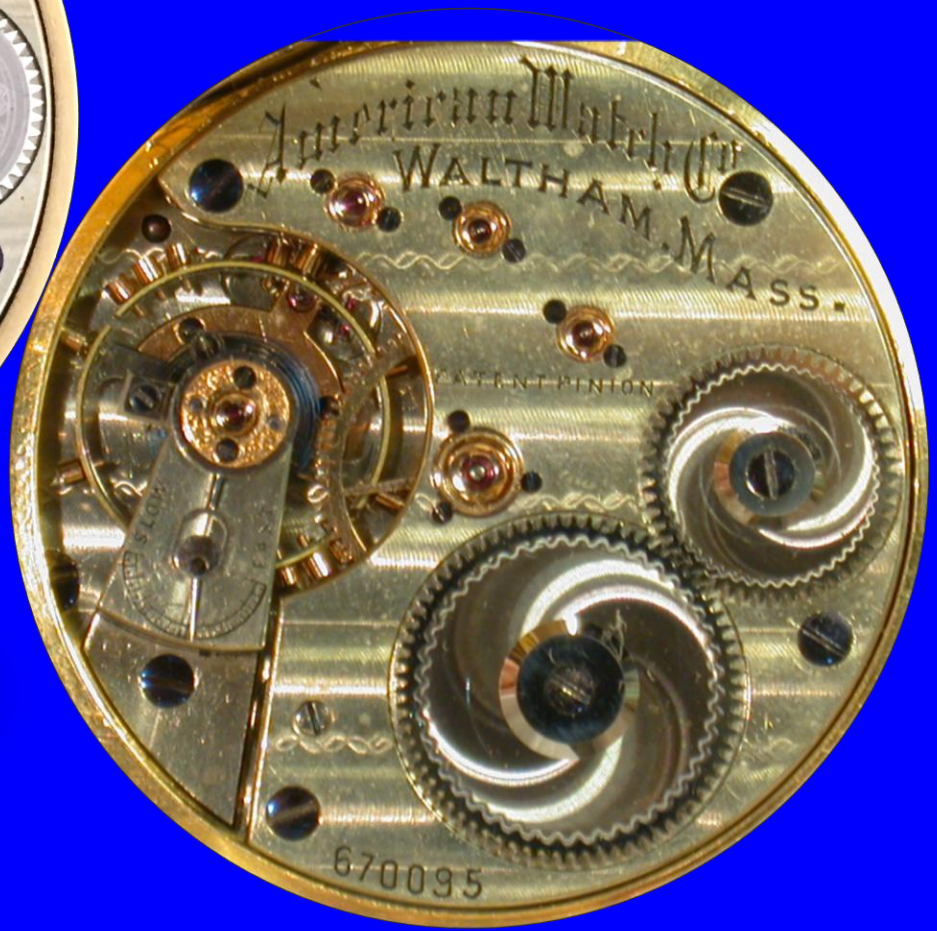
The First AWCo Grade 1872 Model Run: SNs 670,001 – 670,100

SN 670,005, 18 Jewels
Possibly the Earliest Surviving
AWCo Grade M-1872 Movement
Spotted, rather than Damaskeened
Courtesy, Louis Christina



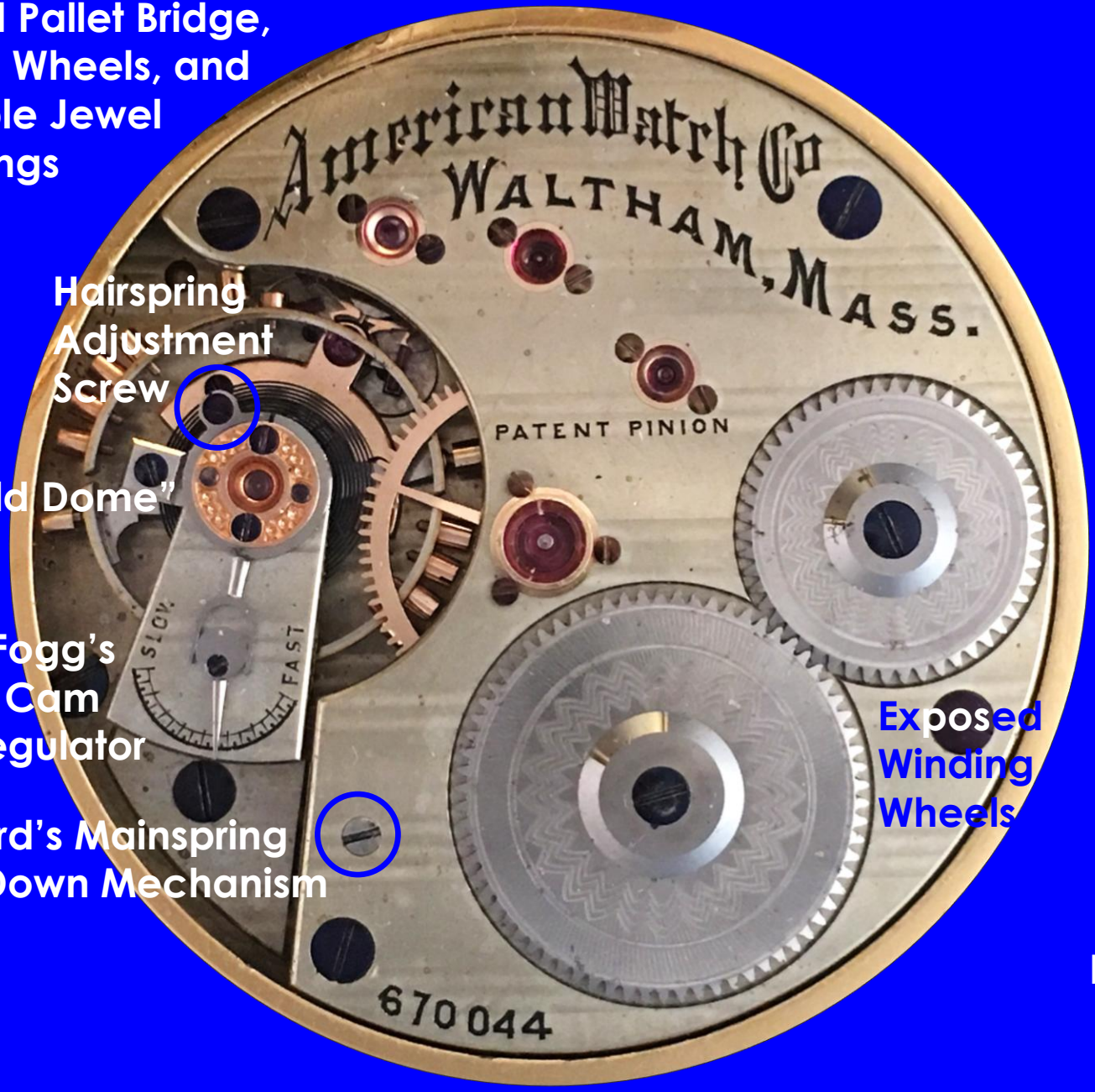
SN 670,044, 19 Jewels
One of the Trio
Of Top Performers
At the Centennial Timing Trials
Courtesy, Tom McIntyre

SN 670,095, 18 Jewels
One of the Trio
Of Top Performers
At the Centennial Timing Trials



AWCo Grade 1872 Model First Run Movement Features

Gold Pallet Bridge, Train Wheels, and Visible Jewel Settings



Hairspring Adjustment Screw

"Gold Dome"

Fogg's Cam Regulator

Woerd's Mainspring Let-Down Mechanism

Exposed Winding Wheels

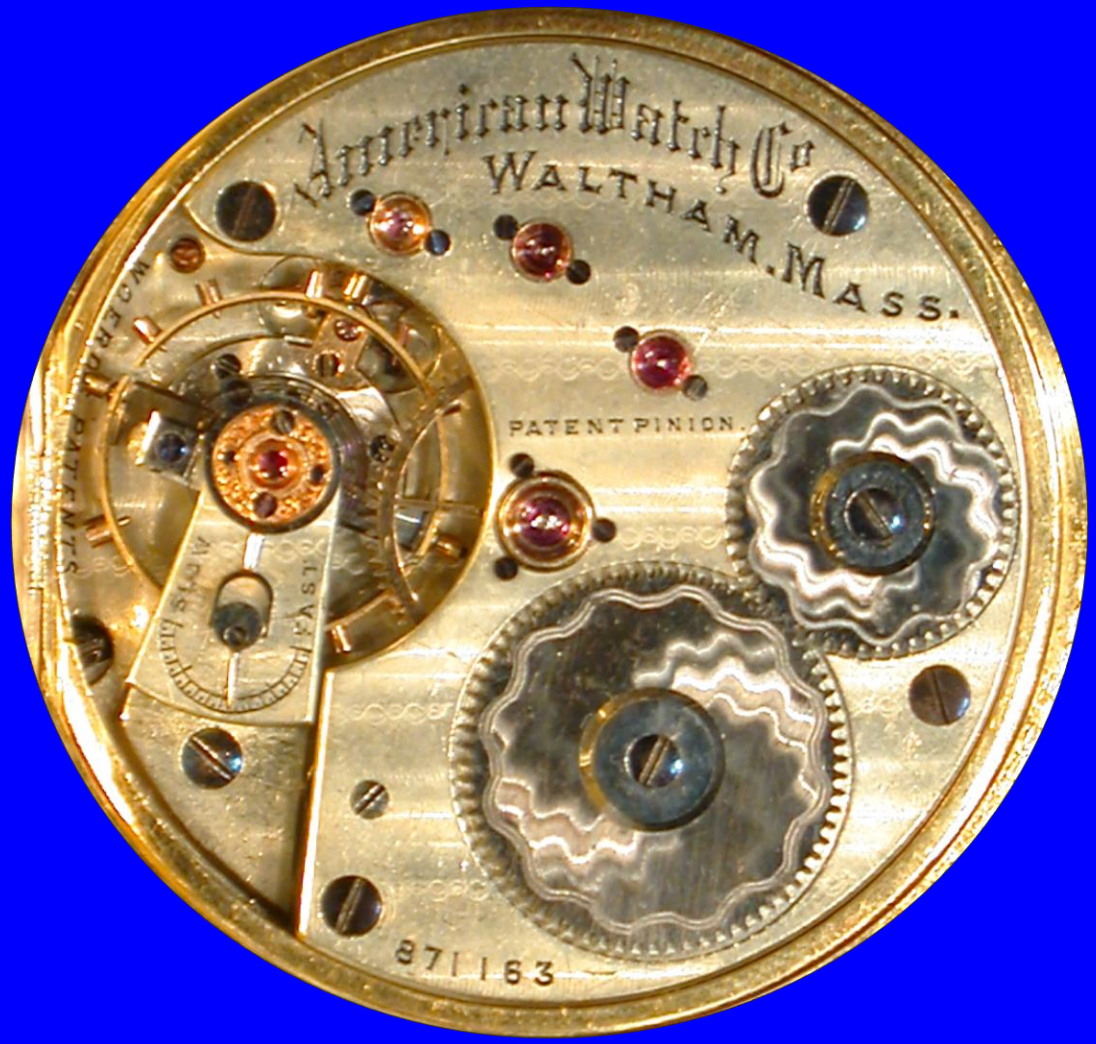
E. C. Fitch's Patented Setting Case Mechanism (converts a button set movement to a "nail set" watch)

