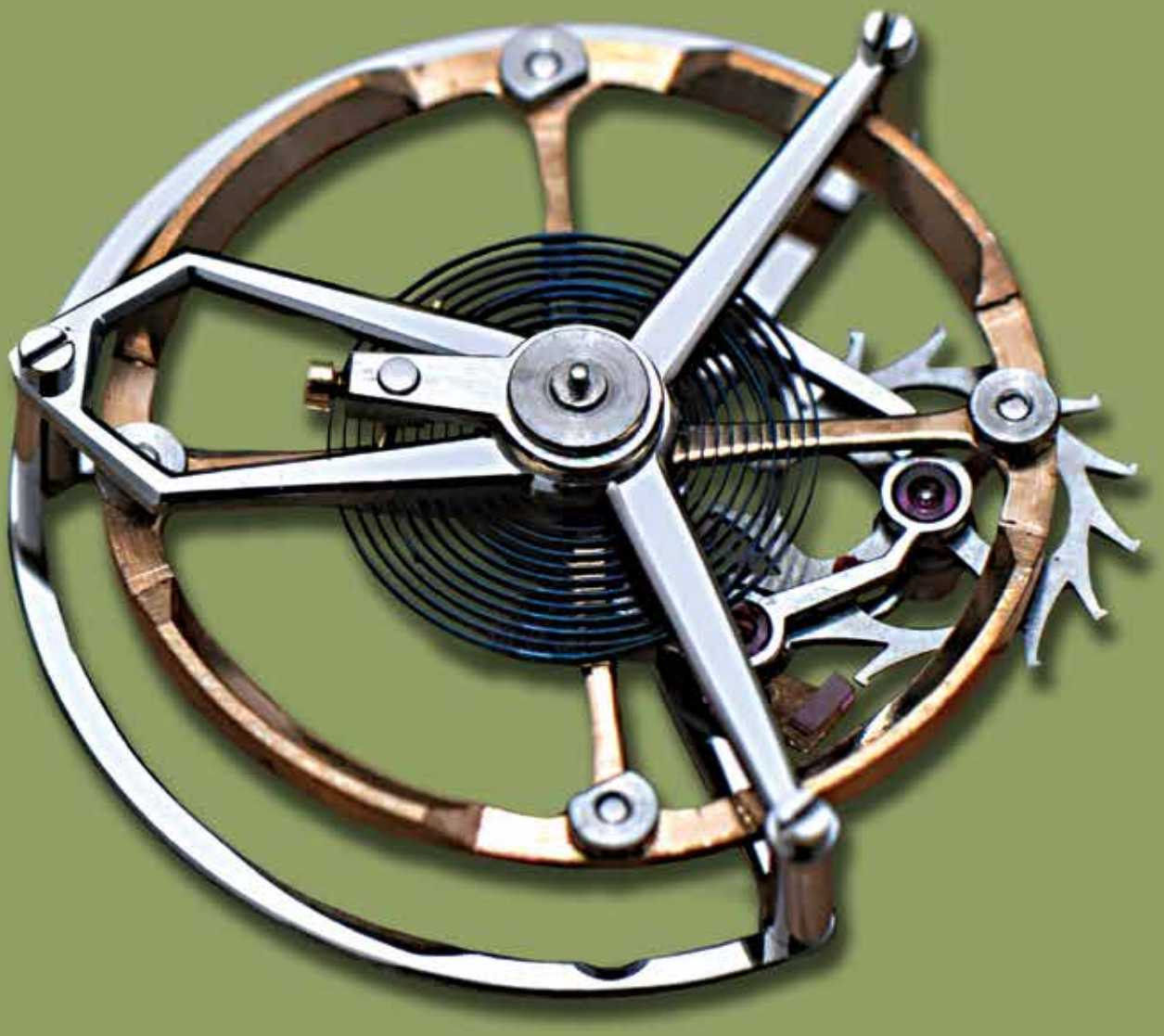
HOROLOGICAL TIMES™

March 2017

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One-minute tourbillon carriage with the Swiss lever escapement.
Photo credit: Kaj Korpela

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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.

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a message from the president

FRED T. WHITE, CMW21



Fred T. White
fwhite@awci.com

Watchmakers and clockmakers are a solitary group for the most part. We spend a good amount of our day or night working by ourselves, with little interaction with other people. That six square inches that so much of our time is spent working in can become very lonely. That is why it is good to take a break and call a fellow craftsperson, because he or she will understand what you are experiencing. We have a lot of time to think, and sometimes "stinking thinking" creeps into our lives. We must do everything we can to keep our minds on the positive things that are going on in our lives and around us. That is why I keep a book of motivational quotes close by.

I find it very therapeutic to take a timepiece that has not run for years, or that the customer has been told cannot be repaired, give it a good servicing, make the necessary repairs, put the balance in place—and it comes to life. That is my reward.

Why do we look at our situation and say the sky is falling? How many times have you missed a repair job because of parts? Did you take the job in and attempt to find parts, or did you just turn the customer away? Who knows how much business you may have missed by that one act? Many times I am reminded of the children's story of the boy who cried wolf so often when there wasn't a wolf that when there was one, no one listened to him. Do we cry wolf, or do we try to find a solution to our problem? We can moan and groan about the parts situation and get our blood pressure up, but the problem is still there; and it will be there until someone wakes up and realizes that they need us. Meanwhile, let's continue to do good work and educate ourselves to be the very best we can be. I have only missed a few jobs because of parts, thanks to my network of people. You can say the sky is falling or do something to improve your lot in life—it is up to you.

Throughout history our industry has had its ups and downs. In the 1960s the quartz watch came on the scene, and many a good watchmaker left the business, never to return. Watchmakers heard there would not be a need for a repair for years. (There were three watchmakers in the small town of 5,000 people where I lived at the time, and today there isn't one left.) I too left because you could not charge enough to make a living at the bench. My second career gave me a good education in sales and sales management and working with people. When a door closes, a window opens; seize the opportunity. As horologists, we have gone through the "good ole' days" when parts were readily available. There was a time when the brands begged us to buy genuine parts because the generic parts were so well-made and sometimes cheaper than the genuine. The downside was there was a flood of watchmakers in the marketplace, and it was difficult to make a living. I knew one watchmaker who worked 12 to 14 hours a day to support his family. So, were the "good ole' days" the best? In many ways they were, but some things were not as good as today. We can always find something to complain about, or we can look for the good. For many years there was a plaque that hung on the wall in my office. It simply said: "The sun always shines after the rain." So look for the sunshine.

When a door closes, a window opens.

a message from the executive director

JORDAN P. FICKLIN, CW21



Jordan P. Ficklin
jordan@awci.com

Before I sat down to write this month's message, I looked through some older copies of *Horological Times* for inspiration. This is what I found: Watchmakers, myself included, are a whining, complaining, sorry lot. Stick with me here. The tone of our magazine has changed dramatically. It probably reflected more closely the sentiments of bench practitioners in the past. Reading the words of Joe Crooks (AWI President 1980-82), I found him to be very cynical and somewhat sarcastic. Anyone who remembers reading the "Rock Quarry" knows that Fred Burckhardt was a master of sarcasm as well. The horological industry has definitely had its ups and downs. Through all of this we had leaders with different leadership styles, but one thing was constant: the watchmakers, and the clockmakers too, complained through all of it.

First of all, I want to recognize that we do have some good reasons to complain. Parts! Need I say more? How about: Wages? Working conditions? And, of course, customers!

I feel like I have been surrounded by negativity lately. Too many of our members chose not to renew this year, the Swiss are laying off workers because sales are down, fewer people are entering the horological profession, and many more have become so disenchanted with the industry that they are pursuing other careers. Despite all of this, I still firmly believe in the theme of last year's convention: It is a great time to be a watchmaker, a clockmaker, or a horological manufacturer!

Throughout the years, watchmakers and clockmakers have demonstrated their ingenuity and resourcefulness (while complaining the whole time). It's time also to demonstrate our flexibility and adaptability.

There is a segment of professionals who always have a positive attitude and are optimistic. There are many who are making really good money through horology and even more who love what they do. So how do we turn our frowns upside down? It might mean turning your perspective on its head.

Let me just share some of the opportunities:

- A quick visit to www.AmericanTimepiece.com reveals almost 50 companies doing some level of design, manufacturing, or assembly of watches and clocks in the United States. As these companies grow, they will need more and more talent.
- The world of collecting fine watches is getting more complicated every day. The excellent talents of watchmakers are needed to verify the origin, validity, and quality of these timepieces.
- Every day there are fewer individuals with the skills to carry out high-quality restoration on antique timepieces.
- More than 80 million high-end watches were exported from Switzerland since the year 2000, which means there are between 10 and 20 million needing service each year.
- Museums, auction houses, and private collectors are looking for support staff to help out in the $15-billion-per-year pre-owned watch market.
- Social media makes it easy for you to connect with customers.

The secret is to figure out what you are best at, where your passion lies, and specialize.

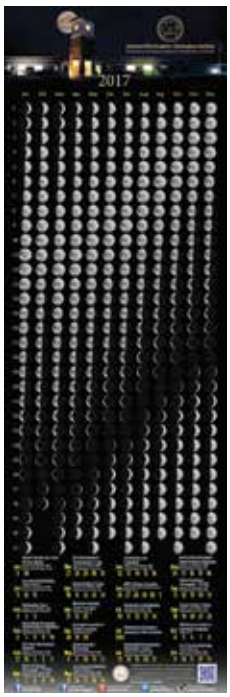
Continued on p. 31



Comments on the Moon-Phase Calendar

I just ventured out into the brisk 8° to get the mail, and the new HT was in the box! Made the trip worth it. That is a very eye-catching moon-phase chart. That will be down in my shop Monday morning!

~Bob Little



HT staff—Good work on the moon calendar!

~Aaron Recksiek

Editor's Note:
If you would like to purchase a calendar that has not been folded, you can order one for $6.95. It will be sent to you in a mailing tube with end caps. Visit www.awci.com/online-store/.

Old-Time Resources *Are* Useful

Clockmaker Karel Ebenstreit commented on our column "Old-Time Resources" in the February 2017 issue of HT. *The Modern Clock* by Ward L. Goodrich was the subject of this column.

I have this book and highly recommend it. It helped me figure out why the old cuckoo and quail clock that I was working on years ago would not work properly. I took the book with me on vacation in Cuba and carefully studied the chapter on this type of clock and realized that the previous repair person had altered the shape of the quail count wheel, which would not allow me to set it up properly. He reshaped the end of a count lever into an L-shape, and glued on the count wheel a disk with graduated length spaces as on the regular count wheel design. I changed the count lever end back into a V-shape end and removed the altered disk, allowing the V-shape lever end to interact with the deep gaps of the original count wheel. This chapter was later reprinted in *Black Forest Clockmaker and the Cuckoo Clock* by Karl Kochmann. So, it is useful to have these older books on the shelf for reference when working on the old, vintage pieces.

~Karel Ebenstreit

Readers Respond

Jack Kurdzionak, author of the column "From the Workshop," received this letter.

Dear Sir,

Thanks for your January column "From the Workshop." When my HT magazine arrives it is usually the first thing for me to read due to its relevance to my working life.

The photos of old envelopes and parts made me laugh. [They were] reminiscent of Fred Burkhardt's humorous articles from the past (which now seem like simpler times).

I learned at WOSTEP back in the 1970s that a clean, organized bench top and workshop at the start and ending of the day brought a peace of mind and focus.

For a while I kept track of time of each job by using a stop watch carried around by neck. Someone saw it and asked if I was a coach and I said, "Yes, for my business!" From timing I could determine whether I was charging enough with goals of business in mind, especially sobering for the solitary watchmaker who "does it all."

You could explore/write a separate article on the psychology of hoarding as only watchmakers know it. Over years of acquiring watchmakers' estates I had to learn what to keep and what to get rid of. What takes up space but never pays its way—and gets in your way. And I had to buy a part, later finding I already had one, as a good lesson in organizing better.

In closing, Plato wrote, "We gain our first measure of intelligence when we admit our own ignorance."

Thanks again for your contribution and experiences.

Sincerely,

~Robert Mohr

Executive Director Jordan Ficklin received this email.

Dear Jordan,

I wanted to congratulate you on how beautiful the journal [*Horological Times*] looks and how interesting the articles are, even to a nonprofessional like me.

My best to you and to all members and staff,

~Caryl Fried Feldmann
(Daughter of Henry B. Fried)

Writers for *Horological Times* can earn between $300 and $875 or more per article. It depends on the length of the article (25 cents per word). Earn a 10% bonus for submitting assigned articles early or on time. If you'd like to write for *Horological Times*, email editor@awci.com for guidelines.





"I left the quartz course with skills I could immediately apply at work. In a couple days we covered theory, servicing basic quartz movements to chronographs, and testing procedures. Understanding the working principles behind these movements helped me improve my diagnostic skills as well. I would definitely recommend attending this course!"

~Judit Katona

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Not sure which course to sign up for? Log onto our website and fill out our experience questionnaire or contact us so we can help you find the best course suited to your skill level, expertise, and interests.

Call or email our Education & Certification Coordinator today for more information: education@awci.com | Phone: 1-866-367-2924, ext 303

educational calendar

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

Class Schedule for 2017

Reserve your spot today. Contact Rob McLeod at 866-FOR-AWCI (367-2924), ext. 303.

