May 2020

HOROLOGICAL TIMES™

AMERICAN WATCHMAKERS-CLOCKMAKERS INSTITUTE · SETTING SERVICE STANDARDS AND EDUCATING THE HOROLOGICAL COMMUNITY

West Dean College of Arts and Conservation

Elemental Components: Friction Clutches in the ETA 7750

Restoring a 1950s Rolex Oyster Perpetual, Ref 6074, Part 2

PRECISION IS PRECIOUS

THE EXCLUSIVE AUTHORIZED NORTH AMERICAN DISTRIBUTOR FOR WITSCHI PRODUCTS

Jules Borel & Company is very thankful for each of our customers. We hope that each and every one of you & your families are safe & well. We look forward to serving you & helping you succeed.

witschi
PREMIUM PARTNER

PHONE 800-776-6858 **WEB** JULESBOREL.COM **FAX** 800-776-6862

AWCI

IN THIS issue

VOLUME 44, NUMBER 5, May 2020

Official Publication of the American Watchmakers-Clockmakers Institute

EXECUTIVE & EDITORIAL OFFICES
American Watchmakers-
Clockmakers Institute (AWCI)
701 Enterprise Drive
Harrison, OH 45030
866-FOR-AWCI (367-2924)
or 513-367-9800
Fax 513-367-1414
awci@awci.com • www.awci.com
www.facebook.com/MyAWCI

Jordan P. Ficklin, CW21
Executive Director
Ext. 310 jordan@awci.com

Donna Hardy
Managing Editor
Ext. 305 donna@awci.com

Kathy Ortt
Editor
kortt@awci.com

Janette Torres-Gomez
Graphic Designer &
Assistant Technical Support
Ext. 302 jgomez@awci.com

Tom Schomaker, CMW21
Watchmaking Instructor
Ext. 309 tschomaker@awci.com

Jason Champion, CW21
Education Director and Watchmaking Specialist
Ext. 303 jason@awci.com

Mike Carpenter, CC21
Clock Director
clocks@awci.com

HOROLOGICAL TIMES **ADVISORY COMMITTEE**
Bob Little, CC, CW, Chair
Daniel Benson, CMW
Paul Corn
Andrew DeKeyser, CW21
Dale LaDue, CMW21
Matt Schloemer, CW21

Reprinting and reproduction is prohibited without written permission from the American Watchmakers-Clockmakers Institute. Copyright © 2020 by the American Watchmakers-Clockmakers Institute.

Horological Times (ISSNO 145-9546) is published monthly and copyrighted by the American Watchmakers-Clockmakers Institute, 701 Enterprise Drive, Harrison, OH 45030-1696. Subscription price for the public is $175.00 per year ($15.00 per copy). Members subscription is $99.00 which is included with annual dues of $175.00. Periodicals postage paid at Harrison, OH 45030 and additional entries. POSTMASTER: Send address changes to *Horological Times*, 701 Enterprise Drive, Harrison, OH 45030.

Feature

AWCI News

Technical Discussions

Industry News

Education & Certification

A first-year student at West Dean College of Arts and Conservation using a watchmaker's lathe to finish clock components. See page 39 for this month's installment of Horological Education Around the World.
Photo courtesy of West Dean College.

Columns

Classifieds

AWCI Directory

OUR VISION:
AWCI's vision is to have an educated and passionate horological community practicing the highest standards and with the resources to provide quality goods and services.

OUR MISSION:
Setting service standards and educating the horological community.

Like us on Facebook!
www.facebook.com/HorologicalTimes

Follow us on Twitter!
www.twitter.com/AWCInstitute

Follow us on Instagram!
www.instagram.com/americanwatchmakers

Like us on Facebook!
www.facebook.com/MyAWCI

Check out our educational videos!
www.youtube.com/awci/videos

TIMECON2020

has been rescheduled

October 8-10

The Summit Hotel—Cincinnati, Ohio

registration now available at www.awci.com/timecon

Join us for this great lineup of instructors and presenters—

Bernhard Stoeber, CW21
Michael Gainey, CC21
David Lindow
Nick Butt—Chelsea Clocks
Robert C. Cheney—Willard House of Clocks
Tom Schomaker, CMW21—AWCI
John Sokol—Richemont
Robert Flood, CC21—Richemont
Verdin Bells & Clocks

Don't miss the American Timepiece Fair—

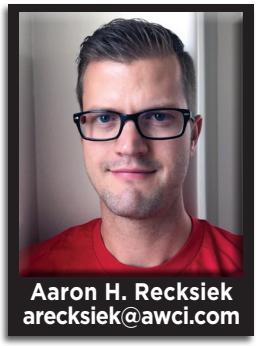
Jules Borel & Co.
Kessler Batteries
Time Machine Repair
Illinois Watch Co.
Cas-Ker Co.
Celeste Watch Co.
Cincy Strap Co.
Richter & Phillips Jewelers
Mercury Refining
And more!

We'll see **YOU** there for all the networking, education, tool shopping, fun, and celebration!

a message from the

president

AARON H. RECKSIEK, CW21



Aaron H. Recksiek
arecksiek@awci.com

Things are really weird right now! I have said this so many times in the past month, just like many of you, that it's starting to lose meaning. Most people have never experienced anything like this, and it's affecting everyone in one way or another. I know many of you are going through some very tough times right now, and I want you to know that AWCI is here for you.

We are trying to do everything we can to operate at full capacity despite not having in-person classes and temporarily closing our headquarters. All of our staff is working from home. We are using this time to not only continue to deliver *Horological Times* every month, but also to do a lot of things that have been on our wish list—things we wanted do once we found the time. Guess what? We found the time!

We are concerned about the financial future of our institute and our members. Fortunately, the institute is financially stable, and because of our perpetuation fund, we still have money coming in every month. However, we lose money by keeping the staff fully employed through these tough times. Typically, we would be teaching classes and having certification exams to bring in money to cover these expenditures. Our Board of Directors committed to employing the staff as long as possible to support our hard-working employees and keep the momentum of the institute going.

This will end, our industry will survive, and we will recover.

You may have noticed some of our new offerings. We are holding weekly webinars that are free to members, and we are also adapting some more complex topics into longer distance-learning courses. These cost less to attend than in-person courses and can be done remotely from your home or workshop. Since I've been involved with AWCI, online education has been a topic that has been brought up and shot down dozens of times. However, as the proverb says, "Necessity is the mother of invention." Meaning, when the need for something becomes imperative, you are forced to find ways of achieving it.

continued on page 50

a message from the

executive director

JORDAN P. FICKLIN, CW21

Jordan P. Ficklin
jordan@awci.com

I sometimes struggle when writing this message because it has to be written nearly a month before you will read it. As I write this message it is early April, and we are in the midst of the COVID-19 pandemic. Last month as I wrote my message we were struggling with the cancellation of TimeCon. Little did I know we would be facing a complete shutdown of our facility. AWCI headquarters has been closed since March 24, but the staff of AWCI is working harder than ever to meet your needs. I don't know what the situation will look like when you read this message two weeks from now. Our mandated closure is supposed to continue through May 1, and I hope we are returning to the office as you receive this magazine.

We are doing everything we can to fulfill our mission of setting service standards and educating the horological community, and we are doing everything we can to meet the needs of AWCI members and the horological community. We can't teach classes in our building and we can't teach on our mobile classroom, but there is much we can do. We know this pandemic has affected all of you and your businesses as well. That is why we want to be here for you.

We are accessible and here to help.

Our magazine staff has been working primarily from home for more than a year. The government-mandated closure of our building has not affected their ability to produce a quality magazine. You will continue to receive *Horological Times* throughout this pandemic.

Tom Schomaker, CMW21, and Jason Champion, CW21, are working from home. While it has taken some time to get used to this adjustment, they have been able to focus on projects we have wanted to tackle for many years, but just haven't found the time to complete. Tom and Jason are developing new classes, working on certification, and discovering ways we can teach virtually. While none of these activities generate the revenue of in-person

continued on page 50

AWCI educational calendar

Reserve your spot today. Contact the education director, Jason Champion, CW21, at 866-FOR-AWCI (367-2924).

Prices reflect members' discount! Contact us so we can help you find the best course suited to your skill level, expertise, and interests.

Due to the global spread of coronavirus (COVID-19), there may be some changes to our upcoming schedule of events and classes. Please be advised that AWCI will send out an email and contact all registered individuals directly as soon as a decision is made about any classes. If you are concerned about a class and you have not heard from AWCI, you should assume it is continuing as scheduled.

June 15-19

WATCH 240: **$1,095**
The Swiss Lever Escapement
Instructor: Tom Schomaker, CMW21
AWCI Headquarters, Harrison, Ohio

The purpose of this course is to gain a good theoretical understanding in order to evaluate the condition of the lever escapement and thus proceed with the verification and analysis of the escapement functions.

July 13-17

WATCH 200: **$1,095**
Modern Mechanical Automatics
Instructor: Tom Schomaker, CMW21
AWCI Headquarters, Harrison, Ohio

This course teaches students all the fundamentals of modern mechanical automatic watch repair that are most prevalent in today's market. Students will learn how to perform the various diagnostics in evaluating the condition of the various components, cleaning, assembling, adjustments, dialing, and casing. Prerequisites: Watch 160 or Watch 190 and read pages 169-188 in *The Theory of Horology*.

July 20-24

WATCH 100: **Members $1,095/Non-members $1,245**
Introduction to Watchmaking
Instructor: Tom Schomaker, CMW21
AWCI Headquarters, Harrison, Ohio

A survey course for the new or prospective watchmaker covering the basic skills and techniques used by the modern watchmaker. This class is perfect for anyone thinking about entering the profession of watchmaking or for the individual who just wants to gain a better appreciation for the art of watchmaking.

July 27-31

WATCH 477: **$1,095**
Part Design and Construction
Instructor: Henrik Korpela
AWCI Headquarters, Harrison, Ohio

Join Henrik Korpela in designing and manufacturing an oscillator for a watch! This class builds upon Watch 475 and 476 to make an oscillator for the 6497. Prerequisites: CW21 or equivalent certification required.

August 3-7

WATCH 230: **$1,095**
Balance Staffing and Timing
Instructor: Tom Schomaker, CMW21
AWCI Headquarters, Harrison, Ohio

The purpose of this course is to teach the student all the fundamentals of balance staffing. Topics covered will include the verification and analysis of the escapement function, poising (static & dynamic), truing and timing adjustment in a mechanical watch, cutting out a balance staff on a lathe and adjusting the balance staff, and removing balance staffs from Glucydur balances with the Horia tool.

August 17-21

WATCH 150: **$1,095**
Service on the Watch Case: Crystals, Crowns, Tubes, and Water Resistance
Instructor: Tom Schomaker, CMW21
AWCI Headquarters, Harrison, Ohio

The purpose of this new course is to teach the student the skills involved with casing. We will explore crystals, case buttons, crowns, and case tubes. These components will be serviced (e.g., taken apart, gaskets replaced, threadlocker applied, etc). Complete disassembly of the cases will be done using the case press and a multitude of various dies.

September 2-4

WATCH 102: **$595**
Watchmaking Theory
Instructor: Tom Schomaker, CMW21
AWCI Headquarters, Harrison, Ohio

This course explains the inner workings of a watch and is a must for anyone considering taking the CW21. The course will cover not only functional issues, but theoretical ones as well. Lubrication, isochronism, automatic systems, calendar systems, and much more will be covered. Tests will be given at the end of each section, with answers reviewed. A great way to learn and practice theoretical test taking.

September 9-11

CLOCK 120: **$595**
Introduction to Clockmaking; American Time and Strike
Instructor: Ken De Lucca
AWCI Headquarters, Harrison, Ohio

Build your skills as a clockmaker with this 3-day class. This course covers the basics of the American-style time/strike movement including disassembly, reassembly, common issues, beat adjustments, synchronization of the strike train, and more.

September 14-18

WATCH 155: **Members $1,095/Non-members $1,245**
Fundamentals on Quartz Watches
Instructor: Jason Champion, CW21
AWCI Headquarters, Harrison, Ohio

This new class focuses on technician-level quartz troubleshooting, diagnostics, and identification. It will prepare you for our new quartz technician certification. This hands-on class teaches students to identify movements by brand, dimensions, and features for quartz watches. Timing equipment will be used to diagnose and test quartz movements. Testing parameters and quality control measures will be covered in this class.

AWCI

For additional details about specific courses in comprehensive syllabi form, including complete tool lists, visit: **www.awci.com/classes** or contact the education director, Jason Champion, CW21, at 866-FOR-AWCI (367-2924). For additional calendar events visit: **www.awci.com/calendar**.

September 14-18	**WATCH 210:** **Quartz and Quartz Chronograph Service Procedures and Diagnostics** Instructor: Tom Schomaker, CMW21 AWCI Headquarters, Harrison, Ohio	**$1,095**	The purpose of this course is to teach the student all the fundamentals of modern quartz watch repair and quartz chronographs that are most prevalent on today's market. The student will learn how to perform the various important electronic tests, e.g., current consumption, coil resistance, lower working voltage, fault finding, etc.
September 21-25	**WATCH 190:** **21st Century Standards** Instructor: Tom Schomaker, CMW21 AWCI Headquarters, Harrison, Ohio	**$1,095**	The purpose of this course is to teach the student the fundamentals and tolerances associated with mechanical watch repair. The "Standard Operating Procedures" (SOP) used in modern watch repair will be discussed and implemented. Verification and analysis of the individual components of the movement will be assessed and corrected.
October 5-9	**WATCH 220:** **Modern Mechanical Chronograph** Instructor: Tom Schomaker, CMW21 AWCI Headquarters, Harrison, Ohio	**$1,095**	Students will learn all the basics of the modern mechanical chronographs that are most prevalent in today's market as well as gain a profound understanding of how chronograph watches operate. Prerequisites: It is beneficial for the student to have a minimum of 3 years' experience in manual and/or automatic watch repair; own *The Theory of Horology* and read chapter 11.
October 8-10	**TIMECON 2020**		**Join us at Time-Con 2020 for classes, before during and after the convention! For more information visit www.awci.com/timecon.**
October 12-16	**WATCH 175:** **Case and Bracelet Refinishing** Instructor: Tom Schomaker, CMW21 AWCI Headquarters, Harrison, Ohio	**$1,395**	Polishing a case today requires many skills. Complex case and bracelet designs are common in the marketplace. Standardized polishing methods were often not taught in watchmaking schools here in the US until recently. Many watchmakers learned polishing by trial and error or observing the procedures of others. Today's consumer has high expectations concerning the quality of the watch repair, which includes the refinishing of the case and bracelet. Knowledge is the key.
November 9-13	**WATCH 100:** **Introduction to Watchmaking** Instructor: Tom Schomaker, CMW21 AWCI Headquarters, Harrison, Ohio	**Members $1,095/Non-members $1,245**	A survey course for the new or prospective watchmaker covering the basic skills and techniques used by the modern watchmaker. This class is perfect for anyone thinking about entering the profession of watchmaking or for the individual who just wants to gain a better appreciation for the art of watchmaking.

https://www.awci.com/webinars

Free/discounted webinars for AWCI members!

Missed a webinar? No worries, review the recorded version!

Stay involved, sharpen your skills, ask questions, and so much more!

Have a topic in mind for a webinar?

Send your suggestions to awci@awci.com!

events calendar 2020




Build your very own watch!

Build a Watch is not only great for collectors and watch enthusiasts, it's also perfect for sales staff and customer service specialists. Why not have your staff join us for a day of watchmaking to learn more about the products they sell, how you perform a quality service, and what it takes to properly complete a repair?

Due to the global spread of coronavirus (COVID-19), there may be some changes to our upcoming schedule of events and classes. Please be advised that AWCI will send out an email and contact all registered individuals directly as soon as a decision is made about any classes. If you are concerned about a class and you have not heard from AWCI, you should assume it is continuing as scheduled.

May 22 — Build a Watch

Las Vegas, NV

July 18 — Build a Watch
Peter & Co. Jewelers

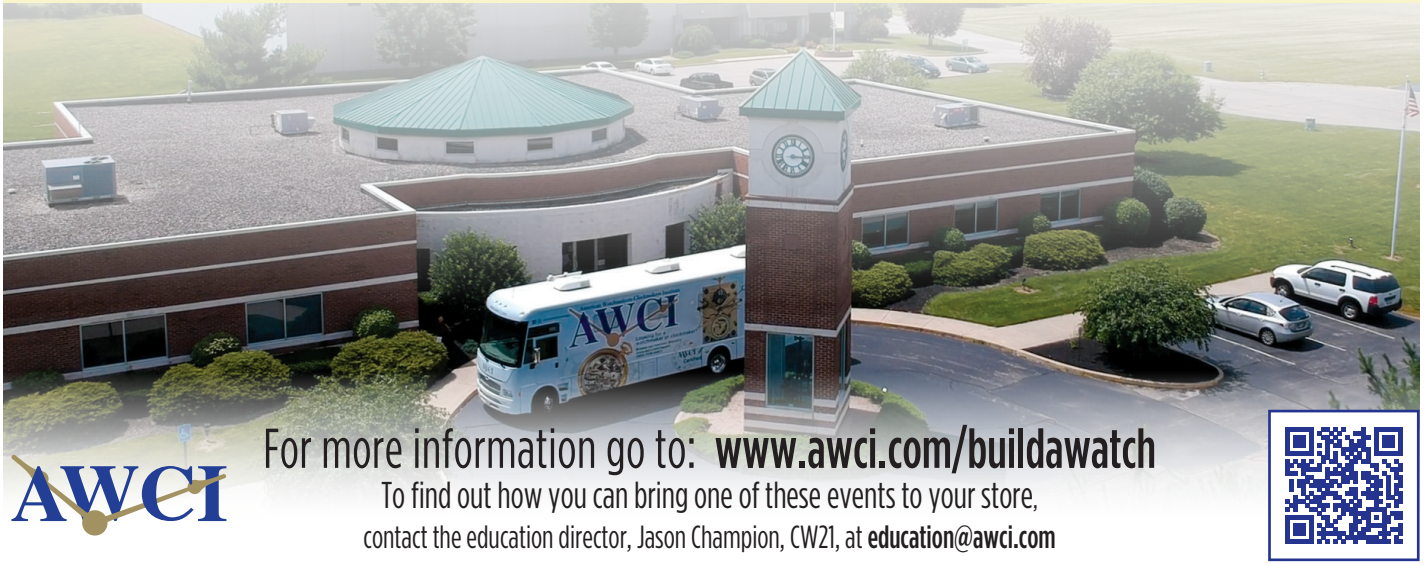
PETER & CO. JEWELERS for you. Forever.

Avon Lake, OH

August 8-10 — Atlanta Jewelry Show

Atlanta, GA

You Pick the Date — Build a Watch — **Your City!**



AWCI

For more information go to: **www.awci.com/buildawatch**

To find out how you can bring one of these events to your store, contact the education director, Jason Champion, CW21, at **education@awci.com**

Webinar: AWCI Education Opportunities and COVID-19 Support

By Donna Hardy

On April 1, AWCI held the first of two webinars to help members and others during the stressful pandemic caused by COVID-19. You can view recordings of the webinars at www.awci.com/webinars. More information on the COVID-19 pandemic and our industry is available at www.awci.com/covid19/. We are planning webinars on technical topics for the future.

The webinar was well attended with 102 people signing on. The goals of the webinar were to:

1. Find out how members have been managing during the pandemic.
2. Update members on which material houses are open during the stay-at-home orders and which are not or have cut back services.
3. Give members information on the financial support available from the government. This portion of the webinar was led by attorney Nicholas Simon of KMK Law in Cincinnati, Ohio.

Survey

To find out how members' businesses have been affected by the shutdowns due to COVID-19, a two-question survey was conducted during the webinar.

1. Have you had to change the way you do business due to COVID-19?

Yes—62
No—7
69 of 102 attendees responded

2. Are you open to the public?

Yes—24
No—41
65 of 102 attendees responded

AWCI's Webinar Capabilities

Executive Director Jordan Ficklin demonstrated AWCI's capabilities to present technical education via the webinar platform. The technical capabilities include a webcam, PowerPoint sharing, bench camera, and chronoscope pro sharing.

Members suggested possible topics for upcoming technical webinars—

- Co-axial escapement.
- Escapement theory, especially Swiss lever escapement.
- Series of webinars on essential workshop tools for the modern watchmaker's shop. Not necessarily bench tools but larger tools, such as refinishing tools, timing machines, and waterproofing tools.
- CAD-CAM design in Fusion for 3-D printers.
- Surface finishes.
- Herschede clocks.
- The proper way to take out a case tube in an Omega or Breitling case.

Handouts

- "Coronavirus Aid, Relief and Economic Security (CARES) Act" from the American Society of Association Executives.
- "H.R. 748, Coronavirus Aid, Relief, and Economic Security (CARES) Act" from AWCI.
- PowerPoint slides from the webinar.

Material Houses

Watchmaking instructor Tom Schomaker reported on how material houses are handling business during the pandemic. Of course, situations were changing almost daily as of April 1. At that time the businesses hoped to be back to normal by May 1, but as of this printing (April 16), that will probably not happen, at least not in all areas.

Jules Borel & Co. planned to be closed until April 23. Currently accepting online orders only with delayed shipping. 3 % off for online orders only.

Cas-Ker Co. planned to be closed until April 6. Taking fax and online orders only. Orders will only be processed once a week. Orders sent by UPS only. No lithium batteries.

Star Time planned to be closed until April 3, which is subject to change.

Twin City Supply. The counter is closed. Phone, website, and email orders are being filled as usual. Phone: 1-800-328-6009. Fax: 1-800-328-6001.

Wm. S. McCaw planned to be closed until April 6. Accepting website, email, and phone orders between 10 a.m. and 3 p.m. EDT. Delayed shipping.

Esslinger planned to be closed until April 10. Accepting PayPal and credit card orders only.

Eckcells. Open for email orders and shipping as usual.

Otto Frei. Phone calls accepted; shipping will continue.

Merritt's closed to walk-in customers but still fulfilling mail orders. Order via website.