Runs 2 & 3 Introduce Lever Setting, Fast Trains & 21 Jewels

(Gold Pallet Bridges, Slow Beat Train, 5 Gold Jewel Settings)

SN 871,101, Run 2. *The first lever set* and the *First quick beat train* AWCo Grade movement

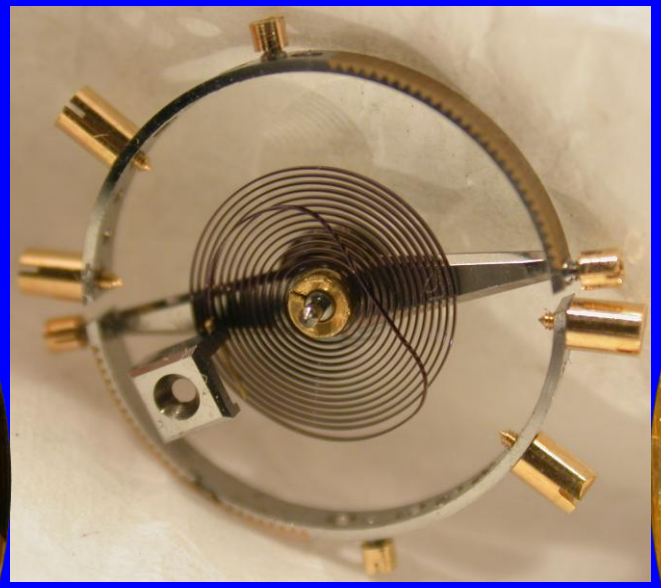
(Nickel Pallet Bridges, Quick Beat Train, all Jewel Settings Gold)

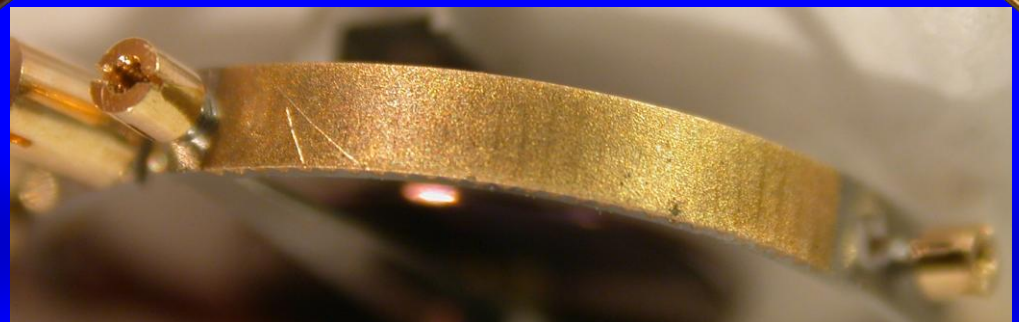


SN 871,163, Run 3. Nominally *the second* regular production *21 jewel movement possibly of any US maker*

MODEL 1872 SN 999,960 (Run #4)
w. WOERD'S PATENT COMPENSATING BALANCE

Glass Enamel
3-line Signature Dial





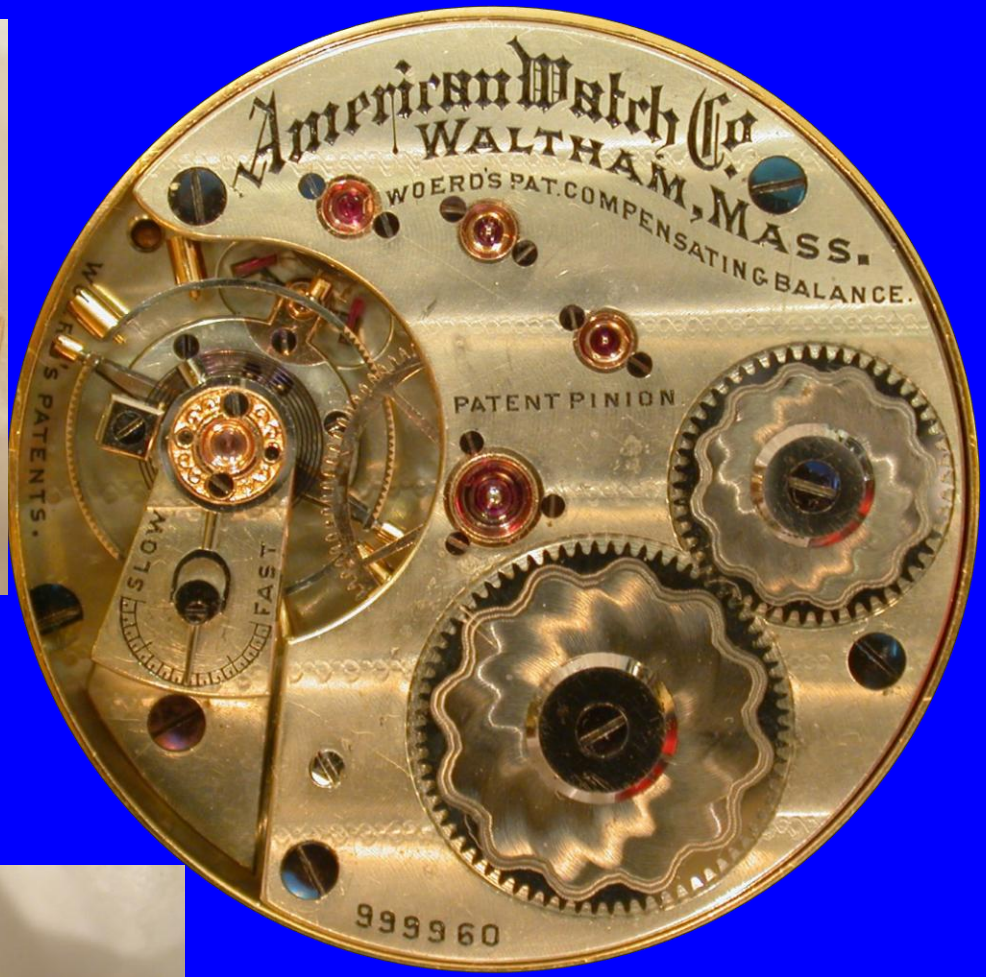


Plate Style 2A, Table 17: "Simple Linear"

Winding Wheel Style 2, Table 18:
"Spiral Lightning"

Case of Woerd's balance movement SN 999,996 with rare patent-marked cuvette

Picture, Courtesy of Paul Hartquist

The Charles vander Woerd Watch

(Woerd's Pat. Balance, Unique Chronograph Mechanism, Gold Inlay Engraving, Personalized Dial)

(First Open Face AWCo Grade 1872)

(No SN, Dated "1875")

(Images Courtesy Craig Risch)

18K AWCo Case with Chronograph Buttons

Selected Movements from Gold Dome Runs 5 through 10 – all 21 Jewel

SN 1,265,944
Run #5
Unusual Winding Wheels

SN 1,427,904
Run #6
4th Reg.
Production
Open Face
AWCo Grade 1872

SN 1,265,940
Run #5
Unusual Plate DMK
Possibly Unique
Winding Wheels

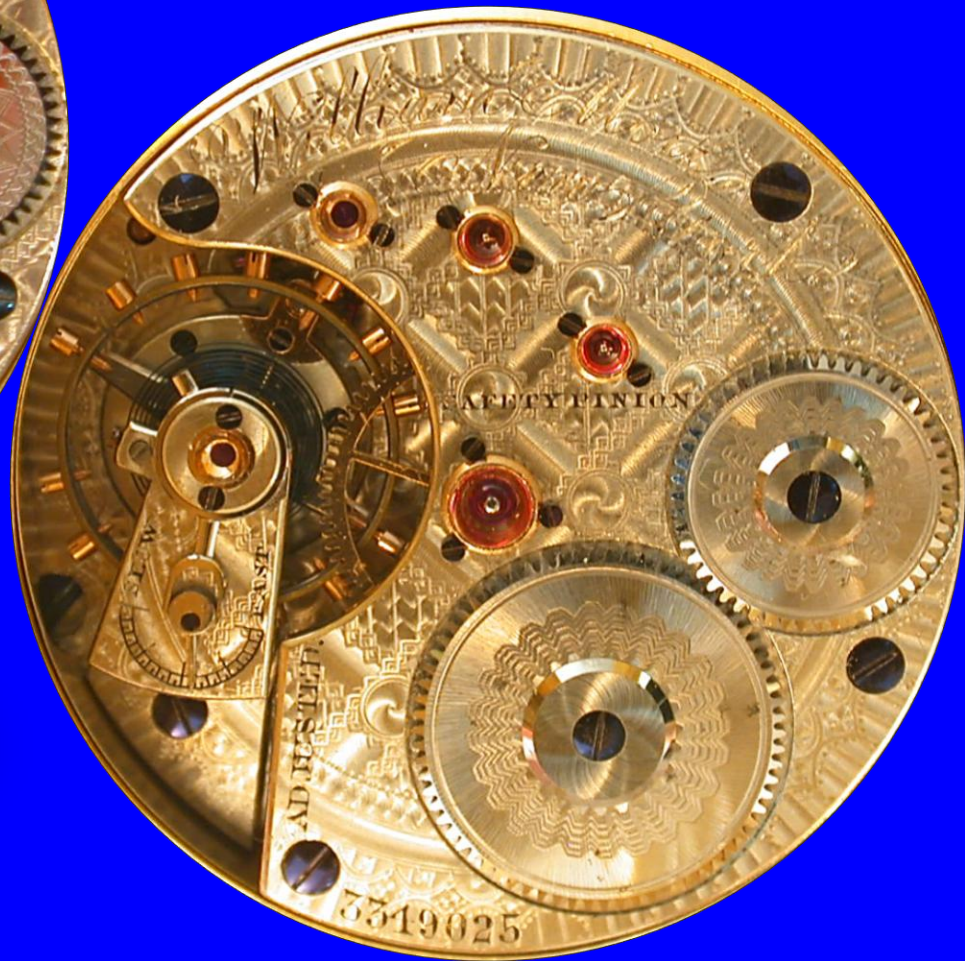
SN 1,719,004
Run #10
Only Gold Dome Run
w. All raised Jewel settings
on Top Plate
(Courtesy, Jones & Horan)

