

HOROLOGICAL TIMES™

AMERICAN WATCHMAKERS-CLOCKMAKERS INSTITUTE

OCTOBER 2010



ISSUE **highlights**

This Month's Focus: Your Business

Last Year for Some Section 179 Tax Breaks

Profitable Watch & Clock Repair

The Mechanical Revival Turns 21

Educate Yourself on Good Business Practices

Making a Watch: The Tourbillon Carriage

AWCI News & Convention Wrap Up

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IN THIS issue

VOLUME 35, NUMBER 10, OCTOBER 2010

features

**Last Year to Take
Advantage of Some
Section 179 Tax Breaks,**
pg. 4

**Profitable Watch and
Clock Repair,**
pg. 6

**The Mechanical Revival
Turns 21. Now What?**
pg. 14

**Announcing a New
Member Benefit from
AWCI,** pg. 20

From the Workshop,
pg. 21

technical discussions

**Challenging Situations:
The Collet,**
pg. 24

Clock Making Elements,
pg. 28

**A 19¢ Fix Could Save You
\$1900,**
pg. 34

**Making a Watch,
Part 3: The Tourbillon
Carriage,** pg. 37

industry news

**Boston Watch Corp.,
Watch Clock &
Jewelry Repair,
Philip Stein Group,**
pg. 13

Book Reviews
pg. 32-33

awci news

President's Message
Mark Butterworth
pg. 2

New Members
pg. 2

**Executive Director's
Message**
James E. Lubic
pg. 3

Bulletin Board
pg. 12

Questions & Answers
David A. Christianson
pg. 27

**AWCI Fiftieth Annual
Convention,**
pg. 42

education

**Insights from Recent
Graduation Speech,**
pg. 47

**Educate Yourself on
Good Business Practices,**
pg. 48

classifieds

Buy Sell Trade
pg. 50-51-52

**AWCI Board of
Directors**
pg. 53

AWCI Staff Directory
pg. 53

Advertisers' Index
pg. 53

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a message from the president

BY MARK BUTTERWORTH



It is Labor Day weekend as I am writing this message. For those of us who live up north, our year really begins on this holiday. It is the beginning of football season. We come to the hard reality that what outside work needs done will have to get done soon

to prepare for the winter—Iowa winters can be brutal. The good news is, in my experience, we are also coming off the low point of the business season, at least for clock repair. People's attention shifts from the outside to the inside and folks rediscover those clocks that have stopped since last winter. The snowbirds will start flocking south by the time you read this and many will find their clocks will not restart after a season of disuse. We look forward to this time with hope and anticipation.

One of my favorite bumper stickers comes from the teaching profession. It reads, "If you think education is expensive, try ignorance." I challenge our members to learn something new each week. It does not need to be earth shaking. Anything new opens the mind. It can better prepare us for a problem or a question on a future job. For example, buy a metric ruler and learn how to read it. Check out a book or some video from the AWCI library. Above all, attend a guild meeting and share experiences with others in the craft. Ask questions; share your exper-

tise. One new thing learned can translate into thousands of dollars of increased income or improved productivity. Increased contacts can mean referral opportunities. It can mean finding someone who has a specialized skill that might help you out someday. The most successful people I know are those who are active. I received a call last week from someone who thought we went out of business as we had changed our telephone number about four years ago. I told him our ad was in every issue of the various trade magazines. He was not a member of anything and doesn't go to meetings. He has no idea of anything going on in the industry or new products for his craft. These people invariably get caught in a death spiral—they decide they cannot afford any tools, dues, meetings, educational programs, etc., and ultimately are forced to simply find a new line of work. They never understand that they simply cannot afford ignorance, and they blame everyone else and everything else for their failures.

While on the subject of change and innovation, we have new personnel at AWCI. We welcome Ms. Amy Dunn, who brings new skills and excitement from the marketing world to AWCI. We look forward to her using these skills to promote membership, advertising revenue, and getting the word out about AWCI. She will serve as our new Marketing Director and Editor of *Horological Times*. I am excited and think you will be, as well.

AWCI new members

Alabama

Wilbur Brady NeSmith-Daphne, AL
D.E. Williams-Mobile, AL

California

Jeff Chou-Hacienda Heights, CA*

Colorado

Peter Newland-Colorado Springs, CO

Georgia

Michael A. Sharp-Griffin, GA*

Hawaii

Lisa Tam-Honolulu, HI*

Illinois

German Alvarez-Northbrook, IL*
Steve Evavold-Chicago, IL
Ronald Geweniger-Wheaton, IL

Indiana

Vincent R. Schrader II-Lafayette, IN

Louisiana

Casey Clayton-Shreveport, LA*

Maryland

Irv Hain-Baltimore, MD*

Minnesota

Theodore Bettein-Clearwater, MN
Daniel R. Warner-Saint Paul, MN

Mississippi

Luiz Goncalves Mendes, Jr.-Campo Grande, MS

Missouri

Richard Duncan-Doniphan, MO*

New York

Wilfredo Alvarez-Rockville Centre, NY*
Mitchell Lodowski-New York, NY*
Jorge Villanueva-Huntington, NY*

Oregon

Sallie Goldwyn-Portland, OR
Mark Wyler-Beaverton, OR*

Pennsylvania

Ian Ainsworth-Lebanon, PA
Caroline Kallman-Philadelphia, PA
Gregg Perry-Topton, PA

Texas

Chris Binkley-Houston, TX*
Charles Burnett-Humble, TX
Adam Kantz-Iola, TX*

Virginia

Marcelo Sandivar-Falls George, VA*

Washington

Timothy Hayes-Puyallup, WA *

*AWCI welcomes back these individuals who have chosen to reinstate their membership.

a message from the executive director

BY JAMES E. LUBIC, CMW21



The AWCI 2011 dues renewals will be arriving in your mail box soon. The annual dues will again be \$137.00 for our regular members. All other membership categories will also be the same as they were in 2010.

There is one exception to the above, and that is in the Industry Advisory Board (IAB). Officially the IAB dues will stay the same for 2011. In case you weren't aware there are 5 categories of IAB membership ranging from \$300 per year to \$10,000 per year. The idea behind this is to make IAB membership affordable for all sizes of industry-related companies. Ideally the smaller companies pay the lower amount and the larger ones pay more.

Again this year Rolex USA is voluntarily increasing their AWCI IAB membership fee to \$25,000. They are also continuing to sponsor the *Challenge Grant* that was so successful last year, by matching up to an additional \$25,000 of dues money raised within the IAB. This could mean an additional \$65,000 in revenue for AWCI. Last year the IAB members contributed an additional \$18,000 to the "Challenge Grant" netting AWCI \$36,000 in additional revenue.

I would like to remind our members of the benefits of being an AWCI member. We all know about *Horological Times*, our industry-recognized certification and our educational programs. We also provide technical information, a library, website, parts forum, museum, and an annual convention—all are fantastic benefits.

The one AWCI member benefit that *all* members should be taking advantage of (and many are not) is the *Referral Directory*. We have consumers use the online Referral Directory every day, as well as calling the office looking for someone to repair their watch or clock. If you want your name and contact information to be visible to these individuals, you must have your Referral Directory listing switched to *YES* on the line that reads *Make Referral Record Public* at our website, and all the correct contact information, too.

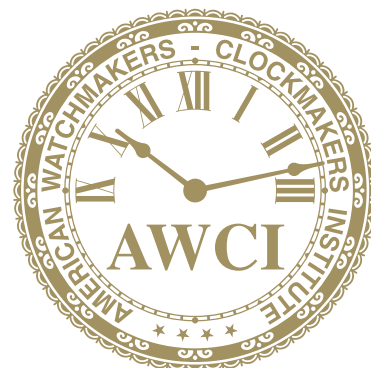
AWCI has spent time and money making www.awci.com a valuable member benefit. Just go to www.awci.com and log in. Scroll down to the *Update your online Referral Directory Record* and follow the directions. It's that easy.

Google is the way many consumers now go about finding things. If you do a Google search on practically any combination of *watch repair*, *clock repair*, *watchmakers* or *clockmakers*, etc., AWCI and our Referral Directory are always on the first page of results, usually anywhere from #1 to #4 out of at least 250,000 websites minimum (in some cases, there are over 1,000,000 pages that reflect a match on this search criteria). In this day and age, you can't afford not to be listed on the AWCI Referral Directory.

For those who are looking for a job, or might like to test the market for a new job, we have the AWCI Career Center. AWCI members are invited to post their resumes for free. You never know who might see your resume in the Career Center. You may get an offer you can't refuse just because you're an AWCI member.

Don't forget about the affordably-priced Health Insurance, Jewelers Block and Commercial Insurance, Credit Card processing, Payroll Processing, Foreign Exchange and International Payment services, along with Office Depot discounts and a website-building service.

All these member benefits are available to AWCI members at no additional cost and they all have the potential of improving your bottom line at no extra cost. Just take the time to look into them—they're only a mouse click or a phone call away.



Last Year To Take Advantage Of Some Section 179 Tax Breaks

Enhanced Small Business Capital Expenditures Incentives Set to Expire On December 31, 2010

IRS Section 179 has offered hefty tax incentives on capital expenditures for small and mid-sized businesses over the past few years. However, these enhanced benefits, which are part of the American Recovery & Reinvestment Act, are set to expire after this year unless Congress acts quickly to renew the higher expensing limits. If you're thinking about purchasing capital equipment to take advantage of these incentives, now's the time to act: New or leased equipment must be purchased and placed into service by December 31, 2010.



The enhanced Internal Revenue Section 179 was one of the best business tax breaks to come along in many years, especially during 2008-09 when a 50% bonus depreciation was allowed. This benefit was dropped for 2010, but you can still take advantage of the remaining benefits if you act soon.

The current Section 179 allows you to write off up to \$250,000 in qualifying equipment expenses during 2010 (subject to a phase-out for capital expenditures over \$800,000.) If you buy or lease qualifying equipment you can deduct the full purchase price from your gross income as long as it does not exceed your total income during the year. Here's a brief overview of what equipment qualifies and what benefits you might see:

EQUIPMENT THAT QUALIFIES (See IRS Section 179 for specifics)

- **Equipment/machines for business use**
(including some equipment purchased for both business and personal use)
- **Computers and software**
- **Tangible personal property used in your business**
- **Office equipment and furniture**
- **Property attached to your building**

You'll need to check with your tax advisor to determine if you qualify for this type of deduction and how it might apply to your particular situation. The important thing is, the savings you can reap from investing in capital equipment this year are substantial and you need to act soon. For more information here's a good website that describes these incentives in detail: www.Section179.org. ♦

SAVINGS EXAMPLE BASED ON \$25,000 EQUIPMENT PURCHASE: (Consult your tax advisor for your specific qualifications)

| | |
|---|----------|
| COST OF NEW OR LEASED CAPITAL EQUIPMENT: | \$25,000 |
| SECTION 179 AVAILABLE DEDUCTION | \$25,000 |
| TOTAL FIRST YEAR DEDUCTION: | \$25,000 |
| CASH SAVINGS REALIZED (based on 35% tax bracket) | \$8,750 |
| CASH SAVINGS ON EQUIPMENT PURCHASE: | \$16,250 |

* Consult your tax professional to determine how this section of the IRS code applies to your specific situation.

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quartz know-how for the professional

Messrs. Urs Häni and Robert Arm of Witschi Electronic Ltd. gave a highly informative presentation on quartz topics at the AWCI 50th Anniversary convention last August. We consider it so valuable to our profession that we wanted to make the information available to all AWCI members. It is now viewable in a PowerPoint presentation on the *Watch Maker* Facebook page.

This presentation was a step-by-step, technical discussion on these subjects:

Components in Detail, including:

- Batteries
- Quartz
- IC/Regulation Systems
- Control of the Stepping Motor

Systematic Trouble-Shooting

Calculation of Battery Service Life

Service Philosophy for Quartz Watches

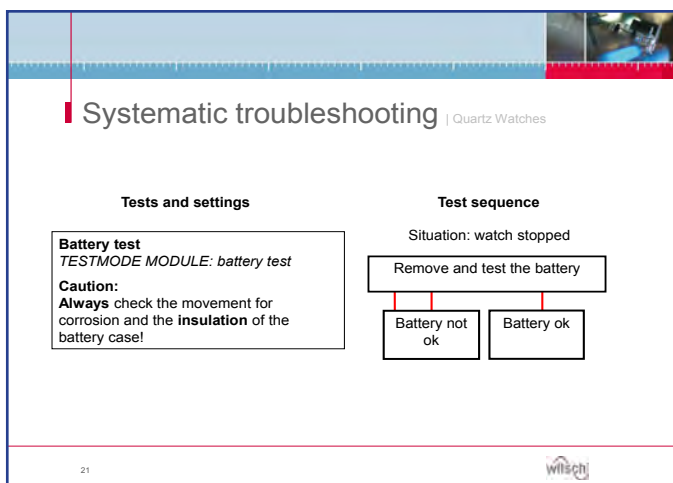
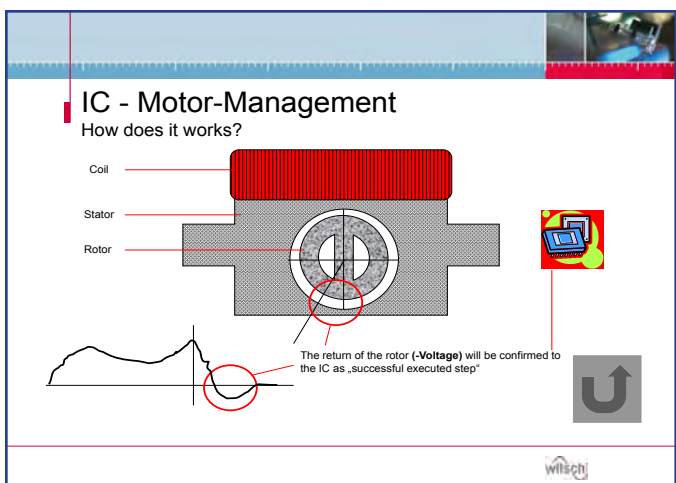
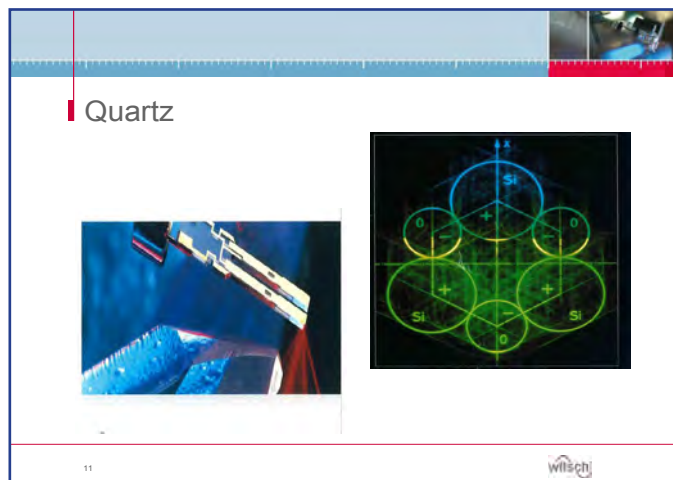
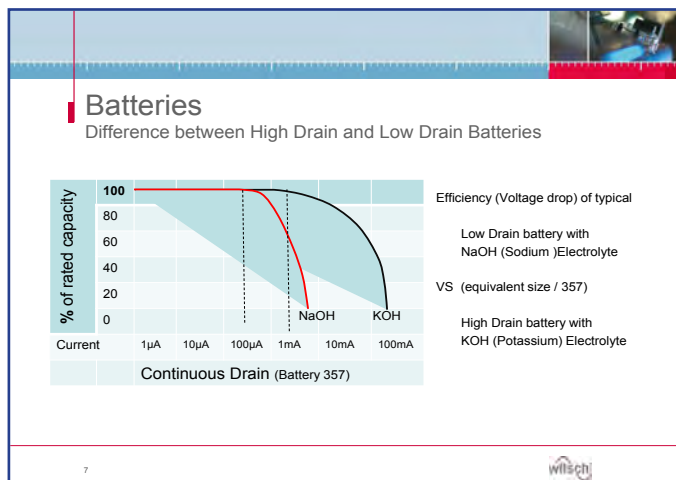
Be sure to see our *Watch Maker* Facebook page for the complete presentation.



Robert Arm, Senior Consultant,
Marketing, Witschi Electronic Ltd.



Urs Häni, Manager,
International Sales,
Witschi Electronic Ltd.



Profitable Watch and Clock Repair

BY JACK KURDZIONAK, CW21

This is an update of an article on profitable business practices by Jack Kurdzionak. These precepts may be more valuable than ever for the watch and clock repair professional.