Legal Advice from Nicholas L. Simon, Partner at KMK Law, Cincinnati, Ohio

Lawyer Nicholas Simon discussed Coronavirus Aid, Relief, and Economic Security Act or the "CARES Act," the Paycheck Protection Program, and the Economic Injury Disaster Loans. Simon said that these will strain the Small Business Administration's (SBA) and lending banks' resources. As banks and borrowers dig into details, there will be questions that require SBA guidance. The SBA's Disaster Loan program is a pre-existing program in which the SBA makes direct loans to homeowners and businesses to help them recover from declared disasters. The Paycheck Protection Program is a modification of the SBA's 7(a) loan program, in which banks make loans to businesses that are guaranteed by the SBA. Most, if not all, states are approved for Economic Injury Disaster Loan Program. It will be crucial for borrowers to understand which loan is better for them, and to get a bank and advisors involved early. Incomplete or incorrect documents and applications will cause delay. KMK Law is assisting many small businesses and nonprofits in this process.

Paycheck Protection Program Loans

This program authorizes $349 billion of federally guaranteed loans to qualifying small- and medium-sized businesses. They are still waiting for more guidance from SBA and Treasury. This program modifies the 7(a) loan program in four important ways:

1. Expands the businesses that are eligible for loans.
2. Modifies the loan terms.
3. Allows for forgiveness of loan if the borrower maintains its payroll.
4. Modifies provisions to incentivize banks to lend, and make the process faster and more efficient.

Generally, businesses, 501(c)(3) nonprofits, or veteran's organizations with 500 or fewer employees are eligible. Also eligible are certain sole-proprietors, independent contractors, and other self-employed individuals. The SBA's definition of "business concern" must be met, which is a business that: is organized for profit; place of business is in the US; operates primarily within the US or makes a significant contribution to the US economy through payment of taxes or use of American products, materials, or labor; is independently owned and operated; is not dominant in its field on a national basis.

The loan amount is 2.5x 2019 average monthly payroll costs, with a maximum of $10 million. The interest rate is 0.5%. Permitted uses include: Payroll costs (defined term), group health costs, insurance premiums, and interest on a preexisting mortgage/other debt, rent, and utility payments. Employee compensation above $100,000 is excluded. The loan may not be used to prepay or refinance debt. There is no collateral or guarantee, and no prepayment penalty. It matures in two years with repayment terms consistent with SBA 7(a) loans. Automatic deferments are for at least six months and up to one year. A business cannot have both this loan and the Economic Injury Disaster Loan (see page 11) with some exceptions. Hobbies are not considered eligible businesses for this loan.

The CARES Act waives the "credit available elsewhere" test normally applicable to SBA loans, so business owners are not required to seek other sources of capital, including equity or debt investments, prior to obtaining a Paycheck Protection Loan. The Paycheck Protection Loan is eligible for loan forgiveness equal to the amount spent by the borrower during an eight-week period after loan closing. This will apply to payroll costs (same exclusions), interest on any mortgage incurred prior to February 15, 2020, rent on any lease in force prior to February 15, 2020, utility payments for which service began before February 15, 2020. The maximum forgiveness is the principal amount of the loan. The amount eligible

for forgiveness is reduced proportionally by the reduction in FTE (full-time equivalent) employees retained compared to the prior year and the reduction in pay of any employee in excess of 25%. Borrowers rehiring workers previously laid off by June 30 will not be penalized, and payments to such workers are eligible for forgiveness. Businesses should ensure they can rehire workers, and they must document payroll and payments.

Economic Injury Disaster Loans

Economic Injury Disaster Loans are working capital loans of up to $2 million with long-term repayment structures (up to a maximum of 30 years). These loans may be used to: pay fixed debts, make payroll, and pay accounts payable. The interest rate for small businesses is 3.75%.

The SBA uses credit scores of business owners in their decisions for approval, and the SBA must be reasonably assured an applicant can repay its loan. Borrowers keep receipts and evidence of how loan proceeds are used for three years. Borrowers who misapply loan proceeds may be liable to SBA for 1.5x of the total loan proceeds disbursed. The loan may be secured or unsecured, but most loans require collateral from owners.

How is a "small business" classified? Size standards are determined on an industry-specific (using NAICS codes) sliding scale based on the annual receipts or revenues of the business or, in some cases, the number of employees.

Businesses must be unable to meet their obligations as they mature or pay its ordinary and necessary operating expenses. Businesses, including their affiliates and 20% owners, must have "used all reasonably available funds" in the business and be "unable to obtain credit elsewhere." There are two tests to determine this—cash flow test and asset test. If applicant meets both tests, the business is presumed to have credit available elsewhere.

Eligible use of funds includes working capital necessary to carry on the business until resumption of normal operations, expenditures necessary to alleviate the specific economic injury, but not in excess of pre-injury expenses, including: payroll, accounts payable, fixed debts, monthly mortgage (may not pay off a mortgage), short term notes, and lines of credit. Payments can be made on IRS deferments but would rather that IRS give more of a deferment.

Loan proceeds may not be used to refinance indebtedness incurred prior to the disaster; make payments on loans owned by another federal agency (including SBA) or a small business investment company; pay tax penalties or fines; repair physical damage or buy fixed assets; pay dividends or other disbursements to owners, partners, officers, or stockholders, except for reasonable remuneration directly related to their performance of services for the business. The funds cannot replace sales or profit of business.

Collateral is required for all loans over $25,000, which may be: mortgage or real estate lien, security interest in personal/business property, or both. SBA will look to 20% owners for collateral. SBA will not decline a loan if an applicant and owners lack sufficient collateral as long as the SBA is reasonably sure the borrower can repay its loan. SBA requires borrowers and owners to pledge what is available and may decline/cancel loans if a borrower refuses to pledge available collateral.

Documents and information that SBA requires: Business Loan Application (SBA Form 5); Tax Information Authorization (IRS Form 4506T); copies of most recent federal income tax returns for the business; Personal Financial Statement (SBA Form 413) for each 20% or more owner and each general partner or managing member; Schedule of Liabilities listing all fixed debts (SBA Form 2202 may be used); 2019 federal tax return or if not filed, a 2019 year-end profit-and-loss statement and balance sheet; a current year-to-date profit-and-loss statement; SBA Form 1368 providing monthly sales figures.

Loan amount available is based on evaluation of economic loss. Phase I loans provide immediate working capital loans generally equal to a few months of gross profit prior to disaster up to a cap. Phase II loans require greater detail on actual economic losses and evaluation of past business operations.

It's preferable to apply for the loan online at disasterloan.sba.gov/ela. SBA will verify your data and make a decision within two to three weeks. Loan closing documents will be sent to you. Once you sign and return the documents, an initial disbursement will be made within five days, and a case manager assigned to you.

If you think you need help with either of these loans, contact Nicholas Simon at KMK Law at 513-579-6574 or nsimon@kmklaw.com. You can also contact your own attorney or an attorney in your area.

Editor's Note: This webinar was given two days before these programs were rolled out. Since then, various media have reported some problems and changes in the original plans. What we have reported here is an outline of how these programs were intended to work, but, as we are all aware, things are changing rapidly. Nicholas Simon has some updates to this information at https://www.kmklaw.com/newsroom-publications-Paycheck-Protection-Program-Interim-Regulations.

Donna Hardy is the managing editor of the *Horological Times*.

New!

Lititz Precision Preciso 47

- Thin attractive design
- Andoized and powder coated aluminum construction
- Fast one-minute to temperature
- Universal voltage (100-240 VAC)
- Extreme accuracy
- Made in USA
- +/-1 degree per Omega working instructions
- 47C(116.6 F) per Omega working instructions
- 4.25" x 5" x 1" (11CM X 13CM X 2.5CM)
- Weight 1/2 pound (225 grams)

590.767

590.767 **$439.00**

MATADOR 4000 Watch Cleaning Machine

Introducing the ultimate in manual watch cleaning machines. Matador 4000 from Lititz Precision Products consists of four stainless steel cleaning/rinsing cups with one movable ultrasonic transducer head and a variable speed/variable temperature dryer.

590.874

590.874 **$2,999.00**

Lititz Precision Products offers high quality equipment manufactured in the USA

Freedom Ultrasonic Small Parts Cleaner

·Five ultrasonic cleaning or rinsing stations
·Ten user-customizable programs
·Powerful effective dryer
·Programmable agitate and dry times
·Programmable agitate strength
·Audible beeper at end of cycle
·4 x 40 character LCD display
·Lift-off index table for easy cleaning
·16" wide x 27" high x 17" deep
·75 lbs.

590.985

590.985 **$7,495.00**

Cas-KerCo. **1-800-487-0408 | CASKER.COM**
SERVING JEWELERS & WATCHMAKERS SINCE 1927

BRITISH HOROLOGICAL INSTITUTE

WOULD YOU LIKE TO READ WHAT MAKES BRITS TICK?

The Horological Journal – published monthly without fail since 1858 – gives you exclusive technical articles and practical updates on clock and watch making.

You'll find news on the latest issue and how to get it at www.bhi.co.uk

CLOCKS magazine

All available from our website
clocksmagazine.com

American Watch Tool Company

By Andrew H. Dervan

This is the second in a series of articles on watch tool companies. This article was originally published in August 2009 NAWCC Bulletin*, pages 443-448. Used with permission from Dervan, A. "American Watch Tool Company,"* NAWCC Bulletin *2009; 381: 443-448, a journal of the National Association of Watch & Clock Collectors, Inc. nawcc.org.*

In 1872 John E. Whitcomb and George F. Ballou left American Watch Co., where they had worked as machinists, to start a lathe manufacturing company in Boston. In 1874 George Ballou left that company for another venture, and John Whitcomb and Henry N. Fisher moved the business to Waltham and continued manufacturing lathes under the name J. E. Whitcomb and Company. The Whitcomb lathe received high praise for its use of a hardened steel spindle and hardened steel bearings. In 1876 Ambrose Webster, Figure 1, resigned from the American Watch Co. and joined John E. Whitcomb, Figure 2, to form the American Watch Tool Company (AWT Co.). Ambrose Webster had apprenticed as a machinist at the Springfield, Massachusetts, government arsenal. In 1857 he had been hired by the American Watch Co. as its first trained machinist and had become an assistant general superintendent.[1-3]

Webster and Whitcomb built and equipped their factory in Waltham. The *Waltham Free Press* reported, "Whitcomb Watch Tool Co. is building a brick factory across from the crayon factory."[4] By 1890 the factory was the largest and most complete in the world for manufacturing lathes, watchmaker's tools, and machinery, Figure 3. In 1878 Webster designed the No. 1-1/2 lathe, with various attachments, that proved very popular. He used his extensive experience working in a watch factory and making watch tools to design the new lathe, considering size and proportions of the spindle, chucks, and the tailstock's form. It replaced the company's two original lathes: No. 1 and No. 2; No. 1 was too small and No. 2 was too large for watch repairers.[5] Company records indicate that 152 various-size lathes were sold in 1880, 650 in 1887, and 721 in 1889. In 1888 Webster designed a lathe known as "Webster-Whitcomb" that had improvements over the one he designed earlier. "A first-class lathe was somewhat expensive, but it was always durable and was the cheapest in the end," Figure 4.[6]

Fig. 1. Ambrose Webster.

Fig. 2. John E. Whitcomb.

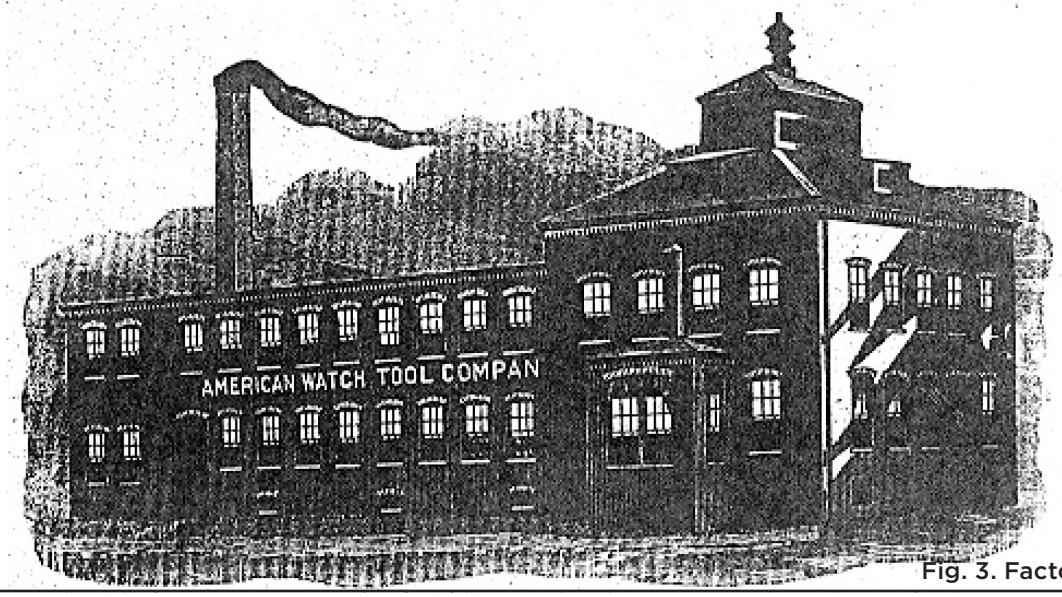


Fig. 3. Factory lithograph.

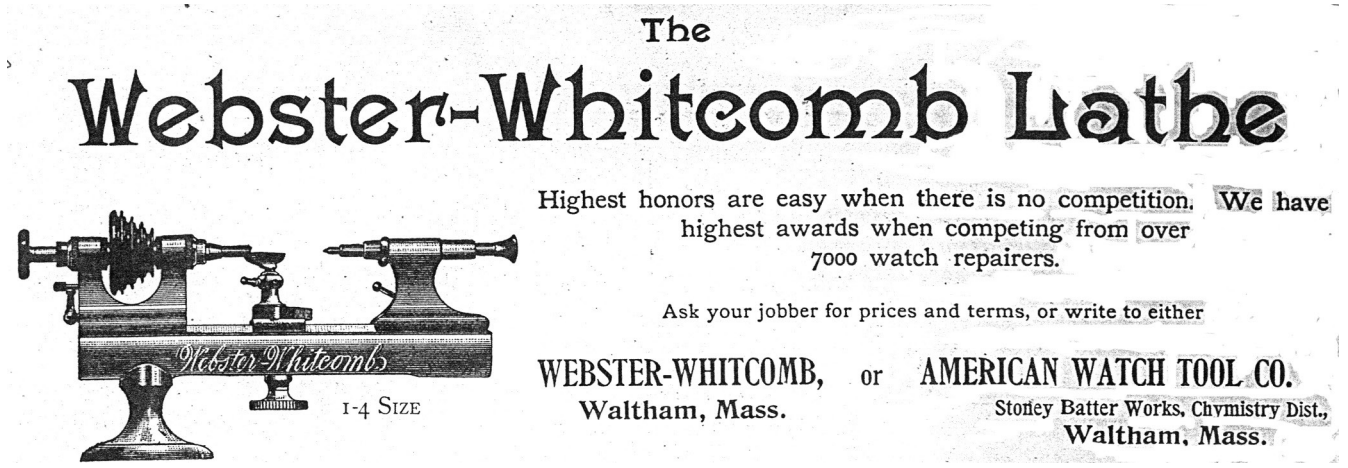


Fig. 4. Webster-Whitcomb lathe advertisement.

Ambrose Webster's biography highlights key personal traits and contributions to the company. In 1877 he accepted a contract to build a large amount of machinery for an English factory. He was engaged to build machinery for watch and clock, sewing machine, and typewriter factories. He made two trips abroad to England, Switzerland, and France.[7]

In 1878 the company received a contract to design, superintend the factory erection, and equip a watch factory to build 1,000 watches per day for the Waterbury Watch Company. This was the first contract ever executed to a single company to design a "turnkey watch factory." *Keystone* articles provide information on the factory and its approximately 80 employees. The metric system was used because of its finer subdivisions, which led to more accurate workmanship. A special machine was used to ensure the perfect alignment of head and tailstock, not only in their regular position but also when either or both were reversed.[8]

Because of increasing business in the West and Northwest, AWT Co. opened a branch office at 31 Washington St., Chicago, where a full line of lathes, attachments, and foot wheels were available. A spokesman for AWT Co. said, "We are selling faster than we can supply them. Every purchaser speaks of them in the highest terms of praise."[9] "This lathe is well known and popular."[10]

The company's business successes were noted in several issues of the 1889 *Jewelers' Circular*: Whitcomb lathe sales were increasing, and the company had just shipped their 5,000th lathe; the company had sold nearly $300,000 worth of tools and machinery to American and foreign watch and clock companies over the past 12 years.[11] "[The] company completed a model for a 'very superior' typewriter that the company plans to manufacture; the new 'Webster-Whitcomb' lathe is creating 'lively demand,' and is Mr. Webster's highest achievement of his long career. Various watch companies are placing many large orders for the new lathe."[12] Lathe prices decreased and became more affordable, Figure 5. Webster-Whitcomb lathes were

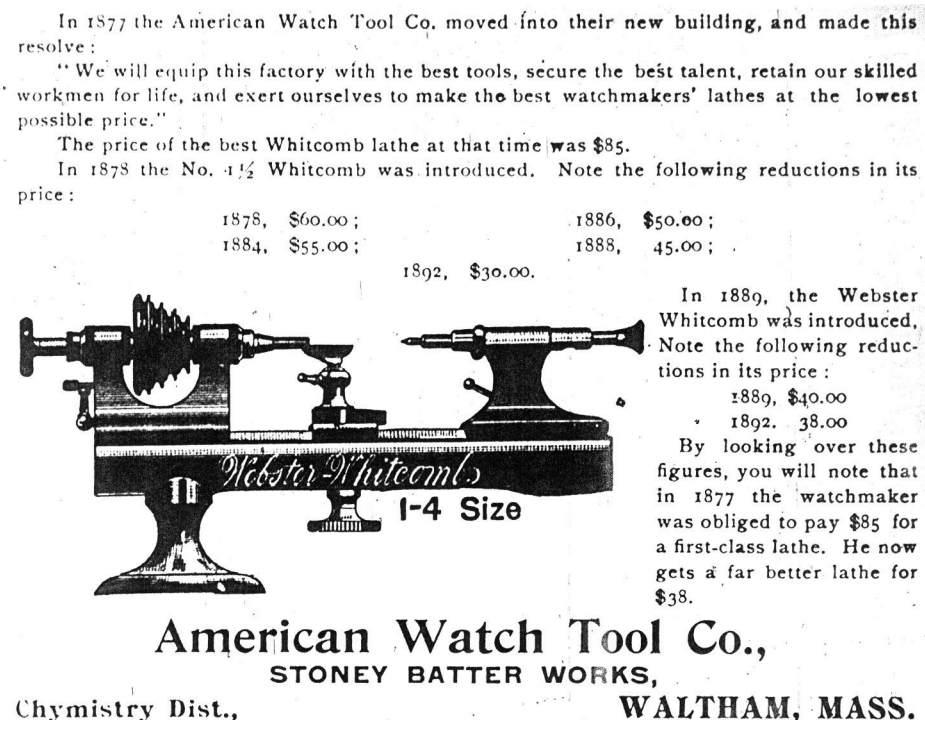


Fig. 5. Advertisement.

shipped to Europe and became very successful; they were copied, and a cheaper European version was exported to America. The American Watch Tool Company warned buyers of the imitation, Figure 6. See photographs of a well-used lathe and a close-up of the lathe's nameplate, Figures 7a and 7b.

The company added a Bruenard milling machine to the lathe department to support the demand for the Webster-Whitcomb lathe and manufactured 5,771 watchmaker's lathes and 2,478 "Webster" foot wheels. They shipped to Mermad Freres, a musical box manufacturer in St. Croix, Switzerland, an entire set of tools and machinery; shipped a large quantity of tooling to the new Lancaster Watch Co. in England; and were working on machinery for the Elgin Watch Co.[13]

Keystone articles highlighted AWT Co. successes. The company completed more practical automatic machines in 1891 than ever before in the same length of time and experts were planning more. Pinion cutters, jewel setters, engraving, scrolling, and stoning machines were made and were operating successfully.[14] The company was "hustling to fill orders which come from all parts of this and other countries"[15] and was overrun with orders.[16, 17]

The company had three US patents for its attachments: No. 167,974 issued September 21, 1875, for building Slide Rests; No. 171,082 issued December 14, 1875, for Universal Heads and Plates on Chuck; No. 412,439 issued October 8, 1889, relating to Tailstocks. Since 1883 the company used the trademark "Webster" with its foot wheel. On July 14, 1889, Ambrose Webster placed a Webster-Whitcomb lathe on top of the Eiffel Tower in honor of the 100th anniversary of the United States.[18]

Fig. 6. Advertisement.

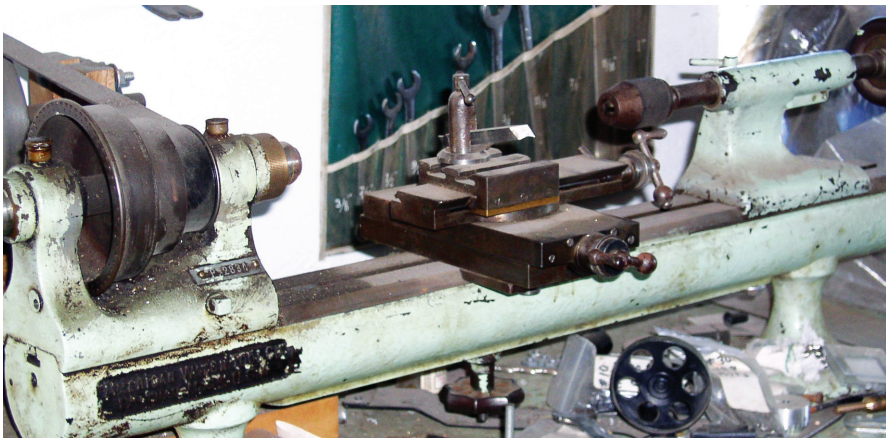


Fig. 7a. Lathe.

Fig. 7b. Lathe nameplate.

The company adopted a nine-hour workday on September 12, 1891, because its increased facilities during the summer enabled the company to produce as much work in nine hours as in 10 hours. Webster had been an advocate for the nine-hour system for watch and watch tool factories.[19] Later, the company gave the real reason why it adopted the nine-hour workday rather than industry standard: the depression in the trade.[20]

AWT Co. made a slight reduction in prices of lathes and chucks to take effect immediately. Machinery development and increased production reduced the cost of work, so that the company offered these price reductions to the watch repairer. The company did very little in the retail trade and preferred to sell principally through jobbers, but it did fill orders from the retailers on a "cash with order" or cash on delivery plan.[21]

The 1893 *Keystone* articles continued to report the company's business successes. "Company is doing more business than ever before in its history."[22] AWT Co. believed retaining its employees was important to productivity and quality. In June 1891 the company announced, "At the conclusion of 10 years' consecutive service in the employ of this company, employees will receive a present of 10 days' pay, and the same amount at the conclusion of 15 years." In 1892 the company paid five employees the 10-year bonus and two employees the 15-year bonus. In 1893 there were three who were paid the 10-year bonus and three the 15-year bonus.[23] Ambrose Webster's stature as a manager had grown so that the Boston Cash Register Co., Northampton, Massachusetts, engaged him to take charge temporarily to reorganize its manufacturing department.[24]

Waltham Daily Tribune reported that AWT Co. owed in 1887 $485.28 in taxes to the city of Waltham, $438.84 in 1888, and $844.20 in 1900. The company had only a short vacation in July 1887, shutting down July 3 and reopening July 6.