Selected Movements from the Late Version AWCo Grade 1872 Runs 11 - 22

SN 2,747,953 Run # 18
Unmarked Open Face
NON-MAGNETIC

SN 2,788,058 Run # 19
Marked Hunting Case
NON-MAGNETIC

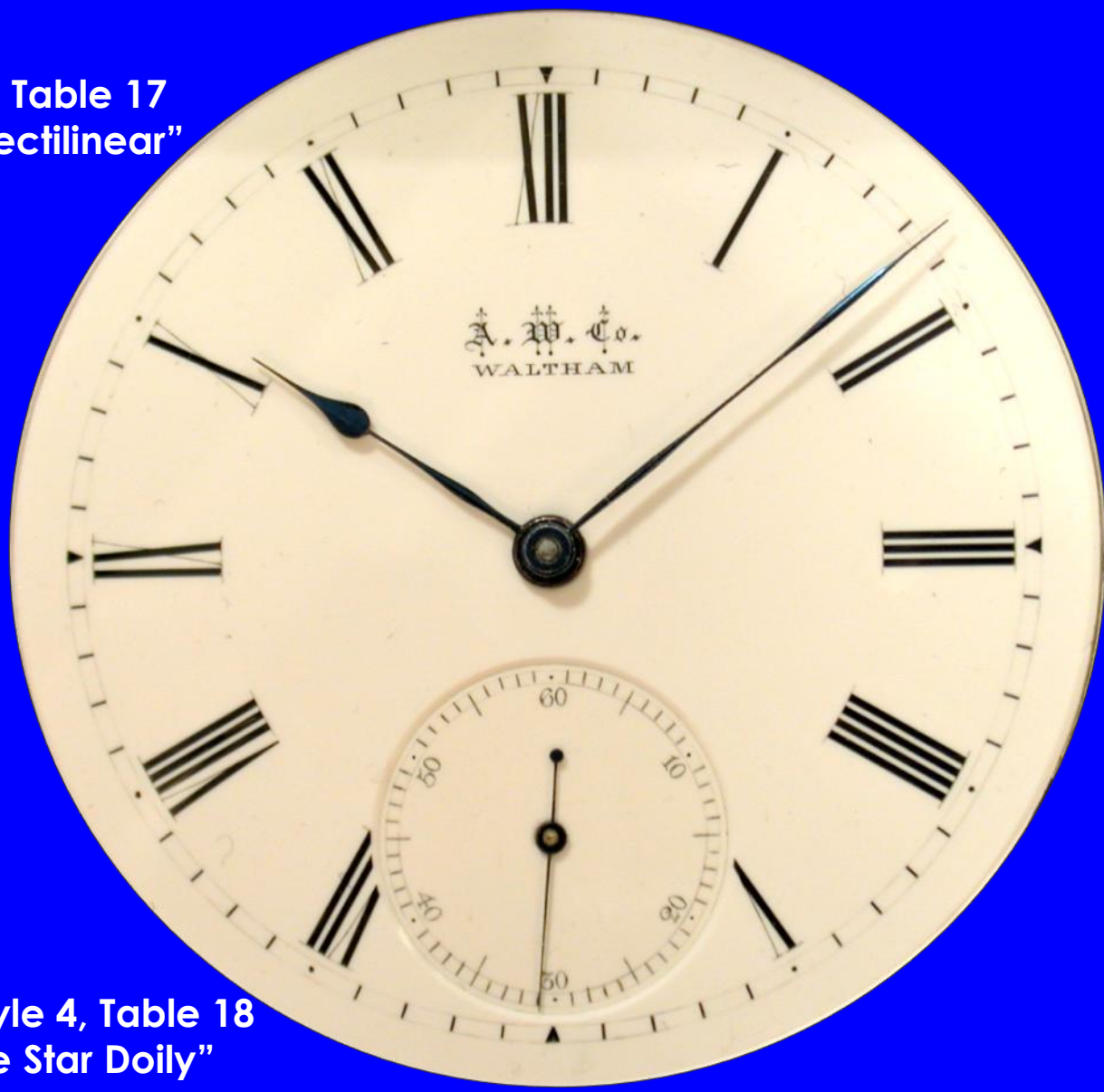
SN 3,349,025 Run # 22
Rare AWCo Grade Private Label
"Wm. Moir, New York"



MODEL 1872 SN 2,788,058 NON-MAGNETIC

(21 ruby jewels in raised gold settings, gold train, Fogg's safety pinion and cam regulator)
(**non-magnetic double roller escapement**, glass enamel A.W.Co dial, "Extra Quality" sculpted steel hands)

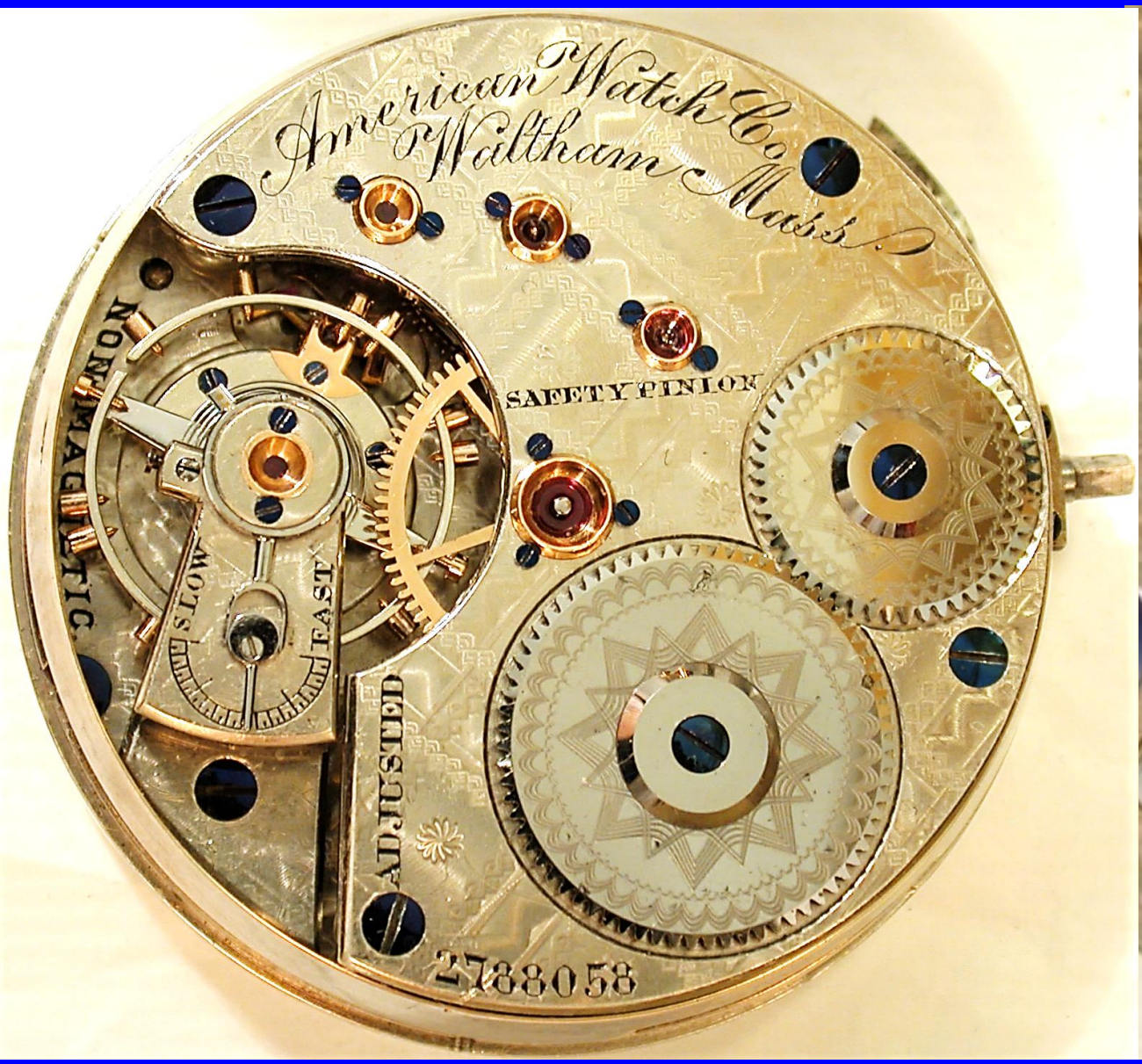
Plate Style 3B, Table 17
"Compound Rectilinear"

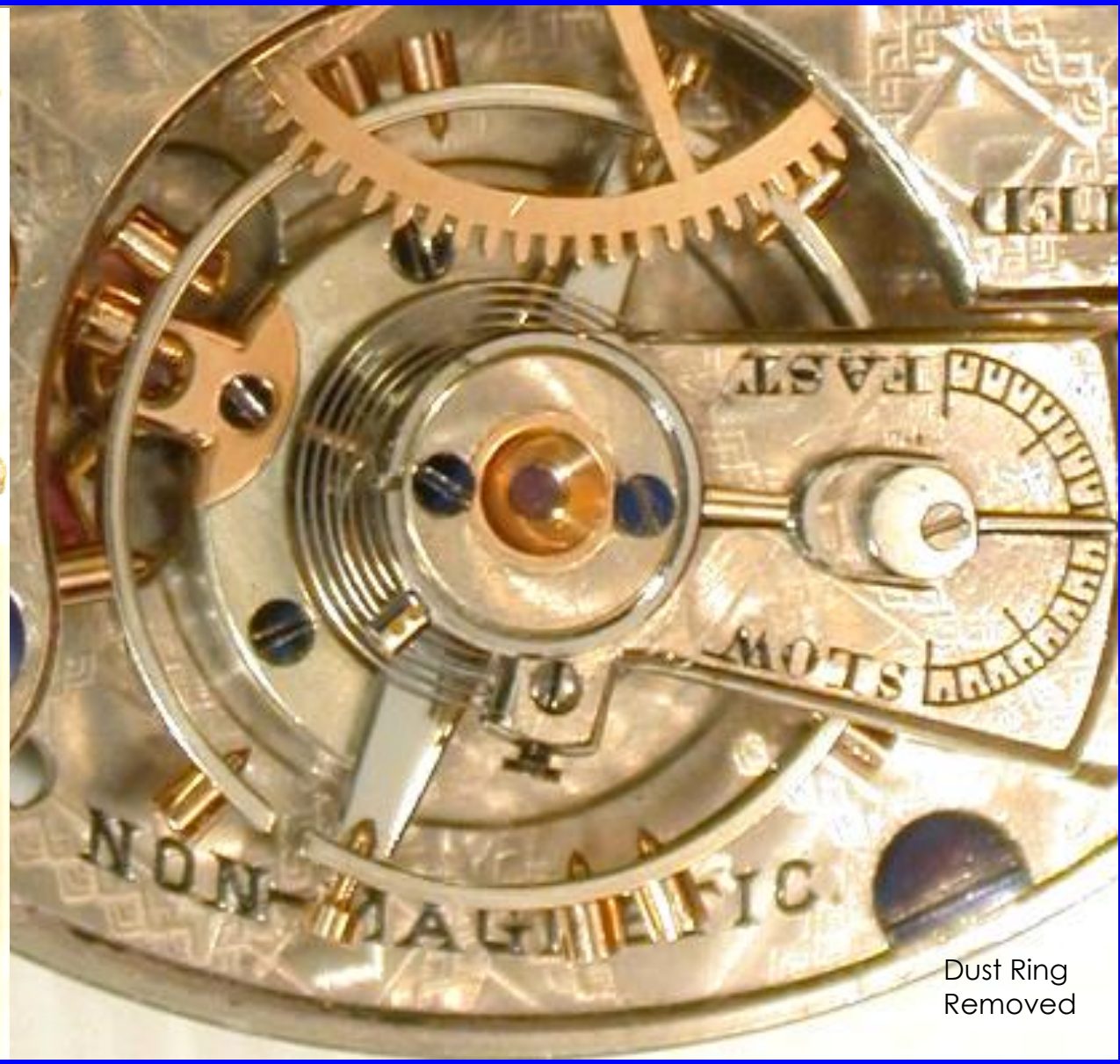


Winding Wheel Style 4, Table 18
"Pointed Double Star Doily"