This presentation will not cover any technical topics. My goal is to help you earn more money doing what you enjoy and what you do best. Begin by examining your salary goals, charges, and methods of operating your shop. Then you will be able to utilize some advice from Poor Richard's Almanac that states, "God helps them that help themselves." No one can give you more hours in which to work. You must take the initiative to change your business practices in order to make better use of your time and talents. You must help yourself to earn more profit from your labor.

Even though I may use the term watchmaker, I don't want to offend the clockmaker. All of what I say applies equally as well to a clockmaker. In fact, I will be citing examples from different types of small businesses since they have much in common. They all require customers, cash flow, labor, and above all common sense to operate at a profit. If they are not profitably operated, none of them will remain in business very long.

1. Profit: Is It Possible?

"Men at some time are masters of their fates: The fault, dear Brutus, is not in our stars, but in ourselves". W. Shakespeare

Is it possible to earn a decent living repairing watches and clocks? I think so. Is it easy? No, if it were easy or highly profitable there would be a watchmaker or two in every town. There are more McDonald's restaurants than there are watchmakers in the USA.

2. How Much Do You Want To Earn Per Year?

"Dost thou love life? Then do not squander time, for that is the stuff life is made of." B. Franklin

How much do you want to earn per year? It's a simple question that must be answered. For example, say our watchmaker wants \$60,000 per year plus

health insurance, paid holidays, sick leave, vacation, and a retirement plan. He asks his employer for that salary and benefit package. He might get it or he might be told to find another job.

For the self-employed it is a bit trickier. You literally have to ask all of your customers to meet your salary requirements. Before you are able to do that, you must know how much it will cost to pay yourself a salary.

There are four items to consider:

1. What is your fixed cost per year? Include rent (even if the shop is in your house), insurance, utilities, etc. For example use \$14,000 per year.
2. Amortize your equipment and current stock of materials. This means to add up the cost of all of your equipment and parts you have in stock and divide it by the number of years it has for a useful life. For example, use the figure of \$60,000 for your equipment and stock with a useful life of 10 years. This will give you a cost of \$6,000 per year.
3. Add in the annual cost of health insurance, a paid vacation, some sick time, and paid holidays. Our example will be \$13,000 per year.
4. Your salary of \$60,000 per year.

When the above figures for fixed expenses, salary, and benefits are added they come to \$93,000 per year. Divide that figure, \$93,000, by 2000 (50 weeks @ 40 hours) working hours per year. That will come out to the base labor charge per hour our watchmaker should be charging. Salary and expenses plus a few benefits come out to \$46.50 per hour our watchmaker must charge. The above assumes that he is productive every hour. A more reasonable assumption is that he can be productive for 5 to 6 of every 8 hours worked. No one really can work 40 non-stop hours per week. There are always bathroom breaks, phone calls, interruptions, etc. Therefore, increase the above number by 1/3 to come up with an hourly charge of \$62 for every working hour.

Price your work by the hour, not by the job. Many watchmakers price a job by what they think it might be worth, what they heard the competition is charging, or what they think the traffic will bear. Do your homework, get out your stopwatch and measure the time it really takes to do a job.

| EXAMPLE: HOW TO CALCULATE YOUR HOURLY CHARGE: | |
|--|-----------------|
| 1. Annual Fixed Costs: (Building, insurance, utilities) | \$14,000 |
| 2. Annual Amortized Equipment/Stock (Equipment and parts of \$60,000/10 years of useful life) | \$6,000 |
| 3. Annual Labor Costs (Health insurance, vacation, sick days, holidays) | \$13,000 |
| 4. Annual Salary | \$60,000 |
| Total Annual Costs | \$93,000 |
| Divide By Total Hours $\$93,000/2,000 = \46.50 per hr. (50 wks @ 40 hrs/wk) | |
| Multiply by factor of 1/3rd $\$46.50 \times 1/3 (+15.50) = \62.00 (Add to rate) | |
| \$62.00 per hr - RATE YOU SHOULD CHARGE | |

Time yourself for many different kinds of jobs. You will learn how long it actually takes to install a stem and crown or clean a forty-year-old mechanical watch. You will find your customary charges for many jobs are unrelated to the actual time taken to do the job. When you "ballpark" an estimate for a repair, you are probably pricing your work below its true value. Once you have the experience of timing yourself on many jobs, you will be able to accurately estimate most of your work without taking each watch apart. Unseen problems in a watch can always cause an estimate to be low. That is why each estimate must have a bit of a hedge in it for extra parts. If you estimate the watch repair is \$100 for labor, \$35 for parts, you should figure a sum to cover the unexpected. An additional \$20 to bring the total to \$155 might cover most errors. In some cases you might overcharge a bit but that will be balanced by the times you underestimate. With some experience, your estimating will become, on average, very accurate. You want to keep the time used for unpaid, quick estimates at a minimum. That is work time you are using. There is no such thing as spare time or free time.

When you are asked to do an estimate for a watch with which you are not familiar or one that is badly damaged, you probably should take it apart for a detailed

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Profitable Watch and Clock Repair

BY JACK KURDZIONAK

estimate. These estimates take more time and that time should be charged to the customer. If he is not willing to pay for the estimate, let him walk. It costs you nothing when you don't work and it costs you dearly if you work at no charge.

Never give a written estimate to a customer unless it is one for which you have been paid. The free estimate is your property. If you provide a free written estimate, you have given your customer a document to carry around to every watch shop he can find searching for a better price. You will have done the diagnostic work for someone else who might be able to charge a lower price because you have done part of the work at no charge.

Recognize what you are selling. You are selling a commodity you cannot replace. That is time and it is an irreplaceable gift, use it wisely and profitably. Sellers of merchandise can always replace what has been sold by ordering more. If you had an order for 1000 new watches, you call the manufacturer and order them. If you were called upon to repair 1000 watches, you couldn't do it any faster just because you were selling 1000 repairs. Merchandise can always be purchased. Time once used, is gone.

3. Organize Your Workplace.

"Remember that time is money." B. Franklin

At one time all you needed was a few hand tools and staking set to repair watches. Not any more. Now a computer in your shop is a must. You can invoice your customers, print estimates for those who pay for a written estimate, keep records of all of the work done for customers, and allow your business to have a polished, professional appearance.

Keep all of your spare parts in an organized system. You will be able to go to your computer, enter the caliber number, find the part number, and retrieve it in a matter of a minute or so.

If you work alone, get a telephone-answering device and use it to screen all incoming calls. Most business

related calls could be returned at your convenience during a time when you are least productive at the bench. As an example, if you are a morning person, you want to do your work uninterrupted until later in the day. Then you can return all phone calls during one session rather than face a constant stream of interruptions during the workday. It is generally understood that every interruption to work, even if only for one minute, actually takes about 15 minutes worth of productive time.



Invest in your shop. Equip your shop with the best equipment you can afford. Good equipment will save time and help you do a better job. Time wasted trying to keep old equipment operating is a loss. Get rid of the old equipment and replace it.

Give yourself plenty of space. Don't skimp on workspace. Time wasted when you constantly move things to make workspace does not earn a profit.

Keep your shop clean and organized. Save what you need and throw away what you don't need. Get rid of obsolete equipment. Sell those unneeded old parts and movements at a mart or on EBay and turn them into \$\$\$.

Present yourself to customers as an organized person. Look and dress the part of being a watchmaker. Customers expect watchmakers to look like watchmakers. A neat appearance with a clean lab coat goes a long way to impress customers that you are a professional in your business.

4. Organize Your Business Practices.

"Take the fast \$5 and leave the slow \$10 for someone else." M. Itzkowitz

Identify your special talents. Specialize. Know what you do best, do it, and guarantee it. If you are not experienced with cylinder watches, don't do them. Avoid complicated work. It is generally less profitable. Myer Itzkowitz, my first employer, was an excellent auto mechanic who always subcontracted difficult and complicated work to specialists. He would never allow us to take an auto engine

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apart. It wasn't our specialty. He reasoned that if we made one error in its assembly; it would have to be done over again at a loss. Watchmakers should heed his advice. Do what you do best so that it doesn't have to be done twice.

Raise your prices in small increments as necessary, frequently. Charlie, my barber is a very astute businessman. He raises his prices a small amount every six months rather than a large amount every now and then. No one seems to mind a frequent small increase in price, but almost everyone complains about infrequent large price increases.

Get your fee the first time you do a job, because you will not get it on the second attempt. Do all that is necessary to a timepiece to assure a competent repair and fully charge for it. A half done job at half price will cost you twice because you will do it again completely at no charge. Our own practice is to replace every mainspring on every watch overhaul and charge for it. If the new mainspring breaks, we cheerfully install a new one at no charge. If we did not install a new mainspring at the time of the overhaul and the old one broke, we would have to replace the mainspring anyway at no charge. If we didn't we would probably lose the customer and have to replace him. It's really better to do it right the first time, charge for the work and the parts, and guarantee them.

Don't overlook the small things. Do you give away spring bars? We don't. We install the best quality stainless ones we can buy and we always install them in pairs, and, of course, charge for both of them. If you don't sell them in pairs, the other one will soon break and you will give away the second one because no one will remember which one broke first.

Never discount labor charges. No one should accept a voluntary wage cut to get a job. Merchandise sales can be discounted slightly to accommodate various classes of customers such as senior citizens. This does not cut your wages and helps your sales department. Merchandise can always be restocked-time can never be replaced.

No free parts and no free services. Charge for what you do and the parts you install. Customers expect to pay for your parts and services. If they are unwilling to pay, they are not customers. Make short work of them.

Profitable Watch and Clock Repair

BY JACK KURDZIONAK

How about when Aunt Emma asks you to repair her watch but you feel uncomfortable asking her to pay your regular charge? You might ask another watchmaker to do it for you and pass on the charges. That way Aunt Emma gets her repair and you don't have to have any guilt because you charged her for the work.

Make short work of solicitors coming into your shop to peddle anything they have. We tell them that we only buy watch and clock related merchandise and send them away with no conversation. If trade salespeople come in without an appointment, they are not seen. If they want to sell a line of watches and clocks, they will make an appointment and we like to schedule them after business hours so they don't interfere with the customers.

No contingency work. Leave that for attorneys. Get paid for every job. When you must do a repair you think may not be successful, collect your fee in advance, repair the watch, and if it works, fine. If it doesn't, you are still paid for your irreplaceable time.

Conserve your cash. You need it to run your business. None of your suppliers will accept anything other than cash to pay for your supplies. Local groups seeking cash donations for their cause besiege every business. If you give them cash, you will damage your cash flow and you won't see that group until next year when they will be seeking another donation of cash. However, there is still a way for you to be a good citizen, make a donation to the charities of your choice, and still keep your cash in the business. Ask if the charity will accept a merchandise gift certificate for whatever amount you are willing to donate. After they are told that your business has a policy of no cash donations, they will usually accept a merchandise gift certificate. You have made a donation and done some good while helping your business meet a new customer when the gift certificate is redeemed.

Your first loss will be your smallest loss. For example, you have taken a watch apart that is severely damaged. You realize its repair will be far more difficult than anticipated or maybe the watch will become a troublesome comeback. Stop the repair, put it back together, and return it unrepaid to its owner. Don't spend endless hours of time attempting to do a nearly impossible repair. Quitting early

on these jobs will save you time because you will be able to go on to more productive work.

Make certain that every customer receives a written invoice for any work done. The invoice should state exactly what work was done, the charges, and the terms of your guarantee. It is a good way to avoid any disagreements over work you have done.

Customers have a habit of overestimating the amount of work done and what they paid. When they rely on memories, they can also underestimate the time since it was done. Help them out with an invoice.



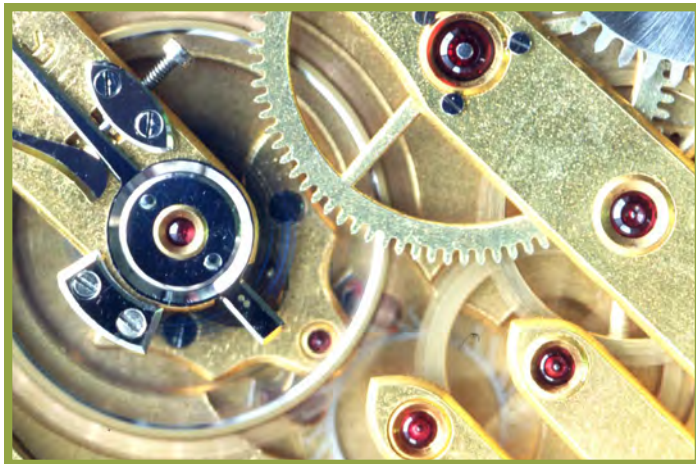
Profitable Watch and Clock Repair

BY JACK KURDZIONAK

5. Make Your Suppliers Your Partners

"No man is an Island." John Donne

Even though most watchmakers work alone at their own bench, they are not alone. Watchmakers depend upon customers to buy their services. They depend upon their suppliers to sell them the spare parts they need to repair watches. Make your spare parts supplier your partner, not your adversary. Don't complain to him about costs. He needs to pay his bills and make a profit. Don't take the cost of spare parts as a personal affront. You are not buying the parts for your own use. Your customer needs them and will pay for them. You need your supplier. Watches cannot be repaired without spare parts. Your supplier needs your business to remain in business to serve you and others. Mark up the cost of all of your parts. You must earn a profit on that investment. On low cost parts that you order by the ¼ dozen, the first customer pays for the three of them. The next two are sold for your profit on the investment.



Make yourself aware of any increases in the cost of parts. Always charge for parts on their replacement cost, not on the basis of what you paid. Many years ago 12 size Waltham balance staffs cost \$6 per dozen. I still have a few of those left. Their replacements now cost as much as \$72 per dozen and that new price determines how much I charge for existing stock.

Stop using expensive parts—use low cost ones. Expensive parts are those you spend precious time searching for in an unorganized assortment. You

might spend 10 minutes searching for a stem that costs \$3. If you find it after 10 minutes of searching, you have spent about \$10 (\$62/hour) worth of time for a \$3 stem. If you don't find it, you have spent \$10 worth of time plus the \$3 cost of buying it from the material dealer. That \$3 stem now costs \$13. When you waste time searching for parts, you have made the cost of those parts very dear. The cost of time spent searching for parts almost always exceeds the dollar cost of purchasing the same.

Never repair a movement or make a part that you can purchase for less money than it costs to repair or make it. Why spend \$50 worth of time to repair a movement that you can buy for \$10? Why spend \$200 worth of time cutting gear teeth if a specialist can do it for \$75?

Pay your bills in a timely fashion. Your suppliers need your prompt payments to run their own businesses. Take any discounts for prompt payment offered to you. It is always a very good deal in your favor. Where else can you get 2% for 20 days on your money? No bank will match that offer.

6. Investments.

"Experience keeps a dear school, but fools will learn in no other." B. Franklin

Invest in yourself: keep learning. Read as many trade journals and books as you can find. Timekeeping technology is not standing still. You shouldn't stand still either.

Take every continuing education class you can possibly afford. AWCI offers many classes. Yes, they cost, but they are an investment in your future. If you are really adventurous, try going to Switzerland to the ETA classes. They are a great opportunity for your continuing education.

Learn from professionals in other crafts and businesses. Watchmakers have much in common with other people in business.

Take a stroll through a local shopping mall. Visit your competitors. How do they operate their businesses? Check their pricing strategy. Leave a watch or two for an estimate. It is a great educational experience.

Profitable Watch and Clock Repair

BY JACK KURDZIONAK

Hire help to deal with the routine jobs such as calling customers, greeting customers, taking in work. If you must earn \$62 per hour, why spend your time doing a job you can get done for \$10 per hour? If you attempt to do everything by yourself, you won't get everything done. No one ever made a business grow without help.

Keep up your professional association memberships. AWCI, BHI, NAWCC, and their local chapters are a good beginning. Join your local Chamber of Commerce. Make your business part of your community. You will develop a valuable network of people in business by joining professional associations.

7. Yes, You Can Earn A Profit.

"There is nothing better for men than that they should be happy in their work." Ecclesiastes 2:22

First, enjoy your work. If you don't, you will never be happy no matter what you earn. If you truly enjoy your work you can make a profit repairing watches and clocks. It's not easy, but it's not impossible.

In summary:

- Define your goals. Know where you want to go. Learn what it takes to get there.
- Recognize that you are selling time and that is not a replaceable commodity. Merchandise can be bought in great quantity. Time is a gift—use it wisely. Make the best possible use of your time by making every minute count.
- Streamline your business practices to avoid squandering your efforts and capital.
- Support the suppliers and others who work for you. They are very important assets to your business.
- Support your community and it will support your business.
- Invest in your business and yourself. ♦

bulletinboard

Do you have information regarding this month's requests? Do you need information about one of this month's responses? If so, send your information to **Horological Times Bulletin Board**, 701 Enterprise Dr., Harrison, OH 45030-1696. PH: 866-367-2924, ext. 307, Fax: 513-367-1414, e-mail: adunn@awci.com.