The year 1894 was a tough economic time in the United States for many companies, and AWT Co.'s activities were reported in 1894 *Keystone* articles. The company sent out letters to other American manufacturers of watchmaking lathes asking them to send letters to the Ways and Means Committee of the House of Representatives requesting them to add a clause to the new tariff bill to force all manufactured articles to indicate the name of the country in which they originated.[25] Ambrose Webster met with *Keystone* reporters and discussed the situation in the watch tool trade. He reported a noticeable improvement in AWT Co.'s business due to the good publicity from the World's Fair and the development of new tools and improvements in manufacturing facilities, which increased production and reduced prices on their products slightly.[26] Employees worked eight hours a day until further notice, and about 100 employees worked all through the summer vacation, which contributed to shortening the workday.[27] He was probably putting on a good face to the media, because *Jewelers' Circular* reported "a very encouraging business outlook" and a gradual increase to the work force and full-time production.[28] AWT Co. continued to actively advertise its Webster-Whitcomb lathe, Figure 8.

Ambrose Webster died unexpectedly in France on a business trip in May 1894 at age 62; his body was shipped home for the funeral and burial in Waltham.[29] On November 16, 1894, American Tool Watch Co. was incorporated with $40,000 capital stock in $100 shares for the manufacture and sale of tools and machinery for watchmaking and other mechanical work. The company incorporators were Henry N. Fisher, John E. Whitcomb, James A. Davis, and J. Albert Brackett.[30] Fisher was the president and Whitcomb

Fig. 8. Webster-Whitcomb lathe advertisement.

was the treasurer. The heirs of Fisher, Whitcomb, and Webster sold the factory and part of the land to the corporation, and the balance of the property was sold to Fisher. In 1898 Silas A. Barton replaced Whitcomb as general manager, and Whitcomb retained the position of treasurer and superintendent. In 1901 the front of the factory was expanded. In 1907 Whitcomb passed away, and Barton became treasurer and general manager. In 1914 Barton passed away and in 1916 Fisher, one of the initial founders, passed away.[31]

Jewelers' Circular articles in 1895, 1896, and 1897 noted the improved business climate. The company reported an encouraging outlook and an increase in inquiries for machinery and estimates, and the prospects for more were good. It made improvements in the plant by adding new tooling as needed and examined other lines of manufacture. One or two articles were expected to be successful. Whitcomb reported business at the factory was in a "flourishing condition, twice the number of hands are employed compared to same time last year.[32, 33] …they have plenty of work and are unusually busy, though a great deal of it is experimental nature. They are doing considerable business with overseas customers." Fifty hands were employed and in general reported a satisfactory condition of trade.[34] The company reported it was running with a large work force and increased their stock of jeweler and watchmaker tools. An important product was the Webster-Whitcomb lathe that was highly favored by jewelers.[35] In 1898-1900 *Keystone* issues, the AWT Co. advertised the Webster-Whitcomb lathe, and various supply houses (Benjamin Allen & Co., Jos. B. Bechtel & Co., Green Bros., B. F. Norris, and E. J. Swigart) also ran advertisements for the lathe. A 1900 *Keystone* advertisement proclaimed the Webster-Whitcomb lathe "Still the Leader," Figure 9.

During the 1890s, bicycles became the rage and AWT Co. acquired several companies involved in manufacturing bicycle components. The 1897 *Jeweler's Circular* reported the company was reorganized and increased its capital stock to $70,000. It announced that it will consolidate the Cycle Improvement Co. of Westboro, Massachusetts, manufacturers of bicycle pedals, and Perry Cycle Seat Co. of Leicester, Massachusetts, to the Westboro plant and run the business as a branch of the company. In the spring of 1897, the company planned to enlarge its Waltham plant and move the Westboro operations to Waltham.

The article continued, "The outlook for a successful future for the American Watch Tool Co. is very bright. In addition to the classes of manufacture indicated above, and the watch lathes and tools for which the American Watch Tool Co. have an unrivaled reputation, they will continue as heretofore to make a specialty of producing special tools for doing all kinds of small work, and instruments of precision and experiment."[36]

Edmund Sanderson kept a diary of his activities while he worked for AWT Co.; here is a brief snapshot of his daily activities (April and May 1896). In April he made faceplate chucks (various sizes), several tailstocks, thread standards, milling attachments for S.R. Mason Co., a sizing tool, a profiling machine slide for Columbia Watch Co., and two No. 2 automatic heads with wire feeds. He generally worked nine hours a day. In May he made an indexed attachment for No. 2 WW lathe, various hanger boxes, a shellacking press, a shaft straightener, an escape wheel cutter and holders for Waltham Clock Co., and two large escape wheel grinders. He also tracked mileage: 500 miles through May 11, 600 miles through May 18, and 700 miles through May 28.[37]

Fig. 9. Webster-Whitcomb lathe is "Still the Leader."

Including the Webster-Whitcomb, AWT Co. developed a series of lathes described below:

Webster-Whitcomb (WW): A 50-mm center height lathe with a 50-mm collet capacity that had become the universal standard for watchmakers' lathes around the world. In addition, most accessories that fit on the bed of a WW lathe could normally be used on another maker's lathes, including the more modern Boley, Lorch, and Leiene lathes.

Magnus: Introduced in 1909, it was a larger capacity and more heavily built lathe that retained the 50-mm center height of ordinary lathes but with collet capacity increased to 80 metrics (5/16").

Elect: Designed for clock and instrument repairers, this was a more heavily built lathe than the original WW style, but it had a 60-mm center height. It used the same collets as the Magnus.[38]

The death of Ambrose Webster; the peaking of watch factory growth; the eventual passing away of key company incorporators; and the loss of experienced employees Frederick W. Derbyshire, Edmund L. Sanderson, and Benjamin F. Ellis, who left American Watch Tool Co. to found their own companies; weakened AWT Co. In 1916, officials of the Metz Company acquired the American Watch Tool Co., incorporated it as a division of Metz Automobile Manufacturing Company, and later consolidated all businesses into one building. In 1918 the Metz Company, including the machine tool divisions, went into voluntary liquidation.[39]

Frederick William Derbyshire began his career in 1874 as an apprentice at American Watch Tool Co. and by 1901 he was the superintendent. Working with founders Ambrose Webster and John Whitcomb, he designed and patented attachments for the Webster-Whitcomb (WW) line of lathes. For over 30 years at the American Watch Tool Co. he was dedicated to building precision lathes, but in 1911 he left the company and founded his own company—F.W. Derbyshire. When the American Watch Tool Co. was liquidated in 1918, F.W. Derbyshire purchased the watch and instrument lathe division, including the patents, trademarks, and copyrights, which included the Webster-Whitcomb (WW) Magnus lathe.[40]

F.W. Derbyshire, Inc., continued the manufacture and support of the small bench lathes (Webster-Whitcomb, Magnus, and Elect) and introduced two new lathes (Model 750, Model A, and Micromill, a miniature precision milling machine).[41]

Acknowledgments

I thank my wife, Linda, for her support and patience with this project. This article could not have been completed without assistance in research from many people and institutions: Tony Griffiths, Larry Magee, Mahlon Shetler, Harvey Schmitz, F.W. Derbyshire, Inc., NAWCC Library, Waltham Historical Society, Waltham Museum, Charles River Museum of Industry, and Waltham Public Library.

Notes

Information for this article series was collected from a variety of sources: *Jeweler's Circular & Horological Guide*, *The Keystone*, various Waltham newspapers, company catalogs, lathes.co.uk website, Waltham Industries, NAWCC Library and Research Center, Waltham Historical Society, Charles River Museum of Industry, Waltham Public Library, and Benson Ford Research Center.

1. *Jeweler's Circular & Horological Guide* (May 24, 1894), 9.
2. *Waltham Free Press* (June 16, 1876).
3. Sanderson, Edmund L., *Waltham Industries*: *A Collection of Sketches of Early Firms and Founders*, 47-48.
4. *Waltham Free Press* (November 9, 1876).
5. *Waltham Free Press* (December 18, 1885), front page.
6. *The Keystone* (November 1890), 22.
7. *The Keystone* (December 1892), 1171.
8. *The Keystone* (November 1890), 32.
9. *Jeweler's Circular & Horological Guide* (May 1884), 131.
10. *Jeweler's Circular & Horological Guide* (December 1887), 438.
11. *Jeweler's Circular & Horological Guide* (June 1889), 85.
12. *Jeweler's Circular & Horological Guide* (January 1885), 403.
13. *Jeweler's Circular & Horological Guide* (June 1889), 85.
14. *The Keystone* (November 1891), 995.
15. *Jeweler's Circular & Horological Guide* (April 1890), 87.
16. *The Keystone* (July 1892), 648.

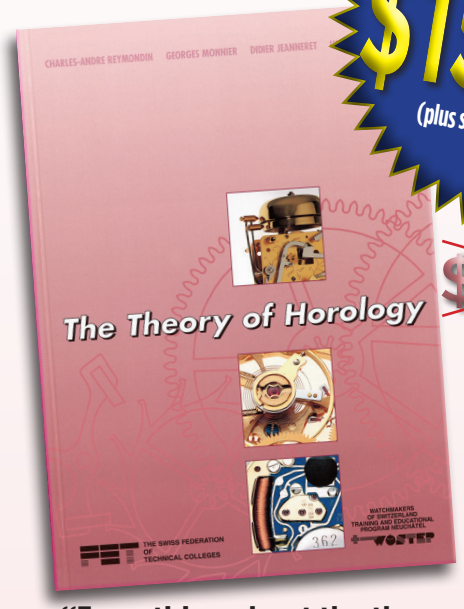
17. *The Keystone* (August 1892), 771.
18. *The Keystone* (August 1892), 850.
19. *The Keystone* (October 1891), 864a.
20. *The Keystone* (November 1891), 975.
21. *The Keystone* (September 1892), 859.
22. *The Keystone* (March 1893), 232.
23. *The Keystone* (January 1890), 34
24. *The Keystone* (January 1893), 44.
25. *The Keystone* (April 1893), 359.
26. *The Keystone* (January 1894), 34.
27. *The Keystone* (February 1894), 120.
28. *Jeweler's Circular & Horological Guide* (July 15, 1894), 16.
29. *Jeweler's Circular & Horological Guide* (June 20, 1894), 20.
30. *Jeweler's Circular & Horological Guide* (November 21, 1894), 17.
31. Sanderson, Edmund L., *Waltham Industries*: *A Collection of Sketches of Early Firms and Founders*, 50-51.
32. *Jeweler's Circular & Horological Guide* (May 15, 1895), 25.
33. *Jeweler's Circular & Horological Guide* (June 19, 1895), 18.
34. *Jeweler's Circular & Horological Guide* (April 1, 1896), 2.
35. *Jeweler's Circular & Horological Guide* (March 3, 1897), 12.
36. *Jeweler's Circular & Horological Guide* (October 13, 1897), 30.
37. The Waltham Historical Society, Edmund L. Sanderson collection.
38. Griffiths, Tony, "Derbyshire & WW Lathes USA," http://www.lathes.co.uk/derbyshire/
39. J. C. Conant Co., *1918 American Watch Tool Co. Sale Catalog*, January 1918.
40. F.W. Derbyshire Inc., "Our Beginnings," official history of company, http://fwderbyshire.com/history.html
41. Griffiths, Tony, "Derbyshire & WW Lathes USA," http://www.lathes.co.uk/derbyshire/

Andy Dervan began collecting antique clocks in 1997 and, finding it a fascinating hobby, joined the NAWCC. Researching the manufacturing histories of various makers and companies was more challenging than simply collecting; he has published many articles in various horological publications.

The Theory of Horology

AWCI members

NOW ONLY $157.50 (plus shipping & handling)



~~$188.96~~

This book has become the "bible" for schools, training centers, and even watch specialists.

"Everything about the theory of watchmaking under one roof! Includes the latest elements of watchmaking in a very clear form."

~Antoine Simonin
Former Director of WOSTEP

Not a member? Join today at
www.awci.com/become-a-member

Purchase your book online at
www.awci.com/online-store

Nonmembers:
New low price of $175.00

www.awci.com/online-store

INNOVATION COMES ONCE. INNOVATING GOES FOREVER.

PRECISION IS PRECIOUS.

witschi

LEADING SWISS PRODUCTS

witschi.com

Distributed by: Jules Borel & Company: julesborel.com

"Columbia is home to one of the world's only horology museums"

—Smithsonian Magazine

The Smithsonian Magazine ranked Columbia, PA, among the top 20 best small towns to visit in the United States, in part, because of its strength in history.

The National Watch & Clock Museum in Columbia includes 19th-century American clocks and watches and timekeepers from around the world.

National Association of WATCH & CLOCK Collectors, Inc. **UPCOMING EVENTS**

Servicing a Swiss Wristwatch
May 15 - 17, 2020

Servicing a Pocket Watch for the Beginner II
June 5 - 7, 2020

Contact the Education Department at 717.684.8261, ext. 237 or education@nawcc.org.

Check out www.museumoftime.org for more info.

Time is Money

Knowing how to properly repair watches and clocks saves time—while also generating additional traffic and profits. It also helps to protect and enhance the brands you promote as well as your reputation and integrity. Expertise through formal training is available through AWCI, and demand is growing! We invite you to learn more about the CW21 and CC21 certification programs.

AWCI

American Watchmakers-Clockmakers Institute
701 Enterprise Drive · Harrison, OH 45030-1696
866-367-2924 · www.awci.com

Like us on Facebook! www.facebook.com/HorologicalTimes

Follow us on Twitter! www.twitter.com/AWCInstitute

Follow us on Instagram! www.instagram.com/americanwatchmakers

Like us on Facebook! www.facebook.com/MyAWCI

Check out our educational videos! www.youtube.com/awci/videos

Elemental Components:
Friction Clutches in the ETA 7750

By Jason Ziegenbein, CW21

It is not uncommon for watch parts to be made of multiple components. Whether the parts are rigidly assembled, such as a minute wheel, or made with freedom of movement, such as a reverser, these multiple component parts are often treated as a single part. Breaking down these parts into their elemental components gives us a better understanding of how they work and how they need to be evaluated and serviced. The ETA 7750 has three friction clutches: each is designed to fulfill a different purpose, but all are designed around the same principle of friction. The force of friction between the two sides of the clutch keeps both sides rotating together without slipping, unless the difference in force between the sides exceeds the force of friction. Deconstructing the Intermediate setting wheel, driving pinion, and hour counter reveals those frictional surfaces and provides insight into long-term serviceability.

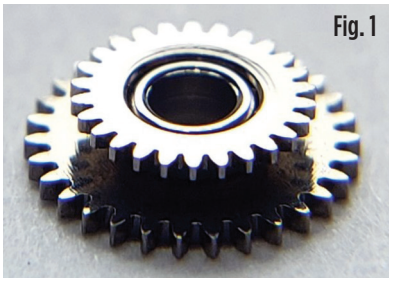
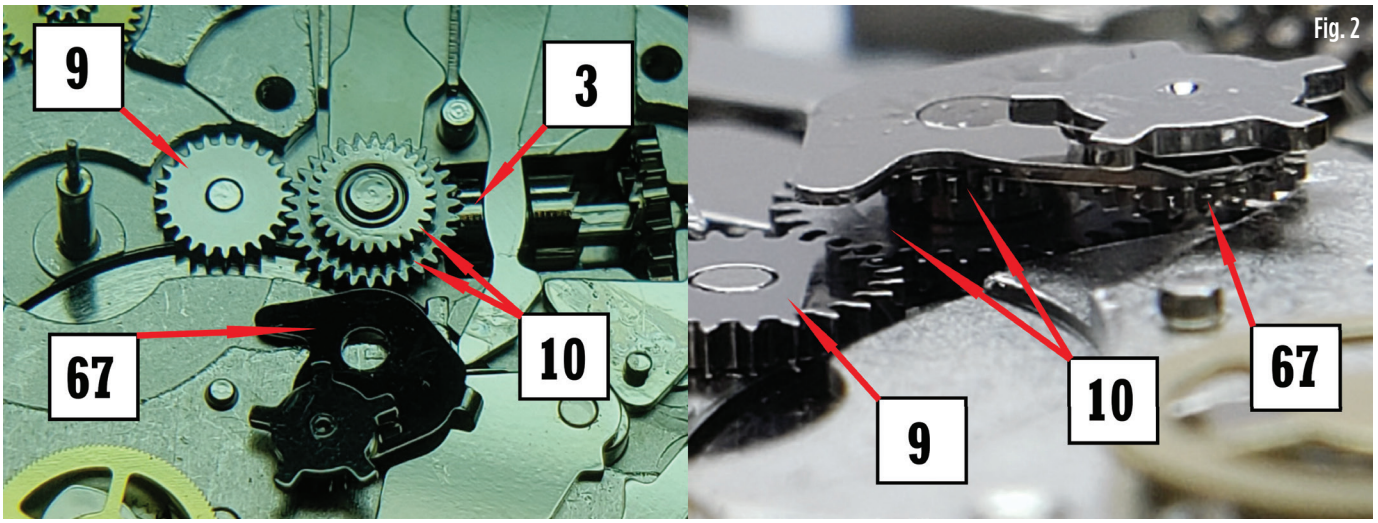


Fig. 1

The Intermediate setting wheel, assembled is part number 10 in the ETA 7750 tech guide released 8.13.19, Figure 1. Its purpose is to transfer torque from the Sliding pinion, #3, to the Time setting gear, #9, during time setting and to drive the Double corrector, #67, for quick setting the day or date, Figure 2.

It is assembled from a larger gear with a tapered tube, Figure 3, and a smaller gear with a crimped tube, Figure 4. When assembled, the crimp of the



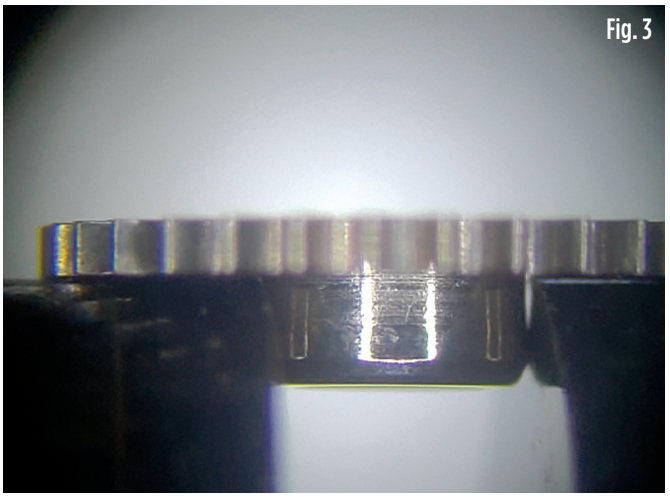


Fig. 3

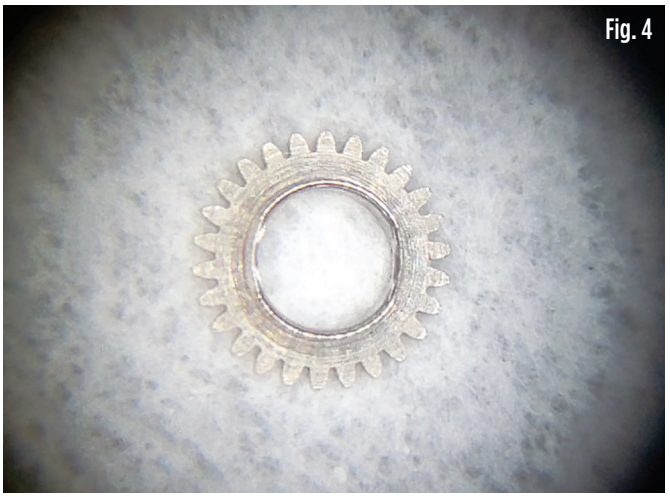


Fig. 4

smaller tube presses against the taper of the larger gear tube, providing friction to bind the components together and, with the taper, keeps the smaller gear seated against the larger not unlike the crimp and taper of a traditional cannon pinion and center wheel. The purpose of this friction mechanism is to prevent damage to the movement if the owner attempts to quick set the date when the fingers of the Day and date drive wheels, #54 & #55, are within the circular pitch of the teeth of the Date indicator, #62, and the Day indicator, assembled, #69 (not pictured), Figure 5.

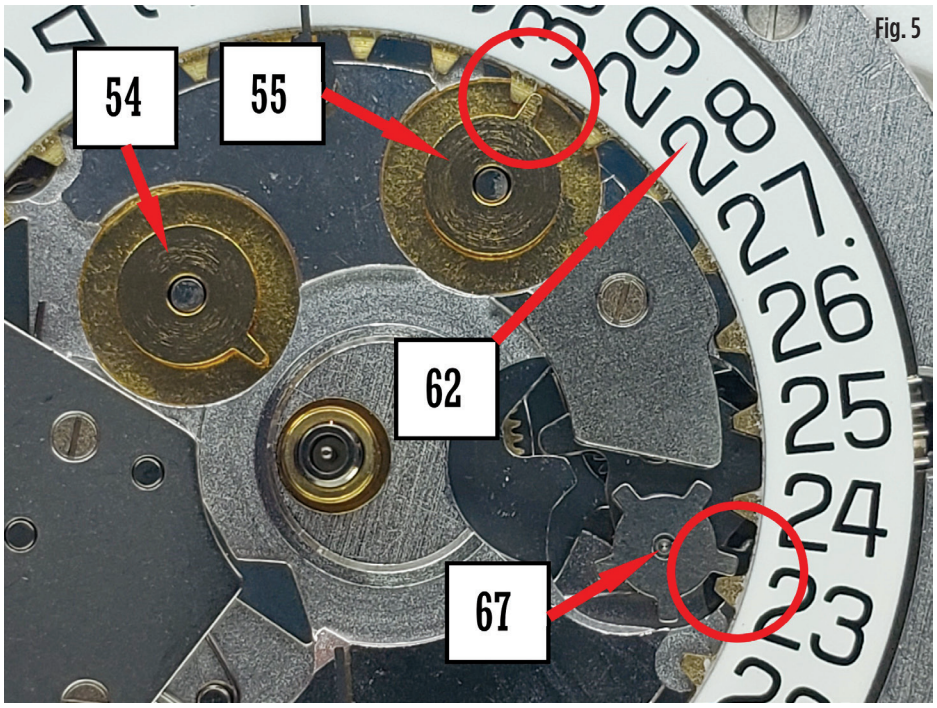


Fig. 5

In this circumstance, if the intermediate setting wheel were solid, something would break or become damaged. The clutch is designed to slip and allow the customer to continue rotating the crown without exerting too much force through the double corrector to cause damage.