MODEL 1872 SN 2,788,058 NON-MAGNETIC

(21 ruby jewels, raised gold train jewel settings, Fogg's cam regulator)
(Fogg's safety pinion, glass enamel AWCo dial, non-magnetic double roller escapement)





Dust Ring Removed

PRIVATE LABEL MODEL 1872 SN 3,349,025 - 18K

(21 ruby jewels, gold train, raised gold jewel settings, Fogg's cam regulator and safety pinion,
Very complex dmk, **double sunk** glass enamel AWWCo dial, "Extra Quality" sculpted steel hands)

William Moir, New York

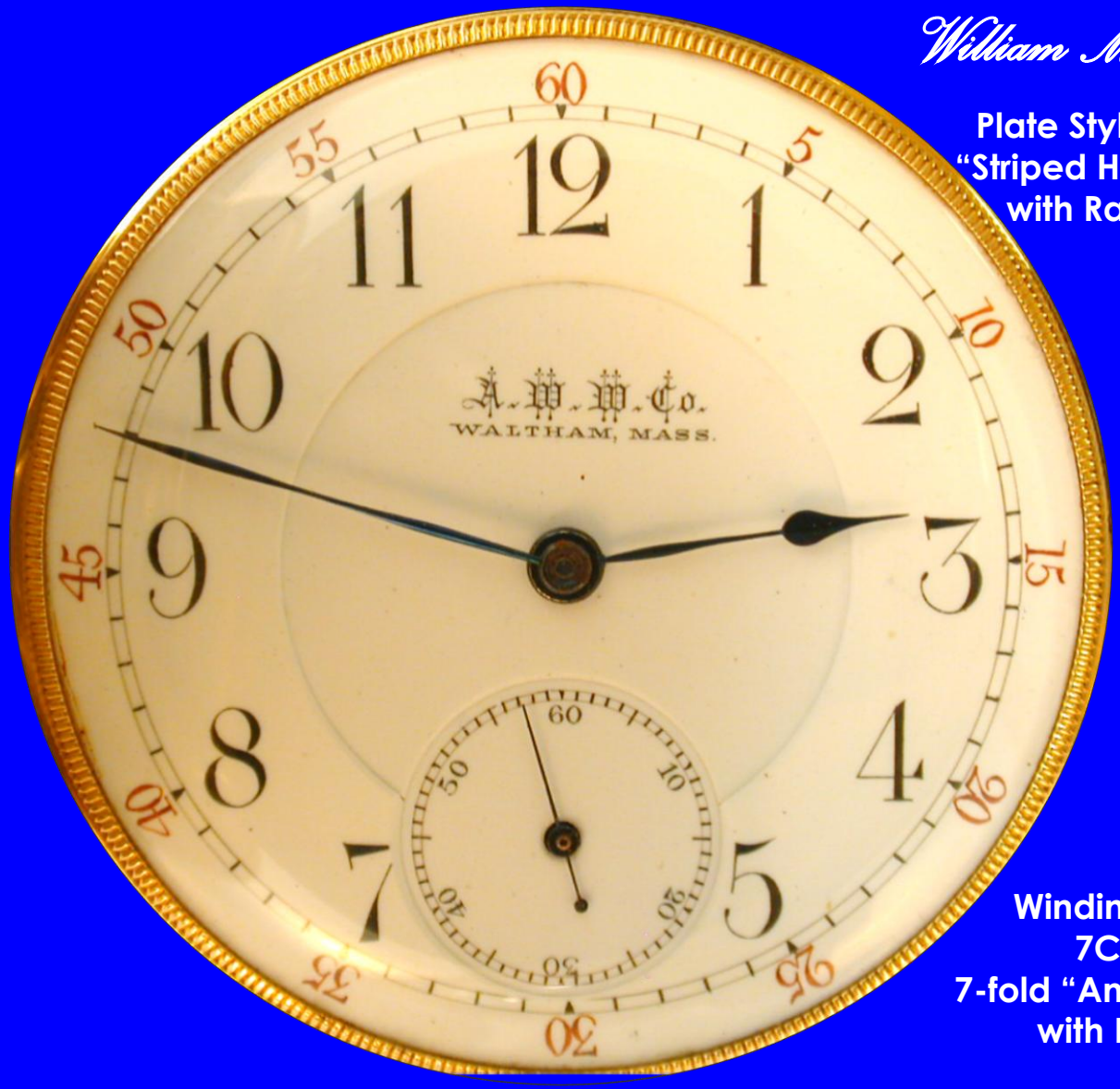


Plate Style 9A, Table 17
"Striped Herringbone Quilt with Radial Borders"

Winding Wheel Style 7C, Table 18
7-fold "Annular Line Pattern with Radial Lines"

AWCo Grade Movement SN 3,349,025

Four rare or outstanding features: (1) private label movement signature (only 5 known); (2) exceptionally complex damaskeening; (3) double sunk "A.W.W.Co." Arabic numeral glass enamel dial; (4) 18K "A.W.W.Co." 1872 model case.

1872 Model "A.W.Co." Cases

Mvt 670,095 Nail Set
Smooth Polished
Bassine Style Hunter

50 DWT

Mvt 871,101 Lever Set
Hand Engraved
Semi-Drum Style Hunter

47 DWT

Mvt 1,427,904 Lever Set
Monogrammed
Box-Hinged Open Face

55 DWT

Mvt 2,788,058 Lever Set
Engraved & Engine Turned
Bassine Style Hunter

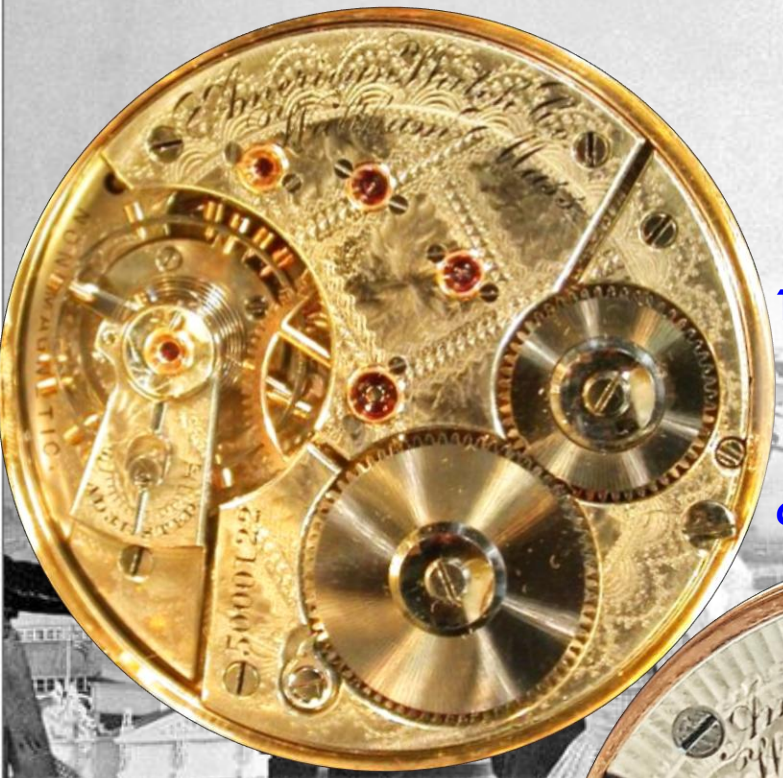
46 DWT

PART 4: THE POST-NASHUA ERA PENDANT SET 1888, 1891, AND 1894 BRIDGE & 1899 BRIDGE MODELS

C. V. Woerd's revolutionary automatic screw-making machine, invented in 1871

Some Stemwind/Pendant Set AWCo Grade Models 1888, 1891, 1894 Bridge & 1899 Bridge Movements in this Presentation

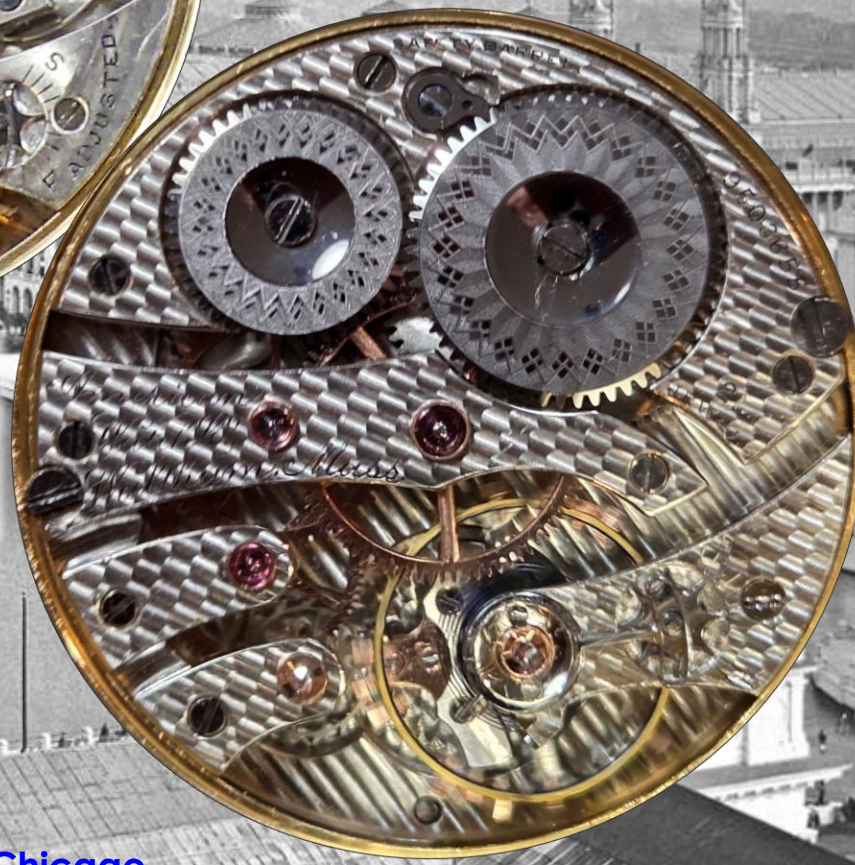
SN	Date	Size	Model	Movement Description
3,574,001	12/1889	16	**1888**	**19 Jewels, marked "NON-MAGNETIC," early Open Face Style, Only known AWCo Grade 1888 Movement with SN < 5 Million**
5,000,122	6/91 to 1/92	16	**1888**	19 jewels; SW/PS; bright nickel; **DS AWWCo Dial, *marked* "NON-MAGNETIC"**
7,000,907	11/96 to 12/96	16	**1888**	21 jewels; SW/PS; bright nickel; **4 diamond endstones, AWWCo Dial**
5,511,521	8/92 to 11/99	00	**1891**	16 jewels; SW/PS; nickel, open face conversion dial, **only ladies AWCo grade model**
8,774,578	~1898	12	**1894 Brg 1st Run**	21 jewels; SW/PS; **4 diamond endstones, recessed hub escape wheel, Church's patent starwheel regulator, Double sunk Hull-style dial**
9,503,655	~1900	16	**1899 Brg 1st Run**	**23 jewels,** SW/PS, **4 diamond endstones, recessed hub escape wheel, Church's pat. starwheel regulator, Double sunk Hull-style dial, fish scale damaskeening, main wheel engraved: "Sapphire Jeweled Bearings"**
12,656,056	~1903	16	**1899 Brg**	**23 jewels;** SW/PS; **4 diamond endstones, recessed hub escape wheel, Whip spring regulator, Double sunk Hull-style dial**