NEW REQUESTS:

Brandt Freres (Omega)

Daniel Benson of Toronto is looking for a model 'CCR' 19 jewel, 20 1/2 ligne (46.7 mm diameter), lever set, serial number 2500659 with a ratchet wheel: 17 mm diameter, 62 teeth for a motor barrel.

ITEMS STILL NEEDED:

Seiko Lassale Movement

Richard Mazza, Van Nuys, CA, is looking for a good Seiko Lassale movement with all parts, movement #5A54.

Patek Philippe 8180

Donal Yax, Howell, MI, is looking for a source for this detent lever.

RESPONSES:

Universal Geneve Center Wheel

Karl Andersen was able to provide this and more for Marty Kale, Brookline, NH, who was looking for this part.



Boston Watch Corp. Is Now Oris Service Center

Boston Watch Corp. President, David Kurdzionak, is pleased to announce that his repair center, The Watchmaker, is now the official Oris after-sales service center for the USA effective September 1, 2010. All Oris repairs, both in or out of warranty, may be sent directly to:

The Watchmaker
379 Main Street
Stoneham, MA 02180
Tel. 781-438-6977
Fax 781-438-6954
www.orisrepair.com
oris@thewatchmaker.com

New Ceramic Timepieces Embedded with Natural Frequency Technology

Philip Stein Group, parent company of the luxury Philip Stein watch brand, has unveiled their latest collection of opulent timepieces in the Ceramic Collection. This fashion line consists of four new unisex styles in white and black ceramic watches on ceramic bracelets.

Like all Philip Stein timepieces, the Ceramic Collection incorporates the company's Natural Frequency Technology, which some believe can provide wearers with a better night's sleep and stress reduction. When worn on the wrist, the watch exposes frequencies and information to the biofield of the person wearing it at a beneficial key frequency of 7-9 hertz. This frequency encompasses what is believed to be the chief resonant frequency of the natural earth.

The new collection has the signature ergonomic curvy case that hugs the wrist for an original and fashion-forward design. The double-layered dial lends the watch a 3-dimensional appearance and the ceramic offers exceptional depth of color.

The Philip Stein Ceramic Collection features dual movements and will retail for \$1,595 for both the small and large sizes. For more information on this new offering visit www.PhilipStein.com.

Congratulations to Watch Clock & Jewelry Repair

Winner of *Best of St. Charles Award*

Watch Clock & Jewelry Repair, an AWCI member since 2007, has received the *2010 Best of St. Charles Award*. They were the winning local small business selected by the U.S. Commerce Association in the *Jewelry Repair Services* category. This *Best of Local Businesses Award* recognizes outstanding local businesses throughout the country. The award is based on quality and is given to those companies they believe enhance the positive image of small business through service to customers and the community.

Once again, congratulations to AWCI member, Yakov Ilyashov, president of Watch Clock & Jewelry Repair in St. Charles, MO, for an outstanding job representing both small business and our industry.



The Mechanical Revival Turns 21. Now What?

JOE THOMPSON, KEYNOTE SPEECH

The following is an informative, forward-looking speech given by Joe Thompson at the AWCI 50th Anniversary Convention. Mr. Thompson, Editor-In-Chief of *WatchTime* magazine, was our convention keynote speaker. We believe his industry analyses and insights are valuable, and we would like to share them with those who could not attend the convention.

Introduction

Twenty-five years ago at the AWCI 25th Anniversary Convention, I was the warm-up act for George Daniels, the keynote speaker that year. I never dreamed that a quarter century later, I would follow in the footsteps of the illustrious Mr. Daniels and become a keynote speaker myself. I want to sincerely thank AWCI for this honor.

If you attended the 1985 Convention you might remember I said, "Everybody is telling you the mechanical watch is doomed." I said, "Well, I'm here to tell you the mechanical is not doomed! You wait and see, 25 years from now, mechanical watches will account for 70% of Swiss watch sales."

How about the tourbillon? In 1985 I said, "Keep your eye on the tourbillon. Not many people know what it is, but you guys do." I added, "25 years from now, more than 100 brands will be selling tourbillon watches for \$100,000, \$200,000 and \$300,000 a piece."

Then there's the image of the watchmaker. I said, "Yes, today it's considered the deadest of dead-end jobs. Today, watchmakers are considered the dullest people on the planet. But," I said, "in 25 years, the best mechanical watchmakers are going to be rock stars. They are going to be considered artists, and people are going to pay for their watches what they pay for Picasso's today."

You were skeptical, but I predicted this in 1985. I remember some of you laughed out loud when I predicted that, in the future, Chanel would be a big deal mechanical watchmaker. Don't ask me how I knew--I can't explain it, but something about those little black dresses and that No. 5 perfume said to me, 'This outfit's got mechanical watch power written all over it.' Remember that?

Honestly, if you remember back to 1985, I didn't predict any of this. Nobody did. What I predicted was that in the next century, we would all be wearing Dick Tracey Walkie Talkie watches made by Seiko, Citizen, Casio, Panasonic, Sony and Toyota. I predicted we would use watches to watch TV, get traffic forecasts and pop popcorn. It was just a matter of miniaturizing various electronic appliances into an electronic watch.

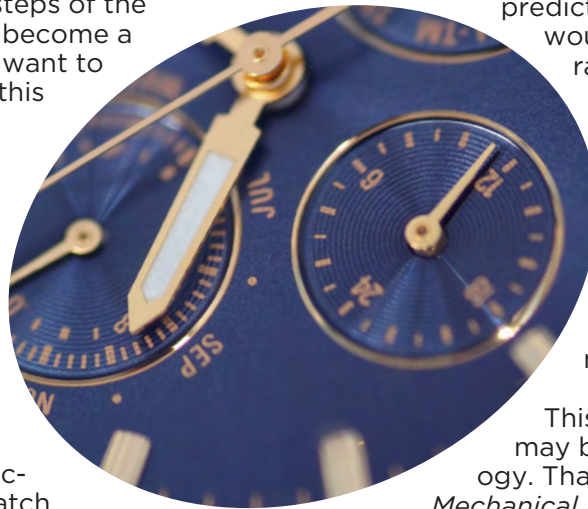
Here's the point: If, in 1985, I had made all those predictions I just pretended to make, you would have considered me a stark raving loony and booed me off the podium, because only a mechanical watch madman could have imagined such fantasies. No one in their right mind would dare to dream such silly things: 120 brands selling tourbillons, including Chanel and Dior??!! Don't be ridiculous! And yet, every one of those things has come true, and so much more.

This mechanical watch renaissance may be unique in the history of technology. That's why the title of this talk is: *The Mechanical Revival Turns 21. Now What?* I will mention some key turning points in the mechanical comeback and then discuss where the mechanical revival goes from here.

The Mechanical Revival

Why do I say the mechanical revival turns 21 in 2010? I believe the first really powerful cultural moment in the mechanical watch revival occurred in 1989 with Patek Philippe's Calibre 89 watch. With all due respect to Jean-Claude Biver's revival of Blancpain which came earlier, and Osvaldo Patrizzi's wristwatch auctions, which came even earlier and were factors in the revival, it was Calibre 89 and its many complications that caught the imagination of the industry and the market. Calibre 89 was the tipping point. That's when the world learned what a mechanical complication was.

I submit as proof *Saturday Night Live* and Dennis Miller. Calibre 89 was a mechanical timepiece the size of a softball created for Patek's 150th anniversary. It took 9 years to make. It had 33 horological complications--the most ever in a watch. On April 9, 1989, the Calibre 89 sold for \$3.2 million, at that time the highest price ever for a watch at auction. It made headlines around the world. And the next weekend it made *Saturday Night Live*.



The Mechanical Revival Turns 21. Now What?

JOE THOMPSON, KEYNOTE SPEECH

You're probably familiar with SNL's Weekend Update segment. The news anchor was comedian Dennis Miller, who had a very sardonic manner of presenting the news. On the screen behind Miller appeared Calibre 89, and Miller says, tapping the desk with a pencil the way he used to do, "*This week in Geneva, a watch sold for \$3.2 million. Apparently this watch does 30 things besides tell time. Yeah, well, for \$3.2 mil, I can tell you what it's gonna have to do for me, baby!*" He got a big laugh, but this notion of mechanical complications was now in the air. Soon, complications were on the wrists of a new generation of mechanical watch collectors and aficionados. The rest, as they say, is history.

Now we see the rise of "manufacture" brands that make a few calibers in-house. Jumbo watches with diameters of 45, 50 and even 60 millimeters with more room for complications. Then there's the watch chat room, bloggers and, thankfully, consumer watch magazines.

Some believe we live in new *Golden Age of Watchmaking*. In fact, *WatchTime* did a special section in 2009 called "Wild Times: A Look Back at a Fast, Furious, Fascinating Decade in Watches." We selected the Top 10 watch stories of the decade and the mechanical revival led the list.

We called the top story of the decade *Mechanical Mavericks*. It recounted the frenzy of creativity and experimentation in high horology that produced watches with astonishing innovations. To mention a few, there's the TAG Heuer Monaco V4 with a revolutionary movement run by tiny polymer drive belts. There's the JLC Grand Complication, a Triptyque with 3 faces. It has the two standard Reverso faces, then a third on a plate underneath the case with a perpetual calendar. How does it work since it is a part of the movement? It's driven by a rocking lever mechanism that reaches out of the case once a day to nudge the calendar forward a notch. Or there's the Ulysse Nardin Freak that has no hands and no crown--the movement itself tells the time. The entire movement turns once every hour thanks to a large mainspring underneath the movement to provide power. You wind and set the watch by turning the caseback and bezel. Even Jacob the Jeweler got in on the act. The Jacob & Company Quantin was the first watch with a 31-day power reserve with a four-barrel movement created for Jacob by one of Switzerland's top suppliers of complicated movements. The point is, we live in a world now awash in mechanical watch marvels.

Our next story was on the explosion of *manufacture* brands and there are now dozens. Another huge story was escapement experiments. You would think that after 5 centuries of tinkering, there wouldn't be much more you could do to improve the escapement. Wrong! George Daniels' Co-Axial, Ulysse Nardin's Dual Direct, Audemars Piguet's Robert Robin, and a slew of new escapements made of silicon show there are still new frontiers to explore. Then there's *Tourbi-mania*. Today, 120 companies sell tourbillons, which is about 100 too many, in my view.

It's clear that at as the revival begins a third decade, the mechanical watch's position in the market is stronger than it's been in 40 years, and mechanical watch technology is far more advanced than ever before. So now what?

What the Future Holds

We've already established that I have no skill at predicting the future. I have a hard enough time figuring out what has already happened -- which is my job -- let alone trying to foretell what might happen. But one way to evaluate the prospects of the mechanical revival is to do a SWOT analysis of it. You may be familiar with the SWOT analysis. S.W.O.T stands for STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS. It's a technique companies use to analyze their businesses. Rather than me making wild guesses about the mechanical's future, let's run a SWOT analysis on it.

STRENGTHS

In the short term, this Golden Age of Mechanical Watchmaking we're experiencing will only get brighter. Mechanical watchmaking is expanding in Switzerland, Germany, Japan and China (but I am focusing on Switzerland). More Swiss watch brands are making more of their own watches than at any time since the quartz crisis. By that I mean making



The Mechanical Revival Turns 21. Now What?

JOE THOMPSON, KEYNOTE SPEECH

Strengths

Weaknesses

Opportunities

Threats

their own movements and parts. The “*manufacture*” trend has become a stampede now. In the last two years, TAG Heuer, Breitling, Carl F. Bucherer, Chronoswiss, Hublot, Armin Strom and more have created their first in-house movements and Tutima and Perrelet will launch their first in-house movements soon.

These companies have two reasons: 1) Integrity—to elevate brand image and price, and even more importantly, 2) Independence—from shortages and other market constraints. What’s really driving the *manufacture* trend today is this need for independence. Between 2004 and 2008 we had a boom market for Swiss mechanical watches. Exports went from 2.5 million units per year to 4.3 million, an increase of 66% in four years. It was difficult for watch assemblers who rely on ETA to get all the movements they needed. The boom created shortages of movements and brands discovered they were at the mercy of suppliers. If ETA delivered fewer movements, they made fewer watches and fewer sales, so some began making their own.

Going forward, there will be even more shortages because the Swatch Group intends to reduce movement sales to some brands outside the Group and in some cases, eliminate them entirely. This is one of the hottest issues in Switzerland right now and it’s driving the *manufacture* trend. The Swatch Group is waiting for a ruling by Switzerland’s Competition Commission or Comco on whether it has the right to restrict sales of mechanical movements and parts. Why does it need Comco’s permission? Because ETA has a monopoly-sized market share in mechanical movements, and it’s the same for Nivarox-FAR in hairsprings.

The expectation is that Comco will rule the Swatch Group does have the right to restrict sales, but will recommend the change not come for a few years to allow competitors to crop up. Firms aren’t waiting. They are becoming *manufactures*. In my view, is a good thing. It makes the industrial base of the mechanical watch industry stronger.

Something to keep your eye on is what happens with hairsprings. With mechanical watch movements, there are now a number of alternatives to ETA: Sellita, La Joux-Perret, Soprod, Concepto, and others. But for hairsprings, there is no good alternative to Nivarox-FAR. Nevertheless, we do see a shift. Firms are beginning to make hairsprings in house. Rolex uses its home-made Parachrom hairspring in all men’s Rolex-brand watches, and so does Roger Dubuis. (That was a big reason the Richemont Group acquired it in 2008.) Bovet and the Festina/Candino Group also own firms that make hairsprings. So it’s likely that new suppliers will emerge, to the benefit of the industry.

One other point on STRENGTHS. The amount of high-mechanical innovation will only grow. *High-mech* will become increasingly *high-tech* as watch producers take advantage of scientific advances in metallurgy, micro-parts technology, photolithography and other fields.

Just one example: In a factory in La Chaux-de-Fonds, a watch has been ticking since November 2008. At this point it’s a lab watch and is strictly experimental. Its creators claim that it is possibly the world’s first watch that will never need oil and never need adjusting. Its movement is made of high-tech materials like carbon crystal, an alloy called Zeropur, and ADLC (which stands for Amorphous Diamond-Like Coating). They are testing the watch and they say that, if all goes well, this watch will remain adjusted throughout a lifetime of wear: It will be the world’s first adjustment-free watch. You know who made this watch? Cartier! The Paris-based *King of jewelers and jeweler of kings* has grown serious about high horology. Like so many others, for the first time in the firm’s history, it’s making its own movements. They started last year and now have nine in-house movements. It’s a sign of the times and a sign of the growing strength of the mechanical revival, there are plenty of WOW watches still to come from other brands.

The Mechanical Revival Turns 21. Now What?

JOE THOMPSON, KEYNOTE SPEECH

WEAKNESSES

Here I'll only mention one, the biggest one: Repairs. Who's going to repair all these mechanical watches? It's no good creating all this demand for mechanical watches, and creating all these watches to meet the demand, if there is no one to service them. If the number of mechanical watches is increasing and the number of watch repairers is decreasing—that's a problem. That's a question for you and the watch companies to answer, but it's a big one.

It seems, if you can restore the image of the mechanical watch product, which the Swiss did. And if you can restore the image and the ranks of producers of the product, which the Swiss also did, then they ought to be able to restore the image and ranks of the repairers of the product. At the end of the 1980's, watch industry employment had fallen to below 30,000. Twenty years later in 2008, it surpassed 53,000. It dipped to just under 50,000 last year because of the recession, but that's still strong by post-quartz crisis standards. For the mechanical watch miracle to be complete, however, there needs to be a revival in the ranks of watch repairers.

OPPORTUNITIES

Opportunities are everywhere: They include:

- Scientific breakthroughs watchmakers will use to invent even more exciting new products.

- The enormous potential for growth in demand for luxury mechanicals in China and other emerging markets.
- The still untapped potential of Switzerland's #2 market the United States, where the appreciation of fine watches remains in its infancy.
- The growing interest in mechanical watches among women.

Demographics indicate there are potentials galore for the mechanical boom.

THREATS

One is the economy, of course. But if the worst global economy since the Great Depression didn't do much damage to the industry—and it didn't—then I don't know what will. Global Swiss watch exports in 2009 fell to 2006 levels. That's bad, but not awful. (Awful is what happened in the United States, where exports fell to 1998 levels and a decade of growth was wiped out in two years!) On the whole, the Swiss watch industry has survived the storm in pretty good shape and is recovering now. Watch exports for the first six months of 2010 are up 20% in value over 2009.