March 27-31	WATCH 250: 5 CEUs **Basic Micromechanics: The Watchmaker's Lathe** Instructor: Tom Schomaker, CMW21 AWCI Headquarters, Harrison, Ohio	$1,095	Expand your knowledge of micromechanics and learn the fundamentals of the watchmaker's lathe including preparation of cutting tools, how to turn cylinders and tapers, how to drill, and how to cut out balance staffs.
April 10-14	WATCH 230: **Balance Staffing & Timing** Instructor: Tom Schomaker, CMW21 AWCI Headquarters, Harrison, Ohio	$1,095	Build on what you know in this course by investigating the verification and analysis of the escapement function, poising (static and dynamic), truing, and timing adjustment in a mechanical watch, cutting out a balance staff on a lathe, adjusting the balance staff, and removing the balance staff from Glucydur balances with the Horia tool.
April 21-23	**Wisconsin Horological Society (WHS)** Instructor: Doug Thompson, CW21 Lake Geneva, Wisconsin		Visit us at www.awci.com or follow us on social media for future info.
April 28-30	**Horological Association of Virginia (HAV)** Instructors: Michael Gainey, CC21 and Scott Walters, CW21 Charlottesville, Virginia		Michael Gainey, CC21, will be presenting on Servicing the Aging Modern Floor Clock in the Home. Scott Walters, CW21, will be presenting Technical Discussion of the Dubois Depraz Modular Chronograph/ Servicing the ETA 6497.
May 8-12	WATCH 200: **Modern Automatic Wristwatches** Instructor: Tom Schomaker, CMW21 AWCI Headquarters, Harrison, Ohio	$1,095	Become the go-to watchmaker for modern automatics in your area by learning the fundamentals of mechanical automatic watch repair that are most prevalent in today's market. In this class you'll investigate how to perform the various components, cleaning, assembling, adjustments, dialing, and casing.
May 15-19	WATCH 175: 5 CEUs **Case & Bracelet Refinishing** **(includes polishing kit)** Instructor: Tom Schomaker, CMW21 AWCI Headquarters, Harrison, Ohio	$1,350	Today's luxury watch consumer demands perfection. This course is perfect for the watchmaker or dedicated refinisher. It will help you achieve the different finishes on modern watch cases. Also covered is disassembly and assembly of common watch cases.
June 12-16	WATCH 240: **Servicing the Lever Escapement** Instructor: Tom Schomaker, CMW21 AWCI Headquarters, Harrison, Ohio	$1,095	This intense five-day course will help you refine your adjusting skills. The course covers all of the adjustments for the Swiss lever escapement, hairspring, and balance. Also covered is the ETAchron system.
July 10-14	WATCH 350: **Intermediate Micromechanics The Watchmaker's Lathe II** Instructor: Tom Schomaker, CMW21 AWCI Headquarters, Harrison, Ohio	$1,095	Take your Lathe skills to the next level with this new course. Check our website for more details: http://www.awci.com/classes
July 14-15	**Watchmaker's Association of Ohio (WAO)** Instructors: Jim Lubec, CMW21 and Tom Schomaker, CMW21 Sugar Grove, Ohio		Jim Lubic, CMW21, is teaching a class on using the jewelers lathe on Friday July 14th. Tom Schomaker, CMW21, will be teaching a class on Watch Estimating on Saturday July 15th.

For additional details about specific courses in comprehensive syllabi form, including complete tool lists, visit: **http://www.awci.com/classes**. or contact **Rob McLeod**, Education & Certification Coordinator, at 866-FOR-AWCI (367-2924), x303. For additional calendar events visit: **http://www.awci.com/calendar**.

July 17-21

WATCH 100: $750

Introduction to Watchmaking

Instructor: Aaron Recksiek, CW21
AWCI Headquarters, Harrison, Ohio

This class is perfect for anyone thinking about entering the profession of watchmaking or the individual who wants to gain a better appreciation for the art of watchmaking. Learn basic skills and techniques used by the modern watchmaker. Before attending, students are recommended to study *Theory of Horology* and be familiar with the basic nomenclature of watchmaking.

July 24-28

$2,495

CW21 Exam

AWCI Headquarters, Harrison, Ohio

To help you prepare for the exam, please visit our watchmaker preparation page and the study aids page.
http://www.awci.com/education-certification/certification/watchmaker-preparation/watchmaker-study-guides/

August 14-18

WATCH 210: $1,095

Quartz & Quartz Chronograph Service Procedures & Diagnostics

Instructor: Tom Schomaker, CMW21
AWCI Headquarters, Harrison, Ohio

Expand what you know to increase your profit! Quartz watches can be one of the most profitable sectors of your business. This course reviews quartz watch repair and quartz chronographs, including the various important electronic tests, giving you the skills you need to be faster and more consistent at servicing quartz watches.

September 11-15

WATCH 230: $1,095

Balance Staffing & Timing

Instructor: Tom Schomaker, CMW21
AWCI Headquarters, Harrison, Ohio

Build on what you know in this course by investigating the verification and analysis of the escapement function, poising (static and dynamic), truing, and timing adjustment in a mechanical watch, cutting out a balance staff on a lathe, adjusting the balance staff, and removing the balance staff from Glucydur balances with the Horia tool.

September 18-22

WATCH 220: 5 CEUs $1,095

Modern Mechanical Chronograph – ETA 7750

Instructor: Tom Schomaker, CMW21
AWCI Headquarters, Harrison, Ohio

Brush up on your chronograph skills before taking the CW21 Exam with this class on the modern mechanical chronograph. It focuses on the service and adjustment of modern mechanical chronographs, such as the ETA 7750.

October 4-8

AWCI Annual Convention & Educational Symposium

Tampa, Florida

Visit us at www.awci.com or follow us on social media for future info.

October 9-13

WATCH 175: 5 CEUs $1,350

Case & Bracelet Refinishing

(includes polishing kit)

Instructor: Tom Schomaker, CMW21
AWCI Headquarters, Harrison, Ohio

Today's luxury watch consumer demands perfection. This course is perfect for the watchmaker or dedicated refinisher. It will help you achieve the different finishes on modern watch cases. Also covered is disassembly and assembly of common watch cases.

When you are not sure if you can get parts:

Visit AWCI's Brand Directory

awci.com/brand-directory

Creating our Directory of Spare Parts Policies was hard work. The committee spent many long hours on the phone with watch brands to get the responses you see at awci.com—and the work is not done. This directory is a dynamic list, and the committee continues to reach out to brands in an effort to complete the list.

When members of the watch-collecting community visit the directory, they will see critical information to help them make an informed decision about purchasing a watch based on the brand's after-sales service and spare parts policies. As a member of AWCI, when you log in to the webpage, you will see the complete survey responses and contact information.

We do not list brands in this directory until they have been given ample opportunity to respond to the survey. Once we have recorded their responses, the results immediately appear on our web page. Brands that decline to participate in the survey will appear in the directory with a note indicating their refusal to participate.

We hope this directory will be a valuable tool in your workshop. When you see a brand that isn't on the list, we would like your help. A blank copy of the full survey is available at awci.com. Please take every opportunity to ask watch brands to participate in the survey. Record your responses and send them to AWCI so we can update our directory.

We know that sometimes you will have an experience that conflicts with what a particular brand reported in their survey results. Use this directory as a tool. When you are told you cannot order parts for a brand that has indicated they sell parts to watchmakers, please take the time to explain to the representative that in a recent survey they reported to the American Watchmakers-Clockmakers Institute that they sold parts to watchmakers. Mention the name of the individual who gave the survey responses. If you still do not get the same results, ask them if they would like to submit new responses to the survey. Please report your findings to AWCI.

A link to the directory appears on the AWCI home page so that consumers can openly see which brands support independent repairpersons.

Brand representatives who feel their company has been misrepresented should contact AWCI so that we can accurately report their company's policies.



Photo credit: Visit Tampa Bay

Here We Go Again!

By Terry Kurdzionak

It is time for YOU to start planning for the 2017 AWCI convention in October! We will be going to Tampa, Florida, where it promises to be sunny and warm with no rain! That's what we were told when Jordan and I spent just under three days there in mid-January.

The convention committee consists of several devoted AWCI members who volunteer their time and talent to this committee. The members are Paul Wadsworth, Peter Whittle, Charles Salomon, John Polk, Bob Ockenden, CMC, Anthony Rachevsky, CW21, and Ernie Tope, CMW21.

When Jordan and I got to Tampa, we went directly to Masterpiece Time, the shop of Ernie Tope. We met his two other watchmakers and had a tour of his shop. He then brought us to a great local Greek restaurant where we had lunch together. After lunch, we toured the city with Ernie who pointed out places of interest. After our tour, we took Ernie back to his shop and then went to the first hotel on our agenda. We sampled the cuisine of that hotel by having dinner in their restaurant, and then breakfast the next morning. Our first full day in Tampa was spent touring three hotels and meeting with each sales department. In the evening, we had a late supper and compared our notes from the day. Our third and final day began with breakfast and another hotel tour in downtown Tampa. We walked the Riverwalk and saw many activities going on within walking distance of the hotel. We also toured several places that might be considered for use by the ELM Trust for their annual fundraising dinner. Just before lunch, a member of the "Visit Tampa Bay" organization picked us up and brought us to Ybor City for lunch at the



Photo credit: Keir Magoulas, Visit Tampa Bay



Photo credit: Keir Magoulas, Visit Tampa Bay



Photo credit: Visit Tampa Bay

Columbia Restaurant, where we had a taste of delicious Cuban-style food. After lunch, we visited the aquarium, The Tampa Club, and a beach before heading to the airport. It was a whirlwind tour of a beautiful city. I finally got home to snowy, cold New Hampshire at just after 1:00 a.m. on Saturday. I cannot wait to go back there in October, and I hope that all of you will join me! Stay tuned for more information in the *Horological Times*. Be sure to check out the website www.visittampabay.com.

Terry Kurdzionak is a graduate of Northeastern University College of Nursing. She has been involved in the family watch/clock/material business for 28 years and has served as an officer and board member of AWCI as well as the membership and convention committees.



KNOW YOUR VALUE

Part Three: What is a Professional Fee?

By Michael Gainey, CC21

A professional fee is enough to earn a professional income. What is a professional income? Because most independent horologists are not willing to openly discuss their incomes, we must look to other sources to help answer that question. Doing some research on job-related websites, such as payscale.com, and trying to use examples of an apprentice-based, craftsperson-style trade, I have found that the top 10% of master carpenters earn about $92,000 per year ($46 per hour). The top 10% of master plumbers earn about $78,000 per year ($39 per hour). Although training times vary, it is widely considered that becoming a master plumber or master carpenter takes four to five years. With that level of training and experience, they are likely to earn something closer to a median wage, not a wage in the top 10%. Those top earners likely have decades of experience. In the repair and craftsperson trades, after training, experience is a prime factor in earnings. With proper training, experience allows you to work more efficiently and solve problems quickly.

Experience is a prime factor in earnings.

In the previous article, we mentioned median incomes for watchmakers from two sources. A third website, payscale.com, lists a range of approximately $13 to $34 per hour. Again, $34 is likely reserved for those with decades of experience. All of the figures we're talking about are called "wages" or "salaries." These terms are normally used to indicate income derived from employment as opposed to income derived from being a business owner. Typically, an independent carpenter, plumber, clockmaker, or watchmaker should be able to earn an income far higher than these figures. This higher income compensates for all the additional responsibilities of owning a business.

As an exercise to show you how the math works, let's pick a nice, round, arbitrary but desirable number. Let's say you want to earn $50 per hour. $50 per hour times 2,000 working hours (50 weeks [assuming two weeks of vacation] times 40 hours) per year comes to $100,000. Since all businesses have expenses, grossing $100,000 per year will not net you $50 per hour. My business has

averaged an expense ratio of about 34% of gross income. My shop is a building I own next to my home. Someone with a storefront in a retail area is likely to have a much greater expense ratio, probably 50% or higher. Using my figure (34%), you would have to gross about $151,515 in order to net $100,000. If you divide this number ($151,515) by the same number of working hours per year (2,000), you would need to bill an average of about $75.75 per hour for your work. Do you know any independent clockmakers or watchmakers who work at the bench eight hours per day? No, of course not. Let's say you get to spend a generous six hours per day at the bench (I often get less than four): six hours times five days equals 30 hours times 50 weeks equals 1,500 hours per year. $151,515 divided by 1,500 hours equals a little more than $100 per hour you would need to bill to net $50 per hour. Another variable, of course, is profit on parts sold. This "extra income" can go a long way to increasing your "hourly" income. (See Parts Markup, in the next column, for more information on how I handle this.)

Determining Your Expense Ratio

If you have not done these kinds of calculations before, let me take a moment to discuss how we arrive at these important figures. First, some definitions: your **gross income** includes everything you earned in a given year (repair and sales) excluding sales tax. Your **expenses** are a total of your cost of doing business. This includes not just utilities and rent but vehicle expense if you use one for work, insurance, alarm systems, office supplies, and cost of parts sold, among others. Income taxes do not figure into any of this. Your **net income** is your gross income less your expenses. Your **expense ratio or percentage** is simply your expense total divided by your gross income.

Obtaining Your Gross Income Goal

To obtain your "goal" gross income from a desired net income, subtract your expense percentage from 100 and then divide your net by that percentage number. Don't forget to translate percentage into a decimal number. Here is what it looks like using the numbers above. Subtract 34% from 100% and you get 66%. Translate 66% into a decimal and you get .66. Now divide your net of $100,000 by .66 and you get $151,515.15.