Running the part through the cleaning machine and wicking Moebius HP-1300 down between the larger and smaller tubes as indicated in the tech guide tends to provide good results. However, there are a few checks that should be performed to ensure proper performance. The standard service procedure should be to check parts while the movement is being disassembled and while reassembling. However, this part can often slip through. The intermediate setting wheel can perform correctly before cleaning and be loose after cleaning. If the friction surfaces are left dry during assembly, it may still work for a while for the owner while material is ripped off the friction surfaces as indicated by the wear lines in Figure 3. After the next cleaning, there is insufficient material/binding to transfer enough torque to quick set the date reliably, if at all. At this point, it's not a lubrication issue but a mechanical one, and the component needs to be replaced. The check for this during assembly is to not only quick set the calendar but to purposely attempt to quick set the date during the date change over midnight. It may feel physically aggressive, but this is a function designed into the movement. The clutch should slip with a significantly higher level of torque than the date change, yet without the fear of breaking teeth. The slip should also feel consistent and not immediately become harder to slip like an under-lubricated cannon pinion can.

Speaking of cannon pinions, the friction clutch that is between the going train and the motion works in the ETA 7750 is the Driving pinion, assembled, #49, Figure 6.

Its purpose is to transfer torque from the Great wheel, #16, of the going train to the Minute wheel, #51, of the motion works, Figure 7.

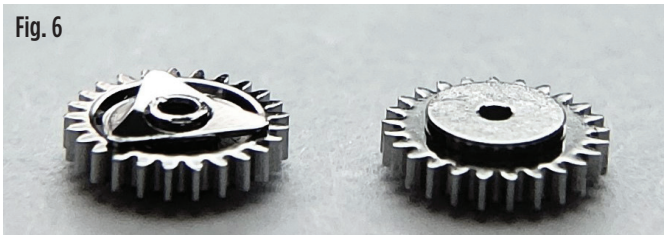


Fig. 6

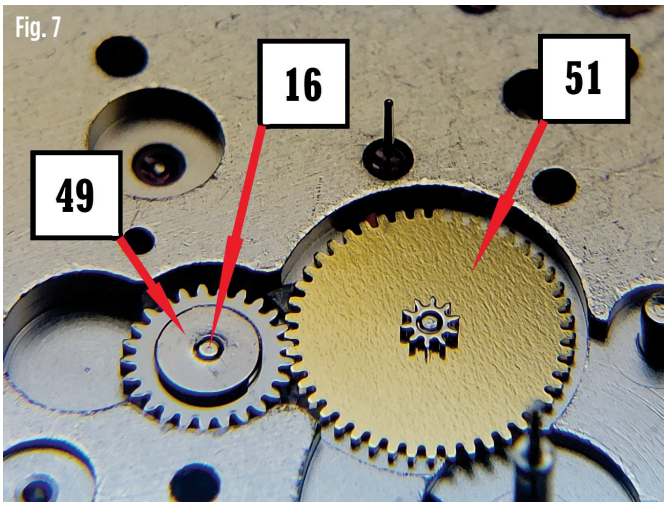


Fig. 7

The driving pinion is constructed of a hub, a gear, and a triangular spring, Figure 8. In operation, the hub is pressed onto the lower post of the great wheel. The gear sits between the hub and the triangular spring. The friction between the gear and the hub and the friction between the spring and the gear are what keeps the gear rotating with the hub, driving the motion work during normal operation. When the time is changed, the minute wheel drives the gear, which then slips between the spring and hub.

It is a balance of frictions that keeps the driving pinion working properly. According to the tech guide, this component must never be cleaned, and only the contact areas between the spring and gear are serviceable. If lifetime barrels are anything to go by, I will continue running my driving pinions through the cleaning machine. Should there be a situation where this part has been cleaned, both friction zones must be re-lubricated. The part can be placed on an anvil with soft tweezers placed on the gear, Figure 9. A small amount of HP-1300 can then be wicked in between the hub and gear. Pressing the gear down gently with the tweezers will open the space between the hub and gear, if necessary, to aid the wicking process. The edge where the triangular spring presses against the gear must also be lubricated with a grease such as Molykote DX per the tech guide.

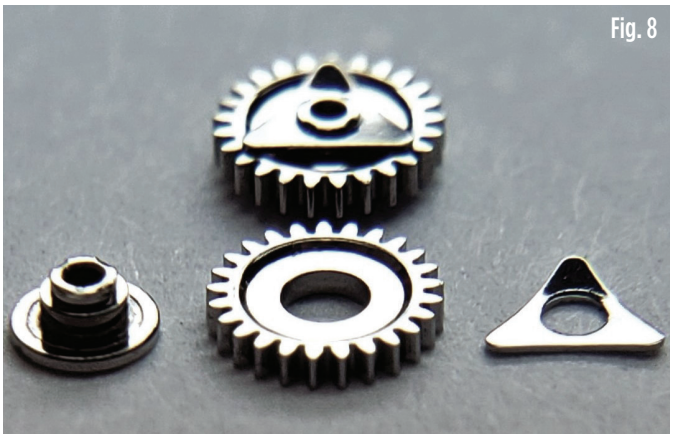


Fig. 8

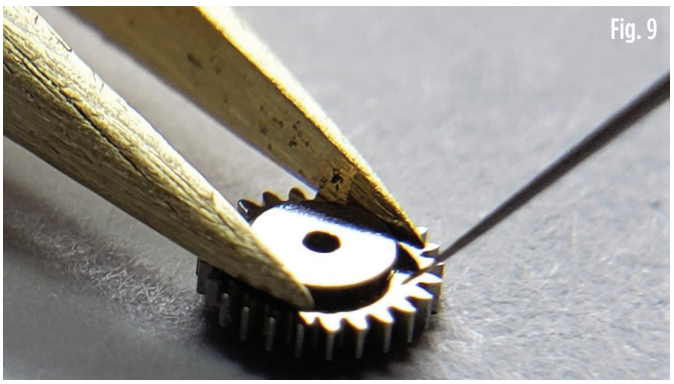


Fig. 9

The one frictional surface left that must not be lubricated is the connection between the hub and the great wheel. This location can become accidently lubricated when an oiler drags up the surface after lubricating the jewel or if the great wheel is removed and reinstalled without cleaning the lower jewel first. It is also a bit of habit that posts get lubricated before receiving their wheels, so this lubrication error may also happen due to inattention. Nevertheless, the connection between the great wheel and driving wheel must be solid and withstand greater torque than the gear slipping during time adjustment. Damage to the hole in the driving pinion can easily occur from pressing it on too far or when removing it by lifting from only one side. During reassembly, the driving pinion must hold tightly when it is even with the end of the great wheel post, or it runs the risk of loosening and spinning on/up the post over time. Proper quality control for this component should include both rapid and extensive time setting in both directions. The hour and minute hands keeping time are also an indicator that the driving pinion is not slipping.

Last and certainly least in terms of friction is the Hour counter, #56, Figure 10. Its purpose is to carry and control the hour counter hand to display the elapsed hours for the chronograph mechanism.

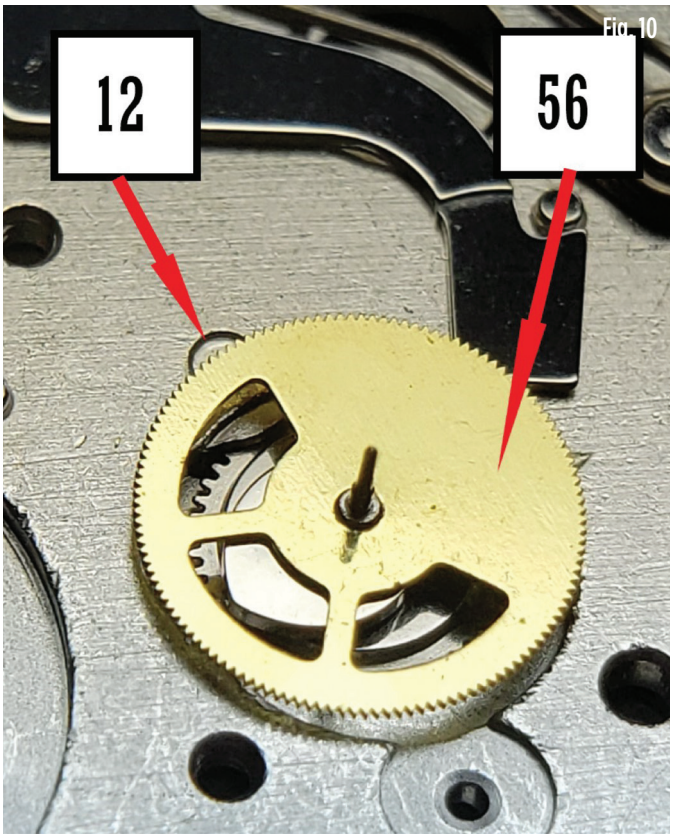


Fig. 10

The hour counter is meshed with the pinion on the bottom of the Movement barrel complete, #12 and also interacts with the Set hour hammer operating lever, #58 when being reset to zero or the Hour counter lock, #59 if the hour counting hand is stopped, Figure 11.

The hour counter is made of an arbor, a heart cam, a brass wheel, a steel wheel, and a triangular spring, Figure 12. The brass wheel and heart cam are rigidly pressed together on the arbor. The steel wheel is pressed against the arbor by the triangular spring riveted to the end of the arbor. When the chronograph is stopped, the hour-counter lock engages with the brass wheel and prevents the arbor from rotating. The steel wheel that is engaged with the barrel continues to rotate and thus the steel wheel slips between the triangular spring and the arbor. When the hour counter is being reset, the hammer acting against the heart cam causes the arbor to rotate quickly, slipping the arbor and spring against the steel wheel. When the chronograph mechanism is running, neither the hour counter lock nor the hour hammer is engaged, and the friction between the steel wheel, triangular spring, and arbor is sufficient to drive the arbor and its hand forward. Lubrication of the friction mechanism is rather straightforward with HP-1300 SC between the tips of the triangular spring and the steel wheel.

The friction in the hour counter is a minimal, delicate balance that must be evaluated practically. When the chronograph mechanism is not running, the friction against the steel wheel works against the barrel, potentially dropping amplitude and necessitating that the frictional resistance be as low as possible. The tradeoff is the resulting low torque available to drive the arbor of the hour counter. Any increase in resistance to the arbor, such as damage to the bearings or a drop in friction from a mishandled and weakened triangular spring, can cause the hour counter to slip when it should not. Practically speaking, there are two checks to perform that ensure proper functioning of this friction clutch. The first is to observe the change in amplitude between the chronograph running and stopped. Many factors introduce resistance to the going train with a resulting amplitude drop when the chronograph mechanism is started, but the hour-counting mechanism is the only place in the ETA 7750 that should see a reduction in the resistance to the going train. A significant increase in the amplitude when the chronograph is started suggests

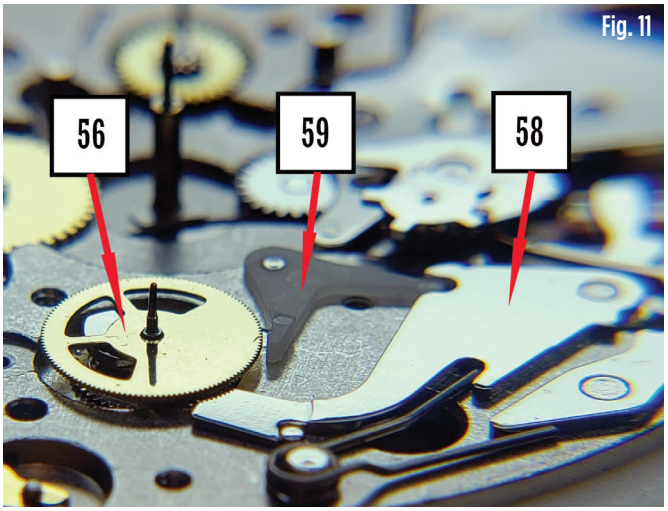


Fig. 11

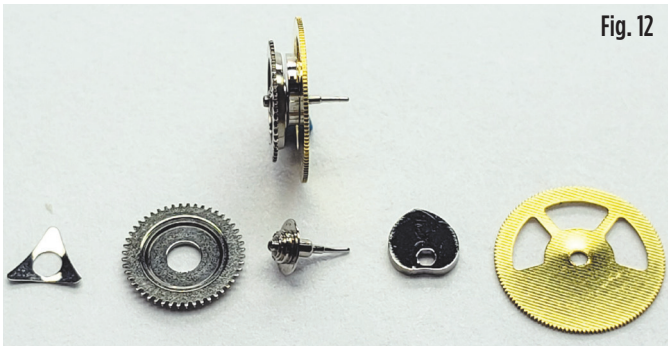


Fig. 12

there may be too much resistance to the barrel from the hour counter and warrants an investigation of that mechanism. The other check is to ensure that the hour counter is recording the appropriate amount of time. Assuming the chronograph mechanism is run for an appreciable amount of time during quality control, the displayed elapsed hours matching the actual elapsed hours indicates that the friction clutch of the hour counter is able to drive the arbor and carry the hand without slipping.

It's normal to break down complex systems into smaller ones that are more easily understood and manageable. It's the same thing we do when breaking an entire watch down into functional systems with their constituent parts. These friction clutches were physically broken apart for demonstration and clarity, but the necessary details were always visible. Taking a moment to evaluate the functionality of each feature of each part is a great way to gain a better understanding of how that part functions not only as a unit but as a part of the larger system.

Jason Ziegenbein is an independent watchmaker in Tulsa, Oklahoma. He is a graduate of the 2003 WOSTEP class at Oklahoma State University.

Explained: Restoring a 1950s Rolex Oyster Perpetual Ref. 6074, Part 2

By Henrik Korpela, FBHI

In the April 2020 issue of *Horological Times,* Henrik Korpela detailed the problems he encountered when he received this family heirloom for repair. Here, Korpela explains the steps he took to restore it. First published on sjxwatches.com, May 15, 2015.

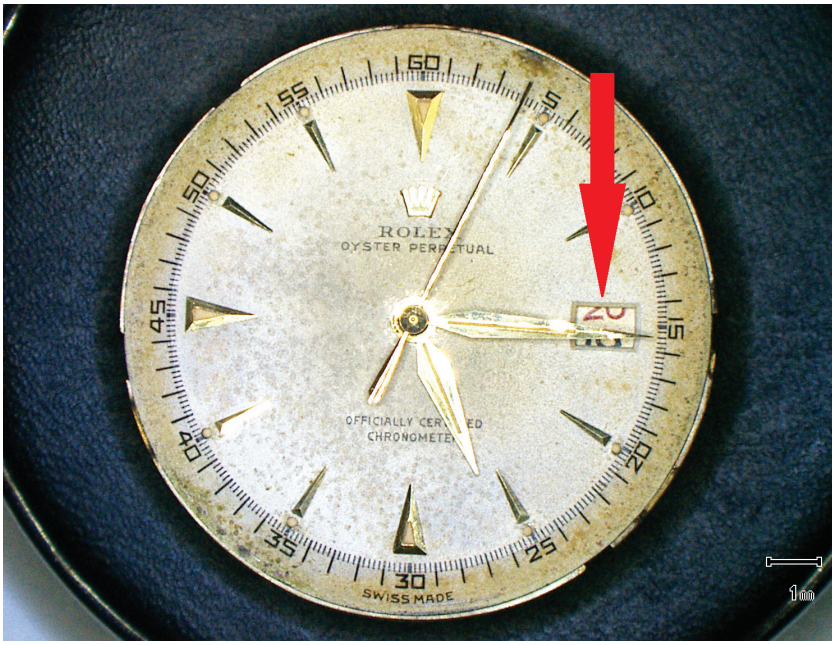
The Restoration

An overhaul of the watch was performed, with key highlights explained step-by-step below. The repair comprised of:

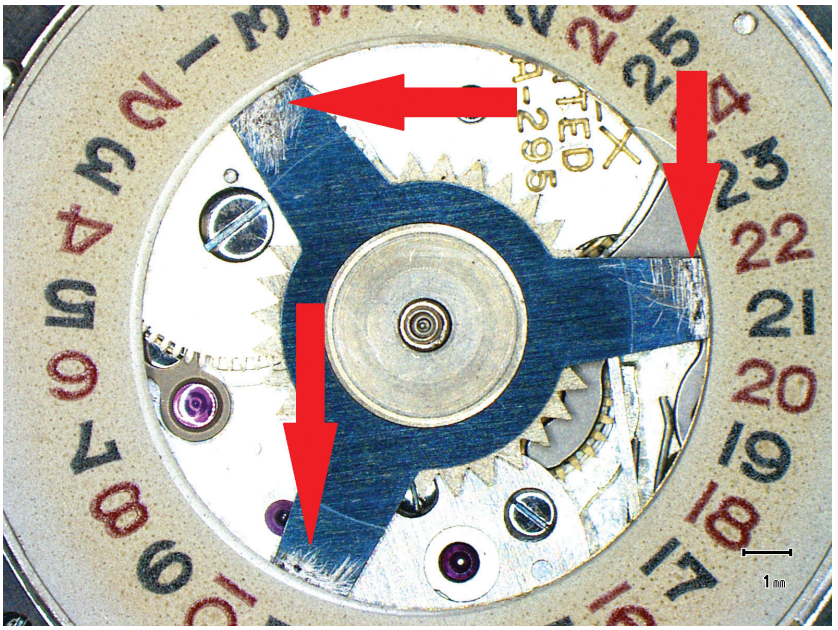
1. Complete disassembly, cleaning, lubrication, and reassembly.
2. Regulation of rate and functionality check.
3. Application of new shellac on pallets and roller jewel.
4. Correcting warping of wheels.
5. Adjusting of pallets.
6. Corrections to balance spring.
7. Light polishing of case and replacement of crystal.
8. Repair of date mechanism.
9. Burnishing of balance staff pivots.
10. Exchanging mainspring with sliding bridle.

The Date Mechanism

The date display was jammed, stuck in between "19" and "20." Removing the dial showed us the problem. The blued steel frame carrying the date disc had a lot of scratches, likely caused by a watchmaker trying to fix it with not much care. The frame did not hold the date disc securely and was sliding around under the date disc instead of carrying the disc around. This was easily fixed by repositioning the date disc and securing it.



The date disc is stuck in the wrong position in relation to the date window.

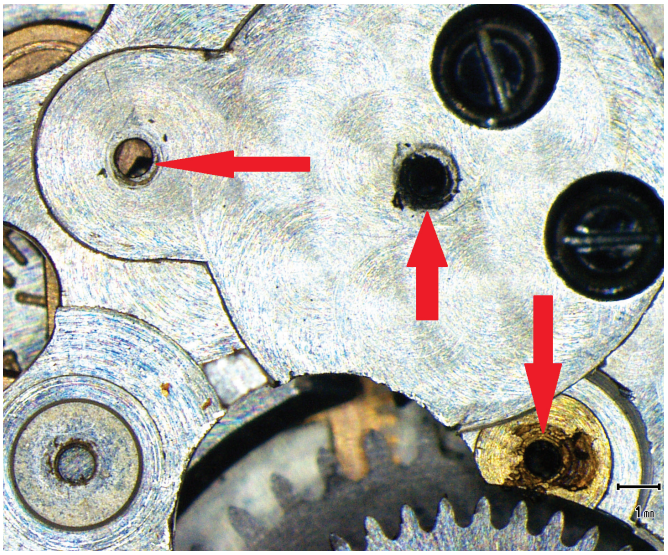


The frame that holds the date disc is badly scratched.

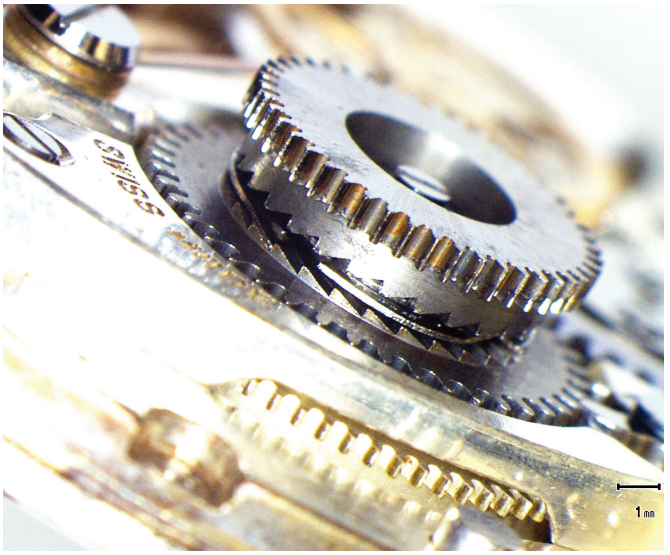
The Winding Mechanism

Removing the upper bridge for the winding mechanism revealed the gears for winding, and under them some expected wear in the pivot holes.

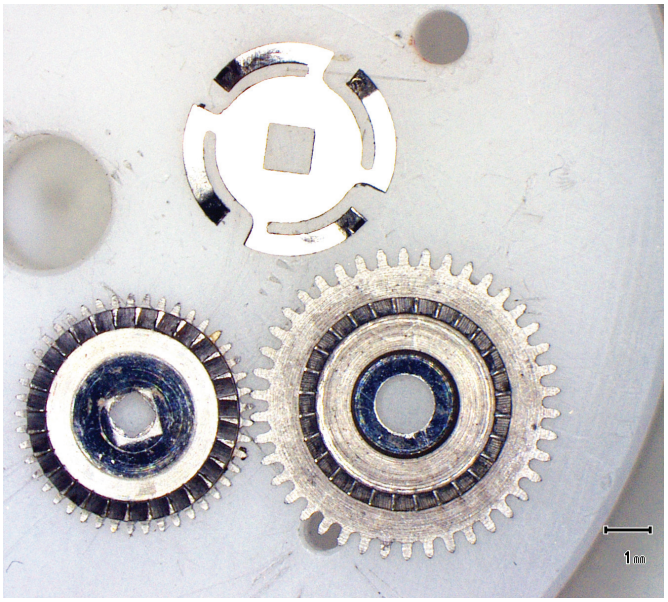
The pivot holes are fixed with new bushings, essentially circular metal rings that fit into the enlarged pivot hole to restore it to the original factory-spec diameter. These bushings are turned on a lathe and then friction fit into the bridge. Each bushing has to be matched up in size with the newly burnished pivots to give the pivots a small lateral play, sideshake, needed for them to function correctly.