Perhaps the biggest threat is the fate of the wristwatch itself in a wireless world. Newsweek magazine famously predicted in 2000 that wristwatches would not survive the 21st century. The threat is the emergence of a new, always connected generation that does not wear wristwatches. If that trend dominates, both mechanical and quartz watches will die. So, long-term is it curtains for the wristwatch? Who can say? I will say this: The prediction reminds me of one I heard in the late 1970's by the CEO of an American digital watch company. People forget that in the quartz watch wars of that time the combatants were the Swiss, the Japanese and the Americans! The Americans were the LED and LCD firms. They weren't watch people, they were electronics companies like Fairchild, Intel, and National Semiconductor. They believed their new digital watches would eliminate not only mechanical timekeeping, but all analog timekeeping. For them, mechanical timing was doomed, for sure, but so was timing with hands. They were certain the future was all digital.



The Mechanical Revival Turns 21. Now What?

JOE THOMPSON, KEYNOTE SPEECH

My CEO friend tried to explain this belief. He said, "Joe, all the clocks in schools now are digital. Kids today only know digital time, and by the year 2000, everybody will use digital." That didn't happen, of course. Despite digital clocks, kids grew up and went analog while many also went mechanical. The only way to find out, of course, is to meet again at AWCI's 75th Anniversary Convention in 2035 to see how the trusty tick-tock is doing then. I'll only be 88, so I look forward to seeing you there! ♦



As editor-in-chief of *WatchTime* magazine, Joe Thompson has written about watches and the global watch market for 33 years. He frequently consults with major news publications such as *The Wall Street Journal*, *Time* and *Newsweek*. He has also been interviewed by multiple news channels like *CNBC* and *WABC* New York. Thompson's articles have won nine editorial excellence awards. *WatchTime* is a leading U.S. consumer watch magazine affiliated with Ebner Verlag GmbH of Germany.

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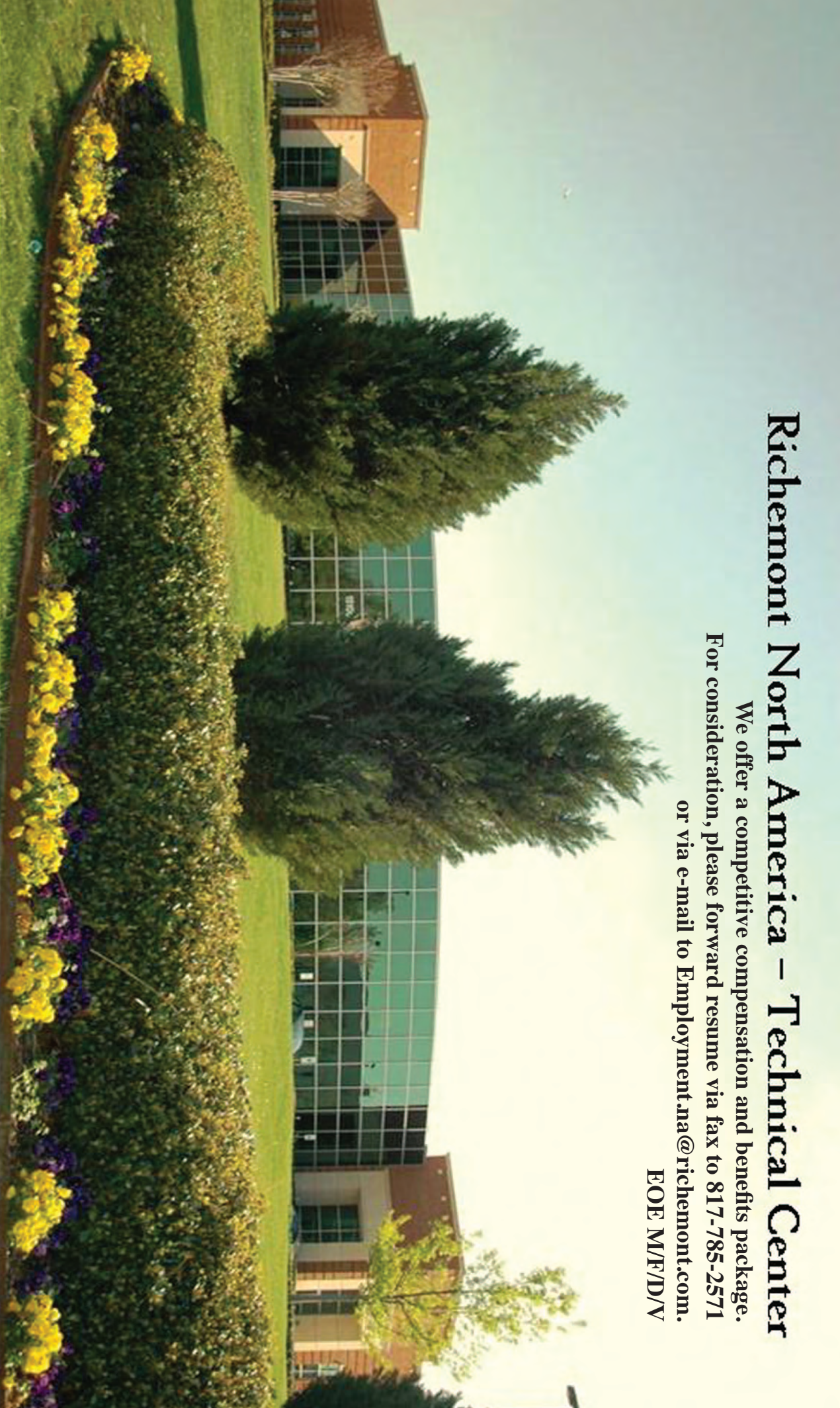
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Over the next few months watch for mailings with information on these benefits. By virtue of being an AWCI member, you already have the No-Cost AD&D coverage. However, to designate your beneficiary for this coverage, you will want to return the reply card you receive. To take advantage of the No-Cost Health Services Discount Card, you will also need to complete and return the reply card. This is a discount card you can use at point of service. At your convenience, an American Income Life Representative will contact you to deliver your No-Cost benefits and answer any questions you may have. While in your home or business, the AIL representative will explain additional insurance programs available, so don't hesitate to ask the representative any questions you may have regarding additional coverage.

AWCI has selected American Income Life because it's one of the largest providers of supplemental insurance in the country serving more than 2 million policy holders. This 50-year old company specializes in providing supplemental insurance plans to associations, credit unions and unions. American Income Life has earned an A+ (Superior) financial strength rating from A.M. Best Co. (as of 6/10).

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ETA 256.XXX FAMILY

This workhorse family of quartz movements is found in a broad variety of watch styles, brands and price ranges, but is not customarily found in the lowest priced range of Swiss watches. Due to its relatively high replacement cost, it can be profitably serviced by a watchmaker familiar with servicing quartz movements. The scope of this article will be confined to the three most popular executions of this model. They are ETA 256.111 (three hands with date), 256.031 (two hands, no date), and 256.041 (two hands with date). All three share many parts in common with a few notable variations. The circuit of the three-hand model has a gate time of one second while the two-hand models' gate time is five seconds. The train wheels are interchangeable on the two-hand models. All screws are interchangeable across the line, the exception being the 256.031 uses no calendar bridge screws. The circuit insulator (ref.4046) is shared across the line and also interchanges with the ETA 956.XXX family of movements. Setting parts are also completely inter-

BY JACK KURDZIONAK, CW21

changeable with the exception of the setting lever jumper (ref. 0445 aka set bridge) on the non date 256.031 model. It has only two positions for time and run while the date models have three positions for run, date set, and time set.

Other than a few common wear points on this model, it is relatively simple to service with very few complications. Watchmakers who frequently service these movements always exchange the sliding pinion (ref. 0407 aka clutch) with a new one. The teeth on the end of the sliding pinion are delicate and, after a few uses, invariably display some degree of wear. Consider a new sliding pinion as a regular part of the service. The setting lever (ref. 0443 aka detent) tip that engages with the stem frequently wears, and must be replaced if it exhibits any sign of wear. Failure to replace it will cause disengagement of the stem while setting.



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from the **workshop**

BY JACK KURDZIONAK

The setting lever recall spring (ref. 0482 aka detent spring) also weakens and needs replacement. It also can cause stem disengagement during setting. Circuits with corrosion on any connection should be discarded and replaced as well as incorrect or damaged insulators.

The delicate stator (ref. 4021) can be safely cleaned with the movement if it is left attached to the plate with two train bridge screws. A distorted stator is often not visibly apparent but it will cause operating problems. If the rotor runs backwards, replace the stator. An otherwise properly serviced movement, with a good circuit, may run erratically, or run with a high current draw due to a bad stator. Replace the stator with a factory fresh new one and test the movement to see if the problem is resolved. Any used stator may be as bad as or worse than the one in question in the poorly running movement. The rotor (ref. 4211) may be left attached to the stator by its own magnetic attraction during the cleaning cycle after which any particles adhering to it can

be removed with Rodico. Check to be certain the magnet of the rotor remains securely bonded to the arbor. If the magnet loosens, replace the rotor. If the rotor is not subjected to the cleaning cycle, it will still need to be cleaned with Rodico to remove any particles or old oil.

After cleaning and lubricating, perform the required electronic tests on the movement to assure its performance. The lower working limit must be at or below 1.30 volts. The two-hand models must have a current consumption at or below 0.75 micro amps while the three hand model must be at or below 1.10 micro amps. In actual practice these numbers are quite high and far lower values for both the lower working limit and current consumption are easily obtained. For a complete technical guide for each model please visit:

<https://secure.eta.ch/CSP/DesktopDefault.aspx>

Then click on technical documents to download the needed technical document. Please note that

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from the **workshop**

BY JACK KURDZIONAK

a portion of this website is password protected, but the technical documents are available to the public without any needed passwords.

Watchmakers who frequently service these movements should consider making, or asking a material dealer to make, a kit containing the most commonly needed spare parts for this movement series. Those watchmakers with spare parts at hand can service movements quickly and without the interruption required to order and wait for a needed part.

| A repair kit for the ETA256.XXX family should contain the following parts. | | | | |
|--|-------------|----------------------|-------------------------|------------------------------|
| Quan. | Ref. number | Movement application | Name | Remarks |
| 1 | 4000.256111 | 256.111 | Circuit | Second hand |
| 1 | 4000.256041 | 256.031 256.041 | Circuit | No second hand |
| 3 | 4046.256101 | All | Insulator | Fits all ETA 956. XXX models |
| 1 | 4211.256111 | All | Rotor | |
| 2 | 4021.256111 | All | Stator | |
| 5 | 0405.256111 | All | Stern | |
| 2 | 0407.256111 | All | Sliding pinion | AKA clutch |
| 1 | 0443.256111 | All | Setting lever | AKA detent |
| 1 | 0445.256111 | 256.112 256.041 | Set lever jumper | AKA set bridge w/date |
| 1 | 0445.256031 | 256.031 | Set lever jumper | AKA set bridge wo/date |
| 1 | 0482.256111 | All | Set lever recall spring | AKA detent spring |
| 1 | 0435.256111 | All | Yoke, assembled | AKA clutch lever |

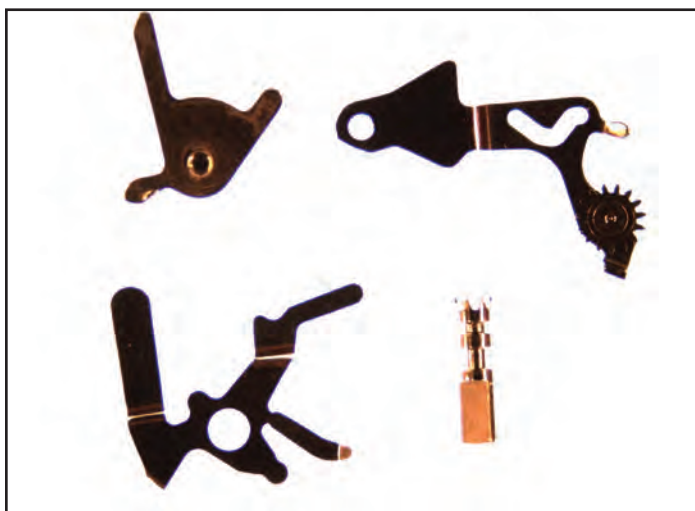


Photo of four commonly replaced parts found in an ETA 256.XXX movement. Clockwise from top left: setting lever, Yoke, sliding pinion, and set lever recall spring.

YOU ARE INVITED

Do you have a solution to a watch or clock repair problem that you want to share with our membership? Do you have a question about a repair problem you would like to ask? I invite you to participate in this column with your suggestions, questions, and comments. It is easy. Just email me at AWCI_Central_magazine@awi-net.org or write using the old standby known as the postal service. You can even fax me at 513-367-1414.

I will do my best to help you help the membership. By sharing your questions and suggestions, all of our members can benefit from our combined knowledge and experience. The ideas, tools, techniques and products presented in this column are suggested by the author and contributing members and are not endorsed by any manufacturer, supplier, advertiser or AWCI itself. ♦

CLOCKS

magazine

A Beginner's Guide to Clock Repair

by Ian Beilby

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challenging situations part 1 **the collet**

BY DALE LADUE

How interesting would our work be if we were not challenged every day? It's a challenge to simply service a time-piece correctly, let alone deal with the unexpected.

I was servicing an 18-size American Waltham pocket watch, and while disassembling it noticed the hair-spring collet was cracked and split open. I have seen collets split and glued onto the balance staff using superglue or epoxy. Once a collet cracks and cleaning solutions infiltrate the brass, it can become crystallized and weakened. A cracked collet would typically hold onto the staff shoulder as long as it was undisturbed. If adjusted for beat or removed for balance staff replacement, it would most assuredly become too loose or break. In this case the collet broke in half as it was being removed. After contemplating what to do, I decided I was going to remove the hairspring from the collet. I could not hold the broken collet in order to drive out the existing taper pin.

I ground away the top surface of the collet to free the hairspring. I released the hairspring even before I considered writing an article. I then realized someone might have considered a situation like this a problem and I decided to demonstrate how I dealt with it. Figure 1 shows the collet ground away allowing the hairspring end to be pried out unharmed. To demonstrate how this was accomplished, I am showing the collet clamped in a Bergeon collet tightening tool and a diamond mandrel in a rotary tool (Figure 2). The spinning diamond point was gently and precisely applied to the top of the partial collet as it ground away the brass.

After the hairspring was released from the broken collet, a new collet was selected. The new collet had to be broached out slightly to fit the hairspring shoulder on the balance staff. Holding the hairspring collet in a lathe chuck and running a five-sided broach through it accomplished this. The chosen new brass collet is shown in Figure 3.

The next step was to pin the hairspring to the new collet. Years ago I fashioned an aid for working on hairsprings that I believe was shown in one of Henry Fried's watch repair books. It consists of a pocket watch seconds track sunk dial epoxied to the end of a drilled 1½" - 2" long brass rod, two steel rods with taper turned and filed square ends, one for small collets and one for larger collets. The steel rods, in this case



Figure 1.
Top surface of broken
collet ground away
allowing hairspring to
release.



Figure 2.
Top surface of broken
collet ground away
using a pointed
diamond coated
mandrel.

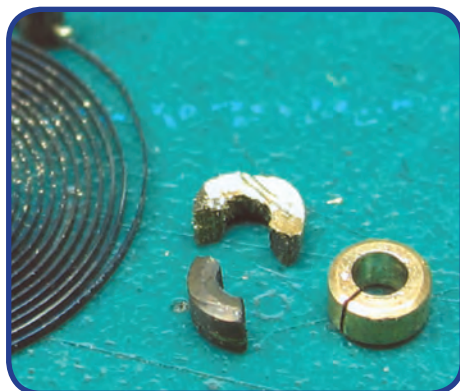


Figure 3.
Chosen collet next
to broken one.



Figure 4.
Collet pressed on
larger taper of
homemade tool and
hairspring inner bend
inserted into collet.

challenging situations part 1 **the collet**

BY DALE LADUE

.055-inch wire, slip into the brass allowing the properly sized square taper to project through the dial. The rod would then be locked in place with a locking screw.

The new collet was pressed onto the larger of the two square tapers and the hairspring was laid over the collet. The inner bend was then inserted into the pinhole as shown in Figure 4. A hairspring collet pin was chosen, which fit almost fully into the hole in the collet (Figure 5).

I prefer to file a flat on the hairspring pin, which affords some control while centering the spring in the collet hole. The preference to file a flat or not is up to each watchmaker. I created the flat by running the pin over a diamond lap while it was being pressed down by a section of a bottle cork (Figure 6). A plastic shim was slid under the hairspring opposite the collet pinhole, which held the hairspring level while the pin was inserted (Figure 7). For leverage, the pin was pressed fully in place with one tip of a tweezers pressing on the end of the pin, and the other tip pressing on the collet holding the square taper (Figure 8). The fully inserted pin is shown in Figure 9. The extended section of the pin was nipped off as close to the collet as possible (Figure 10).