Parts Markup

You cannot perform repairs very long before you have to sell a customer a part. Most professional business owners double the cost of their parts. If you buy a part for $5 (don't forget shipping costs), you sell it to

your customer for $10. Remember, you had to look up the part number, place the order, pay money up front for the part, and then open the package when it comes in. This seems petty but it is not. Add up all the time in the course of a year when you were looking through catalogs and on the phone making orders, and you'll see it is significant. Also, you are now responsible for the part. Is it a part you are guaranteeing? You need to be compensated for that. Labor to install the part is a different charge. To make this a bit more complex, the markup on cheaper parts is often higher, closer to three, four, or even five times the cost. It is unfortunate, but for small shops the larger expense is not the cost of the part but the time it takes to sell the part. I can buy a clock key for about $2, but it makes no sense to sell it for $4. By the time I fit the key to the clock, chat with the customer a bit, write a bill and collect the money, I may have spent 15 minutes. To me that time is worth $25 or more. Admittedly, we often do things from a customer-service standpoint. By selling a key at a more reasonable price (not $25 but not $4 either), we may win the future business of the customer when they need the clock repaired. Sometimes your markup might be higher than double, but other times it might be lower. Because doubling the cost of more expensive parts makes for far more profit, it gives you a bit of room to "discount" the part if you choose. I rarely discount the price of a complete mechanical product, such as a replacement movement, because I have to guarantee it. However, I might discount the price of a "static" nonmechanical part, such as a set of tubes for a tubular bell clock.

Some think that earning $50/hour as an independent clockmaker or watchmaker is unobtainable. I can assure you that it is not.

Using these figures, we can finally determine what a professional fee might be or could be for a given repair job. If a particular job takes you five hours, you will need to charge $500. Now we must consider another variable. What if it takes you 10 hours to complete the same job it takes someone with more skill and experience only five hours to complete? Are you going to be able to charge $1,000 for that same job? Probably not. You are not yet in that top 10% of wage earners because your skill and experience have not risen to that level. This is why being active with others in the trade can be so important, as subjects like this are often discussed before and after classes, in the hallways, and over meals at conventions.

In using my "arbitrary figure," some may think that earning $50 per hour as an independent clockmaker or watchmaker is unobtainable. I can assure you that it is not—at least not for clockmakers. Because we do not have any reliable, researchable numbers on *independent* clockmakers or watchmakers, and in order to help ground this number in reality, I offer the examples of the carpenter and plumber. We must, however, remember that these levels are for people with decades of experience. Clockmakers and watchmakers should not think that this level of income is going to be handed to them on a silver platter. It takes much work and dedication and may involve working hours well beyond a normal 40-hour workweek. For those who are relatively new to the trade, this is a goal to work toward.

In Part Four, I plan to share the ingredients necessary for a successful business.

Michael Gainey is the owner and operator of Master Clock Repair in Columbus, Ohio. He frequently teaches classes and workshops on clock repair.



Memoriam

We Remember Archie B. Perkins

Oct. 31, 1923—Jan. 26, 2017



AWCI has lost a respected and talented member. Archie B. Perkins passed away on January 26, 2017, at the age of 93 in Denver, Colorado. Watchmakers and clockmakers of all ages from all over the country left comments of sympathy on the website of Horan & McConaty funeral services. www.horancares.com/obituary/Archie-B.-Perkins/Denver-CO/1696819

Archie was born in Frances, Kentucky, to George and Lottie (Moseley) Perkins. He was one of five brothers and two sisters. His mother died when he was three, so he was subsequently cared for by his oldest sister, Grace, alongside her own children until his father remarried in 1928. After Archie's father had to leave his job at a fluorspar mine for medical reasons, the family lived on several different farms in Kentucky as his father worked at whatever jobs he could find.

In 1939 Archie started repairing watches and clocks at the family home. In an article in *Horological Times* (August 2015), Archie said, "My father had watchmaking tools before I was born, but they were lost in a fire. When I was a child I saw one of his old watchmaking tool catalogs, and I was fascinated by the tools. So I decided I wanted to try doing the work too. He built me a workbench, and he bought me a few hand tools—even though we couldn't really afford it."

Archie eventually opened a shop in Lola, Kentucky. He worked in his shop until March of 1943 when he was drafted into the Medical Corps during WWII. After he was discharged, Archie worked at watchmaking in Nashville, Tennessee, for a while. In the spring of 1944 he used the newly passed Servicemen's Readjustment Act of 1944 to attend the Elgin Watchmakers College from 1944-1946. W. H. Samelius, director of the Elgin Watchmakers College, was impressed with Archie's abilities and had Archie teaching while he was still a student.

Upon his graduation, Archie was recommended as an instructor at the American Academy of Horology in Denver, Colorado. He taught there for a little over a year and then repaired watches for Denver jewelry stores for a number of years. In 1951 Archie returned to teaching for the Denver Public Schools at the Emily Griffith Opportunity School. He taught there for 32 years until 1983 when he retired. Archie was elected "Vocational Educator of the Year" by the teachers's union in 1981.

Retirement from the Denver Public Schools meant that Archie worked on watches and clocks at home, taught day and night classes on watch repair, taught basic and advanced lathe courses for AWCI, and wrote technical articles for trade journals. Archie's articles appeared in the *British Horological Journal*, *Watch and Clock Review*, the NAWCC *Bulletin*, and our own *Horological Times*. Archie wrote a monthly column for the HT titled "Technically Watches." That column ran for 25 years. He co-authored the

Watchmaking is challenging. Archie Perkins had a way of making it not seem so. Archie Perkins enjoyed helping watchmakers to learn and improve their skills. He was an instructor through and through every day. Archie Perkins made me a better person for knowing him and helped me to follow my passion of watchmaking. Archie passed away at the age of 93. At the NAWCC mart at age 92 he was still buying and trading tools and promoting his books, which are by far the best instructional books that money can buy. I cannot express how fortunate I was to have known him. ~**Ron Landberg**

book, *The Watchmaker's Staking Tool,* published by K and D Staking Tool Co. in 1987. He also wrote *The Modern Watchmakers Lathe and How to Use It*, published by AWCI in 2003, and *Antique Watch Restoration*, Volumes I and II, published by AWCI in 2012 and 2015 respectively.

In the HT article from August 2015, Archie said, "Teaching and writing were the most exciting aspects of my career. I was happy to write for *The American Horologist and Jeweler*. By doing a little each month, I honed my skills in drawing. In 1978 Hal Herman asked me to write for *Horological Times*. I'm proud of my drawings, and I hope the writing is equally as good."

Horological institutions and associations recognized Archie's contributions on numerous occasions. He achieved distinguished AWCI titles of Certified Master Watchmaker and Fellow of the American Watchmakers-Clockmakers Institute. He was also awarded Fellow of the National Association of Watch and Clock Collectors and Fellow of the British Horological Institute. Archie was also an AWCI board member from 1985-1988.

Archie was a devoted husband to wife Daphene, whom he met while renewing his teaching credentials at Colorado State University in 1955. They married in 1956. His book dedications always included her for typing and proofreading his articles. Daphene preceded Archie in death in 2005. He is survived by his son and daughter-in-law, Richard and (Laurel Watts) Perkins and daughter, Judy Perkins, as well as grandchildren Lesley Perkins, Russell Perkins, and Steve Powers.

Some words of remembrance and respect from AWCI's Facebook page

Truly a sad passing. When I was at OSUIT School of Watchmaking, it was clear that he was revered. Technical drawings done by him adorned the first- and second-year theory rooms. His books and articles were, and will remain, points of consultation that most likely will never be matched. It is also sad to see one of the last living graduates of Elgin's school pass. Rest in peace, Mr. Perkins. You are an American Watchmaking icon. ~**Matthew Nolin**

Rest in peace, Mr. Perkins. Thank you for your contribution and inspiration for future generations of watchmakers.

~**Shaun A. Coates**

Ask David Christianson

CMW21, FBHI, FAWCI

Question

Quarter Hour Repeater with Dual Time

Please tell me what you can about this watch. Inside the front cover in a semicircle is "B. H. J. Co." and a "G," also the Swiss hallmark for 18K.750, and also 88, which is the last two digits of the No. 15688 that is in the back cover.

The movement—jeweled lever escapement type—has an extra wheel driven off of the center wheel, probably for the dual time. The balance, fork, and escape wheel have cap jewels. If the lower plate is jeweled the same as the upper, the movement has 35 jewels. Twelve of which are in the repeating part. The mainspring is wound by moving the front cover open and closed, when wound up it just moves freely. The setting lever is located at the 2 o'clock position outside the bezel. Could it be a Le Phare ebauche?

Could you please try and identify it as who made the movement and the case, also about when it was made. The complete watch weighs about 4 1/2 ounces.

Merlin Meyer
M&M Repair
Orcutt, CA











Answer

When I learned, through Maureen Seals at AWCI, that you found out that the "BHJ" on the back of your watch case was Benjamin Haas Jeune & Co and that the initial G stands for Geneva, I was able to learn more about your watch.

Benjamin Haas, then in Besançon, France, won a bronze medal at the Paris Universal Exposition in 1867. A bit later he invented a form of winding where the mainspring was wound by opening the front cover of a hunting case watch. For this invention he received British Patent #3945, December 2, 1873. This patent was licensed by him to other makers as well. The company excelled in unique and exceptional timepieces.

By 1880 the company was located in Geneva, Paris, and Besançon, and they called themselves manufacturers. In 1907 the firm changed its name to Haas Neveux & Cie., and continued making fine and complicated watches until around 1939. As an additional note, a fine Benjamin Haas Jeune pocket chronograph repeater was sold by Christie's in 2013.

David Christianson, Researcher

David Christianson is a graduate of Purdue University, the Kansas City School of Watchmaking, the Gemological Institute of America, and is an internationally known horological historian.

Watchmakers & Clockmakers

Have you worked on an unusual or historic timepiece that fascinated you and you wanted to know more about it?

Where was it made?
How old is it?

Have customers asked you questions about the history of their timepiece that you were unable to answer?

David Christianson, CMW21, FBHI, FAWI can help you answer those questions.



Send your question along with clear, high-resolution photos to Member Services

memserv@awci.com

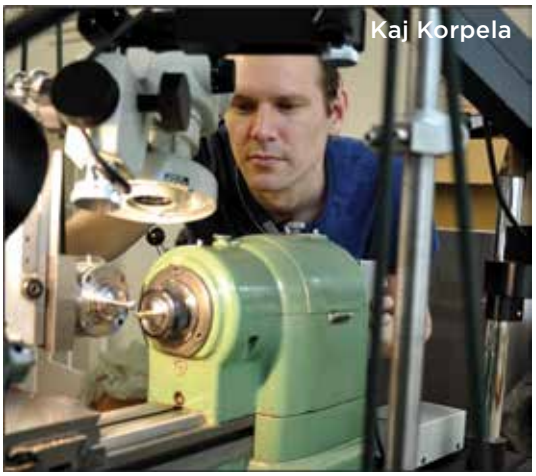
or mail them to

Member Coordinator
701 Enterprise Drive
Harrison, OH 45030

Making a Watch from Conception to Finished Product with Kaj Korpela

Watchmaking, Prototyping, and Restoration of Watches

PART THREE



By Henrik Korpela

As we progress in the making of the watch, we have reached the part where Kaj started to make the gear train of his watch, which we will talk about in this article. I will not go into too much theoretical detail about the gear train, since you can find it in many of the books mentioned in the first article in this series. Rather, I will give you an overview of how Kaj approached making his gear train.

At the end of the article, I include a restoration tip. I will show you a practical approach for how to make a missing stop work (the Maltese-cross part), taking inspiration from J. Malcolm Wild's book *Wheel and Pinion Cutting in Horology*. Wild based his explanations of the stop work making on Archie B. Perkins's articles in the *Horological Times* (January 1988, "Antique Watch Restoration: Geneva Stop Work"; and February 1988, "Antique Watch Restoration: The Construction of a 5 Turn Geneva Stop Work"). When it comes to wheel theory, I would also like to recommend an excellent article in the October 2016 issue of *Horological Times*, "Horological Wheel Theory," written by Andrew DeKeyser, CW21.

Kaj decided to take a chance and not follow the advice in the chapter on movement design in George Daniels's book *Watchmaking*. Daniels says to make the parts one after the other with subsequent testing to make sure they are good before going deeper in the making of the watch. This seems to be a logical and safe approach. Kaj followed the Swiss NIHS standard on the gear-train tooth and leaf profiles. He used a program from the book *traité de construction horlogère* (which includes a CD).[1] In this program, he inserted the standard he wanted to use: number of teeth and leaves of wheels and pinions, frequency, and other known information about his movement. Then the program calculated the rest of the information he needed to make the gears. Kaj made all the wheels and pinions before testing them one by one, trusting that all the theory would work out in practice. He tested them much later and found that some of them did not give the optimum rolling action (there was some binding between some interacting wheels and pinions). The problem was found to be a slight difference between the size of the cutters that he had compared to the drawings he made. Kaj corrected this later by cutting new pinions with the same cutters but very slightly deeper, causing them to become smaller in diameter while maintaining the profile. In the end, the goal is to have a smooth transmission of energy from the barrel with the mainspring with as little frictional losses as possible to reach the escapement. Small adjustments like this might be necessary when

1. Michel Vermot, Philippe Bovay, Damien Prongué, Sébastien Dordor: *traité de construction Horlogère* (2011). (A CD is part of the book.) For the gear train data of Kaj's watch. (In French only).

making the wheels and pinions in practice. Before Kaj started to make any parts for his gear train, and even before making the barrel and center pinion, he made a test escape pinion. This does not seem logical at all, since it's the last part of the gear train and would usually be made much later. The reason he did this, however, was because he wanted to make sure that he could actually make it with the tools, machines, skills, and knowledge he had. Since the escape pinion is one of the most difficult parts to make, he figured that if he could make that part, he should be able to figure out how to make the rest.