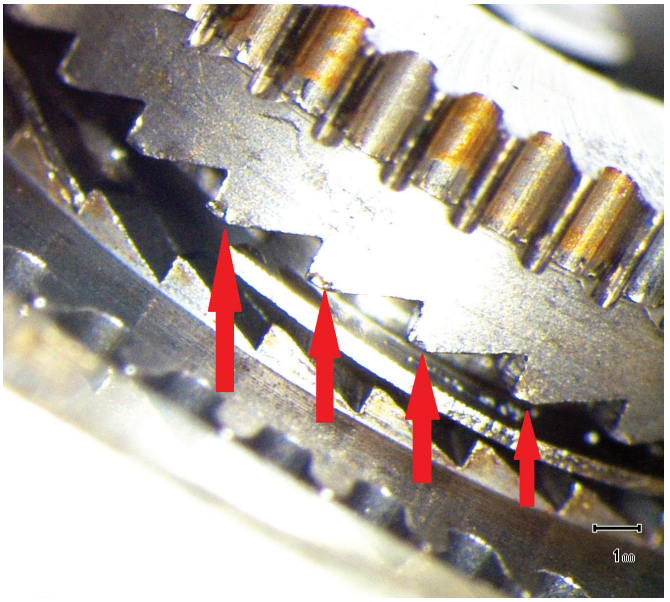
Dirty pivot holes with dried up lubrication must be removed.



The Breguet uncoupling that winds the ratchet wheel in one direction and slides free in the other direction.



The Breguet uncoupling disassembled.

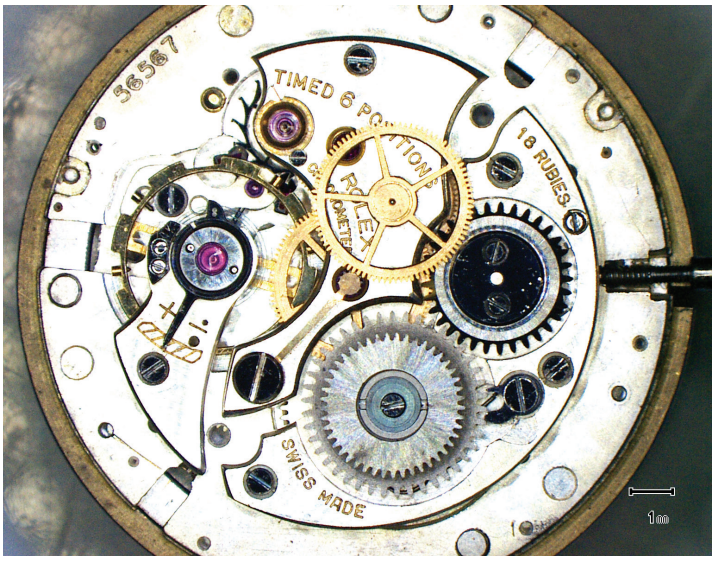


Some wear visible on the teeth of the Breguet uncoupling.

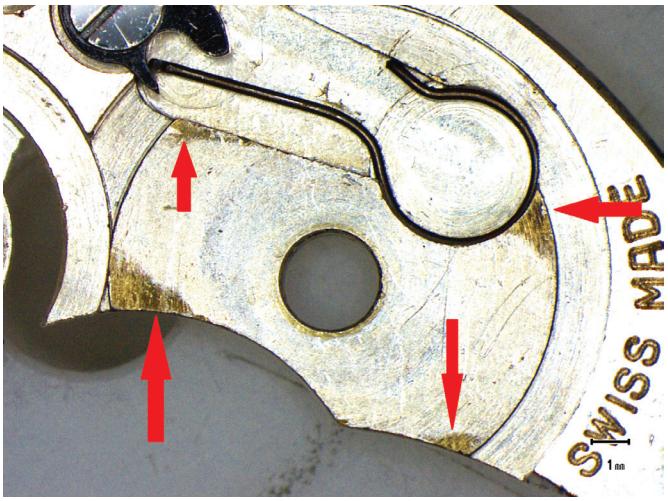
I left the wear on the gears since it wasn't enough to cause any problems. Usually the best solution is to find a new old-stock wheel for that caliber or to make a new wheel if the correct wheel is not found, since repairing a wheel is difficult or impossible. Removing the automatic bridge reveals the movement below, including the unusual balance wheel.

Cleaning Movement Surfaces and Jewel Holes

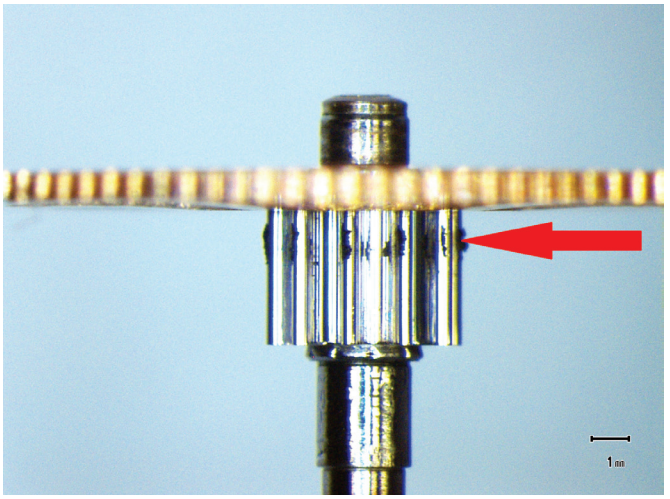
Dirt and remnants of old lubricant in the pivot holes are first removed by hand with pegwood sharpened to a point. Once the jewel holes have all been pegged out and cleaned, the bridges and main plate with the jewel bearings are put in an ultrasonic machine, cleaning the parts in different cleaning and rinsing solutions. Other components are similarly cleaned.



The movement of the 1950s Rolex Oyster Perpetual revealed after removing the automatic bridge.



Some light surface wear with dirt and remnants from old lubrication must be removed.



Dirt and remnants on the center wheel pinion, must be removed.

Re-burnishing Worn Pivots

In older watches, very often the pivots are scored from running dry. They then have to be re-burnished. The process applies a functional polish with the Jacot tool, a pivot polishing lathe. The technique makes the pivots harder on the outside, leaving them more wear resistant.

Replacing the Balance Staff

In older watches without shock absorbers, it is common to see balance staff pivots broken as a result of sudden jolts that a modern, shock-resistant watch can withstand. A broken balance staff cannot be fixed, instead a new balance staff has to be fitted.

First, the hairspring and roller have to be removed in order to be able to take out the broken balance staff. A new balance staff is then riveted to the balance spring with the staking set, and after the riveting, the roller can be friction-fitted to the new balance staff.

Next, the balance would need to be trued in the flat and checked in the round, as well as statically poising the balance. When that has been done, the hairspring can then be attached in its correct position, and the stud can be attached to the bridge and adjusted in beat. The timing of the watch can commence.

Shellacking

Shellac is a natural adhesive, a resin produced by the female lac bug, and used as the bonding agent for pallet and roller jewels in mechanical watches. In older watches, it is common for the shellac to have come off from the pallet or roller jewels. Fresh shellac has to be applied over the jewels with heat. Once it cools, the shellac hardens and holds the jewels securely in place.

Hairspring

Adjusting balance springs is an art in itself and requires hundreds of hours of practice. The goal is a balance spring that runs true, being perfectly flat and round. Often with old watches, and in some cases even new watches, the balance spring is out of round or flat, or both, and needs correcting in order to have the best possible rate.

The reason a balance spring may be out of round or flat is sometimes due to a sharp shock. For instance, the watch being dropped. Watchmakers correcting the balance spring typically use simple tools such as fine tweezers, forming the hairspring by hand to make it flat and round.

Case Polishing

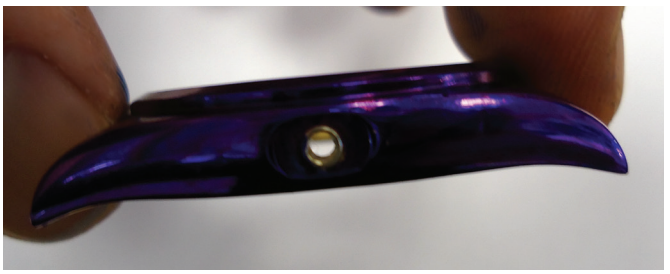
I decided to go easy on the polishing in order to preserve as much of the case material as possible. I used a technique to bring out the scratches and dents, so I could polish only specific areas and leave as much as possible untouched.

I used a marker to completely cover the case in blue ink, and then rubbed off the ink with a fine abrasive paper. The paper only removed the ink from the smooth surfaces, and not the ink inside dents and deeper scratches, thus highlighting the parts that needed work.

Next, I used abrasive material to smooth out the scratches and dents. Extra care was taken not to remove too much material. The final step was to buff the case to a high gloss while leaving the straight-grained surfaces original, creating a sharp contrast between the two surface finishes.

Polishing was gently done to preserve as much of the case material as possible.

Case completely covered in blue marker.



Side view of case covered in blue marker.

The remaining ink highlights dents and nicks in the case.

The contrast between the high-gloss buffing and the original straight-grained surfaces catches the eye.

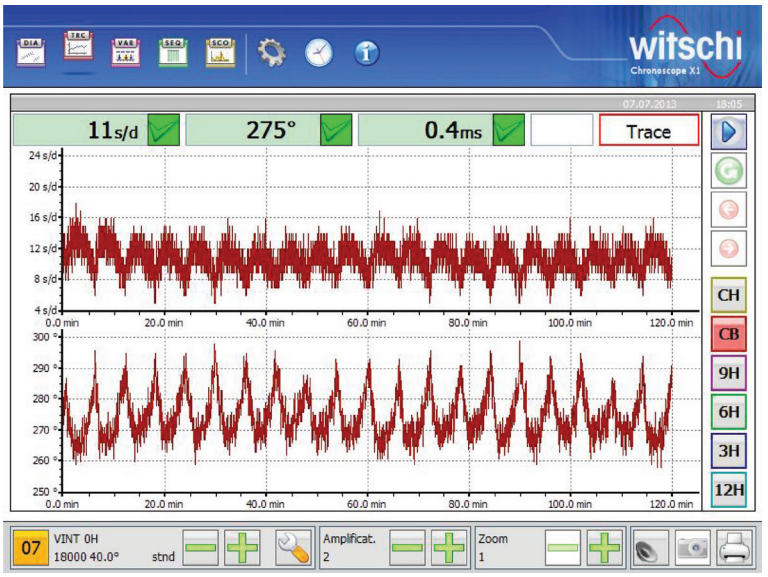
A high-gloss polish on the side of the case provides contrast.

The lugs taper to a sharp point, characteristic of the Oyster case.

The mirror-finished case back.

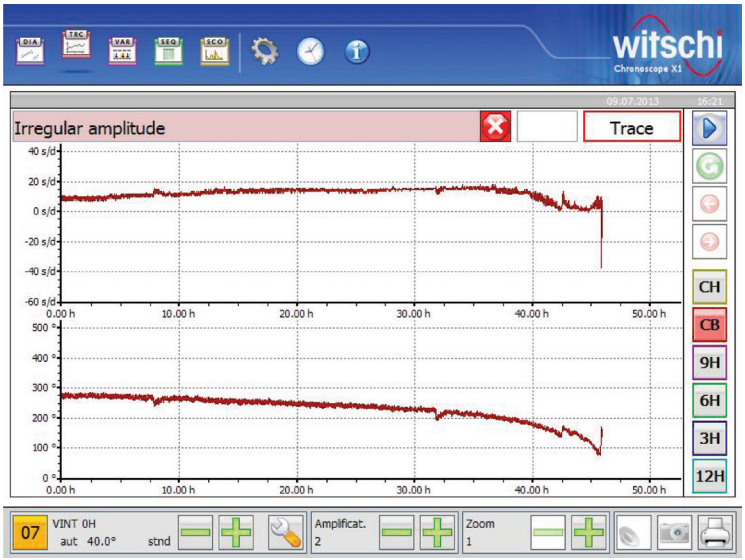
After Restoration

The results of the restoration speak for themselves.

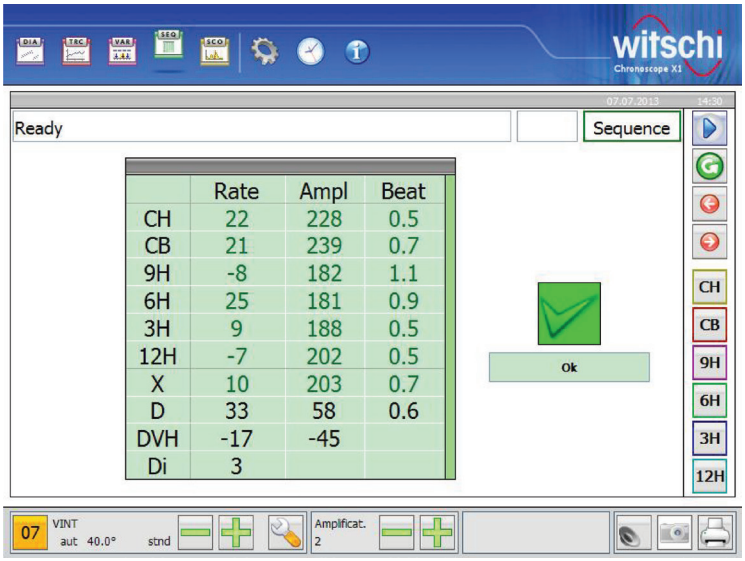


Two-hour trace to give an estimate of the condition of the running gear train by observing the amplitude fluctuation.

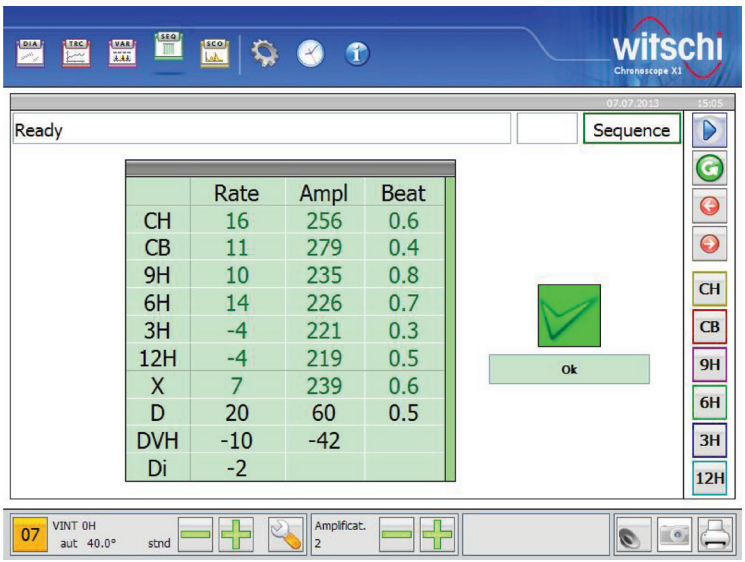
Long trace to check gear train and going barrel running condition as well as duration of run.



Overall rate and amplitude check in six positions at half wound.



All green and good to go.



Henrik Korpela is a watchmaker living in Switzerland and the principal of Korpela and Hofs Watchmaking Competence Centre.

Welcome to Meet the Candidates, 2020. This annual feature gives each candidate for the AWCI Board of Directors the opportunity to introduce themselves to the membership prior to the annual election. These introductions are printed without editing as received from the candidates. This year there are four (4) candidates vying for a seat on the Board of Directors. Candidates are listed in alphabetical order. Two (2) directors will be elected, each for a three-year term. The two who receive the most votes will join the current AWCI board members in October and replace two outgoing board members.

On June 1, each AWCI member will receive an email with a link to their ballot and a background sketch of each candidate. The election email will also contain each candidate's response to a question posed by the Board of Directors. Ballots received via email can be cast online. If we do not have an email address on file, you will receive instructions in the mail for how to vote online.

If you are not receiving regular emails from AWCI, please log in and update your email information or call AWCI so we can assist you. You can update your contact info from the My Profile tab in the Member Center at www.awci.com.

BOARD OF DIRECTORS CANDIDATES

Justin Harrell, CW21

My name is Justin Harrell and I'm running as a candidate for the AWCI Board of Directors. I'm the owner of The Watchmaker's Shop in Asheville, North Carolina. We are a watch retail and repair shop located in the historic Grove Arcade. The first time I sat at a bench was at my family's jewelry store where my mother worked as a jeweler. My passion for the watchmaking industry was ignited while attending watchmaking school and has continued to grow throughout my career. I joined AWCI in 2007 while attending the Lititz Watch Technicum where I graduated and acquired my CW21 and WOSTEP certifications. The trade winds blew me to St. Thomas, Virgin Islands to work for a Rolex boutique where I was exposed to the full spectrum of the business. I met my wife Holly there and we decided to move to Asheville, NC in 2010 to open an independent shop. I was somewhat naive to the challenges facing independent watchmakers and was lucky to have the support of AWCI and it's resources. During the past few years I have served on the Industry Advisors Board, Spare Parts Directory Committee, Mobile Classroom Committee, Finance Committee as well as Vice President. My goal as a watchmaker and a business owner is to have Horologists get the respect that we deserve within the luxury industry. This can only be accomplished by providing a professional image and top notch service.

Dave Kurdzionak

My name is Dave Kurdzionak. I own and operate The Watchmaker in Stoneham MA. I currently serve as the President of the Massachusetts Watchmakers/Clockmakers Association, as well as the Affiliate Chapter Chairperson for the AWCI. I am also proud to serve on the Chamber of Commerce Board of Directors in my hometown. The watch service business has provided for 3 generations of my family so I want to give back however I can. Serving as an elected AWCI director would be an honor and a privilege. I like to think that I can bring a unique perspective that would be valuable to the membership. Because I rely on watchmakers for my livelihood, I appreciate their skills and knowledge and envy the technical mastery that is required to successfully work at the bench. It is my goal to support watchmakers however I can and to promote the trade so that another generation can enjoy the benefits of our profession.

David Lindow

I started my apprenticeship in clocks at 20 years old in 1990. In the 30 years since I have produced in excess of 1,500 clock movements and restored many period clocks as well as others. In addition I have built over 150 clock wheel cutting engines as well as many other horological tools. I began manufacturing rose engine lathes in 2008 which I continue to make. However, what has made me most proud is having had students come through the shop, learn, leave, and thrive on their own. At present there seems to be more interest in learning than ever. My heart is in education. On top of the regular duties of a board member I will endeavor to put new energy into the clock side of the education department and bring my knowledge and experience in a personal and hands on way to task of bringing a systematic education system back into reality. I know there is vast knowledge and experience amongst the membership with a lot of younger people eager to learn. I will endeavor to bring both of these groups together and create a learning environment that makes people excited to take their next course.

I know there is much more to being on a board than simply focusing on one objective, no matter how passionate you are about that objective. I bring to the table the experience of serving on the local school board as well as serving on the board of another organization as president and vice-president for over eight years. At 50 years old I am old enough to have deep experience in the field while being young enough to add energy to the equation.

If you share a vision of education that will produce a system so good that it will attract a new and younger membership to add to the already fantastic group we have now, please vote for me.

Anthony Rachevsky, CW21

My name is Anthony Rachevsky and I am running as a candidate for the AWCI Board of Directors. I currently am a Head Watchmaker at Glezer-Kraus. I come from a family full of watchmakers. I am a 5th generation watchmaker. I grew up always being fascinated in anything mechanical. My grandmother who is a watchmaker saw my fascination and decided to introduce me into watchmaking. I would come to her shop anytime I was off from school and tinker around with old pocket watches. In 2006, I was accepted to Lititz Watch Technicum. Graduating in 2008 with WOSTEP, CW21, and LWT diploma. I went back to Chicago and started my work career at my grandmother's shop Glezer-Kraus. I have continued my education and have received certificates from Swatch, and AWCI.

I currently serve on AWCI's Education and Standards Committee and I am a member of the CW21 Assessment team.

I believe the AWCI membership can play a valuable roll for any watchmaker or clockmaker. This is the number one educational source when it comes to horology. The amount of options that AWCI offers is great. From the Build-A-Watch classes for hobbyists to vintage chronograph coarse to introduction to clockmaking. The Mobile classroom just adds to the amount of options AWCI can offer. The *Horological Times* that gets posted monthly is an excellent source to keep us up to date with the industry. The library has a ton of information from horology books to thousands of technical diagrams that I use on a regular basis.

I would appreciate the opportunity to serve on the board of AWCI.

GEAR UP TO GET CERTIFIED BECAUSE THE CC21 EXAM IS BACK!

$1,150

Clockmakers, after months of preparation, the Certified Clockmaker for the 21st Century Exam is back online. Don't miss this opportunity to show your customers that your work has been approved by the leaders in your industry. This certification will set you apart from your competition and let your customers know that you are dedicated to delivering quality craftsmanship.

Best of all, this exam can be completed in your own workshop. After registering and coordinating the details of your exam, you'll receive each of the components of the exam by mail from AWCI's Clock Director, Mike Carpenter, CC21. Once you've completed them, you'll return them to him by mail. He'll assist you in finding a mentor to help administer parts of the exam and guide you through the process.

To get more information or to start the process, contact our education director, Jason Champion, today at 1-866-367-2924, ext. 303 or certification@awci.com.

"Receiving my Clockmaker's Certification was one of the proudest moments of my life."

~Michael Gainey, CC21

Openmovement Open Sources Movement Design

By Andrew DeKeyser, CW21

Roman Winiger's dream is to develop a mechanical movement that has been improved upon by the watchmaking community and made freely available to that same community. He is president of the Openmovement Association, which consists of over 30 different watchmakers and watchmaking industry companies. The association's stated goal is to create greater collaboration and move away from the cottage-industry model of the past. They seek to support small watchmakers by providing plans and kits of unfinished movements and create "transparency and future security based on the availability of plans and construction details."