The hairspring and new collet was mounted on the balance staff and then inserted in a hairspring-truing caliper. The balance was gently spun and observed. The hairspring was then adjusted at the pinning point and first quarter turn only, correcting an out-of-round condition. The hairspring was also observed and adjusted for an out-of-flat condition. (Figure 11). The balance complete is shown fully functional again in Figure 12. ♦

References: Bergeon #3007, tool for tightening and reaming

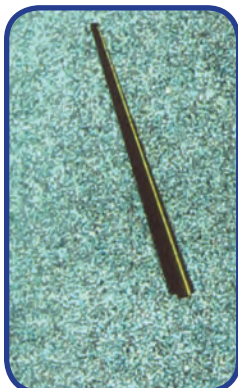


Figure 5.
Hairspring taper pin
resting on diamond
file.



Figure 6.
Pin held against
diamond with section
of bottle cork.



Figure 7.
Plastic shim placed
under spring opposite
pinhole.



Figure 8.
Pin pressed fully in
place.

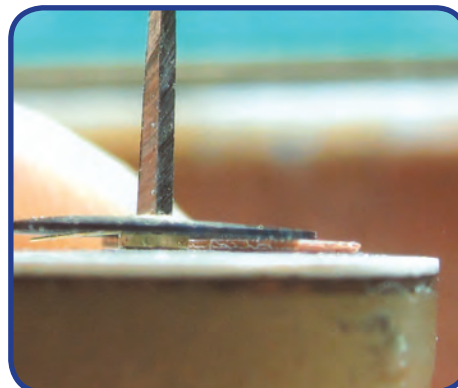


Figure 9.
Side view showing
shim, hairspring and
pin.

challenging situations part 1 **the collet**

BY DALE LADUE

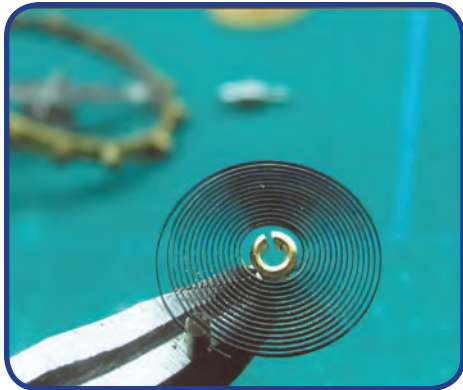


Figure 10.
Excess pin nipped flush at collet.



Figure 11.
New collet and hairspring installed in truing caliper.



Figure 12.
Balance installed and functioning.

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10.10 HT

DAVID CHRISTIANSON, CMW21, FAWI

QUESTION:

I am not sure if you will be able to help me or not, but I am trying to find out information about Jeanjaquet & Cie from Neuchatel, Switzerland. I have a pocket watch by that company and do not know anything about it. If you are not able to help me do you know of anyone who can?

Addison

ANSWER:

Your photos reveal a high-grade Swiss bar movement, stem wind and key set with a long regulator arm to give a more precise adjustment of the balance's oscillation rate. The movement is cased in an 18 karat gold hunting case which is marked Jeanjaquet & Cie of Neuchatel.

I cannot find any information about a Jeanjaquet in Neuchatel. Kathleen Pritchard, in her extensive listing of Swiss watchmakers, shows only two Jeanjaquets, one in Les Verrieres and one in Fleurier, both of whom were involved with clocks, not watches.

Tardy shows a similar rough movement (ebauche) as having been in production between 1867 and 1878 in Switzerland. I suspect that Jeanjaquet either purchased the rough movement and finished and timed it out to a very high quality standard themselves, or they may have purchased the finished movement from a very talented independent watch finisher. In either case they put the movement into a fine 18 karat gold case and marked the case with their name before selling it, probably in the last quarter of the 19th century.

Send your Questions
to Horological Times
701 Enterprise Drive
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magazine@awci.com

QUESTION:

Enclosed find pictures of a French pocket watch. Can you possibly shed some light on this for a customer of mine who is interested in any information, such as maker, year, etc.?

Martin Charlop

ANSWER:

Your calendar pocket watch is housed in an oxidized steel (gun metal) case and has subsidiary dials for the day of the week, date of the month, month and an inset seconds dial showing the phase of the moon. From the names of the month on the dial, the watch was made for a French speaking market.

The bar-style movement, itself, is made from a common Swiss-made ebauche (rough movement). It is stem wound and stem set, which came into common usage in the 1880s. Most examples of triple calendar watches like yours were made right around 1905.

Without a signature or trademark, it is impossible to know who made your watch. During the time your watch was made there were nearly 1000 watchmaking enterprises in Switzerland with an average work force of just 35 people. This production system had the advantage of flexibility, bringing a large variety of products with a wide variety of styles, functions and prices to market. Industrial production as practiced in the US and Japan during the same time period might have cut costs but it did not encourage the same kind of diversity as the Swiss system. Very few of these producers in Switzerland signed their work (an unfortunate situation for those of us who want to know the maker today).



clock making part 9 **elements**

BY LAURIE PENMAN

For this demonstration I am making the pallets out of hard brass because I do not propose to use this escapement in a clock movement. In addition, brass is much easier to saw and file. Normally I would make the pallets from a high carbon steel (gauge plate or flat ground stock are the usual terms). I once made a pair of recoil pallets out of hard brass as an experiment and gave up examining them for wear after a couple of years. Apparently if the driving weight is not great, brass pallets operate quite well. Nevertheless, I have not been brave enough to supply brass pallets to a customer.

I must now make an apology for an error that I made in the August 2010 *HT*. The outside and inside radii of the deadbeat pallets were decided in the August magazine, but when I checked back this month I realized there was an error. The drop was established as 0.25 mm and I subtracted this figure from the outside radius and added it to the inside. In fact, the radii need to be altered by half the drop because the action of the escapement it was immediately obvious when I came to making the pallets. The reduction in the outside radius should be half the drop because when drop occurs, one tooth is lined up with the outside curve and so the other pallet has a drop equal to the sum of the reduction on both pallets. A similar situation exists for the inside radius. A corrected drawing is shown in Figure 1.

Figure 2 shows the form I intend to cut from hard brass, but before I start, a support must be made for the piercing (jeweler's) saw (Figure 3). This is simply cut from scraps of timber that I had in the workshop. It consists of a block that can be gripped firmly in the vise and a thinner piece that has a 'Vee' cut out of it. This is fastened to the block at right



Figure 3

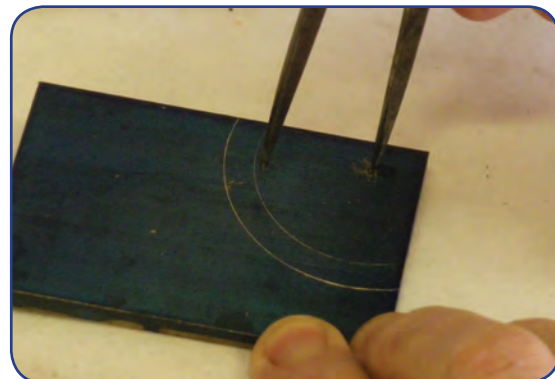


Figure 4



Figure 5

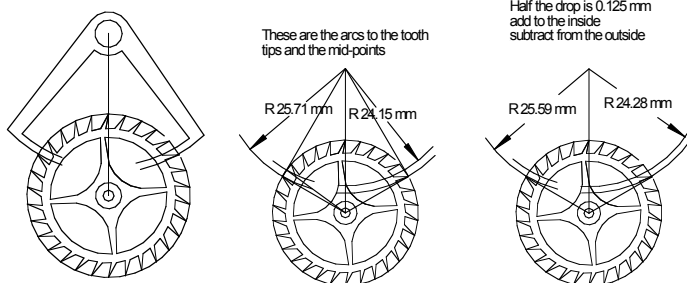


Figure 1

Figure 2

angles with a couple of screws. Figure 3 shows the device. Marking out the blank is carried out by making a center dot and using dividers to draw the inner and outer arcs (Figure 4) shown earlier. The first cuts, however, are made simply holding the blank in aluminum vise jaw guards and cutting away with a full sized hacksaw (Figure 5). Only when the majority of the excess brass has been removed is the piercing saw used (Figure 6). The blades in a piercing saw are fragile and must be treated carefully. The saw is intended to cut on the down stroke because this makes it easier to avoid in order to see where the teeth are cutting. It is also easier to make sure it is not pushed to one side or the other when

clock making part 9 **elements**

BY LAURIE PENMAN

cutting, and, consequently, breaking the blade. Some piercing saws are simply a frame that must be compressed while clamping each end of the blade in order to put tension on the blade when compression is relaxed. My saw has an arrangement that tensions the blade by means of a screw after the blade has been clamped in position. This is much easier and reduces the number of times the blade gets broken when inserting it. The “Vee”-shaped support provides the maximum stability for the work piece without interfering with the saw.



Figure 6

Piercing is not a fast operation even on brass, but as long as the operator does not break a lot of blades (Figure 7) it can be achieved in about ten or fifteen minutes. Long steady strokes, not fast short strokes, are needed. In this respect, piercing is no different to any other type of sawing or filing; use all the teeth, not just an inch or two in the middle of the blade.



Figure 7

The next step is to drill a hole for the pallet arbor. This will serve to locate the blank for machining the inner and outside arcs. Figure 8 shows a center drill being used to provide a start for the drilling of a 5 mm hole. This will be used later to accept a peg in the center of the brass chuck that is being faced and drilled in the lathe (Figure 9).



Figure 8

The brass chuck will have to be taken out of the lathe for the next stage. Replacing it later for machining the pallets will not present any problems. Although it should have the hole centered properly, it does not need to be more precise than about 0.2 mm because the finished pallets can allow for this by modifying the designed center distance. For this reason, the pallet arbor pivot holes are not drilled in the clock plates until the complete escapement, pallets and wheel have been made. Figure 10 shows the blank being prepared with soldering flux.



Figure 9

A 5mm diameter peg is inserted into the brass chuck and it, too, has flux wiped across its machined face (Figure 11). The refractory slabs you can see in Figures 11 and 12 are a product of the barbecue industry; they are very useful, but terribly fragile. The chuck and the blank are tinned by melting soft solder onto both before being assembled and heated until the solder melts again and forms a fillet around the boundary of the pallet (Figure 12). On either side, brass discs are being used as spacers for support. After soldering the blank in the

clock making part 9 **elements**

BY LAURIE PENMAN

desired position, it is set up in the lathe chuck and a clean peg is inserted at its center (the first peg would probably have solder on it).

When machining the outside arc (Figure 13), care must be taken to make small cuts. These should be gentle cuts because this is an interrupted cut and shock occurs at each revolution (Figure 14). I ran this at about 200 rpm-any faster would cause a slight chattering. The result can be seen in Figure 15.

The inside arcs can be cut on the lathe by using a short boring bar and rotating the chuck through small angle and then reversing it. It is a tedious procedure and to machine the other inside arc, the tool must be turned over so the cut is made by rotating the chuck in a counterclockwise direction (not illustrated). The simpler method is to file the inner arcs, but only after machining a guide on the face of the pallets. Fig.16 shows a short boring tool that has been set up until, with all backlash removed (the tool has been drawn back), it just touches the 5 mm diameter peg. My machine has a digital readout so it's simple to zero it in this position. The tool will then be used to face a shallow rebate (after moving the saddle to clear the peg) of the correct radius. That radius is established at a point that is half the diameter of the peg (2.5 mm radius) plus the radius desired for the pallets (24.28 mm radius) from the zeroing. As a double check, and for machines without a digital readout, a vernier caliper is used on the cross slide (Figure 17). The rebate is only 0.5 mm deep, but that is sufficient to act as a guide for the next operation of filing the inside arcs which will follow in another article. ♦



Figure 11

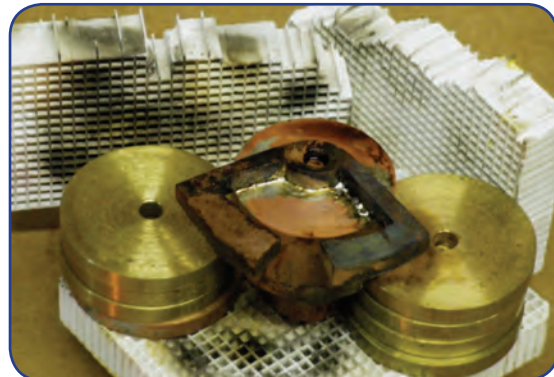


Figure 12



Figure 13



Figure 10

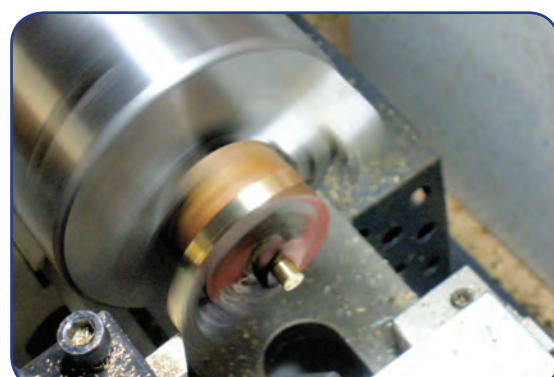


Figure 14

clock making part 9 **elements**

BY LAURIE PENMAN

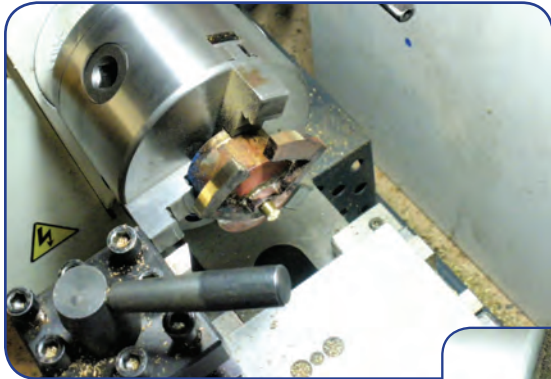


Figure 15



Figure 17

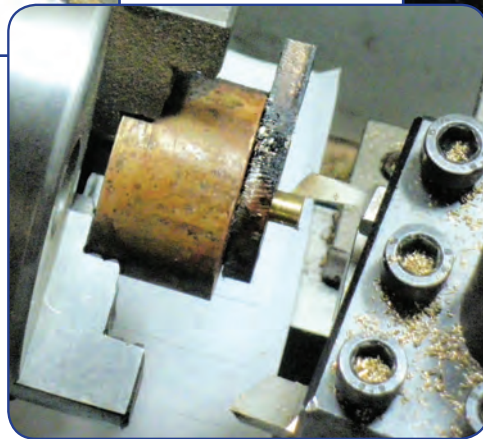


Figure 16

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BY JORDAN FICKLIN, CMW21

***Masters of Contemporary Watchmaking*
Michael Clerizo, 292 pages, 672 illustrations,
493 in color, 2009**

As the title suggests, *Masters of Contemporary Watchmaking* is more about the people who make the watches than it is about the watches themselves. I think that's why I liked it so much. Clerizo conducts thoughtful and insightful interviews of the greatest independent watchmakers of our day in a quest to answer the questions: Are watchmakers artists? And are watches art? These are the individuals who sit down and make watches from start to scratch, mostly by hand, discovering new techniques and inventing new complications along the way. Clerizo interviewed George Daniels, Svend Andersen, Vincent Calabrese, Philippe Dufour, Antoine Prezioso, Franck Muller, Aniceto Jimenez Pita, Alain Silberstein, Marco Lang, Vianney Halter, and Roger Smith and includes gorgeous photographs of their works inside and out.


From the outside the book looks like an oversized picture book, the kind that belongs on the coffee table and merely starts a conversation, but inside the book is

full of text. When it comes to the watches, a picture is worth a thousand words, but when it comes to the watchmaker, the words are worth a thousand pictures. At the end of each chapter I felt like I had been in the room with Clerizo and the Masters. I have come to appreciate these great watchmakers, their genius, and their insanity. I enjoyed the photography. It portrays the level of skill these watchmakers possess, but I enjoyed the text even more because it illustrates what is necessary to achieve the level of mastery these greats have achieved.

The book was a fantastic read and I recommend it to anyone with an interest in horology, but I will warn you it can be difficult to read. It is way too large to hold in your hands, so be prepared to sit at a desk or table for this one. Be sure you have a reading lamp handy, as well. The text is cream-colored on a brown background, and on some pages a light brown image hovers behind the text, making the book quite difficult to read, especially in lower light conditions. Each page is a beautifully composed work of art, but at the price of legibility.