In Figures 1 and 2 you'll see an overview of Kaj's gear train with barrel, including some motion work gears on the dial side.

Fig. 1

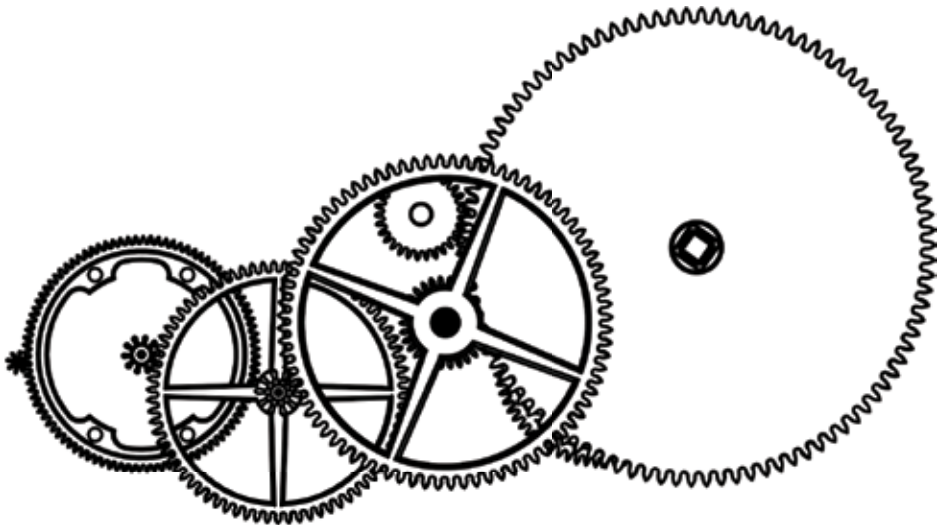
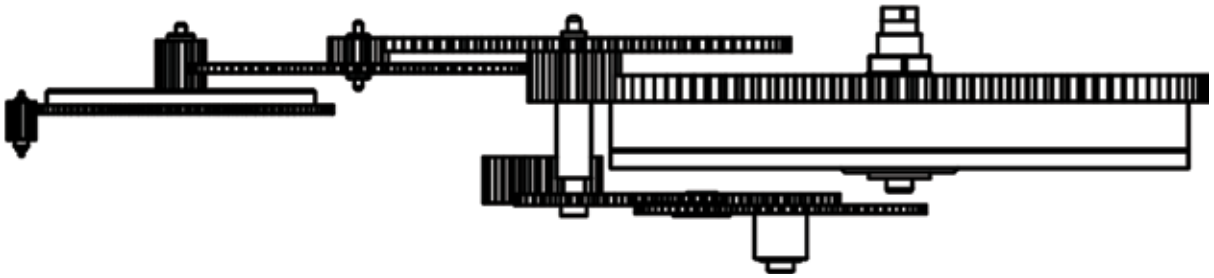


Fig. 2



Here is some data about Kaj's gear train:

Center wheel: 80 teeth, module 0.12

Third pinion: 10 leaves, module 0.12

Third wheel: 75 teeth, module 0.10

Fourth pinion: 10 leaves, module 0.10

Fourth wheel: 96 teeth, module 0.07

Escape pinion: 8 leaves, module 0.07

Next, he made arbors for the cutters and the blank-holding chucks for the wheel blanks, Figure 3.

Fig. 3



Arbor, nut, washer, and the cutter.

The blank-holding chuck for the wheel blanks. The yellowish part is the already-cut wheels stacked on top of each other between the blank-holding chuck and a washer with a central hole secured with two screws. This assembly would then be mounted in a suitable collet in the headstock of the lathe and the brass discs (wheel blanks) would be adjusted true, as George Daniels explains in *Watchmaking*, page 127, figure 233. They would then be turned to the correct, final, full diameter. Also, the central hole is enlarged to run true with the teeth. The advantage of this method is that several blanks are being cut at the same time, instead of making wheel by wheel, and there are fewer burrs to remove between teeth, compared to making them one by one, since they don't need parting off. Even if you are only making one watch, it is useful to have several of the same part in case one or two fails later in the process.

Fig. 4



Fig. 5



Turning a wheel blank.

Fig. 6



Some wheel blanks ready for further preparation.

The blanks glued with Loctite 280 on a brass support. This glue is great for holding parts that need machining because it is relatively resistant to vibrations and shocks that occur while drilling and milling. When you're ready to remove the blanks, dissolve the glue in acetone. If it takes too long to dissolve in acetone, you can use heat to weaken the glue. Make sure the part can take the heat without deformation or change of properties because of too-high heat. This platform was mounted in the Hauser M1 jig boring machine to drill the holes for the two screws going through the blanks.

Fig. 7



Fig. 8



Wheel blanks after the screw hole preparation. They are now ready to be mounted into the blank-holding chuck, which would be held in a collet in the headstock of the lathe.

Fig. 9



The setup of the lathe (Schaublin 102) with the dividing and milling head (attachments) mounted, ready to cut the teeth on the blanks. A microscope mounted on a boom stand from above the work will greatly facilitate the centering of the cutter and, in close-up, allow you to see the teeth being formed.

Fig. 10



The blank-holding chuck mounted in the headstock and the cutter with arbor mounted in the milling head. You can see that a few teeth have already been formed.

Fig. 11



Drilling of the central hole to be concentric with the teeth. Here we have a slightly different blank-holding chuck made from brass but with four blocking screws, which works equally well as Kaj's holder.

Fig. 12



The blanks after forming the teeth. Next, the spokes were crossed out.

Fig. 13



Wheel prepared with reference holes for crossing out[2] the spokes. Holes were drilled with the Hauser M1 jig-boring machine.

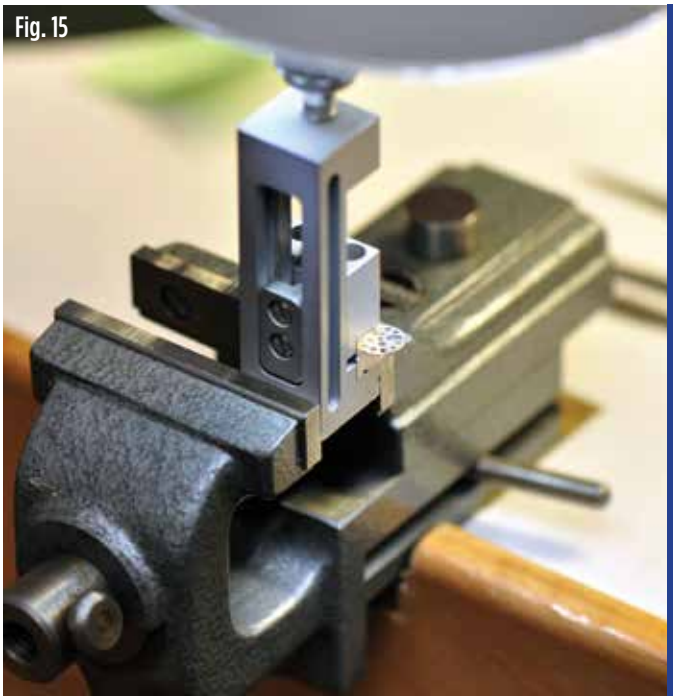
2. G.-A. Berner: *Dictionnaire professionnel illustré de l'horlogerie 1+2*. 2002 p. 459, entry 1942.

Fig. 14



A wheel after the spokes have been roughly crossed out in the M1.

Fig. 15



Another way Kaj made his spokes was by hand filing. The wheel was clamped in a small vice which in turn was clamped in the bench vice. This allowed the wheel to be on a horizontal plane, making it more comfortable to file and easier to see the progress of filing, because the file would go under the wheel rather than over the wheel, giving a clearer view.

Fig. 16



Partially filed.

Fig. 17



Completed spokes.

Fig. 18



One prototype wheel after circular graining, ready to be riveted on a pinion. The pinions are made in a similar fashion, but they can't be stacked on top of each other, so they had to be made one by one.

Fig. 19



Pinion blanks ready for cutting the leaves.

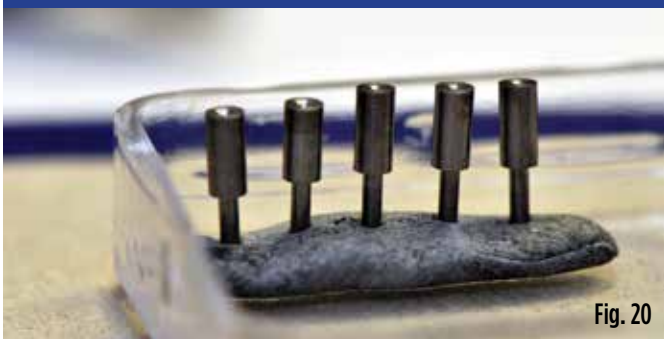


Fig. 20

Fig. 21



Fig. 22

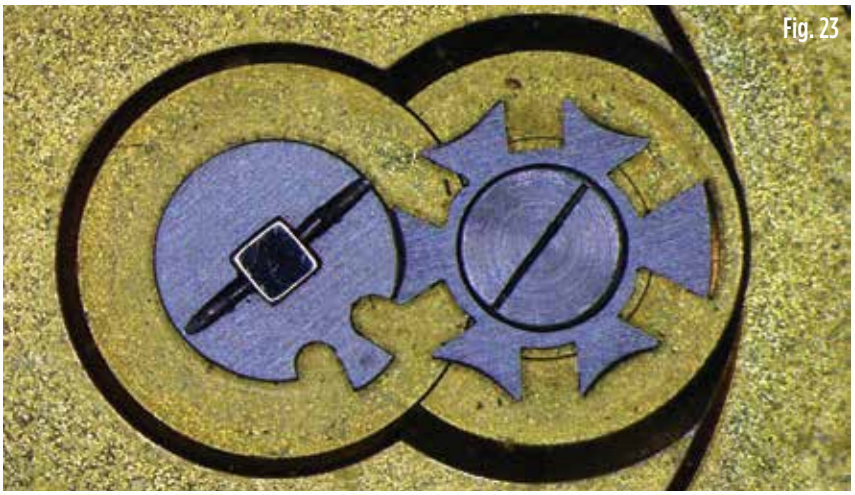


The prototype center wheel and its pinion riveted together.

Various pinions, now with leaves, ready to be turned between centers to create the pivots. They also need to be heat treated and polished before being riveted on the wheels. Notice that instead of having the axle on both sides of the pinion leaves, there is a female cone on one end (the one without axle). It serves as a support when turning the axle and pivot between centers, having a male chuck supporting the female end. This is the reversed way of how most watchmakers would usually do it. At that time, Kaj did not have the female cone chucks. So, instead of making or buying them, he turned them in this unusual way. He later made more pinions in the conventional way, with female chucks, and said it was much easier.

Restoration Tip: Making the Maltese Cross of a Stop Work (Geneva stop work)

Fig. 23



Introduction

This part of the article will be nothing new to the students who attended my restoration and finishing course last year at AWCI. I thought by including it in this article, I could reach more watchmakers. If I reach more watchmakers, it's more likely that someone will adopt it in their regular restoration work. It would be great to get all those old pocket watch barrels back to original function again.

The stop work allows only the use of the middle coils of the mainspring, excluding the use of the beginning and end coils, which are the two extremes. This would provide a more uniform power supply to the gear train. It's comprised of a finger piece fixed to the barrel arbor and a so-called Maltese cross, which is situated on the barrel cover.

This device is rarely seen in modern watches. However, it can sometimes be found on older high-grade pocket watches or clocks. Sometimes you may come across a watch where the finger piece or the cross or both are missing. For some reason, many watchmakers have removed this system. However, there should be no reason to remove it if you are doing high-quality service, repair, or restoration. If the watch was designed to have this system and if it is missing, a new one should be made, since the watch was intended to have it from the beginning. In the following description, only the making of the cross is explained.

Guidelines

1. Read first: *Wheel and Pinion Cutting in Horology* by J. Malcolm Wild, pages 199-205. Or read the Archie B. Perkins articles in the *Horological Times* January and February 1988 issues: "Antique Watch Restoration: Geneva Stop Work" and "Antique Watch Restoration: The Construction of a 5 Turn Geneva Stop Work"
2. Gather as much information as possible from the movement and barrel concerning the stop work: center distance of finger to cross, 4, 5, or 6 winding turns, for example.
3. Make a simple drawing of the stop work you intend to make, based on the information you have gathered. You can also make an enlarged paper prototype of the parts from the drawing and simulate the function on a hard piece of paper board (the profile projector may be of help here, especially if you have one of the parts of the stop work). Or draw the stop work in a computerized drawing program. "Whatever method you use, make sure it makes sense to you."
4. Prepare tools and material.
5. Make one prototype in brass. (This step is not necessary to make a prototype, but it is recommended for someone who is making a Maltese cross for the first time.)
6. Make the real Maltese cross.
7. Test stop work in barrel without mainspring.
8. Make adjustments if necessary.
9. Harden and temper the stop work.
10. Finish and clean.
11. Assemble and test with mainspring.


Fig. 24

Making the Maltese Cross

Measure the center distance between the cross and finger on the barrel cover, since the Maltese cross and finger have a definite relationship to each other depending on the center distance.