The project is based on an open-sourced model for developing a new caliber, OM10, which belongs to all registered members of the Openmovement Association. The initial design and all iterations and improvements will be shared with the community and licensed under Creative Commons. This allows members to take the plans for the movement and tailor it to their needs or develop additional complications and decorations to set themselves apart. Openmovement will supply kits of unfinished components for an undetermined price in addition to freely sharing 2-D plans.

Currently, watchmakers must either manufacture their own movements in-house, such as Rolex or Patek Philippe, or purchase movements from suppliers such as Sellita, Soprod, or ETA. An in-house caliber can cost millions of dollars in development and machinery. Purchasing finished movements greatly limits the watchmaker's ability to customize and improve the design. Openmovement's model will give watchmakers freedom to manufacture their own movements, have the movements made, or purchase the unfinished movements. This allows watchmakers to have their own identity in the market, lower the cost of entry into the market, lower costs overall, and encourage further development of the caliber for the betterment of the entire industry.

The project has been crowdfunded and the initial design of caliber OM10 has been a labor of love from the Openmovement Association's members. If Openmovement can raise an additional $259,100, they can prototype and test OM10 and begin delivering movements within a year.

Sources

https://journal.hautehorlogerie.org/en/openmovement-aims-to-revitalise-watchmaking/
https://www.openmovement.org/

Andrew DeKeyser is the owner of HCP Watchmaking in Sisters, Oregon. He graduated from the Lititz Watch Technicum with WOSTEP certification.

In Summary

Hubert Herr to Close and Kieninger Enters Bankruptcy

By Donna Hardy

Mark Butterworth of Butterworth Clocks, Inc. received a letter from German clock company Hubert Herr that the owners are retiring, and the business will close. Butterworth also received information from Kieninger that the company has entered bankruptcy. It is not certain whether there will be a buyer or group of investors to keep the company going. According to the latest information, this should be sorted out by June 1. Butterworth Clocks, Inc., is a distributor for both Hubert Herr and Kieninger.

Source
Mark Butterworth, Butterworth Clocks, Inc.

Donna Hardy is the managing editor of the *Horological Times*.

Benrus Is New York Mets' Official Timekeeper

By Andrew DeKeyser, CW21

Benrus announced March 5 that the brand will be the official timekeeper for the New York Mets. Benrus was founded in New York City in 1921 and the Mets in 1962. Today, they both draw immense pride in being New York City staples, making their partnership very natural.

Benrus has introduced a limited-edition watch commemorating the Mets' 1969 National League Championship and will install a clock in Citi Field (the Mets' home stadium) for the 2021 season. They have also put together a website outlining the Mets' storied history in America's largest city.

Sources
https://www.metsheritage.com

https://www.jckonline.com/editorial-article/historic-watch-brand-benrus-mets/

Grand Seiko Celebrates 60 Years

By Andrew DeKeyser, CW21

The Grand Seiko brand turns 60 this year. To celebrate, they have unveiled two new calibers, three new models, and four limited editions. The four limited-edition watches feature blue dials, are limited to 2,500 pieces each, and feature case-back engraving to demarcate them. The three new models pay homage to the brand's 60-year history and house a 9S64 manual-wind movement encased in platinum or 18k yellow gold.

The two new calibers feature noteworthy innovations. The 9SA5 automatic movement beats at 36,000 vph while supplying 80 hours of power reserve. The movement is 15% thinner than the rest of the 9S movements. Grand Seiko achieved these feats with two sequentially arranged barrels, a new escapement design, and a free-sprung balance with an over-coil hairspring.

The other new caliber is an automatic Spring Drive 9RA5 with a power reserve of five days and a precision rate of +/-10 seconds per month. The automatic "magic level," a Seiko signature innovation, has been moved off center to allow the movement to be 0.8mm thinner than its predecessor.

The movement also features two mainspring barrels of differing diameters to provide the 120 hours of power reserve. Both new movements feature Grand Seiko's signature high degree of finishing and mechanical aesthetics.

Sources
https://www.grand-seiko.com/us-en/special/60th/

https://www.watchtime.com/wristwatch-industry-news/technology/the-hi-beat-goes-on-grand-seiko-unveils-new-calibers-for-its-60th-anniversary/?utm_source=WW+4-21-20&utm_campaign=WW+03-21-20&utm_medium=email

https://www.watchtime.com/wristwatch-industry-news/watches/grand-seiko-marks-60-years-with-four-new-limited-editions/

https://www.watchtime.com/wristwatch-industry-news/watches/for-its-60th-anniversary-grand-seiko-re-creates-its-very-first-watch-times-three/

Wempe Shows Dedication to Family Values

By Andrew DeKeyser, CW21

According to Rudy Alders, president of Wempe North America, Wempe has decided to continue paying its 750 employees during the closure of their 35 worldwide stores. He shared this sentiment during a live Instagram interview with *Watchonista* editor Josh Shanks.

Alders says, "It is a major challenge to our company and our 750 employees, and it is times like this when you really feel the love that comes from being part of a family business. Our owners have the resources to get us through this, we are still paying our staff and still paying our invoices."

Sources
https://usa.watchpro.com/wempe-shows-its-family-values-as-its-keeps-paying-staff-despite-35-stores-closing-worldwide/

Patek Philippe Postpones All Watch Launches Until 2021, Allows Online Sales

By Andrew DeKeyser, CW21

Amid Baselworld's postponement and virtually all their retail partners being closed, Patek Philippe has made the decision to not introduce any new watches in 2020. This saves their retail partners from having to buy the new collections while sales are down due to the current global pandemic and eases supply strains while Patek is essentially shut down.

In addition, the company is allowing its retail partners to facilitate sales of their watches over the Internet. Customers can add Patek watches to their bag on certain retailer partners' websites such as Hamilton Jewelers in Princeton, New Jersey. This unprecedented relaxation of policy is certainly meant to ease the pain of having to close retail locations to the public.

Sources

https://usa.watchpro.com/exclusive-patek-philippe-postpones-all-watch-launches-until-2021-and-rolex-could-be-next/

https://usa.watchpro.com/exclusive-patek-philippe-lets-authorized-dealers-sell-online/

https://www.hamiltonjewelers.com/categories/Watches/Brand/Patek-Philippe/

PATEK PHILIPPE
GENEVE

Swiss Watch Sales Up Overall Last Year

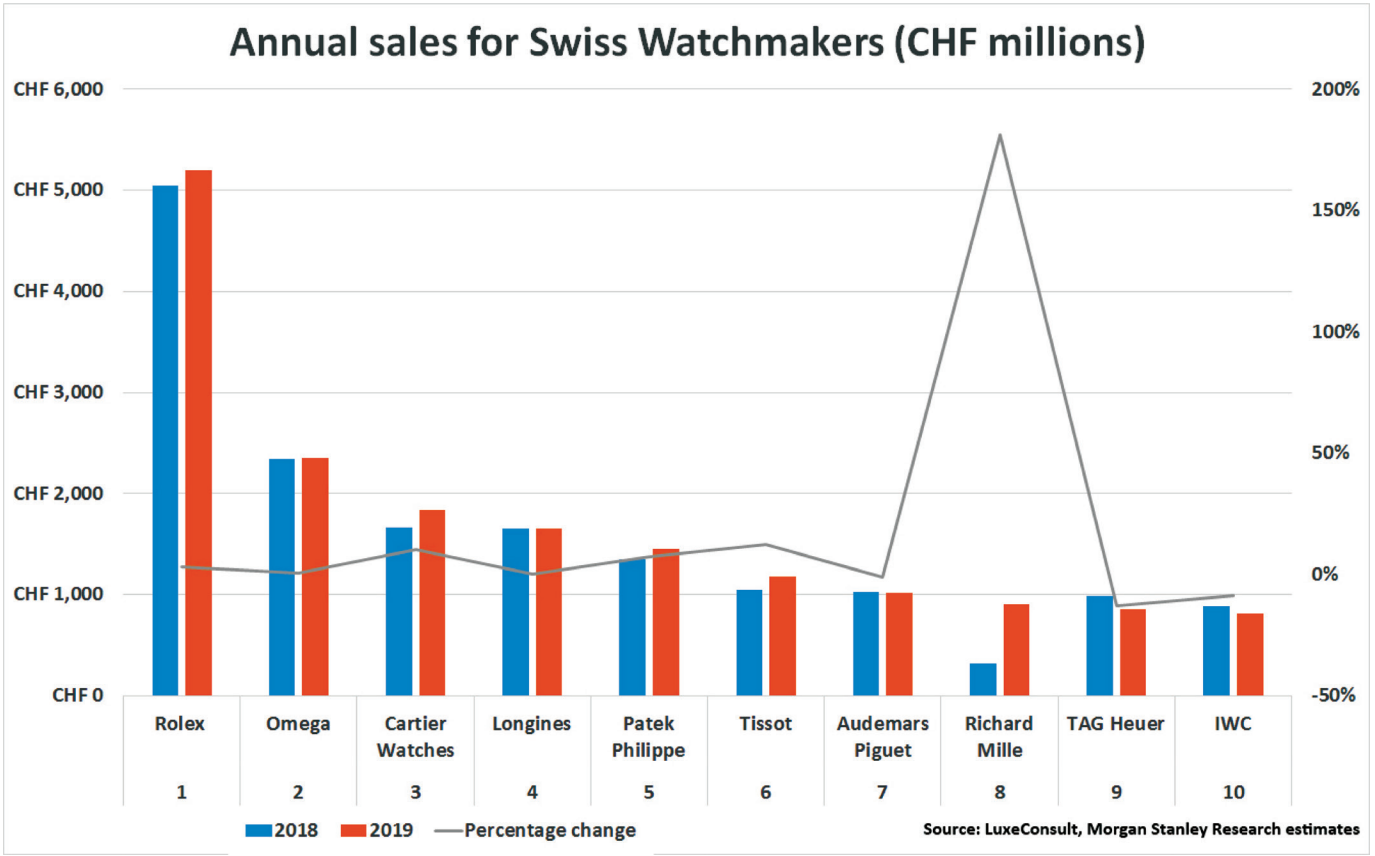
By Andrew DeKeyser, CW21

According to the Watch Report put together by Morgan Stanley and LuxeConsult consultancy, the top 10 Swiss watchmakers had a pretty good year. Overall, the Swiss watch industry was up 2.4%. Audemars Piguet, TAG Heuer, and IWC all saw slight dips in sales while the growth of Omega and Longines was essentially flat for the year. Rolex, Cartier, Patek Philippe, Tissot, and Richard Mille all saw a rise in sales in 2019 when compared to 2018.

This annual report tries to penetrate the secrecy of these Swiss watchmakers by using metrics such as analysis of supply chains, conversations with the brands, Swiss export figures, and financial reports to stock markets. The report is widely respected as accurate in the industry.

Source

https://usa.watchpro.com/rolex-records-best-ever-sales-in-2019-to-reach-turnover-of-chf-5-2-billion/



Andrew DeKeyser is the owner of HCP Watchmaking in Sisters, Oregon. He graduated from the Lititz Watch Technicum with WOSTEP certification.

AWCI Membership Benefits: DIVE IN!

Your membership in AWCI works hard for you, providing you with many benefits–

Education Resources

Classes—Held in the state-of-the art classroom at AWCI headquarters; the Archie Perkins Mobile Horology Classroom that comes to you; Build a Watch events. 10% discount for members.

Annual National Convention—Topnotch classes and speakers on topics for both watchmakers and clockmakers. 10% discount for members.

Certification—Invest in yourself and your career!

Horological Times—Every month we bring you technical articles, industry news, updates on happenings at the institute, and much more.

Affiliate Chapters—Learn at your local guild from respected horologists; meet other horologists in your area.

Henry B. Fried Library—Borrow from 3,500 books, from Archie Perkins to Henry B. Fried. FREE to all members.

Books and DVDs—For sale at 10% discount for members.

Real People to Help You in Real Time

AWCI personnel are available Monday through Friday to answer any question. Jason Champion, CW21, your education director, will help find the right class for you and answer all your questions.

866-FOR-AWCI (367-2924) • 513-367-9800

Don't forget the 10% discount on other merchandise, such as t-shirts, posters, and more!

Business Resources

Tech guides—15,000 tech guides at www.awci.com.

Find a Professional Directory—Get found and get hired! Our database gets 12,000 searches per year.

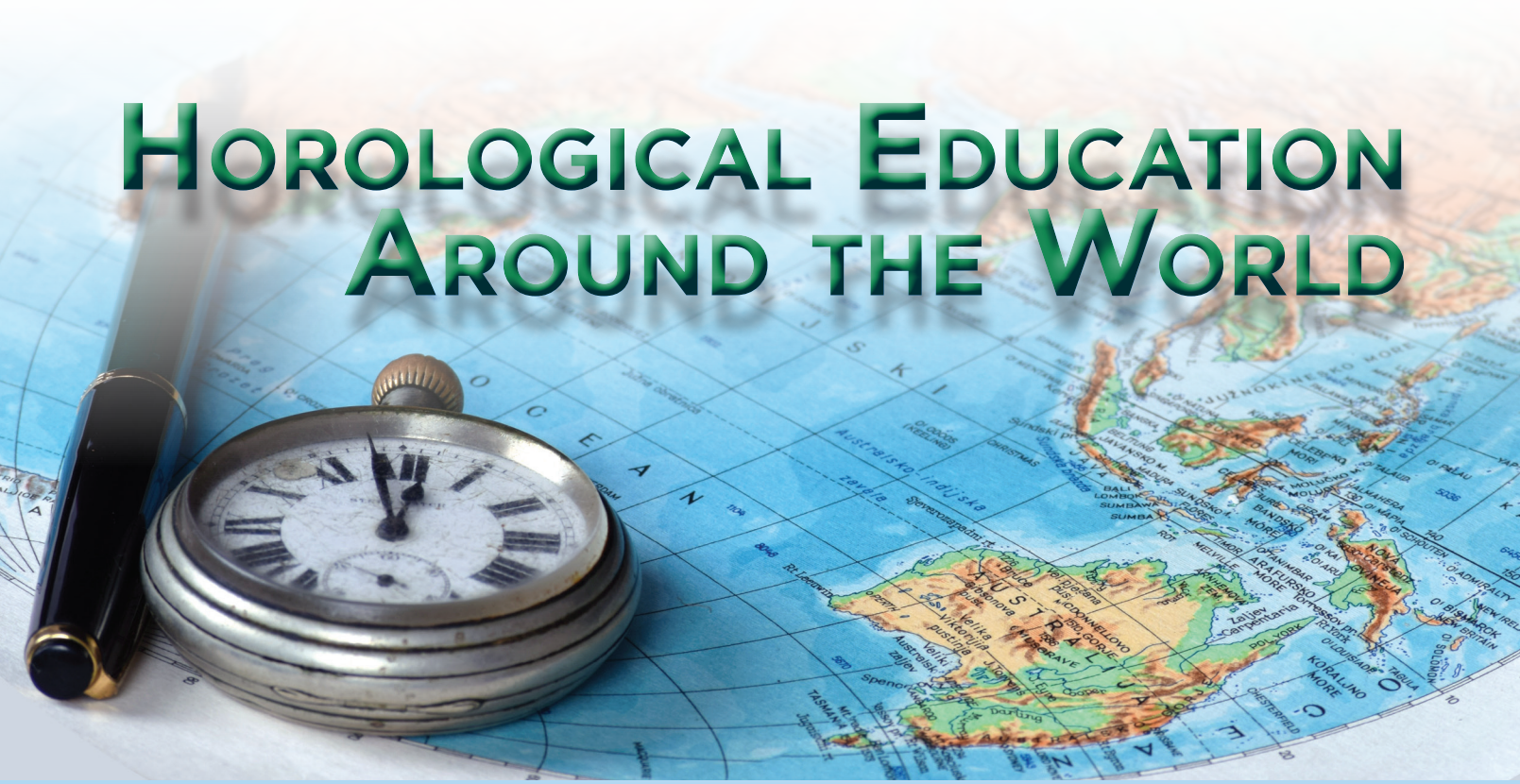
Annual National Convention—One of the best places for networking. 10% discount for members.

Horological Times—Use the classifieds to find a job, hire an employee, or buy or sell equipment.

Explore the Resources You Need to Succeed

AWCI

Horological Education Around the World



By Kathy Ortt

We continue this series of articles about horological educational opportunities around the world at a college located a few miles north of Chichester in West Sussex, England. West Dean College of Arts and Conservation focuses on craft skills with vocational application. The college offers 800 short courses and paths to a degree or diploma, allowing students to study arts and conservation in books and library materials, ceramics, furniture, musical instruments, metalworking, and horology.

West Dean College of Arts and Conservation

West Dean, Chichester, West Sussex, PO18 0QZ

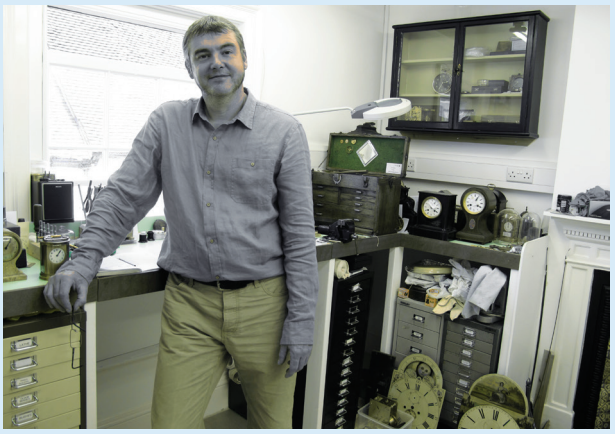
West Dean College offers a wide variety of horology courses at its premises about 74 miles southwest of London, England. At an introductory level, the Horology Taster Course runs for four days, giving students an opportunity to try out the study of horology. For more in-depth study, West Dean College has one- and two-year programs in graduate diploma conservation studies, master's in conservation studies, professional development diploma in horology, and the FdA (foundation degree in arts) historic craft practices–clocks.

According to college literature, students can expect to develop excellent practical skills through object-based treatments, learn the principles and techniques of historical horological manufacture and repair, and work on historic objects. Conservation students benefit from the unique opportunity to study in a working historic house, as well as the college's active relationships with the heritage sector worldwide.

West Dean College of Arts and Conservation is part of The Edward James Foundation, a registered charity which also comprises West Dean Gardens, West Dean Estate, and West Dean Tapestry Studio. Rachel Aked, media consultant for West Dean College, notes that "West Dean College of Arts and Conservation is based in the beautiful countryside of the South Downs National Park, not far from the South coast of England and the city of Chichester." Students have access to various local societies and events as well as the 6,000-acre estate and gardens.

West Dean College of Arts and Conservation Horology Instructors

Malcolm Archer, FBHI
Subject leader, clocks (and related objects) and short-course tutor
Malcolm Archer has extensive experience in private practice, as well as the heritage sector and museums. He possesses a comprehensive knowledge of traditional craft skills, theory, and contextual history. Archer also has an interest in new and innovative ways of applying conservation methods to mechanical objects.



Tim Hughes, MBHI
Subject tutor, clocks (and related objects)
Tim Hughes is a clockmaker trained at West Dean College of Arts and Conservation. He works as a clockmaker, scientific instrument restorer, and as external consultant at Bellmans Auctioneers & Valuers. Hughes has received several awards, including the Trustees' Prize while at West Dean College and a QEST Scholarship. He is a member of the British Horological Institute (MBHI), Antiquarian Horological Society, and the Scientific Instrument Society. He also works at J.E. Allnut & Son, assisting apprentice and work-experience students.

Photos courtesy of West Dean College.

The following questions were answered by Malcolm Archer, the lead horology instructor for West Dean College of Arts and Conservation.

What segment of the industry do most graduates head into—after-sales service for brands, private companies, independent repair/restoration shops?

Many graduates become self-employed, or go to work in commercial workshops, cooperatives, or conservation studios as clockmakers and designers, repairers, restorers, sellers, or advisors.

Students who study the foundation degree may opt to pursue further study in horological conservation, and alumni have gone on to work in museums or with private collections such as the Royal Collection (Buckingham Palace and Windsor Castle). Alumnus Tabea Rude is the dynamic object conservator at the Wien Museum in Vienna, while American alumni include Brittany Nicole Cox. A notable UK alumnus is George de Fossard, the creator of The Solar Time Clock. Another student secured a position at Frodshams, the well-known watchmaking firm in Kent.

Are there entry requirements for potential students, such as educational background, testing, or dexterity? Do you have a 100% graduation rate?

West Dean is a full partner of the University of Sussex and entry requirements for the FdA include Universities and Colleges Admissions Service (UCAS) tariff points: 120 completion of a Level 3 qualification, for example: advanced levels (A-Levels), Business and Technology Education Council (BTEC), or foundation diploma in art and design.

Our courses appeal to those who are naturally practical. We attract students from diverse backgrounds, including engineering, electrical engineering, science, math, and business, as well as the arts. Applicants can be considered if they can provide evidence of prior learning with an appropriate portfolio of work and there is a practical test as part of the application process.

International applicants should provide a digital portfolio, evidence of competency in the English language to Level B2 International English Language Testing System (IELTS 6.0), as well as equivalent Level 3 qualifications.

West Dean College in the distance. Richard Lewknor built the first significant house of the estate in the 1620s, next to the medieval village church. In 1738, Sir John Peachey acquired the West Dean estate. It was then inherited by Sir James Peachey, who was made Lord Selsey in 1794. In the early 19th century, architect James Wyatt designed a suite of grand rooms and tall towers to give West Dean the appearance of a castle, creating one of the largest flint-faced buildings in the country.

Photo courtesy of Chris Ison, West Dean College.

Looking to cultivate prospective students, we recently held a four-day introductory horology course for individuals currently studying for their A-levels or BTEC (typically in engineering, science, math, or a humanities subject), who have an interest in learning hands-on skills.

It's very rare for students to drop out of the course.

Editor's Note: Level 3 generally shows greater knowledge in a subject and is often achieved in years 12 and 13 of education at institutions of further education after secondary school in the UK. UCAS tariff points are comparable to SAT and ACT scores here in the US. In the UK, it could mean scoring a B on three different subjects in advanced level tests (A-levels). There are other grade combinations that can be used to achieve 120 points. As concerns international students being at Level B2 competency, Level B2 corresponds to those who have the necessary fluency to communicate without effort with native speakers. A foundation diploma can be equated with being two-thirds of the way finished with a bachelor's degree.