So, you ask, did Clerizo determine if the greats are artists, and if their works are art? You'll have to read the book to find out.

|



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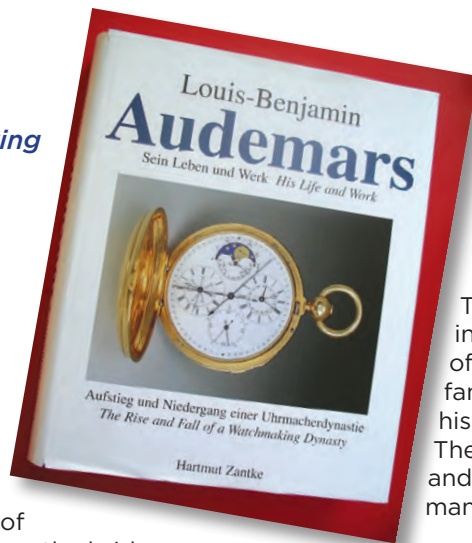
BY ROBERT D. PORTER, CMW

**Louis-Benjamin Audemars:
His Life and Work
The Rise and Fall of a Watchmaking
Dynasty by Hartmut Zantke**

Mr. Hartmut Zantke is the author of this important work detailing the life of Swiss Master Watchmaker Louis-Benjamin Audemars, his sons and successors. This high-quality book measures approximately 10.5 by 12.25 inches with 507+ pages and more than 600 illustrations, many of which are in color and full page size. These large pictures allow the collector or restorer a close-up view of the complications under the dial and on the bridge side of the movement.

More than 160 watches that helped set the standard for high quality watchmaking by the Louis Audemars family and its successors during the 19th century are depicted, including: Perpetual calendar, moon phase, repeaters, and, much more. This unique work is a dual language publication—the left half of the vertical page is written in German and the right side is translated into English.

Mr. Zantke was fortunate to have obtained much interesting personal information about the Audemars family from direct descendants that greatly enhance the value of this publication to its readers. The history of the development of the Swiss watch industry provides insight into how early artisans learned their craft, as well as how the guilds strictly controlled apprenticeships, quality and output. The part which religious persecution played in the development of the horological arts in Switzerland and elsewhere is explained. The importance of the Vallee de Joux to Swiss watchmaking, especially the development of complicated timepieces, is told in detail.



It's interesting reading to see how the influence of many noted artisans, including Breguet, Meylan, Lecoultrre and Piguet (to name a few) interacting with the Audemars family, played a part in the advancement of horological science and manufacturing methods.

This well-researched book provides much insightful information about the business of watch manufacturing by the Audemars family and its successors to the horological historian, researcher, restorer and collector. The pictures and diagrams of complicated and rare watches from the Audemars manufacturing plant are especially valuable.

Narrated in great detail are the successes, as well as business decisions—and the misadventures of a prodigal son. These all had an effect on the business, leading to much hardship and the eventual decline of the Audemars watchmaking dynasty.

This high-quality book is a fitting memorial to an outstanding horological family and is highly recommended to anyone interested in collecting or restoring complicated watches of the finest quality.

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a 19¢ fix that could save you \$1900

Remedying a Common Fault in the Elma RM90 Automatic Watch Cleaning Machine

BY JONATHAN EDWARDS

I have had the good fortune of working with several different automatic watch cleaning machines over the years. The Elma RM90 is the first I was ever exposed to. While it lacks the ultrasonic capabilities and digital settings of machines such as the Greiner ACS 900 and Rolex's CM3, I find its rudimentary construction to be one of its best assets. I also find that the square-bottomed jars it uses to hold the cleaning and rinsing solutions help to compensate somewhat for its lack of an ultrasonic tank, as the square form naturally churns the solution more effectively than the round jars of the aforementioned machines. In all cases, though, whether equipped with an ultrasonic chamber or not, pegging out the jewels after the preliminary cleaning of a watch mechanism is still necessary to maintain the long-term precision timekeeping of any watch.

Recently, the RM90 that we employ in our shop began malfunctioning on us. The cleaning basket would move through the cleaning and rinsing cycles, and it would spin dry, but it would rotate to a standstill shortly after entering any of the solutions.

A similar problem had manifested itself in another RM90 I had used several years ago. The machine was sent out for repairs and we did not receive it back again for more than a month. While we could live without ours for that amount of time, it would put a serious dent in production, and neither my associate nor I were keen to let it go for that long. Especially after contacting the nearest official Elma service center and being quoted \$1900 for the repair, not including shipping. So we decided to have a go at repairing it ourselves. Our unit was three years out of warranty, so there was nothing to void by opening it, and if our efforts didn't yield a solution, we would spend the nearly \$2000 for an official fix.

One trip to the local hardware store and 3 hours later, our cleaning machine was back up and running like new again.

Jonathan Edwards is a contributor to www.watchmakingblog.com and operates the English half of www.alliancehorlogere.com, an open-source and editable reference for watchmakers to share technical information online. Jonathan was trained at the former Royal Greenwich Observatory in Herstmonceux, England, as well as at Canada's National School of Horology in Trois-Rivières, Québec. He presently works as a watchmaker in Canada's capital.

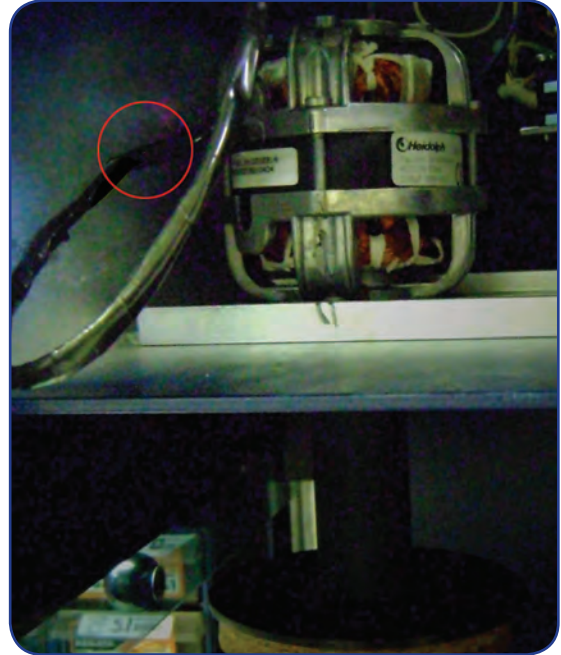


FIGURE 1: HIGHLIGHTED AREA WHERE SPARKS WERE NOTED COMING FROM THE WIRES THAT ATTACH TO THE MOTOR

FINDING THE PROBLEM

We started by opening the machine up and letting it run through the clean, rinse, and dry cycles to observe all of the internal components in action. The first thing we checked was for adequate lubricant in the bushing in which the machine's sliding bracket operates. We also checked that the lubrication on the center column was still in good condition. These two checks are the only maintenance points described in the RM90's user manual. The center shaft and bracket were both well lubricated, so our problem wasn't there. Moving on, we noted the cabling, which runs from the unit's main circuit board to the motor, was quite taut when the motor was positioned at its lowest active point. Upon even closer observation we noticed an occasional, small spark (Figure 1) where the cables entered the motor when the motor moved between the submersed and spin-dry positions. We had found our problem area.

a 19¢ fix that could save you \$1900

Remedying a Common Fault in the Elma RM90 Automatic Watch Cleaning Machine

BY JONATHAN EDWARDS

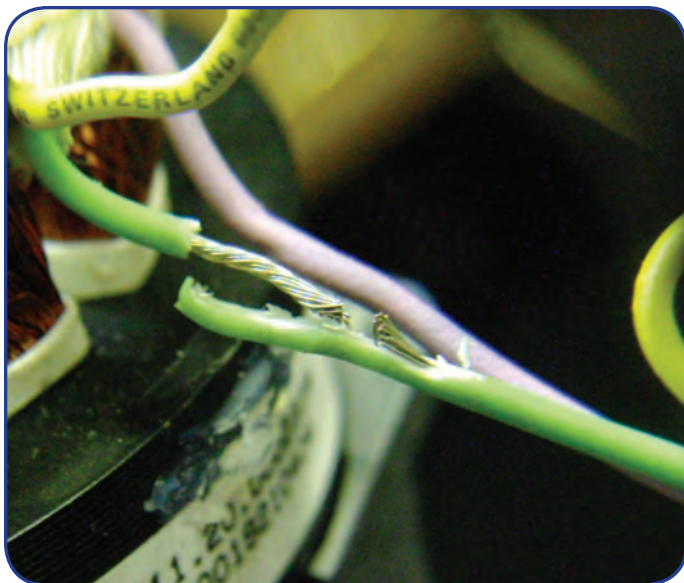


FIGURE 2: THE FRACTURED WIRE THAT WAS CAUSING THE MALFUNCTION

After removing the motor from the cleaning machine and peeling back the wire insulation near the area where we had seen the sparks, we noted the wire had fractured inside of its protective covering and was occasionally poking out through insulation (Figure 2). The wire needed to be replaced.

MAKING THE FIX

The wiring that connects the motor to the circuit board is surprisingly stiff and, after years of repeatedly moving up and down inside of the machine, it had snapped inside of its sheathing. To remedy the problem, we purchased 12" of more flexible wire from the electronics section of a nearby hardware store for 19¢ and replaced the old wiring, with slightly longer lengths, where the wire enters the motor. The fix worked great. It's been more than six months now since we made the repair and our Elma hasn't shown a hint of malfunction since.

Having seen a similar problem with the aforementioned Elma RM90 in the past and after having spoken about the problem with the repair center nearest us, this quirk with the RM90 seems to be a common point of failure. As other watchmakers could probably benefit from knowing how to fix their machines when this happens, I thought it would be a good idea to recap the process that we went through to fix ours.

THE TOOLS NEEDED:

- 3mm metric hex key
- Flathead screwdriver
- Torx T20 screwdriver
- Pliers
- 3" or more of flexible 16-gauge wire
- Wire cutter/stripper
- Exacto knife
- Soldering iron
- Solder
- Heatshrink (electrical tape will also suffice)

THE PROCESS:

1. Unplug the machine
2. Remove the flathead screws that hold the top of the machine in place
3. Set the screws and rubber washers in a safe spot where they won't get lost
4. Lift the top of the machine up slightly and locate the ground wire attached to its underside
5. Dislodge the ground wire from under the top using pliers
6. Remove the top
7. Remove the six flathead screws that hold the right-hand side panel of the machine in place
8. Locate and dislodge the ground wire from the right-hand panel
9. Remove the right-hand panel
10. Detach the wires that run from the motor to the circuit board from the circuit board, taking note of where each wire came from so that you reinstall them in the correct place
11. Open the glass hatch at the front of the machine and loosen the flathead screw that holds the plastic chassis for the cleaning baskets in place
12. Remove the plastic chassis from the machine
13. Use the hex key to unbolt the motor housing from its mount in the cleaning machine
14. Set the hex screws safely aside
15. Carefully slide the motor and its shaft up and out of the cleaning machine
16. Use a torx T20 size screwdriver to remove the torx bolts that hold the motor housing together
17. Set the torx screws safely aside and carefully remove the upper half of the motor housing
18. Slice away the black heatshrink sheathing that covers the wires leading to the motor

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Remedying a Common Fault in the Elma RM90 Automatic Watch Cleaning Machine

BY JONATHAN EDWARDS

19. Strip away the wire insulation near the area where you observed sparks until you find where the wire has fractured (our wiring had begun to sever about an inch and a half from where the wires enter the motor housing)
20. Take a length of new wire and cut away a suitable amount from either side of the original, fractured piece of wire, which will be replaced by the new wire
21. Cut away 10mm or so of the wire insulation from either end of the new piece of wire as well as from the two wire ends from the machine in which you'll be installing the new piece of wire
22. Fray the wire that is exiting the motor housing as well as one of the ends of the new piece of wire
23. Join the two frayed ends and twist them together
24. Solder the joined wires together and then insulate the joint with heatshrink or electrical tape
25. Reinstall the upper half of the motor housing and screw the housing back together with the torx screws from step 16
26. If you will be replacing the heatshrink that originally covered the wires, now is a good time to slide it over the wires—if you will be using electrical tape or another form of insulation, skip this step
27. Repeat steps 21 through 24 to attach the other end of the new piece of wire to the wire that attaches to the circuit board
28. Position the heatshrink and apply heat to fix it in place or use electrical tape to bind the three wires together in order to keep them from catching on other components inside the machine when the motor moves up and down
29. Reseat the motor back inside of the RM90 and fix it in position using the hex screws from step 13
30. Reinstall the plastic chassis for the cleaning basket and fix it in place with the flathead screw that secures it to the motor shaft
31. Reattach the ground wire to the side panel and install the panel back in place with the flathead screws from step 7
32. Reattach the ground wire to the top cover and fix the cover back in place with the flathead screws from step 2

33. Plug the machine in and test to ensure that everything is back in working order

CONCLUDING REMARKS

If your Elma RM90 is beginning to exhibit signs of malfunction with the motor unit, the problem may lie in the wiring that connects it to the main circuit board. If your machine is still under the manufacturer's warranty, I recommend getting in touch with Elma as soon as possible by sending them an email at info@elma-ultrasonic.com. Their staff is very friendly and supportive and will go out of their way to help you. If your machine is no longer covered by the manufacturer's warranty, I hope the above guide will help you get your machine back in full working order again. If you are not confident in carrying out this type of repair, have it done by someone local who is trained in and has a background in electronics repair. ♦

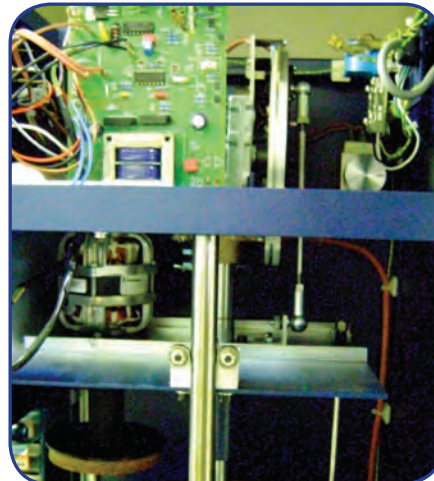


FIGURE 3:
THE INTERNAL
COMPONENTS OF
THE RM90

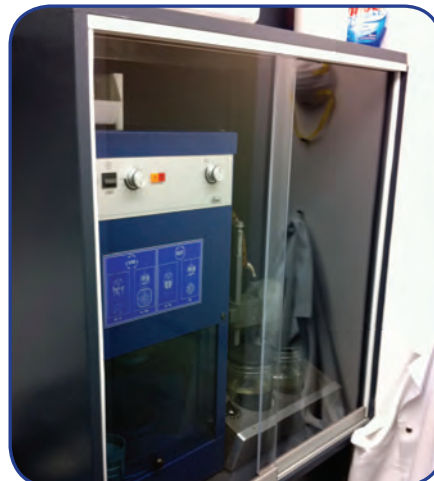


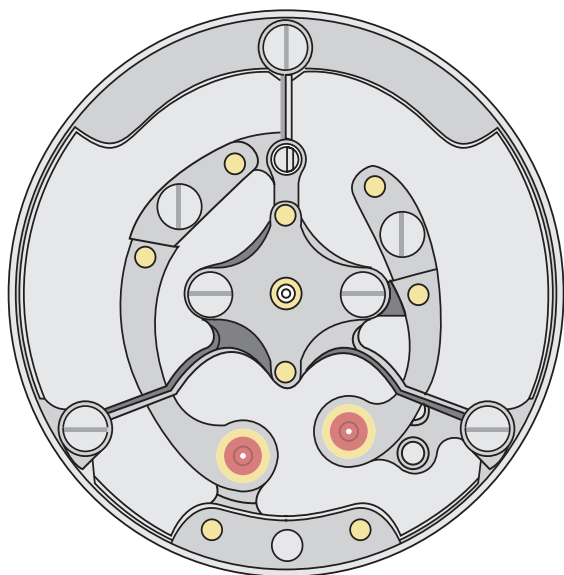
FIGURE 4:
THE REPAIRED RM90
RETURNED TO ITS
RIGHTFUL PLACE IN
OUR WATCH LAB

part 3 making a watch

THE TOURBILLON CARRIAGE BY PAUL LOATMAN

In my last two articles I showed how I made an indexing apparatus, gear cutters, and all the escapement parts. Now with all the escapement parts fit for a tourbillon, I was ready to make the framework for it all. I made a few test pieces before I settled on a design, but even now as I'm writing this I'm thinking of making a few small changes to this current variation. The basic design and styling will be kept, however.