Some fixed values concerning the Maltese cross calculations (4 turns):

1. Diameter of blank = CD x 1.24 (Where CD = center distance in mm)
2. Construction circle diameter = CD x 2
3. Concave circle diameter = CD
4. Width of slots = CD x 0.29
5. Depth of slots = CD x 0.26
6. Radius of concave = CD/2

These values are only applicable for a 4 turn Maltese cross (5 milled slots). (See J. Malcolm Wild: *Wheel and Pinion Cutting in Horology*, page 201. For 5 turns, see page 204)

Example Values from a Customer's Pocket Watch

1. 3.10 x 1.24 = 3.844
2. 3.10 x 2 = 6.20
3. = 3.10
4. 3.10 x 0.29 = 0.899
5. 3.10 x 0.26 = 0.806
6. 3.10/2 = 1.55

With your own values, proceed to make a drawing of the cross. However, as it often is with theory, it might not work out perfectly in practice, so you may have to adapt the cross to the finger or vice versa, especially if one of the pieces exist and you have to make one to work with the existing one, which may have been handmade or modified in some ways. If the finger or cross looks modified, it may sometimes even be easier to make both finger and cross as a set, rather than to adapt one to the other. When you have learned to make one functioning stop work, you can probably skip many of the steps previously mentioned and directly make one functioning set without having to make drawings or prototypes. This will save you much time. After making only a few working sets, you can do it commercially if you have an organized workshop.

One of Multiple Ways the Maltese Cross Can Be Made

1. Use Sandvik 20AP or any similar steel (even silver steel will do) and turn the outside diameter and face the end.

2. Drill the central hole according to the size of the threaded post on the cover but slightly smaller. It will later be opened up to the exact dimension with a reamer (with 0.01mm sideshake).

3. With a boring tool in the cross slide (or, if you feel confident, turning with a hand graver), open up the diameter for the screw-head recess (make sure it is square and has a sharp corner to avoid screw-head binding later). Since there is already a hole in the center, a quick, alternative way to make the recess is to mount an end mill with a slightly larger diameter than the screw head in the head stock, and in the same fashion as drilling, use the end mill to cut the recess, stopping at the correct depth. This does not produce as flat a bottom as boring it out, but it is sufficiently flat for the Maltese cross-screw recess.

4. Part off partially 2/10 or 3/10 deeper than the bottom of the future slots and leave the thickness 2/100 thicker (Figure 25). The reason why we already start parting it off slightly is to help mill the slots easier and to reduce the build-up of burrs once it is parted off.


Fig. 25

Partially parted off.

5. Put some ink on the outside-turned diameter, mount the milling attachment on the cross slide with the spindle being perpendicular to the head stock of the lathe. Fasten a suitable size end mill (producing the correct size slots or slightly smaller) in the milling attachment spindle, using the correct size collet for the end mill shaft. Advance this assembly close to the turned surface, and the moment your end mill touches the ink, zero the milling head in this position. The milling head must obviously be at the same height as the lathe headstock in order not to cut the slots off-center, which would make them look off-centered. Make sure the spindle of the milling attachment cannot move up and down accidentally when milling. Usually it is possible to lock it on a certain height.

6. Mill 5 slots horizontally to the correct depth (Figure 26). If using a smaller-end mill than the desired slot width, also mill up and down the amount it needs to compensate for. The dividing is 12 turns on the dividing head to turn head stock spindle one-fifth

of a turn for the Schaublin 70 lathe. Note: It may be a different ratio on other dividing heads. The Schaublin standard dividing head produces one complete revolution of head stock spindle for every 60 turns of the dividing head. As long as you find a way to divide one turn into 5 equally spaced positions representing the 5 slots you wish to mill, you are correct.


Fig. 26

Milling slots on the Maltese cross.

Milling the curves on the lobes:

7. Change the end mill to one that is of the same diameter as the diameter of the finger body (3.10mm from the above example) and displace the milling head 90° on the cross slide (head stock and milling head spindle are now parallel to each other). Now the end mill will cut on its side instead of the end as when milling the slots and be able to mill curvatures. Turn the dividing head handle 6 turns to displace the head stock spindle to be in a position exactly between 2 slots in relation to the end mill position, which should be the same height as milling the slots.

8. Zero the end mill at the side of the steel to be milled using ink as explained before in step 5.

9. Mill away material until the curve that is being created by the shape of the end mill side meets both sharp ends of the two slots above and below, creating a curved shape. To mill the next lobe, you would need to turn the dividing head stock handle 12 turns. Again, mill one more lobe, and so on, until all four lobes are milled. Skip the fifth one since that one will act as the stop. Since very little material will be removed, you can alternatively file the lobes by hand in the vice once it's parted off, as long as the end result looks good and runs smoothly without binding and with a minimum amount of play.

10. Part off the piece slightly to the left-hand side to avoid burrs being created inside of the slots.

11. Open the hole for the bushing with a reamer or something similar.

12. Make small endshake by removing material on the underside of the cross on fine abrasive paper.

13. Make a small clearance between the lobes and the side of the finger with, for example, a bar of brass the same radius as the lobes charged with tetrabor or some similar abrasive paste. This clearance must be very small. Or, alternatively, file the curves to size.

14. When testing the function, it is wise to hold the barrel arbor with barrel and cover on top with a collet holder (Figures 28 and 29) or, alternatively, in a collet in the lathe. This means that the finger stays fixed in position while the barrel moves freely. The barrel should spin free 4 turns in either direction when it is working correctly. Feel if there is any blockage when turning the barrel and adjust lobes with a fine diamond or ceramic file if necessary.


Fig. 27

Parts of the barrel for testing the Maltese cross (cover is not shown).



Barrel as it appears from the side.

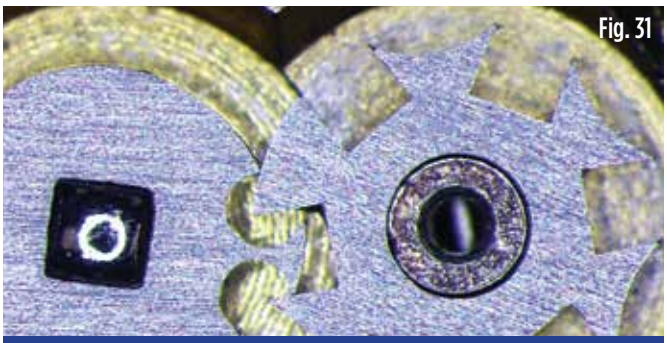


Testing the Maltese cross with the mainspring also installed.

15. Harden and temper.



Maltese cross hardened and tempered (finger in the background).



Complete Maltese cross, slots not perfectly centered but still working without any problem.

16. Finishing by straight graining, black polishing, or whatever the original look should be. Figure 31 shows a 5 turn Maltese cross.

References:

Daniels, George: *Watchmaking*. (2002) 279-318 (movement design); 123-130 (wheel cutting).

Korpela, Henrik: Figures: 11, 23, 26-29, 31.
Korpela, Kaj: interviews on how to make parts of his watch. Figures: 1-10, 12-22.

Perkins, Archie B., "Antique Watch Restoration: Geneva Stop Work" and "Antique Watch Restoration: The Construction of a 5 Turn Geneva Stop Work" in *Horological Times,* January and February 1988.

Wang, Theren (student of K&H Watchmaking Competence Centre): Figures: 24-25, 30.

Wild, J. Malcolm, *Wheel and Pinion Cutting in Horology*. (2003) 199-204 (stop work making).

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



You Can Shape the Future of AWCI and the Horological Industry

The Nominating Committee is now accepting nominations for individuals who would like to serve on the AWCI Board of Directors.



Who can I nominate?

Members may nominate themselves or others they feel are qualified to represent the membership on the board.

What are the qualifications?

Board members must be willing to serve, have been a member of AWCI for at least one year, and attest to the duties of loyalty, confidentiality, and care.

What is required of board members?

Board members must have email access and check it on a regular basis. They must be able to attend monthly conference calls and travel to attend in person the midyear meeting and the annual meeting of AWCI.

Before they take office, board members should become familiar with the Constitution & Bylaws of AWCI as well as the basics of parliamentary procedure.

Board members serve for a term of 3 years.

Are board members compensated for their time?

Board members are not paid for their time but are compensated for travel and lodging expenses related to their efforts to carry out their duty. It is hard work to serve on the Board of Directors and it takes commitment. However, participating in shaping the future of AWCI and the industry can be incredibly rewarding.

Scan QR code to send nominations via email or email to **nominatingcomm@awci.com**.



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AWCI Board Meetings Are Open to All Members!

All members are invited to participate in the monthly conference calls of the Board of Directors. The meeting will be streamed live using the GoToWebinar format, which will allow all interested AWCI members to participate.

To participate in the next meeting you will need to register at least 24 hours in advance. You will need to have your AWCI member number available.

After you register, we will verify your membership. The morning of the call you will receive an email with instructions to join the call.

You will be able to listen to the entire meeting. At certain times during the meeting your feedback may be requested, and you will be able to briefly share your thoughts by using the "raise your hand" button in the platform. The experience will be very limited for individuals who call in on the phone without logging in on their computer.

a message from the **executive director**

JORDAN P. FICKLIN, CW21

Continued from p. 5

The secret is to figure out what you are best at, where your passion lies, and specialize. What do you bring to the industry that is unique? Make a name for yourself and there will always be work.

Twelve years ago when I graduated from the University of Arizona and was contemplating my career in watchmaking, a jewelry store owner told me, "If you become a watchmaker, you will never run out of work to do." He was right. There is no shortage of watches that need service or repair. If you are a watchmaker or clockmaker, I know you are a problem solver, and you want to tackle every job that comes your way. Maybe you can't work on every brand, but if you are talented, your services are needed. Pick an area where you can be successful and become the best that you can be.

We want to hear from you. If you have taken one of the amazing opportunities available to horologists today, please let us know. We want to hear your story. Tell us why you think it is a great time to be a watchmaker, clockmaker, or horological manufacturer. If you think I'm wrong, let us know that as well. We are here to tell your story. Give us a call. Send us an email. Write us a note. We want to hear from you.

Battery Safety

By Bob Little, CC, CW

A fire broke out in the garage of a fairly new house in a neighborhood near Columbus, Ohio. The fire originated in a wastebasket and was traced to a 9-volt battery that had been disposed of in the waste basket. Apparently, the contacts touched something metallic and had just enough power to start the fire. The fire department advises people to always replace the plastic cover that came with the battery to protect the terminals. They add that the cover should be taped on with nonconductive tape, such as blue "painter's tape." If the cover has been lost or thrown away, the battery should have the contacts covered by wrapping with several layers of the nonconductive tape. See photo below.

Repair shops often have devices such as test meters and smoke detectors that still use 9-volt batteries with the contacts close together on the same end. Taking this extra precaution might prevent a devastating fire.

Note: Batteries should be recycled whenever possible, and the terminals should still be protected even if the batteries are put in a recycling bin.



Bob Little is a certified watchmaker and clockmaker who owns and operates a watch, clock, and jewelry repair shop in Logan, Ohio.



$59.99

The Watch Repairer's Manual
by Henry B. Fried

This book is frequently used as the textbook for courses in watch and clock repair. It is ideal for individual study as well. Published in 1986, the 4th edition includes the six chapters on case settings and winding systems, motor barrels and jeweled main wheels, the verge fusee watch, repairing fusee chains, how to make a verge (staff), and the duplex escapement, which were not present in earlier editions. A total of 26 chapters comprise this 456-page book, along with a glossary, appendices, and over 550 illustrations.

Written by Henry B. Fried, dean of American watchmakers, BHI Silver Medalist, and honored teacher, this book is the perfect reference for the beginner, the trade watchmaker, hobbyist, collector, or anyone interested in horology.
To order, go to the online store at **www.awci.com**.

Recommended reading for CW21 certification

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In Summary

By Aaron Recksiek, CW21

Jewelry Store Robberies Lead to First Fatalities of 2017

Two separate robberies occurred in late January marking the first jewelry store robbery fatalities of 2017 reported by Jewelers Circular Keystone. The first occurred January 21 in Henderson, Nevada, at a location of Jared the Galleria of Jewelry. A man brandished a gun inside the store. When a store security guard intervened and attempted to shoot the robbery suspect, the security guard's shot missed the robber and accidentally struck a female employee who later died from her injuries. The suspect escaped the scene without any cash or jewelry and was still on the loose at the time of the report. Authorities were checking surveillance footage from nearby businesses to try to track down the suspect. The second robbery took place at a Kay Jewelers in San Antonio, Texas, inside the Rolling Oaks Mall. Two armed men entered the store attempting a robbery when Jonathan Murphy, a former Marine, intervened. The Marine was a customer of the store who was there with his wife to get their rings cleaned. The Good Samaritan was shot and killed during the struggle. Another shopper, who is licensed to carry a concealed firearm, shot and wounded one of the robbers while the other fled the scene. The wounded robber was apprehended at the scene, while the second robber was apprehended a short time later after crashing a stolen car. Both men are being charged with capital murder and aggravated assault.