19 Jewel 16 Size
1888 Model Hunting Case
SN 5,000,122
Marked NON-MAGNETIC

16 Jewel 00 Size
1891 Model
SN 5,511,618
Ladies Model
c. Jerry Treiman

21 Jewel 12 Size
1894 Bridge Model
Open Face
SN 8,774,578

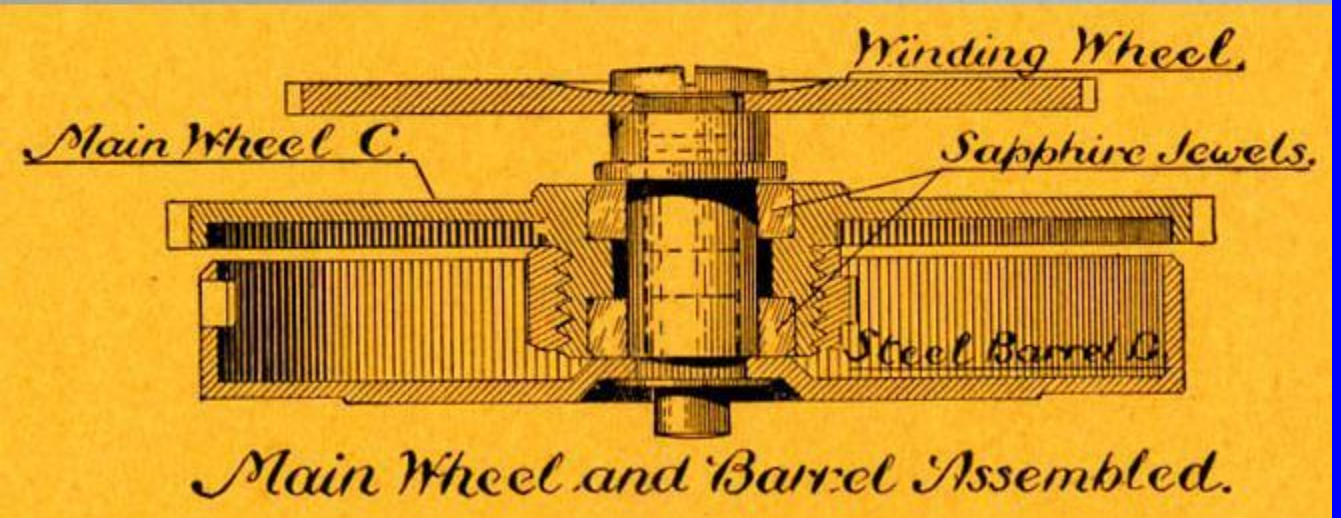


23 Jewel 16 Size Hunting Case
1899 Bridge Model
SN 9,503,655
Rare Fishscale Damaskeening
c. Vince Schweiger

1893 Columbian Exhibition - Chicago

Waltham introduced safety barrels on the 1888 Model

Image from NAWCC Forums



Waltham's final approach to protecting escapements from mainspring failures was the "safety barrel."

The last three AWCo Grade Waltham men's watch models, the 16 Size 1888 Model, the 12 Size 1894 Bridge Model and the 16 Size 1899 Bridge Model, all were designed with safety barrels.

A Waltham safety barrel turns during winding but is stationary during running. It's exterior is smooth and the main wheel carries the teeth.

This arrangement allows the reverse impulse created by a breaking mainspring to be released without being transferred to the wheel train.

AWCo Grade 1888 Models

19 Jewel 1888 Model
Early Open Face Plate Configuration
SN 3,574,001
Marked NON-MAGNETIC
First AWCo Grade 1888 Model

21 Jewel 1888 Model
Late Open Face Configuration
SN 7,000,907
More Common Radial Damaskeening
4 Diamond Endstones

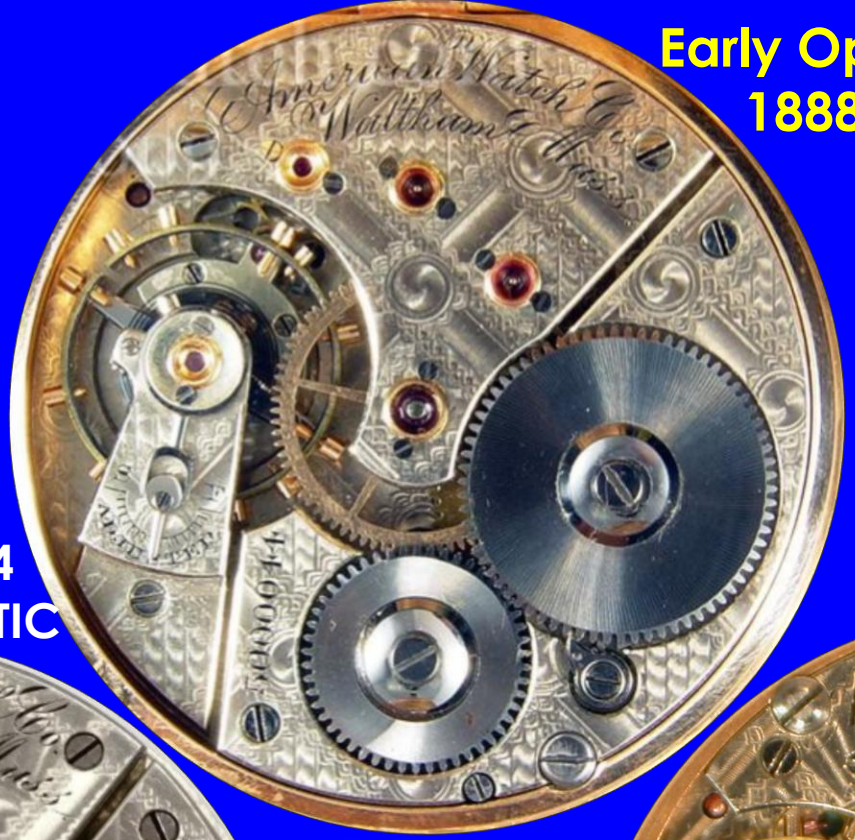
19 Jewel 1888 Model
Hunting Case Plate Configuration
SN 5,000,122
Marked NON-MAGNETIC
Scarce Rectilinear Damaskeening

The Waltham Watch Factory, c. 1890

Early Open Face AWCo Grade 1888 Model Movements

SN 5,000,002
NON-MAGNETIC

SN 5,000,014
NON-MAGNETIC

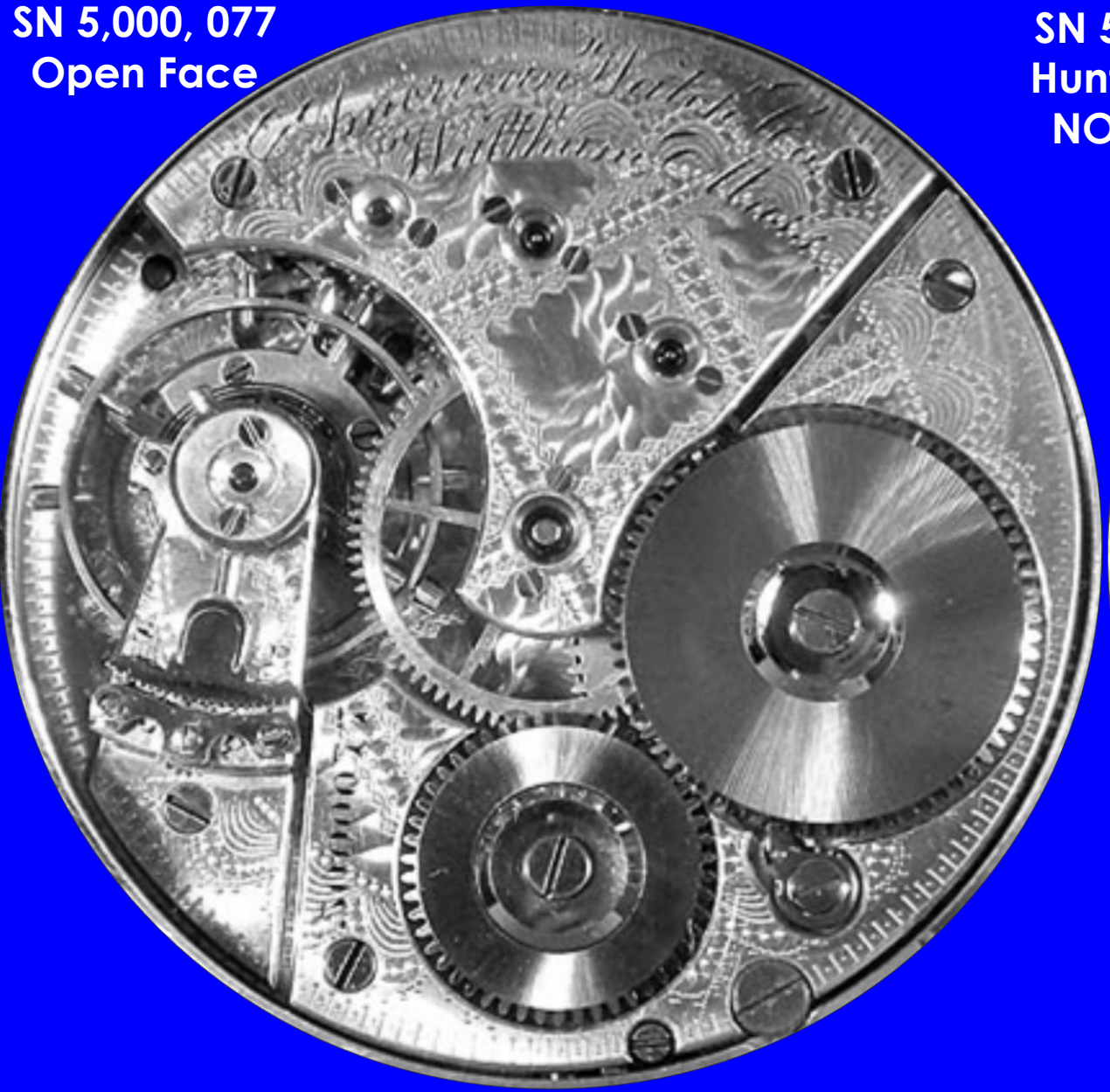


SN 5,000,044
NON-MAGNETIC

SN 5,000,045
Conventional

The closest we've seen to an exact damaskeening match among early AWCo Grade 1888 movements is open face Movement 5,000,077 and hunting case Movement 5,000,122