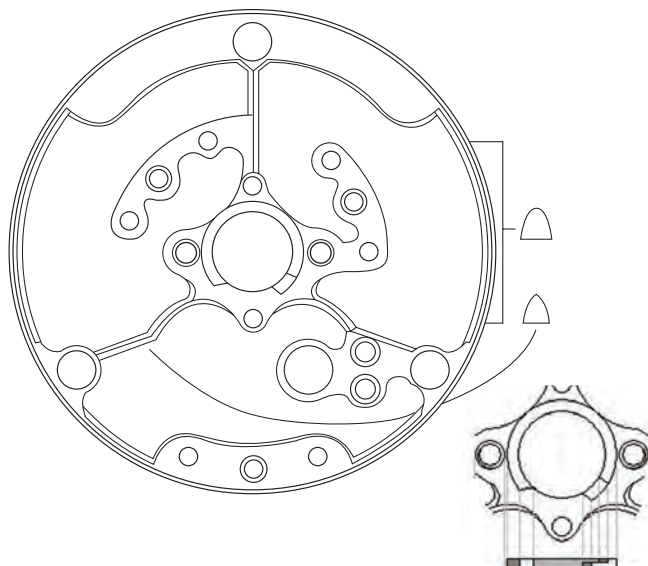
Fig. 1: The tourbillon frame



The carriage consists of two main bridges which hold the balance staff pivots and the lower pivot of the pallet (Fig.1). There are three bridges that hold the escape wheel pivots and the upper pallet pivot. There are two small plates, one each on the upper and lower part of the main bridges. The upper one holds a simple pivot while the lower holds the fourth wheel pinion and its pivot. The banking pins are screwed into the lower main bridge and are adjustable while the center holes in the main bridges hold the shock systems. If you're reusing shock systems, they should be lower shock systems to conserve weight and space. And finally, the upper and lower main bridges are held together with three pillars which have a tapped hole that runs all the way through. On each end of the pillars a screw holds the main bridges in place.

In order to insure that all of these parts would fit together properly, I had to make a sort of drill jig, a template, if you will. With this template I'm able to remake any of the parts again in the event they get damaged or ruined during their construction.

Fig. 2: The lower main bridge



I first started with the main bridges. The lower main bridge is what you would first design to template everything else. Every hole here can be used to make every other component of the carriage. The only exception would be for the hairspring stud on the upper main bridge. Therefore, the lower main bridge is the most complex of all the carriage components. All of the bridges for the pallet and escape wheel are held on the lower main bridge and great care and consideration of the other components should be taken during the design process. The empty area on the upper side of the bridge in Fig. 2 is where you would add weights for poising. You can choose to drill holes to hold a weighted plate on the carriage or try another method of your own design. The purpose is to poise the carriage-this is all that matters. The banking pins are essentially screws without a head, but with a slot in one side and on the other side an offset pin (Fig.3). That way when you turn it from the slot, the offset pin will move farther or nearer to the pallet. These were made with 416 stainless steel which does not require hardening. To get an idea of the size we're dealing with here, the diameter of the lower main bridge is a slight bit less than that of a U.S. penny.

part 3 making a watch

THE TOURBILLON CARRIAGE BY PAUL LOATMAN

Take a penny and shave off the rim—that's about the size of the lower main bridge of my tourbillon.

Fig. 3: Banking pin

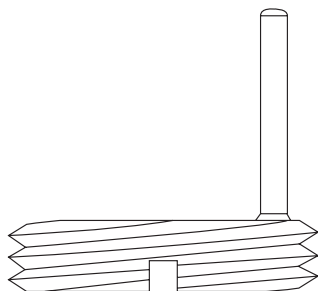
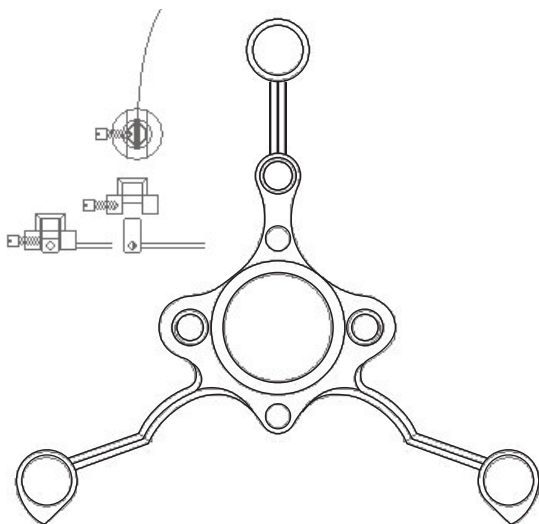


Fig. 4: The upper main bridge

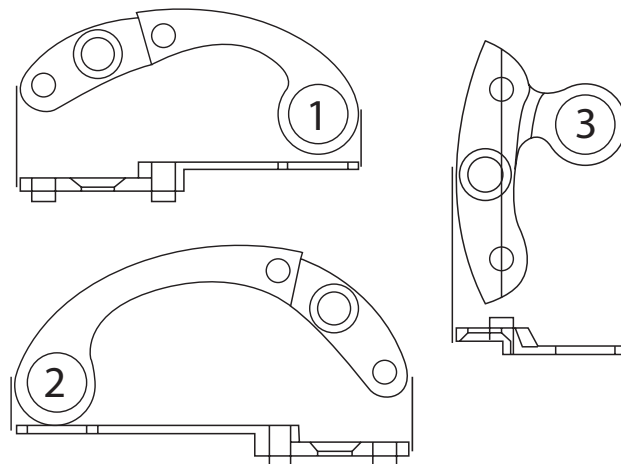


The upper main bridge follows the same design as the lower bridge with the exception of the outer ring and the addition of the drilling for the hair-spring stud. The hairspring stud is held in a brass bushing which is riveted into the appropriate drilling. The bushing is shown in Fig. 4. It's designed to consume as little space as possible. The hairspring should be almost level with the bottom of the bushing. This is possible because there is an area ground out from the bottom of the bushing which allows room for the hairspring. The stud is held in by a small screw which can be acquired from an assortment of hairspring stud screws.

Both the upper and lower main bridges are made at the same time. The holes must be first drilled

and centered, then the basic shape is cut out with a piercing saw. It's important not to cut them out to their final thickness because they will distort far too easily during the hardening process. The pieces are hardened with the holes pinned together to further prevent distortion during the hardening process. The pieces are made from O1 tool steel and must be hardened in oil then tempered to a dark blue. The pieces then have to be turned down to the proper thickness. The centers are kept thicker at 0.8mm. The rest must be turned down to 0.5mm. The arms and rim are filed to a width of 0.35mm and then beveled as shown in (Fig. 2). The lower main bridge center has a few areas cut out to give clearance for the escape wheel and pallet fork shank. It's highly recommended that you use diamond coated files and carbide lathe cutters for working on these parts because the pieces will be extremely difficult to cut with ordinary steel tools after hardening. For finishing the pieces, different types of slipstones should be used. I'll go further into detail about the finish in my next article.

Fig. 5: The pallet and escape wheel bridges



In Fig. 5, number 1 is the upper pallet bridge. Number 2 is the upper escape wheel bridge, and Number 3 is the lower escape wheel bridge. The escape wheel is suspended between two separate bridges and is not held directly by either the lower or upper main bridges. The lower escape wheel bridge hangs below the lower main bridge. This is because the escape wheel pinion must run on the stationary fourth wheel which will be underneath the carriage (the stationary fourth wheel will be produced with the fourth wheel cutter I described in "Making a Watch. Part 1: The Beginnings." These bridges are

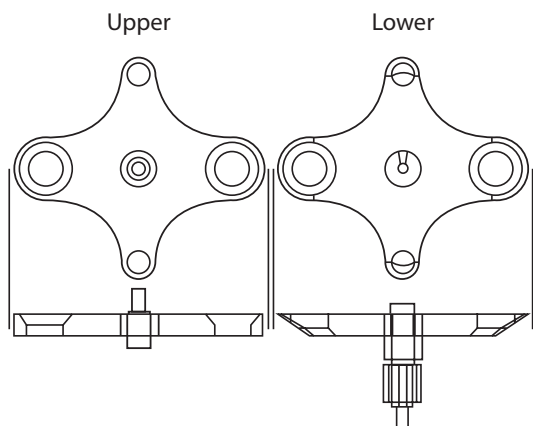
part 3 making a watch

THE TOURBILLON CARRIAGE BY PAUL LOATMAN

made from O1 tool steel and are quite simple in design. There is no mathematical algorithm or strict pattern for them to follow in their design. I wanted to give them an organic feel. Each bridge has two drillings for the steady posts which are fit by friction, and another hole is for the screws. The holes for the screws have a chamfer to conform to the screw's head shape.

These are all made from O1 tool steel in sheet form and the holes are all drilled first then the chamfer is done very carefully using a 3-jaw face plate and a drill bit with the same diameter as the screw head. Hold the drill bit in your tailstock and drill out the depth of the chamfer very carefully by hand. It's important to keep checking the fit with a sample screw. Once this is complete you can finish the shape of the bridge in whatever design or shape you like. However, it's important that the pieces be very small and no thicker than necessary in order to keep the weight as low as possible. The jewels are friction fit first into brass bushings and then the bushings are friction fit into the bridges. This is done mostly because the bridges are hardened steel and it's much better for the jewels to be pressed into a softer material such as brass. The longevity of the jewellery reamers also had to be considered because of my tight budget. However there is also the added appearance like that of older watches which would have had jewels burnished into bushings, which is a nice touch.

Fig. 6: The pivot posts

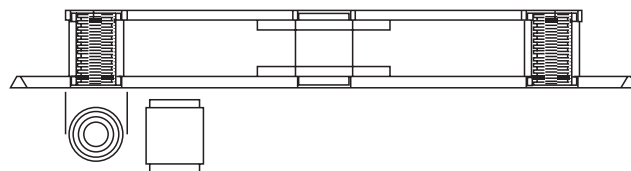


The pivot posts are of simple design, made from O1 tool steel, and do not conform completely to the shape of the main bridges (Fig 6). They're shaped to save weight while still keeping structural integri-

ty. Both have two steady posts and two chamfered holes for the screws. The pivots are held in brass bushings. The lower bushing extends down about twice the thickness of the steel portion. The pinion is held directly under the bushing with a very small space between the leaves of the pinion and the bushings. The exact length depends solely on your own design.

The pivot posts are produced in the same manner as the pallet and escape wheel bridges. The pinion can be produced using the pinion cutter that I described in "Making a Watch. Part 1: The Beginnings." However the original pinion can easily be modified to fit.

Picture 7: The carriage pillars



The carriage pillars are made from brass and are very simple (Fig 7). It's important that they're all made as similarly as possible in order to keep the main bridges absolutely parallel. It's also very important that you mark each pillar so that you know which hole they should stay with in order to insure that the carriage is kept in poise in the event that you service one of your watches in the future.

Fig. 8: The actual tourbillon carriage with all components.



part 3 making a watch

THE TOURBILLON CARRIAGE BY PAUL LOATMAN

Figure 8 shows the tourbillon without its final polish or finish. This is how the tourbillon should look at this point--when the calibrating of all components is done before finishing or poising of the entire ensemble.

I purchased a book that was a great inspiration for my watch. It was written by a man named Steffen Pahlow and is titled *Tourbillon, About my Passion*. It's available only from the author directly; however, it's a good book with an amazing amount of detail on a Glashutte style tourbillon.

Being the clever reader you are, you probably have gathered by now that I haven't given any precise measurements. This is because such figures are unimportant. I've given the general size of the carriage parts. This is all one needs to understand how delicate the carriage should be in order to insure the least amount of weight while maintaining structural integrity. The small details should be designed and shaped to conform to the escapement parts. If you're one of the few people who will attempt what I'm doing, it's better to be creative with your own general design than to simply copy

someone else's watch. That's almost like not even making it yourself and it would be a shame to feel even the slightest bit of doubt after the immense time spent on such a project.

My next article will include details about finishing the components that I've made so far and then poising the carriage. I will also reveal my solutions for poising weights for the carriage. ♦

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AWCI fiftieth annual convention

ONE MAN'S THOUGHTS AND EXPERIENCE BY MICHAEL GAINNEY, CC21

Starting in mid-July my anticipation and excitement begins to build as I see the specially marked dates on my calendar fast approaching. The first one in July reads, "WAO Convention" and then two weeks later follows "AWCI Convention."

Being active in both organizations, I look forward to this time in several ways. First, it is a break from my normal "nose to the grindstone" routine. Second, it is a chance for professional growth and development, and third, I am able to network with others in the trade.

Several weeks before the convention I mentioned to President Butterworth there should be a detailed article with photographs and interviews in *Horological Times* describing the convention events. Not just a dry recounting of what took place, but a story that provides a little color and encourages others to attend. Be careful what you wish for! Next thing I knew, I had "volunteered" to do just that.

I thought about previous conventions I had attended. This one would be my eighth national convention. As I think about the many positive experiences I have had, I am forced to ask myself why I keep going when so many of our members are staying at home. Naturally, there are many logical reasons why someone might not attend. These could be timing, health or financial reasons, among many others. Understanding that the dates for the convention are set almost a full year in advance, there is certainly time to plan ahead by blocking out the dates. There is also plenty of time to budget for it if your income allows for such expenditures. However, the reason I come up with most often is simply that most of our members do not know what they are miss-

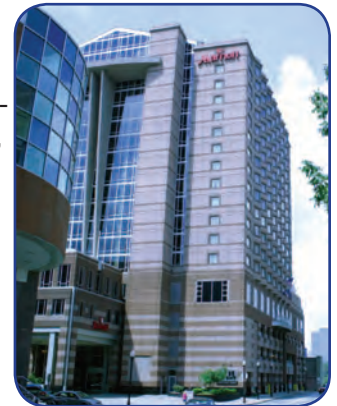
ing. By writing this article I wish to bring to light the "mysterious" activities that take place at these conventions, pulling back the veil, so to speak, and perhaps even peeking behind the curtain so others can understand why things occur the way they do. I feel this is important because I remember the trepidation I felt before I went to my first convention. I only knew one person who would be there and I wondered if I would be accepted by the others, or perhaps stand out like a bump on a log sitting alone in a corner while everyone else was going about their convention activities.

Come along with me as I walk you through what I saw and experienced.

Tuesday, August 3

I arrived about an hour before the first meeting so I had to time to get checked in, unpack my suitcases, change my clothes, grab my camera and admire the beautiful hotel.

Of all the hotels AWCI has used for the convention, this was the most spectacular. All the hotels were nice, of course, but the Marriott River Center Hotel was much more interesting. It was located on the Ohio River with a fantastic view of the Cincinnati skyline. The individual hotel rooms ran around the outside of the structure leaving an



Convention Hotel



AWCI fiftieth annual convention

ONE MAN'S THOUGHTS AND EXPERIENCE BY MICHAEL GAINEY

open interior that stretched 15 floors tall. The centerpiece of this space was a giant gazebo located one floor up on the “roof” of a small bar located in the center of the ground floor lobby area. Adjacent to the gazebo (also one floor up from the lobby) was a large gathering area. Each time I left my room I was able to peer over the railing to the interior floor below and watch various people scurrying about. Most often, everyone I saw was related to the convention, some standing around in small groups talking and others were on their way to different meetings, classes or other activities. Several times I used this vantage point to help find someone whom I might choose to spend some time with when duties were not pressing.

This year's convention started early for me along with 15 others who were asked to attend the Strategic Action Committee meeting. AWCI had hired a Strategic Action Plan consultant to perform preliminary work to give us a feel for what a professional consultant could do. I was eager to hear what a professional might tell us.

The meeting started with a presentation by Marta Brockmeyer, the consultant. This presentation was a result of her interviews with twelve stakeholders in the organization. These stakeholders were asked a series of questions that were designed to begin the process of developing a strategic plan by finding areas that need attention.

As the meeting was breaking up, the first person I bumped into was our President, Mark Butterworth. I felt this would be a good time to bend his ear about my desires for the organization, so I arranged to eat with him and several others.

At this point I would like to mention the current ease I have in regards to finding folks with which to socialize. I have found those who are attending conventions tend to be very social. They are all nice

and eager to speak to anyone who will take the time to do so. Meeting new people at the convention is one of the more interesting aspects of attending. Live, face-to-face conversations with others in our trade are a rare occurrence at home, but at the convention, the opportunities exist everywhere. Do not be shy. Walk up to someone, look at their name tag and introduce yourself.



Hotel Interior

Wednesday, August 4

The official first day of the convention is dominated mostly by events surrounding the Chronometer Club, an AWCI Affiliate Chapter that “piggybacks” onto the greater convention by having their annual meeting at the same time and place. This would be a light day for me as the first AWCI event was not until 6:30 p.m. I did, however, want to get some pictures of the Chronometer Club course at noon, so after sleeping in a bit, I made my way downstairs to enter the packed room where a course was being taught by a Rolex representative. As I began to lift



AWCI fiftieth annual convention

ONE MAN'S THOUGHTS AND EXPERIENCE BY MICHAEL GAINEY

the camera to my face I was quickly told that no pictures would be allowed as the material on the screen was not to be photographed. I left the room a little deflated as this was going to be the beginning of my photo documentary of as many events as possible.