For tips to prevent jewelry store robberies or minimize damage:

www.jckonline.com/2016/02/19/50-tips-prevent-jewelry-store-robberies-or-minimize-damage-should-they-occur

www.jckonline.com/2017/01/23/two-killed-jewelry-store-robberies-over-weekend

www.reviewjournal.com/crime/shootings/employee-accidentally-shot-killed-security-guard-during-attempted-jewelry-store

http://news4sanantonio.com/news/local/breaking-shooting-at-rolling-oaks-mall

More Management Changes at Richemont Brands

Amid the rocky landscape that is currently the Swiss watchmaking industry, Richemont is continuing to make management changes affecting many top brand CEOs. In separate reports from Reuters and Bloomberg News, the CEOs of Dunhill, Jaeger-LeCoultre, Piaget, and Vacheron Constantin will be changing in the next few months. Two CEOs will be retiring, Juan-Carlos Torres, of Vacheron Constantin, and Philippe Leopold-Metzger of Piaget, while Fabrizio Cardinali of Dunhill, and Daniel Riedo of Jaeger-LeCoultre are leaving to "pursue other opportunities." The weakening demand for Swiss luxury watches is being blamed for many of the changes. Richemont Chairman Johann Rupert was quoted speaking to a group of investors, talking about the board of directors, "I want to see less grey men, less grey Frenchmen, as a subcategory," and "We have too few women. We don't have enough diversity."

www.hodinkee.com/articles/richemont-will-replace-four-brand-ceos-in-the-coming-months

www.bloomberg.com/news/articles/2017-01-30/four-richemont-brand-ceos-including-dunhill-said-to-depart

www.reuters.com/article/richemont-ceos-idUSL5N1FK5E9

SIHH 2017

Citing the event's own website, "The Salon International de la Haute Horlogerie is the year's first gathering of professionals in the watchmaking segment. Held in January, it sets the tone for the twelve months to come as it rolls out the latest trends." It's a chance for some brands, typically Richemont brands with a handful of independent watchmakers, to debut new product before the larger and more accessible Baselworld show. The show is five days of wining and dining, along with mini boutiques for each brand amid luxurious hallways. Here are a few watch highlights for the 27th season of the event. The Panerai LAB-ID Luminor 1950 Carbotech 3 Days, containing a movement with bridges made of ceramic-like material and escapement components made of silicon. The watch movement requires no lubrication and comes with a 50-year guarantee. Greubel Forsey debuted their first watch with a chiming complication, the Grande Sonnerie, which also manages to include the brand's signature inclined 24-second tourbillon. Montblanc came out with the limited edition TimeWalker Chronograph 1000, a chronograph that can mechanically measure and display the time accurately to the 1000th of a second. Vacheron Constantin followed their recent trend in setting the bar for the rest of the watchmaking community by debuting the most complicated wristwatch they have ever made to supplement the most complicated timepiece ever made that they produced in 2015. Only one version of The Les Cabinotiers Celestia Astronomical Grand Complication 3600 has been produced so far. It features 23 complications, and sold at the show for over $1,000,000.

https://sihh.org

http://www.panerai.com/en-us/collections/special-editions/2017/panerai-lab-id_---luminor-1950-carbotech-3-days---49mm_pam00700.html

www.greubelforsey.com/en/collection/grande-sonnerie

http://sihh.vacheron-constantin.com/en2/astronomical-watches/les-cabinotiers-celestia-astronomical-grand-complication.html

www.hautetime.com/close-up-with-the-montblanc-timewalker-chronograph-1000-limited-edition-18-watch/81176/

Rolex was a Main Sponsor at Academy Awards

Rolex significantly expanded their sponsorship role for the 89th Academy Awards. Last year Rolex was brought on as a sponsor of the Oscars Greenroom, a backstage hangout for the celebrities and their guests. This year they continued to sponsor the Greenroom but were brought on as a main sponsor for the entire event. Rolex has a dedicated amount of philanthropic funding set aside each year for support of the arts, some of which is spent on the filmmaking industry through the Rolex Mentor and Protégé Arts Initiative. The 89th Academy Awards was broadcast on Sunday, February 26 at 7:30 p.m. ET.

www.jckonline.com/2017/02/01/rolex-sponsor-academy-awards

www.hodinkee.com/articles/rolex-to-sponsor-the-89th-academy-awards

Aaron Recksiek is an independent watchmaker in Salt Lake City, Utah. He is a graduate of the 2008 WOSTEP class at the Lititz Watch Technicum.



Have you always wanted to learn from the experts, the historians, the scientists?



Now you have the chance to do just that! Thanks to the Horological Society of New York, AWCI members can watch videos of the fascinating lectures presented at HSNY. The lineup of speakers is eclectic. Here are the distinguished speakers you can watch to date.

François-Paul Journe on The History of the Calendar

François-Paul Journe, Jack Forster, Pierre Halimi Lacharlotte, and Keith Lehman discuss the development of calendars and their importance in human societies from early times to the present. The first watches showing the date were made more than two centuries ago, today they have evolved into ultra-complicated timepieces.

Dr. Demetrios Matsakis, Chief Scientist for Time Services at the US Naval Observatory, on the Nature of Time

Dr. Matsakis lectures on the nature of time, beginning with Isaac Newton's laws of motion and gravity and progresses through history to Albert Einstein's theory of relativity. He also discusses causality and the concept of worm holes that we often see depicted in movies. A lively Q&A follows this thought-provoking lecture.

Michael Friedman, Historian for Audemars Piquet, on Intertwining Roots—Watchmaking, Artisanship, and Technology

Michael Friedman explores how watchmaking's intertwined relationship with art and technology has been central to its evolution during the past 500 years. He examines key moments during the 1500s, the mid-1600s, the early 1800s, the Industrial Revolution, the mid-20th century, the quartz era, and the present day. Friedman sheds light on why mechanical watches continue to galvanize collectors and enthusiasts worldwide, and why this is a golden age of highly creative and innovative watchmaking.

More videos will be added as they are created. The Horological Society of New York has been giving this lecture series for 150 years. Recently they have welcomed notable horologists such as watchmakers Roger Smith and Kari Voutilainen, and Rory McEvoy, Curator of Horology at the Royal Observatory. We look forward to sharing in this outstanding lecture series!



To watch the videos, go to www.awci.com/hsny or www.hs-ny.org. Check your email for the password.



"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.

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From the Workshop

By Jack Kurdzionak, CW21, FAWCI

A Neat Work Space = Peace of Mind and Focus

Member Robert Mohr of Kansas was kind enough to write a letter of appreciation to me about the January article that focused on New Year's resolutions. He said that he usually reads this column first, due to its relevance to his working life. That comment validates my focus each month, which is to help professional watchmakers do quality work, work efficiently, and maximize their income. Robert wrote, "I learned at WOSTEP back in the 1970s that a clean, organized bench top and workshop at the start and ending of the day brought a peace of mind and focus."

During my own youth, many years ago, I believed I could do all things at once, remember everything possible, and keep tools, equipment, and supplies close by just to have them there if they were needed. My youth and middle years have disappeared, and I have accepted the limitations and a bit of wisdom that arrive gradually with age. I still can do many things, but not at the same time. They are best done sequentially. Although my memory is still sharp, I enlist the help of a computer, parts envelopes organized into a parts cabinet, and a regular trip to our town transfer station (once known as the town dump) to dispose of unneeded watch repair refuse.

In his letter Robert stated how he reviewed his own job performance utilizing a stopwatch to determine the real time required to repair a watch. He understood that too many watchmakers often relied upon irrelevant pricing information to determine their repair charges. That irrelevant information included guessing how much time and material are needed for a repair, what they think others charge and reducing that amount by a few dollars to increase market share, or assuming how much a client believes a repair is worth. By using a stopwatch, Robert learned the true cost of the time involved in each category of repair, thus he could calculate a sensible, realistic price for a given repair.

Finally, he mentioned how he had acquired some watchmakers's parts and equipment from the estates of watchmakers who had passed away, only to learn that many watchmakers are hoarders. Although neither he nor I understand the psychology of hoarding, it is in our best interests to recognize it when we let it get in the way of our primary task of repairing watches. He understands there is no free space anywhere in a workplace. All space in the workplace costs something. Either in rent or time to fill it and then empty it. He regularly moves out the "stuff" that does not pay its own way to make space for other stuff that will enhance his business. Thank you, Robert, for taking the time to share your thoughts with me and our membership.

You Supplied the Wrong Balance Staff

I believe every watch material dealer has heard that comment more than once, especially when the watchmaker has ordered a Waltham 16 size, taper shoulder, friction balance staff (ref. 4861). Figure 1 is the Waltham 4861 staff and the steel hub (ref. 4866).



Fig. 1. The Waltham 4861 staff and the steel hub.

Figure 2 is the staff in the hub improperly driven out of the balance wheel. Figure 3 is how the balance wheel should appear with its hub secured. The Waltham, Hamilton, and Howard companies used friction staffs in many of their products as they had several advantages over riveted staffs. Friction staffs were fit utilizing a staking tool only; no lathe work was needed. They could be replaced innumerable times without any damage to the center hole in the balance wheel. Friction staffs minimized the need to true and re-poise a balance wheel after staff replacement. The strong steel hub absorbed all of the stresses of removal and insertion of a new staff. Friction staffs were not utilized for smaller movements as the hub required a longer balance staff than a thin movement could accommodate.

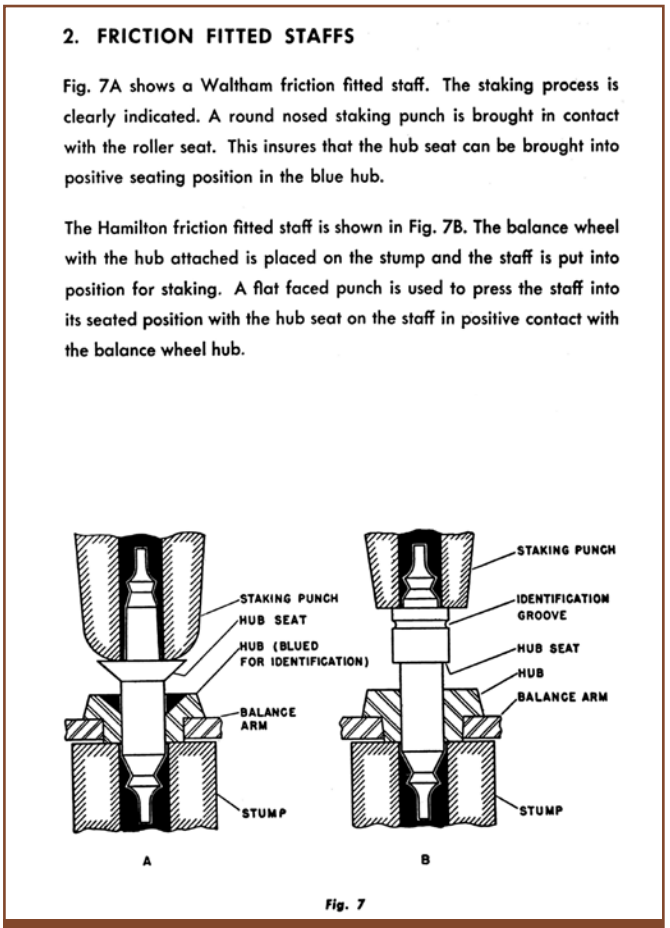


Fig. 2. The staff in the hub improperly driven out of the balance wheel.



Fig. 3. How the balance wheel should appear with its hub secured.

Waltham alerted watchmakers to their friction staff models by bluing the hub, while Hamilton put an extra groove in the periphery of the staff as seen in Figure 4[1]. Watchmakers unfamiliar with the Waltham friction staff could easily mistake the friction staff in its hub as a single unit that resembled a riveted staff. Sometimes they would cut the staff out in a lathe as one would remove a riveted staff, thus rendering the hub useless. Others would simply punch out the staff and hub as a unit as shown in Figure 2. When they received the correct staff for the watch, there was no way to fit it to the balance wheel without its hub. If the hub was destroyed, a replacement was needed. If the hub and staff



2. FRICTION FITTED STAFFS

Fig. 7A shows a Waltham friction fitted staff. The staking process is clearly indicated. A round nosed staking punch is brought in contact with the roller seat. This insures that the hub seat can be brought into positive seating position in the blue hub.

The Hamilton friction fitted staff is shown in Fig. 7B. The balance wheel with the hub attached is placed on the stump and the staff is put into position for staking. A flat faced punch is used to press the staff into its seated position with the hub seat on the staff in positive contact with the balance wheel hub.

Fig. 7

Fig. 4. The proper stumps and punches to use when driving home the replacement staff. Hamilton put an extra groove in the periphery of the staff (Figure 7, View B).

1. *Watch Repair Training Manual* (Bulova School of Watchmaking, 1980), 16.

were just punched out as a unit, the staff could be removed from the hub, and the hub or a replacement hub could be riveted to the balance wheel. Either way, this unnecessary work could easily be avoided by just studying the staff before driving it out after removing the hairspring and roller table. Both the Waltham and Hamilton friction staffs are pushed out of their hubs from the hairspring side of the balance. Support the hub on a stump with a hole just large enough to accept the staff without binding, yet small enough to support the hub while the staff is pushed from the hub. Then select an appropriate punch to push the staff out of the hub. The hub absorbs all of the stresses involved during staff replacement. Figure 4 illustrates the proper stumps and punches to use when driving home the replacement staff. The old-time watchmakers appreciated friction staffs because they simplified the task of staff replacement and had fewer complications arising from previous balance staff replacements.

Other than the method of staff removal from the balance and its replacement, all other techniques for hairspring and roller service are the same as described in last month's workshop article. If you follow this advice, as well as that written in both the Fried[2] and Bulova[3] books, you will never say to your material supplier, "You supplied the wrong balance staff."