SN 5,000, 077
Open Face



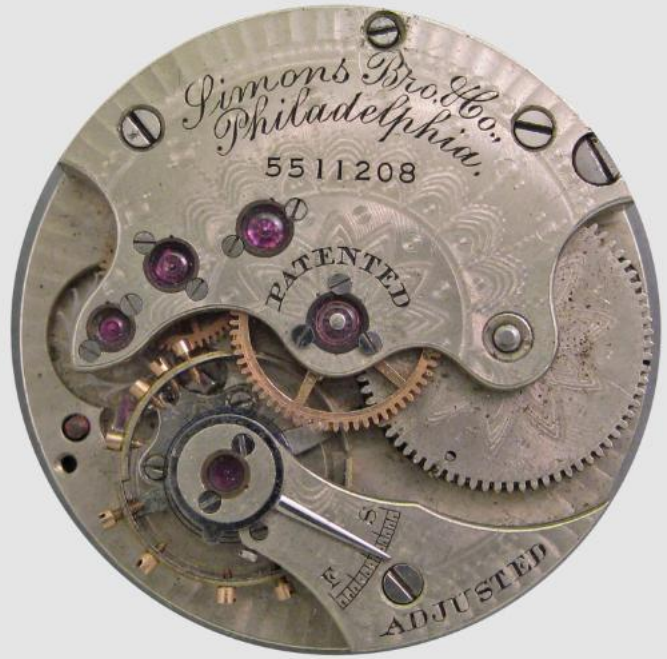
SN 5,000,122
Hunting Style
NON-MAG

Rare Double Sunk Glass Enamel AWWCo Radial Blue Numeral Dial of 19 Jewel Movement SN 5,000,122

Glass Enamel AWWCo Upright Numeral Dial of 21 Jewel Movement SN 7,000,907

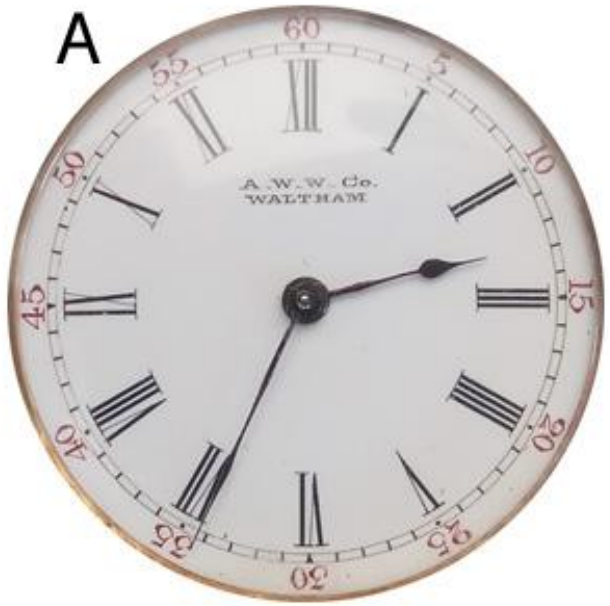
The 1891 Model 00 Size Ladies Watch

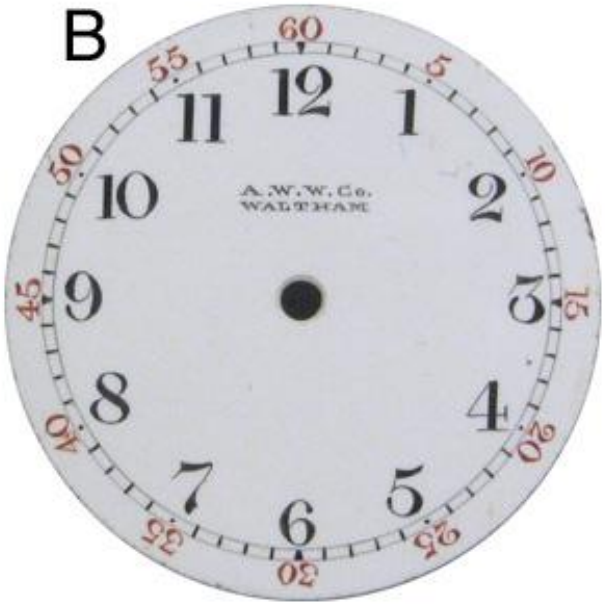
- The 00 size and the “profile” plate shape are unique to AWCo grade 1891 Model movements
- Made in 2 runs nominally of 250 and 800 beginning at SNs 4,242,001 and 5,511,201, but are much scarcer today than those numbers might suggest
- 16 jewels, marked “ADJUSTED,” with a variety of damaskeening patterns, gold train and jewel settings w. steel escape wheel, double rollers, and going barrel
- Hunting style, but many were sold in OF cases with conversion dials
- Various private labels seen, but are uncommon

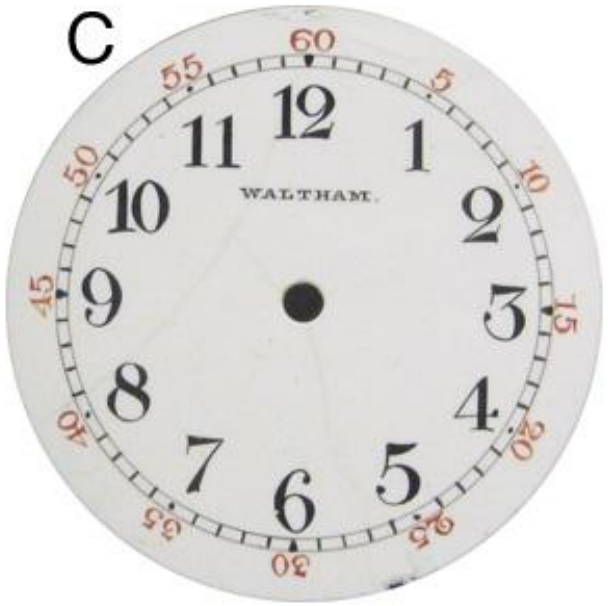


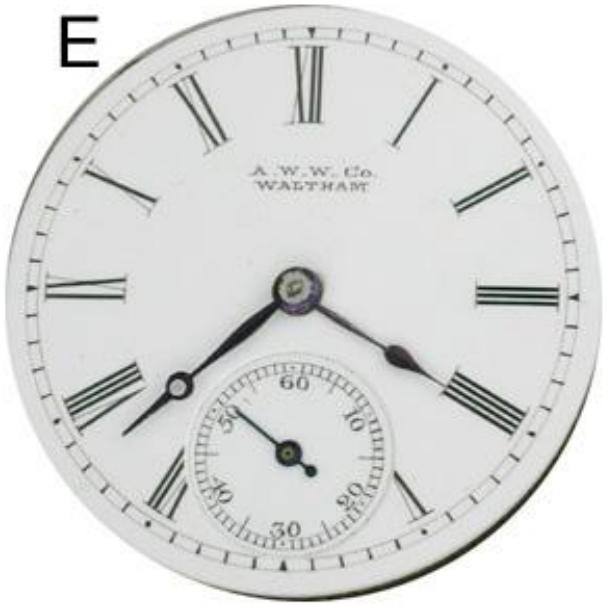
Model 1891 00 Size Pvt. Label for S. W. MacDonald, NY