At 6:30 p.m. I dutifully make my way to the welcome reception (for food and photographs), which is taking place near the gazebo mentioned earlier. This is the first real mingling of the AWCI members. These are the die-hard convention attendees who have arrived early in the week, while many others do not come until Friday.

The food at the welcome receptions has made a great leap forward. It used to be mostly cheese, crackers and deli meat, but this convention and the last included some very good hot food including a pasta station where one could create their own main dish.

Thursday, August 5

Thursday morning started with an excellent full buffet breakfast followed by a general session. During this time the Affiliate Chapter meeting occurred. This meeting included representatives from the various affiliate chapters who gathered to discuss the needs of the affiliates and to elect their representative for AWCI's Board of Directors. The Affiliate Chapter Representatives serve for one year. (This is how I first became a Board member.) Representatives present to the Board any motions forwarded from a meeting.

As the meeting was ending, I once again gathered some people for lunch. No sense eating alone with so many new friends to meet or old friends with which to reconnect. Although I enjoy many aspects of the convention, this is one of my favorite times—a casual lunch with friends I do not get to see often.

There is no excuse for eating alone. With a minimum of effort you can join someone or a group, and I guarantee you will not regret it. If you are having trouble mixing with the others, ask someone to introduce you to a few people. Find me if I am there and I will be happy to join you. Soon, you'll begin to see your circle of acquaintances rapidly expand!



Fun on the Ohio Riverboat cruise



Strategic Action meeting

Having returned from lunch the next item on the agenda was the first of two scheduled Board of Directors meetings. The first meeting required the reading of various reports from the many different committees necessary for running the organization. If you are interested, these reports can be found on the AWCI website. It is important to note the Board of Directors meetings are open to all members and those sitting in the “gallery” are able to approach the Board with questions and or concerns during this time.

The Board meeting was followed by an optional trip to the Cas-Ker facilities for a tour and a casual supper. Unfortunately I did not attend so I am unable to report on it, although I heard many people comment on their enjoyment of the trip.

As people began to return to the hotel they began moving to the hospitality room. This was everyone's chance to spend more time with fellow members, to relax, and to have casual conversation while

AWCI fiftieth annual convention

ONE MAN'S THOUGHTS AND EXPERIENCE BY MICHAEL GAINEY

munching on snacks and drinking a favorite beverage, alcoholic or otherwise. If the view during the day from street level across the river was fantastic, the view from the hospitality room, located in the Presidential Suite, was incredible with a visual display of the downtown lights of Cincinnati.

The hospitality suite was a happy place with folks constantly moving from one group to another. As the night wore on, the room slowly began to empty but there were always a fair number of hearty souls who stayed past the midnight closing time. ♦

To be continued?

Did you enjoy this article? Read the full seven-page unedited version on the AWCI web site or on the *Watch Maker* Facebook page.

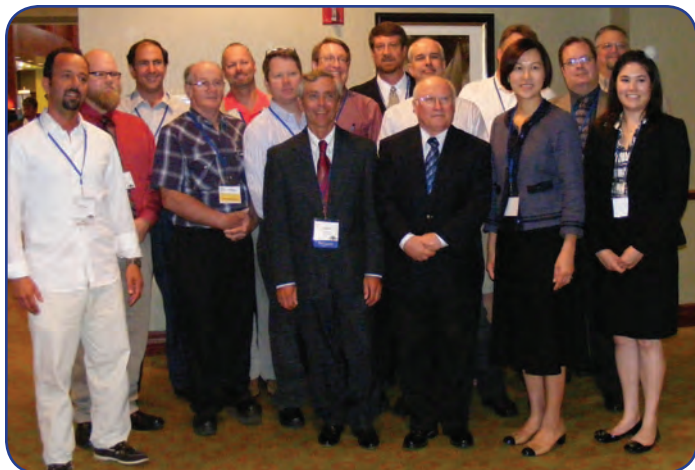
Would you like to see more of this type of writing in *Horological Times*? Please give me your feedback by emailing me at mjongainey@hotmail.com. I need to know if you would like the full report on the convention.



Lively and informative trade fair



New member reception



Some convention attendees

Terry Kurdzionak heads new member reception



Member's Passing

Kenneth C. Denney, who passed away last July, was a charter member of our association and a certified master watchmaker. Born in 1920, "KC Denney" wore many hats during his full life in the Tulsa, Oklahoma area. He began as a watchmaker in the 1940's and owned his own jewelry store in Carthage, Missouri. He was a self-taught electronics expert and worked for Sinclair Oil and Amoco Oil near Tulsa for many years as a research technician. He designed circuitry, worked on camera electronics, and handled just about any electronics-related project that was needed. Throughout his varied career, he remained associated with the clock and watch repair business because it was his life-long passion. AWCI was privileged to have a visionary like Mr. Denney in our organization.

AWCI fiftieth annual convention

MEMBERS RECEIVE RECOGNITION



Jerry Faier presents CC21 award to Karel Ebenstreit



Les Smith receives Outstanding Personal Achievement Award from Milt Stevens



Michael Gainey presents Meritorious Service Award to Jerry Faier



Paul Wadsworth receiving award from President Butterworth



Vince Schrader receives Meritorious Service Award from Jim Lubic

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Insights from Recent Graduation Speech

BY MANUEL YAZIJIAN, CMW21

We can all benefit from the ideas in this speech by Manuel Yazijian, CMW21. The speech was given this fall to graduates of the Seattle Watch Technology Institute of North Seattle Community College.

To the class of 2010 - CONGRATULATIONS! Everyone here today is proud of your accomplishments and successes over these past two years. You chose to attend arguably one of the most prestigious Watchmaking programs in the country... you completed the program and will now be the envy of many of your peers. You may not realize this just yet, but the reputation of this institute and that of the graduates before you makes your entry into this wonderful and exciting profession a great event. As graduates of this Institute you will find there will always be a little spotlight on you as your career path unfolds.

But my genuine message to you today is a simple one that is comprised of three key points:

-Professionalism, in that you will always conduct yourselves in a manner that is of the highest degree of ethical and professional behavior.

-Pride, always be proud of your chosen profession, but more importantly, defend this craft whenever you feel it is being encroached upon.

-Personal well being, in that you must allocate adequate time per week to maintain your physical well-being through physical exercise and healthy diet, as these two points are extremely crucial for your journey in this career. Allow me to expand upon the three preceding points:

PROFESSIONALISM

Many times I have heard watchmakers lament how difficult it is to make a living in this profession. Indeed, every profession has its set of challenges, and watchmaking is no exception. However, there is a great deal each one of you can do to help yourselves, as well as the watchmaking community. You should always maintain a clean and organized image and a professional attitude with your clients as well as your colleagues. True professionalism in this career will only help further elevate every aspect of our industry. Professionalism goes hand-in-hand with my second point.

PRIDE

Watchmaking is a beautiful combination of art and science and only a select few truly understand the special gift you now possess. Be PROUD of your chosen profession at all times, even during moments of adversity, for only YOU will continue to uphold and elevate this craft. I say this, because in all the twenty-five years I have been involved in it, I have witnessed individuals who wanted to benefit from our hard earned toils, yet intentionally failed to properly recognize and reward our skills. Times have changed, ladies and gentlemen, for I encourage you to work hard, continue to gain experience and become the best you can be while you charge like a professional.

PERSONAL WELL BEING

My last point is, our work is sedentary in nature, which involves sitting almost motionless for long hours. It is important we allow the human animal to do what it was designed to do best-be physically active.

As you age with this profession, you may come to realize that something is amiss. The zeal and vigor with which you played while you were younger-when you had more time to have fun and be active-may be replaced by long hours at the bench trying to gain knowledge and experience. I say this now: learn to balance your life by keeping physically active. Don't let your gym membership lapse. Go outside, breathe the fresh air, go for a hike, a run, whatever you do. Just don't let those muscles go soft; you need them as much as you need your sharp eyes and your steady hands.

And last but not least, always maintain a proper and healthy diet which will help you remain fit for the life career you have chosen. The right quality of fuel will only help enhance your performance. In recognition of your extraordinary accomplishments of the past two years, and on behalf of the American Watchmaker's-Clockmaker's Institute, I would like to wish you the very best in your future endeavors and congratulate you once again.

**Be proud of your profession
at all times, even during
moments of adversity**

educate yourself on good business practices

BY JERRY FAIER, CMC21

First of all, AWCI had its annual meeting and it was a success! Again, Happy 50th AWCI and many, many more! Before I say anything else, I want to thank all those who have worked closely with me and the Education Committee and contributed to the successes we now share. I was humbled to receive the Meritorious Service Award and proud to be recognized along with Vince Schrader for our work with the 21st Century Certification program and the Standards and Practices documents!

If you weren't there, you really missed several wonderful opportunities. First was the opportunity to meet and talk with those of us who you know only through the *Horological Times*. I always have a great time meeting and talking with members. This year I had a chance to meet (and tease with) dozens of people whom I met for the first time and I want to thank all of them for sharing their lives and business problems with me. I always find this a special privilege and the best way to keep in touch with "the real guys on the front lines." They are the ones who fuel my columns. Have a question? Contact AWCI. If we don't know you have a problem with something, how can we be of service? Have a complaint or suggestion? We take all kinds as this is how we grow the organization. Much of what I write about is a reflection of the questions and problems that members share with me both by email and at meetings. The advantage at the meeting is that I have a bit more time to really sit, talk and help you resolve those pesky bench and work problems.

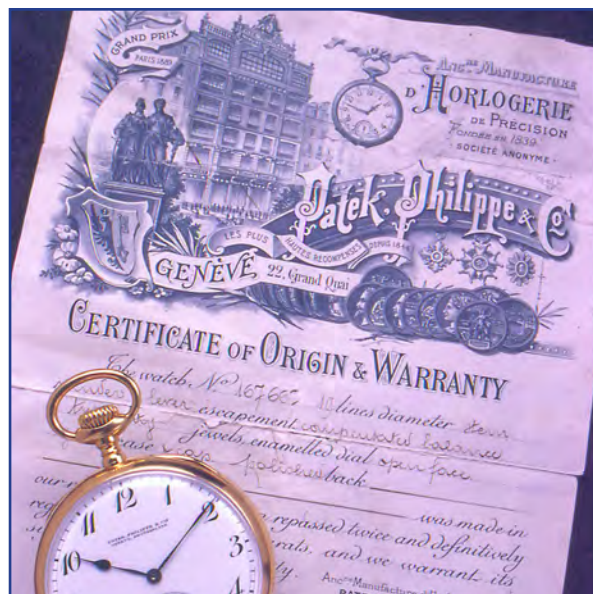
This year instead of giving a talk on some facet of horology, I set up a question and answer opportunity for watch and clockmakers to attend and ask their business questions. I received some excellent ones this year, and I want to share at least one that seems to be a recurrent theme with our members. Think this question through and see if you come to the same conclusions: "Business has been really

slow and I keep getting offered junk to work on. How can I make money in this environment?" I see several challenges here. First, is it junk you are being offered, or is it outside your skill set? Does the customer feel this is what they offered you—junk? Did you feel you couldn't charge enough to make money as the product was too cheap for what you have to charge? Think hard here! What is the real basis for this problem? Second, why do you feel you have to tell the customer what a product is worth? Where is it written that all horologists must also be crack appraisers? With the Internet, how

can you be accurate with any appraisal anyway? After all, the real price of any product is what a *willing buyer will pay* and *willing seller will sell* the product for. How many times have you heard or seen someone buy a "real prize" that you would never have paid a dime for and they paid a small fortune! What's more, if the customer really wants the work done, who are you to tell them that their keepsake is junk!

In a long discussion with a marketing professional, I shared this point and they immediately told me the pro-

fessional is not there to evaluate what is and is not worth doing. Instead, they need to offer what they can do to help the customer. That's why they came into your shop in the first place! If you do not wish to handle such work, then refer it out to someone you know who does. It's all about professional courtesy first. Next, if other work is slow and you want to pay your bills, maybe you need to learn some new skills and take on that item you don't normally do. As I see it, it's your job to offer what you can and let the customer decide what they want. It is **NOT** (repeat, not) your product, it was not in your family and it is not up to you how much someone wants to spend on an item. How many \$6.00 birthday cards that wind up in the trash the next day are you aware of? Did they buy \$6.00 worth of paper? But they bought it anyway—right? The second point is that it is your job to offer service of all types for a price that keeps you in business! If it's a \$10.00 watch that was dropped in the swimming pool,



educate yourself on good business practices

BY JERRY FAIER

you could send them to Wal-Mart for a new one OR you can figure out what it would cost to dry out the movement, correct any damage, then install a new battery and gasket and give them a price. It is not your responsibility to tell them about their product. If Dad gave it to them for graduation, how would you know? But what did you say about Dad when you told them to take the junk somewhere else? Did you build a customer base? Are you offering service or *just your opinion*? And you want to complain about slow business? Don't!

Have you ever written a mission statement for your business? If you did, was it something like: To service all the watches (and/or) clocks presented to me in the most professional quality and manner of which I am capable? Just words? Let me ask this from yet another standpoint. Bad economy you say? Hard to get good work? In the clock assessment, we examine German multi-train movements, American time and strike movements, cuckoos with music, and 400-day products because they represent about 85% of the business most clock shops address. You don't do cuckoos, or 400 days? You feel rebuilding movements are too expensive for the customer so you just flip in a new one or a quartz movement? You just cut off about 50% of your potential income. Why? If it is due to a limited skill level, get busy and learn new techniques because money is oozing out your door. What does this imply to your customers? How many customers have you sent out the door with these approaches? And you say business is poor?

What about the watch segment? I love the guys who say they can't make any money on quartz watches—all they can do is change batteries. I can go so far as to tell you one worker couldn't understand how he was going to stay in the watch business because he couldn't make enough money. When this is all you do, you are competing with the "mall" companies. Don't bother! Even if you work at home, you cannot generate enough income to pay the bills with this type of approach. But who says this is the approach for someone who considers themselves a "bench professional?" Offer what a professional offers—service. Do the battery, do the gasket, clean the terminals and pressure test the product. Show the customer you care about their product as much as they do and I think you will see a different type of customer reaction. Who cares what the value of the product is—to the customer,

this is their prize. Your job is to keep "the prize" in as close to original quality—even if in your mind it's not that great—it is to your customers!

One last example is to build up your bottom line. I get offers daily from folks down on their luck and who knows what else. When they bring me a clock that is useless, what do I do? I tell them the history of the product and try to educate them on what costs would be to repair what they have. I don't tell them to remove their junk from my shop, I tell them it is not the kind of product that I can sell and encourage them to seek other opportunities. I know a half-dozen examples of this very behavior in my shop where, within several months, someone either brings in a great piece for repair or a product that is worth buying. When asked where they got our name—you guessed it—from the person who came in with the trash heap I didn't want to take on! This is the basis of customer service and what builds traffic ALL the time. Customer service (and general kindness) ALWAYS pays rewards! Especially in tough times, people remember the kindness when times were not so tough. What will they remember about you? Was it your kindness? Was it your skills or your customer service—or both? In other words, what do you offer to get the customer back for a "more profitable visit?" ♦



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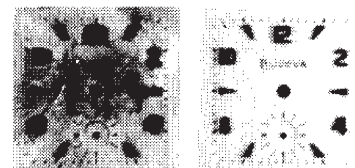
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| | |
|--------------------------------------|--------------------|
| Borel & Co., Jules | |
| (816) 421-6110 | inside front cover |
| Butterworth Clocks, Inc. | |
| (563) 263-6759 | 46 |
| Cas-Ker Co. | |
| (513) 674-7700 | 18 |
| Chronos/WJR | |
| (303) 296-1600 | 21 |
| ClockClassic.com | |
| www.clockclass.com | 33 |
| Clocks | |
| 011 44 131 331 3200 | 23 |
| Eckcells | |
| (800) 514-1270 | 4 |
| Horometer | |
| (954) 816-0006 | 31 |
| Livesay's, Inc. | |
| (813) 229-2715 | 7 |
| Maxell Corp | |
| (201) 794-5900 | back cover |
| Renata | |
| (214) 351-3800 | 9 |
| Richemont North America, Inc. | |
| (817) 785-2571 | 19 |
| Smith Supply House | |
| (213) 622-1687 | 22 |
| Twin City Supply | |
| (952) 545-2725 | 26 |
| Watch Around | |
| 041 32 725 43 29 | 40 |
| Witschi Electronic Ltd. | |
| 011 32 352 05 00 | 32 |

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