Basel Again

I'll be off to Basel again to attend Baselworld 2017. Most of the time I go with a companion, but this year I will be going solo. In past years I have left Boston on a Tuesday evening, flown to Zurich, got some rest on Wednesday and hit the ground running on Thursday morning. As age catches up with me I find I am hitting the ground walking slowly rather than running. This year I will be arriving earlier and taking more time to make some factory visits, meet with old friends, and attend Baselworld.

Baselworld should be more interesting this year with all of the upheavals occurring in the Swiss watch industry, many of which have been reported in our "Industry News" column. Last year I sensed some major changes at Basel that have been followed up by numerous dismal reports of the watch industry in general, and various firms being offered for sale along with a bankruptcy or two. I will be reporting back to you upon my return.

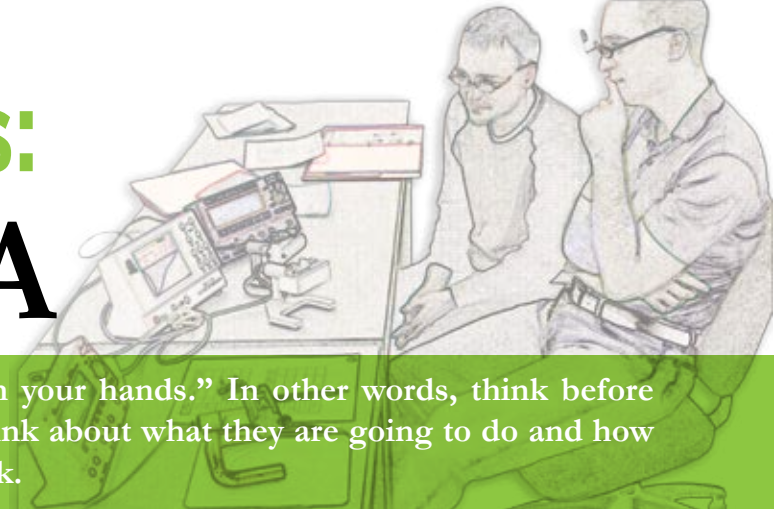
2. Henry B. Fried. *The Watch Repairer's Manual* (D. Van Nostrand, 1961), Chapter VII.
3. *Watch Repair Training Manual* (Bulova School of Watchmaking, 1980), Training Unit 1.

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.

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Sit on Your Hands: Horology Q&A



A wise horologist once said, "You should sit on your hands." In other words, think before you act. Good watchmakers and clockmakers think about what they are going to do and how they're going to do it before they begin their work.

Q What book on horology do you consider a "must read" and why?

Omega—A Journey through Time. Extremely informative and a must read for any Omega lover.

—Antrosesam Ramons

Theory of Horology and George Daniels's ***Watchmaking***.

—Jeff D'Amico

The Practical Watch Escapement by George Daniels. Like most of Daniels's books and the classic text ***Watchmaking***, it is written in such a way that you can understand the concept he is explaining.

—Glen Nutting

Like all good answers, mine is two parts! I would consider my "must read" one of the obvious choices— George Daniels's ***Watchmaking***. But in ignoring one of the obvious choices (including Mr. Perkins's books), I would put Steffan Pahlow's ***Tourbillion*** and his ***The Classical Pocket-Watch Case*** as required. Both are excellent and detailed publications and cover what could be seen as a practical application of techniques (as described so well by Daniels and sometimes expounded upon by Pahlow) to a project. While Pahlow doesn't teach the techniques like Daniels does. Reading through the growth of the projects and the hows and whys is a great mental exercise and has been very enlightening. (Besides I can't resist a beautiful book filled with CAD drawings of pocket watch parts and designs!)

—Peter A. Laktos

Horological Times because it informs readers about the changes in the field of horology.

—Paul Corn

I'm hoping to get my hands on ***Practical Watch Repairing*** by Donald de Carle soon!

—Marcelo Dietrich

Henry B. Fried's ***The Watch Repairer's Manual***. You are most likely going to school for watches if you are reading this book. ***The Watchmakers Lathe and How to Use*** It will be my next purchase!

—Dylan Rich

I quite like de Carle's ***Practical Watch Adjusting***. It really gets into hairspring and other escapement adjustment.

—Christopher Soto

Theory of Horology followed closely by ***The Watch Repairer's Manual.***

—Curtis Jackson

Best of J.E. Coleman

—Wendell Sharp

The ***HT archives***. I have gone back through them numerous times looking for something and have found something else that I printed and read. I got in the habit of doing this on a regular basis. The archive is a real treasure. [To access the HT archives, go to www.awci.com and log on as a member. Then go to Horological Times and then to Archive Issues. You'll find every issue of HT all the way back to January 1977.]

—Bob Little

The Watch Repairer's Manual by Henry B. Fried. It covers the important basics and methods of watchmaking/repairing. Further, the text and diagrams are very detailed and still easy to understand for even the novices.

—WH Jeep

The Watch Repairer's Manual by Fried is awesome! It's expensive but worth it.

—Dan Patten

I've always wanted my own copy of ***Theory of Horology***. Used to browse a past mentor's copy. Or either of Perkins's restoration books too [***Antique Watch Restoration, Volumes I and II***].

—Peter A. Laktos

Practical Benchwork for Horologists by Louis and Samuel Levin. ***Time and Timekeepers*** by Willis Milham for an overall history, and ***The Watch and Clock Makers Handbook, Dictionary, and Guide*** by F.J. Britten

—Nathan Smilie

George Daniels's ***Watchmaking*** has been my favorite book from the day I first discovered it. It is both educational and inspiring. With this book, young watchmakers have a very solid first step to making their own watches. It was written by one of the greatest watchmakers of our time, and it contains timeless wisdom and cutting-edge techniques still being explored today. A must-have in any horological library!

—Andrew DeKeyser

Theory of Horology (Charles-Andre Reymondin, Georges Monnier, Didier Jeanneret, and Umberto Pelaratti) is good for theory. ***Revolution in Time: Clocks and the Making of the Modern World*** (David S. Landes) is good for horological history, to know when certain components of timekeepers were developed. ***Modern Watch Repairing and Adjusting*** (E.A. Borer) is an older book but good for practical troubleshooting or technical advice. It helped me understand how parts interact and affect one another.

—Hannah Mancill

Theory of Horology. I have been thinking about getting this book for a while.

—Brandon Williams

*Editor's Note: *Antique Watch Restoration, Volumes I & II, Best of J.E. Coleman, Theory of Horology, The Watch Repairer's Manual, The Watchmakers Lathe and How to Use It* are all available for purchase through AWCI or for loan through AWCI's library. Contact the member services coordinator at **memserv@awci.com** or call **866-367-2924 to order your copy**.

The Next Question

What advice can you offer watchmakers and clockmakers who are new to the field?

Please submit your response to **answers@awci.com** by **April 6, 2017.**
Join us on Facebook—facebook.com/MyAWCI or facebook.com/horologicaltimes, where we will post the next question the first of every month. If you haven't liked *Horological Times* on Facebook yet, do it now! You can also look for the next question in the email newsletter, which goes out the first week of every month. Your name will be entered in a drawing to win a prize from our grab bag of horological treasures.

CONGRATULATIONS to our winner, **Marcelo Dietrich,** who wins *Practical Watch Repairing* by Donald De Carle.

Joshua Shapiro

By Aaron Recksiek, CW21

Engine turning or guilloche is defined as a style of hand or machine finishing with intersecting wavy or straight lines. Most of the time a combination of the two in a variety of different patterns are used on each workpiece. This finishing is usually an indication of a high-grade and classically designed timepiece. As George Daniels described it in his 1981 book, *Watchmaking*, "The complication of the work and the skills required confined the process to the most expensive hand-made watches." This level of finishing can be found on several places inside and out on a fine timepiece, but is most common on the movement bridges, rotor, case components, and, of course, dials.


Joshua Shapiro

Abraham-Louis Breguet was the first noted watchmaker to incorporate guilloche on his dials. He picked up the idea to use the finish for his watches from a trip to London where he found many pieces of wooden furniture that were engraved with a type of guilloche engraving. A.L. Breguet liked the design not only for its pleasant appearance but also for its functional benefits, including greater legibility of the hands. With a dial made up of patterns, texture, and depth, more refined hands could be used. This eventually led to the use of simple, blued-steel hands with a circular crescent moon shape and attached triangular tip, referred to today simply as "Breguet hands."

Today, there are only a handful of watchmakers or brands that incorporate traditional guilloche on their watch dials. Of course, Montres Breguet SA, the modern incarnation of Breguet et Fils, the company A.L. Breguet started with his son Louis, uses a combination of traditional and modern methods to achieve the classic look. However, not many individuals make dials almost exactly like A.L. Breguet did in the 18th century. Among those who do are Roger Smith, the famous watchmaker from Isle of Man who apprenticed with George Daniels, and Joshua Shapiro, a California-based artisan.

1Can Spirit

pieces Again

Shapiro grew up around a machine shop; his father and grandfather were machinists and owned a sandblasting business. As much as he loved the machines and watching things being manufactured, he started on his own path, studying history at UCLA. With a history degree in hand, Shapiro decided to go into teaching shortly after graduation. Before college, he was an accomplished pole vaulter, and his first job took him back to his high school to be a track and field coach. Arcadia High School had over 4,000 students at the time, with over 400 students enrolled in the track and field program. This, and working on his master's degree, kept Shapiro very busy for the six years he was there. Shapiro moved on to teaching history at two different private schools and eventually moved to a more administrative role. He currently is Vice Principal of Secular Studies at Yeshivat Ohr Chanoch, a private Orthodox Jewish high school located in Los Angeles, California.



A wristwatch conversion and custom dial manufactured by Josh on a Hamilton 921 pocket watch.

In 2011, around the time that Shapiro got married, he became fascinated with watches. This brought back the joy he had experienced being around his family's machine shop as a kid. He dove headfirst into the world of watches, studying *Watchmaking* by George Daniels, and completing the distance-learning course offered by the British Horological Institute. He experimented with skeletonizing some existing watches to become familiar working with small tools in tight tolerances. During this time, it quickly became apparent that making an entire watch would be extremely difficult and require more time than he could spend on it. He was drawn to the 13th and final chapter, Engine-Turned Cases and Dials, of George Daniels's book.

The last four years Shapiro has spent an enormous amount of time and money amassing the tools necessary to create engine-turned dials at a professional level. He began to model his workshop after watching online videos by Roger Smith, where he shows the machines and techniques used in the manufacture of his dials. He even resorted to selling some classic cars he had collected to pay for the new tools. He currently has in



Shaprio in the process of applying a basket weave finish on a David Walter Presidio watch dial.

his machine shop two rose engine lathes, a Schaublin 102, an 8mm Levin, a Hauser 3BA jig borer, a Dyna CNC mill, a Sherline lathe and mill, and a fiber laser that he uses to engrave numerals and cut out hands. When Shapiro sent an email to Roger Smith in 2013 asking what steel he uses to make his hands, he later received a hand-written letter with a stack of 1075 spring steel, the same steel Smith uses. They have been corresponding ever since, and Shapiro has been invited to visit Smith's workshop, an invitation he plans to take advantage of soon.

The first dials Shapiro completed were bespoke projects for some private clients, one being a watch with a Hamilton 921 movement. He got involved with the local watchmaking and collector community for a few years, getting advice from notable independent advocate Tim Jackson along the way. The projects he was commissioned to work on were inevitable learning opportunities. He met David Walter (see "American Spirit" in HT February 2017) about a year and a half ago and struck an agreement to produce the dials for his Presidio line of watches. So far, he has made five completed dials for Walter, and it took manufacturing 11 dials to get enough that would meet his personally imposed, strict standard of quality. With this success, Shapiro has recently been contacted by many independent watchmakers to produce some special edition dials, including Schmutz Watches, Donald W. Corson, and Torsti Laine.

The dials he prefers to make are "single layer," which means all the different finishes are made on one piece of metal, so when a mistake is made on one finish, the entire dial is scrapped. This method is riskier than making "multi-layer" dials, which allows you to manufacture separate layers and attach them in the finishing process, making each section reproducible on its own if a mistake is made. In Shapiro's own words, "A single level engine turning dial specifically with the basket weave is so difficult because the cuts have to start and stop within a border. It is literally like putting a square into a circle at the microscopic level. The first cut of the basket weave I must put a .488mm-sided square into a .5mm border. If I mess that up, it goes in the chapter ring and it's time to start over. Conversely, a multi-level dial is difficult because the different levels must be perfectly machined to fit



Shapiro presenting a completed David Walter Presidio dial.

into their recesses and soldered without destroying the engine-turned parts. They both take about the same amount of time, but both are extremely difficult."

The most recent projects Shapiro has taken on are his most challenging to date and will inevitably be his most rewarding. A private client has asked him to produce a dial for a Breguet quarter-repeater pocket watch from 1808, a watch that may have been handled by A.L. Breguet himself. Some collectors might see this as heresy, but Shapiro sees it as keeping it within the spirit of the watch: A.L. Breguet would often swap out dials for engine-turned ones at a client's request.

Shapiro has also been working on his own line of limited watches to be available sometime this year. They will consist of 18kt-gold cases and movements that are not as common as some of the current mass-manufactured movements being used. The dials will be the ultimate focus. However, Shapiro aims for the quality to be as good as what Roger Smith is producing. The dials will be single-level, utilizing a very fine basket-weave pattern as well as some other patterns that have never been done before. Shapiro estimates that 150 hours will be spent on the manufacturing process for each dial.