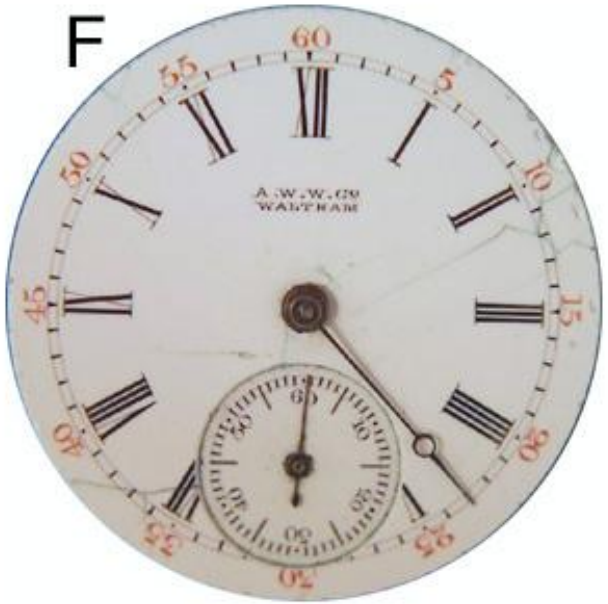
00 Size 1891 Model Dials

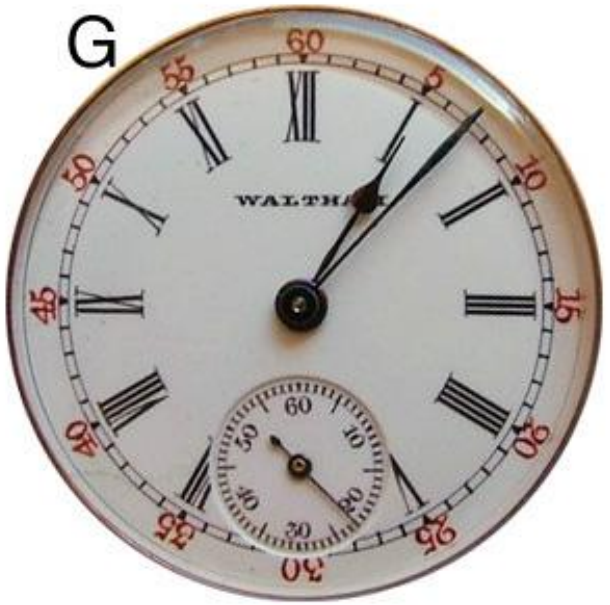


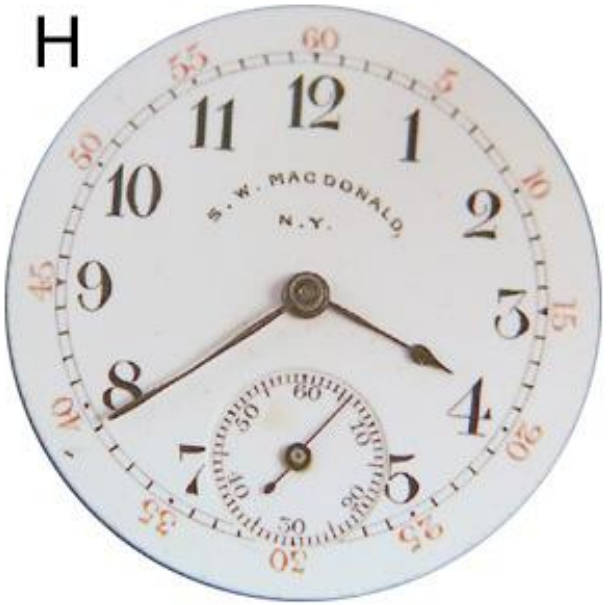






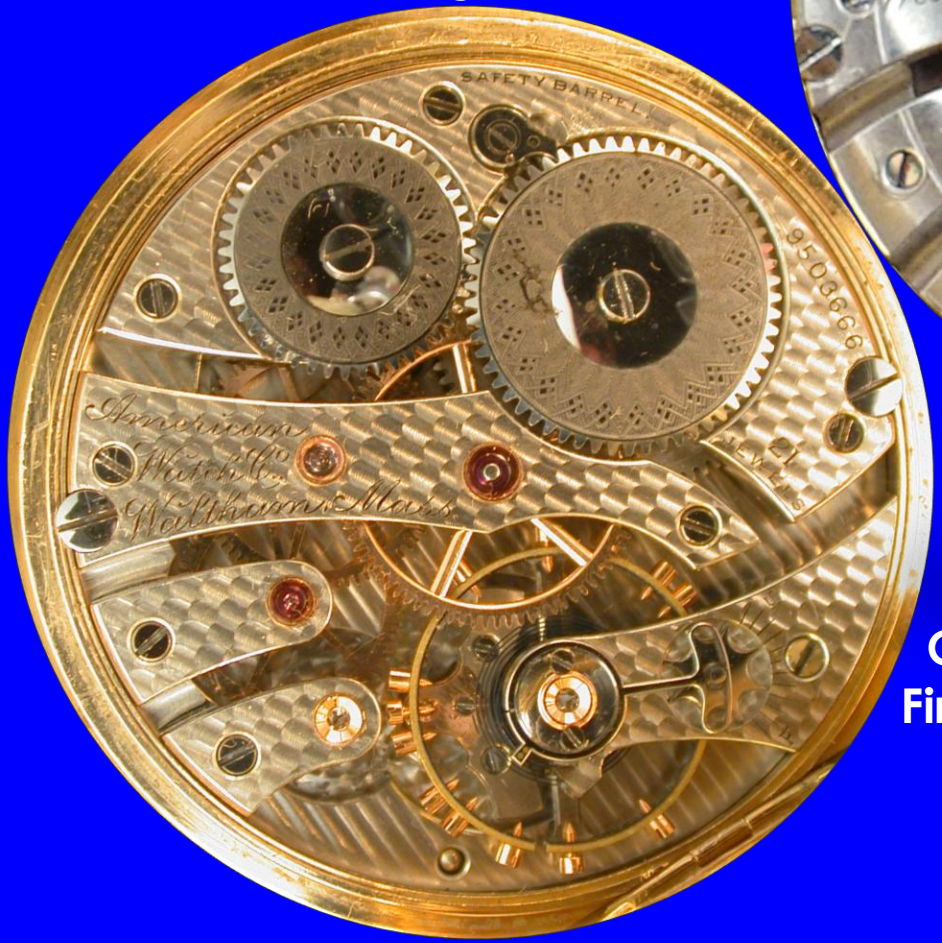






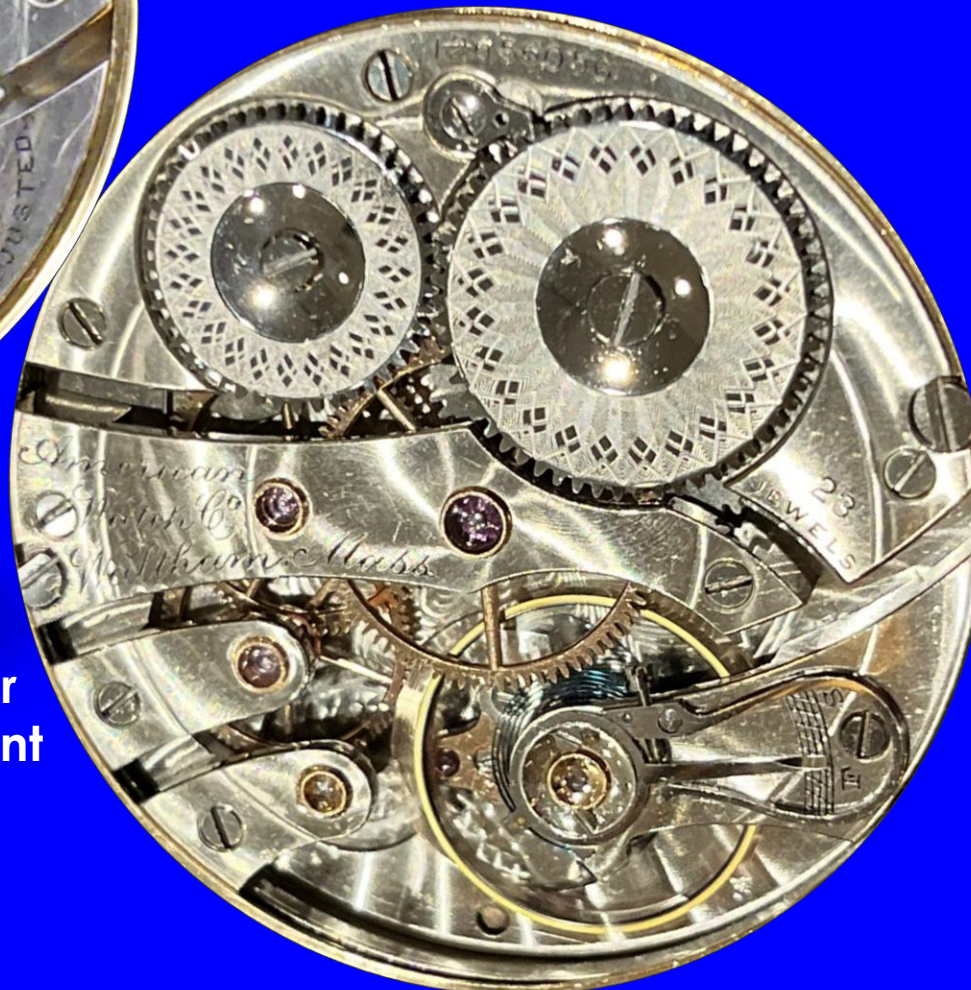
The 1894 12 Size & 1899 16 Size Bridge Models