Are most students local? Do they relocate? If so, do you help them locate housing? Do you accept students who are not UK citizens?

West Dean welcomes applications from both UK and abroad.

Students have numerous housing options on campus or within a five-minute walk of the main campus. Housing options range from updated 19th-century houses and cottages to modern dwellings built to fit in with the general aesthetic of the college. They are: The Dower House, Peachey House, The Stables, Church Lane House, and Forester's Cottage. Accommodations are furnished single bedrooms with en-suite facilities, and all dwellings include a common room. Some have kitchens and laundry rooms. Meal plans are available.

There is no increased fee structure for international students at West Dean College, which is unusual in higher education. To travel to the UK, potential students must pass a points-based assessment.

Those interested in studying in the UK should visit the Home Office website, www.gov.uk/browse/visas-immigration/student-visas, and The UK Council for International Student Affairs website, https://www.ukcisa.org.uk/. Under the conditions of their visas, international students are required to attend classes regularly, notify the program leader if they cannot attend, and contact the appropriate registry office if there are any changes to their circumstances. Interested students should contact the West Dean admissions team for further information.

What is your enrollment period? Is it an indefinite period until the class fills? When are your typical semesters?

The application deadline via Universities and Colleges Admissions Service (UCAS) for equal consideration is January 15; however, check the website regarding the course of interest because we are often able to accept late applications. Or contact the admissions team. Email admission@westdean.org.uk or call +44 (0)1243 818 291. The academic year is split into three terms, running from late September to mid-July. We already have requests for 2021, and those interested need to apply as soon as applications open in September. Anyone with queries in the meantime are welcome to contact the admissions officer by email or phone.

Do you offer both full-time and part-time educational opportunities?

Most of our horology and clockmaking courses are full-time but we do offer a select number of short courses. We find that frequently students begin part-time but then transfer to full-time courses.

Are there projects that need to be finished through the week? Are the students required to have a workshop at home? Are they able to get back into the classroom throughout the week to work on projects?

Students have their own dedicated bench in well-equipped professional workshops with access seven days a week, 8:30 am to 10:00 pm.

West Dean's courses are intensely practical with a high tutor-to-student ratio. Students work on a wide range of clocks and other mechanical objects such as automata, car clocks, and musical boxes. The earliest clocks that we have seen in the workshops date from the 1590s and the most recent date from the early 20th-century and are electro-mechanical. They also work with carriage clocks and pocket watches.

The foundation course takes two years and focuses on learning-through-making. Students who want to go into the conservation sector may decide to pursue their graduate diploma and ultimately advance to a masters in conservation studies.

Do you have a sample class syllabus that you would like to share?

One of the main things that distinguishes the programs at West Dean is the collaboration between different disciplines. Students can work closely with the ceramics department if they are conserving a dial, and with the furniture department if they are working on a case. The metal department can also be involved if a student is working on a clock in a Boulle case. Recently, students assisted the book conservation department when they had a photograph album with a musical box inside!

Students hard at work in the West Dean College clocks workshop.
Photo courtesy of Chris Ison, West Dean College.

West Dean works closely with many of the major institutions and there are visits to the British Museum and Science Museum in London, as well as significant private collections.

Details of the syllabus for the FdA and other programs can be found on the website: https://www.westdean.org.uk/study/specialisms/horology-and-clocks

West Dean College's courses offer the chance to gain practical experience of making and conserving. Depending on a prospective student's level of study, there are a range of courses to choose from.

Levels 4 & 5: Foundation Study in Horology

The foundation degree in horology starts with the basics of clockmaking skills. Over the course of two years it prepares students, no matter what their starting ability, to begin a horological career or to continue further study in professional development or graduate programs.

Level 6: Graduate Diploma in Conservation Studies

The graduate diploma introduces horologists to complex technical repairs. Through a grounding in contemporary methodology and conservation science, this course prepares students for a career within the heritage sector. Graduates of the program often transition to the masters in conservation studies.

Level 7: MA Conservation Studies

West Dean's MA is the global industry standard for conservation; it introduces the student to more challenging practical proficiencies and an in-depth study of materials science relevant to the conservation of historic objects.

Objects from historical and private collections are provided for the student to work on to acquire and perfect both established and developing techniques. Recent examples include a wide range of projects from long case clocks to portable clocks with balance wheel escapements, such as carriage clocks and chronometers. In keeping with professional standards, treatments are discussed and agreed upon with stakeholders. Work is always undertaken with reference to the current and historical context of the item, its technical makeup, and a scientific understanding of its materials.

Interdisciplinary study is a unique feature of West Dean College. Pictured here, furniture and clocks students learn the basics of blacksmithing.

Photo courtesy of West Dean College.

Professional Development Diploma

For those looking to improve their skills or concentrate on more esoteric and specialized repairs and restoration, the PDD in horology is the ideal pathway. This course is not accredited by the University of Sussex, so makes few academic demands of the student. Instead, the format allows for a great deal of customization, giving established horologists the opportunity to develop the skills they are most interested in, supported by the college's well-equipped workshop and the 25+ years of horological experience brought by the team of tutors.

Horology Taster Course

For anyone with an interest in horology who wants to find out more, West Dean College offers a bursary to fully fund prospective students on a four-day taster course. Applicants will be selected based on their ability to demonstrate an interest in pursuing horology.

Subject leader Malcolm Archer explains epicyclic maintaining power to students with an example made by T Cooke & Sons.

Photo courtesy of Chris Ison, West Dean College.

At West Dean, theory is taught in the workshop environment with reference to students' practical projects. Here, Malcolm Archer explains the principles of the duplex escapement.

Photo courtesy of Chris Ison, West Dean College.

Are there financial aid options in the UK?

West Dean and several funders provide opportunities for additional financial aid when students are accepted to study. Last year, 60% of students had some form of funding support.

In addition to applying for aid directly from organizations that offer scholarships, students can also apply for bursary awards available for any West Dean student. Bursaries for horology students include The Skinners' Company, Lawrence Atwell's Charity Awards for Excellence, The Horology Bursary, and the Edward James Foundation Bursary Fund. There are scholarship opportunities for horology students from Australia available from the Britain-Australia Society's Trust Endeavour Award.

International students seeking financial support for their studies in the UK are well-advised to apply for funding as early in the application process as possible. It may be more difficult to arrange financial support once students have left their home countries. Students can also inquire with their own ministries or departments of education, as they may have details of scholarship opportunities for students wishing to study overseas. The British Council and the UK Council for International Student Affairs may also offer guidance for international students. Visit https://www.britishcouncil.us/study-uk and https://www.ukcisa.org.uk/

Are students' tools procured through the school as needed?

A full set of essential tools is supplied, and a variety of tools are made by the students as part of the course in the college's forge and metalworking department.

Do you offer a certification that is comparable with WOSTEP certification? If so, is there a test your graduates take to receive the certification after graduation? Or, do they automatically receive certification upon completion of your course?

The awards are foundation degree, graduate diploma, or master's degree, all awarded by the University of Sussex.

Kathy Ortt is an editor of the *Horological Times*.

From the Workshop

By Jack Kurdzionak, CW21, FAWCI

DOA: Faulty Batteries

A customer called to let me know that the watch batteries we sold to him were no good. As he related the story to me, he explained that a number of watches were returned to him with dead batteries within a few months of each battery's installation. Upon replacing those dead batteries with new ones, the watches ran perfectly. He followed up by testing a few new batteries in his existing stock to find they were all defective. He asked if he could return several hundred unused batteries for a refund, and I said certainly. His package of batteries arrived at my office within a few days. The batteries were counted, and his refund was issued. All of the returned batteries were well within the sell-by date, so they had not been in his shop for an inordinate number of months. Now I had to determine if anything was amiss with those batteries. Most of the returned batteries were still in their factory-sealed packages. About 10 battery packages had been opened and tested by the customer.

I tested all of the batteries that came in opened packages with my trusty Witschi Q-Test 6000 and all were found in excellent condition, testing at 1.58V which is exactly what they should be. Over the past 20 years, I have discussed quality control with several senior-management members of battery manufacturers. Most privately acknowledged that, regardless of brand, the major watch battery manufacturers all produce a quality battery that is nearly 100% perfect when received by the end user. Battery manufacturers constantly check their product quality during production, packaging, and shipping. Their in-house testing shows failure rates of only a few pieces for every one-million batteries produced, and that is as close to perfect as one might expect. Now, when I hear of an entire lot of batteries in varying sizes and all from one manufacturer being no good, it seems all but impossible.

What could possibly have gone wrong with the batteries this watchmaker said were defective? Since he did not submit any of the movements that had stopped with a new battery, I can only speculate what may have happened. This customer is not the first I have heard from regarding batteries they believe are DOA (dead on arrival). During any defective-battery discussion with these customers, I try to learn more by asking questions such as: What kind of device are you using to test the battery? Is the device specifically designed to test these tiny batteries? The answer varies, but often the device is not a high-quality tester specifically designed for analyzing quartz watches, such as the Witschi Q-Test 6000. Inappropriate test equipment can rapidly drain a tiny watch battery and may be giving a false-negative result.

Another possibility is, when a battery fails after a few months of service in a watch, it may be the watch itself that has the problem and not the battery. A new battery may make a watch run for a brief time, but it will not repair a watch that needs service. Before condemning the battery and its manufacturer, it is necessary to test the watch movement for current consumption and its lower working limit. A watchmaker without proper quartz-watch testing equipment cannot definitively determine if a watch problem is a movement fault or a battery failure. Watches with load-compensating circuits, such as those found in many Japanese watches, will automatically increase their current consumption to compensate for additional friction in the gear train caused by wear or lubrication problems. These circuits will keep the watch running until its battery is drained and fails. This may appear to be a bad battery, but a consumption test will show that the current consumption can be six or seven times greater than it should normally be. A customer with this type of watch will most often blame the battery

for the watch failure because the watch didn't stop until the battery was discharged. Another new battery will again make the watch run for an additional brief period. This certainly can make it appear that the battery is at fault because these watches will run with a new battery installed. The real solution for this problem is to service the watch and fit a new battery.

Some problems that can stop a battery-powered watch include dirty cell connectors, a short circuit that can quickly discharge a battery, poor ground connection, and other faults.

How many times is a battery deemed to be at fault when the problem is in the watch movement itself? I speculate that the movement is at fault most of the time when a watch battery is blamed for the problem.

Before declaring a battery DOA and condemning a battery manufacturer for a faulty product, remember that a true battery failure is extremely rare while movement failure is far more common. Without the proper test equipment, it is not possible to determine the exact fault with a watch movement or a battery. Just because a watch is returned with a dead battery and a new battery makes the watch run does not mean the battery is faulty.

Another recommendation is never test a new battery before installation unless it is done with proper test equipment. As stated above, a perfectly good battery can be discharged with improper test equipment. Instead of testing the new battery prior to installing, test the movement for lower working limit, current consumption, and the connections to see if the circuit actually receives the battery voltage. Finally, check the timekeeping rate before installing a fresh battery, which is the usual protocol for battery service as recommended by many watch brands.

Otherwise, without the appropriate movement testing equipment, one must assume that the new battery is good, and the watch movement condition is unknown.

If the watch fails within a few weeks or months after installing a new battery, recheck the condition of the movement and circuit. That will help determine if the movement or the battery is at fault. Without the test equipment, you might need to provide a new battery at no charge and get on with the day and expect that the customer may be back again with the same problem.

Finally, there are as many legends regarding battery quality as there are regarding watch oils and grease. Arguing with a watchmaker about oils, greases, and batteries can be fruitless and produce a heated argument without any good outcome. These old legends regarding lubricants and batteries are still around and seem to have a life of their own. I always assume that the engineers and chemists who design and produce batteries know far more about their specialty than I can ever hope to understand. I will depend upon their battery expertise rather than any legend.

Quarantine

During my youth, my dog occasionally bit someone. Within a day or two, the city veterinarian would pay my mother a visit to quarantine the dog, which meant he had to be confined to home for two weeks until the vet visited again to see if he developed any rabies symptoms. If he was deemed free of the disease, he was again free to roam and cause further trouble, which he often did.

I did not pay much attention to anyone being quarantined until a few weeks ago, when most residents of this country were placed under quarantine to protect themselves, and others, from spreading coronavirus. Now that we, and the rest of the country, are currently quarantined for the near future with no clearly defined end point, it certainly has and will provide plenty of time for endless worry and concern. Although I have witnessed nearly eight decades, I have yet to experience the level of panic that this virus has caused. Bad news is in endless supply with daily news reports of new cases of infection and related deaths listed by city and state, and medical facilities overwhelmed by the number of seriously ill victims of the virus. Television news programs show empty grocery shelves day after day. No matter how quickly the shelves are restocked, they are emptied just as rapidly. Financial news highlights unemployment zooming from 3.6-15% or more within a week, and retirement funds and investments literally evaporating daily. We are saturated with photos of empty streets with closed shops, banks, and restaurants everywhere from the tiniest hamlet to the largest metropolis. This viral disease is a serious threat to all ages and especially dangerous to the elderly and people who are not in the best of health. We all have plenty of cause for concern and

worry, and it appears that this nationwide concern will not be abated by the time this is printed. The pause button has been pressed for the entire country, and almost everything is on hold.

So, until this crisis abates, please do your best to take care of yourself, and do not take needless risks that would require medical intervention. Our medical system is already overburdened. Call relatives and friends to keep in touch. We all need to speak with one another even if it is not in person. Do the best you can to follow governmental directives to minimize the spread of this virus. Keep busy doing something other than worrying until the crisis has passed, because it will pass. With our cooperation to support the efforts of our medical and governmental teams, we will soon be able to overcome this national and worldwide challenge.

Jack Kurdzionak, watchmaker and watch material specialist, owned a Boston-area watch sales and service shop for 40 years. He has a BS (Northeastern University, 1967) and has studied at ETA, WOSTEP, BHI, SGUS, and AWCI, and works for Eckcells Watch Materials.

WHY CHOOSE ECKCELLS?

Customer Comment:

"I have been a watchmaker since 1983, and the Wellner cleaning machine has the widest range of programmability, best cleaning ability, most complete drying ability, and quietest operation of any cleaning machine I've had the opportunity to use. Superior engineering is evident at every point in both software and hardware. The fact that it keeps track of how many washes for each jar of solution makes for the greatest ease of serviceability. It is as if a watchmaker designed the machine to suit modern production efficiency and the highest performance standards."

~Stan, an AWCI member

eckcells
watch materials and tools

Order line open 9 a.m.- 4 p.m., Mon-Fri, 603-726-7646

Email orders and/or questions ANYTIME to eckcells@gmail.com

STEP UP to the ultimate, fully programmable six-jar cleaning machine.

THE WELLNER L1 CLEANING MACHINE

MADE IN GERMANY

One machine does it all!

Quietly cleans, rinses, and dries!

For more information on pricing, options, and delivery, please contact
Jack Kurdzionak
603-726-7646
eckcells@gmail.com

www.eckcells.com

Horological Society of New York (HSNY)

The following information was obtained from The Horologist's Loupe, *submitted by Carolina Navarro, Director of Public Relations, HSNY,* *Copyright©2020. Published by the Horological Society of New York, Inc.; all rights reserved.*

Due to COVID-19, HSNY is canceling their May monthly meeting. The HSNY Gala & Charity Auction will be postponed to August 5, 2020. The venue remains the same, and tickets already purchased are valid for August 5.

HSNY is investing in the future with $55,000 in grants and scholarships. HSNY introduced the Howard Robbins Award, a grant for watchmaking schools created to complement the Henry B. Fried Scholarship for watchmaking students. Howard Robbins (1950-2020) was a professional in the world of timepieces for nearly 40 years and recently passed away in March 2020.

The 2020 recipients of the Howard Robbins Award are the Veterans Watchmaker Initiative in Delaware ($15,000), the only technical school devoted to disabled veterans in the US, and Paris Junior College's Texas Institute of Jewelry Technology in Texas ($10,000), established in 1942 to provide industry job training.

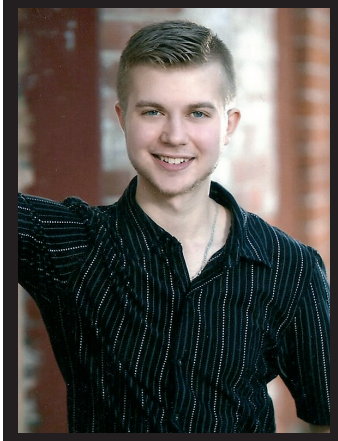
Additionally, HSNY awarded $30,000 to six watchmaking students through its Henry B. Fried Scholarship. Named after a former HSNY president and a prolific author in the field of watchmaking, the Henry B. Fried Scholarship was established in 2017. This year, HSNY received applications from more than half of all watchmaking students in the US and is doubling the number of scholarship recipients from 2019. Six watchmaking students will each receive $5,000 to help cover the cost of watchmaking tools and living expenses.

HSNY Officers

President: Nicholas Manousos

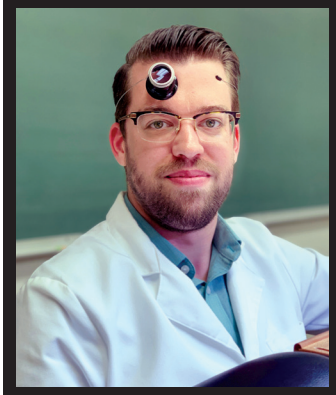
Vice President: John Tiefert

Director of Public Relations: Carolina Navarro · carolina@hs-ny.org



Brandan Cloos
(Lititz Watch Technicum, Pennsylvania)

Gordon Hyde
(Veterans Watchmaker Initiative, Delaware)



Brian Kruppenbacher
(Paris Junior College, Texas Institute of Jewelry Technology, Texas)

Raluca Markow
(Patek Philippe Institute, New York)

Nichelle Nguyen
(North American Institute of Swiss Watchmaking, Texas)

Jared Troy
(Paris Junior College, Texas Institute of Jewelry Technology, Texas)

Photos courtesy of HSNY.

Minnesota Clockmakers Guild (MCG)

The annual conference, co-sponsored by the Midwest Watch and Clock Association (MWCA) and Minnesota Clockmakers Guild (MCG), was scheduled for May 8-9 but has been canceled due to the coronavirus. Also canceled is the AWCI mobile classroom that was to hold classes on May 6-8 before the conference. After this health crisis has passed, MWCA and MCG hope to have a get-together, possibly in August or September.

MCG Officers

President: Ivy Booth · 612-719-0161 · Iboothrn68@gmail.com

Treasurer: Garth Antila · 715-386-3575 · 3mgarth@gmail.com

Secretary: Dean Ziegenbein · 952-454-1247 · ziegedw@gmail.com

Horological Association of Virginia (HAV)

Due to the COVID-19 virus, the Horological Association of Virginia has postponed the May convention until August 28-30, 2020.

HAV Officers

President: Joseph M. Jabbour, M.D. · 845-325-5071
clockappraisal@wildblue.net

First Vice President: Billy Best · 540-797-2357
groovemaster2000@juno.com

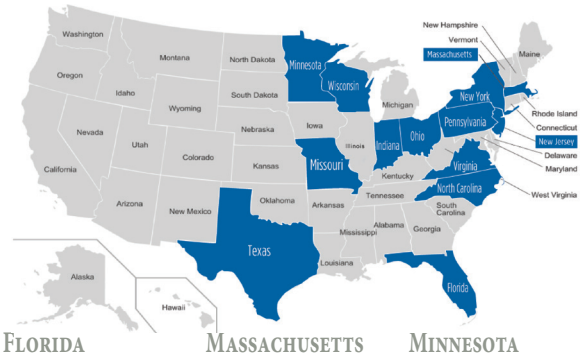
Second Vice President: Fred White · 301-868-7264
fwhitecmw21@yahoo.com

Treasurer: Stan Palen · 540-775-7027 · spalen@crosslink.net

Secretary: Bob Stone · 703-591-6690 · rhstone@cox.net

***Loupes and Tweezers* Editor:** Lloyd Lehn · 703-256-2684
lloyd.lehn@verizon.net

***Loupes and Tweezers* Distributor:** John Enloe · 703-268-3446
jdenloe1939@gmail.com



Do you enjoy spending time with other watchmakers and clockmakers?

Join Your Local Affiliate Chapter

for more information log on to
awci.com/about-us/affiliate-chapters

Florida

Florida Watch & Clockmakers Association, Inc.
Chris Wiles, CW21
President
239-671-3203
chriswiles1@mac.com

Richard LeBeau, CMW21
Treasurer
Saint Petersburg, FL
727-347-3758
SSastar7@aol.com

Fabio Rodrigues, CW21
Education Chair
786-344-2840
fabusa@me.com

Indiana

Indianapolis Horological Association
Monique Baez, President
2064 Alysheba Drive
Indianapolis, IN 46234
317-374-3915
moniquebaez@rocketmail.com

Massachusetts

Massachusetts Watchmakers-Clockmakers Association, Inc.
Dave Kurdzionak, President
c/o The Watchmaker
379 Main Street
Stoneham MA 02180
781-438-6977
davekurdzionak@gmail.com

Nick Butt, Secretary
nickvincent88@gmail.com

Minnesota

Midwest Watchmakers-Clockmakers Association
Fred Fischer, President
Hugo, MN
651-429-3340
cadcom@msn.com
www.mwca.us

Minnesota

Minnesota Clockmakers Guild
Ivy Booth, President
612-719-0161
Iboothrn68@gmail.com

Dean Ziegenbein, Secretary
4651 152nd Court
Apple Valley, MN 55124-6801
952-454-1247
ziegedw@gmail.com

Missouri

Metro St. Louis Watchmakers-Clockmakers Association
Judit Katona, Secretary
watchmaker4225@gmail.com

New Jersey

Watchmakers Association of New Jersey
Richard Cuny, President
Tom's River, NJ
732-818-9460
www.wanj.us

New York

Horological Society of New York
Nicholas Manousos, President
New York, NY
info@hs-ny.org
www.hs-ny.org

New York State Watchmakers Association
Dale LaDue, CMW21
West Henrietta, NY
585-424-1493

North Carolina

North Carolina Watchmakers Association
Mack R. Shuping, CW21
Treasurer
Winston Salem, NC
336-287-8402
336-768-1857 (fax)
mshupingwm@earthlink.net

Ohio

Watchmakers-Clockmakers Association of Ohio
Lew Fleege, President
Orrville, OH
fleege@zoominternet.net
330-683-2391

Mark A. Baker, CMW, CC21
Treasurer
15852 ½ St. Rt. 62
P.O. Box 292
Damascus, OH 44619
330-537-3939 (W)
bakerclock@voyager.net

Pennsylvania

Watchmakers Association of Pennsylvania
George H. Jones
State College, PA
814-238-1668 (B & H)
jones_grace@hotmail.com

Texas

Capital Area Watch & Clockmakers Guild
Glen Morehead, President
Jay Holloway, Secretary
Pflugerville, TX
512-294-7371
jay@HollowayTrading.com
www.cawcg.org

Virginia

Horological Association of Virginia
Joseph M. Jabbour, MD, President
525-K East Market St. # 172
Leesburg, VA 20176
845-325-5071
clockappraisal@wildblue.net
http://havhome.org

Wisconsin

Wisconsin Horological Society
Allan J. Smiles, CMW21, President
402 W. Main St
Ashland, WI 54806-1510
ashjewel@outlook.com
715-682-3155

International Rep

The Chronometer Club
Michael Griner, CW21, President
Panama City, FL
850-866-4303
michael@davidscottjewelry.com
thechronometerclub@gmail.com
www.thechronometerclub.org

President's Message (cont. from page 5)

The great thing is, once we are allowed to continue to go about business as normal, we will continue to offer webinars, an addition to our many existing offerings!