With a full-time education administrator career, and part-time machinist passion projects, Shapiro still finds time for his wife, Ana, his four-year-old daughter, Rivka Leah, and his 18-month-old son, Meir. He is very active on Instagram, @engineturned, and plans to produce a series of YouTube videos later this year that will reveal the process of his dial production.

Sources

Daniels, George. *Watchmaking*. London: Philip Wilson Publishers,1981.

en.worldtempus.com/article/watches/innovation-and-technology/breguet-the-art-of-engine-turning-23192.html

www.breguet.com/en/history

Aaron Recksiek is an independent watchmaker in Salt Lake City, Utah. He is a graduate of the 2008 WOSTEP class at the Lititz Watch Technicum.

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Looking at Options: Business and Workshop Practices Survey

By Hannah Mancill

At AWCI's 2016 annual convention, we administered a survey to gather information from independent watchmakers and clockmakers (those who work in their own shop or in a retail environment). Our goal was to aid members in evaluating and improving business decisions, product selection, and workshop practices.

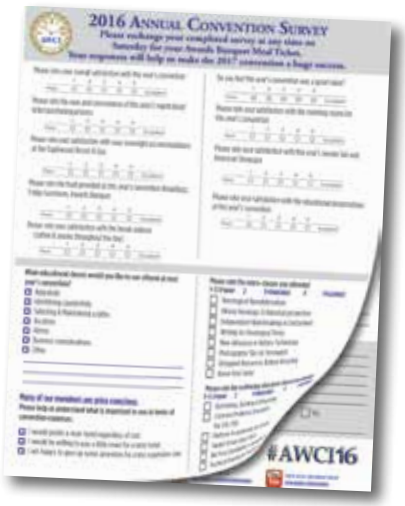
After reviewing the survey results, we realized we'd gathered too much information to be released in a single edition of the HT. Additionally, although in many cases it was clear which products and practices were most popular among survey-takers, the reason for the popularity remained unclear. Has a watchmaker or clockmaker had a bad experience with a certain business decision leading them to select something different? Do they choose one product over another because of its superior quality? In order to consider an alternative product or practice an improvement of their setup, a watchmaker or clockmaker must understand the benefit of this alternative. Otherwise, change is simply not practical.

In setting up their workshops, watchmakers and clockmakers needed to make several choices about how they would operate (from what brand of battery to use to whether or not to charge for an estimate). Most independents probably went through several iterations of their workshop plans before finalizing them. As they discovered less-expensive or better-quality products, they replaced more-expensive or poorer-quality products. As natural disasters or other mishaps occurred (flood, fire, theft), their insurance coverage kicked in, the effectiveness of which probably determined whether or not they continued using the plan or company. Over time, experience teaches watchmakers and clockmakers what is beneficial and what to avoid. Sharing these experiences with new independents can save them several steps in finding the right fit for their businesses.

Not only new independents can benefit from this column; well-established independents can too. If watchmakers or clockmakers have been in business 10 years without updating much, they may not have heard of a tool or technique that could save time or money. If someone is considering whether or not to add an employee and can't decide if the benefit is worth the cost, others who made the same decision in the past may offer helpful advice.

So, we've decided to divide the larger survey conducted at the convention into several shorter surveys and to generate additional questions purposed to not only reveal the most popular products, workshop setups, and business choices but to identify thought processes used to make these decisions.

Starting in this issue, a new, short survey will be released each month as part of a column entitled "Looking at Options." Surveys will be available online via SurveyMonkey.com (look for the URL each month) as well as in HT and on Facebook. The results of the survey will be published in the subsequent issue of the HT along with a copy of the next survey and an article providing a neutral comparison of the products or practices discussed in the previous month's survey (batteries, insurance companies, dial refinishers, etc.). For example, the survey concerning the topic of batteries is part of this month's issue. Next month's column will include



the results of the battery survey and an article comparing battery brands. Topics will include: customer service, productivity, cleanliness, employees, batteries, insurance, dial refinishing, and operating costs among others.

In an effort to include stories of personal learning experiences (which were some of the most interesting and educational parts of the discussion at the convention), some surveys will request contact information for readers willing to divulge anecdotes related to the topic. Interested survey-takers may provide their telephone number or email address, so we may obtain a verbal or written description of the account for possible inclusion in the following issue. Photographs and resources that have informed your decisions are also welcome as well as anything you feel another independent might find useful. (Please note: Readers may still participate in the surveys without providing their contact information.)

Experience teaches us what is beneficial and what to avoid. Sharing these experiences with new independents can save them several steps in finding the right fit for their businesses.

Although questions were created with the independent watchmaker in mind, all readers are invited to participate. If you participated in the survey while at the convention, please also answer these surveys. We need as much reader involvement as possible to most accurately reflect the way the majority of independent watchmakers operate their businesses. Experienced watchmakers and clockmakers, we would love to hear from you. What works? What doesn't? Help your colleagues make good decisions and avoid pitfalls.

Editor's Note: Thanks to Drew Zimmerman, CW21, for initiating the survey at the convention and for moderating the discussion that resulted from it.

Hannah Mancill is a graduate of the North American Institute of Swiss Watchmaking and a watchmaker at a service center in Texas.

To take the Battery Survey, go to: https://www.surveymonkey.com/r/35CC875

Battery Survey

If you don't want to take the survey online, answer the questions below and email to editor@awci.com.

1. What is your preferred battery brand? ***Please select only one answer.***
- A. Casio
- B. Duracell
- C. Energizer
- D. Eveready
- E. Maxell
- F. Panasonic
- G. Renata
- H. Seizaiken (Seiko)
- I. Other

2. What is the primary reason for your preferred battery brand? ***Please select only one answer.***
- A. Easily Obtainable
- B. Longer Lasting
- C. Affordable
- D. Recommended
- E. Other

3. Where do you obtain your batteries? ***Please select only one answer.***
- A. Jules Borel & Co.
- B. Cas-Ker
- C. Eckcells
- D. Box Store
- E. Online (Amazon, etc.)
- F. Other

4. What is the primary reason you obtain batteries from this supplier? ***Please select only one answer.***
- A. Customer Service
- B. Convenience
- C. Affordability
- D. Recommended
- E. Industry Supporting
- F. Other

5. Are you satisfied with your supplier's battery cost?
- A. Yes
- B. No

6. Have you experienced comparably shorter shelf life in a particular brand of battery? ***Select all that apply.***
- A. Casio
- B. Duracell
- C. Energizer
- D. Eveready
- E. Maxell
- F. Panasonic
- G. Renata
- H. Seizaiken (Seiko)
- I. Other
- J. I have not experienced comparably shorter shelf life in a particular brand.

7. Have you experienced frequent corrosion/leakage from a particular brand of battery? ***Select all that apply.***
- A. Casio
- B. Duracell
- C. Energizer
- D. Eveready
- E. Maxell
- F. Panasonic
- G. Renata
- H. Seizaiken (Seiko)
- I. Other
- J. I have not experienced battery corrosion occurring more frequently in any brand

8. Do you use any kind of recycling program for your batteries?
- A. Yes
- B. No

9. Which battery recycling program, if any, do you use?

10. Comments

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~Ernest Tope
Local Tampa resident
Masterpiece Watch Restoration, LLC



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Watchmaking Excellence: CW21 Standards

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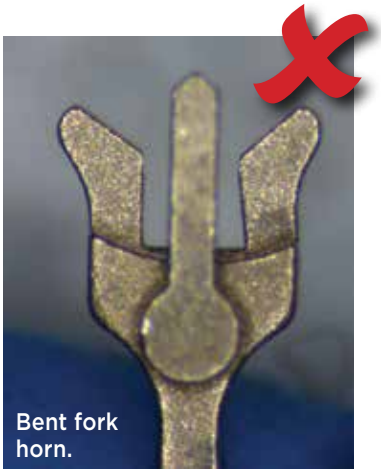
All components must be perfectly clean and in good condition. No particles of dust, debris, or lint are acceptable. The parts should be inspected for damage or wear. Some items, such as a bent guard pin or fork horn, should be detected during the check of their function. If missed in a visual inspection, chipped or worn pallet stones, fork horn slots, or other damage may not be detected until the watch is on the timing machine.


Clean Pallet Stone.


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Bent fork horn.


Damage in fork slot.

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Tessa Gilmore	OK	Scott Niles	OK		

CONGRATULATIONS !

To our members who have recently passed the CW21 EXAM

Tomas Flores	TX	Michael Griner	FL
Zoltan Balazs	NY	Froilan Laygo	NC

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The ELM Trust of AWCI is a recognized 501 (c) (3) charitable organization with a three-pronged mission as indicated by the acronym of its name ELM. The E represents our educational mission to assist schools and students of horology; the L represents our obligation to establish and maintain a horological library; and the M stands for our purpose to establish and maintain a museum containing items of horological interest. The ELM Trust welcomes and appreciates your tax-deductible donation to help it fulfill its mission. Recent donors include the following:

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Horological Society of New York (HSNY)

The following information was obtained from The Horologist's Loupe, *submitted by Walter Pangretitsch, Recording Secretary, HSNY, Copyright©2017. Published by the Horological Society of New York, Inc.; All rights reserved.*

At HSNY's February meeting, John Reardon, International Head of Watches, Christie's, explored how people make a living within the world of watches and horology with "Time is Money - How to Make a Living in the World of Watches."

The scope of Reardon's lecture included stories from the auction industry, museum world, retailers, vintage watch dealers, watchmakers, marketers, designers, photographers, bloggers, social influencers, and more, all underlining how people make a living doing what they love. Reardon shared stories of numerous industry insiders and the many paths people take to be part of this fascinating worldwide community.

John Reardon first became interested in clocks and watches while interning at the American Watch and Clock Museum in his hometown of Bristol, Connecticut, where he learned clock repair and restoration. While completing a degree in history and languages, he worked as a curatorial assistant at the Willard House and Clock Museum in Grafton, Massachusetts. His passion for all things horological brought him to the auction world in New York in the 1990s where his academic and commercial focus turned to watches. In 2001, he joined Patek Philippe USA and become a noted author, writer, and researcher in all things related to the famous Swiss manufacture. After a decade with Patek Philippe, he rejoined the auction world and is presently the International Head of Watches at Christie's. He is a contributing writer for the "Life and Times" feature in Patek Philippe's magazine and has written three books on the history of watches, most notably *Patek Philippe in America: Marketing the World's Foremost Watch.*

At the January HSNY meeting, Bob Frishman delivered a lecture on "Horology in Art." Frishman discussed the symbolism of timepieces included in famous artwork, from classical to modern. In one example, Frishman showed the 1812 portrait of Napoleon by Jacques-Louis David, which features a clock showing the time of 4:00 a.m. The early-morning hour was depicted to show that Napoleon was working hard at all hours of the day. In another example, Frishman showed the 1653 Velazquez portrait of Infanta Maria Theresa to explain how timepieces were included to show the wealth or sophistication of the subject. Frishman concluded his lecture by inviting the audience to the Horology in Art symposium that he is organizing for the National Association of Watch & Clock Collectors in October at the Boston Museum of Fine Arts.

Horological Education

In 2016, HSNY took its horological education classes on the road, visiting Miami, San Francisco, and Los Angeles. For 2017 HSNY will continue its educational tour by visiting cities across the country, stopping in Chicago, Philadelphia, Seattle, and Silicon Valley.

Horological Education classes were offered in Chicago over the weekend of February 11, at Oak &

Oscar's new offices. The next weekend of February 18, HSNY headed east to Philadelphia, where classes were held at Pipeline Workspaces in Center City.

The hands-on course is taught by HSNY's staff of professional watchmakers. Students work on a mechanical watch movement, studying the gear train, winding and setting mechanisms, and escapement. This four-hour course covers everything taught during the four individual courses usually held in New York City.

The Horological Society of New York Henry Fried Scholarship

Most watchmaking schools in the US are free. Tuition is covered by a sponsoring brand, and usually the only school expense that the students cover are their tools. These schools are full-time, two-year programs, and paying for living expenses can be difficult. The Horological Society of New York wants to help American watchmaking students succeed in every way and awards the Henry Fried Scholarship annually.

Any student who has been accepted or is currently studying at a full-time watchmaking school in the US is eligible for the Henry Fried Scholarship. The scholarship is $5,000 and will be awarded every April at the Horological Society of New York's Annual Gala. To apply, students should email a letter to the HSNY that includes a brief biography and explanation of their motivation to study watchmaking. The application deadline is March 1 of every year. For more information, contact HSNY.

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Minnesota Clockmakers Guild (MCG)

For February Dennis Ondik talked about his blue ribbon, state fair clock and the process he used to make the painted dial. MCG members also viewed and discussed a DVD about the fourth marine chronometer built by John Harrison. The DVD was titled "A Detailed Study of H4."

The son of Jim Winkles donated four door prizes from Jim's estate. They were three-ring binders of clock and watch information, and the winners had their choice. John Findley, Fred Fisher, Steve Nicklaus, and Dan Wagers won the drawing.

For Show and Tell, Ivy Booth successfully completed her skeleton project clock with pendulum movement and brought it to show. Ivy also completed a second skeleton project clock with an escape wheel movement.



Richard Zielike examined Ivy Booth's project clock to see the high-quality work she did.

FUTURE MCG MEETINGS/TOPICS

March 2, 2017 – TBD

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George McNeil's Potomac Guild

(A Guild of the Horological Association of Virginia)

In February Ryan Johnson demonstrated wheel cutting on his Derbyshire lathe. The January speaker was Don Henry, and he reported on his study of tumbling clock plates. He provided details of his different experiments and samples of his results.

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