16 Size Open Face 23 Jewel
1899 Bridge Model
SN 9,503,666
Church's Starwheel Regulator
First Run 1899 Bridge Movement



12 Size Open Face 21 jewel
1894 Bridge Model
SN 8,774,578
Church's Starwheel Regulator
First Run 1894 Bridge Movement

16 Size Hunting Case 23 Jewel
1899 Bridge Model
SN 12,656,056
Whip Lash Regulator



Recessed Hub versus a Standard Escape Wheel

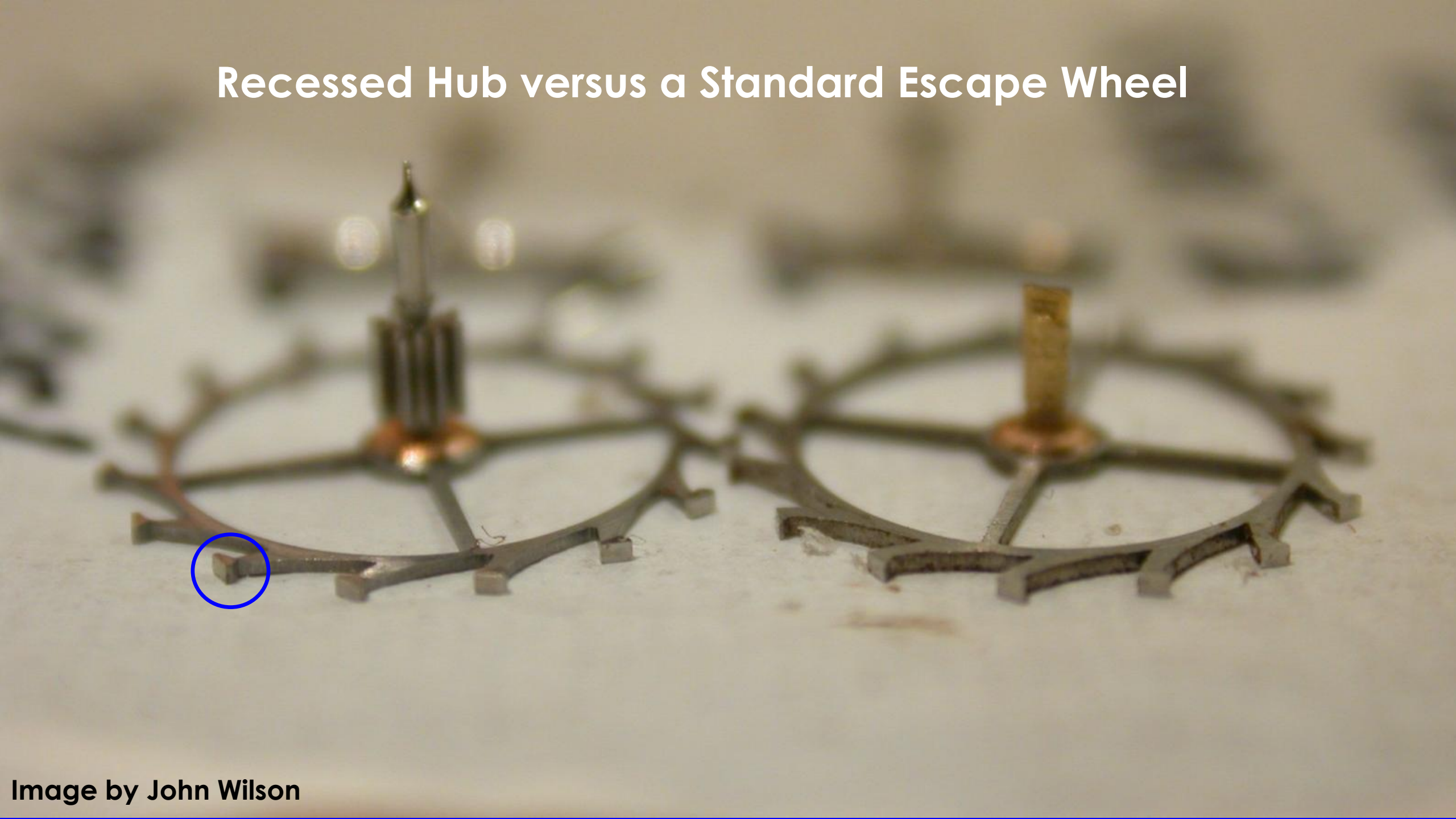


Image by John Wilson

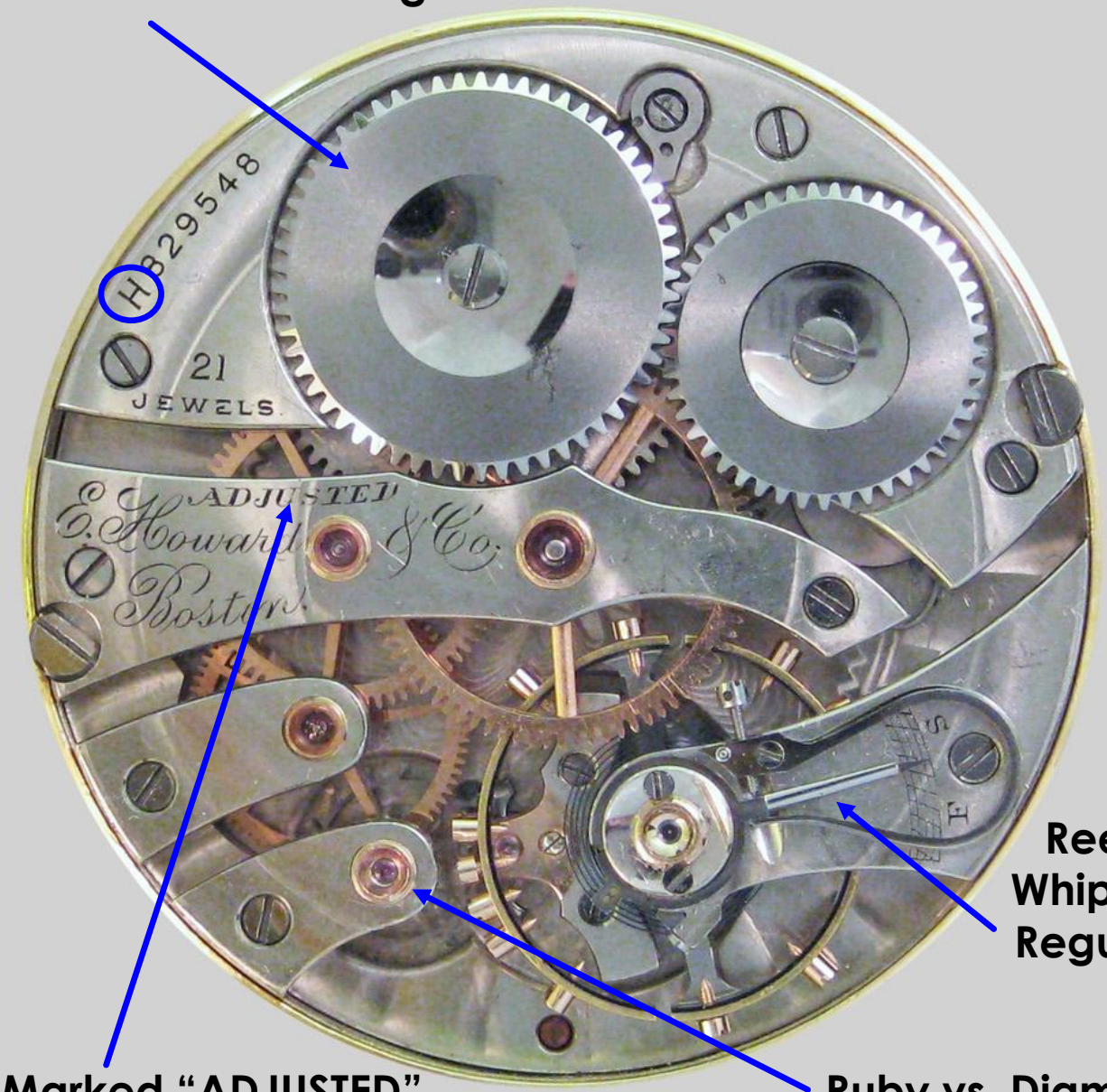
Single and Double Sunk Hull-Style Glass Enamel AWCo Grade Bridge Model Dials

Special Singleton Bridge Model Movements

12 Size 1894 Open Face Model 9,500,000
21 Jewels, Gold Train & Jewel Settings
Church's Patent Starwheel Regulator

12 Size 1894 Open Face Model SN 12,000,000
21 jewels, Gold Train & Jewel Settings, Freesprung
w. Coles Resilient Banking Escapement

E. Howard & Co. Private Label vs. AWCo Bridge Models

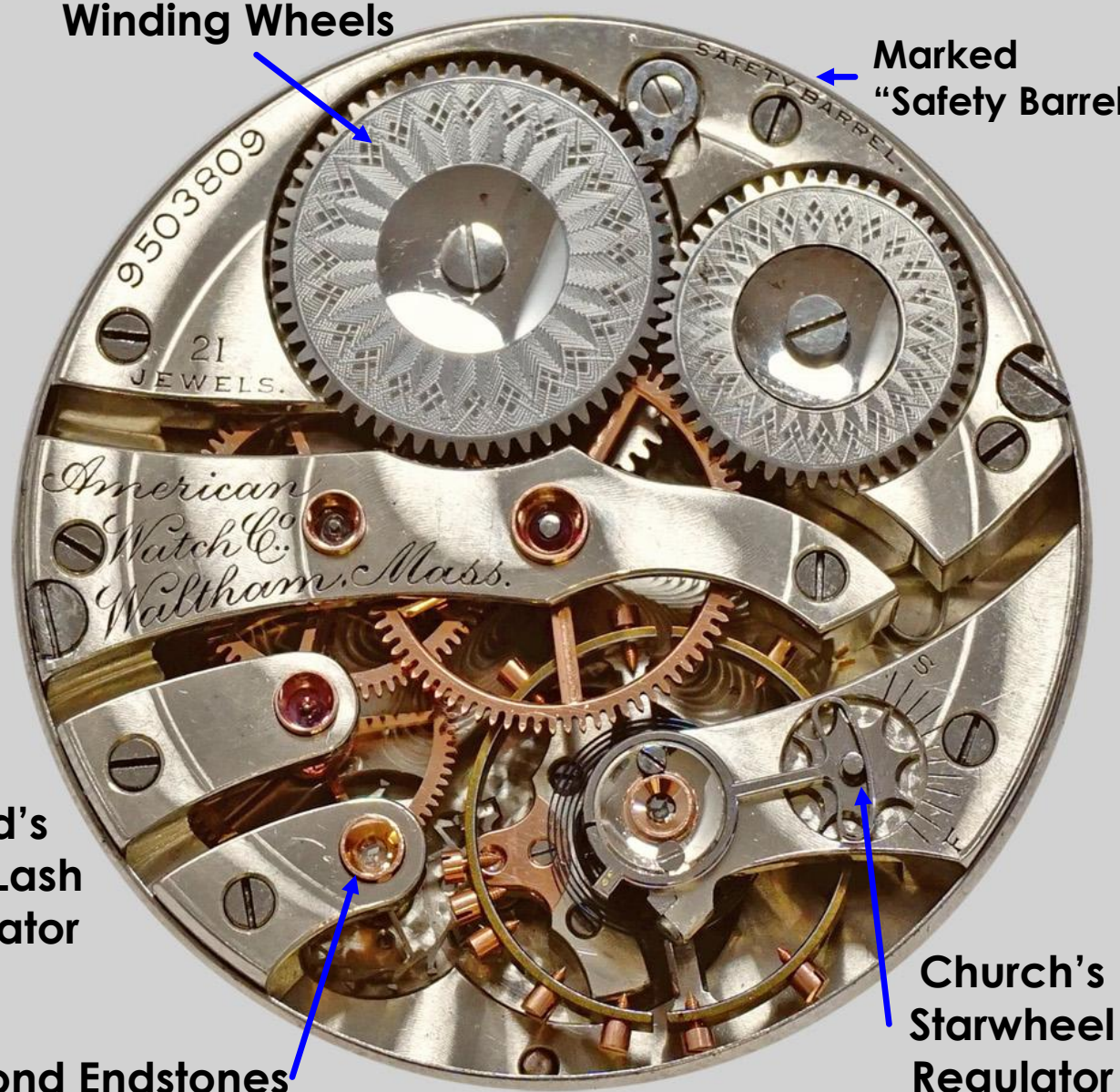


Satin Finish Winding Wheels

Marked "ADJUSTED"

Reed's Whip Lash Regulator

Ruby vs. Diamond Endstones



Signature AWCo Grade 1899 Bridge Model Winding Wheels

Marked "Safety Barrel"

Church's Starwheel Regulator

12 Size Open Face Case w. Chased Bezel & Lid Edges
Engine Turned Rear with Blank Shield

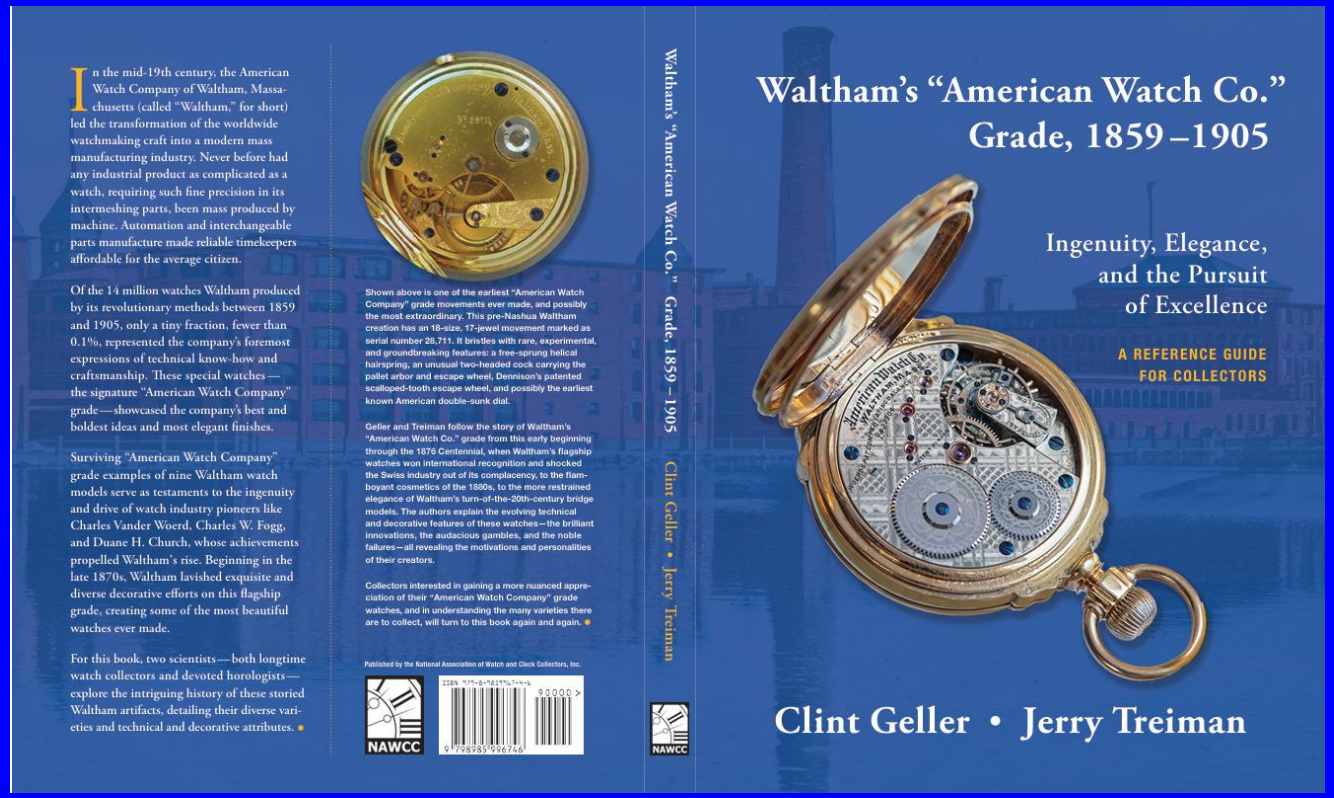
18K Case of 1899 Bridge Movt. 9,503,655

18K Case of 1899 Bridge Movt. 9,503,674

Both 23 jewel
Fishscale DMK Movements
c. Vince Schweiger

Concluding Remarks

We have showcased the elegance and diversity of AWCo Grade movements and their evolution over their 45 or so years of production. I hope you have enjoyed this presentation and that it perhaps has piqued your interest or enhanced your appreciation of AWCo Grade watches. If you are interested in the copious details of the AWCo Grade story, please see Jerry Treiman's and my new book:



Clint Geller

Jerry Treiman

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