If you are in a tough situation right now, I don't discount your experience with a declaration of how we are finding opportunity during this emergency. I hope that my words reassure you that AWCI will continue to be here during this struggle and after. We are trying to make lemonade out of these lemons—we just hope that it tastes good!

Please feel free to reach out to me or to our staff at AWCI if you need anything at all. We will do what we can to help you in this tough time. This will end, our industry will survive, and we will recover from this. As tough as it is, let's get through this unpleasantness and come out stronger on the other side!

Executive Director's Message (cont. from page 5)

classes, we consider this an investment in the future of AWCI. When we are successfully able to deliver distance learning and technical webinars, each of you will benefit. We can expand our audience to everyone who struggles to find time and resources to travel to Harrison, Ohio.

I too have had to adjust to this new (and, hopefully, temporary) reality. Each morning I wake up, eat my breakfast, and head down to my basement where I have created a makeshift office, workshop, and studio. My basement has become the new nerve center of AWCI. From my basement I fulfill orders from our website, broadcast webinars, answer my AWCI phone, check messages and email, return phone calls, and plan for the future of the institute. My wife and children have been very understanding and have allowed me the privacy I need to serve each of you. However, if you call me, you may still hear the stomping of footsteps overhead or the occasional screams, yells, and laughter of childhood. As difficult as staying at home is for me day after day, it is even more difficult for our little ones.

AWCI's member benefits are a treasure—*DIVE IN!*

Education

Take a class with renowned instructor Tom Schomaker in our state-of-the-art classroom at headquarters.

Get onboard our state-of-the art classroom inside the Archie Perkins Mobile Horology Classroom. No travel expenses—we'll come to you!

Time-Con, our annual national convention, offers some of the best horological education from noted instructors in the United States and around the world!

866-FOR-AWCI (367-2924) • 513-367-9800 • awci.com

AWCI

One of the very first decisions we made when we were forced out of our offices was to put together some webinars. For those who were scheduled to attend classes at AWCI, we wanted to be sure they got something right away. Our first two webinars have been focused on responding to the COVID-19 outbreak and its fallout. If you missed them, there is a summary in this magazine (although the information may be a little outdated since the situation is constantly changing.) You can also view recordings of the webinars at www.awci.com/webinars. For now, all of our shorter webinars are free for AWCI members, and we are trying to keep the longer webinars as affordable as possible, always offering a discount to AWCI members.

While I know my message is long this month, I want to share two more items with you. The first is I want to give a big "Thank You" to Maureen Seals who has served as our membership coordinator for more than seven years. Maureen was scheduled to retire on March 30, but as we were forced out of the office a week before that, she decided she would start her retirement a week early. If you have called AWCI anytime in the last seven years, hers was probably the first voice you heard. She has been a hard-working and dedicated representative of AWCI, and we will miss her. For the immediate future your membership needs will be fulfilled by other staff members. If you email Maureen or leave her a message, we will get it and respond.

Lastly, I want to discuss the economic impact of this situation on AWCI. The revenue generated by our in-person education accounts for nearly half of our income. We are feeling the impact—as are many of you. Many of the government resources available for small businesses are not available to 501(c)(6) nonprofits like AWCI. We are working with the American Society of Association Executives to lobby the federal government for some relief, but these things take time. AWCI has planned, and we have a strategy that enables us to endure a situation like this. We have a line of credit in place, and we are drawing upon it. We have reduced costs wherever we can and have planned with our business partners to get through this. We continue to receive our monthly disbursements from the perpetuation fund. When this is all over, we will be able to reschedule our classes and recoup some of the income that we had planned for in March and April.

These are unusual and difficult times that will leave a permanent mark on our industry and many others, but we will get through this. If there is anything that AWCI can do to support you, I encourage you to let us know. We are accessible and here to help.

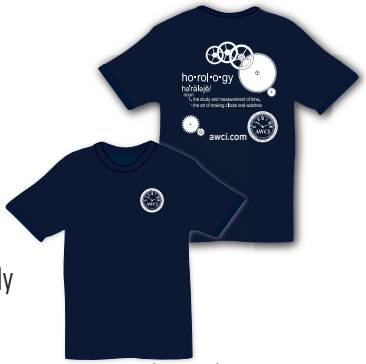
Show off Your Passion for Horology—and AWCI! Wear These with Pride!

www.awci.com/online-store

SHOP NOW WHILE SUPPLIES LAST! Become a member and save!

Horology T-Shirt

Cotton/Polyester Blend
Available in S, M, L, XL
$25.00 – members get free shipping



Patches

Sew on your apron or lab coat
$5.00 – Members Only
Rocker $2.00 – Certified Members Only

Membership Pin

$12.95

AWCI Shoulder Bag

$30.00

The AWCI shoulder bag is the perfect companion to keep everything organized, secured, and readily accessible when away from the shop. Constructed with 600 denier polyester fabric for long-term durability, there is a roomy main compartment with pockets and storage slots for electronic devices, pens/pencils, small tools, business cards, and supplies. Handy outside storage pockets can carry larger items. A key clip, durable snap buckles, and a removable shoulder strap add additional versatility. The AWCI logo is embroidered directly onto the main flap, so it will remain visible for many, many years without peeling or chipping away.

Check out our website for these and other great items!

If you need assistance, contact AWCI at 513-367-9800.

Classified Ads

help wanted

Full-time Watchmaker
LEWIS JEWELERS

located in Houston, Texas, is seeking watchmakers with various levels of experience for our Clear Lake Location. Self-driven, organized and professional is required.
Offering a luxury positive environment with competitive salary and benefits.
Email resume to: info@lewisusa.com

Grand Central Watch
Looking for a Watch Technician

Grand Central Watch is an iconic watch repair service located in the heart of midtown NYC. We are currently seeking a full time watch technician to perform basic services on high grade watches. Competitive salary and benefits available. We will provide training. Great opportunity to gain skills in watchmaking.
Send resume to info@centralwatch.com.

Grand Central Watch
Looking for a Watchmaker

A legendary watch repair business located in the heart of New York City is seeking a watchmaker to work on all major brands. Experience with Eta mechanical movements preferred. Great opportunity to join a long established, fast-growing business. Grand Central Station location, state of the art equipment, very competitive compensation. Please contact Steve Kivel
stevekivel@yahoo.com or 646-789-2900

Fink's Jewelers

is searching for an expert watchmaker for our location in Norfolk, VA and will move to a brand new store in Virginia Beach later this year. Applicants must be WOSTEP, CW21 or SAWTA certified and have at least one years' experience working on Rolex watches.
We are committed to our employees by providing full-time benefits that include participating health insurance, 401K plan, and paid vacations.
Please submit resume to:
Mark Bair at MBair@finks.com
For more details go to
https://awci-jobs.careerwebsite.com / Job ID: 53314015

help wanted

Driver Wanted

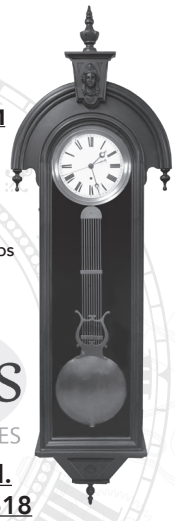
AWCI is looking for an individual to help drive our mobile classroom. This position is perfect for the retired watchmaker or clockmaker who wants to see the open road. Compensation includes hotel stays and return travel expenses plus mileage. CDL and DOT Certificaiton are not required, but preferred. A clean driving record and experience driving large vehicles like a motorhome or straight truck is a must. For more information
email jobs@awci.com or
call Jordan at 513-367-9800

for sale

Our new 2019 CATALOG of parts & repair supplies is now available...
FREE WITH ANY ORDER!

ORDER 24/7 ONLINE AND BROWSE OUR FULL INVENTORY AT WWW.MERRITTS.COM

- Repair Tools & Supplies
- Referance/Repair Books
- Clock Oil & Lubricants
- Clock/Watch Keys & Cranks
- New Hermle Movements
- Battery Movements & Fit-Ups
- Hands, Dials, & Case Parts
- ...and so much more!



Merritt's
CLOCKS & REPAIR SUPPLIES
1860 Weavertown Rd.
Douglassville, PA 19518
PHONE: 610-689-9541 FAX: 610-689-0567

for sale

Sherline lathe 17" package B or mill 12" deluxe package A

$50/mo for 2 yrs. Price as of 04/09/20 includes US shipping and collet set below.
Sherline users: a 10-piece metric set of ER16 collets with adapter for the headstock of the lathe or mill. In a nice oak tool holder. Covers 0mm to 10mm opening. $95 delivered to US addresses.
Butterworth Clocks
5300 59th Ave. W.
Muscatine, IA 52761
Mark Butterworth: 563-263-6759

Franchise For Sale

FAST-FIX JEWELRY AND WATCH REPAIRS

Franchise located in Southcenter Mall in Seattle, Washington a turn key business. 600 sq. ft. In-line store opened in 1999. High demand for watch repairs. Contact Clarence for details at
ncjenkins@comcast.net

wanted to buy

$$WANTED ANYTHING$$
Rolex - Cartier - Patek - Breitling- Panerai - Le Coultre Vacheron - AP - Etc.
Watches, Boxes, Dials, Links, Parts, Bands, Movements, Crystals, Bezels, Crowns, Clocks, Signs, Posters, Catalogs, Instruction Books, Polish Cloths, Wallets, Hats, Shirts, Promo Items, ANYTHING!
Doug Giard, 586-774-3684

ATTENTION RETIRED WATCHMAKERS

Call us before you sell your parts, tools, and watches. We have helped over 200 watchmakers in the last 20 years to dispose of their accumulations. When you're really ready to sell, we're ready to buy!
Phone 229-928-9092 or 727-327-3306.
Ask for Jeff or Nancy.
Email: jeffnancy@mchsi.com

Classified Ads

wanted to buy

WANTED WATCH BOXES
Buy - Sell - Trade
We want most major brands.
Also buying high-end jewelry brand boxes.
Doug Giard, 586-774-3684

WE BUY WATCHES
Rolex, Patek, Cartier, LeCoultre, Vacheron,
Breitling, Audemars, Tudor and others.
Modern or Vintage.
Doug Giard, 586-774-3684

WANTED FOR PARTS
L&R Tempo and Watchmaster
Cleaning Machines
www.timemachinerepair.com
Dale Sutton 609-374-5880 or
service@timemachinerepair.com

services

ELECTRONIC INSTRUMENT SERVICE
We are Factory Authorized Service for:
• Greiner VIBROGRAF
• TICK-O-PRINT & L&R
We service all makes of ultrasonics, all makes of watch rate recorders, and related equipment. 25 years experience.
190 Deepstone Drive San Rafael, CA 94903
Used Equipment Bought & Sold
VISA **For Information** MasterCard
415-479-8960
www.electronicinstrumentservice.com

DIAL REFINISHING CO. FAST SERVICE, FINEST QUALITY,
quantity works welcome.
Specialize on changing dial feet
positions to fit the quartz movement.
Send your works to: **KIRK DIAL OF SEATTLE**
112 Central Avenue North, Kent, WA 98032
253-852-5125

SERVICE/SALES OF TIMING AND CLEANING MACHINES
Vibrograf, L&R, and Watchmaster
Over 20 years experience
Quick repairs & reasonable prices
www.timemachinerepair.com
Dale Sutton 609-374-5880 or
service@timemachinerepair.com

tradespeople

DENNIS KAYE
Advanced Clock Repair Services
108 Corgy Drive • Cary, NC 27513
Call 540-SERVICE (737-8423)
Now Restoring Painted & Silvered Dials!
Porcelain Dial Restoration
Watch • Pocket Watch • Clock
Platform Escapement Repair
Atmos Parts & Service
Kundo / ATO Coil Repair
Large Stock of Electric Motors
All Types Clocks Serviced
Prompt Reliable Service . . . Guaranteed™
Authorized Parts & Service for:
Seiko • Pam Advertising • Melody in Motion
Call or Visit at dialrepair.com

MAINSPRINGS
Clock and music box - All sizes.
Custom made. Brass gear blanks.
Timewise (formerly TANI Engineering)
Ph: 330-947-0047, E-mail: twclock08@att.net

Watch Parts Fabrication:
I make all types of movement parts: Vintage to modern. MATT HENNING CW, 413-549-1950
www.henningwatches.com

FENDLEY & COX WHEEL AND PINION SPECIALIST
1530 Etain Rd., Irving, TX 75060
RICHARD COX, CMC, FNAWCC, CMBHI
972-986-7698 / www.fendley-cox.com

Like us on Facebook!
www.facebook.com/HorologicalTimes

Like us on Facebook!
www.facebook.com/MyAWCI

Follow us on Twitter!
www.twitter.com/AWCInstitute

Follow us on Instagram!
www.instagram.com/americanwatchmakers

Check out our educational videos!
www.youtube.com/awci/videos

2020 CLASSIFIED POLICY

AWCI HT classified advertising fees/rates and minimum schedule remain the same as last year. **We request that you put all classified advertising on a credit card.** We accept MasterCard, Visa, American Express and Discover. If you require a physical invoice and 30-day terms, your rates will be higher due to the additional costs incurred in labor, supplies and carrying charges.

HT Classified Rates for 2020:

For Credit Card Payments...
- $1.10 per word
- Classified "Display" ads with art borders: $47.50 per col. inch (2.25" wide)
- Blind ads – add'l $15.00 per ad

For Paper Invoicing...
- $1.20 per word and
- Classified "Display"ads with art/borders: $52.25 per col inch (2.25" wide)
- Blind ads – add'l $16.50 per ad

Minimum Schedule: 3-Month Minimum
Advertising studies show it takes over 3 viewings for readers to recognize specifics in your ad.

Deadline: 30 days before the first of the month in which you plan to run your ad.

Note: If you place a recruitment ad on the www.awci.com Career Center as a combo online/HT ad, there's no need to resend the ad to us. The website system is automatic.

To Place Your Ad:
Email: classad@awci.com **Fax:** 513-367-1414 **or**
Call: 866-FOR-AWCI (367-2924) • 513-367-9800

VISA MasterCard AMERICAN EXPRESS DISCOVER NETWORK

Horological Times Advertising Policy & Editorial Policy

Advertising Policy for the *Horological Times*

The publisher reserves the right to approve all advertising copy and reject any advertisements not in keeping with the publisher's standards. The publisher may, at the publisher's sole discretion and for any reason and without notice, decline to publish or republish any ad, in which case any fees submitted or paid for such ads shall be returned or rebated to the advertiser. The publisher reserves the right to edit all copy. The advertiser and/or agency agree to assume liability for all content of advertisements printed. The advertiser will also accept responsibility for any claims or suits arising therefrom brought against the publisher. Printed articles may also be used by the publisher without permission expressly sought, or payment made, on www.awci.com, the American Watchmakers-Clockmakers Facebook page, or via other media.

Editorial material and letters of opinion are invited, but reflect the opinions of the authors only and do not represent the views of the American Watchmakers-Clockmakers Institute (AWCI), its directors, officers or employees. AWCI reserves the right to edit all submitted materials and is under no obligation to accept any submitted materials for publication. The approval procedures are available from AWCI and at www.awci.com. The appearance, reference, or advertisement of any product or service in this publication shall not be deemed an endorsement of such products, methods or services by AWCI, its directors, officers, or employees.

Publisher's Standards

AWCI makes a concerted effort not to publish any advertisement which promotes or depicts practices not in harmony with our professional Standards & Practices for Watchmakers & Clockmakers. The advertisement of generic parts, tools, and materials is allowed when such advertisement does not possess any trademarked image, brand, or name. Advertisers can refer to the items by name, function, quality, size, and description. Genuine parts can be advertised as such in accordance with the advertiser's relationship and agreement with the manufacturer.

We encourage advertisers to reach out to our members and market goods and services which will help them to professionally service their clients and represent themselves in a way which will "reflect positively on him or her, on the AWCI, and the entire watch and clock repair industry, including all of its participants."
– AWCI Code of Ethics

awci directory

ADVERTISERS' INDEX

BOARD OF DIRECTORS

Officers

Aaron H. Recksiek, CW21: President
arecksiek@awci.com

Justin Harrell, CW21: Vice President
jharrell@awci.com

Jack Kurdzionak, CW21: Treasurer
jkurdzionak@awci.com

Craig Stone, CW21: Secretary
cstone@awci.com

Immediate Past President
Fred T. White, CMW21
fwhite@awci.com

Directors
Nick Butt
nbutt@awci.com

Andrew DeKeyser, CW21
adekeyser@awci.com

Henry Kessler: Industry Advisory Board (IAB) Chair
hkessler@awci.com

Dave Kurdzionak: Affiliate Chapter Chair
dkurdzionak@awci.com

Parliamentarian
Paul Wadsworth
pwadsworth@awci.com

Fellows
*Robert F. Bishop
*James H. Broughton
Fred S. Burckhardt
Alice B. Carpenter
*Joseph L. Cerullo
David A. Christianson
*George Daniels
Wes Door
Jerry Faier
*Henry B. Fried
*Josephine F. Hagans
*Orville R. Hagans
*Ewell D. Hartman
*Harold J. Herman
*J.M. Huckabee
*Gerald G. Jaeger
Jack Kurdzionak
*Benjamin Matz
*Robert A. Nelson
*Hamilton E. Pease
*Archie B. Perkins
Robert D. Porter
Antoine Simonin
*William O. Smith, Jr.
*Milton C. Stevens
Dennis Warner
*Marvin E. Whitney

*Deceased

American Watchmakers-Clockmakers Institute
701 Enterprise Dr.
Harrison, OH 45030
Ph: 866-FOR-AWCI
513-367-9800
Fax: 513-367-1414
awci@awci.com • www.awci.com

WE THANK THE IAB

AWCI would like to thank our Industry Advisory Board members for their ongoing support of the institute and the industry.

Platinum
JCK LAS VEGAS

Gold
ROLEX

Bronze
Borel
kessler batteries
SONY
muRata
INNOVATOR IN ELECTRONICS
LÖWEN WATCH GROUP

Standard Members
BORSHEIMS
eckcells watch materials and tools
renata batteries
BREITLING 1884
Ferrell & Co., Inc.
Richemont North America
Cas-KerCo.
G-S SUPPLIES, INC
SEIKO DEDICATED TO PERFECTION
CHELSEA CLOCK
JACK MASON
SELCO
CHRISTIE'S
Mercury Refining
America's #1 Recycler of Silver Oxide Batteries
www.MercuryRefining.com
SWATCH GROUP
C.R. Time Co
"WHERE WE HAVE THE TIME FOR YOU"
TOURNEAU THE WATCH AUTHORITY

RICHEMONT NORTH AMERICA, INC.

Cartier
BAUME & MERCIER
MAISON D'HORLOGERIE GENEVE 1830
JAEGER-LECOULTRE
A. LANGE & SÖHNE
GLASHÜTTE I/SA
IWC
SCHAFFHAUSEN
VACHERON CONSTANTIN
Manufacture Horlogère. Genève, depuis 1755.
dunhill
LONDON
Van Cleef & Arpels
ROGER DUBUIS
MONT BLANC
RALPH LAUREN
OFFICINE PANERAI

Richemont owns several of the world's leading luxury companies in the field of luxury goods, with particular strengths in jewelry, luxury watches and other luxury accessories.

We are seeking talented and qualified Watchmakers to work for our brands located throughout the United States and Canada in our Boutiques and Service Centers.

Responsibilities

- *Must be qualified to perform services which include Complete Maintenance and Quick Services on calibers that include*
  - *Quartz*
  - *Mechanical*
  - *Automatic*
  - *Chronograph*
  - *Complications*
- *Diagnosis*
- *Case Preparation*
- *Achieve and maintain Production and Quality Objectives*

Qualifications

- *Accredited Certification*
- *Experience working with luxury brands preferred*
- *Strong attention to detail, with the ability to handle multiple tasks*
- *Ability to work in a fast-paced environment*
- *Strong diagnostic skills*
- *Good customer service and communication skills*
- *Knowledge of SAP System would be a strong advantage*

We offer competitive compensation, on-boarding program, benefits and relocation assistance. To be considered, please submit your resume and profile on www.Richemont.com or by fax to 817-283-2304.

The *New* Global Leader.

Murata has been the sole manufacturer of Sony's micro batteries since 2017.

Now Murata is launching its own line-up of micro batteries, taking over the position as the ***New* Global Leader** in both the OEM and replacement markets for watch batteries!

- Murata's long-life silver oxide batteries feature the best anti-leakage system in the industry.
- Murata offers a "Smarter" Multidrain System, reducing the number of SKUs required without making compromise.
- All SR, CR and LR batteries are offered exclusively in easy push-through tear-strips of 5 cells, marked with a "Use By" (best before) date.
- Murata has produced over 10 billion batteries since 1977 and developed the world's first mercury-free silver oxide battery in 2004.
- All SR and LR type batteries are mercury-free, and produced in Japan. (CR batteries have always been Mercury-Free.)
- All lithium batteries of the size CR1632 or smaller are produced in Japan; larger lithium types are produced in Indonesia.

For free samples and additional details, or for the name of our nearest full-line distributor, please contact:

kessler batteries®

SY KESSLER SALES, INC.
Importer & Distributor of Murata Batteries for the United States & Canada.
800.527.0719 214.351.0380 www.KesslerBatteries.com sales@sykessler.com

muRata
INNOVATOR IN ELECTRONICS